SunTherm™ HEATING PRODUCTS

INSTALLATION MANUAL

Intertek 9700771

Horizontal Air Handler Models:

SEHX - DX Cooling w/ Electric Heat, Uncased
CEHX – DX Cooling w/ Electric Heat, Cased
SCWE – Chilled Water Cooling w/Electric Heat, Uncased-2P
CCWE – Chilled Water Cooling w/Electric Heat, Cased-2P
SDXW - DX Cooling w/ Hot Water Heat, Uncased
CDXW – DX Cooling w/ Hot Water Heat, Cased
SCWW – Chilled Water Cooling w/Hot Water Heat, Uncased-4P
CCWW – Chilled Water Cooling w/Hot Water Heat, Cased-4P

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SECTION 1: GENERAL

The following list includes important facts and information regarding this air handler.

1. This air handler is rated at 208/240 VAC (electric heat) or 115 VAC (hydronic heat), 60 Hertz, Single-Phase
2. This air handler is not designed to operate at 50 Hertz.
3. Air handler size varies by model.
4. This air handler is designed for both A/C and heat pump applications
5. Use 4-wire thermostat cable for heating/cooling applications and 7-wire thermostat cable for heat pump applications.
6. This air handler is designed for horizontal applications only.
7. This air handler must not be operated without the access panels installed.
8. This air handler and its components listed are listed by ETL for the United States and Canada.
9. This air handler is for use at elevations of 10,000 ft (3,048m) or less.
10. This appliance is not to be used by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of this appliance by a person responsible for their safety.

⚠ WARNING

This is a safety alert symbol. When you see this symbol on labels or in manuals, be alert to the potential for personal injury. Understand and pay particular attention to the signal words **DANGER, WARNING, or CAUTION.**

DANGER: Indicates an imminently hazardous situation, which if not avoided, **will result in death or serious injury.**
WARNING: Indicates a potentially hazardous situation, which if not avoided, **could result in death or serious injury.**

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

⚠ WARNING

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

Improper installation, adjustment, alteration, service or maintenance can cause injury or property damage. Refer to this manual for assistance; or for additional information consult a qualified contractor, installer, or service agency.

⚠ WARNING

FIRE OR ELECTRICAL HAZARD

Failure to follow the safety warnings exactly could result in serious injury, death, or property damage.
A fire or electrical hazard may result causing property damage, personal injury or loss of life.

⚠ CAUTION

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

⚠ IMPORTANT

The Clean Air Act of 1990 bans the intentional venting of refrigerant (CFC's and HFC's) as of July 1, 1992. Approved methods of reclaiming must be followed. Fines and/or incarceration may be levied for non-compliance

Safety Requirements

This air handler must be installed in accordance with all national and local building/safety codes and requirements, local plumbing and waste water codes, and other applicable codes. In the absence of local codes, install in accordance with the following codes.

- Standard for the Installation of Air Conditioning and Ventilating Systems (NFPA 90A)
- Standard for the Installation of Warm Air heating and Air Conditioning Systems (NFPA 90B)
- National Electrical Code (NFPA 70)
- Canadian Electrical Code, Part I (CSA C22.2) or ANSI/NFPA No. 70
- All local codes (State, City, and Township)

NOTE: All applicable codes take precedence over any recommendation made in these instructions. SunTherm assumes no responsibility for units installed in violation of any code or regulation.

1. Refer to the air handler rating plate for the air handler model number and refer to the dimensions page of this manual for return air plenum dimensions for the applicable model (see Figures 2 and 3 and Tables 9 and 10). The return air plenum must be installed according to the above listed codes or the instructions in this manual.
2. Refer to the dimensions page of these instructions to determine the proper location to install the air handler.
3. This air handler is **not ETL listed** or approved for installation in a **manufactured (mobile) home.**
4. Provide clearances from combustible materials as listed in the **LOCATION AND CLEARANCES** section.
5. Provide clearances for service access panel to allow access to the control box, electric heater elements, hot water coil, and blower.
6. Power supply wiring and circuit breakers/fuses must be sized for the electrical characteristics listed on the air handler rating plate.
7. Failure to carefully read and follow all instructions in this manual can result in malfunction of the air handler, death, personal injury, and/or property damage.
8. Electric heat air handlers must be installed so the electrical components are protected from water.
9. Installing and servicing heating/cooling equipment can be hazardous due to electrical components.
10. Only trained and qualified personnel should install, repair, or service heating/cooling equipment. Untrained service personnel only perform basic maintenance functions such as cleaning of exterior surfaces and replacing the air filters.
11. Observe all precautions shown in the manuals and on labels attached to the air handler when servicing or conducting maintenance tasks.

