



Climate Control Solutions

Literature Assembly

911-0874

Contains the following:

2100-034(G)	User's Guide
2100-479	Leak Test, Evacuation, Charging
2100-789(D)	Wall Mount Pkg A/C Manual
2110-1473(B)	Replacement Parts Manual
7960-947	Supplemental Dehum Instructions
7960-932(B)	8201-176BX CCM Instructions
7960-420(A)	Warranty



USER'S APPLICATION GUIDE AND TECHNICAL PRODUCT OVERVIEW

Manual: 2100-034G
Supersedes: 2100-034F
Date: 12-17-20

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Bryan, Ohio 43506
www.bardhvac.com



BARDHVAC.COM

Climate Control Solutions

General Information

The User's Application Guide covers a wide range of heating and cooling products manufactured by Bard Manufacturing Company. It is intended to be a general guide for care and operation of typical systems and covers the most important features you should be aware of and are responsible for as the user of the equipment.

Because our product offerings are so varied and can be equipped with many features and options, it is not possible to cover all aspects of what your specific system may be configured for. Some systems may be quite simple in features to provide basic cooling and possibly heating, while other systems may also incorporate various ventilation technologies, dehumidification circuits and many different internal controls as well as room temperature controls. Therefore, you should request a detailed operation sequence and explanation of any special features from your installer and/or service company and also have them instruct you as to any routine maintenance procedures you are responsible for.

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The User's Application Guide and Technical Product Overview covers the following products:



WALL MOUNT
Air Conditioners
and Heat Pumps



I-TEC®
Air Conditioners
and Heat Pumps



Q-TEC™
Air Conditioners
and Heat Pumps

The User's Application Guide and Technical Product Overview covers the following topics:

- Documentation provided by Bard for proper use of your new product.
- Unit installation guidelines.
- Routine unit maintenance.
- Unit operation.
- Unit troubleshooting.

Please use this guide as a general overview regarding unit application, maintenance and troubleshooting. Refer to product installation instructions and supplemental documentation provided with the unit or go to www.bardhvac.com for detailed individual product information.

Documentation

There are two sources of valuable information for your new Bard product:

- Documentation provided with your unit, normally located inside the unit control panel during shipping. This information should be saved once the unit is installed for future maintenance reference or to answer questions about equipment after installation.
- Documentation provided on the internet at www.bardhvac.com. This may be accessed from a desktop computer at the office, a laptop or an internet-capable cell phone at the worksite. Up-to-date documentation is available, along with specification sheets and other valuable resources regarding your new Bard product.

Unit Literature Assembly – Documentation Provided with Your Unit

Bard products are shipped with documentation that when used by a technician with cooling and heating knowledge, can ensure that your product is installed safely, performs optimally and achieves the longest life cycle possible.

Shipped literature includes the following:

- User Manual (this document)
- Installation Instructions
- Replacement Parts Manual
- Wiring Diagrams
- Warranty Information

Installation plays a key part in unit functionality, performance and safety. Product securing and placement, duct design and supply/return location, electrical routing and condensate and defrost drainage all play key roles in making sure a unit will perform per the design specifications.

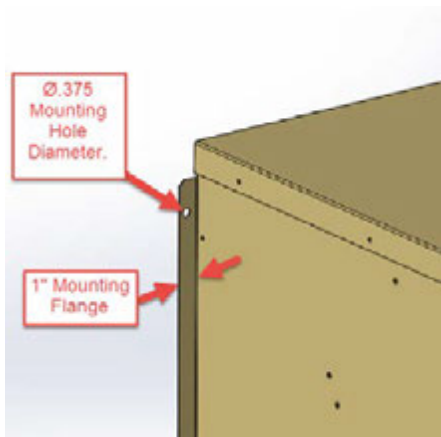
WALL MOUNT Products – Mounting the Product on a Wall Surface



Outdoor products are normally mounted to an exterior wall surface, including brick, cement block, metal or wood construction. These products are labeled as “WALL MOUNT” units. **Before installation begins, the wall surface should be inspected by a construction professional to ensure it will support the weight of the unit and accessory items.** Approximate weights are available from the product specification sheet, and a safety factor should be designed into the installation. Typical fasteners to attach the unit to the wall using the integrated mounting flanges on both sides of the unit include tap cons, bolts, studs and other fastening devices. The selection of the fasteners to be used needs to be reviewed by a construction professional and decided upon based on the wall construction and fastener strength required. It is important to follow all guidelines and procedures covered in the installation instructions manual provided for the product.

Built-In Mounting Flange Detail:

Outdoor WALL MOUNT products include a mounting flange that is part of the cabinet construction. Ø.375" holes are provided for unit mounting unless specified otherwise in installation instructions.



Specification Sheets:

Unit specification sheets provided at www.bardhvac.com include basic unit weights and dimensions (see example below). Ventilation options and other accessories must be added into the total weight of the unit.

Specification Sheet Example

w/Filter (Rated-wet Coil)	
Filter Sizes (inches) STD.	16x25x1
Basic Unit Weight-LBS.	318
Barometric Fresh Air Damper	3.5
Blank-Off Plate	1.0
Motorized Fresh Air Damper	10.0
Commercial Room Ventilator	69.0
Economizer	69.0
Energy Recovery Ventilator	50.0

WALL MOUNT Products – Clearances for Outdoor Condenser Fan Airflow

Unit placement and avoidance of obstructions outside the structure are very critical to unit performance. **Avoid installing the unit in areas that will obstruct outdoor condenser fan airflow or create “pockets” of heated air being exhausted from the condenser coil.** Solid construction fences should not be placed directly in front of the unit without provisions for condenser airflow. Solid exterior walls need to be spaced as far away from units as possible to avoid pockets of heated air causing condenser air recirculation.

Solid barriers located too close to the face or side surfaces (condenser fan inlet and outlet) of the WALL MOUNT can both impede airflow and force heated air to short circuit (be returned) from the condenser outlet to the condenser inlet. Either condition will effectively raise the condensing temperature and pressure reducing cooling capacity and efficiency. In extreme cases, the unit may fail to operate due to high refrigerant pressures inside the unit, and compressor and/or fan motor failure may occur. Clearances given in installation instructions ensure components can be serviced and maintenance can be performed when needed.

National and local electrical codes must be reviewed before unit installation.

Always use common sense when installing products, follow unit clearances given in the installation instructions and contact local Bard distributors when additional knowledge is needed regarding unit clearances for proper unit functionality.

WALL MOUNT Products – Clearances for Indoor Supply and Return Airflow

The Bard unit should be placed in an area where the supply (leaving conditioned air) and return (unit air intake) air paths will be unrestricted. Avoid placing objects in the structure within 24" of the return (unit air intake) grille. Avoid placing objects directly in the path of the supply (conditioned) air grille. This will inhibit the “throw” of the supply air throughout the structure and reduce the cooling and/or heating ability of the unit; in extreme cases, this may cause evaporator coil freezing issues. Supply air must be able to freely circulate conditioned air throughout the structure. Adjustment of supply grille deflectors is often necessary to ensure proper room circulation.

Ducted applications should not exceed the rated duct static pressures given in the unit specification sheets. Special requirements for duct construction and distances to combustible materials need to be followed per the installation instructions when electric heating is used.

WALL MOUNT Products – Condensate and Defrost Drainage

Condensate drainage for air conditioning units needs to be planned before installation. Your new Bard WALL MOUNT product includes provisions to allow condensate water to exit the bottom of the unit. If condensate water is to be routed away from the unit, adequate drain sizing needs to be provided to allow proper drainage for condensate water generation. During normal air conditioning operation, large amounts of condensate water is generated inside the unit as moisture is extracted from the supply air. This is collected in an evaporator pan and drained to either a drainage system (indoor products) or outside the unit cabinet (outdoor products). Evaporator drain traps are not necessary for any of our wall mounted outdoor products, and the use of “standing water” U-shaped traps may be prone to freezing in certain climate zones.

Defrost water drainage from heat pump units needs to be planned before installation. During seasons requiring heating operation, the unit will need to warm the condenser coil to remove frost build-up (defrost). **Outdoor heat pump products include holes in the unit base under the condenser coil for proper water drainage when in the heating defrost cycle. Avoid placing the unit on a pad or blocking the base drainage holes under the condenser coil without proper allowances (6" recommended) for water drainage due to damage caused by freezing conditions.** Without proper drainage, defrost water may freeze causing ice build up and damage the lower portion of the condenser coil.

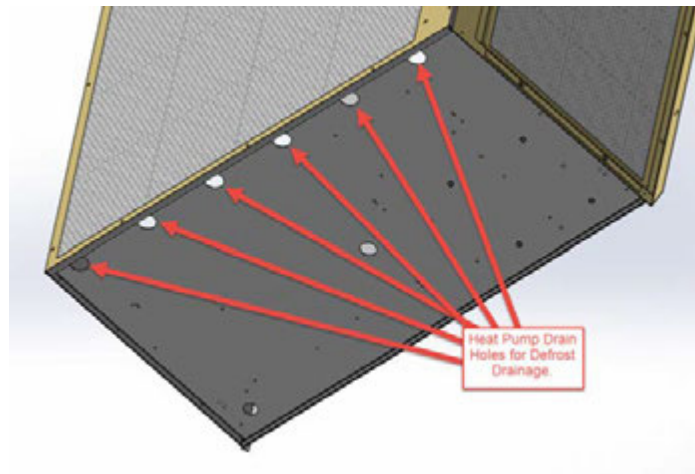
Condensate Water Drainage:

Unit condensate water exits the base of the unit during cooling operation.



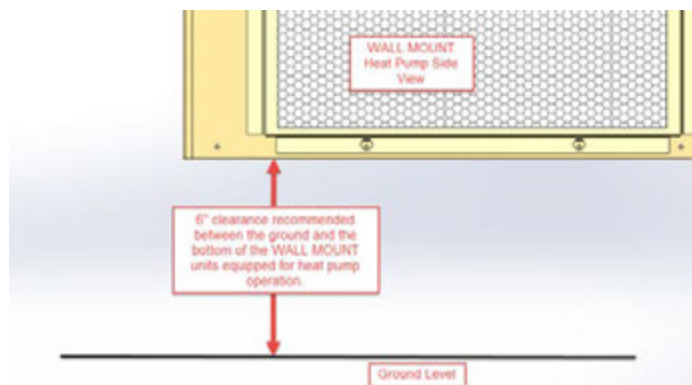
Defrost Water Drainage:

Holes are provided in the front of the unit base for heat pump condensate water drainage.



Defrost Water Drainage:

6" clearance is recommended under WALL MOUNT Heat Pump products to allow proper defrost water drainage.



I-TEC and Q-TEC Products – Installing the Product Inside a Room



I-TEC



Q-TEC

Indoor products are normally supported by the floor surface and are adjacent to an interior wall surface, including brick, cement block, metal or wood construction. These products are normally labeled as “I-TEC” or “Q-TEC” units. **Before installation begins, the floor surface should be inspected by a construction professional to ensure it will support the weight of the unit and accessory items.** Approximate weights are available from the product specification sheet, and a safety factor should be designed into the installation.

A sheet metal sleeve is normally installed in the wall allowing vent and condenser fan air to enter and exit the unit. Different sleeve depths are available for installation into various wall depths. Typical fasteners to attach the sleeve to the outside surface of the wall include tap cons and other fastening devices. The I-TEC or Q-TEC unit is then slid up to the wall surface and connected to the sleeve using screws. Trim kits are available to enclose gaps between the wall surface and the unit. A louver grille is used to cover the external wall opening and fasteners used during sleeve installation.

Wall Sleeve:

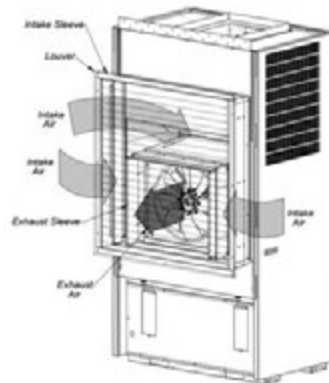
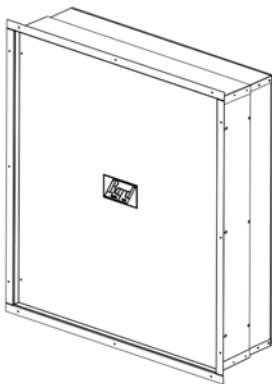
Wall sleeves allow for outdoor air to enter and exit the unit inside the room.

Air Paths:

Air paths through the unit allow for cooling operation and fresh air to enter the structure (I-TEC shown).

Louver Installation:

Outdoor louvers provide an esthetically pleasing look to the installation and cover the unit opening (I-TEC shown).



I-TEC and Q-TEC Products – Clearances for Outdoor Condenser Fan Airflow

Solid barriers located too close to the face of the outdoor louver of the I-TEC or Q-TEC can both impede airflow and force heated air to short circuit (be returned) from the condenser outlet to the condenser inlet. Either condition will effectively raise the condensing temperature and pressure reducing cooling capacity and efficiency. In extreme cases, the unit may fail to operate due to high refrigerant pressures inside the unit, and compressor and/or fan motor failure may occur. It is recommended to allow 15' (457.2 cm) in front of unit louver for proper condenser airflow. Always use common sense when installing products, follow unit clearances given in the installation instructions and contact local Bard distributors when additional knowledge is needed regarding unit clearances for proper unit functionality.

I-TEC and Q-TEC Products – Clearances for Indoor Supply and Return Airflow

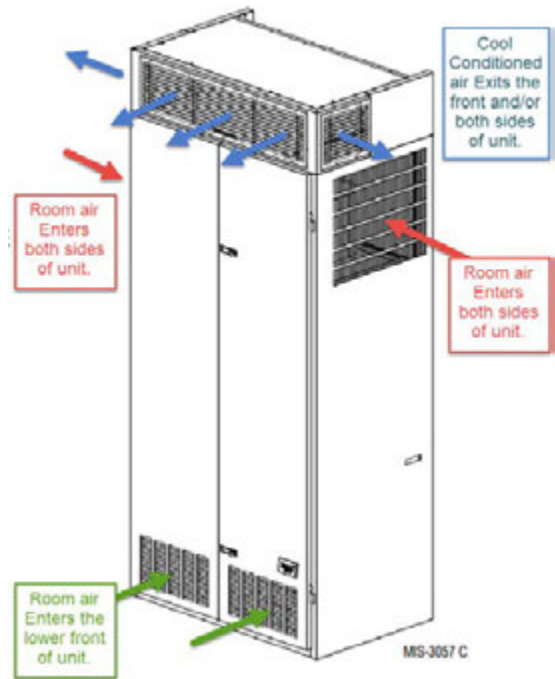
The Bard unit should be placed in an area where the supply (leaving conditioned air) and return (unit air intake) air paths will be unrestricted. Avoid placing objects inside the room within 24" of the return (unit air intake) louvers or grille. Avoid placing objects directly in the path of the supply (conditioned) air grilles. This will inhibit the “throw” of the supply air throughout the structure and reduce the cooling and/or heating ability of the unit and in extreme cases may cause evaporator coil freezing issues. Ducted applications should not exceed the rated duct static pressures given in the unit specification sheets. Special requirements for duct construction and distances to combustible materials need to be followed per the unit installation instructions when electric heating is used.

I-TEC Air Path

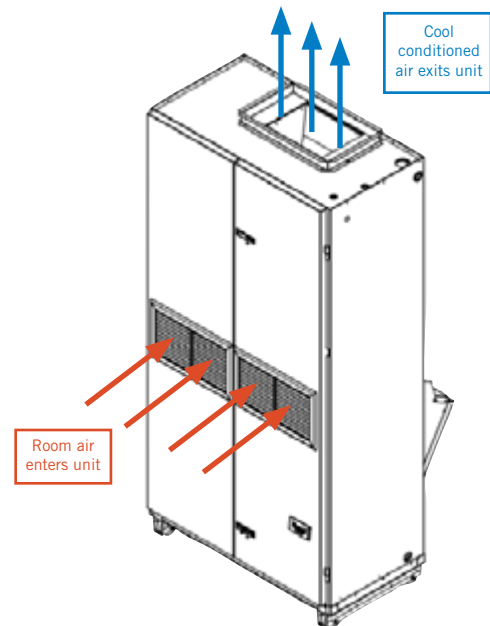
The I-TEC product has been engineered for extremely quiet unit operation and has multiple air paths for air entering and exiting the unit. Room air enters the upper sides to be conditioned (cooled) inside the unit and exits the unit top. The unit will either be ducted to supply registers or have a supply air plenum box installed. A supply air plenum box allows quiet operation without ducting the air leaving the unit. Room air also enters the bottom of both front doors during ventilation operation.

Q-TEC Air Path

The Q-TEC product has been engineered for efficient, economical unit operation and has a mid-mounted front grille for air entering the unit. The unit will either be ducted to supply registers or have a supply air plenum box installed. A supply air plenum box allows quiet operation without ducting the air leaving the unit.



Typical I-TEC Installation



Typical Q-TEC Installation

The I-TEC and Q-TEC product installation instructions contain additional information regarding unit air paths and required clearances. This information may be accessed at www.bardhvac.com.

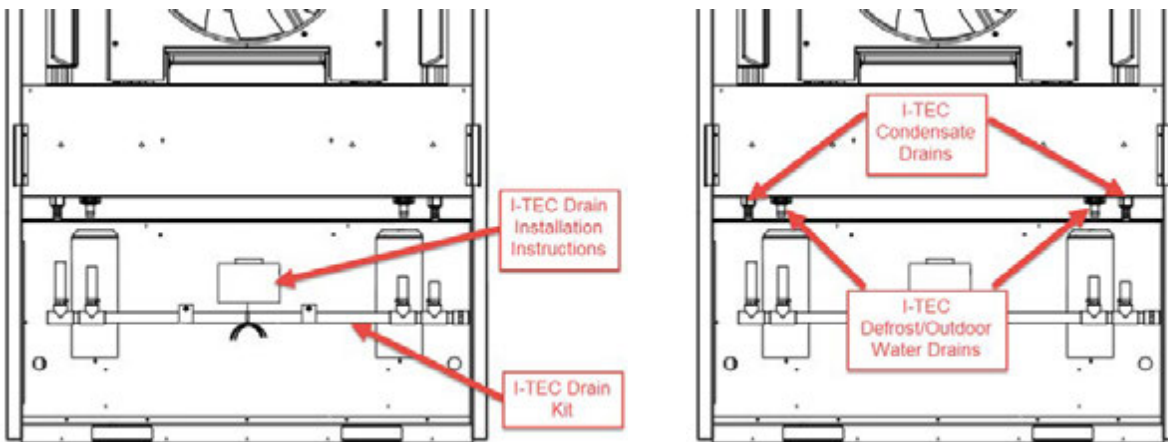
I-TEC and Q-TEC Products – Condensate Drainage

Condensate drainage for Bard indoor cooling units is a very important part of unit installation. During normal air conditioning operation, large amounts of condensate water are generated inside the unit as moisture is extracted from the supply air. This is collected in an evaporator pan and needs to be drained to an external drainage system. Your new Bard product includes provisions to allow condensate water to exit the unit and fittings will need to be field supplied to connect the unit drain to the building. Adequate drain sizing needs to be provided to allow proper drainage for condensate water generation and restriction in drain lines should be avoided. Evaporator drain traps are not necessary unless required by local codes.

Defrost water for heat pump operation and outdoor water entering the condenser area also needs to be drained out of the unit. The I-TEC product uses a combined defrost and outdoor water drainage system. The Q-TEC has a combined defrost and evaporator drain connection unless an optional in-wall drain box is used. Outdoor water exits the Q-TEC through the wall sleeve. Follow all instructions provided in the unit installation instructions regarding drain connections and sleeve installation to avoid water leakage inside the building or structure.

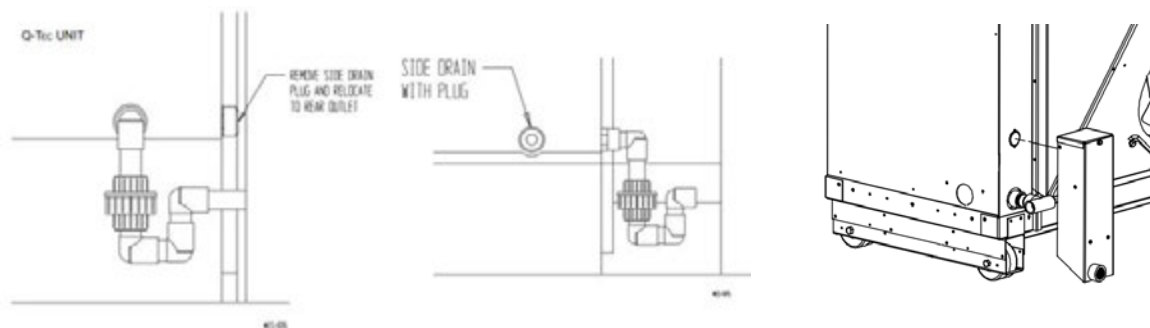
I-TEC Drain System:

The I-TEC drainage system consists of a manifold drain kit that combines all drains behind the unit to allow connection to the building system.



Q-TEC Drain System:

The Q-TEC drainage system consists of a lower right side or lower right rear connection fitting. An optional in-wall drain box may also be purchased as an accessory that allows separate evaporator and defrost water drainage.



Lower Right Side Drain

Lower Right Rear Drain

Optional In-Wall Drain Box

All Products – Power Supply Verification

It is very important to follow all electrical and mechanical safety guidelines and instructions provided in the product installation instructions. Failure to do so may result in death, injury or product damage.

A proper power supply to your new Bard unit is very important. Be sure to verify the following with a multi-meter or other power measuring device before applying power to your Bard product.

Field-Supplied Voltage

Electrical voltage ratings and proper voltage operating ranges are provided in the unit specification sheets and installation instructions. It is important that power supplied to the unit stay in the specified operating voltage range. Voltage above or below the minimum operating value given could result in improper unit startup, unit shutdown, low unit performance, improper thermostat and unit controller operation, compressor damage and premature failure of functional parts. As a general guideline, it is always best if the power source for the unit supplies the nominal electrical rating value given in the specification sheets, installation instructions and unit serial plate for the product being used. To do so will provide the best unit performance possible from your new Bard product.

Single and Three Phase Power

Bard products are available in single and three phase power options. It is important to connect the proper phase listed on the unit serial plate. Three phase power is often used to reduce energy usage, and units rated for 3 phase operation are equipped with a phase monitor safety device. The phase monitor will not allow unit operation with improper phase connection and a red LED light on the monitor indicates phase wiring issues. Connecting 3 phase power to a single phase unit will result in component damage and improper unit operation. Connecting single phase power to a 3 phase unit will also result in component damage and improper unit operation.

Hertz (Frequency)

Bard products are available in 50hz and 60hz power options. It is important to connect power with the proper hz value listed on the unit serial plate. 60hz power is often used in the United States and Canada and units rated for 50hz operation are normally for international sales outside of this area. Connecting 50hz power to a 60hz unit not rated for 50hz operation may result in component damage and improper unit operation. Some equipment may be rated for 50/60hz operation. Review the unit specifications and installation instructions for further information regarding the power requirements of the unit.

The product installation instructions and unit specification sheets contain additional information regarding unit electrical data. This information may be accessed at www.bardhvac.com.

Unit Maintenance

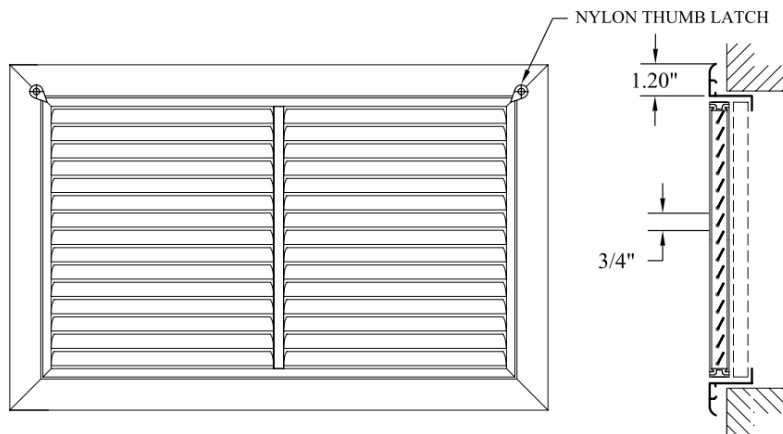
All Products – Filters and Filter Servicing

All Bard products contain air filters that must be cleaned or replaced on a regular basis.

Keeping air filter(s) clean is the single most important responsibility of the user of the equipment. Each type of system must be equipped with an air filter(s) in the indoor circulating air system to clean the air, keep the system itself clean for peak efficiency and capacity and prolong the useful life of the equipment. DO NOT operate the system without the proper air filters. Filters should be inspected at least monthly and replaced or cleaned (depending on type) as needed. The useful life of an air filter can vary widely depending upon application and use of the equipment, and it is critical to monitor filter condition and establish an acceptable maintenance schedule. Failure to do so will increase operating and repair costs, decrease capacity and efficiency and shorten the service life of the equipment. A common symptom of a dirty filter in the cooling mode is a freeze-up of the indoor coil. The air filters used may be a disposable (throwaway) type or may be a cleanable type that can be thoroughly cleaned, rinsed and reused many times. It is important to make sure that the correct filter size and type for your system is always used. If there is any question as to acceptable filter size or type, review the installation instructions for the specific equipment involved, if available. Otherwise, consult with your installing dealer or service company. Most equipment can have the filters inspected and serviced by the user with no problems. In some instances, because of equipment design or specific installation conditions, it may be necessary to have this procedure done by a qualified service company. Have your installer or service company show you where the filter(s) are and demonstrate the service procedure or make arrangements for them to provide this service on an as-needed basis.

Outdoor Unit Wall Mount Room Air Filters

Wall mount filters are normally accessed from the outside of the building. Bard does offer a return air grille with a filter frame built-in for indoor filter access. The return air filter grille is not acceptable as the only source of filtration if vent options are installed in the wall mount unit.



Return Air Filter Grille:

Bard offers the RFG return air filter grille, which may be used in applications where outdoor air is not brought into the structure through vent options. If vent options are used, the filter tray inside the Bard Wall Mount unit must be used.

The product installation instructions contain additional information regarding unit maintenance. This information may be accessed at www.bardhvac.com.

WALL MOUNT Products – Filters and Filter Servicing

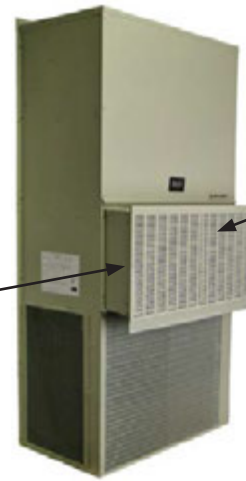
The built-in filter tray and room air filters in the wall mount are located in the middle of the cabinet below the indoor blowers. Units with vent options will have a washable screen behind the vent intake panel.



Filter Door:

The unit room air filter is located behind this panel for units without a vent hood.

Vent Intake Panel



Vent Intake Panel

Vent Hood Door:

The unit indoor filter is located behind this panel for units with a vent hood. The hood contains a washable pre-filter that needs to be cleaned regularly.



Filter Door:

The unit room air filter is located behind this panel.

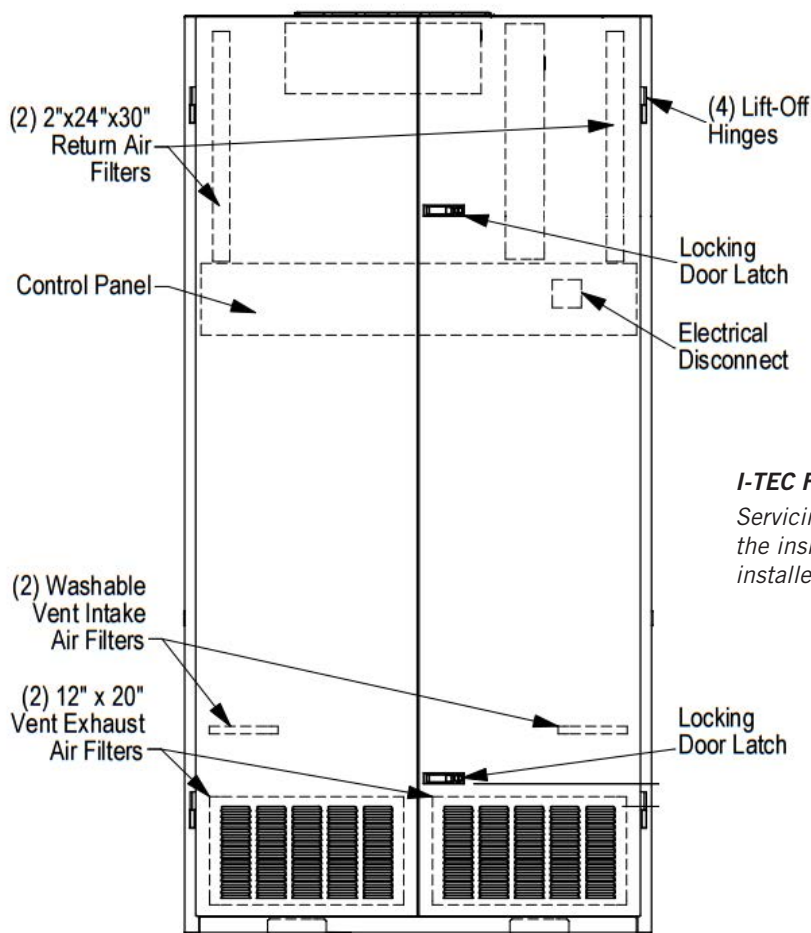
I-TEC Indoor Products – Filters and Filter Servicing

The I-TEC indoor air conditioners and heat pumps have multiple filters that must be maintained and inspected when servicing the unit. Filters play an important part in proper unit operation and prevent dirt and dust buildup inside the I-TEC and the room the unit is installed in. To access the unit filters, open the front hinged doors by unlocking the door latches. The doors fold outward and are on hinges with lift-off pins. Use care when opening doors. If doors are lifted off of the hinge pins, use care as the dense insulation used for sound reduction causes the doors to be heavy.

The upper section of the unit contains two 2" x 24" x 30" throwaway filters as standard with every unit. MERV ratings of the filter are available up to MERV13. These filters filter the air used for cooling inside the classroom or structure and should be changed regularly.

If the unit has an air intake vent option installed, two 1" x 12" x 20" filters are located in the lower section of the front doors behind the louvers. These filters help keep the vent option clean and operating properly.

Two washable filters are also installed in the air intake vent option. These should be inspected during servicing and cleaned when necessary. The washable filters are used to remove dirt and dust from outdoor air that is entering the vent area. If at any time these filters are damaged, they must be replaced with Bard-approved filters.



I-TEC Filter Locations:

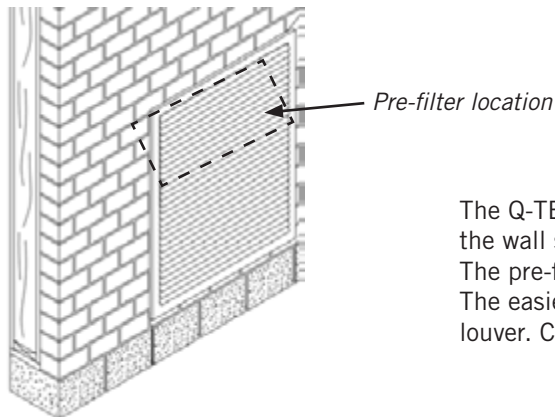
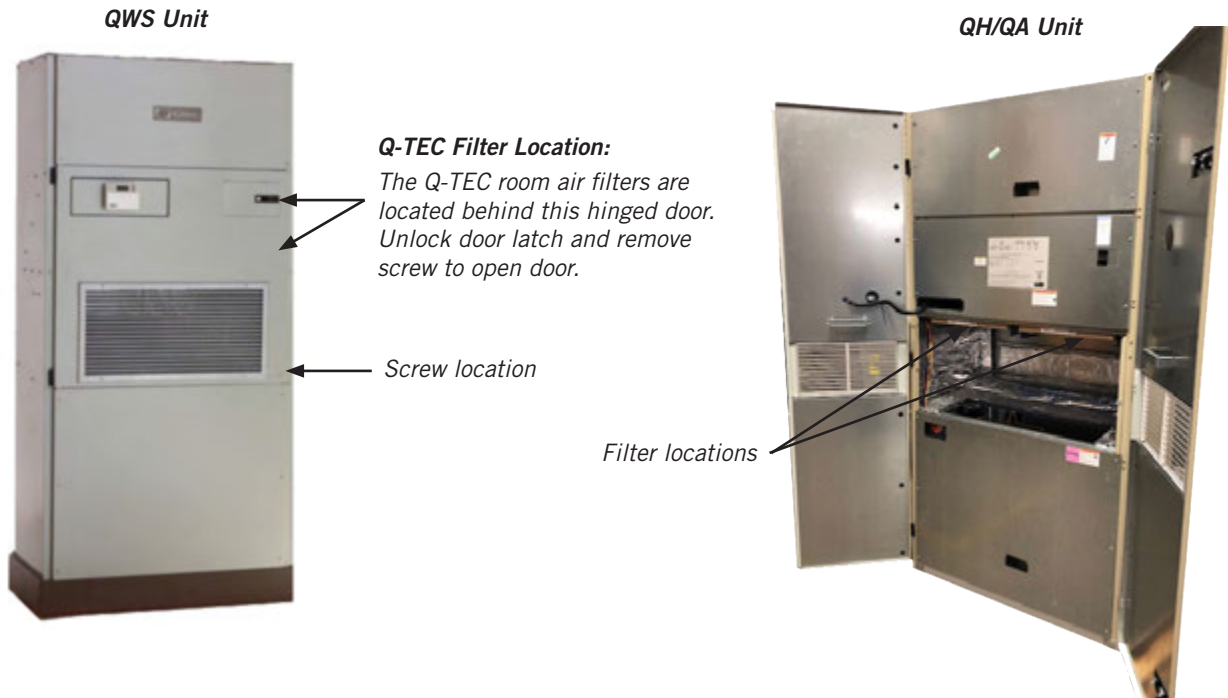
Servicing the filters in your unit will help keep the inside of the unit clean and also the area it is installed in.

The I-TEC product installation instructions contain additional information regarding unit maintenance. This information may be accessed at www.bardhvac.com.

Q-TEC Indoor Products – Filters and Filter Servicing

The Q-TEC indoor air conditioners and heat pumps have two room air filters that must be replaced when servicing the unit. Filters play an important part in proper unit operation and prevent dirt and dust buildup inside the Q-TEC and the room the unit is installed in. To access the unit filters, open the front hinged door by unlocking the door latch. The door folds outward and is on hinges with lift-off pins. Use care when opening doors. If the door is lifted off of the hinge pins, use care as the insulation and louver grille cause the door to be heavy.

The upper section of the Q-TEC contains two 1" throwaway filters standard with every unit. These filters filter the air used for cooling inside the classroom or structure and should be changed regularly.



The Q-TEC will have a permanent pre-filter installed inside the wall sleeve if air intake vent options are inside the unit. The pre-filter must be inspected and cleaned when necessary. The easiest way to remove the pre-filter is through the outdoor louver. Clean the pre-filter with soapy water.

The Q-TEC product installation instructions contain additional information regarding unit maintenance. This information may be accessed at www.bardhvac.com.

All Products – Coil Cleaning

The outdoor coil must be kept clean and free of any airborne debris, which can accumulate over time. Large volumes of air are circulated over the coil, and airborne debris such as lint, dust, materials shed from trees, paper or other types of airborne material that can become airborne can collect on the entering coil surface. The outdoor coil must dissipate heat during the cooling mode and for a heat pump, also absorb heat during the heating mode. If the coil is dirty and matted with debris, the airflow across the coil will be reduced causing poor performance, increased operating run time and associated utility bills and in extreme conditions can shorten the useful life of the equipment.

Depending on the specific equipment involved, the surface that can accumulate debris can be on the opposite side that is exposed to view when standing in front of the machine. Closely review the machine when operating to see which direction or path the airflow takes as it moves through the machine. If the air inlet side of the coil is hidden, try to observe the back (hidden) side by looking into the side grilles, using a flashlight if necessary. While the user of the equipment needs to be aware of the potential of clogging of the outdoor coil surface, actual cleaning of the outdoor coil should not be attempted under most circumstances. If the user should attempt this procedure on their own, never do so without first having the installing dealer or service company instruct you in the proper procedure and technique.

WARNING: Do not open or enter the equipment without first turning off the electrical service disconnect. Failure to do so can result in personal injury due to moving parts and/or electric shock hazard resulting in death.

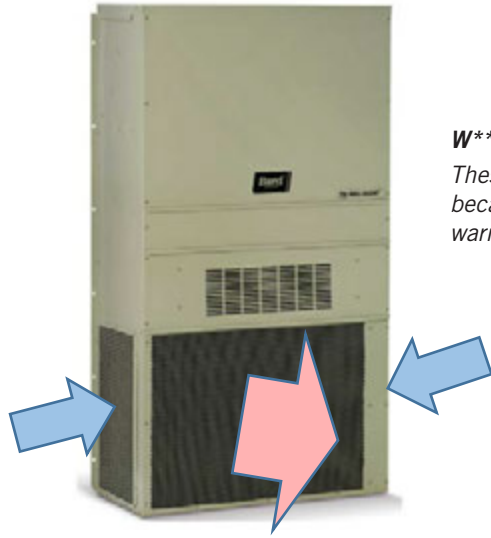
Other conditions that can cause reduction of airflow across the outdoor coil are flowers, shrubbery or other growth too near the outdoor coil air inlet and outlet openings. These living things, especially as they mature and grow, will be just as effective in blocking the airflow and create the same problems as will stacking things against the equipment. These conditions can be easily managed and controlled by the user, as they do not require actually entering into the equipment enclosure, which should only be done by qualified service technicians.

Equipment Corrosion Protection

1. Avoid having any lawn sprinkler spray directly on the equipment, especially if from a brackish water source.
2. In coastal areas or corrosive environments, locate equipment as far away from the corrosion source as feasible. Units exposed directly to salt spray should be coated by a secondary protective coating operation to reduce corrosion on copper tubing, fasteners, motors and other metal parts. Coils should be ordered with a corrosion protective coating. Contact Bard for coating options.
3. Frequent cleaning and waxing of the cabinet using a good automobile polish will help extend its original appearance and protect painted surfaces.

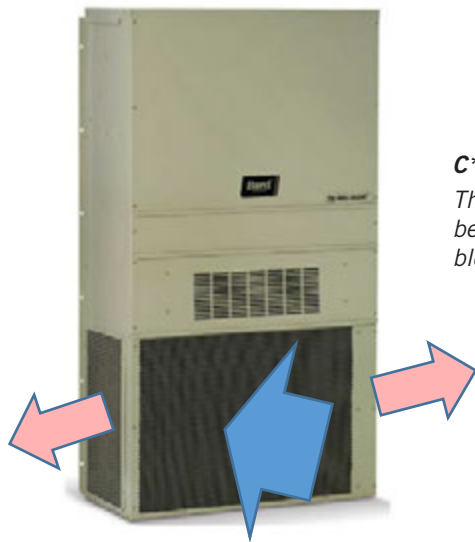
The product installation instructions contain additional information regarding unit coil cleaning. This information may be accessed at www.bardhvac.com.

All Products – Condenser Airflow



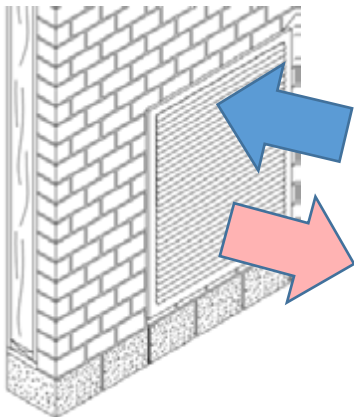
WA, W**H, T**H, T**S, W*RV Wall Mount Units:**

These units are called “blow through condenser airflow” units because they draw cool outdoor air from the sides and blow the warm condenser air exiting the coil through the front grille.



CH Wall Mount Units:**

These units are called “draw through condenser airflow” units because they draw cool outdoor air in the front through the coil and blow the exiting warm condenser air through the unit sides.



I-TEC and Q-TEC Units:

These units draw the cool outdoor air through the top section of the wall louver and exhaust the warmer condenser air out of the lower section of the louver. I-TEC units also draw a small amount of air through the outer right and left side of the louver.

Unit Operation

Air-to-Air Cooling Products (Air Conditioners)

The cooling mode operates similar to a refrigerator, removing heat from inside the conditioned space and rejecting it outside of the space being controlled. There are three main parts of the system:

1. The evaporator (indoor) coil where cold refrigerant absorbs heat from the air, which circulates from the conditioned space through the machine and is returned to the space at a lower temperature and with some of the humidity (moisture) removed. The moisture exits through a condensate drain system. A motor/blower assembly moves the indoor air through the system.
2. The compressor, which is a sealed pump that moves the refrigerant through the system.
3. The condenser (outdoor) coil where the heat that was absorbed from the indoor space is discharged to the outdoor environment. A motor/fan system moves the outdoor air across the condenser coil. A properly sized air conditioner cannot cool a structure off rapidly and instead will pull down the temperature slowly. It also will remove a certain amount of moisture (humidity) from the circulating airstream in the process. It may take several hours to pull down a hot, moist building or structure on initial startup or anytime the system has been turned off for a long period of time. It is generally best to set the thermostat at a comfortable temperature and let it control the system as needed, rather than turning it on and off.

Moisture (humidity) removal with a conventional air conditioner (cooling) unit, or heat pump when operating in the cooling mode, is not directly controlled and is a by-product of the unit operating to control temperature in response to the temperature (thermostat) control device. **Oversized equipment can easily control temperature but will have short run-times, thus reducing its ability to remove moisture from the circulating air stream.**

There are also many additional influences that can affect humidity levels within the conditioned space such as laundry appliances, cooking, showers, exhaust fans and any other items that can generate moisture or affect its removal from the space. Therefore, while operation of the air conditioning or heat pump system in the cooling mode will remove some amount of moisture as it reduces the air temperature, precise humidity regulation in the conditioned space cannot be assured and additional equipment such as a dedicated dehumidifier may be required.

Air-to-Air Cooling and Heating Products (Heat Pumps)

A heat pump is a refrigerant-based system that has additional components and controls that both heats and cools using a compressor for both modes of operation. Most heat pumps will also be equipped with some amount of electric heat to supplement the heating capacity of the compressor system on an as-needed basis. This operation is entirely automatic and is controlled by the indoor thermostat and possibly also an outdoor thermostat.

Cooling Mode

The cooling mode of a heat pump is exactly the same as that described for an air conditioner in the above section.

Heating Mode

The system operates in reverse cycle, meaning that it absorbs and moves heat from the outdoors and transfers it indoors to be rejected into the circulating air stream. Even though it seems cold to humans, there is usable heat that can be extracted efficiently from the outdoor air down to 0°F, although the colder the air is there is less heat to extract and the operating efficiency is diminished.

Defrost Cycle

When operating in the heating mode, the outdoor coil will be colder than the outdoor air that is forced over it by the fan system. When the outdoor air temperature is above approximately 40°F, moisture can accumulate on the coil and it will drain down and out the base of the unit. As the air temperature gets below approximately 40°F, the coil temperature will start to drop below 32°F, and frost or ice will begin to form on the coil.

An automatic defrost system keeps track of system run time when the outdoor coil temperature is in the freezing zone and will initiate a defrost cycle at the appropriate time. The unit continues to operate during the defrost cycle, but the outdoor fan motor will stop and the reversing valve will shift positions to flow hot refrigerant gas through the outdoor coil to melt the accumulated frost. Water will start to drain freely from the unit, and steam may be emitted from the unit.

The length of the defrost cycle will vary depending upon actual outdoor temperature, humidity levels and amount of accumulated frost. It could range from 1-2 minutes up to but not exceeding 8 minutes. When the defrost cycle

terminates, the reversing valve will shift back to heating mode and the outdoor fan will restart. There is typically a large puff of steam emitted as the fan restarts. When the heat pump shifts from cool to heating mode, from heating to cooling mode and especially during defrost cycles, there will be a pressure transfer sound heard as the reversing valve redirects the flow of refrigerant. This is commonly described as a hissing noise and is a normal sound for this type equipment.

For air source heat pumps, it is important to keep heavy snow from accumulating around the machine to the point of blocking the inlet and outlet openings to the outdoor coil section. For wall mounted or other equipment that is elevated, this should not be a factor; but for equipment installed on or near the ground, this can be an issue in areas prone to heavy and/or blowing snow. The air source heat pump cannot operate effectively and efficiently when snowbound just as a car cannot function well in heavy snow conditions.

Water-to-Air Cooling and Heating Products (Geothermal Heat Pumps)

These types of heat pumps are also commonly referred to as water source or geothermal systems. Just like the air source heat pump, they are refrigerant-based systems that both heat and cool using a compressor for both modes of operation. The primary difference is that the system uses water or antifreeze-protected water solution instead of an air-cooled outdoor heat transfer coil, and there is no outdoor motor/fan system but instead a water pump to provide adequate water flow to the system.

Cooling Mode

The cooling mode of a water-to-air heat pump is exactly the same as that described for an air conditioner in the previous Air Conditioner section, except that the outdoor coil uses water instead of air for the heat transfer medium.

Heat Mode

The system operates in reverse cycle, meaning that it acquires and moves heat from the water supply flowing through the water to refrigerant coil and transfers it indoors to be rejected into the circulating air stream.

Most water-to-air heat pumps (but not all) will also be equipped with some amount of electric heat to supplement the heating capacity of the compressor system on an as-needed basis. This operation is entirely automatic and is controlled by the indoor thermostat.

