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User's Manual

Protector[®] ClassMate[®] Laboratory Fume Hoods

Models

Single Vertical-Rising Sash

1604041-xx Series, 4'

1605041-xx Series, 5'

1606041-xx Series, 6'

Single Vertical-Rising Sash with Auto Return

1604042-xx Series, 4'

1605042-xx Series, 5'

1606042-xx Series, 6'

Combination Sash

1604051-xx Series, 4'

1605051-xx Series, 5'

1606051-xx Series, 6'

To receive important product updates,
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Please read the User's Manual before operating the equipment.

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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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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 ClassMate Laboratory Fume Hood. Your Protector ClassMate is designed to protect you. It is the result of Labconco's commitment to developing high performance hoods with more than 60 years of experience of manufacturing fume hoods, and users like you suggested many of its features to us.

The Labconco Protector ClassMate Fume Hood has been engineered to provide maximum visibility in a classroom laboratory, and effectively contain toxic, noxious, or other harmful materials when properly installed and operating at OSHA approved "low flow" velocities as low as 60 feet per minute. The Protector ClassMate offers many unique features to enhance safety, performance and visibility and meets the definition of a SEFA™ high performance fume hood. 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: Theory of Operation 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 Your Fume Hood*, which describes your Protector ClassMate features so that you can use the hood efficiently.



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: Theory of Operation and Safety Precautions explains how the Protector ClassMate operates and the appropriate precautions you should take when using the fume hood.

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

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

Chapter 7: Modifying Your Protector ClassMate describes how to install the optional equipment on the fume hood.

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 ClassMate Components contains labeled diagrams of all of the components of the fume hoods.

Appendix B: Protector ClassMate Dimensions contains comprehensive diagrams showing all of the dimensions for the 4, 5 and 6 foot models of the laboratory fume hoods.

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

Appendix D: Protector ClassMate Accessories lists the part numbers and descriptions of all of the accessories available for your laboratory fume hood.

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

Appendix F: References lists the various resources available that apply to laboratory fume hoods.

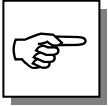
Appendix G: VAV ClassMate Open Area Guidelines to properly assess fume hood effective area whenever variable air volume (VAV) mechanical systems are installed.

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.
- 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 uppercase 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.

- A number icon precedes information that is specific to a particular model of laboratory fume hood. The 4' icon indicates the text is specific to the 4-foot wide model. The 5' icon indicates the text is specific to the 5-foot model. The 6' icon indicates the text is specific to the 6-foot model.


Chapter 1: Introduction



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



- The C icon indicates the text is specific to the 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: Theory of Operation and Safety Precautions*.

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

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

For information on making modifications to the configuration of your unit, go to *Chapter 7: Modifying Your Laboratory Fume Hood*.

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 location requirements for your installation site.
- The support requirements for your installation site.
- The exhaust requirements for your installation site.
- The electrical power requirements for your installation site.
- The service line requirements for your installation site.
- The space requirements for your installation site.

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

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



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.

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 locate the fume hood on a cart, dolly, or mobile bench. ALL Protector ClassMate installations must be permanent and stationary. The supporting structure usually consists of a base cabinet and chemically resistant work surface. See *Appendix D: Protector ClassMate Accessories*.

Ne pas placer la hotte sur un panier, chariot, ou banc mobile. Toutes les installations de protection camarade de classe doivent être permanents et fixes. La structure de support est généralement constitué d'une armoire de base et la surface de travail résistant aux produits chimiques. Voir Annexe D: Protector ClassMate accessoires.

Exhaust Requirements

The exhaust duct connection has been designed for 12" nominal pipe (12.75" OD) to allow for minimum static pressure loss while operating at 60-100 fpm face velocities. The 12" exhaust duct also allows for proper transport velocities away from the hood in the 1000 fpm to 2500 fpm range. It is acceptable to combine the air from two ClassMate hoods with a dual exhaust adapter that combines two exhaust outlets into one 12" (12.75" OD) nominal exhaust outlet. See *Appendix D: Protector ClassMate Accessories* and Chapter 7 for dual exhaust adapter. The proper exhaust volume and static pressure loss are listed next for each hood model:

			Total Exhaust at 18" Sash Opening 60% Open		Total Exhaust at 28" Sash Opening 100% Full Open	
Catalog Number	Standard Single-Rising Sash Model Description (115V)	Face Velocity	Exhaust Volume	Static Pressure Loss	Exhaust Volume	Static Pressure Loss
160404100	48" Hood without fixtures & duplexes, chain drive	60 fpm	295 CFM	0.07" H ₂ O	470 CFM	0.16" H ₂ O
160404200	48" Hood without fixtures & duplexes, chain drive, auto return	80 fpm	395 CFM	0.12" H ₂ O	625 CFM	0.28" H ₂ O
		100 fpm	495 CFM	0.18" H ₂ O	785 CFM	0.44" H ₂ O
160404102	48" Hood with 2 fixtures & 1 GFCI duplex, chain drive	60 fpm	295 CFM	0.07" H ₂ O	470 CFM	0.16" H ₂ O
160404202	48" Hood with 2 fixtures & 1 GFCI duplex, chain drive, auto return	80 fpm	395 CFM	0.12" H ₂ O	625 CFM	0.28" H ₂ O
		100 fpm	495 CFM	0.18" H ₂ O	785 CFM	0.44" H ₂ O
160504100	60" Hood without fixtures & duplexes, chain drive	60 fpm	375 CFM	0.08" H ₂ O	595 CFM	0.19" H ₂ O
160504200	60" Hood without fixtures & duplexes, chain drive, auto return	80 fpm	495 CFM	0.14" H ₂ O	795 CFM	0.35" H ₂ O
		100 fpm	625 CFM	0.22" H ₂ O	995 CFM	0.54" H ₂ O
160504102	60" Hood with 2 fixtures & 1 GFCI duplex, chain drive	60 fpm	375 CFM	0.08" H ₂ O	595 CFM	0.19" H ₂ O
160504202	60" Hood with 2 fixtures & 1 GFCI duplex, chain drive, auto return	80 fpm	495 CFM	0.14" H ₂ O	795 CFM	0.35" H ₂ O
		100 fpm	625 CFM	0.22" H ₂ O	995 CFM	0.54" H ₂ O
160604100	72" Hood without fixtures & duplexes, chain drive	60 fpm	465 CFM	0.10" H ₂ O	735 CFM	0.26" H ₂ O
160604200	72" Hood without fixtures & duplexes, chain drive, auto return	80 fpm	620 CFM	0.19" H ₂ O	980 CFM	0.46" H ₂ O
		100 fpm	775 CFM	0.29" H ₂ O	1225 CFM	0.72" H ₂ O
160604102	72" Hood with 2 fixtures & 1 GFCI duplex, chain drive	60 fpm	465 CFM	0.10" H ₂ O	735 CFM	0.26" H ₂ O
160604202	72" Hood with 2 fixtures & 1 GFCI duplex, chain drive, auto return	80 fpm	620 CFM	0.19" H ₂ O	980 CFM	0.46" H ₂ O
		100 fpm	775 CFM	0.29" H ₂ O	1225 CFM	0.72" H ₂ O

		Total Exhaust at 50% Open Sash Horizontally or Vertically		
Catalog Number	Combination Reduced Air Volume Sash Model Description (115V)	Face Velocity	Exhaust Volume	Static Pressure Loss
160405100	48" Combo Sash Hood without fixtures & duplexes, chain drive	60 fpm	245 CFM	0.04" H ₂ O
		80 fpm	325 CFM	0.08" H ₂ O
		100 fpm	405 CFM	0.12" H ₂ O
160405102	48" Combo Sash Hood with 2 fixtures & 1 GFCI duplex, chain drive	60 fpm	245 CFM	0.04" H ₂ O
		80 fpm	325 CFM	0.08" H ₂ O
		100 fpm	405 CFM	0.12" H ₂ O
160505100	60" Combo Sash Hood without fixtures & duplexes, chain drive	60 fpm	315 CFM	0.05" H ₂ O
		80 fpm	415 CFM	0.09" H ₂ O
		100 fpm	520 CFM	0.15" H ₂ O
160505102	60" Combo Sash Hood with 2 fixtures & 1 GFCI duplex, chain drive	60 fpm	315 CFM	0.05" H ₂ O
		80 fpm	415 CFM	0.09" H ₂ O
		100 fpm	520 CFM	0.15" H ₂ O
160605100	72" Combo Sash Hood without fixtures & duplexes, chain drive	60 fpm	385 CFM	0.07" H ₂ O
		80 fpm	510 CFM	0.12" H ₂ O
		100 fpm	635 CFM	0.19" H ₂ O
160605102	72" Combo Sash Hood with 2 fixtures & 1 GFCI duplex, chain drive	60 fpm	385 CFM	0.07" H ₂ O
		80 fpm	510 CFM	0.12" H ₂ O
		100 fpm	635 CFM	0.19" H ₂ O

Proper blower selection can be determined from these exhaust requirements and the total system static pressure loss. Consult Labconco at 800-821-5525 or 816-333-8811 if you need help sizing a blower. Refer to *Appendix G: VAV ClassMate 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.

Electrical Requirements

The Protector ClassMate Hood models feature internal wiring for the LED light assembly and light switch. All hood models with 115V, 60 Hz duplex outlets are terminated at the internal boxes for hook-up by a qualified electrician. The blower switch, and light switch wires are also terminated at the internal boxes for hook-up by a qualified electrician. Refer to *Chapter 3: Getting Started* and *Appendix C: Protector ClassMate Specifications* for the wiring diagram for proper electrical installation. All models have 115 VAC, 60 Hz, 15 Amp requirements.

Les modèles Protector ClassMate capot disposent câblage interne pour l'ensemble d'éclairage LED et interrupteur. Tous les modèles de la hotte avec 115V, 60 Hz prises doubles sont terminés dans les boîtes internes pour branchement par un électricien qualifié. L'interrupteur de la soufflerie, et fils de l'interrupteur de lumière sont également mis fin aux boîtes internes pour branchement par un électricien qualifié. Reportez-vous au Chapitre 3: Mise en route et à l'Annexe C: Spécifications Protector camarade de classe pour le schéma de câblage pour l'installation électrique appropriée. Tous les modèles ont 115 VAC, 60 Hz, 15 exigences d'amplis.

Service Line Requirements

All service lines to the laboratory fume hood should be 1/4" OD, copper (brass for 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. The supply lines shall be installed from above/under the hood and terminated at the valves by a qualified contractor.

Space Requirements

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

Your Next Step

After you have determined that the location you have selected accommodates the installation and operational requirements of your fume hood, you are ready to begin installation. Proceed to *Chapter 3: Getting Started*.

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 ClassMate Hood.
- Set up the fume hood with the supporting structure and work surface.
- Connect to an exhaust system.
- Connect the electrical supply source.
- Connect the service lines.
- Sealing the Protector ClassMate Hood.
- Arrange certification of your Protector ClassMate 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.



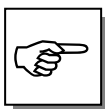
The Protector ClassMate models weigh between 400 – 700 lbs. (182-318 kg). The shipping skid allows for lifting with a mechanical lift truck or floor jack. If you must lift the fume hood manually, use at least six (6) people and follow safe-lifting guidelines. Normally, the fume hood can slide off a hydraulic lift and be placed into position on top of the work surface.

Les modèles de protection camarade de classe pèsent entre 400 à 700 livres. (182 à 318 kg). La palette d'expédition permet de levage avec un chariot élévateur mécanique ou prise de parole. Si vous devez soulever la hotte manuellement, utilisez au moins six (6) personnes et suivre les directives safe-levage. Normalement, la hotte peut glisser un ascenseur hydraulique et être placé en position au-dessus de la surface de travail.

Unpacking Your Laboratory Fume Hood

Carefully remove the shrink-wrap 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.

The 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 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.

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.

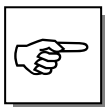
Do not remove the fume hood from its shipping skid until it is ready to be placed into its final location. Move the unit by placing a flat, low dolly under the shipping skid, or by using a floor jack.



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

Ne déplacez pas le capot en l'inclinant sur un camion de main.

Removing the Shipping Skid



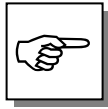
LEAVE THE FUME HOOD ATTACHED TO ITS SHIPPING SKID UNTIL IT IS AS CLOSE TO ITS FINAL LOCATION AS POSSIBLE. MOVE THE HOOD BY USING A SUITABLE FLOOR JACK, OR BY PLACING A FURNITURE DOLLY UNDERNEATH THE SKID. DO NOT MOVE THE HOOD BY TILTING IT ONTO A HAND TRUCK.

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 concealed screws at the top. Then lift off the side panels.
2. Find the hardware (lag screws, etc.) that attach the fume hood to the skid and remove the hardware.

Sash Weight Release

To protect the fume hood from damage in shipment, the sash weights have 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 operating the sash.



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

Install the Protector ClassMate Hood on a Supporting Structure and Work Surface



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

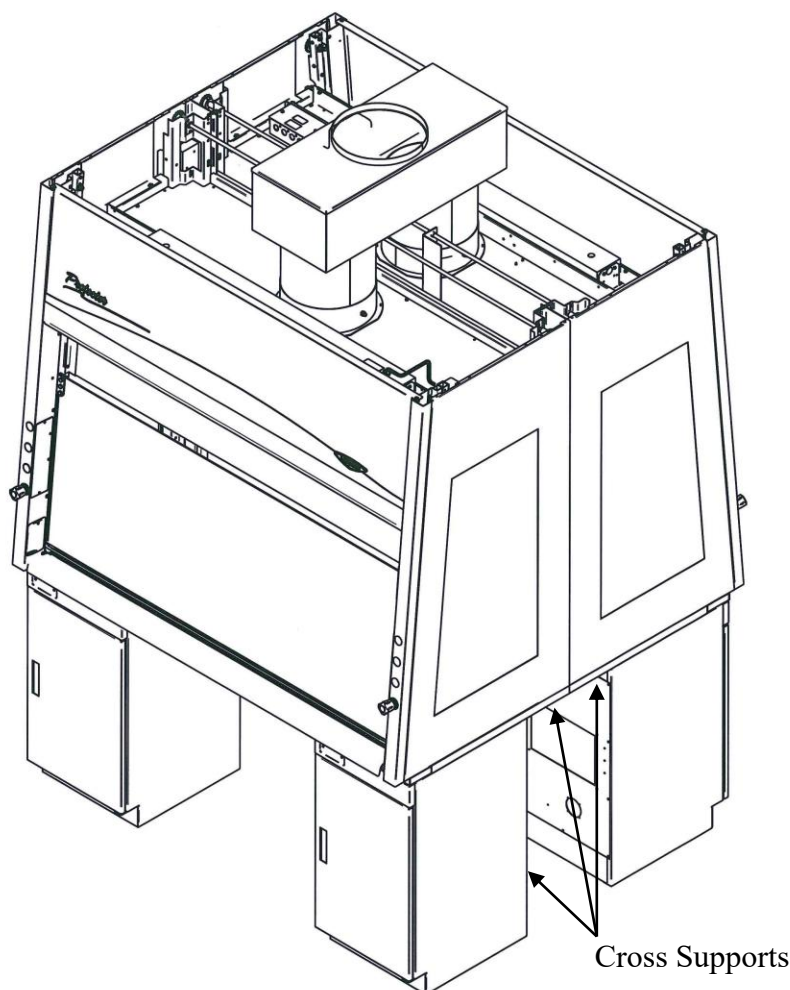
Le camarade de Protector est lourd! Soyez prudent lorsque vous soulever ou déplacer l'appareil.

