



LABCONCO CORPORATION

8811 Prospect Avenue
Kansas City, MO 64132
(800) 821-5525, (816) 333-8811
(816) 363-0130 fax
labconco@labconco.com

User's Manual

Intelli-Sense™ Multi-Speed Blowers

Coated Steel Models

	Complete Intelli-Sense MSB Blower with Controls All 50/60 Hz	Intelli-Sense MSB Blower – No Controls (used for replacement or Integrated Intelli-Sense Hoods) All 50/60 Hz
CS 10"	7061110-115v, -20-230v	7061111-115v, -21-230v
CS 12"	7061112-115v, -22-230v	7061113-115v, -23-230v

Fiberglass Models

	Complete Intelli-Sense MSB Blower with Controls All 50/60 Hz	Intelli-Sense MSB Blower – No Controls (used for replacement or Integrated Intelli-Sense Hoods) All 50/60 Hz
FRP 10"	7181810-115v, -20-230v	7181811-115v, -21-230v
FRP 12"	7181812-115v, -22-230v	7181813-115v, -23-230v

PVC Models

	Complete Intelli-Sense MSB Blower with Controls All 50/60 Hz	Intelli-Sense MSB Blower – No Controls (used for replacement or Integrated Intelli-Sense Hoods) All 50/60 Hz
PVC 10"	7183410-115v, -20-230v	7183411-115v, -21-230v
PVC 12"	7183412-115v, -22-230v	7183413-115v, -23-230v

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

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

Copyright © 2019 Labconco Corporation. The information contained in this manual and the accompanying products are copyrighted and all rights reserved by Labconco Corporation. Labconco Corporation reserves the right to make periodic design changes without obligation to notify any person or entity of such change.

Warranty

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

The warranty for Intelli-Sense™ Multi-Speed Blowers will expire one year from date of installation or two years from date of shipment from Labconco, whichever is sooner. Warranty is non-transferable and only applies to the owner (organization) of record.

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

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

Returned or Damaged Goods

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

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

Limitation of Liability

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

Contacting Labconco Corporation

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

TABLE OF CONTENTS

CHAPTER 1: INTRODUCTION	1
About This Manual	2
Typographical Conventions	3
CHAPTER 2: PREREQUISITES	5
Location Requirements	5
Mounting Support Requirements	6
Electrical Power Requirements	6
Controls Wiring	6
Space Requirements	6
CHAPTER 3: GETTING STARTED	7
Unpacking Your Blower	7
Install Blower on a Supporting Structure	8
Adjust Blower Outlet Orientation	8
Install Exhaust Run with Vibration Dampers	9
Connect Blower Inlet for Coated Steel Blowers	9
Connect Blower Inlet for Fiberglass Blowers	9
Connect Blower Inlet for PVC Blowers	9
Connect PVC Blower Drain	10
Connect to the Blower Outlet	10
For Coated Steel Blowers	13
For Fiberglass Blowers	13
For PVC Blowers	13
Connect to the Electrical Supply Source	14
Modify the Fume Hood Controls and Install the MSB Control Box	15
Adjust Fan Speed and Confirm Performance	21
CHAPTER 4: PERFORMANCE DATA & SAFETY PRECAUTIONS	23
Specifications and Performance Data	23
Blower Curves	24
Safety Precautions	30
CHAPTER 5: USING YOUR BLOWER	31
CHAPTER 6: MAINTAINING YOUR BLOWER	33
Routine Maintenance	33
Motor	33
Bearings	34
Coupler	34
Common Service Operations	34

CHAPTER 7: MODIFYING YOUR BLOWER, CALCULATING STATIC PRESSURE LOSS, AND BLOWER SIZING	35
Airflow Monitors for Fume Hoods	35
Two Main Blower Modifications	36
Additional Modifications by Adding Ductwork Accessories	36
Blower Sizing Example	36
Sizes and Pressure Losses in Thermoplastic Duct	37
Typical Fume Removal System	38
Thermoplastic Duct	39
Duct Couplings, Female	39
Duct Couplings, Male	39
Elbows	39
Thermoplastic Duct Reducers	40
Zero Pressure Weathercaps	40
Spiral Tube	40
Manual Duct Dampers	40
Flexible Duct Connections	41
Blower Transition Adaptors	41
Auxiliary-Air Transition Adaptor	41
T and Y Connections	41
Accessories for Basic 47 Hoods	42
Exhaust Transition Adaptor	42
Accessories for Perchloric Acid Applications	42
Wash Rings	42
Accessories for Pathogens, Organic Vapors and Odor Control Applications	42
HEPA Filter Packs	42
Charcoal Filter Packs	42
Backdraft Dampers	43
Bird Screens	43
CHAPTER 8: PROTECTOR I-S HOOD	45
CHAPTER 9: TROUBLESHOOTING	52
APPENDIX A: BLOWER REPLACEMENT PARTS	55
APPENDIX B: BLOWER DIMENSIONS	58
APPENDIX C: BLOWER ENVIRONMENTAL CONDITIONS, WIRING DETAIL, AND WIRING DIAGRAMS	61
APPENDIX D: TYPICAL INTELLI-SENSE OPERATING CURVE	65
APPENDIX E: TYPICAL LABORATORY CONTROLS WITH INDIVIDUAL INTELLI-SENSE BLOWERS	67
APPENDIX F: TYPICAL PERCHLORIC ACID HOOD INSTALLATION DIAGRAM	68

CHAPTER 1

INTRODUCTION

Congratulations on your purchase of a Labconco Intelli-Sense Multi-Speed Blower (MSB). Your MSB with electronically commutated motor (ECM) has been specifically engineered to meet the demanding requirements of most laboratory ventilation situations associated with fume hood and enclosure exhaust. The outside steel housing of the blower encloses the UL listed ECM motor, shaft, junction box wiring, and bearings. The MSB also includes a fume hood blower control box to be located on top of the fume hood, inlet power control cable, three position switch replacement, and fume hood switch label replacement.

The contaminated air housing of the Coated Steel Blower has a protective phenolic coating. The Fiberglass Blower features a fiberglass reinforced polyester housing and an injection molded polypropylene impeller. The PVC Blower housing is formed out of polyvinyl chloride (PVC) and the impeller wheel is injection molded polyvinylidene fluoride (PVDF). The MSB's feature cooling vents and weather cover that allow for unrestricted exterior roof mounting. The blowers also feature forward curved impellers to ensure quiet operation and optimum air delivery.

All Multi-Speed Blowers utilize a direct drive ECM motor that uses 1/3 less energy than typical AC belt drive motors. ECM's run approximately 95% efficient whereas AC motors run about 60% efficient. Multi-Speed Blowers make it easy to size fume hood blower systems as they cover a much broader speed range. For most applications, the Intelli-Sense Blower is typically used for only one fume hood. The Intelli-Sense Multi-Speed Blower with two or three position operation can be used in standby mode or night setback mode and set to exhaust at a minimum flow rate with the fume hood sash closed. Two or three speed blower systems should be considered when the total number of fume hoods does not financially substantiate the start-up costs of a variable air volume (VAV) system. Two or three position blower systems are less expensive to install and still provide an air volume reduction. Please reference Appendix E for typical laboratory controls with individual Intelli-Sense Blowers. Please refer to Chapter 8 for Integrated Intelli-Sense Hoods supplied with limit switches for automatic Intelli-Sense Blower operation. Studies have shown that fume hoods on two or three

Chapter 1: Introduction

position systems can reduce air flow (CFM) by 50-70% per year. For example, a 6-ft fume hood operating 24 hours a day at 100fpm (735 CFM at \$7/CFM/Yr) at the 18-in sash height at constant volume can cost \$5145 per year to operate, but with a MSB used 4 hours per day and the remaining 20 hours a day in standby mode would cost only \$2578 per year to operate, saving \$2567 per hood annually. For this example, the \$2567 annual savings is 50%.

Your Multi-Speed Blower offers many unique features to enhance performance. To take full advantage of them, acquaint yourself with this manual and keep it handy for future reference. If you are unfamiliar with how blowers operate, review *Chapter 4: Performance Data and Safety Precautions* before you begin operating the blower. Even if you are experienced, review *Chapter 5: Using your Blower*.



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

Si l'appareil n'est pas utilisé comme spécifié dans ce manuel, il peut compromettre la protection offerte par l'appareil.

About This Manual

This manual will help you learn how to install, use, and maintain your blower. Instructions for installing optional equipment on your blower are also included.

Chapter 1: Introduction provides a brief overview of the blower, 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 blower. Electrical and service requirements are discussed.

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

Chapter 4: Performance Data and Safety Precautions explains how the blower operates and the appropriate precautions you should take when using the blower.

Chapter 5: Using your Blower discusses basic operation.

Chapter 6: Maintaining Your Blower explains how to perform routine maintenance on your blower.

Chapter 7: Modifying Your Blower, Calculating Static Pressure Loss, and Blower Sizing explains how to modify the blower or add ductwork accessories.

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

Appendix A: Blower Replacement Parts contains labeled diagrams of all of the components of the blowers.

Appendix B: Blower Dimensions contains comprehensive diagrams showing all of the dimensions for the various blowers.

Appendix C: Blower Environmental Conditions contains the environmental conditions to operate the blower.

Typographical Conventions

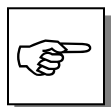
Recognizing the following typographical conventions will help you understand and use this manual:



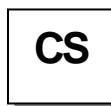
- Book, chapter, and section titles are shown in italic type (e.g., *Chapter 3: Getting Started*).
- Steps required to perform a task are presented in a numbered format.
- Comments located in the margins provide suggestions, reminders, and references.
- Critical information is presented in boldface type 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 the Blower.
- L'information critique est présentée en caractères gras dans les paragraphes qui sont précédés de l'icône d'exclamation. Le non respect de l'information suite à un point d'exclamation peut entraîner des blessures à l'utilisateur ou des dommages permanents au ventilateur.



- Critical information is presented in boldface type in paragraphs that are preceded by the wrench icon. Only a trained certifier or contractor should perform these operations. Failure to comply with the information following a wrench icon may result in injury to the user or permanent damage to your Blower.
- L'information critique est présentée en caractères gras dans les paragraphes qui sont précédés de l'icône de la clé. Seul un certificateur ou un entrepreneur qualifié doit effectuer ces opérations. Le non respect de l'information suite à une icône de la clé peut entraîner des blessures à l'utilisateur ou des dommages permanents à votre ventilateur.



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



- A letter icon precedes information that is specific to a particular blower model. The CS icon indicates the text is specific to the Coated Steel Blower.

Chapter 1: Introduction

**FRP**

- The FRP icon indicates the text is specific to the Fiberglass Blower.

**PVC**

- The PVC icon indicates the text is specific to the PVC Blower.



- CAUTION – See Manual. When this symbol is on the unit it indicates a caution that is detailed in this manual.
- ATTENTION – Voir le manuel. Lorsque ce symbole est allumé l'unité, il indique une mise en garde qui est détaillée dans ce manuel.



- CAUTION – Hot Surface.
- AVERTIR – Surface Chaude

If you would like to review how blowers operate, or their differentiating features go to *Chapter 4: Performance Data and Safety Precautions*.

For information on the operational characteristics of the blower, go to *Chapter 5: Using your Blower*.

If your blower is installed and you need to perform routine maintenance on the blower, proceed to *Chapter 6: Maintaining Your Blower*.

For information on making modifications to the configuration of your blower, go to *Chapter 7: Modifying Your Blower, Calculating Static Pressure Loss, and Blower Sizing*.

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

CHAPTER 2

PREREQUISITES

Before you install your blower, you need to prepare your site for installation. 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 mounting support requirements for your installation site.
- The electrical power requirements for your installation site.
- The fume hood controls, controls wiring, and controls modifications for your installation site.
- The space requirements for your installation site.

Refer to *Appendix B: Blower Dimensions* for complete blower dimensions.

Refer to *Appendix C: Blower Environmental Conditions* for complete environmental conditions and wiring diagram.

Location Requirements

In positioning your blower, care should be taken to make sure that it is away from all other types of air handling equipment (intake fans, air conditioning units, etc.). Your blower should also include a minimum of 7 ft. of ducting above the roofline to generate proper air dispersion of materials being exhausted through the blower. Also consider the location of the blower inlet with respect to the hood you are exhausting. Proper planning and layout are essential in selecting a blower location.

Mounting Support Requirements

You must provide vibration isolators, vibration mounting pads, and/or a roof curb support for proper mounting of the blower. Vibration isolators or vibration mounting pads are available from many sources such as a local industrial supply company. Labconco recommends supporting the blower with 5/16" diameter mounting hardware.

Electrical Power Requirements

Please refer to the wiring diagrams in Appendix C. The exterior blower wiring should be terminated at the junction box located inside the blower housing. The outside blower weather cover is removed to access the junction box. The MSB blower is wired according to the specific voltage and terminations on the motor and blower model. Locate the specific wiring voltage for your blower motor on the instruction manual cover and in the charts in *Chapter 4: Performance Data and Safety Precautions*. All MSB blowers operate at a maximum of 10 full load amps for 115V and 6 full load amps for 230V.

Controls Wiring Requirements

Please refer to the wiring diagrams in Appendix C. The MSB comes with the Intelli-Sense MSB Control Box, controls cable, power inlet cable, 3-position switch, and 3-position switch label. The power for the MSB Control Box comes from the light circuit on the fume hood. The controls wiring for the MSB requires a fume hood modification to add the control cable from the 3-position switch/label. A shielded cable (Belden 9940, 22 GA, 4 conductor shielded or equal) from the roof blower junction box must be run to the MSB Control Box per the wiring diagram and wiring detail in Appendix C. If needed, refer to the diagram in Appendix E that further depicts the controls needed for a typical laboratory with individual Intelli-Sense blowers.

Space Requirements

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

CHAPTER 3

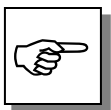
GETTING STARTED

Now you are ready to unpack, inspect, and install the blower. Read this chapter to learn how to:

- Unpack and move your blower.
- Install the blower on a supporting structure.
- Adjust the blower outlet orientation.
- Install the exhaust run with vibration dampers.
- Connect to the blower inlet.
- Connect to the blower outlet.
- Connect the electrical supply source.
- Modify the fume hood controls and install the MSB Control Box.
- Adjust the fan speed and confirm blower performance.
- Connect the PVC Blower drain. (PVC Blowers only)

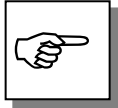
Unpacking Your Blower

Carefully remove the shipping carton from your blower. Inspect the blower for damage that may have occurred in transit. If the blower is damaged, notify the delivery carrier immediately and retain the entire shipment intact for inspection by the carrier.



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

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



IF YOUR BLOWER WAS DAMAGED IN TRANSIT, YOU MUST FILE A CLAIM DIRECTLY WITH THE FREIGHT CARRIER. LABCONCO CORPORATION AND ITS DEALERS ARE NOT RESPONSIBLE FOR SHIPPING DAMAGE.

Do not discard the packing material for your blower until you have installed and tested the blower.

Install the Blower on a Supporting Structure

Now that you have located your blower as instructed in *Chapter 2: Prerequisites*, you are ready to mount the blower on a roof curb support. Additionally, you may isolate the blower by mounting the blower on either vibration isolators or vibration mounting pads, which are available from a local industrial supply company. The supporting structure is custom for each installation. Labconco recommends supporting the blower with 5/16" diameter mounting hardware. See *Appendix B: Blower Dimensions* for appropriate mounting hole locations for your particular blower.

Adjust the Blower Outlet Orientation

The housing on your blower can be rotated to facilitate your duct run configuration. By rotating the blower housing, you will be able to change the blower outlet location on your blower. The Coated Steel Blowers can be rotated to one of eight different positions and the Fiberglass or PVC Blowers can be rotated to one of three different positions. See the drawings in *Appendix A* to locate the parts to disassemble. To rotate the blower housing, proceed as follows:

1. Remove the upper weathercover panel, which has louvers.
2. Once removed, you have complete access to the 8 fasteners that hold your blower housing assembly in position. Removing these fasteners allows you to rotate the housing to one of the other desired outlet positions. Then insert the 8 fasteners and secure the blower housing in that specific position.
3. Reinstall the upper weathercover panel and you are ready for operation.



HINT: Most blowers are installed for upward discharge.

Install the Exhaust Run with Vibration Dampers

Rubber isolation sleeves may be used in your exhaust duct run prior to entering the blower inlet. These isolation sleeves dampen vibration that is being generated by the blower and decrease noise level at the fume hood. See the flexible duct connections listed in *Chapter 7*.

Connect to the Blower Inlet for Coated Steel Blowers

CS

10" Coated Steel Blowers feature a 10-7/8" ID by 1-1/2" wide circular inlet ring. This inlet ring is suitable for use with 10-inch diameter PVC ductwork. The PVC ductwork itself will fit inside the inlet ring and should be fastened by sheet metal screws through the inlet ring. A silicone sealant should also be used to seal between the ductwork and the blower inlet ring to prevent any air or moisture leakage.

12" Coated Steel Blowers feature a 12-1/4" OD by 1-1/2" wide inlet ring, which is suitable for use with 12-inch diameter PVC ductwork. The 12-inch diameter PVC ductwork will fit over the inlet ring on the blower and should be fastened in position by sheet metal screws into the metal ring.

Connect to the Blower Inlet for Fiberglass Blowers

FRP

10" Fiberglass Blowers feature a 10-3/8" OD inlet ring. This inlet ring is suitable for use with 10-inch diameter PVC ductwork. The PVC ductwork will fit outside the inlet ring and should be fastened by sheet metal screws through the fiberglass inlet ring. A silicone sealant is to be used to seal between the ductwork and the blower inlet ring to prevent air or moisture leakage.

12" Fiberglass Blowers feature 12-3/8" OD inlet ring, which is suitable for use with 12-inch diameter PVC ductwork. The 12-inch diameter PVC ductwork will fit over the inlet ring on the blower and fastened by sheet metal screws through the fiberglass inlet ring.

Connect to the Blower Inlet for PVC Blowers

PVC

10" PVC Blowers feature a 10-3/8" OD inlet ring. This inlet ring is suitable for use with 10-inch diameter PVC ductwork. The PVC ductwork will fit outside the inlet ring through the PVC inlet ring. A silicone sealant should also be used to seal between the ductwork and the blower inlet ring to prevent air or moisture leakage.

Chapter 3: Getting Started

12" PVC Blowers feature a 12-3/8" OD inlet ring, which is suitable for use with 12-inch diameter PVC ductwork. The 12-inch diameter PVC ductwork will fit over the inlet ring on the blower and should be fastened in position by sheet metal screws into the fiberglass ring.

PVC

Connect the PVC Blower Drain

The PVC Blower has a 1/2" NPT drain connection in the bottom of the housing. When this connection is used, it should be directed into a proper drain or into the exhaust duct for proper disposal.



CAUTION: Draining the blower housing directly onto the roof may cause damage to your roof due to the corrosive chemicals exhausted.

ATTENTION: Vidange du carter de la soufflante directement sur le toit peut causer des dommages à votre toit en raison des produits chimiques corrosifs épuisés.

Connect to the Blower Outlet

Before proceeding with the blower outlet connection, read the two warnings and follow the suggested pictures listed next:



WARNING: Should your exhaust stack, on the outlet side of the exhaust blower, extend over 7 feet, both guy wires and additional structural supports are required to carry the weight of this ductwork. The guy wires must be substantial enough to support the exhaust stack against high wind velocities. See photos on next page.

ATTENTION: Si votre cheminée d'échappement, sur le côté de sortie du ventilateur d'évacuation, s'étendent sur 7 pieds, les deux haubans et les supports structuraux supplémentaires sont nécessaires pour supporter le poids de cette canalisation. Les haubans doivent être suffisamment importants pour soutenir la cheminée d'échappement contre la vitesse des vents élevés. Voir les photos à la page suivante.

