# User's Manual

## Intelli-Sense™ Multi-Speed Blowers

### Coated Steel Models

| | Complete Intelli-Sense MSB Blower with Controls | Intelli-Sense MSB Blower – No Controls (used for replacement and configured fume hood specials) |
|---|---|---|
| | All 50/60 Hz | 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 | Intelli-Sense MSB Blower – No Controls (used for replacement and configured fume hood specials) |
|---|---|---|
| | All 50/60 Hz | 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 | Intelli-Sense MSB Blower – No Controls (used for replacement and configured fume hood specials) |
|---|---|---|
| | All 50/60 Hz | 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**

*Protecting your laboratory environment*
LABCONCO®

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

## Warranty

Labconco provides a warranty on all parts and factory workmanship. The warranty includes areas of defective material and workmanship, provided such defect results from normal and proper use of the equipment.

The warranty for all Labconco products will expire one year from date of installation or two years from date of shipment from Labconco, whichever is sooner, except the following;

- Purifier® Logic®+ Biological Safety Cabinets and PuriCare® Procedure Stations carry a five-year warranty from date of installation or six years from date of shipment from Labconco, whichever is sooner.
- SteamScrubber® & FlaskScrubber® Glassware Washers carry a two-year warranty from date of installation or three years from date of shipment from Labconco, whichever is sooner.
- Blood Drawing Chairs carry a ten year warranty.
- Carts carry a lifetime warranty.
- Glassware is not warranted from breakage when dropped or mishandled.

This limited warranty covers parts and labor, but not transportation and insurance charges. In the event of a warranty claim, contact Labconco Corporation or the dealer who sold you the product. If the cause is determined to be a manufacturing fault, the dealer or Labconco Corporation will repair or replace all defective parts to restore the unit to operation. Under no circumstances shall Labconco Corporation be liable for indirect, consequential, or special damages of any kind. This statement may be altered by a specific published amendment. No individual has authorization to alter the provisions of this warranty policy or its amendments. Lamps and filters are not covered by this warranty. Damage due to corrosion or accidental breakage is not covered.

## 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 7:00 a.m. and 6:00 p.m., Central Standard Time.

**Part #7115900, Rev. -**
**ECO H871**

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# 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. Studies have shown that fume hoods on two or three 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 présenté 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 présenté 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.


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


- 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 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*.

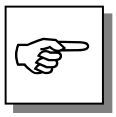
# CHAPTER 3
# GETTING STARTED

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)

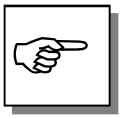
## Unpacking Your Blower

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 fiberglass 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.

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 épuisé.**

# Connect to the Blower Outlet

Before proceeding with the blower outlet connection, read the two warnings listed below:

**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.**

**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.**

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

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

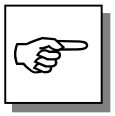
The main electrical power supply connection for the MSB is made directly at the junction box underneath the outer weather cover and below the ECM motor. Refer to wiring detail and wiring diagrams in Appendix C. Remove the weather cover from the MSB and wire directly to the power wires inside the outside 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**

| Mode A | Mode B | Mode C |
|---|---|---|
| MAX | MAX | MAX |
| MED | MIN | OFF |
| MIN | OFF | |

Follow these steps to properly install the control circuitry per the wiring diagrams in Appendix C.

1. Ensure the power is turned off at the roof disconnect and at the fume hood lighting circuit.
2. With shielded wire, 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.

5. Run the MSB Control Box Power Cable with the IEC inlet from the control box to the junction box on the fume hood and connect to the fume hood light circuit per wiring detail and wirings diagram in Appendix C.
6. If two or three position blower setting is desired, remove the blower switch and blower switch label from the fume hood. For simple ON/OFF, skip this step.
7. Remove the wires to the blower switch. **Important: Prevent the existing wires to the blower switch from causing interference with the sash or remove them.**
8. Install the new blower switch label, blower switch, and blower switch retainer. If needed, blower switch cutout is 0.83" x 1.45" (2.1 cm x 3.7 cm).
9. Locate the MSB Control Cable and connect the wires from the blower switch to the MSB Control Box connector per wiring detail and wiring diagrams in Appendix C and reference Appendix E.
10. All electrical connections to the roof mounted blower, the MSB Control Box, and switch wiring should be intact.
11. Restore power to the roof mounted blower and the fume hood lighting circuit.