When installing the Protector ClassMate Fume Hood onto a chemically resistant work surface or benchtop, ensure that the structure can safely support the combined weight of the fume hood and any related equipment. The work surface should be at least as wide as the unit and 25-7/8 inches deep to properly support the unit. For set-up, see Figure 3-1, Figure 3-2, Figure 3-6 and Appendix B for dimensional information.



WARNING: It is important to support the rear of the hood. Prior to setting the hood, install the cross supports after the base cabinets and work surface are leveled. The wood cross support provides support for the bottom of the work surface.

ATTENTION: Il est important de soutenir l'arrière de la hotte. Avant de mettre le capot, installer les supports transversaux après les armoires de base et la surface de travail sont nivelées. Le support transversale du bois fournit un support pour le fond de la surface de travail.

**Figure 3-1**

The following are instructions for mounting a 2 x 4 cross support:

1. Level the base cabinets and the work surface.
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. Place the hood on top of the work surface and cross support.

The work surface should be smooth and durable, and made from a chemically resistant epoxy resin. The surface should be nonporous and resistant to the acids, solvents, and chemicals used in conjunction with the Protector ClassMate Fume Hood. The work surface should also contain a spillway for containing primary spills.

See *Appendix D: Protector ClassMate Accessories* for the work surfaces, and storage cabinets.

Connecting to the Protector ClassMate 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 unit may occur.

AVERTISSEMENT: Le poids du système de conduits d'échappement doit être pris en charge indépendamment de la superstructure de la hotte. Ne laissez pas ce poids à supporter par la structure de capot d'endommager l'appareil peut se produire.

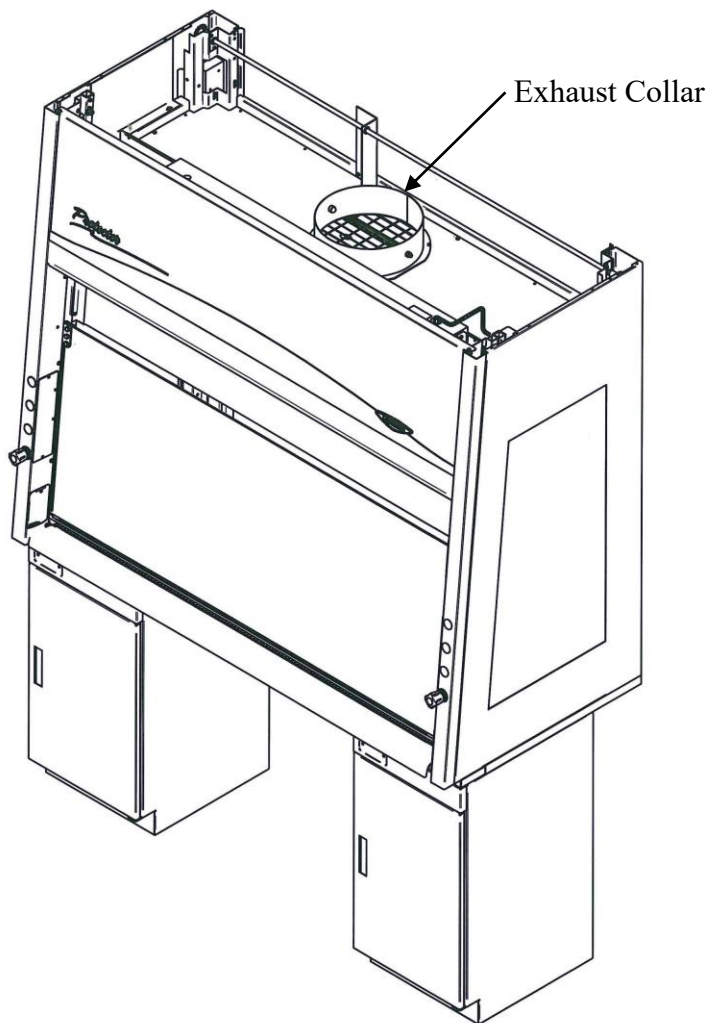
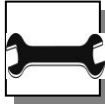


Figure 3-2

Chapter 3: Getting Started



The exhaust connection should be installed by a qualified HVAC contractor.

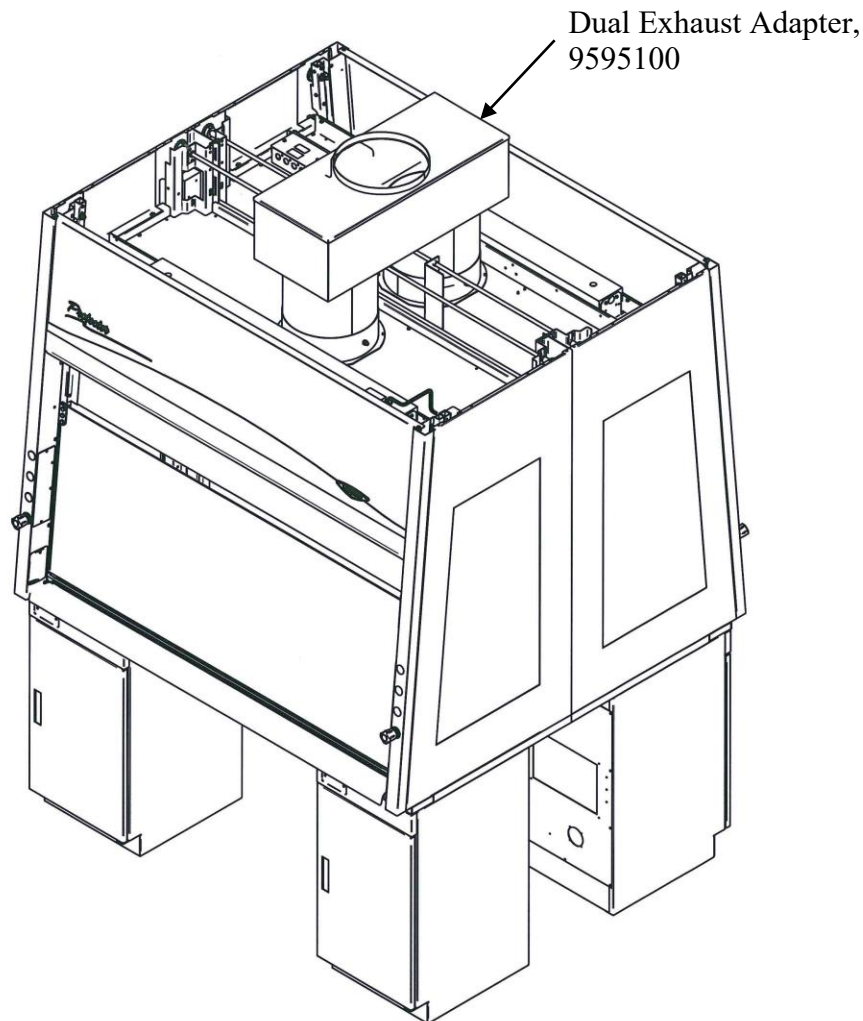


Figure 3-3



The exhaust connection on your hood has been designed for 12" nominal pipe (12.75" OD) to allow for minimum static pressure loss with proper transport velocities away from the hood. It is acceptable to combine the air from two back-to-back hoods with a 12" x 12" x 12" dual exhaust adapter that combines two 12" nominal exhaust outlets into one 12" (12.81" ID) nominal exhaust outlet. See *Appendix D: Protector ClassMate Accessories* for dual exhaust adapter. Refer to exhaust requirements in *Chapter 2: Exhaust Requirements* on exhaust volumes for your model to properly size the blower. Refer to Appendix B, Figure B-2 for Dual Exhaust Adapter installed dimensions. Consult Labconco Sales Engineering Team should you require help sizing your blower for the exhaust volume and total system static pressure loss.

Le raccord d'échappement de votre hotte a été conçu pour un tuyau nominal de 12" (12.75" OD) pour permettre une perte de pression statique minimale avec des vitesses de transport appropriées loin de la hotte. Il est acceptable de combiner l'air de deux capots dos à dos avec un adaptateur d'échappement double 12" x 12" x 12" qui combine deux sorties d'échappement nominales de 12" dans une sortie d'échappement nominale de 12" (12.81" ID). Voir Annexe D: Protecteur ClassMate Accessoires pour adaptateur d'échappement double. Reportez-vous aux exigences relatives aux gaz d'échappement du Chapitre 2: Exigences d'échappement sur les volumes d'échappement pour que votre modèle dimensionne correctement le ventilateur. Reportez-vous à l'annexe B, Figure B-2 pour les dimensions installées de l'adaptateur de sortie double. Consultez l'équipe de Labconco Sales Engineering si vous avez besoin d'aide pour dimensionner votre soufflante pour le volume d'échappement et la perte de pression statique totale du système.

Connecting the Electrical Supply Source to the Protector ClassMate Fume Hood

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



WARNING: The building electrical supply system for Protector ClassMate Hoods should include overload protection. A switch or circuit breaker should 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. Do not position the unit so that it is difficult to operate the main disconnect device.

AVERTISSEMENT: Le système d'alimentation électrique du bâtiment pour le protecteur ClassMate Cagoules devrait inclure la protection de surcharge. Un interrupteur ou disjoncteur doit être à proximité de l'équipement et à portée de main de l'opérateur. L'interrupteur ou le disjoncteur doit être marqué comme dispositif de déconnexion de l'équipement. Ne pas placer l'appareil de sorte qu'il est difficile de faire fonctionner le dispositif de déconnexion principal.

Chapter 3: Getting Started

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 remote blower style Protector ClassMate Hood is fully wired internally for 115 Volt, 50/60 Hz, 20 Amp electrical service or 230 Volt, 50/60 Hz, 10 Amp electrical service. The number of circuits varies depending on the model. The Protector ClassMate Hood models do not feature internal wiring or electrical components excluding the LED light assembly. All of the hood's 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). The single point internal junction box is used for connection of the lights, blower and electrical outlets. Refer to the wiring diagram for your Protector ClassMate in *Appendix C: Protector ClassMate 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. Ensure 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 XStream in *Appendix C: Protector ClassMate Specifications*.

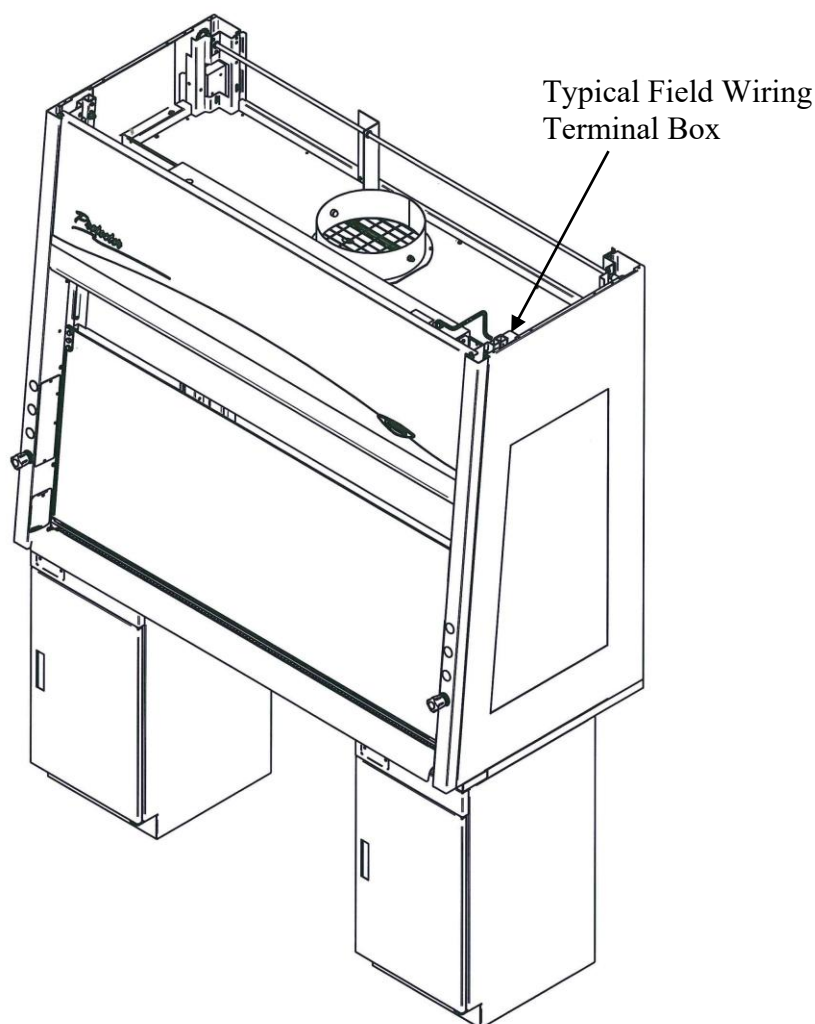


Figure 3-4



All wiring for the enclosure **MUST** be performed by a licensed electrician and conform to all local and national electrical 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 pour l'enceinte **DOIT** être effectué par un électricien agréé et conforme à tous les codes électriques locaux et nationaux. Dans la plupart des cas, le capot ne nécessiter l'utilisation d'un conduit blindé pour protéger le câblage dans la hotte. La connexion de mise à la terre ne doit pas être fait à la couverture de la boîte à bornes.

Chapter 3: Getting Started

The LED light has been mounted outside the top liner panel assembly and is sealed from any vapors used inside the hood structure. To change the LED light bulbs in your hood, you must first remove the front panel from the hood. Next remove the screws holding down the light reflectors. Remove the light reflectors and slide them away temporarily. The LED light assembly is now fully exposed and ready for service. While the fixture is in this position, replace the defective bulbs, and reassemble.

Connecting the Service Lines to the Protector ClassMate Fume Hood

The hoods with service fixtures have been fully plumbed for up to eight valves (four valves per side) on the hood for your installation convenience. Supply tubing shall be provided by the qualified contractor. Tubing is to extend through the work surface or from the top to make connections to the individual supply lines in your facility.

On fixtured models, one of the two fixtures is pre-plumbed on the left for cold water (CW) using 1/4" copper tubing between the valve, and hose connector. The second right hand position fixture is pre-plumbed using 1/4" brass tubing between the valve, and hose connector for use with natural gas (GAS). Optional air (AIR) and vacuum (VAC) knobs and hose connectors are provided on fixtured models to change service.



Figure 3-5

To install the supply tubing, follow these steps:

1. Remove the valve service plate and outer side panels by loosening their individual screws. The valve body and service areas will now be fully exposed.
2. Ensure that the tubing is 1/4" outside diameter, soft metal, and that the end has been deburred completely. (See *Service Fixtures* in Appendix D to order 5.5' of supply tubing 4889900 or 4921100 gas. Other exact sizes of inlet tubes are listed in Appendix D.)
3. Route the tubing from under the fume hood through the slot in the work surface or from the top down to the service fixture. If needed, use 1/4" bulkhead fittings(s), 1449500 to connect the supply lines at the junction. These fittings are listed in Appendix D.



Make sure that the tube routing will not contact any electrical wires.

