
INSTALLATION INSTRUCTIONS

Variable Speed WH Series Wall Mount Heat Pump

Models:

W3VHY-R	W3VHYDR	W5VHY-R	W5VHYDR
W3VHY-S	W3VHYDS	W5VHY-S	W5VHYDS
W3VHY-T	W3VHYDT	W5VHY-T	W5VHYDT



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SAFETY INSTRUCTIONS

READ ALL INSTRUCTIONS BEFORE USE

Your safety and the safety of others are very important.

We have provided many important safety messages in this manual and on your appliance. Always read and follow all safety messages.

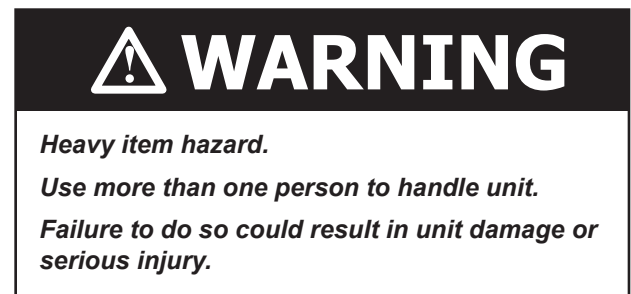
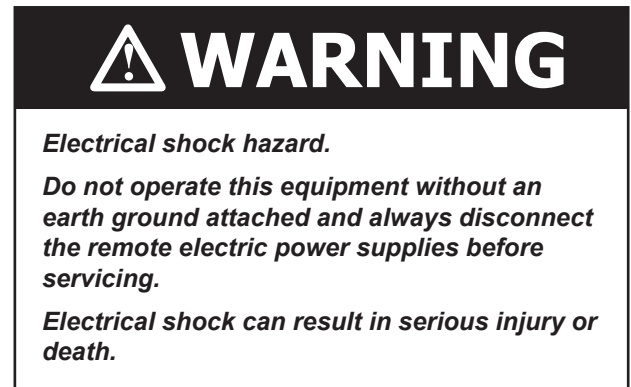
ANSI Z535.5 Definitions:

DANGER: Indicate[s] a hazardous situation which, if not avoided, will result in death or serious injury. The signal word “DANGER” is to be limited to the most extreme situations. DANGER [signs] should not be used for property damage hazards unless personal injury risk appropriate to these levels is also involved.

WARNING: Indicate[s] a hazardous situation which, if not avoided, could result in death or serious injury. WARNING [signs] should not be used for property damage hazards unless personal injury risk appropriate to this level is also involved.

CAUTION: Indicate[s] a hazardous situation which, if not avoided, could result in minor or moderate injury. CAUTION [signs] without a safety alert symbol may be used to alert against unsafe practices that can result in property damage only.

NOTICE: [this header is] preferred to address practices not related to personal injury. The safety alert symbol shall not be used with this signal word. As an alternative to “NOTICE” the word “CAUTION” without the safety alert symbol may be used to indicate a message not related to personal injury.



WARNING

Electrical shock hazard.

Have a properly trained individual perform these tasks.

Failure to do so could result in electric shock or death.

CAUTION

Sharp metallic edges.

Take care and wear appropriate protective devices to avoid accidental contact with sharp edges.

Failure to do so can result in personal injury.

The following symbols are displayed on units.



This symbol indicates that the Operation Manual should be read carefully.



This symbol indicates that a service personnel should be handling this equipment with reference to the Installation Manual.



This symbol indicates that information is available such as the Operation Manual or Installation Manual.

IMPORTANT SAFETY INSTRUCTIONS



WARNING

To reduce the risk of explosion, fire, death, electric shock, scalding or injury to persons when using this product, follow basic precautions, including the following:

GENERAL

- The equipment covered in this manual is to be installed by trained, experienced service and installation technicians.
- This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.
- The refrigerant system is completely assembled and charged. All internal wiring is complete.
- The unit is designed for use with or without duct work. Flanges are provided for attaching the supply and return ducts.
- These instructions explain the recommended method to install the air-cooled self-contained unit and the electrical wiring connections to the unit.
- These instructions and any instructions packaged with any separate equipment required to make up the entire air conditioning system should be carefully read before beginning the installation. Note particularly "Starting Procedure" and any tags and/or labels attached to the equipment.
- While these instructions are intended as a general recommended guide, they do not supersede any national and/or local codes in any way. Authorities having jurisdiction should be consulted before the installation is made. See Additional Publications for information on codes and standards.
- Size of unit for a proposed installation should be based on heat loss calculation made according to methods of Air Conditioning Contractors of America (ACCA). The air duct should be installed in accordance with the Standards of the National Fire Protection Association for the Installation of Air Conditioning and Ventilating Systems of Other Than Residence Type, NFPA No. 90A, and Residence Type Warm Air Heating and Air Conditioning Systems, NFPA No. 90B. Where local regulations are at a variance with instructions, installer should adhere to local codes.

INSTALLATION

- This product is not intended for use at altitudes exceeding 2,000 meters (6,561 feet). For appliances intended for use at altitudes exceeding 2,000 m (6,561 feet), the maximum altitude of use shall be stated.
- Before use, the appliance must be properly installed as described in this manual.
- Contact the authorized service technician for repair or maintenance of this unit.
- Contact the installer for installation of this unit.
- The air conditioner is not intended for use by young children or invalids without supervision.
- Young children should be supervised to ensure that they do not play with the air conditioner.
- Installation work must be performed in accordance with the National Electric Code by qualified and authorized personnel only.
- Connect to a properly rated, protected, and sized power circuit to avoid electrical overload.
- Adhere to all industry recommended safety procedures including the use of long-sleeved gloves and safety glasses.
- Use care when unpacking and installing. The edges of the product may be sharp.
- Keep packaging materials out of the reach of children. These materials can pose a suffocation risk to children.

OPERATION

- This appliance is not intended for use by persons (including children) with reduced physical, sensory, or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.
- Use this appliance only for its intended purpose.
- Never attempt to operate this appliance if it is damaged, malfunctioning, partially disassembled, or has missing or broken parts.
- Do not tamper with controls.

INSTRUCTIONS DE SÉCURITÉ

LIRE TOUTES LES INSTRUCTIONS AVANT UTILISATION

Votre sécurité et celle des autres sont très importantes.

Nous avons fourni de nombreux messages de sécurité importants dans ce manuel et sur votre appareil. Lisez et suivez toujours tous les messages de sécurité.

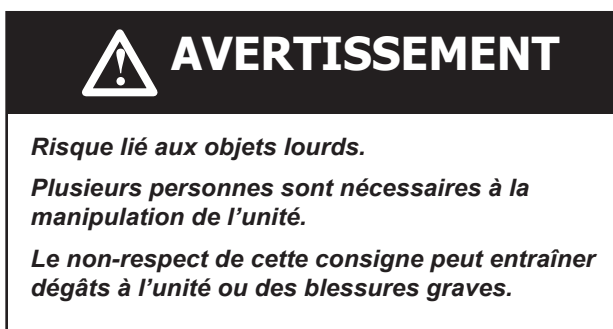
Définitions ANSI Z535.5 :

DANGER : Indique une situation dangereuse qui, si elle n'est pas évitée, entraînera certainement la mort ou des blessures graves. Le mot « DANGER » doit être limité aux situations extrêmes. Les indications « DANGER » ne doivent pas être utilisées pour les risques de dégâts matériels, à moins qu'il n'existe un risque concomitant de blessures corporelles.

AVERTISSEMENT : Indique une situation dangereuse qui, si elle n'est pas évitée, peut entraîner la mort ou des blessures graves. Les indications « AVERTISSEMENT » ne doivent pas être utilisées pour les risques de dégâts matériels, à moins qu'il n'existe un risque concomitant de blessures corporelles.

ATTENTION : Indique une situation dangereuse qui, si elle n'est pas évitée, peut entraîner des blessures mineures à modérées. Les indications « ATTENTION », sans symbole d'avertissement, peuvent être utilisées pour alerter sur des pratiques dangereuses pouvant entraîner des dégâts matériels uniquement.

REMARQUE : cet avis concerne les pratiques n'entraînant aucune blessure corporelle. Le symbole d'avertissement ne doit pas être utilisé avec ce mot. Comme alternative à « AVIS », le mot « ATTENTION » sans symbole d'avertissement peut être utilisé pour indiquer un message non lié à des blessures corporelles.





AVERTISSEMENT

Risque de choc électrique.

Ces tâches doivent être réalisées par une personne parfaitement qualifiée et formée.

Le non-respect de cette consigne peut entraîner des chocs électriques ou la mort.



ATTENTION

Arêtes métalliques vives.

Faites attention et portez des dispositifs de protection appropriés pour éviter tout contact accidentel avec des arêtes vives.

Le non-respect de cette consigne peut entraîner des blessures corporelles.

Les symboles suivants sont affichés sur les unités.



Ce symbole indique que le manuel d'utilisation doit être lu attentivement.



Ce symbole indique qu'un membre du personnel de service devrait manipuler cet équipement en se référant au manuel d'installation.



Ce symbole indique que des informations sont disponibles telles que le manuel d'utilisation ou le manuel d'installation.

INSTRUCTIONS DE SÉCURITÉ IMPORTANTES



AVERTISSEMENT

Pour réduire le risque d'explosion, d'incendie, de décès, de choc électrique, d'échaudure ou de blessures pour les personnes lors de l'utilisation de ce produit, suivez les précautions de base, notamment les suivantes :

GÉNÉRALITÉS

- L'équipement couvert dans ce manuel doit être installé par des techniciens de service et d'installation formés et expérimentés.
- Cet appareil n'est pas destiné à être utilisé par des personnes (y compris des enfants) ayant des capacités physiques, sensorielles ou mentales réduites, ou un manque d'expérience et de connaissances, à moins qu'elles n'aient reçu la supervision ou l'instruction concernant l'utilisation de l'appareil par une personne responsable de leur sécurité.
- Le système de réfrigérant est complètement assemblé et chargé. Tout le câblage interne est complet.
- L'unité est conçue pour être utilisée avec ou sans conduits. Des brides sont prévues pour fixer les conduits d'alimentation et de retour.
- Ces instructions expliquent la méthode recommandée pour installer l'unité autonome refroidie à l'air et les connexions de câblage électrique à l'unité.
- Ces instructions et toutes les instructions emballées avec tout équipement distinct requis pour constituer l'ensemble du système de climatisation doivent être lues attentivement avant de commencer l'installation. Notez en particulier « Procédure de démarrage » et les étiquettes et / ou étiquettes attachées à l'équipement.
- Bien que ces instructions soient conçues comme un guide général recommandé, elles ne remplacent en aucune façon les codes nationaux et/ou locaux. Les autorités compétentes devraient être consultées avant que l'installation ne soit effectuée. Voir d'autres publications pour obtenir des renseignements sur les codes et les normes.
- La taille de l'unité pour une installation proposée devrait être basée sur le calcul de la perte de chaleur effectué selon les méthodes de Air Conditioning Contractors of America (ACCA). Le conduit d'air devrait être installé conformément aux Normes de la National Fire Protection Association for the Installation of Air Conditioning and Ventilating Systems of Other Than Residence Type, NFPA No. 90A, et aux Systèmes de chauffage et de climatisation d'air chaud de type résidence, NFPA No. 90B. Lorsque les réglementations locales sont en contradiction avec les instructions, l'installateur doit respecter les codes locaux.

L'INSTALLATION

- Ce produit n'est pas destiné à être utilisé à des altitudes supérieures à 2 000 mètres (6 561 pieds). Pour les appareils destinés à être utilisés à des altitudes supérieures à 2 000 m (6 561 pieds), l'altitude maximale d'utilisation doit être indiquée.
- Avant utilisation, l'apppliance doit être correctement installée comme décrit dans ce manuel.
- Communiquez avec le technicien d'entretien autorisé pour la réparation ou l'entretien de cette unité.
- Contactez le programme d'installation pour l'installation de cet appareil.
- Le climatiseur n'est pas destiné à être utilisé par de jeunes enfants ou des invalides sans surveillance.
- Les jeunes enfants devraient être surveillés pour s'assurer qu'ils ne jouent pas avec le climatiseur.
- Les travaux d'installation doivent être effectués conformément au Code national de l'électricité par du personnel qualifié et autorisé uniquement.
- Connectez-vous à un circuit d'alimentation correctement évalué, protégé et dimensionné pour éviter les surcharges électriques.
- Respectez toutes les procédures de sécurité recommandées par l'industrie, y compris l'utilisation de gants à manches longues et de lunettes de sécurité.
- Faites attention lors du déballage et de l'installation. Les bords du produit peuvent être tranchants.
- Gardez les matériaux d'emballage hors de la portée des enfants. Ces matériaux peuvent poser un risque d'étouffement pour les enfants.

OPÉRATION

- Cet appareil n'est pas destiné à être utilisé par des personnes (y compris des enfants) ayant des capacités physiques, sensorielles ou mentales réduites, ou un manque d'expérience et de connaissances, à moins qu'elles n'aient reçu une supervision ou une instruction concernant l'utilisation de l'appareil par une personne responsable de leur sécurité.
- Utilisez cet appareil uniquement aux fins prévues.
- N'essayez jamais de faire fonctionner cet appareil s'il est endommagé, défectueux, partiellement démonté ou s'il a des pièces manquantes ou cassées.
- Ne pas altérer les contrôles.