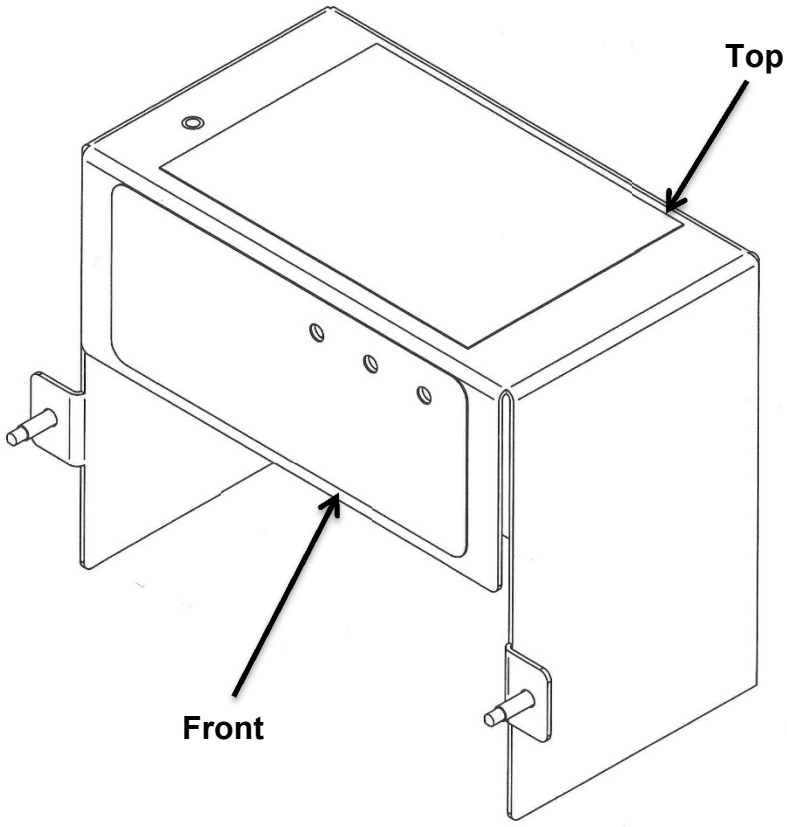



**Figure 3-1**
**MSB Control Box**

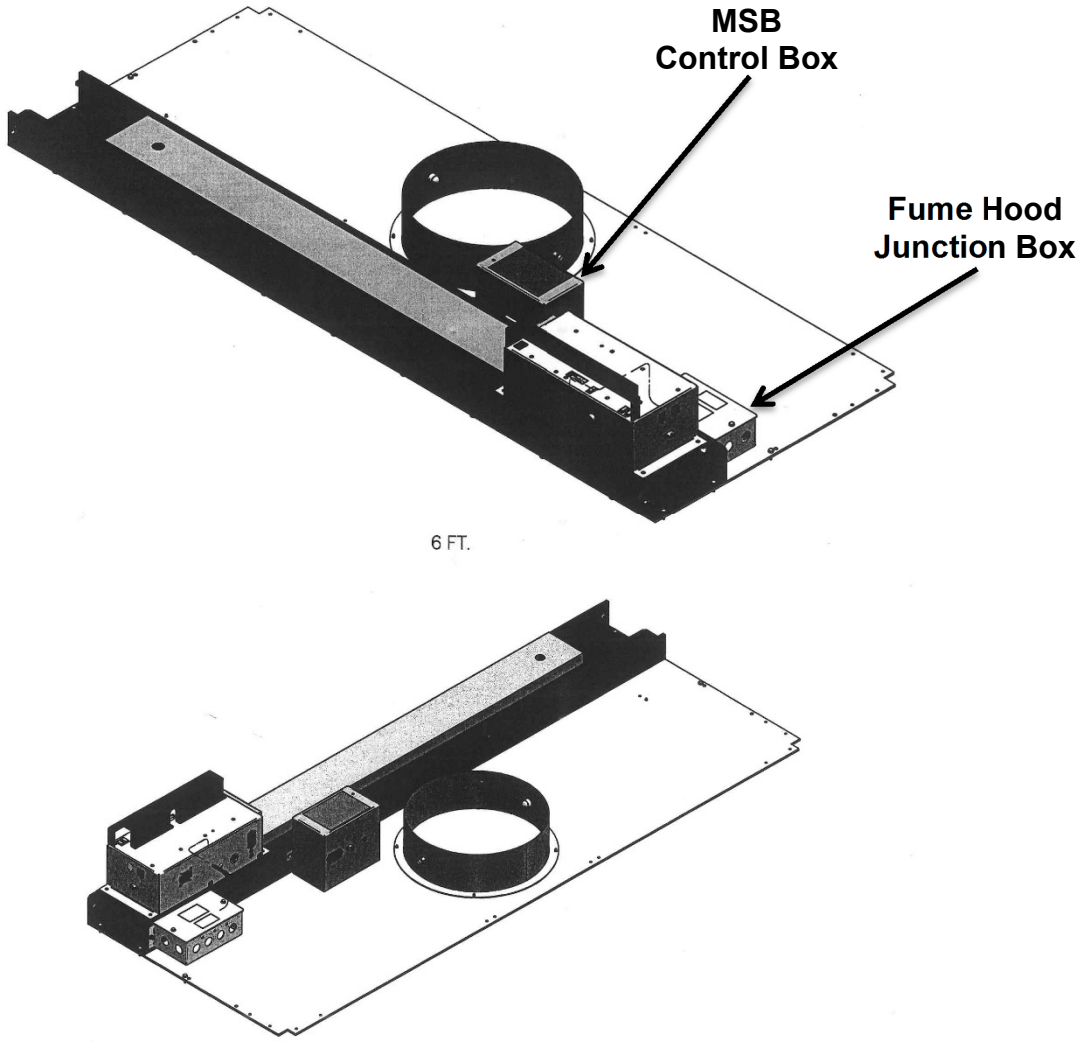



**Figure 3-2**
**Top View of Typical Isometric View of MSB Control Box**

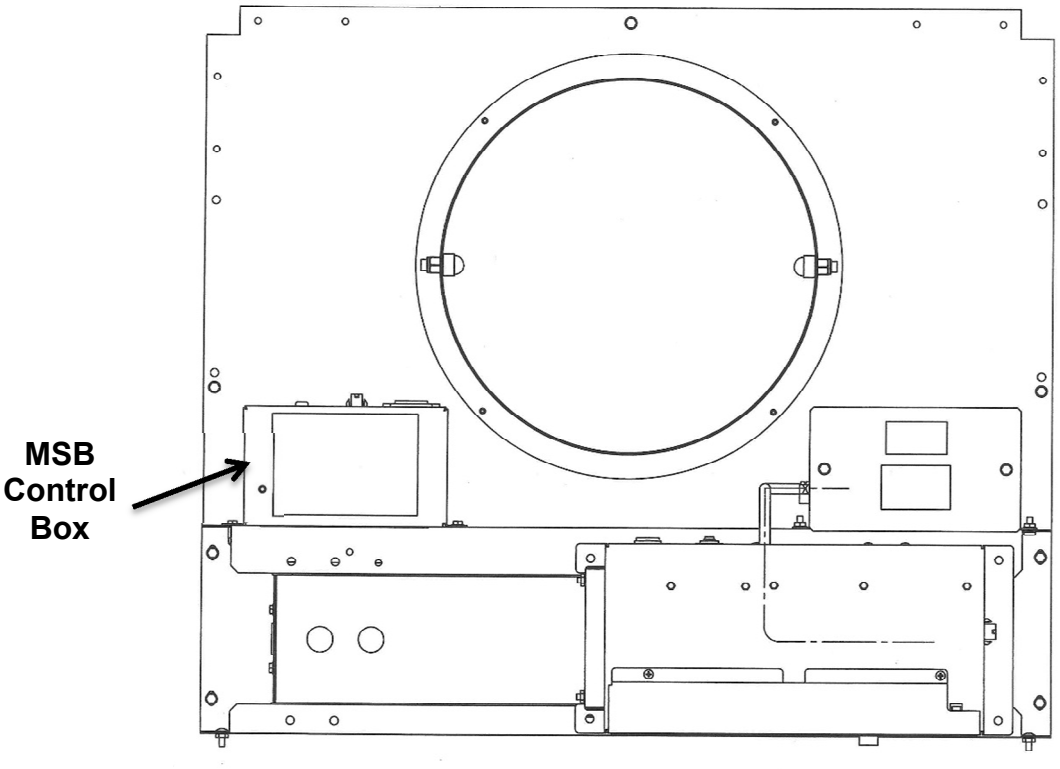



**Figure 3-3**
**3' Installation Location**

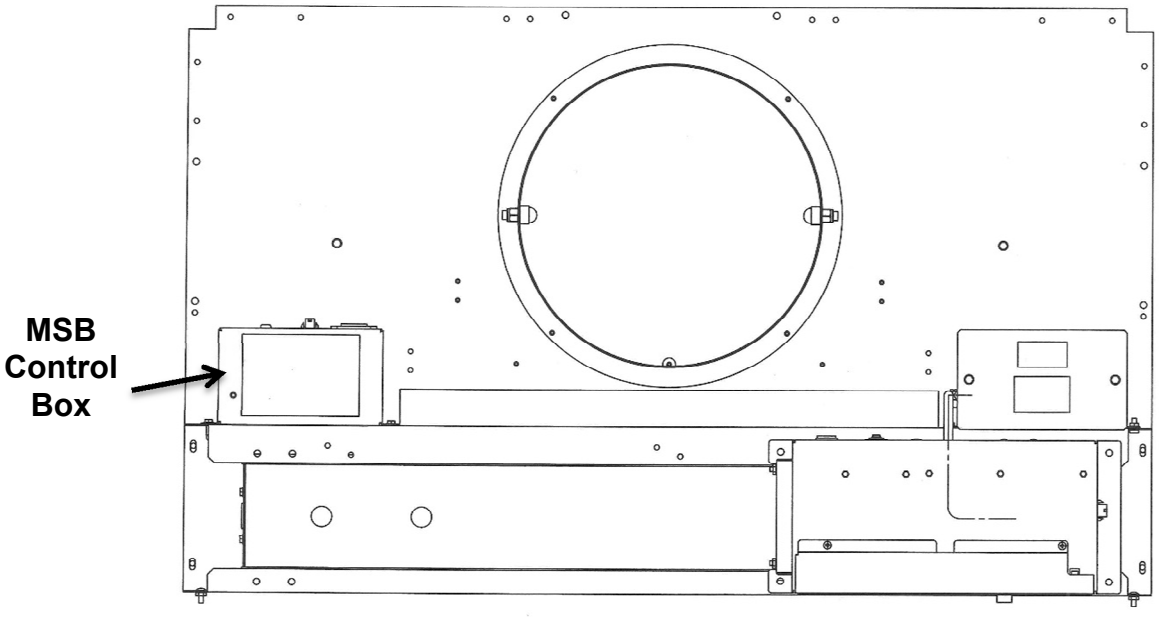



**Figure 3-4**
**4' Installation Location**

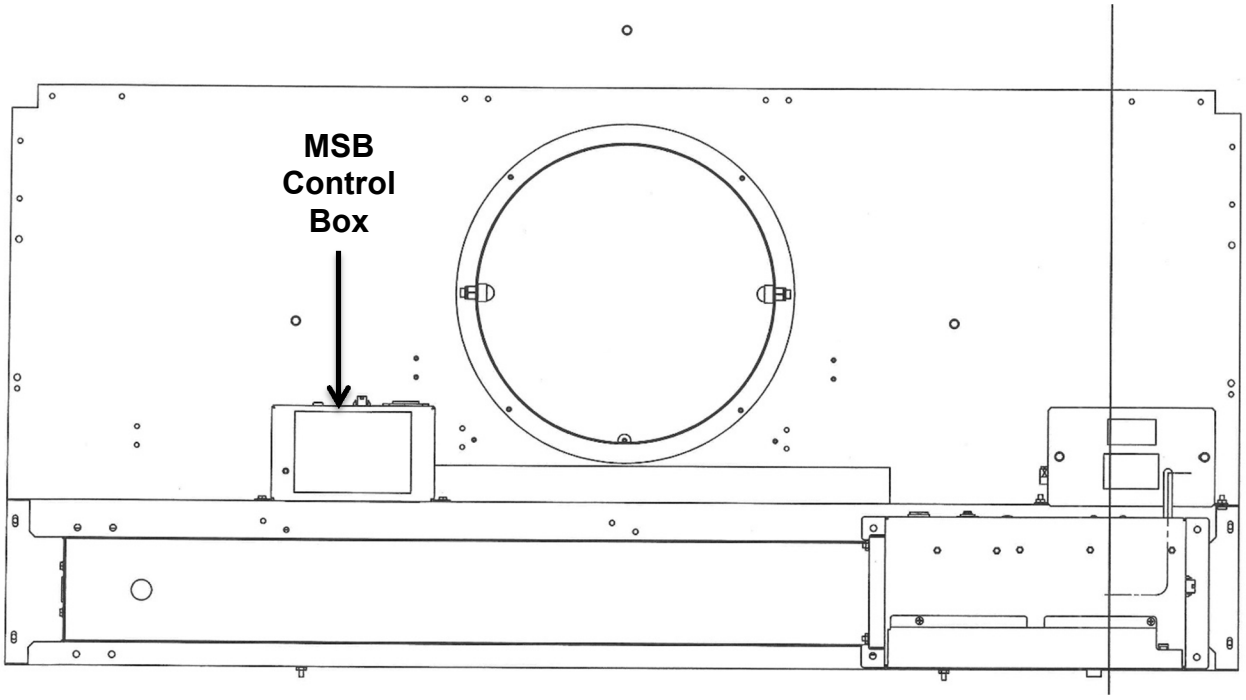



**Figure 3-5**
**5' Installation Location**

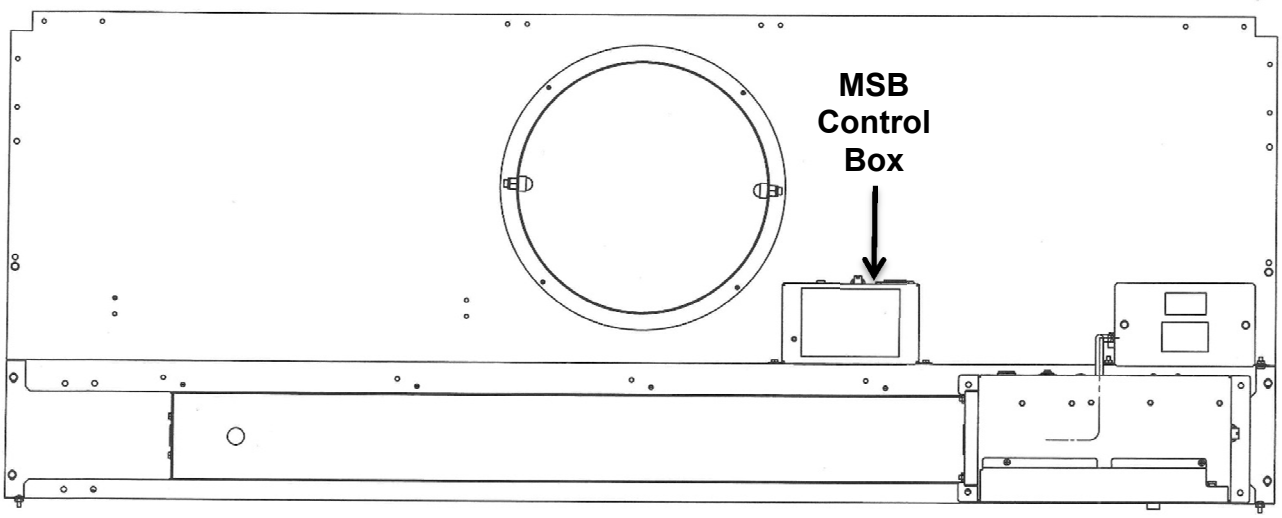



**Figure 3-6**
**6' Installation Location**

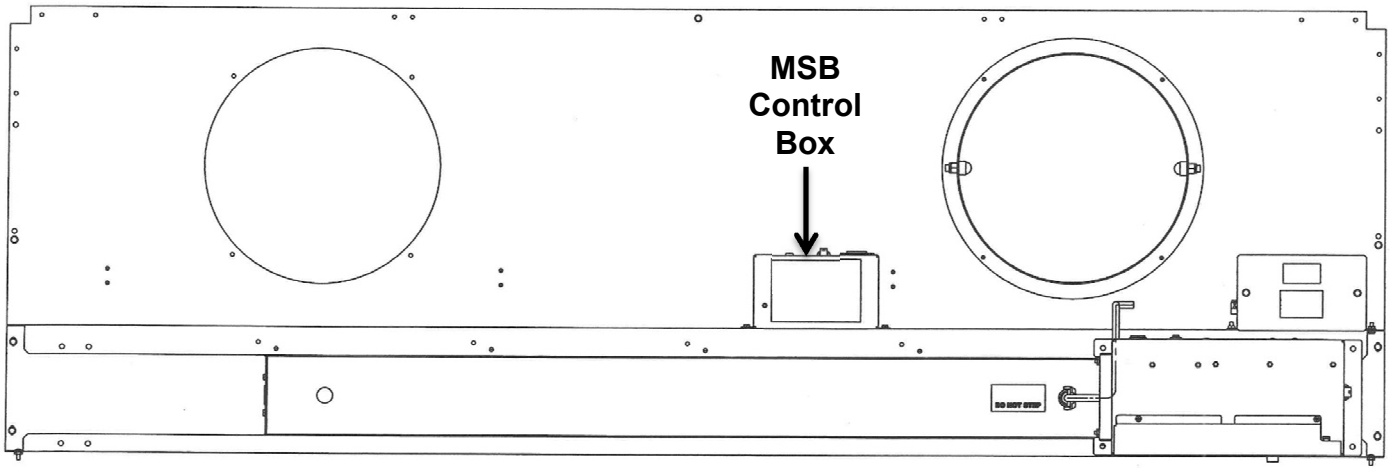



**Figure 3-7**
**7' Installation Location**

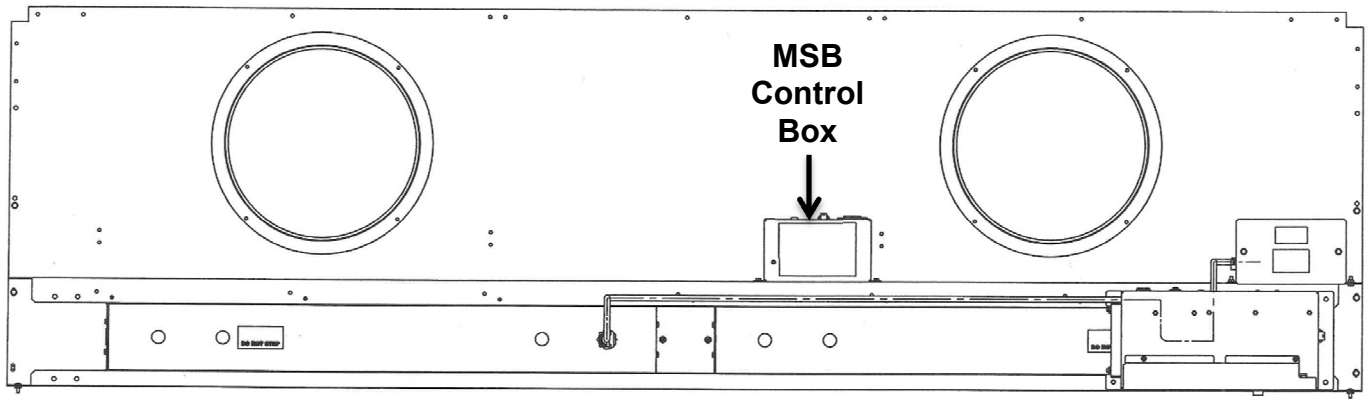



**Figure 3-8**
**8' Installation Location**

# 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.

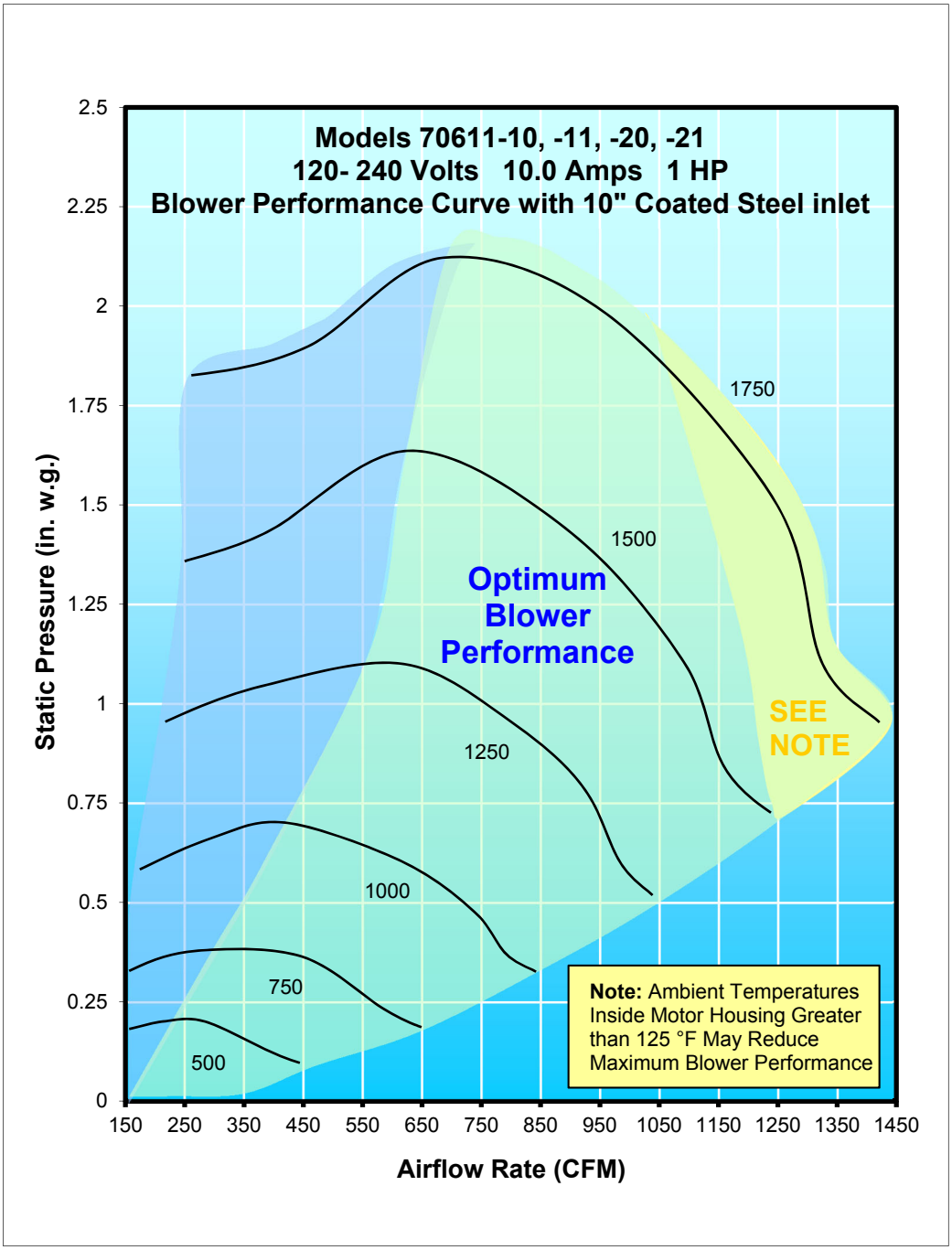
