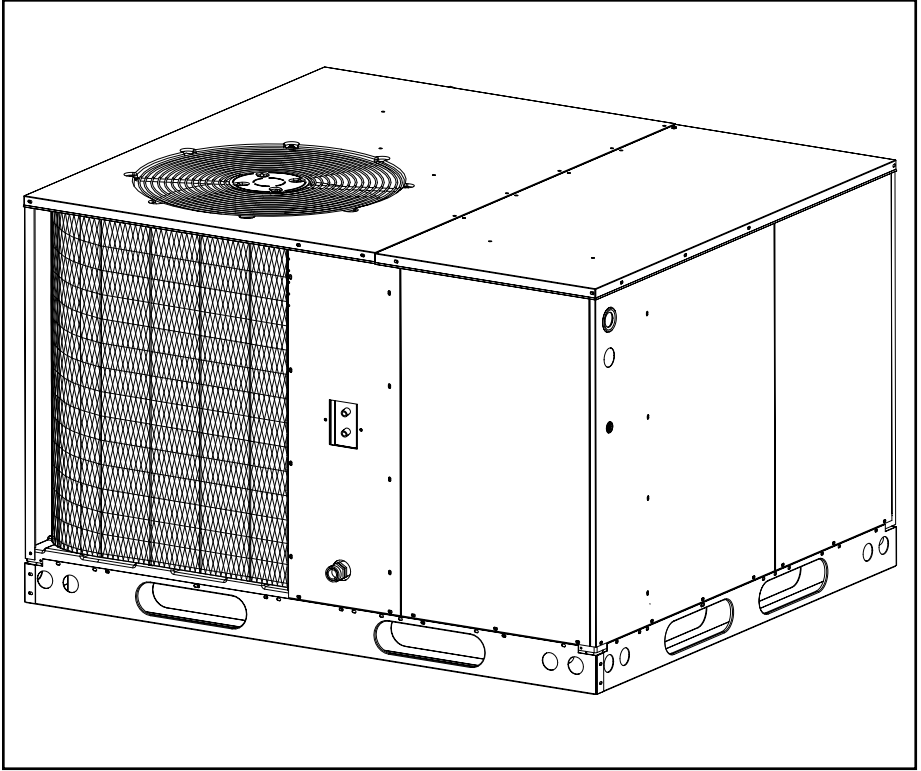


Single Package Heat Pump

Installation Instructions

460 Volt Q4 Series



IMPORTANT

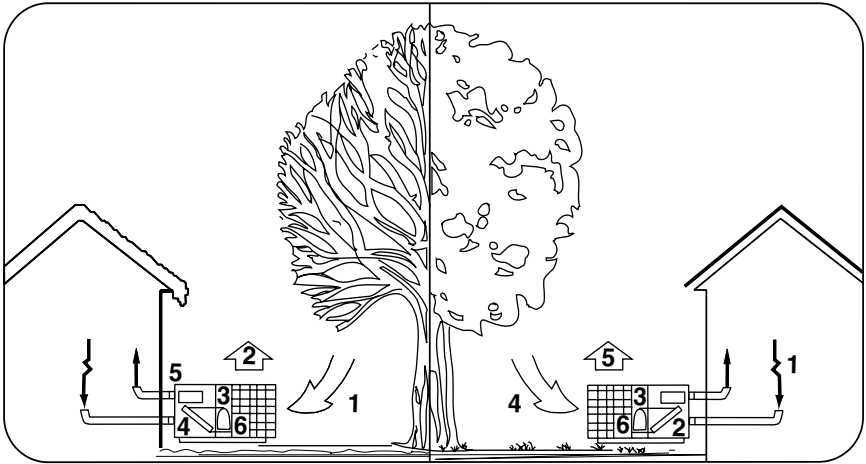
Read these instructions thoroughly before starting the installation. Follow all precautions and warnings contained within these instructions and on the unit.

These instructions are primarily intended to assist qualified individuals experienced in the proper installation of heating and/or air conditioning appliances. Some local codes require licensed installation/service personnel for this type equipment. All installations must be in accordance with these instructions and with all applicable national and local codes and standards.

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SECTION 1. OWNER INFORMATION



WINTER HEATING

SUMMER COOLING

1. Outdoor air enters the heat pump.
2. The cold, heat-transfer section (outdoor coil) extracts the heat from the air as the refrigerant evaporates from a liquid to a cold gas.
3. The refrigerant, compressed to a hot gas by the heat pump, carries the heat to the heat-transfer section (indoor coil).
4. The hot, heat-transfer section (indoor coil) releases the heat as the refrigerant condenses from a gas to a liquid.
5. The blower circulates the heat throughout the home via the supply duct.
6. The refrigerant returns to the outdoor coil and evaporates once again to absorb more heat.

1. Indoor air enters the return air duct.
2. The cold, heat-transfer section (indoor coil) extracts the heat from the air as the refrigerant evaporates from a liquid to a cold gas.
3. The refrigerant, drawn to the heat pump and compressed to a hot gas, carries the heat outdoors.
4. The hot, heat-transfer section (outdoor coil) releases the heat as the refrigerant condenses from a gas to a liquid.
5. The heat pump (outdoor fan) discharges the heat to the outside air.
6. The refrigerant returns to the indoor coil and evaporates once again to absorb more heat.

It is the sole responsibility of the homeowner to make certain that heat pump has been correctly set up and adjusted to operate properly.

NORDYNE warrants the heat pump to be free from defects in material or workmanship for a period of one year. A warranty certificate with full details is included with the heat pump. However, NORDYNE will not be responsible for any costs found necessary to correct problems due to improper setup, improper installation, adjustments, improper operating procedure on the part of the user, etc.

Some specific examples of service calls which are not included in the limited warranty are:

1. Correcting wiring problems in the electrical circuit supplying the heat pump.

2. Resetting circuit breakers or other switches.
3. Adjusting or calibrating of thermostat.

To avoid misunderstandings at a later date, carefully review these responsibilities with your dealer or service company.

The heat pump system will heat and cool your home and save your energy dollars.

During the summer, a heat pump cools a house by absorbing heat from within the house and exhausting it outdoors. During the winter, a heat pump heats a house by absorbing heat outdoors and exhausting it indoors. This is an efficient heating means because you pay for "moving" heat from outdoors to indoors, but do not pay to generate the heat.

OPERATING INSTRUCTIONS

To Operate Your Heat Pump For Cooling —

1. Set the thermostat system switch to COOL and the thermostat fan switch to AUTO. (See Figure 1)
2. Set the thermostat temperature selector to the desired cooling temperature. The outdoor unit fan, the indoor blower, and the compressor will all cycle on and off to maintain the indoor temperature at the desired cooling level.