GENERAL INFORMATION

General

The equipment covered in this manual is to be installed by trained, experienced service and installation technicians.

This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.

Children should be supervised to ensure that they do not play with the appliance.

The refrigerant system is completely assembled and charged. All internal wiring is complete.

The unit is designed for use with or without duct work. Flanges are provided for attaching the supply and return ducts.

These instructions explain the recommended method to install the air cooled self-contained unit and the electrical wiring connections to the unit.

These instructions and any instructions packaged with any separate equipment required to make up the entire air conditioning system should be carefully read before beginning the installation. Note particularly "Starting Procedure" and any tags and/or labels attached to the equipment.

While these instructions are intended as a general recommended guide, they do not supersede any national and/or local codes in any way. Authorities having jurisdiction should be consulted before the installation is made. See **Additional Publications** for information on codes and standards.

Size of unit for a proposed installation should be based on heat loss calculation made according to methods of Air Conditioning Contractors of America (ACCA). The air duct should be installed in accordance with the Standards of the National Fire Protection Association for the Installation of Air Conditioning and Ventilating Systems of Other Than Residence Type, NFPA No. 90A, and Residence Type Warm Air Heating and Air Conditioning Systems, NFPA No. 90B. Where local regulations are at a variance with instructions, installer should adhere to local codes.

Shipping Damage

Upon receipt of equipment, the carton should be checked for external signs of shipping damage. If damage is found, the receiving party must contact the last carrier immediately, preferably in writing, requesting inspection by the carrier's agent.

Additional Publications

These publications can help when installing the heat pump. They can usually be found at the local library or purchased directly from the publisher. Be sure to consult the current edition of each standard.

National Electrical Code.....ANSI/NFPA 70

Standard for the Installation of Air Conditioning and Ventilating Systems
.....ANSI/NFPA 90A

Standard for Warm Air Heating and Air Conditioning Systems
.....ANSI/NFPA 90B

Load Calculation for Winter and Summer Air Conditioning
..... ACCA Manual J Residential

Duct Design for Residential Winter and Summer Air Conditioning and Equipment Selection
..... ACCA Manual D

For more information, contact these publishers:

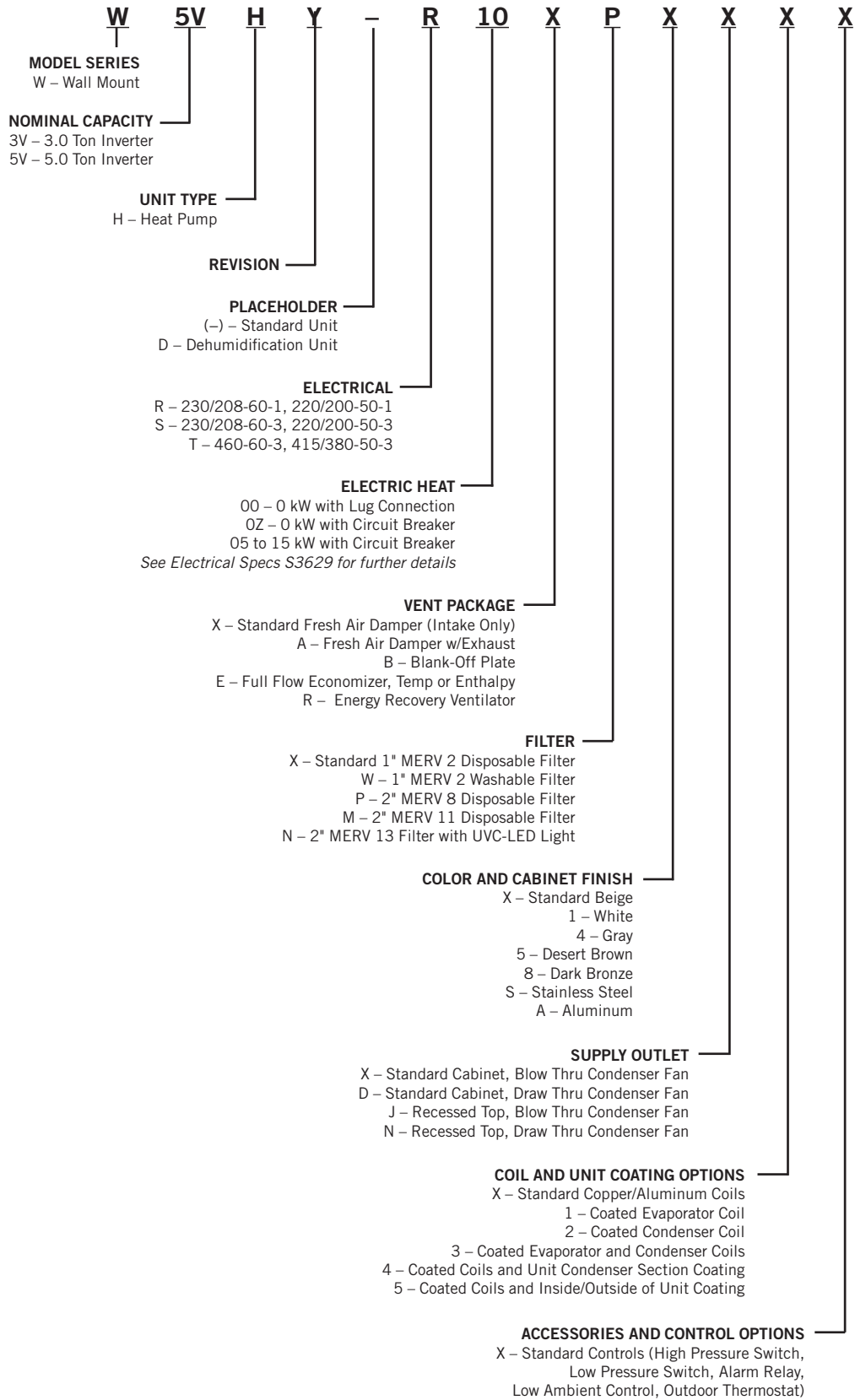
ACCA **Air Conditioning Contractors of America**
1712 New Hampshire Ave. N.W.
Washington, DC 20009
Telephone: (202) 483-9370
Fax: (202) 234-4721

ANSI **American National Standards Institute**
11 West Street, 13th Floor
New York, NY 10036
Telephone: (212) 642-4900
Fax: (212) 302-1286

ASHRAE **American Society of Heating, Refrigeration and Air Conditioning Engineers, Inc.**
1791 Tullie Circle, N.E.
Atlanta, GA 30329-2305
Telephone: (404) 636-8400
Fax: (404) 321-5478

NFPA **National Fire Protection Association**
Batterymarch Park
P.O. Box 9101
Quincy, MA 02269-9901
Telephone: (800) 344-3555
Fax: (617) 984-7057

Variable Speed Heat Pump Wall Mount Model Nomenclature



Duct Work

All duct work, supply and return, must be properly sized for the design airflow requirement of the equipment. Air Conditioning Contractors of America (ACCA) is an excellent guide to proper sizing. All duct work or portions thereof not in the conditioned space should be properly insulated in order to both conserve energy and prevent condensation or moisture damage.

Design the duct work according to methods given by the Air Conditioning Contractors of America (ACCA). When duct runs through unheated spaces, it should be insulated with a minimum of 1" of insulation. Use insulation with a vapor barrier on the outside of the insulation. Flexible joints should be used to connect the duct work to the equipment in order to keep the noise transmission to a minimum.

All model series require a 1/4" clearance to combustible material for the first 3' of duct attached to the outlet air frame is required. See wall mounting instructions beginning on page 13 and Figures 4 – 8 (pages 17 – 20) for further details.

Ducts through the walls must be insulated and all joints taped or sealed to prevent air or moisture entering the wall cavity.

Some installations may not require a return air duct. A metallic return air grille is required with installations not requiring a return air duct. The spacing between louvers on the grille shall not be larger than 5/8".

Any grille that meets with 5/8" louver criteria may be used. It is recommended that Bard Return Air Grille Kits RG5 or RFG5 be installed when no return duct is used. Contact distributor or factory for ordering information. If using a return air filter grille, filters must be of sufficient size to allow a maximum velocity of 400 fpm.

NOTE: *If no return air duct is used, applicable building codes may limit this cabinet to installation only in a single story structure.*

Fresh Air Intake

All units are built with fresh air inlet louvers punched in the side grilles.

If the unit is equipped with a fresh air damper assembly, the assembly is shipped already attached to the unit. Remove right side grille to access the damper blade.

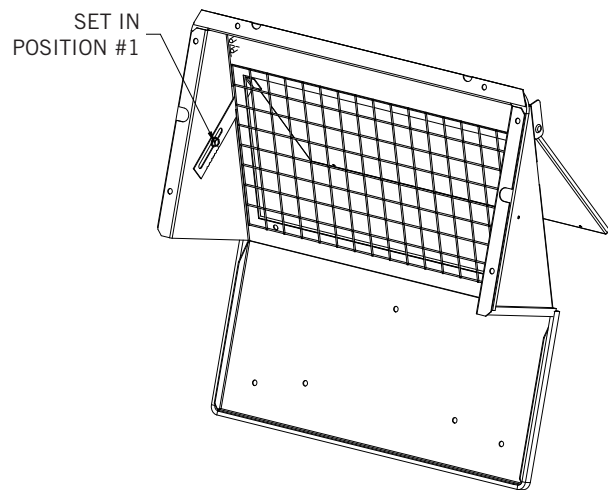
There is an adjustable slide on the side of the fresh air intake that can be adjusted to limit how far the damper opens so that the amount of fresh air that enters the structure is regulated. The damper is shipped pre-set in the #1 position.

Graphs found on pages 32 and 33 gives approximate fresh air amounts based on the slide adjustment setting.

All capacity, efficiency and cost of operation information is based upon the fresh air blank-off plate in place.

The blank-off plate is available upon request from the factory and is installed in place of the fresh air damper shipped with each unit.

FIGURE 1
Fresh Air Damper



MIS-3977A

MIS-3977

INSTALLATION

Basic Installation Design and Application Planning

Successful unit installations require proper planning and site inspection before installation begins. Before installing the wall mount unit, make sure that all service and airflow clearances are met and that the unit can meet all applicable code and regulation requirements. Provide an inspection of both the inside and outside of the structure by reviewing floorplans and/or visiting the installation site.

Wall Construction

The wall must be inspected to ensure that the weight of the unit can be supported. Be sure to review all applicable construction codes and regulations including seismic requirements. When inspecting wood frame walls, the wall construction must be strong and rigid enough to carry the weight of the unit without transmitting any unit vibration. It is important that the side unit wall mounting lags and optional bottom bracket are supported by structural members inside the wall cavity. Concrete block and brick walls must be thoroughly inspected to ensure that they are capable of carrying the weight of the installed unit. Metal buildings must contain structural components to support the unit weight. If heavily corrugated siding is present, it may need to be trimmed and flashed similar to a window to provide a flat, even surface to attach and seal the unit to the wall. Heavy gauge corrugations that would be present on shipping containers and blast-proof structures may require the installation of a metal plate over the corrugated area. It is important that the unit area is weatherized and sealed to avoid air and water infiltration into the area between the unit and the wall.

Outdoor Area Inspection

Inspect the outdoor area of the jobsite or review construction plans and locate the area where the wall mount is to be installed. The outdoor area must be free from obstructions including fences, bushes and walls that will hinder unit operation regarding outdoor condenser airflow and unit serviceability. Do not install units in enclosed areas that limit the amount of ambient temperature airflow. Warm air will exit the front condenser section of the unit, and outdoor ambient temperature air must be able to enter side intake condenser openings of the unit. Portable or modular building placement must be in a way that the wall mount units have a constant supply of outdoor air for proper unit operation. Make sure that the service panels of the unit are accessible. Inspect wall surfaces for obstructions that could hinder unit installation and servicing including outdoor electrical conduits, junction boxes, wall drains, vent hoods, windows, doors, overhangs and posts.

Condensate Water Drainage

Review all codes and requirements for unit condensate drainage. A clear, flexible PVC drain hose (3/4" ID, 1" OD) extends from the drain pan in the upper section of the unit and extends down to the unit base. An opening is supplied towards the back of the unit base for the drain hose to pass through, and the hose extends 1" to 2" below the unit base. Water removed from the indoor air (condensate) will be expelled from the unit in large amounts during cooling operation through the hose. Units running in cooling operation in cold outdoor below freezing conditions can cause the condensate to freeze after leaving the drain hose. In the event the drain hose is connected to a drain system of some type, it must be an open or vented type system to ensure proper drainage throughout seasonal use.

Indoor Ducted and Non-Ducted Applications

Air distribution inside the structure being conditioned plays an important role in making sure the area is a consistent temperature. Improper air distribution can result in areas being cooler or warmer, electrical equipment not receiving sufficient airflow or occupancy discomfort felt inside an area. Thermostat or indoor temperature sensor placement inside the area being conditioned also plays an important role in indoor climate control.

