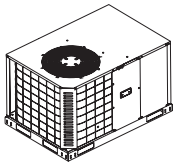
INSTALLATION MANUAL

R-410A, 13 SEER
LATITUDE™ SERIES

UQ024-060

2-5 Ton



ISO 9001 Certified Quality Management System

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General

YORK® Model UQ units are factory assembled heat pump designed to be installed along side the home or building. Field-installed electric heater accessories are available to provide supplemental electric heat.

The units are completely assembled on rigid base rails. All piping, refrigerant charge, and electrical wiring is factory installed and tested. The units require only electric power and duct connections at the point of installation.

The electric heaters have nickel-chrome resistance wire elements and utilize single point power connection.

Safety Considerations

This is a safety alert symbol ⚠. When you see this symbol on labels or in manuals, be alert to the potential for personal injury.

Understand and pay particular attention the signal words **DANGER**, **WARNING** or **CAUTION**.

DANGER indicates an **imminently** hazardous situation, which, if not avoided, **will result in death or serious injury.**

WARNING indicates a **potentially** hazardous situation, which, if not avoided, **could result in death or serious injury.**

CAUTION indicates a potentially hazardous situation, which, if not avoided **may result in minor or moderate injury.** It is also used to alert against unsafe practices and hazards involving only property damage.

⚠WARNING

Improper installation may create a condition where the operation of the product could cause personal injury or property damage. Improper installation, adjustment, alteration, service or maintenance can cause injury or property damage. Refer to this manual for assistance or for additional information, consult a qualified contractor, installer or service agency.

⚠ CAUTION

This product must be installed in strict compliance with the installation instructions and any applicable local, state and national codes including, but not limited to building, electrical, and mechanical codes.

⚠WARNING

Before performing service or maintenance operations on unit, turn off main power switch to unit. Electrical shock could cause personal injury. Improper installation, adjustment, alteration, service or maintenance can cause injury or property damage. Refer to this manual. For assistance or additional information consult a qualified installer or service agency.

⚠ CAUTION

This system uses R-410A Refrigerant which operates at higher pressures than R-22. No other refrigerant may be used in this system. Gage sets, hoses, refrigerant containers and recovery systems must be designed to handle R-410A. If you are unsure, consult the equipment manufacturer. Failure to use R-410A compatible servicing equipment may result in property damage or injury.

Due to system pressure, moving parts, and electrical components, installation and servicing of air conditioning equipment can be hazardous. Only qualified, trained service personnel should install, repair, or service this equipment. Untrained personnel can perform basic maintenance functions of cleaning coils and filters and replacing filters.

Observe all precautions in the literature, labels, and tags accompanying the equipment whenever working on air conditioning equipment. Be sure to follow all other applicable safety precautions and codes including.

Wear safety glasses and work gloves. Use quenching cloth and have a fire extinguisher available during brazing operations.

Inspection

As soon as a unit is received, it should be inspected for possible damage during transit. If damage is evident, the extent of the damage should be noted on the carrier's freight bill. A separate request for inspection by the carrier's agent should be made in writing.

Reference

Additional information is available in the following reference forms:

- Technical Guide - 546039
- General Installation - 548267
- Electric Heat Accessory - 552392

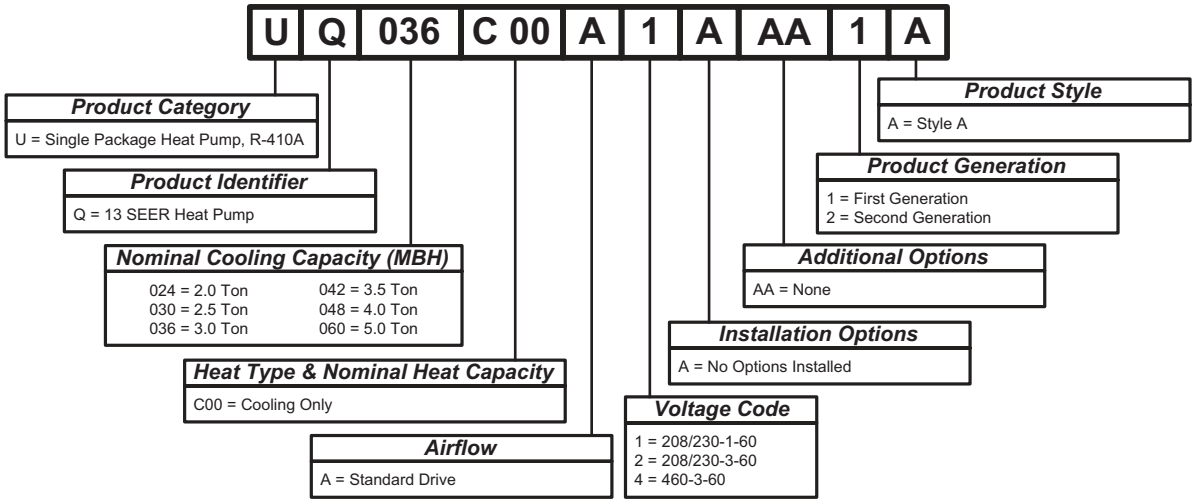
Renewal Parts

Contact your local York® parts distribution center for authorized replacement parts.

⚠WARNING

Improper installation may create a condition where the operation of the product could cause personal injury or property damage.

Nomenclature



Installation

Limitations

These units must be installed in accordance with the following national and local safety codes.

1. National Electrical Code ANSI/NFPS No. 70 or Canadian Electrical Code Part 1, C22.1 (latest editions).
2. Local plumbing and waste water codes and other applicable local codes.

Refer to Table 6 for unit physical data and to Table 5 for electrical data.

If components are to be added to a unit to meet local codes, they are to be installed at the dealer's and/or the customer's expense.

Size of unit for proposed installation should be based on heat loss/heat gain calculations made in accordance with industry recognized procedures identified by the Air Conditioning Contractors of America.

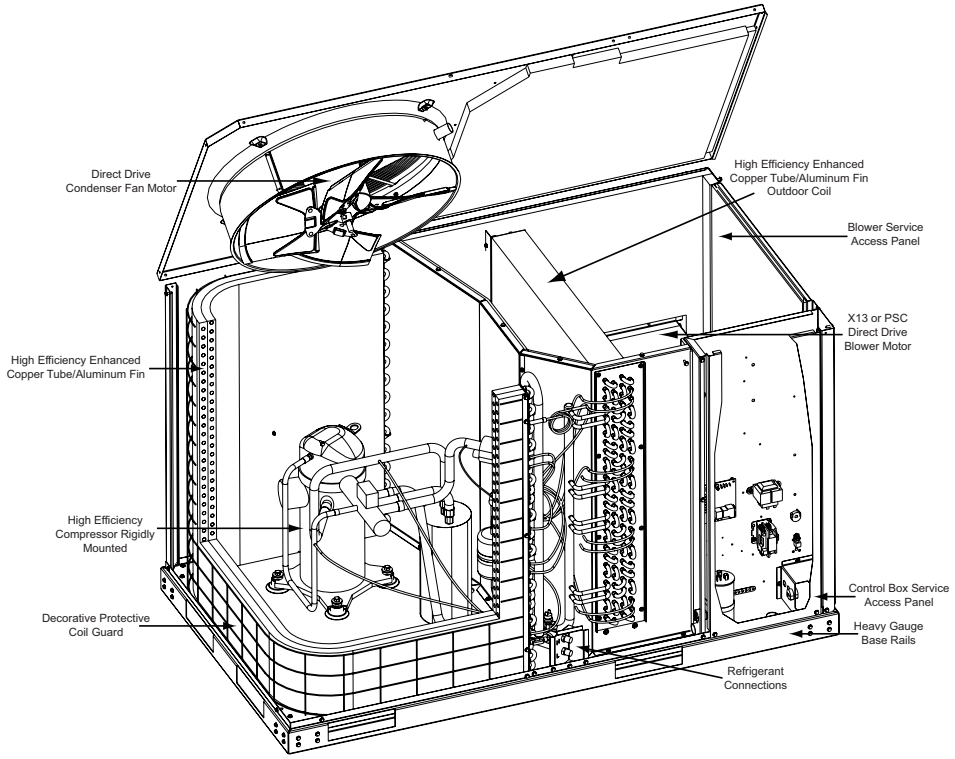


Figure 1: Component Location

Table 1: Unit Limitations

Size (Tons)	Unit Voltage	Unit Limitations		
		Applied Voltage		Outdoor DB Temp
		Min	Max	Max (°F)
024 (2.0)	208/230-1-60	187	252	125
030 (2.5)	208/230-1-60	187	252	125
036 (3.0)	208/230-1-60	187	252	125
	208/230-3-60	187	252	125
042 (3.5)	208/230-1-60	187	252	125
048 (4.0)	208/230-1-60	187	252	125
	208/230-3-60	187	252	125
060 (5.0)	208/230-1-60	187	252	125
	208/230-3-60	187	252	125
	460-3-60	432	504	125

Unit Location

Several important factors must be considered before selecting the site for this unit:

1. Site – Select a solid level position, preferably on a concrete slab, slightly above grade level and parallel to the home.
2. Proximity to home or building – The length of the supply and return ducts should be kept to a minimum with no sharp bends. Consideration should be given to the distance and routing of electrical service to connect the unit. Try to select a site for the unit that it is as close as possible to the proposed return grille location. Unit may be positioned to draw air from underneath structure.
3. Proximity to the clothes dryer vent – The clothes dryer vent should not be located upwind from the unit.
4. Ability to service – Side access panels of the unit should not be closer than 24 inches to a structure so blower and controls may be serviced.
5. Sound transmission – Locate the unit away from bedroom windows or other rooms where sound may be objectionable.
6. Air Circulation – The outside coil sides should not be closer than 24 inches to a structure that will restrict air flow through the coil. The air discharge of the unit requires a 60-inch clearance between the top of the unit and any obstruction.See Figure 2.
7. Wind direction – The hot condenser air must be discharged up and away from the home or building, and if possible in a direction with the prevailing wind.
8. Relationship between building, sun and unit – If practical, place the air conditioner in an area where the unit and the ducts will be shaded from the afternoon sun (when the heat load is the greatest).
9. Defrost and Water Drainage - Water will run off the outdoor coil when the heat pump defrosts during the heating season. This water will run through the drain holes of the heat pump base pan onto the ground below. A slight grade away from the unit will improve drainage.
10. Average Winter Snow Depth - The heat pump must be installed above the average snow depth to allow the outdoor coil to drain properly.