NOTE: If the thermostat temperature level is re-adjusted, or if the thermostat system switch is re-positioned, the outdoor unit fan and the compressor may not start immediately. A protective timer circuit holds the compressor and the outdoor fan off for approximately six minutes following a previous operation or the interruption of the main electric power

To Operate Your Heat Pump For Heating —

1. Set the thermostat system switch for HEAT and the thermostat fan switch to AUTO. (See Figure 1)
2. Set the thermostat temperature selector to the desired heating temperature. The outdoor unit fan, the indoor blower, and the compressor will all cycle on and off to maintain the indoor temperature at the desired heating level.

NOTE: If the thermostat temperature level is re-adjusted, or if the thermostat system switch is re-positioned, the outdoor unit fan and the compressor may not start immediately. A protective timer circuit holds the compressor and the outdoor fan off for approximately six minutes following a previous operation or the interruption of the main electrical power.

Emergency Heat — Some thermostats will include a system switch position termed EM HT or AUX HT, etc. This is a back-up heating mode to be used only if there is a suspected problem. With the system switch set to EM HT, etc., the compressor and outdoor fan will be locked off and supplemental heat (electric resistance heating) will be used as a source of heat. Sustained use of electric resistance heat in place of the heat pump will result in an increase in electric utility costs.

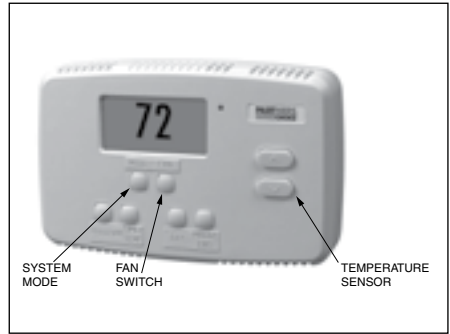


Figure 1. Typical Thermostat

Defrost — During cold weather heating operation, the outdoor unit will develop a coating of snow and ice on the heat transfer coil. This is normal and the unit will periodically defrost itself. During the defrost cycle, the outdoor fan will stop, while the compressor continues to run and heat the outdoor coil, causing the snow and ice to melt. During defrost, there may be some steam rise from the outdoor unit as the warm coil causes some melted frost to evaporate.

SPECIFICATIONS

Model Series Q4 Single Package Heat Pumps are designed for outdoor rooftop or ground level slab installations. The units are shipped ready for horizontal duct connections and are easily converted for down flow applications.

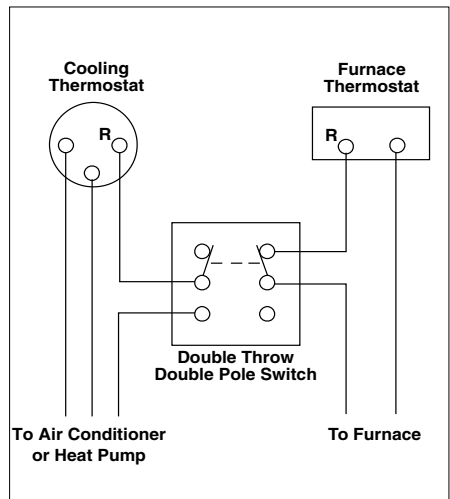


Figure 2. Thermostat Interlock System

All models are shipped from the factory with the following:

1. Zero clearance to combustibles
2. Multi-speed direct-drive blower.
3. Blower Speed Relay.
4. Horizontal or Down flow duct connections.

The unit dimensions are shown in **Figure 3**.

Optional field-installed electric heater kits are available in 9 kw and 15 kw heating capacities. A separate installation instruction document for the electric heaters and their application accompanies this one. A two stage heat 24VAC thermostat should be used with electric heater kits installed.

SAFETY CONSIDERATIONS

It is the responsibility of the installer to ensure that the installation is made in accordance with all applicable local and national codes.



WARNING:

Improper installation, service, adjustment, or maintenance may cause explosion, fire, electrical shock or other hazardous conditions which may result in personal injury or property damage. Unless otherwise noted in these instructions, only factory authorized kits or accessories may be used with this product. Noncompliance may void the unit's warranty.

Labels, Tags — When working with this equipment, follow all precautions in the literature, on tags, and on labels provided with the unit and/or approved field installed kits. The type of hazard and severity are described on each label or tag.

Pressures Within The System — This equipment contains liquid and gaseous refrigerant under high pressure. Installation or servicing should only be performed by qualified trained personnel thoroughly familiar with this type equipment.

INSTALLATION REQUIREMENTS

Equipment Check — Before beginning the installation, verify that the unit model is correct for the job. The unit model number is printed on the data label. All units have been securely packaged at the point of shipment. After unpacking the unit, carefully inspect it for apparent and concealed damage. Claims for damage should be filed with the carrier by the consignee.

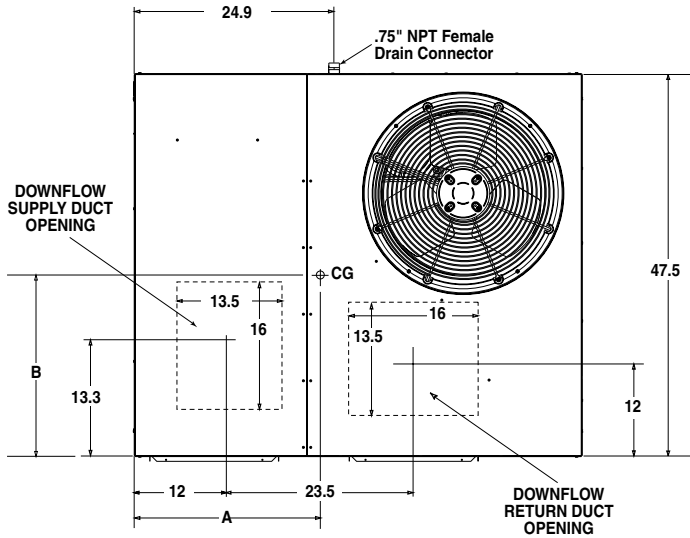
Requirements and Codes — The installer must comply with all local codes and regulations which govern this type equipment. Local codes and regulations take precedence over any recommendations contained in these instructions. All electrical wiring must be made in accordance with local codes and regulations and with the National Electric Code (ANSI/NFPA 70) or in Canada the Canadian Electric Code Part 1 CSA C.22.1. Air Ducts must be installed in accordance with the standards of the National Fire Protection Association “Standards for Installation of Air Conditioning and Ventilation Systems” (NFPA 90A), “Standard for Installation of Residence Type Warm Air Heating and Air Conditioning Systems” (NFPA 90B), these instructions and all applicable local codes.

