



Literature Assembly

911-0406

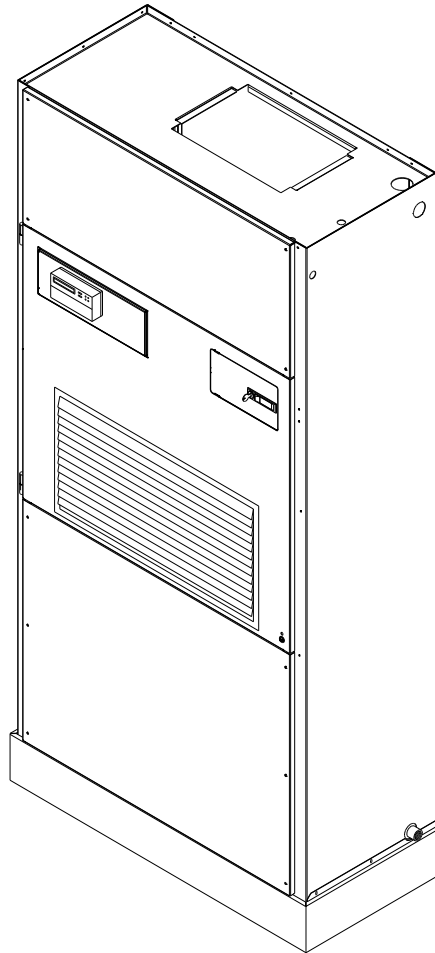
Contains the following:

2100-416(K)	QC Installation Instructions
2100-383(D)	QWV Installation Instructions
7960-356(D)	Installation Instructions
7960-359(K)	Installation Instructions
7960-438(B)	Installation Instructions
2100-034(G)	User's Guide
2100-479	Servicing Procedures
2110-544(P)	Replacement Parts Manual
7960-420	Warranty Form

INSTALLATION INSTRUCTIONS

QC Series Chilled Water Unit

Model: QC501



Climate Control Solutions

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

Manual No.: 2100-416K
Supersedes: 2100-416J
Date: 4-28-20

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GETTING OTHER INFORMATION AND PUBLICATIONS

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

National Electrical Code ANSI/NFPA 70
Standard for the Installation ANSI/NFPA 90A
of Air Conditioning and Ventilating Systems
Standard for Warm Air..... ANSI/NFPA 90B
Heating and Air Conditioning Systems
Load Calculation for Residential ACCA Manual J
Winter and Summer Air Conditioning
Duct Design for Residential ACCA Manual D
Winter and Summer Air Conditioning and Equipment
Selection
Closed-Loop/Ground Source Heat Pump..... IGSHPA
Systems Installation Guide
Grouting Procedures for Ground-Source IGSHPA
Heat Pump Systems
Soil and Rock Classification for the Design..... IGSHPA
of Ground-Coupled Heat Pump Systems
Ground Source Installation Standards..... IGSHPA
Closed-Loop Geothermal Systems – Slinky IGSHPA
Installation Guide

For more information, contact these publishers:

ACCA Air Conditioning Contractors of America
1712 New Hampshire Avenue
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 Refrigerating,
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

**IGSHPA International Ground Source
Heat Pump Association**
490 Cordell South
Stillwater, OK 74078-8018

QC SERIES WATER SOURCE GENERAL INFORMATION

QC Model Nomenclature

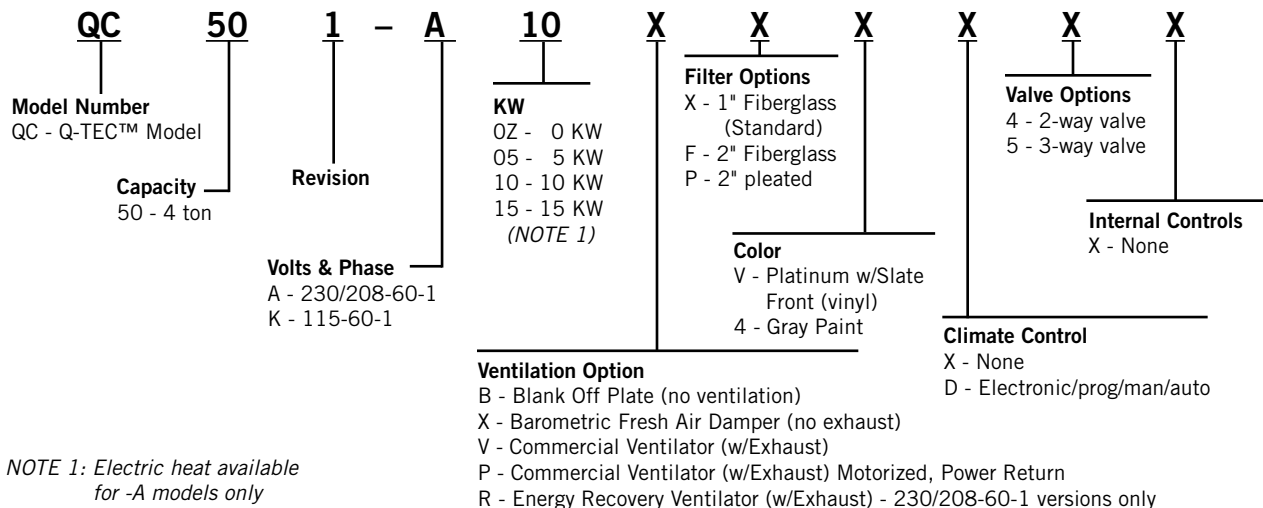


TABLE 1
Factory Built-in Electric Heat Table

Models	QC501-A	
	240V-1	208V-1
KW	BTUH	BTUH
5.0	16,380	12,290
10.0	32,670	24,570
15.0	49,150	36,860

TABLE 2
Electrical Specifications

Models	SINGLE CIRCUIT						DUAL CIRCUIT							
	Rated Volts & Phases	No. Field Power Circuits	③ Minimum Circuit Ampacity	① Maximum External Fuse or Circuit Breaker	② Field Power Wire Size	② Ground Wire Size	③ Minimum Circuit Ampacity		① Maximum External Fuse or Circuit Breaker		② Field Power Wire Size		② Ground Wire Size	
							CKT A	CKT B	CKT A	CKT B	CKT A	CKT B	CKT A	CKT B
QC501-A0Z -A05 -A10 -A15	230/208-1	1	7	15	14	14	-	-	-	-	-	-	-	-
1		33	35	8	10	-	-	-	-	-	-	-	-	
1		58	60	6	10	-	-	-	-	-	-	-	-	
1 or 2		83	90	4	8	50	33	50	40	8	8	10	10	
QC501-K0Z	115-1	1	10	15	14	14	-	-	-	-	-	-	-	-

① Maximum size of the time delay fuse or HACR type circuit breaker for protection of field wiring conductors.

② Based on 75°C copper wire. All wiring must conform to the National Electrical Code and all local codes.

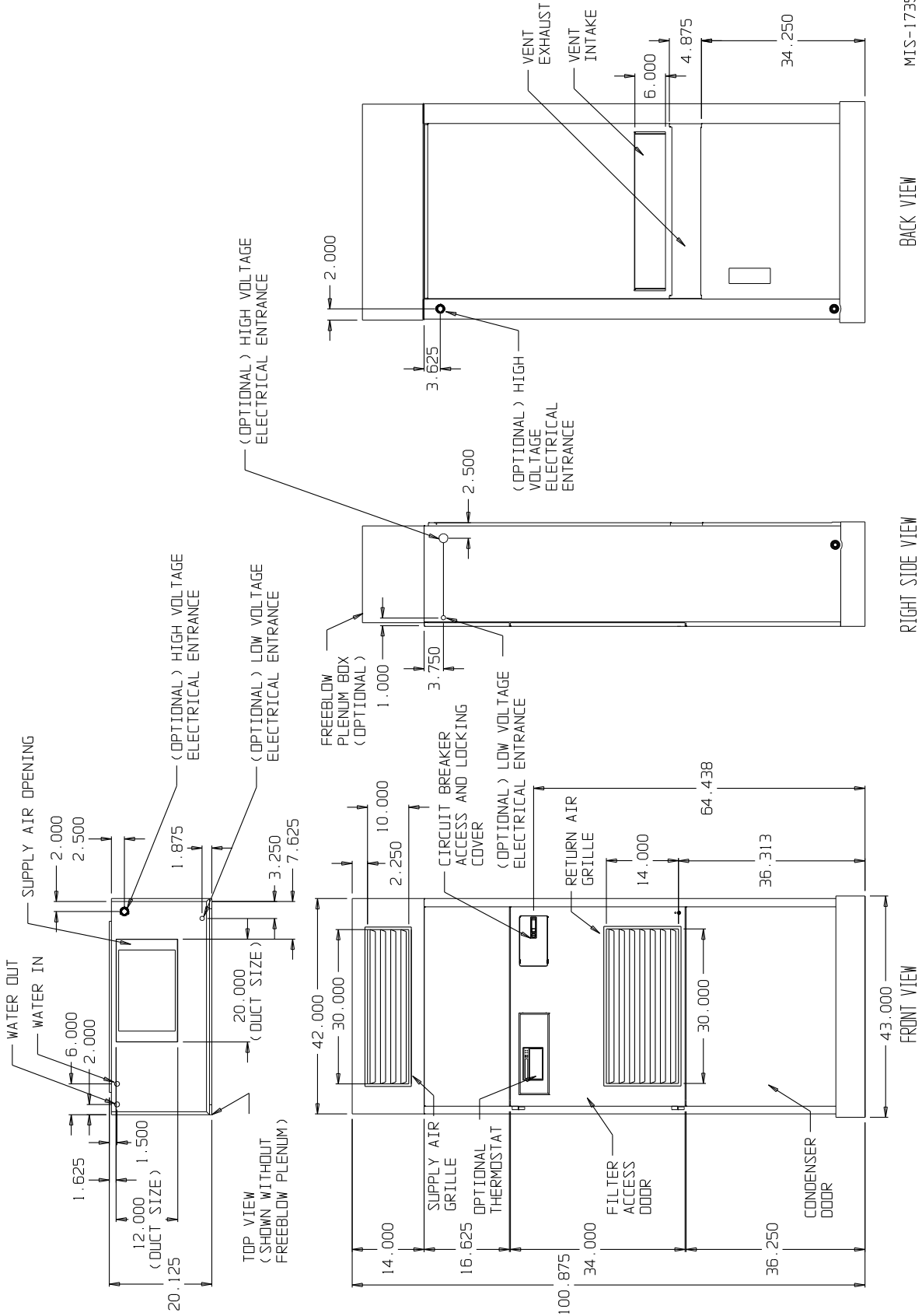
③ These "Minimum Circuit Ampacity" values are to be used for sizing the field power conductors. Refer to the National Electric Code (latest revision), article 310 for power conductor sizing.

CAUTION: When more than one field power conductor 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 conductors are in a raceway.

TABLE 3
Cooling Performance chart

GPM	EWT	CFM	BTUH Capacity (1000)			BTUH Capacity (1000)			Water Coil Pressure Drop	
			Stage 1			Stage 1 and 2			PSIG	Ft. Hd.
			Total	Sensible	Latent	Total	Sensible	Latent		
6	42	1000	15.1	10.5	4.6	38.5	25.3	13.2	1.9	4.4
8			16.4	11.1	5.3	41.5	26.8	14.7	3.3	7.5
10			17.4	11.7	5.7	43.2	27.4	15.8	4.9	11.3
6	44	1000	13.9	10.0	3.9	35.8	24.2	11.6	1.9	4.4
8			15.1	10.6	4.5	38.4	25.4	13.0	3.3	7.5
10			16.0	11.1	4.9	40.0	26.0	14.0	4.9	11.3
6	46	1000	12.8	9.6	3.2	33.0	23.0	10.0	1.9	4.4
8			13.9	10.1	3.8	35.3	24.0	11.3	3.3	7.5
10			14.7	10.6	4.1	36.9	24.6	12.3	4.9	11.3
6	48	1000	11.6	9.1	2.5	30.3	21.9	8.4	1.9	4.4
8			12.6	9.6	3.0	32.2	22.6	9.6	3.3	7.5
10			46.6	10.0	3.3	33.7	23.2	10.5	4.9	11.3
6	42	1200	15.9	11.5	4.4	42.1	29.0	13.1	1.9	4.4
8			17.4	12.2	5.2	46.0	30.6	15.4	3.3	7.5
10			18.8	12.8	6.0	49.3	31.9	17.4	4.9	11.3
6	44	1200	14.8	11.1	3.7	39.3	27.7	11.6	1.9	4.4
8			16.2	11.7	4.5	42.7	29.2	13.5	3.3	7.5
10			17.4	12.3	5.1	45.6	30.4	15.2	4.9	11.3
6	46	1200	13.6	10.7	2.9	36.4	26.5	9.9	1.9	4.4
8			14.9	11.3	3.6	39.5	27.9	11.6	3.3	7.5
10			16.1	11.7	1.1	42.0	29.0	13.0	4.9	11.3
6	48	1200	12.5	10.3	2.2	33.6	25.2	8.4	1.9	4.4
8			13.7	10.8	2.9	36.2	26.5	9.7	3.3	7.5
10			14.7	11.2	3.5	38.3	27.5	10.8	4.9	11.3

FIGURE 1
Unit Dimensions



Shipping Damage

Upon receipt of equipment, the carton should be checked for external signs of shipping damage. The skid must remain attached to the unit until the unit is ready for installation. If damage is found, the receiving party must contact the last carrier immediately, preferably in writing, requesting inspection by the carrier's agent.

Unit Removal from Skid

WARNING

This unit is heavy and requires more than one person to handle and remove from the skid. Check unit wheels to insure that wheels are locked before removing from skid. Extreme caution must be taken to prevent injury to personnel and damage to the unit.

It is recommended that the unit not be removed from the skid with a forklift.

The shipping brackets on each side of the unit must be removed and discarded (see A on Figure 2). The return air grille panel can be removed to provide a place to hold the unit. The unit can be slid forward on the skid until the front wheels hang over the edge of the skid (see B on Figure 2). The unit can be tipped forward and slid down the edge of the skid until the front wheels touch the ground (see C on Figure 2). The wheels will not roll as they are shipped from the factory locked. The back of the skid will have to be held down

to keep it from tipping up. The skid can be slid out from under the unit. The unit can then be set upright.

Handling Unit after Removal from Skid

WARNING

Exercise extreme caution when pushing the unit on the rollers. Handle and push from the lower 1/3 of the unit. Ensure that debris is not on the floor where the unit is to be moved on the rollers. Failure to do so could result in the unit tipping over and causing bodily injury and/or damage to the unit.

The unit will have to be turned sideways and removed from the skid to fit through a 36" doorway. If the door height allows, the unit can be slid sideways through the door.

If the unit cannot be slid through the door, then the unit will have to be put on a cart and tipped down to roll through the door. It is recommended that an appliance cart be used with a strap to hold the unit on the cart. **The wheels of the unit must be locked.** If the wheels were allowed to roll, the unit could roll off the cart. The blade of the appliance cart should be slid under the wheels of the unit as shown in Figure 3 on page 8. The strap of the appliance cart should be placed around the unit and strapped tightly. Help will be required to tip the unit back onto the cart. The unit can be leaned far enough back to be rolled through the door. Be careful when setting the unit back up to keep from damaging the unit.

FIGURE 2
Removal of Unit from Skid

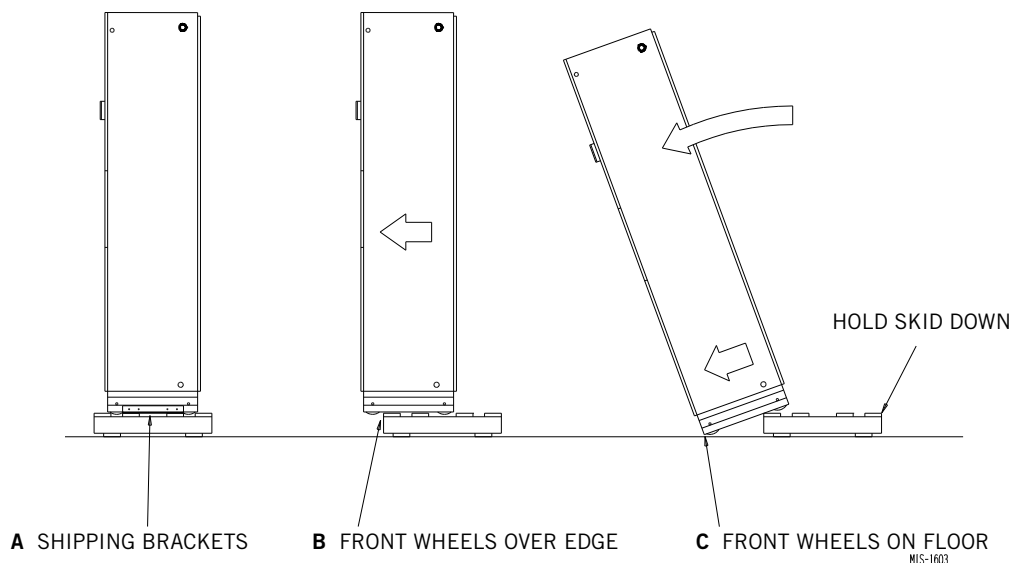
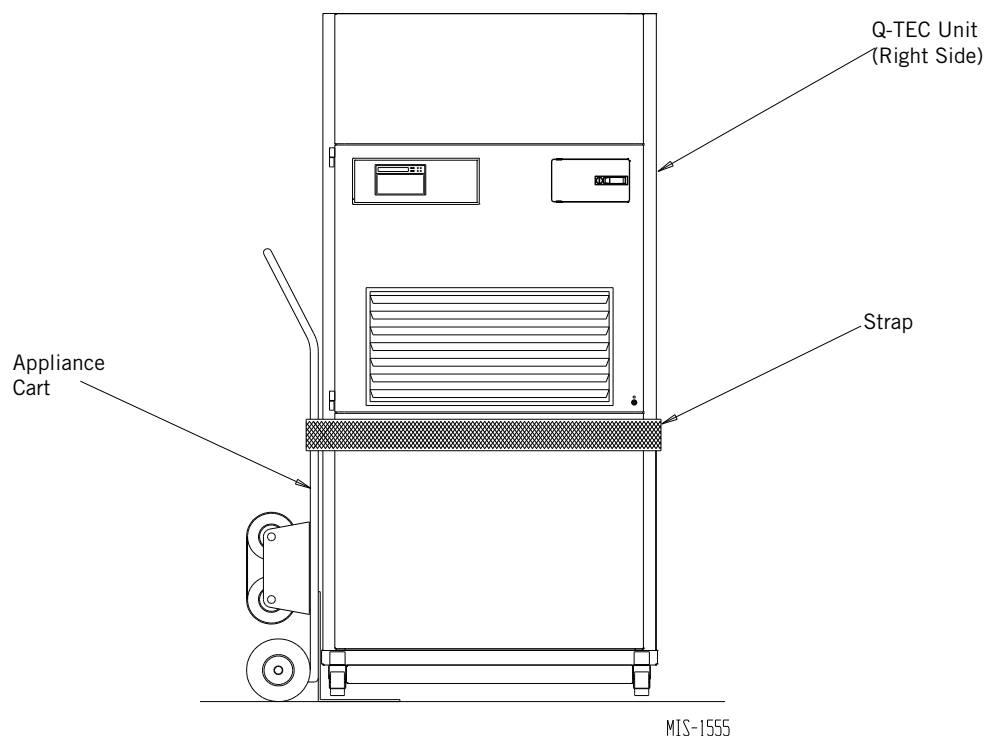


FIGURE 3
Proper Handling of Unit after Removal from Skid



Removal of Wall Bracket from Shipping Location

Units without Vent Options

The wall brackets are attached to the back of the unit, as shown in the BACK VIEW in Figure 5 on page 10. Remove and retain the wall brackets for use when attaching the unit to the wall.

Units with Vent Options

Units equipped with a vent option require a wall sleeve. Remove and retain the unit to sleeve brackets for use when attaching the unit to the sleeve. The brackets are attached to the shipping crate, as shown in FRONT VIEW in Figure 5 on page 10.

General

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

The unit is designed for use with or without duct work. For use without duct work, Plenum Box QPB** is recommended.

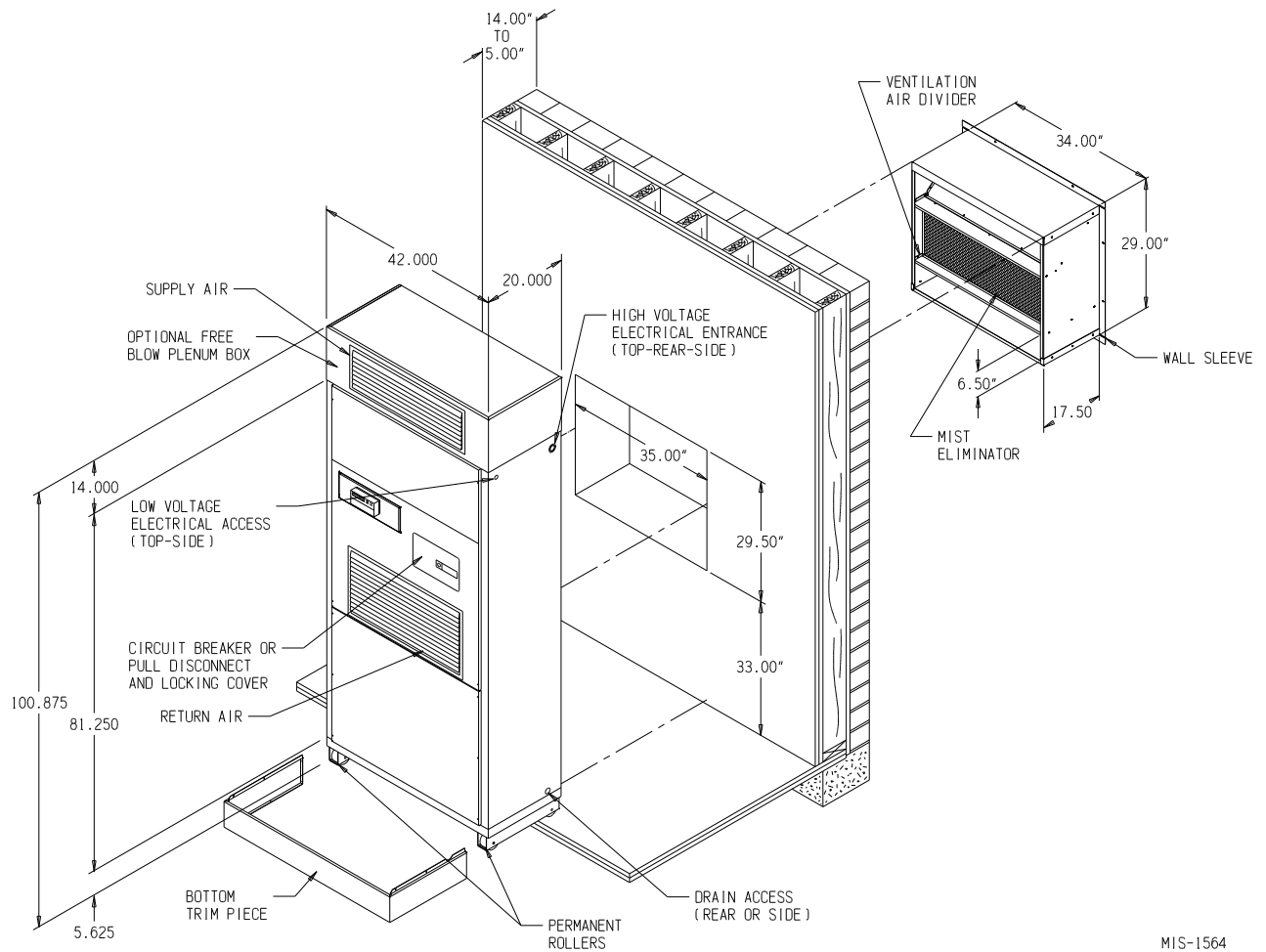
These instructions explain the recommended method to install the water source self-contained unit and the electrical wiring connections to the unit.

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 "Start 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 page 3 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 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.

FIGURE 4
Installation of Unit through Wall with Wall Sleeve



MIS-1564

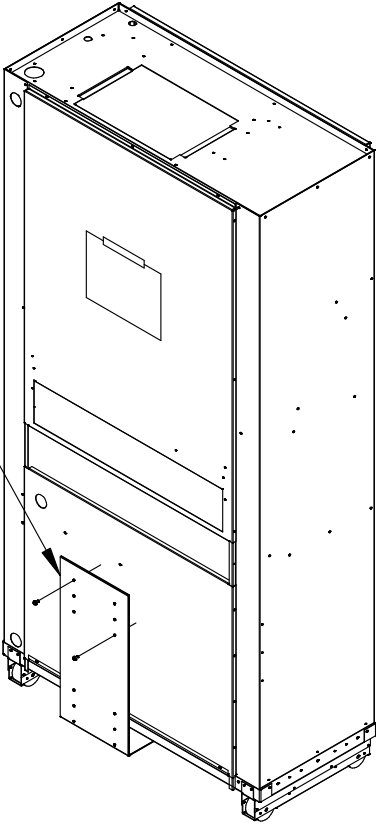
Minimum Installation Height

The minimum installation height of the unit with a free blow plenum is 8' 6". This provides enough clearance for the plenum to be removed (see Figure 7 on page 12).

The minimum installation height for ducted applications is 8' 4½". This provides enough clearance to install the duct work (see Figure 8 on page 12).