Assurez-vous que le routage de tube ne communiquera pas avec les fils électriques.

4. Make sure that the tube fitting on the valve is loose, but do not remove it. Look inside the fitting to make sure the tube ferrules are there.
5. Push the tube into the fitting until it is properly seated. The tube will go approximately 3/4 inch into the fitting.
6. Tighten the tube fitting hand tight and then using a 7/16 inch wrench, tighten it at least 3/4 turn more, but most of the time, tighten 1-1/4 turns more.
7. Close the service valve in the Protector ClassMate Fume Hood and then slowly open the shutoff valve on the service line.



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

NOTE: Inspectez tous les raccords pour les fuites. Serrer l'écrou du tube légèrement si nécessaire.



CAUTION: Do not use oxygen with service fixtures as supplied with this hood. Contact Labconco for oxygen fixture information and refer to Appendix D.

ATTENTION: Ne pas utiliser de l'oxygène avec des installations de service, tel que fourni avec ce capot. Communiquez avec Labconco pour obtenir des renseignements sur les appareils à oxygène et consultez l'annexe D.

Chapter 3: Getting Started

Should access to the hood plumbing fixture bodies be required, remove the individual valve service plates on the corner covers by loosening their individual screws. 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
- Vacuum



WARNING: Contact Labconco Corporation directly before using any service other than those listed above in these valves to assure full compatibility. Refer to Appendix D.

AVERTISSEMENT: Contact Labconco Corporation directement avant d'utiliser tout service autre que ceux énumérés ci-dessus dans ces vannes pour assurer une compatibilité totale. Voir l'annexe D.



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.

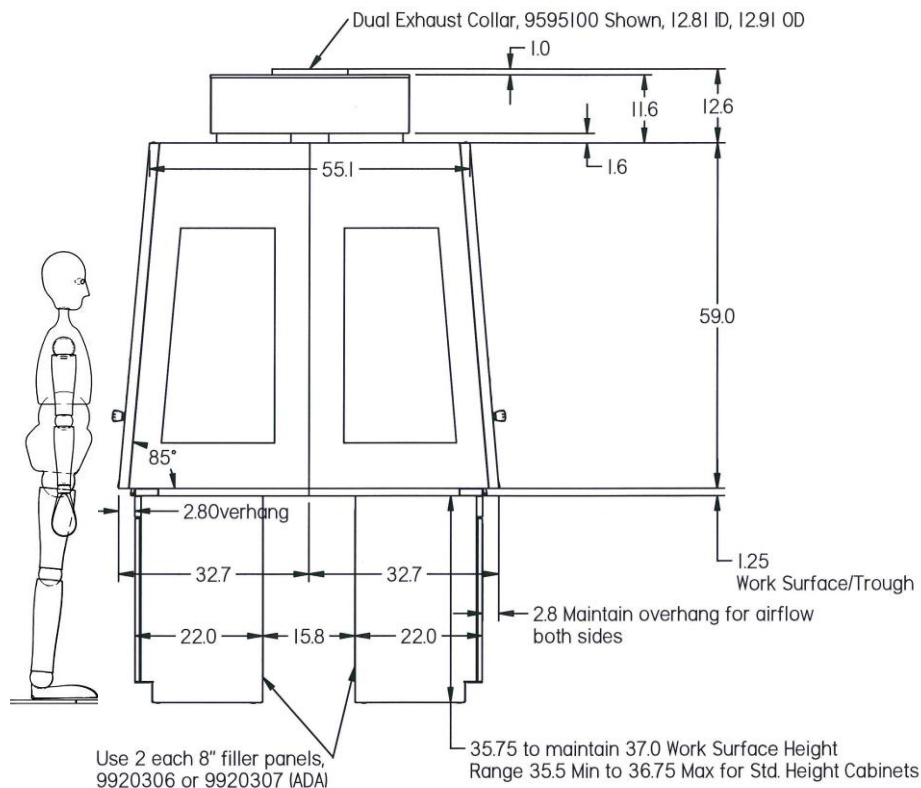
ATTENTION: Le gaz naturel doit être utilisé que dans le dispositif de service qui a été pré-aplomb avec un tube de laiton. La teneur en soufre du gaz pourrait entraîner une détérioration de canalisations d'alimentation en cuivre standard.

Sealing the Protector ClassMate Hood

When the hood has been set in place, ducted, wired, and plumbed, it should be sealed at the work surface. The sealing of the hood structure to the work surface will prevent spilled materials from collecting under the walls of the hoods. Materials such as silicone sealants may be used to seal the hood structure.

Certifying the Protector ClassMate Fume Hood

The combination of your laboratory hood, exhaust ductwork, and exhaust blower enables you flexibility to change the airflow generated across the sash opening on the hood. To determine the actual face velocity through 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. Labconco recommends an average face velocity through the fume hood opening of 60 to 100 feet per minute. Reference airflows for your particular model in *Chapter 2: Exhaust Requirements*.



Note: Overhang increases to 4.0 on Intelli-Sash - ClassMate Only. See Figure B-3.

Figure 3-6

Your Protector ClassMate Fume Hood has been certified per ASHRAE 110-1995. In this procedure Labconco tests the “as manufactured” hood for average face velocity readings, smoke visualization, and tracer gas containment readings less than 0.05 part per million (PPM) with a mannequin. For “field use” ASHRAE testing contact Labconco for a certified on-site contractor.



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

REMARQUE: les profils de vitesse du visage et des tests de fumée doivent être effectués régulièrement pour garantir un fonctionnement fiable appropriée.

Your Next Step

After your Fume Hood has been installed and certified, you are ready to proceed to *Chapter 4: Performance Features*.

CHAPTER 4

PERFORMANCE FEATURES

AND SAFETY PRECAUTIONS

Performance Features

The Protector® ClassMate High Performance Laboratory Hood is designed to meet the needs of the science instructor, and provide superior containment while conserving energy at OSHA approved “low flow” velocity as low as 60 feet per minute. The Protector ClassMate meets the SEFA™ definition of a high performance fume hood. Clear back and sides and taller front viewing window provide enhanced visibility for the instructor conducting chemistry demonstrations or observing students using the hood. The ergonomic inclined front promotes additional visibility into the laboratory. The clear back also does not obstruct visibility when hoods are placed back-to-back in an island configuration. A fully featured high performance fume hood with baffle and air foil, this by-pass hood maintains safe airflow with or without sash opening restriction that further conserves energy. The Protector ClassMate Hood is offered in 4', 5', and 6' widths. Additional energy saving Combination Sash models are also available. The hood features by-pass airflow design that promotes full containment as the sash is moved. Airflow is diverted behind the front and under the air foil to help control fluctuations in face velocity, which occur as the sash is closed.

The major components in Protector ClassMate Laboratory Hoods are outlined as follows and in Figure 4-1, and Figure 4-1A:

1. **Clear, tempered safety glass sides, back and baffle provide maximum visibility.** All glass components except sashes are removable for cleaning. Visibility up to 45" on sides and back.
2. **Unique sash provides maximum visibility of 37.5" high while conserving energy.** Vertical-rising sash may be raised from a closed to

- 18" or 28" operating height. See Chapter 2 for exhaust volume, static pressure, and blower sizing.
3. **Anti-racking shaft** provides smooth vertical sash movements.
 4. **By-pass airflow design** ensures containment as the sash moves.
 5. **Large usable interior work depth of 25" and interior height of 48"** provide ample working space.
 6. **High performance baffle** directs airflow to the rear of the interior to provide efficient airflow. The baffle may be removed or pivoted down for cleaning purposes only.
 7. **Tissue screen** located directly below the exhaust outlet prevents debris from potentially damaging the remote blower.
 8. **Interior cover plates, corner post access plates, and outer side panels** are removable for easy access to plumbing and sash weights.
 9. **Lift-away front panel** provides easy access to electrical wiring, sash weights, and lighting fixtures.
 10. **Energy efficient LED lighting** is located behind a tempered safety glass shield mounted to the top of the hood interior. LED T8 direct wired bulbs provide long lasting 50,000 hour life and are more energy efficient, utilizing approximately $\frac{1}{2}$ the power of fluorescent bulbs (see Appendix A). The factory wired light is serviceable from outside the hood cavity.
 11. **Low mounted, factory wired light and blower switches** are ADA compliant.
 12. **Ergonomic air foil** allows air to sweep work surface for maximum containment and provide a Patented Clean Sweep™ on the upper surface to provide maximum containment required for high performance.
 13. **Low profile trough** below the air foil contains spills. The trough is the same depth as the work surface (1.25") and requires no cabinet overhang.
 14. **Streamlined corner posts** provide maximum visibility.
 15. **All hoods are factory prepared for up to 8 service fixtures** that are remotely controlled and can be used regardless of sash position. Consult Labconco and see Appendix D.
 16. **GFCI Duplex electrical receptacles** are mounted on the inner corner posts to allow convenient and safe connections. Receptacles are factory wired to hood field wired junction box.
 17. **Shipped fully assembled** and eliminates the need for costly onsite assembly.
 18. **Accessory Airflow Monitor** continuously monitors face velocity. An audio/visual alarm alerts the user to low airflow conditions. The corner post can be factory prepared to accommodate the Guardian Digital Airflow Monitor or Guardian Airflow Monitor (sold separately), see Chapter 7 and Appendix D.

Chapter 4: Performance Features & Safety Precautions

19. **Optional Sash Models.** See Figure 4-1, cover, and Chapter 2. Sashes are offered in smooth anti-racking chain, auto-return, or combination vertical rising and horizontal sliding.
20. **Aerodynamic containment-enhancing sash handle** includes a perforated air passage directly atop the handle to bleed air into the hood chamber and direct chemical concentrations away from the user breathing zone. The large radiused handle sweeps airflow into the hood with minimal turbulence.
21. **Frame of powder-coated steel and aluminum** is durable and corrosion resistant.
22. **Exhaust Connection.** The hood features 12" (12.75" OD pipe) molded 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. Dual exhaust Adapter is sold separately. See Chapter 3, Chapter 7 and Appendix D.
23. **Accessory SpillStopper™ Work Surface** is solid epoxy and dished to contain spills. Work surface is sold separately. See Appendix D.
24. **Upper By-pass (not shown)** provides by-pass air from above the work area and works to bathe the hood interior with clean air and reduces chemical fumes along the sash plane, near the critical breathing zone. The upper by-pass works well with both constant airflow volume (CAV) or variable airflow volume (VAV).