Indoor Supply Airflow

Indoor installation areas must provide a non-restrictive path for the conditioned supply air to leave supply grilles and registers. Inspect the area to ensure that all indoor portions of the room or rooms will have access to supply air. Ductwork may be used to ensure proper air circulation and all provided ductwork guidelines and clearances must be followed. Non-ducted applications must use a supply louver grille installed over the supply opening inside the room. Be sure to adjust supply deflectors to properly disperse the conditioned supply air to all parts of the room. Avoid closing sections of the supply grilles which would cause unneeded supply duct pressurization.

Indoor Return Airflow


A non-restrictive path for room air returning to the center section of the unit must be provided inside the room. Avoid placing objects including furniture, electronics equipment, equipment racks and cabinets directly in front of the unit return grilles and registers. Bard recommends at least 2' between solid objects and return grilles or registers. Ductwork may be used to ensure proper air circulation and all provided ductwork guidelines and clearances must be followed. Non-

ducted applications must use a return louver grille installed over the return opening inside the room.

Ducted Applications

Field fabricated supply and return duct work may be installed inside the structure being conditioned. A short supply and/or return stub duct may be connected to the unit supply and return flanges before unit installation to help with duct connections inside the structure. Supply and return ducts must be properly sized for the design airflow requirement of the equipment. Air Conditioning Contractors of America (ACCA) is an excellent guide to proper sizing. All duct work or portions thereof not in the conditioned space should be properly insulated in order to conserve energy, reduce heat conductivity, and prevent condensation or moisture damage. Design the duct work according to methods given by the Air Conditioning Contractors of America (ACCA). When duct work is installed in unheated spaces, it should be insulated with a minimum of 1" of insulation. Use insulation with a vapor barrier on the outside of the insulation. Flexible joints should be used to connect the duct work to the equipment in order to keep the noise transmission to a minimum. Ducts through the walls must be insulated and all joints taped or sealed to prevent air or moisture from entering the wall cavity.

All model series require a 1/4" clearance to combustible material for the first 3' of duct attached to the outlet air frame is required.

 **WARNING**

Fire hazard.

Maintain minimum 1/4" clearance between the supply air duct and combustible materials in the first 3' of ducting.

Failure to do so could result in fire causing damage, injury or death.

Free Blow Applications

Some installations may not require extensive supply duct work throughout the structure and are referred to as free blow applications. A short field-fabricated supply duct must be used in the wall cavity to transition between the supply collar on the unit and the supply louver grille in the room. The duct must be properly insulated in order to conserve energy, reduce heat conductivity and prevent condensation or moisture damage. All joints must be taped or sealed to prevent air or moisture entering the wall cavity. Follow all clearances including distances to combustible materials and all instructions provided in this manual.

A non-restrictive metallic supply air grille with deflectors is required for free blow applications. Contact the local Bard distributor or visit www.bardhvac.com for ordering information.

A metallic return air grille is required for non-ducted applications. The spacing between louvers on the grille shall not be larger than 5/8". It is recommended that a Bard Return Air Grille Kit is installed that is designed specifically for the wall mount product. Contact the local Bard distributor or visit www.bardhvac.com for ordering information. A field-supplied return grille that meets the 5/8" louver criteria and does not cause the unit to exceed the maximum specified external static pressure (ESP) may be used. If using a return air filter grille, filters must be of sufficient size to allow a maximum velocity of 400 fpm. Filter return air grilles do not filter air being brought into the structure through ventilation options including fresh air dampers, ventilators, economizers and energy recovery ventilators. Be sure to install the return grille with the louvers pointed downward towards the floor. This will help ensure return air is drawn upward from the floor and improve air circulation in the room.

NOTE: *If no return air duct is used, applicable building codes may limit this cabinet to installation only in a single story structure.*

Thermostat or Indoor Temperature Sensor Placement

The location and installation of the thermostat or temperature sensor that monitors indoor temperature is very important regarding unit operation. Avoid placing the thermostat in an area exposed to direct sunlight or air from doorways leading outdoors. Use a piece of insulating material to close off conduit openings or holes in the wall surface for wire entry into the thermostat or temperature sensor. This will help avoid non-conditioned air from entering the thermostat and effecting temperature and/or humidity readings. As common practice, the thermostat or temperature sensor should measure the temperature of the air being returned to the unit, and not the conditioned air being supplied by the unit. Placing the thermostat or temperature sensor near a return air opening will normally result in optimal unit performance.

Unit Installation

Make sure to have the proper tools at the work site that are needed for unit installation. The following steps are provided to ensure the unit is installed properly to the wall surface, and that the unit will provide years of service with minimal service requirements.

Materials/Tools List

Additional hardware and miscellaneous supplies are needed for installation. These items are field supplied and must be sourced before installation. This list also includes tools needed for installation.

- Appropriate safety gear including gloves and safety glasses
- 5/16" hex bit with drill driver
- Phillips head screwdriver
- Small straight (thermostat) screwdriver
- Tape measure
- Leveling device
- Two (2) tubes of caulk and caulk gun
- Utility knife
- Tools for cutting holes in the wall surface (if needed)
- Electrical components and wiring along with electrical tools
- Multimeter
- Wall fasteners for side flanges, bottom mounting bracket and top rain flashing.
- Duct tape and/or other duct sealing materials.

Wall Preparation

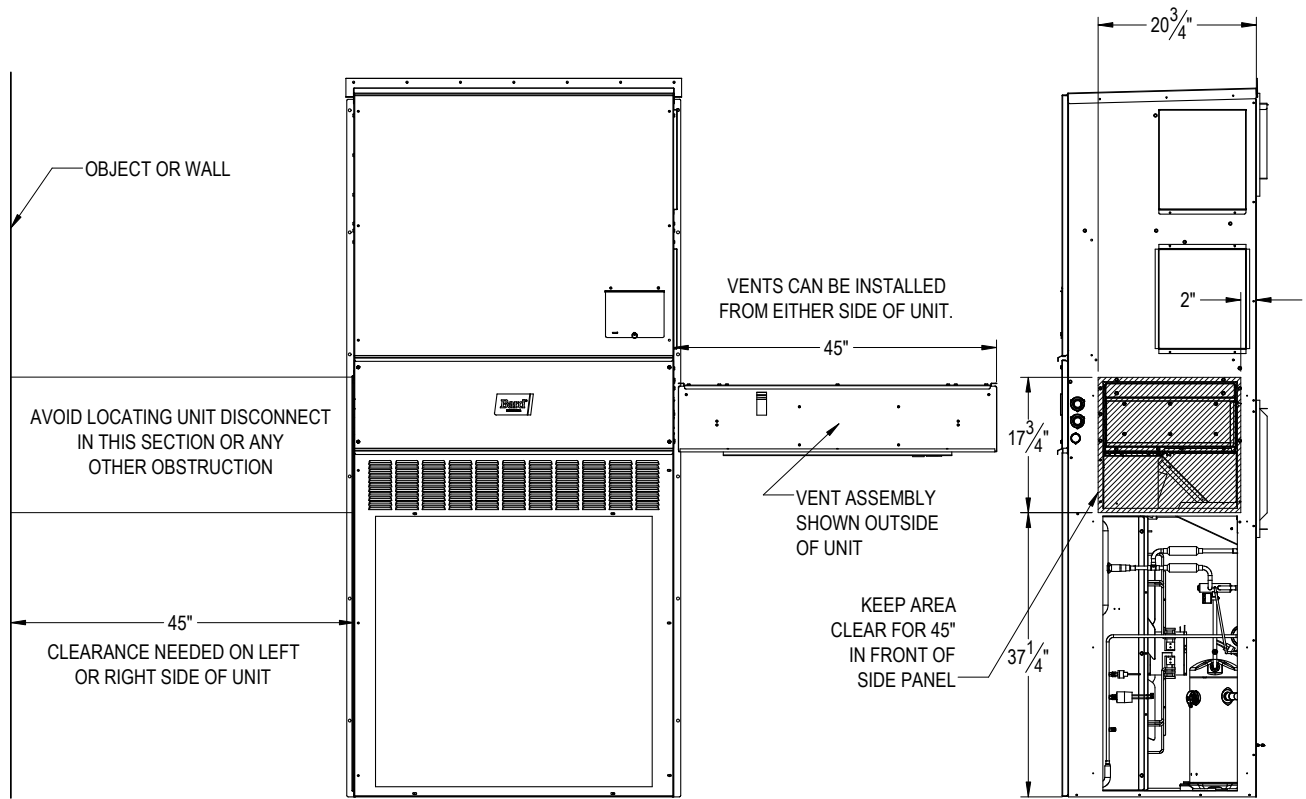
1. Two holes for the supply and return air openings must be cut through the wall as shown in Figure 4 on page 17. Be sure the openings are square and level. Follow all clearances including distances to combustible materials and all instructions provided in this manual.
2. Review all electrical requirements provided in this manual and plan out electrical entrances into the building. Also plan electrical conduit routing and thermostat placement, if necessary.
3. Install necessary duct work and prepare the openings for unit installation.
4. Clean the exterior wall where the unit is to be installed and make sure it is able to provide a smooth, level, debris-free surface. Remove all construction debris from the supply, return and electrical hole cutting process.

Wall Mount Installation to Wall Surface

1. Remove packaging from unit and make sure the unit is not damaged before installation. A top rain flashing is supplied for field use and is mounted to the back of the unit for shipping. Remove the rain flashing before locating the unit against the wall. Top rain flashing is required to avoid water entering the area behind the unit that is against the wall. A bottom mounting bracket, attached to the skid for shipping, is provided for ease of installation but is not required. Review all requirements listed on unit labels and on serial plate located on the side of the unit.

2. Locate and mark bolt hole locations and bottom mounting bracket location. Install bottom mounting bracket with field-supplied fasteners to wall if it is to be used (optional). Bracket must be level and installed in the correct location to help support the unit during the installation process (see Figure 14).
3. Position the wall mount unit close to the wall surface where it will be installed. Install rain flashing at the top of the unit facing the wall by hooking the hem bend into the rear bend of the unit top (see Figure 14).
4. Apply a liberal amount of caulk on left and right cabinet side wall mount brackets and back of top rain flashing. Place unit back surface flush against wall. Unit must be level to ensure proper condensate drainage. Optional bottom bracket may be used to help support the unit.
5. Units are secured to the wall by using field-supplied fasteners along each side of the wall mount through the built-in wall mounting brackets. It is the responsibility of the installer to select the proper fastener to secure the unit to the wall based on wall construction and applicable building codes. Typical installations may include 5/16" fasteners with 7/8" diameter flat washers. Be sure unit is securely mounted and all weight-bearing fasteners are attached to the weight supporting structural members of the wall.
6. Apply a bead of caulk between the back of the unit top and the front surface of the top rain flashing (see Figure 14).
7. Connect unit duct work from the inside of the building following all clearances and instructions provided. For additional mounting rigidity, the return air and supply air frames or collars can be drilled and screwed or welded to the structural wall itself (depending upon wall construction). Be sure to use code approved duct tape or other sealing materials to seal the duct work to the unit.
8. On side-by-side installations, maintain a minimum of 20" clearance on both sides to allow access to heat strips and to provide proper airflow to the outdoor coil. Additional clearance may be required to meet local or national codes.

FIGURE 2
Economizer Vent Installation/Removal Clearance Required



MIS-4042 A

TABLE 1
Clearance Required for Service Access and Adequate Condenser Airflow

Model	Left Side	Right Side	Discharge – Front
W3VHY W5VHY	20"	20"	10'

TABLE 2
Minimum Clearances Required to Combustible Materials

Model	Supply Air Duct (1st 3')	Cabinet
W3VHY W5VHY	1/4"	0"

1. For vent installation and removal, one side of the unit requires 45" clearance in the vent area. See Figure 2 for clarity.
2. Bard recommends a minimum clearance of 4" under the unit cabinet for condenser defrost drainage during heat pump operation.

See Specifications Sheet S3629.

FIGURE 3
Unit Dimensions

	Width (W)	Depth (D)	Height (H)	Supply		Return														
				A	B	C	B	E	F	G	I	J	K	L	M	N	O	R	S	T
W3VHY	42.00	25.52	84.75	9.88	29.88	15.88	29.88	43.88	12.63	39.06	30.06	43.25	26.94	55.59	52.59	8.82	43.00	1.44	16.00	1.88
W5VHY	42.00	25.52	92.88	9.88	29.88	15.88	29.88	43.88	12.63	45.00	30.06	49.25	35.06	61.72	58.72	8.82	43.00	1.44	16.00	10.00

All dimensions are in inches. Dimensional drawings are not to scale.