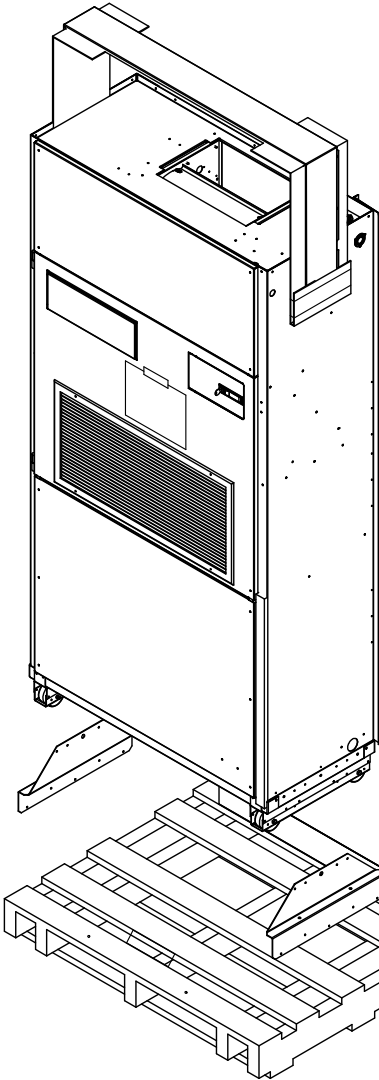
FIGURE 5
Shipping Assembly – Bracket Locations

BACK VIEW



Q-SERIES WALL BRACKETS(2)
 PART #112-289 ATTACHED
 TO BACK OF UNIT
 NOTE: FOR USE WITH
 BLANK-OFF PLATE OPTION ONLY

Q-SERIES SLEEVE MOUNTING BRACKETS (2).
 ATTACHED TO SHIPPING PALLET.
SMALL CABINET
 PART #112-289 (2 PLACES)
LARGE CABINET
 PART #113-387 (2 PLACES)
 NOTE: NOT A PICTORIAL REPRESENTATION
 OF THE ACTUAL SIZES

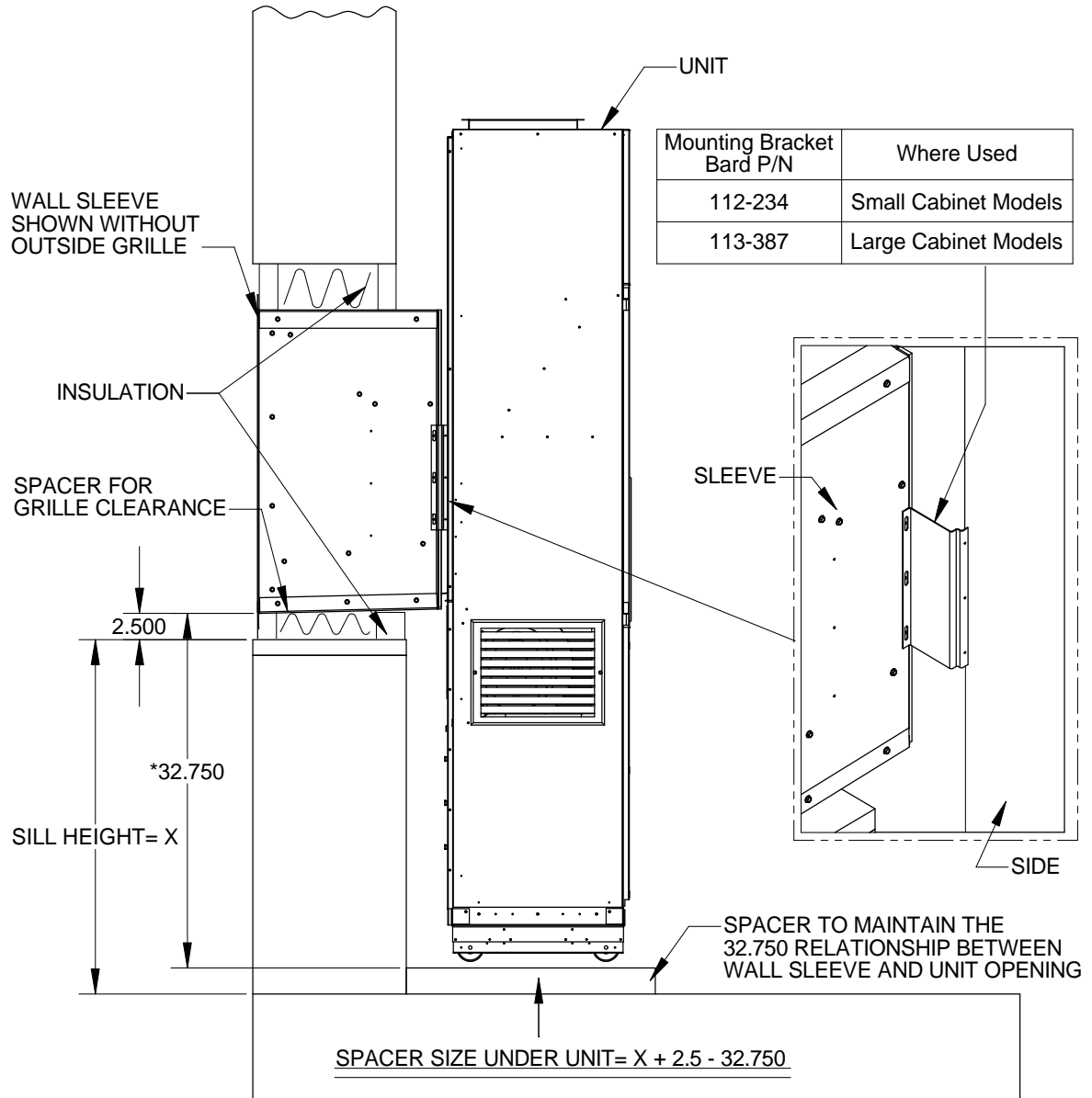


SIDE TRIM
 PART #134-178-7

FRONT VIEW

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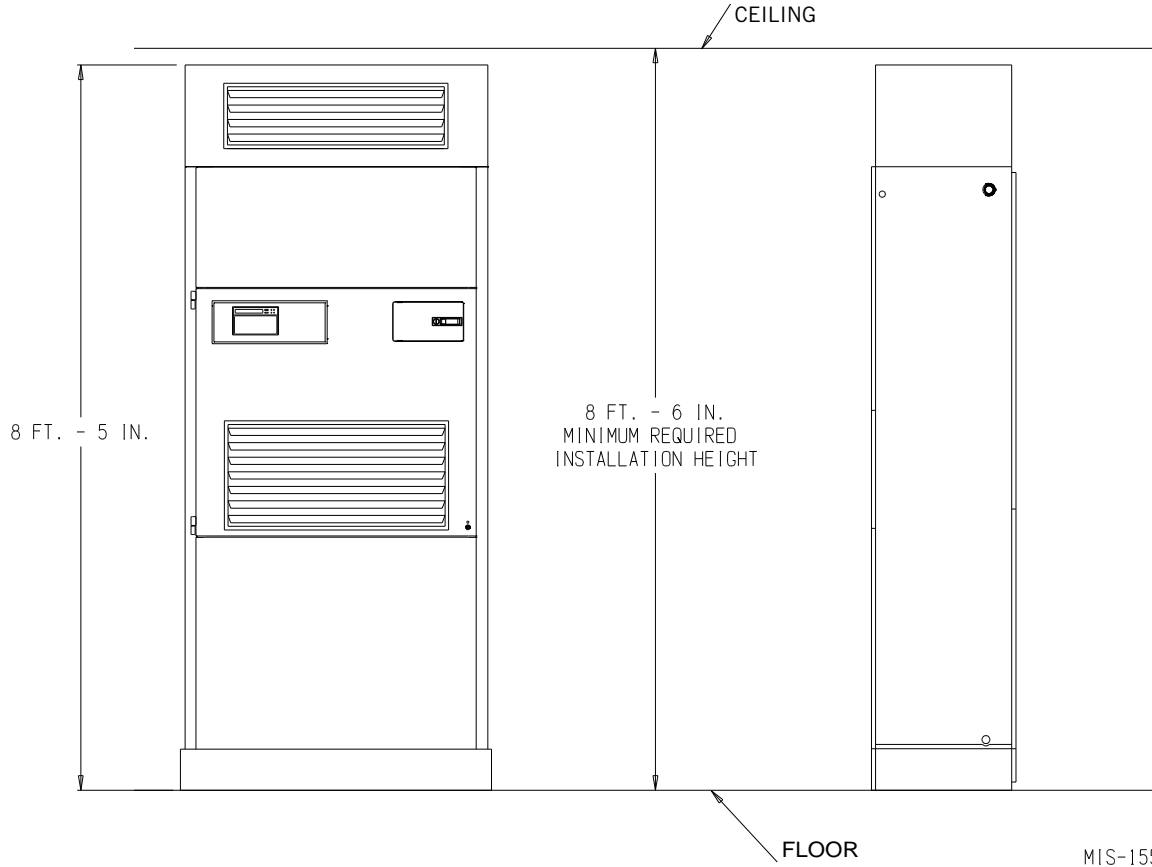
FIGURE 6
Installation of QC Wall Sleeve Through a Window Opening



*THIS DIMENSION MUST REMAIN CONSTANT
 WHEN FABRICATING UNIT AND WALL SLEEVE
 REGARDLESS OF THE WINDOW SILL DIMENSIONS

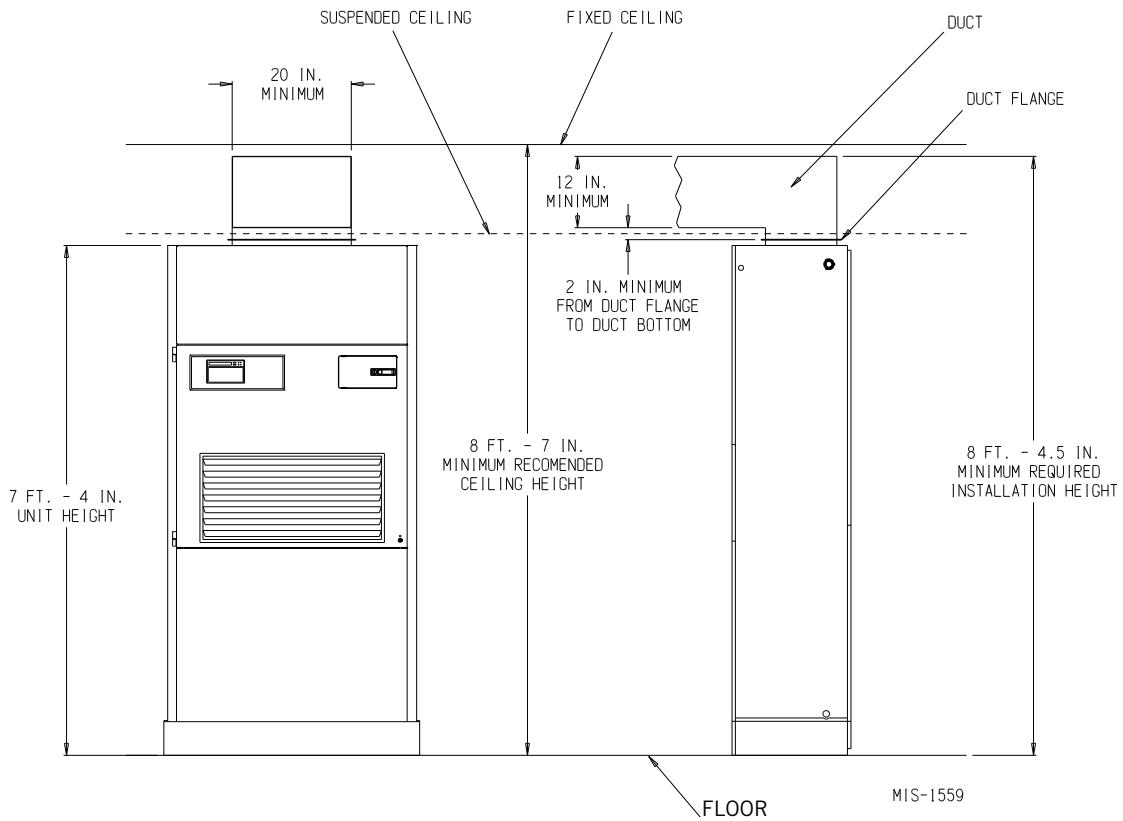
MIS-1614 A

FIGURE 7
Installation with Free Blow Plenum



MIS-1558

FIGURE 8
Ducted Application



MIS-1559

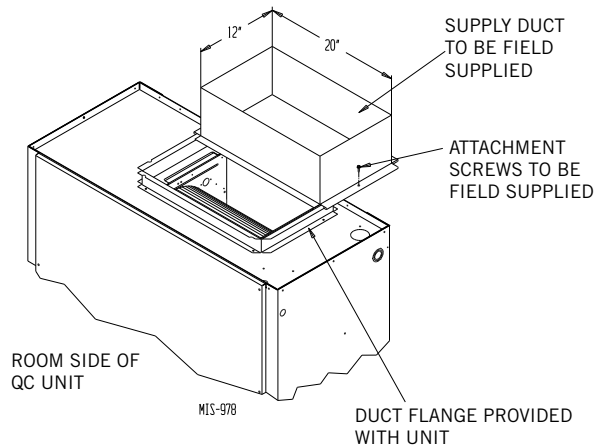
Duct Work

Any heat pump is more critical of proper operating charge and an adequate duct system than a straight air conditioning unit. All duct work 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. 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.

The Q-TEC series unit has provision to attach a supply air duct to the top of the unit. Duct connection size is 12" x 20". The duct work is field supplied and must be attached in a manner to allow for ease of removal when it becomes necessary to slide the unit out from the wall for service. See Figure 9 for suggested attachment method.

NOTE: *Unit cabinet, supply air duct and free blow plenum are approved for "0" clearance to combustible material.*

FIGURE 9
Supply Duct Connections



The Q-TEC series units are designed for use with free return (non-ducted) and either free blow with the use of QPB Plenum Box or a duct supply air system.

The QPB Plenum Box mounts on top of the unit and has both vertically and horizontally adjustable louvers on the front discharge grille.

When used with a ducted supply, a QCX cabinet extension can be used to conceal the duct work above the unit to the ceiling. This extends 20" above the unit for a total height above the floor of 10'-7/8". See specifications sheet for the correct cabinet extension model number. The unit is equipped with a variable speed indoor blower motor, which increases in speed with an increase in duct static pressure. The unit will therefore deliver proper rated airflow up to the Maximum ESP shown in Table 6 on page 25. However, for quiet operation of the air system, the duct static should be kept as low as practical, within the guidelines of good duct design.

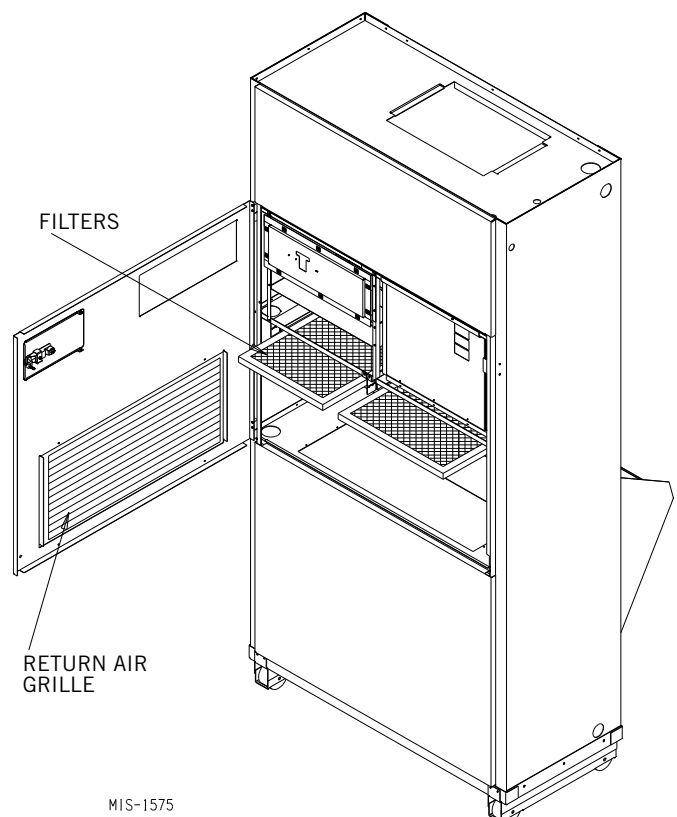
Filters

Two 1" throw away filters are supplied with each unit. The filters fit into a fixed rack.

The filters are serviced from the inside of the building. To gain access to the filters, release the latch on the circuit breaker door and one 1/4 turn fastener near the bottom of the door. This door is hinged on the left so it will swing open.

The internal filter brackets are adjustable to accommodate 2" filters. The tabs for the 1" filters must be bent down to allow the 2" filters to slide in place.

FIGURE 10
Filter Location



Condensate Drain

The condensate drain hose is routed down from the evaporator drain pan on the right side of the unit into the compressor compartment. There are three locations that the drain can exit the cabinet. For a stand pipe type of drain, the drain hose can exit the rear of the cabinet. There is adequate hose length to reach the floor on the right-hand side of the unit.

If the drain is to be hard plumbed, there is a 3/4" pipe connection located on the right-hand cabinet side near the rear and one on the cabinet rear panel. In these

installations, the drain tube is to be slipped over the pipe connection inside of the cabinet.

See Figures 11A, 11B and 11C.

NOTE: *Whichever type of drain connection is used, a "P" trap must be formed.*

The **side drain** requires a water trap for proper drainage (see Figure 11A). The drain can be routed through the floor or through the wall. **If the drain is to be routed through an unconditioned space, it must be protected from freezing.** The drain line must be able to be removed from the unit if it is necessary to remove the unit from the wall.

FIGURE 11A
Side Drain (Side View)

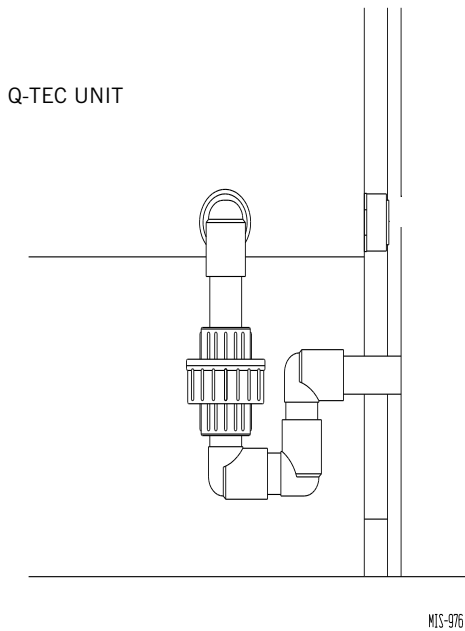


FIGURE 11B
Optional Rear Drain

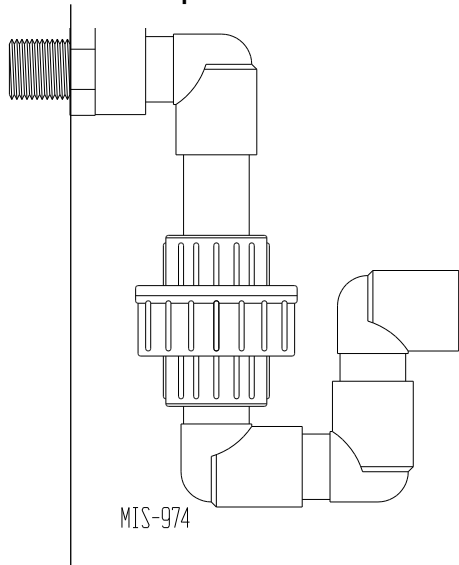
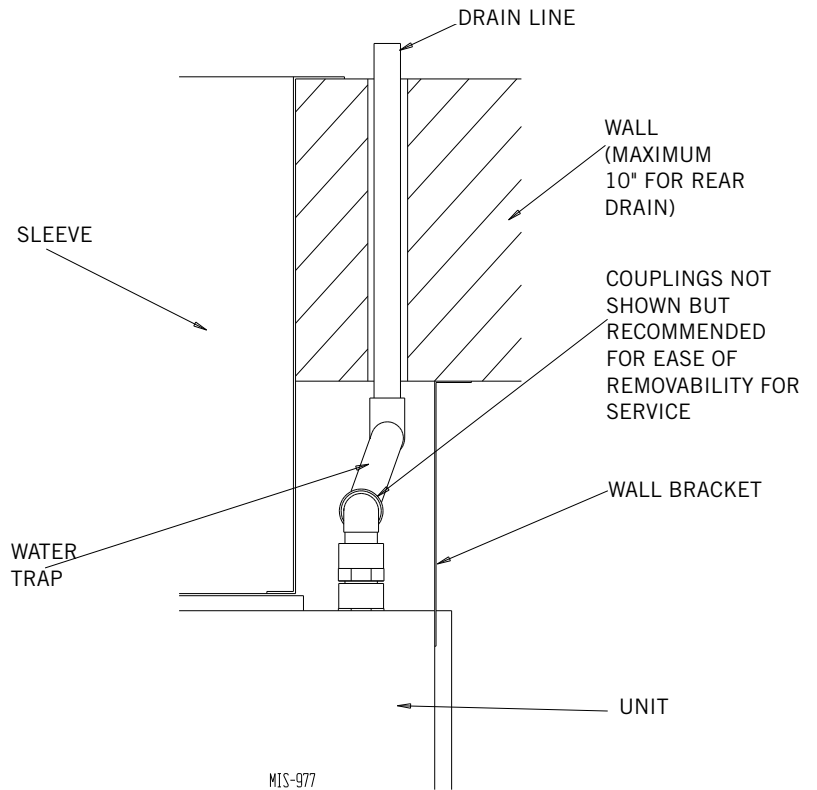


FIGURE 11C
Rear Drain (Top View)



The **rear drain** can be used where there is a distance of 4 1/2" available between the unit and wall to install a trap (see Figure 11B). The trap cannot extend beyond the edge of the unit or it will interfere with the wall mounting bracket. The drain can be routed through the floor or through the wall. If the drain is routed through the wall, the drain line must be positioned such that it will not interfere with the sleeve flange or the grille (see Figure 11C). **If the drain is to be routed through an unconditioned space, it must be protected from freezing.**

Mist Eliminator Service

(Optional – only used with one of the vent options)

A mist eliminator is supplied with the wall sleeve. The mist eliminator is constructed of aluminum frame and mesh. The mist eliminator is located in the top section of the wall sleeve and can be removed from the inside of the building without removing the unit from the wall. This requires that the ventilation package must be removed.

The steps necessary to remove each of the vent options are listed below.

It is recommended that the mist eliminator be inspected annually and serviced as required. The mist eliminator can be inspected from the outside of the building by looking through the outdoor grille. The mist eliminator can be serviced from the outside. The outdoor grille must be removed to do so.

The mist eliminator can be cleaned by washing with soap and water. The excess water should be shaken off the mist eliminator before it is re-installed.

Barometric Fresh Air Damper (Optional)

Before starting the removal make sure the power has been turned off. The hinged return air grille panel must be opened. The fresh air damper assembly can be seen on the back of the unit. Refer to Figure 12 on page 16.

1. The fresh air damper is attached to the back of the unit with one screw on either side of the assembly. Both of the screws must be removed.
2. Once the mounting screws are removed, tilt the assembly down and lift it out.

The mist eliminator can be seen through the opening. The mist eliminator must be raised up and the bottom can be pulled toward the front of the unit.

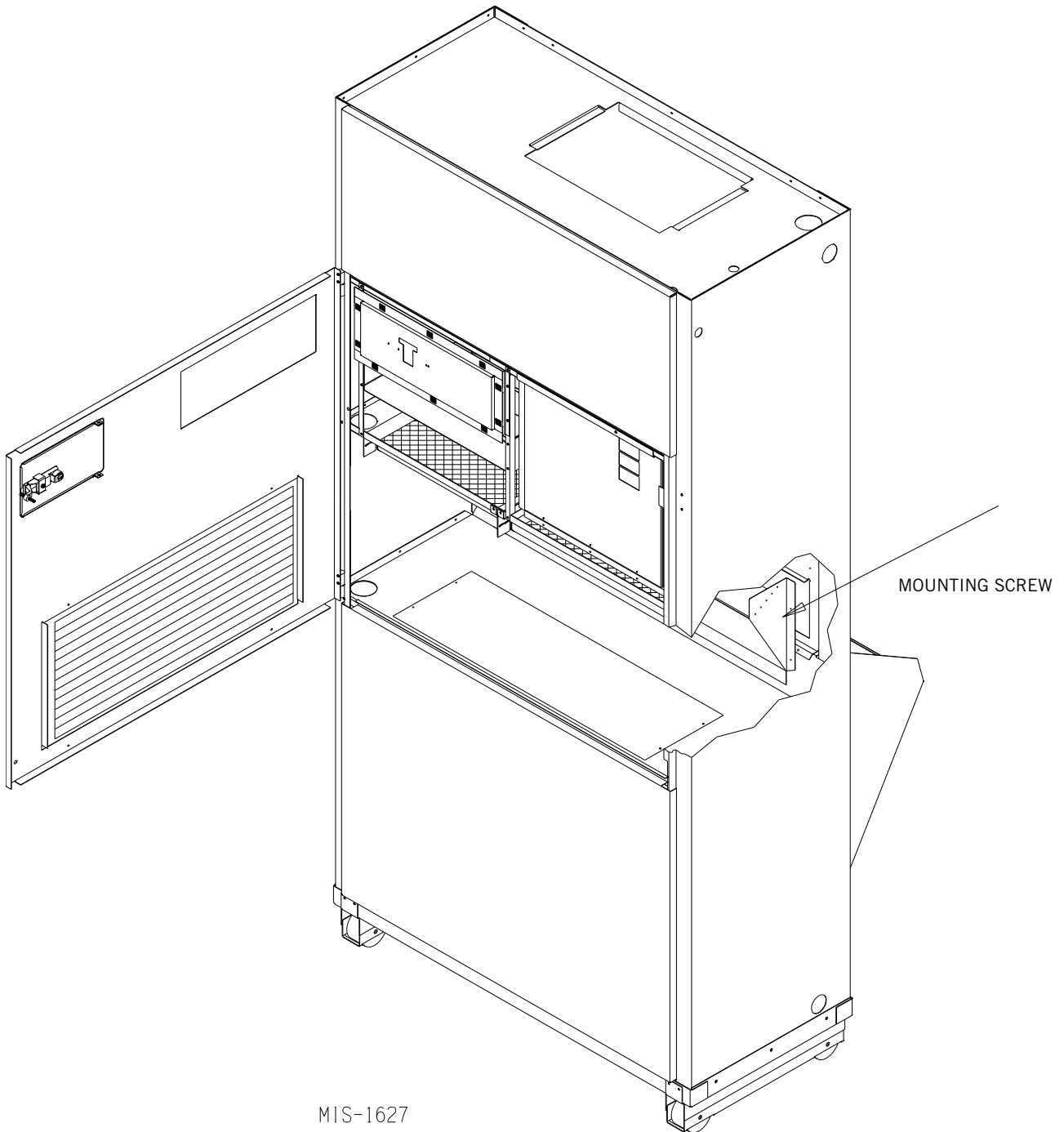
Commercial Room Ventilator Option

Before starting the removal make sure the power has been turned off. The hinged return air grille must be opened. The commercial room ventilator (CRV) can be seen after the panel has been removed. The CRV must be removed to gain access to the mist eliminator.