NFPA publications are available by writing:

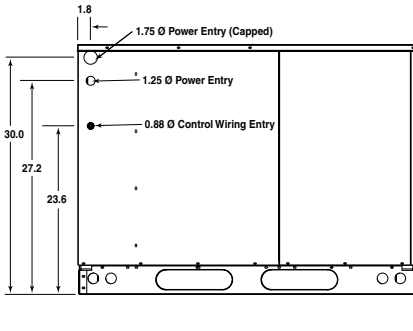
National Fire Protection Association
Batterymarch Park
Quincy, Maine 02269

Unit Location — The Q4 series heat pump is designed only for outdoor installations. Choosing the location of the unit should be based on minimizing the length of the supply and return ducts. Consideration should also be given to availability of electric power, service access, noise, and shade. Sufficient clearance for unobstructed airflow through the outdoor coil must be maintained in order to achieve rated performance. **See Figure 4** for minimum clearances to obstructions.

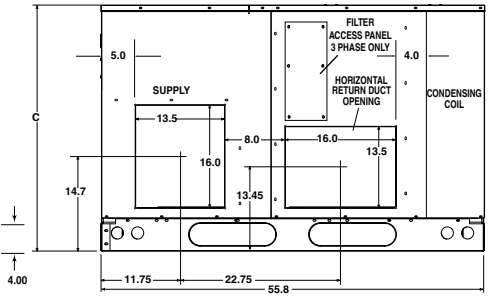
Air Filter Requirements — Three phase units “Only” are supplied from the factory with an internal filter rack assembly. Air filters are not supplied; a suitable air filter must be installed in the unit or in the return air system for all units.



Top View



Side View



Back View

Model No.	Unit Weight	Center of Gravity		Height (in inches) C	
		A	B	with base rails	without base rails
				Q4SA-036	340
Q4SA-048	345	28.0	26.0	35	31.3
Q4SA-060	400	29.5	26.5	39	35.3

Figure 3. Dimensions

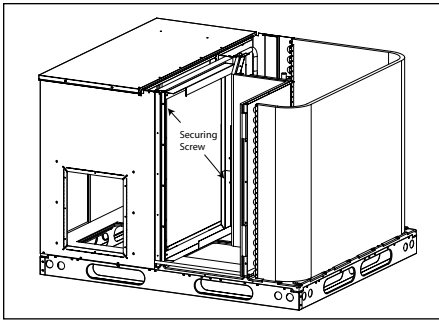


Figure 3a. Internal Filter Rack Location

See **Table 1a** for internal filter size requirements. When utilizing an Economizer or Fresh Air Equipment, the factory installed filter rack assembly must be removed prior to installation. A suitable Air filter must be installed in the return air system. Air filter pressure drop must not exceed 0.08 inches WC @300 fpm. Air filter(s) must be installed in the return air ductwork ahead of the evaporator coil of this unit. All return air to this unit must pass through the filter(s) before entering this unit. (See Routine Maintenance for Installation/Removal of air filters).

Removal of Internal Filter Rack — First remove the Return Air Panel from the unit. Remove the height adjustment screw from the inside of the rack, and the (1) screw securing the assembly to the coil located on the left leg of the rack. The assembly can easily be collapsed and removed from the unit. See **Figure 3a** for filter rack securing screw locations.

For single phase downflow installations only, an internal filter accessory kit can be ordered. For horizontal installations, the air filter system must be installed in the return air ductwork. All return air to this unit must pass through the filter(s) before entering the evaporator coil.

Condensate Drain — Condensate is removed from the unit through the 3/4" female pipe fitting located on the front side of the unit. (See **Figure 5.**) Install a 2 inch condensate trap in the drain line of the same size and prime with water. When connecting rigid drain line, hold the female fitting with a wrench to prevent twisting. **Do not over tighten!** Refer to local codes and restrictions for proper condensate disposal requirements.

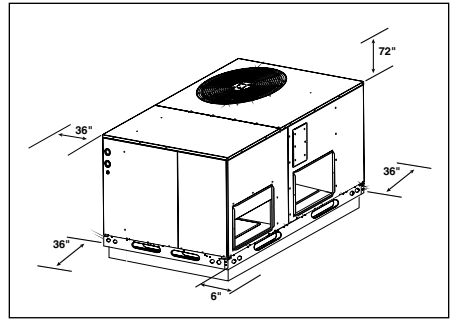


Figure 4. Minimum Clearances

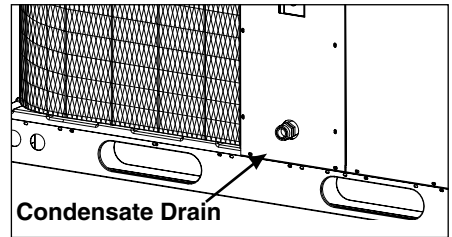


Figure 5. Condensate Drain

UNIT INSTALLATION

Ground Level — When installing the unit at ground level, provide a concrete mounting pad separate from the building foundation. The pad must be level to insure proper condensate disposal and strong enough to support the unit's weight. Refer to **Figure 3**. Make sure the slab is a minimum of 2" above the grade and in an area that drains well (See **Figure 6**).

Rigging and Hoisting — The unit should be lifted using slings and spreader bars. The spreader bars are necessary to prevent damaging the top of the unit's cabinet. Make sure that the lifting equipment is adequate for the load. Refer to **Figure 3** for unit weights. Keep the unit in an upright position at all times. **For rooftop installations, remove and discard the two supports attached beneath the unit.**

WARNING:

To avoid the risk of property damage or personal injury; it is the rigger's responsibility to insure that whatever means are used to hoist the unit are safe and adequate.

CAUTION:

All panels must be securely in place when rigging and hoisting.

The rigging must be located outside the unit's center of gravity. Refer to **Figure 3** for center of gravity locations.

Rooftop — For rooftop installations use the appropriate accessory roof curb and follow all instructions included with it. Make sure the two supports beneath the unit have been removed. Locate the unit according to local building codes and ordinances. The curb must be level to insure proper condensate drainage (**See Figure 7**).

The roof must be capable of handling the weight of the unit. (**See Figure 3**) for unit weights. Reinforce the roof if required.

AIR DUCTS

This unit is designed only for use with a supply and return duct. Air ducts should be installed in accordance with the standards of the National Fire Protection Association "Standard for Installation of Air Conditioning Systems" (NFPA 90A), "Standard for Installation of Residence Type Warm Air Heating and Air Conditioning Systems" (NFPA 90B), and all applicable local codes.

Design the duct work according to methods described by the National Warm Air Heating and Air Conditioning Association (ACCA). The ducts must be properly sized not to exceed .2" w.c. pressure drop at 400 scfm per nominal ton of cooling capacity.