    Cinder blocks, if permitted by local codes, or a metal frame may be used to support the unit above the snow. Insure that the support does not obstruct drainage holes in the base pan of the unit. Metal frame legs must be supported by concrete pads. The heat pump must set level and securely upon the support.

NOTE: If installing on blocks, the middle rail must be supported.

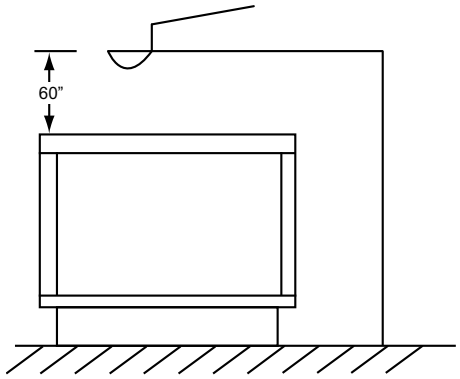


Figure 2: Air Discharge Clearance

Site Preparation

After the site has been selected and prepared, using criteria mentioned above, install the air conditioner support pad at the selected site.

NOTE: This unit must be installed and operated on a level surface. Failure to do so will result in condensate drainage problems.

Clearances

All units require certain clearances for proper operation and service. Refer to Table 3 for the clearances required for construction, servicing and proper unit operation.

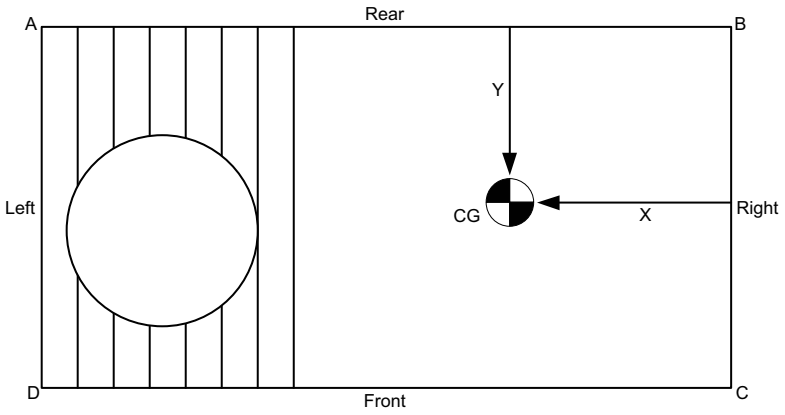


Figure 3: Unit 4 Point Load Weight

Size	Weight (lbs.)		Center of Gravity		4 Point Load Location (lbs.)			
(Tons)	Shipping	Operating	X	Y	A	B	C	D
024 (2.0)	328	325	21.75	14	75	67	86	96
030 (2.5)	343	340	21.75	14	78	70	90	101
036 (3.0)	348	345	23.5	15	79	83	94	90
042 (3.5)	375	372	23.5	15	100	69	83	120
048 (4.0)	388	385	28.75	16.25	95	95	98	98
060 (5.0)	395	392	28.75	16.25	97	97	99	99

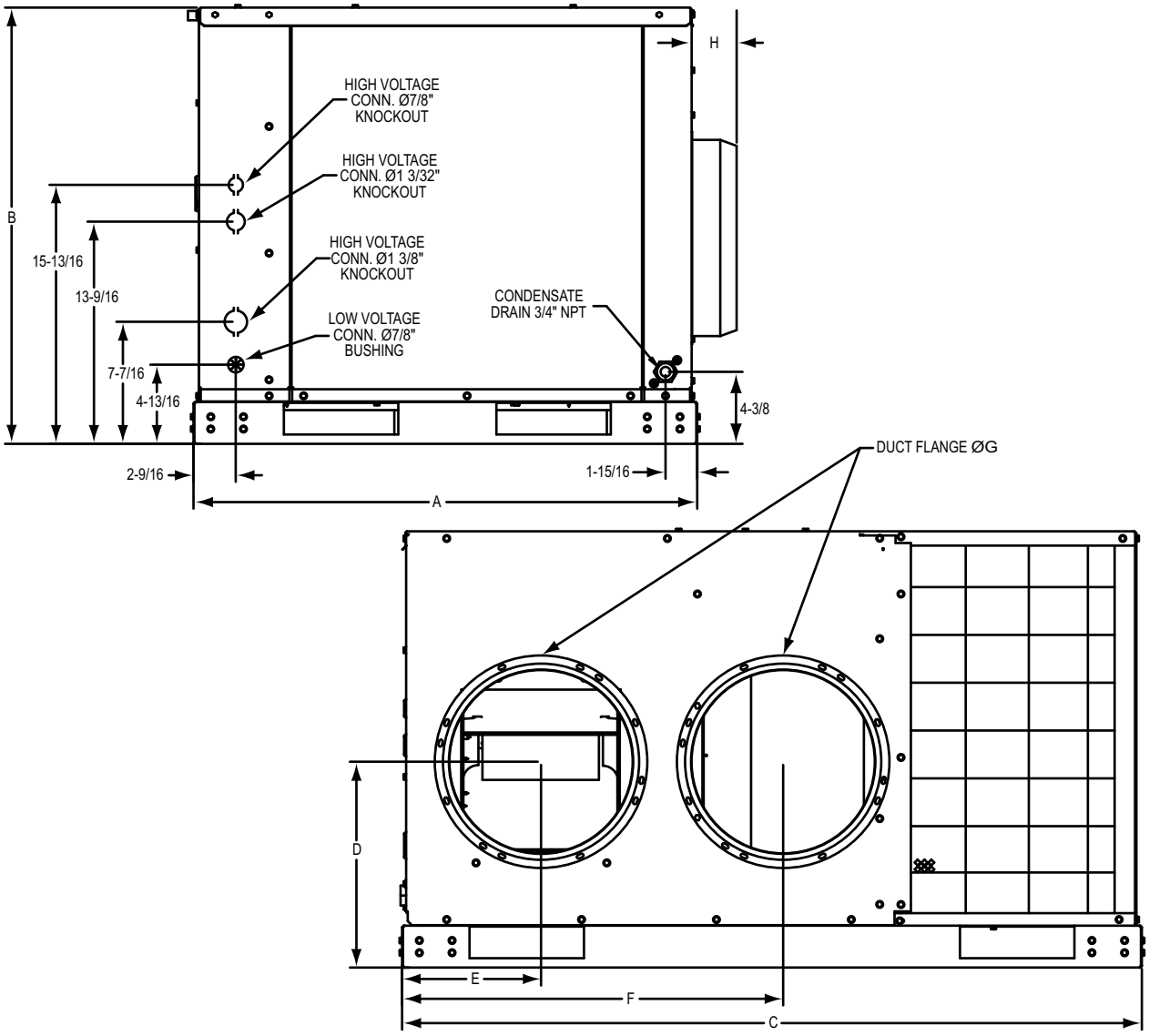


Figure 4: Unit Dimensions

Table 2: Unit Dimensions

Size (Tons)	Dimensions							
	"A"	"B"	"C"	"D"	"E"	"F"	"G"	"H"
024 (2.0)	32 13/16	30 15/16	47 1/4	12 9/16	8 1/2	24 1/16	12	2 3/4
030 (2.5)	32 13/16	30 15/16	47 1/4	12 9/16	8 1/2	24 1/16	12	2 3/4
036 (3.0)	32 13/16	30 15/16	47 1/4	12 9/16	8 1/2	24 1/16	12	2 3/4
042 (3.5)	32 13/16	34 15/16	57 9/16	11 9/16	10 5/16	28 7/8	14	2 3/4
048 (4.0)	32 13/16	34 15/16	57 9/16	11 9/16	10 5/16	28 7/8	14	2 3/4
060 (5.0)	32 13/16	34 15/16	57 9/16	11 9/16	10 5/16	28 7/8	14	2 3/4

Table 3: Unit Clearances

Direction	Distance (in.)	Direction	Distance (in.)
Top[1]	60	Right	24
Front	36	Left	24
Rear[2]	18	Bottom	0

1. Units must be installed outdoors. Over hanging structure or shrubs should not obscure condenser air discharge outlet.
2. Unit may be positioned to draw air from underneath structure.

Installing Of Duct To Unit (Manufactured Housing)

⚠ CAUTION

When installing this air conditioning system in conjunction with a furnace, a damper must be installed in the furnace to prevent cold air being discharged around the heat exchanger. The presence of such cold air could damage the heat exchanger and could cause asphyxiation.A damper, part number 7900-6771* is available for use on Unitary Products Group manufactured housing gas and oil furnaces. (See 7900-6771* damper assembly installation instructions packed with the damper assembly for more in-formation. For other makes of furnaces, check with the furnace manufacturer for damper requirements.

Flanges for round ducts are packed with the unit.The unit's supply and return air connections are sized for optimum performance.

Should the ductwork connecting to the air conditioner be of smaller dimensions, it is recommended that transitions connecting the ducts to the unit be constructed to allow a smooth airflow to the air conditioner's return air opening and from the supply air opening. Abrupt duct size changes increase the system static pressure and reduces air volume which may cause unsatisfactory performance. Duct-work should be in accordance with Local and National Codes.

Ductwork exposed to outside environmental conditions must be insulated and weather proofed. Out-side wall openings through which the ducts pass must be weather proofed in accordance with Local and National Codes.

Supply and return air ducts passing through unconditioned spaces of the building must be insulated and covered with a vapor barrier. Following this practice will prevent thermal losses and condensate formation on the ducts.

Supply and Return Ducts

Duct should be sized to accommodate a maximum of .8" water column. Metal ducts may be used when properly insulated and vapor proofed. Any duct used should be covered with insulation having a minimum R-value of 4.0 or in accordance with any local codes or standards regarding duct material. Insulation must be covered with a vapor barrier. Install the air conditioning duct connections to the unit. Insure that the seam is towards bottom. A good quality duct tape should be used to insure an airtight installation.

The Return — Air Grille Boxes

The return air grille assembly should be installed first. The return air grille box and filter should be located and installed in the "out-rigger" areas of the home. Keep in mind, the closer to the cooling unit, the better. The return ducting connects to the bottom of the return air box so it will be necessary to provide an opening beneath the box. See Figure 5.

