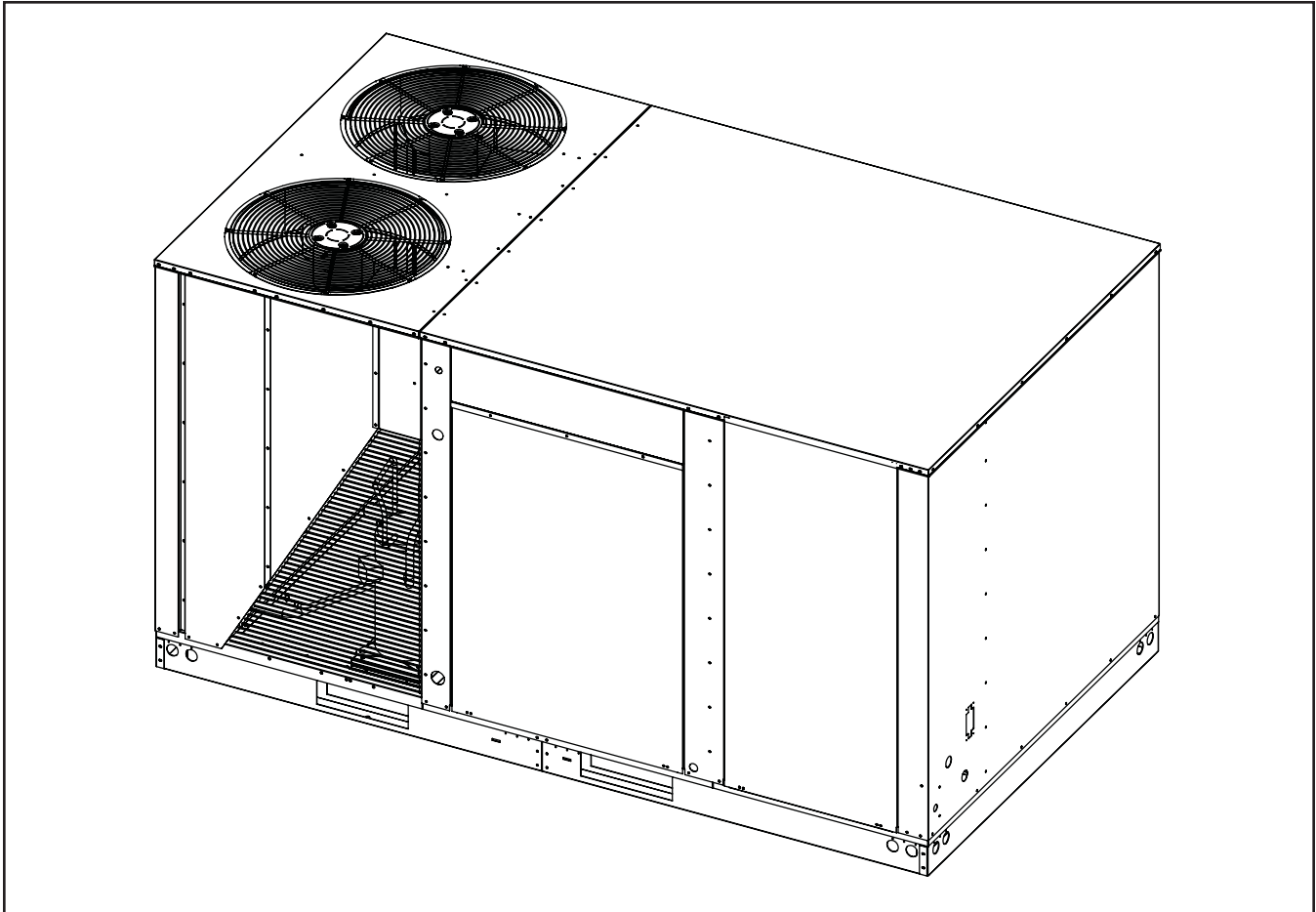


Installation Instructions

7½ and 10 Ton Series

Single Package Electric Heat Pump Rooftop Unit



These instructions are intended primarily to assist qualified individuals experienced in the proper installation of this appliance. Some local codes require licensed installation/service personnel for this type of equipment. Read all instructions carefully before starting the installation.

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

⚠ WARNING:

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.

Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.

DO NOT DESTROY. PLEASE READ CAREFULLY AND KEEP IN A SAFE PLACE FOR FUTURE REFERENCE.

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GENERAL SPECIFICATIONS

Single Package Electric Heat Pump units are designed for outdoor rooftop or ground level slab installations. The units are shipped ready for downflow duct connections and are easily converted for horizontal flow connections.

All models are shipped from the factory with the following:

1. R-22 Refrigerant
2. Adjustable belt drive blower system
3. Downflow duct connections
4. 24V circuit breaker protection.
5. Factory wired accessory plugs for economizers and electric Heat Kits.

Unit dimensions are shown on the Physical Data pages.

Optional field installed 3 phase electric heater kits are available in 9, 18, and 35 KW capacities for 230 Volt models and 18 and 35 KW capacities for 460 Volt models. A three stage heat / two stage cool 24VAC heat pump thermostat is required when electric heat kits are 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. Non compliance may void the units warranty.

Literature, Labels, and 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 Application — Before beginning the installation, verify that the unit model is correct for the

job. The unit model number is printed on the data label. This furnace is **NOT** to be used for temporary heating of buildings or structures under construction.

Equipment Check — 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 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), “Installation of combination heating/cooling units must also conform with current C.S.A. Standard B52 “Mechanical Refrigeration Code.”

NFPA publications are available by writing:

National Fire Protection Association
Batterymarch Park
Quincy, ME 02269

Unit Location — The electric unit 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 fuel, electric power, service access, noise, and shade. The unit installation shall avoid areas where condensate drainage may cause problems.

Clearances to Combustible Materials — See Figure 3 for required clearances to combustible materials. Refer to the unit data label for the model number.

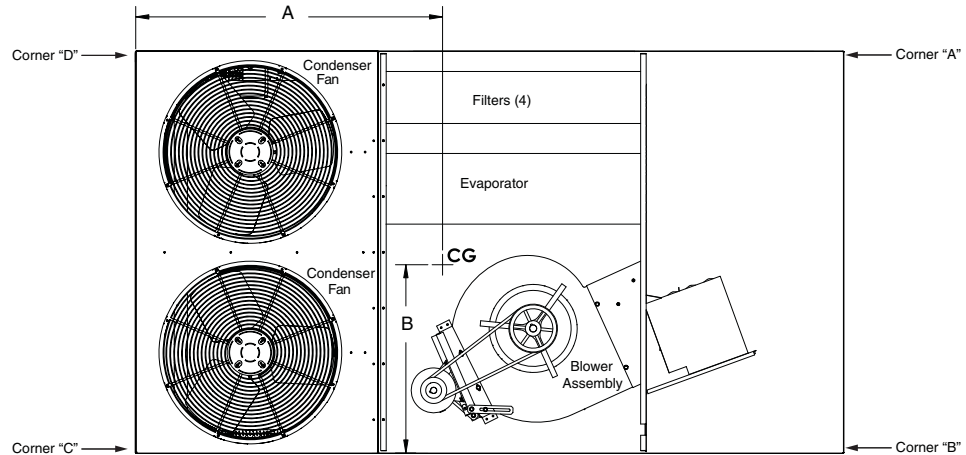
WARNING!

Rooftop installations with vertical ducts must be provided with a 90-degree elbow installed in the supply duct to comply with U.L. (Underwriters Laboratories) codes for use with electric heat so the elements are not directly over a supply grille.

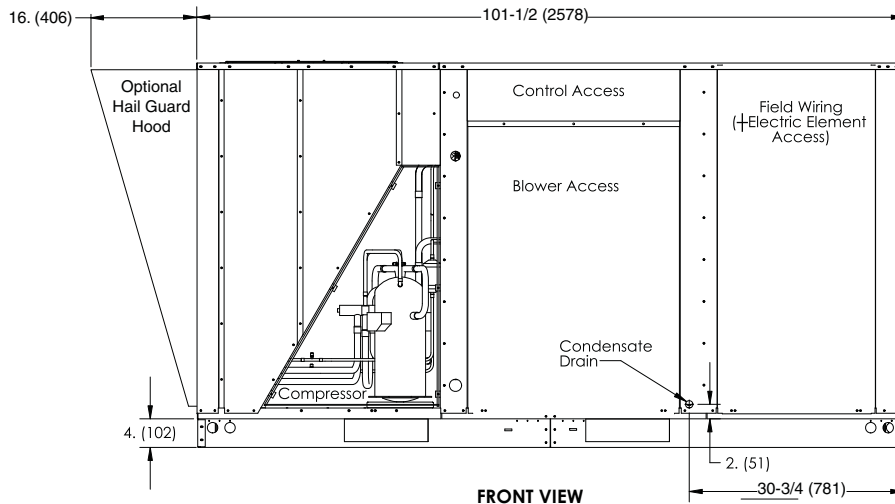
The electric unit is suitable for installation on combustible flooring or class A, B, or C roofing materials. A clearance of at least 36 inches from all sides of the unit is recommended to allow for servicing and maintenance. **Where accessibility to combustibles clearances are greater than minimum clearances, accessibility clearances must take preference.** Sufficient clearance for unobstructed airflow through the outdoor coil must be maintained in order to achieve rated performance. See Figure 3 for minimum clearances to obstructions.

Q5SN-090 AND 120 SERIES – PHYSICAL DATA

Dimensions shown in inches (mm)