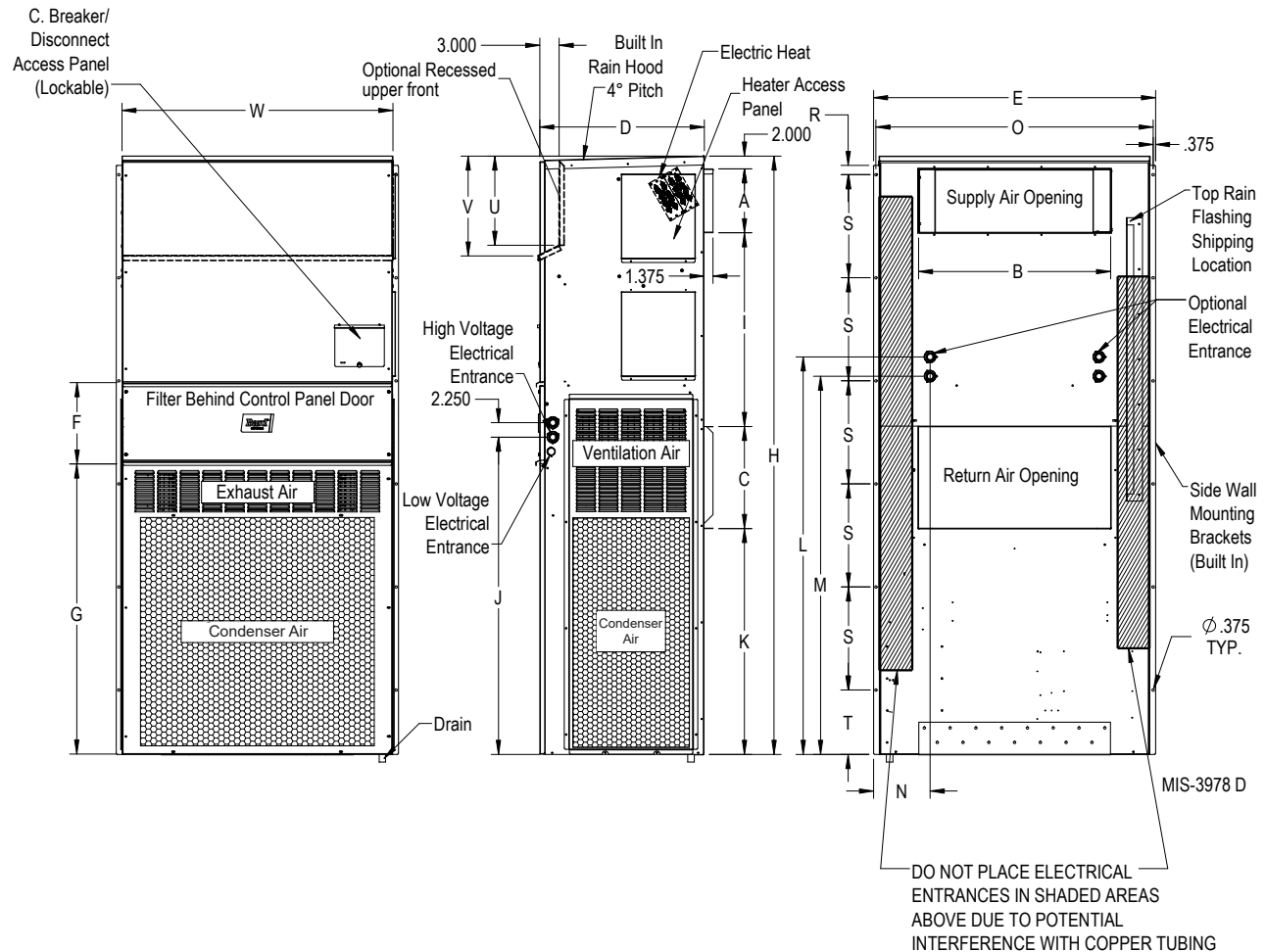
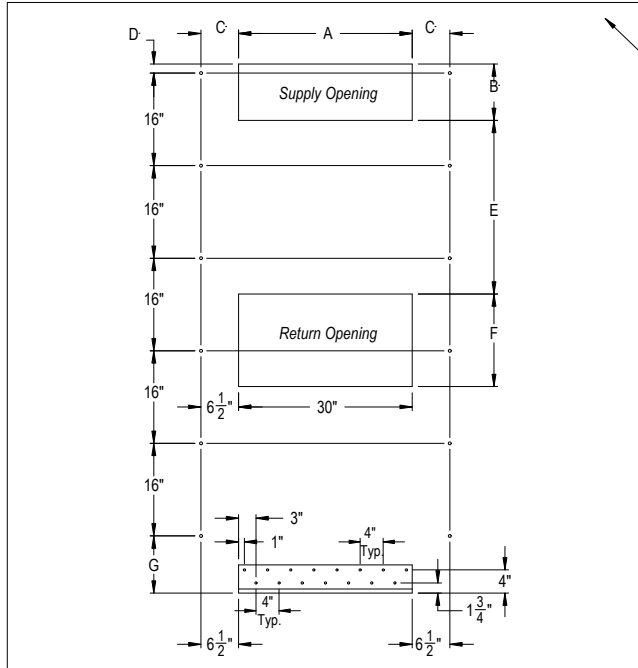
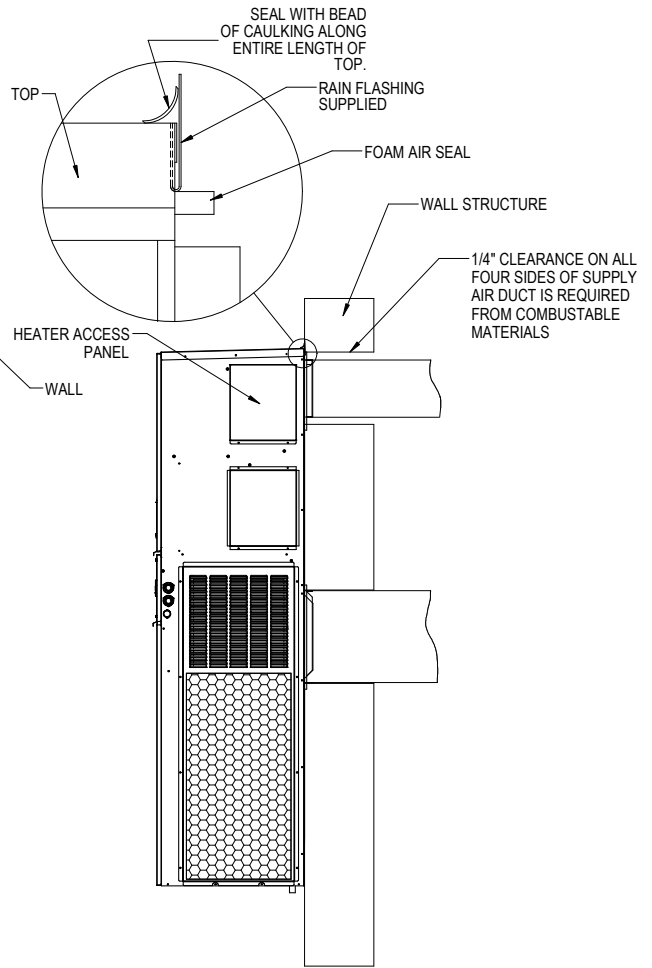


FIGURE 4
Mounting Instructions

UNITS	REQUIRED DIMENSIONS	A	B	C	D	E	F	G
W3VHY	REQUIRED DIMENSIONS TO MAINTAIN 1/4" MIN. CLEARANCE FROM COMBUSTIBLE MATERIALS	30 1/2	10 1/2	6 1/4	1 1/4	29 3/4	16	17/8
	REQUIRED DIMENSIONS TO MAINTAIN RECOMMENDED 1" CLEARANCE FROM COMBUSTIBLE MATERIALS	32	12	5 1/2	2	29	16	17/8
W5VHY	REQUIRED DIMENSIONS TO MAINTAIN 1/4" MIN. CLEARANCE FROM COMBUSTIBLE MATERIALS	30 1/2	10 1/2	6 1/4	1 1/4	29 3/4	16	10
	REQUIRED DIMENSIONS TO MAINTAIN RECOMMENDED 1" CLEARANCE FROM COMBUSTIBLE MATERIALS	32	12	5 1/2	2	29	16	10



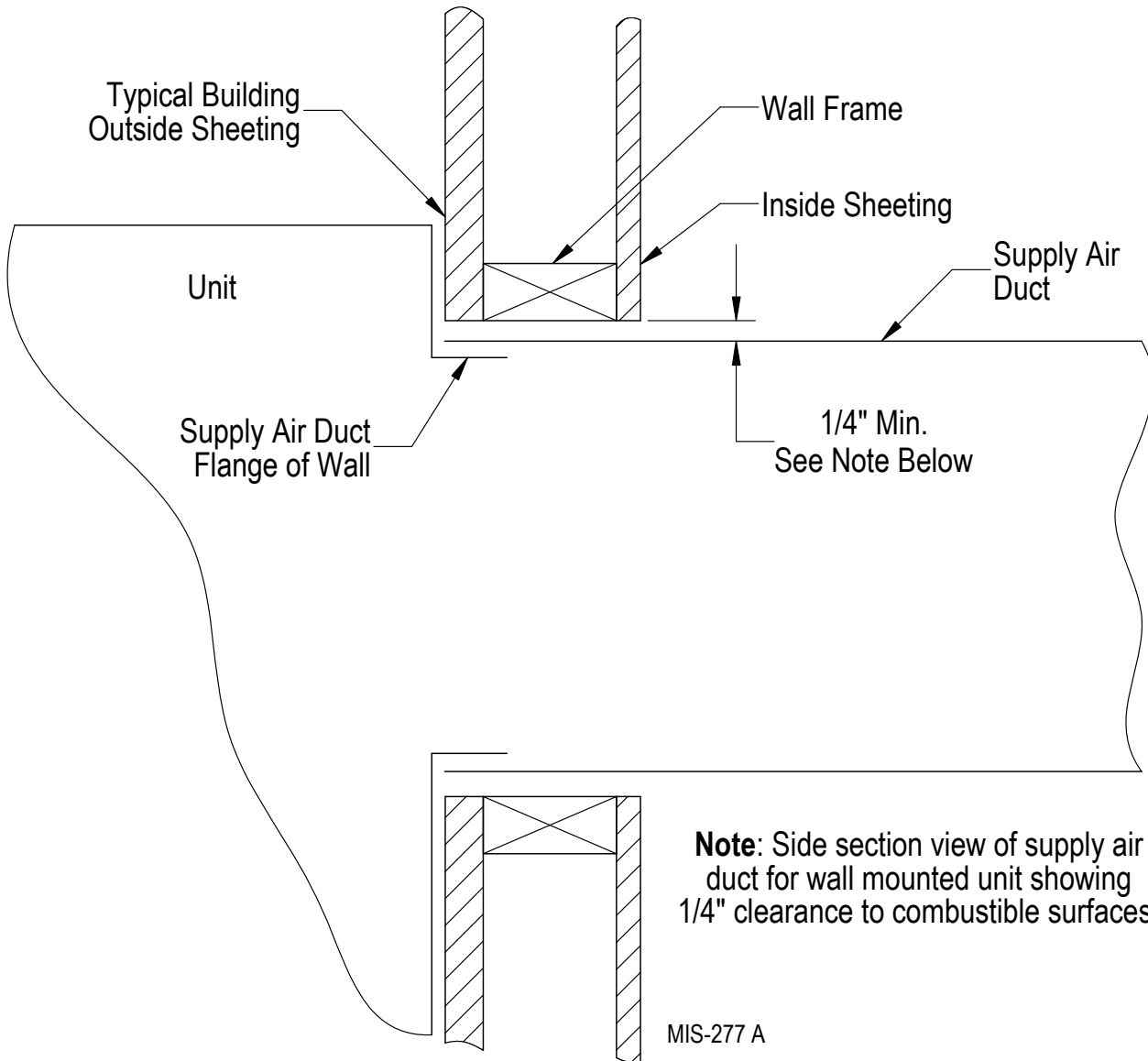
Wall Opening and Hole Location View



Right Side View

MIS-4087 C

FIGURE 5
Electric Heat Clearance



⚠ WARNING

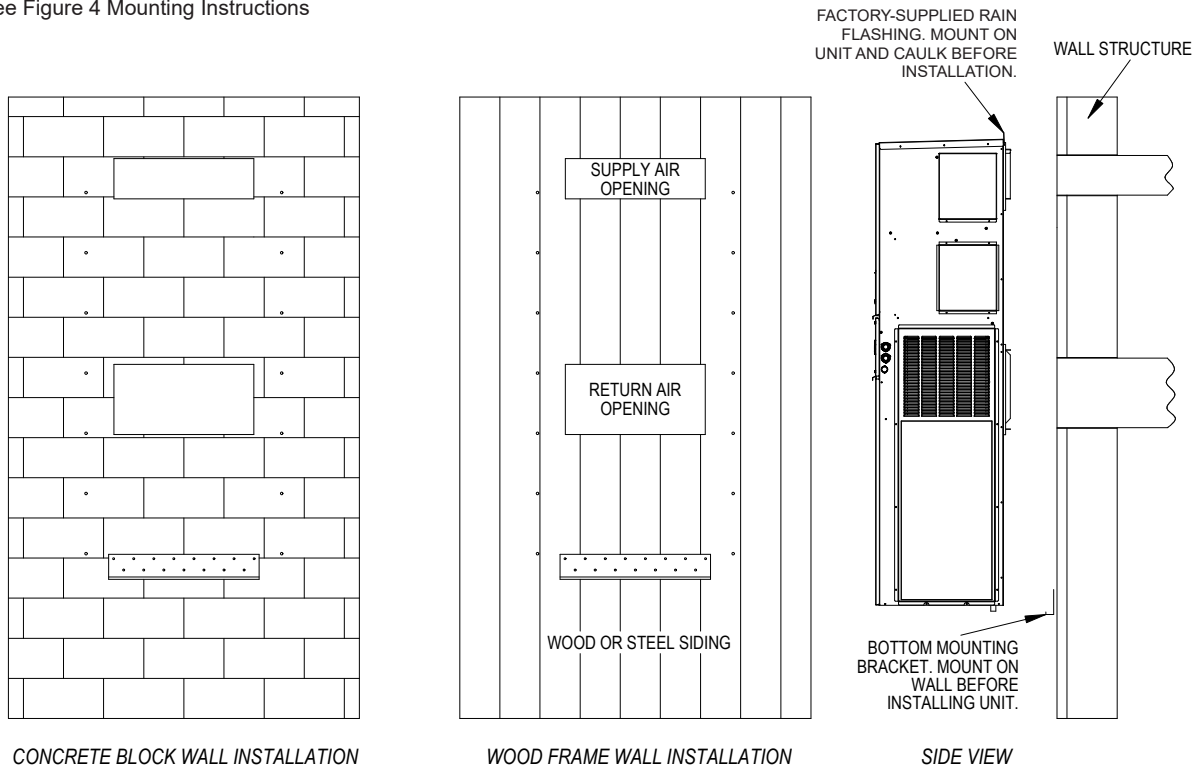
Fire hazard.