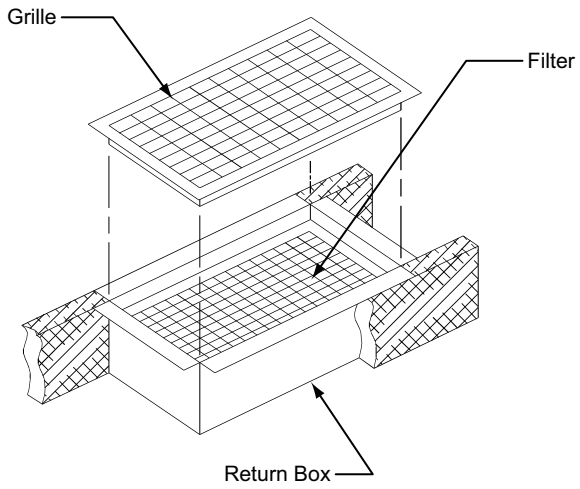


Figure 5: Return Air Box and Grille

After determining the location of the return air opening, start installation from beneath the manufactured home.

1. Cut a small hole in the fiber under board to determine floor joist location.Floor joists are generally located on 16" centers, leaving 14-3/8" between joists.
2. Cut a 12-1/2" x 20-1/2" rectangular hole in the floor between two joists.
3. Set the return box into the opening and mark a circular pattern on the fiber under board through the flex duct connector collar, then remove the return box from the opening.
4. Cut outside of the circular mark to allow enough space to pull the flex duct up through the hole and fasten to the return box.

5. When attaching the flex duct to the return air box, secure the duct collar and return box collar together with at least three (3) sheet metal screws and seal with duct tape.
6. Set the return air box, with flex duct attached, back into the floor opening.
7. Fasten the return air box securely to the floor with screws or nails.
8. Seal fiber under board hole around flex duct.

For ease of installation of the flexible ductwork, it is recommended that as much work as possible be done outside the underneath area of the manufactured home. Accurate measurements are required. Plan the ducting configuration well and double check the measurements.

Check the intended routing and length required of the flexible duct.

Remember, each slight change in direction of the duct add static resistance and reduces airflow.

Keep flexible ducts straight and short. Wide sweeping bends should be used when turns are necessary, not sharp corners or angles.

1. When return air grille box is installed, run the duct to the return air inlet flange on the unit.
2. Cut the duct to the required length using a knife, or tin snips, and cut the helical wire with a wire cutter.
3. Insert a stub collar in the raw end of the duct and tape securely in place.
4. Make sure the duct is not stretched tight and does not have kinks from excessive length after installation.
5. Attach the duct end, with the stub collar, to the air conditioner return air flange with screws and duct tape sealing the duct cover securely.

Wye Insulation

It is necessary to field fabricate and install an insulation jacket for the Wye. Insulation will prevent loss of capacity especially where the gain or loss is critical in a borderline installation. See Figures 6 and 7.

1. Use “faced” batt insulation material.
2. Place the insulation on the topside of the Wye, with the faced or vinyl side out.
3. Tape to insulation placed on bottom of Wye and tape together “diaper style”.
4. Make sure a tight bond is obtained and attach to flexible duct sleeves with tape.
5. Tape insulation to return air opening flange, airtight.

NOTE: The insulation should not be compressed around the Wye. This defeats the purpose of the insulation.

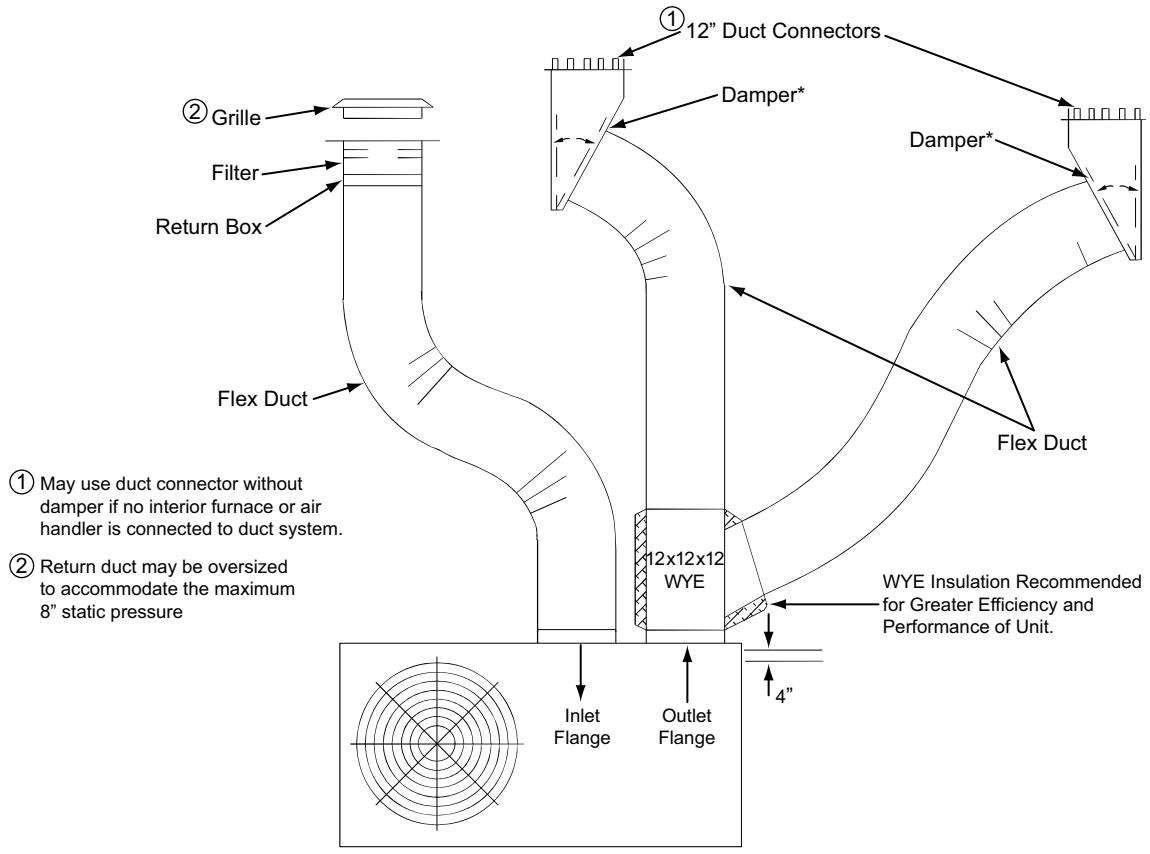


Figure 6: Wye Installation (Outlet)

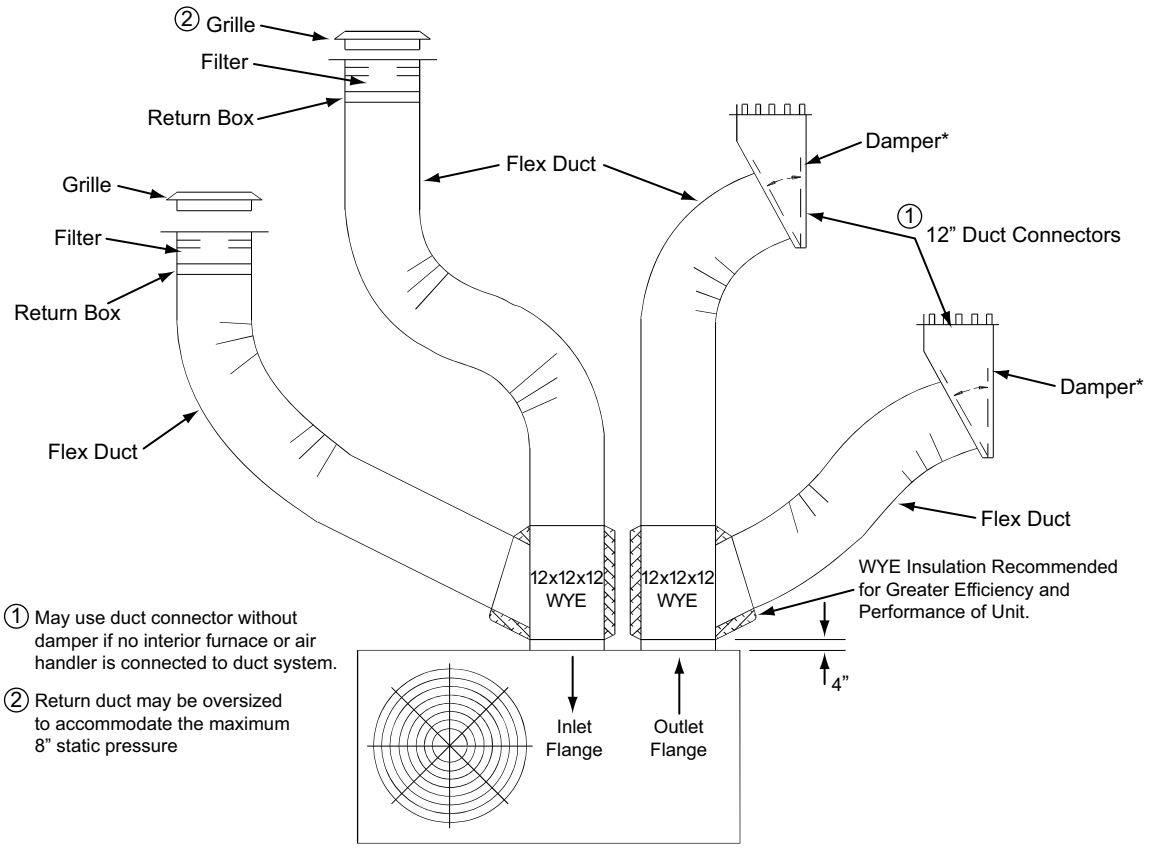


Figure 7: Wye Installation (Inlet and Outlet)

Discharge Duct Installation

If an interior furnace or air handler will be connected to the supply duct system, the supply duct connector should be equipped with a damper. See Figure 8.

If no interior furnace or air handler will be connected to the ductwork, the duct connector may be a 12”diameter round duct. See Figure 9.

When locating the duct connector, check carefully for floor joists, axles, wheels and frame members that could interfere with the installation of the duct connector or the running of the duct. Ideally, the duct connector should be located in the bottom of the main duct, forward of center of the manufactured home. Do not install duct connector under a register.This will help to eliminate the transmission of sound into the home.