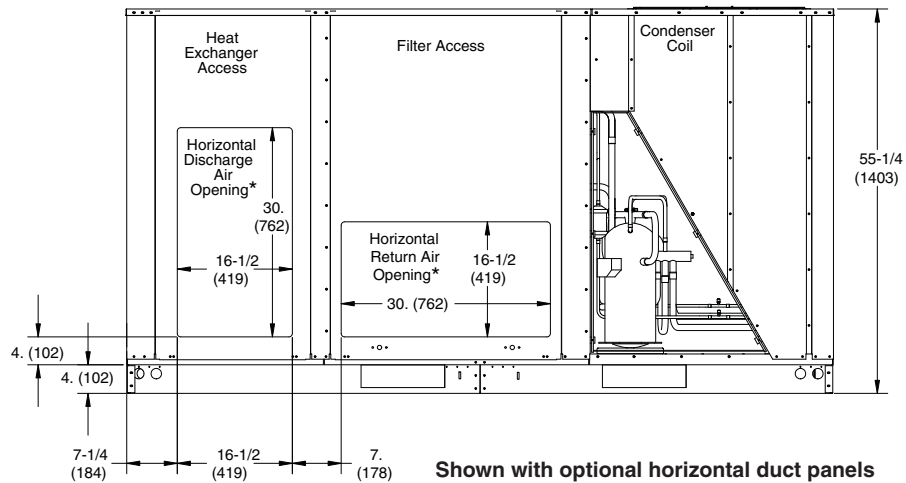


TOP VIEW



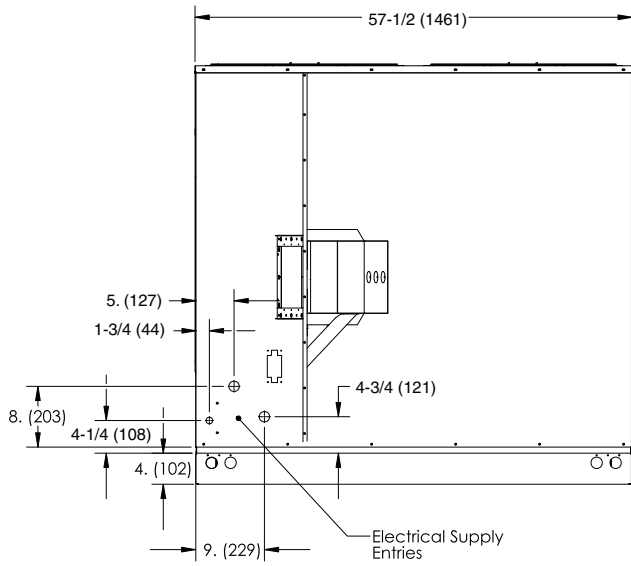
FRONT VIEW

FRONT VIEW

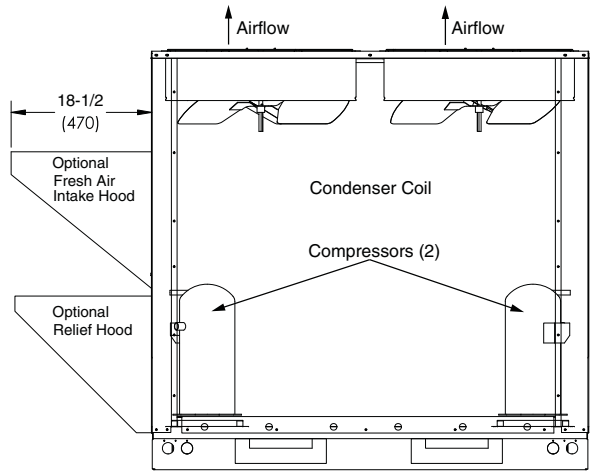


REAR VIEW

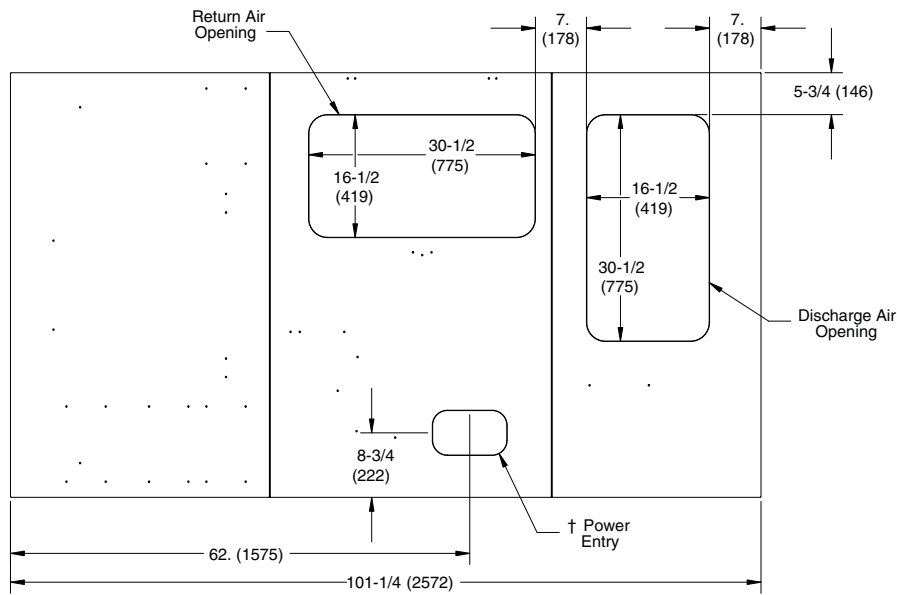
Q5SN-090 AND 120 SERIES – PHYSICAL DATA continued
 Dimensions shown in inches (mm)



HEAT EXCHANGER END



CONDENSER END



BOTTOM PAN TOP VIEW

Model No.	Unit Weight ‡		Shipping Weight		Center of Gravity Inches (mm)		Corner Weights						Unit Height			
	Lbs.	Kg.	Lbs.	Kg.	A	B	A		B		C		D			
							Lbs.	Kg.	Lbs.	Kg.	Lbs.	Kg.	Lbs.	Kg.		
Q5SN-090(C,D)	1065	484	1205	548	45 (1143)	27 (686)	218	99	255	116	320	145	273	124	51 (1295)	55-1/4 (1409)
Q5SN-120(C,D)	1130	514	1270	577	44 (1118)	27 (686)	226	103	264	120	345	157	295	134		

‡ Unit weight without packaging or field installed accessories.

† Field Installed Kit

Thermostat – A 2 stage heating / 2 stage cooling 24VAC heat pump thermostat is required for these units. **NOTE:** If “optional” electric heat is added a 3 Stage Heat / 2 Stage Cool 24VAC heat pump thermostat must be used.

Air Filter Requirements — A suitable air filter must be installed in the unit or in the return air system. Refer to Specification & Electrical Data Table for recommended filter sizes. Air filter pressure drop must not exceed 0.08 inches WC.

This unit is supplied with air filters. Air filter(s) must be installed ahead of the evaporator coil of this unit. All return air to this unit must pass through the filters before entering this unit.

! WARNING!

Never operate unit without a filter. A failure to follow this warning could result in a fire, personal injury, or death.

Condensate Drain - Condensate is removed from the unit through the 3/4" (19mm) PVC pipe located on the front side of the unit. Install a 3" (8 cm) Min. trap between the drain line and an open vent of the same size for proper condensate removal. (See Figure 2) Refer to local codes and restrictions for proper condensate disposal requirements.

When connecting rigid drain line, hold any fittings with a wrench to prevent twisting. Do not overtighten!

UNIT INSTALLATION

Minimum Clearance Requirements – Units are certified as combination Heating and Cooling equipment for outdoor installation only at the minimum clearances to combustible materials shown. Clearances shown are for both Downflow and Horizontal discharge. (See Figure 3)

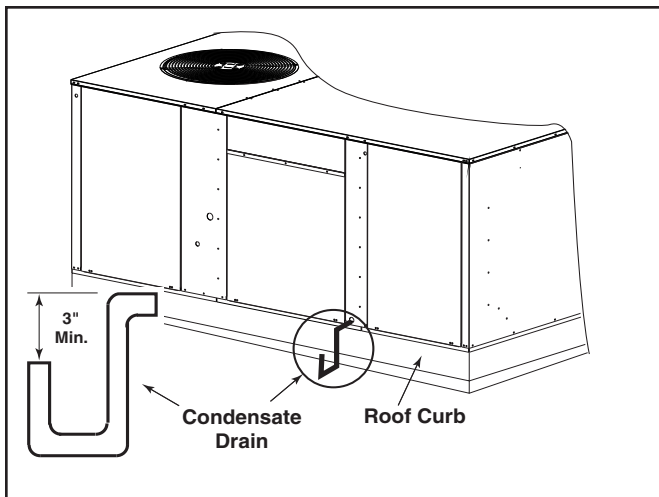


Figure 2. Condensate Drain

! WARNING!

This product contains fiberglass wool. Disturbing the insulation of this product during installation, maintenance, or repair will expose you to fiberglass wool. Breathing this may cause lung cancer. (Fiberglass wool is known to the State of California to cause cancer.)

Fiberglass wool may also cause respiratory, skin, and eye irritation.

Units may be installed on wood flooring or on Class A, B, or C roof covering material when used with side supply and return air ducts. (Horizontal Discharge Kit required.)

Units may be installed on wood flooring or on Class A, B, or C roof covering material when used with bottom discharge and return air ducts in conjunction with a roof curb.

Notice to Installer: If installing units on a combustible floor with downflow discharge, a roof curb is required.

Units may be installed on non- combustible flooring when used with bottom supply and return air ducts.

Rooftop Mounting – For rooftop installations use the appropriate accessory roof curb and follow all instructions included with it. Locate the unit according to local building codes and ordinances. The roof curb must be square and level to ensure proper condensate drainage.

On bottom discharge applications, supply and return air ducts must be attached to the roof curb duct supports, not the unit. Install all ductwork before setting unit to curb or frame.

Notice to Installer: In downflow applications never drill or punch holes in unit base. Leakage may occur if unit bottom pan is punctured.

If any brand other than a NORDYNE Roof Curb is to be used the frame support must be constructed using non-

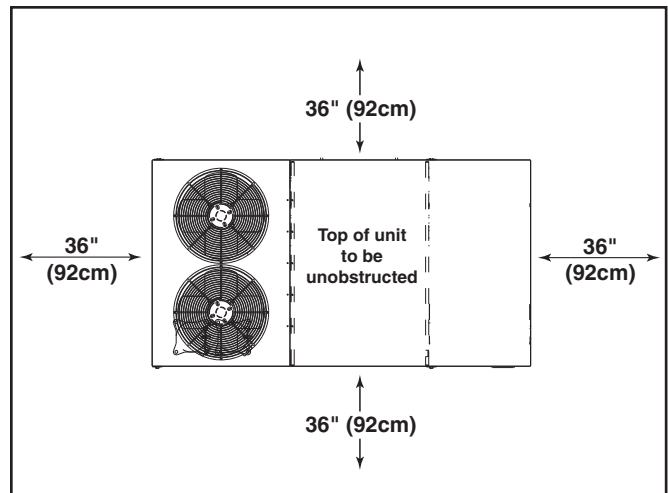


Figure 3. Minimum Clearances to Combustibles and Obstructions

combustible materials. Units require full perimeter support under the unit. Supports must be made of steel or suitably treated wood materials. The unit must be square and level to ensure proper condensate drainage.

The roof must be capable of handling the weight of the unit. See Physical Data pages for unit weights. Reinforce the roof if required.

Frame must be high enough to ensure prevention of any moisture from entering the unit. Recommended height to unit base is 8”(20cm) for both Downflow and Horizontal applications.

Secure roof curb or frame to roof using acceptable mechanical methods per local codes.

 **WARNING!**

Do not place combustible material on or against the unit cabinet. Do not place combustible materials, including gasoline and any other flammable vapors and liquids, in the vicinity of the unit.

Ground Level – If installing the unit at ground level, provide a concrete mounting pad separate from the building foundation. The pad must be level to ensure proper condensate disposal and strong enough to support the unit’s weight. Make sure the slab is a minimum of 3” (8cm) above grade and in an area that drains well.

Unit clearances must be in accordance with those shown in Figure 3.

Ductwork should be attached directly to flanges on panels supplied in horizontal duct conversion kits. Unit Base Rails provide full perimeter support under the unit. The unit must be square and level to ensure proper condensate drainage.

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

Rigging and Hoisting — Loosen all crating brackets and remove the wooden top cap, wood side panels, and wood end panels. For roof curb installations loosen the bottom shipping boards by removing two screws from brackets located at each forklift opening. Boards can be removed once the unit is lifted slightly by sliding the assembly out from the condenser end.