### Intelli-Sash MSB Blower Quick Selection Guide

| 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 |
| | *Note: 10" Blowers have a minimum achievable airflow of 175CFM and a maximum airflow of 1100CFM* | | | | | | | | |
| 12" Blower Airflow Range (CFM) | 200-495 | 200-735 | 200-955 | 200-1180 | 200-1410 | 200-1410 | 200-1410 | 200-1410 | 200-1410 |
| | *Note: 12" Blowers have a minimum achievable airflow of 200CFM and a maximum airflow of 1410CFM* | | | | | | | | |
| 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 |

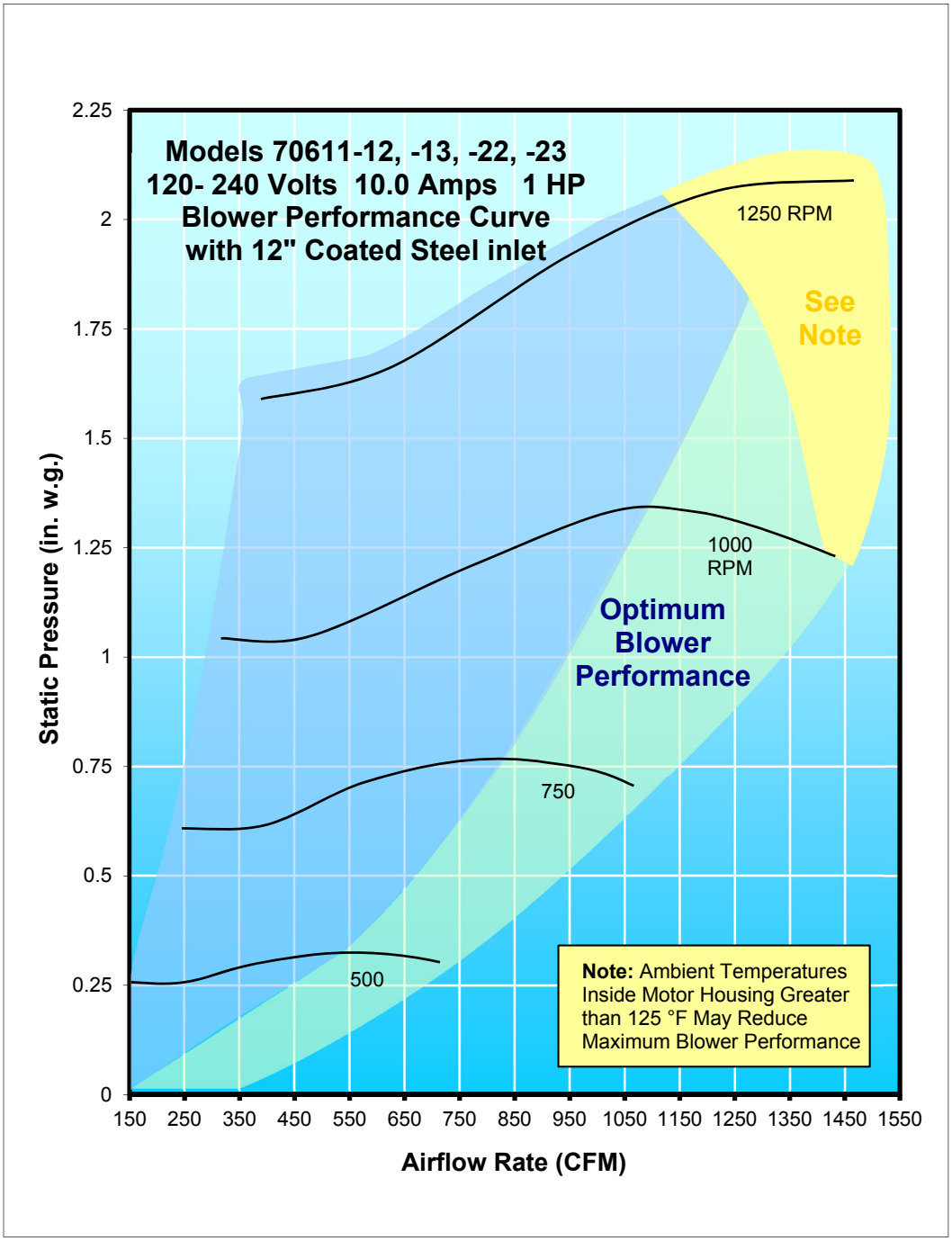
*Note: For best results, always use a manual damper in the exhaust for fine tuning blower along with variable speed RPM motor.*