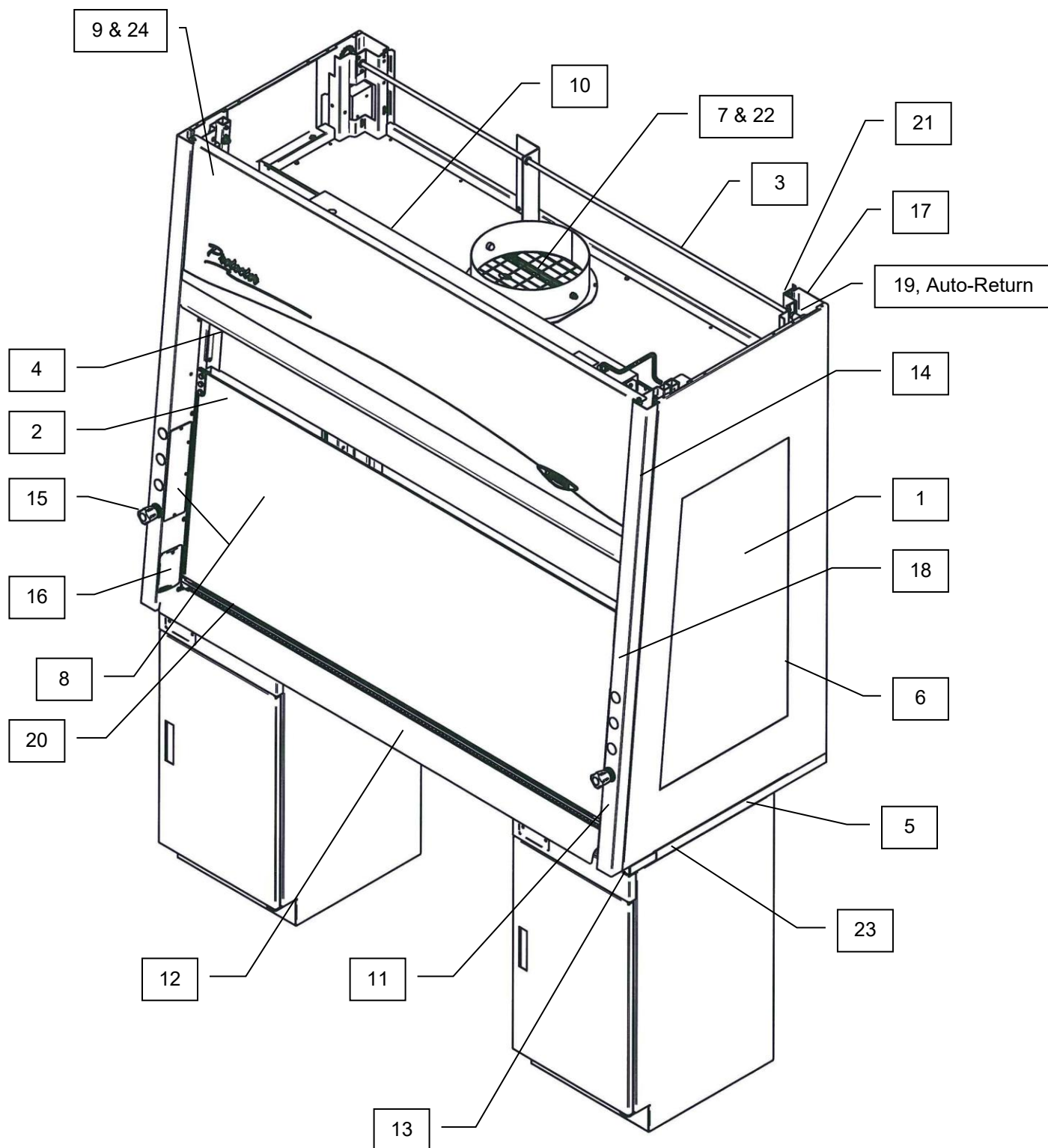


Figure 4-1

Chapter 4: Performance Features & Safety Precautions

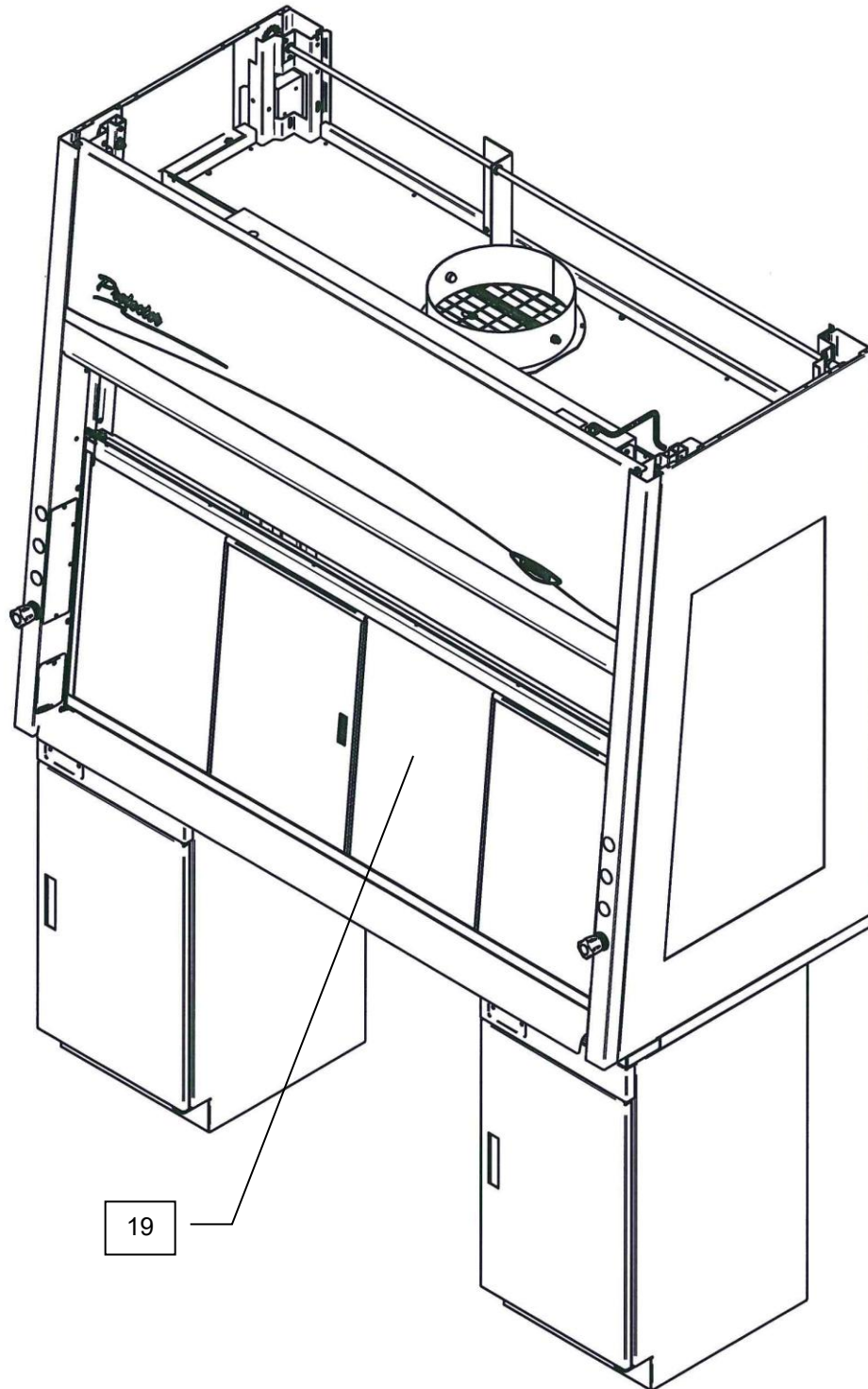


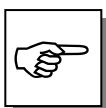
Figure 4-2

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 the proper velocity of 60-100 fpm.

Bien que la hotte de laboratoire a été conçu pour maintenir une sécurité optimale de l'opérateur, la prudence doit toujours être utilisé tout en travaillant dans la hotte. Avant d'utiliser le capot, vérifiez que le ventilateur d'échappement fonctionne et que l'air entre dans le capot à la vitesse appropriée de 60-100 fpm.



USE GOOD HOUSEKEEPING IN THE HOOD AT ALL TIMES. CLEAN UP SPILLS IMMEDIATELY. PERIODICALLY CLEAN HOOD INTERIOR, INCLUDING LED 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, PLACE THE OBJECT ON A BLOCK UP 2" TO 3" TO ALLOW A FLOW OF AIR UNDER THE OBJECT AND INTO THE LOWER REAR BAFFLE EXHAUST SLOT OF THE HOOD. ENSURE BLOCKS ARE LEVEL AND SET IN PLACE.



Blocking the bottom of the baffle at 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).

Le blocage de la partie inférieure de la chicane à l'arrière du capot va changer le modèle d'écoulement d'air dans la hotte provoquant une turbulence et une fuite possible à la face du capot. (Ne pas entreposer les contenants ou des fournitures contre chicanes, car cela aura une incidence sur le débit d'air à travers le capot).

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

Chapter 4: Performance Features & Safety Precautions

Evitez de placer votre tête dans le capot. Gardez les mains sur le capot autant que possible.

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

Toujours travailler aussi loin dans le capot que possible. Il est préférable de garder tous les produits chimiques et appareils 6" à l'intérieur de l'avant du capot.

This hood has not been built with explosion proof components. Therefore, use of flammable or explosive materials in quantities above the explosive limit are not recommended. (Consult with Labconco).

Cette hotte n'a pas été construit avec des composants antidéflagrants. Par conséquent, l'utilisation de matériaux inflammables ou explosives dans des quantités supérieures à la limite d'explosion ne sont pas recommandés. (Consultez Labconco).

Do not work with or store chemicals in this hood without the exhaust system running. Do not store chemicals in a fume hood.

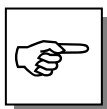
Ne pas travailler avec ou magasin de produits chimiques dans la hotte sans que le système d'échappement en marche. Ne pas stocker des produits chimiques sous une hotte aspirante.

Perchloric acid use in this hood is prohibited.

Utilisation de l'acide perchlorique dans cette hotte est interdite.

High-level radioisotope materials are prohibited for use in this hood.

Matériaux de radio-isotopes de haut niveau sont interdits d'utilisation dans la hotte.



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 ClassMate Laboratory Hood should be certified by a qualified certification technician before its initial use. The hood should be re-certified whenever it is relocated, serviced or at least annually thereafter.

Le Protecteur du ClassMate Laboratoire capot doit être certifié 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 unit 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.

Assurez-vous que l'appareil 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 le capot du service électrique.

Proper operation of the fume hood depends largely upon the hood's location and the operator's work habits. Consult the *Prerequisites Chapter 2, Installation Chapter 3, and Using your Hood Chapter 5.*

Le bon fonctionnement de la hotte dépend largement de l'emplacement de la hotte et les habitudes de travail de l'opérateur. Consultez le Prérequis Chapitre 2, Installation Chapitre 3, et l'aide de votre capot Chapitre 5.

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 4: Performance Features & Safety Precautions



Do not touch the blower motor. The surfaces of the motor can become hot and could cause burns.

Ne pas toucher le moteur de soufflerie. Les surfaces du moteur peuvent devenir chaudes et pourrait causer des brûlures.



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.



To prevent the possibility of minor injury keep hands and fingers clear of sprockets at the top of the four corners.

Pour éviter les risques de blessures mineures garder les mains et les doigts de pignons en haut de la quatre coins.

Your Next Step

After you understand the theory of operation and safety precautions, you are ready to proceed to *Chapter 5: Using Your Protector ClassMate Fume Hood*.

CHAPTER 5

USING YOUR PROTECTOR CLASSMATE FUME HOOD

S

Operating the Vertical-Rising Sash

Because of the Protector ClassMate's counterbalanced, anti-racking 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 vertical-rising sash may be raised from a closed to 28" operating height or to 18" operating height where it bumps the sash stop. See Chapter 2 for airflows. Optional models with auto-return to 18" are available.

C

Operating the Combination Sash

Some hood models have additional energy-saving combination sashes in place of vertical-rising sashes. These combination sashes allow the operator to use the hood with sashes either half open horizontally or vertically to conserve energy. The horizontal sashes are used in normal operating mode. An optional integral sash stop prevents raising the vertical sash above the half-open position unless manually defeated by the operator. The airflow requirements are sized for the 50% horizontal open sash condition. See Chapter 2 for airflow requirements.

S

Operating the Blower

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

C

S**C**

Operating the Lights

Your Protector ClassMate Fume Hood utilizes a factory wired LED light to illuminate the hood interior. Simply turn the light switch to “ON” to operate

Working in your Protector ClassMate 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 LED 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.
- Do not obstruct the front air foil (sill), or rear baffle slots.
- Large objects should not be placed close together. Larger objects should be spaced above the work surface 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.

Shutdown

- Turn off the LED light and close the sash.

Your Next Step

After you understand how to operate and work in the fume hood, you are ready to proceed to *Chapter 6: Maintaining Your Protector ClassMate Fume Hood*.

CHAPTER 6

MAINTAINING YOUR

PROTECTOR CLASSMATE

FUME HOOD

Now that you have an understanding of how to work in the fume hood, 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.
- 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, 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.



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.

Chapter 6: Maintaining Your Protector ClassMate

- 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 LED lamps if needed.
- Remplacer les lampes LED, si nécessaire.
- Have the fume hood recertified by a qualified certification technician. See “Certifying the Protector ClassMate Fume Hood” in *Chapter 3*.
- Recertifier la hotte aspirante par un technicien agréé en certification. Voir Certifier le Protecteur ClassMate Fume Hood au chapitre 3.
- 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, chains and sprockets.

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.

S

Changing the Lamp:

C

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 the 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 YOUR PROTECTOR CLASSMATE FUME HOOD

There are several ways to modify the fume hood for your individual requirements. These include the addition of service fixtures, exhaust adapter, air monitor, distillation grids, and electrical duplex outlets. See *Appendix D: Protector ClassMate Accessories* to order.



Installing Work Surfaces

The work surface used for the ClassMate Flush Foil has precise dimensions for optimal performance. Contact Labconco Customer Service and see Appendix D for ordering information.



Installing Additional Service Fixtures

Additional service fixtures can be installed in the four available service fixture holes in both side walls. If the service line pressure exceeds 40 PSI, it must be equipped with a pressure regulator to reduce the line pressure. Please use the appropriate instructions for the appropriate valves. See *Appendix D: Protector ClassMate Accessories* to order.



Service Fixtures

1. Decide on the locations you want to install the service fixture and outlet fitting and remove the hole plugs, and appropriate access panels. Refer to Figure 3-5 in Chapter 3 and Appendix D.
2. Mount the Valve through the hole and tighten with the supplied nut. Mount the knob, lens, and label underneath the lens.
3. On the hood inside, mount the Bulkhead Union or Outlet Connector on the sidewall hole and tighten the supplied nut and lockwasher if applicable.
4. Connect one end of the Outlet Service Tube to the Bulkhead Union Tube fitting by pressing the tube all the way into the fitting, and through the two ferrules turning the tubing nut hand tight, and then approximately one more 1-1/4 turn using pliers or a 9/16" wrench.

Chapter 7: Modifying Your Protector ClassMate

5. Connect the other end of the Outlet Service Tube to the bulkhead fitting and then to the Valve fitting by pressing the tube all the way into the fitting and through the two ferrules turning the tubing nut hand tight, and then approximately one more 1-1/4 turn using pliers or a 9/16" wrench. Note the flow direction on the valve.
6. Connect the Supply Service Tube between the source and the Bulkhead Fitting/Valve fitting by pressing the tube all the way into the fitting and through the two ferrules turning the tubing nut hand tight, and then approximately one more 1-1/4 turn using pliers or a 9/16" wrench. (Order P/N 4889900 or 4921100 (Gas) for 5.5' of supply tubing). See Appendix D for exact supply tubes.
7. If applicable, Apply PTFE tape P/N 1485700 to the Bulkhead Fitting and tighten the appropriate colored Plastic Hose Connector with a wrench. If fitting is metal, then ignore this step.
8. Make sure the valve service fitting is turned off before pressurizing the service line. Once pressurized, check the valve body, connectors, and fittings for leaks. Tighten any leaking joints.



Installing Exhaust Adapter for Back to Back Hoods

The common exhaust adapter P/N 9595100 allows you to duct two back-to-back Protector ClassMate Fume Hoods from two 12" (12.75" OD pipe) exhaust stacks to one 12" (12.75" OD pipe) exhaust stack (see Figure 7-1). See Appendix B for dimensions.

- Step 1. Simply place the adapter on both hood exhausts and seal with silicone sealant.
Step 2. Attach the 12" (12.75" OD) pipe to your blower exhaust.

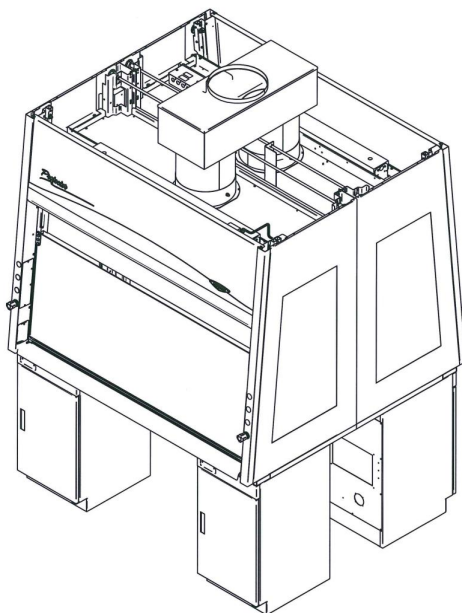


Figure 7-1



Installing Airflow Monitors

The Airflow Monitor allows you to continuously monitor face velocity through the fume hood opening. The airflow monitors mount to the right corner post. (See Appendix D to order)



Distillation Grids – Field Installation

Location – Standard Mounting

The distillation grids P/N's 6973300, 6973301, and 6973302 have vertical rod center lines at a distance of 4" in front of the lower baffle and middle baffle. The distillation grids allow the hood user to mount motors, stirrers, and other apparatus.