 **WARNING!**

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

The unit should be lifted with slings or chains along with spreader bars. Spreader bars are necessary to ensure even loading and to prevent damaging the top of the unit’s cabinet.

Ensure the lifting equipment is adequate for the load. Refer to Physical Data pages for unit weights. Keep the unit in an upright position at all times. The rigging must be located outside the units center of gravity. Refer to Physical Data pages for center of gravity location.

 **WARNING!**

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

CIRCULATING AIR SUPPLY

 **WARNING!**

All return ductwork must be adequately sealed, all joints must be taped, and the ductwork must be secured to the unit with sheet metal screws. When return air is provided through the bottom of the unit, the joint between the unit and the return air plenum must be air tight.

The roof curb or framing on which the unit is mounted must provide sound physical support of the unit with no gaps, cracks, or sagging between the unit and the curb or frame.

Return air and circulating air ductwork must not be connected to any other heat producing device such as a fireplace insert, stove, etc. Doing so may result in fire, explosion, carbon monoxide poisoning, personal injury, or property damage.

This unit is designed only for use with a supply and return duct. Any exterior ducts, joints, or openings in the building roof or walls must be weatherized with conventional flashing and sealing compounds. Air ducts should be installed in accordance with all applicable local codes and the standards of the National Fire Protection Association “Standard for Installation of Air Conditioning Systems” (NFPA 90A).

Design the ductwork according to methods described by the Air Conditioning Contractors of America (ACCA) Manual D. The ducts must be properly sized not to exceed 0.2 inches WC pressure drop at 400 scfm per nominal ton of cooling capacity.

If outside air is utilized as return air to the unit for ventilation or to improve indoor air quality, the system must be designed so that the return air to the unit is not less than 50°F (10°C) during heating operation. If a combination of indoor and outdoor air is used, the ducts and damper system must be designed so that the return air supply to the furnace is equal to the return air supply under normal, indoor return air applications.

Unconditioned Spaces — All ductwork 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 Ductwork — Certain installations may require the use of acoustical lining inside the supply ductwork. 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 ductwork may be used in place of internal duct liners if the fiber ductwork is in accordance with the current revision of the SMACNA construction standard on fibrous glass ducts. Fibrous ductwork and internal acoustical lining must be NFPA Class 1 air ducts when tested per UL Standard 181 for Class 1 ducts.

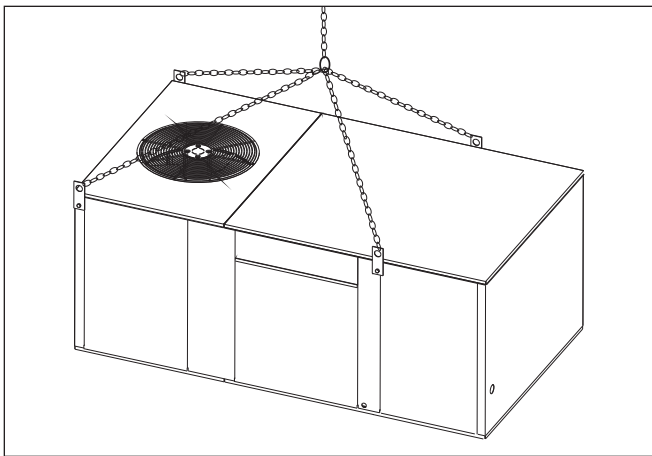


Figure 4. Rigging and Hoisting

Downflow to Horizontal Conversion — The unit is shipped ready for downflow duct connections. If horizontal ducts are required, the unit must be converted according to the directions in the conversion kit for both the supply and return ducts.

ELECTRICAL WIRING

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.

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 gauge and temperature rating.

NOTE: 1-3/8" conduit openings are supplied for high voltage field wiring entrance. If smaller openings are required use suitable (field supplied) reducers to meet specific conduit size requirements.

Line Voltage Connections — All (*)Q5SN model units are shipped factory ready for Single Circuit Electrical Supply connections. See Table 3 or unit rating label for proper high voltage wiring requirements.

For Dual Electrical Supply connections see unit rating plate or heater kit installation instructions for proper high voltage wiring requirements. Use NORDYNE P/N-917468,3 Pole Dual Circuit Adaptor for converting to dual supply connections.

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.

Model Number Q5SN	Nominal Electrical Supply	Voltage Range		Compressors (2) Ea.		Outdoor Motor FLA	Blower Drive System	Indoor Motor FLA	Single Circuit Min. Circuit Ampacity				Single Circuit Max. Circuit Ampacity			
		Min.	Max.	FLA	LRA				0 kw	9 kw	18 kw	35 kw	0 kw	9 kw	18 kw	35 kw
		-090C	208-230/60/3	187	253				14.3	91	2.3	LSD	4.2	41.0	53.8	79.1
							HSD	6.2	43.0	55.8	81.1	133.4	50	60	90	150
-090D	460/60/3	414	506	7.2	46	1.2	LSD	2.0	20.6	-	40.5	65.8	25	-	45	70
							HSD	2.9	21.5	-	41.4	66.7	25	-	45	70
-120C	208-230/60/3	187	253	17.2	124	2.3	LSD	6.2	49.5	59.4	84.7	137.1	60	70	90	150
							HSD	9.1	52.4	62.3	87.6	140.0	60	70	90	150
-120D	460/60/3	414	506	8.3	61.8	1.2	LSD	2.9	24.0	-	42.8	68.1	30	-	45	70
							HSD	4.4	25.5	-	44.3	69.6	30	-	45	70

NOTES: FLA = Full Load Amps; LRA = Lock Rotor Amps; RLA = Rated Load Amps, LSD = Low Static Drive Kit, HSD = High Static Drive Kit

Table 3. Electrical Data with Electric Heat

This unit must be electrically grounded in accordance with local codes or, in the absence of local codes, with the National Electrical Code (ANSI/NFPA 70) or the CSA C22.1 Electrical Code.

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.

Units are shipped from the factory wired for 240 or 460 volt operation (See unit data label for proper incoming field wiring). For 208 volt operation, remove the lead from the transformer terminal marked 240V (on 208-230 models only) and connect it to the terminal marked 208V. For maximum circuit ampacity and maximum overcurrent protection, see the unit rating plate or Table 3.

WARNING!

The unit cabinet must have an 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.

Overcurrent protection must be provided at the branch circuit distribution panel and sized as shown in Table 3 or on the unit rating label and according to the National Electric Code and applicable local codes.

Provide power supply 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 terminal block 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.

Blower Speed—The blower speed is preset at the factory. For optimum system performance and comfort, it may be necessary to change the factory set speed. Refer to Fan Performance Data page for proper operating range.

To change the blower speed:

1. Disconnect all electrical power to the unit and remove the blower access panel.
2. Loosen the motor tension bars to allow removal of the blower belt from the motor sheave.
3. Loosen top set screw on motor sheave and turn clockwise to close (increases blower speed), or counterclockwise to open (decreases blower speed).

4. Replace belt on pulleys and position motor mounting plate to correct position for proper belt tension.
5. Tighten tension bar bolts.

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

WARNING!

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.

LOW VOLTAGE CONNECTIONS

Room Thermostat—A two stage heating/two stage cooling 24 VAC heat pump thermostat is required for these units. **NOTE: If “optional” electric heat is added a 3 Stage Heat / 2 Stage Cool 24VAC heat pump thermostat must be used.** Several options are available for a room thermostat depending on the accessories installed with the unit. Select a thermostat which operates in conjunction with the installed accessories. The thermostat should be mounted about five feet above the floor on an inside wall. The thermostat should be kept away from drafts, slamming doors, lamps, direct sunlight and the supply air flow.

To install the thermostat:

1. Position the subbase 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. See Figure 7 for recommended wire size.
3. Connect the cable leads to the subbase or thermostat terminals and to the unit’s low voltage terminal block as shown in Figure 7. System wiring diagrams are also provided on the inside of the control access panel and in Figure 8a and 8b of these installation instructions.
4. Secure the subbase or thermostat to the wall using screws provided with the thermostat.
5. Install the correct thermostat housing to subbase.
6. Refer to thermostat instruction sheet for complete detailed mounting and operating 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 left side of the control panel. Three interval settings are available: 30, 60, and 90 minutes. Time setting selection is dependent on the climate where the unit is being installed. Longer settings

are recommended for drier climate areas and shorter time intervals are recommended for moist climate areas.

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.

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.

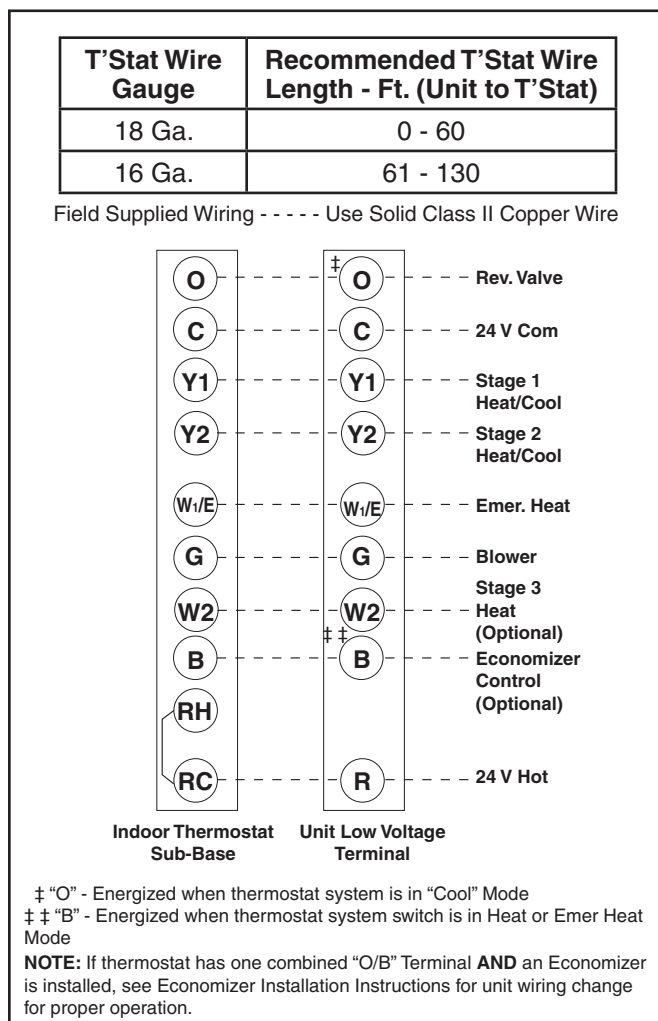


Figure 7. Typical Connections - 2 Stage Cool/3 Stage Heat T-Stat

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 ductwork is sealed to prevent air leakage.
- Verify that the line voltage power leads are securely connected and the unit is properly grounded.
- Verify that low voltage wires are securely connected to correct leads in the low voltage area of the control box.
- 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.”



WARNING!

The unit is equipped with crankcase heaters. 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.