1. The two mounting screws in the front of the CRV must be removed.
2. The power connectors for the CRV (located on the right side of the unit) must be disconnected. Squeeze the tabs on the sides of the connector and pull straight out. Unplug both of the connectors.
3. Slide the CRV straight out of the unit.

The mist eliminator can be seen through the opening in the back of the unit. The mist eliminator must be raised up and the bottom can be pulled toward the front of the unit and removed.

FIGURE 12
Fresh Air Damper Removal



Q-TEC Energy Recovery Ventilator Option

Before starting the removal make sure that the power has been turned off. The hinged return air grille panel must be opened. The energy recovery ventilator (QERV) can be seen after the panel is opened. To gain access to the mist eliminator, the QERV must be removed. Refer to Figure 13.

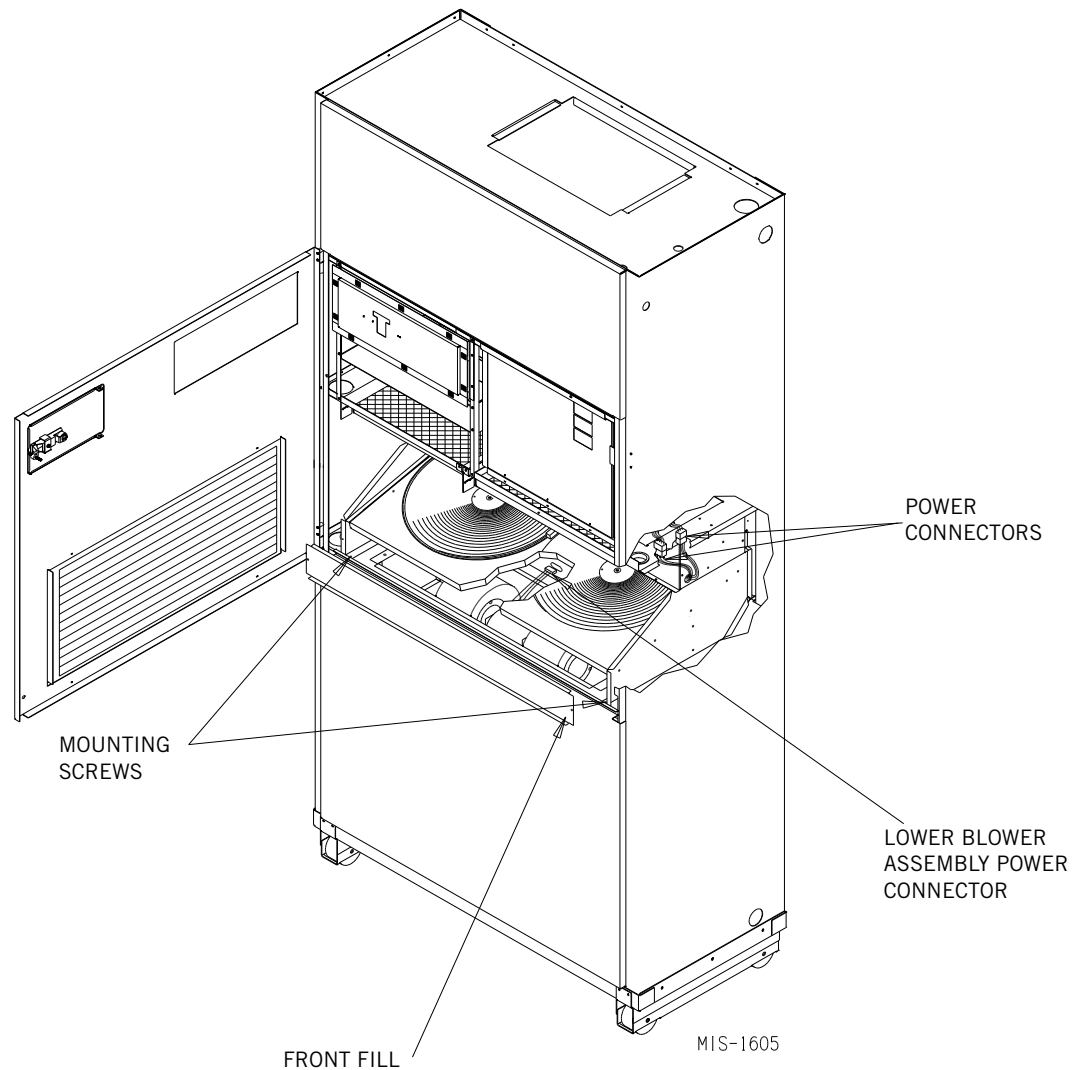
1. The front fill plate of the QERV must be removed. There is one screw on either side of the plate. Remove these screws and remove the plate.
2. On either side of the QERV there are mounting screws that hold the QERV in place. Remove both of these screws.
3. Underneath the heat recovery cassette there is a power connector for the lower blower assembly. To

disconnect this plug, the tabs on both sides of the plug must be squeezed to release the plug. While squeezing the tabs, pull the plug out of the socket.

4. The QERV is plugged into the unit on the right side of the unit. Both of these plugs must be disconnected to remove the QERV. Squeeze the tabs on the sides of the connector and pull straight out.
5. Slide the QERV assembly straight out of the unit being careful not to let the cassette slide out of the QERV.

The mist eliminator can be seen through the opening in the back of the unit. The mist eliminator must be raised up and the bottom can be pulled toward the front of the unit and removed.

FIGURE 13
Removal of the Q-TEC Energy Recovery Ventilator



INSTALLATION

Mounting the Unit

When installing a QC unit near an interior wall on the left side, a minimum of 8" is required; 12" is preferred.

When installing a QC unit near an interior wall on the right side, a minimum of 12" is required as additional space is required to connect the drain.

This clearance is required to allow for the attachment of the unit to the wall mounting brackets and the side trim pieces to the wall.

This unit is to be secured to the wall when there is not a vent sleeve used with the wall mounting brackets provided. (NOTE: See Figure 5 on page 10 for wall and sleeve bracket locations on shipping crate and for a pictorial representation of brackets.) The unit itself, the supply duct and the free blow plenum are suitable for "0" clearance to combustible material.

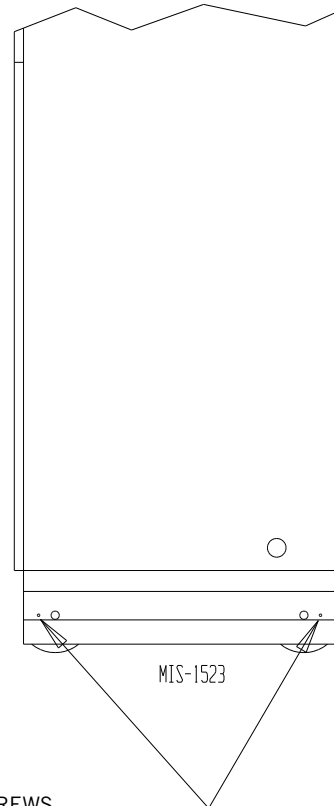
NOTE: When a wall sleeve is to be used, attach the unit to the sleeve with bracket supplied with the wall sleeve. See Figure 5 for wall sleeve bracket.

Following are the steps for mounting the QC units; for reference see Figure 15.

1. Attach wall mounting bracket to the structure wall with field-supplied lag bolts. The fluid piping connections are to be within the confines of this bracket. See Figure 1 on page 6 for cabinet openings and location of fluid coil connection points.
2. Position the unit in front of the wall mounting bracket.
3. Remove the locking screws from the wheels. Refer to Figure 14.
4. Roll the unit up to the wall mounting bracket. The unit must be level from side to side. If any adjustments are necessary, shim up under the rollers with sheets of steel or any substance that is not affected by moisture.
5. Secure the unit to the wall bracket with provided #10 hex head sheet metal screws. There are prepunched holes in the cabinet sides and the bracket has slotted holes to allow for some misalignment.
6. Position the bottom trim piece to the unit and attach with provided screws (dark colored).
7. Position side trim pieces to the wall and attach with field-supplied screws. There are two long and two short pieces supplied. The long pieces are to enclose the gap behind the unit. The short pieces are to fill the gap behind the cabinet extension or the free blow plenum box. They may be cut to suit

the ceiling height or overlap the unit side trim. There is sufficient length to trim up to a 10'-2" ceiling.

FIGURE 14
Removing Locking Screws from Wheels



REMOVE SCREWS
FROM WHEELS BEFORE
ROLLING INTO PLACE

FIGURE 15
Unit Mounting without Ventilation Wall Sleeve

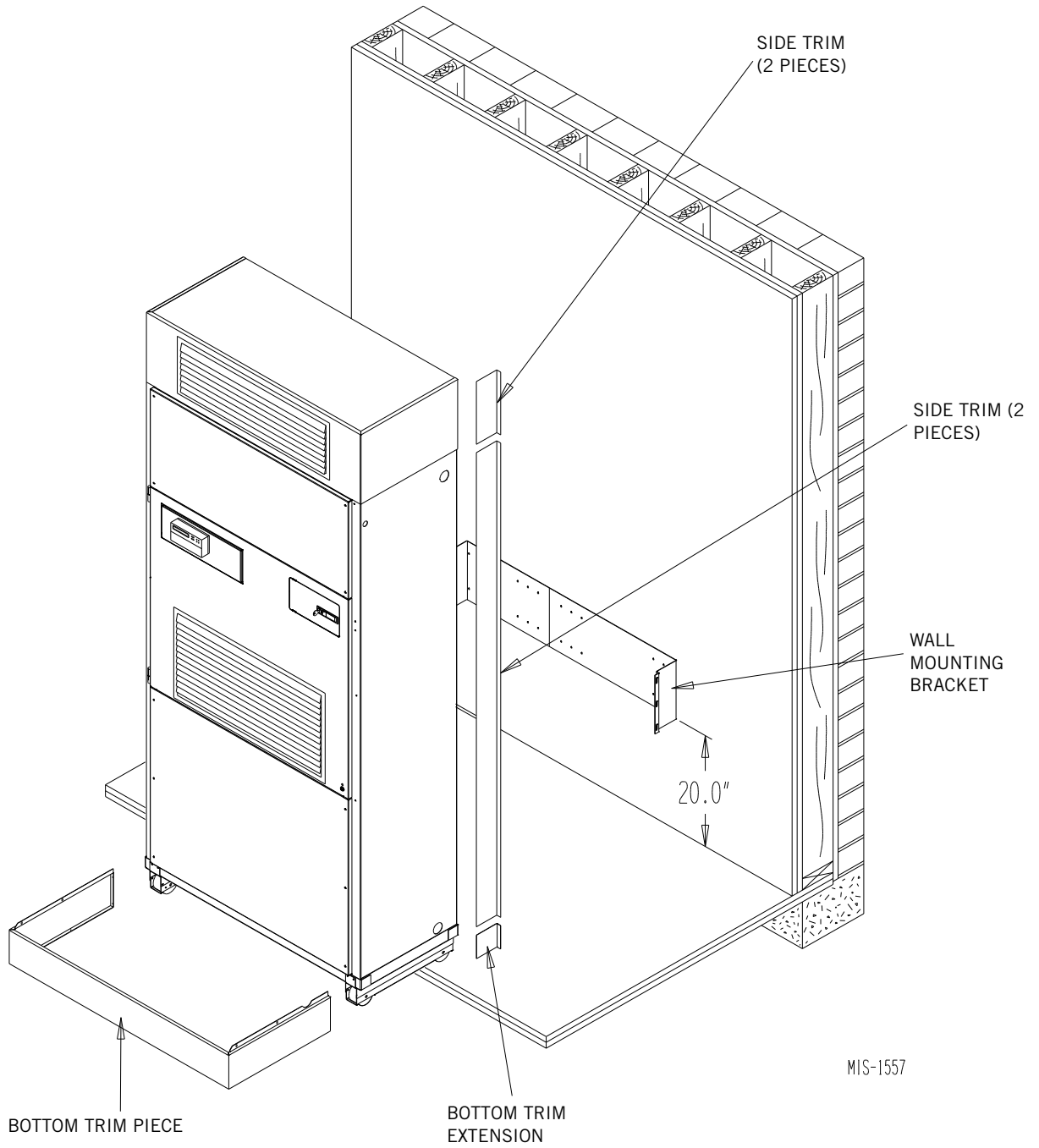
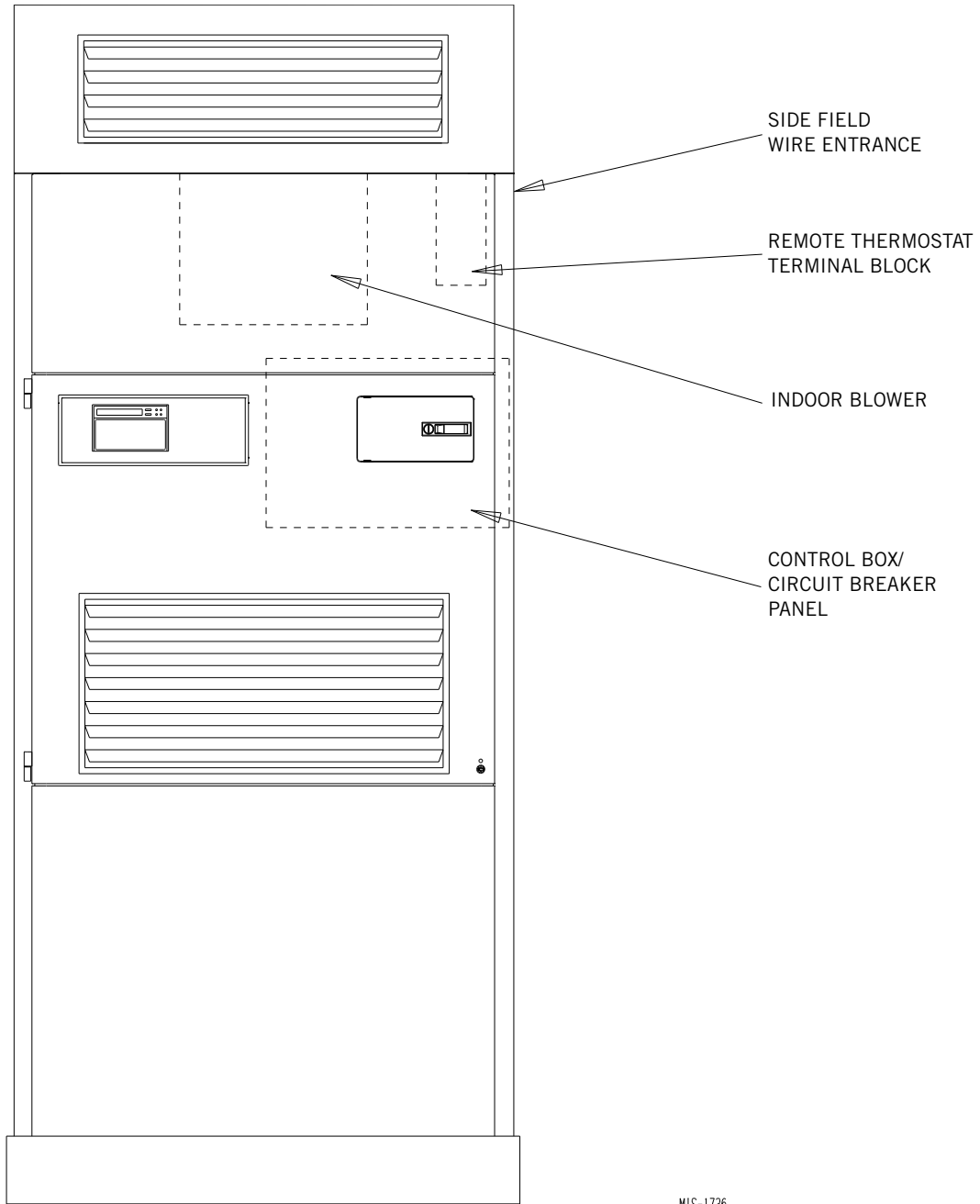


FIGURE 16
Component Location



MIS-1736

Wiring – Main Power

Refer to the unit rating plate and/or Table 2 on page 4 for wire sizing information and maximum fuse or circuit breaker size. Each 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 and wire sizes (75°C copper) 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 assure 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.

The field wiring connections are located behind the top panel in the circuit breaker panel. The return air panel must be removed first. This panel is equipped with a door switch which shuts the unit down when it is removed. The filter rack must be removed next.

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 as noted in Table 4.

TABLE 4
Operating Voltage Range

TAP	RANGE
240V	253 - 216
208V	220 - 18

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).*

The standard Climate Control **Option X** is a remote thermostat connection terminal block. See Figure 18 on page 23 for wiring diagram. Compatible thermostat is listed in Table 5.

TABLE 5
Wall Thermostat

Thermostat	Predominant Features
8403-060 (1120-445)	3 stage Cool; 3 stage Heat Programmable/Non-Programmable Electronic HP or Conventional Auto or Manual changeover

The Climate Control **Option D** is an electronic, programmable thermostat. The subbase of the thermostat is factory wired to the front panel of the unit. Compatible for use with energy recovery ventilator or economizer.

General

This unit is equipped with a variable speed ECM motor. The motor is designed to maintain rated airflow up to the maximum static allowed. **It is important that the blower motor plugs are not plugged in or unplugged while the power is on. Failure to remove power prior to unplugging or plugging in the motor could result in motor failure.**



CAUTION

Do not plug in or unplug blower motor connectors while the power is on.
Failure to do so may result in motor failure.

Fluid Connections

See Figure 1 on page 6 for location of fluid connection. Connection size is 1" FPT.

If the free blow plenum box is to be used, there are knockouts in the top of the box that can be removed to allow passage of the fluid piping.

All plumbing to and from the unit is to be installed in accordance with local plumbing codes. The use of plastic pipe where permissible is recommended to prevent electrolytic corrosion of the fluid pipes.

It is strongly recommended that the fluid piping to the unit be insulated to prevent water droplets from condensing on the pipe surface.

Low Voltage Connections

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

The “R” terminal is the *hot* terminal and the “C” terminal is *grounded*.

“G” terminal or pins 6 and 1 of P2 are the *fan inputs*. **Both must be energized for proper fan operation.**

This is done automatically in the factory-installed climate control options. If the climate control option is abandoned and connections are made directly to P2, both pins 6 and 1 of P2 must be energized for proper operation.

“Y1” terminal or pin 7 of P2 is the *first stage cooling input*.

“W1” terminal or pin 8 of P2 is the *first stage heating input*.

“R” terminal or pin 10 of P2 is *24 VAC hot*.

“C” terminal or pin 11 of P2 is *24 VAC grounded*.

“Y2” terminal or pin 12 of P2 is the *second stage cooling input*.

“W2” terminal or pin 9 of P2 is *second stage heating output*.

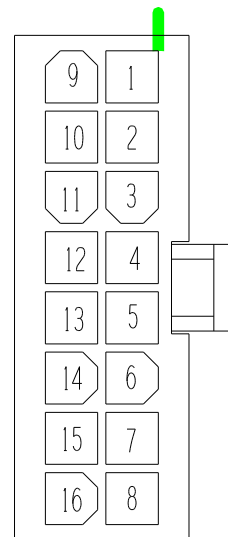
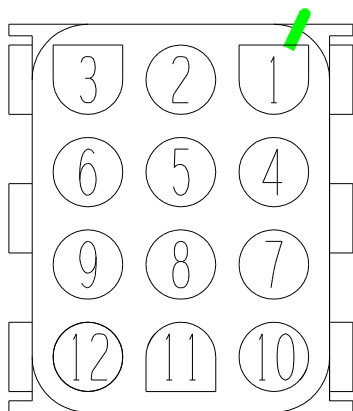
“3” terminal of pin 5 of P2 is the *ventilation input*. This terminal energizes any factory installed ventilation option.

Low Voltage Connections for DDC Control	
Fan Only	Energize G
1st Cooling Mode	Energize Y1, G
2nd Cooling Mode	Energize Y1, Y2, G
1st Stage Heating	Energize G, W1
2nd Stage Heating	Energize G, W1, W2
Ventilation	Energize G, 3

FIGURE 17
Blower Motor Low Voltage Wire Harness Plug

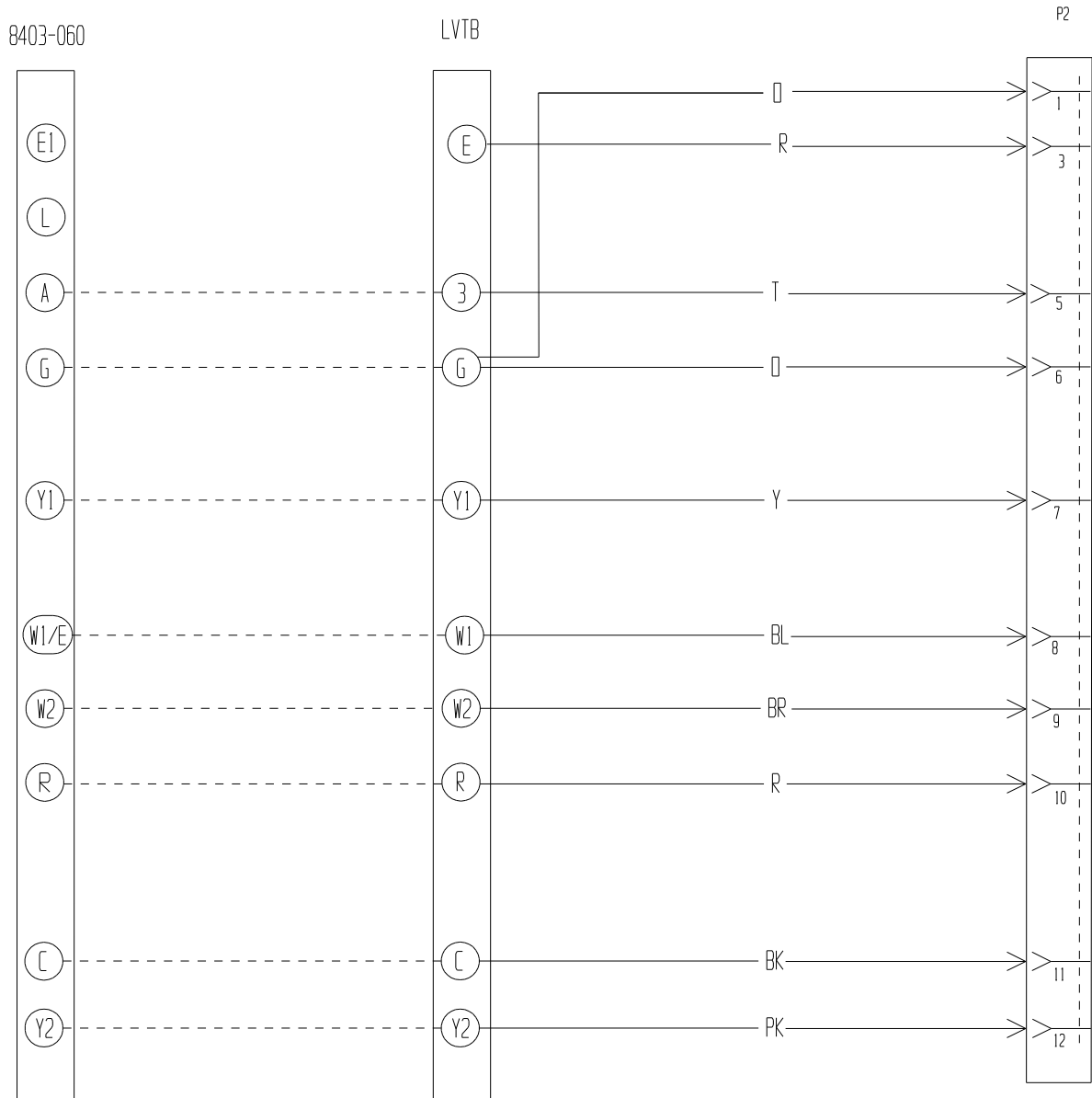
THERMOSTAT PLUG
TERMINALS
P2 AND P4
(VIEWED FROM PIN END)

BLOWER MOTOR
LOW VOLTAGE PLUG
(VIEWED FROM PIN END)



MIS-1285

FIGURE 18
Remote Thermostat Wiring Diagram
"X" Option



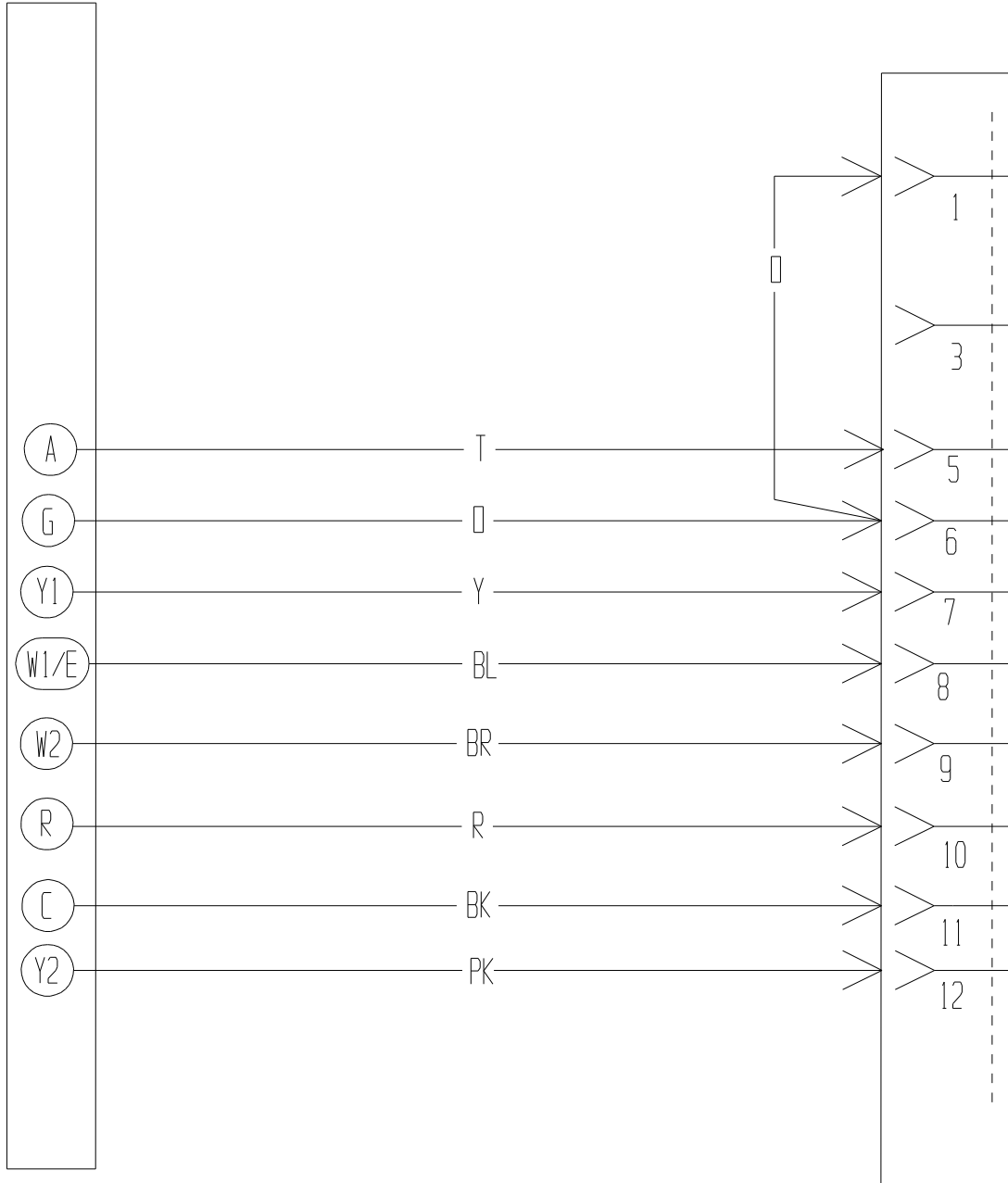
MIS-1734 C

FIGURE 19
Remote Thermostat Wiring Diagram
"D" Thermostat Option

8403-060

4102-049

P2



Optional CFM

These units are shipped from the factory set to operate at the optional CFM level shown in Table 6. This provides lower operating sound levels for non-ducted, free discharge applications. This CFM level will reduce the system capacity performance by approximately 2% at the same energy efficiency.