Duct work should be attached directly to the unit flanges for horizontal applications. On roof curb installations the ducts must be attached to the curb hangers, not the unit.

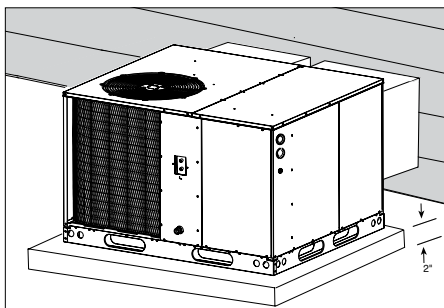


Figure 6. Ground Level Installation

Unconditioned Spaces— All duct work passing through unconditioned space must be properly insulated to minimize duct losses and prevent condensation. Use insulation with an outer vapor barrier. Refer to local codes for insulation material requirements.

Acoustical Duct Work — Certain installations may require the use of acoustical lining inside the supply duct work. Acoustical insulation must be in accordance with the current revision of the Sheet Metal and Air Conditioning Contractors National Association (SMACNA) application standard for duct liners. Duct lining must be UL classified batts or blankets with a fire hazard classification of FHC-25/50 or less. Fiber duct work may be used in place of internal duct liners if the fiber duct work is in accordance with the current revision of the SMACNA construction standard on fibrous glass ducts. Fibrous duct work and internal acoustical lining must be NFPA Class 1 air ducts when tested per UL Standard 181 for Class 1 ducts.

Horizontal to Down flow Conversion

— The unit is shipped ready for horizontal duct connections. If down flow ducts are required, the unit must be converted following the steps below for both the supply and return ducts.

- 1) Locate the duct cap inside the duct openings and remove the screw holding it in place.
- 2) Lift the cap out of the unit. (The cap can be pushed up from the bottom by reaching through the fork slot).
- 3) Cover the horizontal duct opening with the cap. The insulation will be on the indoor side.
- 4) Fasten the cover with screws and seal to prevent air leakage.

Clearance — The Q4 Series is approved for 0 inch clearance.

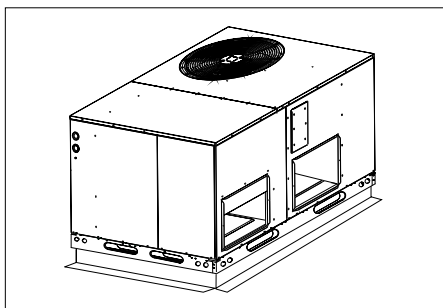


Figure 7. Roof Top Installation

ELECTRICAL WIRING

General — Electrical power wiring must be made in accordance with all applicable local codes and ordinances, and with the current revision of the National Electric Code NFPA 70 or in Canada CSA C.22.1 - Canadian Electrical Code Part 1. If any of the original wire as supplied with the unit must be replaced, it must be replaced with material of the same gage and temperature rating.

Line Voltage — Before proceeding with the electrical connections, make certain that the voltage, frequency, and phase of the supply source are the same as those specified on the unit rating plate. Also verify that the service provided by the utility is sufficient to handle the additional load imposed by this equipment.



WARNING:

To avoid the risk of electrical shock, personal injury, or death, disconnect all electrical power to the unit before performing any maintenance or service. The unit may have more than one electrical power supply.

See **Figure 8** or the unit wiring label for proper high and low voltage wiring. Make all electrical connections in accordance with all applicable codes and ordinances.

Use a separate branch electrical circuit for this unit. A means of electrical disconnect must be located within sight of and readily accessibility to the unit. Internally mounted circuit breakers are available as field installed options. These circuit breakers can be used as an electrical disconnect.

Provide power supply (or supplies) for the unit in accordance with the unit wiring diagram, and the unit rating plate. Connect the line-voltage leads to the corresponding terminals on the contactor (or the circuit breaker when the field installed circuit breaker kits are used) inside the control compartment. Use only copper wire for the line voltage power supply to this unit. Use proper code agency listed conduit and a conduit connector for connecting the supply wires to the unit and for obtaining proper grounding. Grounding may also be accomplished by using the grounding lug provided in the control box.



WARNING:

The unit cabinet must have and uninterrupted or unbroken electrical ground to minimize personal injury if an electrical fault should occur. This ground may consist of electrical wire or approved conduit when installed in accordance with existing national or local codes.

Blower Speed — The blower speed is preset at the factory for operation at the same speed for heating and cooling. For optimum system performance and comfort, it may be necessary to change the factory set speed. To change the blower speed:

1. Disconnect all electrical power to the unit and remove the service panel.
2. Cut the wire tie holding the motor lead bundle. See **Figure 9** for detailed information on the appropriate model and speed desired.



CAUTION:

To avoid personal injury or property damage, make certain that the motor leads cannot come into contact with any uninsulated metal components of the unit.

Check all factory wiring per the unit wiring diagram and inspect the factory wiring connections to be sure none loosened during shipping or installation.

Low Voltage Connections

Room Thermostat — Several options are available for a room thermostat depending on the accessories installed with the unit. The available thermostats recommended for use with the Q4 units are listed with the accessories in Table 5. Select a thermostat which operates in conjunction with the installed accessories. The thermostat should be mounted about five feet above the ground on an inside wall. The thermostat should be kept away from drafts, slamming doors, lamps, direct sunlight, or in line with the supply air flow.

To install the thermostat:

1. Position the sub base on an inside wall and mark the mounting holes and thermostat cable openings.
2. Cut out the cable opening and route the thermostat cable from the unit's low voltage compartment to the thermostat location. The thermostat cable is supplied by the installer.
3. Connect the cable leads to the sub base or thermostat terminals and to the unit's low voltage pigtails as shown in **Figure 10**. A system wiring diagram is also provided on the inside of the control panel cover and in **Figure 8** of these installation instructions.
4. Secure sub base or thermostat to the wall using screws provided with the thermostat.
5. If sub base is used, install the correct thermostat housing to sub base.
6. Refer to thermostat instruction sheet for complete detailed mounting information.

Defrost Cycle Timer — The defrost cycle timer controls the time interval of the hot gas defrost after the defrost sensor closes. It is located in the lower left corner of the defrost control board on the low voltage side of the control box. Three interval settings are available: 30 minutes, 60 minutes, and 90 minutes. Time setting selection is dependent on the climate where the unit is being installed.

Example 1. Dry climate of Southern Arizona. A 90 minute setting is recommended.

Example 2. Moist climate of Seattle, Washington. A 30 minute setting is recommended.

To set the cycle timer, place the timing pin on the defrost control board to the desired time interval post.

Note: All units are shipped from the factory with the default time setting of 30 minutes.