	Description	Model No.
4'	Hood Distillation Grid Kit	6973300
5'	Hood Distillation Grid Kit	6973301
6'	Hood Distillation Grid Kit	6973302

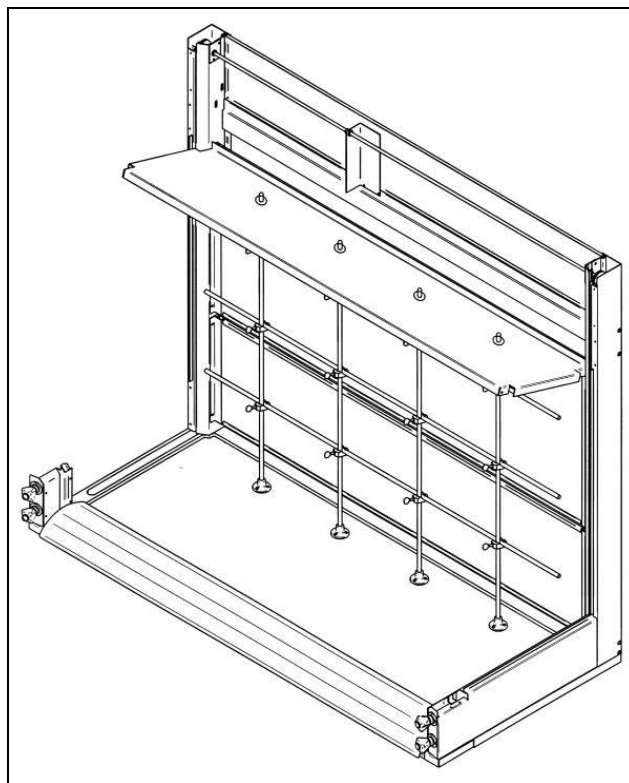


Figure 7-2

Chapter 7: Modifying Your Protector ClassMate

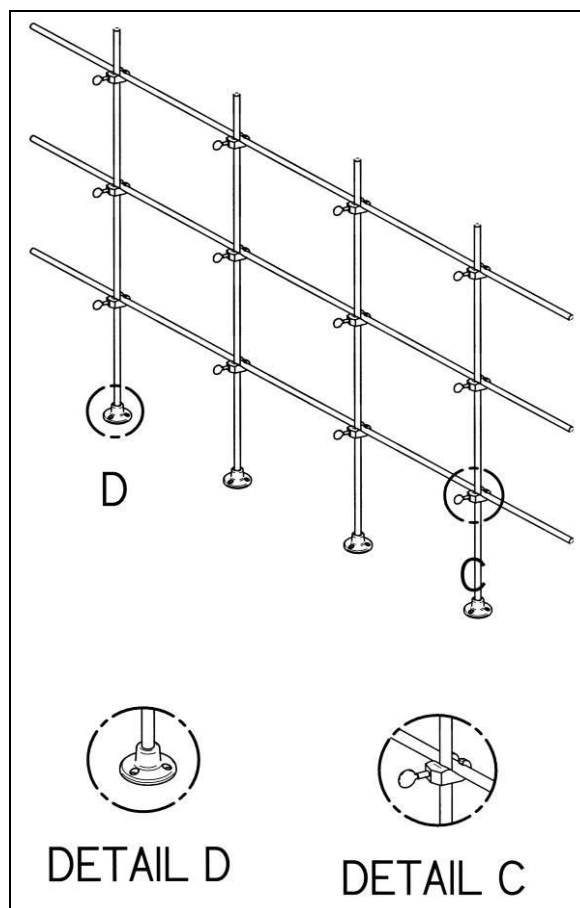


Figure 7-3

1. Remove the hole plugs and install the grommets into the upper baffle.
2. The vertical rods can now be systematically installed in front of the horizontal rods. The bottom of the rods slip into the footplates, which rest on the work surface. Tighten the clamping screws on the footplates. For support you need to drill .147 diameter pilot holes and mount the footplates that rest on the work surface. Use the additional #8 thread forming screws in the kit to mount the footplates to the work surface. Another alternative is to secure the footplates to the work surface with clear RTV sealant.
3. Install all the hook connectors, which connect all the vertical rods to the horizontal rods, then install the horizontal rods. Please note that all the vertical rods are in **front** of the horizontal rods. Simply tighten all the thumbscrews on the hook connectors.
4. The installation is now complete and is ready to mount your apparatus.



Installing Ceiling Enclosures Above the Fume Hood

Your Protector ClassMate Fume Hood requires a ceiling enclosure to close off the area between the top of the hood and the ceiling, see Appendix D. Other special sizes are available upon request. Contact Labconco Customer Service for ordering information.



Installing Rear Panels Behind the Fume Hood

Your Protector ClassMate Fume Hood can be modified to add a rear panel behind the fume hood when the fume hood is placed on an island, see Appendix D. Contact Labconco Customer Service for ordering information.



Installing an Electrical Receptacle Outlet

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

Votre Protector ClassMate des hottes peut être commandé avec sorties de réceptacle, cependant, si vous avez commandé un modèle sans une prise électrique femelle, vous pouvez faire installer sur le terrain par un électricien qualifié. Contactez le service à la clientèle de Labconco et consultez l'annexe D pour obtenir des informations sur la commande. (Non acceptable sur hottes antidéflagrantes).

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 turn on	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 turn on but lights work	Blower wiring is disconnected.	Inspect blower wiring, and switch.
	Blower motor is defective.	Replace blower motor.
Fume Hood blower turns on but lights don't work	Lamp not installed correctly.	Inspect lamp installation.
	Lamp is defective.	Replace lamp.
	Lamp circuit breaker in building is tripped.	Reset the lamp circuit breaker.
	Lamp wiring is disconnected.	Inspect lamp wiring.
	Defective lamp ballasts.	Replace lamp ballasts.

PROBLEM	CAUSE	CORRECTIVE ACTION
Contamination outside of laboratory fume hood	Improper technique or procedure for the fume hood.	See “Certifying the Hood Chapter 3 and “Safety Precautions” Chapter 4 sections in the manual. (Ref. Appendix F)
	Restriction of the baffle air slots or – blockage of the exhaust outlet.	Ensure that all baffle 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 Precaution” Chapter 4 sections of this manual. (Ref. Appendix F)
	Fume Hood has improper face velocity.	Have fume hood re-certified at 60-100 fpm and check remote blower exhaust system.
Fume Hood Vertical Sash no longer operates smoothly	Cable is frayed or plastic protection is damaged.	Inspect cable and replace cable if worn or damaged; otherwise injury could result.
	Pulley bearing is damaged.	Replace pulley, bearing or add grease.
	Cable or chain has slipped off the pulleys or sprockets.	Re-install, cable or chain to be replaced if damaged.
	Weight has broken pulleys or sprockets.	Replace weight pulleys or sprockets.
Fume Hood Combination Sash no longer operates smoothly	Horizontal glass panels have come off the tracks.	Re-install horizontal glass on tracks and secure with clips.
	Vertical sash frame is crooked.	Place horizontal glass symmetrically and pull sash down to air foil to re-align. Re-align the chain as needed.

Chapter 8: Troubleshooting

PROBLEM	CAUSE	CORRECTIVE ACTION
Electrical duplex outlets no longer have power	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.

APPENDIX A

PROTECTOR CLASSMATE

COMPONENTS

Illustrations A-1 and A-2 indicate the location of the following service parts:

Protector ClassMate Replacement Parts

Item	Quantity	Part No.	Description
1A	1	9817000	Labconco Valve (AIR, GAS, VAC, NIT, etc.) 1/4"
1B	1	9823700	Labconco Valve Water 1/4"
1C	1	9823702	Labconco Valve Deionized Water 1/4"
1D	1	9818000	Nut Valve Mtg. Labconco
2A	1	6983700	WaterSaver* Rigid Gooseneck and Valve
2B	1	6983701	WaterSaver (VAC) Connector and Valve
2C	1	6983702	WaterSaver (AIR) Connector and Valve
2D	1	6983703	WaterSaver (GAS) Connector and Valve
2E	1	6983704	WaterSaver Swivel Gooseneck and Valve
2F	1	6983705	WaterSaver Swivel Gooseneck Only
3A	1	9818700	Knob (Argon - Gray)
3B	1	9818701	Knob (CW – Green)
3C	1	9818702	Knob (GAS – Blue)
3D	1	9818703	Knob (AIR – Orange)
3E	1	9818704	Knob (VAC – Yellow)
3F	1	9818705	Knob (HW – Red)
3G	1	9818706	Knob (DW – White)
3H	1	9818707	Knob (STM – Black)
3I	1	9818708	Knob (NIT – Brown)
3J	1	9818900	Lens
4A	1	9818800	Hose Connector (Gray) Standard Argon
4B	1	9818801	Hose Connector (Green) Cold Water
4C	1	9818802	Hose Connector (Blue) Gas
4D	1	9818803	Hose Connector (Orange) Air
4E	1	9818804	Hose Connector (Yellow) VAC
4F	1	9818805	Hose Connector (Red) Hot Water
4G	1	9818806	Hose Connector (White) Deionized Water
4H	1	9818807	Hose Connector (Black) Steam
4I	1	9818808	Hose Connector (Brown) Nitrogen
5	1	9825500	Label, Knob
6	1	1302300	Switch, Rocker
7A	1	1294300, 1294100	115V Duplex Receptacle (Gray), 115 GFCI Rec. (Gray)
7B	1	9818200, 9818100	Duplex Cover Plate (Gray), GFCI Rec. Cover (Gray)
8A	1	1297503	LED, Direct Wired T8 x 3' – newest models use on 4' Hoods – 12 watts each
8B	1	1297504	LED, Direct Wired T8 x 4' – newest models use on 5' & 6' Hoods – 22 watts each

*WaterSaver® is a registered trademark of WaterSaver Faucet Company.

Appendix A: Protector ClassMate Components

Item	Quantity	Part No.	Description
9A	1	9945300	LED Light Fixture, 3' Bulbs (use on 4' Hood)
9B	1	9945301	LED Light Fixture, 4' Bulbs (use on 5', 6' Hoods)
10A	1	9564800 (LH), 9564801 (RH)	Corner Post Access Cover, LH & RH
10B	1	9563501	Label Set, Corner Posts
11	1	6988400	Access Panel, Interior
12A	1	9563100	Side Panel R.H.
12B	1	9563101	Side Panel L.H.
13A	1	9560300	Air Foil Std. 4'
13B	1	9560301	Air Foil Std. 5'
13C	1	9560302	Air Foil Std. 6'
14A	1	9559800	Trough 4', Spill
14B	1	9559801	Trough 5', Spill
14C	1	9559802	Trough 6', Spill
15	2	1924305	Screw, Shoulder #10-24/ .25 x .12
16	1	1885405	Screw, #6-32 x .31 Stainless
17A	1	9561400	Front Panel 4' Installation
17B	1	9561401	Front Panel 5' Installation
17C	1	9561402	Front Panel 6' Installation
17D	2	9563502	Label, Front Panel ClassMate Script
18A	2	9785110, 9785111	Chain Only, Chain for Auto-Return
18B	2	9785101	Master Link, Chain
18C	4	9935800	Threaded Connector
19A	1	9589300	Sash Assy., Combo 4'
19B	1	9589301	Sash Assy., Combo 5'
19C	1	9589302	Sash Assy., Combo 6'
19D	1	9546600	Combo Sash Retention Kit (Retains 4 Combo Sashes)
20A	1	9595000	Spring Reel Assy., Auto-Return
20B	4	1920601	Fitting, Crimp 1/16" Cable, Auto-Return
20C	1	1911406	Washer, #6 – Auto-Return
21A	1	9564900	Sash Stop Kit, Std., 18"
21B	1	9564902	Sash Stop Kit, Combo, 14"
21C	1	9564928	Reverse Sash Stop Kit, Auto-Return 28"

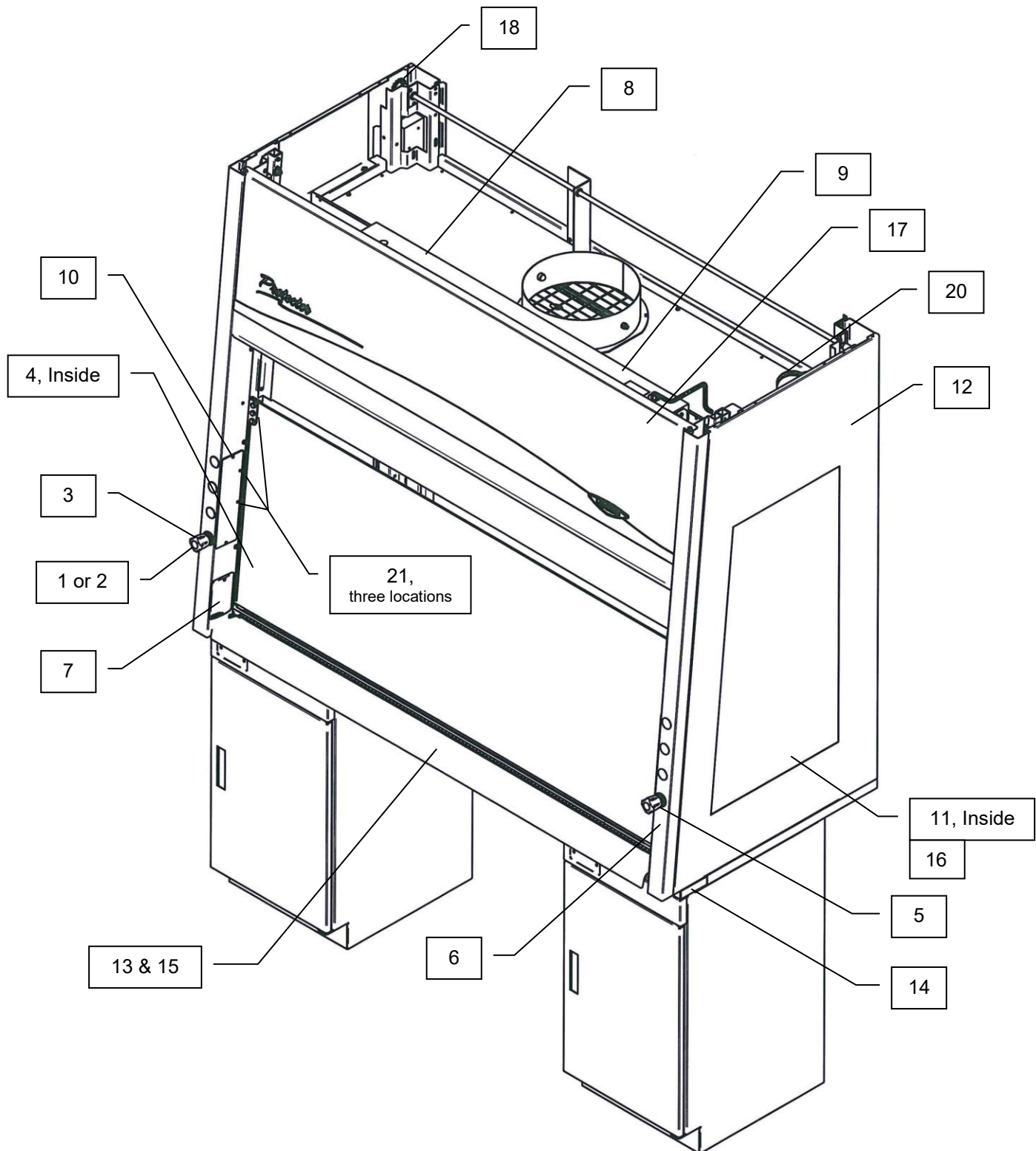
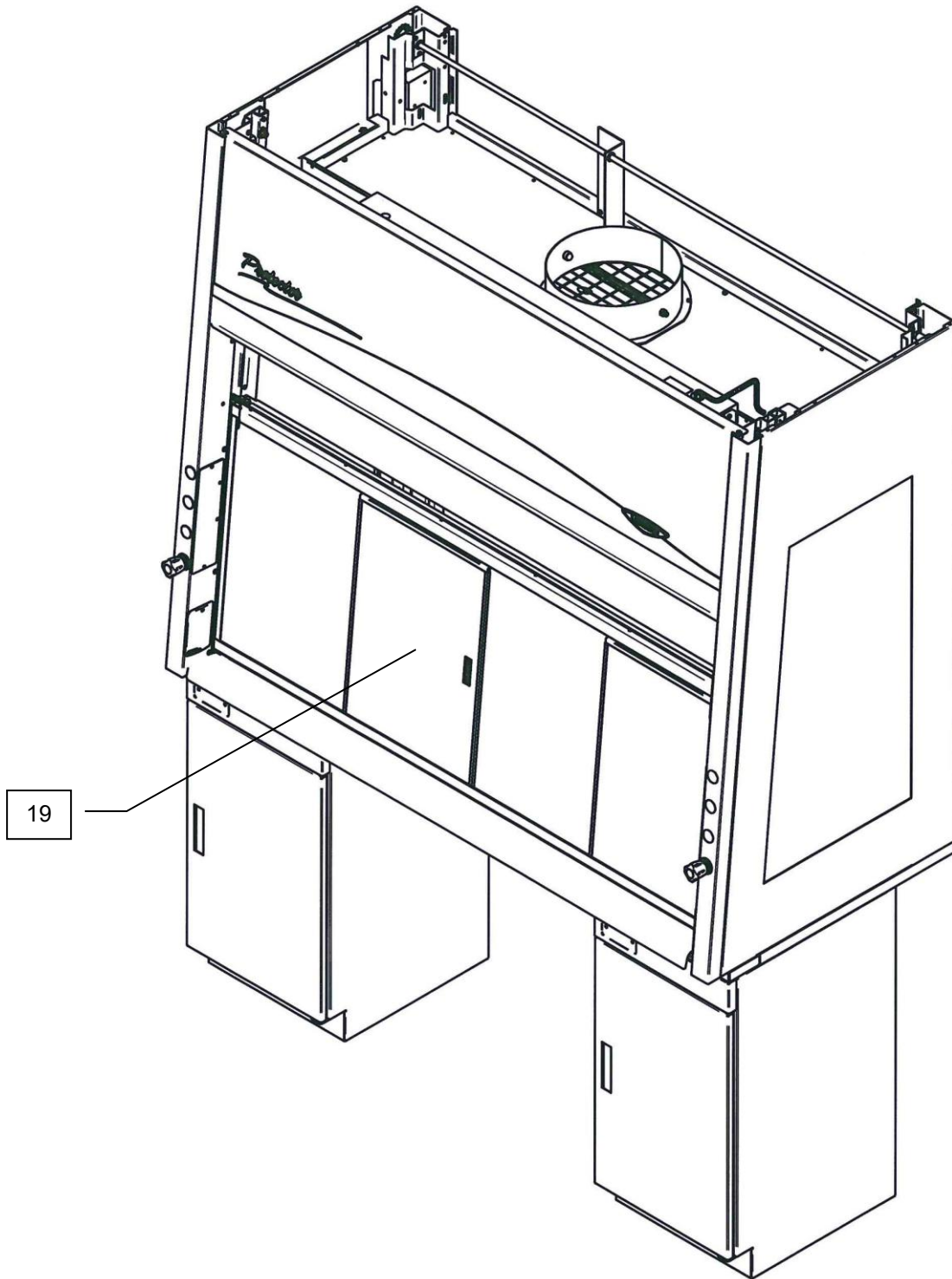