START-UP PROCEDURE

- Close all electrical disconnects to energize the system.
- Check all electrical wiring for loose connections and tighten as required.
- Check unit for return air filters and condensate trap.

Air Circulation — Leave the thermostat system switch set to “Off” and set the thermostat fan switch to “On.” The blower motor should run continuously. Check for air delivery at the register(s). Ensure that there are no obstructions at the registers or in the ductwork. Set thermostat fan switch to “Auto,” the blower will shut down immediately. **Note:** If blower is turning opposite of arrow direction, shut off main power to the unit and switch any two field wires at the disconnect. **DO NOT** alter unit wiring.

Heat Pump Cooling Operation - 2 Stage (2 individual refrigerant systems)

1. Set the thermostat system switch to “Cool” and the thermostat fan switch to “Auto.” Lower the thermostat temperature switch below room temperature and observe that the blower, both compressors and fan(s) energize. **Note: This unit is equipped with a five minute anti-short cycle timer (ASCT) built in to the defrost control board for Stage 1 Heat/Cool (Y1).** If the thermostat temperature level is re-adjusted, or if the system switch is re-positioned, Stage 1 compressor will not start immediately. Stage 2 Heat/Cool (Y2) has no ASCT protection and can operate immediately upon a call from the thermostat. Some thermostats may also have anti-short cycle protection built in causing a delay in one or both stages. A protective timer circuit could hold the compressor(s) off for up to five minutes following a previous operation or an interruption of the main power. Consult the operation manual for the type thermostat being installed.
2. Check that air cooler than room temperature is being discharged at the register. Ensure unit refrigerant pressures are in order. Blower should be turning in direction indicated by arrow. **NOTE: If refrigerant pressures are abnormal and blower is rotating in the opposite direction of the arrow, shut off main power to the unit and switch any two field wires at the disconnect. Ensure proper rotation of both compressors. DO NOT alter unit wiring. Listen for any unusual noises. Locate the source and correct as needed.**
3. After allowing the unit to run for several minutes, set the temperature selector above room temperature, verify that the fan, blower, and compressors cycle off with the thermostat.

Short Cycle Protection — Following the shut down sequence in the Heat Pump Cooling Operation Start-Up procedures, immediately lower the set point temperature of the thermostat slightly below room temperature and verify that the indoor blower is energized and after approximately 5 minutes the compressor and outdoor fans energize.

Heat Pump Heating Operation — 2 or 3 Stage 2 individual refrigerant systems + Electric Heat (Optional)

1. Set the thermostat system switch to “Heat” and the thermostat fan switch to “Auto.” Raise the thermostat temperature switch above room temperature and observe that the outdoor fans, compressor(s), and indoor blower energize. **Note: This unit is equipped with a five minute anti-short cycle timer (ASCT) built in to the defrost control board for Stage 1 Heat/Cool (Y1).** If the thermostat temperature level is re-adjusted, or if the system switch is re-positioned, Stage 1 compressor will not start immediately. Stage 2 Heat/Cool (Y2) has no ASCT protection and can operate immediately upon a call from the thermostat. Some thermostats may also have anti-short cycle protection built in causing a delay in one or both stages. A protective timer circuit could hold the

compressor(s) off for up to five minutes following a previous operation or an interruption of the main power. Consult the operation manual for the type thermostat being installed.

2. Check that air warmer than room temperature is being discharged at the registers.
3. After allowing the unit to operate for several minutes, set the thermostat temperature switch below room temperature, verify that fans, blower, and compressors cycle off with the thermostat.

Note: If electric heat has been added, Stage 2 compressor will cycle off while Stage 3 heater elements are energized.

Field Installed Electric Heat (Optional) - This package heat pump system is designed to allow optional electric heat to be field installed as required by the building's particular heating load, as make up heat during defrost mode, and as Emergency Heat. Note: If "Optional" electric heat is added a 3 Stage Heat / 2 Stage Cool 24VAC heat pump thermostat must be used.

9, 18, and 35 KW capacities for 230 Volt models and 18 and 35 KW capacities for 460 Volt models are available.

Install the heater kits as directed by the instruction sheet that comes as part of the heater kit. Follow all cautions and warnings as directed.

1. Set the thermostat to above room temperature.
2. Verify that Stage 1 compressor outdoor fan motors and blower are energized and the electric heat is energized.
3. After the unit has run for approximately five minutes, set the thermostat below room temperature and verify that the electric heat, Stage 1 compressor, fans, and blower have de-energized.

Emergency Heat — Most Heat Pump 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 Emer. Ht., etc., the compressor(s) and outdoor fans 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.

Defrost Mode — During cold weather heating operation, the outdoor unit will develop a coating of snow and ice on the outdoor heat transfer coil. This is normal and the unit will periodically defrost itself automatically. During the defrost cycle, the outdoor fans will stop while the compressor(s) continue to operate 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.

 **WARNING!**

Uninsulated live components are exposed when control access panel is removed.

Verify Operation of Over-Temperature Limit Control — To verify operation of the over-temperature limit control, make sure that all access panels are in place and that there is power to the unit. Block the return airflow to the unit by installing a close-off plate in place of or upstream of the filter. Set the thermostat to a temperature above room temperature and verify the unit operates with the correct sequence of operation (see Operating Sequence). The over-temperature limit control should function to turn off the electric strip heat within approximately four minutes (the exact time depending on the efficiency of the close-off in blocking the return air to the unit).

The circulating air blower should continue to run when the over-temperature limit control switch opens. Remove the close-off immediately after the over-temperature limit control opens. If the unit operates for more than four minutes with no return air, set the thermostat to a temperature below room temperature, shut off the power to the unit, and replace the over-temperature limit control.

COMPONENT FUNCTIONS

High Pressure switch (HPS) — Prevents compressors from operating at elevated pressures. High pressure switches are located on both compressor hot gas lines and are fitted with schrader cores. The switch is non-adjustable set to open at 425 PSIG and close at 295 PSIG. Stage 1 system is auto-reset and Stage 2 system is manual reset.

Low Pressure switch (LPS) — Prevents compressors from operating at sufficiently low pressures due loss of charge. Low pressure switches are located on both compressor return gas lines and are fitted with schrader cores. The switch is non-adjustable set to open at 5 PSIG and close at 20 PSIG.

Freezestat — Prevents evaporator coils from freeze-ups due to lack of airflow or below normal return air temperatures. The switch is a non-adjustable, sealed, bi-metal sensor set to open at 28 Deg. F and closes at 57 Deg. F.

Defrost Control Board — This control includes - 5 minute anti-short cycle timer protection for Stage 1 Heat/Cool, defrost time interval selection, and reversing valve, outdoor fan, and auxiliary heat operation during defrost control. See Operating Sequence page 13.

Defrost Temperature Sensor — Switches are located on the hairpin end of both outdoor coils. The switch is a non-adjustable, sealed, bi-metal sensor set to open at 68 Deg. F and closes at 30 Deg. F. When closed, compressor run time is accumulated and initiates coil defrost dependent on time interval selected.

Over-Temperature Limit Control — The over-temperature limit control acts to prevent the air temperature leaving the unit from exceeding the maximum outlet air temperature. If the limit opens, electric heat will shut off.

Heat Pump Relay (HPR) — The heat pump relay is located to the left side of the unit's main control panel. It is required for proper operation of an economizer (optional) in the heat pump Heating mode, if installed. Refer to the Economizer Installation Instructions "Set up Procedures" if an economizer is being installed in this unit.

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.

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.

Refrigerant Charging — Packaged electric units are fully charged at the factory. The system refrigerant charge can be checked and adjusted through the service ports provided behind the compressor service panel. Use only gauge lines which have a "Schrader" depression device present to actuate the valve. Draw a vacuum on gauge lines to remove air or moisture before attaching them to the service ports on the unit. Refrigerant charging must be done by qualified personnel familiar with safe and environmentally responsible refrigerant handling procedures. See Unit Rating Plate for proper amount of charge.

WARNING!

The units 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.

Routine Maintenance — Proper maintenance is important to achieve optimum performance from the air conditioner. 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:

Air Filters — It is recommended that you inspect and clean or replace the air filters every three to four weeks. Units are equipped with 2" pleated disposable filters. Filter rack is adjustable for 1" permanent type filters. Do not use 1" disposable filters. Replace using filters of like size and kind.

WARNING!

Never operate the unit without a filter in place. Dust and lint in the return air can build up on internal components, resulting in loss of efficiency, equipment damage, and possible fire risk.

Condensate Drain and Outdoor Coil — Inspect the condensate drain and outdoor coil at the beginning of each cooling season. Remove any debris. Clean the outdoor coil and hail guard louvers (optional) as necessary using a mild detergent and water. Rinse thoroughly with water.

Electrical — Inspect the electrical connections for tightness at the beginning of each heating and cooling season. Service as necessary.

CAUTION:

Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation.

Motor Lubrication — The motors for the circulating air blower and outdoor fans, are pre-lubricated at the factory. No further oiling is required for the life of this product.

WARNING!

Lubrication of the motors in this unit is not required. Do not lubricate any motor in this product.

Blower Compartment — The blower compartment should be cleaned monthly during the heating and cooling seasons to remove any dirt and lint that may have accumulated in the compartment or on the blower and motor. Buildup of dirt and lint on the blower and motor can create excessive loads on the motor resulting in higher than normal operating temperatures and possible shortened service life.

 **CAUTION:**

Verify proper operation after servicing.

OPERATING SEQUENCE

The operating sequences for the heating, cooling, and fan modes are described below. Refer to the wiring diagram for the unit.

Heat Pump Cooling Mode:

1. Set the thermostat system switch to “Cool” and the thermostat fan switch to “Auto”. Note: Heat pump thermostats typically energize reversing valves through the “O” terminal with the system switch set to “Cool”. Reversing valves will remain energized until the system switch is moved to “Off”, “Heat”, or “Emer. Heat”. Consult the instructions for the specific type of thermostat being used for proper unit operation.
2. On a call for cooling the thermostat closes, applying 24 VAC directly to Y1, “G”, and “Y2” if Stage 2 cooling is required. Note: Stage 1 Compressor (Y1) has a built in 5 minute anti-short cycle timer (ASCT) function built into the defrost board. Any loss of power or 24V interruption to the defrost board will cause the ASCT to reset and start the timing cycle over.
3. “G” applies 24VAC to the main circulating blower circuit.
4. “Y1” and “Y2” apply 24VAC through all safety switches before energizing their respective compressor contactors.
5. Outdoor fan contactor is energized through auxiliary contacts on either of the compressor contactors once energized.
6. As the thermostat is satisfied the contactors are de-energized in sequence.
7. The circulating blower motor is de-energized immediately.

Blower Mode:

1. On a call for fan operation, the thermostat applies 24 VAC directly to the “G” terminal and the blower contactor.
2. The circulating blower is energized immediately.

Heat Pump Heating Mode:

1. Set the thermostat system switch to “Heat” and the thermostat fan switch to “Auto”. On a call for heating the thermostat closes, applying 24 VAC to “Y1”, “G”, and “Y2” if Stage 2 heating is required.
2. “G” applies 24VAC to the main circulating blower circuit.