START UP AND SYSTEM CHECK

Pre-Start Check List

- Verify that the unit is level to allow proper condensate drainage.
- Verify that there is free airflow to and from the outdoor coil and that all clearance requirements are met.
- Verify that the duct work is sealed to prevent air leakage.
- Verify that the line voltage power leads are securely connected and the unit is properly grounded.

- Verify that the low voltage wires are securely connected to the correct leads on the low voltage terminal strip.
- Verify that all exterior panels are replaced and securely fastened.
- Verify that the outdoor fan turns freely.
- Verify that the power supply branch circuit overcurrent protection is sized properly.
- Verify that the thermostat is wired correctly. The thermostat function switch should be set to "Off" and the thermostat fan switch should be set to "Auto."

Start-Up Procedure

Close all electrical disconnects to energize the system.



WARNING:

If the unit is equipped with a crankcase heater, allow 24 hours prior to continuing the start up procedures to allow for heating of the refrigerant compressor crankcase. Failure to comply may result in damage and could cause premature failure of the system. This warning should be followed at initial start up and any time the power has been removed for 12 hours or longer.

Air Circulation — Leave the thermostat system switch set to "Off" and set the thermostat fan switch to "On." The blower motor should run

4 and 5 Ton Blower Wiring

Blower Leads	Blower Speed		
	Low	Medium	High
Red	BR T3	ISOLATE	ISOLATE
Black	TB T2	TB T1	BR T3
Gray	TB T2	TB T1	ISOLATE
Blue	TB T1	BR T3	ISOLATE
Violet	TB T1	ISOLATE	ISOLATE

BR T () - Blower Relay Terminal (number)

TB T () - Terminal Block Terminal (number)

3 Ton Blower Wiring

Blower Leads	Blower Speed		
	Low	Medium	High
Red	BR T3	ISOLATE	ISOLATE
Black	TB T1	TB T1	BR T3
Gray	TB T1	TB T1	ISOLATE
Blue	ISOLATE	BR T3	ISOLATE
Violet	ISOLATE	ISOLATE	ISOLATE

BR T () - Blower Relay Terminal (number)

TB T () - Terminal Block Terminal (number)

Figure 9. Motor Lead Connection

continuously. Check for air delivery at the register(s). Ensure that there are no obstructions at the registers or in the duct work. Set thermostat fan switch to "Auto."

System Cooling

1. Set the thermostat system switch to "Cool" and the thermostat fan switch to "Auto". Gradually lower the thermostat temperature switch below room temperature and observe that the blower, compressor, and fan energize. Check that air cooler than room temperature is being discharged at the register. Listen for any unusual noises.
2. After allowing the unit to run for several minutes, set the temperature selector above room temperature. The fan and compressor cycles off with the thermostat. The blower should also stop unless fan switch is set to "ON" position.

System Heating — Set the system thermostat switch to HEAT and set the thermostat fan switch to AUTO. Verify that the compressor, outdoor fan, and blower are energized. Check for warm air at the supply registers.

DEFROST CONTROL BOARD OPERATION AND TESTING

1. Terminals "R"-"C" must have 24±V present between them in order for the time delay and defrost sequences to be operational.
2. Jumper the "T2"-"DFT" test pins. This will indicate to the board that the defrost T-stat is closed(if the compressor is running). Defrost T-stat is closed at 32° or below and is open at 68° or above. But it's state is unknown if the temperature is between 32°F and 68°F. The defrost thermostat tells the board whether a defrost cycle needs to be started or terminated. With the DFT closed the unit will run for 30/60/90 minutes in heat mode and then defrost the outdoor coil. The defrost will turn off the outdoor fan, turn on the compressor and raise the coil temperature to 68°F. This will open the DFT and terminate the defrost. If the DFT does not open the defrost will end after 10 minutes.
3. Defrost board speed-up. With compressor running in heat mode, next jump the "Test" pin to "C" on terminal strip. This will initiate a defrost test in 5, 10 or 15 seconds (This is determined by the 30, 60 or 90 minute defrost pin settings. The factory setting will be 30 minutes). Note that this will bypass the compressor off delay when the unit goes into

defrost test and if left in defrost test, the delay will be bypassed when the test is terminated by the processor. If the jumper is removed before the test is over the processor will perform the remainder of a normal defrost. See step 2 above.

4. Remove the jumpers.

Note: The delay/no-delay pin concerns compressor operation during defrosts. The default setting is delay. Reciprocating compressors should only use this setting in conjunction with an approved hard start kit. Scroll compressors that have noise issues while going into or coming out of defrost should use this 30 second delay to reduce the defrost noise. To switch from no-delay to delay remove the pin from the "no-delay" pin location and shift it to the "delay" pin location.

Speed up changes:

Manually initiating a defrost will cause the compressor to run continually when entering defrost.

Normal defrost operation:

To test normal defrost operation when the temperature is above 35°F, jumper "R" to "DFT" on the 624656 board and allow the unit to run for 30 minutes. Defrost will continue until the "R" to "DFT" jumper is removed or for 10 minutes. Remove the jumper.

The 5 minute time delay feature can be shortened 1 time to 1 second by jumping the "Test" to "C" terminal. Remove the jumper and repeat as desired.

Note: If jumper is left on the "Test" to "common" pins permanently, the defrost cycle will become inoperable.

Defrost Test Procedure for 624656

1. Jumper "T2" to "DFT" at the test terminals.
2. With unit running in heat mode, short the "TEST" terminal to the common terminal near it. This will speed up the board and cause it to enter defrost mode in 5/10/15 seconds depending on the defrost time selection. Compressor delay will not function during speed-up.
3. This test will end in 5 seconds if the "TEST"-common short is not removed.
4. Remove both the short and the "T2" to "DFT" jumper to terminate the defrost cycle. The 30 second compressor delay should operate normally.
5. Test is complete, reset thermostat to home owner preference.