To locate the center of the duct, first cut a 6” hole in the fiberboard below the duct at the desired location.After locating the duct center, increase the hole in the fiber board to approximately the size of the duct connector.

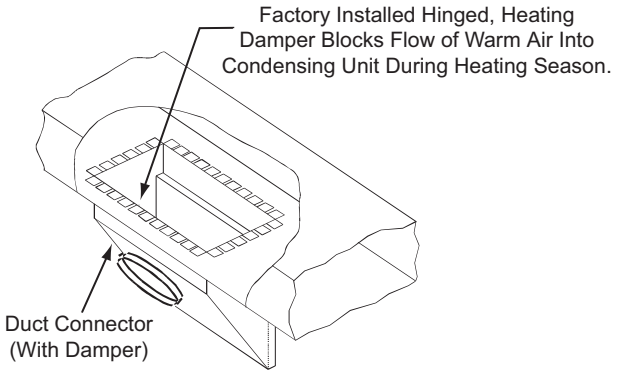


Figure 8: Duct Connector (With Damper)

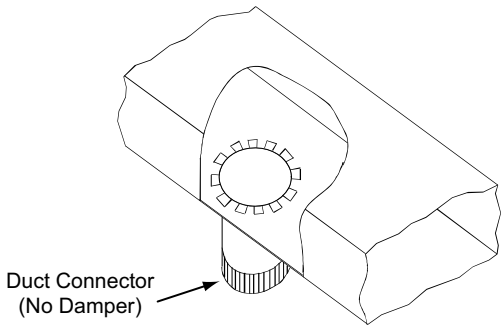


Figure 9: Duct Connector (No Damper)

If using the duct connector with damper, cut a 9-1/8”x 16-1/8” hole in the center of the duct bottom. If using the 12” diameter duct connector without damper cut a 12-1/8” diameter hole in the center of the duct bottom. Place the duct connector in the hole and secure tightly with the tabs. If necessary, sup-port duct connector with support braces. See Figures 6 & 7.

NOTE: It is advisable to tape joints at the duct connector airtight. There is extreme pressure exerted by the blower at this point.

Installing Of Duct To Unit (Residential)

Flanges are provided to help install the ducts to the air conditioner. The duct flanges must be field in-stalled on the unit’s side.

The unit’s supply and return air connections are sized for optimum performance. Should the duct work connecting to the air conditioner be of smaller dimensions, it is recommended that transitions connecting the ducts to the unit be constructed to allow a smooth airflow to the heat unit’s return air opening and from the supply air opening. Abrupt duct size changes increase the system static pressure and reduces air volume which may cause unsatisfactory performance.

Ductwork should be in accordance with local and national codes.

Ductwork exposed to outside environmental conditions must be insulated and weather proofed. Out-side wall openings through which the ducts pass must be weather proofed in accordance with good construction practices.

Supply and return air ducts passing through unconditioned spaces of the building must be insulated and covered with a vapor barrier. Following this practice will prevent thermal losses and condensate formation on the ducts.

Installing Drain Tube And Connection

A drain tube, a barbed elbow plastic fitting, and a plastic hose clamp are provided in the small parts package packed in the blower chute.

1. To insure proper condensate drainage, the barbed plastic elbow fitting should be screwed into the unit drain fitting (located in the front corner of the unit), and the drain tube installed on the barbed end of the plastic fitting secured in plastic fitting with the plastic hose clamp.
2. If it is necessary to drain water away from unit, attach a drain hose to the drain tube.

⚠ CAUTION

The drain hose must not rise above the level of the drain fitting at any point in its routing. Failure to do so will result in condensate water overflowing into the unit’s interior.

Service Access

Access to all serviceable components is provided at the following locations:

- Blower compartment access panel
- Control box access panel

Refer to Figure 1 for location of these access locations and minimum clearances in Table 3.

⚠ CAUTION

This system uses R-410A Refrigerant which operates at higher pressures than R-22. No other refrigerant may be used in this system. Gage sets, hoses, refrigerant containers and recovery systems must be designed to handle R-410A. If you are unsure, consult the equipment manufacturer. Failure to use R-410A compatible servicing equipment may result in property damage or injury.

⚠WARNING

Wear safety glasses and gloves when handling refrigerants. Failure to follow this warning can cause serious personal injury.

Compressors

The compressor used in this product is specifically designed to operate with R-410A Refrigerant and cannot be interchanged.

⚠ CAUTION

This system uses R-410A Refrigerant which operates at higher pressures than R-22. No other refrigerant may be used in this system.

The compressor also uses a polyolester (POE oil), Mobil 3MA POE. This oil is extremely hydroscopic, meaning it absorbs water readily. POE oil can absorb 15 times as much water as other oils designed for HCFC and CFC refrigerants. Take all necessary precautions to avoid exposure of the oil to the atmosphere.

⚠ CAUTION

Do not leave the system open to the atmosphere. Unit damage could occur due to moisture being absorbed by the **POE oil** in the system. This type of oil is highly susceptible to moisture absorption

POE (polyolester) compressor lubricants are known to cause long term damage to some synthetic roofing materials.

⚠ CAUTION

Exposure, even if immediately cleaned up, may cause embrittlement (leading to cracking) to occur in one year or more. When performing any service that may risk exposure of compressor oil to the roof, take precautions to protect roofing.

Procedures which risk oil leakage include, but are not limited to, compressor replacement, repairing refrigerant leaks, replacing refrigerant components such as filter drier, pressure switch, metering device or coil.

Units are shipped with compressor mountings which are factory-adjusted and ready for operation.

⚠ CAUTION

Do not loosen compressor mounting bolts.

Power And Control Wiring

Field wiring to the unit must conform to provisions of the current N.E.C. ANSI/NFPA No. 70 or C.E.C. and/or local ordinances. The unit must be electrically grounded in accordance with local codes or, in their absence, with the N.E.C./C.E.C. Voltage tolerances which must be maintained at the compressor terminals during starting and running conditions are indicated on the unit Rating Plate and Table 5.

The wiring entering the cabinet must be provided with mechanical strain relief.

A fused disconnect switch should be field provided for the unit. If any of the wire supplied with the unit must be replaced, replacement wire must be of the type shown on the wiring diagram.

Electrical line must be sized properly to carry the load. Each unit must be wired with a separate branch circuit fed directly from the meter panel and properly fused.

Power Wiring

This heat pump is equipped to accept a single circuit of supply power. If an auxiliary heater is installed, dual circuiting to the unit can be used. When installing a 14.3 KW heater, this method will avoid the use of large wiring. To provide single circuiting, an optional jumper bar can be used to electrically connect the circuit breakers provided with the heater kit.

If auxiliary electric heaters are not installed, refer to data sheet for minimum circuit ampacity and maximum overcurrent protective device size. If auxiliary electric heaters are being installed, refer to the installation instructions (included with heater packages) for electrical requirements and wiring information.

To wire this system without the use of auxiliary electric heat, remove the control box access door.

1. Remove side panel. Run power line service wiring into control box through the bottom knockout opening in the casing. (The two top knockouts are used when installing an auxiliary heater.)
2. For single phase units - Connect one supply wire to L1 on the contactor, and the other supply wire to L2 on the contactor. Connect ground wire to ground lug in control box. See Figure 10.
3. For three phase units - connect supply wires to L1, L2 and L3 on the contactor. Connect ground wire to ground lug in control box.
4. Unless the heat pump is grounded through proper wiring to the service entrance ground terminal, a suitable separate ground must be provided at the air conditioner.

Control Wiring

1. Run low voltage control circuit wires through the “fingered” snap bushing into the low voltage compartment.
2. Run low voltage control circuit wires through the fingered snap bushing to the low voltage terminal wire. Refer to Figure 11 diagram to connect the low voltage control wiring to the units low voltage connections.
3. If using auxiliary electric heat, refer to the wiring instructions provided with the heating kit.

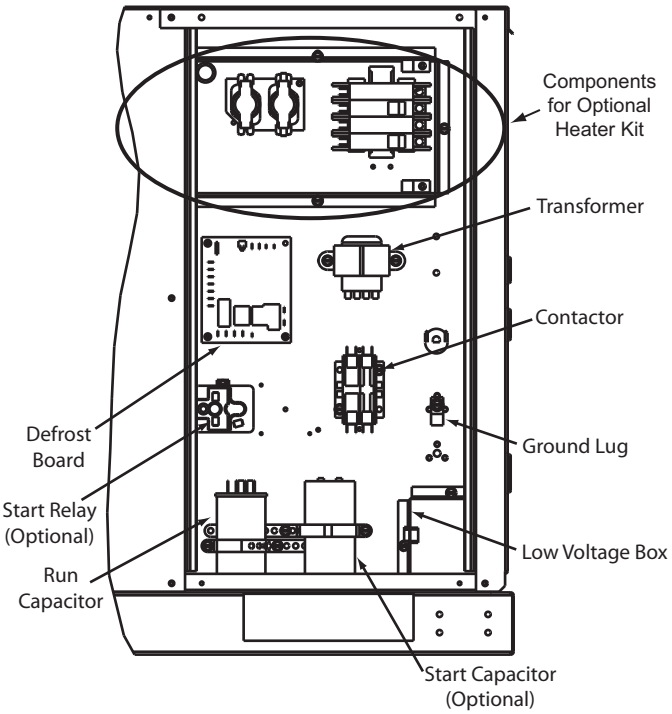


Figure 10: Unit Component Location

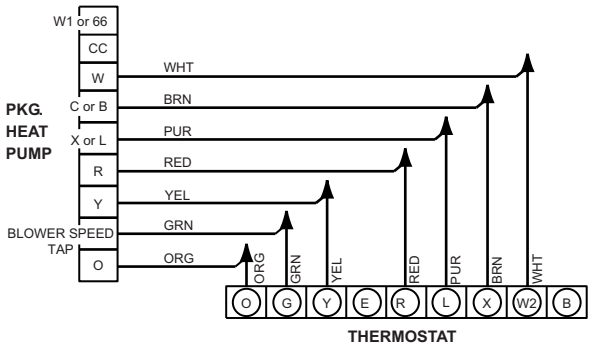


Figure 11: Thermostat Wiring

Wall Thermostat Installation

⚠ CAUTION

If installing this heat pump system in conjunction with a gas furnace, a baffle must be installed in the furnace to prevent cold air from being discharged around the heat exchanger. This could damage the heat exchanger and cause asphxiation. A sheet metal plate may be inserted in the supply outlet duct of the furnace to serve as a baffle. **Advise the homeowner that the baffle plate must be removed before attempting to operate the interior furnace.**

A thermostat interlock system must be provided to prevent simultaneous operation of any furnace with the heat pump. If a furnace will be in the home, a separate furnace thermostat must be used and an interlock switch (See Figure 12) must be installed in both thermostat circuits, insuring only one thermostat can be operated at a time. This switch must break the control circuit of any furnace used.