Because of the design of water-to-air heat pumps and the water temperatures involved, no defrost system is required as in air-to-air heat pumps.

Water Supply Systems

Depending upon the type and application of the water-to-air heat pump, the water side of the system could be one of the following:

1. Individual closed loop buried in a trench or vertical bore hole(s).
2. Individual loop submerged in a pond.
3. Water supplied from a well and discharged into pond, stream, ditch or another well.
4. Water supplied from a boiler/tower system, typically only in larger multi-unit installations.

Dehumidification and Ventilation Operation

Dehumidification (Air-to-Air or Water-to-Air Systems)

Many Bard systems, typically those used in schools or other commercial applications, have a dedicated dehumidification capability by having a special additional refrigeration circuit (factory-installed option only) in addition to the basic system. These special systems, sometimes also referred to as hot gas reheat, are designed to control humidity on demand from a humidity controller much the same as the basic cooling and/or heating system is controlled by a wall thermostat. Consult your installer and/or service company to determine if your installation has any of these devices and for any instructions or maintenance requirements you should be aware of as the user.

Ventilation Options (Air-to-Air or Water-to-Air Systems)

All Bard systems are available with factory-installed vent options. Most units can have ventilation field installed after unit installation.

Ventilation has multiple purposes:

- Outside air intake for occupied structures
- Positive pressurization
- Energy savings when outdoor air can be used for cooling
- Agricultural use of bringing in outdoor air and exhausting room air
- Equipment and electronics ventilation

Review product specifications and manuals for more details regarding available ventilation options and features. Product documentation is shipped with the product and also available at www.bardhvac.com.

All Units – Troubleshooting

Your Bard product is made to operate for many trouble-free years if installed properly and maintenance practices are followed. Be sure to verify that all filters are clean, and condenser coils are free of dirt and debris. Often these items may look clean at first, but upon closer inspection, show signs of dirt and debris build-up. New units on new structures may have dirt and dust in filters from the building construction process.

Thermostats and unit controllers often contain vent holes for proper sensor measurement inside the device. Make sure the thermostat or controller are not full of dirt and dust from building construction or years of use.

Verify all requirements in the installation instructions and specification sheets are met. Unit voltages, airflow clearance requirements and clean unit power without brownouts or spikes play a critical role in unit performance. If 208 VAC power is supplied to the unit, the 208V tap must be used on the 24 VAC transformer located inside the control panel. Common sense must also be used when installing the unit in an environment that may put the unit at risk of improper operation.

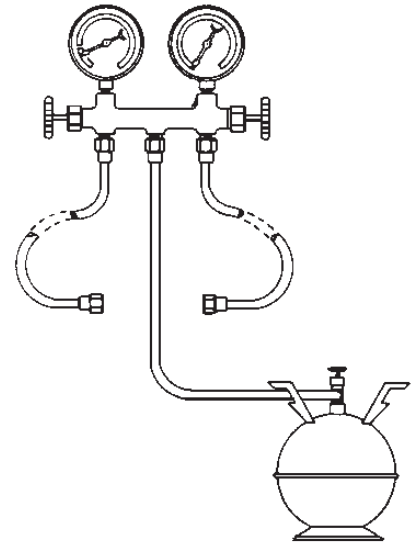
Helpful Hints and Good Operating Practices

The following information will help you enjoy the full comfort and benefits of your Bard cooling and heating system, maximize the performance and efficiency and help extend the life of your system.

1. Always keep the equipment in peak operating condition with routine scheduled maintenance, especially for the air filters, and to assure a clean outdoor coil.
2. For most efficient operation, set the thermostat at the temperature you prefer and then let it take control. If any changes to the settings are required, they should be made in small adjustments and the system be allowed time to respond. Rapid changes either up or down should not be done.
3. Setting the thermostat very high does not make the system heat faster and setting it very low does not make it cool faster.
4. It is not recommended to turn the system "Off" then back "On" when you need it. This can allow temperature and humidity to build up in warm weather conditions and force the system to run continuously to try and catch up. If the building is to be unoccupied for a lengthy period, it is best to adjust the thermostat to a reasonable higher (or lower—depending on the season) setting rather than turning it completely off. Upon return, the inside conditions will not be totally out of control and recovery time to desired conditions would be much shorter.
5. Airflow inside the room or building is very important. Keep all supply registers open and all returns free and unrestricted. Avoid placing objects in areas that will hinder unit airflow. The heating and cooling system is designed to have a certain amount of airflow for proper operation. Therefore, closing off registers, in unused rooms as an example, could reduce airflow below acceptable levels and should not be done without review by your service company who can assess the overall situation and advise you accordingly.
6. Heat pumps, especially air-to-air heat pumps, may have the system (compressor) run continuously at lower outdoor temperatures, and this is normal. The heat pump (compressor) mode is controlled by the beginning stages of the thermostat and delivers the most efficient heat. As the outdoor temperature drops off, the heat pump mode heat will also diminish (because there is less heat in the outdoor air to absorb) and must be supplemented by additional electric heat stages, which are not as efficient as the heat pump. The thermostat automatically controls everything and the backup heat will only operate on demand as needed to maintain the desired temperature.
7. The thermostat or controller is the user's primary connection to the system so it is very important to have a thorough understanding of how it works and how to use it properly. Have your installer or service company explain and demonstrate proper operation of the controls.
8. Make sure you thoroughly understand how the heating and cooling system itself is intended to operate and what to expect from it. Have your installer or service company explain and demonstrate proper operation of the heating and cooling system.

SERVICING PROCEDURE

R-410A LEAK TEST EVACUATION CHARGING



Climate Control Solutions

Bard Manufacturing Company, Inc.
Bryan, Ohio 43506
Since 1914...Moving ahead, just as planned.

Manual No.: 2100-479
Supersedes: NEW
File: Volume I, Tab 1
Date: 03-08-07

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GENERAL



WARNING

The oils used with R-410A refrigerant are hygroscopic and absorb water from the atmosphere readily. Do not leave systems open to the atmosphere for more than 5 minutes. If the system has been open for more than 5 minutes, change the filter dryer immediately before evacuation. Then recharge the system to the factory specified charge.

Recovery equipment rated for R-410A refrigerant

R-410A has an ozone depletion potential of zero, but must be reclaimed due to its global warming potential.

The gauge manifold set is specially designed to withstand the higher pressure associated with R-410A. Manifold sets are required to range up to 800 psig on the high side and 250 psig on the low side with a 250 psig low side retard.

All hoses must have a service rating of 800 psig. (This information will be indicated on the hoses.)

Vacuum Pump and micron gauge must be used when evacuating a system to 500 microns.

Leak Detectors

An electronic leak detector capable of detecting HFC refrigerant can be used with R-410A refrigerant.

GAUGE MANIFOLD



WARNING

Gauge manifold must be suitable for use with R-410A refrigerant and POE oils.

A necessary instrument in checking and serving air conditioning and heat pump equipment is the gauge manifold. Its purpose is to determine the operating refrigerant pressures in order for the serviceman to analyze the condition of the system.

The valving on the manifold is so arranged that when the valves are closed (front-seated) the center port on the manifold is closed to the gauges and gauge ports. With the valves in the closed position, the gauge ports are still open to the gauges, permitting the gauges to register system pressures. Opening either valve opens the center port to that side of the manifold and system.

ATTACHING GAUGE MANIFOLD

For leak testing, purging, checking charge, charging liquid or evacuating, connect high pressure side of gauge manifold to Schrader valve on liquid or discharge line. Connect suction side of gauge manifold to Schrader valve on suction line. On heat pumps the suction line is between compressor and reversing valve.

ATTACHING MANIFOLD HOSE TO SCHRADER VALVE



WARNING

As a safety measure, it is wise to detach refrigerant hoses at the lowest pressure readings on the system. To do this:

- A. Put high pressure hose "B" on first. (Unit should not be running.)
- B. Put low pressure hose "A" on second. (Unit should be running.)

1. Remove cap from valve.
2. Make sure gauge manifold valves are closed.
3. If hose does not have an unseating pin, a number 395 Superior or equivalent unseating coupler must be used.
4. Make sure coupler is lined up straight with Schrader valve. Screw coupler on to valve.
5. Open gauge manifold valve slightly and purge air from hose with refrigerant.
6. Read the suction pressure on compound gauge and heat pressure on pressure gauge.
7. To remove, push end of hose tight against end of Schrader valve and hold in place while quickly unscrewing coupler nut from Schrader valve.
8. Remove coupler from Schrader valve. Replace caps on valve.

Leak Test

1. Remove gauge port cap from suction and liquid service valve ports and attach manifold gauge hoses. Connect an upright R-410A drum to center port of gauge manifold. Open refrigerant drum valve and manifold high pressure gauge valve to pressurize system to a positive pressure with refrigerant vapor. Pressurize the complete system with dry nitrogen, or CO₂ until the pressure reaches 200 psig. **Do not** exceed 250 psig.
2. Close manifold high pressure gauge valve. Check all soldered joints, including those on the evaporator coil with an Electronic Leak Detector suitable for use with HFC refrigerants or R-410A. If a leak is found which requires soldering, pressure in the system must be bled off since it is impossible to solder with unit pressurized. Be sure all leaks are located and marked before bleeding pressure from system.

3. Close drum valve and disconnect from center port. Release nitrogen or CO₂ into the atmosphere through suction line of gauge manifold.
4. Correct any leaks and recheck. When leaks, if any, have been repaired, system is ready to be evacuated and charged. Relieve all pressure from the system down to 0 psig.
5. Change the filter dryer. When leaks, if any, have been repaired, system is ready to be evacuated and charged. Relieve all pressure from the system down to 0 psig.

EVACUATION

Evacuation

An evacuation to 500 microns is usually sufficient to remove moisture from a system using R-22 and mineral oil lubricant. A 500 micron evacuation, however, will not separate moisture from Polyol Ester oil (POE) in R-410A systems.

In addition to a 500 micron evacuation, the liquid line filter dryer (R-410A compatible) must be replaced any time the system is open. When removing a filter dryer from a system, do not use a torch; use a tubing cutter to avoid releasing moisture back into the system.

Older R-22 leak detectors, as well as halide torch leak detectors, will not detect leaks in R-410A systems. Never use air and R-410A to leak check, as the mixture may become flammable at pressures above 1 atmosphere. A system can be safely leak-checked by using nitrogen or a trace gas of R-410A and nitrogen.

Remember: *Always use a pressure regulator with nitrogen and a safety valve down stream - set at no more than 150 psig.*

1. Evacuate system to less than 500 microns, using a good vacuum pump and an accurate high vacuum gauge. Operate the pump below 500 microns for 60 minutes and then close valve to the vacuum pump. Allow the system to stand for 30 additional minutes to be sure a 500 micron vacuum or less is maintained.



WARNING

At no time use the compressor to evacuate the system or any part of it.

2. Disconnect charging line at vacuum pump and connect to refrigerant supply. Crack the cylinder valve and purge charging line at center on manifold. Then close cylinder valve.
3. The system is now ready for the correct operating charge of Refrigerant R-410A.

R-410A System Charging

Even though R-410A has a very small fractionation potential, it cannot be ignored completely when charging. To avoid fractionation, charging of an air conditioner or heat pump system incorporating R-410A **shall be done with “liquid”** to maintain optimum system performance. To insure that the proper blend composition is charged into the system, it is important that liquid only be removed from the charging cylinder. Some cylinders supplied by manufacturers have dip tubes, which allow liquid refrigerant to be removed from the cylinder when it is in the upright position. Cylinders without dip tubes have to be tipped upside down in order for liquid to be removed. The Service Technician must differentiate between which type of charging cylinder they are using to avoid removing vapor refrigerant instead of liquid refrigerant to avoid fractionation and for safety concerns.

Connect the gauge manifold to the high and low side. Allow liquid to enter the high side only. The high side will hold 80-100% of the total charge. When liquid stops flowing, close high side port. The remainder of the charge will be added to the low side. Keep in mind two issues: first, never start the compressor with less than 55 psig of suction pressure. Secondly, make sure the liquid is throttled, thus vaporized into the low side of the system to avoid compressor damage. A throttling valve can be used to insure that liquid is converted to vapor prior to entering the system. Proper manipulation (restricting) of the manifold gauge set can also act as a throttling device to insure liquid is not entering the compressor.

CHARGING

1. **Single Package Units**—Refer to the unit serial plate for the full operating charge.

PRELIMINARY CHARGING STEPS

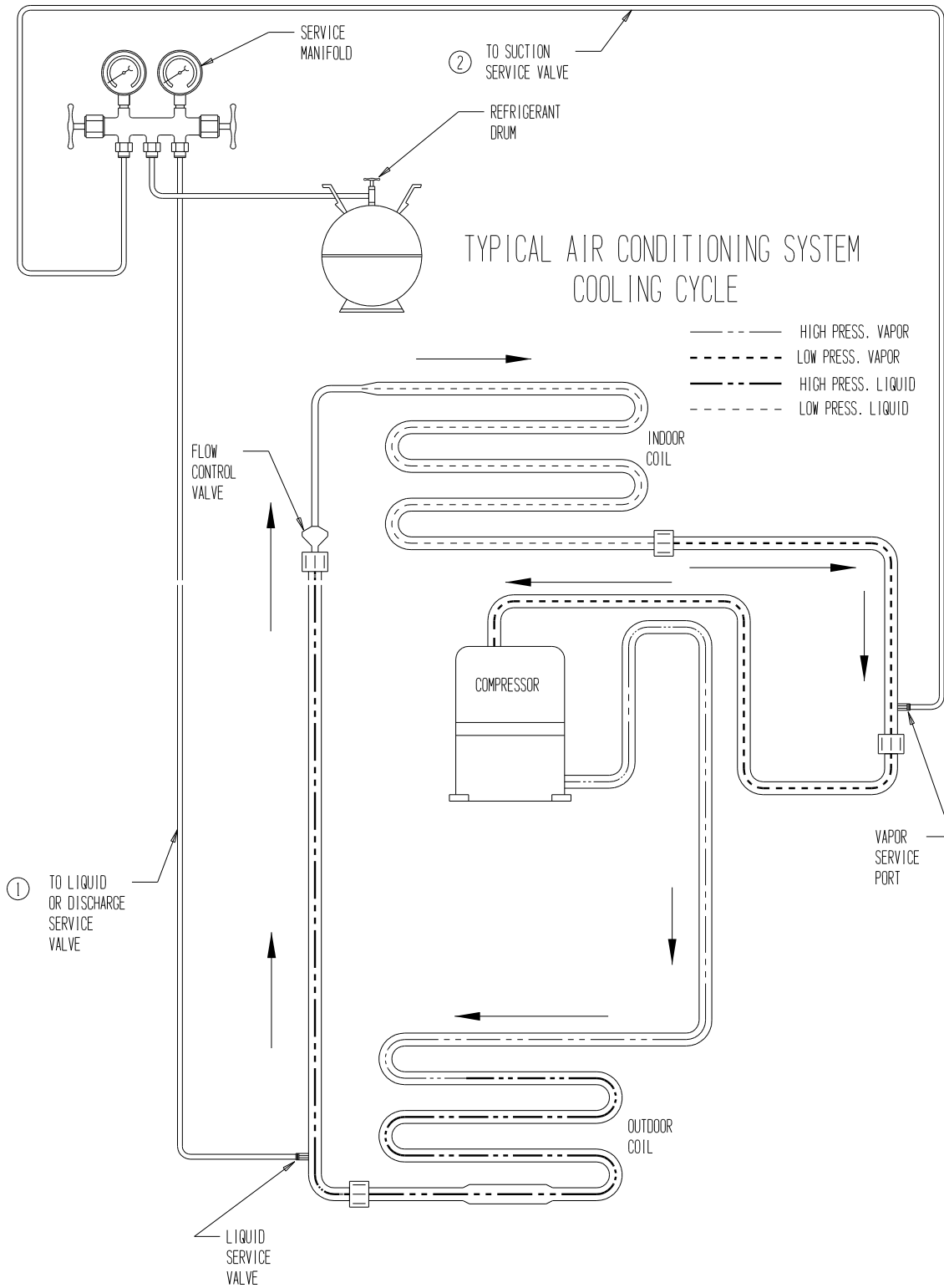
If the system has been open to the atmosphere, the filter dryer should be replaced and then evacuated. Then proceed as follows:

1. Attach a drum of proper, clean refrigerant to the center port of the charging manifold with one of the charging hoses.
2. Attach a second charging hose to the suction gauge (low pressure) side of the gauge manifold.
3. Remove the cap from the suction line valve.
4. Loosely attach the suction gauge hose to the line valve. Open the valve on the refrigerant drum and the suction valve on the charging manifold slightly to purge the air from the manifold and hoses before tightening the fitting.
5. Attach the third hose to the high pressure side of the manifold and the liquid line valve. Repeat steps 3 and 4 above.

CHARGING THE SYSTEM BY WEIGHT

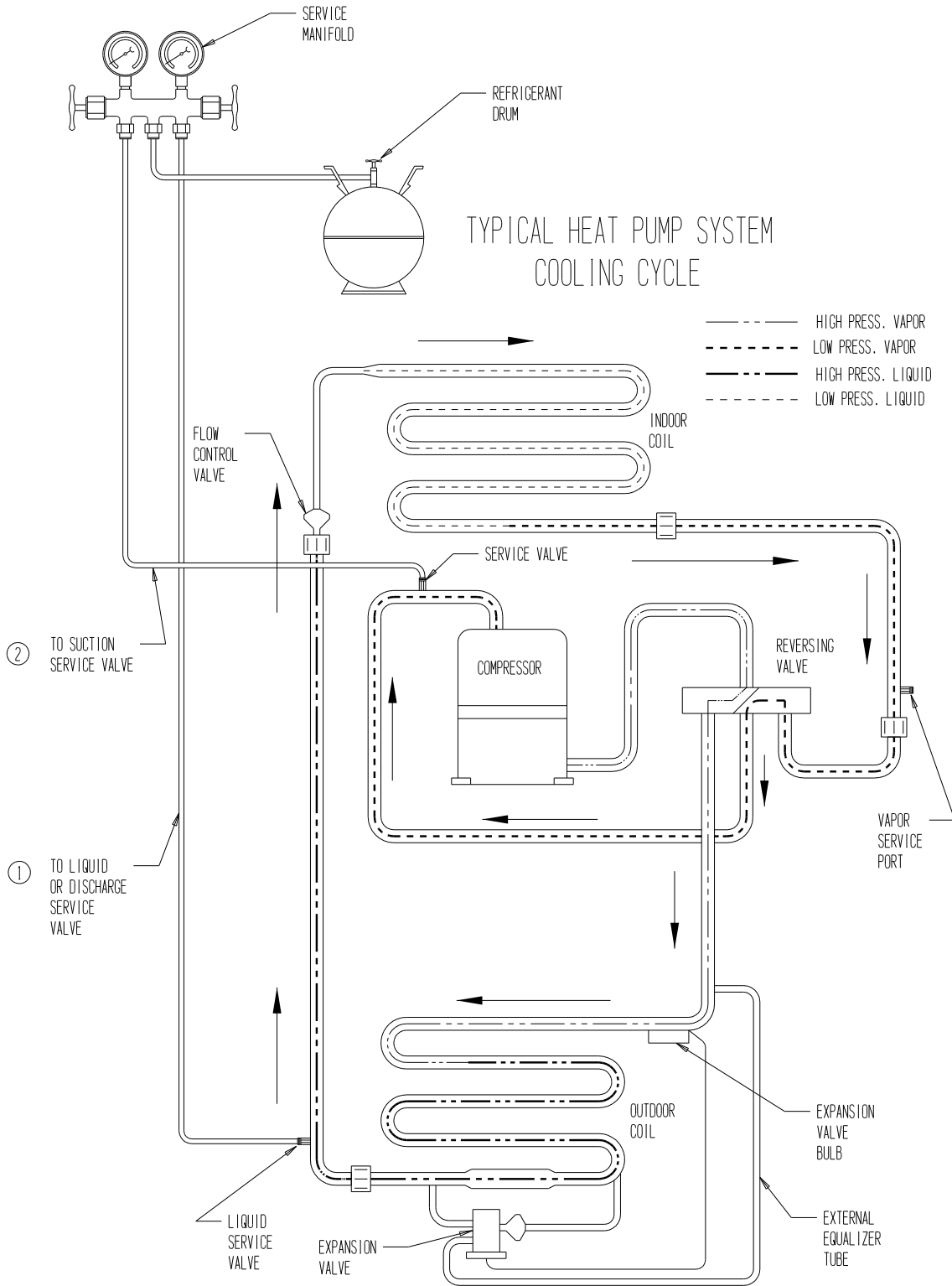
1. Connect manifold as instructed.
2. Place refrigerant drum upright on scale and determine exact weight of the refrigerant and cylinder.
3. With manifold suction valve closed and manifold discharge valve open, open refrigerant cylinder liquid valve and allow pressure in system to balance with pressure of cylinder or 80% of charge is in the unit - whichever comes first.
4. When there is approximately an 80% charge, front seat (close) the discharge manifold valve and let the system stabilize for about five minutes.
5. Start compressor by setting thermostat.
6. Finish charging with liquid by cracking the suction valve. Open the manifold low pressure valve to allow refrigerant to flow into the system. Throttle the manifold valve to keep pressure about 100 psig for R-410A.
7. When the correct weight of refrigerant has been added to the unit, close refrigerant cylinder valve and allow unit to run for 30 minutes. Refer to Start-Up Procedure and Check List for further start-up details.
8. Front seat gauge manifold valves, disconnect charging and gauge hoses and replace all valve caps.

**FIGURE 1
TYPICAL AIR CONDITIONING SYSTEM COOLING CYCLE**



MIS-369

FIGURE 2
TYPICAL HEAT PUMP SYSTEM COOLING CYCLE

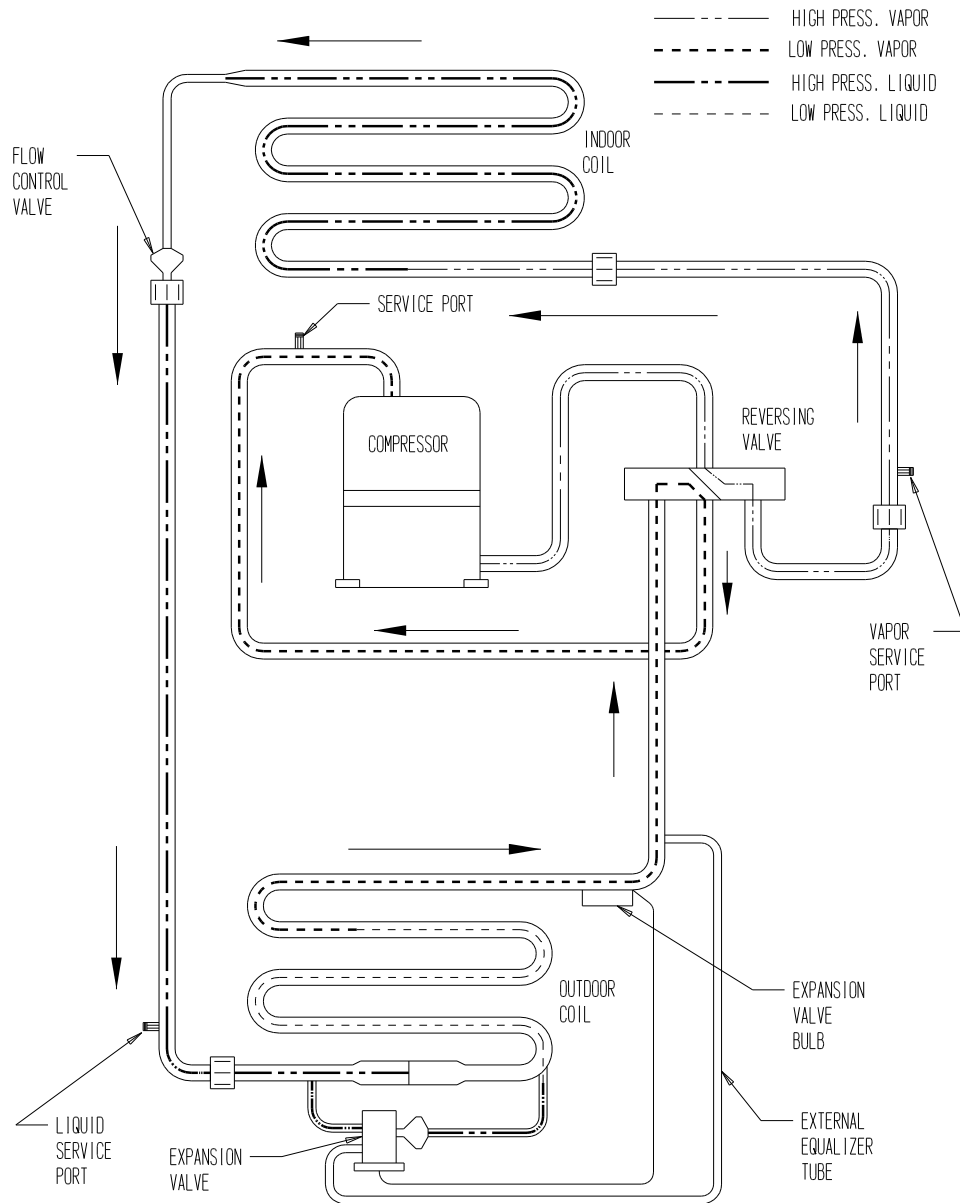


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WARNING

To speed refrigerant flow, it may be necessary to place refrigerant drum in a pan of warm water (not greater than 130°F). Remember to either consider the total weight of the pan of water or remove the drum for weighing frequently to keep track of the charging process.

**FIGURE 3
HEATING CYCLE**



MIS-289

TROUBLESHOOTING THE MECHANICAL SYSTEM

AIR CONDITIONING AND HEAT PUMP — COOLING

LOW SUCTION—LOW HEAD PRESSURE

1. Restricted airflow over indoor coil.
2. Defective indoor fan motor.
3. Low indoor temperature
4. Iced indoor coil.
5. Restricted liquid line, dryer, metering device, etc.
6. Low charge.
7. Low ambient entering air temperature. (Low entering water temperature to water coil.Ⓢ)

HIGH SUCTION—LOW HEAD PRESSURE

1. Defective or broken valves.
2. IPRV valve open.
3. Defective reversing valve.

LOW SUCTION—HIGH HEAD PRESSURE

1. Partial restriction and then overcharged.

HIGH SUCTION—HIGH HEAD PRESSURE

1. High entering outdoor air temperature. (High entering water temperature.Ⓢ)
2. Low airflow outdoor coil. (Low water flow.Ⓢ)
3. Overcharged.
4. Air in system.
5. Restricted outdoor coil. (Restricted water coil.Ⓢ)
6. High indoor air temperature.

Ⓢ Water source heat pump.

HEAT PUMP — HEATING

LOW SUCTION—LOW HEAD PRESSURE

1. Restricted airflow through outdoor coil. (Restricted water flow through water coil.Ⓢ)
2. Defective outdoor motor. (Defective water pump.Ⓢ)
3. Low outdoor air temperature. (Low water temperature.Ⓢ)
4. Frozen outdoor coil. (Frozen water coil.Ⓢ)
5. Restricted liquid line, dryer, metering device, etc.
6. Low charge.
7. Low indoor air temperature.

HIGH SUCTION—LOW HEAD PRESSURE

1. Defective or broken valves.
2. IPR valve open.
3. Defective reversing valve.

LOW SUCTION—HIGH HEAD PRESSURE

1. Partial restriction and then overcharged.

HIGH SUCTION—HIGH HEAD PRESSURE

1. High entering outdoor air temperature. (High entering water temperature.Ⓢ)
2. Low indoor airflow.
3. Overcharged.
4. Air in system.
5. Restricted air coil.
6. High indoor air temperature.

Ⓢ Water source heat pump.

TROUBLESHOOTING CHART FOR AIR CONDITIONERS

	Meters to Line Side of Meter	Power Supply	Control Circuit	Motors	Compressor	System Operation	Condenser Air	Evaporator Air	Low Side	General
Power Failure	● Blown Fuses or Tripped Circuit Breakers	● Faulty Wiring	● Faulty Wiring	● Compressor Motor	● Seized Compressor	● High Suction Pressure	● Condenser Fan Dirty or Plugged	● Plugged or Restricted Metering Device	● Evaporator Fins Dirty or Plugged	● Thermostat Location
● Generally the cause. Always make these checks first.	● Single 1PH Failure of 3PH	● Open Disconnect Switch	● Loose Terminal	● Condenser Motor	● Defective Compressor Valves	● High Head Pressure	● Liquid Valve Partially Closed	● Excessive Load in Space	● Evaporator Belt Slipping	● Stratified Air in Space
◆ Occasionally the cause. Make these checks only if first checks fail to locate trouble.	◆ Low Voltage	◆ Faulty Wiring	◆ Faulty Wiring	◆ Compressor Motor	◆ Defective Compressor Bearings	◆ Refrigerant Charge Low	◆ Excessive Load in Space	◆ Non-Condensables (Air, etc.)	◆ Evaporator Fins Dirty or Plugged	◆ Thermostat Setting
■ Rarely the cause. Make this check only if previous checks fail to locate trouble.	■ Voltage Too High	■ Open Disconnect Switch	■ Loose Terminal	■ Evaporator Motor	■ Hold Down Bolts	■ Open or Short Motor Windings	■ Low Suction Pressure	■ Temperatures	■ Evaporator Belt Slipping	■ Restrictions
● Compressor and condenser fan motor will not start but compressor fan will run.	● Blown Fuses or Tripped Circuit Breakers	● Faulty Wiring	● Loose Terminal	● Compressor Motor	● Compressor Off on Internal Overload	● Refrigerant Charge Low	● Low Suction Pressure	● Condenser Fan Dirty or Plugged	● Evaporator Fins Dirty or Plugged	● Ductwork Small or Restricted
● Compressor fan motor will not start	● Faulty Wiring	● Faulty Wiring	● Faulty Wiring	● Condenser Motor	● Compressor Oil Level	● Refrigerant Charge Low	● High Suction Pressure	● Condenser Fan Dirty or Plugged	● Evaporator Fins Dirty or Plugged	● Dirty Filters
● Compressor "hums" but will not start	● Faulty Wiring	● Faulty Wiring	● Faulty Wiring	● Compressor Motor	● Compressor Off on Internal Overload	● Refrigerant Charge Low	● High Suction Pressure	● Condenser Fan Dirty or Plugged	● Evaporator Fins Dirty or Plugged	● Dirty Filters
● Compressor cycles on overload	● Faulty Wiring	● Faulty Wiring	● Faulty Wiring	● Compressor Motor	● Compressor Off on Internal Overload	● Refrigerant Charge Low	● High Suction Pressure	● Condenser Fan Dirty or Plugged	● Evaporator Fins Dirty or Plugged	● Dirty Filters
● Compressor short cycles	● Faulty Wiring	● Faulty Wiring	● Faulty Wiring	● Compressor Motor	● Compressor Off on Internal Overload	● Refrigerant Charge Low	● High Suction Pressure	● Condenser Fan Dirty or Plugged	● Evaporator Fins Dirty or Plugged	● Dirty Filters
● Compressor runs continuously—no cooling	● Faulty Wiring	● Faulty Wiring	● Faulty Wiring	● Compressor Motor	● Compressor Off on Internal Overload	● Refrigerant Charge Low	● High Suction Pressure	● Condenser Fan Dirty or Plugged	● Evaporator Fins Dirty or Plugged	● Dirty Filters
● Compressor runs continuously—cooling	● Faulty Wiring	● Faulty Wiring	● Faulty Wiring	● Compressor Motor	● Compressor Off on Internal Overload	● Refrigerant Charge Low	● High Suction Pressure	● Condenser Fan Dirty or Plugged	● Evaporator Fins Dirty or Plugged	● Dirty Filters
● Compressor noisy	● Faulty Wiring	● Faulty Wiring	● Faulty Wiring	● Compressor Motor	● Compressor Off on Internal Overload	● Refrigerant Charge Low	● High Suction Pressure	● Condenser Fan Dirty or Plugged	● Evaporator Fins Dirty or Plugged	● Dirty Filters
● Compressor leaks oil	● Faulty Wiring	● Faulty Wiring	● Faulty Wiring	● Compressor Motor	● Compressor Off on Internal Overload	● Refrigerant Charge Low	● High Suction Pressure	● Condenser Fan Dirty or Plugged	● Evaporator Fins Dirty or Plugged	● Dirty Filters
● Head pressure too high	● Faulty Wiring	● Faulty Wiring	● Faulty Wiring	● Compressor Motor	● Compressor Off on Internal Overload	● Refrigerant Charge Low	● High Suction Pressure	● Condenser Fan Dirty or Plugged	● Evaporator Fins Dirty or Plugged	● Dirty Filters
● Head pressure too low	● Faulty Wiring	● Faulty Wiring	● Faulty Wiring	● Compressor Motor	● Compressor Off on Internal Overload	● Refrigerant Charge Low	● High Suction Pressure	● Condenser Fan Dirty or Plugged	● Evaporator Fins Dirty or Plugged	● Dirty Filters
● Liquid line frosting or sweating	● Faulty Wiring	● Faulty Wiring	● Faulty Wiring	● Compressor Motor	● Compressor Off on Internal Overload	● Refrigerant Charge Low	● High Suction Pressure	● Condenser Fan Dirty or Plugged	● Evaporator Fins Dirty or Plugged	● Dirty Filters
● Suction pressure too high	● Faulty Wiring	● Faulty Wiring	● Faulty Wiring	● Compressor Motor	● Compressor Off on Internal Overload	● Refrigerant Charge Low	● High Suction Pressure	● Condenser Fan Dirty or Plugged	● Evaporator Fins Dirty or Plugged	● Dirty Filters
● Suction pressure too low	● Faulty Wiring	● Faulty Wiring	● Faulty Wiring	● Compressor Motor	● Compressor Off on Internal Overload	● Refrigerant Charge Low	● High Suction Pressure	● Condenser Fan Dirty or Plugged	● Evaporator Fins Dirty or Plugged	● Dirty Filters
● Evaporator frosting	● Faulty Wiring	● Faulty Wiring	● Faulty Wiring	● Compressor Motor	● Compressor Off on Internal Overload	● Refrigerant Charge Low	● High Suction Pressure	● Condenser Fan Dirty or Plugged	● Evaporator Fins Dirty or Plugged	● Dirty Filters
● Suction line frosting or sweating	● Faulty Wiring	● Faulty Wiring	● Faulty Wiring	● Compressor Motor	● Compressor Off on Internal Overload	● Refrigerant Charge Low	● High Suction Pressure	● Condenser Fan Dirty or Plugged	● Evaporator Fins Dirty or Plugged	● Dirty Filters
● Evaporator blower will not start	● Faulty Wiring	● Faulty Wiring	● Faulty Wiring	● Compressor Motor	● Compressor Off on Internal Overload	● Refrigerant Charge Low	● High Suction Pressure	● Condenser Fan Dirty or Plugged	● Evaporator Fins Dirty or Plugged	● Dirty Filters
● Condenser fan motor runs contactor not pulled in	● Faulty Wiring	● Faulty Wiring	● Faulty Wiring	● Compressor Motor	● Compressor Off on Internal Overload	● Refrigerant Charge Low	● High Suction Pressure	● Condenser Fan Dirty or Plugged	● Evaporator Fins Dirty or Plugged	● Dirty Filters
● Liquid refrigerant flooding back to compressor—cap tube system	● Faulty Wiring	● Faulty Wiring	● Faulty Wiring	● Compressor Motor	● Compressor Off on Internal Overload	● Refrigerant Charge Low	● High Suction Pressure	● Condenser Fan Dirty or Plugged	● Evaporator Fins Dirty or Plugged	● Dirty Filters
● Space temperature too high	● Faulty Wiring	● Faulty Wiring	● Faulty Wiring	● Compressor Motor	● Compressor Off on Internal Overload	● Refrigerant Charge Low	● High Suction Pressure	● Condenser Fan Dirty or Plugged	● Evaporator Fins Dirty or Plugged	● Dirty Filters
● System Too Small	● Faulty Wiring	● Faulty Wiring	● Faulty Wiring	● Compressor Motor	● Compressor Off on Internal Overload	● Refrigerant Charge Low	● High Suction Pressure	● Condenser Fan Dirty or Plugged	● Evaporator Fins Dirty or Plugged	● Dirty Filters

INSTALLATION INSTRUCTIONS

11EER WA Series Wall Mount Air Conditioner

Right Hand Models:

W18AY-A	W24AY-A	W30AY-A	W36AY-A	W36AYRC
	W24AY-B	W30AY-B	W36AY-B	W36AY-D
	W24AY-C	W30AY-C	W36AY-C	W36AY-E
	W24AY-D	W30AY-D		W36AY-F
	W24AY-F	W30AY-F		
		W30AYDA		W36AYDA
		W30AYDB		W36AYDB
		W30AYDC		W36AYDC
				W36AYDV

Left Hand Models:

W18LY-A	W24LY-A	W30LY-A	W36LY-A	W36LYRC
	W24LY-B	W30LY-B	W36LY-B	W36LY-F
	W24LY-F	W30LY-C	W36LY-C	
		W30LY-F		

In compliance with 40 CFR Part 84, commonly referred to as the EPA HFC Technology Transition rule, R410A products that were manufactured after 1/1/25 but before 1/1/27 are solely for data center, computer room, and ITEF applications. These units may be sold, distributed, or exported for said applications up until 12/31/29.



Bard Manufacturing Company, Inc.
Bryan, Ohio 43506
www.bardhvac.com

Manual: 2100-789D
Supersedes: 2100-789C
Date: 10-24-24

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NOTICE

APPLIANCE ACCESSIBLE TO THE GENERAL PUBLIC.

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.

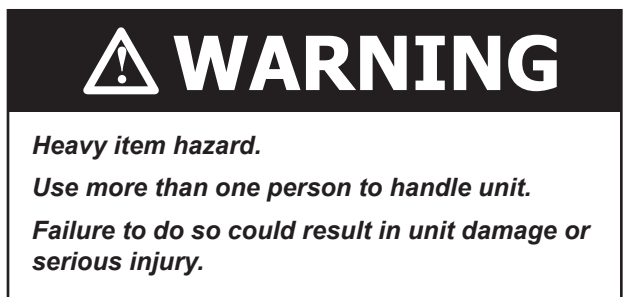
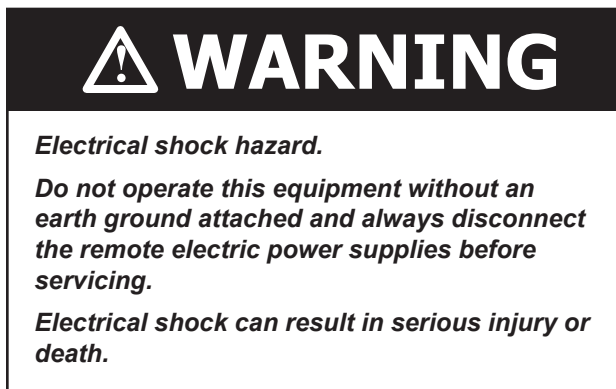
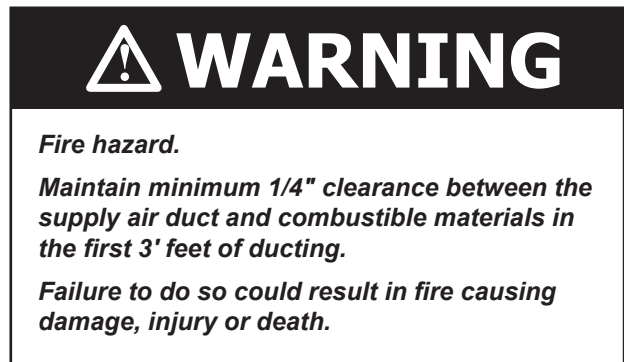
ANSI Z535.5 Definitions:

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.

Ne pas faire fonctionner cet équipement sans qu'il soit relié à la terre et toujours débrancher les alimentations électriques avant de procéder aux opérations d'entretien.

Une électrisation peut entraîner des blessures graves ou la mort.

REMARQUE


APPAREIL ACCESSIBLE AU GRAND PUBLIC.

 **AVERTISSEMENT**

Risque d'incendie.

Conserver un dégagement minimal de 6,35 mm/1/4 po entre le conduit d'air soufflé et les matériaux combustibles sur les 900 premiers millimètres (3 pi) du conduit.

Le non-respect de cette consigne entraîne des risques de dégâts matériels, de blessures corporelles ou de décès.

 **AVERTISSEMENT**

Risque lié aux objets lourds.

Plusieurs personnes sont nécessaires à la manipulation de l'unité.

Le non-respect de cette consigne peut entraîner dégâts à l'unité ou des blessures graves.



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'appareil doit être correctement installé 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 air conditioner. 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 CodeANSI/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:

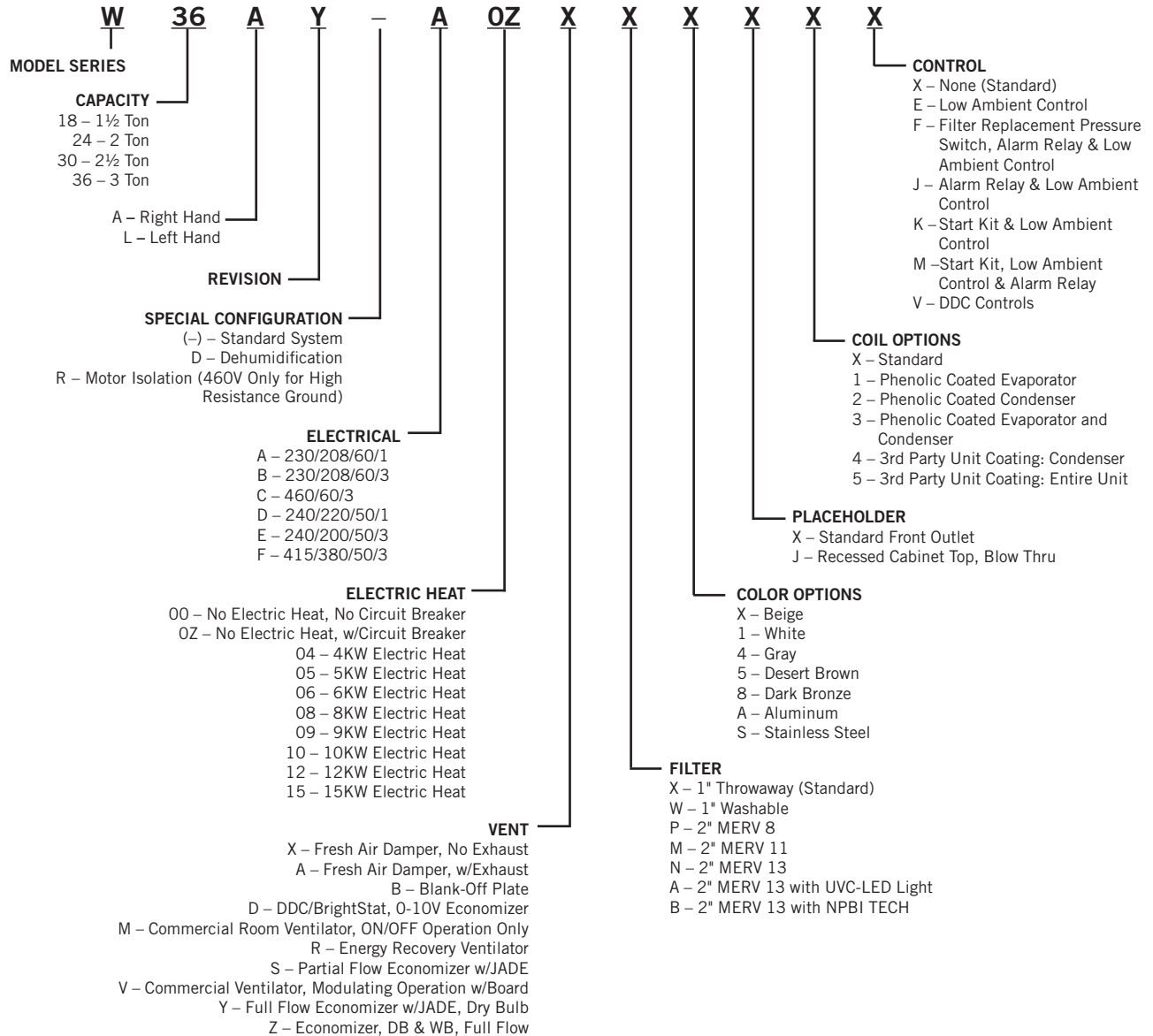
ACCA **Air Conditioning Contractors of America**
1712 New Hampshire Ave. N.W.
Washington, DC 20009
Telephone: (202) 483-9370
Fax: (202) 234-4721

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

Air Conditioner 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.

Refer to Maximum ESP of Operation Electric Heat Table 17 on page 45.

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.

For all models, a 1/4" clearance to combustible material for the first 3' of duct attached to the outlet air frame is required. See wall mount installation instructions on page 15 and Figures 3 – 7 (pages 18 – 22) 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 RG2 through RG3 or RFG2 through RFG3 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 installation codes may limit this cabinet to installation only in a single story structure.*

Filters

A 1" throwaway filter is standard with each unit. The filter slides into position making it easy to service. This filter can be serviced from the outside by removing the filter access panel. Additional 1" and 2" filters are also available as optional accessories. The internal filter brackets are adjustable to accommodate the 2" filter by bending two tabs down on each side of the filter support bracket.