Corrosion Resistance Guide

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

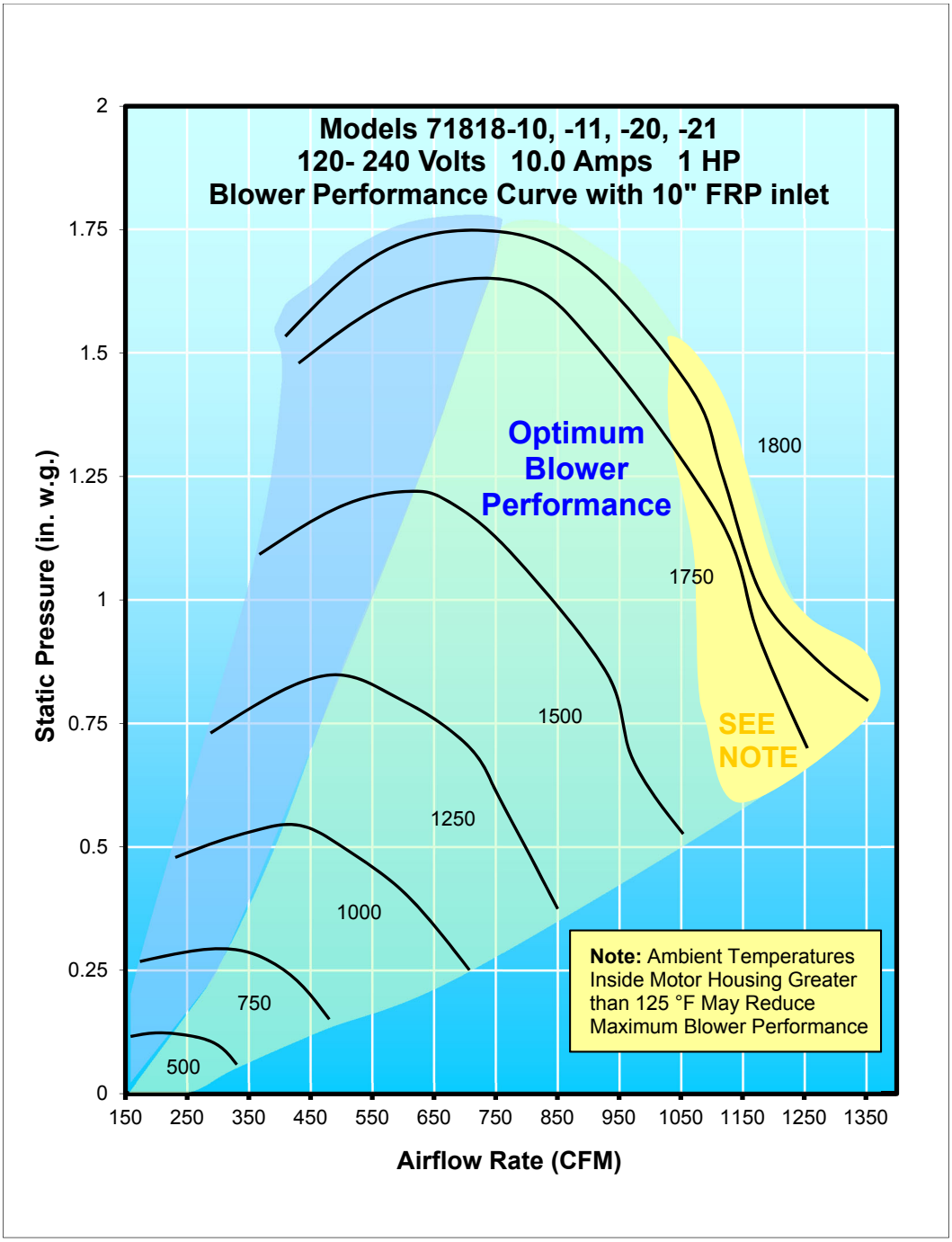



| Speed (RPM) | Optimum Airflow (CFM) and Static Pressure (inches of water) |
|---|---|
| 1800 MAX | 750 CFM @ 2.2" to 1050 CFM @ 1.9" |
| 1500 | 650 CFM @ 1.6" to 1250 CFM @ 0.7" |
| 1250 | 550 CFM @ 1.1" to 1050 CFM @ 0.5" |
| 1000 | 400 CFM @ 0.7" to 850 CFM @ 0.33" |
| 750 | 275 CFM @ 0.37" to 650 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" |

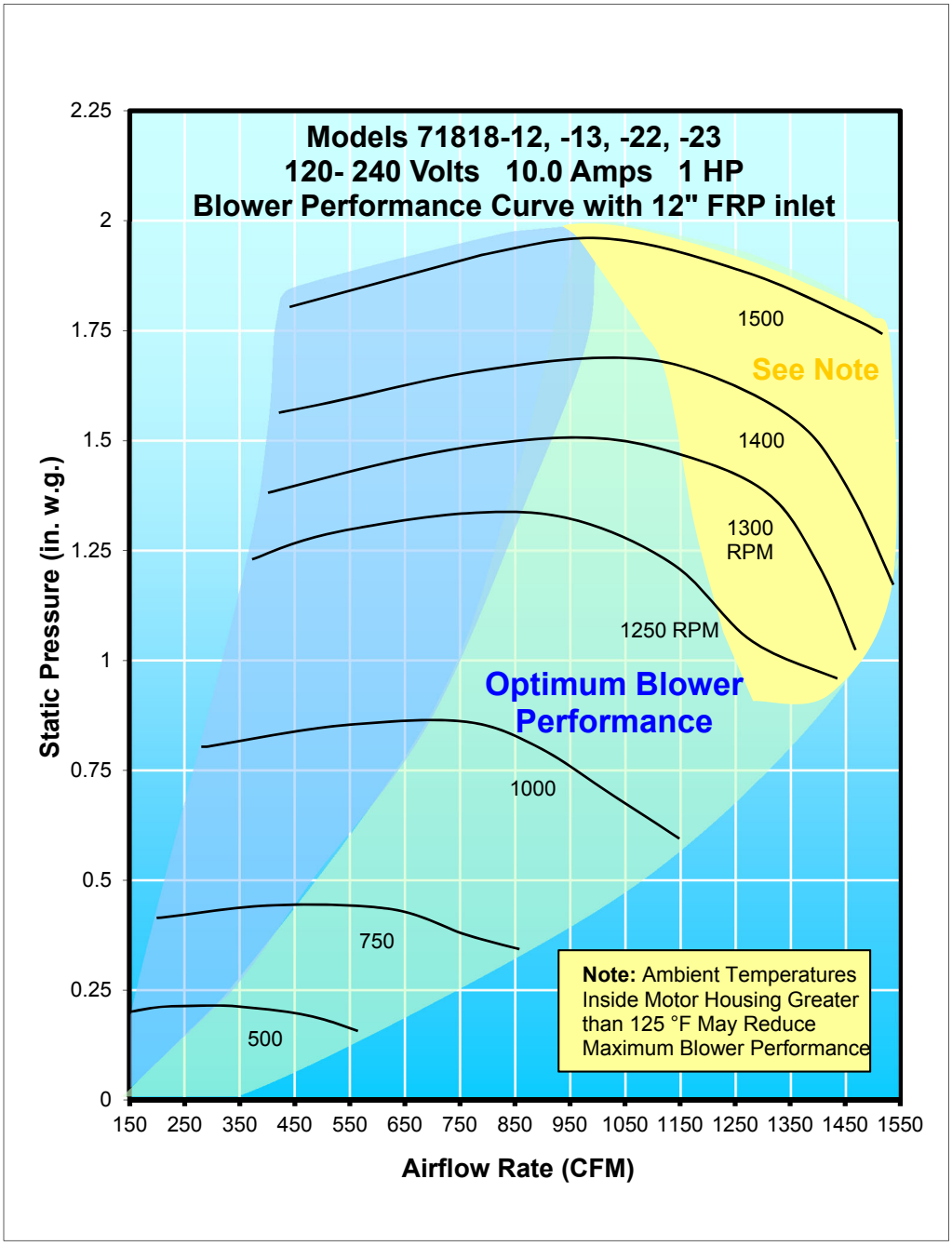



| Speed (RPM) | Optimum Airflow (CFM) and Static Pressure (inches of water) |
|---|---|
| 1125 MAX | 1200 CFM @ 1.6" to 1350 CFM @ 1.5" |
| 1000 | 1100 CFM @ 1.3" to 1450 CFM @ 1.2" |
| 750 | 800 CFM @ 0.8" to 1150 CFM @ 0.7" |
| 500 | 550 CFM @ 0.33" to 725 CFM @ 0.3" |
| 300 | 200 CFM @ 0.08" to 450 CFM @ 0.1" |