General recommendations for the location of the thermostat are as follows:

The proper location of the room thermostat is most important to insure that it will provide a comfortable home temperature.

Observe the following general rules when selecting a location:

1. Locate thermostat about 5 feet above floor.
2. Install on a partitioning wall, not on an outside wall.
3. Never expose it to direct light from lamps, sun, fireplaces, etc.
4. Avoid locations close to doors that lead outside, to windows or to adjoining outside walls.
5. Avoid locations close to radiators, warm air registers, or in the direct path of heat or cold air from them.
6. Make sure that there are no pipes or ductwork in that part of the wall chosen for thermostat location.
7. Never locate it in a room that is warmer or cooler than the rest of the home, such as a kitchen or hallway.
8. The living or dining room is normally a good location provided there is no cooking range or refrigerator on the opposite side of wall.

Make final check of complete electrical system for correct wiring. Check for any possible loose connections.

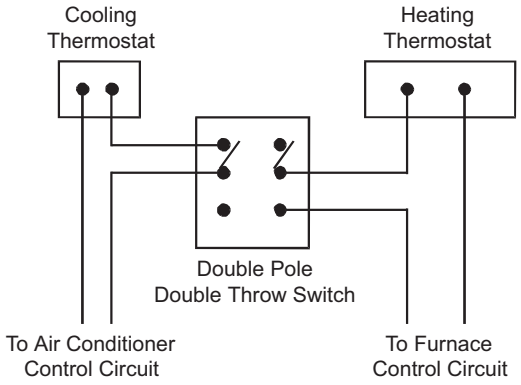


Figure 12: Switch Installation

Pre-start Procedure

Before starting air conditioner, make sure of the following:

1. The unit is properly located and level.
2. The ductwork is properly sized, insulated, weather proofed and correctly spaced from combustible materials.
3. Air is free to flow to and from outdoor coil.
4. All wiring is correct, tight and according to the wiring diagrams.
5. The unit is properly grounded electrically.
6. The condensate drain is connected and directed away from the unit and structure.
7. The outdoor fan and indoor blower wheel will turn freely.
8. The indoor blower is factory wired to provide the correct speed.

System Startup, Check-out

1. Insure that all access doors are in position. The wall thermostat system switch should be in the OFF position, the fan switch in the AUTO position and the emergency heat switch in the NORM position.
2. The electrical power supply to the heat pump should be on for 12 hours and the compressor crankcase heater (if provided) is working.
3. Set the wall thermostat fan switch to ON. The outdoor blower should run.
4. Set wall thermostat fan switch to AUTO. The indoor blower should not run.
5. Set the wall thermostat system switch to COOL and the temperature selection lever below the room temperature. The heat pump should be running in the cooling mode.
6. Set the wall thermostat system switch to the HEAT position. The heat pump should stop.
7. Raise the wall thermostat temperature selection lever to a setting above the room temperature. The heat pump should now run in the heating mode.
8. To check the emergency heat operation, set the wall thermostat system switch to EMERGENCY HEAT. Raise the wall thermostat temperature selection lever high enough to close the second stage of the thermostat, if it is not already closed. The indoor blower will turn on when the heating elements stage on. If accessory heaters are not installed, the blower will not run.
9. Set the wall thermostat to the seasonal mode of operation (heat or cool), adjust the temperature selection lever to the desired setting. Record the following information for your service records after the heat pump has run for 20 minutes:
   - Operating Mode _____
   - Discharge Pressure _____
   - Suction Pressure _____
   - Suction Line Temp. at Compressor _____
   - Indoor Dry Bulb Temperature _____
   - Indoor Wet Bulb Temperature _____
   - Outdoor Dry Bulb Temperature _____
   - Outdoor Wet Bulb Temperature _____
   - Voltage at Contactor _____
   - Current at Contactor _____
   - Model Number _____
   - Serial Number _____
   - Owner _____
   - Date _____
10. Reinstall all panels on the heat pump.
11. Check the heat pump system for tubing and sheet metal rattles.
12. Instruct the owner on the operation and maintenance of this heat pump system.
13. Give the Customer Envelope to the owner and explain why the registration card should be filled out and returned.

Other Features Incorporated In The Control

Anti-Short Cycle time Delay

Five minute duration, activated each time the indoor thermostat opens and each time the system is turned on. This delay may be reduced by a ratio of 256:1 by shorting the “TEST" posts.

Safety Lock-Out

This device opens the circuit to the compressor contactor in response to High Pressure Limit switch opening. The compressor will remain off, even though the limit switches close and will start up only when the Lock-out is reset.

The Lock-out also lights the Emergency Heat Indicator. To reset the Lock-out momentarily turn the thermostat to “OFF" then back to its original position. The unit will start up after the 5 minute delay, mentioned above.

Defrost Operation

The demand defrost control implements a temperature differential (”delta-T”) demand defrost algorithm. The heat pump is allowed to operate in the heating mode until the combination of outdoor ambient and outdoor coil temperatures indicate that defrosting is necessary (See Figure 13). When coil temperature is below the initiate point for the ambient temperature continuously for 4-1/2 minutes, the heat pump is put into a defrost cycle. This 4-1/2 minute timer eliminates unnecessary defrost cycles caused by refrigeration surges such as those that occur at the start of a heating cycle.

A timed inhibit feature prevents the system from responding to a call for defrost less than 20 minutes after the initiation of the previous defrost. After the 20 minute inhibit time has expired, temperature conditions must call for defrost continuously for 4-1/2 minutes before a defrost cycle is initiated. A temperature inhibit feature prohibits defrost if the coil temperature is above 40°F.

A forced-defrost feature puts the system into a defrost period every 6 hours and 4 minutes to recirculate lubricants, unless the coil temperature is above 40°F. All defrost timing occurs only while the compressor is on.

During the defrost mode, the defrost control will provide a 24 volt signal from terminal “W1/66” to the fan control terminal “W1”. This signal will energize electric heat stage 1, if the unit is so equipped.

For trouble shooting purposes, the defrost cycle can be manually initiated by shorting the “TEST” pins together for 5 seconds. Defrost will terminate normally during the “TEST” mode.