Fresh Air Intake

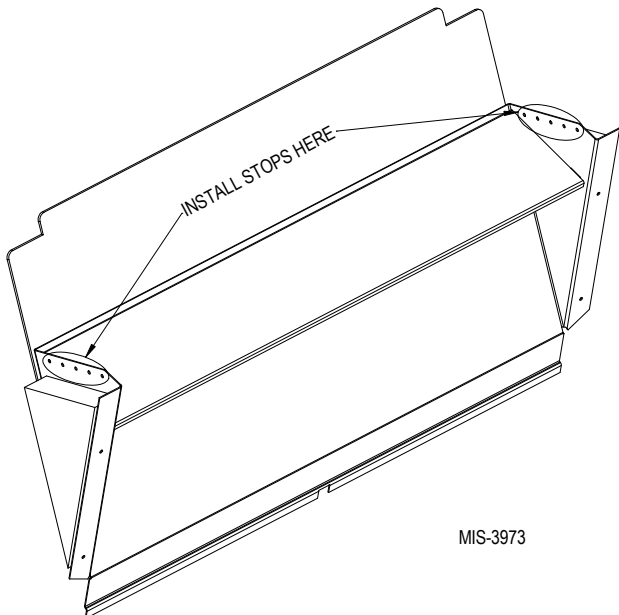
All units are built with fresh air inlet slots punched in the service door.

If the unit is equipped with a fresh air damper assembly, the assembly is shipped already attached to the unit. The damper blade is pre-set in the #3 position. If more or less fresh air is required, adjust damper pins (see Figure 1). Graphs found on pages 49 and 50 give approximate fresh air amounts based on the blade position stop location.

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

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-3973

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. Refer to Maximum External Static Pressure (ESP) of Operation Table 17 on page 45. 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.

For all models, a 1/4" clearance to combustible material for the first 3' of duct attached to the outlet air frame is required. See instructions on page 15 and Figures 3 – 7 (pages 18 – 22) for further details.

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 installation 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. The following 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 Figures 3A and 3B on pages 18 and 19. 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 Figures 3A and 3B).
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 Figures 3A and 3B).
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 Figures 3A and 3B).
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 right side (on W**A units) to allow access to control panel and heat strips and proper airflow to the outdoor coil (20" clearance on left side on W**L units). Additional clearance may be required to meet local or national codes.

TABLE 1
Clearance Required for Service Access and
Adequate Condenser Airflow

Model	Left Side	Right Side	Discharge Side
W18A W24A W30A W36A	15"	20"	10'
W18L W24L W30L W36L	20"	15"	10'

NOTE: For side-by-side installation of two W**A models, there must be 20" between units. This can be reduced to 15" by using a W**L model (left side compressor and controls) for the left unit and W**A (right side compressor and controls) for right unit.

See Specifications Sheet S3642.

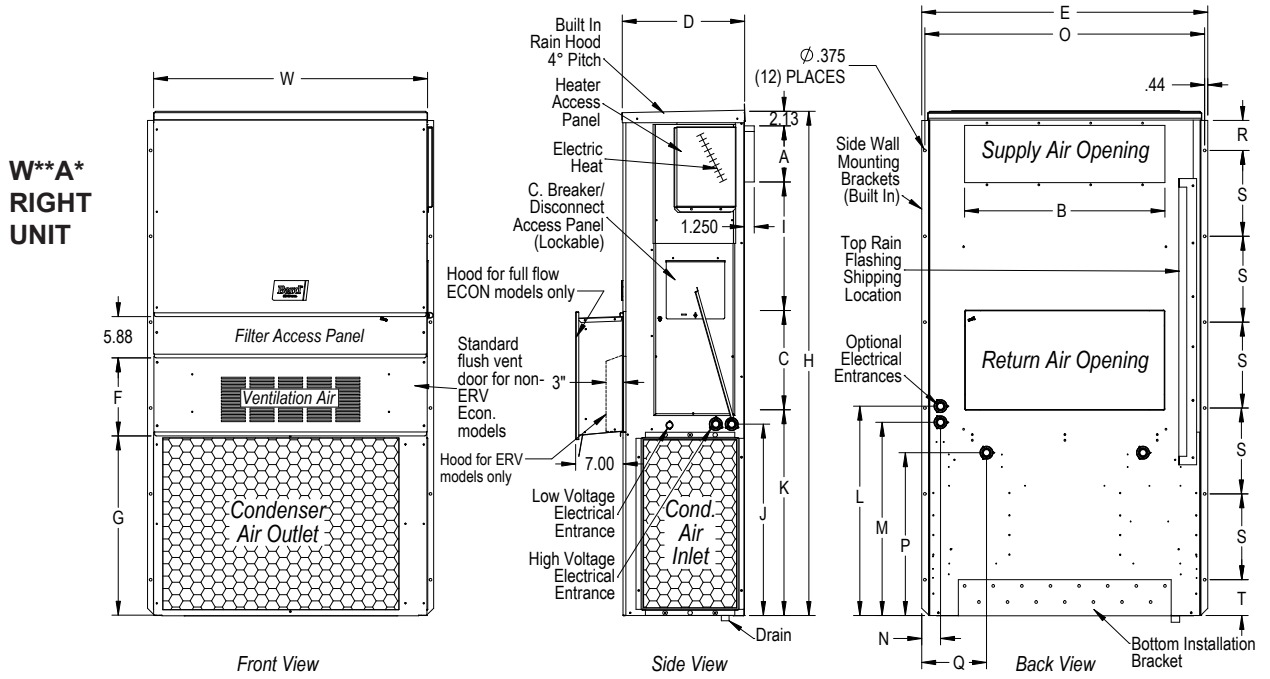
TABLE 2
Minimum Clearances Required
to Combustible Materials

Model	Supply Air Duct (1st 3')	Cabinet
W18A, L W24A, L	1/4"	0"
W30A, L W36A, L	1/4"	0"

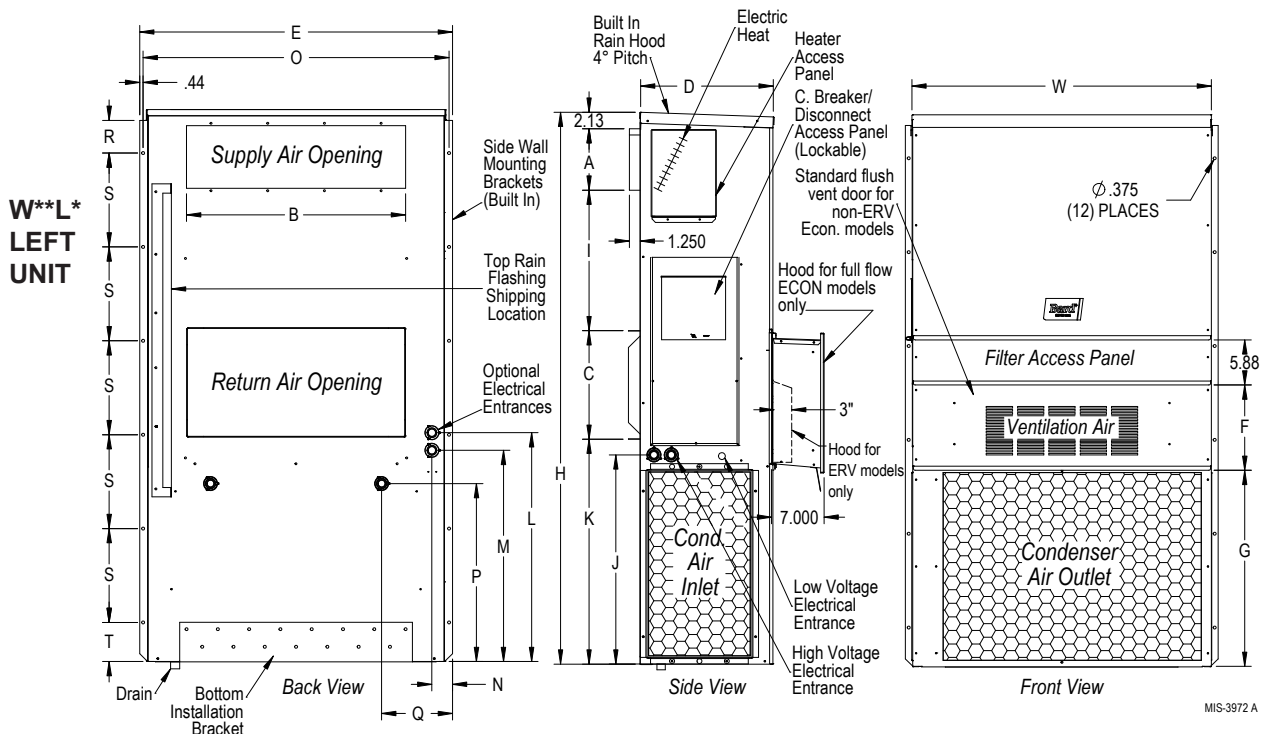
FIGURE 2
Unit Dimensions

	Width (W)	Depth (D)	Height (H)	Supply		Return																
				A	B	C	B	E	F	G	I	J	K	L	M	N	O	P	Q	R	S	T
W18*Y	33.300	17.125	74.563	7.88	19.88	11.88	19.88	35.00	10.88	29.75	20.56	30.75	32.06	33.25	31.00	2.63	34.13	26.06	10.55	3.94	12.00	9.00
W24*Y																						
W30*Y	38.200	17.125	74.563	7.88	27.88	13.88	27.88	40.00	10.88	29.75	17.93	30.75	32.75	33.25	31.00	2.75	39.13	26.75	9.14	3.94	12.00	9.00
W36*Y																						

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



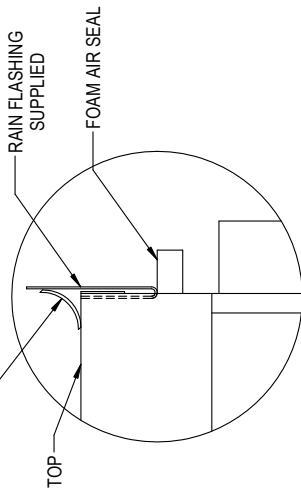
MIS-3976 B



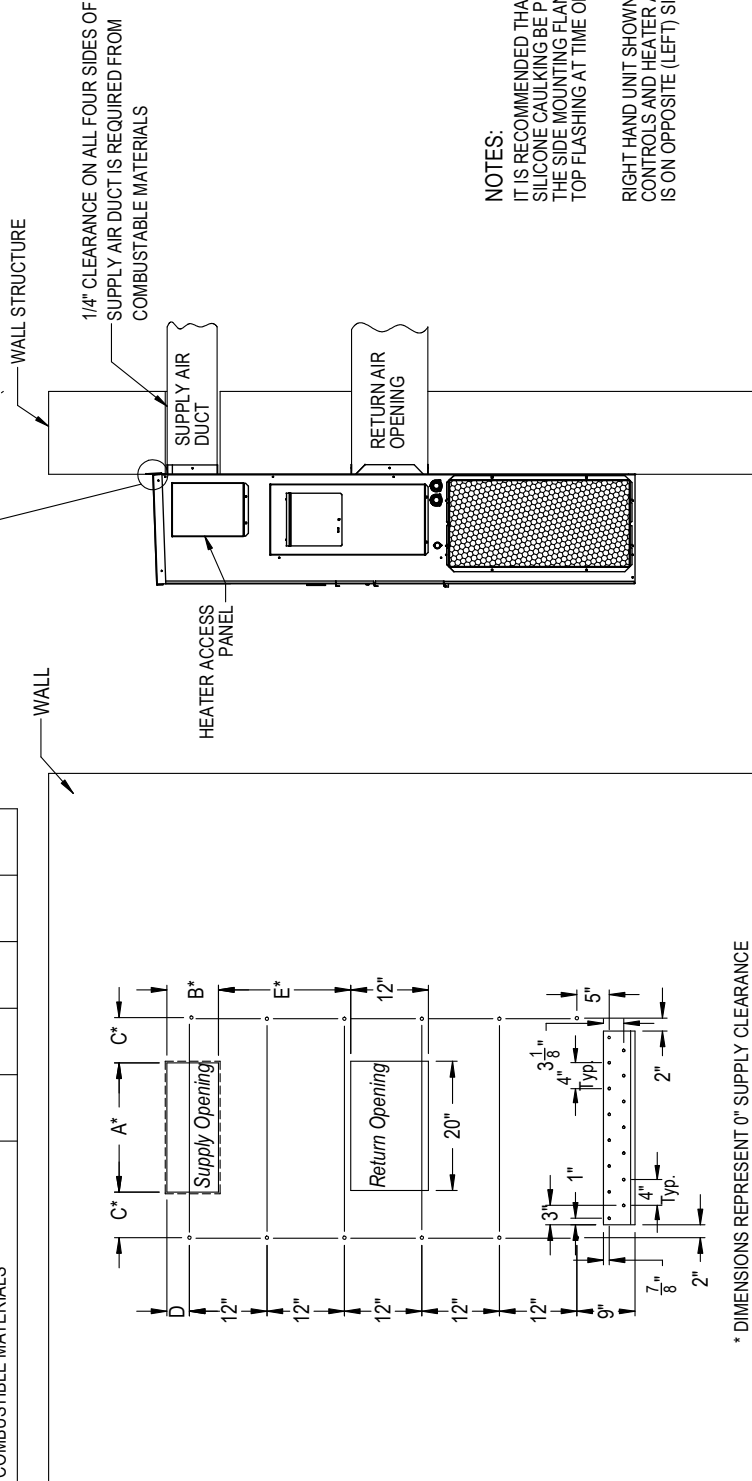
MIS-3972 A

FIGURE 3A
W18AY, W18LY, W24AY, W24LY Mounting Instructions

CRITICAL NOTE: SEAL WITH BEAD OF CAULKING ALONG ENTIRE LENGTH OF TOP.



	A	B	C	D	E
REQUIRED DIMENSIONS TO MAINTAIN 1/4" MIN. CLEARANCE FROM COMBUSTIBLE MATERIALS	20 1/2	8 1/2	6 13/16	3 3/4	20 1/4
REQUIRED DIMENSIONS TO MAINTAIN RECOMMENDED 1" CLEARANCE FROM COMBUSTIBLE MATERIALS	22	10	6 1/16	4 1/2	19 1/2



Right Side View

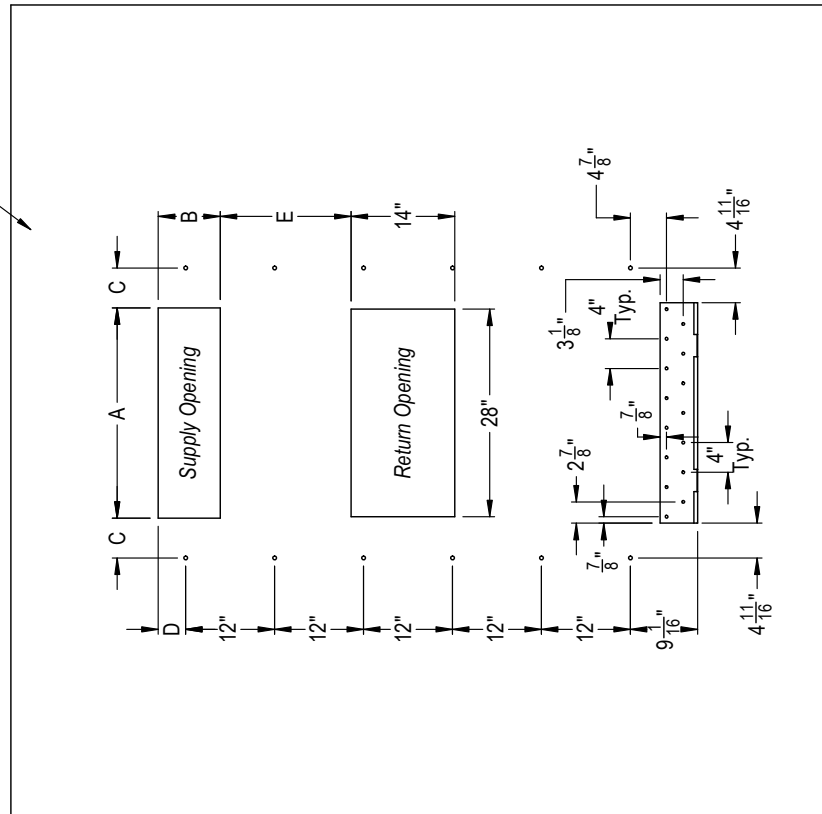
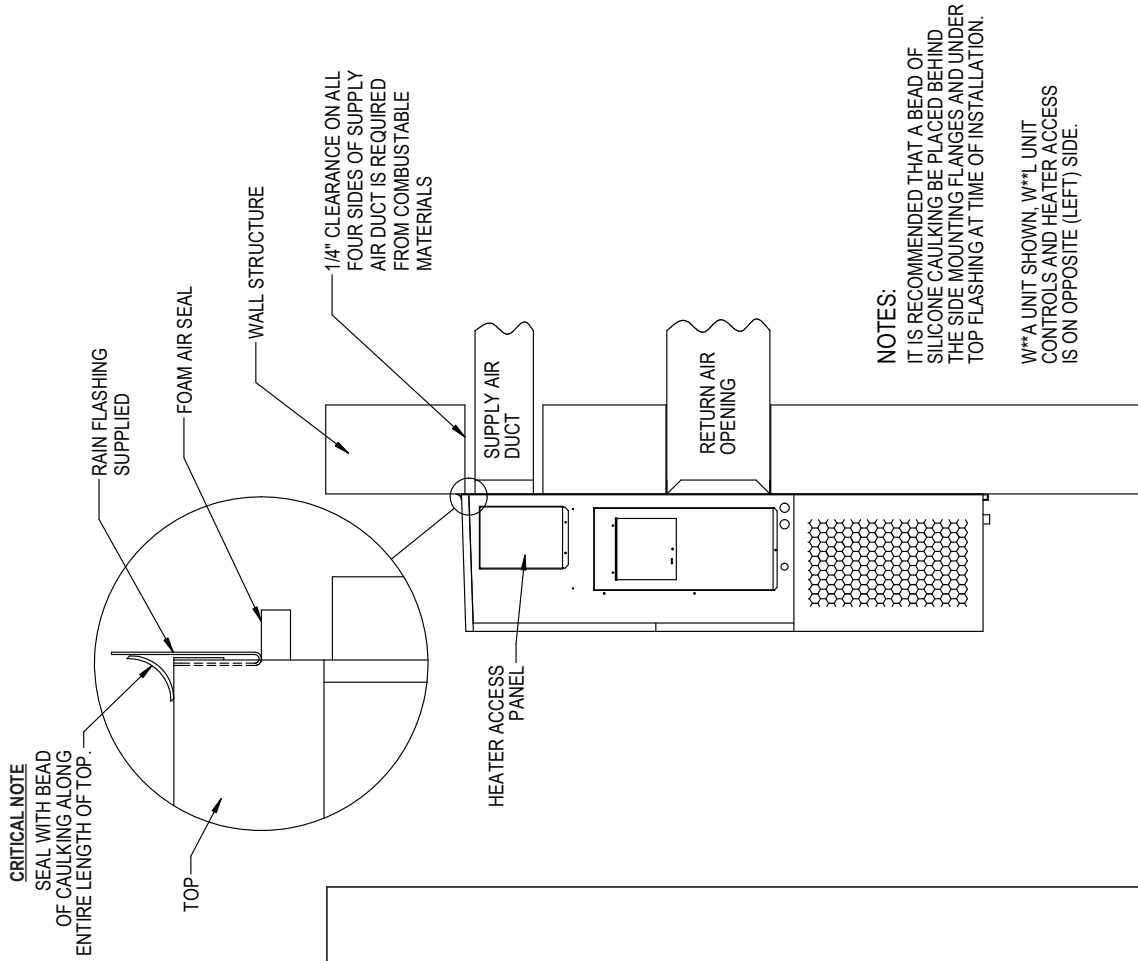
Wall Opening and Hole Location View

NOTES:
 IT IS RECOMMENDED THAT A BEAD OF SILICONE CAULKING BE PLACED BEHIND THE SIDE MOUNTING FLANGES AND UNDER TOP FLASHING AT TIME OF INSTALLATION.
 RIGHT HAND UNIT SHOWN, LEFT HAND UNIT CONTROLS AND HEATER ACCESS IS ON OPPOSITE (LEFT) SIDE.

MIS-4036 B

W30AY, W30LY, W36AY, W36LY Mounting Instructions
FIGURE 3B

	A	B	C	D	E
REQUIRED DIMENSIONS TO MAINTAIN 1/4" MIN. CLEARANCE FROM COMBUSTIBLE MATERIALS	28 3/8	8 3/8	5 3/8	3 3/4	17 5/8
REQUIRED DIMENSIONS TO MAINTAIN RECOMMENDED 1" CLEARANCE FROM COMBUSTIBLE MATERIALS	29 7/8	9 7/8	4 5/8	4 1/2	16 7/8

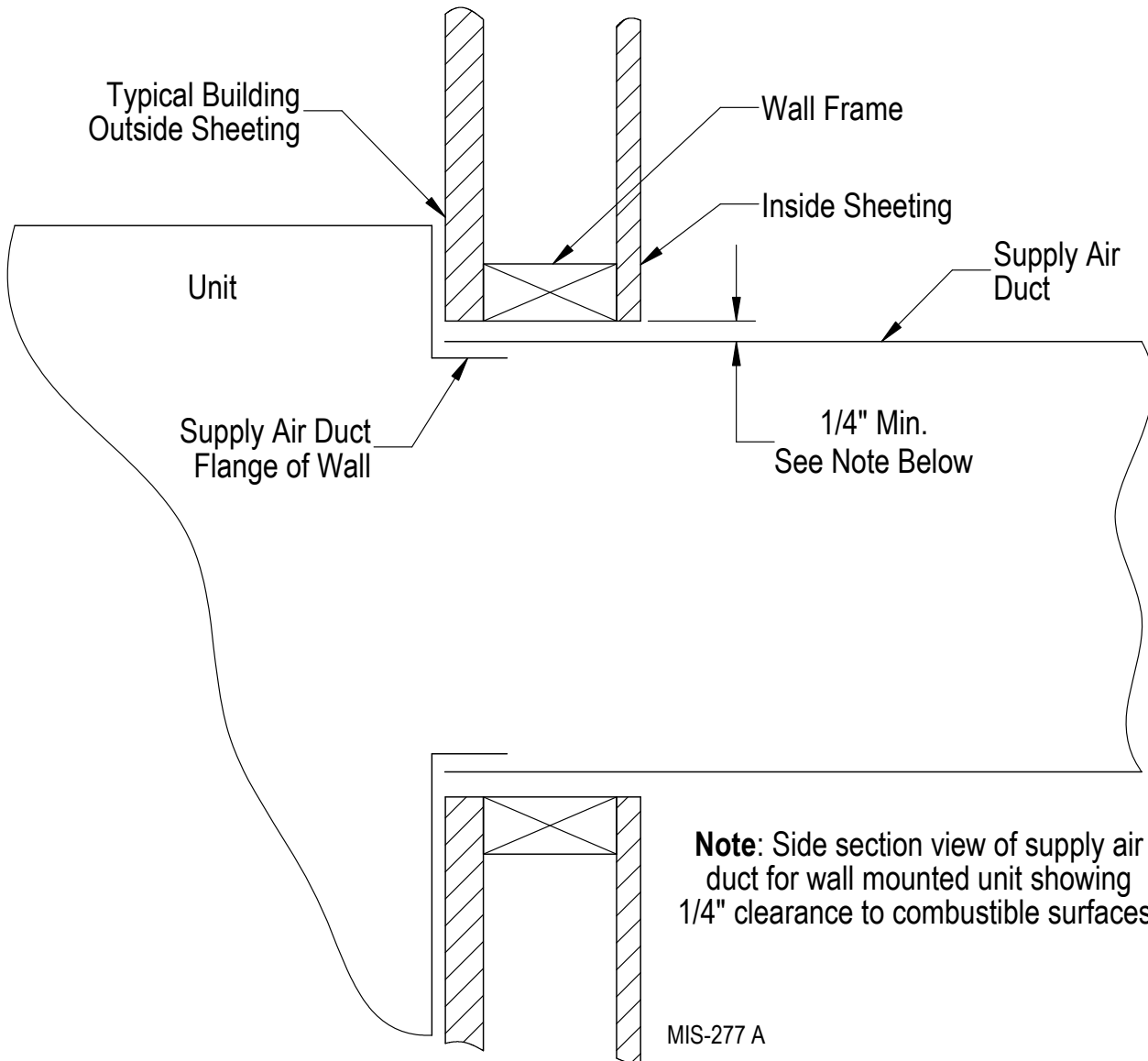


Right Side View

Wall Opening and Hole Location View

MIS-3820 A

FIGURE 4
Electric Heat Clearance – All Models



⚠ 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.

FIGURE 5
Wall Mounting Instructions

See Figures 3A and 3B Mounting Instructions

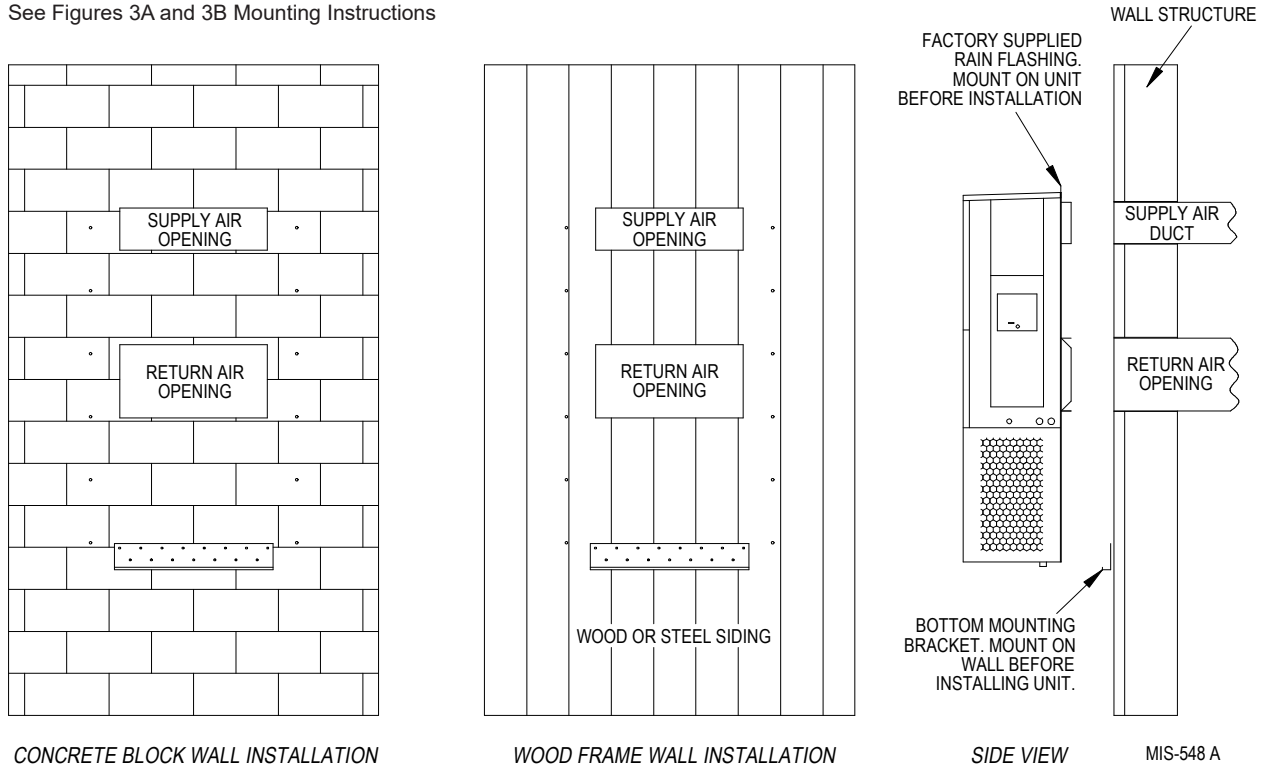


FIGURE 6
Wall Mounting Instructions

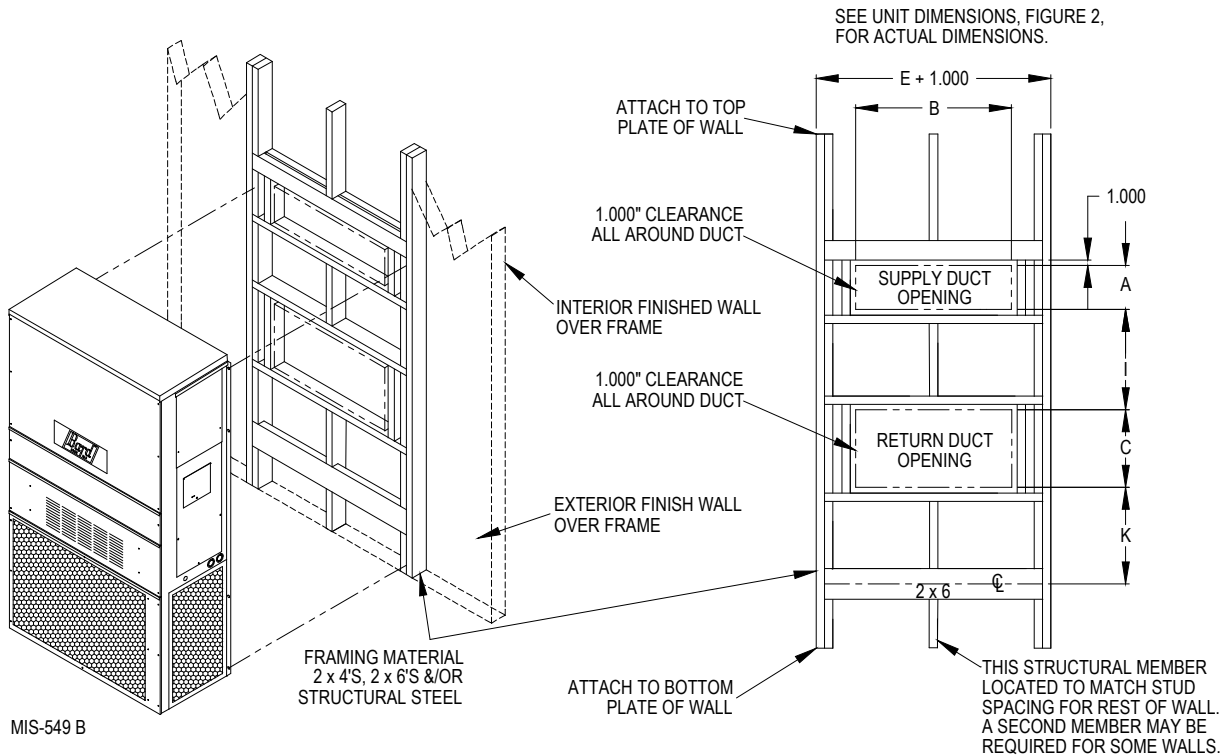
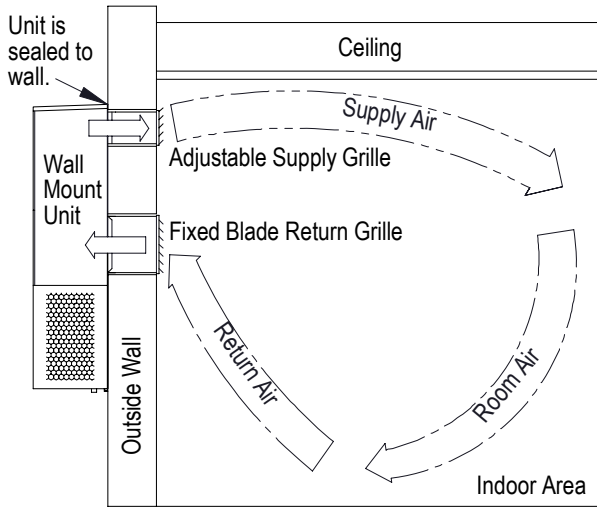


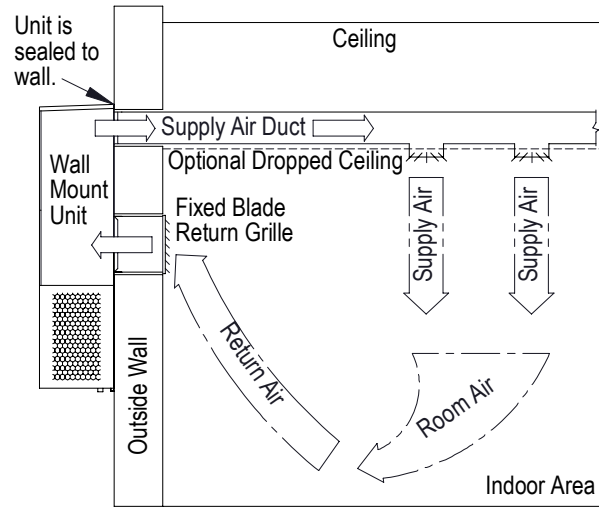
FIGURE 7
Common Wall Mounting Installations

Non-Ducted Installations



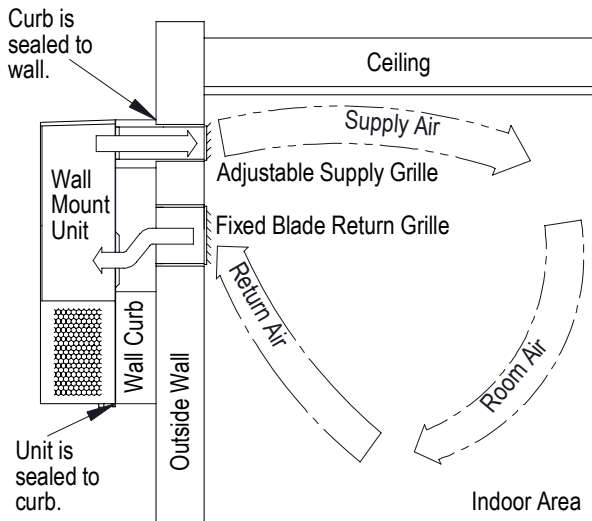
Non-ducted installations supply conditioned air into indoor room areas without extensive duct work. The supply airstream is directed by adjusting the 4-way supply grille to reach areas being conditioned. The supply air mixes with the room air and cools or heats occupants and/or equipment in the area. Unconditioned room air is returned to the unit through the return grille. Avoid supply air leaving supply grille and re-entering the unit return grille without mixing with room air.

Ducted Installations



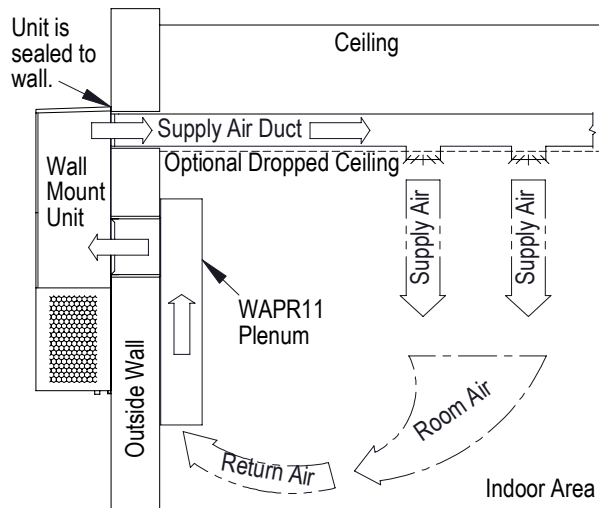
Ducted installations supply conditioned air into indoor room areas using solid or flexible ducts. The supply air is distributed throughout a single area or multiple areas. The supply air mixes with the room air and cools or heats occupants and/or equipment. Unconditioned room air is returned to the unit through a return grille or return duct work. Avoid using restrictive duct work to provide the best unit performance and efficiency. Review duct static pressure requirements provided in this manual.

Outdoor Wall Curb Installations



Outdoor Wall curbs are installed between the wall mount unit and the outer wall surface. Wall curb use may avoid resizing supply and return openings that are currently in an existing wall. Wall curbs may also provide sound isolation and indoor area sound reduction. Various curb options are available, and it is important to select a curb that will meet the application requirements and also be the correct size for the unit. Unit duct static requirements cannot be exceeded when using a wall curb. Follow all instructions provided with the wall curb when installing the product.

WAPR11 Indoor Sound Plenum Installations



Indoor sound plenums are installed inside the room over the unit return air opening. Plenum use can provide sound isolation and indoor area sound reduction. The WAPR11 sound plenum provides a single solution for all unit tonnage sizes. The WAPR11 may be installed horizontally or vertically in the room. Unit duct static requirements cannot be exceeded when using a sound plenum. Follow all instructions provided with the sound plenum when installing the product.

MIS-550 D

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).

NOTE: *In applications where a field-supplied transformer is used to step down a higher incoming voltage, the center leg must be grounded when high resistance grounding is used.*

Refer to the unit rating plate for wire sizing information and 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 lists 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 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.

The disconnect access door on this unit may be locked to prevent unauthorized access to the disconnect. To convert for the locking capability, bend the tab located

in the bottom left-hand corner of the disconnect opening under the disconnect access panel straight out. This tab will now line up with the slot in the door. When shut, a padlock may be placed through the hole in the tab preventing entry.

See **START UP** on page 29 for important information on three phase scroll compressor start ups.

See Tables 12 and 13 on pages 38 and 39 for electrical specifications.

Wiring – Low Voltage

All 230/208V 1 phase and 3 phase equipment have dual primary voltage transformers. All equipment leaves the factory wired on 240V tap. For 208V operation, reconnect from 240V to 208V tap. The acceptable operating voltage range for the 240 and 208V taps are:

Tap: 240 Range: 253 – 216
Tap: 208 Range: 215 – 197

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).*

For low voltage wiring, an 18 gauge copper, color-coded cable is recommended. See Table 6 on page 26 for more information.

Low Voltage (24VAC) Connections

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

C terminal is the *24VAC common and is grounded.*

G terminal is the *indoor blower input.*

Y1 terminal is the *1st Stage input for cooling.*

Y2 terminal is the *2nd Stage compressor input for cooling* (if equipped with an economizer) or *Y2 disables Balanced Climate mode if the Y1-Y2 jumper is removed* (see **Balanced Climate Feature** on page 24).

B/W1 terminal is the *1st stage electric heat.*

W2 terminal is the *2nd stage heat* (if equipped).

A terminal is the *ventilation input.* This terminal energizes any factory-installed ventilation option and indoor blower.

D terminal is the *dehumidification input.* If installed, this terminal energizes any factory-installed dehumidification option.

L terminal is *24 volt alarm active output.*

For units equipped with an alarm relay:

1 terminal is the *normally closed contact on the relay.*

2 terminal is the *normally open contact on the relay.*

3 terminal is the *common contact on the relay.*

See Table 3 on page 24 for additional low voltage connections on auxiliary terminal strip.

TABLE 3
Additional Low Voltage Connections (if applicable)

Terminal	Unit	Description
9	V Control Option Only	Discharge Air Sensor, 10K Ohm
10	V Control Option Only	Discharge Air Sensor, 10K Ohm
11	F, V Control Options	Filter Switch, Normally Open Contact
12	F, V Control Options	Filter Switch, Normally Open Contact
13	V Control Option Only	Blower Airflow Switch, Normally Open Contact
14	V Control Option Only	Blower Airflow Switch, Normally Open Contact
15	V Control Option Only	Compressor Current Sensor, Normally Open Contact
16	V Control Option Only	Compressor Current Sensor, Normally Open Contact

Unit Shutdown Feature (Standard on All Models)

The RT terminal is the 24VAC transformer output, and the R terminal is the 24VAC hot terminal for the operation of the equipment. RT and R are connected with a brass jumper bar which can be removed and RT and R connected to an external NC (normally closed) contact such as a fire/smoke detector that will cause shutdown of the equipment upon activation.

Balanced Climate™ Feature (Standard on All Models)

All units are equipped with the capability of running in Balanced Climate mode. This mode is designed to enhance the comfort level by reducing the indoor airflow amount and extending the run time to help extract more humidity during cooling operation. The Y1 terminal is the 24VAC input for Balanced Climate compressor cooling operation. The Y2 terminal is the 24VAC input for compressor cooling standard operation. Y1 and Y2 are connected with a brass jumper bar which can be removed to enable Balanced Climate mode. Units with an economizer will not have the brass jumper installed. Refer to vent manuals for instructions on how Balanced Climate works with each vent.

NOTE: *Units with mechanical dehumidification require an additional connection to be made when enabling Balanced Climate. Refer to dehumidification supplemental instructions for this step.*

To operate in Balanced Climate mode, a 2-stage cooling thermostat is required. The lower indoor airflow operation is overridden by utilizing a 2-stage thermostat. If the call for cooling is not satisfied within a given time frame or temperature differential (specified by the thermostat), the thermostat will send a signal to Y2 which then increases the blower speed

back to the selected speed. See pages 32 – 34 for blower speed selection options.

Refer to page 30 for additional Balanced Climate requirements and limitations.

Dehumidification Feature (Optional)

The D terminal is the 24VAC input for dehumidification operation on dehumidification hot gas reheat equipped units. When 24VAC is applied to the D terminal, 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. A humidity sensing thermostat or humidistat is required to control dehumidification operation.

Ventilation Features (Optional)

See ventilation instructions provided with unit for low voltage wiring.

Low Ambient Control (LAC)

The low ambient control is a pressure switch that is attached to the liquid line of the system and monitors high side pressure. Operation of the LAC occurs as outdoor temperatures drop below 60°F. On/Off and modulating controls are used which operate based on pressure changes caused by outdoor temperature changes. On/Off LAC operation cycles the condenser fan on/off to maintain desired liquid pressure while modulating LAC operation is factory adjusted and slows the condenser fan speed (rpm).

Outdoor Temperature Switch and Freeze Protection Thermostat

An outdoor temperature switch and an evaporator freeze protection thermostat is supplied with all units that have a low ambient control. The outdoor switch disables Balanced Climate mode (if enabled) when the temperature drops below 50°F. This prevents potential evaporator coil freeze up issues. For units with mechanical dehumidification, this switch must remain disconnected when Balanced Climate mode is not being used. Refer to unit wiring diagram. The freeze thermostat cuts out compressor operation if the evaporator begins to freeze up.

Alarm Relay Feature (Controls Option)

The alarm relay provides a set of NO (normally open) and NC (normally closed) pilot duty contacts that operate when the compressor control module locks out compressor operation because of a high or low system refrigerant pressure event.

DDC Controls Feature (Controls Option)

The DDC controls option provides additional sensors that can be used with a field-supplied advanced logic

controller. The DDC controls option contains the following installed components:

Dirty Filter Switch Indicator (DFS)

The switch is adjustable and measures pressure drop across the unit filter surface. When pressure drop is higher than the switch setting, NO contacts are provided to indicate the filter needs to be serviced. Refer to page 34 for instructions on making switch adjustments.

Discharge Air Sensor

The discharge air sensor provides a temperature reading of the supply air leaving the unit. The sensor is a 10K OHM @ 77°F measuring device. It is installed in the supply airstream in the heater bracket.

Airflow Switch

The airflow switch measures the pressure differential between the blower inlet and outlet. It is located directly above the blower partition. Relay contacts (NO) are provided for the DDC controls option that indicates the indoor blower assembly needs to be serviced.

Compressor Current Sensor

The compressor current sensor indicates when the compressor is operational by measuring amp draw. It is located inside the unit control panel. Relay contacts (NO) are provided to indicate the compressor is not operating. See Table 4 for low voltage connections for DDC control.