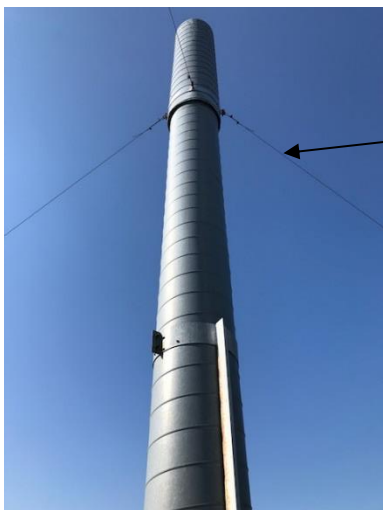
HINT: An exhaust damper either before or after the MSB Blower is very useful for fine tuning the airflow.

Good Installation – Picture 1

Two-piece C-clamp coupler supports exhaust duct diameter to secure weight load of duct picked up by structural support.

Structural support is connected to C-clamp coupler.

Note: Duct diameters, duct materials, and heights change and Labconco does not carry the structural supports or guy wires.

Good Installation – Picture 2

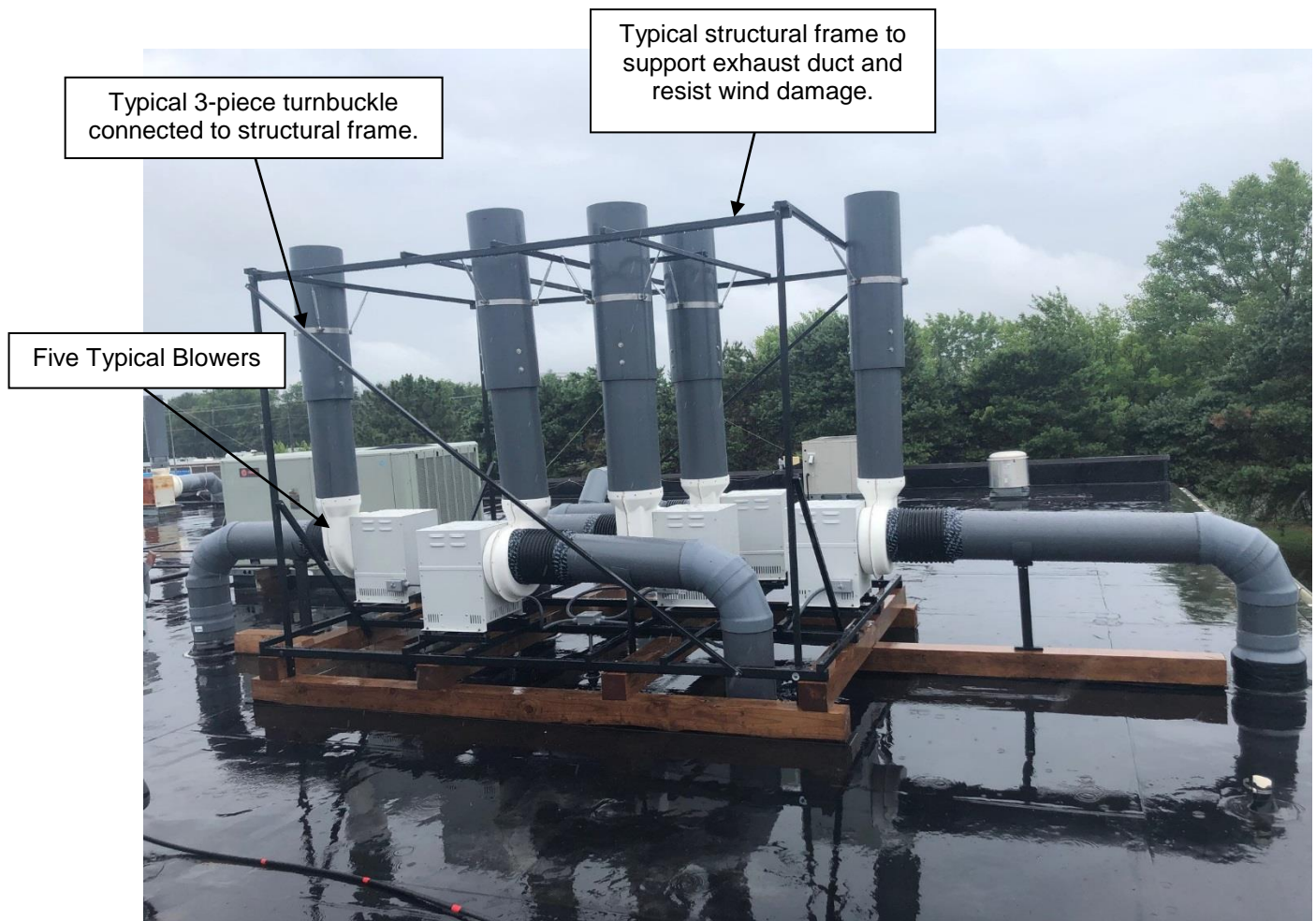
Guy wires from 3 sides are supported off the roof to prevent wind velocities from deflecting the exhaust duct.

Poor Installation – Picture 3

Blower damage can occur without structural supports and guy wires. (Please note the crooked exhaust duct when installed without structural supports and without guy wires.)

Chapter 3: Getting Started

Good Installation – Picture 4



Note: Duct diameters, duct materials, and heights change and Labconco does not carry the structural supports or guy wires.

CS

For Coated Steel Blowers

10" Coated Steel Blowers include a 10" by 5-1/2" rectangular outlet. A rectangular to round Transition Adaptor, Labconco part number 4722401, adapts the outlet connection to accept 10-inch diameter PVC ductwork Transition Adaptor. Labconco part number 4722400 adapts the outlet on these blowers to accept 8-inch diameter PVC ductwork.

12" Coated Steel Blowers include a 13-1/2" by 7" rectangular outlet. Transition Adaptor, Labconco part number 7003400, adapts the outlet of these blowers to accept 12-inch diameter PVC ductwork.

FRP

For Fiberglass Blowers

10" Fiberglass Blowers feature a 10-3/4" ID outlet connection. Ten-inch diameter ductwork will slip into this connection and should be held by sheet metal screws through the housing. Silicone sealant should be used to seal any air leaks between the duct and blower outlet connection.

12" Fiberglass Blowers feature a 12-3/4" ID outlet connection. Twelve-inch diameter ductwork will slip into this connection and should be held by sheet metal screws through the housing. Silicone sealant should be used to seal any air leaks between the duct and blower outlet connection.

PVC

For PVC Blowers

10" PVC Blowers feature a 10-3/4" ID outlet connection. Ten-inch diameter ductwork will slip into this connection and should be held by sheet metal screws through the housing. Silicone sealant should be used to seal any air leaks between the duct and blower outlet connection.

12" PVC Blowers feature a 12-3/4" ID outlet connection. Twelve-inch diameter ductwork will slip into this connection and should be held by sheet metal screws through the housing. Silicone sealant should be used to seal any air leaks between the duct and blower outlet connection.

Connect to the Electrical Supply Source

The main electrical power supply connection for the MSB is made directly at the junction box underneath the outer weather cover and below the ECM motor. Refer to wiring detail and wiring diagrams in Appendix C. Remove the weather cover from the MSB and wire directly to the power wires inside the outside junction box located beneath the ECM motor. A knockout has also been provided on the side of the j-box for this purpose.

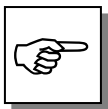
Access the j-box by removing the top weathercover of the blower base. This weathercover is held in position by machine screws, and once they have been removed, you will have access to the j-box of your blower.



CAUTION: Inspect the MSB blower nameplate voltage and model number carefully prior to connecting your electrical service. The wiring harness determines the voltage. The 115V harness is 7115300 and the 230V harness is 7115301 per wiring diagrams in Appendix C.

ATTENTION: Vérifiez la tension nominale ventilateur MSB et le numéro de modèle attentivement avant de brancher votre service électrique. Le câblage détermine la tension. Le harnais de 115V est 7115300 et le faisceau de 230V est 7115301 par les schémas de câblage à l'annexe C.

The blower base end panel is positioned above the blower base to allow for a continuous flow of cooling air through the motor cavity. Slots and louvers have also been placed on both the front and back of the blower base to provide airflow through this motor cavity. Because there is a gap between the end panel and the base, you will be able to run your electrical conduit directly underneath this panel. No special cutouts or modifications are necessary.



NOTE: WHEN THE WIRING FOR YOUR BLOWER HAS BEEN COMPLETED, CHECK FOR PROPER MOTOR ROTATION. THE MOTOR SHOULD OPERATE IN A CLOCKWISE ROTATION AS VIEWED FROM THE SHAFT SIDE TO OBTAIN PROPER ROTATION OF THE IMPELLER WHEEL. WHEN IN OPERATION, THE IMPELLER SHOULD ROTATE COUNTERCLOCKWISE WHEN VIEWED FROM THE BLOWER INLET.



CAUTION: This blower contains an electrical motor, which requires proper electrical connection per the countries National Electrical Code to prevent hazards. The National Electrical Code and local codes may require that a circuit disconnect, overload protection, and short circuit protection be included in the installation. The unit should be connected by a licensed electrician.

ATTENTION: Ce ventilateur contient un moteur électrique, ce qui nécessite une bonne connexion électrique par les pays National Electrical Code de prévention des risques. Le National Electrical Code et les codes locaux peuvent exiger que la déconnexion du circuit, protection de surcharge, et la protection de court-circuit sont inclus dans l'installation. L'appareil doit être raccordé par un électricien agréé.

Modify the Fume Hood Controls and Install the MSB Blower Control Box

Labconco Intelli-Sense Blowers require control circuitry to vary the speed and set up the fume hood for two or three speed operation. If desired, the MSB can still be set up for simple ON/OFF operation. The three switch options are listed below and on the wiring diagrams in Appendix C.

Switch Options		
<u>Mode A</u>	<u>Mode B</u>	<u>Mode C</u>
MAX	MAX	MAX
MED	MIN	OFF
MIN	OFF	

Follow these steps to properly install the control circuitry per the wiring diagrams in Appendix C. Note: If using the Integrated Intelli-Sense Hood supplied with limit switches for automatic Intelli-Sense Blower operation, then refer to Chapter 8 and only follow steps 1, 2, 4, 11, and 12.

1. Ensure the power is turned off at the roof disconnect and at the fume hood.
2. With shielded wire (Belden 9940, 22 GA, 4 conductor shielded or equal), run the control wires from the roof mounted junction box beneath the ECM motor to the top of the fume hood.
3. With the two self-tapping screws provided, mount the MSB Control Box to the back of the light support per diagrams, Figure 3-1 through 3-8.
4. Crimp the shielded control wire from the roof mounted blower to the MSB Control box per the wiring detail and wiring diagrams in Appendix C. As needed, reference Appendix E for installation.

-
- AIR FLOW MONITOR 9413400, 01 REAR VIEW
- AIR FLOW MONITOR 9413300, 01 REAR VIEW
- C NO
ALARM
DISABLE
- BLOWER
- 7115400
- MONITOR
- 7115400
- 7117700
- 7115100
- RED
- WHT
- BLK
- BACK OF NEW BLOWER SWITCH
- SW I/P