Rated CFM is required for ducted applications for maximum performance rating. To obtain full CFM on these models, connect jumper wire as follows:

1. Disconnect all power to the unit. Failure to do so may result in damage to the motor.
2. Open hinged return air grille panel.
3. Open control panel cover.
4. Add pink jumper wire (provided) to terminals 5 and 6 on the terminal board.
5. Reverse steps to reassemble.

Important Installer Note

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

Service Hints

1. Caution user to maintain clean air filters at all times and to not close off supply air registers needlessly. This may reduce airflow through the system, which shortens equipment service life as well as increasing operating costs and noise levels.
2. The wall thermostat perform multiple functions. Be sure that all function switches are correctly set for the desired operating mode before trying to diagnose any reported service problems.

Sequence of Operation

First Stage Cooling – Circuit R-Y1 makes the thermostat open the first stage cooling water valve.

Second Stage Cooling – Circuit R-Y2 makes the thermostat open the second stage cooling water valve. The G (indoor motor) circuit is automatically completed on any call for cooling operation, or can be energized by manual fan switch on subbase for constant air circulation.

CAUTION: *Second stage cooling must always be energized in conjunction with first stage. If the second state were energized alone, the condensate from the upper part of the coil could be blown off or re-evaporated as it passes down over the dry portion of the coil.*

Heating – A thermostat demand for heating makes R-W1 circuit as well as R-G circuit. This starts the indoor blower as well as turns on the electric heater.

Second Stage Heating (15 KW only) – Circuit R-W2 energizes the second contactor and brings on the last 5 KW of heat.

TABLE 6
Indoor Blower Performance

MODEL	RATED ESP	① MAX. ESP	② RATED CFM	③ OPTIONAL CFM	④ CONTINUOUS CFM	CFM @ MAX. ESP
QC501	0.0	0.8	1200	1000	1000	1175

NOTE: *These units are equipped with a variable speed (ECM) indoor motor that automatically adjusts itself to maintain approximately the same rate of indoor air flow in both heating and cooling, dry and wet coil conditions, and at both 230/208 or 460 volts.*

- ① Maximum ESP (" WC) shown is with 1" thick disposable filter (reduced by .2 for 2" filter).
- ② Rated CFM for ducted applications – required for maximum performance rating. To obtain full CFM, locate low voltage terminal strip in the circuit breaker box. There is a pink jumper wire with both ends attached to terminal marked "G2". Move one end of the jumper to terminal "Y1".
- ③ Optional CFM – the unit is shipped from the factory set to operate at the optional CFM level shown. This provides lower operating sound levels for non-ducted, free discharge applications. This reduces system capacity performance by approximately 2% at the same energy efficiency.
- ④ Continuous fan CFM is the total air being circulated during continuous fan mode.

TROUBLESHOOTING INDOOR ECM™ BLOWER MOTORS

CAUTION:

Disconnect power from unit before removing or replacing connectors, or servicing motor. To avoid electric shock from the motor's capacitors, disconnect power and wait at least 5 minutes before opening motor.

Symptom

Motor rocks slightly when starting

Motor won't start
• No movement

• Motor rocks, but won't start

Motor oscillates up load & down while being tested off of blower

Motor starts, but runs erratically
• Varies up and down or intermittent

• "Hunts" or "puffs" at high CFM (speed)

• Stays at low CFM despite system call for cool or heat CFM

• Stays at high CFM

• Blower won't shut off

Excessive noise

• Air noise

Cause/Procedure

• This is normal start-up for ECM

• Check blower turns by hand
• Check power at motor
• Check low voltage (24 Vac R to C) at motor
• Check low voltage connections (G, Y, W, R, C) at motor
• Check for unseated pins in connectors on motor harness
• Test with a temporary jumper between R - G
• Check motor for tight shaft
• Perform motor/control replacement check
• **Perform Moisture Check**

• Check for loose or compliant motor mount
• Make sure blower wheel is tight on shaft
• Perform motor/control replacement check

• It is normal for motor to oscillate with no on shaft

• Check line voltage for variation or "sag"
• Check low voltage connections (G, Y, W, R, C) at motor, unseated pins in motor harness connectors
• Check "Bk" for erratic CFM command (in variable-speed applications)
• Check out system controls, Thermostat
• **Perform Moisture Check**

• Does removing panel or filter reduce "puffing"?
- Reduce restriction
- Reduce max airflow

• Check low voltage (Thermostat) wires and connections
• Verify fan is not in delay mode; wait until delay complete
• "R" missing/not connected at motor
• Perform motor/control replacement check

• "R" missing/not connected at motor
• Is fan in delay mode? - wait until delay time complete
• Perform motor/control replacement check

• Current leakage from controls into G, Y or W? Check for Triac switched thermostat or solid-state relay

• Determine if it's air noise, cabinet, duct or motor noise; interview customer, if necessary
• High static creating high blower speed?
- Is airflow set properly?
- Does removing filter cause blower to slow down? Check filter
- Use low-pressure drop filter
- Check/correct duct restrictions

Symptom

• Noisy blower or cabinet

• "Hunts" or "puffs" at high CFM (speed)

Evidence of Moisture

• Motor failure or malfunction has occurred and moisture is present
• Evidence of moisture present inside air mover

Do

• Check out motor, controls, wiring and connections thoroughly before replacing motor
• Orient connectors down so water can't get in
- Install "drip loops"
• Use authorized motor and model #'s for replacement
• Keep static pressure to a minimum:
- Recommend high efficiency, low static filters
- Recommend keeping filters clean.
- Design ductwork for min. static, max. comfort
- Look for and recommend ductwork improvement, where necessary

• Size the equipment wisely
• Check orientation before inserting motor connectors

Moisture Check

• Connectors are oriented "down" (or as recommended by equipment manufacturer)
• Arrange harness with "drip loop" under motor
• Is condensate drain plugged?
• Check for low airflow (too much latent capacity)
• Check for undercharged condition
• Check and plug leaks in return ducts, cabinet

Comfort Check

• Check proper airflow settings
• Low static pressure for lowest noise
• Set low continuous-fan CFM
• Use humidistat and 2-speed cooling units
• Use zoning controls designed for ECM that regulate CFM
• Thermostat in bad location?

Cause/Procedure

• Check for loose blower housing, panels, etc.
• High static creating high blower speed?
- Check for air whistling through seams in ducts, cabinets or panels
- Check for cabinet/duct deformation

• Does removing panel or filter reduce "puffing"?
- Reduce restriction
- Reduce max. airflow

• Replace motor and **Perform Moisture Check**

• **Perform Moisture Check**

Don't

• Automatically assume the motor is bad.
• Locate connectors above 7 and 4 o'clock positions
• Replace one motor or control model # with another (unless an authorized replacement)
• Use high pressure drop filters some have 1/2" H2O drop!
• Use restricted returns
• Oversize system, then compensate with low airflow
• Plug in power connector backwards
• Force plugs

Replacing ECM Control Module

To replace the control module for the GE variable-speed indoor blower motor you need to take the following steps:

1. You **MUST** have the correct replacement module. The controls are factory programmed for specific operating modes. Even though they look alike, different modules may have completely different functionality.

USING THE WRONG CONTROL MODULE VOIDS ALL PRODUCT WARRANTIES AND MAY PRODUCE UNEXPECTED RESULTS.

2. Begin by removing AC power from the unit being serviced. **DO NOT WORK ON THE MOTOR WITH AC POWER APPLIED.** To avoid electric shock from the motor's capacitors, disconnect power and wait at least 5 minutes before opening motor.

3. It is not necessary to remove the motor from the blower assembly, nor the blower assembly from the unit. Unplug the two cable connectors to the motor control assembly. There are latches on each connector. **DO NOT PULL ON THE WIRES.** The plugs remove easily when properly released.

4. Locate the screws that retain to the motor control bracket to the sheet metal of the unit and remove them. Remove two (2) nuts that retain the control to the bracket and then remove two (2) nuts that retain sheet metal motor control end plate. Refer to Figure 20.

5. Disconnect the three (3) wires interior of the motor control by using your thumb and forefinger squeezing the latch tab and the opposite side of the connector plug, gently pulling the connector. **DO NOT PULL ON THE WIRES, GRIP THE PLUG ONLY.** Refer to Figure 20.

6. The control module is now completely detached from the motor. Verify with a standard ohmmeter that the resistance from each motor lead (in the motor plug just removed) to the motor shell is $>100K$ ohms. Refer to Figure 21. (Measure to unpainted motor end plate.) If any motor lead fails this test, do not proceed to install the control module. **THE MOTOR IS DEFECTIVE AND MUST BE REPLACED.** Installing the new control module will cause it to fail also.

7. Verify that the replacement control is correct for your application. Refer to the manufacturer's authorized replacement list. **USING THE WRONG CONTROL WILL RESULT IN IMPROPER OR NO BLOWER OPERATION.** Orient the control module so that the 3-wire motor plug can be inserted into the socket in the control. Carefully insert the plug and press it into the socket until it latches. **A SLIGHT CLICK WILL BE HEARD WHEN PROPERLY INSERTED.**

8. Reverse the steps #5, 4, 3 to reconnect the motor control to the motor wires, securing the motor control cover plate, mounting the control to the bracket, and mounting the motor control bracket back into the unit. **MAKE SURE THE ORIENTATION YOU SELECT FOR REPLACING THE CONTROL ASSURES THE CONTROL'S CABLE CONNECTORS WILL BE LOCATED DOWNWARD IN THE APPLICATION SO THAT WATER CANNOT RUN DOWN THE CABLES AND INTO THE CONTROL. DO NOT OVERTIGHTEN THE BOLTS.**

9. Plug the 16-pin control plug into the motor. The plug is keyed. Make sure the connector is properly seated and latched.

10. Plug the 5-pin power connector into the motor. Even though the plug is keyed, **OBSERVE THE PROPER ORIENTATION. DO NOT FORCE THE CONNECTOR.** It plugs in very easily when properly oriented. **REVERSING THIS PLUG WILL CAUSE IMMEDIATE FAILURE OF THE CONTROL MODULE.**

11. Final installation check. Make sure the motor is installed as follows:

- Motor connectors should be oriented between the 4 o'clock and 8 o'clock positions when the control is positioned in its final location and orientation.
- Add a drip loop to the cables so that water cannot enter the motor by draining down the cables. Refer to Figure 22.

The installation is now complete. Reapply the AC power to the HVAC equipment and verify that the new motor control module is working properly. Follow the manufacturer's procedures for disposition of the old control module.

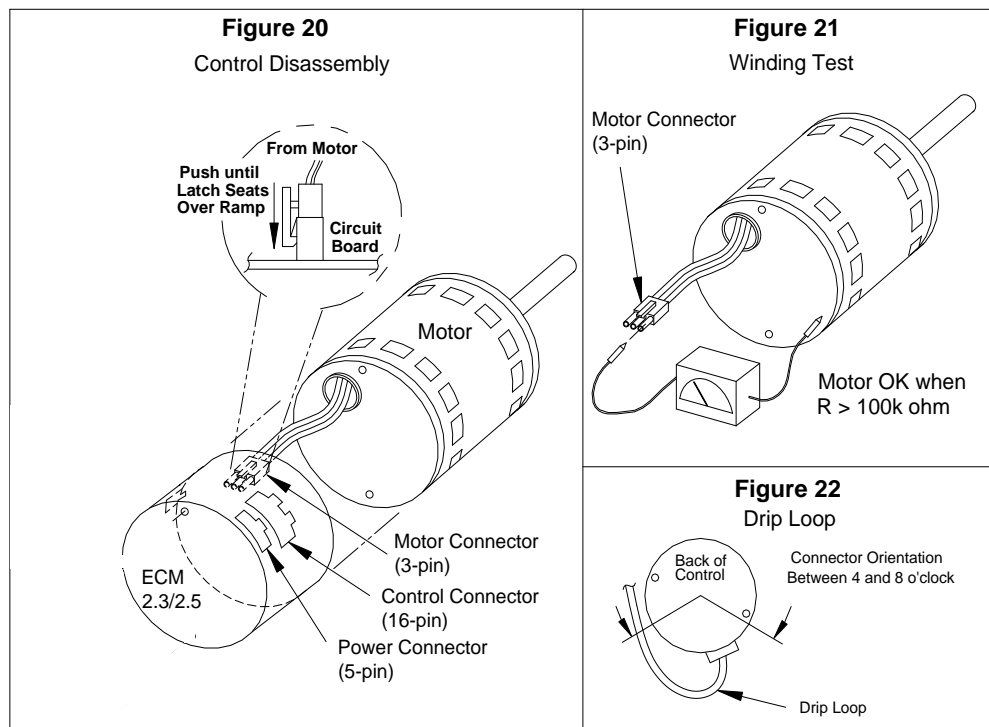
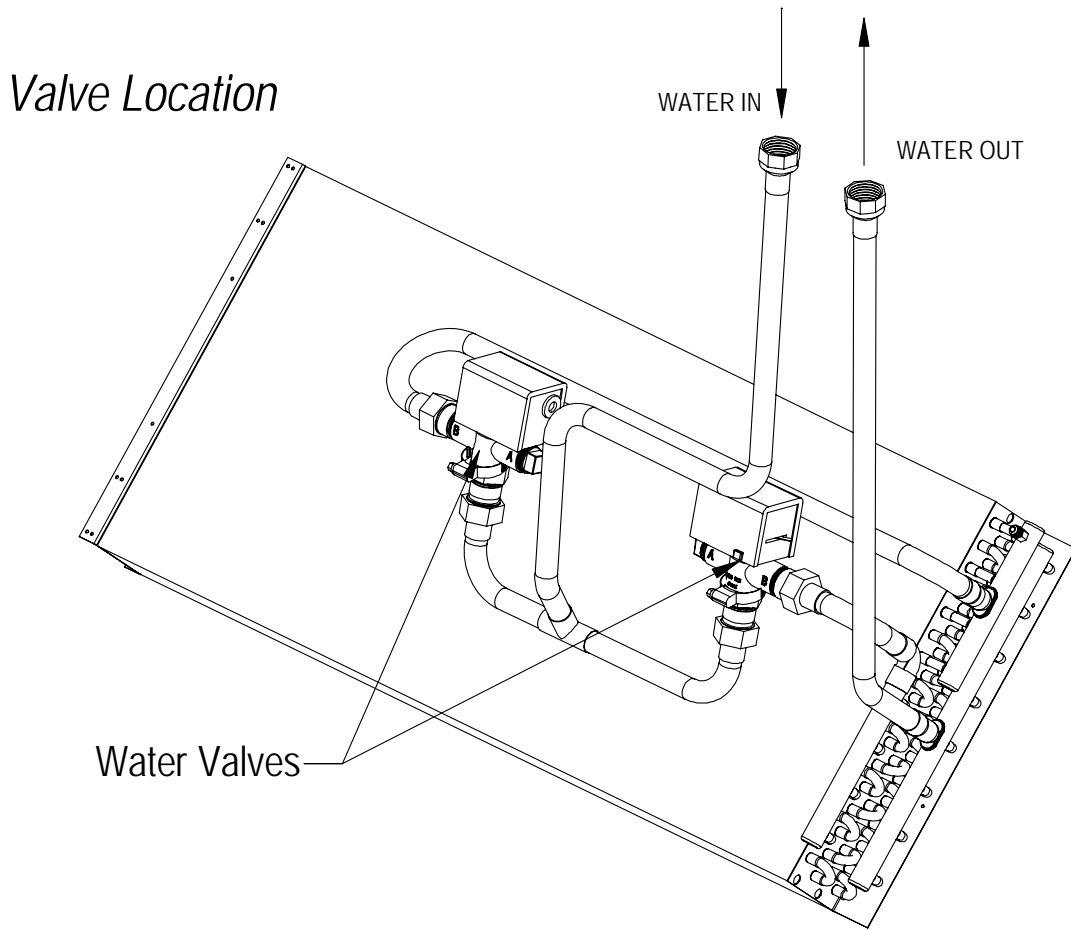
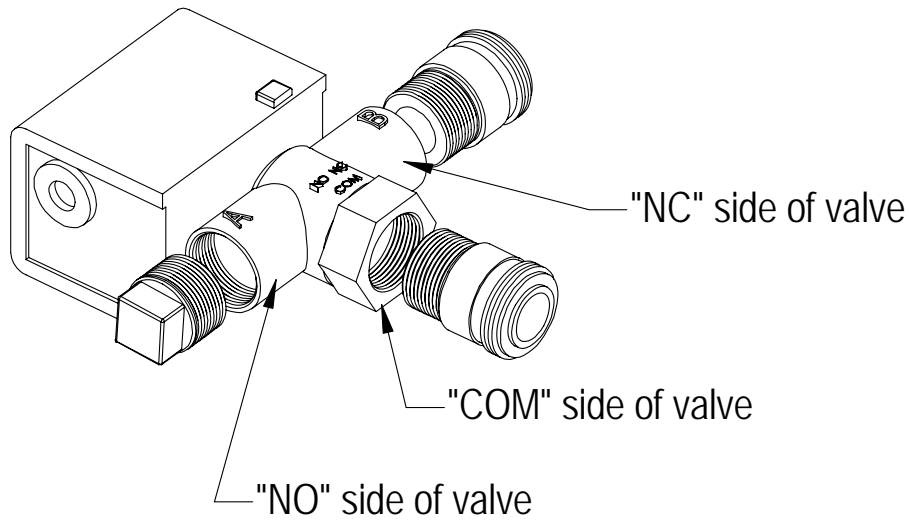


FIGURE 23
Internal 2-Way Valve Piping

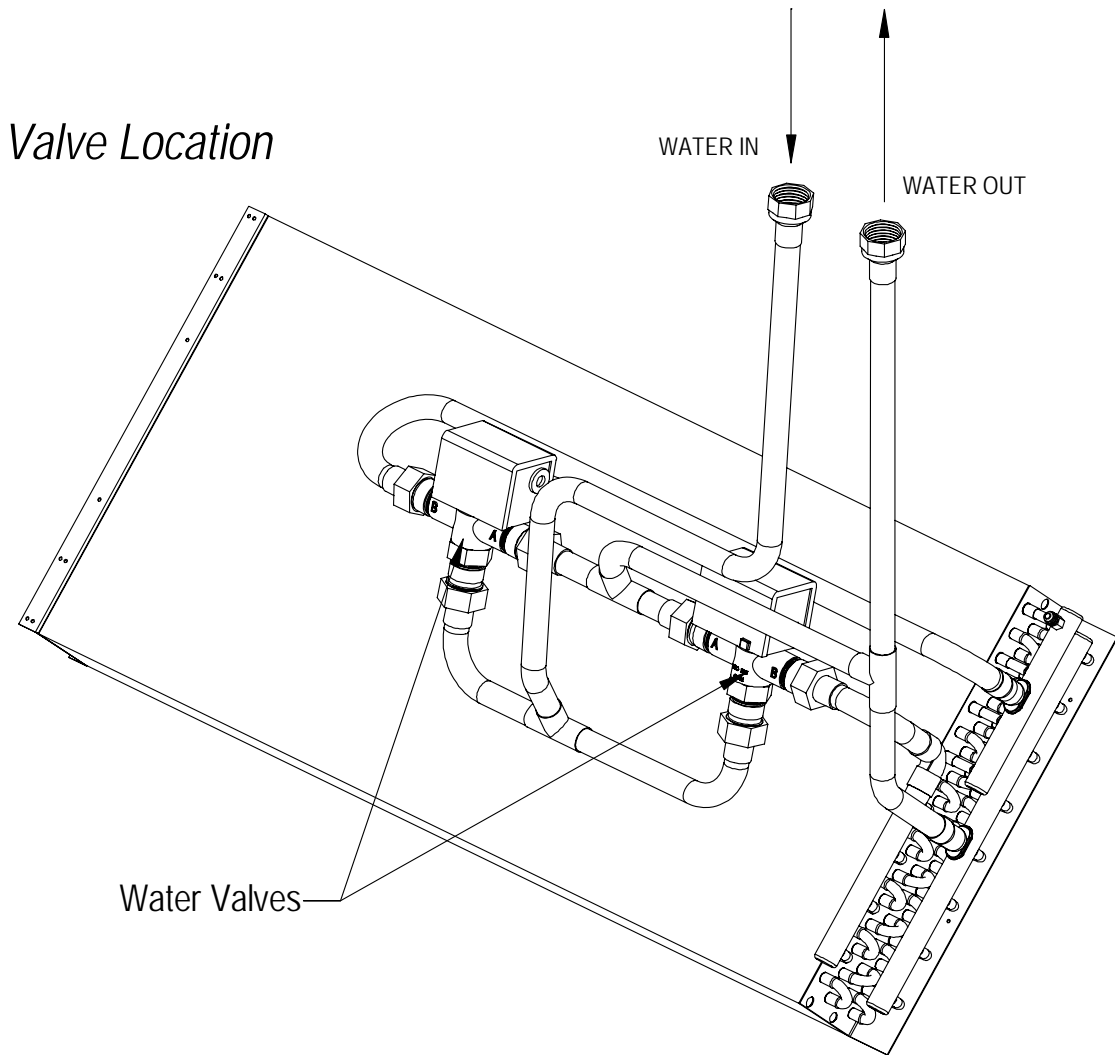


Valve Detail

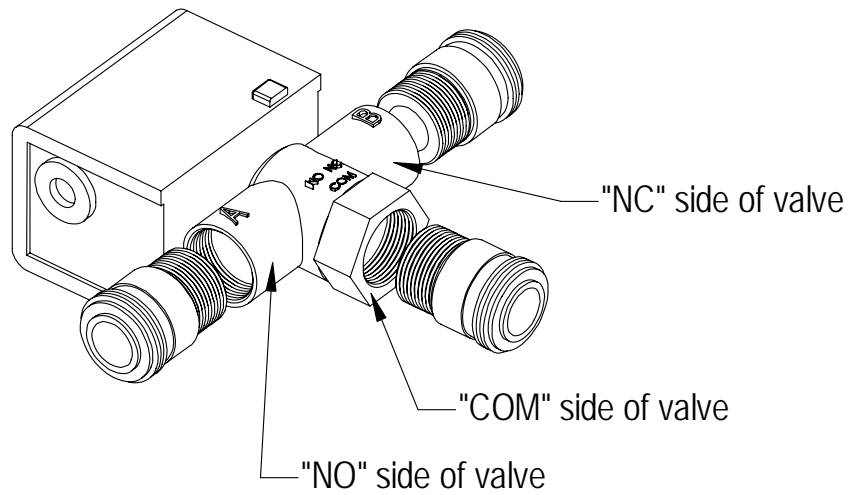


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FIGURE 24
Internal 3-Way Valve Piping



Valve Detail



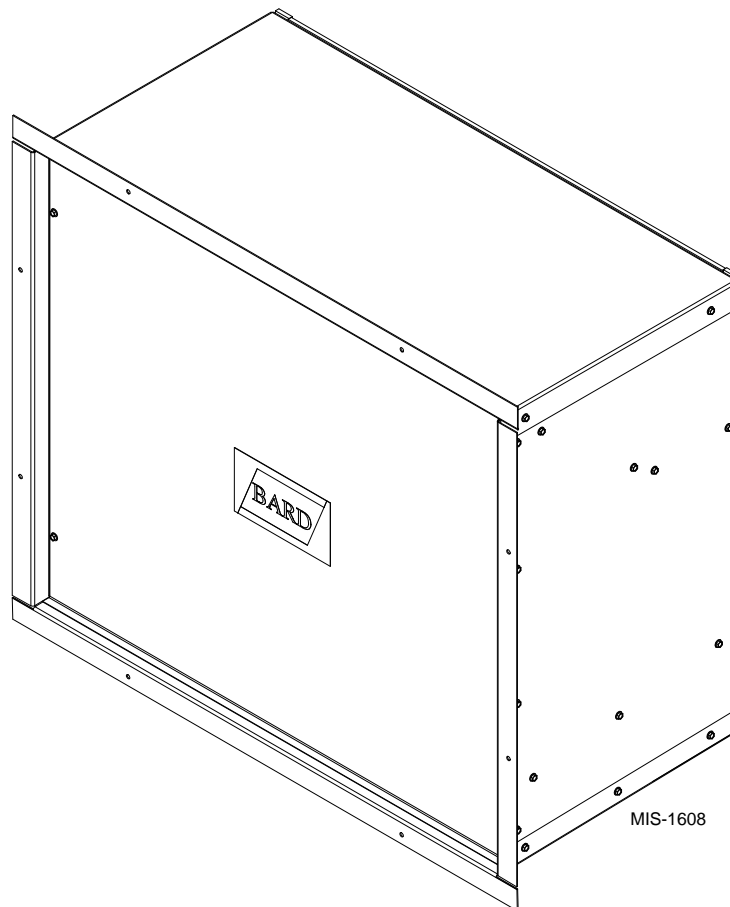
MIS-1900 A

INSTALLATION INSTRUCTIONS

QW Series Wall Sleeve

Models:

QWVS42 QWVS42-19 QWVS42-H



Climate Control Solutions

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

Manual: 2100-383D
Supersedes: 2100-383C
Date: 4-28-20

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GETTING OTHER INFORMATION AND PUBLICATIONS

The following publications can help when installing the wall sleeve. 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.