**TABLE 4
Low Voltage Connections for DDC Control**

	Standard Units	Units w/ Economizers
Fan Only	Energize G	Energize G
1st Stage Cooling Mode/ Balanced Climate	Energize Y1, G	Energize Y1, G (Free Cooling or Compressor Cooling)
2nd Stage Cooling Mode/ Rated Indoor Airflow	Energize Y2 to override Balanced Climate mode when Y1-Y2 jumper is removed	Energize Y1, Y2, G (Compressor Cooling)
1st Stage Heating	Energize B/W1	Energize B/W1
2nd Stage Heating (if employed)	Energize B/W1, W2	Energize B/W1, W2
Ventilation	Energize A	Energize A
Dehumidification (if employed)	Energize D	Energize D

**TABLE 5
Wall Thermostats**

Part Number	Predominate Features
8403-060 (1120-445)	3 Stage Cool; 3 Stage Heat – HP or Conventional; Programmable/Non-Programmable; Auto or Manual Changeover; Dehumidification Output
8403-089	1 Stage Cool, 1 Stage Heat – Conventional; Programmable/Non-Programmable; Auto or Manual Changeover
8403-090	2 Stage Cool, 3 Stage Heat – Heat Pump; 2 Stage Cool, 2 Stage Heat – Conventional; Programmable/Non-Programmable; Auto or Manual Changeover
8403-092	2 Stage Cool, 3 Stage Heat – Heat Pump; 2 Stage Cool, 2 Stage Heat – Conventional; Programmable/Non-Programmable; Auto or Manual Changeover; Wi-Fi
8403-095	1 Stage Cool, 2 Stage Heat – Conventional; Programmable/Non-Programmable; Auto or Manual Changeover

TABLE 6
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

TABLE 7
Humidity Controls

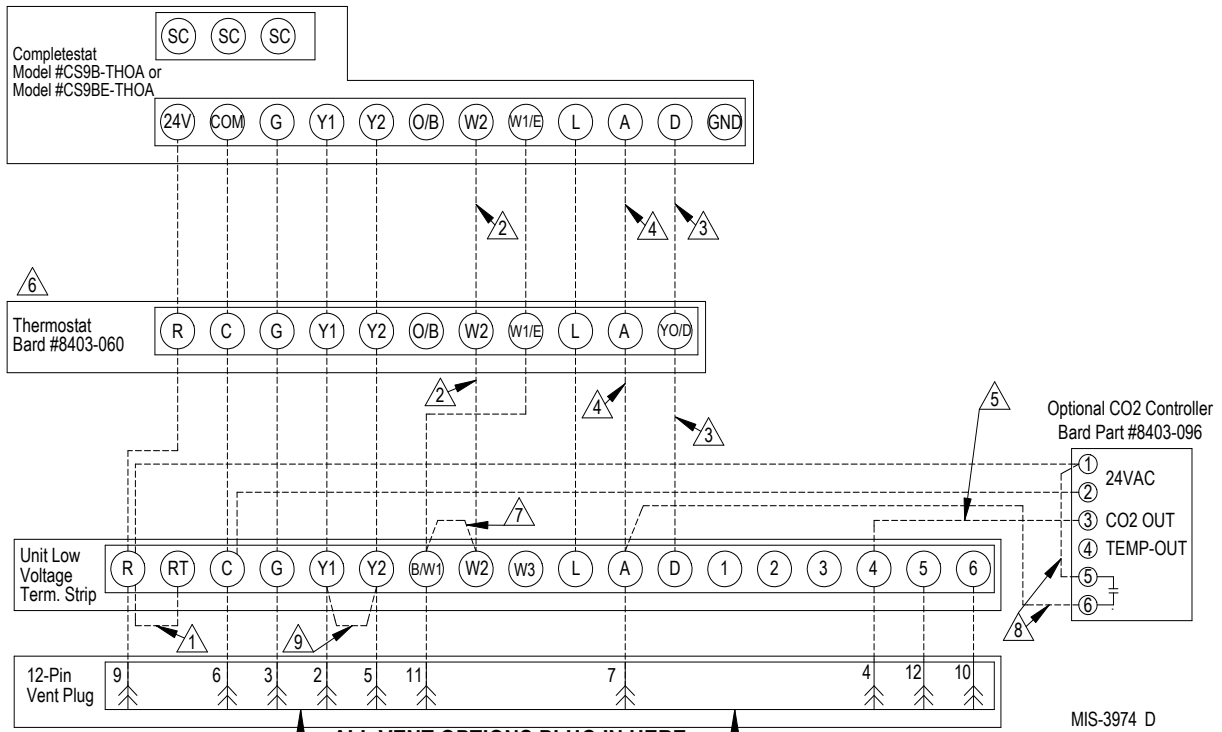
Part Number	Predominate Features
8403-100* (H6062A1000)	Electronic humidistat DPST Humidity range 10-90% with adjustable stops
8403-047 (H200-10-21-10)	Electronic dehumidistat SPST, closes-on-rise Humidity range 10-90% with adjustable stops

* If using 8403-100 humidistat, it must be configured for dehumidification in the Setup menu.

TABLE 8
CO₂ Controllers

Part Number	Predominate Features
8403-056	CO ₂ ventilation control with digital display. Normally Open SPST (Default: Close at 800ppm)
8403-096	Normally Open SPST relay, closes-on-rise 24V Dual wave length sensor Default setting 950ppm, adjustable to 0-2000ppm Default off setting 1000ppm, adjustable to 0-200 ppm, can be calibrated

FIGURE 8
Programmable Thermostat Connections

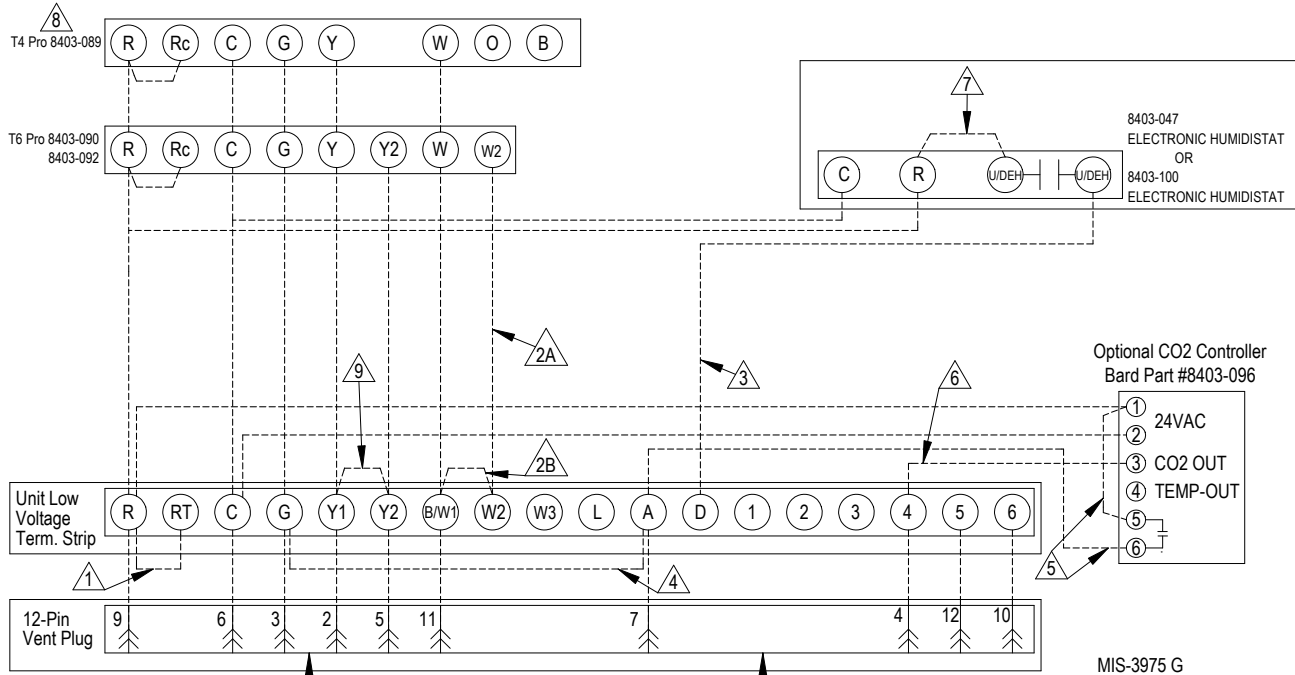


MIS-3974 D

If not equipped with a ventilation option to plug in, a jumper plug must be installed.

- | | |
|---|--|
| <ul style="list-style-type: none"> ① Factory installed jumper. Remove jumper and connect to N.C fire alarm circuit if emergency shutdown required. ② Wire not needed below 15KW. ③ Wire required for dehumidification models only. ④ Do not connect "A" from thermostat if optional CO2 controller is used ⑤ 0-10 VDC modulating CO2 control signal for modulating ventilation control (optional for ECON only - see vent instruction manuals) | <ul style="list-style-type: none"> ⑥ Change model configuration from heat pump to heat/cool. Must be configured to programmable and fan set to be programmed fan for the "A" output to function during scheduled occupied periods. Must be configured for multi-stage for Y1 output to be active 1st stage cooling. For dehumidification, must be configured for "No Economizer" for YO/D to be active for humidity control. ⑦ Install jumper for 1 stage electric heat on units with more than 10KW ⑧ Do not add these wires if setting up for modulating control. See note 5. ⑨ Factory installed jumper. Remove jumper to activate Balanced Climate™ mode. A 2-stage thermostat is recommended for Balanced Climate mode. |
|---|--|

FIGURE 9
Thermostat Connections



ALL VENT OPTIONS PLUG IN HERE

If not equipped with a ventilation option to plug in, a jumper plug must be installed.

- ⚠️ FACTORY INSTALLED JUMPER. REMOVE JUMPER AND CONNECT TO N.C FIRE ALARM CIRCUIT IF EMERGENCY SHUTDOWN REQUIRED.
- ⚠️ WIRE NOT NEEDED BELOW 15KW.
- ⚠️ INSTALL JUMPER FOR 1 STAGE ELECTRIC HEAT ON UNITS WITH MORE THAN 10KW.
- ⚠️ WIRE REQUIRED FOR DEHUMIDIFICATION MODELS ONLY.
- ⚠️ FOR VENT OPERATION, ADD JUMPER IF OPTIONAL CO2 CONTROLLER IS NOT USED. VENT WILL RUN WHILE BLOWER IS ENERGIZED.
- ⚠️ FOR ECON & CRV-V AN ADDITIONAL WIRE CHANGE IS REQUIRED SEE INSTALL MANUAL.
- ⚠️ DO NOT ADD THESE WIRES IF SETTING UP FOR MODULATING CONTROL. SEE NOTE 6.
- ⚠️ 0-10 VDC MODULATING CO2 CONTROL SIGNAL FOR MODULATING VENTILATION CONTROL (OPTIONAL FOR ECON ONLY) - SEE VENT INSTALLATION MANUAL.
- ⚠️ JUMPER NEEDS ADDED.
- ⚠️ THERMOSTAT WILL NOT WORK WITH UNITS EQUIPPED WITH ECONOMIZERS UNLESS CO2 CONTROLLER IS USED.
- ⚠️ FACTORY INSTALLED JUMPER. REMOVE JUMPER TO ACTIVATE BALANCED CLIMATE™ MODE. A 2-STAGE THERMOSTAT IS RECOMMENDED FOR BALANCED CLIMATE MODE. Y1 Y2 JUMPER NOT PRESENT IF ECONOMIZER IS FACTORY INSTALLED. UNITS WITH ECONOMIZERS HAVE BALANCED CLIMATE JUMPER IN ECONOMIZER, REFER TO ECONOMIZER MANUAL.
- ⚠️ HUMIDISTAT 8403-100 WILL NEED TO BE CONFIGURED FOR DEHUMIDIFICATION IN THE MENU. SEE USER'S MANUAL.

NOTICE

These units require R-410A refrigerant and polyol ester oil.

General

1. Use separate service equipment to avoid cross contamination of oil and refrigerants.
2. Use recovery equipment rated for R-410A refrigerant.
3. Use manifold gauges rated for R-410A (800 psi/250 psi low).
4. R-410A is a binary blend of HFC-32 and HFC-125.
5. R-410A is nearly azeotropic—similar to R-22 and R-12. Although nearly azeotropic, charge with liquid refrigerant.
6. R-410A operates at 40-70% higher pressure than R-22 and systems designed for R-22 cannot withstand this higher pressure.
7. R-410A has an ozone depletion potential of zero, but must be reclaimed due to its global warming potential.
8. R-410A compressors use polyol ester oil.
9. Polyol ester oil is hygroscopic; it will rapidly absorb moisture and strongly hold this moisture in the oil.
10. A liquid line dryer must be used—even a deep vacuum will not separate moisture from the oil.
11. Limit atmospheric exposure to 15 minutes.
12. If compressor removal is necessary, always plug compressor immediately after removal. Purge with small amount of nitrogen when inserting plugs.

Topping Off System Charge

If a leak has occurred in the system, Bard Manufacturing recommends reclaiming, evacuating (see criteria above) and charging to the nameplate charge. If done correctly, topping off the system charge can be done without problems.

With R-410A, there are no significant changes in the refrigerant composition during multiple leaks and recharges. R-410A refrigerant is close to being an azeotropic blend (it behaves like a pure compound or single component refrigerant). The remaining refrigerant charge, in the system, may be used after leaks have occurred and then “top-off” the charge by utilizing the pressure charts on the inner control panel cover as a guideline.

REMEMBER: When adding R-410A refrigerant, it must come out of the charging cylinder/tank as a liquid to avoid any fractionation, and to ensure optimal system performance. Refer to instructions for the cylinder that is being utilized for proper method of liquid extraction.

Safety Practices

1. Never mix R-410A with other refrigerants.
2. Use gloves and safety glasses. Polyol ester oils can be irritating to the skin, and liquid refrigerant will freeze the skin.
3. Never use air and R-410A to leak check; the mixture may become flammable.
4. Do not inhale R-410A—the vapor attacks the nervous system, creating dizziness, loss of coordination and slurred speech. Cardiac irregularities, unconsciousness and ultimate death can result from breathing this concentration.
5. Do not burn R-410A. This decomposition produces hazardous vapors. Evacuate the area if exposed.
6. Use only cylinders rated DOT4BA/4BW 400.
7. Never fill cylinders over 80% of total capacity.
8. Store cylinders in a cool area, out of direct sunlight.
9. Never heat cylinders above 125°F.
10. Never trap liquid R-410A in manifold sets, gauge lines or cylinders. R-410A expands significantly at warmer temperatures. Once a cylinder or line is full of liquid, any further rise in temperature will cause it to burst.

Important Installer Note

For improved start up performance, wash the indoor coil with a dishwashing detergent.

High Pressure Switch

All W**A/W**L wall-mounted air conditioner series models are supplied with a remote reset for the high and low pressure switch. If tripped, the pressure switch may be reset by turning the thermostat off then back on again. High pressure switch settings: Opens 650 +/- 15 PSI, Closes 520 +/- 15 PSI.

Three Phase Scroll Compressor Start Up Information

Scroll compressors, like several other types of compressors, will only compress in one rotational direction. Direction of rotation is not an issue with single phase compressors since they will always start and run in the proper direction.

However, three phase compressors will rotate in either direction depending upon phasing of the power. Since there is a 50-50 chance of connecting power in such a way as to cause rotation in the reverse direction, verification of proper rotation must be made. Verification of proper rotation direction is made by observing that suction pressure drops and discharge pressure rises when the compressor is energized. Reverse rotation also results in an elevated sound level over that with correct rotation, as well as substantially reduced current draw compared to tabulated values.

Verification of **proper rotation** must be made at the time the equipment is put into service. If improper rotation is corrected at this time, there will be no negative impact on the durability of the compressor. However, reverse operation for over 1 hour may have a negative impact on the bearing due to oil pump out.

NOTE: *If compressor is allowed to run in reverse rotation for an extended period of time, the compressor's internal protector will trip.*

All three phase compressors are wired identically internally. As a result, once the correct phasing is determined for a specific system or installation, connecting properly phased power leads to the same Fusite terminal should maintain proper rotation direction.

The direction of rotation of the compressor may be changed by reversing any two line connections to the unit.

Phase Monitor

All units with three phase scroll compressors are equipped with a three phase line monitor to prevent compressor damage due to phase reversal.

The phase monitor in this unit is equipped with two LEDs. If the Y signal (call for cooling) is present at the phase monitor and phases are correct, the green LED will light.

If phases are reversed, the red fault LED will be lit and compressor operation is inhibited.

If a fault condition occurs, reverse two of the supply leads to the unit. **Do not reverse any of the unit factory wires as damage may occur.**

Condenser Fan Operation

NOTE: *Certain models may be equipped with a low ambient control (LAC), and if so, the condenser fan motor will have a delayed start until system refrigerant operating pressure builds up. After starting, the fan motor may or may not cycle depending upon ambient conditions. This is normal operation.*

50 Hz models must have fan wired on low speed. These models are factory wired on low speed.

Service Hints

1. Caution owner/operator to maintain clean air filters at all times and also not to needlessly close off supply and return air registers. This reduces airflow through the system, which shortens equipment service life as well as increasing operating costs.
2. Check all power fuses or circuit breakers to be sure they are the correct rating.
3. Periodic cleaning of the outdoor coil to permit full and unrestricted airflow circulation is essential.

Sequence of Operation

Circuit R-Y1 makes at thermostat pulling in compressor contactor, starting the compressor and outdoor motor. (See **NOTE** under **Condenser Fan Operation** concerning models equipped with low ambient control.) The G (indoor motor) circuit is automatically completed by the thermostat on any call for cooling operation or can be energized by manual fan switch on subbase for constant air circulation. On a call for heating, circuit R-W1 makes at the thermostat pulling in heat contactor for the strip heat and blower operation. On a call for second stage heat, R-W2 makes bringing on second heat contactor, if so equipped.

Balanced Climate™ Mode

Balanced Climate™ is a great comfort feature that can easily be applied under any normal circumstances. If the Bard air conditioning system is being set up in a typical environment where 72°F is the lowest cooling setpoint, remove the Y1/Y2 jumper and install a 2-stage cooling thermostat. This will increase the humidity removal up to 35% and provide a much more comfortable environment.

NOTE: *Units with mechanical dehumidification require an additional connection to be made when enabling Balanced Climate. Refer to dehumidification supplemental instructions for this step.*

If the application is likely to require air conditioning operation below 60°F outdoor conditions, a low ambient control (LAC) kit must be installed. The LAC kit is equipped with an outdoor temperature switch that disables Balanced Climate mode when the outdoor temperature drops below 50°F. This prevents potential evaporator coil freeze up issues. The LAC kit also comes with an evaporator freeze protection thermostat that cuts out the compressor if the evaporator begins to freeze up.

If the unit is being installed with any ventilation package, a Bard LAC kit must be installed. Failure to utilize an LAC with any air conditioner can cause coil freeze up.

Balanced Climate can readily be applied to duct-free (supply and return air grille) applications. It may also be applied to ducted applications with **limited static of 0.20" ESP (total including both supply and return**

statics). Consult Bard Application Engineering for details prior to implementation.

CAUTION: *Balanced Climate is not a replacement for a dehumidification (hot gas reheat) unit for extreme applications, but rather an enhancement feature for limited climates and applications.*

Vent Connection Plug

All units are equipped with a vent connection plug in the side of the control panel for the different ventilation packages to plug in to. If the compressor will not start and there is no "Y1" at the compressor control module, first check to make sure that either the optional vent is plugged into the vent connection plug or the supplied jumper plug is in place. **The unit will not operate without anything plugged in.** This plug is located on the side of the control panel behind the front vent door (behind the filter access door). If the unit is supplied with a factory-installed vent package, it will be plugged in but the jumper plug will also be tethered next to the connection for troubleshooting purposes, if necessary.

Compressor Control Module

The compressor control module (CCM) is standard on all models covered by this manual.

Features

- Delay-on-Make Timer
- Short Cycle Protection/Delay-on-Break
- Low Pressure Detection
- High Pressure Detection
- LPC and HPC Status LEDs
- Test Mode
- Brownout Protection with Adjustment

Delay-on-Make Timer

A delay-on-make timer is included to be able to delay startup of the compressor. This is desired when more than one unit is on a structure so that all of the units do not start at the same time which could happen after a power loss or building shutdown. The delay-on-make time period is 2 minutes plus 10% of the delay-on-break time period. To ensure that all of the units do not start at the same time, adjust the delay-on-break timer on each unit to a slightly different delay time.

Short Cycle Protection/Delay-on-Break

An anti-short cycle timer is included to prevent short cycling the compressor. This is adjustable from 30 seconds to 5 minutes via the adjustment knob (see Figure 10 on page 32). Once a compressor call is lost, the time period must expire before a new call will be initiated.

Low Pressure Detection

Low pressure switch monitoring allows for a lockout condition in a situation where the switch is open. If the low pressure switch remains open for more than 2 minutes, the CCM will de-energize the compressor

for the delay-on-break time. If the switch closes again, it will then restart the compressor. If the switch trips again during the same Y call, the compressor will be de-energized and the alarm terminal will be energized indicating an alarm. The blue LED will light and stay on until power is cycled to the control or a loss of voltage is present at Y terminal for more than ½ second.

High Pressure Detection

High pressure switch monitoring allows for a lockout condition in a situation where the switch is open. If the high pressure switch opens, the CCM will de-energize the compressor. If the switch closes again, it will then restart the compressor after the delay-on-break setting has expired on the device. If the switch trips again during the same thermostat call, the compressor will be de-energized and the alarm terminal will be energized indicating an alarm. The red LED will light and stay on until power is cycled to the control or a loss of voltage is present at Y terminal for more than ½ second.

Test Mode

By rapidly rotating the potentiometer (POT) clockwise (see Figure 10), all timing functions will be removed for testing.

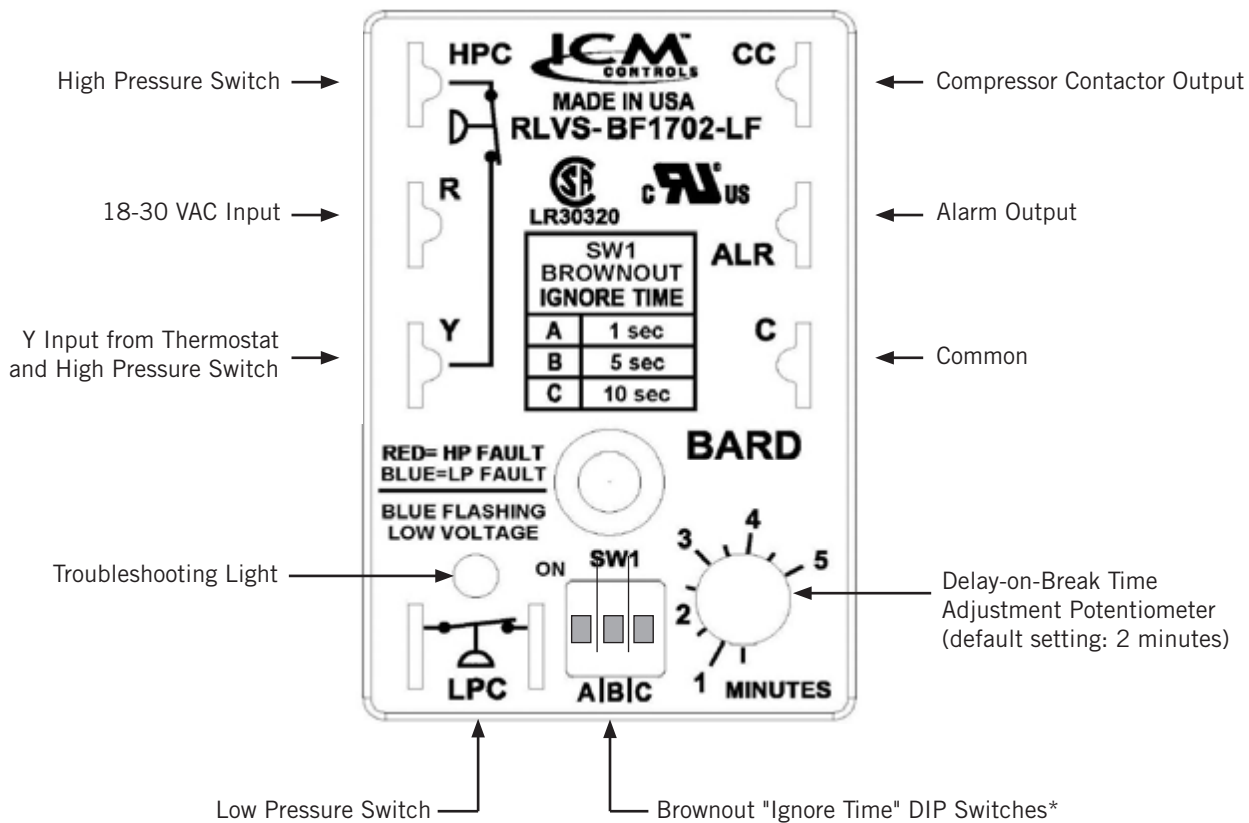
The conditions needed for the unit to enter test mode are as follows: POT must start at a time less than or equal to the 40 second mark. The POT must then be rapidly rotated to a position greater than or equal to the 280 second mark in less than ¼ second. Normal operation will resume after power is reset or after the unit has been in test mode for at least 5 minutes.

Brownout Protection with Adjustment

Brownout protection may be necessary if the utility power or generator power has inadequate power to prevent the voltage from dropping when the compressor starts. This is rare but can happen if the generator is undersized at the site or if the site is in a remote location far from the main power grid. Under normal circumstances, allowing the brownout to be ignored for a time period should not be needed. The CCM is shipped with all the DIP switches in the 'off' or 'do not ignore' position (see Figure 10).

If ignoring the brownout is needed because of the above conditions, three preset timers can be set by DIP switches in order to delay signaling a power brownout for a specific length of time after compressor contactor is energized. This allows the compressor a time period to start even if the voltage has dropped and allows the voltage to recover. This delay only happens when the CC terminal energizes. The delay can be set to 1 second ("A" DIP switch), 5 seconds ("B" DIP switch) or 10 seconds ("C" DIP switch); time is not cumulative—only the longest setting will apply. If the voltage recovers during the brownout delay period, the compressor will continue running.

FIGURE 10
Compressor Control Module



* Turn on only one switch for that specific "Ignore Time" setting. 10 seconds is the maximum brownout "Ignore Time". If all switches are "off", the control is in "do not ignore".

If a brownout condition is detected by the CCM at any point while there is a cooling call or power is on at Y, the troubleshooting light will flash blue. The light will continue to flash until the cooling call is satisfied or power is removed from the Y terminal. This condition does not prevent operation; it only indicates that a brownout condition was present at some point during the call. If a brownout condition is detected while CC has an output, CC will be de-energized and will retry after the delay-on-break timer is satisfied, honoring any DIP switch timer chosen when the CC output is re-energized; this process will continue until call is satisfied.

If inadequate utility or generator power continues after the delay-on-make or delay-on-break timer is fulfilled, the CC output will not energize. This could lead to the compressor never starting. The control will see the brownout immediately and not start.

A common scenario and one that has been seen in the field is when a unit or units switch from utility power to generator power. With slower transfer switches, the time delay between the utility power and generator power didn't cause a problem. The units lost power, shut off

and came back on line normally. With the introduction of almost instantaneous transfer switches, the power glitch may be enough that the compressor will start to run backwards.

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 pages 36 and 37. It is imperative to match the correct pressure table to the unit by model number.

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.

Troubleshooting Nidec SelecTech Series ECM Motors

If the Motor Is Running

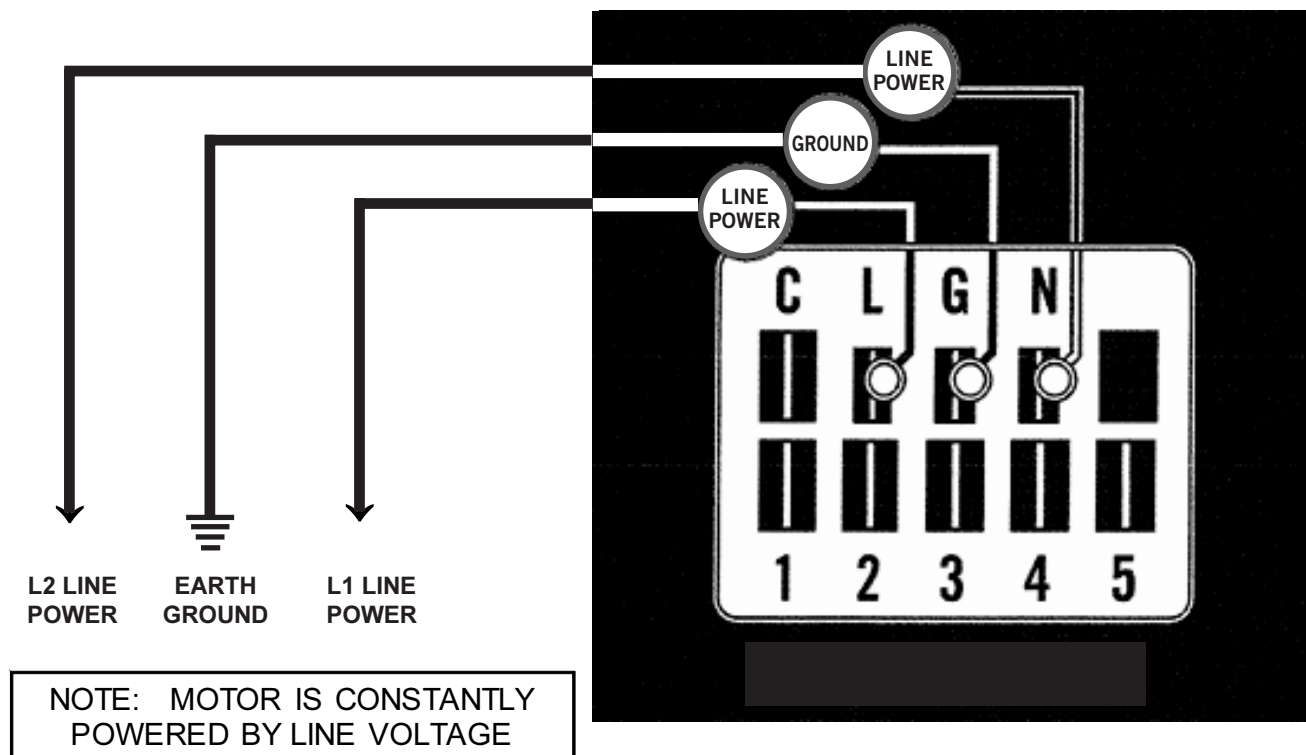
1. It is normal for the motor to rock back and forth on start up. Do not replace the motor if this is the only problem identified.
2. If the system is excessively noisy, does not appear to change speeds in response to a demand (Heat, Cool, Other) or is having symptoms during the cycle such as tripping limit or freezing coil, check the following:
 - A. Wait for programmed delays to time out.
 - B. Ensure that the motors control inputs are wired as shown in the factory-supplied wiring diagram to ensure motor is getting proper control signals and sequencing.
 - C. Remove the filter and check that all dampers, registers and grilles are open and free flowing. If removing the filters corrects the problem, clean or replace with a less restrictive filter. Also check and clean the blower wheel or coil as necessary.

- D. Check the external static pressure (total of both supply and return) to ensure it is within the range as listed on the unit serial plate. If higher than allowed, additional duct work is needed.
- E. If the motor does not shut off at the end of the cycle, wait for any programmed delays to time out (no more than 90 seconds). Also make sure that there is no call for "Continuous Fan" on the G terminal.
- F. If the above diagnostics do not solve the problem, confirm the voltage checks in the next section below, then continue with the **Model SelecTech Communication Diagnostics**.

If the Motor Is Not Running

1. Check for proper high voltage and ground at the L/L1, G, N/L2 connections at the motor (see Figure 11). Correct any voltage issues before proceeding to the next step. The SelecTech motor is voltage specific. Only the correct voltage should be applied to the proper motor. Input voltage within plus or minus 10% of the nominal line power VAC is acceptable.

**FIGURE 11
Motor Connections**



- If the motor has proper high voltage and ground at the L/L1, G, N/L2 connections, then continue with the **Model SelecTech Communication Diagnostics**.

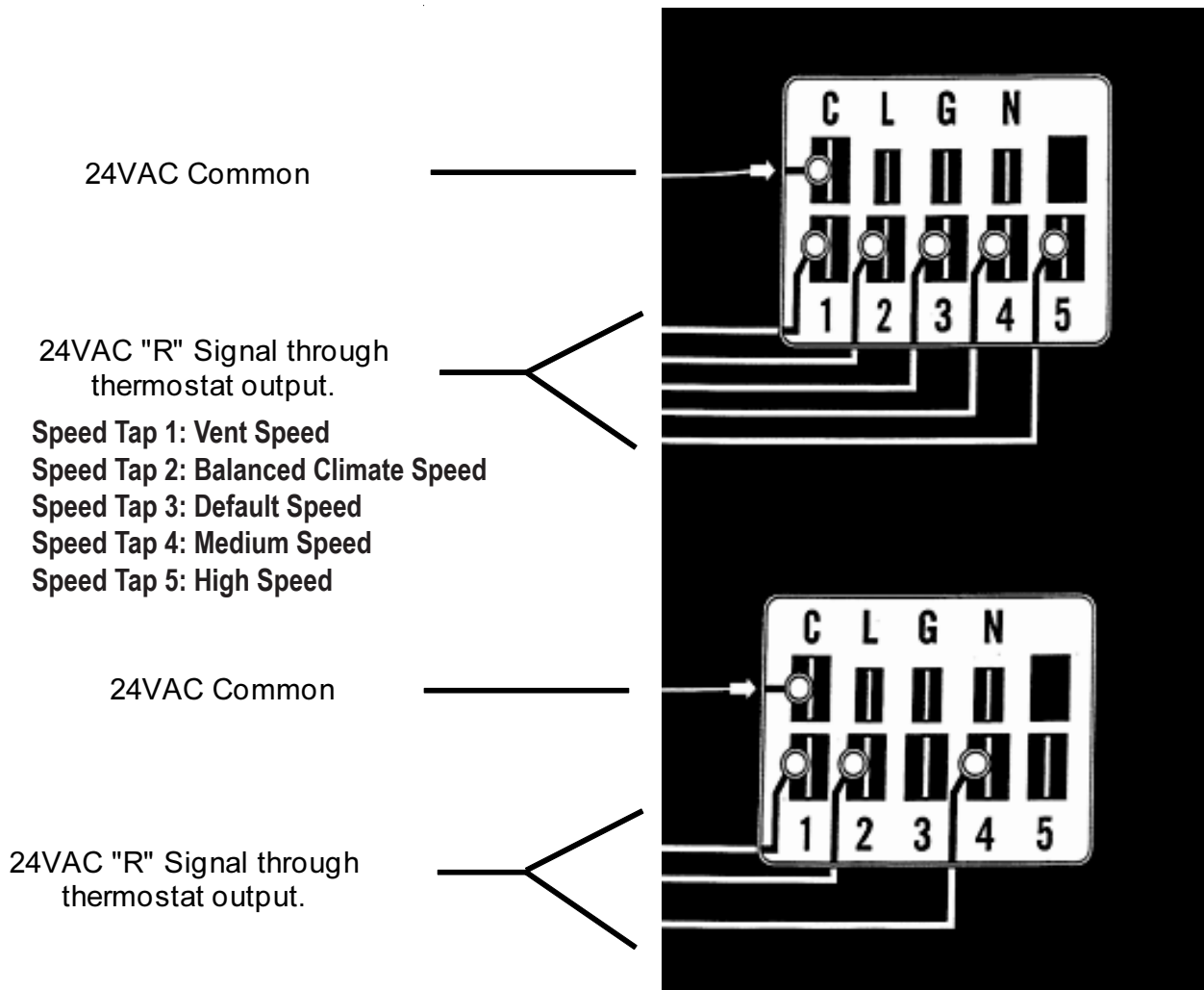
Model SelecTech Communication Diagnostics

The SelecTech motor is communicated through 24 VAC low voltage (thermostat control circuit wiring).

- Start with unit wiring diagram to confirm proper connections and voltage (see Figure 12).
- Initiate a demand from the thermostat and check the voltage between the common and the appropriate motor terminal (1-5). (G input is typically on terminal #1, but always refer to wiring diagram.)

- If the low voltage communication is not present, check the demand from the thermostat. Also check the output terminal and wire(s) from the terminal strip or control relay(s) to the motor.
- If the motor has proper high voltage (verified in Step 1 of **If the Motor Is Not Running** on page 33), proper low voltage to a programmed terminal and is not operating, the motor is failed and will require replacement.

FIGURE 12
Motor Connections



Fan Blade Setting Dimensions

Shown in Figure 13 is the correct fan blade setting for proper air delivery across the outdoor coil. Refer to Table 9 for unit specific dimension.

Any service work requiring removal or adjustment in the fan and/or motor area will require that the dimensions below be checked and blade adjusted in or out on the motor shaft accordingly.

FIGURE 13
Fan Blade Setting

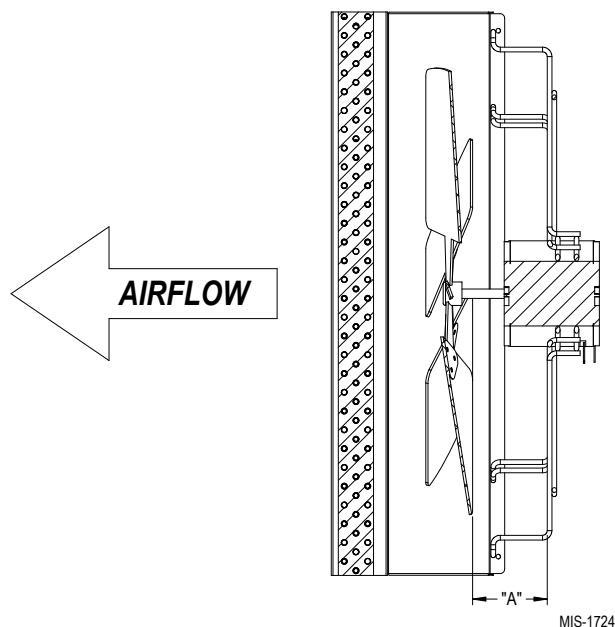


TABLE 9
Fan Blade Dimensions

Model	Dimension A
W18AY/W18LY W24AY/W24LY	1.00"
W30AY/W30LY W36AY/W36LY	1.25"

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 following pressure table shows 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.

Removal of Fan Shroud

1. Disconnect all power to the unit.
2. Remove the screws holding both grilles, one on each side of unit, and remove grilles.
3. Remove nine screws holding fan shroud to condenser and bottom.
4. Unwire condenser fan motor.
5. Slide complete motor, fan blade and shroud assembly out the left side of the unit.
6. Service motor/fan as needed.
7. Reverse steps to reinstall.

TABLE 10
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	131
W18A/L	75/62	Low Side	120	122	126	129	132	134	137	138	139	141	142	144
		High Side	296	318	340	364	388	413	440	466	494	524	553	590
	80/67	Low Side	128	131	135	138	141	143	146	148	149	151	152	154
		High Side	304	326	349	373	398	424	451	478	507	537	567	605
	85/72	Low Side	132	136	140	143	146	148	151	153	154	156	157	159
		High Side	315	337	361	386	412	439	467	495	525	556	587	626
W24A/L	75/62	Low Side	123	125	127	129	132	134	136	137	139	141	143	146
		High Side	302	323	344	367	391	415	441	467	494	523	552	589
	80/67	Low Side	132	134	136	138	141	143	145	147	149	151	153	156
		High Side	310	331	353	376	401	426	452	479	507	536	566	604
	85/72	Low Side	137	139	141	143	146	148	150	152	154	156	158	161
		High Side	321	343	365	389	415	441	468	496	525	555	586	625
W30A/L	75/62	Low Side	122	124	126	129	131	133	135	137	138	140	142	143
		High Side	317	337	360	383	409	435	462	490	520	551	583	622
	80/67	Low Side	130	133	135	138	140	142	144	146	148	150	152	153
		High Side	325	346	369	393	419	446	474	503	533	565	598	638
	85/72	Low Side	135	138	140	143	145	147	149	151	153	155	157	--*
		High Side	336	358	382	407	434	462	491	521	552	585	619	--*
W36A/L	75/62	Low Side	128	130	132	133	135	137	138	140	142	144	146	148
		High Side	318	339	362	385	410	436	463	491	521	552	583	623
	80/67	Low Side	137	139	141	142	144	146	148	150	152	154	156	158
		High Side	326	348	371	395	421	447	475	504	534	566	598	639
	85/72	Low Side	142	144	146	147	149	151	153	155	157	159	161	--*
		High Side	337	360	384	409	436	463	492	522	553	586	619	--*

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.

NOTE: Pressure table based on high speed condenser fan operation. If condensing pressures appear elevated check condenser fan wiring. See **Condenser Fan Operation** on page 30.

* Operating at these conditions would be outside the compressor operating envelope and is not recommended.

TABLE 11
Cooling Pressure – Balanced Climate 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	131
W18A/L	75/62	Low Side	117	119	121	122	124	126	129	131	133	135	137	139
		High Side	295	317	338	362	385	410	436	463	491	520	550	587
	80/67	Low Side	125	127	129	131	133	135	138	140	142	144	146	149
		High Side	303	325	347	371	395	421	447	475	504	533	564	602
	85/72	Low Side	129	131	134	136	138	140	143	145	147	149	151	154
		High Side	314	336	359	384	409	436	463	492	522	552	584	623
W24A/L	75/62	Low Side	116	118	120	122	123	125	128	130	132	135	137	139
		High Side	296	318	339	362	385	410	434	460	488	515	544	579
	80/67	Low Side	124	126	128	130	132	134	137	139	141	144	146	149
		High Side	304	326	348	371	395	420	445	472	500	528	558	594
	85/72	Low Side	128	130	132	135	137	139	142	144	146	149	151	154
		High Side	315	337	360	384	409	435	461	489	518	546	578	615
W30A/L	75/62	Low Side	117	120	122	124	126	128	130	132	134	135	137	138
		High Side	312	334	357	381	406	432	458	486	514	543	572	609
	80/67	Low Side	125	128	130	133	135	137	139	141	143	144	146	148
		High Side	320	343	366	391	416	443	470	498	527	557	587	625
	85/72	Low Side	129	132	135	138	140	142	144	146	148	149	151	153
		High Side	331	355	379	405	431	459	486	515	545	576	608	647
W36A/L	75/62	Low Side	120	122	123	124	126	128	130	132	135	137	138	141
		High Side	312	332	354	377	402	427	454	483	513	543	576	616
	80/67	Low Side	128	130	132	133	135	137	139	141	144	146	148	151
		High Side	320	341	363	387	412	438	466	495	526	557	591	632
	85/72	Low Side	132	135	137	138	140	142	144	146	149	151	153	156
		High Side	331	353	376	401	426	453	482	512	544	576	612	654

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

Tables are based upon Balanced Climate 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.

NOTE: Pressure table based on high speed condenser fan operation. If condensing pressures appear elevated check condenser fan wiring. See **Condenser Fan Operation** on page 30.

TABLE 12
Electrical Specifications – WAY Series**

Model	Rated Volts & 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	
					Ckt. A	Ckt. B	Ckt. A	Ckt. B
W18AY-A00, A0Z A05 A08 A10	230/208-1	1 1 1 1	16 30 46 56	20 30 50 60				
W24AY-A00, A0Z A05 A08 A10	230/208-1	1 1 1 1	21 31 47 57	25 35 50 60				
W24AY-B00, B0Z B05	230/208-3	1 1	15 20	20 20				
W24AY-C00, C0Z C05	460-3	1 1	7 10	15 15				
W30AY-A00, A0Z A05 A10 A15	230/208-1	1 1 1 1 or 2	23 31 57 83	30 35 60 90	57	26	60	30
W30AY-B00, B0Z B05 B09 B15	230/208-3	1 1 1 1	17 20 32 50	20 20 35 50				
W30AY-C00, C0Z C05 C09 C15	460-3	1 1 1 1	8 10 16 25	15 15 20 25				
W36AY-A00, A0Z A05 A10 A15	230/208-1	1 1 1 1 or 2	28 33 59 85	35 35 60 90	59	26	60	30
W36AY-B00, B0Z B05 B09 B15	230/208-3	1 1 1 1	20 22 34 52	25 25 35 60				
W36AY-C00, C0Z C05 C09 C15	460-3	1 1 1 1	11 11 17 26	15 15 20 30				
W36AYRC00, RC0Z RC05 RC09 RC15	460-3	1 1 1 1	11 11 17 26	15 15 20 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.

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 13
Electrical Specifications – WLY Series**

Model	Rated Volts & 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	
					Ckt. A	Ckt. B	Ckt. A	Ckt. B
W18LY-A0Z A05 A10	230/208-1	1 1 1	16 30 56	20 30 60				
W24LY-A0Z A05 A10	230/208-1	1 1 1	21 31 57	25 35 60				
W24LY-B0Z B05	230/208-3	1 1	15 20	20 20				
W30LY-A0Z A05 A10 A15	230/208-1	1 1 1 1 or 2	23 31 57 83	30 35 60 90	57	26	60	30
W30LY-B0Z B09 B15	230/208-3	1 1 1	17 32 50	20 35 50				
W30LY-C0Z C09 C15	460-3	1 1 1	8 16 25	15 20 25				
W36LY-A0Z A05 A10 A15	230/208-1	1 1 1 1 or 2	28 33 59 85	35 35 60 90	59	26	60	30
W36LY-B0Z B09 B15	230/208-3	1 1 1	20 34 52	25 35 60				
W36LY-C0Z C09 C15	460-3	1 1 1	11 17 26	15 20 30				
W36LYRC0Z RC09 RC15	460-3	1 1 1	11 17 26	15 20 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.

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.

Setting Unit Airflow

The unit is set from the factory at the default speed. Most units have three selectable cooling speed taps that can be utilized. The default speed is the lowest cooling speed. The two higher speed taps can be used for higher duct static applications so that the unit can maintain the recommended airflow as shown in Table 14. The higher speeds can also be used when higher sensible cooling is desired. To change to the higher speed taps, move the orange/black wire on the blower speed terminal block to either MED or HI. Refer to Table 16 on page 36 for the corresponding airflow of each tap. Set the unit duct static based on the highest airflow that the unit will run at.

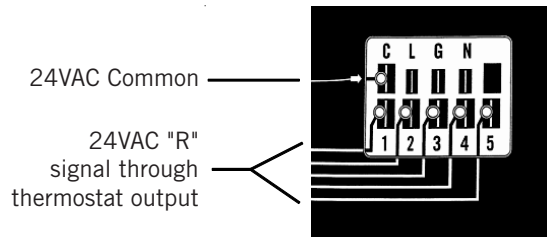
NOTE: Be sure to adjust the system static or blower speed to maintain airflows above the minimum recommendations to prevent freeze up conditions if Balanced Climate mode is activated.

Do not operate the unit in Balanced Climate mode if running high static applications as indicated in the blower performance table. If Balanced Climate mode is activated as described on page 24, the unit will run in this mode at all times unless there is a call for ventilation, electric heat or 2nd stage cooling from a 2-stage thermostat. At that time, the unit will automatically activate a higher speed tap.

Blower Speeds

Five factory programmed speed taps (torque settings) are available for the motor, and are selected through different unit modes of operation. These modes are energized by 24VAC signals from the low voltage terminal block located inside the control panel by a thermostat or other controlling device. Each speed tap is programmed by Bard at the factory to different motor torque settings (see Figure 14).