12. These instructions cover minimum requirements and conform to existing national standards and safety codes. In some cases, these instructions exceed certain local codes and ordinances, especially those who have not kept up with changing home construction practices. These instructions are to be followed and are the minimum requirement for a safe installation.
13. The capacity of the air handler should be based on an acceptable heat loss calculation for the structure such as ACCA Manual J or other approved methods.
14. 115 VAC models must be connected to a nominal 115 VAC, Single-Phase, 60-Hertz power supply. **DO NOT CONNECT THIS APPLIANCE TO A 50 HZ POWER SUPPLY OR VOLTAGE ABOVE 132 VOLTS OR BELOW 98 VOLTS.**
15. 208/240 VAC models must be connected to a nominal 208 or 240 VAC, Single-Phase, 60-Hertz power supply. **DO NOT CONNECT THIS APPLIANCE TO A 50 HZ POWER SUPPLY OR VOLTAGE ABOVE 253 VOLTS OR BELOW 187 VOLTS.**
16. Ground wire connections must be securely fastened to the ground lugs inside the control box.
17. Ductwork must be installed in accordance with the standards of the National Fire Protection Association (NFPA) Warm Air Heating and Ventilation Systems (NFPA Standards 90A and 90B). The air distribution duct should be sized for 0.2 inches of static pressure. See Air Conditioning Contractors of America (ACCA) Manual D for duct sizing.
18. The safety testing label appearing on this air handler covers the air handler and the factory installed coil only. It does not cover any other equipment.
19. Exterior surface of the cabinet may sweat when installed in a non-conditioned space such as an attic or garage. Installer must provide protection for the building structure such as a full size auxiliary drain pan under all air handlers installed in the non-conditioned space. The auxiliary drain pan is needed to prevent building damage from condensation runoff from the unit casing.
20. Cabinet insulation used in this air handler is rated for R-2.1 (standard) and is ½" thick. Some jurisdictions require R-4.2 or R-6.0 on installations in a non-conditioned spaces. Add 1" thick insulation to the exterior casing of the air handler to comply in these jurisdictions and add a vapor barrier on the outside of the added insulation.

⚠ WARNING

ALWAYS SHUT OFF ELECTRICITY AT THE DISCONNECT SWITCH OR TURN OFF THE CIRCUIT BREAKERS IN THE MAIN ELECTRICAL ENTRANCE BEFORE PREFORMING ANY SERVICE ON THE APPLIANCE.

GENERAL INFORMATION

This air handler provides the flexibility for installation in any horizontal application and may be used with or without electric heat or hydronic heat. The direct-drive three 3-speed PSC motor or 5-speed constant torque motor is capable of providing sufficient air flow for most applications. Return air may enter the bottom or end of a cased air handler.

Inspection

As soon as the air handler is received, it should be inspected for damage that may have occurred during transit. If shipping damage is found, the extent of the damage should be noted on the carrier's freight bill. A separate request for inspection by the carrier's agent should be made in writing. Before installing the air handler, check the cabinet for screws or bolts which may have become loose during transit. Some air handler models have shipping supports for the blower motor shaft. Remove this support before operating the air handler unit.

See the local wholesale distributor for more information. Mortex Products, Inc assumes no liability for freight damage.