Figure A-1

Appendix A: Protector ClassMate Components

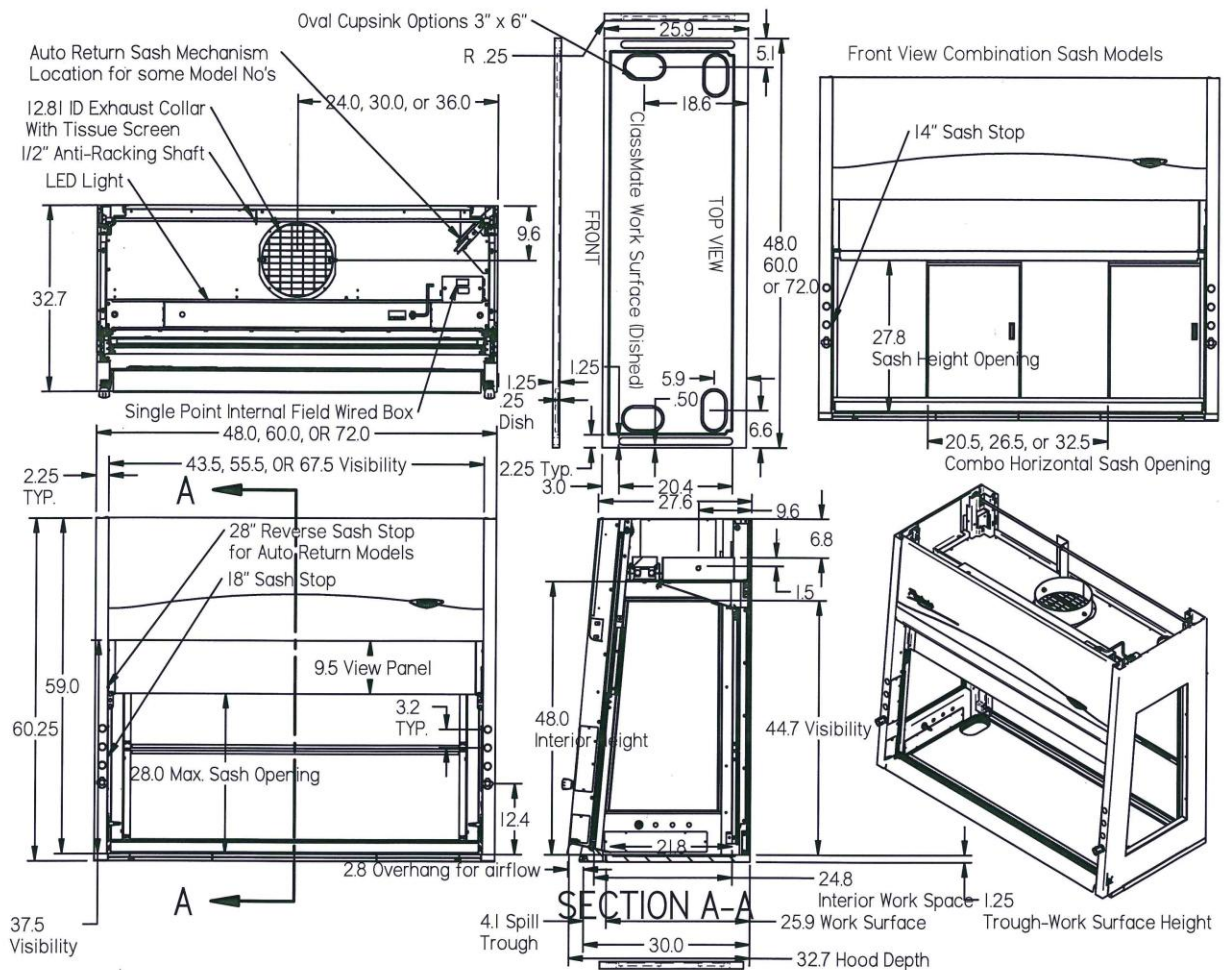
**Figure A-2**

APPENDIX B

PROTECTOR CLASSMATE

DIMENSIONS

Standard Education Hood

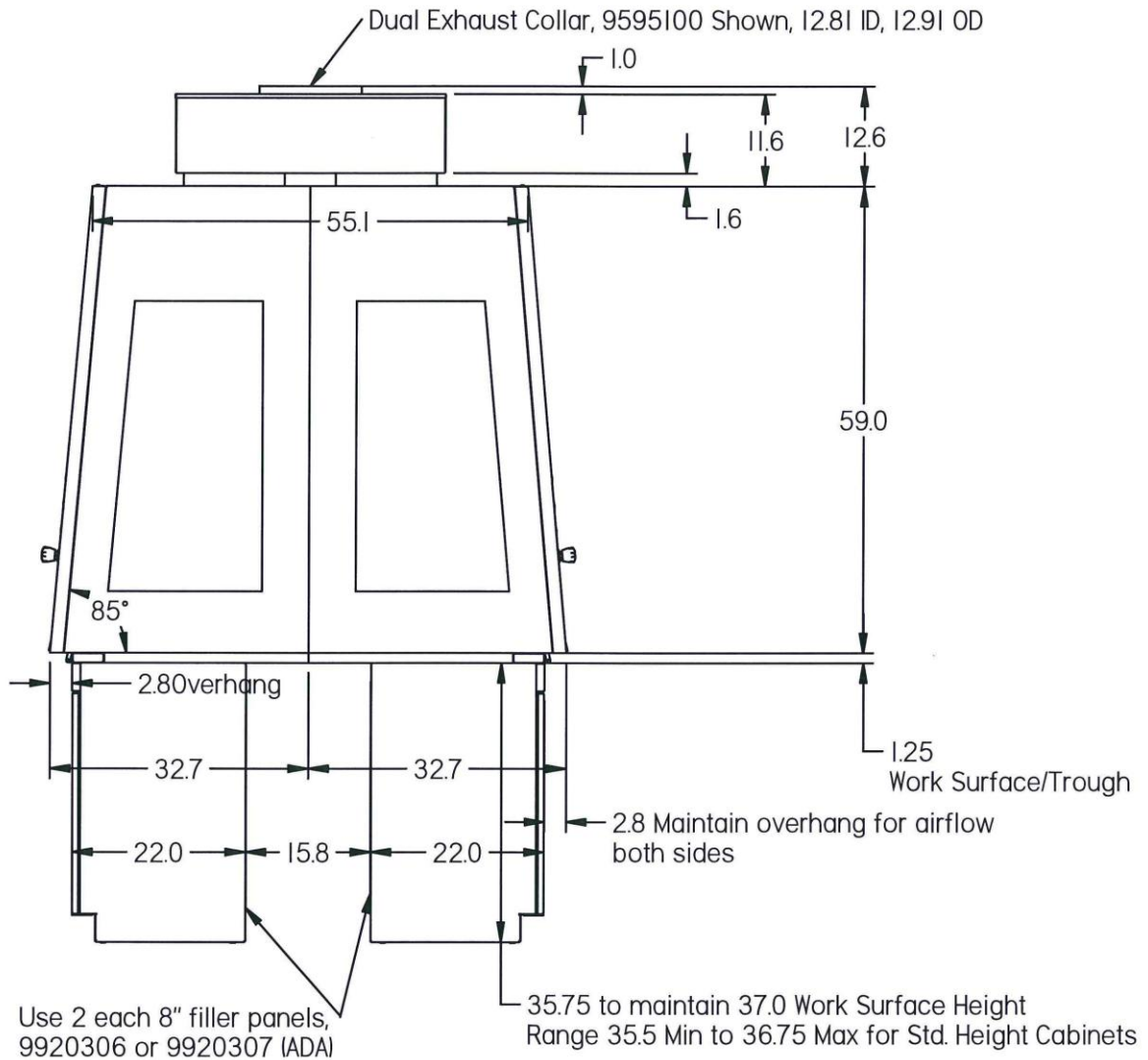


Note: Overhang increases to 4.0 on Intelli-Sash - ClassMate Only. See Figure B-3.

Figure B-1

Appendix B: Protector ClassMate Dimensions

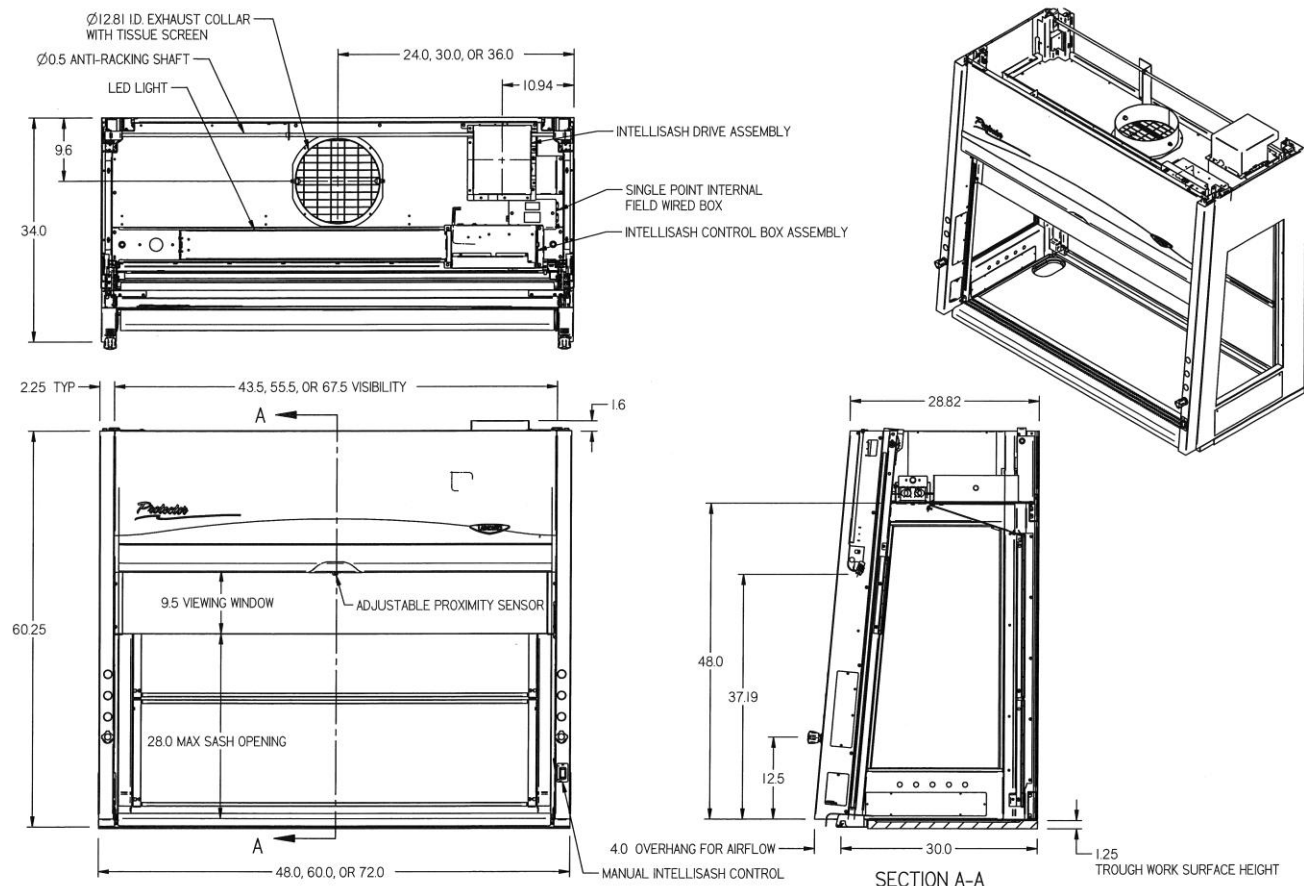
Back-to-Back with Work Surface and Cabinets



Note: Overhang increases to 4.0 on Intelli-Sash - ClassMate Only. See Figure B-3.