FIGURE 14
Speed Taps



- Speed Tap 1: Vent Speed
- Speed Tap 2: Balanced Climate Speed
- Speed Tap 3: Default Speed
- Speed Tap 4: Medium Speed
- Speed Tap 5: High Speed

Multiple motor speed taps may be energized simultaneously by 24VAC power during different modes of operation. The highest number speed tap energized takes priority with 5 being the highest and 1 being the lowest. See Table 15 for the corresponding blower speeds with the different modes of operation.

Programmed blower speed taps are as follows (see also Figure 15):

Speed Tap 1: **Vent/blower only** speed

Speed Tap 2: **Balanced Climate** speed

Speed Tap 3: **Default LO cooling & heating** speed. Energized by default for cooling operation through the blower speed tap selection and is labeled as LO.

Speed Tap 4: **Optional MED Cooling & heating** speed. Selected manually through the blower speed tap selection and is labeled as MED.

Speed Tap 5: **Optional HI cooling & heating** speed. Selected manually through the blower speed tap selection and is labeled as HI.

TABLE 14
Recommended Airflow

Model	Nominal Rated CFM*	Nominal Rated ESP*	Recommended Airflow Range	Factory Speed Connection
W18A W18L	600	.10	550 - 725	Default
W24A W24L	800	.10	700 - 950	Default
W30A W30L	950	.15	900 - 1125	Default
W36A W36L	1150	.15	1000 - 1200	Default

* Rated CFM and ESP on factory speed connection.

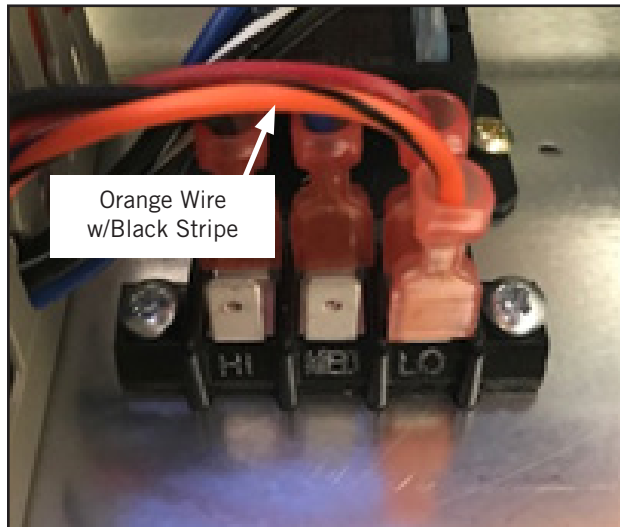
TABLE 15
Blower Speeds for Unit Operational Modes

Unit Operation	Thermostat Inputs – 24VAC							Speed Taps			Blower Speed	Compressor Operation
	G	Y1	Y2	W1	W2	A	D	1	2	3-4-5 ¹		
Blower Only	X							X			Vent/Blower Only	Off
Balanced Climate Cooling	X	X						X	X		Balanced Climate	On
Full Load Cool	X	X	X					X	X	X	Lo/Med/Hi	On
1st Stage Heat				X						X	Lo/Med/Hi	Off
2nd Stage Heat				X	X					X	Lo/Med/Hi	Off
Dehumidify ²							X	X	X		Balanced Climate	On

¹ Fan speed is selectable through the blower speed control terminal block. LO (default), MED or HI speeds can be used.

² Dehumidification operation is disabled when a call for heating or cooling occurs. Unit runs at Balanced Climate speed during dehumidification operation.

FIGURE 15
Speed Taps



Speed Tap 1 – Vent/Blower Only

Speed taps 1 and 3 are programmed to identical torque settings in the ECM motor. This means that if speed tap 1 is energized, the airflow amount will be the same as default airflow. Tap 1 is used when a vent is installed and ventilation is called for by energizing the A terminal of the low voltage terminal block with 24VAC. Speed tap 1 is the lowest priority; if any of the other speed taps are energized, they will override speed tap 1.

Speed Tap 2 – Balanced Climate

Speed tap 2 is programmed to a lower than rated speed in the ECM motor. In order for Balanced Climate speed to be used during compressor cooling mode, the jumper between Y1 and Y2 must be removed. This

means that if speed tap 2 is energized, the airflow amount will be lower than default airflow. Tap 2 is used when Balanced Climate is called for by energizing the Y1 terminal of the low voltage terminal block with 24VAC. Speed tap 2 is overridden if taps 3, 4, or 5 are energized.

Speed Tap 3 – Default LO Cooling & Heating

Speed tap 3 is programmed for rated speed in the SelecTech motor. This means that if speed tap 3 is energized, the airflow amount will be the default airflow. Tap 3 is used by default when cooling is called for by energizing the Y1 terminal of the low voltage terminal block with 24VAC. The unit is shipped with the jumper between Y1 and Y2 installed and it must be removed to use Balanced Climate mode. The unit is shipped with the orange/black wire connected to terminal LO (rated speed) on the blower selection speed terminal block. Speed tap 3 can be overridden if taps 4 or 5 are energized by changing the position of the orange/black wire on the blower selection speed terminal block to MED (4) or HI (5) positions.

Speed Tap 4 – Optional MED Cooling & Heating

Speed tap 4 is programmed to a higher than rated speed in the ECM motor. This is a user-selectable airflow amount that will be higher than rated airflow. Tap 4 is used for cooling operation if the orange/black wire on the blower speed selection terminal block is moved to MED. Speed tap 4 can be overridden if tap 5 is energized.

Speed Tap 5 – Optional HI Cooling & Heating

Speed tap 5 is programmed to the highest speed in the ECM motor. This is a user-selectable airflow amount that will provide the highest rated airflow. Tap 5 is used for cooling operation if the orange/black wire on the blower speed selection terminal block is moved to HI.

Dirty Filter Switch

1. Disconnect all power to the unit. Remove control panel outer cover and upper front panel.
2. The dirty filter switch is located on top of the filter partition to the right of the blower wheels on W**AB units and to the left of the blower wheels on W**LB units (see Figure 16). The dirty filter indicator light and reset switch is attached to the side of the control panel on the right side of the filter access opening on W**AB units and on the left side of the filter access opening on W**LB units. Remove the cover on the dirty filter switch and ensure the knob is set at 0.4" W.C. (see Figure 17). This is only a recommended starting point prior to making switch adjustments. Switch setting is highly dependent on filter type used, blower speed, unit ducting and other unit installation characteristics. See **Dirty Filter Switch Adjustment** for instructions on how to make proper switch adjustments.
3. Re-install upper front panel.

Dirty Filter Switch Adjustment

1. Apply power to the unit.
2. Turn the unit indoor blower on (energize R-G on low voltage terminal board).
3. With air filters installed and switch initially set at 0.4" W.C. (see Step 2 under **Dirty Filter Switch**), begin restricting the air filter of the unit using a piece of cardboard under the filters until the switch trips and the light comes on. If the filter is restricted by 75% (or desired restriction amount), skip to Step 6.
4. If switch setting adjustment is required, disconnect power to the unit. Remove the upper front panel and the cover on the airflow switch so that adjustment can be made. If the switch tripped before 75% restriction was reached, turn the knob slightly clockwise. If the switch tripped after 75%, turn the knob counter-clockwise (see Figure 17).
5. Replace the upper front panel and repeat Steps 1-3. Continue to make adjustments described in Step 4 until the desired restriction is obtained.
6. Remove the restriction and reset the filter switch. Replace the switch cover once adjustment is complete.
7. Install the outer control panel cover. This completes the adjustment.

FIGURE 16
Dirty Filter Switch Location

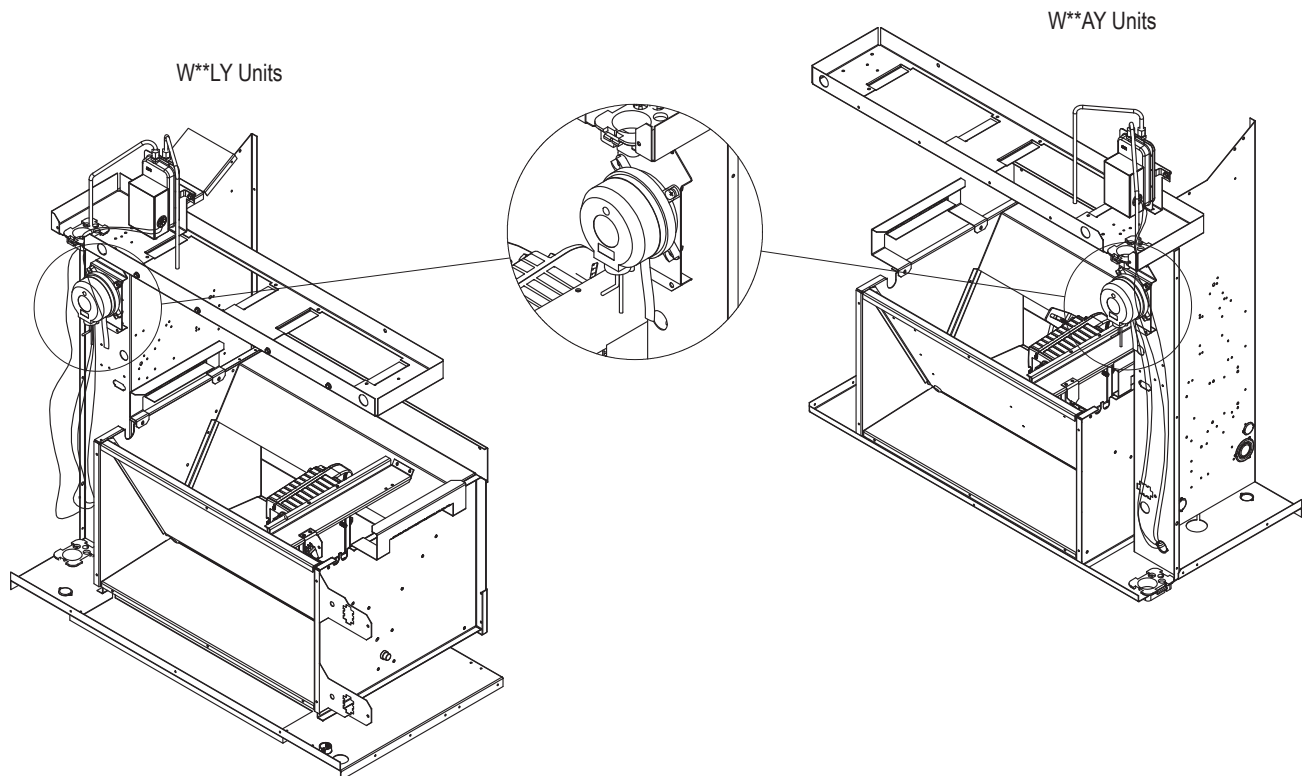


FIGURE 17
Adjusting Dirty Filter Switch

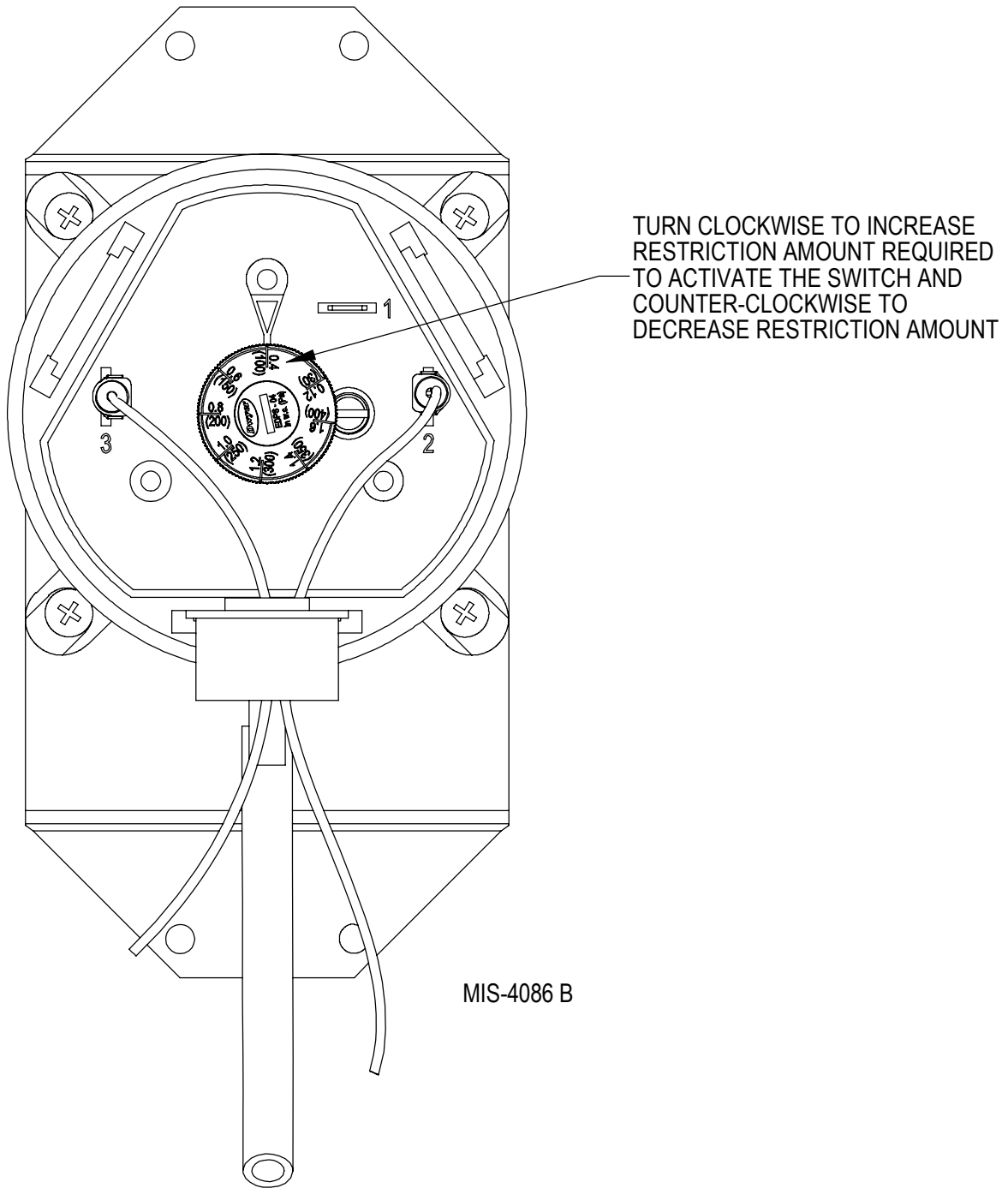


TABLE 16
Indoor Blower Performance

	E.S.P. ¹ (In. H ₂ O)	Balanced Climate™ Speed		Default LO Cooling & Heating/ Ventilation Speed ²		Optional MED Cooling & Heating Speed		Optional HI Cooling & Heating Speed	
		Dry Coil	Wet Coil	Dry Coil	Wet Coil	Dry Coil	Wet Coil	Dry Coil	Wet Coil
W18AY/W18LY	0.00	520	510	680	665	Dedicated electric heat speed (same airflows as W24AY/W24LY default airflows)		865	855
	0.10	435	420	615	600			810	800
	0.15	395	380	585	565			785	770
	0.20			555	535			760	745
	0.25			525	510			735	720
	0.30			495	480			710	695
	0.40			440	425			665	650
	0.50			385	375			620	605
W24AY/W24LY	0.00	630	625	890	835	1005	980	1025	1035
	0.10	580	565	825	800	960	930	990	980
	0.15	550	535	795	780	935	910	975	955
	0.20	525	500	770	755	910	885	955	930
	0.25			740	730	890	865	935	910
	0.30			715	705	870	840	915	885
	0.40			670	650	825	805	870	845
	0.50			630	585	785	765	825	805
W30AY/W30LY	0.00	830	825	1050	1020	1170	1135	1200	1205
	0.10	765	745	1000	975	1120	1105	1170	1155
	0.15	730	705	975	950	1095	1085	1150	1130
	0.20	700	670	950	925	1070	1060	1130	1105
	0.25			920	900	1050	1040	1110	1080
	0.30			890	870	1025	1015	1085	1055
	0.40			830	815	975	955	1040	1000
	0.50			770	755	930	890	985	945
W36AY/W36LY	0.00	925	900	1255	1225	1365	1345	1495	1480
	0.10	850	825	1205	1175	1320	1300	1445	1425
	0.15	815	790	1180	1150	1295	1275	1415	1395
	0.20	780	755	1155	1125	1275	1250	1385	1360
	0.25			1130	1100	1250	1220	1350	1320
	0.30			1100	1070	1225	1195	1310	1280
	0.40			1050	1015	1180	1140	1225	1185
	0.50			1000	960	1130	1075	1130	1075

¹ E.S.P. is the total combined external static pressure of both the supply and return ducts or grills.

² This is the speed set at the factory.

TABLE 17
Maximum ESP of Operation
Electric Heat Only

Model	W18A/L	W24A/L	W30A/L	W36A/L
-A05	.50	.50	.50	.50
-A08	.50	.50		
-A10	.40	.40	.40	.50
-A15			.35	.35
-B05		.50	.50	.50
-B09			.50	.50
-B15			.35	.35
-C05		.50	.50	.50
-C09			.50	.50
-C15			.35	.35

Values shown are for units equipped with 2" pleated MERV 13 filter.

TABLE 18
Electric Heat

Electric Heat Nomenclature	Nominal KW	Total KW and BTUH @ Field-Supplied Voltage										
		@ 230V (1)				@ 208V (1)				@ 460V		
		KW	1 PH Amps	3 PH Amps	BTUH	KW	1 PH Amps	3 PH Amps	BTUH	KW	3 PH Amps	BTUH
4	4	3.7	16		12,600	3	14.4		10,200			
5	5	4.6	20	11.5	15,700	3.8	18	10.4	12,800	4.6	5.8	15,700
6	6	5.5		13.9	18,800	4.5		12.5	15,400	5.5	6.9	18,800
8	8	7.4	32		25,100	6	28.8		20,500			
9	9	8.3		20.8	28,300	6.8		18.7	23,000	8.3	10.4	28,300
10	10	9.2	40		31,400	7.5	36.1		25,600			
12	12									11	13.9	37,700
15	15	13.8	60	34.6	47,100	11.3	54.1	31.2	38,400	13.8	17.3	47,100
18	18	16.6		41.6	56,500	13.5		37.5	46,100	16.6	20.8	56,500
20	20	18.4	80		62,800	15	72.1		51,200			

TABLE 19
Vent and Control Options

Part Number	Description	W18, W24	W30, W36
CMA-14	ODT	X	X
CMC-15	Start Kit (230V 1-Phase)	X	X
CMC-31	Dirty Filter Sensor Kit	X	X
CMC-34	Alarm Relay	X	X
CMC-36	Crankcase Heater (230V)	X	X
CMC-37	Crankcase Heater (460V)	X	X
CMA-37	LAC - Modulating (230V)	X	
CMA-38	LAC - Modulating (460V)	X	
CMA-40	DDC	X	X
CMA-41	LAC - On/Off		X
BOP2	Blank-Off Plate	X	
FAD-NE2	Fresh Air Damper - No Exhaust	X	
FAD-BE2	Fresh Air Damper - Barometric Exhaust	X	
CRV-F2-*	Commercial Ventilator - On/Off, Spring Return	X	
CRV-V2-*	Commercial Ventilator - 0-10V, Spring Return	X	
ECON-NC2A-*	Economizer - Bldg. Equipment, 0-10V, No Controls	X	
ECON-S2-*	Economizer - School	X	
ECON-WD2A-*	Economizer - Bldg. Equipment, Enthalpy	X	
ECON-DB2A-*	Economizer - Bldg. Equipment, Temperature	X	
ERV-FA2-*	Energy Recovery Ventilator (230V)	X	
ERV-FC2-*	Energy Recovery Ventilator (460V)	X	
BOP3	Blank Off Plate		X
FAD-NE3	Fresh Air Damper - No Exhaust		X
FAD-BE3	Fresh Air Damper - Barometric Exhaust		X
CRV-F3-*	Commercial Ventilator - On/Off, Spring Return		X
CRV-V3-*	Commercial Ventilator - 0-10V, Spring Return		X
ECON-NC3A-*	Economizer - Bldg. Equipment, 0-10V, No Controls		X
ECON-S3-*	Economizer - School		X
ECON-WD3A-*	Economizer - Bldg. Equipment, Enthalpy		X
ECON-DB3A-*	Economizer - Bldg. Equipment, Temperature		X
ERV-FA3-*	Energy Recovery Ventilator (230V)		X
ERV-FC3-*	Energy Recovery Ventilator (460V)		X

* Insert color to match unit (X = Beige, 1 = White, 4 = Gray, 5 = Desert Brown, 8 = Dark Bronze, S = Stainless, A = Aluminum)

TABLE 20A
Optional Accessories – Right Hand

		W18AY-A	W24AY-A	W24AY-B	W24AY-C	W30AY-A	W30AY-B	W30AY-C	W36AY-A	W36AY-B	W36AY-C	W36AYRC
Heater Kits	EHWA018A-A05	X										
	EHWA018A-A08	X	X									
	EHWA018A-A10	X	X									
	EHWA024A-A05		X						X			
	EHWA024A-B05			X			X					
	EHWA024A-C05				X							
	EHWA030A-A05					X						
	EHWA030A-A10					X			X			
	EHWA030A-A15					X						
	EHWA030A-B09						X			X		
	EHWA030A-B15						X					
	EHWA030A-C05							X				
	EHWA030A-C09							X				
	EHWA030A-C15							X				
	EHWA036A-A15								X			
	EHWA036A-B05									X		
	EHWA036A-B15									X		
	EHWA036A-C05										X	X
EHWA036A-C09										X	X	
EHWA036A-C15										X	X	
Circuit Breaker (WMCB) and Pull Disconnect (WMPD)	WMCB-02A	X										
	WMCB-03A		X									
	WMCB-04A					X						
	WMCB-05A								X			
	WMCB-02B			X			X					
	WMCB-03B									X		
	WMPD-01C				X			X			X	X

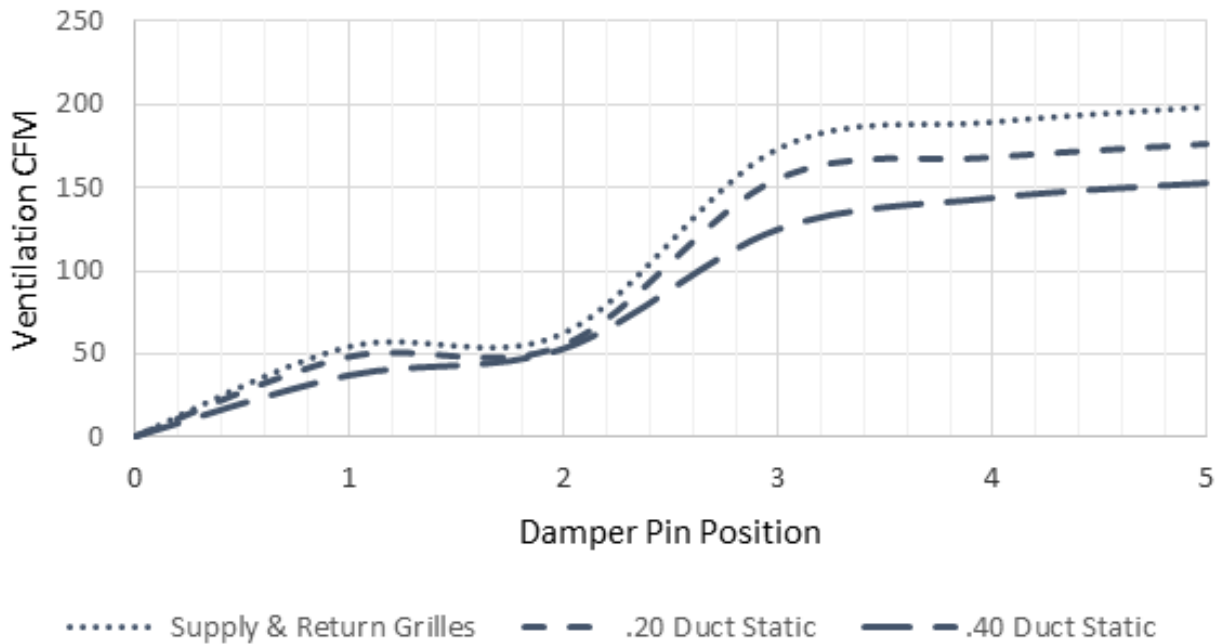
TABLE 20B
Optional Accessories – Left Hand

	W18LY-A	W24LY-A	W24LY-B	W30LY-A	W30LY-B	W30LY-C	W36LY-A	W36LY-B	W36LY-C	W36LYRC	
Heater Kits	EHWL018A-A05	X									
	EHWL018A-A10	X	X								
	EHWL024A-A05		X				X				
	EHWL024A-B05			X							
	EHWL030A-A05				X						
	EHWL030A-A10				X		X				
	EHWL030A-A15				X						
	EHWL030A-B09					X		X			
	EHWL030A-B15					X					
	EHWL030A-C09						X				
	EHWL030A-C15						X				
	EHWL036A-A15							X			
	EHWL036A-B15								X		
	EHWL036A-C09									X	X
	EHWL036A-C15									X	X
Circuit Breaker (WMCB) and Pull Disconnect (WMPD)	WMCB-02AL	X									
	WMCB-03AL		X								
	WMCB-04AL				X						
	WMCB-05AL						X				
	WMCB-02BL			X		X					
	WMCB-03BL							X			
	WMPD-01CL						X		X	X	

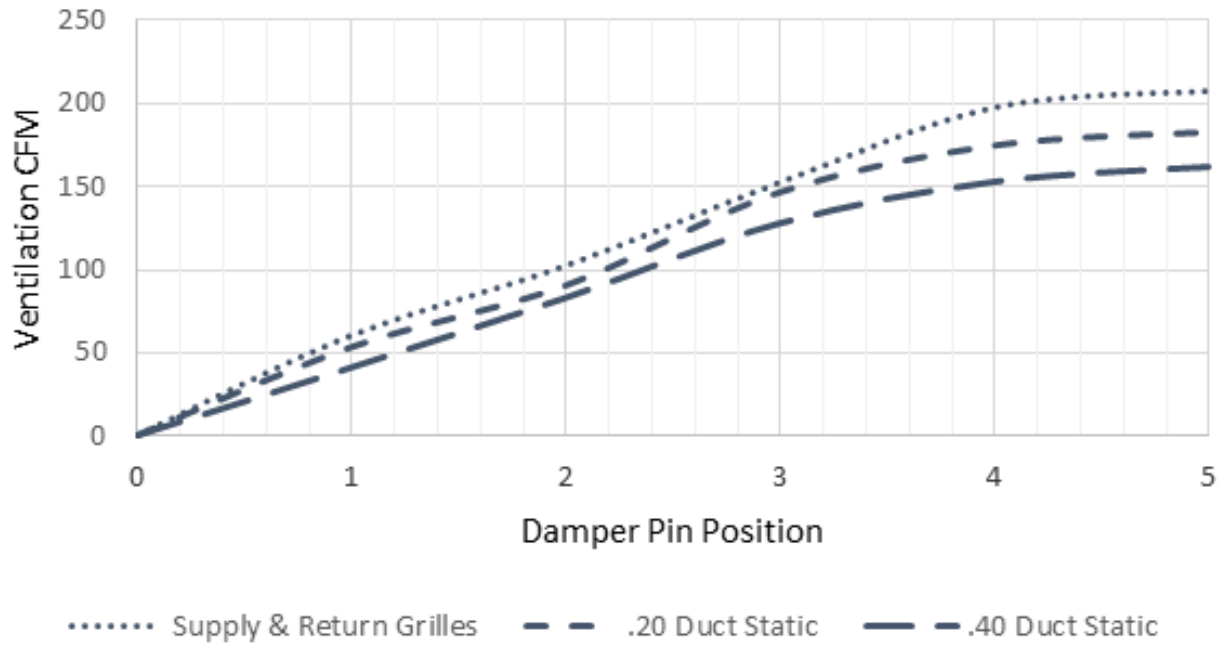
GRAPH 1
W18*Y FAD-NE2, 3 W/O Exhaust Ventilation Delivery



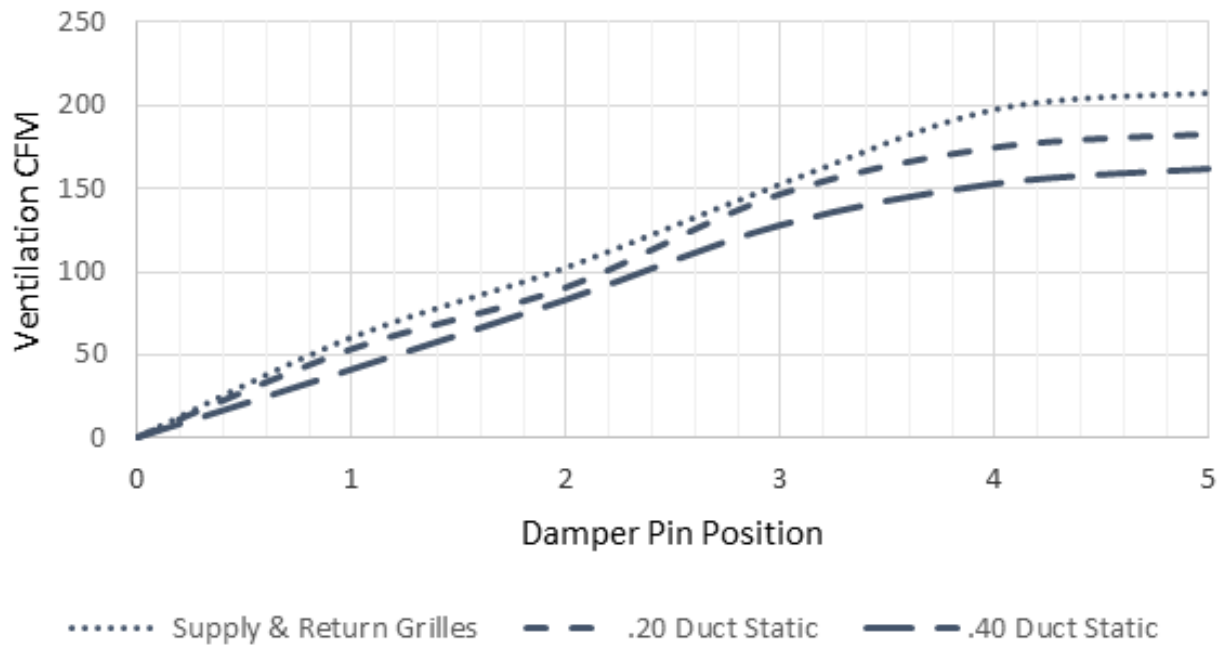
GRAPH 2
W24*Y FAD-NE2, 3 W/O Exhaust Ventilation Delivery



GRAPH 3
W30*Y FAD-NE2, 3 W/O Exhaust Ventilation Delivery



GRAPH 4
W36*Y FAD-NE2, 3 W/O Exhaust Ventilation Delivery



REPLACEMENT PARTS MANUAL

Wall-Mounted Packaged Air Conditioner

Models:

W30AY-A	W36AY-A	W30AYDA	W36AYDA
W30AY-B	W36AY-B	W30AYDB	W36AYDB
W30AY-C	W36AY-C	W30AYDC	W36AYDC
W30AY-D	W36AYRC		W36AYDV
W30AY-F	W36AY-D		
	W36AY-E		
	W36AY-F		

Contents

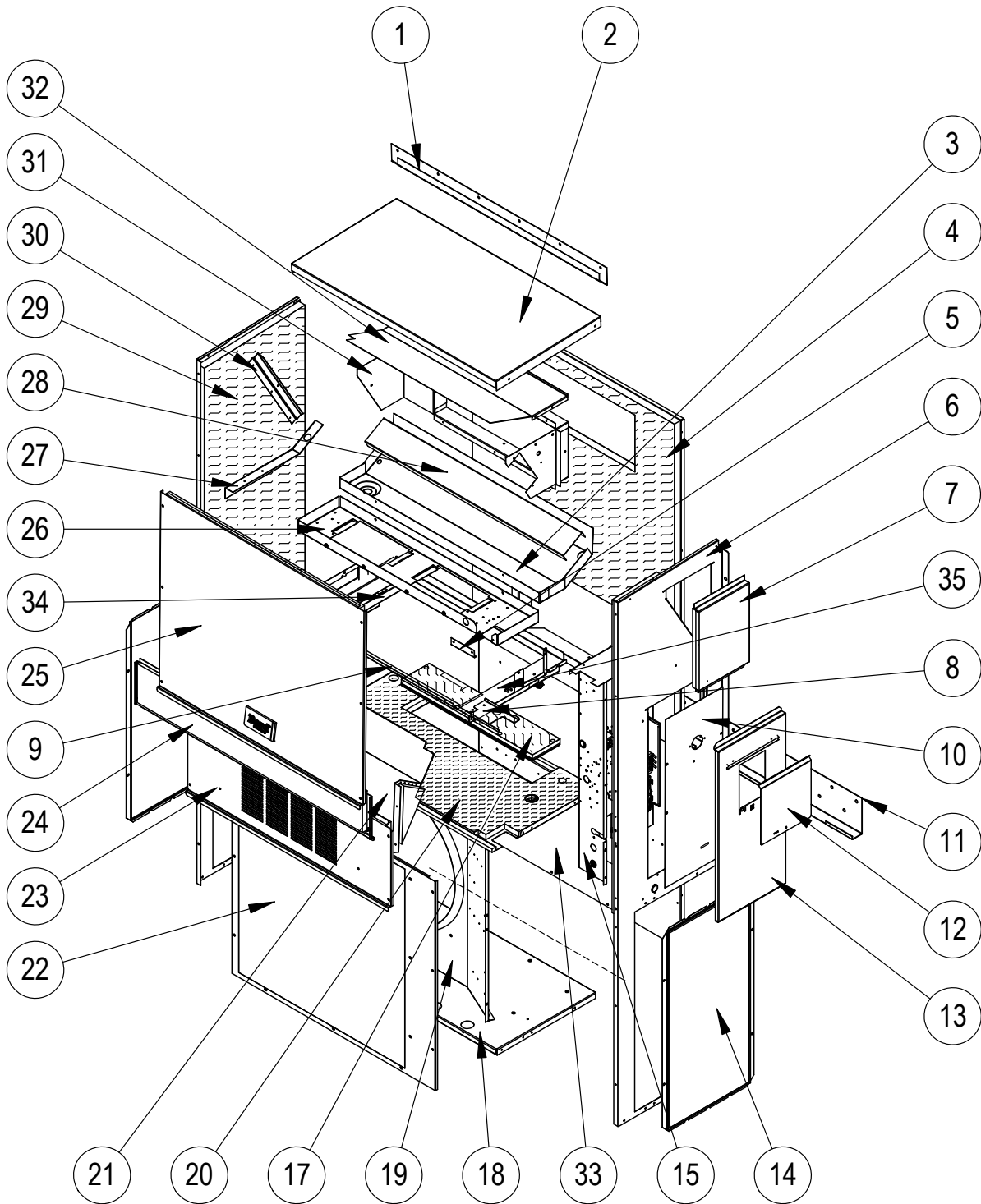
Description	Page	Description	Page
Cabinet Components – Standard & Dehum.		Blower Assembly	
♦ Exploded View	2	♦ Exploded View	14
♦ Usage List	3	♦ Usage List	14
♦ Usage List	4		
Functional Components		General Notes	
♦ Exploded View	6	➤ Revised and/or additional pages may be issued from time to time.	
♦ Usage List – Standard	7	➤ A complete and current manual consists of pages shown in the following contents section.	
♦ Usage List – Dehum.	8		
EEV Controller Assembly		Important	
♦ Exploded View	9	➤ Contact the installing and/or local Bard distributor for all parts requirements. Make sure you have the complete model and serial number available from the unit rating plates.	
♦ Usage List	9		
Control Panel – Standard			
♦ Layout View	10		
♦ Usage List	11		
Control Panel – Dehum.			
♦ Layout View	12		
♦ Usage List	13		



Bard Manufacturing Company, Inc.
Bryan, Ohio 43506
www.bardhvac.com

Manual: 2110-1473B
Supersedes: 2110-1473A
Date: 1-3-24

CABINET COMPONENTS - STANDARD & DEHUMIDIFICATION



This drawing to be used for reference for pages 3 and 4

SEXP-1102

CABINET COMPONENTS – STANDARD & DEHUMIDIFICATION

Dwg No.	Part Number	Description	W30AY-A, B, D	W30AY-C, F	W30AYDA, B	W30AYDC	W36AY-A, B, D, E	W36AY-C, F, RC	W36AYDA, B	W36AYDC, V
1	113-149-*BX ①	Top Rain Flashing	X	X	X	X	X	X	X	X
1	113-360BX ②	Top Rain Flashing	X	X	X	X	X	X	X	X
1	113-149-4BX ③	Top Rain Flashing	X	X	X	X	X	X	X	X
2	507-308-*BX ①	Top	X	X	X	X	X	X	X	X
2	507-319BX ②	Top	X	X	X	X	X	X	X	X
2	507-320BX ③	Top	X	X	X	X	X	X	X	X
3	123-127BX	Drain Pan	X	X	X	X	X	X	X	X
3	123-141BX ②③	Drain Pan	X	X	X	X	X	X	X	X
4	509-451BX	Upper Back	X	X	X	X	X	X	X	X
4	509-455BX ②	Upper Back	X	X	X	X	X	X	X	X
4	509-453BX ③	Upper Back	X	X	X	X	X	X	X	X
5	105-1302BX	Grommet Retainer	X	X	X	X	X	X	X	X
6	501-933-*BX ①	Right Side	X	X	X	X	X	X	X	X
6	501-994BX ②	Right Side	X	X	X	X	X	X	X	X
6	501-937BX ③	Right Side	X	X	X	X	X	X	X	X
7	543-175-*BX ①	Right Side Cover Plate (Outer)	X	X	X	X	X	X	X	X
7	543-185BX ②	Right Side Cover Plate (Outer)	X	X	X	X	X	X	X	X
7	543-184BX ③	Right Side Cover Plate (Outer)	X	X	X	X	X	X	X	X
8	137X1101BX	Filter Fill Plate	X	X	X	X	X	X	X	X
9	131-194BX	Filter Partition Bracket	X	X	X	X	X	X	X	X
10	132-104BX	Control Panel Cover (Inner)	X		X		X		X	
10	132-172BX	Control Panel Cover (Inner)		X		X		X		X
11	113-140BX	Bottom Mounting Bracket	X	X	X	X	X	X	X	X
12	153-218BX ①	Disconnect Access Door	X	X	X	X	X	X	X	X
12	153-405BX ②	Disconnect Access Door	X	X	X	X	X	X	X	X
12	153-387BX ③	Disconnect Access Door	X	X	X	X	X	X	X	X
13	533-228BX ①	Control Panel Cover (Outer)	X	X	X	X	X	X	X	X
13	533-235BX ②	Control Panel Cover (Outer)	X	X	X	X	X	X	X	X
13	533-236BX ③	Control Panel Cover (Outer)	X	X	X	X	X	X	X	X
14	118-124-*BX ①	Side Grille	2	2	2	2	2	2	2	2
14	118-140BX ②	Side Grille	2	2	2	2	2	2	2	2
14	118-141BX ③	Side Grille	2	2	2	2	2	2	2	2
15	Control Panel Assembly	See Control Panel on pages 10 – 13	X	X	X	X	X	X	X	X
17	536-498BX	Cond. Partition Block Off Plate	X	X	X	X	X	X	X	X
17	536-877BX ②	Cond. Partition Block Off Plate	X	X	X	X	X	X	X	X
18	127-471BX	Lower Base	X	X	X	X	X	X	X	X
18	127-528BX ②	Lower Base	X	X	X	X	X	X	X	X
19	125-081BX	Fan Shroud	X	X	X	X	X	X	X	X
19	125-083BX ②	Fan Shroud	X	X	X	X	X	X	X	X
20	521X527BX	Condenser Partition	X	X	X	X	X	X	X	X
20	521-552BX ②	Condenser Partition	X	X	X	X	X	X	X	X
21	FAD-NE3	Fresh Air Damper Assembly	X	X	X	X	X	X	X	X

Continued on page 4

- ① Exterior cabinet parts are manufactured with various paint color options. To ensure the proper paint color is received, include the complete model and serial number of the unit for which cabinet parts are being ordered.
- ② Exterior cabinet parts are manufactured from stainless steel Code "S"
- ③ Exterior cabinet parts are manufactured from aluminum Code "A"

CABINET COMPONENTS – STANDARD & DEHUMIDIFICATION

Dwg No.	Part Number	Description	W30AY-A, B, D	W30AY-C, F	W30AYDA, B	W30AYDC	W36AY-A, B, D, E	W36AY-C, F, RC	W36AYDA, B	W36AYDC, V
<i>Continued from page 3</i>										
22	118-103-*BX ①	Condenser Grille	X	X	X	X	X	X	X	X
22	118-108BX ②	Condenser Grille	X	X	X	X	X	X	X	X
22	118-145BX ③	Condenser Grille	X	X	X	X	X	X	X	X
23	553-523-*BX ①	Vent Option Door	X	X	X	X	X	X	X	X
23	553-540-*BX ①	Vent Option Door with ERV	X	X	X	X	X	X	X	X
23	553-665-*BX ①	Vent Option Door with CRV or ECON-S	X	X	X	X	X	X	X	X
23	553-549BX ②	Vent Option Door	X	X	X	X	X	X	X	X
23	553-557BX ②	Vent Option Door with ERV	X	X	X	X	X	X	X	X
23	553-694BX ②	Vent Option Door with CRV or ECON-S	X	X	X	X	X	X	X	X
23	553-550BX ③	Vent Option Door	X	X	X	X	X	X	X	X
23	553-558BX ③	Vent Option Door with ERV	X	X	X	X	X	X	X	X
23	553-695BX ③	Vent Option Door with CRV or ECON-S	X	X	X	X	X	X	X	X
24	553-524-*BX ①	Filter Door	X	X	X	X	X	X	X	X
24	553-553BX ②	Filter Door	X	X	X	X	X	X	X	X
24	553-554BX ③	Filter Door	X	X	X	X	X	X	X	X
25	514-241-*BX ①	Upper Front	X	X	X	X	X	X	X	X
25	514-238BX ②	Upper Front	X	X	X	X	X	X	X	X
25	514-239BX ③	Upper Front	X	X	X	X	X	X	X	X
26	121X467BX	Blower Partition	X	X	X	X	X	X	X	X
27	105X850BX	Side Support	X	X	X	X	X	X	X	X
28	137-685BX	Bottom Evaporator Fill	X	X			X	X		
28	137-722BX	Bottom Evaporator Fill			X	X			X	X
29	501-934-*BX ①	Left Side	X	X	X	X	X	X	X	X
29	501-995BX ②	Left Side	X	X	X	X	X	X	X	X
29	501-940BX ③	Left Side	X	X	X	X	X	X	X	X
30	147-044BX	Evaporator Support	X	X	X	X	X	X	X	X
31	111X247BX	Outlet Air Frame Assembly	X	X	X	X	X	X	X	X
32	135X123BX	Heat Shield	X	X	X	X	X	X	X	X
33	109-450BX	Lower Back	X	X	X	X	X	X	X	X
33	109-454BX ②	Lower Back	X	X	X	X	X	X	X	X
33	109-452BX ③	Lower Back	X	X	X	X	X	X	X	X
34	131-190BX	Filter Tray Angle	X	X	X	X	X	X	X	X
35	131X189BX	Filter Partition	X	X	X	X	X	X	X	X
NS	135-329BX	Air Baffle	X	X			X	X		
NS	5252-033	Bard Nameplate	X	X	X	X	X	X	X	X

① Exterior cabinet parts are manufactured with various paint color options. To ensure the proper paint color is received, include the complete model and serial number of the unit for which cabinet parts are being ordered.