Maintain minimum 1/4" clearance between the supply air duct and combustibles materials in the first 3' of ducting.

Failure to do so could result in fire causing damage, injury or death.

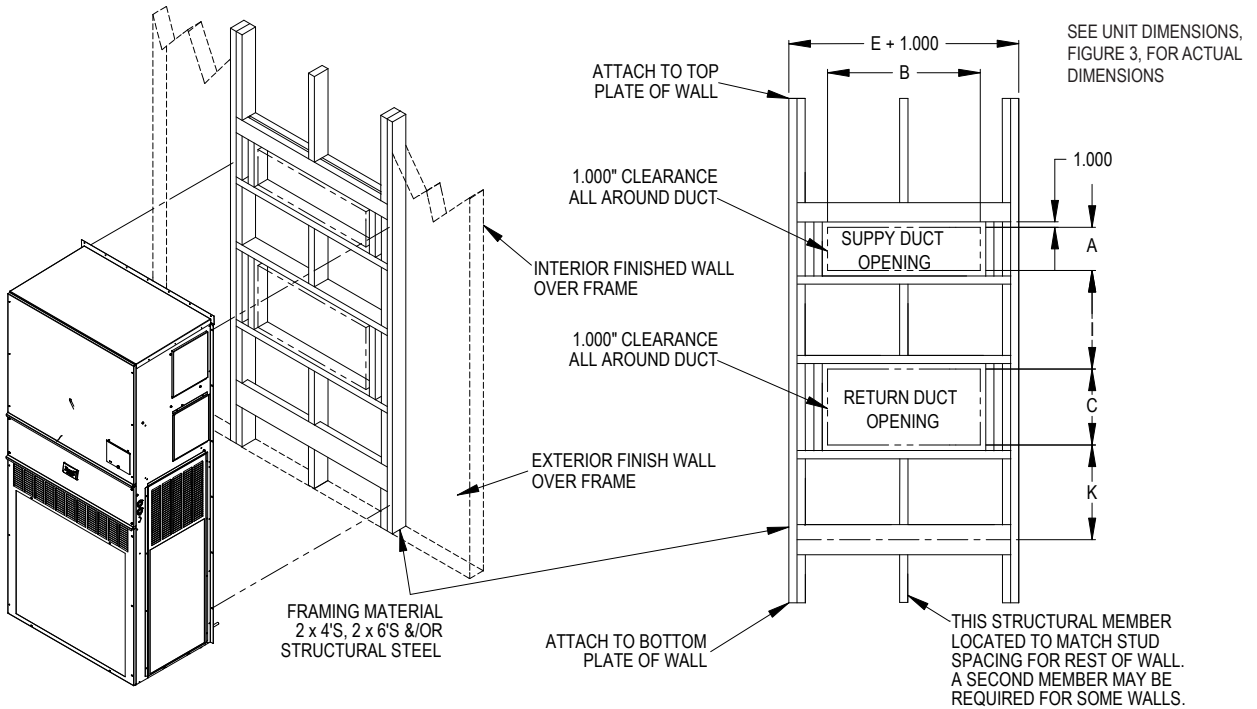
FIGURE 6
Wall Mounting Instructions

See Figure 4 Mounting Instructions



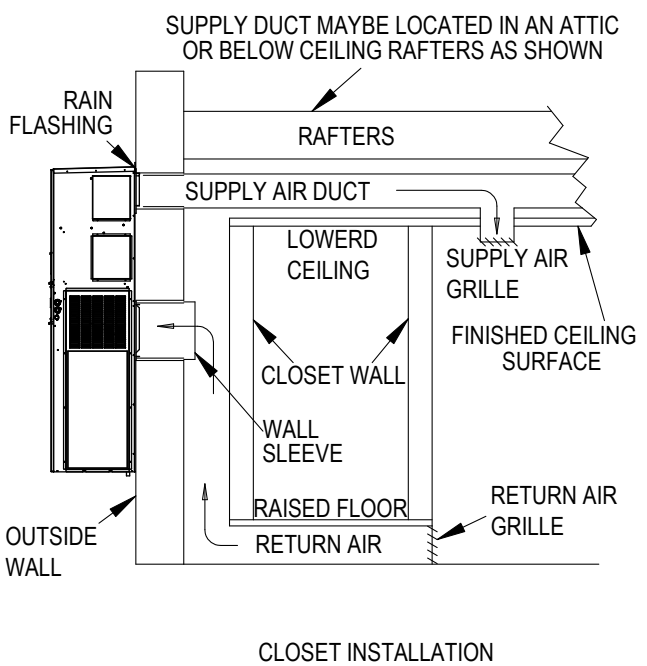
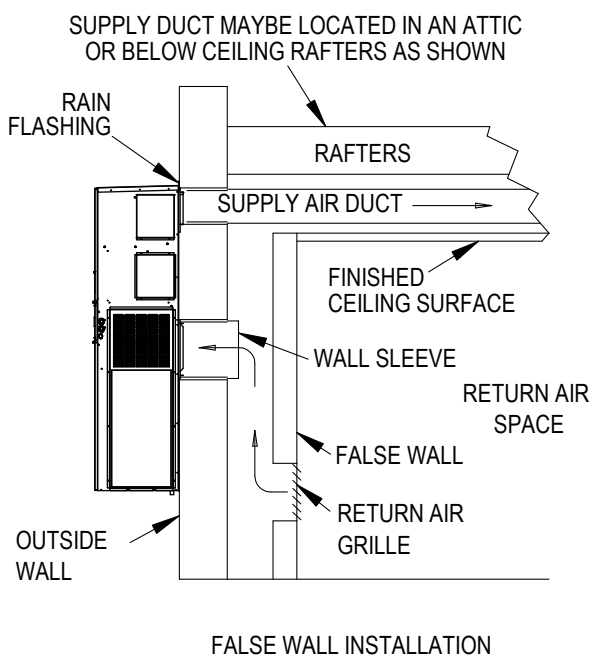
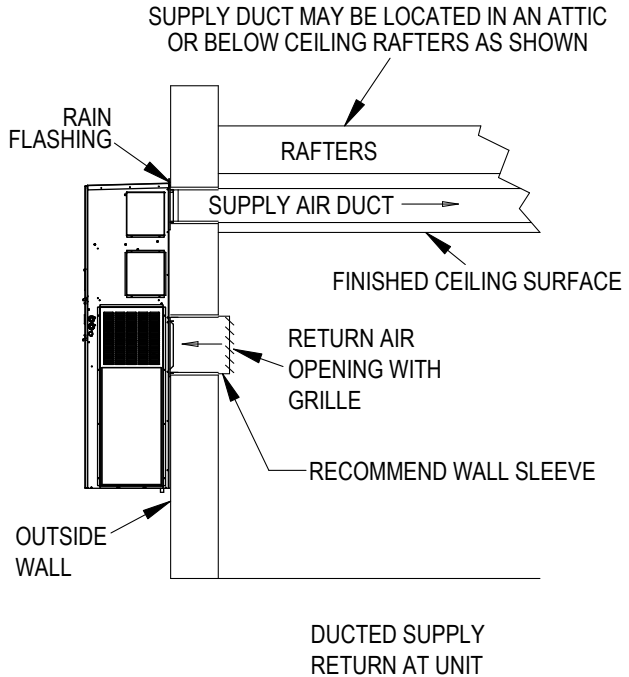
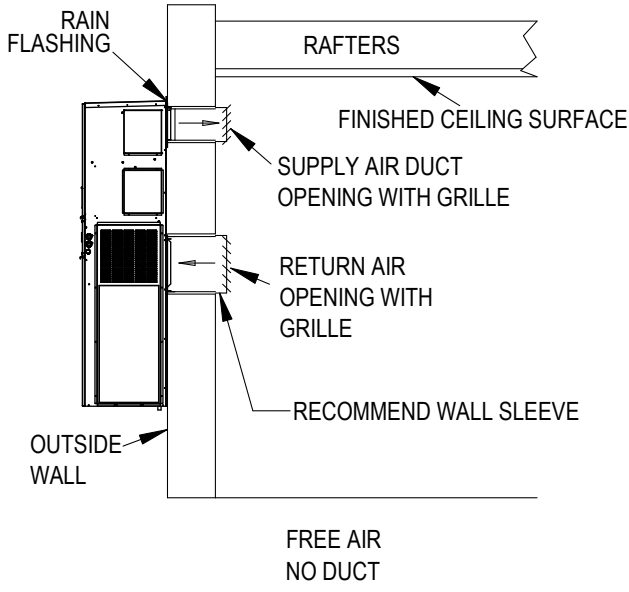
MIS-3981 C

FIGURE 7
Wall Mounting Instructions



MIS-3982 B

FIGURE 8
Common Wall Mounting Installations



MIS-4043 B

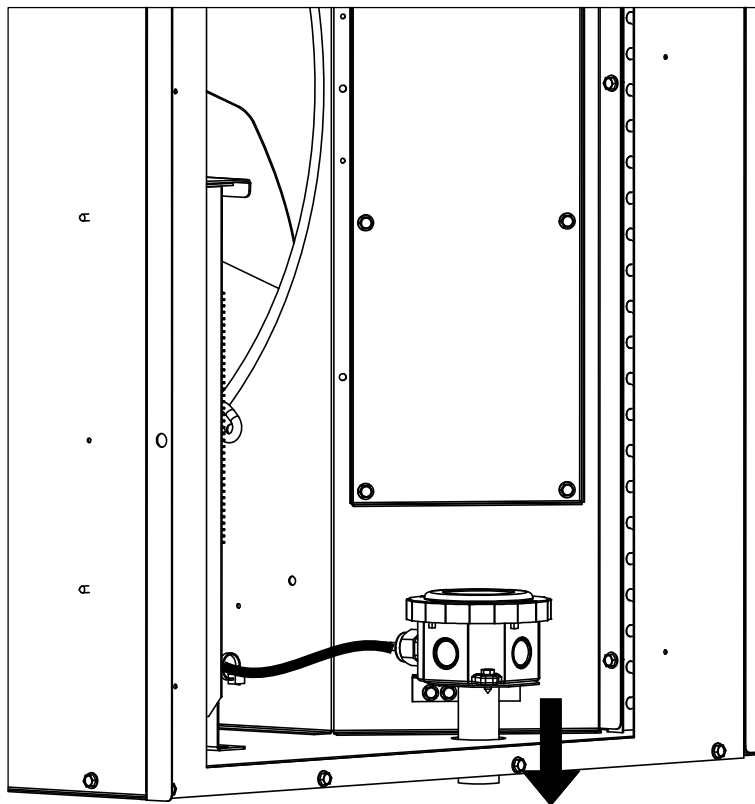
FIGURE 9
Outdoor Thermostat Mounting

Outdoor thermostat must be relocated through the unit base before unit begins operation. This ensures that the sensor is exposed to actual outdoor conditions and not impacted by condenser fan operation. Unit is delivered with the outdoor thermostat in "shipping only" position to prevent damage to sensor during loading and shipping.

To install outdoor thermostat in proper position for unit operation:

1. Remove two (2) screws from mounting bracket holding thermostat in shipping position.
2. Lower sensor assembly to next lower set of mounting holes.
3. Re-install screws into the lower set of holes. In proper position, the sensor extension will protrude through the unit base as shown below.

IMPORTANT: Failure to relocate outdoor sensor may result in inaccurate outdoor temperature readings and improper unit operation.



SENSOR MUST PROTRUDE THROUGH BASE. FAILURE TO MOVE SENSOR INTO THE PROPER POSITION MAY RESULT IN REDUCED UNIT PERFORMANCE AND ECONOMIZER MALFUNCTION.

IMPORTANT: FAILURE TO RELOCATE OUTDOOR SENSOR MAY RESULT IN INACCURATE OUTDOOR TEMPERATURE READINGS AND PROPER UNIT OPERATION.

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Wiring – Main Power

WARNING

Electrical shock hazard.

Do not operate this equipment without an earth ground attached and always disconnect the remote electric power supplies before servicing.

Electrical shock can result in serious injury or death.