Product Service 1-800-522-7658

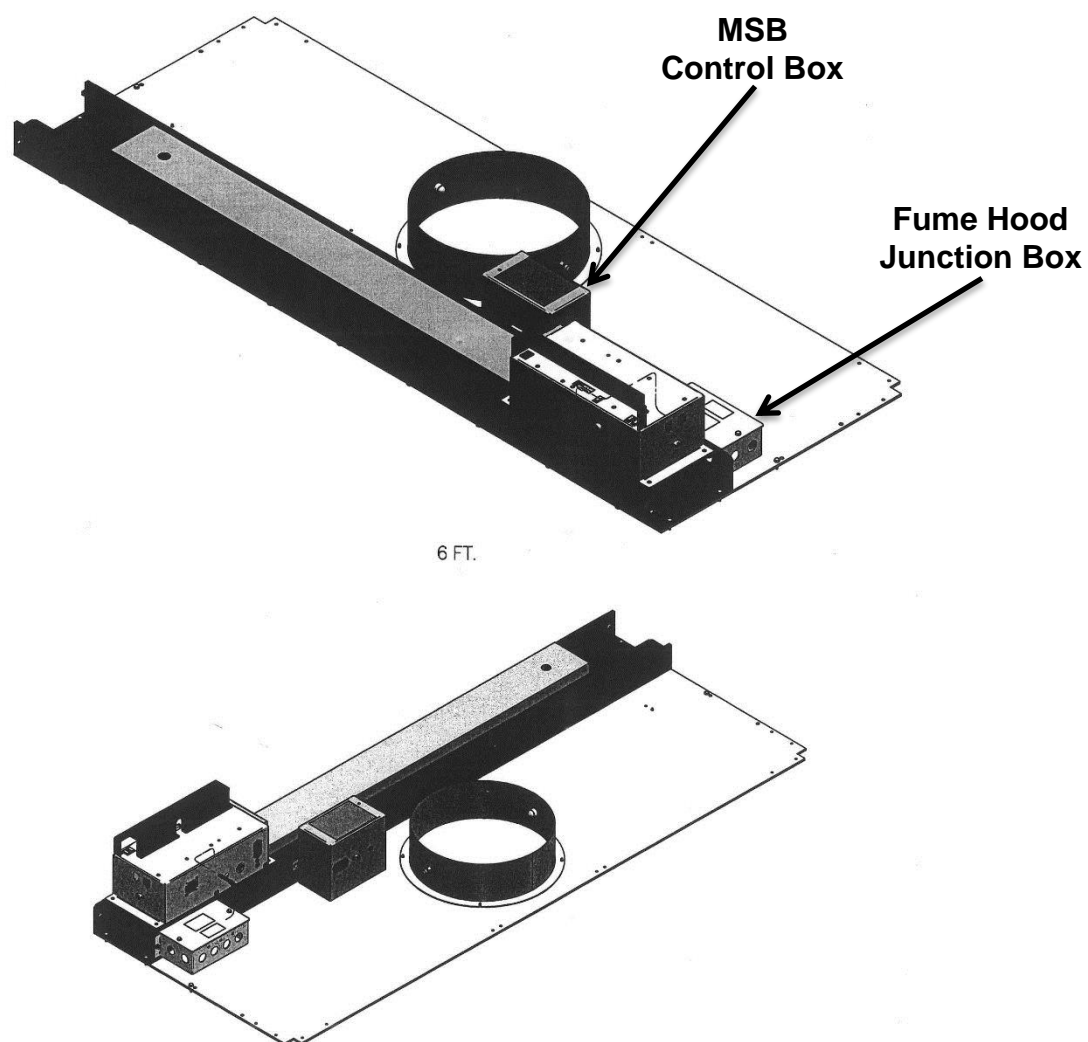


Figure 3-2
Top View of Typical Isometric View of MSB Control Box

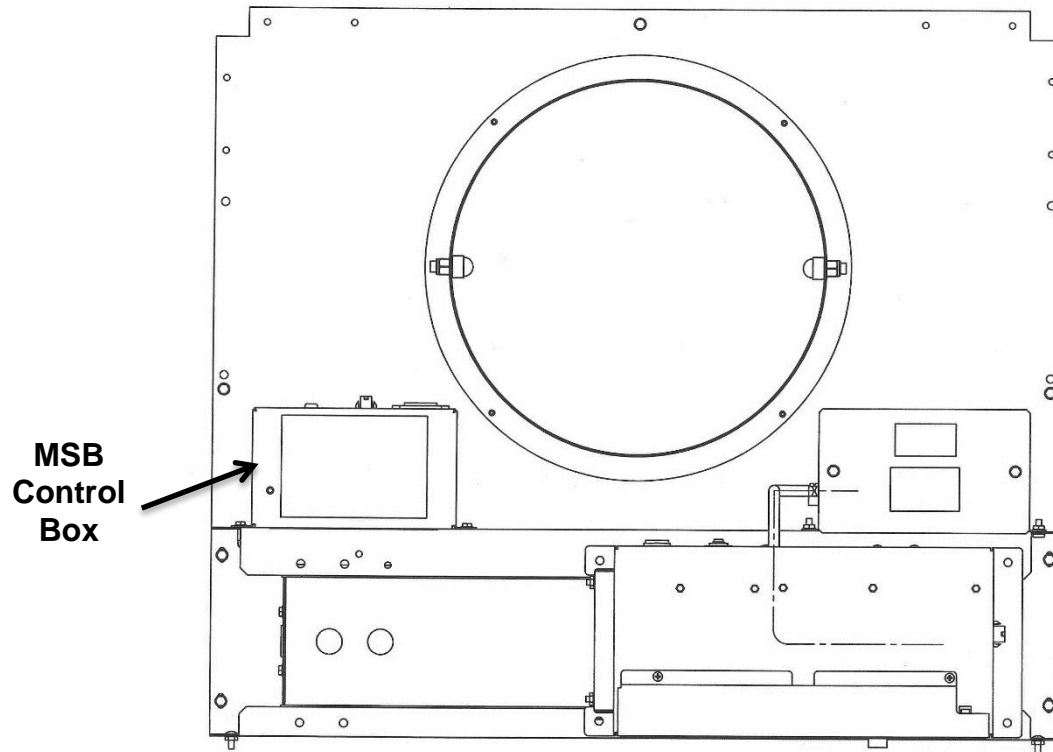


Figure 3-3
3' Installation Location

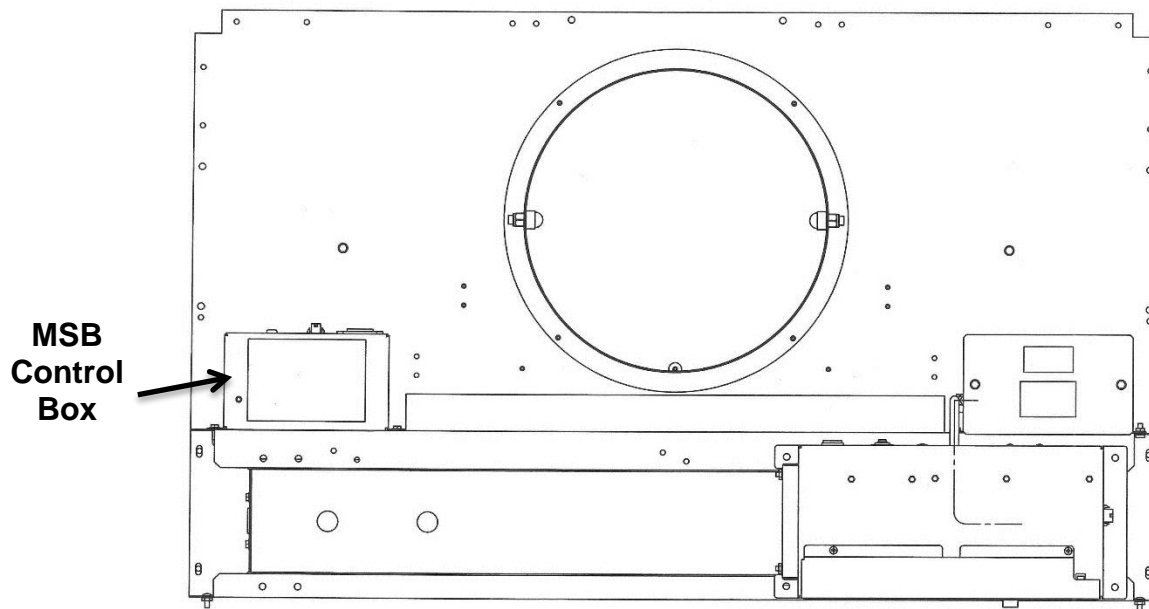


Figure 3-4
4' Installation Location

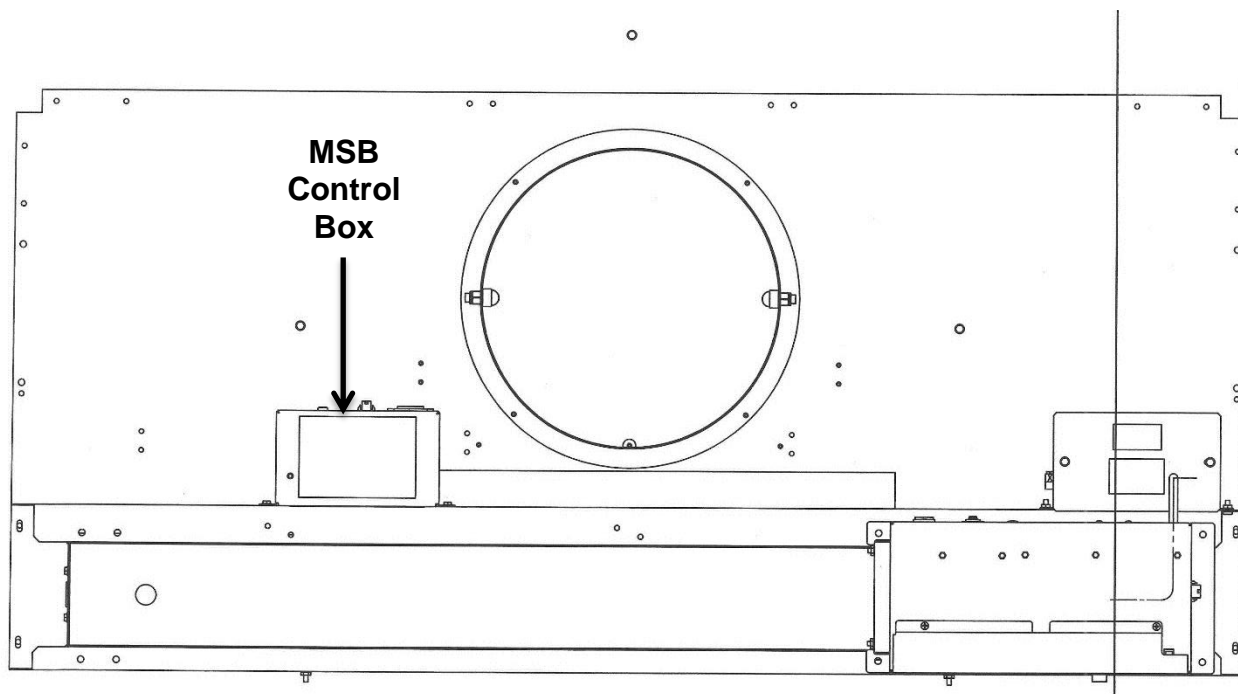


Figure 3-5
5' Installation Location

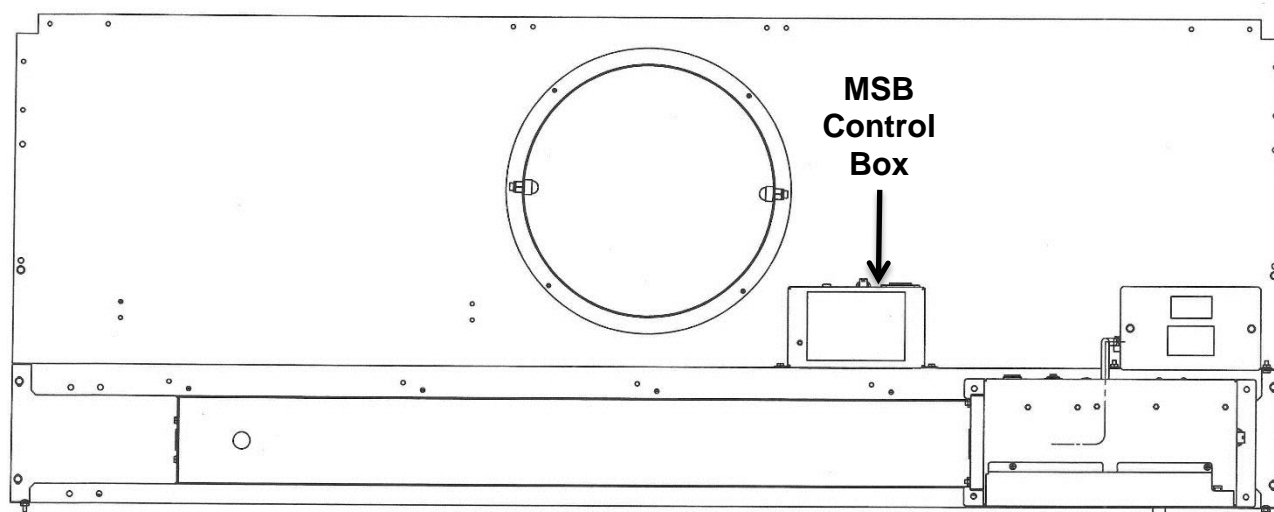


Figure 3-6
6' Installation Location

Chapter 3: Getting Started

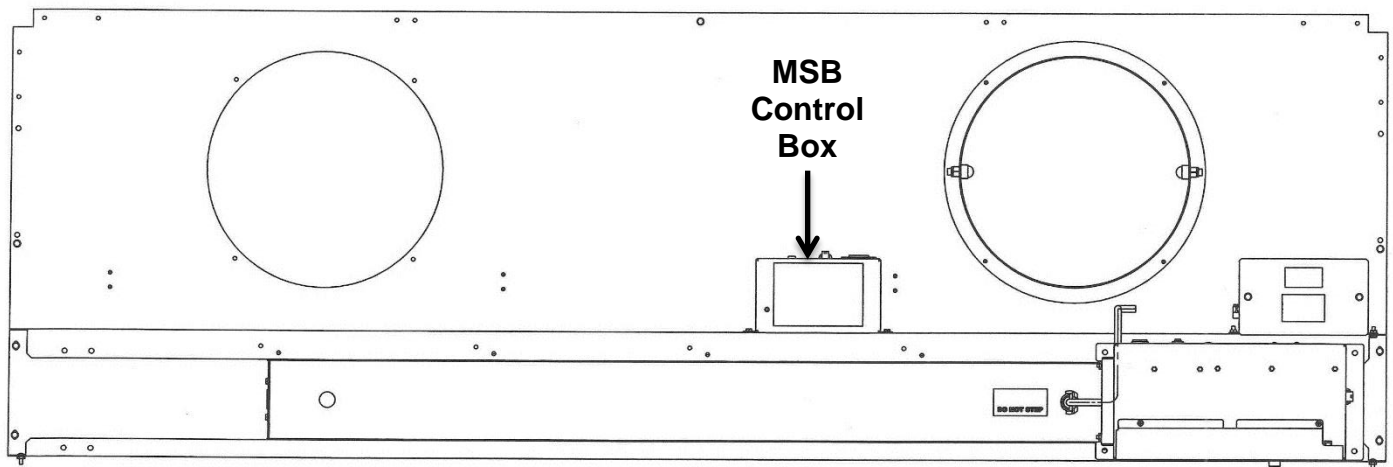


Figure 3-7
7' Installation Location

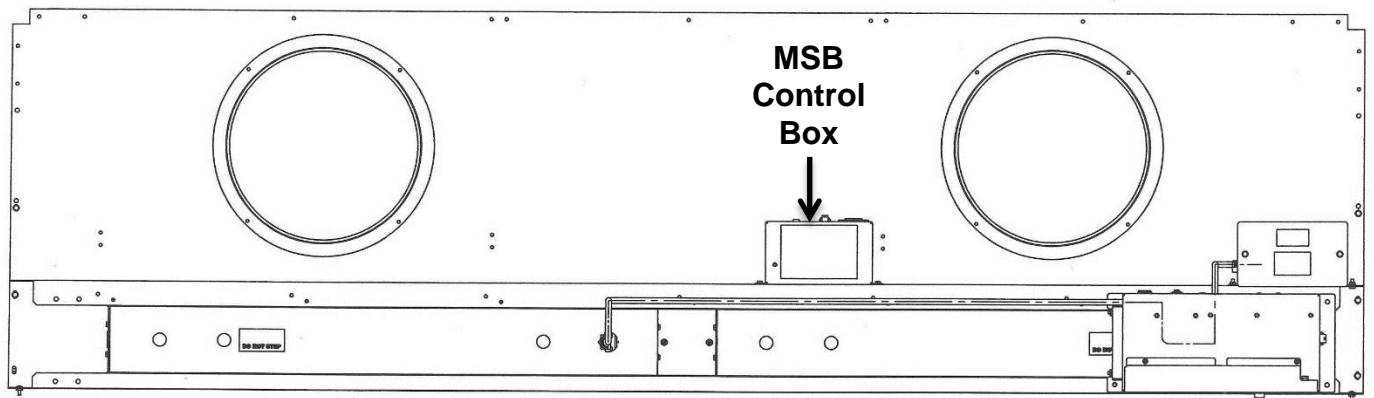


Figure 3-8
8' Installation Location

Adjust the Fan Speeds and Confirm the Performance of your Multi-Speed Blower/Hood System

The MSB fan speeds need to be adjusted in the field to allow the hood to operate at the proper face velocity. In order to adjust the blower to the proper speeds, refer to the diagram in Figure 3-9 and follow the procedure below.

1. Ensure the blower is turned on at the roof and the control circuit is installed and powered up.
2. Refer to Figure 3-9 and place the blower switch on the hood to its maximum position.
3. Locate the Intelli-Sense MSB Control Box on top of the fume hood. With a small jewelers screw driver, adjust the MSB “MAX” setting and measure the fume hood airflow with a thermal anemometer at the proper sash height setting. Readjust the MSB “MAX” setting as required to set the face velocity. Counter-clockwise rotation increases the blower speed and corresponding fume hood airflow (CFM) increase.
4. It will be necessary to check the blower wheel shaft speed by removing the weathercover to confirm operation per the blower airflow charts in Chapter 4.



HINT: Many times a manual damper is used in the exhaust for fine tuning and operating in the proper portion of the blower airflow chart. For lower airflow volume (CFM) at any RPM, close the damper. Refer to Appendix E that shows a manual damper. Refer to Appendix D that shows a typical blower operating curve with the damper adjusted to different positions.

5. Repeat steps 3 and 4 for MSB “MED/MIN” speed. Decide if operation is for medium or minimum based on fume hood sash position. If “OFF” is desired, then turn “MED/MIN” to lowest setting.
6. Repeat steps 3 and 4 for MSB “MIN/OFF” speed. Decide if operation is for “minimum” or “OFF” based on fume hood sash position and fume hood airflow requirements.
7. Cycle hood at each blower switch setting and confirm airflow requirements. If necessary, confirm blower shaft RPM on the roof and confirm with blower performance charts in Chapter 4.
8. With fume hood air monitor installed, calibrate airflow monitor and confirm airflow at each speed setting.
9. Replace weathercover over the ECM motor.



Figure 3-9
Adjust the Fan Speeds

CHAPTER 4

PERFORMANCE DATA AND SAFETY PRECAUTIONS

Specifications and Performance Data

The specifications and performance data for your particular model are listed in detail in Chapter 4 and sub-grouped by Coated Steel, Fiberglass, and PVC Blowers. Refer to Appendix D to view the effect damper position has on performance. All ECM blower motors feature thermal override protection and RPM speeds are automatically reduced when motor is overloaded. Listed below is a quick selection guide.

Intelli-Sash MSB Blower Quick Selection Guide

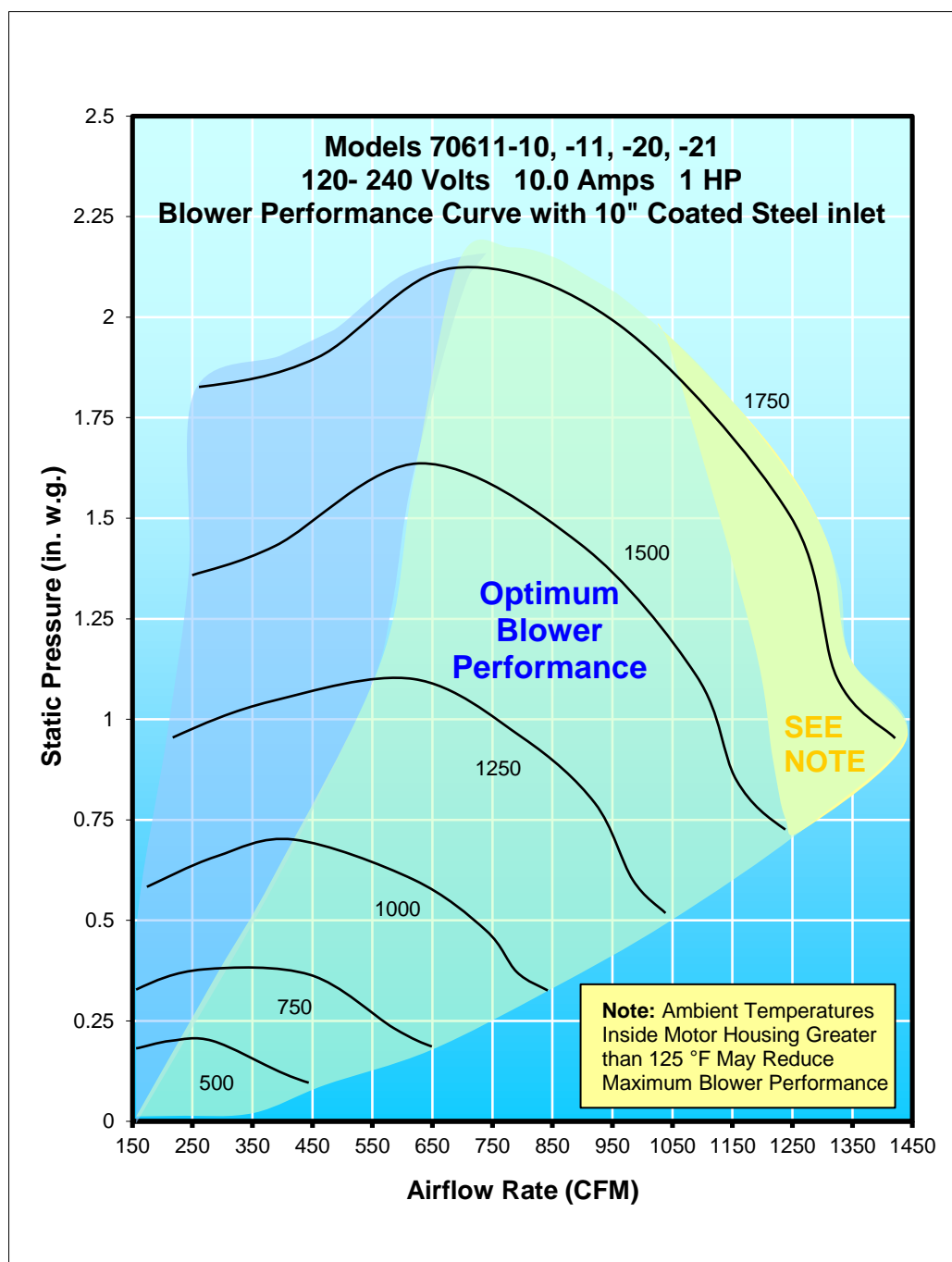
Hood Size	3'	4'	5'	6'	7'	8'	10'	12'	16'
10" Blower Airflow Range (CFM)	175-495	175-735	175-955	175-1100	175-1100	175-1100	N/A	N/A	N/A
<i>Note: 10" Blowers have a minimum achievable airflow of 175CFM and a maximum airflow of 1100CFM</i>									
12" Blower Airflow Range (CFM)	200-495	200-735	200-955	200-1180	200-1410	200-1410	200-1410	200-1410	200-1410
<i>Note: 12" Blowers have a minimum achievable airflow of 200CFM and a maximum airflow of 1410CFM</i>									
18" Reduced Sash Height	10" Blower	10" Blower	10" Blower	10" or 12" Blower	10" or 12" Blower	10" or 12" Blower	12" Blower	12" Blower	12" Blower
28" Full Open Sash Height	10" or 12" Blower	10" or 12" Blower	10" or 12" Blower	12" Blower	12" Blower	12" Blower	12" Blower	N/A	N/A
Sash Height and Airflow Restrictions if any	None	None	None	None	None	80fpm max. at full open 28" sash	60fpm max. at full open 28" sash	80fpm max. at 60% open 18" sash	60fpm max. at 60% open 18" sash

Note: For best results, always use a manual damper in the exhaust for fine tuning blower along with variable speed RPM motor.

Corrosion Resistance Guide

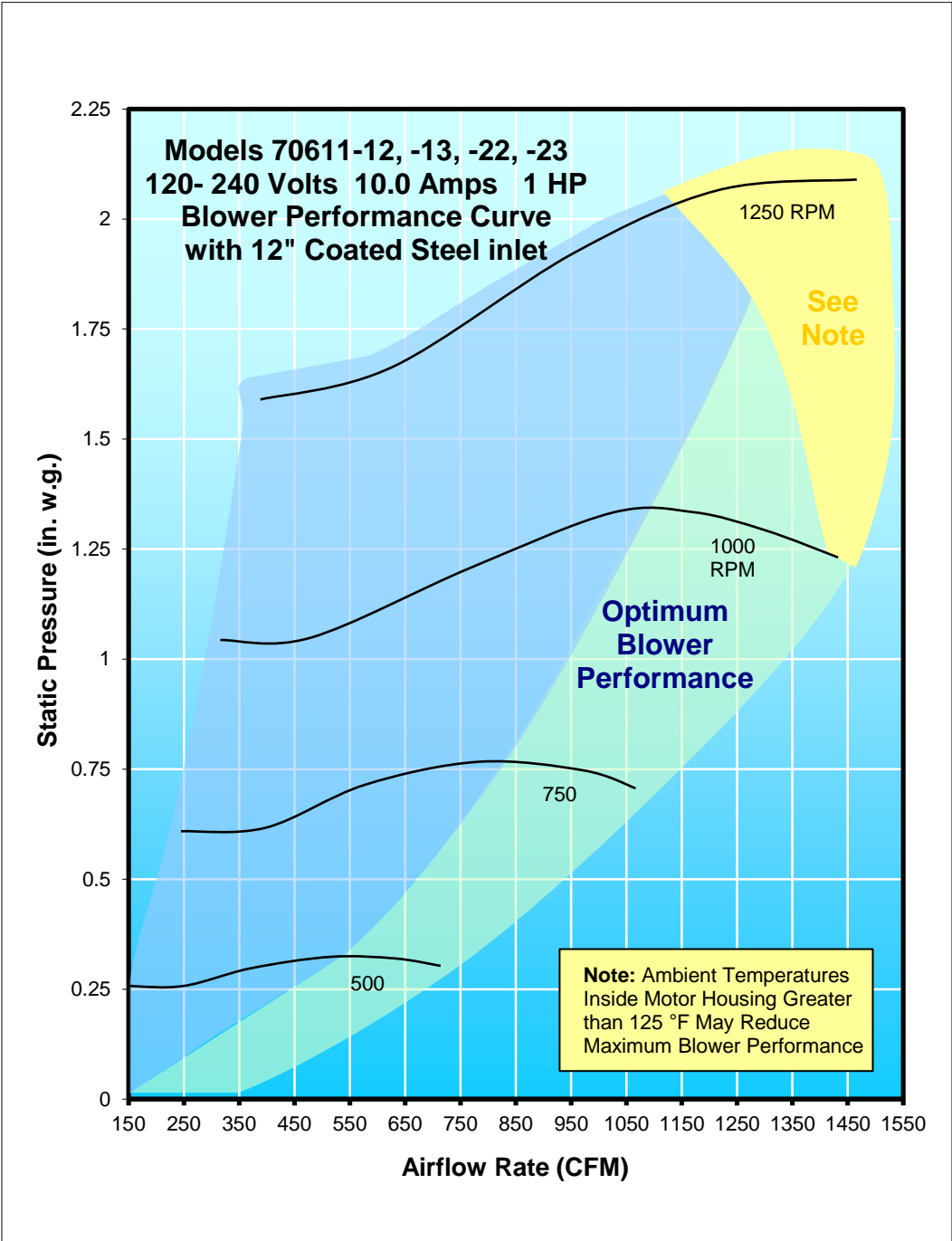
Mild to moderate corrosive chemicals	Coated Steel Blowers
Moderate to highly corrosive chemicals	Fiberglass FRP Blowers
Highly corrosive acids	PVC Blowers