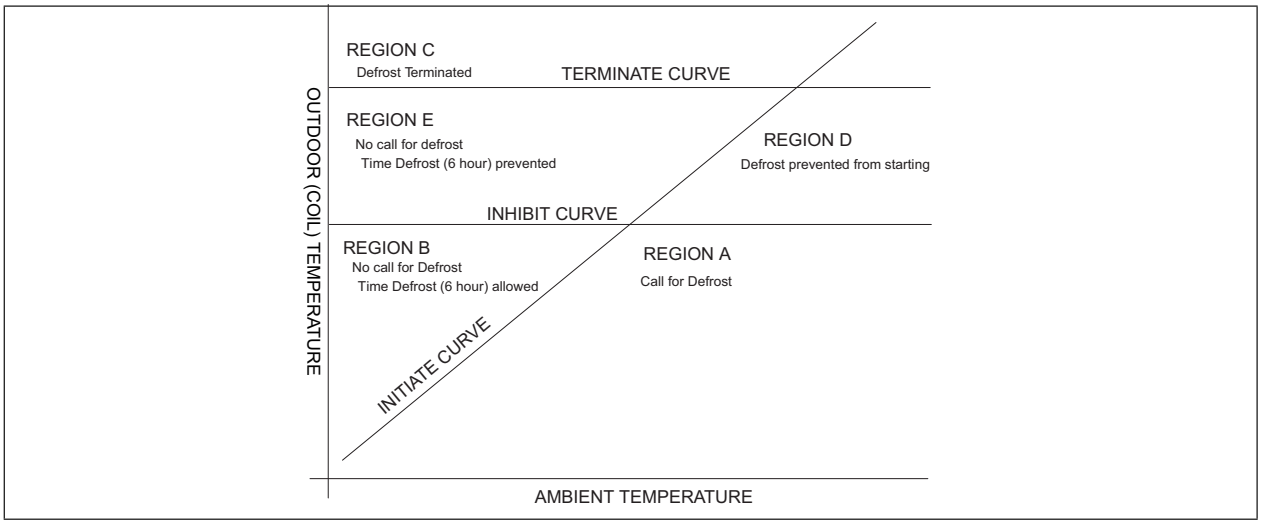


Figure 13: Defrost Operation Curves

Table 4: Demand Defrost Selection

Unit	Pin Position
UQ 024, 030, 042	2
UQ 036, 048, 060	2

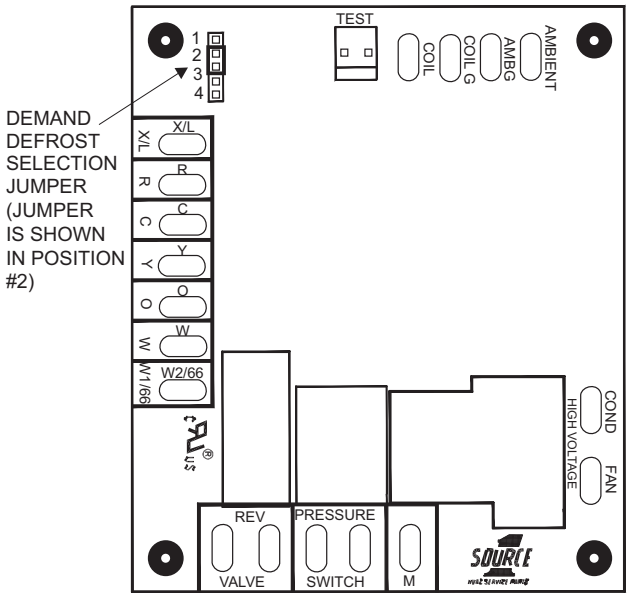


Table 5: Electrical Data

Size (Tons)	Volt	Compressors (each)			OD Fan Motors (each)	Supply Blower Motor	Electric Heat Option				MCA[1] (Amps)	MOCP[2] (Amps)	Factory Fuse[3]/ Size (Amps)
		RLA	LRA	MCC	FLA	FLA	Model	kW	Stages	Amps			
024 (2.0)	208/230-1-60	13.4	58.3	21.0	1.2	4.1	None	-	-	-	22.1	30	30
							2PH08520506	3.6/4.8	1	17.2/19.9	43.6/46.9	50/50	50/50
							2PH08520706	4.9/6.5	1	23.5/27.1	51.4/55.9	60/60	60/60
							2PH08521006	7.2/9.6	1	34.5/39.8	65.2/71.8	70/80	70/80
							2PH08521506	10.8/14.3	1	51.7/59.7	86.7/96.7	90/100	90/100
030 (2.5)	208/230-1-60	14.1	73.0	22.0	1.2	4.1	None	-	-	-	22.9	30	30
							2PH08520506	3.6/4.8	1	17.2/19.9	44.5/47.8	50/50	50/50
							2PH08520706	4.9/6.5	1	23.5/27.1	52.3/56.8	60/60	60/60
							2PH08521006	7.2/9.6	1	34.5/39.8	66/72.7	70/80	70/80
							2PH08521506	10.8/14.3	1	51.7/59.7	87.6/97.6	90/100	90/100
036 (3.0)	208/230-1-60	16.6	79.0	26.0	1.4	4.1	None	–	–	–	26.3	35	35
							2PH08520506	3.6/4.8	1	17.2/19.9	47.8/51.1	60/60	60/60
							2PH08520706	4.9/6.5	1	23.5/27.1	55.6/60.1	60/70	60/70
							2PH08521006	7.2/9.6	1	34.5/39.8	69.4/76	70/80	70/80
							2PH08521506	10.8/14.3	1	51.7/59.7	90.9/100.9	100/110	100/110
	208/230-3-60	10.4	73.0	16.3	1.4	4.1	None	–	–	–	18.5	25	25
042 (3.5)	208/230-1-60	21.8	105.0	34.0	2.2	7.6	None	–	–	–	37.1	50	50
							2PH08520506	3.6/4.8	1	17.2/19.9	58.6/61.9	70/70	70/70
							2PH08520706	4.9/6.5	1	23.5/27.1	66.4/70.9	80/80	80/80
							2PH08521006	7.2/9.6	1	34.5/39.8	80.2/86.8	90/90	90/90
							2PH08521506	10.8/14.3	1	51.7/59.7	101.7/111.7	110/125	110/125
048 (4.0)	208/230-1-60	20.5	115.0	32.0	2.2	7.6	None	-	-	-	35.4	45	45
							2PH08520506	3.6/4.8	1	17.2/19.9	57/60.3	70/70	70/70
							2PH08520706	4.9/6.5	1	23.5/27.1	64.8/69.3	70/80	70/80
							2PH08521006	7.2/9.6	1	34.5/39.8	78.5/85.2	90/90	90/90
							2PH08521506	10.8/14.3	1	51.7/59.7	100.1/110.1	110/125	110/125
	208/230-3-60	16.0	115.0	25.0	2.2	7.6	None	-	-	-	29.8	40	40
060 (5.0)	208/230-1-60	25.0	134.0	39.0	2.2	7.6	None	-	-	-	41.1	60	60
							2PH08520506	3.6/4.8	1	17.2/19.9	62.6/65.9	80/80	80/80
							2PH08520706	4.9/6.5	1	23.5/27.1	70.4/74.9	80/90	80/90
							2PH08521006	7.2/9.6	1	34.5/39.8	84.2/90.8	100/100	100/100
							2PH08521506	10.8/14.3	1	51.7/59.7	105.7/115.7	110/125	110/125
	208/230-3-60	15.9	110.0	24.8	2.2	7.6	None	-	-	-	29.7	40	40
	460-3-60	7.0	52.0	11.0	1.1	3.8	None	-	-	-	13.7	20	20

1. Minimum Circuit Ampacity.
2. Maximum Over Current Protection per standard UL 1995.
3. Fuse or HACR circuit breaker size installed at factory or field installed.

Table 6: Physical Data

Component	Models					
	UQ024	UQ030	UQ036	UQ042	UQ048	UQ060
Nominal Tonnage	**2.0**	**2.5**	**3.0**	**3.5**	**4.0**	**5.0**
ARI COOLING PERFORMANCE						
Gross Capacity @ ARI A point (Btu)	23220	28750	37000	41404	48000	54384
ARI net capacity (Btu)	22600	28000	35200	40200	46500	53000
EER	11.2	11.2	11.2	11.4	11.6	10.8
SEER	13	13	13	13	13	13
Nominal CFM	900	1000	1200	1450	1600	1650
System power (KW)	2.02	2.50	3.16	3.74	4.02	4.84
Refrigerant type	R-410A	R-410A	R-410A	R-410A	R-410A	R-410A
Refrigerant charge (lb-oz)						
System 1	7-7	9-4	9-10	12-4	12-8	12-8
ARI HEATING PERFORMANCE						
47°F Capacity Rating (MBH)	20000	26500	32000	38300	43000	50000
System Power KW/COP	1720/3.4	2386/3.25	2930/3.2	3280/3.40	3654/3.45	4523/3.25
17°F Capacity Rating (MBH)	11000	14800	18400	21600	24400	29200
System Power KW/COP	1610/2.00	2122/2.04	2598/2.04	3125/2.03	3437/2.08	4057/2.10
HSPF BTU/Watts-hr	7.7	7.7	7.7	7.7	7.7	7.7
DIMENSIONS (inches)						
Length	47-1/4	47-1/4	47-1/4	57-9/16	57-9/16	57-9/16
Width	32-13/16	32-13/16	32-13/16	32-13/16	32-13/16	32-13/16
Height	30-15/16	30-15/16	30-15/16	34-15/16	34-15/16	34-15/16
OPERATING WT. (lbs.)	325	340	340	372	382	390
COMPRESSORS						
Type	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll
Quantity	1	1	1	1	1	1
CONDENSER COIL DATA						
Face area (Sq. Ft.)	11.1	11.28	11.28	16	16	20
Rows	1	2	2	2	2	2
Fins per inch	20	15	20	15	15	20
Tube diameter (in.)	3/8	3/8	3/8	3/8	3/8	3/8
Circuitry Type	Intertwined	Intertwined	Intertwined	Intertwined	Intertwined	Intertwined
Refrigerant Control	TXV	TXV	TXV	TXV	TXV	TXV
EVAPORATOR COIL DATA						
Face area (Sq. Ft.)	4.67	4.67	4.67	5.44	5.44	5.44
Rows	3	3	3	4	4	4
Fins per inch	13	13	16	13	13	13
Tube diameter	3/8	3/8	3/8	3/8	3/8	3/8
Circuitry Type	Intertwined	Intertwined	Intertwined	Intertwined	Intertwined	Intertwined
Refrigerant control	Orifice	Orifice	Orifice	Orifice	Orifice	TXV
CONDENSER FAN DATA						
Quantity	1	1	1	1	1	1
Fan diameter (Inch)	20	20	20	22	22	22
Fan type	Prop	Prop	Prop	Prop	Prop	Prop
Drive type	Direct	Direct	Direct	Direct	Direct	Direct
No. speeds	1	1	1	1	1	1
Number of motors	1	1	1	1	1	1
Motor HP each	1/4	1/4	1/4	1/3	1/3	1/3
RPM	850	850	1100	1100	1100	1100
Nominal total CFM	2500	2500	2850	3200	3200	3200
DIRECT DRIVE EVAP FAN DATA						
Quantity	1	1	1	1	1	1
Fan diameter (Inch)	10 x 7	10 x 7	10 x 7	11 x 10	11 x 10	11 x 10
Fan type	Centrifugal	Centrifugal	Centrifugal	Centrifugal	Centrifugal	Centrifugal
Drive type	Direct	Direct	Direct	Direct	Direct	Direct
No. speeds	5	5	5	5	5	5
Number of motors	1	1	1	1	1	1
Motor HP each	1/2	1/2	1/2	1	1	1
RPM	1100	1100	1100	1100	1100	1100
Frame size	48	48	48	48	48	48
FILTERS						
Size / Quantity	-	-	-	-	-	-

Airflow Performance

Table 7: Airflow Performance

Size (Tons)	Unit Speed)	External Static Pressure (Inch Water Gauge)														
		0.2			0.4			0.6			0.8			1.0		
		SCFM	W	RPM	SCFM	W	RPM	SCFM	W	RPM	SCFM	W	RPM	SCFM	W	RPM
024 (2.0)	Low	786	113	709	720	127	803	653	141	893	560	156	1004	467	170	1115
	Low/Medium	889	149	760	831	163	843	757	179	939	703	191	1005	649	203	1072
	Medium	1037	223	840	984	237	911	914	253	993	857	264	1057	799	276	1121
	Medium/High	1185	297	920	1137	311	979	1071	326	1048	1010	338	1109	949	349	1170
	High	1336	471	1031	1263	479	1081	1154	446	1114	1027	397	1133	853	340	1153
030 (2.5)	Low	786	113	709	720	127	803	653	141	893	560	156	1004	467	170	1115
	Low/Medium	1003	196	822	950	210	891	886	225	966	820	240	1049	754	255	1132
	Medium	1115	262	883	1061	275	947	998	292	1021	916	293	1085	834	294	1150
	Medium/High	1227	327	945	1172	341	1003	1109	358	1076	1011	345	1121	913	332	1167
	High	1336	471	1031	1263	479	1081	1154	446	1114	1027	397	1133	853	340	1153
036 (3.0)	Low	1017	219	835	954	236	910	878	251	980	821	269	1053	751	281	1125
	Low/Medium	1166	306	912	1101	323	977	1037	338	1042	977	351	1102	833	321	1139
	Medium	1211	346	942	1135	362	1004	1073	375	1065	987	368	1113	837	325	1143
	Medium/High	1255	385	971	1169	400	1030	1109	412	1087	996	384	1123	841	328	1146
	High	1336	471	1031	1263	479	1081	1154	446	1114	1027	397	1133	853	340	1153
042 (3.5)	Low	1152	224	759	934	263	892	796	282	965	643	318	1086	490	354	1207
	Low/Medium	1265	273	802	1110	312	916	902	339	1005	786	360	1076	670	381	1147
	Medium	1364	318	824	1222	358	933	1012	396	1043	905	417	1101	798	438	1159
	Medium/High	1849	647	990	1734	688	1072	1519	662	1136	1090	535	1161	-	-	-
	High	2227	978	1086	1976	889	1129	1677	757	1151	-	-	-	-	-	-
048 (4.0)	Low	1260	275	807	1096	313	915	910	336	992	804	355	1057	774	290	979
	Low/Medium	1471	375	870	1338	415	968	1118	455	1079	963	474	1110	788	323	1016
	Medium	1546	394	865	1391	439	975	1187	479	1080	1062	501	1088	892	347	1034
	Medium/High	1597	434	893	1460	476	989	1277	518	995	1079	515	1050	1529	669	1132
	High	2227	978	1086	1976	889	1129	1677	757	1151	1827	822	1136	1620	732	1158
060 (5.0)	Low	1368	331	849	1229	369	953	1015	397	1045	898	420	1106	781	443	1167
	Low/Medium	1612	480	923	1488	522	1018	1318	570	1127	1059	515	1157	-	-	-
	Medium	1849	647	990	1734	688	1072	1519	662	1136	1090	535	1161	-	-	-
	Medium/High	2033	820	1050	1856	808	1115	1546	684	1145	1065	535	1166	-	-	-
	High	2227	978	1086	1976	889	1129	1677	757	1151	-	-	-	-	-	-