3. “Y1” and “Y2” apply 24VAC through all safety switches before energizing their respective contactors.
4. Outdoor fan contactor is energized through auxiliary contacts on either of the compressor contactors once energized.
5. As the thermostat is satisfied the contactors are de-energized in sequence.
6. The circulating blower motor is de-energized immediately.

Heat Pump Heating Mode + “Optional” Electric Heat: (Stage 3 Heat or Emergency Heat)

- If “optional” electric heat is added a 3 Stage Heat / 2 Stage Cool 24VAC heat pump thermostat must be used.
- This heating system energizes the fan on a call for heat. Select the “GAS” setting for fan mode of operation during thermostat configuration.
- Several options are available for a room thermostat depending on the accessories installed with the unit. Consult the instructions for the specific type of thermostat being used for proper unit operation.

On a call for heating the thermostat closes, applying 24 VAC to “Y1”, “G”, and “Y2” if Stage 2 heating is required. If the desired room temperature is not maintained, Stage 3 heat will call applying 24 VAC to “W2”, energizing the electric heat kits. **NOTE:** If Stage 3 Electric Heat is energized, Stage 2 compressor will cycle off.

As the thermostat is satisfied the contactors are de-energized in sequence.

Emergency Heat Mode:

Set the thermostat system switch to “Emer.Heat” and the thermostat fan switch to “Auto”. On a call for heating the thermostat closes, applying 24 VAC to “W2” only. Compressors and outdoor fans will not operate when Emergency Heat mode is selected. Sustained use of electric resistance heat in place of the heat pump will result in an increase in electric utility costs.

Unit Fails to Operate

If the unit does not operate properly in either the heating or cooling mode, be certain to check the following:

1. The thermostat is operating properly.
2. Electrical power to the unit is turned on.
3. All safety switches are closed.
4. The service doors are in place.
5. Transformer circuit breaker is reset.

SPECIFICATIONS AND ELECTRICAL DATA

Model Q5SN-	090C	090D	120C	120D
Performance Data				
Gross Cooling Capacity (High) - BTUH	94,000	94,000	120,800	120,800
¹ Net Cooling Capacity (High) - BTUH	90,000	90,000	115,000	115,000
¹ Net Cooling Capacity (Low) - BTUH	46,800	46,800	59,800	59,800
A.R.I. Rated Airflow - CFM	3,375	3,375	4,000	4,000
² E.E.R. - Cooling Efficiency (Btu/Watt)	10.50	10.50	10.10	10.10
³ I.P.L.V.	10.80	10.80	10.20	10.20
Gross Heating Capacity (Low) - BTUH	85,000	85,000	106,000	106,000
Gross Heating Capacity (High) - BTUH	45,000	45,000	57,000	57,000
A.R.I. Rated Airflow - CFM	3,375	3,375	4,000	4,000
⁴ C.O.P. - Heating Efficiency	3.2	3.2	3.2	3.2
Electrical Rating - 60 Hz.				
w/ Factory Standard Blower Drive				
Phase	3	3	3	3
Operating Voltage	187-253	414-506	187-253	414-506
Maximum Rated Ampacity	37.4	18.8	45.2	21.9
Minimum Circuit Ampacity (MCA)	41.0	20.6	49.5	24.0
Max. Overcurrent Protection (MOP)	50	25	60	30
Electrical Rating - 60 Hz.				
w/ Factory High Static Blower Drive				
Phase	3	3	3	3
Operating Voltage	187-253	414-506	187-253	414-506
Maximum Rated Ampacity	39.4	19.7	48.1	23.4
Minimum Circuit Ampacity (MCA)	43.0	21.5	52.4	25.5
Max. Overcurrent Protection (MOP)	50	25	60	30
Compressor Data				
	2 ea.	2 ea.	2 ea.	2 ea.
Compressors (Scrolls)	ZR45KC	ZR45KC	ZR57KC	ZR57KC
Volts	208/230	460	208/230	460
Rated Load Amps	14.3	7.2	17.2	8.3
Lock Rotor Amps	91	46	124	62
Indoor Blower - Belt Drive				
(Qty.) - Wheel Diameter	(1) - 15 x 15	(1) - 15 x 15	(1) - 15 x 15	(1) - 15 x 15
Standard Blower Drive Motor - HP / RPM				
	1.5 / 1725	1.5 / 1725	2 / 1725	2 / 1725
Standard Blower Drive Motor - Amps	4.2	2.0	6.2	2.9
Blower RPM Range	665 - 840		695 - 948	
High Static Blower Drive Motor - HP / RPM				
	2 / 1725	2 / 1725	3 / 1725	3 / 1725
High Static Blower Drive Motor - Amps	6.2	2.9	9.1	4.4
Blower RPM Range	908 - 1100		944 - 1160	
Outdoor Fan Data				
	2 ea.	2 ea.	2 ea.	2 ea.
Motor - HP / RPM	1/3 - 1075	1/3 - 1075	1/3 - 1075	1/3 - 1075
Motor Amps (ea.)	2.3	1.2	2.3	1.2
Fan Diameter / CFM	24" / 8200	24" / 8200	24" / 8200	24" / 8200
Refrigerant Charge - oz. (R-22)				
Stage 1 Circuit	200	200	230	230
Stage 2 Circuit	200	200	230	230
High Pressure Switch (PSIG)	Stage 1 - 425 +/- 10 Auto Reset Stage 2 - 425 +/- 10 Manual Reset			
Loss of Charge Switch (PSIG)	Cut Out: 5 +/- 5 Cut In: 20 +/- 5			
Freeze Protection Thermostats	Opens (oF): 28 +/- 5 Closes (oF): 57 +/- 6			
Filters				
Style	Disposable - 2" Pleated			
Size (Qty.)	16" x 25" x 2" (4)			

Footnotes:

Note - Net capacity includes indoor blower motor heat deduction. Gross capacity does not include indoor blower motor heat reduction

¹ Certified in accordance with A.R.I. Standard 340/360 at 95°F outdoor db and 80 °F db/67 F°wb evaporator entering air at minimum external duct static pressure.

² E.E.R. - Energy Efficiency Ratio

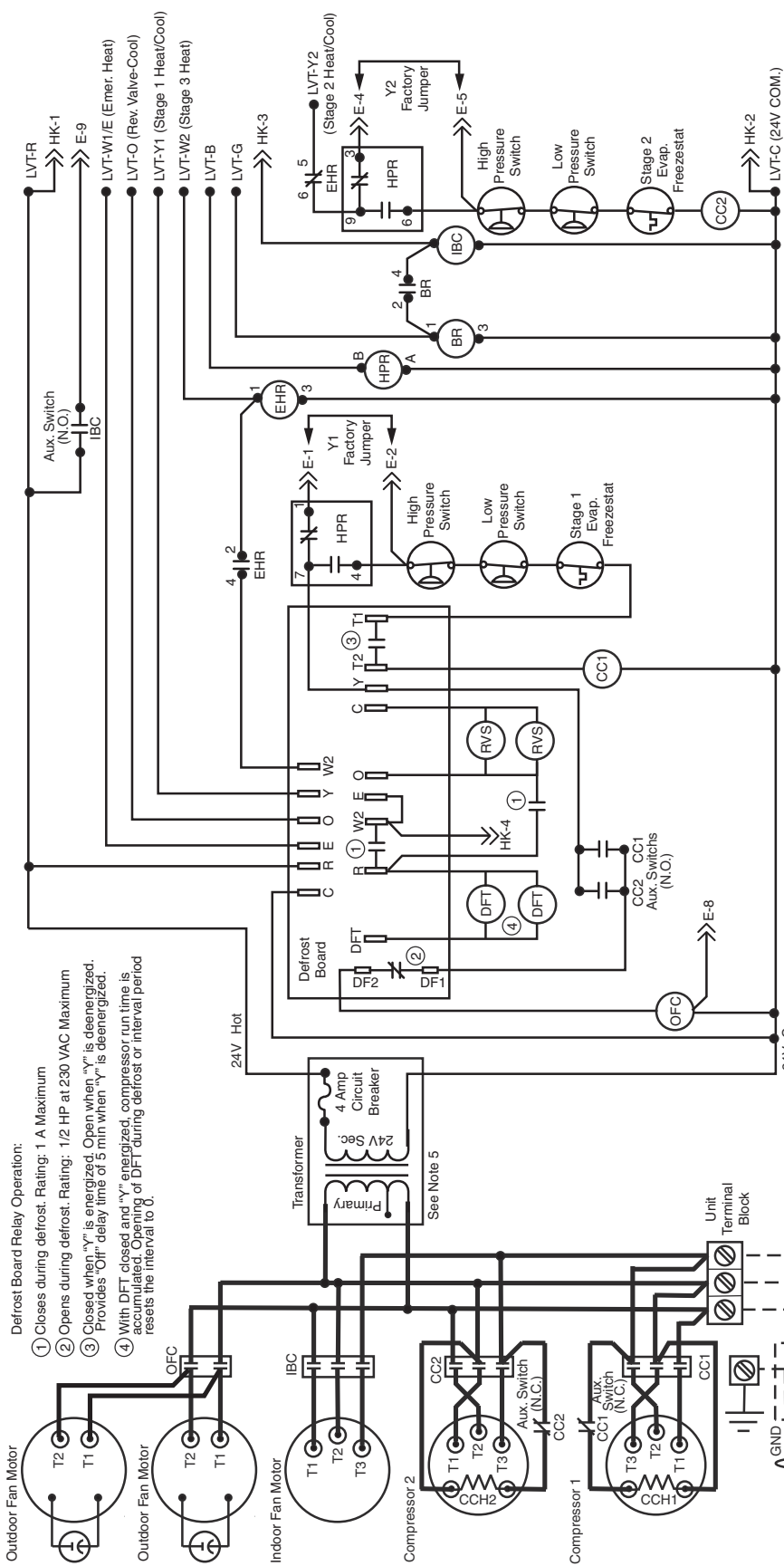
³ I.P.L.V. - Integrated Part Load Value

⁴ C.O.P. - Coefficient of Performance

Table 6. Specifications and Electrical Data

Q5SN Series Convertible Packaged/Electric Heat Pump 208-230/460 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 105C.
 4. For supply wire ampacities and overcurrent protection, see unit rating label.
 5. On 120C Models only. For 208V operation remove wire from 230V tap and place on 208V tap.



Defrost Board Relay Operation:

- ① Closes during defrost. Rating: 1 A Maximum
- ② Opens during defrost. Rating: 1/2 HP at 230 VAC Maximum
- ③ Closed when "Y" is energized. Open when "Y" is deenergized. Provides "Off" delay time of 5 min when "Y" is deenergized.
- ④ With DFT closed and "Y" energized, compressor run time is limited to 5 min. After 5 min, DFT1 during defrost or interval period resets the interval to 0.