Main electrical power must be supplied to the unit from a clean, reliable power source. Verify voltage being supplied to the unit is consistent during all times of the day and within the range specified for the unit in the unit specifications and on the unit serial plate. Voltage must be measured at the field power connection point in the unit and while the unit is operating at full load (maximum amperage operating condition).

Refer to the unit serial plate and unit specifications for maximum fuse or circuit breaker size. Each outdoor unit is marked with a “Minimum Circuit Ampacity”. This means that the field wiring used must be sized to carry that amount of current. Depending on the installed kW of electric heat, there may be two field power circuits required. If this is the case, the unit serial plate will so indicate.

All models are suitable only for connection with copper wire. Each unit and/or wiring diagram will be marked “Use Copper Conductors Only”. These instructions must be adhered to. Refer to the National Electrical Code (NEC) for complete current carrying capacity data on the various insulation grades of wiring material. All wiring must conform to NEC and all local codes.

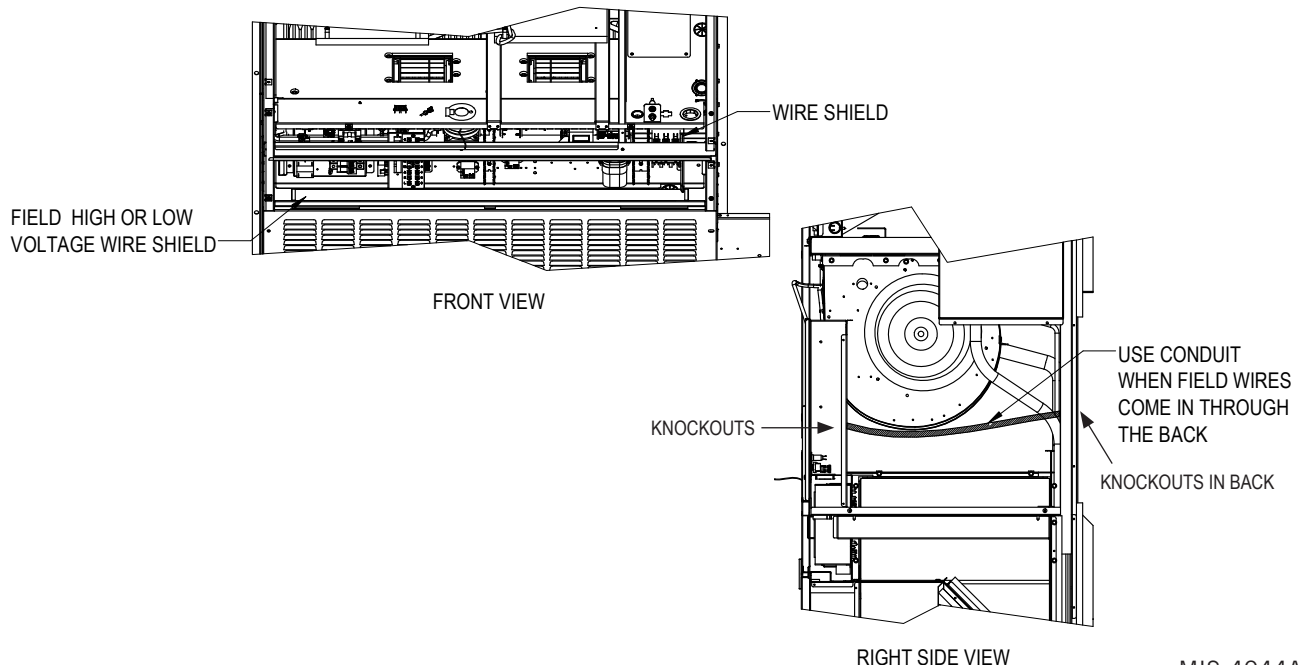
The electrical data on the serial plate, in the unit specifications and also in Table 6 on page 30 list fuse sizes for all models including the most commonly used heater sizes. Also shown are the number of field power circuits required for the various models with heaters. The unit rating plate lists a “Maximum Time Delay Relay Fuse” or circuit breaker that is to be used with the equipment. The correct type and size must be used for proper circuit protection and also to ensure that there will be no nuisance tripping due to the momentary high starting current of the compressor motor.

High Voltage Connections

1 phase and 3 phase models should be wired following high voltage field wiring practices. The variable speed drive boards handle any phase and power issues by disabling compressor control and providing alarm outputs to the PLD Pro display (see service manual 2100-791).

Route field wires under the field wire shield shown in Figure 10. (The field wire shield can be removed for wire installation.) If field power is supplied to the left side of the unit, run the high voltage wires under the shield shown in Figure 10 and to the right of the wire shield

FIGURE 10
High Voltage Connections



MIS-4044A

next to the power terminal block and up into the upper control panel where the connections are made. If field power is supplied to the right side of the unit, the low voltage wires can be run under the field wire shield to access the low voltage terminal strip.

When field wires are supplied through the back of the unit, flexible conduit must be extended through the back of the unit and terminate into the knock-outs on the upper control panel (see Figure 10).

Wiring – Low Voltage

NOTE: The voltage should be measured at the field power connection point in the unit and while the unit is operating at full load (maximum amperage operating condition).

230/208V Wiring

All 230/208V 1 phase and 3 phase equipment have dual primary voltage transformers. All equipment leaves the factory wired on 240V tap. **It is very important that the correct voltage tap is used.** For 208V operation, reconnect from 240V to 208V tap. The acceptable operating voltage range for the 240 and 208V taps are: 240V tap (253 – 216) and 208 tap (215 – 197).

460V Wiring

460V 3 phase equipment use triple primary voltage transformers. All equipment leaves the factory wired on 480V tap. **It is very important that the correct voltage**

tap is used. The acceptable operating voltage range for the 480V, 415V and 380V taps are: 480V tap (429 and above), 415 Tap (395 – 428) and 380 tap (below 395).

For low voltage wiring, an 18 gauge copper, color-coded cable is recommended. See Table 3 for more information.

TABLE 3
Thermostat Wire Size

Transformer VA	FLA	Wire Gauge	Maximum Distance In Feet
55	2.3	18 gauge	60
		16 gauge	100
		14 gauge	160
		12 gauge	250

Low Voltage Connections

These units use a 24-volt AC low voltage circuit.

Connect thermostat to unit terminals (see Figure 11):

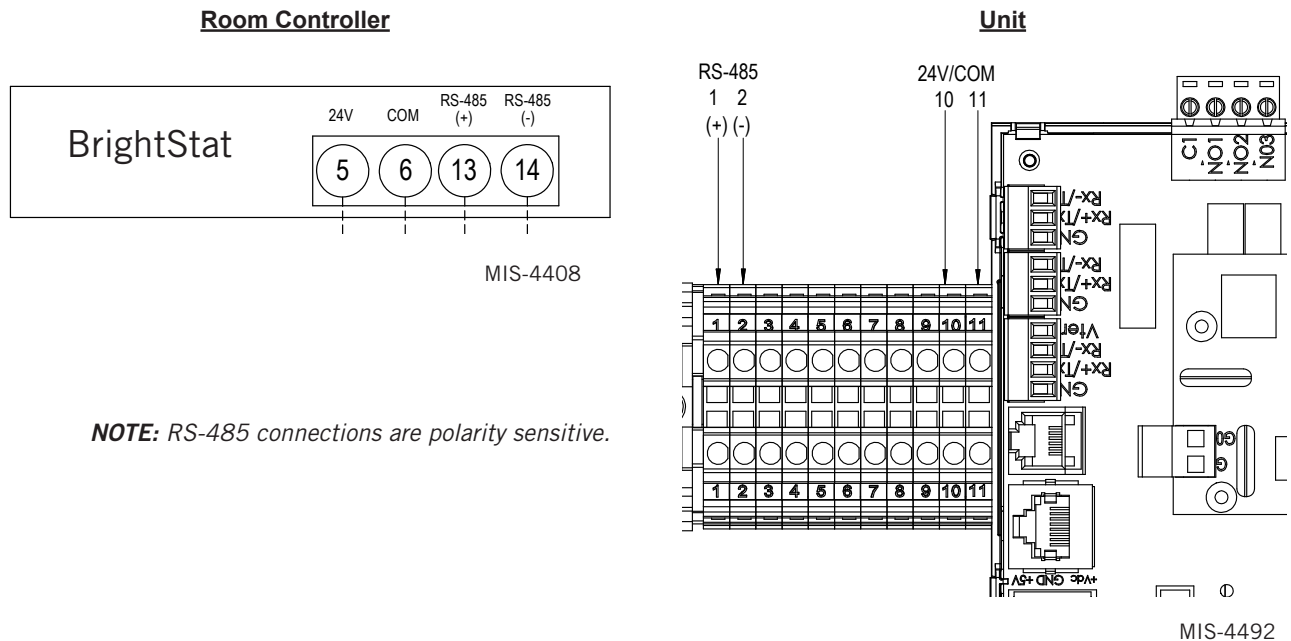
Terminal #1 Rx/Tx (+) communication

Terminal #2 Rx/Tx (-) communication

Terminal #10 is 24VAC

Terminal #11 is the 24VAC common and is grounded

FIGURE 11
Thermostat Connections



Unit Disable Input/Alarm

The unit is equipped with an input that can be used in conjunction with a smoke detector, fire suppression system or unit disable switch with a dry contact on DI1 (see Figure 12). When this connection is open between DI1 and terminal #5, the wall unit will cease all operations. The alarm can be set to automatically clear when the alarm condition is no longer present, or require manual reset from the end user.

Dehumidification Feature (Optional)

When dehumidification is active, a 3-way valve solenoid is energized. The reheat coil located behind the evaporator coil is then active to reheat the supply air during cooling mode. This allows humidity to be removed from the air entering the unit without a large amount of sensible cooling capacity. During dehumidification, the indoor blower speed is reduced to help with the humidity removal.

If there is a call for dehumidification and comfort cooling at the same time, the call for cooling takes precedence over dehumidification.

Ventilation Features (Optional)

See ventilation instructions provided with unit for low voltage wiring.

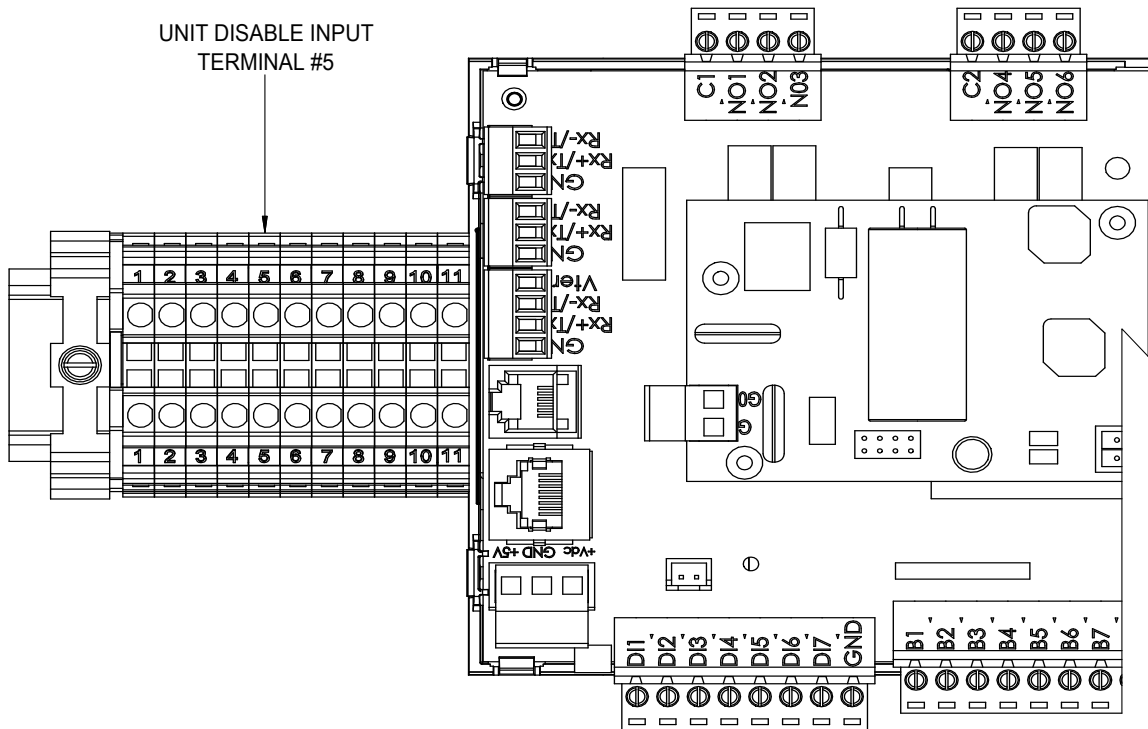
Low Ambient Control (LAC)

The low ambient control utilizes the high pressure transducer that is attached to the discharge line of the system and monitors high side system pressure. Operation of the LAC occurs as discharge pressure drops below 240 psi. LAC operation cycles the condenser fan on/off based on discharge pressure. Fan modulates down to 240 psi.

Freeze Protection

The unit monitors suction pressure to determine a freeze event in cooling mode. If the discharge pressure falls below 93 psi for 5 minutes, the compressor operation is disabled for 5 minutes.