Chapter 4: Performance Data & Safety Precautions



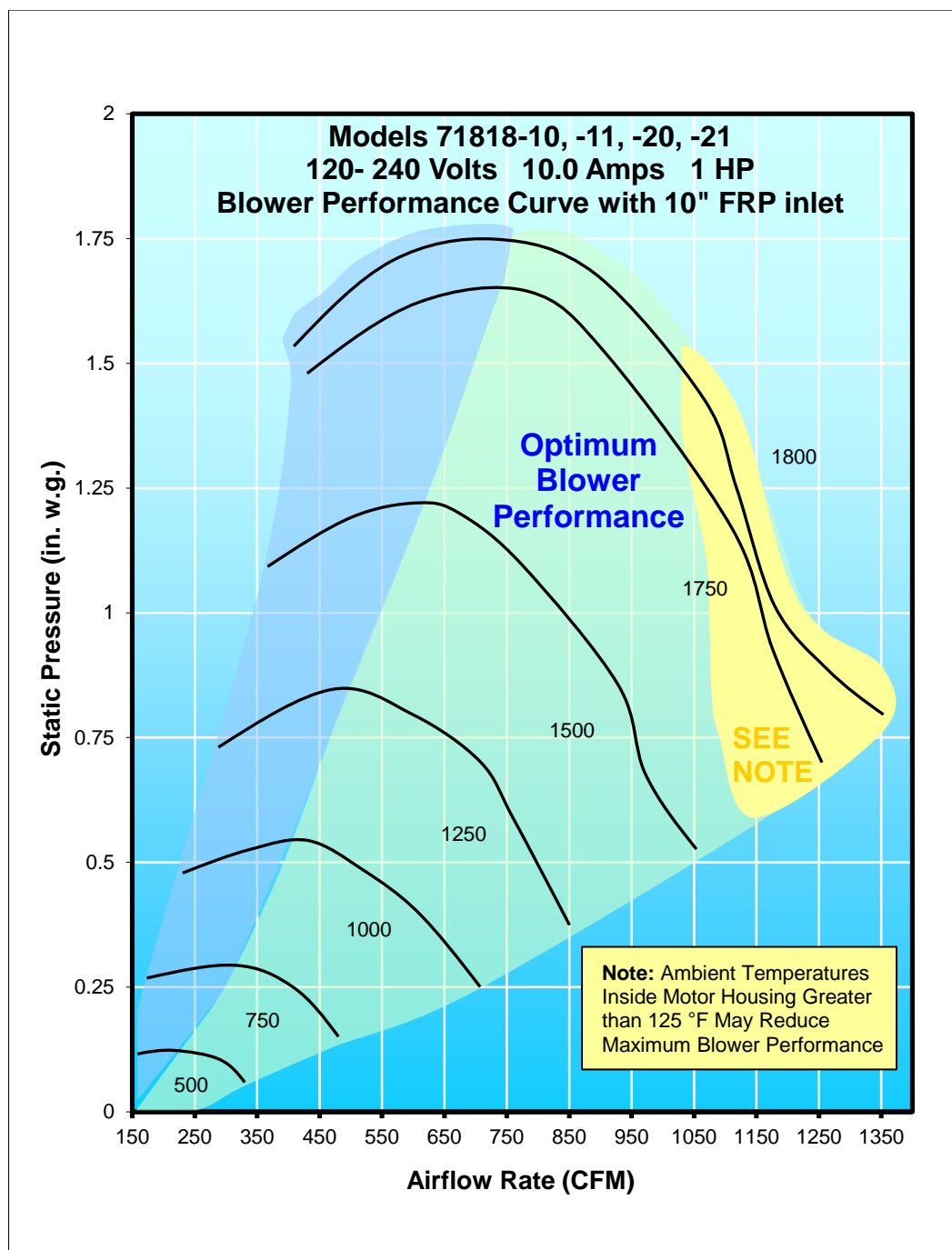
Speed (RPM)	Optimum Airflow (CFM) and Static Pressure (inches of water)
1800 MAX	750 CFM @ 2.2" to 1050 CFM @ 1.9"
1500	650 CFM @ 1.6" to 1250 CFM @ 0.7"
1250	550 CFM @ 1.1" to 1050 CFM @ 0.5"
1000	400 CFM @ 0.7" to 850 CFM @ 0.33"
750	275 CFM @ 0.37" to 650 CFM @ 0.20"
500	200 CFM @ 0.20" to 450 CFM @ 0.10"
300	175 CFM @ 0.06" to 350 CFM @ 0.08"

Practical range is 175 CFM, 0.06" to 1050 CFM, 1.9" or 1200 CFM, 1.0"



<u>Speed (RPM)</u>	<u>Optimum Airflow (CFM) and Static Pressure (inches of water)</u>
1125 MAX	1200 CFM @ 1.6" to 1350 CFM @ 1.5"
1000	1100 CFM @ 1.3" to 1450 CFM @ 1.2"
750	800 CFM @ 0.8" to 1150 CFM @ 0.7"
500	550 CFM @ 0.33" to 725 CFM @ 0.3"
300	200 CFM @ 0.08" to 450 CFM @ 0.1"
Practical range is 200 CFM, 0.08" to 1350 CFM, 1.5" or 1450 CFM @ 1.2"	

Chapter 4: Performance Data & Safety Precautions

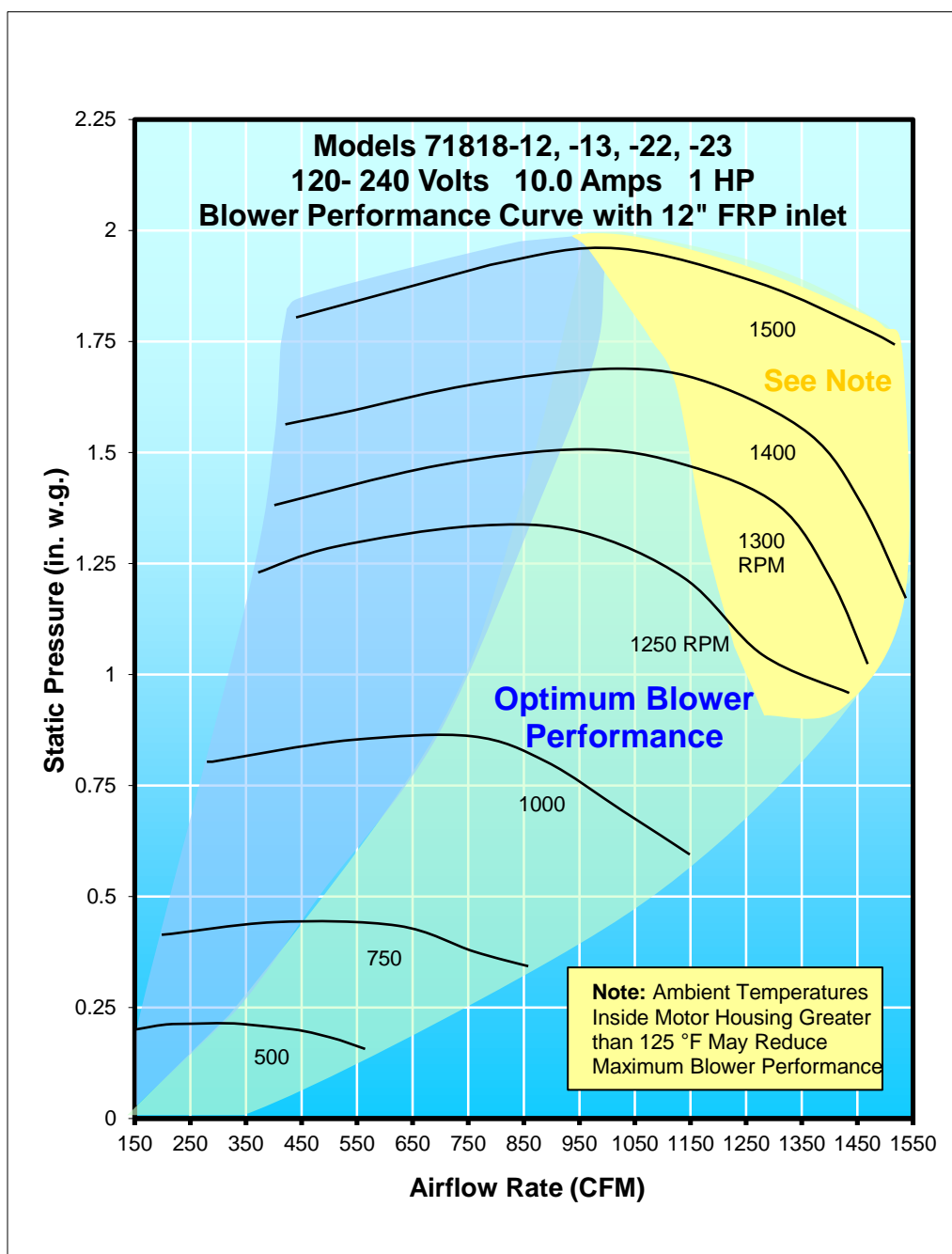


**Speed
(RPM)**
 1800 MAX
 1500
 1250
 1000
 750
 500
 300

Optimum Airflow (CFM) and Static Pressure (inches of water)

750 CFM @ 1.7" to 1025 CFM @ 1.55"
 600 CFM @ 1.2" to 1050 CFM @ 0.5"
 500 CFM @ 0.8" to 850 CFM @ 0.37"
 400 CFM @ 0.6" to 700 CFM @ 0.25"
 300 CFM @ 0.3" to 475 CFM @ 0.12"
 200 CFM @ 0.12" to 325 CFM @ 0.06"
 175 CFM @ 0.06" to 275 CFM @ 0.04"

Practical range is 175 CFM, 0.06" to 1025 CFM, 1.5"



**Speed
(RPM)**

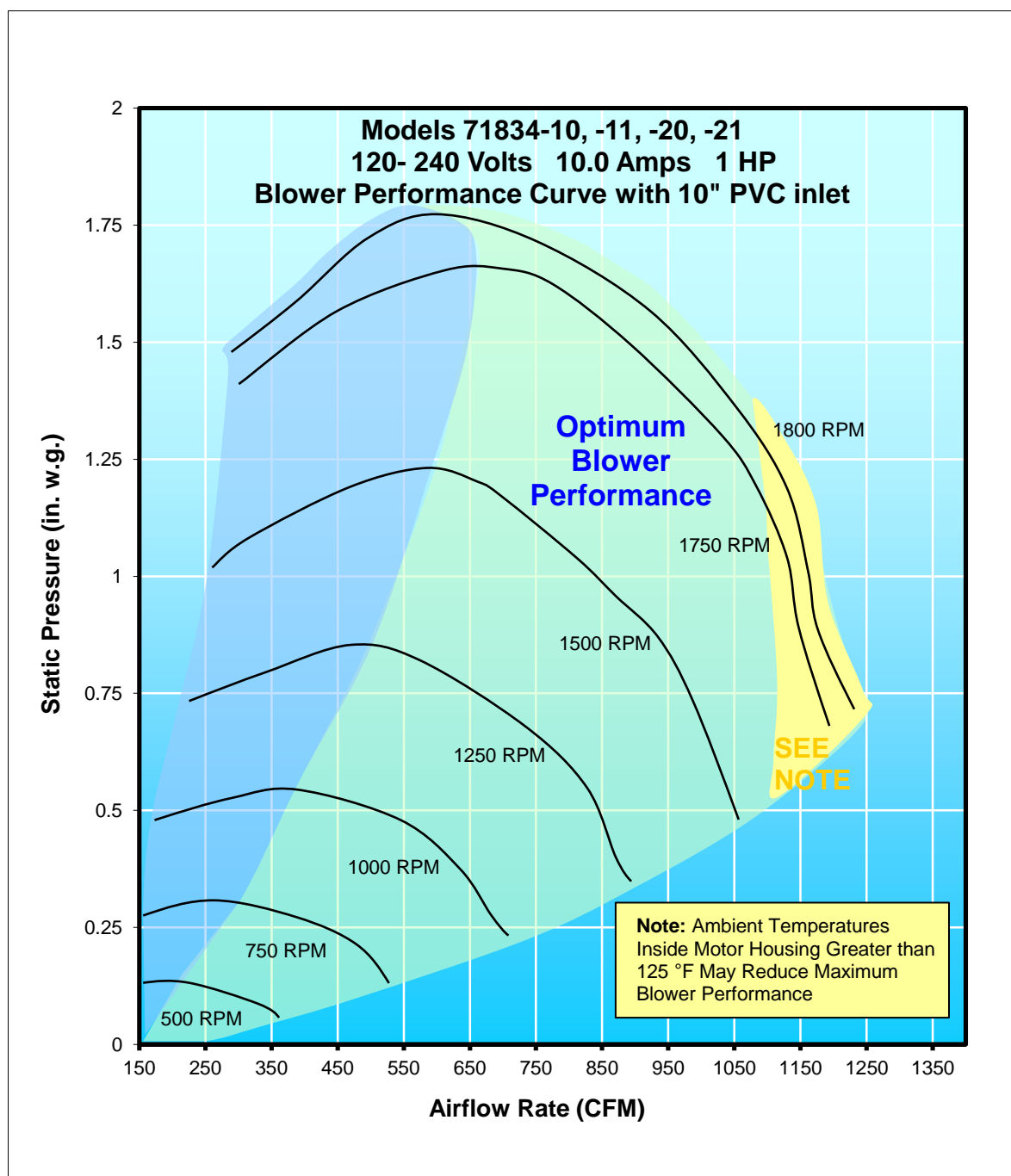
1400 MAX
 1300
 1250
 1125
 1000
 750
 500
 300

Optimum Airflow (CFM) and Static Pressure (inches of water)

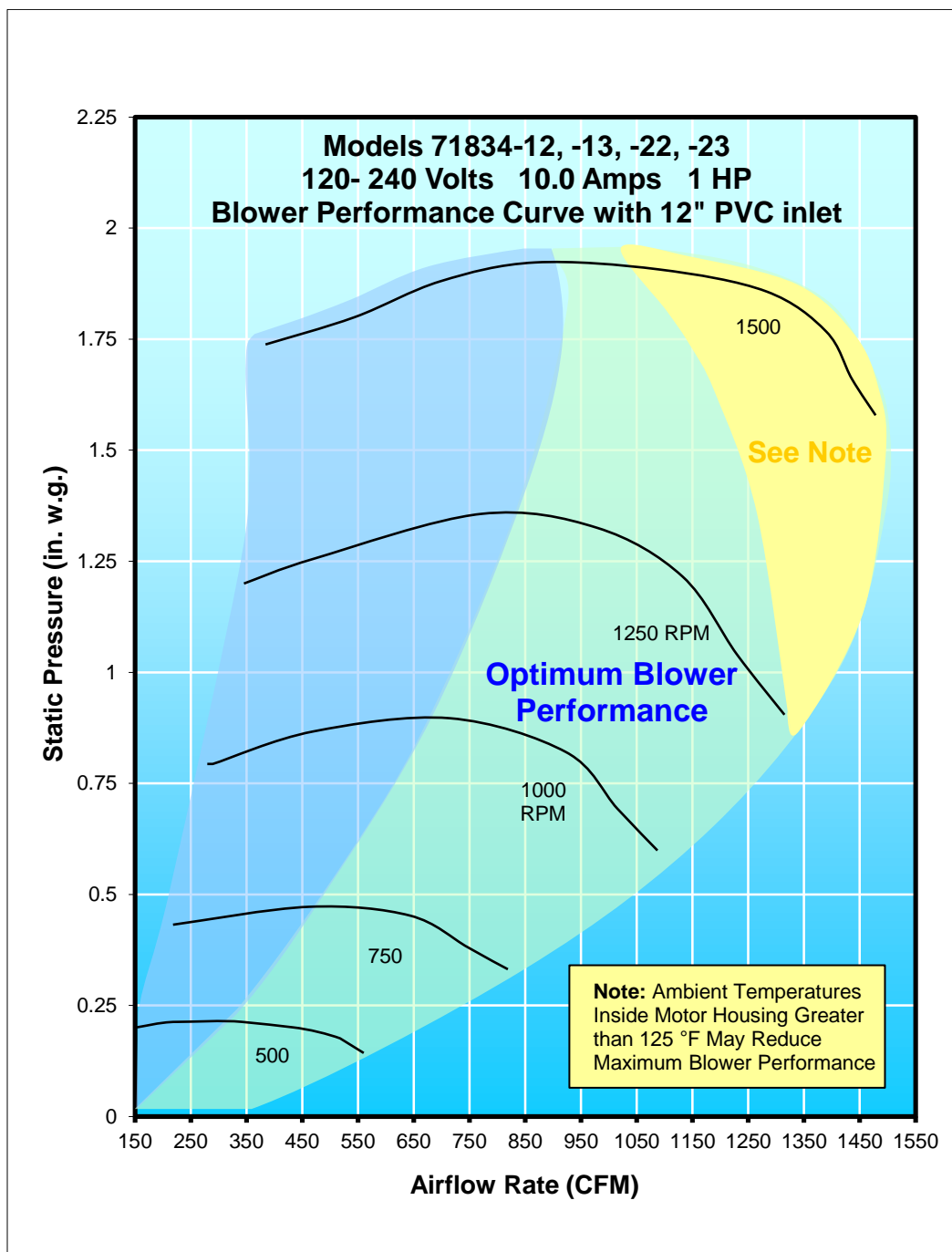
960 CFM @ 1.7" to 1100 CFM @ 1.7"
 900 CFM @ 1.5" to 1150 CFM @ 1.4"
 850 CFM @ 1.3" to 1400 CFM @ 0.87"
 780 CFM @ 1.1" to 1310 CFM @ 0.75"
 700 CFM @ 0.87" to 1180 CFM @ 0.62"
 450 CFM @ 0.4" to 860 CFM @ 0.34"
 300 CFM @ 0.20" to 575 CFM @ 0.12"
 200 CFM @ 0.08" to 450 CFM @ 0.10"

Practical range is 200 CFM, 0.08" to 1400 CFM, 0.87" or 1150 CFM, 1.4"

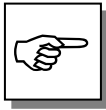
Chapter 4: Performance Data & Safety Precautions



Speed (RPM)	Optimum Airflow (CFM) and Static Pressure (inches of water)
1800 MAX	650 CFM @ 1.7" to 1100 CFM @ 1.3"
1500	600 CFM @ 1.2" to 1050 CFM @ 0.5"
1250	500 CFM @ 0.8" to 900 CFM @ 0.33"
1000	375 CFM @ 0.6" to 700 CFM @ 0.2"
750	300 CFM @ 0.3" to 525 CFM @ 0.12"
500	200 CFM @ 0.12" to 350 CFM @ 0.06"
300	175 CFM @ 0.06" to 275 CFM @ 0.04"
Practical range is 175 CFM, 0.06" to 1100 CFM, 1.3"	



<u>Speed (RPM)</u>	<u>Optimum Airflow (CFM) and Static Pressure (inches of water)</u>
1500 MAX	900 CFM @ 1.9" to 1025 CFM @ 1.8"
1400	900 CFM @ 1.8" to 1180 CFM @ 1.7"
1250	850 CFM @ 1.37" to 1325 CFM @ 0.8"
1000	675 CFM @ 0.9" to 1100 CFM @ 0.6"
750	450 CFM @ 0.45" to 825 CFM @ 0.33"
500	300 CFM @ 0.20" to 550 CFM @ 0.12"
300	200 CFM @ 0.08" to 400 CFM @ 0.10"
Practical range is 200 CFM, 0.08" to 1180 CFM, 1.7"	



NOTE: FOR A COMPLETE PERSPECTIVE OF YOUR MSB, REFER TO *APPENDIX A REPLACEMENT PARTS*.