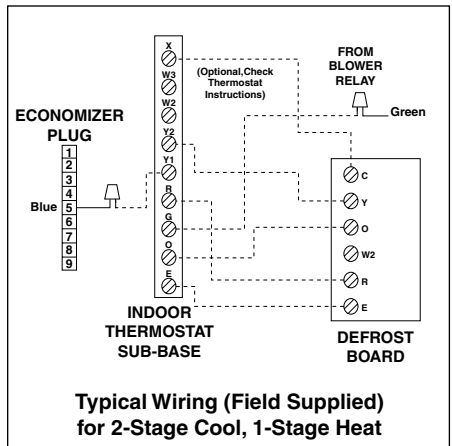
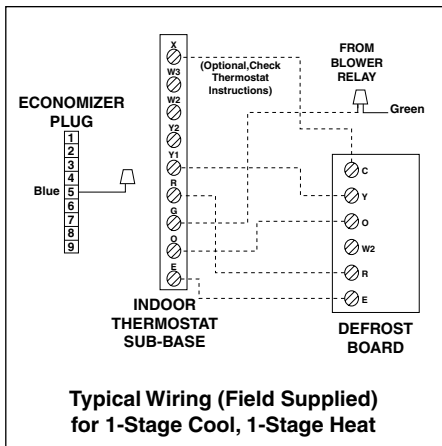


Figure 10. Typical Thermostat Connection

		External Static Pressure Drop - inches water column							
Model	Speed	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
Q4SA-036	High	1600	1510	1410	1310	1200	1070	930	760
	Medium	1410	1330	1250	1150	1050	940	820	670
	Low	1130	1070	1000	930	850	760	650	530
Q4SA-048	High	2200	2140	2070	2000	1930	1850	1770	1690
	Medium	1940	1890	1830	1760	1700	1630	1560	1490
	Low	1560	1510	1460	1410	1360	1310	1250	1200
Q4SA-060	High	2200	2140	2070	2000	1930	1850	1770	1690
	Medium	1940	1890	1830	1760	1700	1630	1560	1490
	Low	1560	1510	1460	1410	1360	1310	1250	1200

- Speed set at factory

Table 1. Q4 Blower Curves

UNIT MAINTENANCE



WARNING:

To avoid risk of electrical shock, personal injury, or death, disconnect all electrical power to the unit before performing any maintenance or service. The unit may have more than one electrical supply.

Refrigerant Charging — The Q4 packaged heat pumps are fully charged at the factory . The system refrigerant charge can be checked and adjusted through the service ports provided in the front panel. Use only gauge lines which have a “Schrader” depression device present to actuate the valve. Refrigerant charging must be done by qualified personnel familiar with safe and environmentally responsible refrigerant handling procedures.



WARNING:

The Q4 Single Packaged Heat Pumps are shipped fully charged and ready for installation. When a system is installed according to these instructions, no refrigerant charging is required. If repairs make it necessary for evacuation and charging, it should only be done by qualified, trained personnel thoroughly familiar with this equipment. Some local codes require licensed installation/ service personnel to service this type of equipment. Under no circumstances should the owner attempt to install and/ or service this equipment. Failure to comply with this warning could result in property damage, personal injury, or death.



CAUTION:

Use care when removing parts from this unit. Personal injury can result from sharp metal edges present in all equipment of sheet metal construction.

UNIT SIZE	INTERNAL FILTER SIZE
R4GA 024-042, R4BC 024 P4SA 036, P4SA 048 P4SC 036, Q4SA 036	(2) 14" x 25" x 1" or (2) 14" x 25" x 2"
R4GA 048-060, R4GC 030-042 P4SA 060, P4SC 048-060, Q4SA 048-060, Q4SC-048-060	(2) 16" x 25" x 1" or (2) 16" x 25" x 2"
R4GC 048-060 R4GM 024-072 Q4SC 048-060	(2) 18" x 25" x 1" or (2) 18" x 25" x 2"

Table 1a. Internal Filter Size Requirements.

Routine Maintenance — Proper maintenance is important to achieve optimum performance from the heat pump. The ability to properly perform maintenance on this equipment requires certain mechanical skills and tools. If you do not possess these skills, contact your dealer for maintenance. Consult your local dealer about the availability of maintenance contracts. At a minimum, routine maintenance should include the following:

1. Inspect and clean or replace air filters at the beginning of each heating and cooling season, or more frequently if required.
2. Inspect the condensate drain and outdoor coil at the beginning of each cooling season. Remove any debris. Clean the outdoor coil and louvers as necessary using a mild detergent and water. Rinse thoroughly with water.
3. Inspect the electrical connections for tightness at the beginning of each heating and cooling season. Service as necessary.



CAUTION:

The unit should never be operated without a filter in the return air system. Replace disposable filters with the same type and size.

Heat Pump in Heating

Q4SA-036

OUTDOOR TEMPERATURE (DEG. F)																			
0		10			20			30			40			50			60		
Suc. Press.	Disch. Temp.	Disch. Press.	Suc. Temp.	Suc. Press.	Disch. Temp.	Disch. Press.	Suc. Temp.	Suc. Press.	Disch. Temp.	Disch. Press.	Suc. Temp.	Suc. Press.	Disch. Temp.	Disch. Press.	Suc. Temp.	Suc. Press.	Disch. Temp.		
17	123	138	22	135	138	27	146	138	32	158	137	41	164	149	54	190	171	194	
18	130	136	23	141	136	28	151	136	33	161	135	42	171	146	55	197	167	187	
19	137	134	24	147	134	29	156	134	34	165	133	43	178	143	56	204	162	181	
20	144	132	25	152	132	30	161	132	35	169	131	44	185	140	57	211	158	175	
21	151	130	26	158	130	31	165	130	36	172	129	45	192	137	58	218	153	169	
22	158	128	27	164	128	32	170	128	37	176	127	46	199	134	59	225	149	163	
23	165	126	28	170	126	33	175	126	38	180	125	47	206	132	60	232	144	157	

Q4SA-048

OUTDOOR TEMPERATURE (DEG. F)																			
0		10			20			30			40			50			60		
Suc. Press.	Disch. Temp.	Disch. Press.	Suc. Temp.	Suc. Press.	Disch. Temp.	Disch. Press.	Suc. Temp.	Suc. Press.	Disch. Temp.	Disch. Press.	Suc. Temp.	Suc. Press.	Disch. Temp.	Disch. Press.	Suc. Temp.	Suc. Press.	Disch. Temp.		
14	129	134	20	143	135	25	158	135	31	172	136	39	178	141	51	200	152	162	
15	136	132	21	149	133	26	162	133	32	175	134	40	185	138	52	207	147	156	
16	143	130	22	155	131	27	167	131	33	179	132	41	192	136	53	214	143	150	
17	150	128	23	161	129	28	172	129	34	183	130	42	199	133	54	221	138	144	
18	157	126	24	167	127	29	177	127	35	186	128	43	206	130	55	228	134	137	
19	164	124	25	173	125	30	181	125	36	190	126	44	213	127	56	235	129	131	
20	171	122	26	179	123	31	186	123	37	194	124	45	220	124	57	242	125	125	

* Note: All pressures are listed in psig. And all temperatures in deg. F.



- Shaded Boxes indicate flooded conditions



- Rated Design Values. Suction Pressure will be lower than design value if indoor air flow, entering dry bulb, or entering wet bulb temperatures are lower than design.

- Discharge temperatures greater than charted values indicates a refrigerant undercharge.