Table 8: Additional Static Resistance

Size (Tons)	Model	CFM	Wet Indoor Coil	Electric Heat, kW			
				5	6.5	10	15
024 (2.0)	UQ	400	0.05	0.05	0.05	0.06	0.07
		500	0.06	0.06	0.06	0.07	0.08
		600	0.07	0.07	0.07	0.08	0.09
		700	0.08	0.08	0.08	0.09	0.10
		800	0.09	0.09	0.09	0.10	0.12
		900	0.1	0.10	0.10	0.11	0.13
		1000	0.12	0.12	0.12	0.13	0.15
		1100	0.13	0.13	0.13	0.14	0.17
		1200	0.15	0.15	0.15	0.16	0.19
		1300	0.17	0.17	0.17	0.18	0.21
		1400	0.19	0.19	0.19	0.20	0.23
030 (2.5)	UQ	400	0.05	0.05	0.05	0.06	0.07
		500	0.06	0.06	0.06	0.07	0.08
		600	0.07	0.07	0.07	0.08	0.09
		700	0.08	0.08	0.08	0.09	0.10
		800	0.09	0.09	0.09	0.10	0.12
		900	0.1	0.10	0.10	0.11	0.13
		1000	0.12	0.12	0.12	0.13	0.15
		1100	0.13	0.13	0.13	0.14	0.17
		1200	0.15	0.15	0.15	0.16	0.19
		1300	0.17	0.17	0.17	0.18	0.21
		1400	0.19	0.19	0.19	0.20	0.23
036 (3.0)	UQ	400	0.05	0.05	0.05	0.06	0.07
		500	0.06	0.06	0.06	0.07	0.08
		600	0.07	0.07	0.07	0.08	0.09
		700	0.08	0.08	0.08	0.09	0.10
		800	0.09	0.09	0.09	0.10	0.12
		900	0.1	0.10	0.10	0.11	0.13
		1000	0.12	0.12	0.12	0.13	0.15
		1100	0.13	0.13	0.13	0.14	0.17
		1200	0.15	0.15	0.15	0.16	0.19
		1300	0.17	0.17	0.17	0.18	0.21
		1400	0.19	0.19	0.19	0.20	0.23

Table 8: Additional Static Resistance (Continued)

Size (Tons)	Model	CFM	Wet Indoor Coil	Electric Heat, kW			
				5	6.5	10	15
042 (3.5)	UQ	500	0.09	0.09	0.09	0.10	0.12
		600	0.1	0.10	0.10	0.11	0.13
		700	0.12	0.12	0.12	0.13	0.15
		800	0.13	0.13	0.13	0.14	0.17
		900	0.15	0.15	0.15	0.16	0.19
		1000	0.17	0.17	0.17	0.18	0.21
		1100	0.19	0.19	0.19	0.20	0.23
		1200	0.21	0.21	0.21	0.22	0.25
		1300	0.23	0.23	0.23	0.24	0.27
		1400	0.25	0.25	0.25	0.26	0.29
		1500	0.27	0.27	0.27	0.28	0.31
		1600	0.29	0.29	0.29	0.30	0.33
		1700	0.31	0.31	0.31	0.32	0.35
		1800	0.33	0.33	0.33	0.34	0.37
		1900	0.35	0.35	0.35	0.36	0.39
		2000	0.37	0.37	0.37	0.38	0.41
		2100	0.39	0.39	0.39	0.40	0.43
		2200	0.41	0.41	0.41	0.42	0.45
048 (4.0)	UQ	500	0.09	0.09	0.09	0.10	0.12
		600	0.1	0.10	0.10	0.11	0.13
		700	0.12	0.12	0.12	0.13	0.15
		800	0.13	0.13	0.13	0.14	0.17
		900	0.15	0.15	0.15	0.16	0.19
		1000	0.17	0.17	0.17	0.18	0.21
		1100	0.19	0.19	0.19	0.20	0.23
		1200	0.21	0.21	0.21	0.22	0.25
		1300	0.23	0.23	0.23	0.24	0.27
		1400	0.25	0.25	0.25	0.26	0.29
		1500	0.27	0.27	0.27	0.28	0.31
		1600	0.29	0.29	0.29	0.30	0.33
		1700	0.31	0.31	0.31	0.32	0.35
		1800	0.33	0.33	0.33	0.34	0.37
		1900	0.35	0.35	0.35	0.36	0.39
		2000	0.37	0.37	0.37	0.38	0.41
		2100	0.39	0.39	0.39	0.40	0.43
		2200	0.41	0.41	0.41	0.42	0.45
060 (5.0)	UQ	500	0.09	0.09	0.09	0.10	0.12
		600	0.1	0.10	0.10	0.11	0.13
		700	0.12	0.12	0.12	0.13	0.15
		800	0.13	0.13	0.13	0.14	0.17
		900	0.15	0.15	0.15	0.16	0.19
		1000	0.17	0.17	0.17	0.18	0.21
		1100	0.19	0.19	0.19	0.20	0.23
		1200	0.21	0.21	0.21	0.22	0.25
		1300	0.23	0.23	0.23	0.24	0.27
		1400	0.25	0.25	0.25	0.26	0.29
		1500	0.27	0.27	0.27	0.28	0.31
		1600	0.29	0.29	0.29	0.30	0.33
		1700	0.31	0.31	0.31	0.32	0.35
		1800	0.33	0.33	0.33	0.34	0.37
		1900	0.35	0.35	0.35	0.36	0.39
		2000	0.37	0.37	0.37	0.38	0.41
		2100	0.39	0.39	0.39	0.40	0.43
		2200	0.41	0.41	0.41	0.42	0.45

Table 9: Electric Heat Minimum Supply Air

Size (Tons)	Voltage	Minimum Supply Air (CFM) Heater kW			
		5.0	6.5	10.0	15.0
024 (2.0)	208/230-1-60	800	800	800	750
030 (2.5)	208/230-1-60	800	800	800	750
036 (3.0)	208/230-1-60	800	800	800	750
042 (3.5)	208/230-1-60	1300	1300	1270	1270
048 (4.0)	208/230-1-60	1300	1300	1270	1270
060 (5.0)	208/230-1-60	1300	1300	1270	1270

Table 10: Indoor Blower Specifications

Size (Tons)	Motor				
	HP	RPM	Eff.	SF	Frame
024 (2.0)	1/2	1100	0.8	1.0	48
030 (2.5)	1/2	1100	0.8	1.0	48
036 (3.0)	1/2	1100	0.8	1.0	48
042 (3.5)	1	1100	0.8	1.0	48
048 (4.0)	1	1100	0.8	1.0	48
060 (5.0)	1	1100	0.8	1.0	48

Table 11: Electric Heat Multipliers

Voltage		kW Capacity Multipliers[1]
Nominal	Applied	
240	208	0.75
	230	0.92

1. Electric heaters are rated at nominal voltage. Use this table to determine the electric heat capacity for heaters applied at lower voltages.

Maintenance

Normal Maintenance

⚠WARNING

Prior to any of the following maintenance procedures, shut off all power to the unit, to avoid personal injury.

Periodic maintenance consists of changing or cleaning filters and general cleaning of the outdoor coil.

FILTERS - Inspect once a month. Replace Disposable or clean Permanent Type as necessary. DO NOT replace Permanent Type with Disposable.

MOTORS - Indoor and outdoor fan motors are permanently lubricated and require no maintenance.

OUTDOOR COIL - Dirt should not be allowed to accumulate on the outdoor coil surface or other parts in the air circuit. Cleaning should be as often as necessary to keep the coil clean. Use a brush, vacuum cleaner attachment, or other suitable means. If water is used to clean the coil, be sure that the power to the unit is shut off prior to cleaning.