Safety Precautions



Before attempting any service and/or maintenance on your blower, always disconnect the blower motor from its power source to prevent possible injury. Upon initial start-up, always wear protective eyewear. A qualified technician should certify the blower/hood system before it is initially used. The blower/hood system should be re-certified annually or whenever it is relocated.

Avant de procéder à un entretien et / ou de maintenance sur votre ventilateur, débranchez toujours le moteur du ventilateur de sa source d'alimentation pour éviter tout risque de blessure. Après le démarrage initial, toujours porter des lunettes de protection. Un technicien qualifié doit certifier le système souffleur / capot avant est initialement utilisé. Le système ventilateur / hotte doit être re-certifié chaque année ou chaque fois qu'il est déplacé.



Do NOT contact blower wheel while still in motion.

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

CHAPTER 5

USING YOUR BLOWER

Normal Operation

Once your blower has been fully ducted and electrically wired, it is ready for operation. The blower is activated from a manually operated 3-position switch on the fume hood unless configured for Integrated Intelli-Sense Hoods supplied with limit switches for automatic Intelli-Sense Blower operation outlined in Chapter 8. For night set back to save energy, fully lower the fume hood sash and select the lowest switch setting. Always monitor your airflow constantly with a fume hood airflow monitor. For best results, use Labconco's Guardian Digital Airflow Monitor and order from Chapter 7.

Laboratory work can resume when the blower is operational or placed in one of the two higher speeds, so that any prevailing fumes and/or odors can be exhausted from the fume hood effectively. Work must cease prior to turning the blower off or when placed at the minimum setting for night set back.

Chapter 5: Using Your Blower

CHAPTER 6

MAINTAINING YOUR BLOWER

Now we will review the suggested maintenance schedule and the common service operations necessary to maintain your blower for peak performance.



Only trained and experienced certification technicians should perform some of the service operations after the blower has been properly decontaminated. The wrench icon precedes the service operations that require qualified technicians.

Routine Maintenance



CAUTION: Before attempting any service and/or maintenance on your blower, always disconnect the unit from its power supply source.

ATTENTION: Avant de procéder à un entretien et / ou de maintenance sur votre ventilateur, débranchez toujours l'appareil de sa source d'alimentation.

Motor

Under normal usage, the electronically commutated (ECM) motor will not require maintenance and is projected to last 50,000 hours at maximum speed or greater at lower speeds. Refer to Appendix A.

Chapter 6: Maintaining Your Blower

Bearings

The pillow block bearings on your blower are factory sealed and lubricated. Under normal operation, no further lubrication is required. Excessive lubricating may cause damage to the bearing seal and significantly shorten the life span of the bearing. Refer to Appendix A.

Coupler

The shaft coupler from the ECM motor to the blower wheel shaft can be inspected once a year as needed. Tightening of the coupler screws would indicate possible misalignment or an unbalanced blower wheel. Refer to Appendix A.

Common Service Operations (See drawings in Appendix A Replacement Parts)

Pillow Block Bearing Replacement

If you need to replace a pillow block bearing on your blower, make sure that the locking collars on the bearings face one another. The setscrews used on the locking collars have been sealed with a removable thread sealant. Thread sealant should be applied when a pillow block bearing is replaced in the field. Refer to Appendix A.

Motor Replacement

With the power disconnected, remove the upper weathercover, the mounting hardware that supports the ECM motor frame and remove the ECM motor. Remove both of the wire lead connectors to the motor. Re-install the new motor in reverse order. Refer to Appendix A.

Intelli-Sense MSB Control Box Replacement

With the power disconnected, remove the existing Intelli-Sense MSB Control Box and replace it with the new one. Make all connections per electrical wiring diagram in Appendix C. Then follow the instructions in Chapter 3 to adjust the fan speeds and confirm the performance of your Intelli-Sense Multi-Speed Blower/Hood System. Refer to Appendix A.

CHAPTER 7

MODIFYING YOUR BLOWER, CALCULATING STATIC PRESSURE LOSS, AND BLOWER SIZING

Airflow Monitors for Fume Hoods

Guardian™ Airflow Monitors continuously monitor face velocity through the fume hood opening and should always be used with Intelli-Sense Multi-Speed Blowers.



Guardian™ Airflow Monitors

Sense and alert the operator to low airflow conditions. From the monitor's face plate, the user can easily select and calibrate a set point between 30 and 250 fpm using a velocity meter and a screwdriver. Audible/visual alarm. Includes night setback, external alarm and alarm mute functions. Flush-mount design on Protector Premier, XStream and XL Fume Hoods.

Catalog #	Ranges	For use with Hood	Shipping Wt. lbs. / kg.
9413300	100-115 volts, 50/60 Hz	Premier, XStream, XL	6 / 2.7
9413301*	208-230 volts, 50/60 Hz	Premier, XStream, XL	6 / 2.7

**International electrical configuration*

Chapter 7: Modifying Your Blower



Guardian™ Digital Airflow Monitors

Guardian Digital Airflow Monitor senses and alerts the operator to low airflow conditions. LCD displays actual airflow in fpm or m/sed. Audible/visual alarm alerts the user to sustained low velocity condition. Calibration instructions displayed on LCD. Each monitor also includes a temperature-compensated sensor, external alarm, night setback and alarm mute functions. Flush-mount design on Protector Premier, XStream and XL Fume Hoods. Contact Labconco for optional temperature sensor and optional RS-485 port for Modbus** RTU communication.

Catalog #	Ranges	For use with Hood	Shipping Wt. lbs. / kg.
9413400	100-115 volts, 50/60 Hz	Premier, XStream, XL	6 / 2.7
9413401*	208-230 volts, 50/60 Hz	Premier, XStream, XL	6 / 2.7

*International electrical configuration

**Modbus is a registered trademark of Schneider Automation

7117700 Cable, Airflow Monitor – Night Setback

This cable is pre-configured to attach to the three position switch at minimum setting and send an input signal to the airflow monitor for night setback to disable the air monitor and prevent it from alarming. Use jumper wires 7115400 located in switch and control box labeled 7110800 to prevent power being cut to the air monitor. See wiring diagrams in Appendix C and item 17 in Appendix A.

Two Main Blower Modifications

There are two main ways to modify the performance of your blower as listed in *Chapter 3: Getting Started*. One way is the adjustment of the blower outlet orientation. The other way is the adjustment of the fan speed to fine-tune the performance of your blower/hood system. Refer to Chapter 3 for these instructions. Additionally, all the performance data for your particular blower model number are listed in *Chapter 4: Performance Data and Safety Precautions*.

Additional Modifications by Adding Ductwork Accessories

There are additional ways to equip your blower by adding any of the accessories on the following pages. To ensure that your blower exhaust system will operate properly, the ductwork and accessories linking your hood and blower must be sized correctly. Along with the accessories listed next are the “equivalent resistance in feet of straight duct” for each accessory. It is necessary to compute the sum of the equivalent resistance factors for each accessory and ductwork length for your entire hood/blower system. Then the blower can be sized properly from the total equivalent resistance for your exhaust system. Blower Sizing Example: You have selected a Labconco Protector Premier 48 Laboratory Hood at 100 fpm and 725 CFM. The static pressure of the Protector Premier 48 at 100 fpm is 0.22". The exhaust collar of this hood is sized to receive 12" diameter PVC duct directly. In this example, your fume removal system requires 30 feet of straight

duct, two 90° elbows and one zero pressure weathercap to adequately exhaust the chemical fumes. You will be handling low to moderately corrosive materials, so you have selected a Coated Steel Blower.

The information following for the 90° elbow tells you that each 90°, 12" diameter elbow has the equivalent resistance of 25 feet of straight duct. The zero pressure weathercap has 5 feet of equivalent resistance. The total equivalent feet for the system is:

Feet of straight duct	30 Feet
2 elbows @ 25 feet each	50 Feet
1 zero pressure weathercap @ 5 feet	<u>5 Feet</u>
	85 Feet

The chart following converts “equivalent resistance in feet of straight duct” to static pressure. So the static pressure of 85 equivalent feet of 12" nominal duct is equal to $(85/10) \times 0.011" = 0.094"$. Now this is added to the hood static pressure of 0.22" for a total system static pressure of 0.314". Look at the performance data in Chapter 4 for Coated Steel Blowers. Refer to the 0.25" to .50" range at 725 CFM since this is closest to 0.314". The chart will lead you to select a Coated Steel Blower model that is 10" set at 900 RPM or a 12" set at 600 RPM. In this example, models 7061110, 7061112, 7061120 and 7061122 all would work. A manual damper would also provide additional fine tuning of the blower/hood exhaust system.

Sizes and Pressure Losses in Thermoplastic Duct

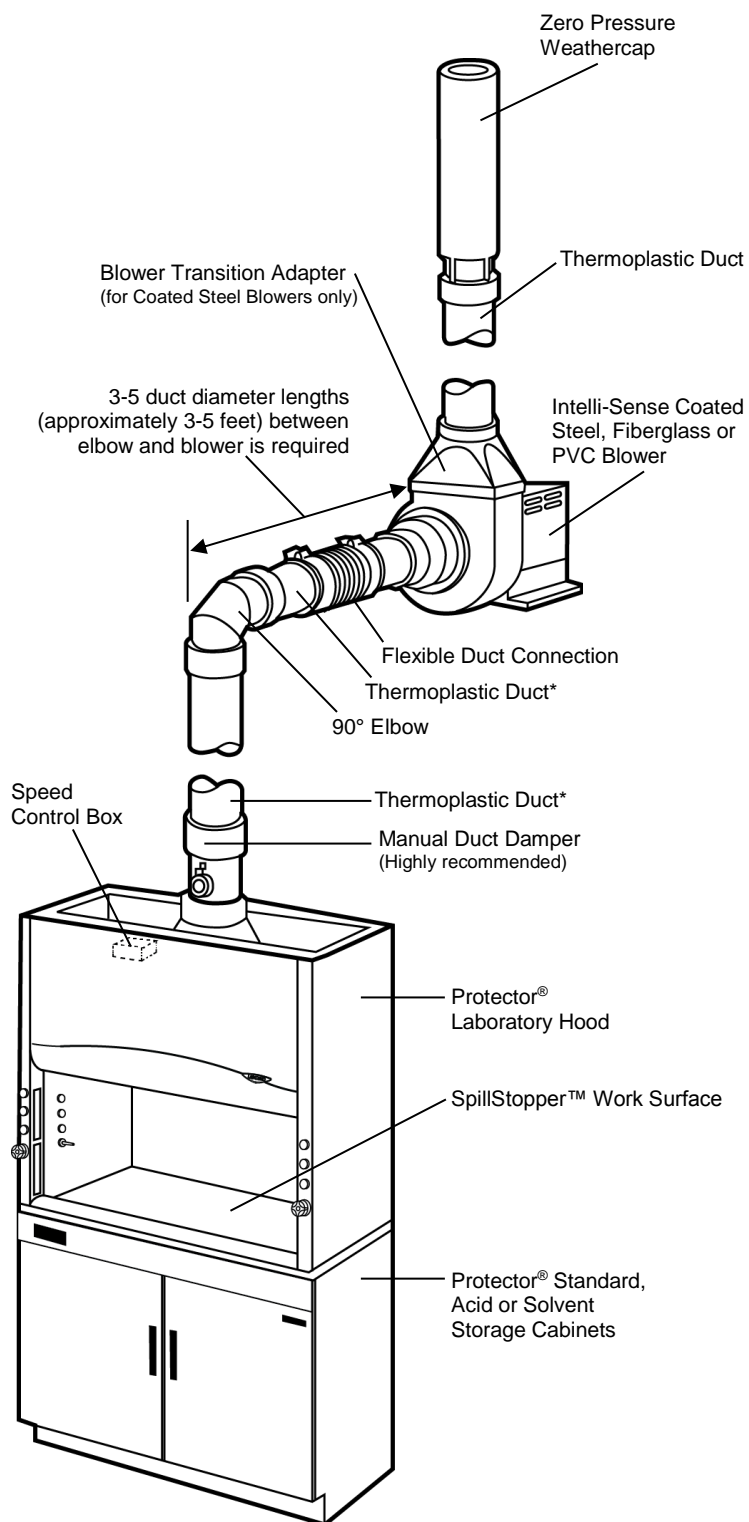
This chart provides static pressure losses for 10' long duct lengths of various diameters over a range of airflows in CFM for use in sizing hood/blower combinations at 100 feet per minute.

Nominal Diameter/Inches	6	8	10	12	16
Actual OD/inches	6.625	8.625	10.750	12.750	16.000
Actual ID/inches	6.25	8.250	10.375	12.375	15.625
Catalog Number	47086	47189	70272	56020	56050
Shipping Wt./lbs.	20	35	50	65	80
Airflow/CFM	Static Pressure Loss/Inches H ₂ O For Each 10 ft. of Duct Length				
250	.039	.011	.003	.001	--
500	.147	.037	.013	.005	.001
750	.321	.079	.026	.011	.003
1000	.557	.140	.043	.018	.005
1250	.855	.210	.066	.027	.008
1500	--	.300	.095	.039	.012
1750	--	.380	.130	.053	.016
2000	--	.485	.155	.067	.020
2500	--	--	.245	.109	.031
3000	--	--	--	.145	.042
4000	--	--	--	.240	.074
5000	--	--	--	--	.120

Chapter 7: Modifying Your Blower

Typical Fume Removal System

This diagram details the many components that are needed to complete a typical fume removal system. All of these components as well as others are available from Labconco.



**Minimum of 5 to 15 feet of duct in both locations is recommended for noise reduction.*

Thermoplastic Duct

PVC exhaust duct is Type 1, unplasticized, schedule 40, lightweight and corrosion-resistant. A female duct coupling is required to join two sections. Connections are simple with solvent cement. This rigid duct may be cut without special tools. Comes in 10' lengths.

Nominal Diameter/Inches	6	8	10	12	16
Catalog Number	47086	47189	70272	56020	56050
Actual OD/inches	6.625	8.625	10.750	12.750	16.000
Actual ID/inches	6.250	8.250	10.375	12.375	15.625
Shipping Wt./lbs.	25	35	50	65	80

Duct Couplings, Female

PVC coupling makes connection between two sections of thermoplastic duct quick and easy.

Nominal Diameter/Inches	6	8	10	12	16
Catalog Number	47089	47192	70275	56023	56053
Shipping Wt./lbs.	4	5	5	6	7
Equivalent Resistance in Feet of Straight Duct	0	0	0	0	0

Duct Couplings, Male

PVC duct in 6" length facilitates connections between Coated Steel Blowers and elbows, thermoplastic duct reducers and weather caps.

Nominal Diameter/Inches	6	8	10	12
Catalog Number	21447	47199	70278	70673
Actual OD/Inches	6.625	8.625	10.750	12.750
Actual ID/Inches	6.250	8.250	10.375	12.375
Shipping Wt./lbs.	3	4	5	6

Elbows

PVC elbows both 45° and 90°, are compatible with thermoplastic duct. Designed and engineered for quick installation and minimum pressure losses, they feature belled end connections to receive PVC duct directly.

90° Elbow	Nominal Diameter/Inches	6	8	10	12	16
	Catalog Number	47087	47190	70273	56021	56051
	Approx. Height/Inches	13-5/8	17-5/16	20-3/8	24-3/16	29
	Shipping Wt./lbs.	8	10	12	14	17
	Equivalent Resistance in feet of Straight Duct	12	15	20	25	36

45° Elbow	Nominal Diameter/Inches	6	8	10	12	16
	Catalog Number	47088	47191	70274	56022	56052
	Approx. Height/Inches	8-3/4	10-3/4	12-1/2	15	17-1/2
	Shipping Wt./lbs.	8	10	12	14	17
	Equivalent Resistance in feet of Straight Duct	6	7.5	10	12.5	18

Chapter 7: Modifying Your Blower

Thermoplastic Duct Reducers

PVC coupling type reducers are designed for connecting thermoplastic duct of different diameters. Compare your blower inlet size with your duct size to see if one is necessary.

Nominal Size/Inches	6x8	8x10	10x12	12x16
Catalog Number	56059	56060	56061	56307
Shipping Wt./lbs.	2	5	6	8
Equivalent Resistance in feet of Straight Duct	0	0	0	0

Zero Pressure Weathercaps

The zero pressure weathercap is made of strong, corrosion-resistant PVC. The cap adds little static pressure to the exhaust system and allows for vertical discharge of the effluent air for dispersion away from the building.

Nominal Diameter/Inches	6	8	10	12	16
Catalog Number	47222	47223	70951	56221	56222
Height/Inches	36	40	48	56	72
Shipping Wt./lbs.	20	25	30	35	40
Equivalent Resistance in feet of Straight Duct	5	5	5	5	5

Spiral Tube

This spiral tube simplifies temporary installations. It is corrosion-resistant, neoprene-impregnated fiberglass reinforced with steel wire. Includes rigid duct connector and two clamps. Length is ten feet.

Nominal Diameter/Inches	7" for use with 6" fittings	9" for use with 8" fittings	11" for use with 10" fittings	13" for use with 12" fittings
Catalog Number	19651	47194	70277	56223
Shipping Wt./lbs.	10	15	20	25
Equivalent Resistance in feet of Straight Duct	Because this ductwork is flexible and may conform to various configurations, it is not possible to know the precise equivalent resistance.			

Manual Duct Dampers

This damper fitting allows you to balance airflow. It may be used with exhaust and auxiliary air ducts, and is usually placed directly above the fume hood, but can be placed anywhere in the duct system.

Nominal Diameter/Inches	6	8	10	12	16
Catalog Number	47242	47413	59834	59812	47264
Shipping Wt./lbs.	10	12	15	20	25
Approx. Height/Inches	14	19-1/8	19-1/2	19-2/3	24

Flexible Duct Connections

This flexible connection reduces vibration between the blower and PVC ductwork. It is supplied with two clamps for easy installation.

Nominal Diameter/Inches	9" for use with 8" fittings	11" for use with 10" fittings	13" for use with 12" fittings
Catalog Number	47265	70342	56214
Shipping Wt./lbs.	5	5	5

Blower Transition Adaptors

This epoxy-coated steel transition adaptor fits all Labconco Coated Steel Blowers. This adaptor allows you to connect round thermoplastic duct to the exhaust side of the blower to create an exhaust stack. Nominal size PVC duct fits inside the adaptor opening.

Nominal Diameter/Inches	8	10	12
Catalog Number	47224	4722401	70034
Shipping Wt./lbs.	3	4	4
For use with Labconco Blowers	70680-70687	70680-70687	70688-70697

Auxiliary-Air Transition Adaptor

The auxiliary-air transition adaptor is the same construction as the blower transition adaptor, but is designed to allow you to connect round thermoplastic duct to the regular auxiliary-air collar of Protector Fume Hoods.

Nominal Diameter/Inches	10
Catalog Number	48893
Shipping Wt./lbs.	4

T and Y Connections

PVC fittings shaped in T and Y configurations are compatible with thermoplastic duct. End connections receive PVC pipe directly. Contact Labconco for help in sizing blowers with these accessories.

Nominal Diameter/Inches		10x10x12
T's	Catalog Number	56304
	Shipping Wt./lbs.	20
	Approx. Height/Inches	19

Nominal Diameter/Inches		10x10x12	12x12x16
Y's	Catalog Number	56301	56305
	Shipping Wt./lbs.	19	20
	Approx. Height/Inches	12-3/4	23-1/4

Chapter 7: Modifying Your Blower

Accessory for Basic 47 Hoods

Exhaust Transition Adaptor

The exhaust transition adapts to 7" and 10" rectangular outlet on Basic 47 Hoods, model series 22473 and 22475, to receive 10" diameter PVC duct.

Nominal Diameter/Inches	10
Catalog Number	22648
Shipping Wt./lbs.	5

Accessory for Perchloric Acid Applications

Wash Rings

Wash rings are suited for use in Perchloric acid duct systems. Each features a wide-angle conical spray nozzle and wash water connector nipple fabricated into a PVC coupling for use with 10" or 12" nominal duct.