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

Standard for Warm Air Heating and Air Conditioning SystemsANSI/NFPA 90B

In addition, it may be helpful to consult the latest revision of QW Installation Instructions manual 2100-381.

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

INSTALLATION

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.

General

The QWVS42 wall sleeve is designed for use with QW Series water-to-air heat pumps where vent options are utilized. The QWVS42 is for use on installations where wall thickness is 14" or less. The QWVS42-19 is for use on installations where wall thickness is 16" or less.

The QWVS-H is for use with an outdoor louver grille that meets hurricane impact requirements, and is for use where wall thickness is 14" or less.

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

These instructions explain the recommended method to install the wall sleeve.

These instructions and any instructions packaged with any separate equipment required to make the entire air conditioning system should be carefully read before beginning the installation.

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.

Installation – Wood Framed Walls

For wood frame construction walls, the dimensions of the opening must be 29.5" tall by 35" wide. A 2 x 6 header will be required for the opening. The sides of the opening must have trimmer studs to support the header and to provide a structural member on which to fasten the sleeve (see Figure 1). All of the dimensions are referenced from the finished floor height.

Once the opening is framed, the sheeting can be installed, the sheeting material must not extend into the opening.

The sleeve should be test fit into the opening to make sure of the dimensions. The sleeve must be inserted into the opening from the outside of the building. The bottom of the sleeve must be level from side-to-side and the sleeve must be square in the opening. A slope is built into the bottom of the sleeve from the inside to the outside. This will allow any water that gets into the sleeve to drain out. Once the test fit is completed, the sleeve must be removed from the opening and a 1/4" bead of sealant must be applied to the mounting flanges of the sleeve (see Figure 2).

FIGURE 1
Wood Framed Installation

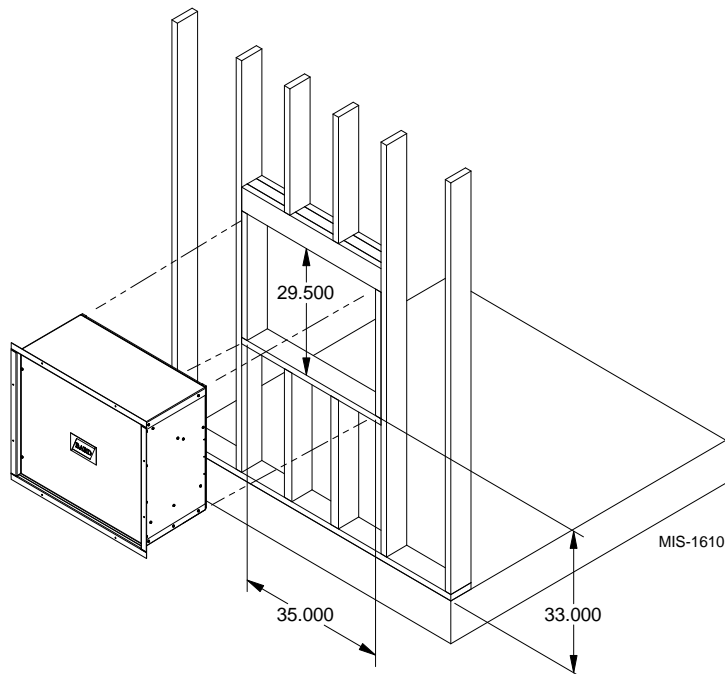
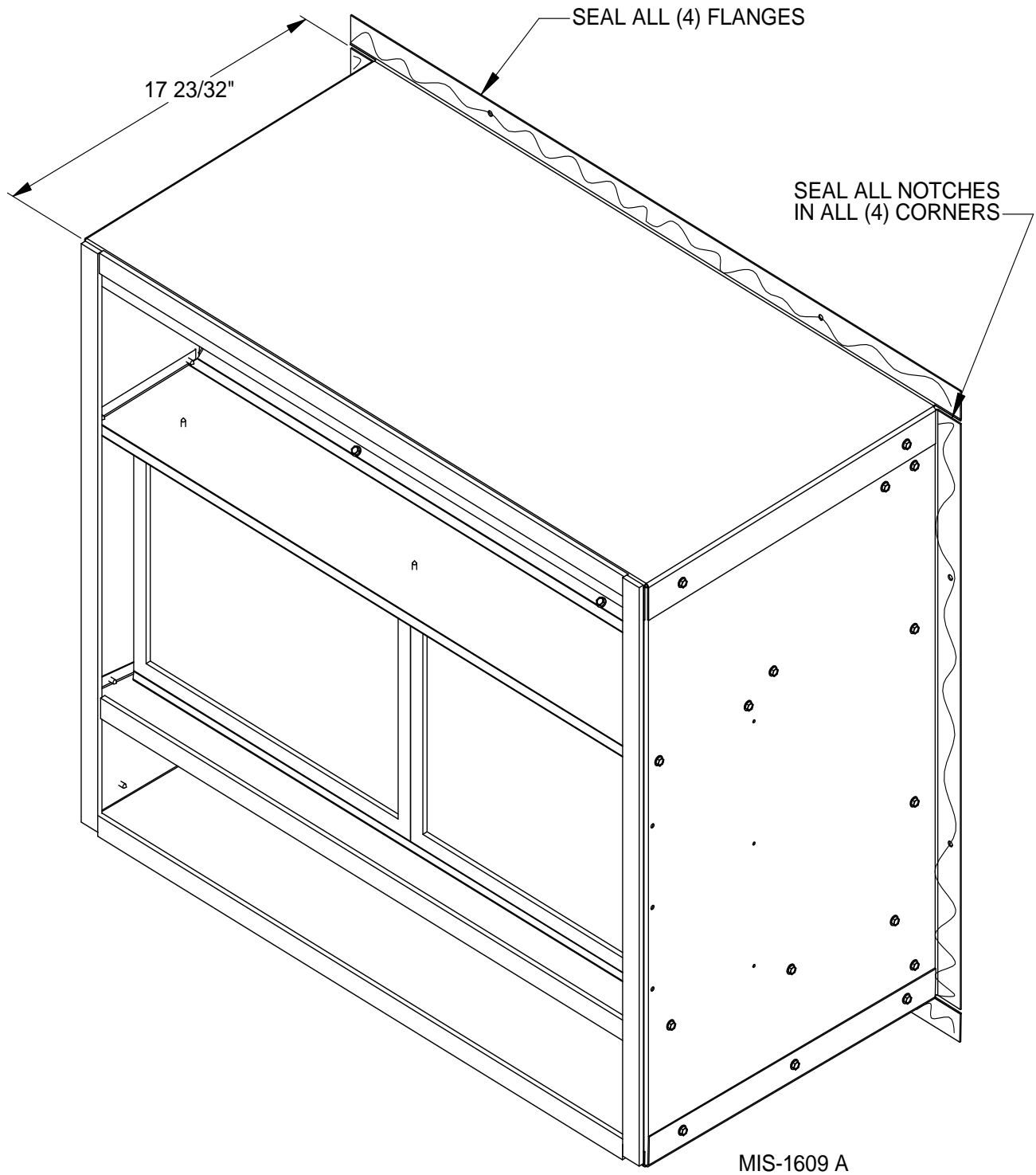


FIGURE 2
Application of Sealant to Flanges



The sleeve is then re-inserted into the prepared opening from the outside of the building. All of the mounting flanges must contact the exterior wall. Check to see that there is enough sealant to make this joint watertight. Additional sealant must be applied as necessary. The sleeve must be centered in the opening, and the bottom of the sleeve must be checked to make certain that it is level from side-to-side. The bottom flange should be secured to the wall by using two screws through the holes in the bottom mounting flange of the sleeve. The sleeve must be checked to make sure that it is square in the opening. Once the sleeve is square, the side and top mounting flanges of the sleeve must be secured to the wall with screws through the holes in the flanges. The gaps between the side, top and bottom flanges must be filled with additional sealant.

On the inside of the building, the gaps between the sleeve and the opening must be filled with insulation. This will help insulate the sleeve and prevent infiltration of any unwanted outdoor air (see Figure 4).

There are two brackets supplied with the sleeve for attachment to the unit. Position these brackets to the sleeve and attach with three screws per side. Roll

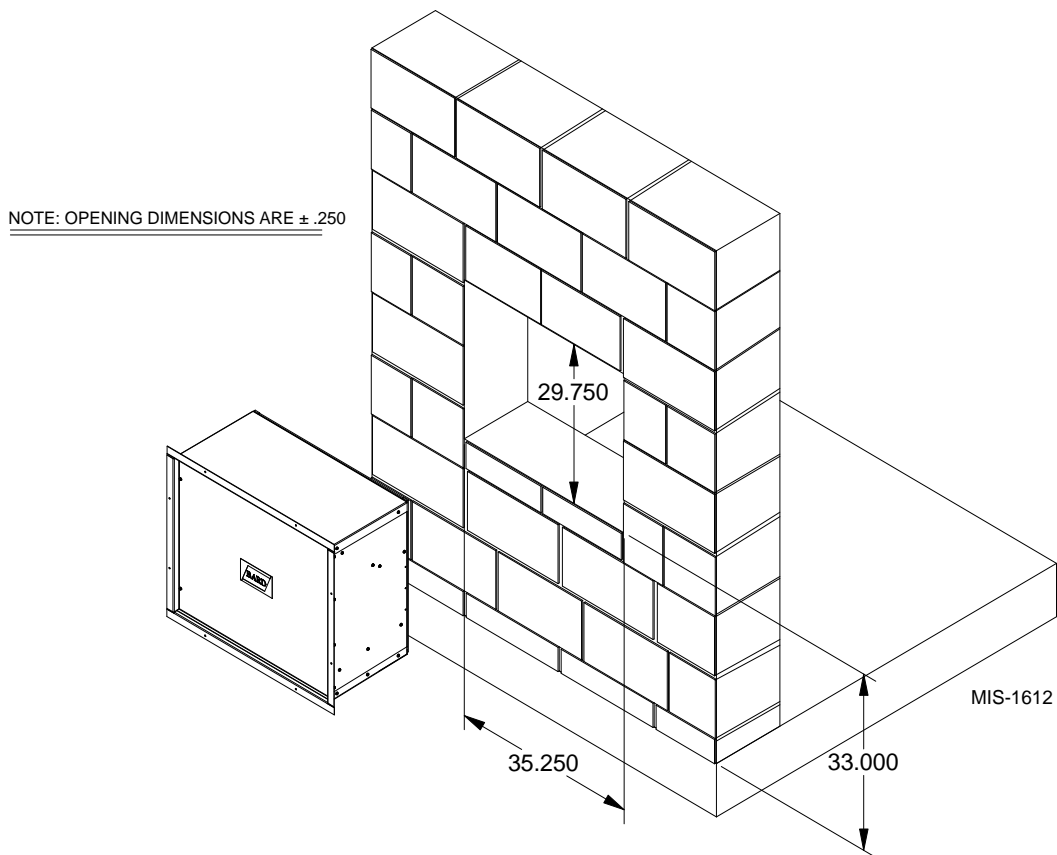
unit up to sleeve making sure the cabinet rear is tight against the gasket on the sleeve flange to provide an air tight seal. Drill 1/8" diameter holes through the brackets into the cabinet side and attach with screws provided. See Figure 5 on page 8 for more details.

Installation – Masonry Construction Walls

For masonry construction walls, the dimensions for the opening will be 29.75" tall by 35.25" wide. These dimensions are +/- 1/4" and are measured from the finished floor height (see Figure 3). These will be the finish dimensions of the opening.

The sleeve should be test fit in the opening before final preparations are made. The sleeve will be installed into the opening from the outside of the building. The sleeve must be centered in the opening from side-to-side. The mounting flanges of the sleeve must contact the outside wall all around the opening. The side and top mounting flanges must have the mounting holes drilled into the outside wall for the concrete anchors which will hold the sleeve in the wall. The holes should be drilled through the holes in the sleeve with

FIGURE 3
Masonry Construction Installation



the sleeve level and square in the opening. A slope is built into the bottom of the sleeve from the inside to the outside. This will allow any water that gets into the sleeve to drain out. Once the test fitting has been checked out, the sleeve should be removed from the wall.

With the sleeve removed, a 1/4" bead of sealant must be applied to the flanges that contact the outside wall (see Figure 2).

The sleeve must be installed back in the wall making sure that the predrilled holes in the wall line up with the holes in the mounting flanges of the sleeve. Check to make sure that there is enough sealant between the wall and the flanges to make the joint watertight. Additional sealant must be applied as required. The sleeve must be anchored to the wall. All four mounting flanges must be fastened with two fasteners each to

the outside wall. The gaps between the side, top and bottom flanges must be sealed to the wall.

On the inside of the building, the gaps between the sleeve and the opening must be filled with insulation. This will help insulate the sleeve and prevent infiltration of any unwanted outdoor air (see Figure 4).

There are two brackets supplied with the unit for attachment to the sleeve. Position these brackets to the sleeve and attach with three screws per side. Roll unit up to sleeve making sure the cabinet rear is tight against the gasket on the sleeve flange to provide an air tight seal. Drill 1/8" diameter holes through the brackets into the cabinet side and attach with screws provided. See Figure 5 on page 8 for more details.

FIGURE 4
Typical Installation

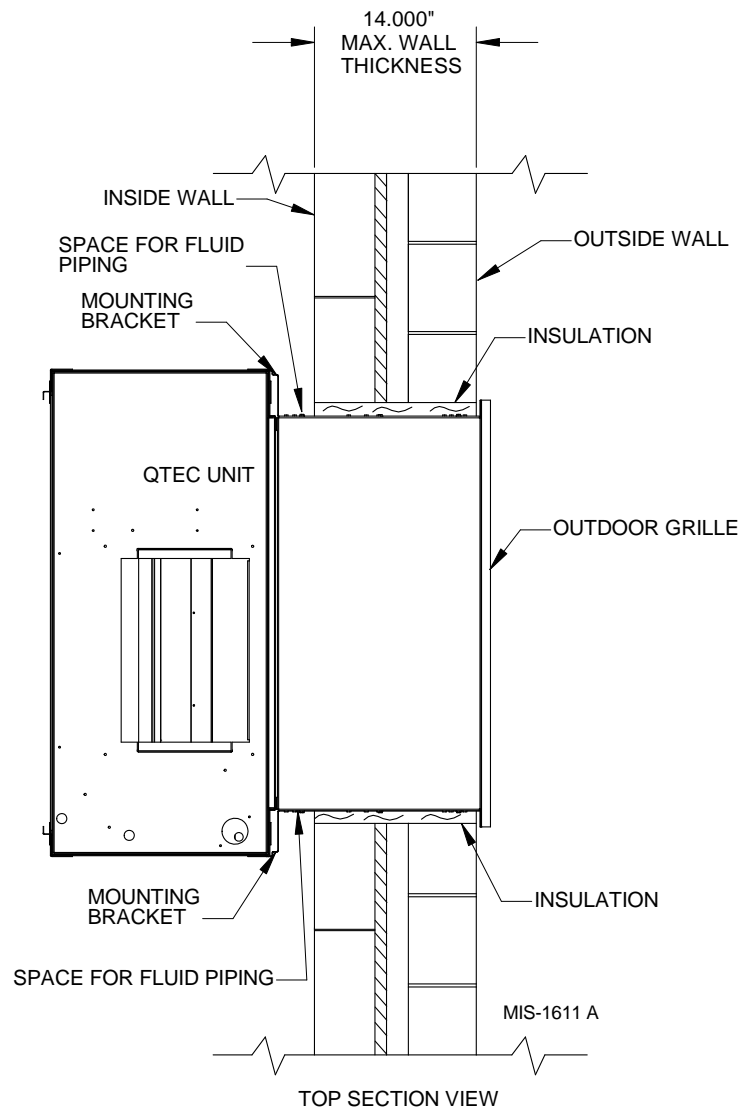
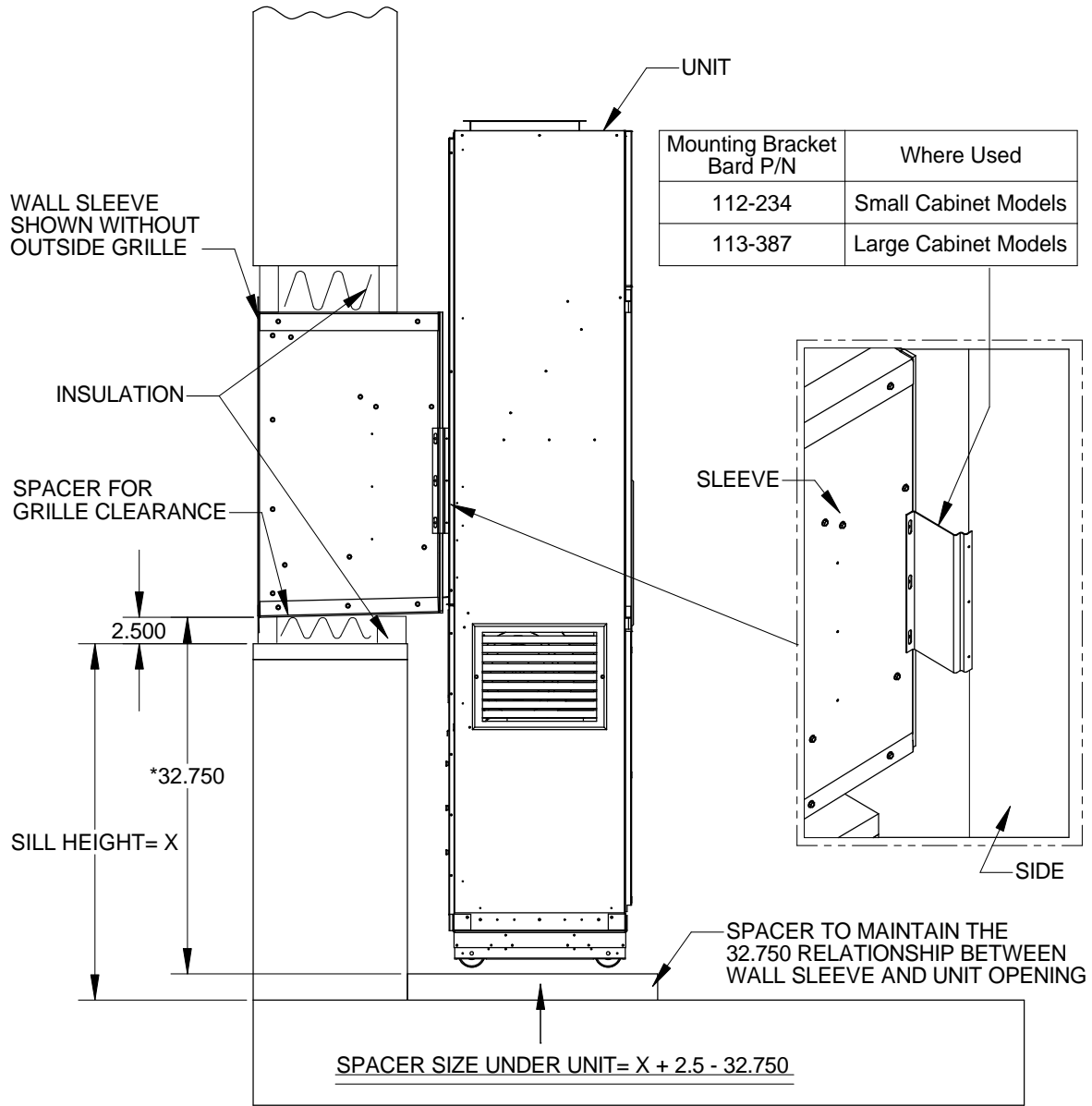


FIGURE 5
Installation of QW Wall Sleeve Through a Window Opening



*THIS DIMENSION MUST REMAIN CONSTANT
 WHEN FABRICATING UNIT AND WALL SLEEVE
 REGARDLESS OF THE WINDOW SILL DIMENSIONS

MIS-1614 A

Installation Through a Window Opening

NOTE: Depending on the window sill height as measured from the inside finished floor, a spacer may be required under the unit wheels to ensure the proper relationship from the bottom of the sleeve and the window sill. To determine the height of this spacer, measure the window sill height from the finished floor, add 2.5" and subtract 32.75". Example: With a sill height of 33", add 2.5" and subtract 32.75". This equals a spacer height of 2.75". This spacer is to continue across the front of the unit to seal up the gap between the floor and the bottom trim piece. When the unit is placed on these spacers, the locking screws must be driven back into the wheel to secure the unit's position. Also, there are two brackets used for securing the sleeve to the unit. These brackets are shipped with the unit. Proper attachment at the proper location can be seen in Figure 5.

The QWVS42, QWVS42-19 and QWVS42-H may be used when the installation is through an existing window opening.

A 2.5" spacer is to be placed on the window sill. This spacer must be weather resistant and attached to the window sill. See Figure 5 for the location of this spacer.

The QWVS42, QWVS42-19 and QWVS42-H must extend through the window opening on the inside wall by 4" to allow clearance between the unit and the wall for the water pipes.

The window opening can be framed to provide an opening for the sleeve, 35" wide by 29.5" tall. The height of the opening is measured from the top surface of the 2.5" spacer. Once the opening is framed, the sheeting can be installed. The sheeting material must not extend into the opening.

The sleeve should be test fit into the opening to confirm the dimensions are correct. The sleeve must be inserted into the opening from the outside of the building. The bottom of the sleeve must be level from side-to-side and the sleeve must be square in the opening. A slope is built into the bottom of the sleeve from the inside to the outside. This will allow any water that gets into the sleeve to drain out. Once the test fit is completed, the sleeve must be removed from the opening and 1/4" bead of sealant must be applied to the mounting flanges of the sleeve (see Figure 2).

The sleeve is then re-inserted into the prepared opening from the outside of the building. All of the mounting flanges must contact the exterior wall. Check to see that there is enough sealant to make this joint watertight. Additional sealant must be applied as necessary. The sleeve must be centered in the opening and the bottom of the sleeve must be checked to make certain that it is level from side-to-side. The bottom flange should be secured to the wall by using two screws through the holes in the bottom mounting flange of the sleeve. The sleeve must be checked to make sure that it is square in the opening. **Once the sleeve is square, the side and top mounting flanges of the sleeve must be secured to the wall with screws through the holes in the flanges.*** The gaps between the side, top and bottom flanges must be filled with additional sealant.

There are two brackets supplied with the unit for attachment to the sleeve. Position these brackets to the sleeve and attach with three screws per side. Roll unit up to sleeve making sure the rear of the cabinet is tight against the gasket on the sleeve flange to provide an air tight seal. Drill 1/8" diameter holes through the brackets in to the cabinet side and attach with screws provided. See Figure 5 for more detail.