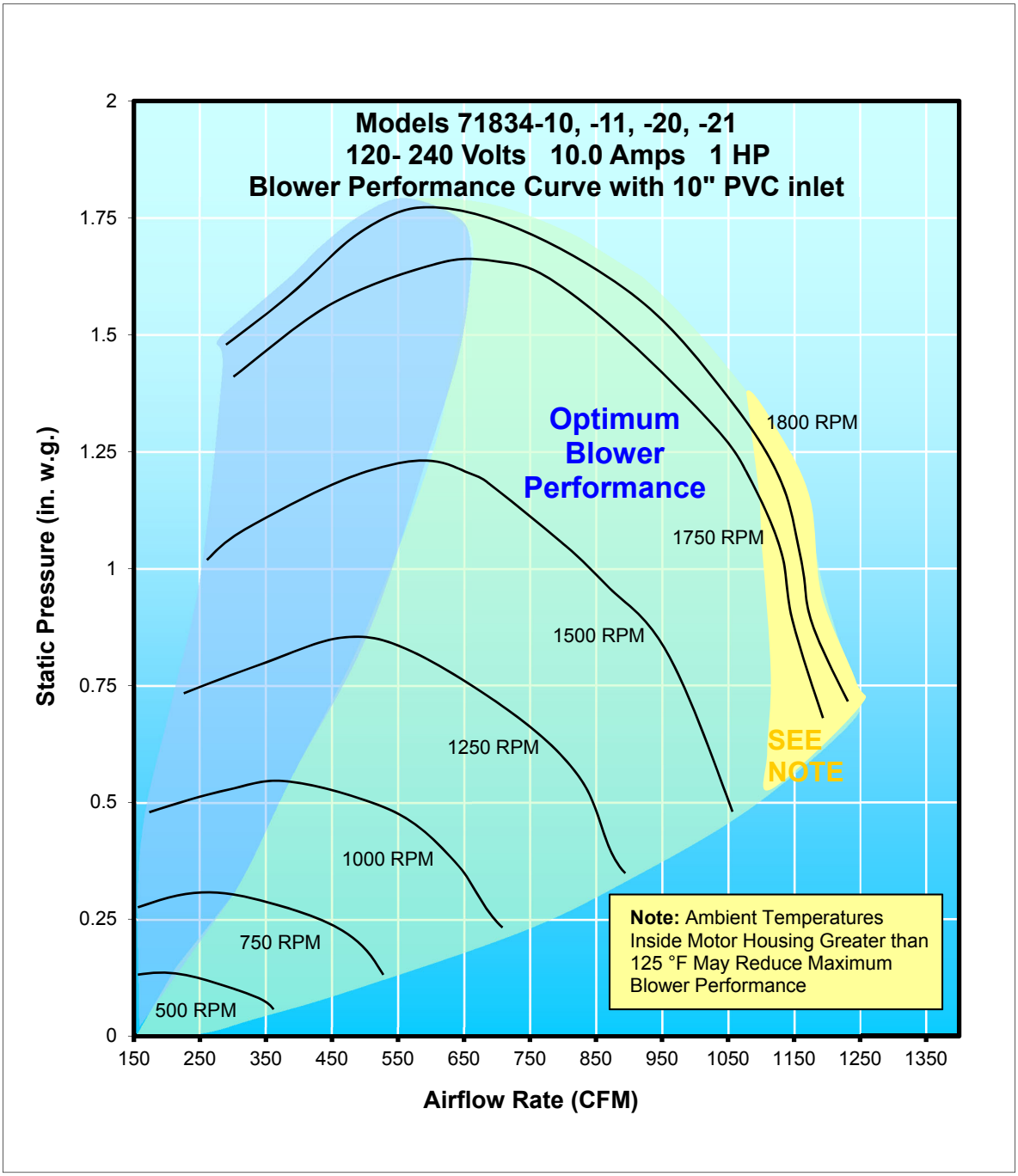
Practical range is 200 CFM, 0.08" to 1350 CFM, 1.5" or 1450 CFM @ 1.2"



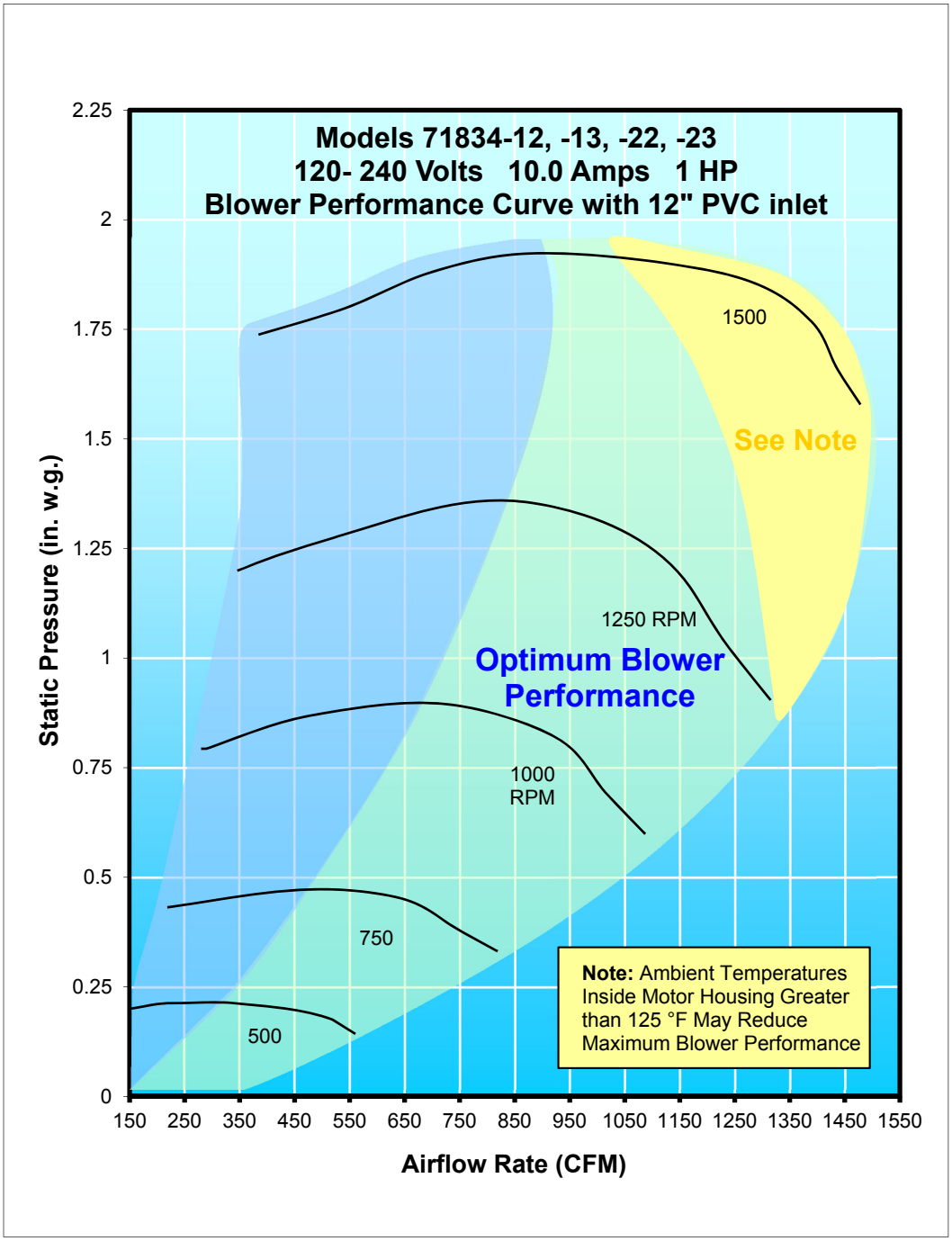

| Speed (RPM) | Optimum Airflow (CFM) and Static Pressure (inches of water) |
|---|---|
| 1800 MAX | 750 CFM @ 1.7" to 1025 CFM @ 1.55" |
| 1500 | 600 CFM @ 1.2" to 1050 CFM @ 0.5" |
| 1250 | 500 CFM @ 0.8" to 850 CFM @ 0.37" |
| 1000 | 400 CFM @ 0.6" to 700 CFM @ 0.25" |
| 750 | 300 CFM @ 0.3" to 475 CFM @ 0.12" |
| 500 | 200 CFM @ 0.12" to 325 CFM @ 0.06" |
| 300 | 175 CFM @ 0.06" to 275 CFM @ 0.04" |
| | Practical range is 175 CFM, 0.06" to 1025 CFM, 1.5" |



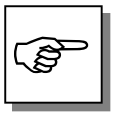

| Speed (RPM) | Optimum Airflow (CFM) and Static Pressure (inches of water) |
|---|---|
| 1400 MAX | 960 CFM @ 1.7" to 1100 CFM @ 1.7" |
| 1300 | 900 CFM @ 1.5" to 1150 CFM @ 1.4" |
| 1250 | 850 CFM @ 1.3" to 1400 CFM @ 0.87" |
| 1125 | 780 CFM @ 1.1" to 1310 CFM @ 0.75" |
| 1000 | 700 CFM @ 0.87" to 1180 CFM @ 0.62" |
| 750 | 450 CFM @ 0.4" to 860 CFM @ 0.34" |
| 500 | 300 CFM @ 0.20" to 575 CFM @ 0.12" |
| 300 | 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" |




| 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" |




| Speed (RPM) | Optimum Airflow (CFM) and Static Pressure (inches of water) |
|---|---|
| 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 switch on the fume hood. 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 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.

**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*


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.

**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 1" 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 | 5 Feet |
| | 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) x 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.