Nominal Diameter/Inches	10	12
Catalog Number	47460	47461
Shipping Wt./lbs.	5	6

Accessories for Pathogens, Organic Vapors and Odor Control Applications

HEPA Filter Packs

High Efficiency Particulate Air Filter for non-radioactive particulate and pathogenic applications. Rated for 1000 CFM airflow with initial 1.0" static pressure drop. Replaceable HEPA filter media removes 99.97% of all particles 0.3 micron or greater. Furnished with clamping frame and duct connections. Unit measures 28" x 28" x 25" high.

Charcoal Filter Packs

Activated Charcoal Filter for non-radioactive organic vapors and odor control are rated for 1000 CFM airflow with 0.2" static pressure drop. Unit measures 28" x 28" x 25" high.

Nominal Diameter/Inches		8	10	12
HEPA Filter	Catalog Number	22400	22401	22442
	Shipping Wt./lbs.	100	100	100
Charcoal Filter	Catalog Number	22430	22431	22441
	Shipping Wt./lbs.	100	100	100

Backdraft Dampers

Designed for use in buildings under negative pressure to keep outside air from entering the laboratory through the hood ventilation system. Damper is weighted to stay in down/resting position when the hood is not in use, and rises from the airflow exhausting when the blower is on. It mounts vertically on blower outlet. The damper is made of PVC Type 1, unplasticized, schedule 40 duct.

Nominal Diameter/Inches	8	10	12
Catalog Number	S304508	S304510	S304512
Shipping Wt./lbs.	15	18	20

Bird Screens

Screen attaches easily with screws to auxiliary-air blower inlet to keep birds from nesting in blower.

Nominal Diameter/Inches	10	12
Catalog Number	S122500	S122501
Shipping Wt./lbs.	5	5

Chapter 7: Modifying Your Blower

CHAPTER 8

PROTECTOR I-S Hood

Labconco offers Protector® I-S™ Fume Hood models installed with limit switches for automatic Intelli-Sense Blower operation that change 3 speeds automatically based off the sash position. The Intelli-Sense Blower low speed runs with the rising sash from 0"-3", with the medium speed sash from 4"-19" and the high speed sash from 20"-28"; the medium and high speed sash height positions can be altered by 1" increments in the field between 15" and 20". The limit switches are installed and wired per the automatic operation wiring diagrams in Appendix C. The limit switches replace the manually operated 3-position switch. A Digital Airflow Monitor on the Protector I-S Hood constantly monitors face velocity at all speeds and sash positions to ensure proper hood operation. Note: The integrated Protector I-S Hoods with limit switches are only available from the factory due to the wiring complexity.

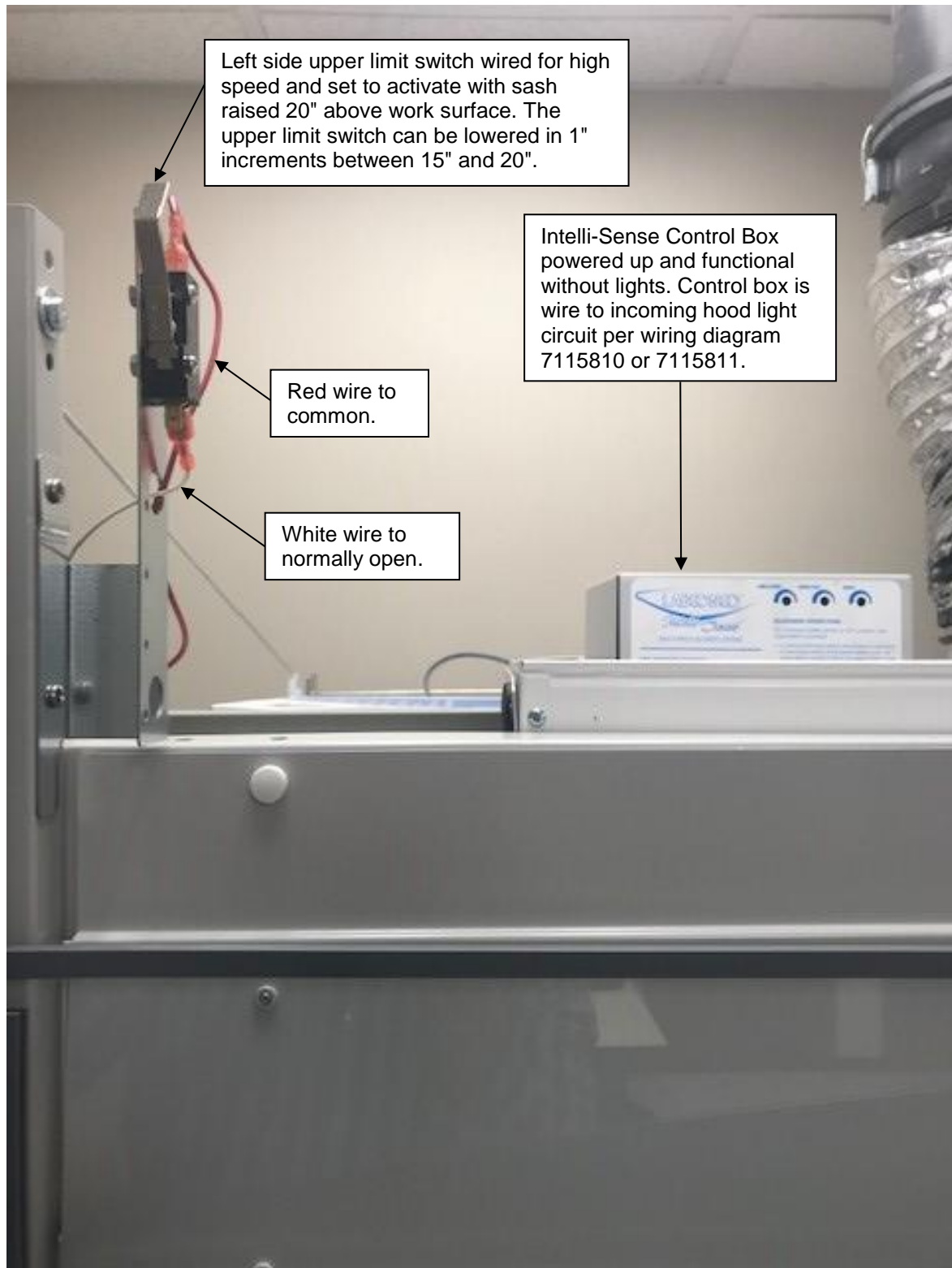
The integrated Protector I-S Hood models with limit switches automatically regulate the Intelli-Sense Blower, but independent of any room controls. Room controls such as room pressurization controls depicted in Appendix E are sold separately and are not sold by Labconco. The Protector I-S Hood is primarily used for small hood projects when the number of fume hoods cannot justify a complete variable airflow volume system or VAV. The Protector I-S Hood alters the (RPM) speed of the electronically commutated motor (ECM) blower wheel automatically with the sash position to change speeds. Some VAV systems can degrade and usually have annual service issues, but the Protector I-S Hood with Intelli-Sense Blower is reliable with little maintenance as it has no belts, valves or sophisticated controls systems. The reliable Intelli-Sense Blower has a rated bearing life of 50,000 hours (6 years) at full speed and a test life of over 150,000 hours (over 17 years).

Chapter 8: Protector I-S Hood

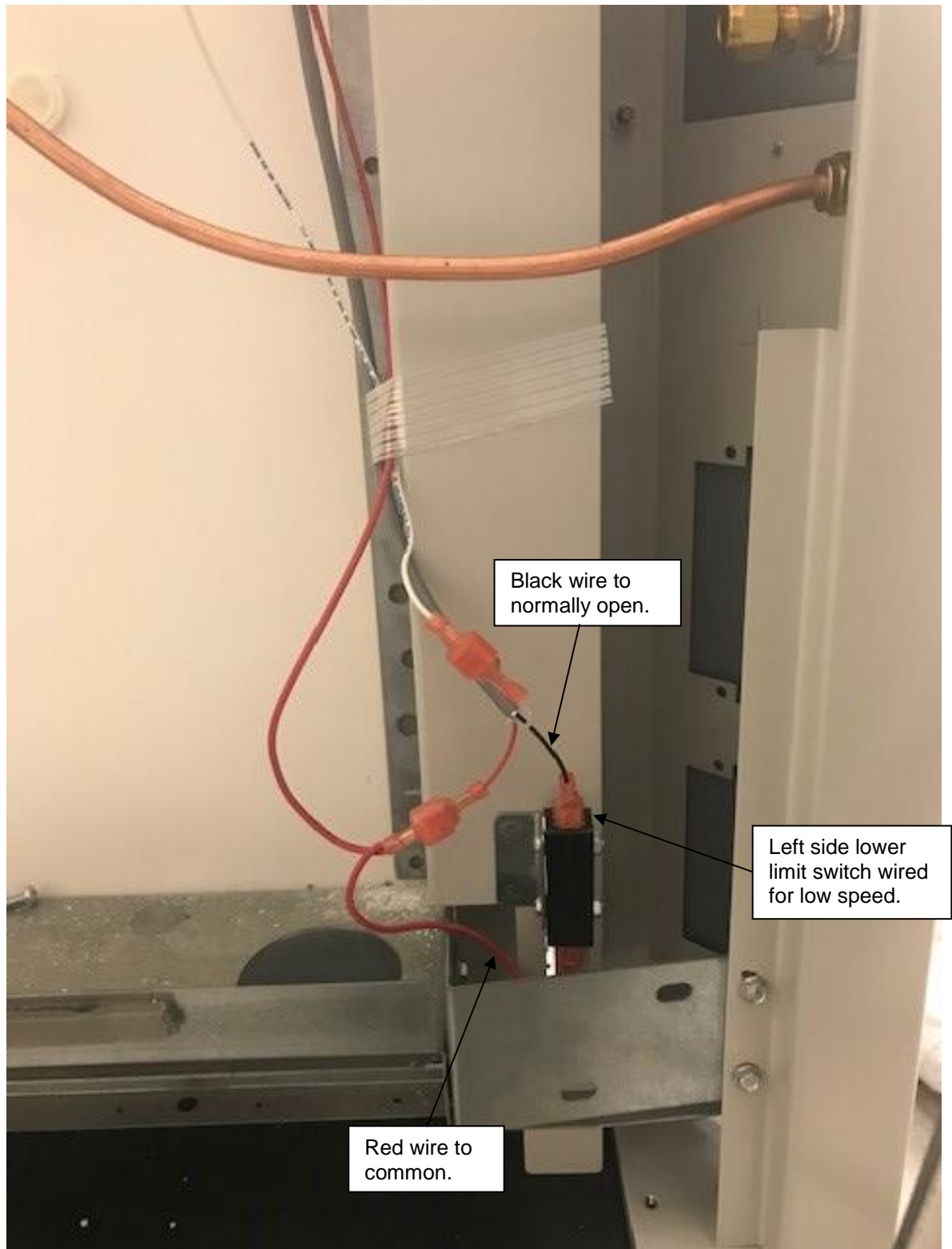
Please keep in mind that room controls such as room pressurization controls (Appendix E), duct sensors, or hood exhaust volume controls are not included. The variety of room controls MUST BE selected by the building controls engineering department. Note: Room controls are not sold by Labconco. In typical environments the room controls are set to a negative pressure with a range of -0.01" to -0.05" depending on the application.

The following summarizes the Protector I-S Hood installed with limit switches for automatic Intelli-Sense Blower operation.

- **INTEGRATED** – Minimal set up, pre-mounted, multi-speed MSB controller, and pre-wired limit switches.
- **INDEPENDENT** – No conscious control as blower speeds change automatically with sash position and room controls work independently. Room controls are sold separate and not sold by Labconco.
- **INTELLIGENT** – The Integrated Intelli-Sense Hood becomes a Smart Hood that adjusts 3 speeds automatically based off sash position, has built-in over-amperage adjustment to prevent overheating, provides simple blower sizing, and provides 3 easy speed adjustments (MIN, MED, MAX) based off MIN sash height of 0"-3", MED sash height of 4"-19", and MAX sash height of 20"-28"; the MED and MAX sash heights can be altered by 1" increments in the field between 15" and 20".



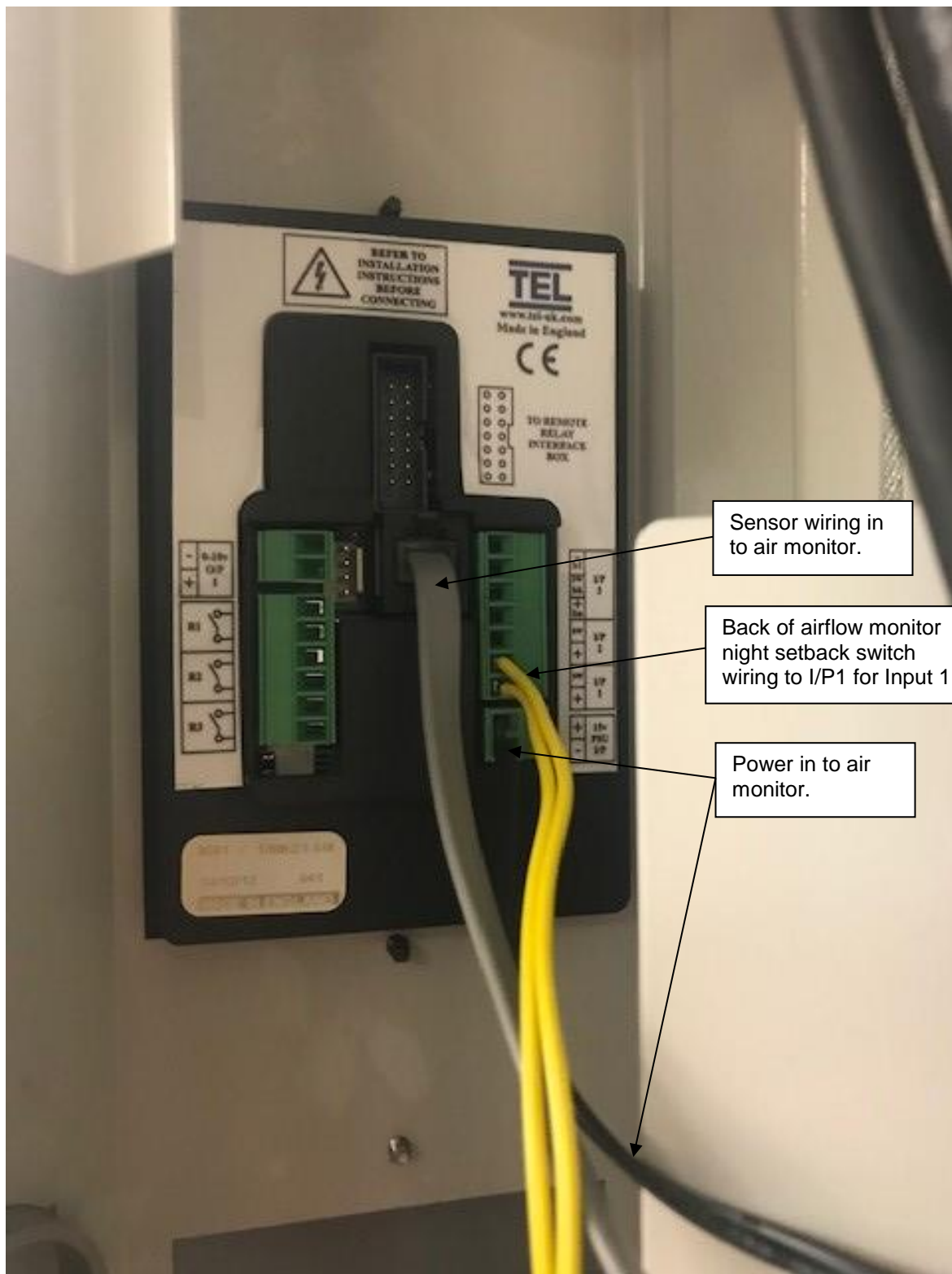
Chapter 8: Protector I-S Hood





Chapter 8: Protector I-S Hood





CHAPTER 9

TROUBLESHOOTING

Refer to the following table if your blower 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 won't operate.	Wires not connected at junction boxes or switches.	Check connection of switches.
		Check connection to control box on top of fume hood, connection of switch control wires, and connection of shielded control wires from roof blower. If needed, replace control box on top of fume hood.
	Circuit breakers tripped in building electrical supply.	Reset circuit breakers.
	Blower wiring is disconnected.	Inspect blower wiring and 2 or 3 position switch for manual operation. Inspect Intelli-Sense Hood limit switch wiring for automatic operation per Chapter 8.
	Blower motor is defective.	Check connection of ECM motor cables or replace ECM motor.
	Shaft coupling is loose.	Tighten shaft coupling with lockwashers between ECM motor and blower wheel.

PROBLEM	CAUSE	CORRECTIVE ACTION
Contamination outside of fume hood.	Fume hood has improper face velocity	Have fume hood re-certified and check remote blower exhaust system. Hood should have average face velocity of 60-100 fpm depending on application.
Remote blower has excessive vibration.	Improper motor mount.	Review <i>Chapter 2: Prerequisites</i> and <i>Chapter 3: Getting Started</i> . The blower should be mounted on vibration isolators or vibration mounting pads to isolate vibration.
	Inspect wheel for damage and appropriate clearance.	Replace damaged wheel or adjust clearance.
	Check for objects in blower wheel.	Remove objects in blower wheel.
	Improper inlet connection.	Review <i>Chapter 3: Getting Started</i> . The blower inlet should be installed with a vibration damper or flexible duct connection.
Fume hood has improper face velocity.	Blower not sized properly.	Review <i>Chapter 7: Modifying Your Blower. Blower Sizing</i> . Size the blower properly with equivalent resistance method. Refer to Chapters 4 and 7.
	Blower requires RPM adjustment or a manual damper is needed in the exhaust ductwork.	Review <i>Chapter 3: Getting Started</i> . Adjust the fan speed and confirm blower performance. See Chapters 3, 4, and 7.

APPENDIX A

BLOWER REPLACEMENT

PARTS WITH WIRING SHOWN

The following replacement parts are organized for Intelli-Sense MSB's for low pressure coated steel, low pressure fiberglass, and low pressure PVC. See next page for illustrations.