** Model QWVS42-H is not secured to the wall by the flanges. Instead, it is secured along with the hurricane grille through the sides of the sleeve per requirements.*

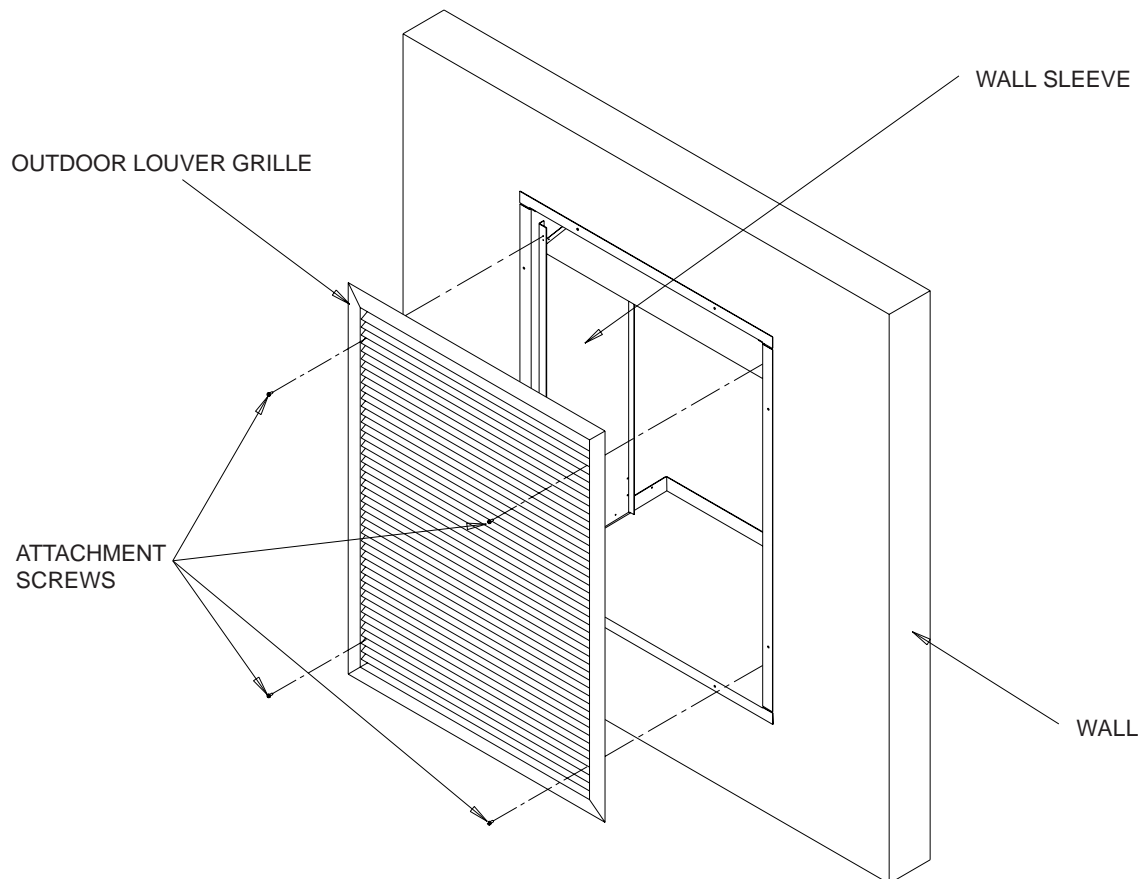


Climate Control Solutions

Bard Manufacturing Company, Inc.
Bryan, Ohio 43506

**QLG-10, QLG-11, QLG-15,
QLG-20, QLG-21, QLG-25,
QLG-30, QLG-31, QLG-35**

OUTDOOR LOUVER GRILLE INSTALLATION INSTRUCTIONS



MIS-967

1. Remove the four screws holding the weather panel. Save these screws, they will be used to attach the grille. *NOTE: A T-25 Torx Driver is required.*
2. Remove the weather panel from the sleeve from the outside and discard.
3. Position the Outdoor Louver Grille in the sleeve opening. The louvers must be facing downward.
4. The Outdoor Louver Grille flanges should touch the sleeve flanges on the outside wall.
5. Locate the four mounting holes in the Outdoor Louver Grille. They can be seen by looking under the louvers.
6. The Outdoor Louver Grille fastens through the same holes in the sleeve as the weather panel.
7. Insert the screws through the grille mounting holes and attach the Outdoor Louver Grille using the mounting holes provided in the sleeve.

SUPPLEMENTAL INSTRUCTIONS

Plenum Box

Models:

QPB42-V	QPBS42-V	QPBS48-V
QPB42-X	QPBS42-V-8	QPBS48-V-8
QPB42-1	QPBS42-X	QPBS48-X
QPB42-4	QPBS42-X-8	QPBS48-X-8
QPB48-V	QPBS42-1	QPBS48-1
QPB48-X	QPBS42-1-8	QPBS48-1-8
QPB48-1	QPBS42-4	QPBS48-4
QPB48-4	QPBS42-4-8	QPBS48-4-8

Installation

The plenum box is designed for use with the Q-TEC™ Series heat pumps. It is for use in free blow applications.

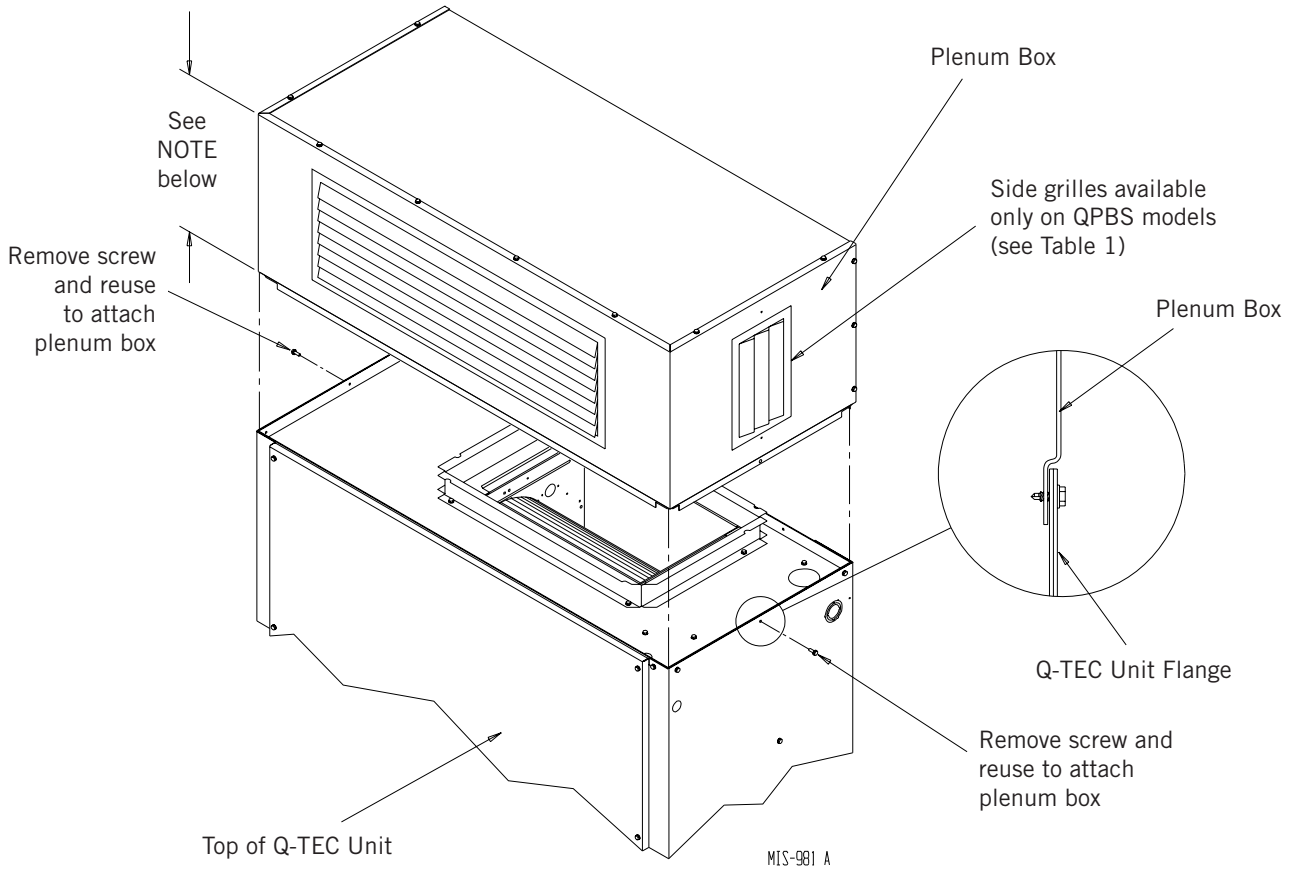
1. Remove the center screw from each top side of the unit (see Figure 1 on page 2).
2. Place plenum box on top of Q-TEC unit with the open side down and the grille facing the front of the unit.
3. Make sure that the bottom offsets of the plenum box are inside the top of the Q-TEC unit flange as shown in Figure 1. The outside of the plenum box should be flush with the outside of the unit.
4. Re-install the center screw in each top side of the Q-TEC unit. These screws will go through the clearance holes on the plenum box and hold it in place.
5. Adjust louvers to obtain desired air distribution.



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

Manual: 7960-359K
Supersedes: 7960-359J
Date: 10-18-23

Figure 1



NOTE: Height of plenum box is 14" on all models except QPBS**-*-8 models which are 8" tall.

Table 1

Model Number	Front Grille Part Number	Side Grille Part Number	Model Number	Front Grille Part Number	Side Grille Part Number
QPBS42-V	7051-035	7051-046	QPBS48-1	7051-045	7051-046
QPBS42-V-8	7051-073	7051-046	QPBS48-1-8	7051-078	7051-046
QPBS42-X	7051-035	7051-046	QPBS48-4	7051-045	7051-046
QPBS42-X-8	7051-073	7051-046	QPBS48-4-8	7051-078	7051-046
QPBS42-1	7051-035	7051-046	QPB42-V	7051-035	--
QPBS42-1-8	7051-073	7051-046	QPB42-X	7051-035	--
QPBS42-4	7051-035	7051-046	QPB42-1	7051-035	--
QPBS42-4-8	7051-073	7051-046	QPB42-4	7051-035	--
QPBS48-V	7051-045	7051-046	QPB48-V	7051-045	--
QPBS48-V-8	7051-078	7051-046	QPB48-X	7051-045	--
QPBS48-X	7051-045	7051-046	QPB48-1	7051-045	--
QPBS48-X-8	7051-078	7051-046	QPB48-4	7051-045	--



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CABINET EXTENSION INSTALLATION INSTRUCTIONS

QCX10A-4

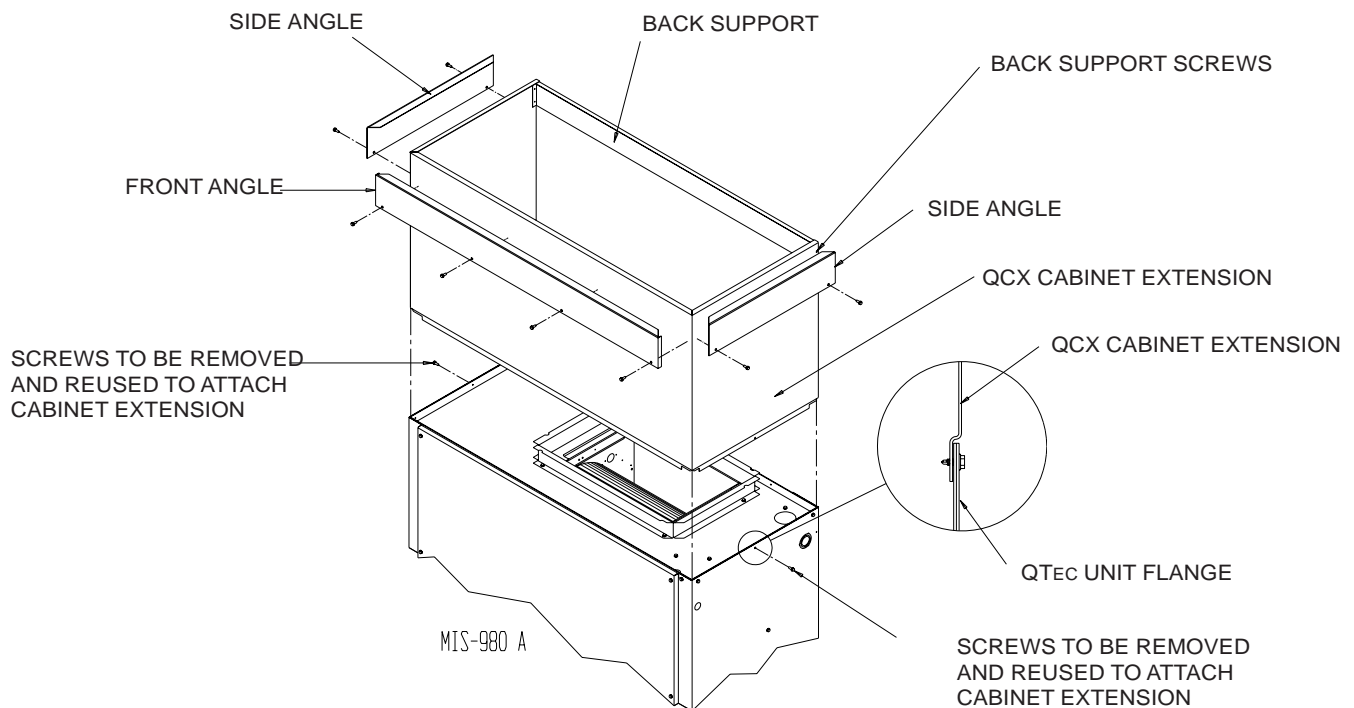
QCX15A-4

QCX10A-V

QCX15A-V

QCX10A-X

QCX15A-X



1. Remove the four (4) screws holding on the Back Support on the Cabinet Extension.
2. Remove the Back Support from the Cabinet Extension
3. Remove the center screw from each of the top sides of the unit.
4. Place the Cabinet Extension on top of the QTEC unit with the open side to the rear and the offsets down. The bottom offset of the extension should be inside the top flange of the unit. The outside of the extension should be flush with the outside of the unit
5. Reinstall the screws in the top of the QTEC unit. These screws will hold the Cabinet Extension in place.
6. Slide the Back Support behind the duct and position it on the Cabinet Extension.
7. Reinstall screws to the Back Support.
8. The QCX has additional angles if more height is needed to reach the ceiling. The angles provide up to an additional five (5) inches in height for a maximum trim height of 112 inches.
9. Hold the side angles against the side of the cabinet extension and slide up to the ceiling. Make sure the angle is centered on the side. Mark the holes on the side of the cabinet extension. Drill an 1/8 inch hole in the center of the marks. Reposition the angle and attach with the screws provided.
10. Hold the front angle against the front of the cabinet extension and slide up to the ceiling. Make sure the angle is centered on the front. Mark the holes on the front of the cabinet extension. Drill an 1/8 inch hole in the center of the marks. Reposition the angle and attach with the screws provided.



USER'S APPLICATION GUIDE AND TECHNICAL PRODUCT OVERVIEW

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

Bard Manufacturing Company, Inc.
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.

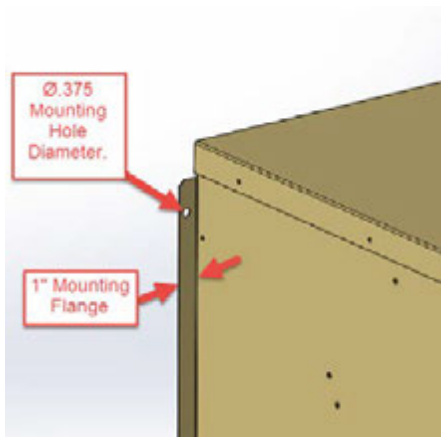
WALL MOUNT Products – Mounting the Product on a Wall Surface



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.

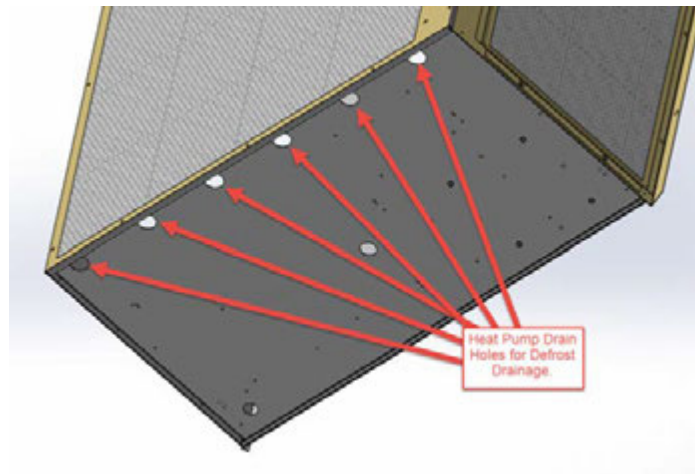
Condensate Water Drainage:

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



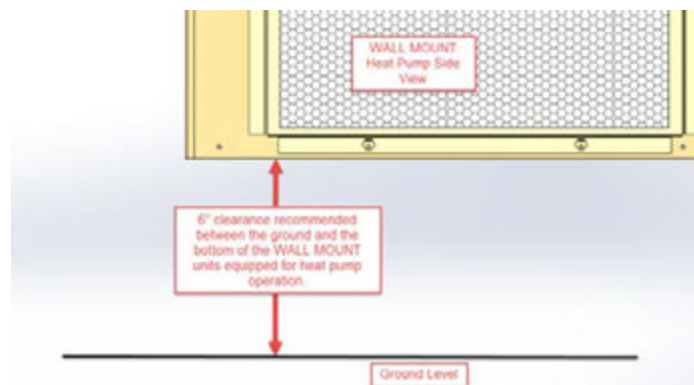
Defrost Water Drainage:

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:

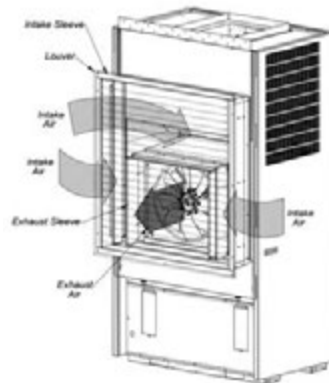
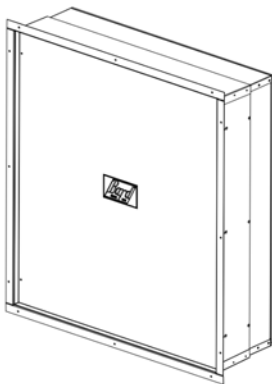
Wall sleeves allow for outdoor air to enter and exit the unit inside the room.

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

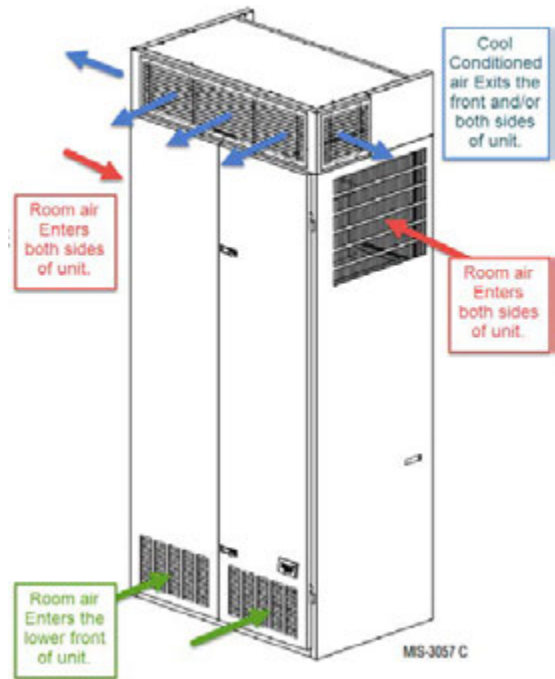
The Bard unit should be placed in an area where the supply (leaving conditioned air) and return (unit air intake) air paths will be unrestricted. Avoid placing objects inside the room within 24" of the return (unit air intake) louvers or grille. Avoid placing objects directly in the path of the supply (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

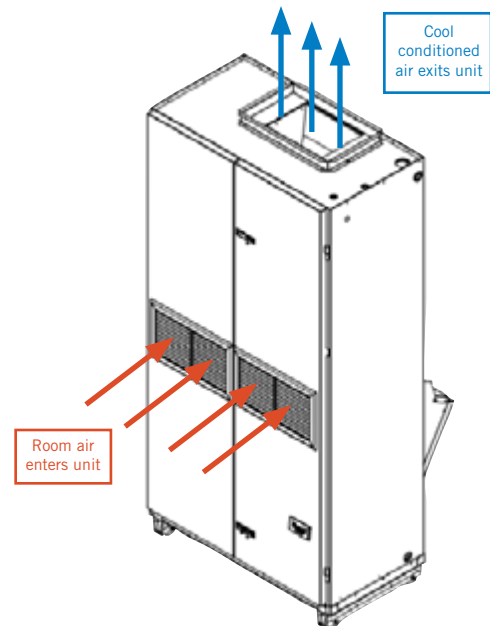
The I-TEC product has been engineered for extremely quiet unit operation and has multiple air paths for air entering and exiting the unit. Room air enters the upper sides to be conditioned (cooled) inside the unit and exits the unit top. The unit will either be ducted to supply registers or have a supply 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.

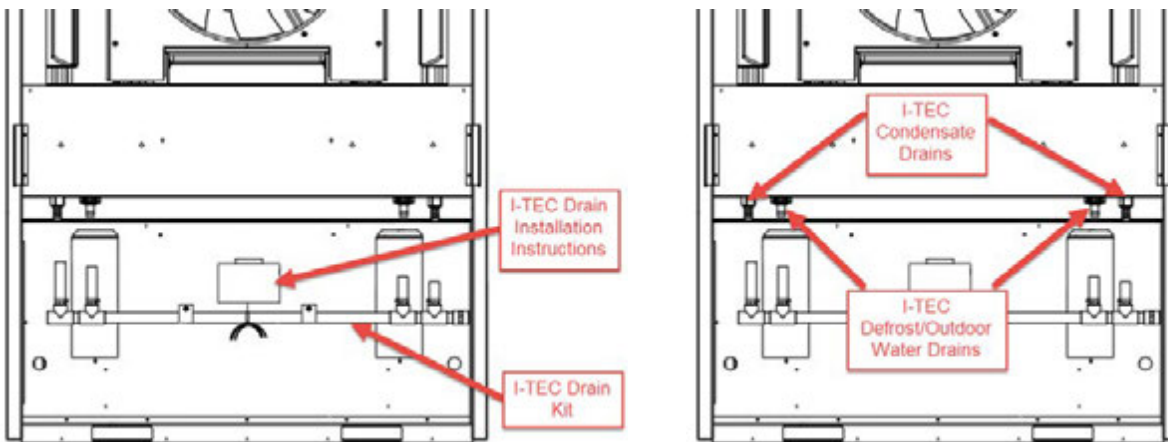
I-TEC and Q-TEC Products – Condensate Drainage

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.

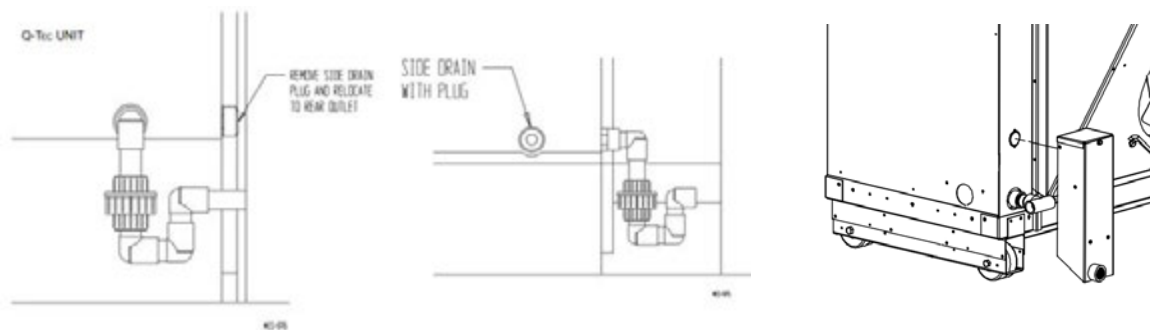
I-TEC Drain System:

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

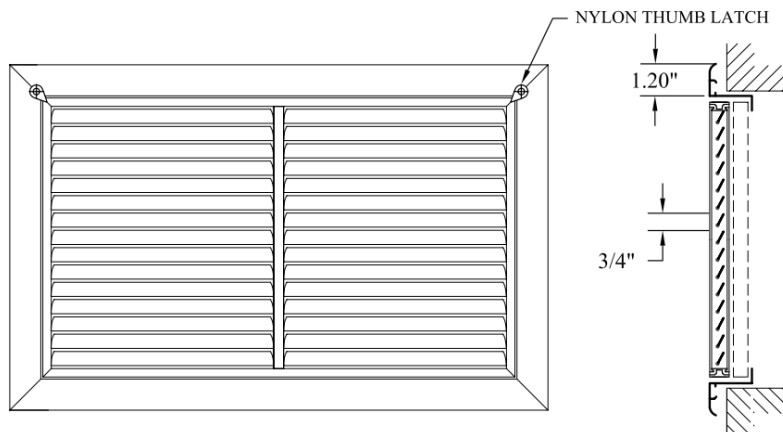
All Products – Filters and Filter Servicing

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

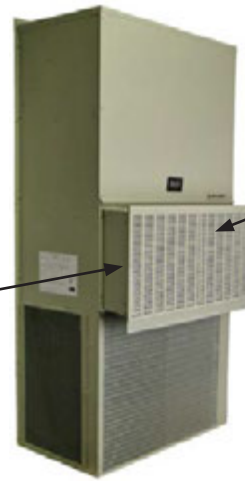
The built-in filter tray and room air filters in the wall mount are located in the middle of the cabinet below the indoor blowers. Units with vent options will have a washable screen behind the vent intake panel.



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.