FIGURE 12
Unit Disable Input/Alarm Connection



MIS-4491

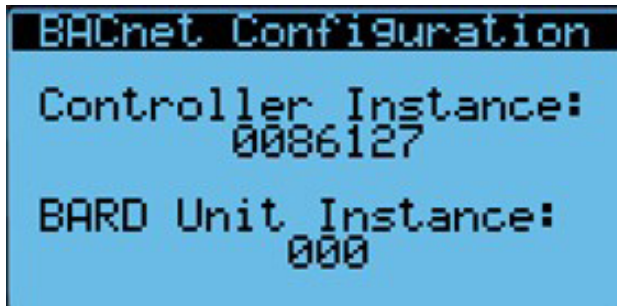
BACnet Set Up

Once the unit is powered, the room controller and unit will need to be configured for BACnet communication.

Room Controller

The instance number is how the room controller is identified and the same instance number must be present in the unit controller. In the unit, the controller instance number can be seen or changed using the PLD-Pro hand-held monitor to view the BACnet configuration screen shown in Figure 13.

FIGURE 13
BACnet Configuration



In the room controller, the instance number can be viewed or changed by navigating to the Network screens. Touch and hold the top middle of the screen for 3 seconds. In the menu, select Network and navigate to the screen shown in Figure 14. The room controller instance must be set to the same value as the unit controller, which is 86127 (see Bard manual 2100-681). Verify that the COM address matches the last three digits of the BACnet instance (see Figure 15). If they don't match, change the COM address to the correct value. Changing the COM address setting will also change the BACnet instance number shown on screen 2/2 (see Figure 14).

The controller instance number in the unit and the instance number in the controller must be the same for the devices to communicate.

Unit Controller

Bard Unit Instance: This is used ONLY if more than one unit/controller combination is utilizing the same RS-485 line. If so, they will a unique number assigned. This is the address for the unit communication. The unit instance is the address that is used to tell the room controller which device it is communicating back to. The default is 000 (see service manual 2100-791).

FIGURE 14
BACnet Instance

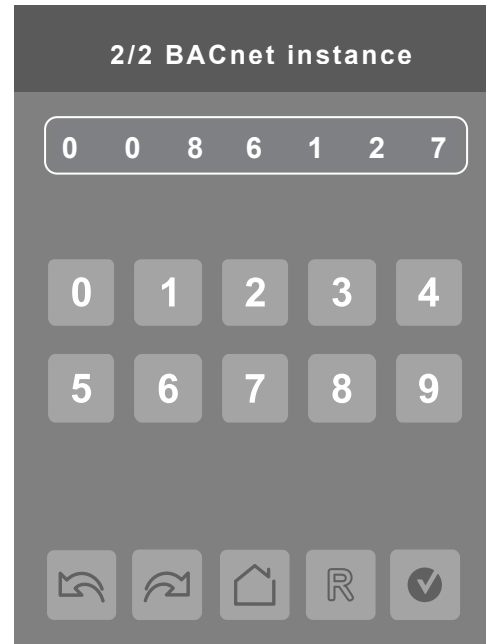
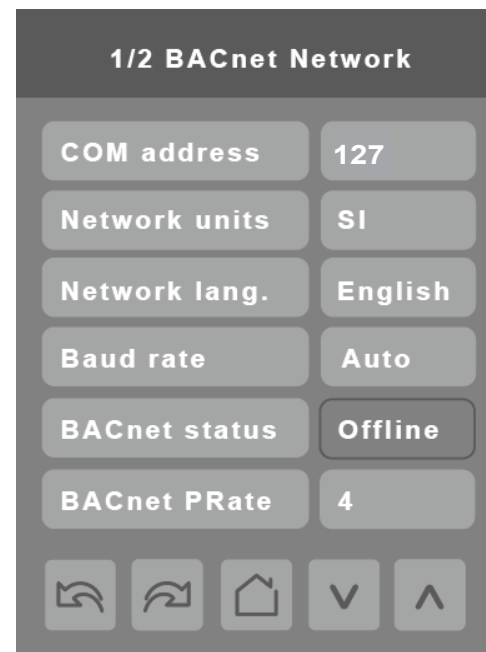


FIGURE 15
BACnet Instance



START UP

Sequence of Operation

Inverter Drive Operation

System operation is variable including fan, blower and compressor. Unit is equipped with an inverter drive module. This drive is connected to the compressor and provides variable control of the compressor which can modulate output from 1,850 RPMs to 7,200 RPMs.

Cooling

When a demand for cooling is present, both the compressor and blower will start. Outdoor fan operation is based on discharge pressure, so a brief delay may occur prior to condenser fan operation. The system is completely variable so the compressor, condenser fan and indoor blower are all capable of modulating. See each component section for operation details. Cooling operation seeks to maintain a space temperature by gradually increasing/reducing refrigeration demand as setpoint is approaching and may satisfy the thermostat call.

Heating

When a demand for heating is present, the unit will operate in heat pump mode. The system will activate the reversing valve that controls heating cycle operation. The system is completely variable so the compressor, condenser fan and indoor blower are all capable of modulating. Blower operation is designed to target a certain discharge pressure in heating, so a brief delay in blower response may occur. See each component section for operating details. Heating operation seeks to maintain a space temperature by gradually increasing/reducing refrigeration demand as setpoint is approaching and may satisfy the thermostat call. If demand continues to increase, then the unit will continue to increase system output until heat pump alone can not satisfy. In the event that heat pump alone won't approach setpoint, then 1st stage electric heat is engaged.

Low Pressure Bypass Operation

The control has a configurable low pressure bypass time delay to ignore the low pressure input when the compressor starts to operate. This delay (120 to 300 seconds) can be adjusted via the Low Pressure Alarm B5 screen (default is 120 seconds).

After this period expires, the control will then monitor the low pressure transducer to ensure pressure remains above 40psi during compressor operation.

Drive Assembly

High Pressure Switch Operation

A high pressure switch is connected to the inverter drive and when tripped (635-665 psi), the system is immediately shut down. However, the control logic

has high pressure mitigation designed to reduce high pressure lockouts. In high ambient or high demand, the compressor output will be gradually reduced to target and maintain a max of 575 psi discharge pressure. This is to allow continued system operation and conditioning to the space in lieu of cycling or locking out.

Discharge Limit Temperature (DLT) Sensor

A discharge limit temperature sensor is connected to the inverter drive. To protect the compressor, the drive will terminate cooling/heating operation if DLT sensor reaches 120°C/250°F.

Operational Mitigations

System operation is designed to provide heating and cooling capacity in undesirable conditions. This may require compressor output to be reduced, but will continue to provide BTUs to the space in lieu of shutting down. These include discharge pressure management during high ambient, drive temp protection and excessive compressor amp draw.

See service manual 2100-791 for details.

Stator Heat

The variable speed compressor comes with built-in stator heat to prevent refrigerant migration. When enabled, no alarms are present and compressor speed is zero when stator heat is active. The compressor drive board provides a low amount of power to energize the motor windings in a manner that does not turn the motor. This energizes the motor windings to generate heat to warm the compressor.

Defrost Cycle

The defrost cycle is controlled by temperature and time on the unit PLC.

When the outdoor temperature is in the lower 40°F temperature range or colder, the outdoor coil temperature is 32°F or below. This coil temperature is sensed by the coil temperature sensor mounted near the bottom of the outdoor coil. Once coil temperature reaches 30°F or below, the coil temperature sensor sends a signal to the PLC and the defrost timer will start accumulating run time.

After 30, 60 or 90 minutes of heat pump operation at 30°F or below, the heat pump control will place the system in the defrost mode.

During the defrost mode, the refrigerant cycle switches back to the cooling cycle, the outdoor motor stops, electric heaters are energized and hot gas passing through the outdoor coil melts any accumulated frost. When the temperature rises to approximately 57°F, the coil temperature sensor will send a signal to the PLC which will return the system to heating operations automatically.

If some abnormal or temporary condition such as a high wind causes the heat pump to have a prolonged defrost cycle, the heat pump control will restore the system to heating operation automatically after 8 minutes.

Vent Connection Plug

All units are equipped with a vent connection in the back of the control panel for different packages to plug in to. This plug is located in the control panel (remove control panel doors to access). If unit is shipped with a factory-installed vent package, it will be plugged in.

Pressure Service Ports

High and low pressure service ports are installed on all units so that the system operating pressures can be observed. Pressure tables covering all models can be found on page 29. It is imperative to match the correct pressure table to the unit by model number. Unit must be operated in test mode with overrides for troubleshooting. Refer to service manual 2100-791 for instructions.

This unit employs high-flow Coremax valves instead of the typical Schrader type valves.

WARNING! Do NOT use a Schrader valve core removal tool with these valves. Use of such a tool could result in eye injuries or refrigerant burns!

To change a Coremax valve without first removing the refrigerant, a special tool is required which can be obtained at www.fastestinc.com/en/SCCA07H. See the replacement parts manual for replacement core part numbers.

SERVICE

R-410A Refrigerant Charge

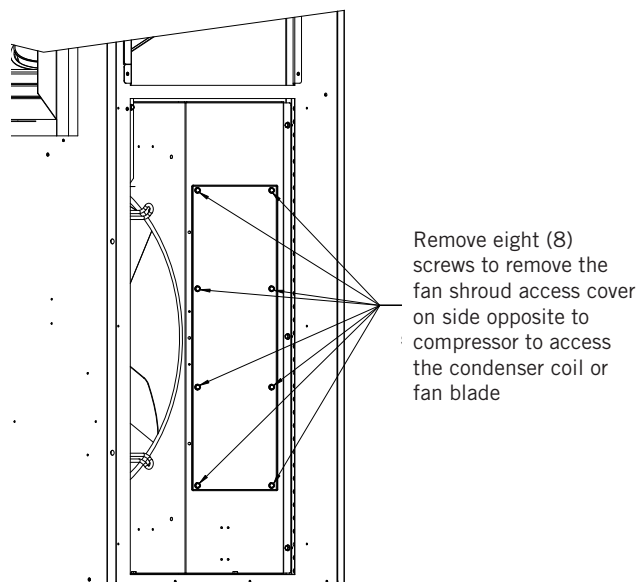
This unit was charged at the factory with the quantity of refrigerant listed on the serial plate. AHRI capacity and efficiency ratings were determined by testing with this refrigerant charge quantity.

The pressure tables on page 29 show nominal pressures for the units. Since many installation specific situations can affect the pressure readings, this information should only be used by certified technicians as a guide for evaluating proper system performance. They shall not be used to adjust charge. If charge is in doubt, reclaim, evacuate and recharge the unit to the serial plate charge.

Condenser Coil Cleaning Access

1. Disconnect all power to the unit.
2. On the side opposite of the compressor, remove the screws holding grille in place (see Figure 16).
3. Remove screws connecting fan shroud access door to fan shroud.
4. Clean condenser coil as thoroughly as needed.
5. Reverse steps to re-install.

FIGURE 16
Condenser Coil Access Removal



Parts hidden for clarity

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Important Cleaning Note

For improved start-up performance, wash the indoor coil with dishwasher detergent.

Please be aware of the cabinet style of installed unit. The units are manufactured as blow thru or draw thru. This will affect which side of coil will need most attention when cleaning.

Blow Thru

On blow thru units, dirt and debris will collect on the back side of the coil inside the fan shroud area.

Draw Thru

On draw thru units, dirt and debris will collect on the front side of the coil behind the front condenser grille.

TABLE 5A
Rated Output Cooling Pressure – Standard Airflow

Air Temperature Entering Outdoor Coil °F

Model	Return Air Temp (DB/WB)	Pressure	75	80	85	90	95	100	105	110	115	120	125
W3VHY	75/62	Low Side High Side	128 298	130 320	131 343	133 367	134 391	136 416	137 442	138 468	139 495	141 523	142 551
	80/67	Low Side High Side	137 306	139 329	140 352	142 376	143 401	145 427	146 453	148 480	149 508	150 536	152 565
	85/72	Low Side High Side	142 316	143 340	145 364	147 389	148 415	150 442	152 469	153 497	154 525	156 555	157 585
W5VHY	75/62	Low Side High Side	128 314	130 333	131 353	132 374	133 397	134 421	135 446	136 472	137 500	138 529	138 560
	80/67	Low Side High Side	137 322	139 342	140 362	141 384	143 407	144 432	145 457	146 485	147 513	147 543	148 574
	85/72	Low Side High Side	142 334	143 354	145 375	146 397	148 421	149 447	150 473	151 502	152 531	153 562	153 594

Low side pressure ± 4 PSIG
High side pressure ± 10 PSIG

Tables are based upon rated CFM (airflow) across the evaporator coil. If there is any doubt as to correct operating charge being in the system, the charge should be removed and system evacuated and recharged to serial plate charge weight.

Unit must be operated in test mode with overrides for troubleshooting. Refer to service manual 2100-791 for instructions.

TABLE 5B
Heating Pressure – Standard Airflow

Air Temperature Entering Outdoor Coil °F

Model	Indoor Temperature	Pressure	0	5	10	15	20	25	30	35	40	45	50	55	60	65
W3VHY	70	Low Side High Side	33 328	41 333	48 339	55 343	63 348	71 353	78 358	86 362	94 367	102 371	110 376	118 380	126 684	135 388
W5VHY	70	Low Side High Side	41 303	46 309	51 315	56 320	62 326	68 331	74 337	81 342	88 347	95 352	103 356	110 361	118 365	127 370

Unit must be operated in test mode with overrides for troubleshooting. Refer to service manual 2100-791 for instructions.