Item	Quantity	Part No.	Description – Roof Blower Components
1A	1	7117101	Shaft Coupler
1B	4	1889012	Coupler Socket Head Screw 10-32 x .75"
1C	4	1910110	Coupler, Lock Washer #10 stainless
1D	1	7116100	Fan, Motor Cooling
2A	1	7116201	ECM Motor, 1 HP - 10" Coated Steel, 1900 RPM
2B	1	7116202	ECM Motor, 1 HP - 12" Coated Steel, 1250 RPM
2C	1	7116203	ECM Motor, 1 HP - 10" Fiberglass FRP, 1900 RPM
2D	1	7116204	ECM Motor, 1 HP - 12" Fiberglass FRP, 1500 RPM
2E	1	7116205	ECM Motor, 1 HP - 10" PVC, 1900 RPM
2F	1	7116206	ECM Motor, 1 HP - 12" PVC, 1500 RPM
2G	1	7116500	Motor Mounting Bracket
2H	1	7115300, 01	Motor Harness to Blower J-Box (115V-00, 230V-01)
2I	1	3843500	Motor Clamp Bracket
2J	3	7117000	Vibration Foot Support, Motor
2K	1	1880924	Screw, Motor Clamp
2L	1	1905623	Nut, Motor Clamp
2M	3	1881020	Screw, Vibration Mount
2N	3	1906921	Nut, Vibration Mount
3A	1	7117800	Impeller Wheel Assembly, 10" Coated Steel
3B	1	7117801	Impeller Wheel Assembly, 12" Coated Steel
3C	1	7117200	Impeller Wheel Assembly, 10" Fiberglass FRP
3D	1	7117201	Impeller Wheel Assembly, 12" Fiberglass FRP
3E	1	7117202	Impeller Wheel Assembly, 10" PVC
3F	1	7117203	Impeller Wheel Assembly, 12" PVC
4A	1	7099100	Shaft Seal
4B	1	1852400	Key, Shaft
5A	1	7116700	Weather Cover
5B	1	7116800	Internal Rain Guard, Motor Cover
5C	6	1885806	Weather Cover, Screw

Appendix A: Blower Replacement Parts

Item	Quantity	Part No.	Description – Roof Blower Components
6A	1	1860500	Flanged Pillow Block Bearing 5/8" Bore
6B	2	1881712	Screw – Cap Hex Head 3/8 – 16 x 0.75" SS
6C	2	1910018	Lockwasher 3/8
7A	1	9816700	J-Box, Blower
7B	1	9816800	Cover, J-Box Blower
7C	2	4450100	Screw, Cover J-Box
8A	1	7115100	Cable, Blower Switch to MSB Control Box
8B	1	7115101	Cable, Automatic Limit Switches to MSB Control Box
9A	1	7115000, -10	MSB Control Box, 115V (-10 Automatic)
9B	1	7115001, -20	MSB Control Box, 230V(-20 Automatic)
10	1	7116000	Power Cable, Control Box Power Inlet from hood lighting
11A	1	1302401	Blower Switch, 3 Position – Manually Operated
11B	1	1305200	Retainer, Blower Switch
11C	3	3832400	Limit Switch, Automatic Blower Operation
12	1	9486200	Label, 3 Position Blower Switch for Hood Corner Post
13	1	3207100	ECM Blower Motor control Board
14A	1	7115200	Internal Harness Power, Control Box 115V
14B	1	7115201	Internal Harness Power, Control Box 230V
15	1	7117500	Power Supply, 24V – Control Box
16	2	7117700	Accessory Cable, Airflow Monitor Night Set Back (not included)
17	1	7115400	Cable, Jumper, Blower – Air Monitor (see Chapter 7 and Appendix C)

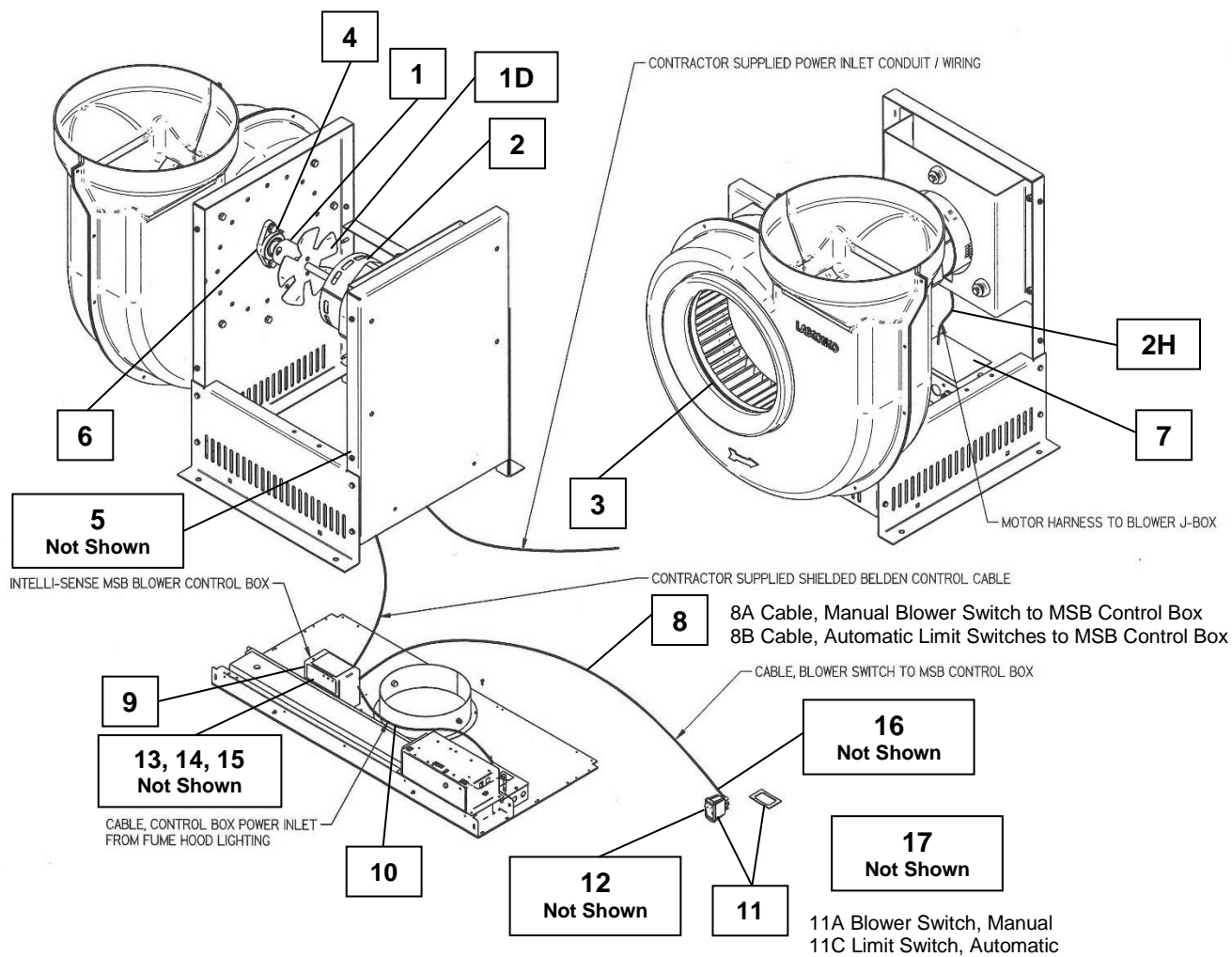
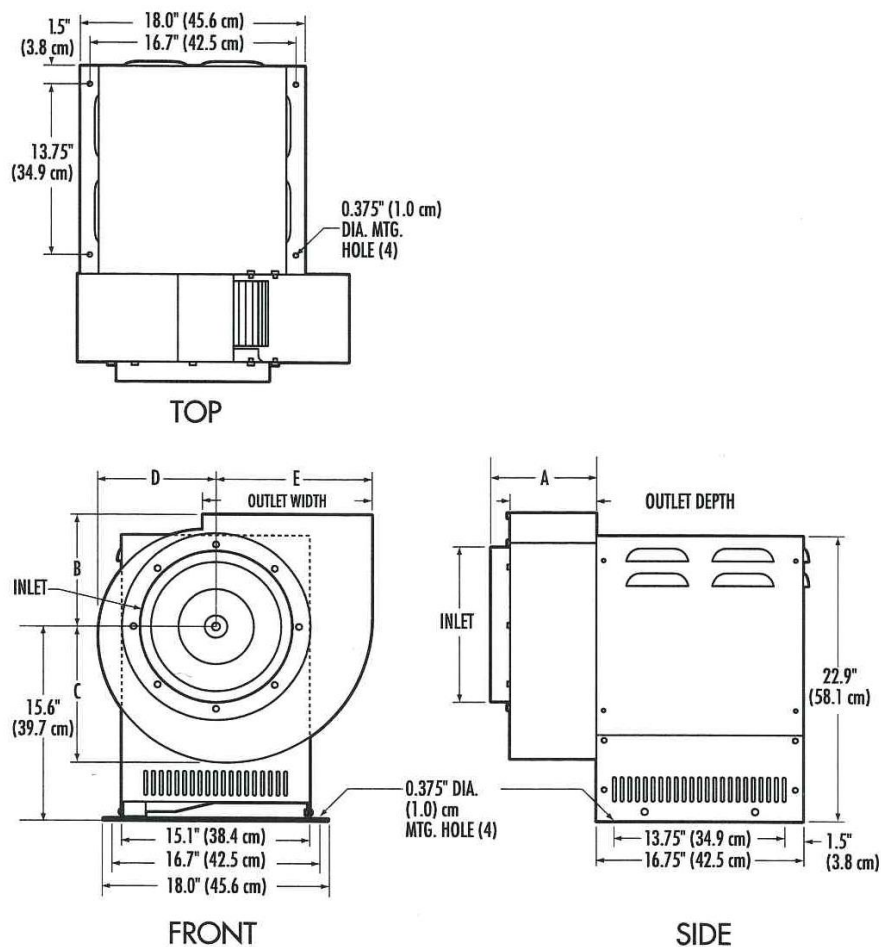


Figure A-1

APPENDIX B

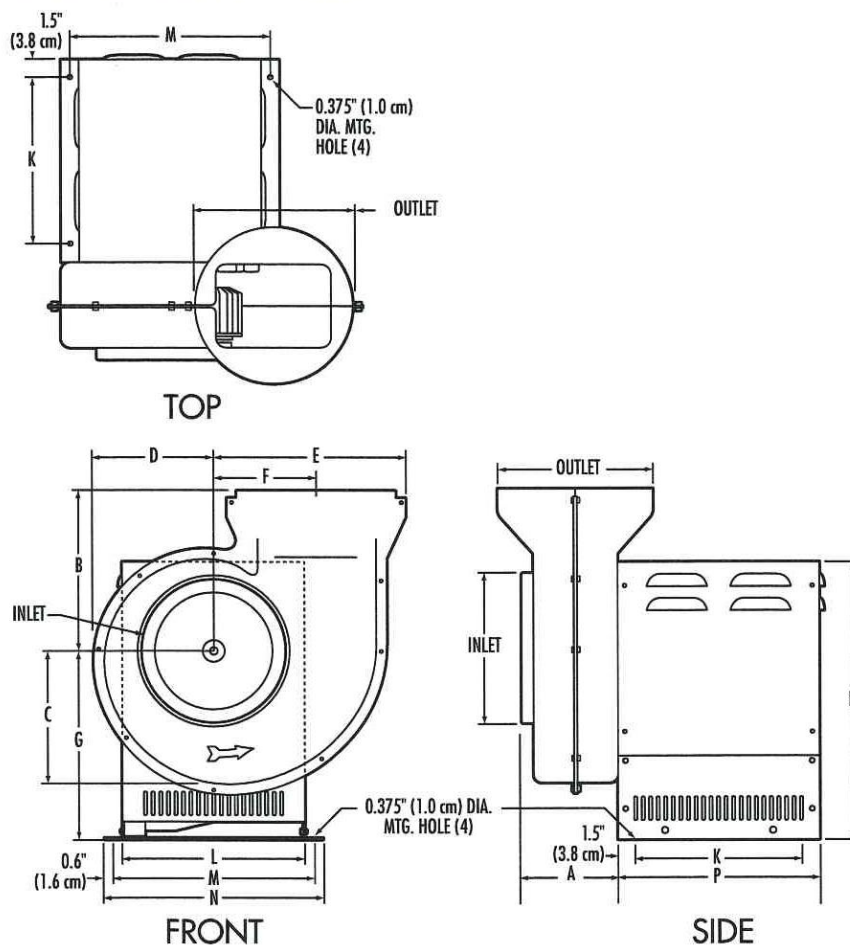
BLOWER DIMENSIONS

Dimensional Data



Dimension	Catalog# 7061110 & 7061120	Catalog# 7061112 & 7061122
A	7.2" (18.2 cm)	8.6" (21.7 cm)
B	7.0" (17.8 cm)	9.0" (22.9 cm)
C	8.1" (20.7 cm)	10.5" (26.7 cm)
D	6.8" (17.3 cm)	9.0" (22.9 cm)
E	9.25" (23.5 cm)	12.5" (31.8 cm)
Inlet	10.9" (27.6 cm) ID	12.25" (31.1 cm) OD
Outlet	5.5" (14.0 cm) D x 10.0" (25.4 cm) W	7.0" (17.8 cm) D x 13.5" (34.3 cm) W
Wheel	9.2" (23.3 cm) Dia. x 4.25" (10.8 cm) W	12.2" (31.0 cm) Dia. x 5.25" (13.3 cm) W

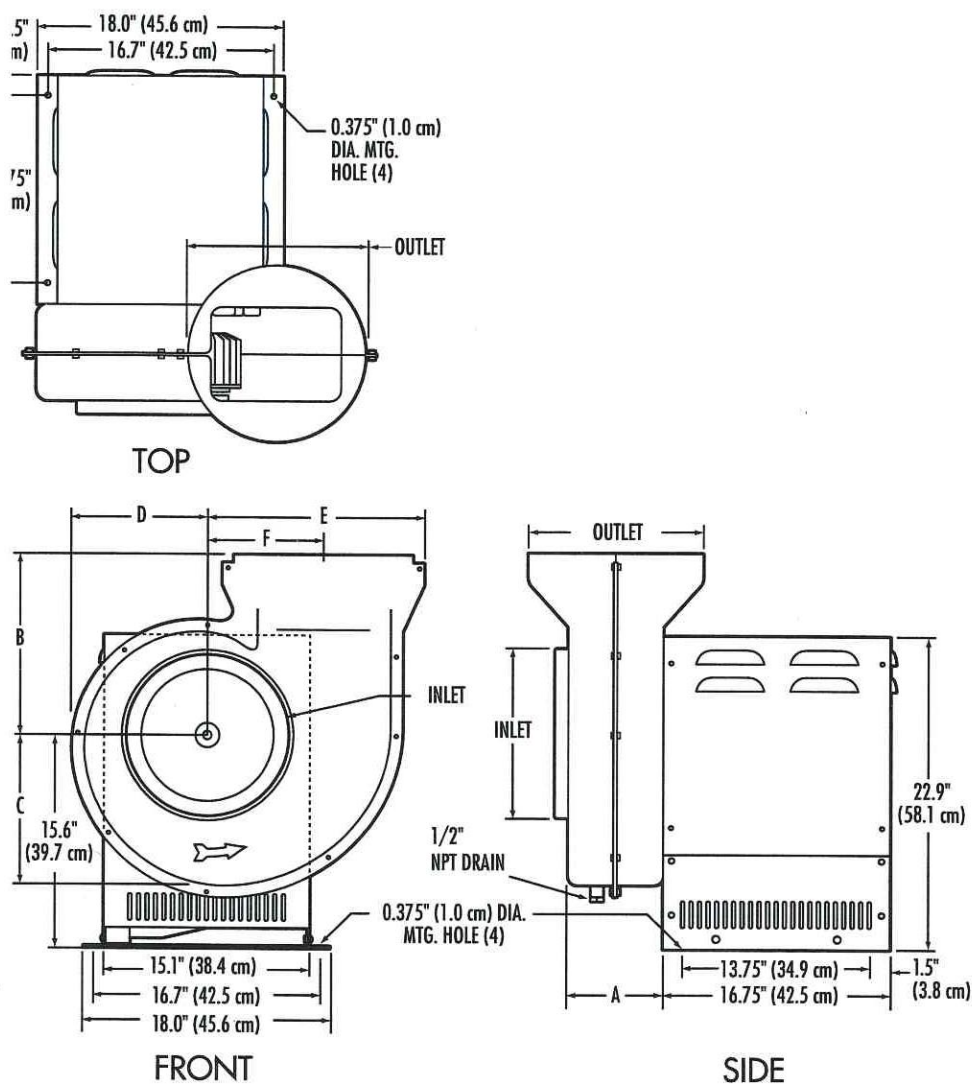
Dimensional Data



Dimension	Catalog# 7181810 & 7181820	Catalog# 7181812 & 7181822
A	7.1" (18.1 cm)	8.0" (20.3 cm)
B	12.7" (32.2 cm)	13.2" (33.5 cm)
C	10.5" (26.7 cm)	12.0" (30.5 cm)
D	8.75" (22.2 cm)	10.0" (25.4 cm)
E	13.9" (35.3 cm)	15.9" (40.3 cm)
F	7.5" (19.1 cm)	8.5" (21.6 cm)
G	15.6" (39.7 cm)	15.6" (39.7 cm)
H	22.9" (58.1 cm)	22.9" (58.1 cm)
K	13.75" (34.9 cm)	13.75" (34.9 cm)
L	15.1" (38.4 cm)	15.1" (38.4 cm)
M	16.7" (42.5 cm)	16.7" (42.5 cm)
N	18.0" (45.6 cm)	18.0" (108.0 cm)
P	16.75" (42.6 cm)	16.75" (42.6 cm)
INLET	10.4" (26.4 cm) OD	12.4" (108.2 cm) OD
OUTLET	10.75" (27.3 cm) ID	12.75" (32.4 cm) ID
WHEEL	9.9" (25.2 cm) Dia. x 3.3" (8.4 cm) W	11.8" (30.0 cm) Dia. x 4.25" (10.8 cm) W

Appendix B: Blower Dimensions

Dimensional Data



Dimension	Catalog# 7183410 & 7183420	Catalog# 7183412 & 7183422
A	7.1" (18.1 cm)	8.0" (20.3 cm)
B	12.7" (32.2 cm)	13.2" (33.5 cm)
C	10.5" (26.7 cm)	12.0" (30.5 cm)
D	8.75" (22.2 cm)	10.0" (25.4 cm)
E	13.9" (35.3 cm)	15.9" (40.3 cm)
F	7.5" (19.1 cm)	8.50" (21.6 cm)
INLET	10.4" (26.4 cm) OD	12.4" (31.4 cm) OD
OUTLET	10.75" (27.3 cm) ID	12.75" (32.4 cm) ID
WHEEL	9.9" (25.2 cm) Dia. x 3.3" (8.4 cm) W	11.8" (30.0 cm) Dia. x 4.25" (10.8 cm) W