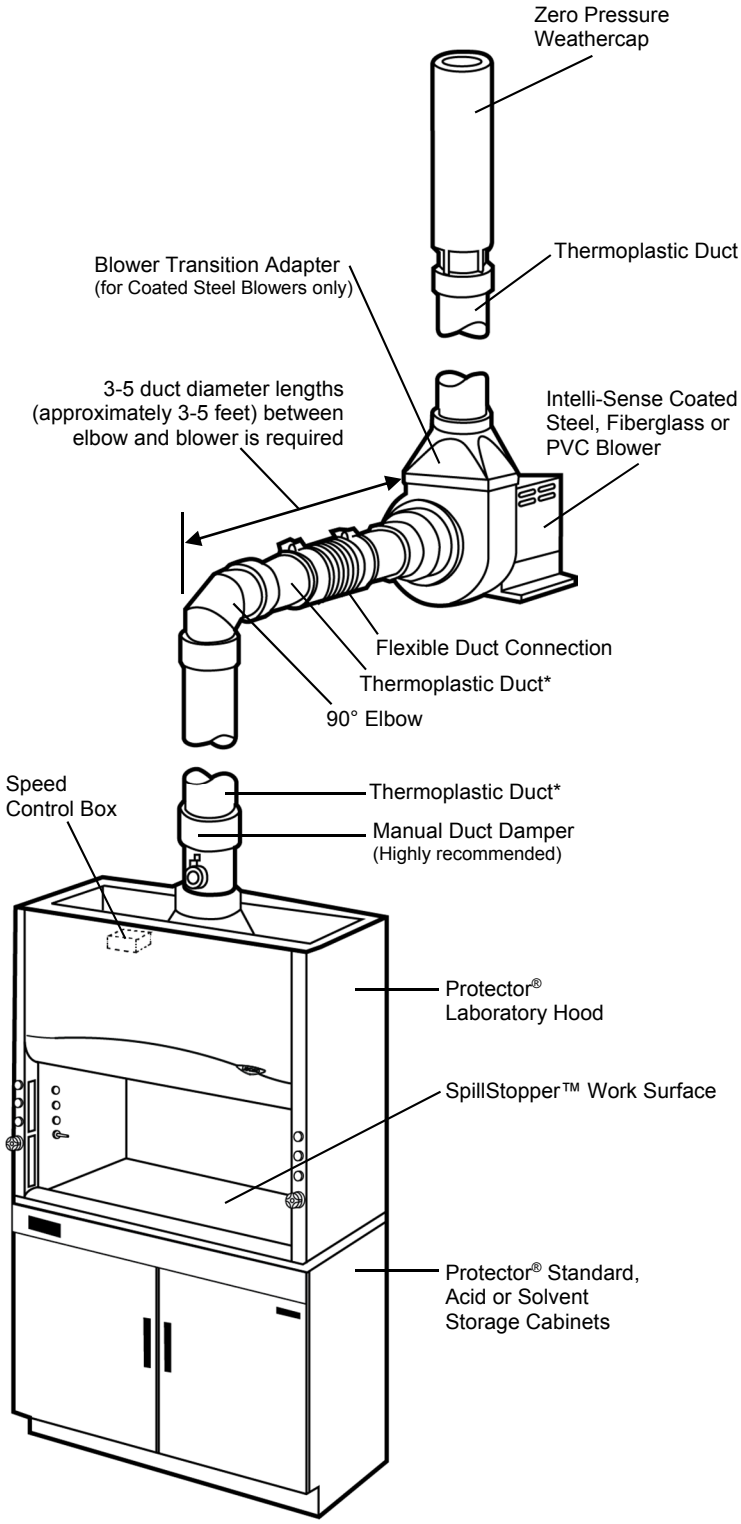
**Sizes and Pressure Losses in Thermoplastic Duct**

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 $H_20$ 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 |

## 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.

| | Nominal Diameter/Inches | 6 | 8 | 10 | 12 | 16 |
|---|---|---|---|---|---|---|
| 90° Elbow | 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 |

| | Nominal Diameter/Inches | 6 | 8 | 10 | 12 | 16 |
|---|---|---|---|---|---|---|
| 45° Elbow | 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 |

### 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.

| 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 |

### 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 8
# 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. |
| | 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 *Chapter 2: Prerequisites* and *Chapter 3: Getting Started*. 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 *Chapter 3: Getting Started*. 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 *Chapter 7: Modifying Your Blower*. *Blower Sizing* 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 *Chapter 3: Getting Started* 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 |

| 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 |
| 8 | 1 | 7115100 | Cable, Blower Switch to MSB Control Box |
| 9A | 1 | 7115000 | MSB Control Box, 115V |
| 9B | 1 | 7115001 | MSB Control Box, 230V |
| 10 | 1 | 7116000 | Cable, Control Box Power Inlet from hood lighting |
| 11A | 1 | 1302401 | Blower Switch, 3 Position |
| 11B | 1 | 1305200 | Retainer, Blower Switch |
| 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 | 1 | 7117700 | Accessory Cable, Airflow Monitor Night Set Back (not included) |

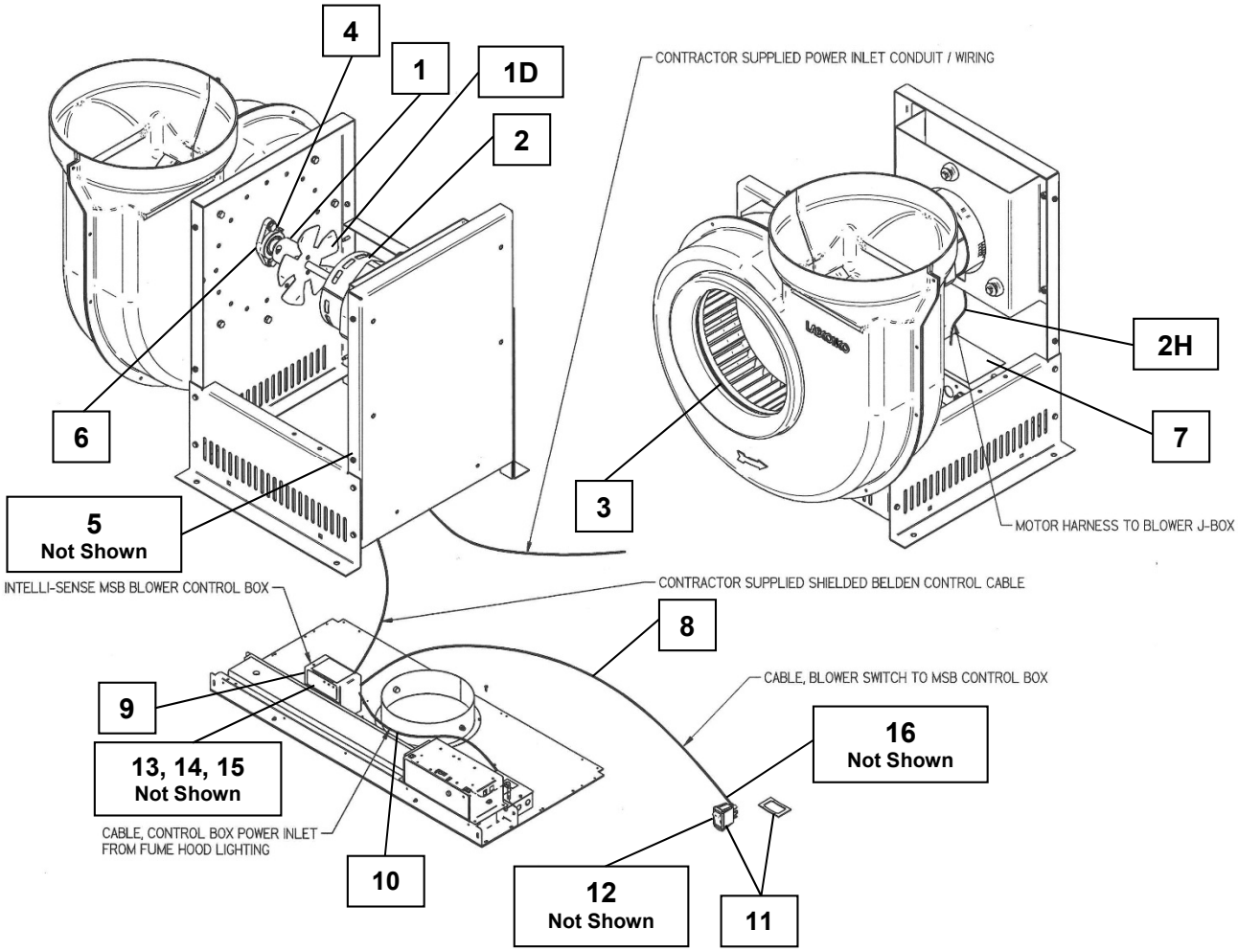
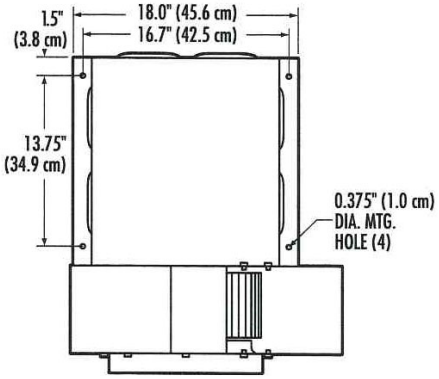

4
1
1D
2
6
5
Not Shown
INTELLI-SENSE MSB BLOWER CONTROL BOX
CONTRACTOR SUPPLIED POWER INLET CONDUIT / WIRING
2H
7
3
MOTOR HARNESS TO BLOWER J-BOX
CONTRACTOR SUPPLIED SHIELDED BELDEN CONTROL CABLE
8
CABLE, BLOWER SWITCH TO MSB CONTROL BOX
9
16
Not Shown
13, 14, 15
Not Shown
CABLE, CONTROL BOX POWER INLET
FROM FUME HOOD LIGHTING
10
12
Not Shown
11