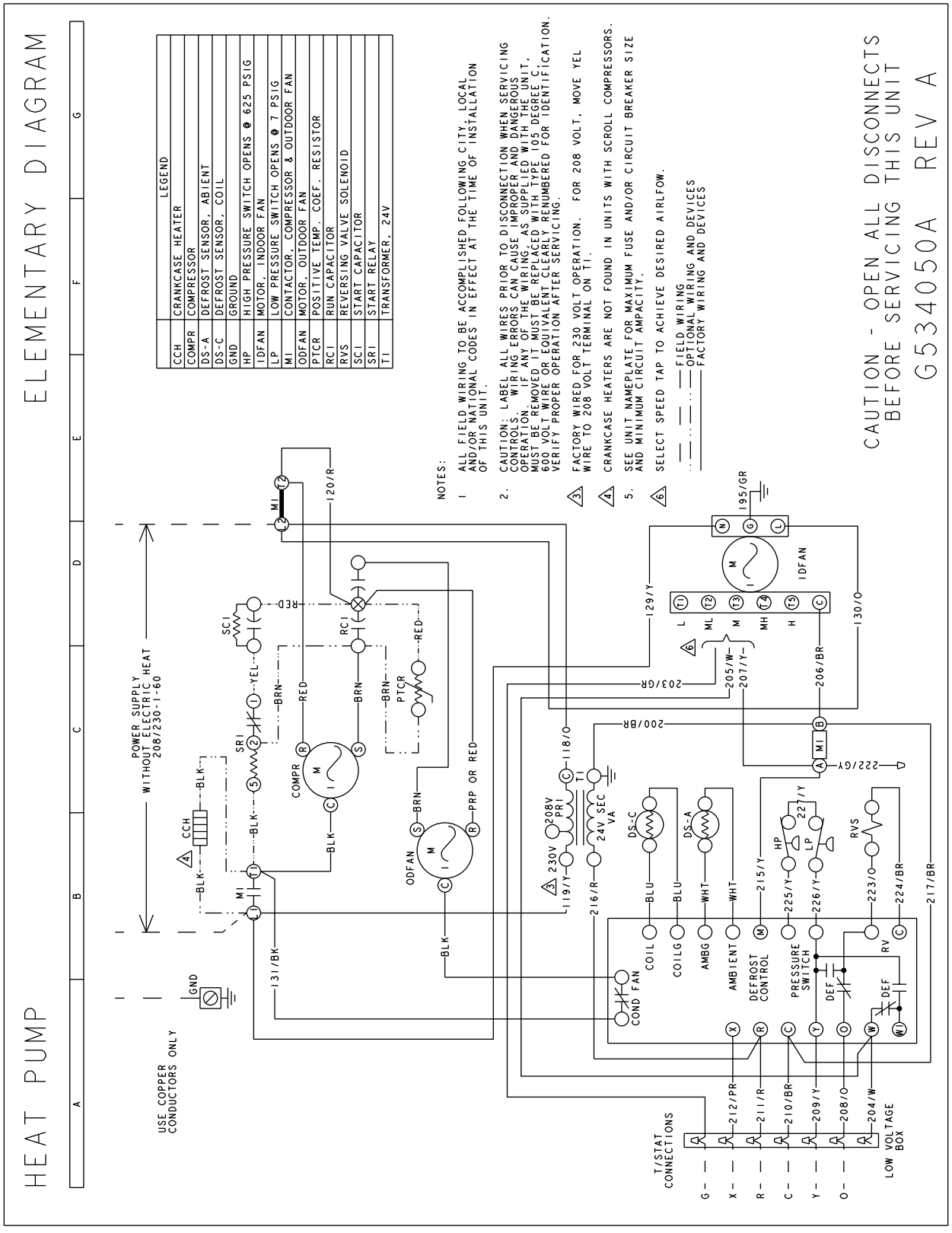
⚠ CAUTION

Exercise care when cleaning the coil so that the coil fins are not damaged.

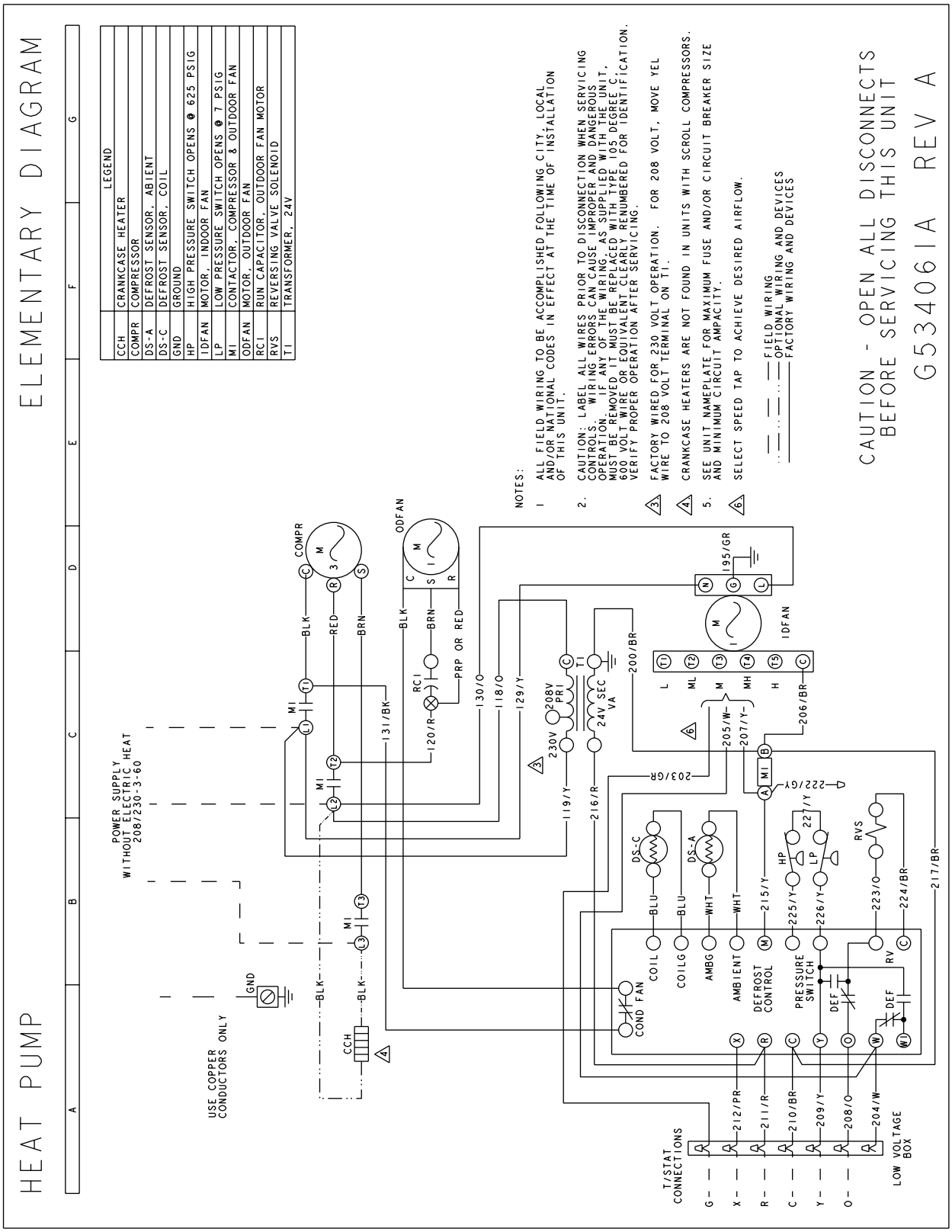
Do not permit the hot condenser air discharge to be obstructed by overhanging structures or shrubs.

Typical Wiring Diagrams

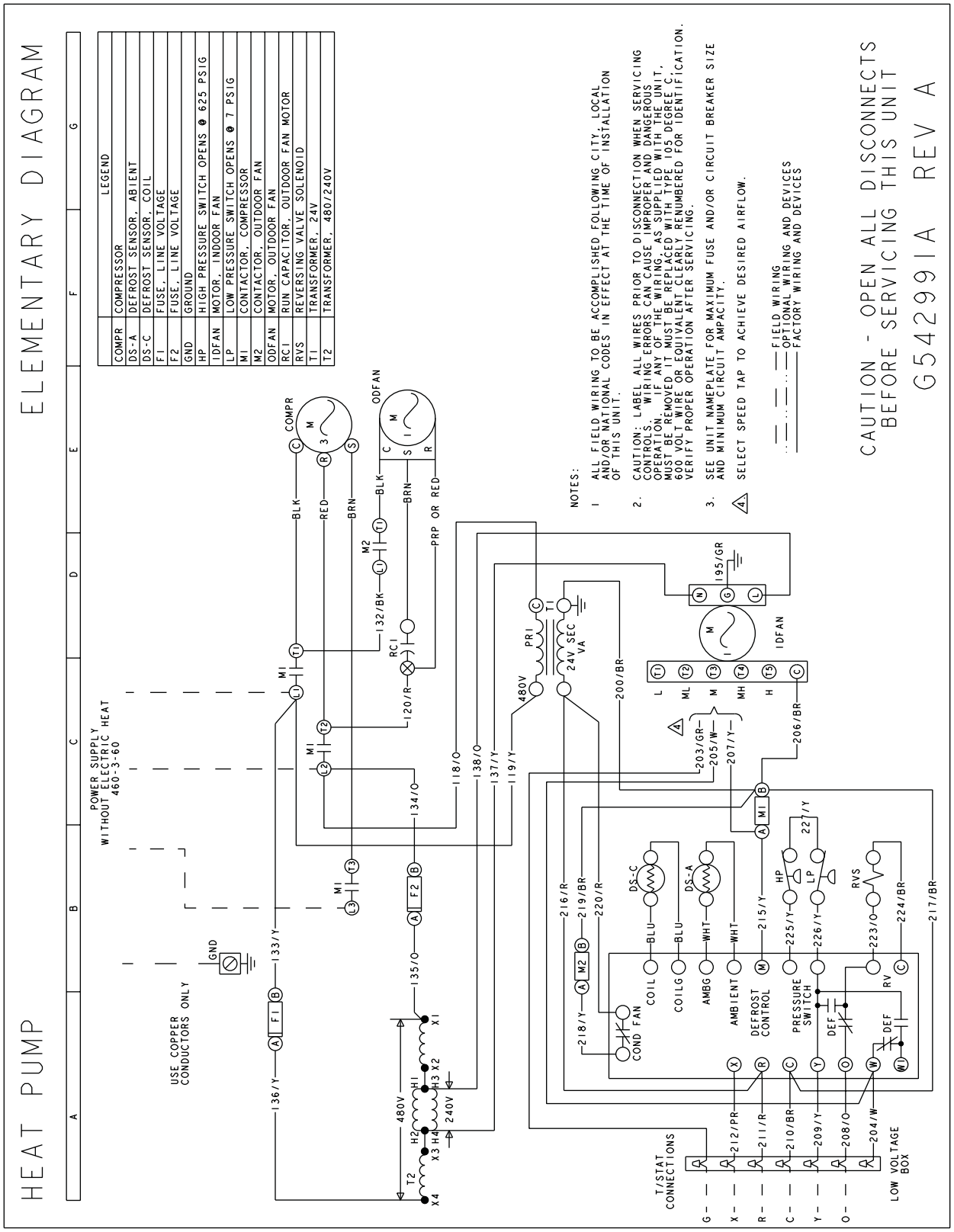
UQ024-060 Typical Heat Pump 208/230-1-60 volt Wiring Diagram



UQ036, 048 and 060 Typical Heat Pump 208/230-3-60 volt Wiring Diagram



UQ060 Typical Heat Pump 460-3-60 volt Wiring Diagram



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