APPENDIX C

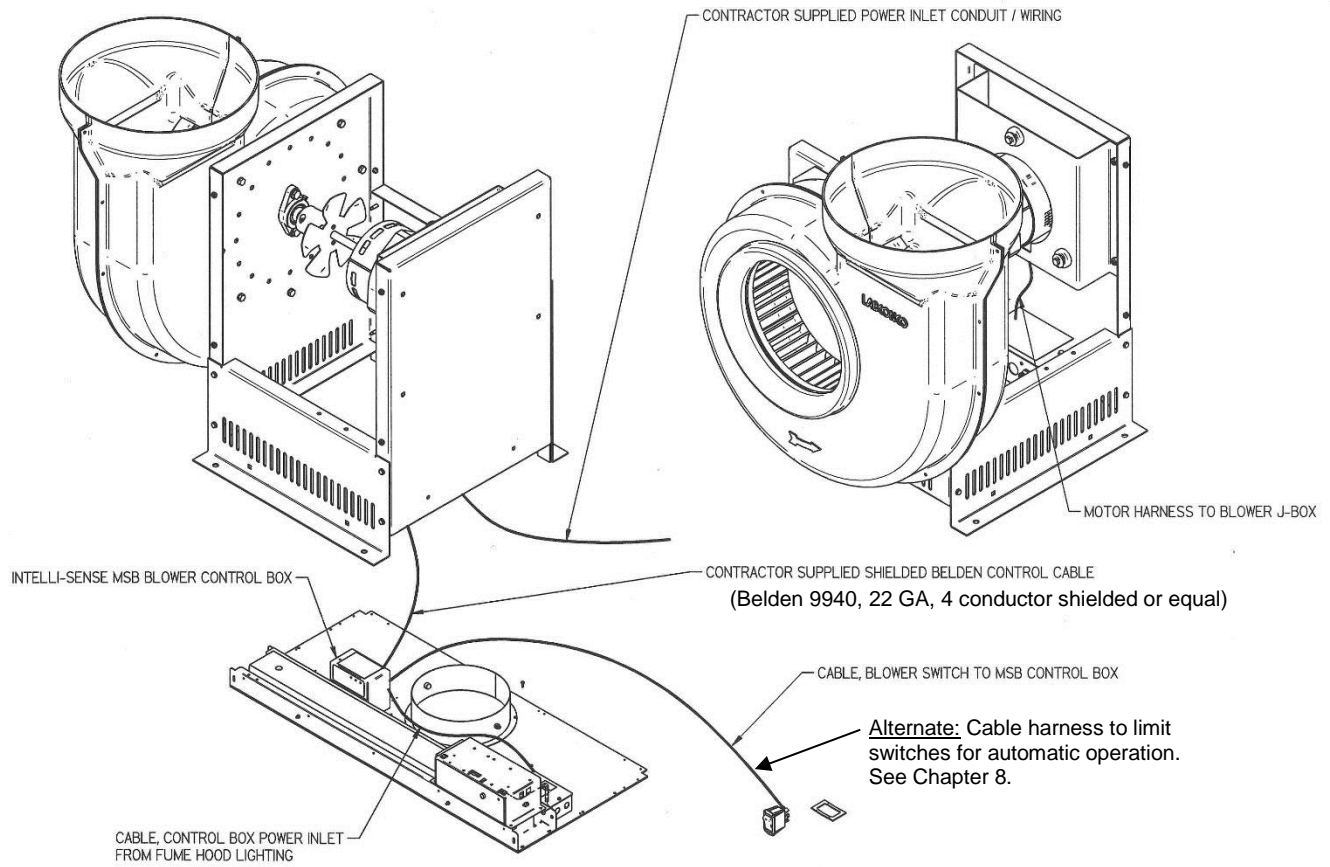
BLOWER ENVIRONMENTAL CONDITIONS, WIRING DETAIL & WIRING DIAGRAMS

Environmental Conditions

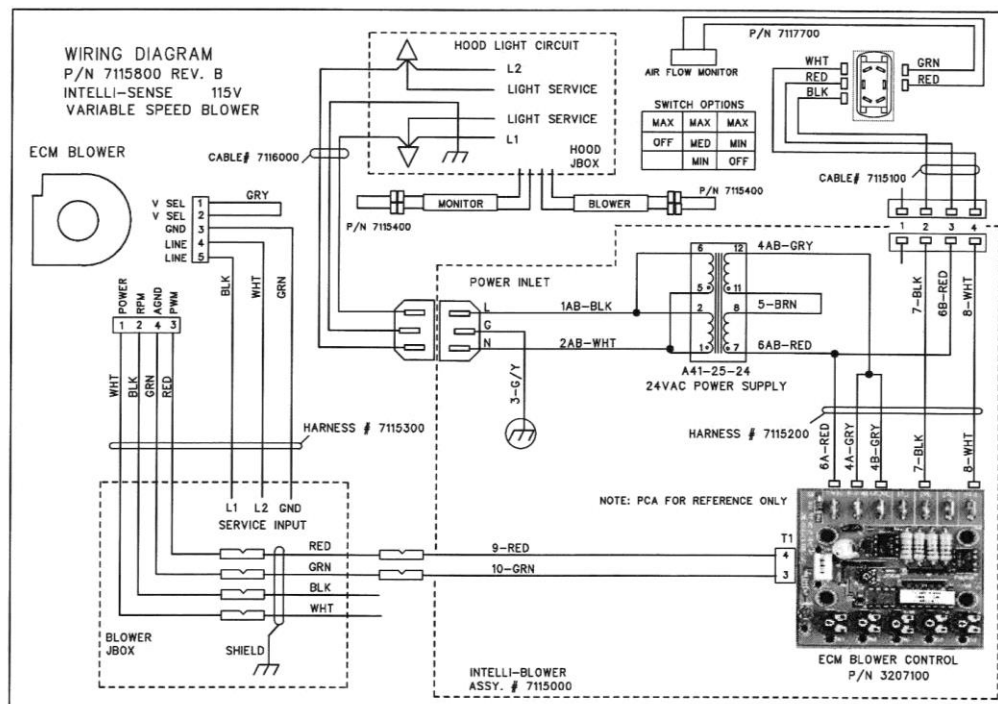
- Maximum altitude: 9843 feet (3000 meters).
- Ambient temperature range: -30° to 130°F (-34° to 54°C).
- Main supply voltage fluctuations not to exceed $\pm 10\%$ of the nominal voltage.
- Transient over-voltages according to Installation Categories II (Over-voltage Categories per IEC 1010). Temporary 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.

Appendix C: Blower Environmental Conditions & Wiring Diagrams

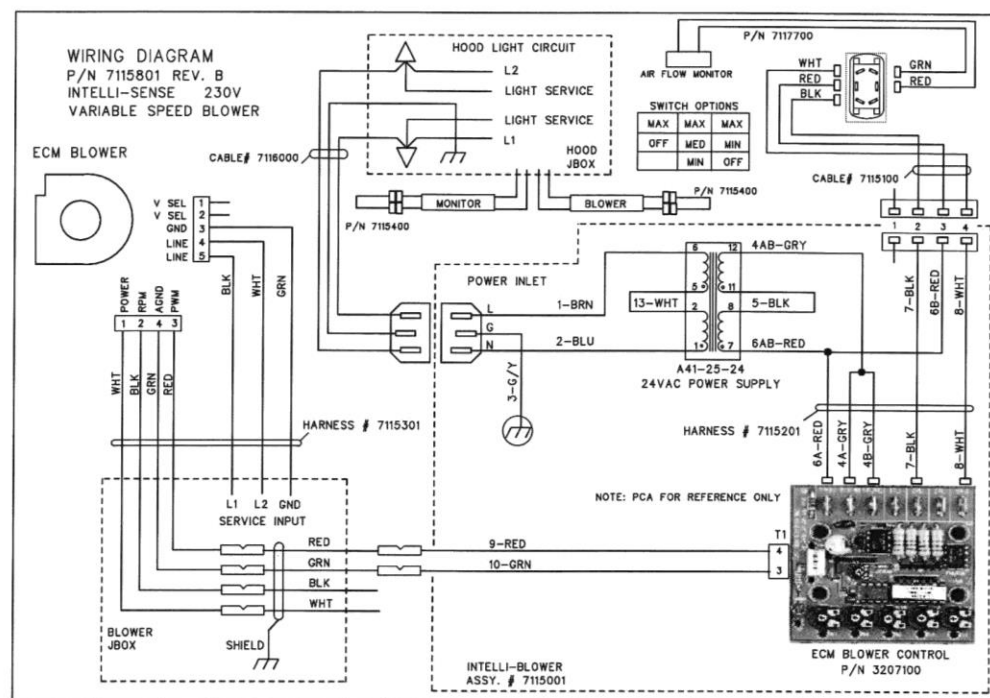
Wiring Detail



115V Wiring Diagram – Manual Operation

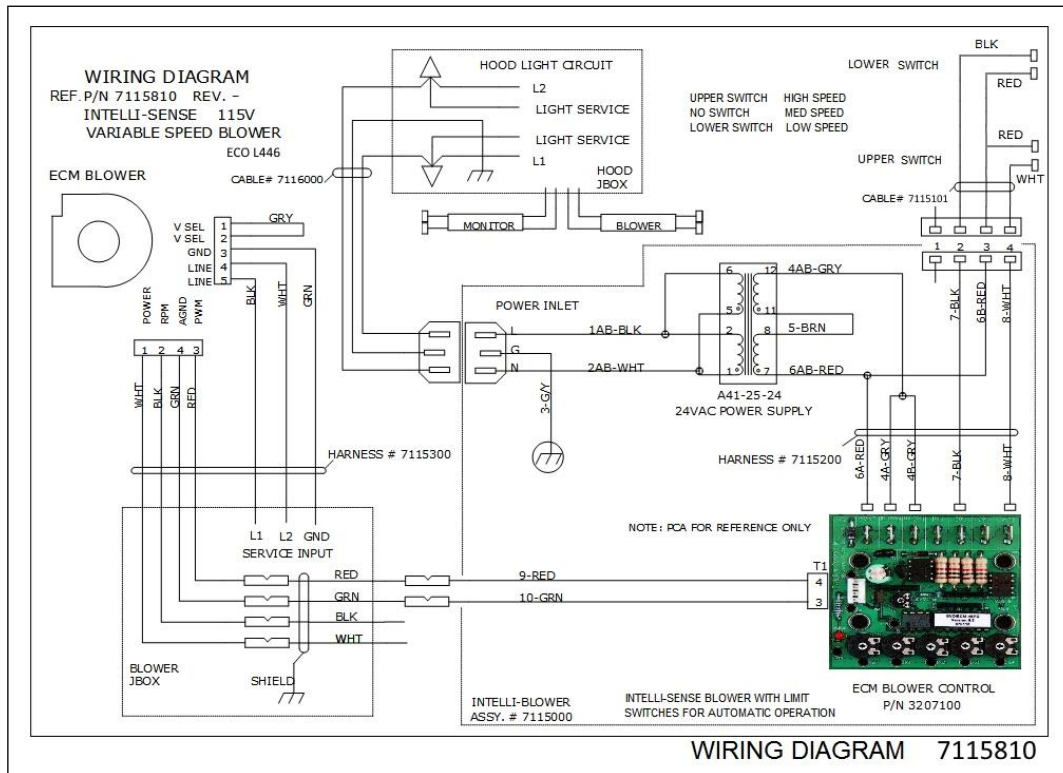


230V Wiring Diagram – Manual Operation

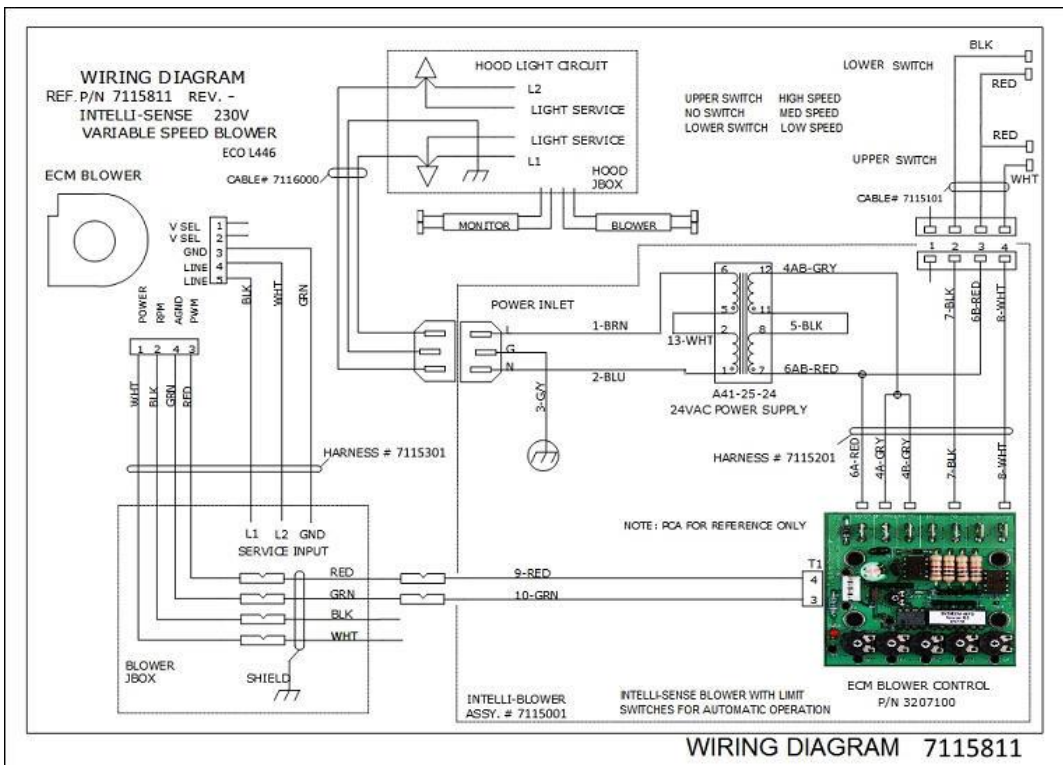


Appendix C: Blower Environmental Conditions & Wiring Diagrams

115V Wiring Diagram – Automatic Operation



230V Wiring Diagram – Automatic Operation



APPENDIX D

TYPICAL INTELLI-SENSE BLOWER OPERATING CURVE

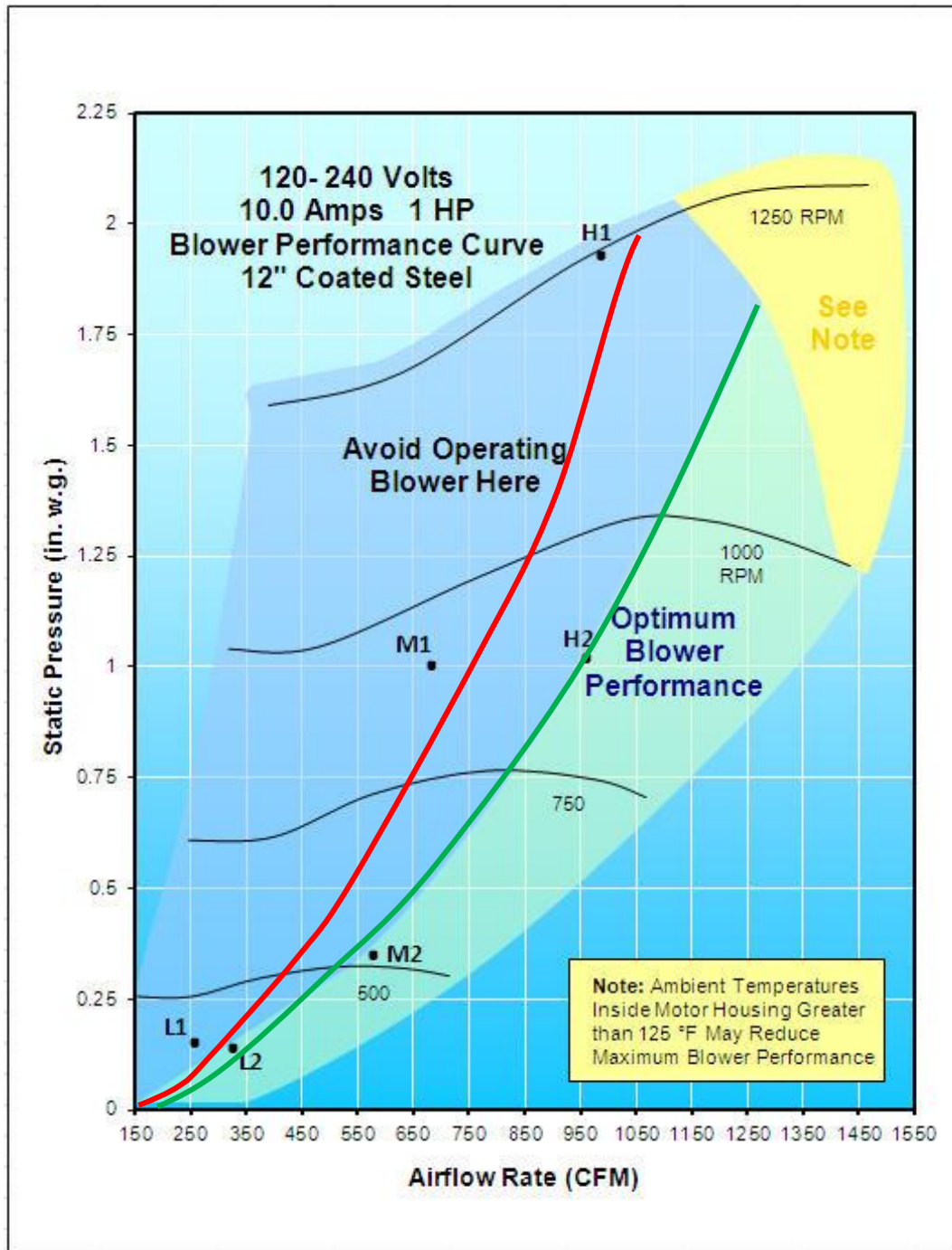
Damper 50% Open (Red)

- High Data Point, H1 895 CFM, 1.8" S.P., 1250 RPM
- Medium Data Point, M1 675 CFM, 1.0" S.P., 895 RPM
- Low Data Point, L1 260 CFM, 0.12" S.P., 330 RPM

Damper 75% Open (Green)

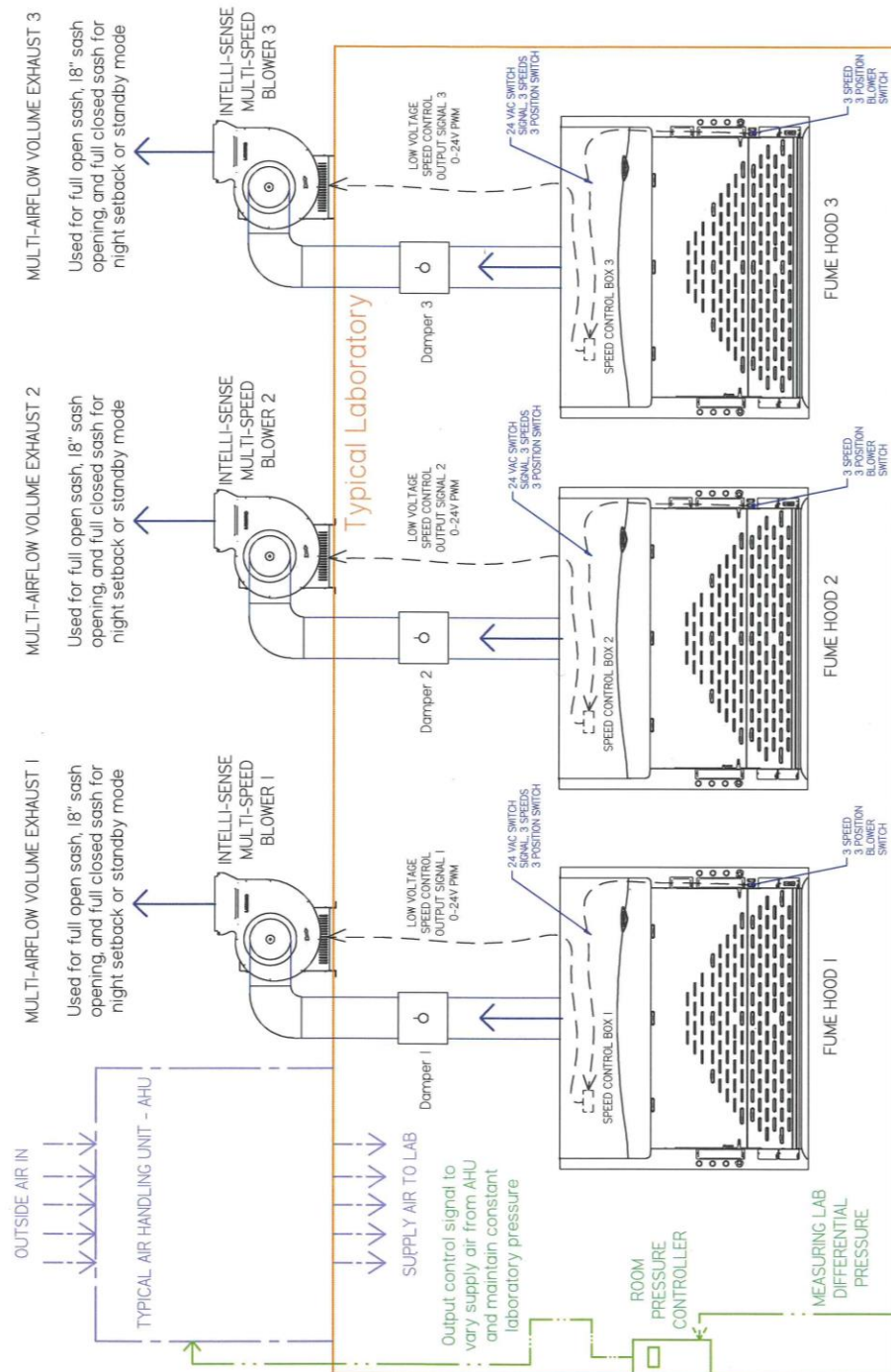
- High Data Point, H2 955 CFM, 1.0" S.P., 875 RPM
- Medium Data Point, M2 565 CFM, 0.37" S.P., 515 RPM
- Low Data Point, L2 330 CFM, 0.12" S.P., 315 RPM

Appendix D: Typical Intelli-Sense Blower Operating Curve



APPENDIX E

TYPICAL LABORATORY CONTROLS WITH INDIVIDUAL INTELLI-SENSE BLOWERS



APPENDIX F

TYPICAL PERCHLORIC ACID HOOD INSTALLATION DIAGRAM