- Legend:**
- CCH - Crankcase Heaters, Stage 1&2 Compressor
 - CC1&2 - Contactor, Stage 1&2 Compressor
 - IBC - Contactor, Indoor Blower Motor
 - RVS - Reversing Valve Solenoid
 - OFC - Contactor, Outdoor Fan
 - HPR - Heat Pump Relay
 - LVT - Low Voltage Terminal
 - DFT - Defrost Thermostat
 - BR - Blower Relay
 - HK - Heater Kit
 - E - Economizer
- Other Symbols:**
- ⋈ - Indicates plug connection.
 - Letter indicates which plug.
 - Number indicates pin location.
- For supply connections use copper conductors only.
- Field Supplied Disconnect (3Phase Power Only)

7106790
0907

Figure 8A. (*)Q5SN-090/120 Series

Q5SN-090(-)C COOLING (With One Compressor Operating)

CFM	O.D.T		65°F			75°F			85°F			95°F		
	E.D.B.	E.W.B.	T.C.	S.C.	K.W.	T.C.	S.C.	K.W.	T.C.	S.C.	K.W.	T.C.	S.C.	K.W.
3000	75	62	48.7	23.6	3.70	47.1	23.9	3.98	45.4	23.8	4.29	43.6	23.9	4.65
	75	67	48.7	25.0	3.70	47.1	24.7	3.98	45.4	24.3	4.29	43.6	23.9	4.65
	75	72	48.7	33.8	3.70	47.1	33.2	3.97	45.4	32.5	4.28	43.6	31.8	4.64
	80	62	48.7	28.4	3.70	47.1	28.3	3.98	45.4	28.2	4.30	43.5	28.3	4.66
	80	67	48.7	20.6	3.70	47.1	21.3	3.98	45.4	22.1	4.29	43.6	22.4	4.65
	80	72	48.7	26.0	3.70	47.1	25.6	3.97	45.4	25.2	4.29	43.6	24.8	4.65
	85	62	48.7	33.8	3.70	47.1	33.7	3.98	45.4	33.4	4.30	43.5	33.0	4.66
	85	67	48.7	25.0	3.70	47.1	25.2	3.98	45.4	25.3	4.30	43.5	25.3	4.66
	85	72	48.7	20.1	3.70	47.1	19.5	3.98	45.4	18.9	4.29	43.6	18.2	4.65
3375	75	62	49.6	28.1	3.72	47.9	28.2	4.00	46.2	28.3	4.31	44.3	28.4	4.67
	75	67	49.6	27.0	3.72	48.0	26.7	4.00	46.2	26.3	4.31	44.3	25.9	4.67
	75	72	49.6	38.5	3.72	48.0	35.3	3.99	46.2	34.6	4.30	44.4	33.9	4.66
	80	62	49.6	33.7	3.72	47.9	33.3	4.00	46.2	33.2	4.32	44.3	32.9	4.68
	80	67	49.6	25.7	3.72	48.0	26.2	4.00	46.2	26.6	4.31	44.3	27.9	4.67
	80	72	49.6	28.0	3.72	48.0	27.6	4.00	46.2	27.2	4.31	44.4	26.8	4.67
	85	62	49.6	37.1	3.73	47.9	36.6	4.00	46.1	36.2	4.32	44.3	35.6	4.68
	85	67	49.6	30.5	3.72	47.9	30.4	4.00	46.2	30.2	4.32	44.3	29.9	4.68
	85	72	49.6	22.5	3.72	48.0	21.9	4.00	46.2	21.6	4.31	44.3	21.7	4.67
3750	75	62	50.3	32.2	3.74	48.6	32.5	4.02	46.8	32.5	4.33	44.9	33.1	4.69
	75	67	50.4	29.0	3.74	48.7	28.6	4.01	46.9	28.2	4.32	45.0	27.8	4.68
	75	72	50.4	38.1	3.74	48.7	37.4	4.01	46.9	36.7	4.32	45.0	35.9	4.67
	80	62	50.3	38.4	3.74	48.6	38.3	4.02	46.8	37.7	4.33	44.9	37.3	4.70
	80	67	50.3	30.3	3.74	48.6	31.0	4.01	46.8	31.7	4.33	44.9	32.3	4.69
	80	72	50.4	30.0	3.74	48.7	29.6	4.01	46.9	29.2	4.32	45.0	28.7	4.68
	85	62	50.3	40.0	3.74	48.6	39.6	4.02	46.8	38.8	4.34	44.9	38.0	4.70
	85	67	50.3	36.1	3.74	48.6	36.1	4.02	46.8	35.6	4.33	44.9	35.3	4.69
	85	72	50.3	26.0	3.74	48.7	26.2	4.01	46.8	26.6	4.33	44.9	26.5	4.69

Q5SN-090(-)C COOLING (With Two Compressors Operating)

CFM	O.D.T		85°F			95°F			105°F			115°F		
	E.D.B.	E.W.B.	T.C.	S.C.	K.W.	T.C.	S.C.	K.W.	T.C.	S.C.	K.W.	T.C.	S.C.	K.W.
3000	75	62	92.2	67.9	7.69	88.6	66.4	8.41	84.9	64.9	9.24	80.9	63.3	10.19
	75	67	92.3	67.9	7.68	88.7	66.4	8.40	85.0	64.9	9.22	81.0	63.3	10.16
	75	72	92.3	67.9	7.67	88.8	66.5	8.38	85.1	65.0	9.19	81.2	63.4	10.12
	80	62	92.2	67.9	7.69	88.6	67.1	8.42	84.8	67.0	9.26	80.8	65.1	10.22
	80	67	92.2	67.9	7.69	88.6	66.4	8.41	84.9	64.9	9.24	80.9	63.3	10.19
	80	72	92.3	67.9	7.68	88.7	66.4	8.39	85.0	64.9	9.22	81.0	63.3	10.16
	85	62	92.2	67.8	7.70	88.5	67.1	8.43	84.7	66.1	9.27	80.7	64.7	10.23
	85	67	92.2	67.9	7.69	88.6	66.4	8.42	84.8	64.9	9.25	80.8	63.3	10.21
	85	72	92.2	67.9	7.68	88.6	66.4	8.41	84.9	64.9	9.23	80.9	63.3	10.18
3375	75	62	93.8	72.3	7.73	90.1	70.8	8.45	86.2	69.2	9.28	82.1	67.5	10.23
	75	67	93.8	72.3	7.72	90.2	70.8	8.44	86.3	69.2	9.26	82.3	67.6	10.20
	75	72	93.9	72.3	7.71	90.2	70.8	8.42	86.4	69.3	9.23	82.4	67.7	10.16
	80	62	93.7	72.2	7.74	90.0	72.2	8.46	86.1	71.3	9.30	82.0	70.2	10.26
	80	67	93.8	72.3	7.73	90.1	70.8	8.45	86.2	69.2	9.28	82.2	67.5	10.23
	80	72	93.8	72.3	7.72	90.2	70.8	8.44	86.3	69.2	9.26	82.3	67.6	10.20
	85	62	93.7	73.2	7.74	90.0	72.1	8.47	86.1	70.9	9.31	82.0	69.4	10.28
	85	67	93.7	72.2	7.73	90.1	70.8	8.46	86.2	69.2	9.30	82.1	67.5	10.25
	85	72	93.8	72.3	7.73	90.1	70.8	8.45	86.3	69.2	9.28	82.2	67.6	10.22
3750	75	62	95.1	76.5	7.77	91.3	75.0	8.49	87.4	73.4	9.32	83.2	71.6	10.27
	75	67	95.1	76.5	7.75	91.4	75.0	8.47	87.5	73.4	9.30	83.4	71.7	10.23
	75	72	95.2	76.6	7.74	91.5	75.0	8.46	87.6	73.4	9.27	83.5	71.8	10.20
	80	62	95.0	77.3	7.77	91.3	76.5	8.50	87.3	76.2	9.34	83.1	74.3	10.29
	80	67	95.1	76.5	7.76	91.3	75.0	8.49	87.4	73.4	9.32	83.2	71.6	10.26
	80	72	95.1	76.5	7.75	91.4	75.0	8.47	87.5	73.4	9.29	83.4	71.7	10.23
	85	62	95.0	78.5	7.78	91.2	77.2	8.51	87.2	75.6	9.35	83.0	73.9	10.31
	85	67	95.1	76.5	7.77	91.3	75.0	8.50	87.3	73.3	9.33	83.2	71.6	10.29
	85	72	95.1	76.5	7.76	91.3	75.0	8.48	87.4	73.4	9.31	83.3	71.6	10.26

T.C.- Total net cooling capacity (mbtuh).

S.C.- Sensible cooling capacity (mbtuh).

Q5SN-0120(-)C COOLING (With One Compressor Operating)

		O.D.T		65°F			75°F			85°F			95°F		
CFM		E.D.B.	E.W.B.	T.C.	S.C.	K.W.	T.C.	S.C.	K.W.	T.C.	S.C.	K.W.	T.C.	S.C.	K.W.
3600	75	62	56.1	28.9	5.80	54.5	29.2	6.10	52.4	28.9	6.45	50.1	28.9	6.85	
	75	67	60.7	21.8	5.89	59.0	21.4	6.18	56.8	20.9	6.53	54.4	20.3	6.94	
	75	72	68.0	24.1	6.03	66.2	23.5	6.32	64.1	22.8	6.67	61.5	22.0	7.08	
	80	62	56.7	42.3	5.79	55.1	42.1	6.09	53.1	41.7	6.44	50.8	41.4	6.85	
	80	67	61.3	23.9	5.88	59.6	24.8	6.18	57.6	25.7	6.53	55.2	26.0	6.94	
	80	72	66.1	21.7	5.97	64.4	21.3	6.27	62.2	20.9	6.61	59.6	20.3	7.02	
	85	62	58.0	55.1	5.80	56.6	54.5	6.10	54.9	53.4	6.46	53.0	51.9	6.88	
	85	67	61.9	37.2	5.88	60.3	37.5	6.17	58.1	37.5	6.52	55.7	37.4	6.93	
	85	72	66.8	21.2	5.97	65.2	20.5	6.26	63.0	19.7	6.61	60.4	18.9	7.02	
4000	75	62	57.3	33.9	5.82	55.6	34.0	6.12	53.5	33.9	6.47	51.2	33.8	6.87	
	75	67	61.7	23.0	5.91	60.0	22.6	6.20	57.8	22.1	6.55	55.4	21.5	6.96	
	75	72	69.0	28.1	6.05	67.3	24.2	6.34	65.0	23.4	6.69	62.4	22.6	7.10	
	80	62	58.0	48.8	5.82	56.4	48.3	6.12	54.4	47.9	6.47	52.1	47.1	6.88	
	80	67	62.5	29.8	5.91	60.8	30.4	6.20	58.7	30.9	6.55	56.2	32.4	6.96	
	80	72	67.1	22.9	5.99	65.5	22.5	6.29	63.2	22.0	6.63	60.6	21.5	7.04	
	85	62	60.1	58.4	5.84	58.7	57.4	6.14	57.0	56.2	6.50	55.0	54.4	6.92	
	85	67	63.1	44.3	5.90	61.5	44.3	6.19	59.4	44.0	6.55	56.9	43.5	6.95	
	85	72	68.0	23.7	5.99	66.3	23.0	6.28	64.1	22.6	6.63	61.5	22.9	7.05	
4400	75	62	58.2	38.3	5.84	56.5	38.6	6.13	54.4	38.4	6.49	52.0	38.9	6.89	
	75	67	62.6	24.2	5.92	60.9	23.8	6.22	58.7	23.2	6.57	56.1	22.6	6.97	
	75	72	69.8	25.3	6.06	68.0	24.7	6.35	65.7	24.0	6.70	62.9	23.2	7.11	
	80	62	59.2	54.5	5.84	57.6	54.2	6.14	55.6	53.1	6.49	53.2	52.2	6.90	
	80	67	63.5	35.0	5.92	61.8	36.0	6.22	59.6	36.8	6.57	57.1	37.5	6.97	
	80	72	68.1	24.1	6.01	66.4	23.7	6.30	64.1	23.2	6.65	61.5	22.6	7.06	
	85	62	62.0	61.3	5.88	60.5	60.3	6.18	58.7	58.5	6.53	56.6	56.5	6.95	
	85	67	64.3	51.7	5.92	62.6	51.8	6.22	60.5	51.1	6.57	58.0	50.6	6.98	
	85	72	69.0	27.8	6.01	67.3	28.2	6.30	65.0	28.8	6.65	62.4	28.8	7.06	