Figure B-2

Appendix B: Protector ClassMate Dimensions



Protector ClassMate Intelli-Sash

Figure B-3

APPENDIX C

PROTECTOR CLASSMATE

SPECIFICATIONS

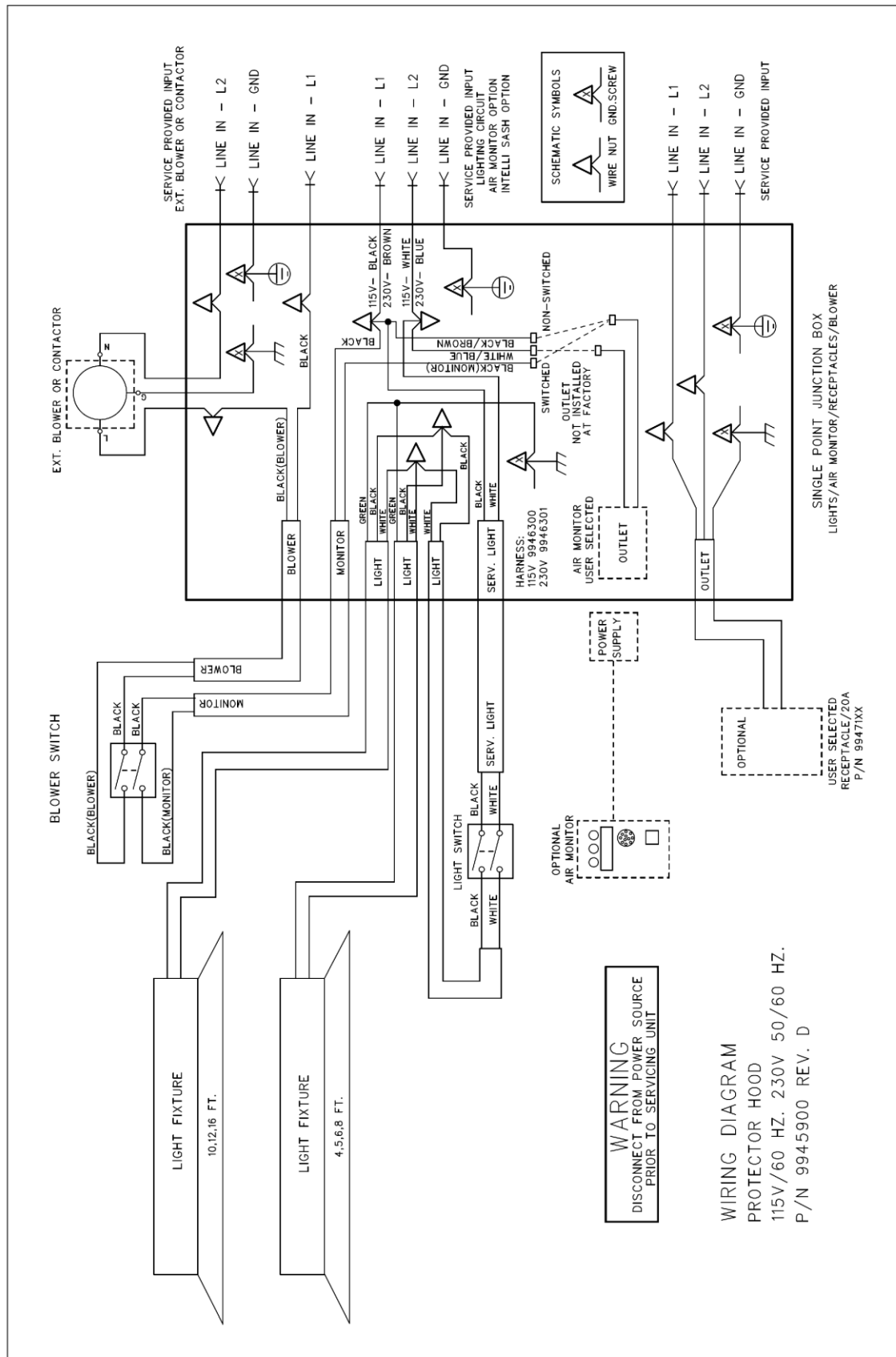
Environmental Conditions

- 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 ClassMate Specifications





APPENDIX D

PROTECTOR CLASSMATE

FUME HOOD ACCESSORIES

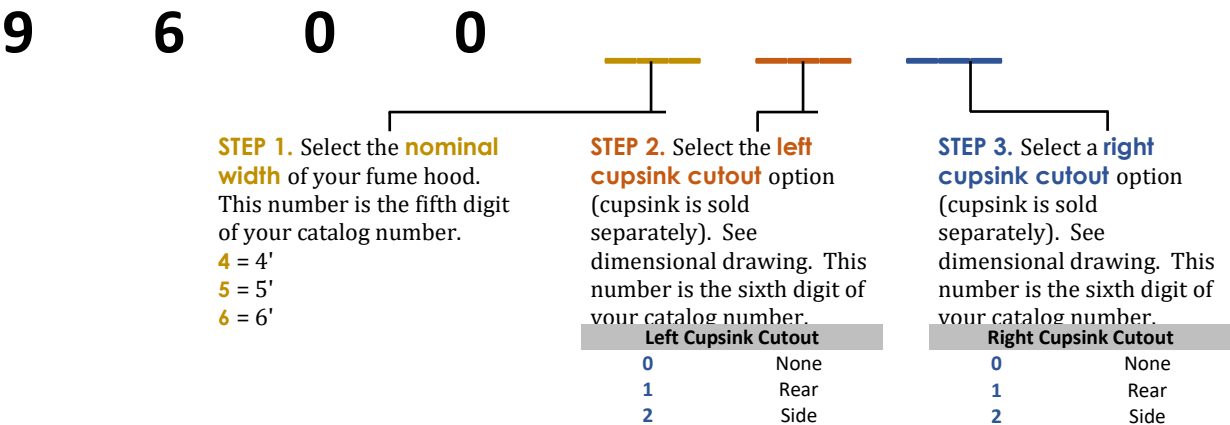
S

SpillStopper Work Surfaces

C

The solid epoxy work surfaces are 1.25" thick and are dished to contain a primary spill. The work surface rests on the storage cabinets and the fume hood rests on the work surface. The work surface rests immediately behind the secondary spill trough provided on all Protector ClassMate Fume Hood models. The standard ClassMate work surface is not designed to accept vent kits. Consult Labconco for custom work surfaces with vent holes.

Use this key to configure the **seven digit catalog number** to order your ClassMate SpillStopper Dished Solid Epoxy Work Surface. For example, a **9600610** is a 6' SpillStopper Work Surface, with the left rear cupsink cutout for use with the Protector Class Mate Hood.



S

Cupsinks

C

The cupsinks are ordered separately if required for your work surface.

Catalog #	Description
4005200	Durcon* CS-4, 3 x 6 Oval Cupsink

*Durcon® is a registered trademark of Laboratory Tops, Inc.

S

Storage Cabinets

C

Labconco manufactures four types of Storage Cabinets – Acid, Solvent, Standard Base, and Vacuum Pump.

Protector® Acid Storage Cabinets have been engineered to efficiently store corrosive materials and include an interior plastic liner to protect the metal from corrosion.

Protector® Solvent Storage Cabinets are designed to efficiently store flammable materials and includes a 1-1/2" double wall construction for fire protection.

Protector® Standard Base Storage Cabinets are utilized for general storage and are not recommended for corrosive or flammable materials.

Protector® Vacuum Pump Storage Cabinets are utilized for vacuum pump storage.

All cabinets feature 18 gauge steel construction with powder coated paint, to give you both a durable and chemically resistant finish that ensures many years of quality service.

All the model numbers are listed next for your convenience in ordering.

Size/Description	SOLVENT			ACID		
	Dual Doors	Right Hinge	Left Hinge	Dual Doors	Right Hinge	Left Hinge
48"	9902000	-	-	9901000	-	-
36"	9902100	-	-	9901100	-	-
30"	9902200	-	-	9901200	-	-
24"	-	9902300	9902400	-	9901300	9901500
18"	-	-	-	-	9901400	9901600
12"	-	-	-	-	-	-
48" w/Self Closing Doors	9903000	-	-	-	-	-
36" w/Self Closing Doors	9903100	-	-	-	-	-
30" w/Self Closing Doors	9903200	-	-	-	-	-
24" w/Self Closing Doors	-	9903300	9903400	-	-	-
24" ADA	-	9906000	9906100	-	9905000	9905200
24" ADA w/Self Closing Doors	-	9906200	9906300	-	-	-
18" ADA	-	-	-	-	9905100	9905300
12" ADA	-	-	-	-	-	-

Size/Description	STANDARD BASE			VACUUM PUMP		
	Dual Doors	Right Hinge	Left Hinge	Dual Doors	Right Hinge	Left Hinge
48"	9900000	-	-	-	-	-
36"	9900100	-	-	-	-	-
30"	9900200	-	-	-	-	-
24"	-	9900300	9900600	-	-	-
18"	-	9900400	9900700	-	9907000	9907100
12"	-	9900500	9900800	-	-	-
48" w/Self Closing Doors	-	-	-	-	-	-
36" w/Self Closing Doors	-	-	-	-	-	-
30" w/Self Closing Doors	-	-	-	-	-	-
24" w/Self Closing Doors	-	-	-	-	-	-
24" ADA	-	9904000	9904300	-	-	-
24" ADA w/Self Closing Doors	-	-	-	-	-	-
18" ADA	-	9904100	9904400	-	-	-
12" ADA	-	9904200	9904500	-	-	-

S

Remote Blowers

C

Labconco supplies a full line of coated steel, fiberglass, and PVC blowers, which are too numerous to list here. Consult Labconco at 800-821-5525 or 816-333-8811 to request a blower brochure or if you need help with blower selection and sizing.

Appendix D: Protector ClassMate Accessories

S

Ductwork and Accessories

C

Labconco supplies a full line of ductwork, couplings, elbows, dampers, T-connectors, Y-connectors, reducers, and zero pressure weather caps. Consult Labconco at 800-821-5525 or 816-333-8811 to request the blower brochure, which has the ductwork accessories or if you need help with selection.

S

Service Fixtures

C

Standard Service Fixture Kits (Reference Figure 3-5 in Chapter 3)

For mounting on the left or right side of a Protector ClassMate Hood. Each kit includes one remotely-controlled service fixture with valve and 0.25" diameter tubing, color-coded fixture knob and color-coded hose connector. **Inlet tubing is not included.** Shipping weight 4 lbs. (1.8 kg)

-XX Schedule Description is the following:

POS 11 through 14 on right, POS 15 through 18 on left. POS 11 and POS 15 is lowest. POS 11 and POS 15 is nearest the front sash. Gooseneck mounted in interior rear position. Mixing CW and HW goosenecks use lowest positions on front corner posts.

Catalog #	Kit	Tubing	Valve	Knob/Connector Color	Max. Flow Rate	Typical Usage Pressure
95637-XX	Cold Water (CW)	Copper	Brass	Green	3.5 GPM (13.2 LPM)	40 psi
95640-XX	Air (AIR)	Copper	Brass	Orange	23.7 CFM	40 psi
95641-XX	Vacuum (VAC)	Copper	Brass	Yellow	8.6 CFM	14.7 psi
95636-XX	Gas (GAS)	Brass	Brass	Blue	29.0 CFM (441 BTU/sec)	40 psi
95644-XX	Argon (ARG)	Copper	Brass	Gray	20.2 CFM	40 psi
95642-XX	Hot Water (HW)	Copper	Brass	Red	3.5 GPM (13.2 LPM)	40 psi
95643-XX	Deionized/Distilled Water (DI)	Stainless Steel	Nickel-Plated & Stainless Steel	White	3.5 GPM (13.2 LPM)	40 psi
95645-XX	Nitrogen (NIT)	Copper	Brass	Brown	24.1 CFM	40 psi
95646-XX	Cold Water (CW) Gooseneck	Copper	Brass	Green	3.5 GPM (13.2 LPM)	40 psi
95647-11 or -15 only	Hot Water (HW) & Cold Water (CW) Mixing Gooseneck	Copper	Brass	Green & Red	3.5 GPM (13.2 LPM)	40psi

WaterSaver Service Fixture Kits

For mounting on the left or right side of a Protector ClassMate Hood. Each kit includes one remotely-controlled service fixture with valve and 0.25" diameter tubing, color-coded fixture knob and color-coded hose connector. Lead times may be extended for WaterSaver. **Inlet tubing is not included.** Shipping weight 4 lbs. (1.8 kg)

-XX Schedule Description is the following:

POS 11 through 14 on right, POS 15 through 18 on left. POS 11 and POS 15 is lowest. POS 11 and POS 15 is nearest the front sash. Gooseneck mounted in interior rear position. Mixing CW and HW goosenecks use lowest positions on front corner posts.

Catalog #	Kit	Tubing	Valve	Knob/Connector Color	Max. Flow Rate	Typical Usage Pressure
95871-XX	Cold Water (CW)	Copper	Brass	Green	3.5 GPM (13.2 LPM)	40 psi
95872-XX	Air (AIR)	Copper	Brass	Orange	23.7 CFM	40 psi
95873-XX	Vacuum (VAC)	Copper	Brass	Yellow	8.6 CFM	14.7 psi
95870-XX	Gas (GAS)	Brass	Brass	Blue	29.0 CFM (441 BTU/sec)	40 psi
95876-XX	Argon (ARG)	Copper	Brass	Gray	20.2 CFM	40 psi
95874-XX	Hot Water (HW)	Copper	Brass	Red	3.5 GPM (13.2 LPM)	40 psi

Appendix D: Protector ClassMate Accessories

Catalog #	Kit	Tubing	Valve	Knob/Connector Color	Max. Flow Rate	Typical Usage Pressure
95875-XX	Deionized/Distilled Water (DI)	Stainless Steel	Nickel-Plated & Stainless Steel	White	3.5 GPM (13.2 LPM)	40 psi
95880-XX	Steam (STM)	Copper	Brass	Black	0.5 LBM/min	40 psi
95877-XX	Nitrogen (NIT)	Copper	Brass	Brown	24.1 CFM	40 psi
95881-XX	Oxygen (OXY)	Copper	Brass with Oxygen	Light Green	22.6 CFM	40 psi
95878-XX	Cold Water (CW) Gooseneck	Copper	Brass	Green	3.5 GPM (13.2 LPM)	40 psi

WaterSaver ADA Panel Mount Service Fixture Kits (As a custom under normal conditions. Consult Labconco.)

For mounting on the left or right side of a Protector ClassMate Hood. Each kit includes one remotely-controlled service fixture with valve and 0.25" diameter tubing, color-coded fixture knob and color-coded hose connector. **Inlet tubing is not included.** Shipping weight 4 lbs. (1.8 kg)

-XX Schedule Description is the following:

POS 11 and POS 12 on right. POS 13 and POS 14 on left. POS 11 and POS 13 is nearest the front sash. Gooseneck mounted in interior rear position, but is rotated forward for the side mounted cupsink location. Mixing CW and HW Goosenecks use lowest positions on front corner posts.