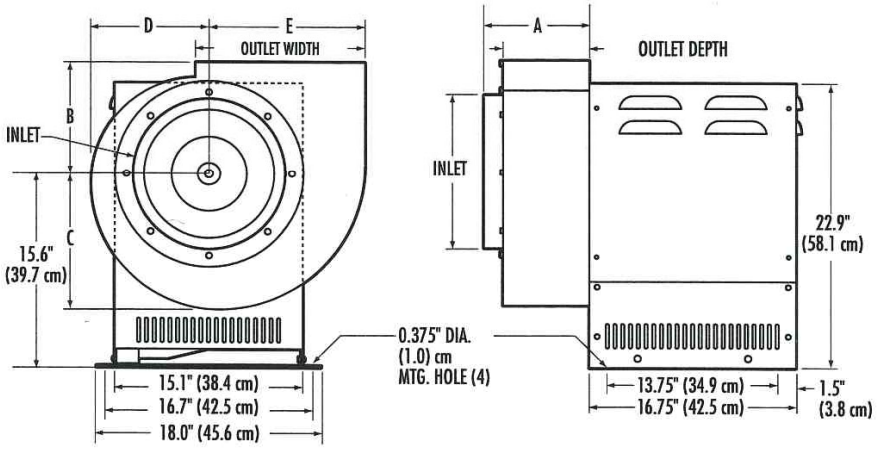
**Figure A-1**

# APPENDIX B
# BLOWER DIMENSIONS

## Dimensional Data



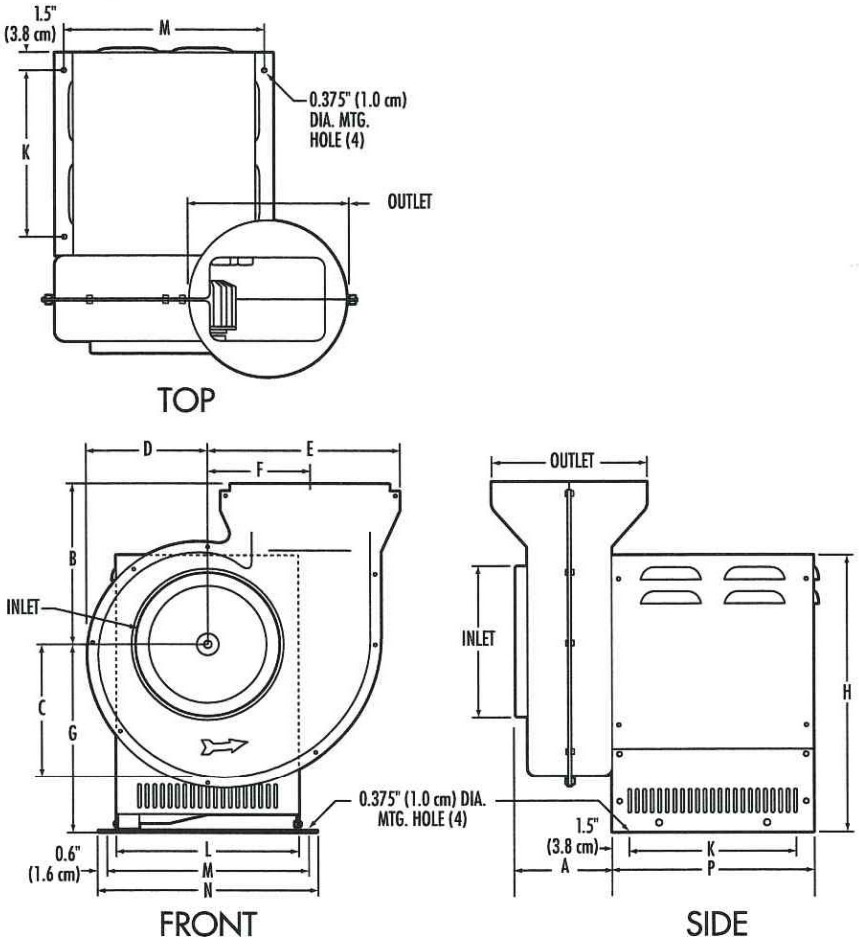

TOP




FRONT SIDE

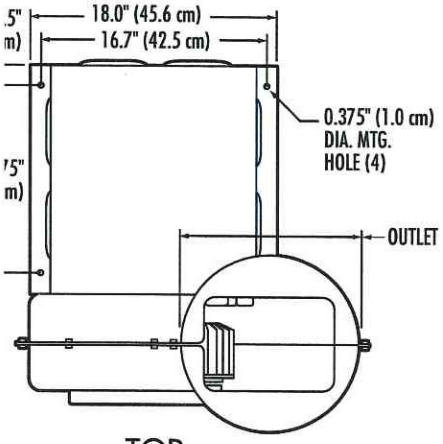
| Dimension | Catalog# 7061110 & 7061120 | Cataolg# 7061112 & 7061122 |
|---|---|---|
| A | 7.2" (18.2 cm) | 8.6" (21.7 cm) |
| B | 7.0" (17.8 cm) | 9.0" (22.9 cm) |
| C | 8.1" (20.7 cm) | 10.5" (26.7 cm) |
| D | 6.8" (17.3 cm) | 9.0" (22.9 cm) |
| E | 9.25" (23.5 cm) | 12.5" (31.8 cm) |
| Inlet | 10.9" (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

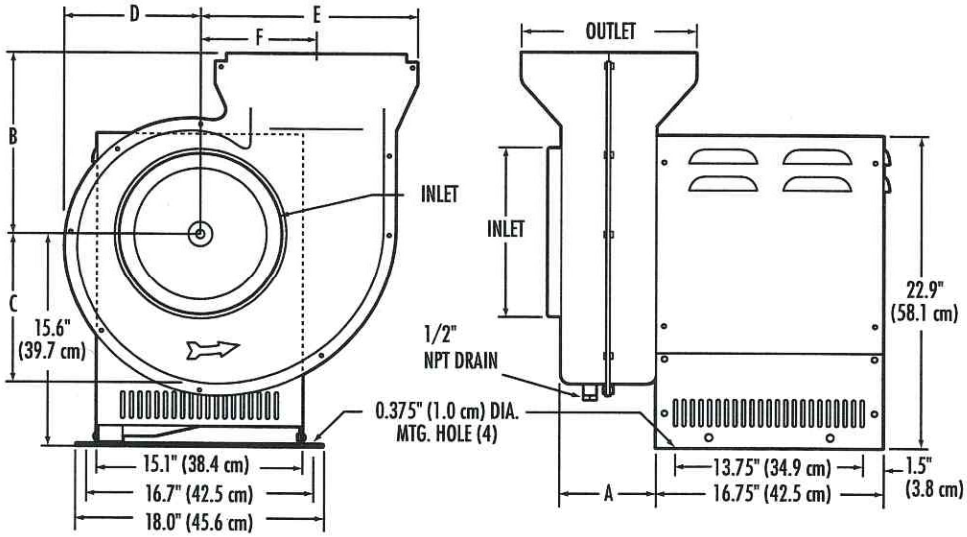



| Dimension | Catalog# 7181810 & 7181820 | Cataolg# 7181812 & 7181822 |
|---|---|---|
| A | 7.1" (18.1 cm) | 8.0" (20.3 cm) |
| B | 12.7" (32.2 cm) | 13.2" (33.5 cm) |
| C | 10.5" (26.7 cm) | 12.0" (30.5 cm) |
| D | 8.75" (22.2 cm) | 10.0" (25.4 cm) |
| E | 13.9" (35.3 cm) | 15.9" (40.3 cm) |
| F | 7.5" (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 |

## Dimensional Data




TOP




FRONT SIDE

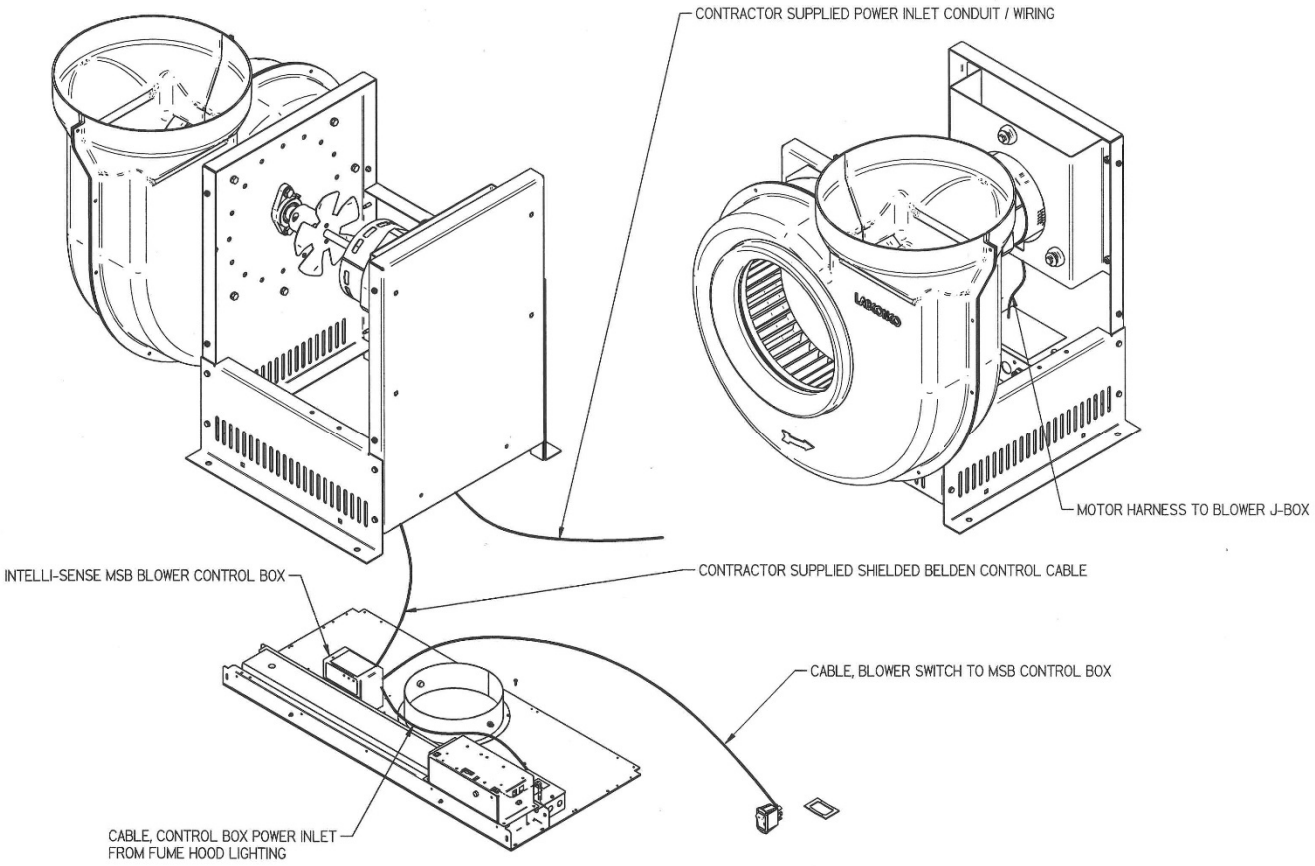
| Dimension | Catalog# 7183410 & 7183420 | Cataolg# 7183412 & 7183422 |
|---|---|---|
| A | 7.1" (18.1 cm) | 8.0" (20.3 cm) |
| B | 12.7" (32.2 cm) | 13.2" (33.5 cm) |
| C | 10.5" (26.7 cm) | 12.0" (30.5 cm) |
| D | 8.75" (22.2 cm) | 10.0" (25.4 cm) |
| E | 13.9" (35.3 cm) | 15.9" (40.3 cm) |
| F | 7.5" (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