Q5SN-0120(-)C COOLING (With Two Compressors Operating)

		O.D.T		85°F			95°F			105°F			115°F		
CFM		E.D.B.	E.W.B.	T.C.	S.C.	K.W.	T.C.	S.C.	K.W.	T.C.	S.C.	K.W.	T.C.	S.C.	K.W.
3600	75	62	108.7	86.0	10.48	104.3	83.7	11.31	99.6	81.4	12.26	93.8	78.5	13.34	
	75	67	117.6	69.4	10.67	112.8	67.3	11.49	107.7	65.0	12.43	101.1	62.1	13.55	
	75	72	131.3	52.1	10.95	126.1	50.2	11.78	120.2	48.2	12.75	112.8	45.6	13.92	
	80	62	110.1	102.2	10.50	105.6	100.0	11.32	101.0	97.9	12.26	95.5	93.5	13.40	
	80	67	118.9	85.7	10.68	114.1	83.6	11.50	109.0	81.3	12.45	102.5	78.3	13.60	
	80	72	128.2	68.9	10.87	123.1	66.9	11.70	117.4	64.6	12.66	110.3	61.8	13.82	
	85	62	114.0	112.9	10.56	110.2	109.4	11.40	106.1	105.5	12.36	100.9	100.5	13.51	
	85	67	119.9	102.1	10.68	115.2	99.9	11.51	110.2	97.5	12.46	103.7	94.4	13.63	
		85	72	129.4	85.2	10.88	124.4	83.1	11.71	118.8	80.8	12.68	111.7	77.9	13.85
4000	75	62	110.8	90.6	10.53	106.3	88.3	11.35	101.4	85.9	12.28	95.4	82.8	13.41	
	75	67	119.6	72.4	10.71	114.7	70.2	11.53	109.4	67.9	12.47	102.6	64.8	13.63	
	75	72	133.1	53.4	10.99	127.8	51.6	11.82	121.7	49.4	12.79	113.8	46.8	13.95	
	80	62	112.6	108.0	10.55	108.2	105.8	11.37	103.3	103.0	12.31	98.1	98.1	13.46	
	80	67	121.1	90.4	10.72	116.0	88.0	11.49	110.9	85.8	12.49	104.0	82.6	13.66	
	80	72	130.2	71.8	10.91	125.0	69.8	11.74	119.2	67.4	12.71	111.8	64.5	13.87	
	85	62	118.0	117.1	10.64	114.0	113.4	11.48	109.7	109.3	12.45	104.1	103.8	13.65	
	85	67	122.3	108.3	10.73	117.5	106.1	11.56	112.4	103.5	12.51	105.7	100.1	13.67	
	85	72	131.6	89.8	10.92	126.5	87.7	11.76	120.6	85.3	12.72	113.3	82.3	13.90	
4400	75	62	112.7	95.2	10.57	108.0	92.8	11.39	103.0	90.2	12.32	96.8	87.0	13.45	
	75	67	121.2	75.2	10.74	116.2	73.0	11.57	110.8	70.6	12.51	103.8	67.5	13.67	
	75	72	134.3	54.7	11.02	128.9	52.8	11.85	122.5	50.6	12.81	114.5	48.0	13.97	
	80	62	115.2	112.8	10.60	110.5	110.0	11.43	106.2	106.2	12.38	100.7	100.7	13.52	
	80	67	122.8	94.8	10.76	117.8	92.6	11.58	112.5	90.2	12.53	105.5	87.0	13.68	
	80	72	131.9	74.6	10.95	126.6	72.5	11.78	120.6	70.1	12.74	113.1	67.1	13.91	
	85	62	121.5	121.0	10.71	117.3	117.0	11.56	112.8	112.6	12.52	107.0	106.8	13.71	
	85	67	124.4	114.3	10.78	119.6	111.8	11.61	114.3	109.0	12.56	107.7	104.9	13.73	
	85	72	133.4	94.2	10.96	128.2	92.1	11.80	122.2	89.6	12.77	114.8	86.6	13.94	

T.C.- Total net cooling capacity (mbtuh). S.C.- Sensible cooling capacity (mbtuh).

EXPANDED HEATING PERFORMANCE

Q5SN - 090 (*) (with two compressors operating)

		OUTDOOR TEMPERATURE (Deg. F)																							
CFM	Indoor T. Deg.F	10			17			20			30			40			47			50			60		
		MBH	COP	kW	MBH	COP	kW	MBH	COP	kW	MBH	COP	kW	MBH	COP	kW	MBH	COP	kW	MBH	COP	kW	MBH	COP	kW
3000	60	37.9	1.83	6.08	46.8	2.16	6.34	50.6	2.30	6.45	63.4	2.72	6.83	76.2	3.10	7.21	85.1	3.34	7.47	89.0	3.44	7.58	101.7	3.75	7.96
	70	36.7	1.60	6.73	45.6	1.92	6.98	49.4	2.04	7.09	62.1	2.45	7.44	74.8	2.82	7.79	83.7	3.05	8.04	87.5	3.15	8.14	100.2	3.46	8.50
	80	36.3	1.44	7.41	45.0	1.72	7.66	48.8	1.84	7.77	61.3	2.21	8.13	73.8	2.55	8.49	82.5	2.77	8.74	86.3	2.86	8.84	98.8	3.15	9.20
3375	60	38.6	1.88	6.01	47.7	2.24	6.25	51.5	2.38	6.35	64.5	2.83	6.69	77.5	3.23	7.02	86.6	3.50	7.26	90.4	3.60	7.36	103.4	3.94	7.70
	70	37.5	1.66	6.63	46.5	1.99	6.85	50.3	2.13	6.94	63.2	2.55	7.26	76.0	2.94	7.57	85.0	3.2	7.79	88.8	3.30	7.89	101.7	3.64	8.20
	80	36.9	1.48	7.32	45.8	1.78	7.53	49.6	1.91	7.62	62.2	2.30	7.93	74.9	2.67	8.23	83.8	2.91	8.44	87.6	3.01	8.53	100.3	3.33	8.83
3750	60	38.9	1.90	6.00	48.1	2.27	6.22	52.1	2.42	6.32	65.3	2.89	6.63	78.5	3.31	6.95	87.7	3.59	7.17	91.7	3.70	7.26	104.9	4.06	7.58
	70	38.4	1.69	6.65	47.4	2.03	6.84	51.3	2.17	6.92	64.2	2.62	7.19	77.1	3.03	7.47	86.1	3.30	7.66	90.0	3.41	7.74	102.9	3.77	8.01
	80	37.6	1.51	7.32	46.6	1.82	7.49	50.4	1.95	7.57	63.2	2.37	7.82	76.0	2.76	8.07	84.9	3.02	8.25	88.8	3.13	8.32	101.6	3.47	8.57

Q5SN - 120 (*) (with two compressors operating)

		OUTDOOR TEMPERATURE (Deg. F)																							
CFM	Indoor T. Deg.F	10			17			20			30			40			47			50			60		
		MBH	COP	kW	MBH	COP	kW	MBH	COP	kW	MBH	COP	kW	MBH	COP	kW	MBH	COP	kW	MBH	COP	kW	MBH	COP	kW
3600	60	51.7	1.86	8.17	62.2	2.17	8.41	66.7	2.30	8.51	81.6	2.70	8.86	96.5	3.08	9.20	107.0	3.32	9.44	111.4	3.42	9.55	126.4	3.75	9.89
	70	50.3	1.61	9.14	60.8	1.91	9.34	65.2	2.03	9.43	80.2	2.42	9.71	95.1	2.79	10.00	105.5	3.03	10.20	110.0	3.14	10.28	124.9	3.47	10.57
	80	50.0	1.45	10.14	60.3	1.71	10.33	64.7	1.82	10.41	79.4	2.18	10.67	94.2	2.52	10.94	104.5	2.75	11.13	108.9	2.85	11.21	123.6	3.16	11.48
4000	60	52.7	1.93	7.99	63.3	2.26	8.20	67.8	2.40	8.29	82.9	2.83	8.59	98.0	3.23	8.89	108.6	3.50	9.10	113.1	3.61	9.19	128.2	3.96	9.49
	70	51.4	1.69	8.89	61.9	2.00	9.07	66.4	2.13	9.14	81.4	2.55	9.38	96.5	2.94	9.63	107.0	3.2	9.80	111.5	3.31	9.87	126.5	3.67	10.12
	80	50.7	1.50	9.91	61.2	1.78	10.05	65.6	1.90	10.11	80.5	2.29	10.31	95.4	2.66	10.51	105.9	2.92	10.65	110.4	3.02	10.71	125.3	3.37	10.91
4400	60	53.0	1.96	7.91	63.7	2.31	8.10	68.4	2.45	8.19	83.7	2.90	8.46	99.1	3.33	8.74	109.9	3.61	8.93	114.5	3.73	9.01	129.9	4.10	9.29
	70	52.5	1.74	8.85	63.0	2.06	8.99	67.6	2.19	9.04	82.6	2.62	9.24	97.7	3.04	9.43	108.2	3.32	9.56	112.7	3.44	9.62	127.8	3.82	9.81
	80	51.7	1.54	9.82	62.2	1.84	9.92	66.7	1.96	9.96	81.6	2.37	10.10	96.6	2.77	10.24	107.1	3.04	10.33	111.6	3.16	10.37	126.6	3.53	10.51

Downflow Configuration

Q5SN-090 Series Blower Performance

Model	Motor Sheave Position	External Static Pressures (Inches Water Column)																					
		0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.10											
Q5SN-090 (1.5 HP)	Fully Closed							3420	837	1.41	3250	839	1.33	3080	840	1.26							
	1 Turn Open					3640	806	1.41	3410	808	1.32	3180	810	1.23	3070	811	1.18	2960	812	1.13			
	2 Turns Open			3770	770	1.36	3570	773	1.28	3370	775	1.21	3120	778	1.12	2870	780	1.02					
	3 Turns Open		3740	735	1.26	3530	738	1.18	3300	740	1.10	3070	741	1.02	2800	741	0.93						
	* 4 Turns Open	3690	700	1.14	3480	702	1.07	3270	703	1.00	3020	706	0.92	2770	708	0.84							
Kit	3450	665	1.00	3230	665	0.93	2980	669	0.86	2700	670	0.78											