Table 2. Q4SA Heating Charging Charts


Heat Pump in Heating

Q4SA-060

		OUTDOOR TEMPERATURE (DEG. F)																				
		0			10			20			30			40			50			60		
Suc. Press.	Disch. Temp.	Disch. Press.	Suc. Temp.	Disch. Temp.	Disch. Press.	Suc. Temp.	Disch. Temp.	Disch. Press.	Suc. Temp.	Disch. Temp.	Disch. Press.	Suc. Temp.	Disch. Temp.	Disch. Press.	Suc. Temp.	Disch. Temp.	Disch. Press.	Suc. Temp.	Disch. Temp.	Disch. Press.	Suc. Temp.	
12	122	126	19	139	127	26	156	127	33	172	128	41	179	135	51	199	148	61	220	161		
13	129	124	20	145	125	27	160	125	34	176	126	42	186	132	52	206	143	62	227	155		
14	136	122	21	151	123	28	165	123	35	180	124	43	193	129	53	213	139	63	234	149		
15	143	120	22	156	121	29	170	121	36	183	122	44	200	126	54	220	134	64	241	143		
16	150	118	23	162	119	30	175	119	37	187	120	45	207	123	55	227	130	65	248	136		
17	157	116	24	168	117	31	179	117	38	191	118	46	214	120	56	234	125	66	255	130		
18	164	114	25	174	115	32	184	115	39	194	116	47	221	118	57	241	121	67	262	124		

* Note: All pressures are listed in psig. And all temperatures in deg. F.

 - Shaded Boxes indicate flooded conditions

 - Rated Design Values. Suction Pressure will be lower than design value if indoor air flow, entering dry bulb, or entering wet bulb temperatures are lower than design.

- Discharge temperatures greater than charted values indicates a refrigerant undercharge.

Table 2a. Q4SA Heating Charging Charts

Heat Pump in Cooling

Q4SA-036

OUTDOOR TEMPERATURE (°F)																	
		70		75		80		85		90		95		100		105	
Suct. Press.	Disch. Temp.	Disch. Press.	Disch. Temp.	Disch. Press.	Disch. Temp.	Disch. Press.	Disch. Temp.	Disch. Press.	Disch. Temp.	Disch. Press.	Disch. Temp.	Disch. Press.	Disch. Temp.	Disch. Press.	Disch. Temp.	Disch. Press.	Disch. Temp.
72	189	153															
74	190	167	204	158													
76	190	184	205	170	219	158	230	155	242	156							
78	191	201	206	184	221	172	234	160	245	164	256	160					
80	192	218	208	198	222	185	236	172	249	170	260	166	271	163			
82			209	213	224	198	238	187	252	178	265	171	275	169	286	167	
84					226	210	240	198	254	189	267	181	280	175	291	173	
86								256	200	269	191	282	184	295	178		
88												285	194	298	187		
90													287	203	300	196	
92															303	205	

Q4SA-048

OUTDOOR TEMPERATURE (°F)																	
		70		75		80		85		90		95		100		105	
Suct. Press.	Disch. Temp.	Disch. Press.	Disch. Temp.	Disch. Press.	Disch. Temp.	Disch. Press.	Disch. Temp.	Disch. Press.	Disch. Temp.	Disch. Press.	Disch. Temp.	Disch. Press.	Disch. Temp.	Disch. Press.	Disch. Temp.	Disch. Press.	Disch. Temp.
68	188	122															
70	191	123	204	135													
72	192	140	207	139	222	137	234	146	248	152							
74	192	157	208	154	224	151	239	147	252	160	266	160					
76	193	174	210	168	226	164	241	160	257	164	270	166	284	167			
78			211	182	227	177	243	174	259	172	274	171	288	173	302	174	
80					229	190	245	185	261	183	276	181	292	180	307	180	
82								263	193	279	191	297	199	310	188		
84												297	199	312	197		
86												299	208	315	206		
88														317	215		

* Note: All pressures are listed in psig. And all temperatures in deg. F.

- Shaded Boxes indicate flooded conditions

- Rated Design Values. Suction Pressure will be lower than design value if indoor air flow, entering dry bulb, or entering wet bulb temperatures are lower than design.

- Discharge temperatures greater than charted values indicates a refrigerant undercharge.

Table 3. Q4SA Cooling Charging Charts

Heat Pump in Cooling

Q4SA-060

Suct. Press.		OUTDOOR TEMPERATURE (°F)															
		70		75		80		85		90		95		100		105	
		Disch. Press.	Disch. Temp.	Disch. Press.	Disch. Temp.	Disch. Press.	Disch. Temp.	Disch. Press.	Disch. Temp.	Disch. Press.	Disch. Temp.	Disch. Press.	Disch. Temp.	Disch. Press.	Disch. Temp.	Disch. Press.	Disch. Temp.
68	192	157															
70	193	165	208	164													
72	194	182	210	172	226	164	239	165	252	167							
74	195	199	211	187	227	178	243	168	256	175	269	171					
76	195	216	213	201	229	191	245	181	260	180	273	178	287	175			
78	195	231	214	215	231	204	247	195	262	188	278	183	291	181	304	179	
80					232	216	249	207	265	199	280	193	295	188	309	185	
82									267	210	282	203	298	197	313	192	
84													300	206	315	201	
86													303	216	318	210	
88															320	219	

* Note: All pressures are listed in psig. And all temperatures in deg. F.

- Shaded Boxes indicate flooded conditions

- Rated Design Values. Suction Pressure will be lower than design value if indoor air flow, entering dry bulb, or entering wet bulb temperatures are lower than design.

- Discharge temperatures greater than charted values indicates a refrigerant undercharge.

Table 3a. Q4SA Cooling Charging Charts

Q4 ACCESSORIES	
Description	Part Number
Roof Curb (8")	547830
Roof Curb (14")	547831
Manual Fresh Air Damper	547832
Economizer, downflow	547833
Supply/return transition, 16"	547834
Supply/return transition, 18"	547835
Concentric diffuser, flush 16"	547836
Concentric diffuser, flush 18"	547837
Concentric diffuser, step down 16"	547838
Concentric diffuser, step down 18"	547839
Motorized Fresh Air Damper	547840
Economizer, horizontal (special order)	547841
Power Exhaust, downflow economizer (special order)	547842
Power Exhaust horizontal economizer (special order)	547843
Hail guard 30x76 (special order, see Note 1)	547845
Hail guard 34x76 (special order, see Note 2)	547846
Filter Kit, Downflow (See Note 1)	547887
Filter Kit, Downflow (See note 2)	547888
Filter Rack, Downflow	547885
T-stat, HP, 2 stage htg/1 stage cool, ("M" brand)	912931
T-stat, HP, 2 stage htg/1 stage cool, ("I" brand)	912929
T-stat, HP, 2 stage htg/1 stage cool, manual ("M" brand)	912932
T-stat, HP, 2 stage htg/1 stage cool, manual ("I" brand)	912930
T-stat, AC, 2 stage htg/1 stage cool, ("T,P,F" brand)	917004
T-stat, HP, 2 stage htg/1 stage cool, ("T,P,F" brand)	917005
12" Flex duct adapter kit	913811
14" Flex duct adapter kit	913812
12" Flex duct adapter kit & P-Trap	913813
14" Flex duct adapter kit & P-Trap	913814
Universal Hard Start Kit	912933
Low Pressure Switch Kit	913551
High Pressure Switch Kit	913550
Low Ambient Kit	913770
P-Trap Kit	913810
Outdoor Thermostat Kit	913852
Circuit Breaker Kit - Single Phase	913554
Circuit Breaker Kit - Three Phase	913740
4-pole single circuit adapter kit (Single Phase Units Only)	913350
6-pole single circuit adapter kit (Single Phase Units Only)	913556