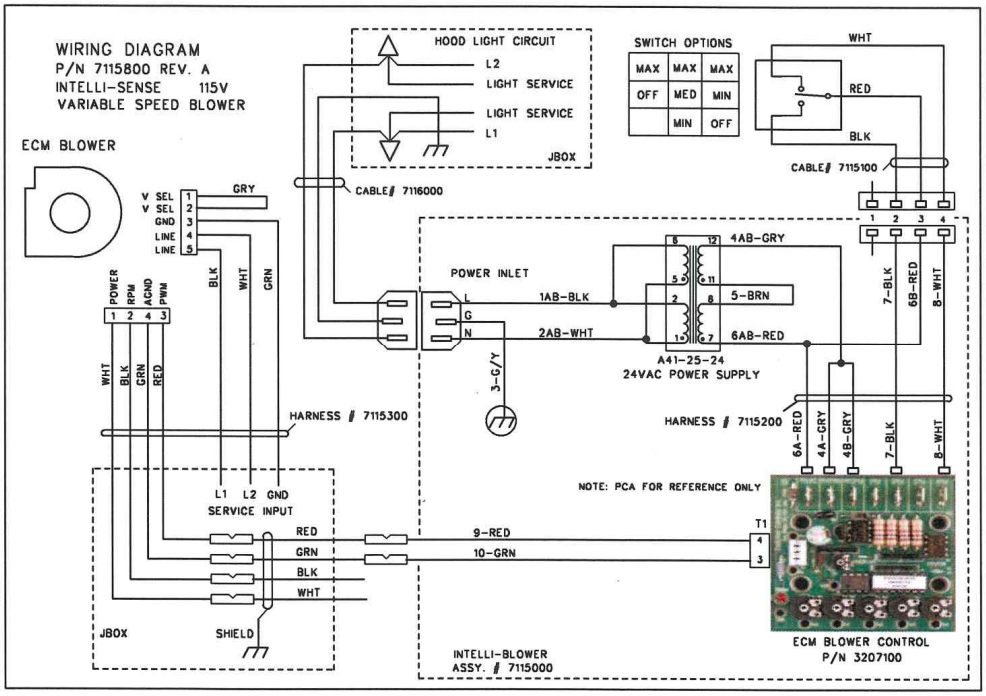
## Environmental Conditions

- Maximum altitude: 9843 feet (3000 meters).
- Ambient temperature range: -30° to 130°F (-34° to 54°C).
- Main supply voltage fluctuations not to exceed ±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.

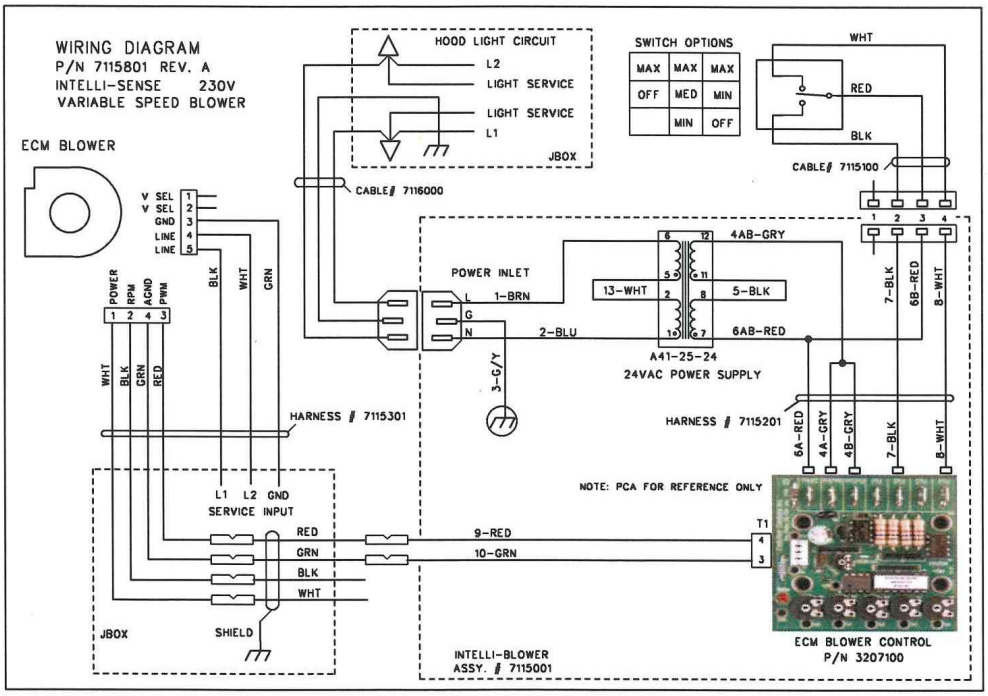
# Wiring Detail



# 115V Wiring Diagram




# 230V Wiring Diagram



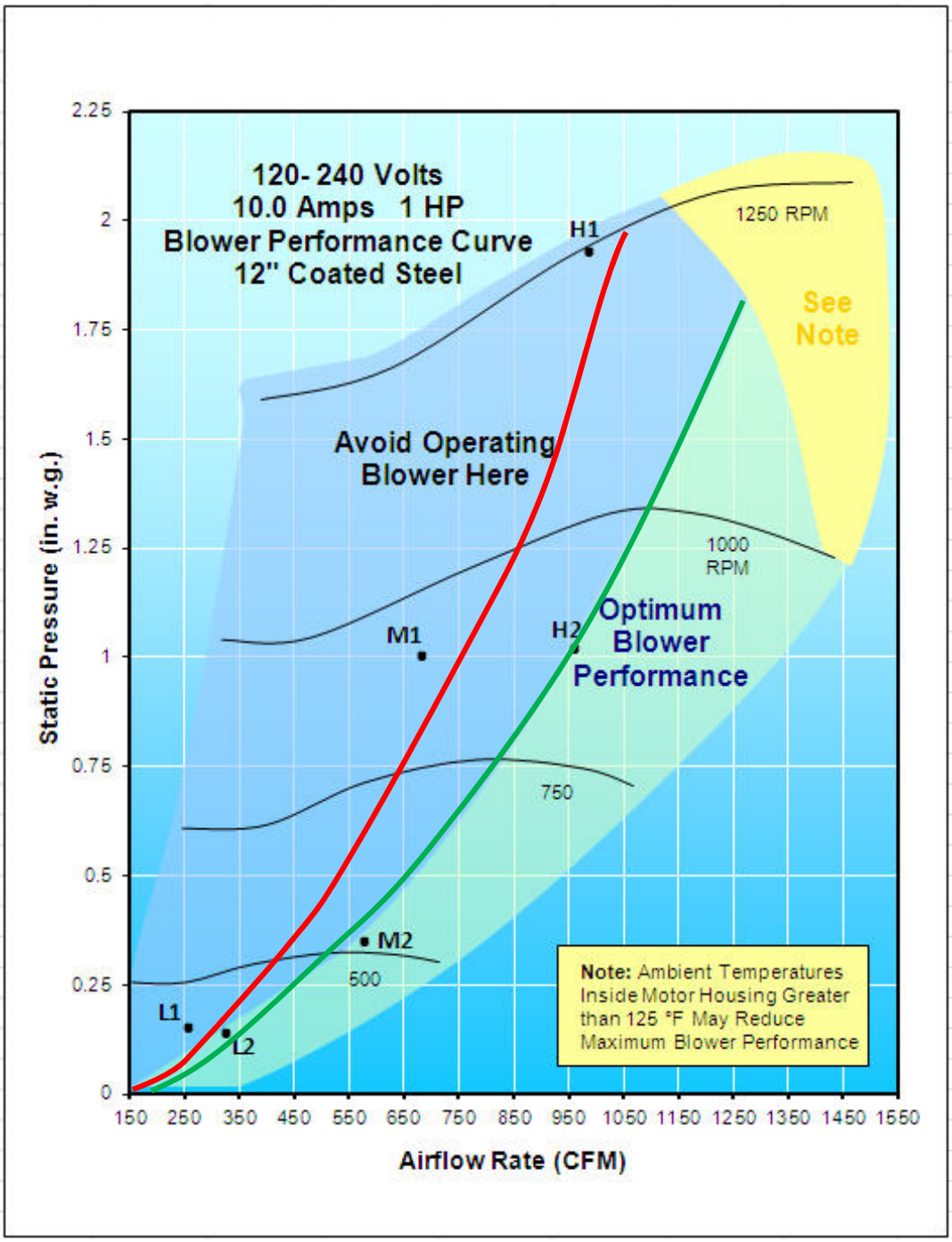
# APPENDIX D
# TYPICAL INTELLI-SENSE BLOWER OPERATING CURVE

## 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


120- 240 Volts
10.0 Amps 1 HP
Blower Performance Curve
12" Coated Steel
1250 RPM
1000 RPM
750
600
H1
H2
M1
M2
L1
L2
See Note
Avoid Operating Blower Here
Optimum Blower Performance
Note: Ambient Temperatures Inside Motor Housing Greater than 125 °F May Reduce Maximum Blower Performance
Static Pressure (in. w.g.)
2.25
2
1.75
1.5
1.25
1
0.75
0.5
0.25
0
150 250 350 450 550 650 750 850 950 1050 1150 1250 1350 1450 1550
Airflow Rate (CFM)

# APPENDIX E
# TYPICAL LABORATORY CONTROLS WITH INDIVIDUAL INTELLI-SENSE BLOWERS