Model	Motor Sheave Position	External Static Pressures (Inches Water Column)																				
		1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0										
Q5SN-090 (2 HP)	Fully Closed																					
	1 Turn Open													3480	1064	2.17	3220	1068	1.97			
	2 Turns Open					3760	1021	2.21	3560	1023	2.08	3360	1028	1.97	3060	1035	1.79					
	3 Turns Open		3850	982	2.13	3620	985	1.98	3440	990	1.89	3220	995	1.75								
	4 Turns Open		3740	946	1.91	3500	950	1.79	3275	953	1.65	3040	957	1.53								
Kit	3590	908	1.67	3360	912	1.56	3140	916	1.46	2860	919	1.32										

Low Static Drive Kit = 1VP44 Motor Sheave, BK 95 Blower Pulley, and B52 Belt
 High Static Drive Kit = 1VP50 Motor Sheave, BK 80 Blower Pulley, and B52 Belt

Q5SN-120 Series Blower Performance

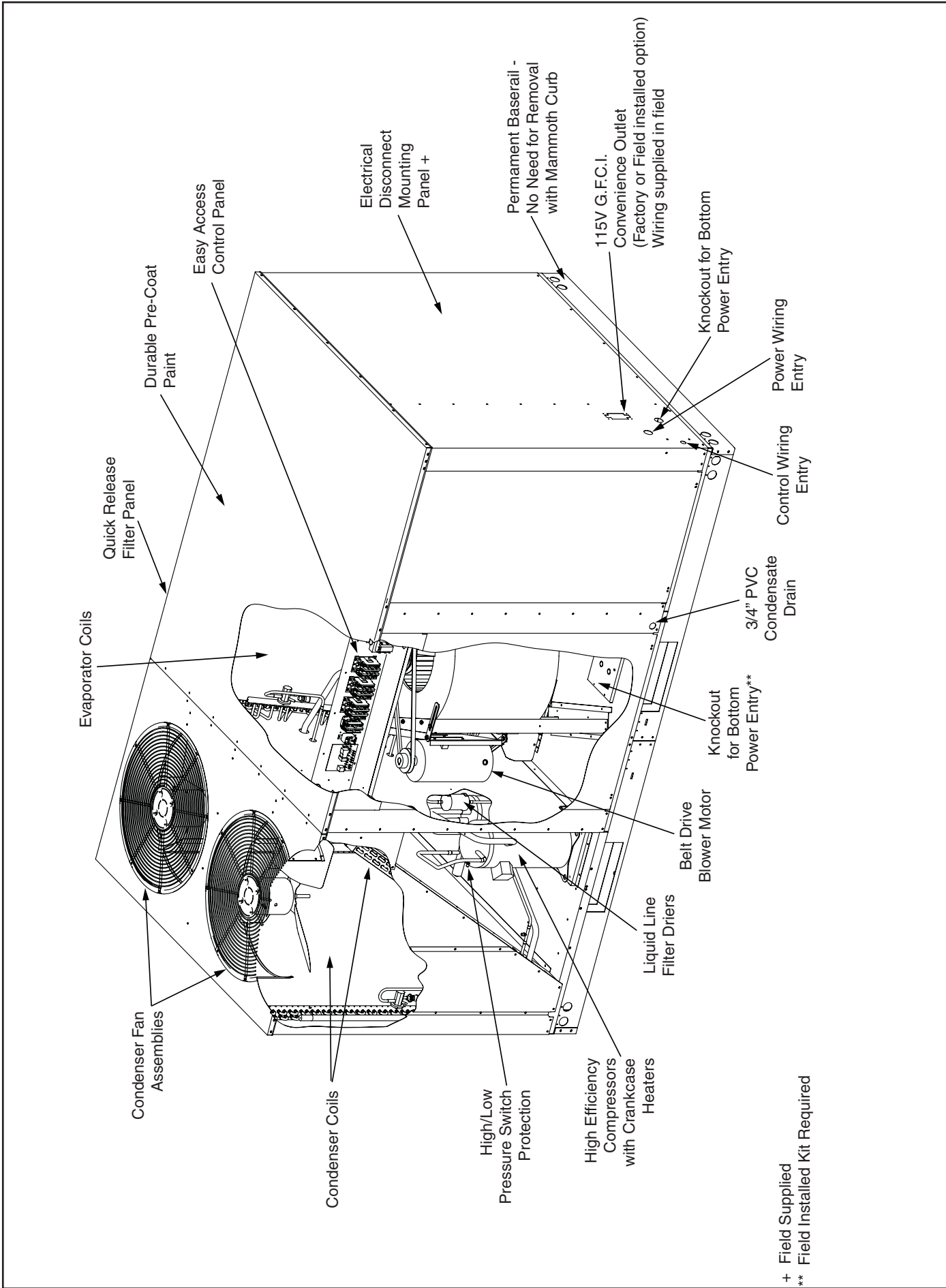
BLOWER PERFORMANCE - DOWNFLOW
 -120 SERIES

Model	Motor Sheave Position	External Static Pressures (Inches Water Column)																					
		0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.10											
Q5SN-120 (2 HP)	Fully Closed																						
	1 Turn Open																						
	2 Turns Open																						
	3 Turns Open	4791	820	2.14	4667	823	2.04	4490	826	1.98	4317	830	1.88	4127	833	1.79	3936	835	1.70	3722	837	1.58	3507
	* 4 Turns Open	4525	780	1.82	4368	783	1.76	4183	785	1.68	3975	788	1.61	3785	790	1.52	3594	792	1.44				
	Kit	4235	739.4	1.53	4034	741	1.46	3847	743	1.39	3645	745	1.32	3415	747	1.23							

Model	Motor Sheave Position	External Static Pressures (Inches Water Column)																					
		1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2											
Q5SN-120 (3 HP)	Fully Closed																						
	1 Turn Open																						
	2 Turns Open																						
	3 Turns Open																						
	4 Turns Open	4724	1023	2.90	4583	1026	2.80	4368	1029	2.69	4161	1032	2.56	3954	1035	2.42	3757	1037	2.30	3559	1039	2.18	
	* 5 Turns Open	4397	986	2.54	4186	988	2.40	3969	990	2.29	3723	993	2.14	3476	995	1.99							
Kit	3973	943.5	2.14	3754	946.3	2.03	3479	949	1.87														

Low Static Drive Components = 1VP40 Motor Sheave, BK 75 Blower Pulley, and B-49 belt
 High Static Drive Components = 1VP50 Motor Sheave, BK 75 Blower Pulley, and B-51 belt

NOTES:
 * Denotes Factory sheave setting.
 Boldface type indicates factory recommended blower operating range.
 Values include losses for air filters, unit casing, and dry evaporator coil.
 Duct 250 C.F.M. from values shown for units equipped with electric heat.
 Values can be approximated for 1/2 turn increments by interpolating between lines.
 See Accessory Performance Data table for additional static pressure information



+ Field Supplied
 ** Field Installed Kit Required

ACCESSORIES

NORDYNE Part#	Description	Q5SN -090	Q5SN -120
547881	Horizontal Supply & Return Kit	X	X
547860	Hinged Roof Curb 8" High - K/D	X	X
547861	Hinged Roof Curb 14" High - K/D	X	X
547862	Hinged Roof Curb 18" High - K/D	X	X
547863	Hinged Roof Curb 24" High - K/D	X	X
547874	0-35% Manual Outside Air Damper	X	X
547865	0-35% Motorized Damper - Only (Requires 547874 Panel Kit)	X	X
547848	CO2 Sensor for economizer control - 4-9v dc	X	X
559374	Economizer - Modulating w/ Relief, Adapts Horizontal	X	X
920233	Sensor, Enthalpy, C7400A (For Economizer Differential Enthalpy Control)	X	X
547876	Power Exhaust - Prop (208/230v/3ph), Adapts Horizontal		X
547877	Power Exhaust - Prop (460v/3ph), Adapts Horizontal		X
547878	18" x 28" Supply & Return Transition		X
547879	18" x 28" Flush Mount Concentric Diffuser		X
547880	18" x 28" Step Down Concentric Diffuser		X
547869	20" Supply & Return Transition Round	X	
547870	20" Flush Mount Concentric Diffuser Round	X	
547871	20" Step Down Concentric Diffuser Round	X	
558857	Hooded Hail Guard	X	X
547892	Duct Smoke Detector Photo Elect.	X	X
547893	Duct Smoke Detector, Remote Multi-signal control SSK 451	X	X
547894	Smoke Detector Sampling Tube ST3, 2-4 ft.	X	X
547895	Smoke Detector Sampling Tube ST5, 4-8 ft.	X	X
917163	Low Ambient Kit	X	X
917454	Bottom Power Entry Kit	X	X
917423A	H5HK009Q-01 9KW, 208/240V, 3Ø	X	X
917424A	H5HK018Q-11 18KW, 208/240V, 3Ø	X	X
917425A	H5HK035Q-22 35KW, 208/240V, 3Ø	X	X
917426A	H5HK018S-01 18KW, 480V, 3Ø	X	X
917427A	H5HK035S-01 35KW, 480V, 3Ø	X	X
1F95-1277	Thermostat-3 Stage Heat/2 Stage Cool (requires "O" & "B" terminals)	X	X

REPLACEMENT PARTS

Replacement parts are available through all NORDYNE distributors. When ordering, remember to have the complete Model and Serial number of the unit.

Electrical

Transformers
Thermostats

Contactors
Capacitors
Relays

Temperature Limit Switches
Pressure Switches
Defrost Boards

Motors

Fan Motor
Expansion Valves
Blower Assembly
Gaskets

Blower Motor
Cabinet Panels
Fan Grille
Reversing Valves

Components

Compressors
Filter Driers
Filters

INSTALLATION/PERFORMANCE CHECK LIST

LOCATION _____ CITY _____ STATE _____

INSTALLER _____ CITY _____ STATE _____

UNIT MODEL NUMBER _____ UNIT SERIAL NUMBER _____

Minimum Clearances per Figure 3? _____ Has the Owner's Information been reviewed with the
Electrical Connections tight? _____ owner? _____
Supply Voltage: _____ Volts Has the Literature Package been left with the
Blower Motor H.P.: _____ owner? _____
Supply Air Temperature: _____ (°F)
Return Air Temperature: _____ (°F)
Temperature Rise: _____ (°F)
Is the Filter(s) clean? _____
Has the Thermostat been calibrated? _____
Is the Thermostat level? _____
Is the Heat Anticipator Setting correct? _____

**INSTALLER: PLEASE LEAVE THESE
INSTALLATION INSTRUCTIONS
WITH THE OWNER.**



We Encourage Professionalism



Through Technician Certification by NATE