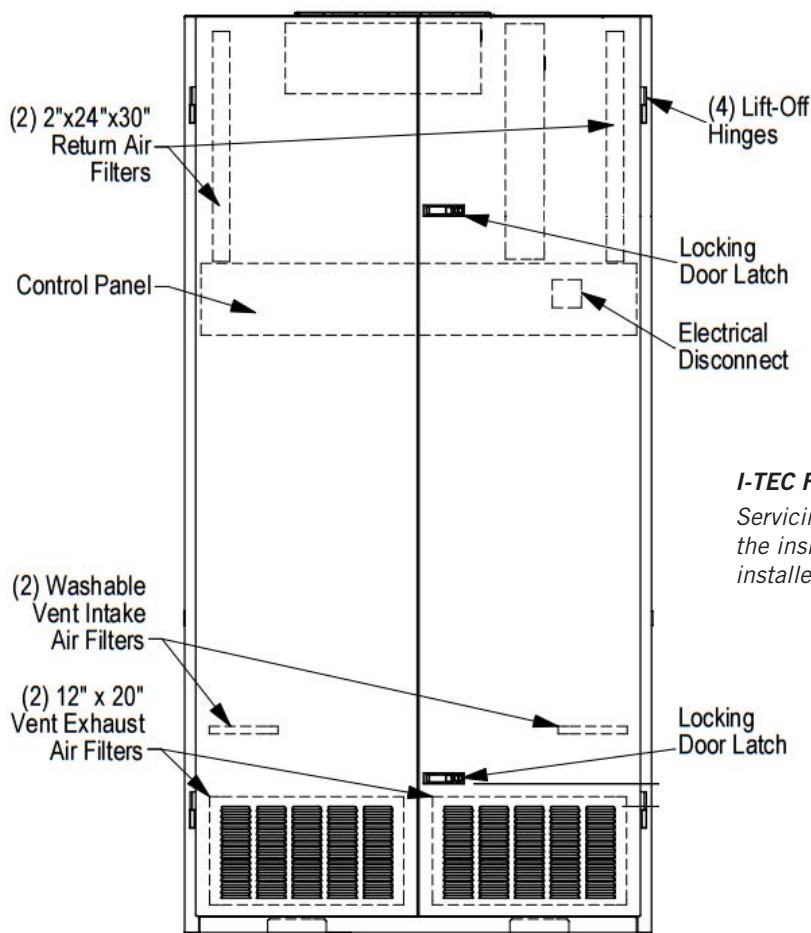
I-TEC Indoor Products – Filters and Filter Servicing

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:

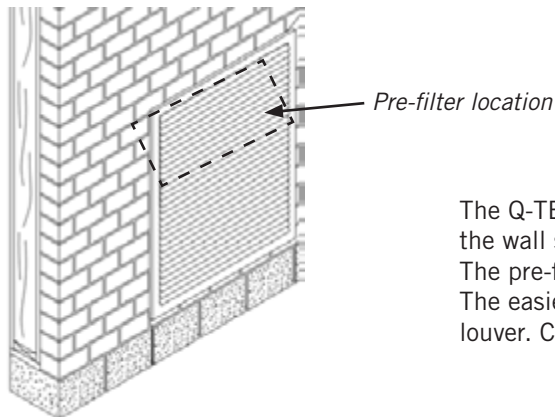
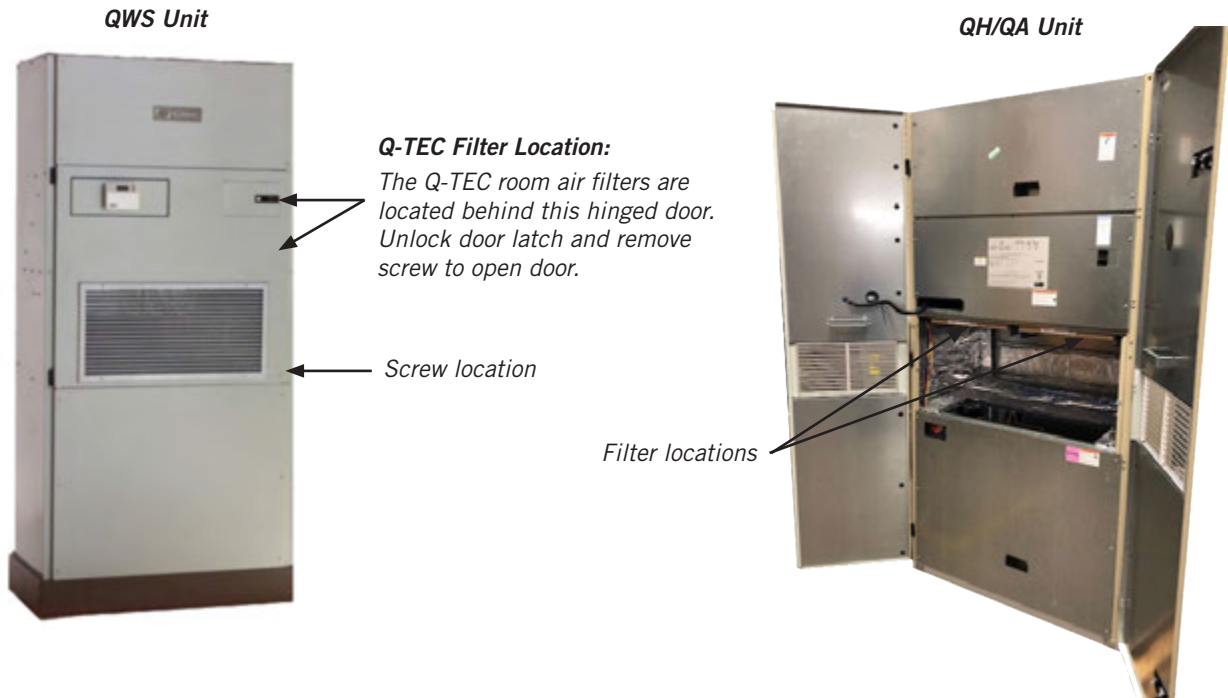
Servicing the filters in your unit will help keep the inside of the unit clean and also the area it is installed in.

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.

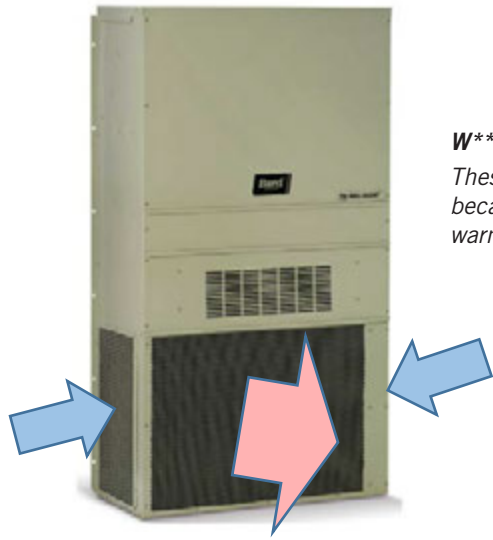
Other conditions that can cause reduction of airflow across the outdoor coil are flowers, shrubbery or other growth too near the outdoor coil air inlet and outlet openings. These living things, especially as they mature and grow, will be just as effective in blocking the airflow and create the same problems 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.

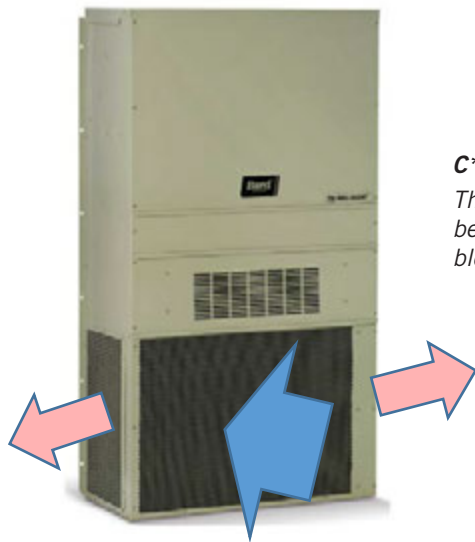
The product installation instructions contain additional information regarding unit coil cleaning. This information may be accessed at www.bardhvac.com.

All Products – Condenser Airflow



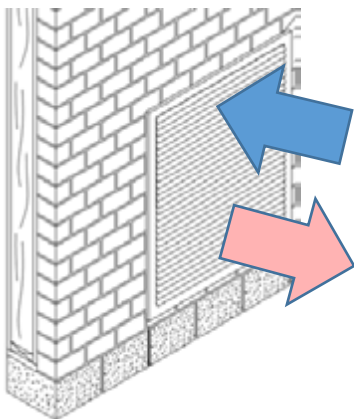
WA, W**H, T**H, T**S, W*RV Wall Mount Units:**

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.

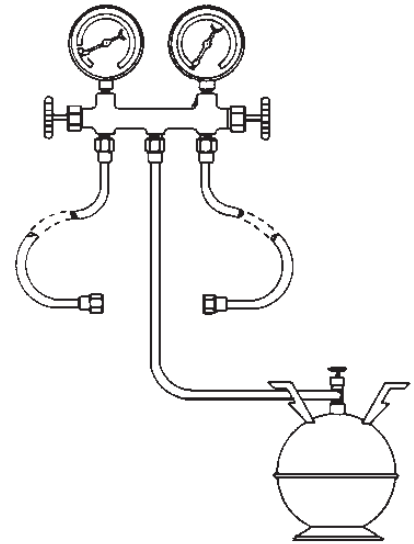
Helpful Hints and Good Operating Practices

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

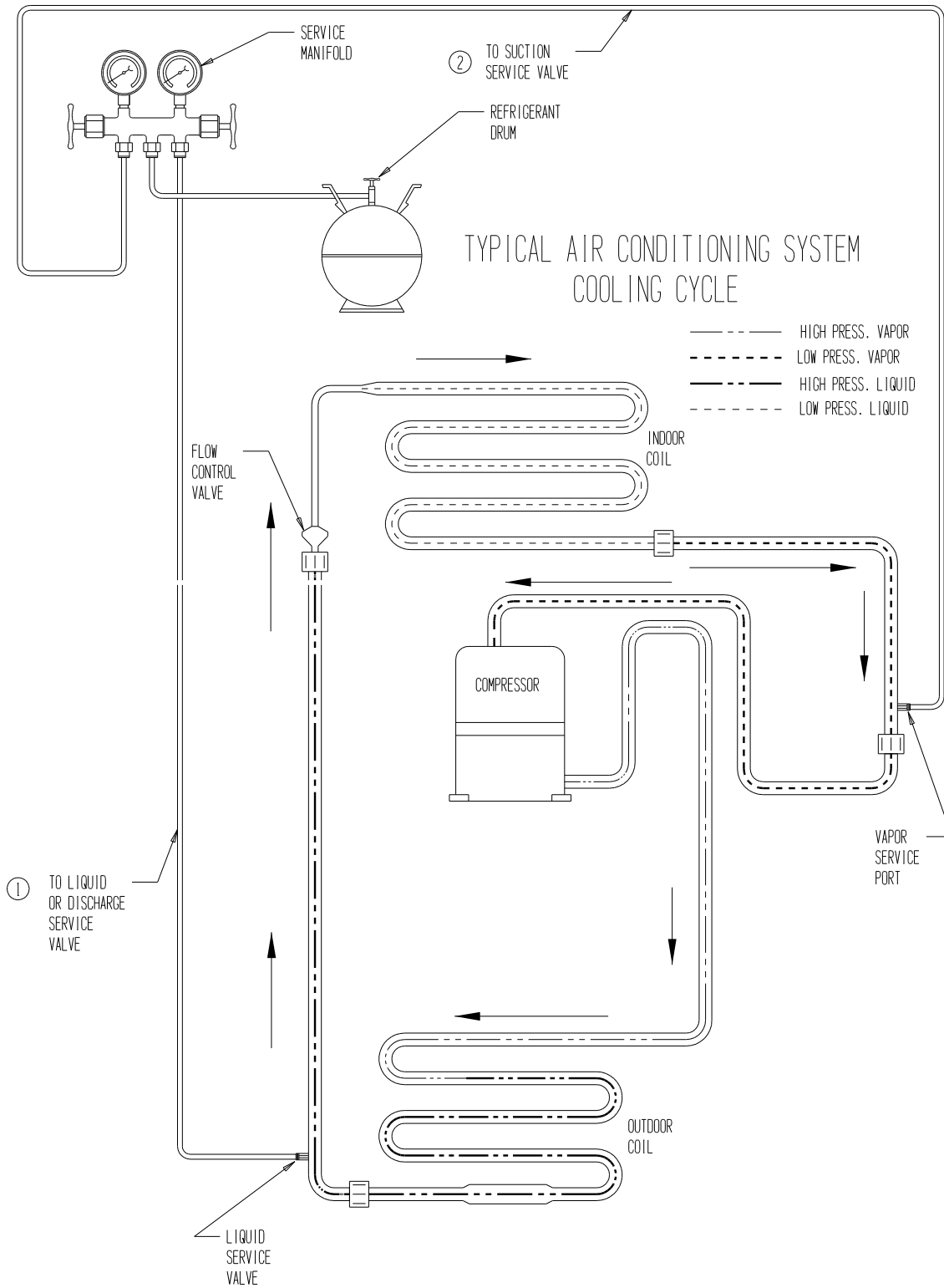
If the system has been open to the atmosphere, the filter dryer should be replaced and then evacuated. Then proceed as follows:

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

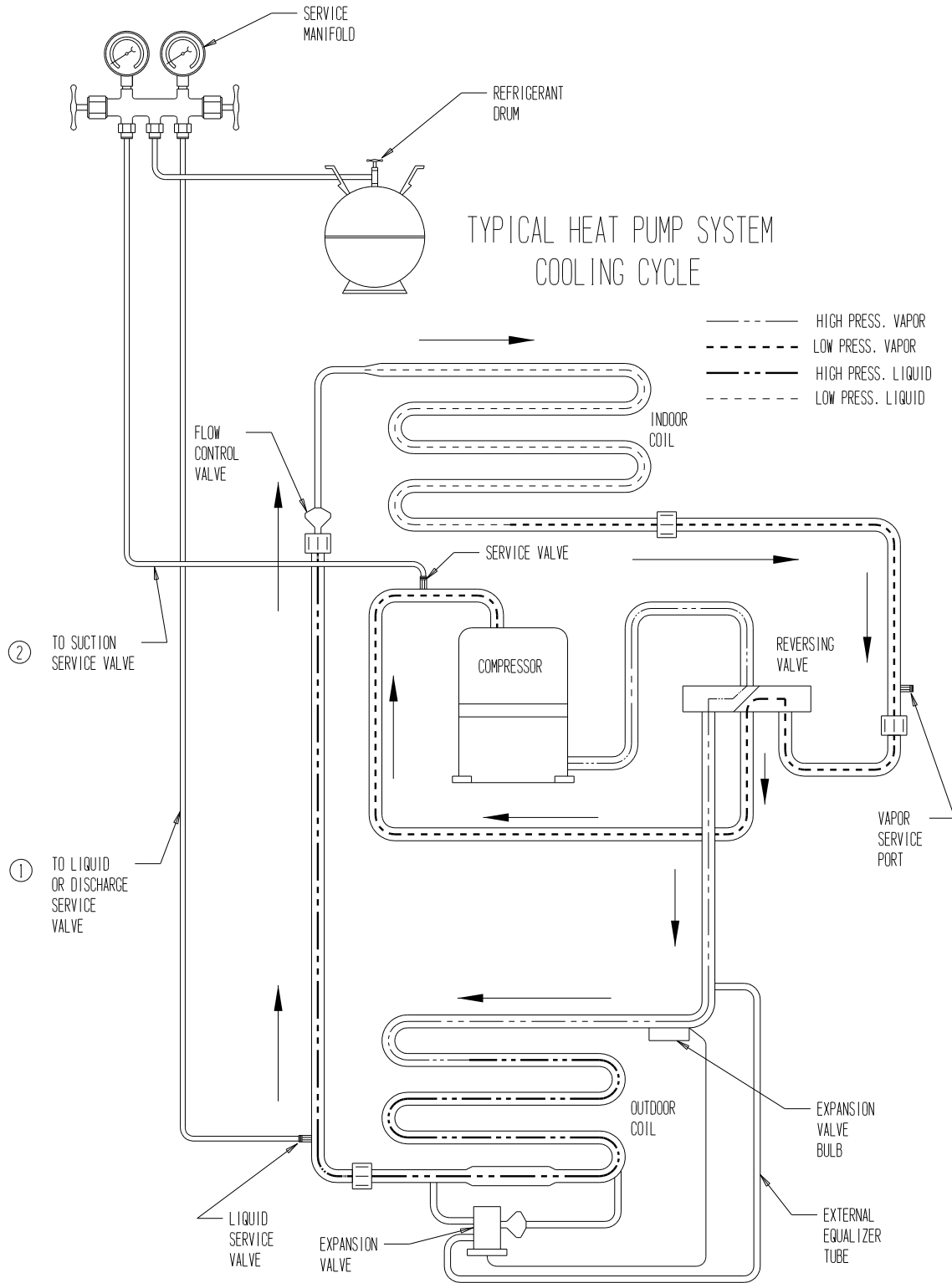
1. Connect manifold as instructed.
2. Place refrigerant drum upright on scale and determine exact weight of the refrigerant and cylinder.
3. With manifold suction valve closed and manifold discharge valve open, open refrigerant cylinder liquid valve and allow pressure in system to balance with pressure 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

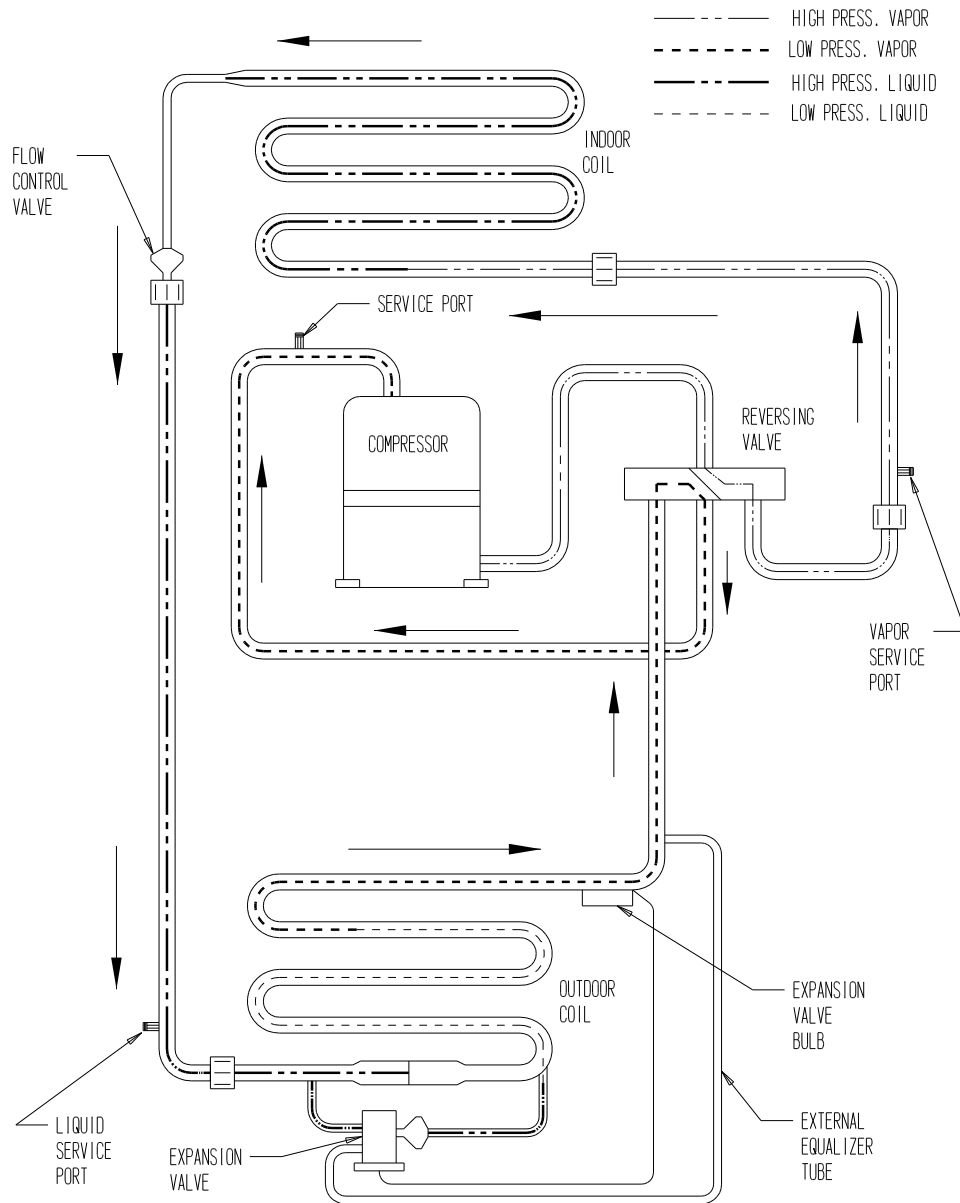


MIS-368

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.

REPLACEMENT PARTS MANUAL

QC Series Chilled Water Unit

Models:

QC501-A QC501-K QC501-L QC501-LOZRPD137

Contents

Description	Page
Cabinet Components	
♦ Exploded View	2
♦ Usage List	3
♦ Usage List	4
Functional Components	
♦ Exploded View	6
♦ Usage List	7
Upper Control Panel Components	
♦ Layout View	8
♦ Usage List	9
Blower Assembly Components	
♦ Exploded View	10
♦ Usage List	11
Optional Climate Control Components	
♦ Layout View	12
♦ Usage List	13
Wall Sleeve Cabinet Components	
♦ Exploded View	14
♦ Usage List	15

General Notes

- Revised and/or additional pages may be issued from time to time.
- A complete and current manual consists of pages shown in the following contents section.

Important

- Contact the installing and/or local Bard distributor for all parts requirements. Be sure to have the complete model and serial number available from the unit rating plate.

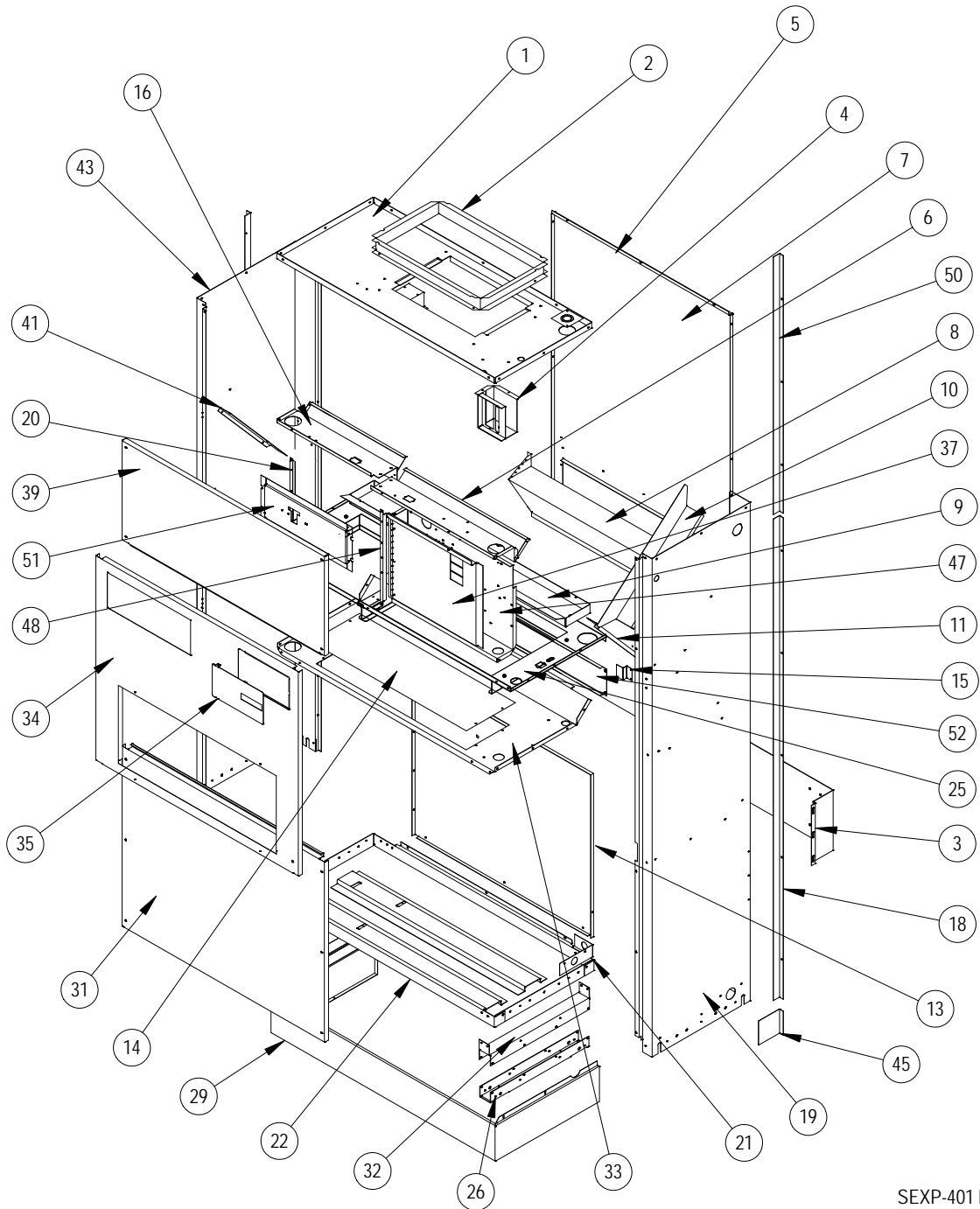


Climate Control Solutions

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

Manual: 2110-544P
Supersedes: 2110-5440
Date: 3-23-22

CABINET COMPONENTS



SEXP-401 B

This exploded view is referenced in tables on pages 3 and 4

CABINET COMPONENTS

Drawing No.	Part No.	Description	QC501-A	QC501-K	QC501-L
1	506-408	Top Assembly	X	X	X
2	110-044	Outlet Duct Flange	2	2	2
3	112-289	Wall Bracket	2	2	2
4	117-249	Low Voltage Box Assembly DDC (Opt.)	X	X	X
5	136-359	T.K.O. Plate	X	X	X
6	534-191	Evaporator Coil Shield – Right	X	X	X
7	508-133	Back Assembly	X	X	X
8	538-106	Fresh Air Damper	X	X	X
9	523-104	Evaporator Drain Pan Assembly	X	X	X
10	134-154	Wire Channel	X	X	X
11	140X277	Right Evaporator Support	X	X	X
13	508-164	Lower Back	X	X	X
14	520-346	Condenser Partition Assembly	X	X	X
15	103-443	Door Latch Offset	X	X	X
16	534-190	Evaporator Coil Shield – Left	X	X	X
18	S135-177-* ①	Side Trim – Lower	2	2	2
19	500-405-* ①	Right Side Assembly	X	X	X
20	104-1096	Right Thermostat Support Angle	X	X	X
21	112-278	Drain Bracket	X	X	X
22	527-310-X	Lower Base Assembly	X	X	X
25	919-0011	Filter Partition Assembly	X	X	X
26	140-276	Lower Roller Support	2	2	2
29	534-155-6	Base Trim Assembly	X	X	X
31	552-349-* ①	Condenser Door Assembly	X	X	X
32	140-280	Upper Roller Support	2	2	2
33	536-351	Condenser Blank Off Plate	X	X	X
34	552-330-* ①	Filter Door Assembly	X	X	X
35	152-336-* ①	Circuit Breaker Door	X	X	X
<i>Continued on page 4</i>					

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.