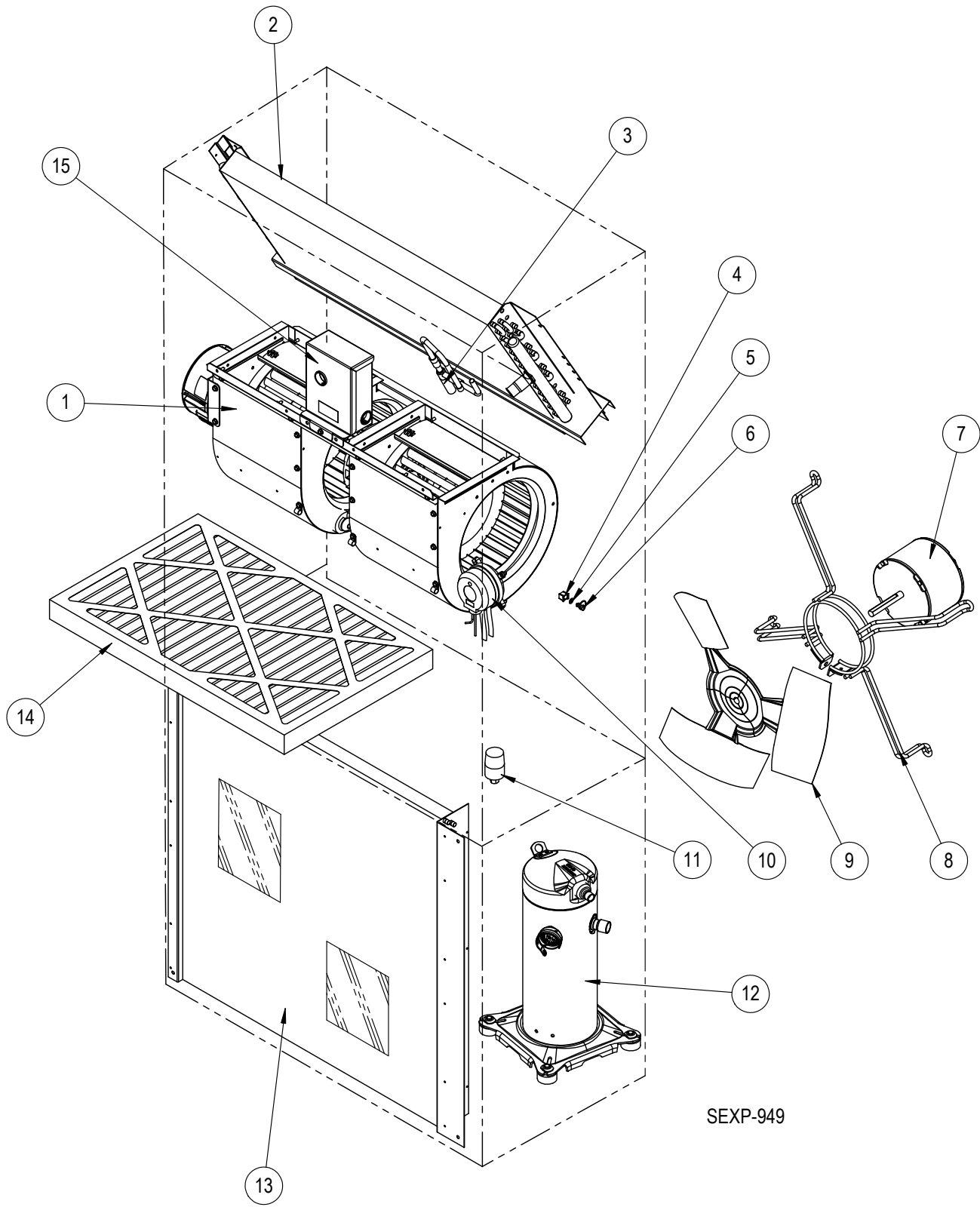
② Exterior cabinet parts are manufactured from stainless steel Code "S"

③ Exterior cabinet parts are manufactured from aluminum Code "A"

Refer to drawing on page 2

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FUNCTIONAL COMPONENTS



This drawing to be used for reference for pages 7 and 8

FUNCTIONAL COMPONENTS - STANDARD

Dwg No.	Part Number	Description	W30AY-A	W30AY-B	W30AY-C	W30AY-D	W30AY-F	W36AY-A	W36AY-B	W36AY-C	W36AYRC	W36AY-D	W36AY-E	W36AY-F
1	900-360-0150BX	Blower Assembly	X	X		X	X							
1	900-361-0151BX	Blower Assembly			X									
1	900-360-0152BX	Blower Assembly						X	X		X	X	X	X
1	900-361-0153BX	Blower Assembly								X				
2	917-0355BX	Evaporator Coil w/Distributor Assy.	X	X	X	X	X							
2	917-0356BX	Evaporator Coil - Coated w/Distributor Assy.	X	X	X	X	X							
2	917-0357BX	Evaporator Coil w/Distributor Assy.						X	X	X	X	X	X	X
2	917-0358BX	Evaporator Coil - Coated w/Distributor Assy.						X	X	X	X	X	X	X
3	800-0456BX	Distributor Assembly						X	X	X	X	X	X	X
3	800-0479BX	Distributor Assembly	X	X	X	X	X							
4	1171-023	1/4" Receptacle	X	X	X	X	X	X	X	X	X	X	X	X
5	1171-024	1/4" Turn Retainer	X	X	X	X	X	X	X	X	X	X	X	X
6	1171-022	1/4" Turn Fastener	X	X	X	X	X	X	X	X	X	X	X	X
7	8103-029BX	Condenser Motor	X	X		X		X	X			X	X	
7	8103-030BX	Condenser Motor			X					X	X			
7	8103-013BX	Condenser Motor					X							X
8	8200-001BX	Fan Motor Mount	X	X	X	X	X	X	X	X	X	X	X	X
8	8200-050BX ①	Stainless Steel Fan Motor Mount	X	X	X	X	X	X	X	X	X	X	X	X
9	5151-045BX	Fan Blade	X	X	X	X	X	X	X	X	X	X	X	X
9	5151C045BX ①	Coated Fan Blade	X	X	X	X	X	X	X	X	X	X	X	X
10	CMC-31	Dirty Filter Switch Kit	X	X	X	X	X	X	X	X	X	X	X	X
11	CMA-41	Low Ambient Control (Screw On) ②	X	X	X	X	X	X	X	X	X	X	X	X
12	8000-277BX	Compressor	X											
12	8000-365BX	Compressor		X										
12	8000-366BX	Compressor			X		X							
12	8000-438BX	Compressor				X								
12	8000-278BX	Compressor						X						
12	8000-283BX	Compressor							X				X	
12	8000-342BX	Compressor								X	X			X
12	8000-439BX	Compressor										X		
13	5051-203BX	Condenser Coil	X	X	X	X	X							
13	5054-203BX	Condenser Coil - Coated	X	X	X	X	X							
13	5051-202BX	Condenser Coil						X	X	X	X	X	X	X
13	5054-202BX	Condenser Coil - Coated						X	X	X	X	X	X	X
14	7004-019	Air Filter 1" Throw-Away (16x30x1)	X	X	X	X	X	X	X	X	X	X	X	X
14	7003-031	Air Filter 1" Washable ② (16x30x1)	X	X	X	X	X	X	X	X	X	X	X	X
14	7004-026	Air Filter 2" Pleated ② (16x30x2)	X	X	X	X	X	X	X	X	X	X	X	X
14	7004-048	Air Filter 2" Pleated MERV 11 ② (16x30x2)	X	X	X	X	X	X	X	X	X	X	X	X
14	7004-062	Air Filter 2" Pleated MERV 13 ② (16x30x2)	X	X	X	X	X	X	X	X	X	X	X	X
NS	8406-142BX	High Pressure Switch (Screw On)	X	X	X	X	X	X	X	X	X	X	X	X
NS	8406-140BX	Low Pressure Switch (Screw On)	X	X	X	X	X	X	X	X	X	X	X	X
NS	5201-021BX	Filter Drier	X	X	X	X	X	X	X	X	X	X	X	X
NS	5451-024	Tubing Isolation Grommet	2	2	2	2	2	2	2	2	2	2	2	2
NS	6031-009	Coremax Valve Core	2	2	2	2	2	2	2	2	2	2	2	2
NS	1171-028	Filter Door Clip	2	2	2	2	2	2	2	2	2	2	2	2
NS	1171-057	Filter Door Screw	2	2	2	2	2	2	2	2	2	2	2	2
NS	1171-027	Filter Door Screw Retainer	2	2	2	2	2	2	2	2	2	2	2	2
NS	CMC-29	Freeze Thermostat Kit	X	X	X	X	X	X	X	X	X	X	X	X
NS	910-2189BX	460V Transformer Assembly									X			

NS – Not Shown

① – Used with stainless steel cabinet option

② – Optional on these models

FUNCTIONAL COMPONENTS – DEHUMIDIFICATION

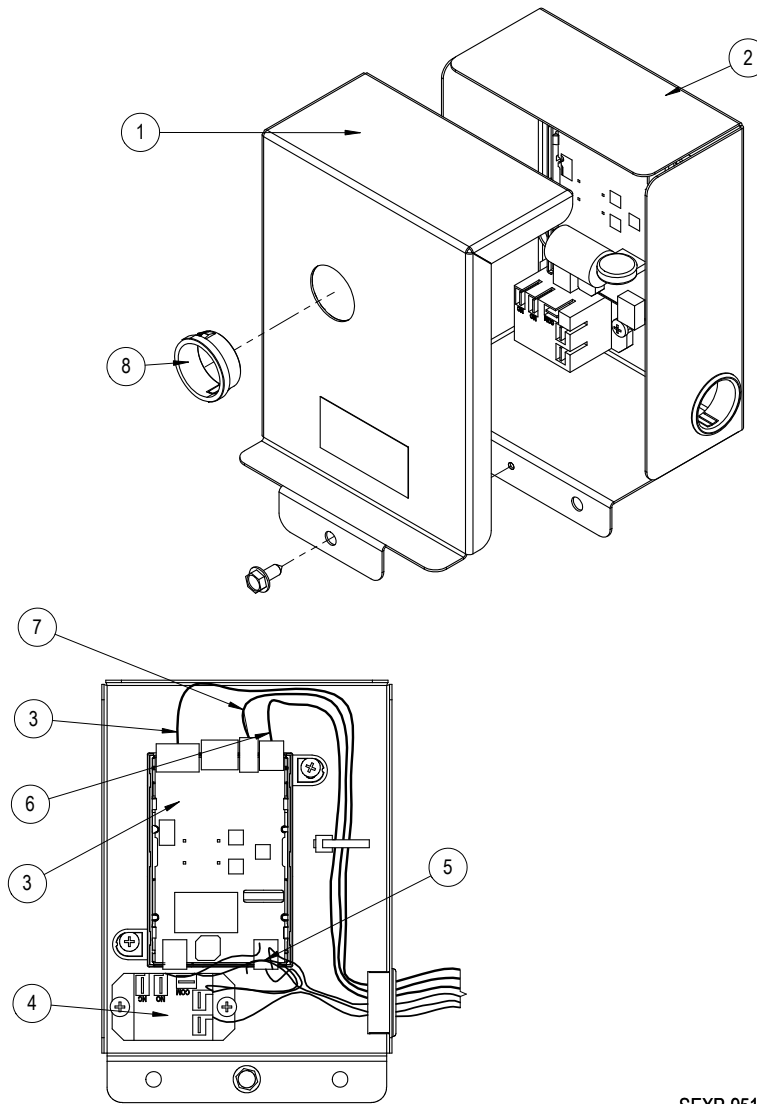
Dwg No.	Part Number	Description	W30AYDA	W30AYDB	W30AYDC	W36AYDA	W36AYDB	W36AYDC	W36AYDV
1	900-360-0150BX	Blower Assembly	X	X					
1	900-361-0151BX	Blower Assembly			X				
1	900-360-0152BX	Blower Assembly				X	X		
1	900-361-0153BX	Blower Assembly						X	X
2	917-0364BX	Evaporator Coil w/Distributor Assy.	X	X	X				
2	917-0365BX	Evaporator Coil - Coated w/Distributor Assy.	X	X	X				
2	917-0359BX	Evaporator Coil w/Distributor Assy.				X	X	X	X
2	917-0360BX	Evaporator Coil - Coated w/Distributor Assy.				X	X	X	X
3	800-0460BX	Distributor Assembly	X	X	X	X	X	X	X
3	5651S245BX	Electronic Expansion Valve	X	X	X	X	X	X	X
3	905-0732BX	Electronic Expansion Valve Assembly	X	X	X	X	X	X	X
4	1171-023	1/4" Receptacle	X	X	X	X	X	X	X
5	1171-024	1/4" Turn Retainer	X	X	X	X	X	X	X
6	1171-022	1/4" Turn Fastener	X	X	X	X	X	X	X
7	8103-029BX	Condenser Motor	X	X		X	X		
7	8103-030BX	Condenser Motor			X			X	X
8	8200-001BX	Fan Motor Mount	X	X	X	X	X	X	X
8	8200-050BX ①	Stainless Steel Fan Motor Mount	X	X	X	X	X	X	X
9	5151-045BX	Fan Blade	X	X	X	X	X	X	X
9	5151C045BX ①	Coated Fan Blade	X	X	X	X	X	X	X
10	CMC-31	Dirty Filter Switch Kit	X	X	X	X	X	X	X
11	CMA-41	Low Ambient Control (Flare) ②	X	X	X	X	X	X	X
12	8000-277BX	Compressor	X						
12	8000-365BX	Compressor		X					
12	8000-366BX	Compressor			X				
12	8000-278BX	Compressor				X			
12	8000-283BX	Compressor					X		
12	8000-342BX	Compressor						X	X
13	5051-203BX	Condenser Coil	X	X	X				
13	5054-203BX	Condenser Coil - Coated	X	X	X				
13	5051-202BX	Condenser Coil				X	X	X	X
13	5054-202BX	Condenser Coil - Coated				X	X	X	X
14	7004-019	Air Filter 1" Throw-Away (16x30x1)	X	X	X	X	X	X	X
14	7003-031	Air Filter 1" Washable ② (16x30x1)	X	X	X	X	X	X	X
14	7004-026	Air Filter 2" Pleated ② (16x30x2)	X	X	X	X	X	X	X
14	7004-048	Air Filter 2" Pleated MERV 11 ② (16x30x2)	X	X	X	X	X	X	X
14	7004-062	Air Filter 2" Pleated MERV 13 ② (16x30x2)	X	X	X	X	X	X	X
15	910-2050-001BX	EEV Controller Assembly (see page 9 for breakdown)	X	X	X	X	X	X	X
NS	8406-142BX	High Pressure Switch (Flare)	X	X	X	X	X	X	X
NS	8406-140BX	Low Pressure Switch (Flare)	X	X	X	X	X	X	X
NS	8406-158BX	Low Pressure Transducer	X	X	X	X	X	X	X
NS	3000-1603BX	Transducer Wire Assembly – Connects to Transducer	X	X	X	X	X	X	X
NS	5201-021BX	Filter Drier	X	X	X	X	X	X	X
NS	5650-051BX	Dehumidification Valve	X	X	X	X	X	X	X
NS	5651-219BX	Check Valve	X	X	X	X	X	X	X
NS	5451-024	Tubing Isolation Grommet	2	2	2	2	2	2	2
NS	6031-009	Coremax Valve Core	2	2	2	2	2	2	2
NS	1171-028	Filter Door Clip	2	2	2	2	2	2	2
NS	1171-057	Filter Door Screw	2	2	2	2	2	2	2
NS	1171-027	Filter Door Screw Retainer	2	2	2	2	2	2	2

NS – Not Shown

① – Used with stainless steel cabinet option

② – Optional on these models

EEV CONTROLLER ASSEMBLY

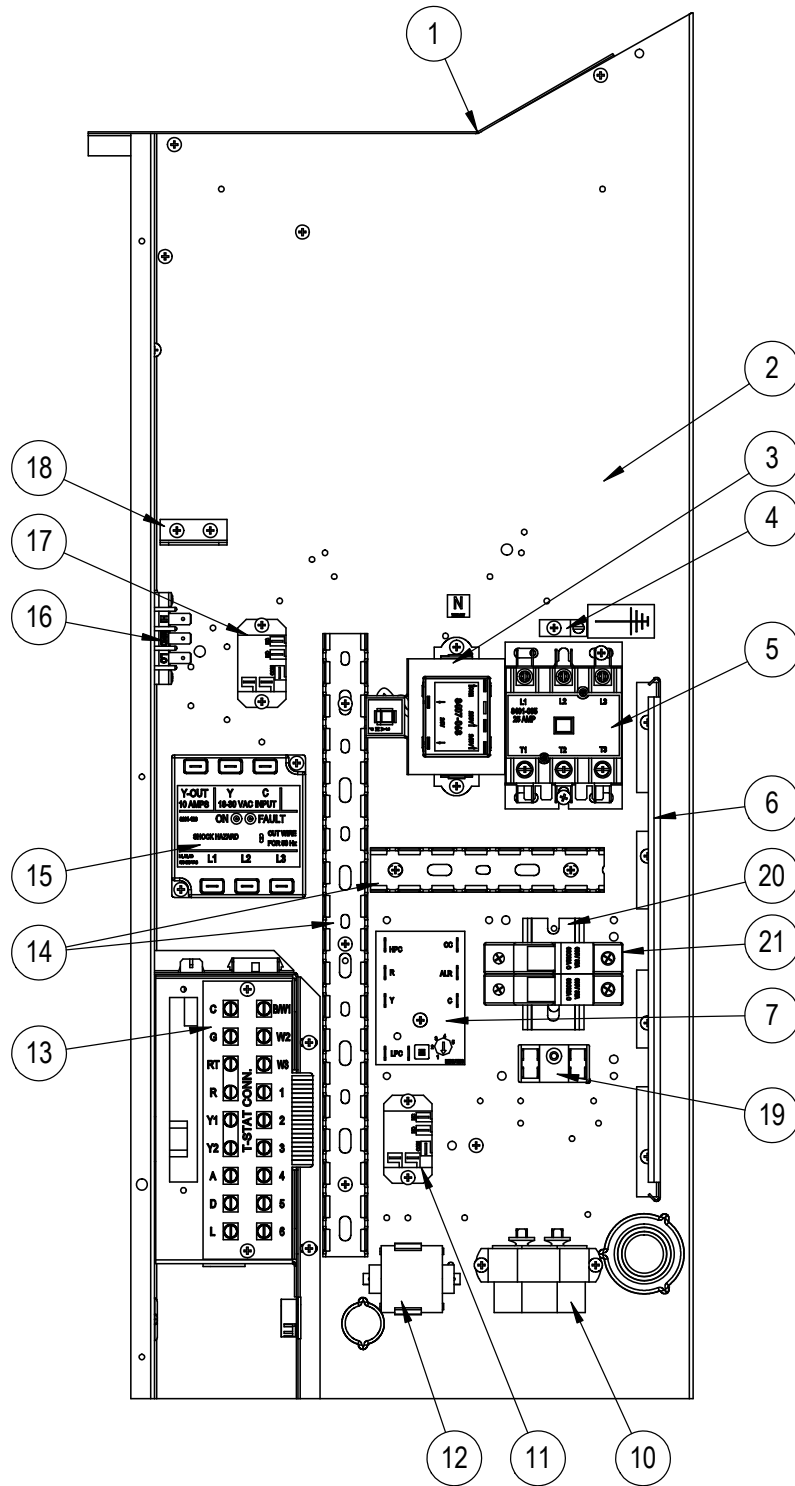


SEXP-951

910-2050-001BX

Dwg No.	Part Number	Description	
1	143-219BX	EEV Control Box Cover	X
2	127-572BX	EEV Control Box	X
3	8301-079-0001BX	EEV Control Module & Stator Cable	X
3	5651-246BX	EEV Stator Cable Only	X
4	8201-130BX	Control Relay	X
5	3000-1602BX	Main Wire Assembly	X
6	3000-1611BX	Transducer Wire Assembly – Connects to EEV Board	X
NS	3000-1603BX	Transducer Wire Assembly – Connects to Transducer	
7	8408-056BX	EEV Thermistor	X
8	8611-075	Clear Snap Plug	X

CONTROL PANEL



SEXP-908 A

CONTROL PANEL - STANDARD

Dwg No.	Part Number	Description	W30AY-A	W30AY-B	W30AY-C	W30AY-D	W30AY-F	W36AY-A	W36AY-B	W36AY-C	W36AYRC	W36AY-D	W36AY-E	W36AY-F
1	117X137BX	Control Panel Top	X	X	X	X	X	X	X	X	X	X	X	X
2	117X407BX	Control Panel	X	X	X	X	X	X	X	X	X	X	X	X
3	8407-068BX	Transformer	X	X		X	X	X				X	X	X
3	8407-069BX	Transformer			X					X	X			
4	8611-006	Ground Terminal	X	X	X	X	X	X	X	X	X	X	X	X
5	8401-033BX	Compressor Contactor	X			X	X					X		
5	8401-035BX	Compressor Contactor		X	X		X		X	X	X		X	X
6	135-122BX	Wire Shield	X	X	X	X	X	X	X	X	X	X	X	X
7	8201-176BX	Compressor Control Module	X	X	X	X	X	X	X	X	X	X	X	X
9	8607-017BX	Terminal Block (Optional)	X	X	X	X	X	X	X	X	X	X	X	X
10	8552-052BX	Compressor Capacitor	X				X							
10	8552-002BX	Outdoor Motor Capacitor		X	X		X		X	X	X		X	X
10	8552-062BX	Compressor Capacitor				X						X		
11	8201-130BX	Alarm Relay (Optional)	X	X	X	X	X	X	X	X	X	X	X	X
12	8551-004BX	Start Device (PTCR) (Optional)	X			X		X				X		
13	8607-063BX	Low Voltage Terminal Strip	X	X	X	X	X	X	X	X	X	X	X	X
14	8611-140-1400	Cable Duct – 14" Piece	X	X	X	X	X	X	X	X	X	X	X	X
14	8611-140-0500	Cable Duct – 5" Piece	X	X	X	X	X	X	X	X	X	X	X	X
15	8201-174BX	Phase Monitor		X	X		X		X	X	X		X	X
16	8607-042	Blower Speed Terminal	X	X	X	X	X	X	X	X	X	X	X	X
17	8201-130BX	Blower Control Relay	X	X	X	X	X	X	X	X	X	X	X	X
18	141-595BX	Plug Support Bracket	X	X	X	X	X	X	X	X	X	X	X	X
19	8607-017BX	Terminal Block									X			
20	8611-210BX	DIN Rail									X			
21	8614-058	Fuse Block									X			
21	8614-047	3.2A Fuse									2			
NS	8615-038BX	Circuit Breaker 35A 2 Pole (Opt.) ①	X					X				X		
NS	8615-054BX	Circuit Breaker 20A 3 Pole (Opt.) ①		X										
NS	8615-051BX	Circuit Breaker 25A 3 Pole (Opt.) ①						X						
NS	8615-052BX	Circuit Breaker 30A 3 Pole (Opt.) ①				X							X	
NS	8615-095BX	Toggle Disconnect (Optional) ①			X		X		X	X				X
NS	8607-013BX	Terminal Block 2 Pole					X							X
NS	113-601BX	Terminal Block Bracket					X							X
NS	4213-124	Wiring Diagram	X			X		X				X		
NS	4213-224	Wiring Diagram		X				X					X	
NS	4213-324	Wiring Diagram			X					X				
NS	4213-327	Wiring Diagram									X			
NS	4213-624	Wiring Diagram					X							X
NS	3000-1598BX	Blower Power Plug	X	X	X	X	X	X	X	X	X	X	X	X
NS	3000-1599BX	Blower Speed Plug	X	X	X	X	X	X	X	X	X	X	X	X
NS	3000-1524BX	Vent Jumper Plug	X	X	X	X	X	X	X	X	X	X	X	X
NS	3000-1224BX	Compressor Plug/Harness	X			X		X				X		
NS	3000-1231BX	Compressor Plug/Harness		X	X		X		X	X	X		X	X
NS	3003-126BX	Control Panel Harness	X			X		X				X		
NS	3003-127BX	Control Panel Harness		X	X			X	X	X			X	
NS	3003-128BX	Control Panel Harness					X							X
NS	3000-1608BX	Low Voltage Terminal Block Harness	X	X	X	X	X	X	X	X	X	X	X	X
NS	910-2047BX	Complete Low Voltage Box Assembly (Sheet Metal, LVTS & Wire Harness)	X	X	X	X	X	X	X	X	X	X	X	X

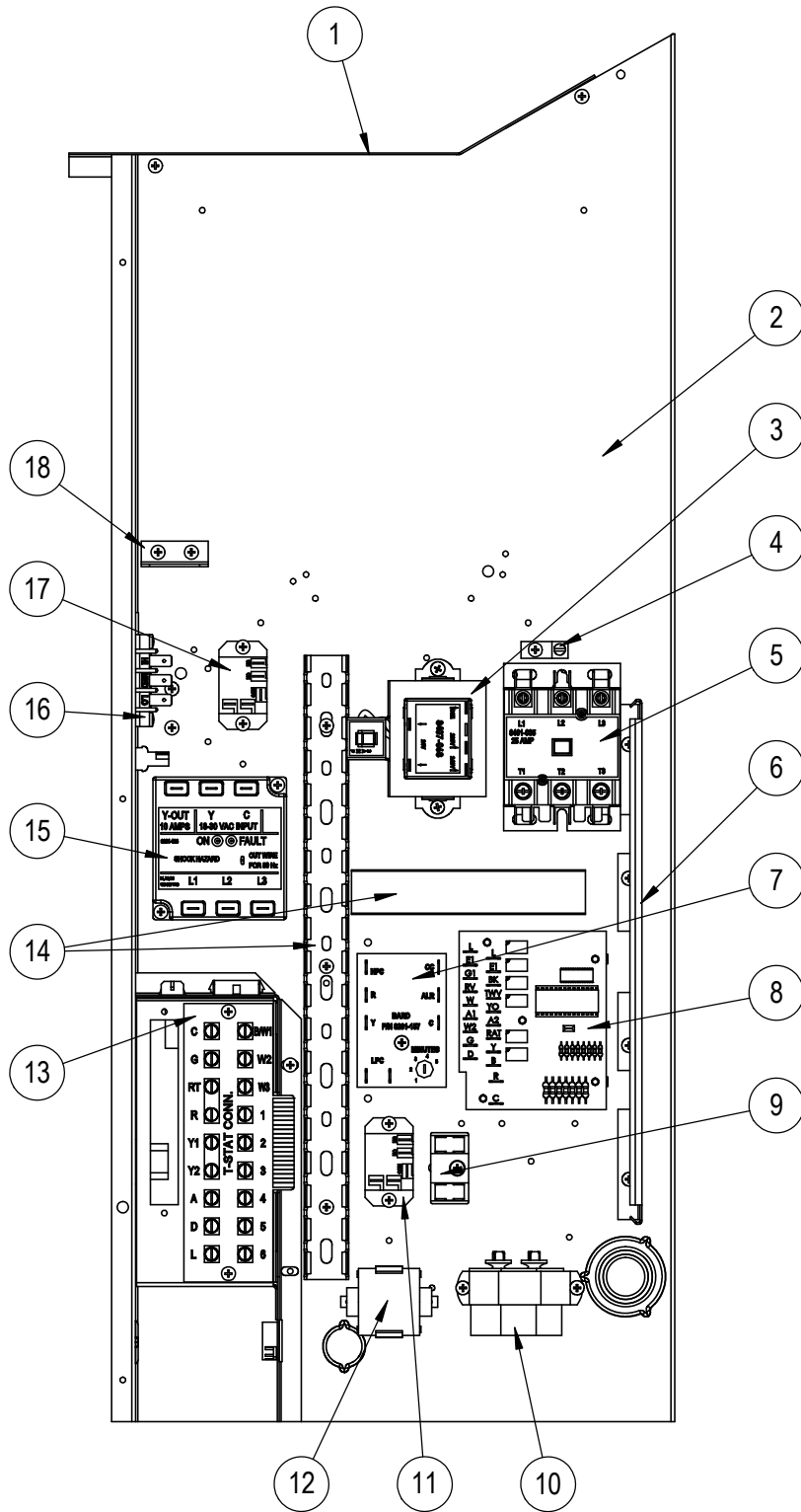
NS = Not Shown

① Circuit breakers listed are for units without electric heat, "OZ" models. See heater replacement parts manual for units with electric heat.

Manual 2110-1473B

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CONTROL PANEL



SEXP-948

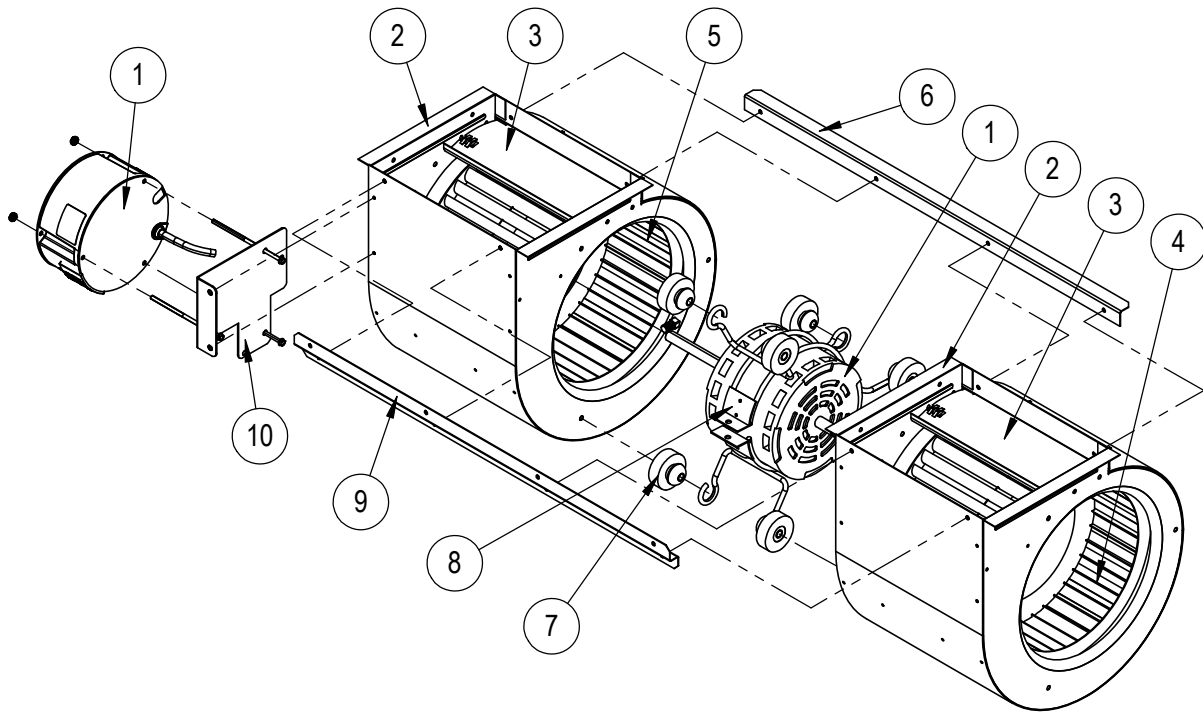
CONTROL PANEL – DEHUMIDIFICATION

Dwg No.	Part Number	Description	W30AYDA	W30AYDB	W30AYDC	W36AYDA	W36AYDB	W36AYDC	W36AYDV
1	117X137BX	Control Panel Top	X	X	X	X	X	X	X
2	117-407BX	Control Panel	X	X	X	X	X	X	X
3	8407-068BX	Transformer	X	X		X	X		
3	8407-069BX	Transformer			X			X	X
4	8611-006	Ground Terminal	X	X	X	X	X	X	X
5	8401-033BX	Compressor Contactor	X			X			
5	8401-035BX	Compressor Contactor		X	X		X	X	X
6	135-122BX	Wire Shield	X	X	X	X	X	X	X
7	8201-176BX	Compressor Control Module	X	X	X	X	X	X	X
8	8201-113BX	Dehum. Logic Control	X	X	X	X	X	X	X
9	8607-017BX	Terminal Block (Optional)	X	X	X	X	X	X	X
10	8552-052BX	Compressor Capacitor	X			X			
10	8552-002BX	Outdoor Motor Capacitor		X	X		X	X	X
11	8201-130BX	Dehumidification Control Relay	X	X	X	X	X	X	X
12	8551-004BX	Start Device (PTCR) (Optional)	X			X			
13	8607-063BX	Low Voltage Terminal Strip	X	X	X	X	X	X	X
14	8611-140-1400	Cable Duct – 14" Piece	X	X	X	X	X	X	X
14	8611-140-0500	Cable Duct – 5" Piece	X	X	X	X	X	X	X
15	8201-174BX	Phase Monitor		X	X		X	X	X
16	8607-042	Blower Speed Terminal	X	X	X	X	X	X	X
17	8201-130BX	Blower Control Relay	X	X	X	X	X	X	X
18	141-595BX	Plug Support Bracket	X	X	X	X	X	X	X
NS	8615-038BX	Circuit Breaker 35A 2 Pole (Optional) ①	X			X			
NS	8615-054BX	Circuit Breaker 20A 3 Pole (Optional) ①		X					
NS	8615-051BX	Circuit Breaker 25A 3 Pole (Optional) ①					X		
NS	8615-095BX	Toggle Disconnect (Optional) ①			X			X	X
NS	4213-125	Wiring Diagram	X			X			
NS	4213-225	Wiring Diagram		X			X		
NS	4213-325	Wiring Diagram			X			X	
NS	4213-625	Wiring Diagram							X
NS	3000-1598BX	Blower Power Plug	X	X	X	X	X	X	X
NS	3000-1599BX	Blower Speed Plug	X	X	X	X	X	X	X
NS	3000-1524BX	Vent Jumper Plug	X	X	X	X	X	X	X
NS	3000-1224BX	Compressor Plug/Harness	X			X			
NS	3000-1231BX	Compressor Plug/Harness		X	X		X	X	X
NS	3003-129BX	Control Panel Harness	X			X			
NS	3003-130BX	Control Panel Harness		X	X		X	X	X
NS	3000-1608BX	Low Voltage Terminal Block Harness	X	X	X	X	X	X	X
NS	910-2047BX	Complete Low Voltage Box Assembly (Sheet Metal, LVTS & Wire Harness)	X	X	X	X	X	X	X

NS = Not Shown

① Circuit breakers listed are for units without electric heat, "OZ" models. See heater replacement parts manual for units with electric heat.

BLOWER ASSEMBLY



SEXP-909

Dwg No.	Part Number	Description	900-360-0150BX	900-360-0152BX	900-361-0151BX	900-361-0153BX
1	8106-068-0150BX	Blower Motor & Control (230/208V)	X			
1	8106-068-0152BX	Blower Motor & Control (230/208V)		X		
1	8106-069-0151BX	Blower Motor & Control (460V)			X	
1	8106-069-0153BX	Blower Motor & Control (460V)				X
1	C8106-068-0150	Programmed Control Only (230/208V)	0			
1	C8106-068-0152	Programmed Control Only (230/208V)		0		
1	C8106-069-0151	Programmed Control Only (460V)			0	
1	C8106-069-0153	Programmed Control Only (460V)				0
2	151-111BX	Housing	2	2	2	2
3	144-174BX	Diffuser	2	2	2	2
4	5152-090BX	Wheel CW	X	X	X	X
5	5152-091BX	Wheel CCW	X	X	X	X
6	105-870BX	Back Brace	X	X	X	X
7	5451-011	Grommets	6	6	6	6
8	8200-031BX	Motor Mount	X	X	X	X
9	103-401BX	Front Brace	X	X	X	X
10	113-721BX	Motor Control Bracket	X	X	X	X

X – Standard Component
O – Optional Component

Supplemental Instructions

Models:

W30AYD W36AYD W42AYD W48AYD W60AYD W72AYD

This model provides a unique dehumidification circuit for periods of low outdoor ambient temperature and high indoor humidity conditions.

Refer to Specification Sheet S3642 for the standard features of the base units and this manual for electrical data.

Dehumidification Circuit

The dehumidification circuit incorporates an independent heat exchanger coil in the supply air stream. This coil reheats the supply air after it passes over the cooling coil without requiring the electric resistance heater to be used for reheat purposes. This results in very high mechanical dehumidification capability from the air conditioner on demand without using electric resistance reheat.

The dehumidification refrigerant reheat circuit is controlled by a dehumidification valve directing the refrigerant gas to the normal condenser during periods when standard air conditioning is required. During periods of high indoor humidity, a humidistat senses the need for mechanical dehumidification. It then energizes both the compressor circuit and the dehumidification valve, thus directing the hot refrigerant discharge gas into a separate desuperheating condenser circuit, which reheats the conditioned air before it is delivered to the room. The refrigerant gas is then routed from the desuperheating condenser to the system condenser for further heat transfer. When the humidistat is satisfied, the system automatically switches off. The result is separate humidity control at minimum operating cost.

Dehumidification Sequence of Operation

Dehumidification is controlled through the thermostat (if capable) or through a separate humidistat. On a call for dehumidification mode of operation, the compressor and dehumidification valve of the unit are energized through circuit R - D to provide dehumidification. Dehumidification will continue until the humidistat is satisfied.

A cooling call takes precedence over a dehumidification call as long as the cooling call is present. A heating call takes precedence over a dehumidification call as long as the heating call is present.

Refer to the table on page 12 for a full list of outputs that can be expected for different input combinations.

Balanced Climate™ Mode

It is recommended to enable Balanced Climate mode and utilize a 2-stage thermostat to enhance the dehumidification performance and comfort. To activate this mode, the jumper between Y1 and Y2 on the low voltage terminal strip needs to be removed and the unconnected purple wire laying in the cable duct needs to be pulled out and placed on the terminal block so that it connects to the yellow wire from the outdoor temperature switch. Refer to the unit wiring diagram for clarity.

NOTE: *In units with dehumidification, never have both the Balanced Climate jumper in place and the outdoor temperature switch connected at the same time!*



Bard Manufacturing Company, Inc.
Bryan, Ohio 43506
www.bardhvac.com

Manual: 7960-947
Supersedes: **NEW**
Date: 6-29-23

This mode will allow the indoor blower to run at a reduced airflow on the first stage of cooling. A 2-stage thermostat connected to Y2 will then allow the airflow to return to normal rated speed if the call for dehumidification or cooling is not satisfied within the allotted time frame specified by the thermostat. See latest revision of unit installation instructions 2100-787 or 2100-789 for more information regarding the Balanced Climate operation.

Electronic Expansion Valve

Operation

This model employs an electronic expansion valve (EEV) which meters the refrigerant to the evaporator. The EEV is made of a stepper motor that is controlled with a step output from the controller. The valve is capable of 480 steps which drives a needle valve that in turn regulates the flow of refrigerant. The EEV allows for tighter control and better capacity management in varying operating conditions than a standard TXV. The EEV system consists of the electronic valve and stator, control board, relay, suction temperature sensor and suction pressure transducer. The pressure transducer and temperature sensor monitor the suction line to provide real time data to the control board so that a real time superheat can be calculated. This then determines the EEV position. The controller is sent to maintain around 13° superheat. The relay is used to activate the EEV system's controller anytime that the compressor is energized.

WARNING/AVERTISSEMENT

- Exposure to high pressure refrigerant hazard.
- This unit is equipped with an electronic expansion valve. In order to fully recover refrigerant or evacuate the system during repairs, be sure to use service tool 2151-021 to manually open the electronic expansion valve or be sure to recover and evacuate from all service ports: suction, liquid, and discharge.
- Failure to do so could result in eye injuries and/or refrigerant burns.

- Exposition à un risque de réfrigérant à haute pression.
- Cet appareil est équipé d'un détendeur électronique. Afin de récupérer complètement le réfrigérant ou d'évacuer le système pendant les réparations, assurez-vous d'utiliser l'outil de service 2151-021 pour ouvrir manuellement le détendeur électronique ou assurez-vous de récupérer et d'évacuer de tous les ports de service: aspiration, liquide et refoulement.
- Ne pas le faire pourrait entraîner des blessures aux yeux et / ou des brûlures de réfrigérant.

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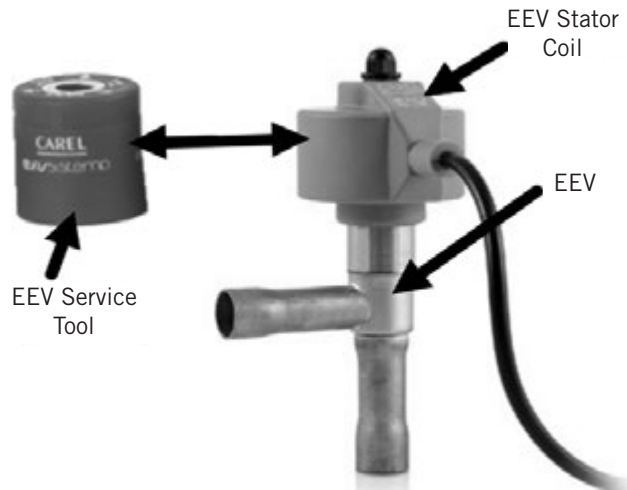
EEV Instructions for Vacuuming, Reclaiming and Charging Unit

The electronic expansion valve moves to a closed position when there is no call to control. In order to pull a complete vacuum, fully reclaim the system or charge the unit, connections to all service ports—suction, liquid and discharge—need to be utilized or the valve needs to be manually opened first. The valve can be opened manually using the magnetic EEV service tool (Bard Part # 2151-021) shown in Figure 1. To do this, remove the EEV stator coil (red color with retaining nut on top), slide the magnetic tool over the shaft

where the stator was removed and turn in a clockwise direction to open the valve to the full open position (directional arrows are provided on the tool).

Reapply the EEV stator coil and retaining nut once complete. Upon powering the unit back up, the control board will automatically drive the EEV back to the fully shut position. Once the compressor starts, the control board will again modulate the EEV position to control the system superheat.

FIGURE 1
Electronic Expansion Valve (EEV) and Service Tool



Troubleshooting the Electronic Expansion Valve

The control board has two status LEDs.

- The green LED should be lit anytime that the board has power and the control is functioning.
- The red LED is to show that an alarm is present.

See Table 1 for a guide to know where to start troubleshooting the EEV. Refer to the appropriate unit replacement parts manual for any parts that are needed.

Control Board

Check that the controller is getting 24VAC signal (GO 24VAC Hot and G 24VAC common). Reference unit wiring diagram for proper connections. If 24V is present but the green LED is not lit, replace the controller. If the green LED is now lit but the superheat is still not being maintained, troubleshoot the relay to check that the DI is connected to G; refer to **Relay in EEV Control Box** on page 3.

Electronic Expansion Valve

Check to see if valve can be moved by manually moving the stepper motor using the EEV service tool shown in Figure 1 (Bard Part # 2151-021). If valve still does not control, check the transducer and thermistor sensors as described on page 4. If sensors are good, replace the valve.

TABLE 1
Electronic Expansion Valve Troubleshooting

Problem	Probable Cause	Troubleshoot
The green LED is not lit.	Controller not receiving 24VAC signal.	Control Board
The green LED is lit, but superheat is not being maintained.	The relay is not closing the controller's DI connection to ground.	Relay
The red LED is flashing and EEV is not controlling superheat properly (13° superheat). One of the following is likely the fault:		
1. Low superheat is detected and the controller is taking steps to protect the system by closing the valve.	Stator is broken or connected incorrectly.	Stator
	Valve is stuck open.	EEV Valve
2. Suction temperature sensor error.	Poor connection of sensor or faulty sensor.	Thermistor
3. Suction pressure transducer error.	Pressure transducer wiring incorrect or faulty transducer.	Transducer
The red LED is on steady.	The operating parameters have been damaged.	Replace Control Board

Relay in EEV Control Box

Contacts NO to DI and COM to G must be closed for EEV control to start controlling superheat. Check that the relay is getting 24VAC. Reference unit wiring diagram for proper connections. If 24V is present, measure the resistance between COM and NO; it should be 0 ohms when the relay is getting 24V. If the resistance is out of range, replace the relay.

Stator Coil

Disconnect the stator from the valve and the control and measure the resistance of the windings using an electrical tester. The resistance of both windings should be around 40 ohms +/- 10%. The four wire sets that will have resistance between them are: White and red, green and red, yellow and purple, blue and purple. If the resistance falls outside these values, replace the stator.

Transducer Sensor

1. Check that there is 5VDC Nominal between the red and black wires going to the transducer.
2. Check the signal voltage between the blue and black wires (0.5-4.5VDC Actual). The following formula and Figure 2 can be used to determine if the transducer's voltage to pressure ratio is within range. Replace transducer if out of range.
3. Check to ensure wires are correctly connected as follows:

Blue wire = pin 1 of controller plug to pin C on transducer plug

Red wire = pin 2 of controller plug to pin B on transducer plug

Black wire = pin 3 of controller plug to pin A on transducer plug

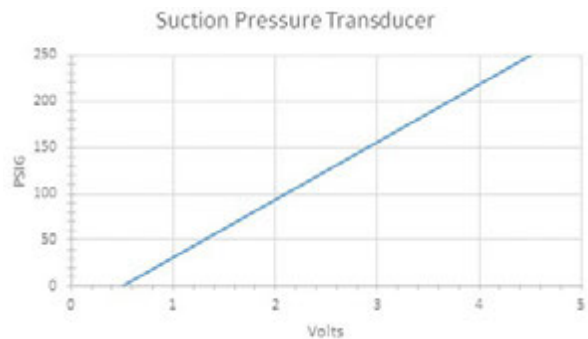
4. Check continuity of all three wires from transducer plug to controller plug. Replace wires if poor connection in any wire.

Formula for Tech:

$$(\text{Measured Pressure} \times .016) + .5 =$$

Expected Transducer Signal Voltage (see Figure 2)

FIGURE 2
Voltage to Pressure: Suction Pressure Transducer



Thermistor Sensor

1. Make a visual check for broken wire insulation, broken wires or cracked epoxy material.
2. Disconnect 10k ohm NTC thermistor from the EEV control box.
3. Use an ohmmeter to measure the resistance between the two connectors. Also use ohmmeter to check for short or open.
4. Compare the resistance reading to Table 2. Use sensor ambient temperature. (Tolerance of part is $\pm 10\%$.)
5. If sensor is out of tolerance, shorted, open or reads very low ohms, it should be replaced.