Note 1: Q4SA-036()

Note 2: Q4SA-048(), Q4SA-060(), Q4SC-036()

Note 3: Q4SC-048K, Q4SC-060K

Table 4. Field Installed Accessory Kits

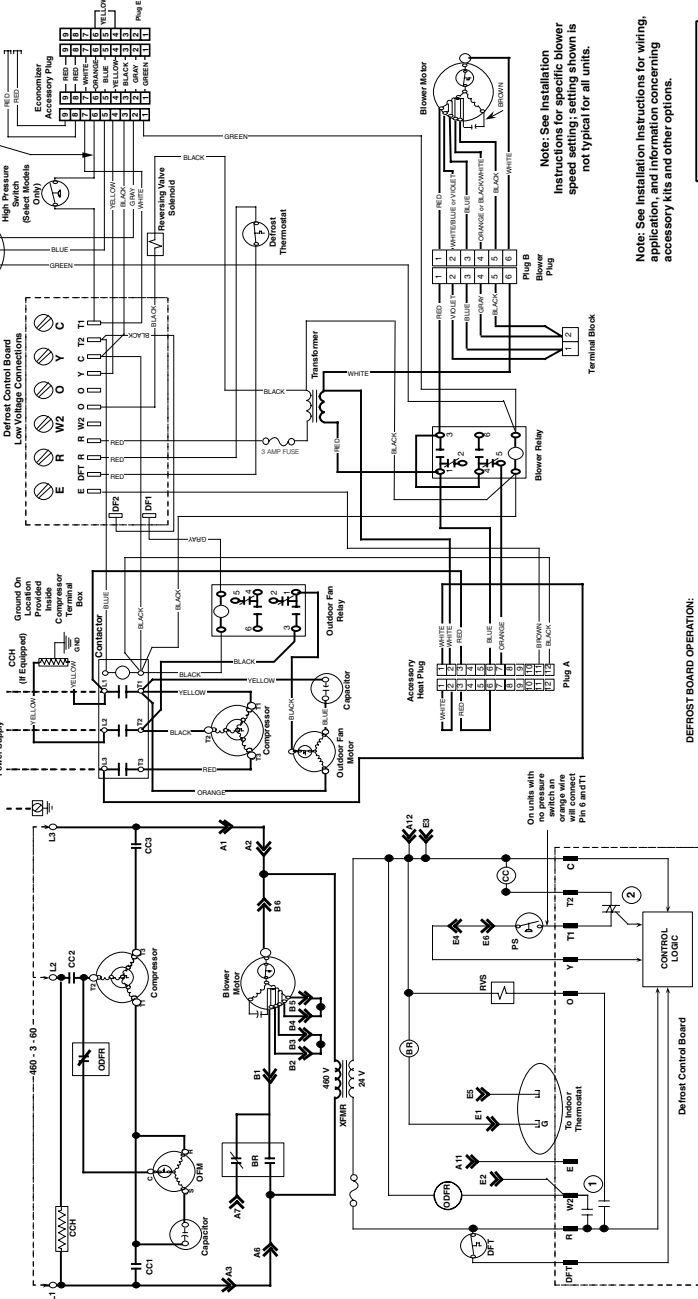
Convertible Packaged Heat Pump

460 Volt

Three Phase

60 Hz

- NOTES:**
1. Disconnect all power before servicing.
 2. For supply connections use copper conductors only.
 3. If any of the original wire as supplied with the furnace must be replaced, it must be replaced with wiring material having a temperature rating of at least 105° C.
 4. For supply wire ampacities and overcurrent protection, see unit rating plate.



Field Wiring

---	Field Wiring
---	Factory Wiring
---	Low Voltage
---	High Voltage

Note: See installation instructions for wiring, application, and information concerning accessory kits and other options.

Note: See installation instructions for specific blower speed setting; setting shown is not typical for all units.

DEFROST BOARD OPERATION:

1. CLOSURES DURING DEFROST. RATING: 1 A MAXIMUM
2. CLOSED WHEN "Y" IS ENERGIZED. OPEN WHEN "Y" IS DEENERGIZED.
3. PROVIDES "OFF" DELAY TIME OF 5 MIN WHEN "Y" IS DEENERGIZED.
4. WITH DPT CLOSED AND "Y" ENERGIZED, COMPRESSOR RUN TIME IS ACCUMULATED. OPENING OF DPT DURING DEFROST OR INTERVAL PERIOD RESETS THE INTERVAL TO 0.

- BR - BLOWER RELAY
- CC - COMPRESSOR CONTACTOR
- CCH - CRANKCASE HEATER (IF EQUIPPED)
- DPT - OUTDOOR THERMOSTAT (OPTIONAL)
- DP1 - DEFROST PRESSURE SWITCH (OPTIONAL)
- PS - PRESSURE SWITCH (SELECT MODELS)
- CC1 - CRANKCASE HEATER (IF EQUIPPED)
- CC2 - CRANKCASE HEATER (IF EQUIPPED)
- CC3 - CRANKCASE HEATER (IF EQUIPPED)
- CC4 - CRANKCASE HEATER (IF EQUIPPED)
- CC5 - CRANKCASE HEATER (IF EQUIPPED)
- CC6 - CRANKCASE HEATER (IF EQUIPPED)
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- CC98 - CRANKCASE HEATER (IF EQUIPPED)
- CC99 - CRANKCASE HEATER (IF EQUIPPED)
- CC100 - CRANKCASE HEATER (IF EQUIPPED)

Figure 8. 3 Phase Wiring Diagram



**INSTALLER: PLEASE LEAVE THESE
INSTALLATION INSTRUCTIONS WITH
THE HOMEOWNER**

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708143C (Replaces 708143B)