CABINET COMPONENTS

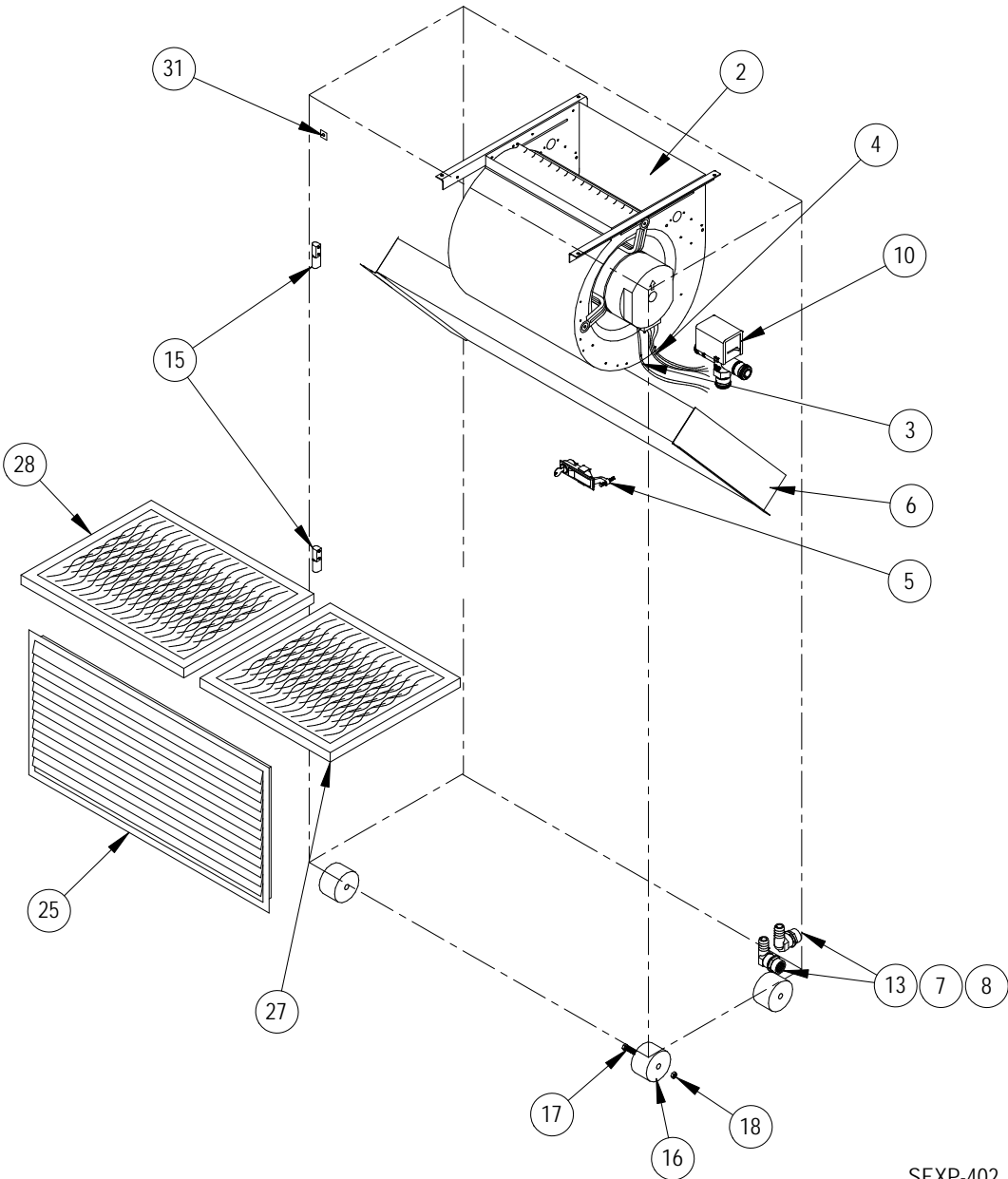
Drawing No.	Part No.	Description	QC501-A	QC501-K	QC501-L
<i>Continued from page 3</i>					
37	132-176	Circuit Breaker Door Inner		X	
37	132-165	Circuit Breaker Door Inner	X		X
39	552-331-* ①	Blower Door Assembly	X	X	X
41	140Y277	Left Evaporator Support	X	X	X
43	500-404-* ①	Left Side Assembly	X	X	X
45	135-165-* ①	Base Trim Extension	2	2	2
47	See page 8	Control Panel Assembly	X	X	X
48	104-1096	Left Thermostat Support Bracket	X	X	X
50	S135-178-* ①	Side Trim – Upper	2	2	2
51	See page 12	Thermostat Mounting Plate	X	X	X
52	542-077	Discharge Blank Off Plate	X	X	X
NS	133-174	Low Voltage Box Cover	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.

This table references exploded view on page 2

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FUNCTIONAL COMPONENTS

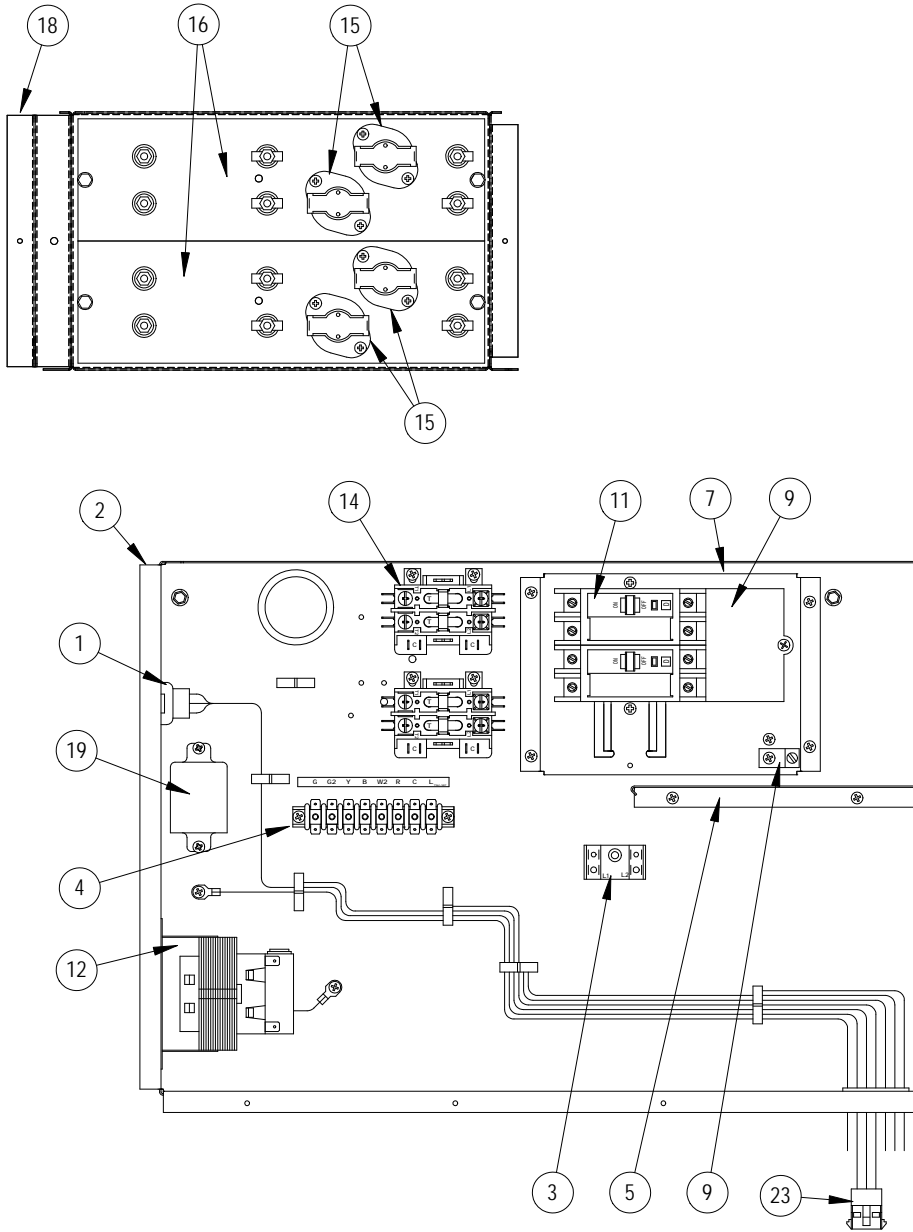


SEXP-402

FUNCTIONAL COMPONENTS

Drawing No.	Part No.	Description	QC501-A	QC501-K	QC501-L	QC501-L****D137
2	S900-395-002	Blower Assembly	X			
2	S900-395-003	Blower Assembly		X		
2	S900-396-001	Blower Assembly			X	
2	S900-396-002	Blower Assembly				X
3	3000-1171	Wire Harness High Voltage		X		
3	3000-1046	Wire Harness High Voltage	X		X	X
4	3000-1042	Wire Harness Low Voltage	X	X	X	
4	3000-1578	0-10 VDC to PWM Adaptor				X
5	1171-049	Keylatch/Circuit Breaker Door	X	X	X	X
6	5060-116BX	Evaporator Coil	X	X	X	X
7	6094-008	Drain Adapter	2	2	2	2
8	6094-007	Drain Elbow	2	2	2	2
10	5650-035	Water Valve	2	2	2	2
13	6094-003	Drain Fitting	2	2	2	2
15	5400-005	Hinge	2	2	2	2
16	1171-035	Wheel	4	4	4	4
17	1012-129	Bolt – Shoulder	4	4	4	4
18	1012-224	Nut – Locking	4	4	4	4
25	7051-034	Return Air Grille (for Beige & Buckeye Gray Units)	X	X	X	X
25	7051-061	Return Air Grille (for Vinyl Units)	X	X	X	X
27	7004-009	Air Filter 16 x 16 x 1	X	X	X	X
27	7004-032	Air Filter Fiberglass 16 x 16 x 2 (Optional)	X	X	X	X
27	7004-034	Air Filter Pleated 16 x 16 x 2 MERV 8 (Optional)	X	X	X	X
27	7004-069	Air Filter 16 x 16 x 2 MERV 13 (Optional)	X	X	X	X
28	7004-010	Air Filter 16 x 20 x 1	X	X	X	X
28	7004-033	Air Filter 2" Fiberglass 16 x 20 x 2 (Optional)	X	X	X	X
28	7004-035	Air Filter 2" Pleated 16 x 20 x 2 MERV 8 (Optional)	X	X	X	X
28	7004-070	Air Filter 16 x 20 x 2 MERV 13 (Optional)	X	X	X	X
31	1012-315	"U" Clip Fastener	10	10	10	10
NS	4100-110	Wiring Diagram	X			
NS	4100-701	Wiring Diagram		X		
NS	4100-128	Wiring Diagram			X	
NS	4100-129	Wiring Diagram				X

UPPER CONTROL PANEL COMPONENTS



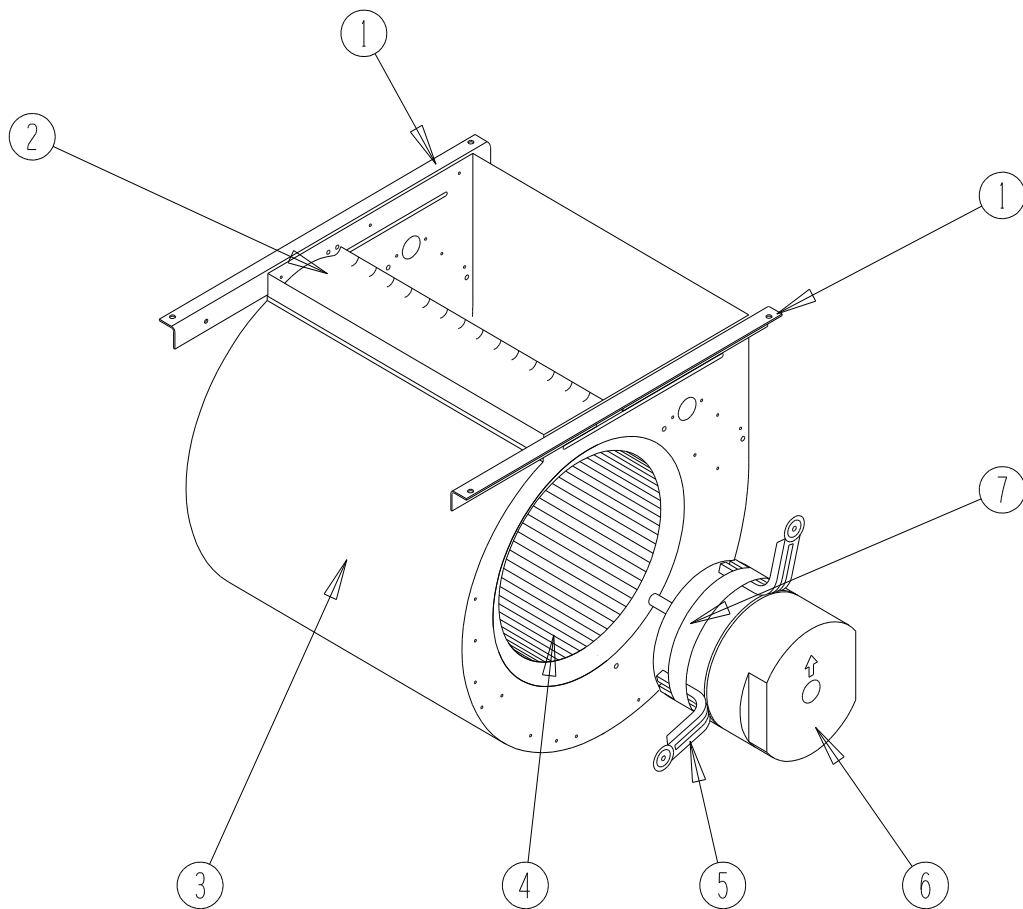
SEXP-403

UPPER CONTROL PANEL COMPONENTS

Drawing No.	Part No.	Description	QC501-A0Z	QC501-A05	QC501-A10	QC501-A15	QC501-K0Z	QC501-L0Z
1	3000-1195	Wire Set P2	X	X	X	X	X	X
2	117-241	Control Panel	X	X	X	X	X	X
3	8607-017	Terminal Block	X	X	X	X	X	X
4	8607-022	Terminal Block	X	X	X	X	X	X
5	117-242	Box Partition	X	X	X	X	X	X
7	127-267	Circuit Breaker Base	X	X	X	X	X	
7	127-599	Circuit Breaker Base						X
9	8611-006	Ground Lug	X	X	X	X	X	X
10	8615-047	Jumper Bar Base				X		
11	8615-060	Circuit Breaker 2 Pole 15A Ckt A	X					
11	8615-038	Circuit Breaker 2 Pole 35A Ckt A		X				
11	8615-055	Circuit Breaker 2 Pole 40A Ckt A				X		
11	8615-040	Circuit Breaker 2 Pole 50A Ckt B				X		
11	8615-041	Circuit Breaker 2 Pole 60A Ckt A			X			
11	8615-070	Circuit Breaker 1 Pole 15A Ckt A					X	
11	8615-113	Circuit Breaker 2 Pole 10A (277V)						X
12	8407-048	Transformer	X	X	X	X		
12	8407-039	Transformer					X	
12	8407-075	Transformer						X
14	8401-006	Contactor		X		X		
14	8401-025	Contactor			X	X		
15	8402-100	Limits		1	2	3		
16	8604-103	Heat Strip 5 KW		X		X		
16	8604-104	Heat Strip 10 KW			X	X		
18	116-191	Heat Strip Wrapper		X	X	X		
23	3000-1148	Wire Set	X	X	X	X		X
23	3000-1171	Wire Set					X	
NS	132-145	Heat Strip Cover		X	X	X		
NS	4101-110	Wiring Diagram		X				
NS	4101-111	Wiring Diagram			X			
NS	4101-112	Wiring Diagram				X		
NS	4101-113	Wiring Diagram	X					X

NS = Not Shown

BLOWER ASSEMBLY COMPONENTS

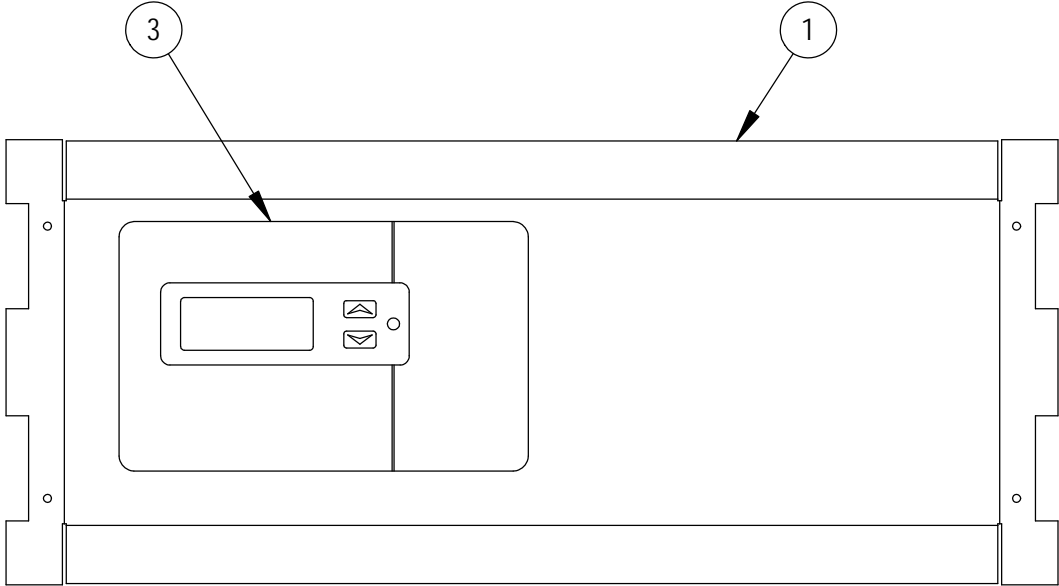


SEXP-245

BLOWER ASSEMBLY COMPONENTS

Drawing No.	Part No.	Description	900-395-003	900-395-001	900-396-001	900-396-002
1	104-980	Blower Angle	2	2	2	2
2	144-210	Diffuser	X	X	X	X
3	151-128	Blower Housing	X	X	X	X
4	5152-061	Blower Wheel	X	X	X	X
5	8620-034	Motor Mount Arm	1	1	1	1
6	8106-072-0027	1/2 HP ECM Motor w/Programmed Control	X			
6	C8106-072-0027	Programmed Motor Control Only	X			
6	8106-072-0005BX	1/2 HP ECM Motor w/Programmed Control		X		
6	C8106-072-0005B	Programmed Motor Control Only		X		
6	8106-077-0214	1/2 HP ECM Motor w/Programmed Control			X	
6	8106-077-0227	1/2 HP ECM Motor w/Programmed Control				X
7	8620-034	Motor Mount Band	X	X		

OPTIONAL CLIMATE CONTROLS



SEXP-404

OPTIONAL CLIMATE CONTROLS

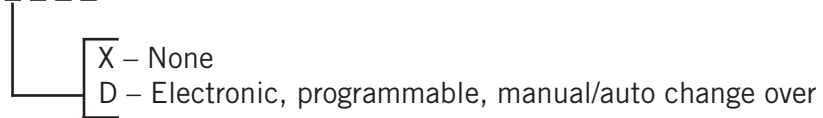
Drawing No.	Part No.	Description	QC501	
			Option X	Option D
1	S127-313-* ①	Thermostat Plate	X	
1	S127-308-* ①	Thermostat Plate		X
3	8403-060	Electronic/Programmable/Manual/Auto Change Over		X
NS	3000-1194	Wire Harness, Low Voltage, Terminal Strip to PL2	X	
NS	3000-1172	Wire Harness, Thermostat to PL2		X
NS	4102-029	Wiring Diagram	X	
NS	4102-049	Wiring Diagram		X

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

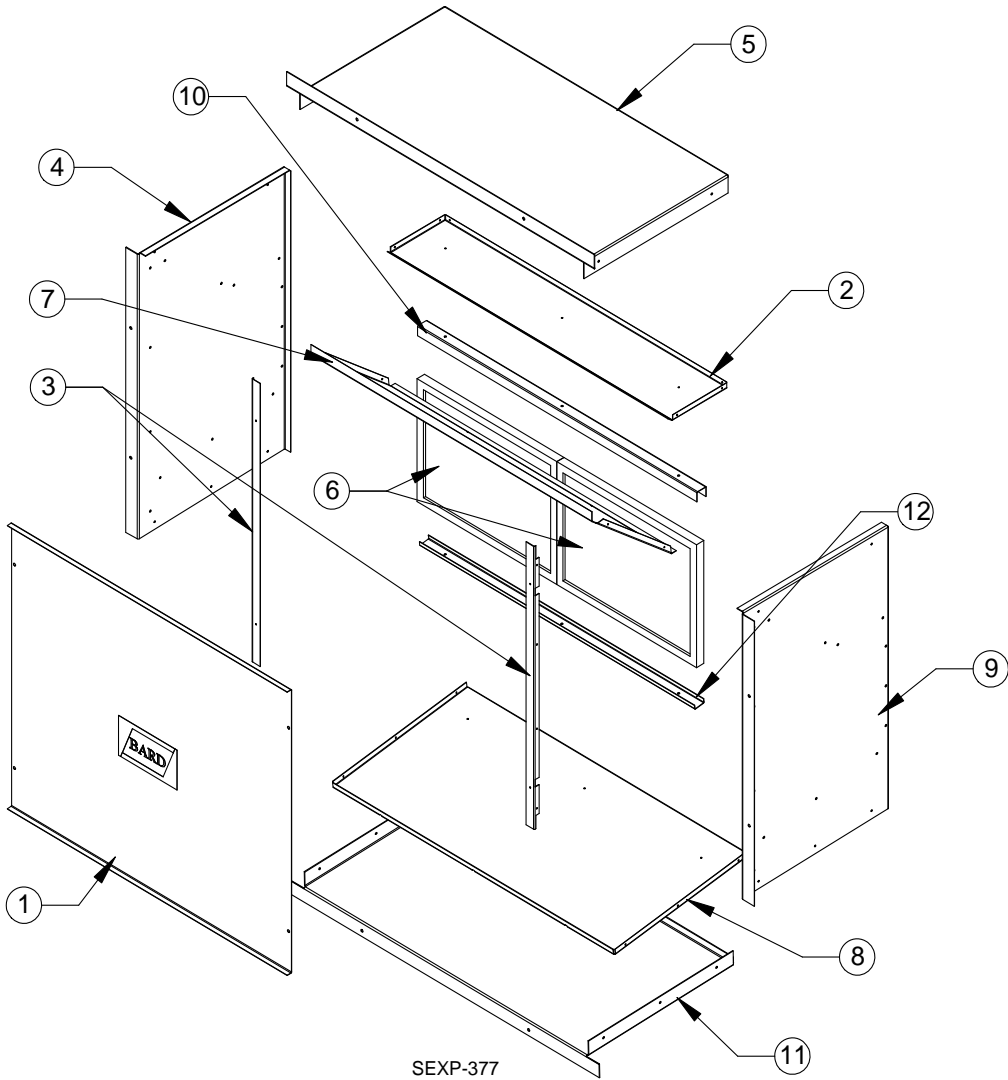
NS = Not Shown

CLIMATE CONTROL OPTION NOMENCLATURE AS SHOWN IN UNIT MODEL NUMBER

QC 501 - A 05 X X X X X X



WALL SLEEVE CABINET COMPONENTS



WALL SLEEVE CABINET COMPONENTS

Drawing No.	Part No.	Description	QWVS42
1	142-076	Cover	X
2	121-350-X	Top Partition	X
3	104-1103-X	Angle	2
4	110-073-X	Left Side	X
5	110-074-X	Top	X
6	7003-056	Mist Eliminator	2
7	111-076-X	Air Deflector	X
8	121-349-X	Partition	X
9	110-072-X	Right Side	X
10	165-566-X	Upper Support Channel	X
11	110-075-X	Base	X
12	165-567-X	Lower Support Channel	X



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.

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 ^{② ④ ⑤}	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, W3SA, W4SA, W5SA, Q36A, Q42A, Q48A, I30A, I36A, I42A, I48A, I60A	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	5	5	5	N/A
ENVIRONMENTAL CONTROL UNITS W6RV, W6LV	5	5	1	N/A
AGRICULTURAL UNITS A36C 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, 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, Humidistats, CO2 Controllers, add-on controller/ther- mostat cards and all other field-installed accessories not listed separately	N/A N/A N/A N/A	N/A N/A N/A N/A	5 5 1 1	N/A N/A N/A 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.