**TABLE 2
10K Ohm NTC Sensor: Temperature/Resistance**

Temperature			Resistance			Temperature			Resistance			Temperature			Resistance		
F	C	Ω	F	C	Ω	F	C	Ω	F	C	Ω	F	C	Ω	F	C	Ω
-40	-40	188,500	28.4	-2	29,730	96.8	36	6,700	165.2	74	1,980						
-38.2	-39	178,500	30.2	-1	28,480	98.6	37	6,470	167	75	1,920						
-36.4	-38	169,000	32	0	27,280	100.4	38	6,250	168.8	76	1,870						
-34.6	-37	160,200	33.8	1	26,130	102.2	39	6,030	170.6	77	1,820						
-32.8	-36	151,900	35.6	2	25,030	104	40	5,830	172.4	78	1,770						
-31	-35	144,100	37.4	3	23,990	105.8	41	5,630	174.2	79	1,920						
-29.2	-34	136,700	39.2	4	23,000	107.6	42	5,440	176	80	1,670						
-27.4	-33	129,800	41	5	22,050	109.4	43	5,260	177.8	81	1,620						
-25.6	-32	123,300	42.8	6	21,150	111.2	44	5,080	179.6	82	1,580						
-23.8	-31	117,100	44.6	7	20,300	113	45	4,910	181.4	83	1,530						
-22	-30	111,300	46.4	8	19,480	114.8	46	4,750	183.2	84	1,490						
-20.2	-29	105,700	48.2	9	18,700	116.6	47	4,590	185	85	1,450						
-18.4	-28	100,500	50	10	17,960	118.4	48	4,440	186.8	86	1,441						
-16.6	-27	95,520	51.8	11	17,240	120.2	49	4,300	188.6	87	1,370						
-14.8	-26	90,840	53.6	12	16,560	122	50	4,160	190.4	88	1,340						
-13	-25	86,430	55.4	13	15,900	123.8	51	4,030	192.2	89	1,300						
-11.2	-24	82,260	57.2	14	15,280	125.6	52	3,900	194	90	1,270						
-9.4	-23	78,330	59	15	14,690	127.4	53	3,770	195.8	91	1,230						
-7.6	-22	74,610	60.8	16	14,120	129.2	54	3,650	197.6	92	1,200						
-5.8	-21	71,100	62.6	17	13,580	131	55	3,540	199.4	93	1,170						
-4	-20	67,770	64.4	18	13,060	132.8	56	3,430	201.2	94	1,140						
-2.2	-19	64,570	66.2	19	12,560	134.6	57	3,320	203	95	1,110						
-0.4	-18	61,540	68	20	12,090	136.4	58	3,220	204.8	96	1,080						
1.4	-17	58,680	69.8	21	11,630	138.2	59	3,120	206.6	97	1,050						
3.2	-16	55,970	71.6	22	11,200	140	60	3,020	208.4	98	1,020						
5	-15	53,410	73.4	23	10,780	141.8	61	2,930	210.2	99	1,000						
6.8	-14	50,980	75.2	24	10,380	143.6	62	2,840	212	100	970						
8.6	-13	48,680	77	25	10,000	145.4	63	2,750									
10.4	-12	46,500	78.8	26	9,630	147.2	64	2,670									
12.2	-11	44,430	80.6	27	9,280	149	65	2,590									
14	-10	42,470	82.4	28	8,940	150.8	66	2,510									
15.8	-9	40,570	84.2	29	8,620	152.6	67	2,440									
17.6	-8	38,770	86	30	8,310	154.4	68	2,360									
19.4	-7	37,060	87.8	31	8,010	156.2	69	2,300									
21.2	-6	35,440	89.6	32	7,730	158	70	2,230									
23	-5	33,900	91.4	33	7,450	159.8	71	2,160									
24.8	-4	32,440	93.2	34	7,190	161.6	72	2,100									
26.6	-3	31,050	95	35	6,940	163.4	73	2,040									

W30AYD Cooling and Dehumidification Application Data¹

DB/WB ²	OD Temp.		65°F ³		70°F		75°F		80°F		85°F		90°F		95°F		100°F		105°F			
	Mode	AC	Dehum	AC	Dehum	AC	Dehum	AC	Dehum	AC	Dehum	AC	Dehum	AC	Dehum	AC	Dehum	AC	Dehum	AC	Dehum	
75/62.5 (50% RH)	Total Cooling Btuh	32,100	14,400	12,100	30,600	10,100	29,300	7,500	28,500	5,200	27,600	2,900	26,700	500	26,700	500	25,900	25,900	25,000	25,000	25,000	
	Sensible Btuh	22,500	5,400	22,000	21,500	2,300	21,100	300	20,700	(1,400)	20,300	(3,000)	20,000	(4,700)	20,000	(4,700)	19,700	(6,400)	19,400	(8,000)	19,400	(8,000)
	S/F	0.701	0.375	0.705	0.306	0.228	0.720	0.040	0.726	0	0.736	0	0.749	0	0.749	0	0.761	0	0.776	0	0.776	0
	Latent Btuh	9,600	9,000	9,200	8,400	9,100	7,800	8,200	7,200	6,600	7,300	5,900	6,700	5,200	6,200	4,500	5,600	4,500	5,600	3,800	3,800	3,800
	Lbs. H ₂ O/hr.	9.1	8.5	8.7	7.9	8.6	7.4	7.7	6.8	7.4	6.2	6.9	5.6	6.3	4.9	5.8	4.2	5.8	4.2	5.3	3.6	3.6
	Supply Air DB	52.5	67.9	52.9	70.2	53.3	72.4	53.7	74.6	54.0	76.8	54.4	79.0	54.8	81.1	55.1	83.3	83.3	85.4	85.4	85.4	85.4
	Supply Air WB	50.8	55.9	51.2	57.0	51.2	57.9	51.9	59.2	52.2	60.3	52.6	61.3	52.9	62.4	53.2	63.2	63.2	64.5	64.5	64.5	64.5
	Suction PSIG ⁴	121	115	123	117	125	119	125	121	127	123	128	126	129	128	131	130	132	132	132	133	133
	Discharge PSIG ⁴	271	228	291	243	311	257	335	272	358	288	382	304	408	320	434	336	462	336	462	353	353
	Total Cooling Btuh	32,900	15,400	32,900	13,100	32,300	10,900	31,100	9,600	30,200	8,500	29,300	7,200	28,400	3,900	27,600	1,500	26,700	26,700	25,900	25,900	25,900
Sensible Btuh	22,100	4,700	21,600	3,000	21,100	1,300	20,700	(400)	20,300	(2,100)	19,900	(3,800)	19,600	(5,400)	19,300	(7,100)	19,300	(7,100)	19,000	(8,700)	(8,700)	
S/F	0.672	0.31	0.675	0.23	0.678	0.12	0.685	0	0.693	0	0.701	0	0.710	0	0.723	0	0.734	0	0.734	0	0.734	
Latent Btuh	10,800	10,700	10,400	10,100	10,000	9,600	9,500	8,900	9,000	8,300	8,500	7,700	8,000	6,900	7,400	6,300	7,400	6,300	6,900	5,500	5,500	
Lbs. H ₂ O/hr.	10.2	10.1	9.8	9.5	9.4	9.1	9.0	8.4	8.5	7.8	8.0	7.3	7.5	6.5	7.0	5.9	7.0	5.9	6.5	5.2	5.2	
Supply Air DB	53.9	68.9	54.3	71.1	54.6	73.3	55.0	75.5	55.4	77.7	55.8	79.9	56.1	82.1	56.5	84.3	84.3	86.4	86.4	86.4	86.4	
Supply Air WB	52.3	57.0	52.6	58.1	53.0	59.2	53.3	60.3	53.7	61.4	54.0	62.4	54.4	63.5	54.7	64.5	64.5	65.0	65.0	65.0	65.0	
Suction PSIG ⁴	125	118	126	120	127	122	129	124	130	127	131	129	133	131	134	134	136	136	136	136	136	
Discharge PSIG ⁴	273	231	293	245	314	260	337	275	360	290	384	306	410	322	436	339	463	339	463	356	356	
Total Cooling Btuh	33,800	16,400	32,900	14,200	32,300	12,200	31,100	9,600	30,200	8,500	29,300	7,200	28,400	2,500	27,600	200	26,700	26,700	26,700	26,700	26,700	
Sensible Btuh	21,600	3,900	21,100	2,200	20,700	800	20,200	(1,100)	19,900	(2,800)	19,500	(4,500)	19,200	(6,200)	18,900	(7,800)	18,900	(7,800)	18,600	(9,500)	(9,500)	
S/F	0.639	0.238	0.641	0.155	0.641	0.066	0.650	0	0.659	0	0.666	0	0.676	0	0.685	0	0.697	0	0.697	0	0.697	
Latent Btuh	12,200	12,500	11,800	12,000	11,600	11,400	10,900	10,700	10,300	10,000	9,800	9,400	9,200	8,700	8,700	8,000	8,000	8,000	8,100	7,300	7,300	
Lbs. H ₂ O/hr.	11.5	11.8	11.1	11.3	10.9	10.8	10.3	10.1	9.7	9.4	9.2	8.9	8.7	8.2	8.2	7.5	7.5	7.5	7.6	6.9	6.9	
Supply Air DB	55.2	69.8	55.6	72.1	56.0	74.3	56.4	76.5	56.8	78.7	57.1	80.9	57.5	83.1	57.8	85.2	85.2	87.4	87.4	87.4	87.4	
Supply Air WB	53.7	58.1	54.1	59.2	54.0	60.0	54.8	61.4	55.1	62.5	55.5	63.5	55.8	64.6	56.1	65.6	65.6	66.7	66.7	66.7	66.7	
Suction PSIG ⁴	129	121	130	123	132	125	132	128	134	130	135	132	136	135	137	139	140	140	140	140	140	
Discharge PSIG ⁴	274	233	295	248	314	262	338	277	362	293	386	309	411	325	438	341	465	341	465	358	358	
Total Cooling Btuh	34,600	17,400	33,700	15,200	33,200	13,200	31,900	10,600	31,000	8,200	30,100	5,900	29,300	3,600	28,400	1,200	27,600	27,600	27,600	27,600	27,600	
Sensible Btuh	21,200	3,200	20,700	1,500	20,300	-	19,800	(1,900)	19,400	(3,600)	19,100	(5,200)	18,700	(6,900)	18,400	(8,600)	18,400	(8,600)	18,200	(10,200)	(10,200)	
S/F	0.613	0.18	0.614	0.10	0.611	0.00	0.621	0	0.626	0	0.635	0	0.638	0	0.648	0	0.659	0	0.659	0	0.659	
Latent Btuh	13,400	14,200	13,000	13,700	12,900	13,200	12,100	12,500	11,600	11,800	11,000	11,100	10,600	10,500	10,000	9,800	9,800	9,400	9,000	9,000	9,000	
Lbs. H ₂ O/hr.	12.6	13.4	12.3	12.9	12.2	12.5	11.4	11.8	10.9	11.1	10.4	10.5	10.0	9.9	9.4	9.2	9.4	9.2	8.9	8.5	8.5	
Supply Air DB	56.6	70.8	57.0	73.0	57.4	75.2	57.8	77.4	58.1	79.6	58.5	81.8	58.8	84.0	59.2	86.2	86.2	89.3	89.3	89.3	89.3	
Supply Air WB	55.2	59.1	55.5	60.3	55.5	61.1	56.2	62.5	56.6	63.5	56.9	64.6	57.2	65.7	57.6	66.7	66.7	67.9	67.9	67.9	67.9	
Suction PSIG ⁴	132	125	133	127	135	129	136	131	137	133	139	136	140	138	142	140	143	143	143	143	143	
Discharge PSIG ⁴	276	236	297	250	316	265	340	280	364	295	388	311	413	327	440	344	467	344	467	361	361	
Total Cooling Btuh	35,500	18,400	34,600	16,200	34,000	14,200	32,800	11,600	31,900	9,300	31,000	6,900	30,100	4,600	29,300	2,200	28,400	28,400	28,400	28,400	28,400	
Sensible Btuh	20,800	2,500	20,300	800	19,800	(700)	19,400	(2,600)	19,000	(4,300)	18,600	(6,000)	18,300	(7,600)	18,000	(9,300)	17,700	(9,300)	17,700	(10,900)	(10,900)	
S/F	0.586	0.136	0.587	0.049	0.582	0	0.591	0	0.596	0	0.600	0	0.608	0	0.614	0	0.623	0	0.623	0	0.623	
Latent Btuh	14,700	15,900	14,300	15,400	14,200	14,900	13,400	14,200	12,900	13,600	12,400	12,900	11,800	12,200	11,300	11,500	10,700	10,700	10,700	10,700	10,700	
Lbs. H ₂ O/hr.	13.9	15.0	13.5	14.5	13.4	14.1	12.6	13.4	12.2	12.8	11.7	12.2	11.5	11.5	10.7	10.8	10.1	10.1	10.1	10.1	10.1	
Supply Air DB	58.0	71.7	58.4	74.0	58.7	76.2	59.1	78.4	59.5	80.6	59.9	82.8	60.2	85.0	60.6	87.1	87.1	90.9	90.9	90.9	90.9	
Supply Air WB	56.6	60.2	57.0	61.3	56.9	62.2	57.7	63.5	58.0	64.6	58.4	65.7	58.7	66.8	59.0	67.8	67.8	69.3	69.3	69.3	69.3	
Suction PSIG ⁴	136	128	137	130	139	132	139	134	141	137	143	139	144	141	144	144	147	147	147	147	147	
Discharge PSIG ⁴	278	238	298	252	318	267	342	282	365	298	390	314	415	330	441	346	469	346	469	363	363	
Total Cooling Btuh	35,200	18,400	34,300	16,100	33,800	14,100	32,500	11,500	31,600	9,200	30,700	6,800	29,900	4,500	29,000	2,100	28,200	28,200	28,200	28,200	28,200	
Sensible Btuh	18,500	5,400	18,000	3,700	17,600	2,300	17,100	300	16,700	(1,400)	16,400	(3,000)	16,000	(4,700)	15,700	(6,400)	15,500	(6,400)	15,500	(8,000)	(8,000)	
S/F	0.526	0.29	0.525	0.23	0.521	0.16	0.526	0.03	0.528	0	0.534	0	0.535	0	0.541	0	0.550	0	0.550	0.00	0.00	
Latent Btuh	16,700	13,000	16,300	12,400	16,200	11,800	15,400	11,200	14,900	10,600	14,300	9,800	13,900	9,200	13,300	8,500	12,700	12,700	12,700	7,700	7,700	
Lbs. H ₂ O/hr.	15.8	12.3	15.4	11.7	15.3	11.1	14.5	10.6	14.1	11.0	13.5	9.2	13.1	8.7	12.5	8.0	12.0	12.0	12.0	7.3	7.3	
Supply Air DB	57.3	72.4	57.7	74.6	58.0	76.9	58.5	79.1	58.8	81.3	59.2	83.5	59.5	85.6	59.9	87.8	87.8	90.2	90.2	89.9	89.9	
Supply Air WB	56.7	60.4	57.0																			

W36AYD Cooling and Dehumidification Application Data¹

DB/WB ²	65°F ³		70°F		75°F		80°F		85°F		90°F		95°F		100°F		105°F		
	AC	Dehum	AC	Dehum	AC	Dehum	AC	Dehum	AC	Dehum	AC	Dehum	AC	Dehum	AC	Dehum	AC	Dehum	
75/62.5 (50% RH)	Total Cooling Btuh	39,800	18,700	38,700	16,200	37,500	13,700	36,500	11,100	8,500	34,200	10,300	33,000	8,500	32,000	11,800	30,600	10,500	29,000
	Sensible Btuh	29,200	7,100	28,700	5,300	28,200	3,900	27,700	1,600	27,200	26,600	(2,200)	26,100	(3,000)	25,500	(4,200)	25,000	(6,100)	24,500
	S/F	0.734	0.380	0.742	0.327	0.752	0.255	0.759	0.144	0.771	0	0.778	0	0.791	0	0.802	0	0.817	0
	Latent Btuh	10,600	11,600	10,900	10,900	9,300	10,200	8,800	9,500	8,100	8,800	7,600	8,100	6,900	7,400	6,300	6,500	5,600	5,700
	Lbs. H ₂ O/hr.	10.0	10.9	9.4	10.3	8.8	9.6	8.3	9.0	7.6	8.3	7.2	7.6	6.5	7.0	5.9	6.1	5.3	5.4
	Supply Air DB	52.0	67.0	52.4	69.0	52.8	71.1	53.3	73.2	73.2	75.4	74.1	77.5	75.4	79.7	74.8	81.9	75.1	84.1
	Supply Air WB	50.5	55.1	51.0	56.1	51.3	57.0	51.7	58.1	52.1	59.2	52.4	62.2	52.8	61.3	53.1	62.5	53.4	63.6
	Suction PSIG ⁴	125	119	127	120	128	120	122	131	123	131	123	133	126	134	126	135	128	137
	Discharge PSIG ⁴	287	239	307	254	329	269	351	284	376	300	401	317	427	334	455	352	484	371
	Total Cooling Btuh	40,900	19,800	39,800	17,400	38,500	14,900	37,500	12,300	36,300	9,700	35,200	7,100	34,000	4,400	32,800	1,600	31,700	0
Sensible Btuh	27,500	6,200	27,000	4,400	26,500	2,500	26,000	700	25,500	(1,200)	25,000	(3,200)	24,500	(5,100)	23,900	(7,000)	23,300	(9,000)	
S/F	0.672	0.31	0.678	0.25	0.687	0.17	0.693	0.06	0.702	0	0.710	0	0.721	0	0.729	0	0.735	0	
Latent Btuh	13,400	13,600	12,800	13,000	12,100	12,400	11,500	11,600	10,900	10,900	10,200	10,300	9,500	9,500	8,900	8,600	8,400	7,800	
Lbs. H ₂ O/hr.	12.6	12.8	12.1	12.3	11.4	11.7	10.8	10.9	10.2	10.3	9.6	9.7	9.0	9.0	8.4	8.1	7.9	7.4	
Supply Air DB	53.2	68.0	53.6	70.1	54.1	72.2	54.5	74.3	74.3	76.4	75.3	78.6	75.6	80.7	76.0	83.0	76.4	85.2	
Supply Air WB	51.9	56.2	52.3	57.2	52.7	58.2	53.1	59.2	53.5	60.3	53.8	61.3	54.2	62.4	54.5	63.5	54.8	64.7	
Suction PSIG ⁴	128	122	130	123	131	124	133	125	134	126	136	127	137	129	138	131	140	133	
Discharge PSIG ⁴	288	242	309	256	330	271	353	287	377	303	402	320	429	337	457	355	485	373	
Total Cooling Btuh	41,900	21,000	40,800	18,600	39,500	16,100	38,500	13,500	37,400	10,900	36,200	8,300	35,000	5,600	33,900	2,800	32,700	0	
Sensible Btuh	25,900	5,300	25,400	3,500	24,900	1,700	24,400	(300)	23,900	(2,100)	23,400	(4,100)	22,800	(6,000)	22,300	(7,900)	21,700	(9,900)	
S/F	0.618	0.252	0.623	0.188	0.630	0.106	0.634	0	0.639	0	0.646	0	0.651	0	0.658	0	0.664	0	
Latent Btuh	16,000	15,700	15,400	15,100	14,600	14,400	14,100	13,800	13,500	13,000	12,800	12,400	12,200	11,600	11,600	10,700	11,000	9,900	
Lbs. H ₂ O/hr.	15.1	14.8	14.5	14.2	13.8	13.6	13.3	13.0	12.7	12.3	12.1	11.7	11.5	10.9	10.9	10.1	10.4	9.3	
Supply Air DB	54.4	69.1	54.9	71.1	55.2	73.2	55.7	75.3	75.3	77.4	76.5	79.6	76.9	81.8	77.2	84.0	77.6	86.2	
Supply Air WB	53.3	57.3	53.7	58.3	54.0	59.2	54.5	60.3	54.8	61.3	55.2	62.4	55.5	63.5	55.9	64.6	56.2	65.8	
Suction PSIG ⁴	131	125	133	126	134	126	136	128	137	129	138	130	140	132	141	134	143	136	
Discharge PSIG ⁴	290	245	310	259	332	274	355	290	379	306	404	322	431	340	458	358	487	376	
Total Cooling Btuh	42,900	22,200	41,800	19,800	40,600	17,300	39,500	14,700	38,400	12,100	37,200	9,500	36,100	6,800	34,900	4,000	33,700	1,200	
Sensible Btuh	24,200	4,400	23,800	2,600	23,300	700	22,800	(1,200)	22,200	(3,100)	21,700	(5,000)	21,200	(6,900)	20,600	(8,800)	20,100	(10,800)	
S/F	0.564	0.20	0.569	0.13	0.574	0.04	0.577	0	0.578	0	0.583	0	0.587	0	0.590	0	0.596	0	
Latent Btuh	18,700	17,800	18,000	17,200	17,300	16,600	16,700	15,900	15,900	15,200	15,500	14,500	14,900	13,700	14,300	12,800	13,600	12,000	
Lbs. H ₂ O/hr.	17.6	16.8	17.0	16.2	16.3	15.7	15.8	15.0	15.3	14.3	14.6	13.7	14.1	12.9	13.5	12.1	12.8	11.3	
Supply Air DB	55.7	70.1	56.1	72.2	56.5	74.2	56.9	76.3	76.3	78.5	77.7	80.6	78.1	82.8	78.4	85.0	78.8	87.3	
Supply Air WB	54.7	58.4	55.1	59.4	55.4	60.3	55.8	61.4	56.2	62.4	56.6	63.5	56.9	64.6	57.2	65.7	57.5	66.9	
Suction PSIG ⁴	134	128	136	129	137	129	139	131	140	132	141	133	143	135	144	137	146	139	
Discharge PSIG ⁴	292	247	312	262	334	277	356	292	380	308	406	325	432	342	460	360	489	379	
Total Cooling Btuh	43,900	23,400	42,800	21,000	41,600	18,500	40,600	15,900	39,400	13,300	38,300	10,600	37,100	7,900	35,900	5,200	34,700	2,400	
Sensible Btuh	22,600	3,500	22,100	1,700	21,700	(200)	21,100	(2,100)	20,600	(4,000)	20,100	(5,900)	19,500	(7,800)	19,000	(9,700)	18,400	(11,700)	
S/F	0.515	0.150	0.516	0.081	0.522	0	0.520	0	0.523	0	0.525	0	0.526	0	0.529	0	0.530	0	
Latent Btuh	21,300	19,900	20,700	19,300	19,900	18,700	19,500	18,000	18,800	17,300	18,200	16,500	17,600	15,700	16,900	14,900	16,300	14,100	
Lbs. H ₂ O/hr.	20.1	18.8	19.5	18.2	18.8	17.6	18.4	17.0	17.7	16.3	17.2	15.6	16.6	14.8	15.9	14.1	15.4	13.3	
Supply Air DB	56.9	71.1	57.3	73.2	57.7	75.2	58.1	77.4	77.4	79.5	78.9	81.7	79.3	83.9	79.7	86.1	80.3	88.3	
Supply Air WB	56.0	59.5	56.4	60.4	56.7	61.4	57.2	62.5	57.6	63.5	57.9	64.6	58.3	65.7	58.6	66.8	58.9	68.0	
Suction PSIG ⁴	137	131	139	132	140	132	142	134	143	135	144	136	146	138	147	140	149	142	
Discharge PSIG ⁴	293	250	314	264	335	279	358	295	382	311	407	328	434	345	462	363	490	382	
Total Cooling Btuh	44,300	24,700	43,200	22,200	42,000	19,700	41,000	17,200	39,800	14,600	38,700	11,900	37,500	9,200	36,300	6,500	35,100	3,700	
Sensible Btuh	28,800	7,600	28,300	5,800	27,800	3,900	27,300	2,000	26,800	100	26,200	(1,800)	25,700	(3,700)	25,200	(5,700)	24,600	(7,600)	
S/F	0.650	0.31	0.655	0.26	0.662	0.20	0.666	0.12	0.673	0.01	0.677	0	0.685	0	0.694	0	0.701	0	
Latent Btuh	15,500	17,100	14,900	16,400	14,200	15,800	13,700	15,200	14,500	14,500	12,500	13,700	11,800	12,900	11,100	12,200	10,500	11,300	
Lbs. H ₂ O/hr.	14.6	16.1	14.1	15.5	13.4	14.9	12.9	14.3	12.3	13.7	11.8	12.9	11.1	12.2	10.5	11.5	9.9	10.7	
Supply Air DB	57.6	72.1	58.0	74.2	58.4	76.2	58.4	78.4	78.4	80.5	79.6	82.6	80.0	84.8	80.4	87.0	80.7	89.3	
Supply Air WB	56.4	59.5	56.8	60.5	57.1	61.4	57.5	62.5	57.9	63.5	58.3	64.6	58.6	65.7	58.9	66.8	59.2	68.0	
Suction PSIG ⁴	138	133	140	134	141	134	143	136	144	137	145	139	147	140	148	142	150	144	
Discharge PSIG ⁴	293	250	313	265	335	280	357	295	381	311	407	328	433	345	461	363	490	382	

¹ Values listed are with ventilation package disabled
² Return air temperature °F @ Default airflow (1150 CFM) for AC tests and Balanced Climate airflow (790 CFM) for dehumidification tests
³ Below 50°F, unit requires a factory or field installed low ambient control.
⁴ Suction pressure +/- 4 psi, Discharge pressure +/- 10 psi

W42AYD Cooling and Dehumidification Application Data¹

DB/WB ²	OD Temp. Mode		65°F ³		70°F		75°F		80°F		85°F		90°F		95°F		100°F		105°F			
	AC	Dehum	AC	Dehum	AC	Dehum	AC	Dehum	AC	Dehum	AC	Dehum	AC	Dehum	AC	Dehum	AC	Dehum	AC	Dehum		
75/62.5 (50% RH)	Total Cooling Btuh	45,900	19,700	16,800	14,000	40,600	11,000	39,300	8,000	38,100	4,900	36,900	1,700	35,700								
	Sensible Btuh	33,300	9,200	32,100	4,900	30,900	0.761	29,800	(2,000)	29,800	(4,300)	29,300	(6,600)	28,800	(9,000)							
	Latent Btuh	12,600	13,300	11,900	11,100	11,900	10,700	10,700	10,000	10,000	8,300	9,200	7,600	8,300	6,900	7,500						
	Lbs. H2O/hr.	11.9	12.5	11.2	10.5	11.2	10.8	9.2	10.1	8.5	9.4	7.8	8.7	7.2	7.8	6.5	7.1					
	Supply Air DB	52.6	66.1	53.0	68.3	53.3	70.4	53.8	72.6	54.2	74.8	54.9	79.1	55.3	81.4	55.6	83.6					
	Supply Air WB	50.8	51.2	55.9	51.6	56.8	51.9	58.0	52.3	59.0	52.6	60.1	52.9	61.1	53.3	62.1	53.6	63.2				
	Suction PSIG ⁴	119	108	120	109	121	110	122	112	123	114	125	118	127	121	129	124					
	Discharge PSIG ⁴	274	243	295	260	315	273	339	292	362	307	384	322	407	335	431	348	455	360			
	Total Cooling Btuh	47,200	24,000	45,800	21,200	44,500	18,300	43,200	15,400	41,900	12,400	40,600	9,400	39,400	6,300	38,200	3,200	37,000				
	Sensible Btuh	31,500	8,200	30,900	6,000	30,300	3,800	29,700	1,500	29,100	(700)	28,600	(3,000)	28,000	(5,300)	27,500	(7,600)	27,000	(10,000)			
SF	0.667	0.34	0.675	0.28	0.681	0.21	0.688	0.10	0.695	0	0.704	0	0.711	0	0.720	0	0.730	0				
75/64.1 (55% RH)	Total Cooling Btuh	15,700	15,800	14,900	15,200	14,500	13,900	12,800	13,100	12,400	11,600	11,400	10,800	10,000	10,000							
	Sensible Btuh	14.8	14.9	14.1	14.3	13.4	12.7	13.1	12.1	12.4	11.3	11.7	10.8	10.1	10.2	9.4	9.4					
	Latent Btuh	53.8	67.1	54.2	69.2	54.6	71.4	54.9	73.5	55.3	75.7	77.9	56.1	80.1	82.3	56.8	84.5					
	Lbs. H2O/hr.	17.7	17.2	17.0	16.6	16.3	15.8	15.7	15.5	14.9	14.7	14.1	13.6	13.3	13.0	12.5	11.7	11.7				
	Supply Air DB	54.9	68.0	55.3	70.2	55.6	72.3	56.1	74.5	56.5	76.7	78.8	57.2	81.0	83.3	58.0	85.5					
	Supply Air WB	53.6	57.0	54.0	58.1	54.3	59.0	54.7	60.1	55.0	61.1	62.2	55.7	63.2	64.3	56.3	65.3					
	Suction PSIG ⁴	125	114	126	115	127	117	128	118	129	121	131	122	132	125	134	128	135	131			
	Discharge PSIG ⁴	277	249	298	266	318	279	342	298	366	313	387	328	411	341	434	354	458	366			
	Total Cooling Btuh	49,800	26,800	48,400	24,000	47,100	21,100	45,800	18,300	44,500	15,300	43,300	12,300	42,000	9,200	40,800	6,100	39,700	2,800			
	Sensible Btuh	28,000	6,200	27,300	4,000	26,800	1,900	26,200	(500)	25,600	(2,700)	25,000	(5,000)	24,500	(7,300)	24,000	(9,600)	23,500	(12,000)			
SF	0.562	0.23	0.564	0.17	0.569	0.09	0.572	0	0.575	0	0.577	0	0.583	0	0.588	0	0.592	0				
75/66.7 (65% RH)	Total Cooling Btuh	21,800	20,600	21,100	20,000	20,300	19,200	19,600	18,800	18,900	18,000	17,300	17,500	16,500	16,800	15,700	16,200	14,800				
	Lbs. H2O/hr.	20.6	19.4	19.9	18.9	19.2	18.1	18.5	17.7	17.8	17.0	16.3	16.5	15.6	15.8	14.8	15.3	14.0				
	Supply Air DB	56.1	69.0	56.5	71.1	56.8	73.3	57.3	75.4	57.7	77.6	79.8	58.4	82.0	84.2	59.1	86.4					
	Supply Air WB	55.0	58.1	55.3	59.1	55.7	60.0	56.1	61.2	56.4	62.2	56.8	63.2	57.1	64.3	57.4	65.3	57.7	66.4			
	Suction PSIG ⁴	128	118	129	119	130	120	131	121	133	123	134	126	135	128	137	131	138	134			
	Discharge PSIG ⁴	279	252	300	269	320	282	344	301	366	316	389	331	412	344	436	357	459	369			
	Total Cooling Btuh	51,100	28,300	49,800	25,500	48,500	22,500	47,100	19,700	45,800	16,800	44,600	13,700	43,400	10,600	42,200	7,500	41,000	4,300			
	Sensible Btuh	26,200	5,200	25,600	3,000	25,000	900	24,400	(1,500)	23,800	(3,700)	23,300	(6,000)	22,700	(8,300)	22,200	(10,600)	21,700	(13,000)			
	SF	0.513	0.184	0.514	0.118	0.515	0.040	0.518	0	0.520	0	0.522	0	0.523	0	0.526	0	0.529	0			
	75/68 (70% RH)	Total Cooling Btuh	24,900	23,100	24,200	22,500	23,500	21,600	22,700	21,200	22,000	20,500	19,700	20,700	18,900	20,000	18,100	19,300	17,300			
Lbs. H2O/hr.		23.5	21.8	22.8	21.2	22.2	20.4	21.4	20.0	20.8	19.3	20.1	18.6	19.5	17.8	18.9	17.1	18.2	16.3			
Supply Air DB		57.3	69.9	57.7	72.1	58.0	74.2	58.5	76.4	58.8	78.6	80.8	59.2	83.0	85.2	60.3	87.4					
Supply Air WB		56.4	59.2	56.7	60.2	57.1	61.1	57.5	62.2	57.8	63.3	58.1	64.3	58.5	65.4	58.8	66.4	59.1	67.5			
Suction PSIG ⁴		131	121	132	122	133	123	134	125	136	127	137	129	138	131	140	134	141	137			
Discharge PSIG ⁴		280	255	302	272	322	285	345	304	368	319	391	334	414	347	437	360	461	372			
Total Cooling Btuh		51,700	29,200	50,300	26,400	49,000	23,400	47,600	20,600	46,400	17,700	45,100	14,600	43,900	11,500	42,700	8,400	41,500	5,200			
Sensible Btuh		32,900	9,900	32,200	7,700	31,700	5,600	31,100	3,200	30,500	1,000	29,900	(1,300)	29,400	(3,600)	28,900	(5,900)	28,400	(8,300)			
SF		0.636	0.34	0.640	0.29	0.647	0.24	0.653	0.16	0.657	0.06	0.663	0	0.670	0	0.677	0	0.684	0			
80/68.3 (55% RH)		Total Cooling Btuh	18,800	19,300	18,100	18,700	17,300	17,800	16,500	17,400	15,900	16,700	15,200	15,900	14,500	14,300	13,100	13,500				
	Lbs. H2O/hr.	17.7	18.2	17.1	17.6	16.3	16.8	15.6	16.4	15.0	15.8	14.3	15.0	13.7	14.2	13.0	13.5	12.4	12.7			
	Supply Air DB	58.0	70.4	58.4	72.5	58.7	74.6	59.2	76.8	59.6	79.0	81.2	60.4	83.4	85.6	61.1	87.8					
	Supply Air WB	56.3	59.2	56.7	60.2	57.0	61.2	57.4	62.3	57.7	63.3	58.1	64.4	58.4	65.4	58.7	66.4	59.0	67.5			
	Suction PSIG ⁴	131	121	132	122	133	123	135	125	136	127	137	129	139	132	140	135	141	138			
	Discharge PSIG ⁴	280	255	302	273	322	285	346	305	368	320	391	334	414	348	437	360	461	373			

¹ Values listed are with ventilation package disabled
² Return air temperature °F @ Default airflow (1350 CFM) for AC tests and Balanced Climate airflow (950 CFM) for dehumidification tests
³ Below 50°F, unit requires a factory or field installed low ambient control.
⁴ Suction pressure +/- 4 psi, Discharge pressure +/- 10 psi

W48AYD Cooling and Dehumidification Application Data¹

DB/WB ²	65°F ³		70°F		75°F		80°F		85°F		90°F		95°F		100°F		105°F		
	AC	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum	
75/62.5 (50% RH)	Total Cooling Btuh	53,100	26,400	52,100	23,400	50,800	17,000	49,600	17,000	48,000	17,000	46,200	10,100	44,200	2,800	39,700			
	Sensible Btuh	39,800	11,100	39,300	8,700	39,200	6,300	38,200	3,900	37,500	1,400	36,700	(1,100)	35,900	(3,600)	34,000	(8,700)		
	S/F	0.750	0.420	0.754	0.372	0.772	0.315	0.770	0.229	0.781	0.103	0.794	0	0.812	0	0.831	0	0.856	0
	Latent Btuh	13,300	15,300	12,800	14,700	11,600	13,700	11,400	13,100	10,500	12,200	9,500	11,200	8,300	10,100	7,100	8,900	5,700	7,700
	Lbs. H ₂ O/hr.	12.5	14.4	12.1	13.9	10.9	12.9	10.8	12.4	9.9	11.5	9.0	10.6	7.8	9.5	6.7	8.4	5.4	7.3
	Supply Air DB	51.5	65.9	51.7	67.9	52.0	69.8	52.3	71.9	52.7	73.9	53.2	76.0	53.8	78.0	54.4	80.1	55.1	82.2
	Supply Air WB	50.4	54.8	50.7	55.7	50.9	56.7	51.3	57.7	51.7	58.7	52.2	59.8	52.6	60.8	53.1	61.9	53.7	63.0
	Suction PSIG ⁴	127	117	129	118	130	119	132	121	134	123	135	125	136	127	136	130	137	133
	Discharge PSIG ⁴	287	237	307	254	328	269	349	288	373	304	397	320	424	336	451	351	480	366
	Total Cooling Btuh	54,400	28,000	53,400	25,000	52,400	21,800	50,800	18,600	49,300	15,200	47,500	11,700	45,500	8,400	43,300	4,400	41,000	600
Sensible Btuh	37,500	9,700	37,000	7,400	36,500	5,000	35,900	2,600	35,200	100	34,400	(2,400)	33,600	(4,900)	32,600	(7,400)	31,600	(10,000)	
S/F	0.689	0.35	0.693	0.30	0.699	0.23	0.707	0.14	0.714	0.01	0.724	0	0.738	0	0.753	0	0.771	0	
Latent Btuh	16,900	18,300	16,400	17,600	15,900	16,800	14,900	16,000	14,100	15,100	13,100	14,100	11,900	13,000	10,700	11,800	9,400	10,600	
Lbs. H ₂ O/hr.	15.9	17.3	15.5	16.6	14.8	15.8	14.1	15.1	13.3	14.2	12.4	13.3	11.2	12.3	10.1	11.1	8.9	10.0	
Supply Air DB	52.9	67.0	53.1	68.9	53.4	70.9	53.7	73.0	54.2	75.0	54.6	77.0	55.2	79.1	55.8	81.2	56.5	83.3	
Supply Air WB	51.9	55.9	52.2	56.8	52.5	57.8	52.9	58.8	53.2	59.8	53.7	60.9	54.1	61.9	54.7	63.0	55.2	64.1	
Suction PSIG ⁴	130	120	132	121	134	122	135	124	137	126	138	129	139	130	139	133	140	136	
Discharge PSIG ⁴	289	239	308	257	329	274	351	291	374	307	399	323	425	338	452	354	481	368	
Total Cooling Btuh	55,600	29,600	54,700	26,500	53,300	23,200	52,100	20,100	50,500	16,800	48,800	13,300	46,800	9,700	44,600	6,000	42,300	2,200	
Sensible Btuh	35,200	8,400	34,700	6,100	34,500	3,700	33,600	1,300	32,900	(1,200)	32,100	(3,700)	31,200	(6,200)	30,300	(8,700)	29,300	(11,300)	
S/F	0.633	0.284	0.634	0.230	0.647	0.159	0.645	0.065	0.651	0	0.658	0	0.667	0	0.679	0	0.693	0	
Latent Btuh	20,400	21,200	20,000	20,400	18,800	19,500	18,800	18,800	17,600	18,000	16,700	17,000	15,600	15,900	14,300	14,700	13,000	13,500	
Lbs. H ₂ O/hr.	19.2	20.0	18.9	19.2	17.7	18.4	17.5	17.7	16.6	17.0	15.8	16.0	14.7	15.0	13.5	13.9	12.3	12.7	
Supply Air DB	54.3	68.0	54.5	70.0	54.8	72.0	55.2	74.0	55.6	76.1	56.1	78.1	56.6	80.2	57.2	82.2	57.9	84.3	
Supply Air WB	53.4	57.0	53.7	57.9	53.9	58.9	54.4	59.9	54.8	60.9	55.2	62.0	55.7	63.0	56.2	64.1	56.7	65.2	
Suction PSIG ⁴	133	123	135	124	137	125	138	127	140	129	141	131	142	134	142	136	143	139	
Discharge PSIG ⁴	290	242	309	259	331	274	352	293	375	309	400	325	426	341	454	356	483	371	
Total Cooling Btuh	56,900	31,200	56,000	28,100	54,600	24,800	53,400	21,700	51,800	18,400	50,100	14,900	48,100	11,300	45,900	7,600	43,500	3,800	
Sensible Btuh	32,800	7,100	32,400	4,800	32,200	2,400	31,200	(100)	30,500	(2,500)	29,800	(5,000)	28,900	(7,500)	28,000	(10,000)	27,000	(12,600)	
S/F	0.576	0.23	0.579	0.17	0.590	0.10	0.584	0	0.589	0	0.595	0	0.601	0	0.610	0	0.621	0	
Latent Btuh	24,100	24,100	23,600	23,300	22,400	22,400	22,200	21,800	20,900	20,900	20,300	19,900	19,200	18,800	17,900	17,600	16,500	16,400	
Lbs. H ₂ O/hr.	22.7	22.7	22.3	22.0	21.1	21.1	20.9	20.6	20.1	19.7	19.2	18.8	18.1	17.7	16.9	16.6	15.6	15.5	
Supply Air DB	55.8	69.1	56.0	71.1	56.2	73.0	56.6	75.1	57.0	77.1	57.5	79.2	58.0	81.2	58.6	83.3	59.3	85.4	
Supply Air WB	54.9	58.0	55.2	59.0	55.4	60.0	55.9	61.0	56.3	62.0	56.7	63.0	57.2	64.1	57.7	65.2	58.2	66.3	
Suction PSIG ⁴	136	126	138	127	140	129	141	130	143	132	144	134	145	137	145	139	146	142	
Discharge PSIG ⁴	291	244	311	262	332	276	353	296	377	312	402	328	428	343	455	359	484	373	
Total Cooling Btuh	58,200	32,800	57,200	29,700	55,900	26,400	54,700	23,300	53,100	20,000	51,300	16,500	49,400	12,900	47,200	9,200	44,800	5,500	
Sensible Btuh	30,500	5,800	30,100	3,400	29,900	1,100	28,900	(1,400)	28,200	(3,800)	27,400	(6,300)	26,600	(8,800)	25,700	(11,300)	24,700	(13,900)	
S/F	0.524	0.177	0.526	0.114	0.535	0.042	0.528	0	0.531	0	0.534	0	0.538	0	0.544	0	0.551	0	
Latent Btuh	27,700	27,000	27,100	26,300	26,000	25,300	25,800	24,700	24,900	23,800	23,900	22,800	22,800	21,700	21,500	20,500	20,100	19,200	
Lbs. H ₂ O/hr.	26.1	25.5	25.6	24.8	24.5	23.9	24.3	23.3	23.5	22.5	22.5	21.5	21.5	20.5	20.3	19.3	19.0	18.1	
Supply Air DB	57.2	70.2	57.4	72.1	57.6	74.1	58.0	76.2	58.4	78.2	58.9	80.2	59.4	82.3	60.1	84.4	60.7	86.5	
Supply Air WB	56.5	59.1	56.7	60.1	57.0	61.1	57.4	62.1	57.8	63.1	58.2	64.1	58.7	65.2	59.2	66.3	59.7	67.4	
Suction PSIG ⁴	139	130	141	131	143	132	144	134	146	136	147	138	148	140	148	143	149	146	
Discharge PSIG ⁴	293	247	312	264	333	279	355	298	378	314	403	330	429	346	457	361	485	376	
Total Cooling Btuh	58,200	33,300	57,300	30,200	56,900	26,900	54,700	23,800	53,100	20,500	51,400	17,000	49,400	13,400	47,200	9,700	44,800	5,800	
Sensible Btuh	37,900	11,200	37,500	8,800	37,300	6,500	36,300	4,000	35,600	1,600	34,900	(900)	34,000	(3,400)	33,100	(5,900)	32,100	(8,500)	
S/F	0.651	0.34	0.654	0.29	0.667	0.24	0.664	0.17	0.670	0.08	0.679	0	0.688	0	0.701	0	0.717	0	
Latent Btuh	20,300	22,100	19,800	21,400	18,600	20,400	18,400	19,800	17,500	18,900	16,500	17,900	15,400	16,800	14,100	15,600	12,700	14,300	
Lbs. H ₂ O/hr.	19.2	20.8	18.7	20.2	17.5	19.2	17.4	18.7	16.5	17.8	15.6	16.9	15.4	15.8	13.3	14.7	12.0	13.5	
Supply Air DB	57.5	70.5	57.7	72.5	58.0	74.4	58.3	76.5	58.8	78.5	59.2	80.6	59.8	82.7	60.4	84.7	61.1	86.8	
Supply Air WB	56.5	59.1	56.8	60.1	57.0	61.1	57.4	62.1	57.8	63.1	58.3	64.1	58.7	65.2	59.2	66.3	59.8	67.4	
Suction PSIG ⁴	139	130	142	131	143	133	145	134	146	136	147	138	148	141	149	143	149	146	
Discharge PSIG ⁴	288	241	307	258	329	272	350	292	373	308	398	324	424	340	452	355	481	370	

¹ Values listed are with ventilation package disabled
² Return air temperature °F @ Default airflow (1550 CFM) for AC tests and Balanced Climate airflow (1090 CFM) for dehumidification tests
³ Below 50°F, unit requires a factory or field installed low ambient control.
⁴ Suction pressure +/- 4 psi, Discharge pressure +/- 10 psi