TABLE 6
Electrical Specifications – W*VHY Series

Model	Rated Volts, Hz & Phase	No. Field Power Circuits	Single Circuit		Multiple Circuit			
			① Minimum Circuit Ampacity	② Maximum External Fuse or Circuit Breaker	① Minimum Circuit Ampacity		② Maximum External Fuse or Circuit Breaker	
					Circuit A	Circuit B	Circuit A	Circuit B
W3VHY-R0Z ③ R05 ③ R10 ④ R15	230/208-60-1 220/200-50-1	1 1 1 or 2 1 or 2	29 55 81 84	35 60 90 90	29 32	52 52	35 35	60 60
W3VHY-S0Z ③ S05 ③ S09 ④ S15	230/208-60-3 ⑤ 220/200-50-3 ⑤	1 1 1 1	22 37 49 51	25 40 50 60				
W3VHY-T0Z ③ T05 ③ T09 ④ T15	460-60-3 ⑤ 415/380-50-3 ⑤	1 1 1 1	13 21 27 27	15 25 30 30				
W5VHY-R0Z ③ R05 ③ R10 ④ R15	230/208-60-1 220/200-50-1	1 1 or 2 1 or 2 1 or 2	38 64 90 90	45 70 90 90	38 38 38	26 52 52	45 45 45	30 60 60
W5VHY-S0Z ③ S05 ③ S09 ④ S15	230/208-60-3 ⑤ 220/200-50-3 ⑤	1 1 1 1	27 42 54 54	35 45 60 60				
W5VHY-T0Z ③ T05 ③ T09 ④ T15	460-60-3 ⑤ 415/380-50-3 ⑤	1 1 1 1	16 23 29 29	20 25 30 30				

- ① These "Minimum Circuit Ampacity" values are to be used for sizing the field power conductors. Refer to the National Electrical code (latest version), Article 310 for power conductor sizing. **CAUTION:** When more than one field power circuit is run through one conduit, the conductors must be derated. Pay special attention to note 8 of Table 310 regarding Ampacity Adjustment Factors when more than three (3) current carrying conductors are in a raceway.
- ② Maximum size of the time delay fuse or circuit breaker for protection of field wiring conductors.
- ③ 5 kW, 9 kW and 10 kW electric heat operation is 1 stage. Electric heat is supplemental to heat pump operation and may operate concurrently.
- ④ 15 kW electric heat operation is 2 stage: 10 kW 1st stage and 5 kW 2nd stage. 2nd stage electric heat does not operate concurrently with heat pump operation.
- ⑤ 3-phase equipment uses a Delta configuration (3 power wires and a ground).

NOTE: The Maximum Overcurrent Protection (MOCP) value listed is the maximum value as per UL 60335 calculations for MOCP (branch-circuit conductor sizes in this chart are based on this MOCP). The actual factory-installed overcurrent protective device (circuit breaker) in this model may be lower than the maximum UL 60335 allowable MOCP value, but still above the UL 60335 minimum calculated value or Minimum Circuit Ampacity (MCA) listed.

IMPORTANT: While this electrical data is presented as a guide, it is important to electrically connect properly sized fuses and conductor wires in accordance with the National Electrical Code and all local codes.

TABLE 7A
Electric Heat – 60 Hz

Electric Heat Nomenclature	Nominal kW	Total kW and BTUH @ Field-Supplied Voltage										
		@ 208V ①				@ 230V ①				@ 460V		
		kW	1- PH Amps	3-PH Amps	BTUH	kW	1-PH Amps	3-PH Amps	BTUH	kW	3-PH Amps	BTUH
05	5.0	3.8	18.0	10.4	12,800	4.6	20.0	11.5	15,700	4.6	5.8	15,700
09	9.0	6.8	--	18.7	23,000	8.3	--	20.8	28,300	8.3	10.4	28,300
10	10.0	7.5	36.1	--	25,600	9.2	40.0	--	31,400	--	--	--
15	15.0	11.3	54.1	31.2	38,400	13.8	60.0	34.6	47,100	13.8	17.3	47,100

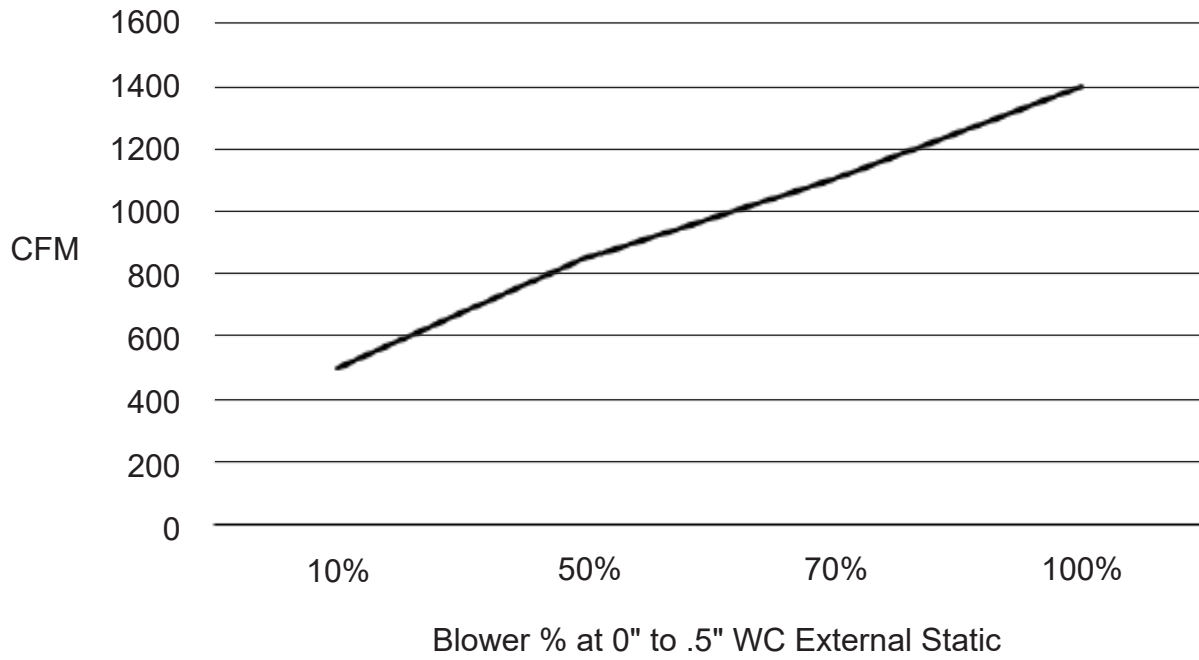
① Listed electric heaters are available for 230/208V units only.

TABLE 7B
Electric Heat – 50 Hz

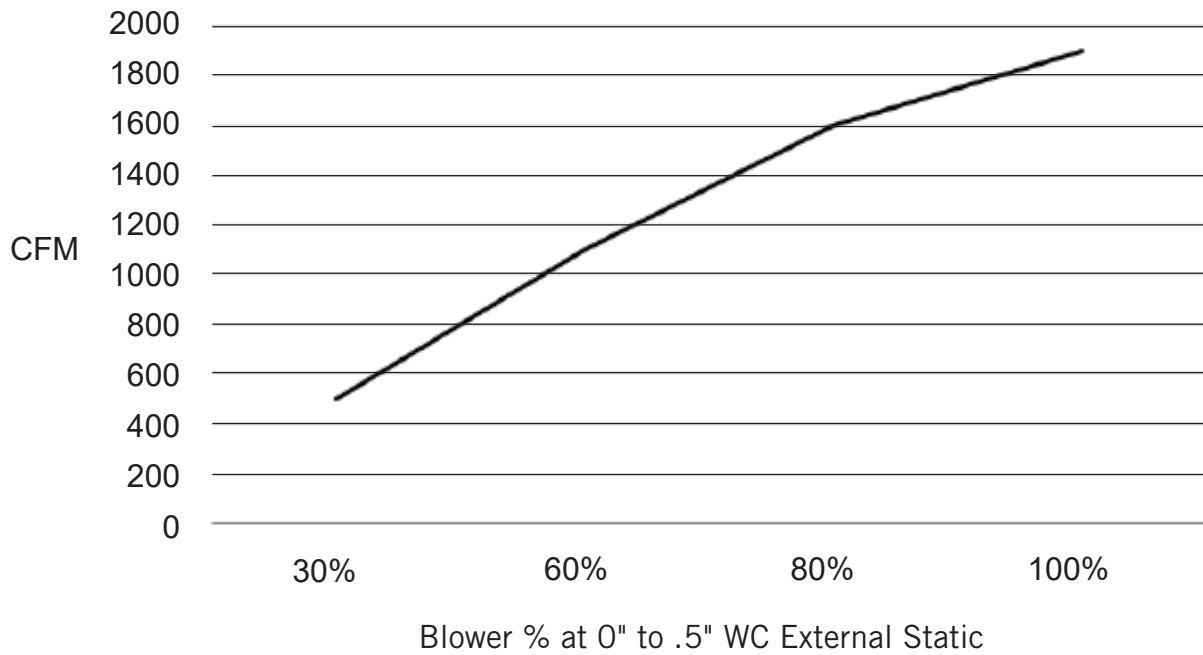
Electric Heat Nomenclature	Nominal kW	Total kW and BTUH @ Field-Supplied Voltage										
		@ 200V ①				@ 220V ①				@ 415V		
		kW	1-PH Amps	3-PH Amps	BTUH	kW	1-PH Amps	3-PH Amps	BTUH	kW	3-PH Amps	BTUH
05	5.0	3.5	17.3	10.0	11,800	4.2	19.1	11.0	14,300	3.8	5.2	12,800
09	9.0	6.2	--	17.9	21,200	7.6	--	19.8	25,800	6.8	9.4	23,000
10	10.0	6.9	34.5	--	23,500	8.4	38.2	--	28,700	--	--	--
15	15.0	10.4	51.8	29.9	35,300	12.6	57.3	33.1	43,000	11.3	15.7	38,400

① Listed electric heaters are available for 200/200V units only.

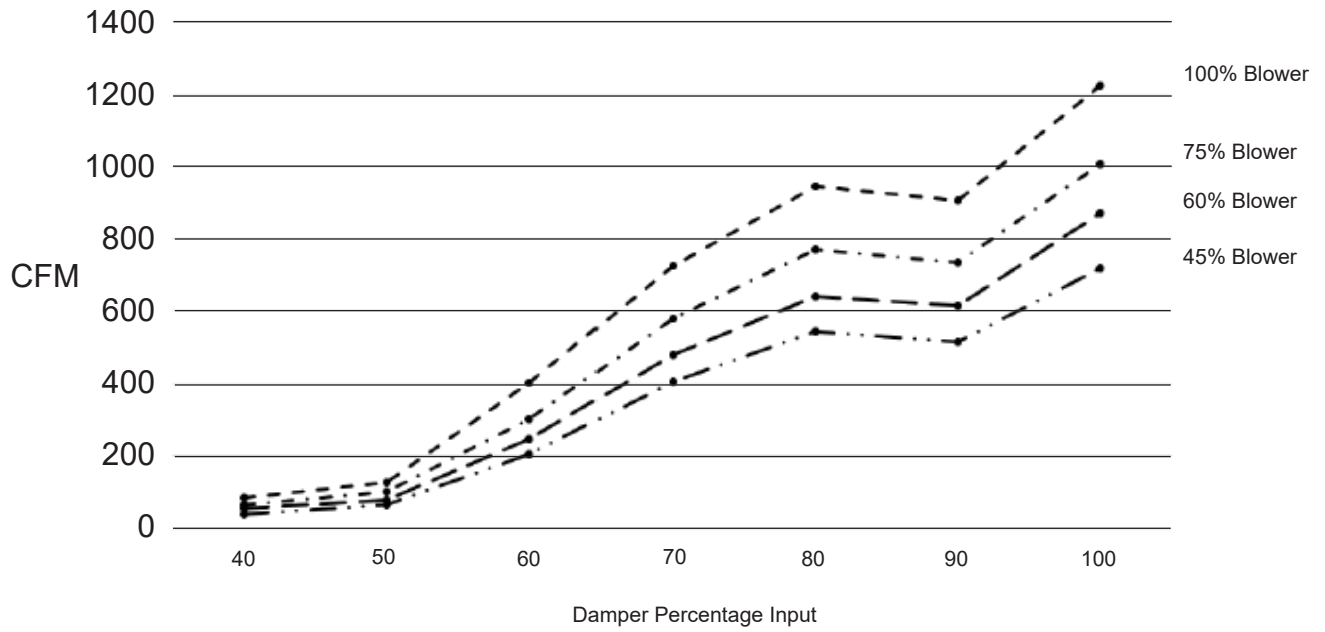
GRAPH 1
W3VHY Indoor Blower Performance



GRAPH 2
W5VHY Indoor Blower Performance



GRAPH 3
W3VHY Economizer Ventilation Airflow



GRAPH 4
W5VHY Economizer Ventilation Airflow