Catalog #	Kit	Tubing	Valve	Knob/Connector Color	Max. Flow Rate	Typical Usage Pressure
95931-XX	Cold Water (CW)	Copper	Brass	Green	3.5 GPM (13.2 LPM)	40 psi
95932-XX	Air (AIR)	Copper	Brass	Orange	23.7 CFM	40 psi
95933-XX	Vacuum (VAC)	Copper	Brass	Yellow	8.6 CFM	14.7 psi
95930-XX	Gas (GAS)	Brass	Brass	Blue	29.0 CFM (441 BTU/sec)	40 psi
95936-XX	Argon (ARG)	Copper	Brass	Gray	20.2 CFM	40 psi
95934-XX	Hot Water (HW)	Copper	Brass	Red	3.5 GPM (13.2 LPM)	40 psi
95935-XX	Deionized/Distilled Water (DI)	Stainless Steel	Nickel-Plated & Stainless Steel	White	3.5 GPM (13.2 LPM)	40 psi
95940-XX	Steam (STM)	Copper	Brass	Black	0.5 LBM/min	40 psi
95937-XX	Nitrogen (NIT)	Copper	Brass	Brown	24.1 CFM	40 psi
95941-XX	Oxygen (OXY)	Copper	Brass with Oxygen	Light Green	22.6 CFM	40 psi
95938-XX	Cold Water (CW) Gooseneck	Copper	Brass	Green	3.5 GPM (13.2 LPM)	40 psi
95939-11 or -13	Hot Water (HW) & Cold Water (CW) Mixing Gooseneck	Copper	Brass	Green & Red	3.5 GPM (13.2 LPM)	40 psi

Your Protector ClassMate Fume Hood is equipped to mount up to eight service fixtures, four per side. The service fixtures include serrated hose connector, valve, fittings, and outlet plumbing. Supply tubing for Standard Service Fixture Kits listed separately as shown below:

Catalog #	Qty	Inlet Description for Standard Service Fixture Kits Only
4889900	1	5.5' Copper Tubing 1/4" OD, Main Supply
4921100	1	5.5' Brass Tubing (GAS) 1/4" OD, Main Supply
1449500	1	Bulkhead Fitting, 1/4" Brass
9594600	1	POS 1 RH, 1/4" Copper Supply Inlet Tube, Pre-bent Front
9594601	1	POS 1 LH, 1/4" Copper Supply Inlet Tube, Pre-bent Front
9594602	1	POS 1 RH, 1/4" (GAS) Brass Supply Inlet Tube, Pre-bent Front
9594603	1	POS 1 LH, 1/4" (GAS) Brass Supply Inlet Tube, Pre-bent Front
9594700	1	POS 2 RH, 1/4" Copper Supply Inlet Tube, Pre-bent, Front
9594701	1	POS 2 LH, 1/4" Copper Supply Inlet Tube, Pre-bent Front
9594702	1	POS 2 RH, 1/4" (GAS) Brass Supply Inlet Tube, Pre-bent Front

Appendix D: Protector ClassMate Accessories

Catalog #	Qty	Inlet Description for Standard Service Fixture Kits Only
9594703	1	POS 2 LH, 1/4" (GAS) Brass Supply Inlet Tube, Pre-bent Front
9594800	1	POS 3 RH, 1/4" Copper Supply Inlet Tube, Pre-bent Front
9594801	1	POS 3 LH, 1/4" Copper Supply Inlet Tube, Pre-bent Front
9594802	1	POS 3 RH, 1/4" (GAS) Brass Supply Inlet Tube, Pre-bent Front
9594803	1	POS 3 LH, 1/4" (GAS) Brass Supply Inlet Tube, Pre-bent Front
9594900	1	POS 4 RH, 1/4" Copper Supply Inlet Tube, Pre-bent Front
9594901	1	POS 4 LH, 1/4" Copper Supply Inlet Tube, Pre-bent Front
9594902	1	POS 4 RH, 1/4" (GAS) Brass Supply Inlet Tube, Pre-bent Front
9594903	1	POS 4 LH, 1/4" (GAS) Brass Supply Inlet Tube, Pre-bent Front

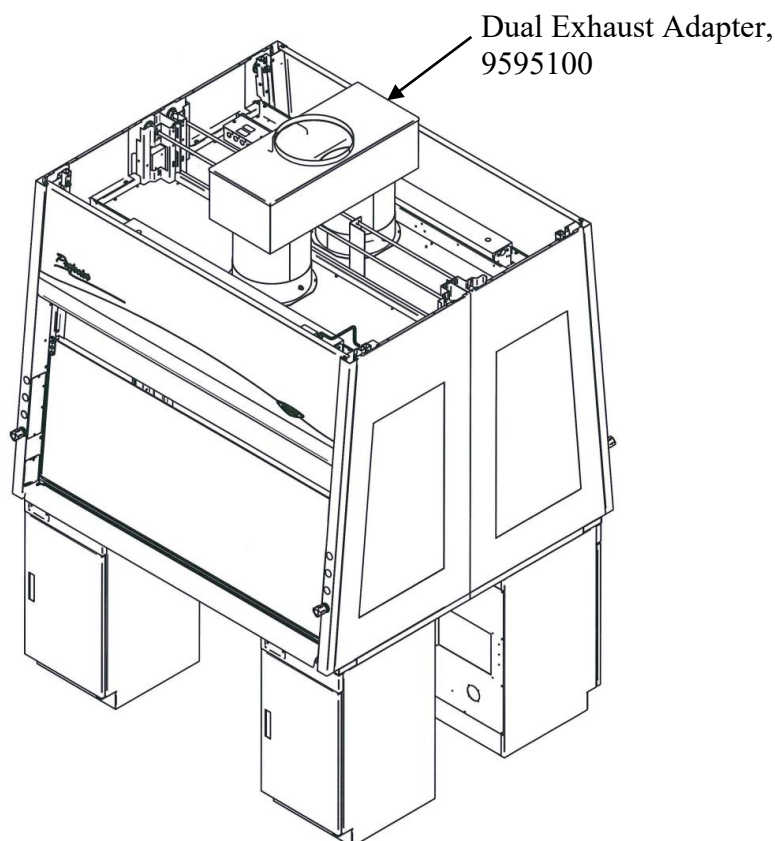
S

C

Dual Exhaust Adapter for Back to Back Hoods

The common exhaust adapter allows you to duct two back-to-back Protector ClassMate Fume Hoods from two 12" (12.75" OD pipe) exhaust stacks to one 12" (12.75" OD pipe) exhaust stack. Reference Figure B-2 in Appendix B as well as Figures 3-3 and 3-6 in Chapter 3.

Catalog #	Description
9595100	Dual Exhaust Adapter 12 x 12 x 12



S

Airflow Monitors

The airflow monitors with low flow alarm allows you to continuously monitor face velocity through the fume hood opening.

C

Catalog #	Description
9413400	Guardian Digital Airflow Monitor, 100-115V, 50/60 Hz
9413401	Guardian Digital Airflow Monitor, 208-230V, 50/60 Hz

S

Distillation Grids

The distillation grids allow the hood user to mount motors, stirrers, and other apparatus.

C

Catalog #	Description
6973300	4' Hood Distillation Grid Kit
6973301	5' Hood Distillation Grid Kit
6973302	6' Hood Distillation Grid Kit

See *Distillation Grids-Field Installation* in Chapter 7 for installation.

S

Electrical Receptacle Outlet Kits

You can install an electrical receptacle outlet in the field. See *Installing an Electrical Receptacle Outlet* in Chapter 7. Order the following parts for installation:

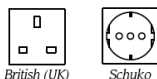
C

Electrical Receptacle Kits

For mounting in left or right side of any 4', 5' or 6' Protector ClassMate Hood. Each Receptacle Kit includes an electrical receptacle, wiring, and receptacle cover plate. The International GFCI Switch is mountable in one corner post location above or below any international single outlet but only allowed on custom corner posts. Contact Labconco for ordering information.

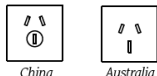


9851413 Duplex Electrical Receptacle Kit, 115 volts, 20 amps AC, GFCI, 60 Hz



British (UK)

Schuko



China

Australia



India-South Africa

Catalog #	Kits	Outlet Type	Shipping Wt. lbs./kg
9851023	115 volts, 20 amps AC, 60 Hz	Duplex, U.S.	4/1.8
9851423	115 volts, 20 amps AC, GFCI, 60 Hz	Duplex, U.S.	4/1.8
9854123	230 volts, 20 amps AC, 60 Hz	Duplex, U.S.	4/1.8
9412423	230 volts, 13 amps AC, 50 Hz	Single, British (UK)	4/1.8
9412623	230 volts, 16 amps AC, 50 Hz	Single, Schuko	4/1.8
9412823	230 volts, 10 amps AC, 50 Hz	Single, China	4/1.8
9413023	230 volts, 10 amps AC, 50 Hz	Single, Australia	4/1.8
9413823	230 volts, 6-16 amps AC, 50 Hz	Single, India-South Africa	4/1.8
9414223	International GFCI Switch, 16 amps	Not Applicable	4/1.8

Appendix D: Protector ClassMate Accessories

S

Decorative Rear Panels

C

The decorative rear panels allow the upper back of the hood to be protected and more aesthetic. This accessory can be purchased when the hood is placed in the middle of the room where the back of the hood is exposed.

Catalog #	Description
9562700	4' Decorative Rear Panel
9562701	5' Decorative Rear Panel
9562702	6' Decorative Rear Panel

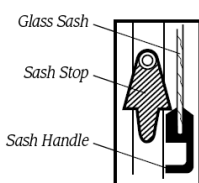
S

Sash Stop Kits

C

Sash Stop Kits (for Replacement)

A Sash Stop restricts how far a vertical-rising sash may be opened. This small plastic device may be easily field installed on the fixture panel. Alternate sash positions may be field drilled. Each Sash Stop Kit includes components for one sash.



Catalog #	Kits
9564900	Standard Sash Stop Kit
9564902	Combination Sash Stop Kit
9564928	Reverse Sash Stop Kit, holds sash open at full open

S

Ceiling Enclosure Kits

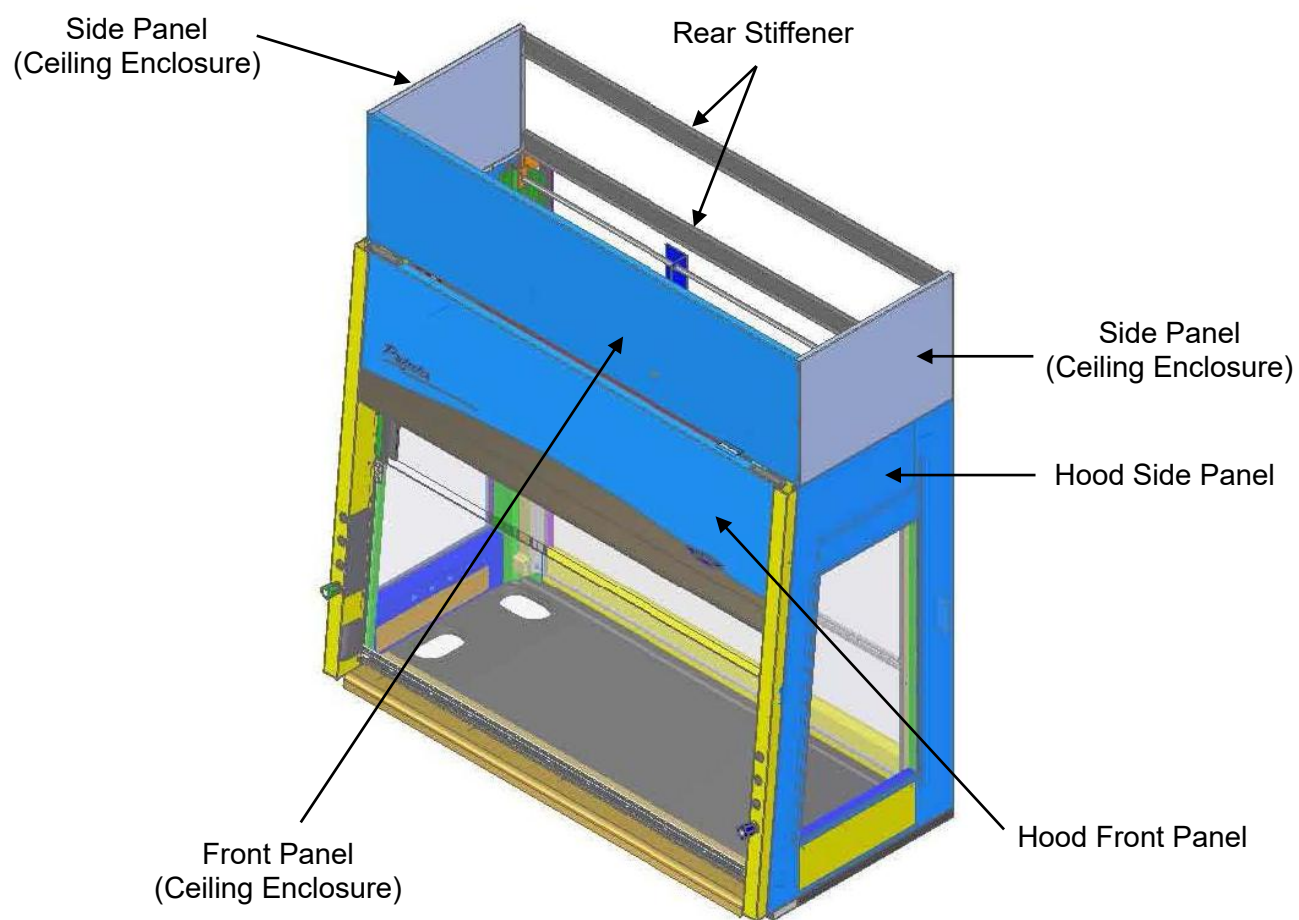
C

The ClassMate non-adjustable ceiling enclosures were developed for simplicity and style in 6 different heights based on hood width per the configurator below to close off the area between the top of the hood and the ceiling. Note: Other special sizes available.

9574-W-0-H

W: Widths where 4= 4'w, 5= 5'w, 6= 6'w

H: Heights where 0= 6"h, 1= 12"h, 2= 18"h, 3= 24"h, 4= 30"h, and 5= 36"h



APPENDIX E

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>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

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 E: 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 E

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 E: 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 F

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

ASHRAE Standard Committee. *ASHRAE Standard* Atlanta: ASHRAE Publications Sales Department, 1995

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

Appendix F: 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

DiBerardinis, L. et al. *Guides for Laboratory Design, Health and Safety Considerations*. Wiley & Sons, 1987

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

Miller, Brinton M. et al. *Laboratory Safety: Principles and Practices*. American Society for Microbiology, Washington, D.C.: 1986

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 G

VAV CLASSMATE OPEN AREA GUIDELINES

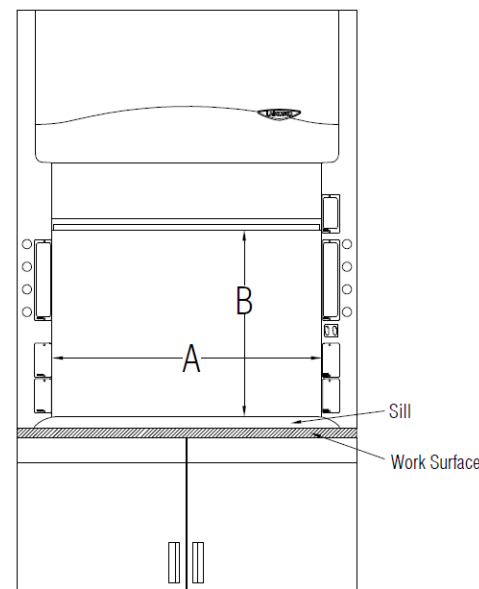
Use the following method when integrating a Labconco ClassMate fume hood into a variable air volume (VAV) mechanical system. The method properly assesses the effective area opening, critical to ensure correct controller calibration to maintain face velocity across all sash positions. Depending on your VAV controller brand, 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 160

1. Determine the free opening dimensions
 - 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. (Do not measure the incline, but vertically at 90 degrees):

Vertical Opening _____ inches = B



Appendix G: VAV ClassMate Open Area Guidelines

2. Determine Total Effective Opening Area

- i. Apply the following formula using the width opening A and vertical opening B. :

Total Effective Area = $0.90 \times A \times (B + 1.3)$ = _____
square inches

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

Total Effective Area = _____ square feet

* Industry standards call for sash height to be measured vertically at 90 degrees from the work surface. However, in determining the total effective area, the measurement is to be taken vertically at 90 degrees from the top of the lower airfoil sill to the bottom of the sash handle. ClassMate fume hoods utilize an angled front face; measuring vertically is important.