W60AYD Cooling and Dehumidification Application Data¹

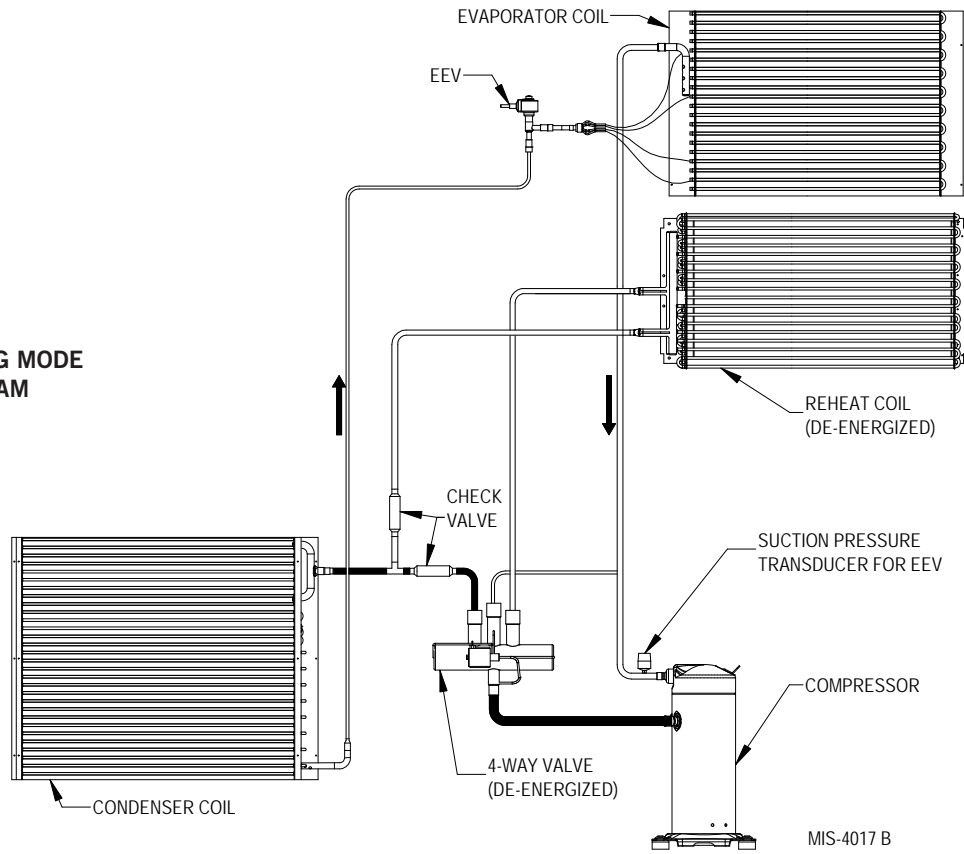
DB/WB ²	OD Temp. Mode		65°F ³		70°F		75°F		80°F		85°F		90°F		95°F		100°F		105°F	
	AC	Dehum	AC	Dehum	AC	Dehum	AC	Dehum	AC	Dehum	AC	Dehum	AC	Dehum	AC	Dehum	AC	Dehum	AC	Dehum
75/62.5 (50% RH)	Total Cooling Btuh	65,400	28,500	24,700	60,500	21,600	58,800	18,000	14,300	57,000	14,300	55,200	10,500	53,300	6,600	51,400	2,600	49,800	0	48,200
	Sensible Btuh	47,600	11,200	45,200	8,700	44,700	3,800	43,900	1,300	43,000	0.296	0.760	0.211	0.770	0.091	0.781	0	0.794	0	0.807
	SF	0.728	0.426	0.744	0.352	0.744	0.296	0.744	0.250	0.744	0.200	0.744	0.150	0.744	0.100	0.744	0.050	0.744	0	0.744
	Latent Btuh	17,800	17,300	15,900	16,000	15,100	14,300	13,300	13,400	12,400	11,800	11,200	10,600	10,000	9,400	8,800	8,200	7,600	7,000	6,400
	Lbs. H2O/hr.	16.8	17.3	15.9	16.3	15.0	14.2	13.3	13.4	12.4	11.8	11.2	10.6	10.0	9.4	8.8	8.2	7.6	7.0	6.4
	Supply Air DB	50.3	50.7	49.7	50.0	49.4	48.7	48.1	47.5	46.9	46.3	45.7	45.1	44.5	43.9	43.3	42.7	42.1	41.5	40.9
	Supply Air WB	49.4	49.7	49.1	49.4	48.8	48.1	47.5	46.9	46.3	45.7	45.1	44.5	43.9	43.3	42.7	42.1	41.5	40.9	40.3
	Suction PSIG ⁴	126	118	127	119	127	120	122	120	122	120	122	120	122	120	122	120	122	120	122
	Discharge PSIG ⁴	296	278	316	291	339	305	359	318	382	333	405	348	430	364	455	381	481	398	500
	Total Cooling Btuh	66,800	33,600	65,200	30,300	63,600	26,800	61,900	23,300	60,200	19,700	58,400	16,000	56,600	12,200	54,700	8,300	52,800	4,400	50,900
Sensible Btuh	45,000	12,000	44,300	9,600	43,500	7,200	42,800	4,700	42,000	2,200	41,200	300	40,400	3,000	39,600	5,600	38,800	8,400	38,000	
SF	0.674	0.36	0.679	0.32	0.684	0.27	0.691	0.20	0.698	0.11	0.705	0	0.714	0	0.724	0	0.735	0	0.746	
Latent Btuh	21,800	21,600	20,900	20,700	20,100	19,600	18,600	18,200	17,500	17,200	16,300	16,200	15,200	15,200	14,200	13,900	13,900	12,800	12,800	
Lbs. H2O/hr.	20.6	20.4	19.7	19.5	19.0	18.5	18.0	17.5	17.2	16.5	16.2	15.4	15.3	14.3	14.2	13.1	13.2	12.1	12.1	
Supply Air DB	51.7	51.7	51.2	51.2	50.8	50.4	50.0	49.6	49.2	48.8	48.4	48.0	47.6	47.2	46.8	46.4	46.0	45.6	45.2	
Supply Air WB	50.9	50.9	50.4	50.4	50.0	49.6	49.2	48.8	48.4	48.0	47.6	47.2	46.8	46.4	46.0	45.6	45.2	44.8	44.4	
Suction PSIG ⁴	129	121	130	122	131	124	132	125	133	126	134	127	135	129	137	130	138	132	126	
Discharge PSIG ⁴	298	282	318	295	340	308	362	322	384	337	408	352	432	368	458	385	484	402	500	
Total Cooling Btuh	68,200	35,300	66,600	32,000	65,000	28,100	63,300	25,000	61,600	21,400	59,800	17,700	58,000	13,900	56,100	10,100	54,200	6,100	52,300	
Sensible Btuh	42,300	10,300	41,600	8,000	40,900	5,400	40,100	3,100	39,400	600	38,600	2,000	37,800	4,600	37,000	7,300	36,100	10,000	35,200	
SF	0.620	0.292	0.625	0.250	0.629	0.192	0.633	0.124	0.637	0.028	0.645	0	0.652	0	0.660	0	0.666	0	0.672	
Latent Btuh	25,900	25,000	24,000	24,000	24,100	22,700	23,200	21,900	22,200	20,800	21,200	19,700	20,200	18,500	19,100	17,400	18,100	16,100	16,100	
Lbs. H2O/hr.	24.4	23.6	23.6	22.6	22.7	21.4	21.9	20.7	20.7	19.6	19.6	18.6	18.6	17.5	18.0	16.4	17.1	15.2	15.2	
Supply Air DB	53.0	52.7	52.4	52.4	52.0	51.6	51.2	50.8	50.4	50.0	49.6	49.2	48.8	48.4	48.0	47.6	47.2	46.8	46.4	
Supply Air WB	52.3	52.3	51.8	51.8	51.4	51.0	50.6	50.2	50.0	49.6	49.2	48.8	48.4	48.0	47.6	47.2	46.8	46.4	46.0	
Suction PSIG ⁴	132	125	133	125	134	127	132	125	131	124	130	123	130	123	131	124	130	123	126	
Discharge PSIG ⁴	301	286	321	299	344	313	364	326	387	341	410	356	435	372	460	389	486	406	500	
Total Cooling Btuh	69,600	37,100	68,000	33,700	66,400	29,900	64,700	26,800	63,000	23,100	61,200	19,400	59,400	15,700	57,600	11,800	55,600	7,800	53,700	
Sensible Btuh	39,700	8,700	38,900	6,400	38,200	3,800	37,500	1,500	36,700	1,000	35,900	3,600	35,100	6,200	34,300	8,900	33,500	11,600	32,600	
SF	0.570	0.23	0.572	0.19	0.575	0.13	0.580	0.06	0.583	0	0.587	0	0.591	0	0.595	0	0.603	0	0.607	
Latent Btuh	29,900	28,400	29,100	27,300	28,200	26,100	27,200	25,300	26,300	24,100	25,300	23,000	24,300	21,900	23,300	20,700	22,100	19,400	19,400	
Lbs. H2O/hr.	28.2	26.8	27.5	25.8	26.6	24.6	25.7	23.9	24.8	22.7	23.9	21.7	22.9	20.7	22.0	19.5	20.8	18.3	18.3	
Supply Air DB	54.4	54.7	54.7	54.7	54.4	54.1	53.8	53.4	53.1	52.8	52.4	52.1	51.8	51.5	51.2	50.9	50.6	50.3	50.0	
Supply Air WB	53.8	53.8	53.3	53.3	53.0	52.7	52.4	52.1	51.8	51.5	51.2	50.9	50.6	50.3	50.0	49.7	49.4	49.1	48.8	
Suction PSIG ⁴	136	128	137	129	138	130	139	131	140	133	141	134	142	135	143	137	145	138	132	
Discharge PSIG ⁴	303	290	324	303	347	317	367	330	389	345	413	360	437	376	463	393	489	410	500	
Total Cooling Btuh	71,000	38,800	69,400	35,500	67,800	31,600	66,100	28,500	64,400	24,900	62,700	21,200	60,800	17,400	59,000	13,500	57,100	9,600	55,200	
Sensible Btuh	37,000	7,100	36,300	4,700	35,600	2,200	34,800	1,000	34,000	2,600	33,200	5,200	32,500	7,800	31,600	10,500	30,800	13,200	29,900	
SF	0.521	0.183	0.523	0.132	0.525	0.070	0.526	0	0.528	0	0.531	0	0.535	0	0.536	0	0.539	0	0.543	
Latent Btuh	34,000	31,700	33,100	30,800	32,200	29,400	31,300	28,600	30,400	27,500	29,400	26,400	28,300	25,200	27,400	24,000	26,300	22,800	22,800	
Lbs. H2O/hr.	32.1	29.9	31.2	29.1	30.4	27.7	29.5	27.0	28.7	25.9	27.7	24.9	26.7	23.8	25.8	22.6	24.8	21.5	21.5	
Supply Air DB	55.8	55.8	55.8	55.8	55.5	55.2	54.9	54.6	54.3	54.0	53.7	53.4	53.1	52.8	52.5	52.2	51.9	51.6	51.3	
Supply Air WB	55.2	55.2	54.7	54.7	54.4	54.1	53.8	53.5	53.2	52.9	52.6	52.3	52.0	51.7	51.4	51.1	50.8	50.5	50.2	
Suction PSIG ⁴	139	131	140	132	141	134	143	135	143	136	144	137	146	139	147	140	148	141	134	
Discharge PSIG ⁴	306	294	326	307	349	321	369	334	392	349	416	364	440	380	465	397	491	414	500	
Total Cooling Btuh	71,400	39,200	69,900	35,900	68,200	32,000	66,600	28,900	64,800	25,300	63,100	21,600	61,300	17,800	59,400	14,000	57,500	10,000	55,600	
Sensible Btuh	45,800	13,600	45,100	11,200	44,400	8,700	43,600	6,400	42,800	3,800	42,000	1,300	41,200	3,000	40,400	5,600	39,600	8,400	38,700	
SF	0.641	0.35	0.645	0.31	0.651	0.27	0.655	0.22	0.660	0.15	0.666	0.06	0.672	0	0.680	0	0.689	0	0.698	
Latent Btuh	25,600	25,600	24,800	24,700	23,800	23,300	23,000	22,500	22,000	21,500	21,100	20,300	20,100	19,100	19,000	18,000	17,900	16,700	16,700	
Lbs. H2O/hr.	24.2	24.2	23.4	23.3	22.5	22.0	21.7	21.2	20.8	20.3	19.9	19.2	19.0	18.0	17.9	17.0	16.9	15.8	15.8	
Supply Air DB	56.1	56.1	56.5	56.5	56.2	55.9	55.6	55.3	55.0	54.7	54.4	54.1	53.8	53.5	53.2	52.9	52.6	52.3	52.0	
Supply Air WB	55.4	55.4	55.7	55.7	55.4	55.1	54.8	54.5	54.2	53.9	53.6	53.3	53.0	52.7	52.4	52.1	51.8	51.5	51.2	
Suction PSIG ⁴	140	132	141	133	142	134	143	135	144	137	145	138	146	139	148	141	149	142	135	
Discharge PSIG ⁴	305	292	325	308	348	322	368	336	391	350	415	366	439	381	464	398	490	415	500	

¹ Values listed are with ventilation package disabled
² Return air temperature °F @ Default airflow (1750 CFM) for AC tests and Balanced Climate airflow (1180 CFM) for dehumidification tests
³ Below 50°F, unit requires a factory or field installed low ambient control.
⁴ Suction pressure +/- 4 psi, Discharge pressure +/- 10 psi

W72AYD Cooling and Dehumidification Application Data¹

DB/WB ²	OD Temp. Mode	65°F ³		70°F		75°F		80°F		85°F		90°F		95°F		100°F		105°F			
		AC	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum	A/C	Dehum
75/62.5 (50% RH)	Total Cooling Btuh	79,000	38,500	77,000	35,000	75,200	31,700	73,100	27,700	71,000	23,800	69,000	19,800	67,000	15,700	64,900	11,400	62,800	6,900	6,900	
	Sensible Btuh	55,100	15,100	54,100	14,400	53,200	9,800	52,200	6,900	51,200	4,100	50,300	1,200	49,400	0	48,500	(4,700)	47,700	(7,700)	0	
	SF	0.697	0.392	0.703	0.354	0.707	0.309	0.714	0.249	0.721	0.172	0.729	0.061	0.737	0	0.747	0	0.760	0	0	0
	Latent Btuh	23,900	23,400	22,900	22,600	22,000	21,900	20,900	20,800	19,800	19,700	18,700	18,600	17,600	17,400	16,400	16,400	15,100	14,600	14,600	14,600
	Lbs. H ₂ O/hr.	22.5	22.1	21.6	21.3	20.8	20.7	19.7	19.6	18.7	18.6	17.6	17.5	16.6	16.4	15.5	15.2	14.2	13.8	13.8	13.8
	Supply Air DB	48.5	64.9	48.9	66.7	49.4	68.3	49.8	70.3	70.3	50.3	72.2	50.7	74.2	51.1	76.1	51.6	78.1	52.0	80.2	80.2
	Supply Air WB	47.6	53.1	48.1	54.0	48.5	54.9	48.9	56.0	49.4	57.0	49.8	58.0	50.2	59.0	50.6	60.0	50.9	61.1	61.1	61.1
	Suction PSIG ⁴	117	109	119	111	120	112	121	113	122	114	122	114	124	116	125	117	126	119	127	120
	Discharge PSIG ⁴	301	300	321	313	342	326	365	341	389	356	413	372	439	389	466	406	494	425	425	425
	Total Cooling Btuh	80,800	40,600	78,900	37,200	76,900	33,600	74,900	29,800	72,900	26,000	70,900	21,900	68,900	17,800	66,700	13,500	64,600	9,000	9,000	
Sensible Btuh	52,200	13,200	51,200	10,600	50,200	7,800	49,200	5,100	48,300	2,300	47,400	(600)	46,500	(3,500)	45,600	(6,500)	44,700	(9,500)	(9,500)	(9,500)	
SF	0.646	0.33	0.649	0.28	0.653	0.23	0.657	0.17	0.663	0.09	0.669	0	0.676	0	0.684	0	0.692	0	0	0	
Latent Btuh	28,600	27,400	27,700	26,600	26,700	25,800	25,700	24,700	24,600	23,700	23,500	22,500	22,300	21,300	21,100	20,000	19,000	18,500	18,500	18,500	
Lbs. H ₂ O/hr.	27.0	25.8	26.1	25.1	25.2	24.3	24.2	23.3	23.2	22.4	22.2	21.2	21.0	20.1	19.9	18.9	18.8	17.5	17.5	17.5	
Supply Air DB	49.9	66.2	50.4	67.9	50.8	69.7	51.3	71.6	71.6	51.7	73.5	52.1	75.4	52.6	77.3	53.0	79.4	53.4	81.4	81.4	
Supply Air WB	49.1	54.2	49.6	55.1	50.0	56.1	50.4	57.0	50.9	58.0	51.3	59.0	51.7	60.1	52.1	61.1	52.4	62.2	62.2	62.2	
Suction PSIG ⁴	120	112	122	114	123	115	124	116	125	118	127	119	128	120	129	122	130	123	123	123	
Discharge PSIG ⁴	304	305	324	317	346	331	368	345	392	361	416	377	442	394	469	411	497	430	430	430	
Total Cooling Btuh	82,700	42,700	80,700	39,300	78,900	36,000	76,700	32,000	74,700	28,100	72,700	24,100	70,600	19,900	68,600	15,600	66,500	11,200	11,200		
Sensible Btuh	49,300	11,400	48,200	8,700	47,300	6,200	46,300	3,300	45,400	400	44,400	(2,400)	43,500	(5,400)	42,700	(8,300)	41,800	(11,300)	(11,300)	(11,300)	
SF	0.596	0.267	0.597	0.221	0.599	0.172	0.604	0.103	0.608	0.014	0.611	0	0.616	0	0.622	0	0.629	0	0	0	
Latent Btuh	33,400	31,300	32,500	30,600	31,600	29,800	30,400	28,700	29,300	27,700	28,300	26,500	27,100	25,300	25,900	23,900	24,700	22,500	22,500	22,500	
Lbs. H ₂ O/hr.	31.5	29.5	30.7	28.9	29.8	28.1	28.7	27.1	27.6	26.1	26.7	25.0	25.6	23.9	24.4	22.5	23.3	21.2	21.2	21.2	
Supply Air DB	51.3	67.4	51.8	69.2	52.2	70.8	52.7	72.8	72.8	53.1	74.7	53.6	76.6	54.0	78.6	54.4	80.6	54.8	82.6	82.6	
Supply Air WB	50.6	55.2	51.1	56.2	51.5	57.1	51.9	58.1	52.3	59.1	52.8	60.1	53.2	61.2	53.5	62.2	53.9	63.3	63.3	63.3	
Suction PSIG ⁴	124	115	125	117	126	118	127	119	128	121	130	122	131	123	132	125	133	126	126	126	
Discharge PSIG ⁴	307	309	327	322	349	335	371	350	395	365	420	381	445	398	472	416	500	434	434	434	
Total Cooling Btuh	84,500	44,800	82,600	41,400	80,700	38,100	78,600	34,100	76,600	30,200	74,500	26,200	72,500	22,000	70,400	17,700	68,300	13,300	13,300		
Sensible Btuh	46,300	9,600	45,300	6,900	44,400	4,400	43,400	1,400	42,400	(1,400)	41,500	(4,300)	40,600	(7,200)	39,700	(10,100)	38,900	(13,200)	(13,200)	(13,200)	
SF	0.548	0.21	0.548	0.17	0.550	0.12	0.552	0.04	0.554	0	0.557	0	0.560	0	0.564	0	0.570	0	0	0	
Latent Btuh	38,200	35,200	37,300	34,500	36,300	33,700	35,200	32,700	34,200	31,600	33,000	30,500	31,900	29,200	30,700	27,800	29,400	26,500	26,500	26,500	
Lbs. H ₂ O/hr.	36.0	33.2	35.2	32.5	34.2	31.8	33.2	30.8	32.3	29.8	31.1	28.8	30.1	27.5	29.0	26.2	27.7	25.0	25.0	25.0	
Supply Air DB	52.7	68.6	53.2	70.4	53.6	72.0	54.1	74.0	74.0	54.5	75.9	55.0	77.8	55.4	79.8	55.8	81.8	56.2	83.9	83.9	
Supply Air WB	52.1	56.3	52.5	57.3	53.0	58.2	53.4	59.2	53.8	60.2	54.2	61.2	54.6	62.2	55.0	63.3	55.4	64.3	64.3	64.3	
Suction PSIG ⁴	127	118	128	120	129	121	131	122	132	123	133	125	134	126	135	128	136	129	129	129	
Discharge PSIG ⁴	310	314	331	327	352	340	375	355	398	370	423	386	448	403	475	421	503	439	439	439	
Total Cooling Btuh	86,400	47,000	84,400	43,500	82,600	40,200	80,400	36,200	78,400	32,300	76,400	28,300	74,300	24,200	72,200	19,900	70,100	15,400	15,400		
Sensible Btuh	43,400	7,800	42,400	5,100	41,500	2,500	40,400	(400)	39,500	(3,200)	38,600	(6,100)	37,700	(9,000)	36,800	(12,000)	36,000	(15,000)	(15,000)	(15,000)	
SF	0.502	0.166	0.502	0.117	0.502	0.062	0.502	0	0.504	0	0.505	0	0.507	0	0.510	0	0.514	0	0	0	
Latent Btuh	43,000	39,200	42,000	38,400	41,100	37,700	40,000	36,600	38,900	35,500	37,800	34,400	36,600	33,200	35,400	31,900	34,100	30,400	30,400	30,400	
Lbs. H ₂ O/hr.	40.6	37.0	39.6	36.2	38.8	35.6	37.7	34.5	36.7	33.5	35.7	32.5	34.5	31.3	33.4	30.1	32.2	28.7	28.7	28.7	
Supply Air DB	54.2	69.8	54.6	71.6	55.1	73.3	55.5	75.3	75.3	56.0	77.2	56.4	79.1	56.8	81.0	57.2	83.0	57.6	85.1	85.1	
Supply Air WB	53.6	57.4	54.0	58.4	54.5	59.2	54.9	60.3	55.3	61.3	55.7	62.3	56.1	63.3	56.5	64.4	56.9	65.4	65.4	65.4	
Suction PSIG ⁴	130	121	131	123	132	124	134	125	135	126	136	128	137	129	138	131	140	132	132	132	
Discharge PSIG ⁴	313	319	334	332	355	344	378	360	401	375	426	391	452	408	478	425	506	444	444	444	
Total Cooling Btuh	86,500	46,800	84,600	43,300	82,700	40,000	80,600	36,000	78,600	32,100	76,500	28,100	74,500	23,900	72,400	19,600	70,300	15,200	15,200		
Sensible Btuh	53,200	14,300	52,200	11,700	51,300	9,100	50,300	6,200	49,300	3,300	48,400	500	47,500	(2,400)	46,700	(5,400)	45,800	(8,400)	(8,400)	(8,400)	
SF	0.615	0.31	0.617	0.27	0.620	0.23	0.624	0.17	0.627	0.10	0.633	0.02	0.638	0	0.645	0	0.651	0	0	0	
Latent Btuh	33,300	32,500	32,400	31,600	31,400	30,900	30,300	29,800	29,300	28,800	28,100	27,600	27,000	26,300	25,700	25,000	24,500	23,600	23,600	23,600	
Lbs. H ₂ O/hr.	31.4	30.7	30.6	29.8	29.6	29.2	28.6	28.1	27.6	27.2	26.5	26.0	25.5	24.8	24.2	23.6	23.1	22.3	22.3	22.3	
Supply Air DB	54.3	70.4	54.8	72.2	55.3	73.8	55.7	75.8	75.8	56.2	77.7	56.6	79.6	57.0	81.6	57.4	83.6	57.8	85.6	85.6	
Supply Air WB	53.5	57.6	54.0	58.6	54.4	59.5	54.8	60.5	55.3	61.5	55.7	62.5	56.1	63.6	56.5	64.6	56.8	65.6	65.6	65.6	
Suction PSIG ⁴	131	122	132	123	133	124	135	126	136	127	137	129	138	130	139	131	140	133	133	133	
Discharge PSIG ⁴	314	321	334	334	356																

**AIR CONDITIONING MODE
CIRCUIT DIAGRAM**



**DEHUMIDIFICATION MODE
CIRCUIT DIAGRAM**

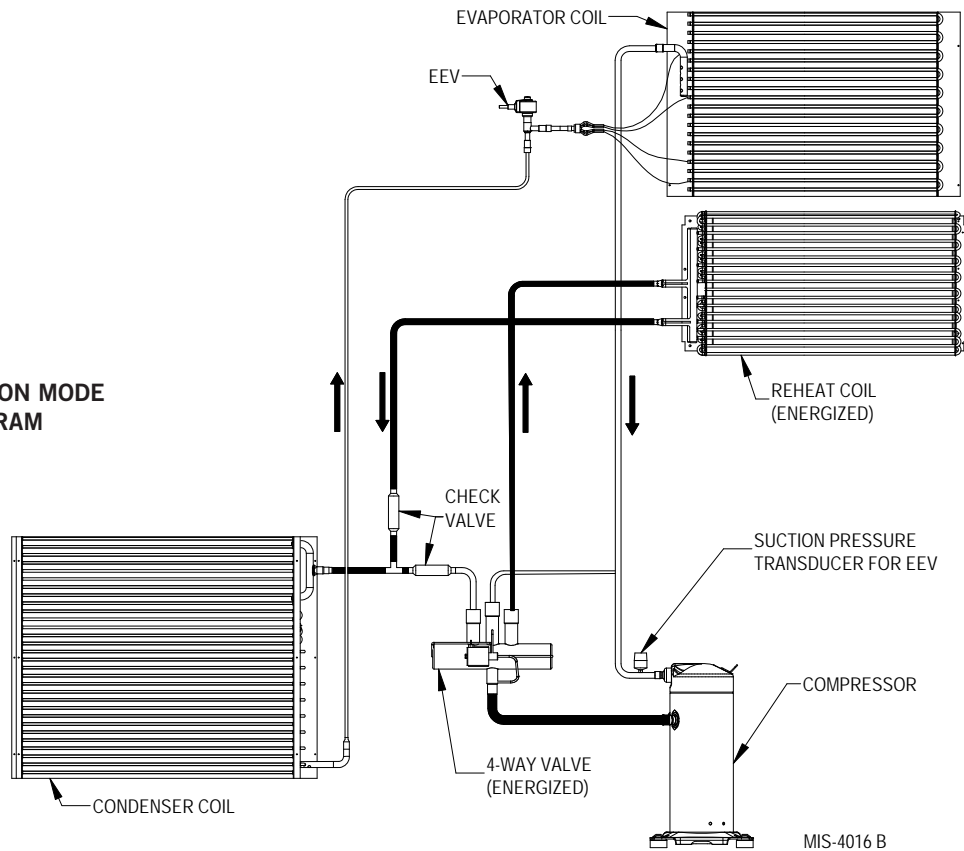


TABLE 3
Dehumidification Relay Logic Board

Energize on Unit Terminal Strip	Mode	Occupied/Unoccupied	Inputs to the Board				Outputs from the Board	
			Y	W2	A1	D	TWV	YO
Y1, G	Cooling	Unoccupied	X					X
Y1, G, A	Cooling	Occupied	X		X			X
Y1, G, A, D	Cooling w/Dehum ①	Occupied	X		X	X		X
Y1, G, D	Cooling w/Dehum ①	Unoccupied	X			X		X
G, B/W1	1st Stage Electric Heat	Unoccupied		X				
G, B/W1, A	1st Stage Electric Heat	Occupied		X	X			
G, B/W1, A, D	1st Stage Electric Heat w/Dehum ②	Occupied		X	X			
G, B/W1, D	1st Stage Electric Heat w/Dehum ②	Unoccupied		X				
G, B/W1, W2	2nd Stage Electric Heat	Unoccupied		X				
G, B/W1, W2, A	2nd Stage Electric Heat	Occupied		X	X			
G, B/W1, W2, A, D	2nd Stage Electric Heat and Dehum ②	Occupied		X	X			
G, B/W1, W2, D	2nd Stage Electric Heat and Dehum ②	Unoccupied		X				
D	Dehum	Unoccupied				X	X ③	X ③
D, A	Dehum	Occupied			X	X	X	X

① Cooling takes precedence over dehumidification. A cooling call cancels dehumidification.

② The dehumidification input “D” is not received by the board because of an isolation relay that is energized by the call for heating (B/W1). Thus, the heating call (B/W1) always takes precedence over dehumidification.

③ The relay logic board has a jumper (J1) on it to choose between “any-time dehumidification” and “occupied dehumidification”. The factory default is P1-P2. With the jumper in the P1-P2 position, dehumidification is available any time there is a “D” input to the relay logic board. With the jumper in the P2-P3 position, dehumidification is available when there is an occupancy signal to the “A1” terminal, “D” would also need to be energized to dehumidify.

Refer to sequence of operation. In most cases cooling and heating modes take priority over dehumidification.

TABLE 4A
Electrical Specifications – Dehumidification Models

Model	Rated Volts & Phase	No. Field Power Circuits	Single Circuit		Dual 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
W30AYDA0Z A05 A10	230/208-1	1 1 1	23 31 57	30 35 60				
W30AYDB0Z B05 B09	230/208-3	1 1 1	17 20 32	20 20 35				
W30AYDC0Z C05 C09	460-3	1 1 1	8 10 16	15 15 20				
W36AYDA0Z A05 A10	230/208-1	1 1 1	27 32 58	35 35 60				
W36AYDB0Z B05 B09	230/208-3	1 1 1	19 21 33	25 25 35				
W36AYDC0Z C05 C09	460-3	1 1 1	11 11 17	15 15 20				

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.

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 4B
Electrical Specifications – Dehumidification Models

Model	Rated Volts & Phase	No. Field Power Circuits	Single Circuit		Dual 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
W42AYDA00, AOZ A05 A10 A15	230/208-1	1 1 1 1 or 2	31 32 58 84	40 40 60 90	58	26	60	30
W42AYDB00, BOZ B05 B09	230/208-3	1 1 1	23 23 33	30 30 35				
W42AYDC00, COZ C05 C09	460-3	1 1 1	11 11 17	15 15 20				
W48AYDA00, AOZ A05 A10 A15	230/208-1	1 1 1 1 or 2	35 35 59 85	45 45 60 90	59	26	60	30
W48AYDB00, BOZ B05 B09	230/208-3	1 1 1	25 25 34	30 30 35				
W48AYDC00, COZ C05 C09	460-3	1 1 1	12 12 17	15 15 20				
W60AYDA00, AOZ A05 A10 A15	230/208-1	1 1 1 1 or 2	41 41 59 85	50 50 60 90	59	26	60	30
W60AYDB00, BOZ B09 B15	230/208-3	1 1 1	28 34 53	35 35 60				
W60AYDC00, COZ C09 C15	460-3	1 1 1	14 18 27	20 20 30				
W72AYDA00, AOZ A05 A10 A15	230/208-1	1 1 1 or 2 1 or 2	57 57 61 87	60 60 70 90	57 57	52 52	60 60	60 60
W72AYDB00, BOZ B09 B15	230/208-3	1 1 1	39 39 54	45 45 60				
W72AYDC00, COZ C09 C15	460-3	1 1 1	19 19 27	25 25 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.

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.

Supplemental Instructions

8201-176BX Compressor Control Module

(Replaces 8201-088, 8201-148, 8201-157,
8201-162, 8201-164, 8201-169, 8201-171, 8620-244)

Features

Delay-on-Make Timer
Short Cycle Protection/Delay-on-Break
Low Pressure Detection
High Pressure Detection
HPC and LPC Status LEDs
Test Mode
Brownout Protection with Adjustment

Delay-on-Make Timer

A delay-on-make timer is included to be able to delay startup of the compressor. This is desired when more than one unit is on a structure so that all of the units do not start at the same time which could happen after a power loss or building shutdown. The delay-on-make time period is 2 minutes plus 10% of the delay-on-break time period. To ensure that all of the units do not start at the same time, adjust the delay-on-break timer on each unit to a slightly different delay time.

Short Cycle Protection/Delay-on-Break

An anti-short cycle timer is included to prevent short cycling the compressor. This is adjustable from 30 seconds to 5 minutes via the adjustment knob. Once a compressor call is lost, the time period must expire before a new call will be initiated.

Low Pressure Detection

Low pressure switch monitoring allows for a lockout condition in a situation where the switch is open. If the low pressure switch remains open for more than 2 minutes, the compressor control module (CCM) will

de-energize the compressor for the delay-on-break time. If the switch closes again, it will then restart the compressor. If the switch trips again during the same Y call, the compressor will be de-energized and the alarm terminal will be energized indicating an alarm. The blue LED will light and stay on until power is cycled to the control or a loss of voltage is present at Y terminal for more than ½ second.

High Pressure Detection

High pressure switch monitoring allows for a lockout condition in a situation where the switch is open. If the high pressure switch opens, the CCM will de-energize the compressor. If the switch closes again, it will then restart the compressor after the delay-on-break setting has expired on the device. If the switch trips again during the same thermostat call, the compressor will be de-energized and the alarm terminal will be energized indicating an alarm. The red LED will light and stay on until power is cycled to the control or a loss of voltage is present at Y terminal for more than ½ second.

Test Mode

By rapidly rotating the potentiometer (POT) clockwise (see Figure 1 on page 2), all timing functions will be removed for testing.

The conditions needed for the unit to enter test mode are as follows: POT must start at a time less than or equal to the 40 second mark. The POT must then be rapidly rotated to a position greater than or equal to the 280 second mark in less than ¼ second. Normal operation will resume after power is reset or after the unit has been in test mode for at least 5 minutes.



Bard Manufacturing Company, Inc.
Bryan, Ohio 43506
www.bardhvac.com

Manual: 7960-932B
Supersedes: 7960-932A
Date: 8-16-24

Brownout Protection with Adjustment

Brownout protection may be necessary if the utility power or generator power has inadequate power to prevent the voltage from dropping when the compressor starts. This is rare but can happen if the generator is undersized at the site or if the site is in a remote location far from the main power grid. Under normal circumstances, allowing the brownout to be ignored for a time period should not be needed. The 8201-176BX is shipped in “0” do not ignore position, with all the DIP switches off (see Figure 1).

If ignoring the brownout is needed because of the above conditions, three preset timers can be set by DIP switches in order to delay signaling a power brownout for a specific length of time after compressor contactor is energized. This allows the compressor a time period to start even if the voltage has dropped and allows the voltage to recover. This delay only happens when the CC terminal energizes. The delay can be set to 1 second (“A” DIP switch), 5 seconds (“B” DIP switch) or 10 seconds (“C” DIP switch); time is not cumulative—only the longest setting will apply. If the voltage recovers during the brownout delay period, the compressor will continue running.

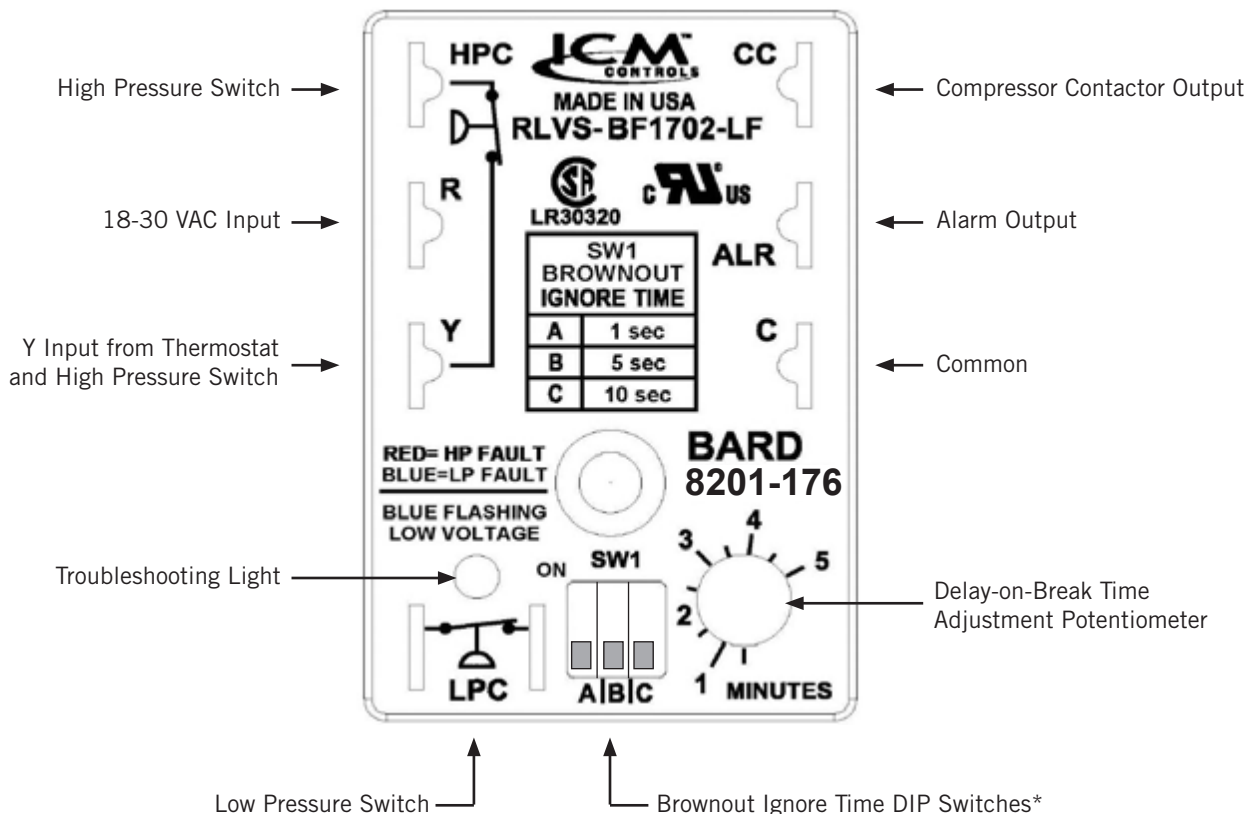
If a brownout condition is detected by the compressor control module at any point while there is a cooling

call or power is on at Y, the troubleshooting light will flash blue. The light will continue to flash until the cooling call is satisfied or power is removed from the Y terminal. This condition does not prevent operation, it only indicates that a brownout condition was present at some point during the call. If a brownout condition is detected while CC has an output, CC will be de-energized and will retry after the delay-on-break timer is satisfied, honoring any DIP switch timer chosen when the CC output is re-energized; this process will continue until call is satisfied.

If inadequate utility or generator power continues after the Delay-on-Make or Delay-on-Break timer is fulfilled, the CC output will not energize. This could lead to the compressor never starting. The control will see the brownout immediately and not start.

A common scenario and one that has been seen in the field is when a unit or units switches from utility power to generator power. With slower transfer switches, the time delay between the utility power and generator power didn’t cause a problem. The units lost power, shut off and came back on line normally. With the introduction of almost instantaneous transfer switches, the power glitch may be enough that the compressor will start to run backwards.

FIGURE 1
8201-176BX Compressor Control Module



* Turn on only one switch for that specific “Ignore Time” setting. 10 seconds is the maximum brownout “Ignore Time”.



Climate Control Solutions

Limited Warranty

For units applied within the United States, Puerto Rico,
US Virgin Islands, Guam, Canada and Mexico

Limited Warranty To Original Purchaser:

Bard Manufacturing Company, Inc. Bryan, Ohio 43506 warrants to you, the original purchaser, that your Bard product will be free from defects in materials and workmanship when used under normal conditions from the installation date through the time periods outlined in the "Duration of Warranty" section (see reverse side).

Proof Of Purchase:

You must be able to show us the date on which you purchased your product when you make a claim under this warranty. Your owner's registration card filed online at www.wallmountwarranty.com or your contractor's invoice, bill of sale, or similar document is sufficient at time of warranty claim. This must be registered within 90 days of installation. If you can not show us the actual date of purchase, the time periods in this warranty will start on the date that we shipped your Bard product from our factory.

What This Warranty Does Not Cover: (Also see Duration of Warranty on reverse side.)

This warranty does not cover defects or damage caused by:

1. Alterations not approved by Bard; improper installation (including over or under sizing), improper repairs, or servicing; or improper parts and accessories not supplied by Bard.
2. Misuse or failure to follow installation and operating instructions (including failure to perform preventative maintenance) or limitations on the rating plate. This includes failure to use low ambient controls on all applications requiring compressor operation in cooling mode below 60F outdoor ambient.
3. Any corrosion from operation in a corrosive atmosphere (examples: acids, halogenated hydrocarbons or environmental conditions).
4. Parts that must be replaced periodically (such as filters, mist eliminators, ERV belts, pile seals, etc.).
5. Improper fuel or electrical supply (such as low voltage, voltage transients, power interruption, and units on generators with no brownout protection).
6. Accidents or other events beyond our reasonable control (such as storm, fire, or transportation damage).
7. Defects that happen after
 - (a) Anyone has tampered with the product.
 - (b) The product has been improperly serviced according to accepted trade practices;
 - (c) The product has been moved from its original place of installation; or,
 - (d) The product has been damaged by an event beyond Bard's control (See also No. 5 above).
8. Consequential damages (such as increased living expenses while the product is being repaired). Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.
9. This warranty has certain limitations for units installed on over-the-road trucks, vans and trailers. (See reverse side.)
10. Cost of service call at installation site to diagnose causes of trouble, labor to replace defective component or transportation costs for replacement parts.
11. This Limited Warranty does not apply to products installed or operated outside of the US, Puerto Rico, US Virgin Islands, Guam, Canada and Mexico. Units operated in coastal areas where the operating environment is exposed to airborne saline particles (typically 5 miles from coast line) must have corrosion protection or warranty claims will be declined on corrosion-based cabinet and part failures.
12. Bard does not endorse, approve or certify any online sales of its products through auction websites, online retailers, liquidators or any other method of online sales direct to consumers. Bard will not honor the factory warranty of any Bard equipment purchased over the Internet.

Your Responsibilities:

You are responsible for

1. Preventative maintenance of the product (such as cleaning coils and replacement of filters, nozzles and other consumable parts).
2. Ensuring that the instruction manual is followed for care and use of your product.
3. Ensuring that your product is installed by a competent, qualified contractor, following all local and national codes, and industry standards.

What Bard Will Do About A Defect:

Bard will either repair or replace the defective part only. Replacement parts may be reconditioned parts. The warranty for the repaired or replaced part will last only for the remainder of the warranty period for the original part.

Defective parts must be supplied to a Bard distributor who will then submit a parts warranty claim form. Credits are issued to the Bard distributor.

Bard will not pay or be responsible for labor or defective/replacement part transportation costs or delays in repairing or failures to complete repairs caused by events beyond our reasonable control.

What You Must Do

1. Tell your heating and air conditioning contractor as soon as you discover a problem and have the contractor make repairs.
2. Pay for all transportation, related service labor, diagnostic charges, refrigerant, refrigerant recovery and related items.

Service

If your product requires service, you should contact the contractor who installed it or the contractor that has been providing the product's preventative maintenance and repair service. You may find the installing contractor's name on the product or in your Owner's packet. If you do not know who that is, you should contact a competent, qualified contractor to make the repairs. If in doubt, you should contact the nearest distributor that handles Bard products (www.bardhvac.com). Please note that contractors and distributors that handle Bard products are independent contractors and distributors, and therefore, are not under the direction of Bard Manufacturing Company, Inc.

Only Warranty

There are no other express warranties. All implied warranties are limited in duration to the duration of the applicable written warranty made above.

Some states do not allow limitations on how long an implied warranty lasts, so the above limitation or exclusion may not apply to you.

State of Florida Customers

The full length of the manufacturer's warranty of a HVAC system or component of the system is effective in the state of Florida on the date of installation if installed by a contractor licensed under part I of chapter 489. This form and the provided card are for warranty registration purposes. Failure to return the card or form does not diminish any warranty rights or decrease the warranty length.

BARD MANUFACTURING CO., INC. — BRYAN, OHIO 43506
Dependable quality equipment . . . since 1914

Form No. 7960-420
Issued: 08/13/24
Supersedes: 07/13/23

Duration Of Warranty is limited to defects arising during the periods shown in the following table:

Model Number Series:	— Number of Years from Installation Date ① —			
	Compressor ④	Sealed System Components ②④⑤	All Other Functional Parts ③	Heat Exchangers
AIR CONDITIONERS W12A, W18A, W24A, W30A, W36A, W42A, W48A, W60A, W72A, W090A, W120A, W150, W180A, W18L, W24L, W30L, W36L, W35A, W45A, W55A, Q36A, Q42A, Q48A, I30A, I36A, I42A, I48A, I60A, I36Z, I42Z, I48Z, I60Z	5	5	5	N/A
AIR SOURCE HEAT PUMPS W18H, W24H, W30H, W36H, W42H, W48H, W60H, C24H, C30H, C36H, C42H, C48H, C60H, T24H, T30H, T36H, T42H, T48H, T60H, T24S, T30S, T36S, T42S, T48S, T60S, Q24H, Q30H, Q36H, Q43H, Q48H, I30H, I36H, I42H, I48H, I60H, I36Z, I48Z, I60Z, W3VH, W5VH	5	5	5	N/A
ENVIRONMENTAL CONTROL UNITS W6RV, W6LV	5	5	1	N/A
AGRICULTURAL UNITS A36R and all HVAC equipment used in this application.	5	5	1	N/A
EQUIPMENT SHELTER UNITS MULTI-TEC, MEGA-TEC, FUSION-TEC, and all HVAC equipment used in this application.	5	5	1	N/A
GEOHERMAL/WATER SOURCE HEAT PUMPS QW2S, QW3S, QW4S, QW5S, QC50 (No Compressor)	5	5	5	N/A
GAS/ELECTRIC WALL-MOUNT W24G, W30G, W36G, W42G, W48G, W60G, WG2S, WG3S, WG4S, WG5S	5	5	5	10
ACCESSORIES Factory/Field Installed Bard Ventilation and Heater Packages, Bard branded Thermostats/ Temperature Controllers, UV-C LED Light Kits, LC6000, LV1000, MC4002, DC3003, TEC40, BG1000, PGD, PGDX, MC5300, MC5600.	N/A	N/A	5	N/A
Humidistats, C02 Controllers, add-on controller/thermostat cards and all other field-installed accessories not listed separately	N/A	N/A	1	N/A

- ① For equipment that does not have an online warranty registration, the warranty period starts when the product was shipped from the factory.
- ② Heat transfer coils (refrigerant to air coils for air source and coaxial coils for water source units) are covered for leaks for 5 years. Physical damage to air side coils resulting in leaks or insufficient airflow, or fin deterioration due to corrosive atmosphere (such as acids, halogenated hydrocarbons, agricultural or coastal environmental conditions) are not covered. Leaks in coaxial coils due to freezing of the coils are not covered. Copper coaxial coils for QW are not warranted for ground water/open loop installations.
- ③ Functional parts warranty is 1 year for all telecommunication, electric switch stations, pump stations, agricultural use, and similar applications. This also applies to all OTR (over the road) applications.
- ④ All OTR (over the road) applications that are moved from one location to another: Factory Warranty applies up to the point of initial start-up and test at all OEM manufacturing locations or subsequent outfitting facility. Once it goes into OTR service, the warranty expires immediately for compressor and sealed system components. This OTR exemption does not apply to relocatable classrooms, construction, or office trailers.
- ⑤ Factory-coated coils have a "5" year warranty in corrosive environments that are listed as approved.



Internet Resources

Recognized as a leader in the HVAC industry, Bard combines quality products and outstanding service with innovation and technological advances to deliver high-performance heating and cooling products around the world. Please visit www.bardhvac.com for additional information regarding warranty and product information.