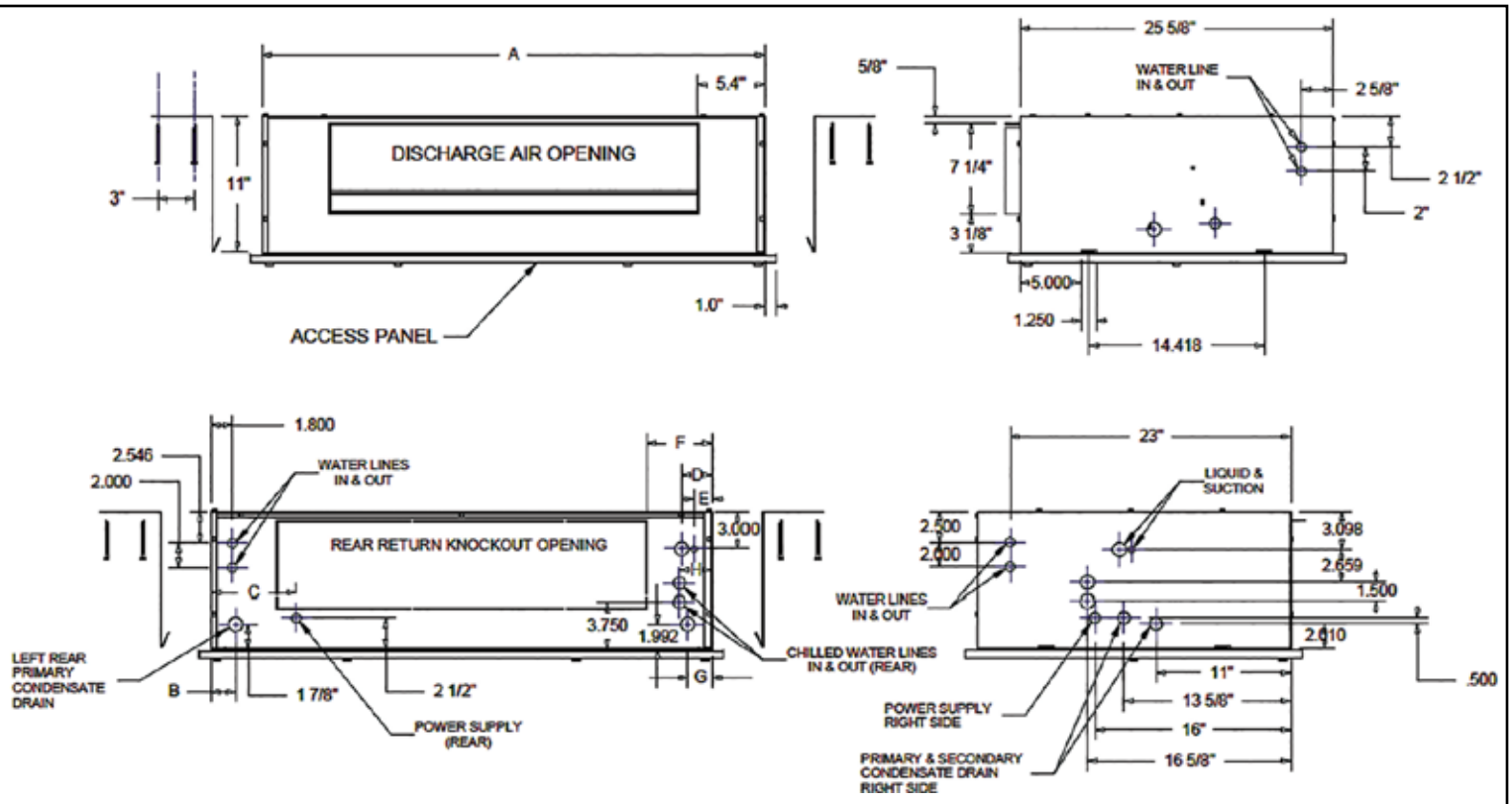

Figure 1: CEHX/ CCWE/ CDXW/ CCWW Dimensions - DX or Chilled Water Cooling With or Without Electric Heat

Model Number	Physical Dimensions							
	A	B	C	D	E	F	G	H
CEHX / CCWE / CDXW / CCWW - 18	41	2.625	7.125	4	3	5.25	2.625	3.75
CEHX / CCWE / CDXW / CCWW - 19	41	2.625	7.125	4	3	5.25	2.625	3.75
CEHX / CCWE / CDXW / CCWW - 24	41	2.625	7.125	4	3	5.25	2.625	3.75
CEHX / CCWE / CDXW / CCWW - 25	47	2	10.5	2.5	1.5	4.625	2	2.6875
CEHX / CCWE / CDXW / CCWW - 30	47	2	10.5	2.5	1.5	4.625	2	2.6875
CEHX / CCWE / CDXW / CCWW - 31	47	2	10.5	2.5	1.5	5.875	2	2.6875
CEHX / CCWE / CDXW / CCWW - 34	53.5	3.25	13.75	3.25	2.75	5.875	3.25	3.9375
CEHX / CCWE / CDXW / CCWW - 35	53.5	3.25	13.75	3.25	2.75	5.875	3.25	3.9375
CEHX / CCWE / CDXW / CCWW - 36	60.5	3.25	17.5	3.25	2.75	5.875	3.25	3.9375
CEHX / CCWE / CDXW / CCWW - 37	60.5	3.25	17.5	3.25	2.75	5.875	3.25	3.9375

Table 1: CEHX/ CCWE/ CDXW/ CCWW Dimensional Data

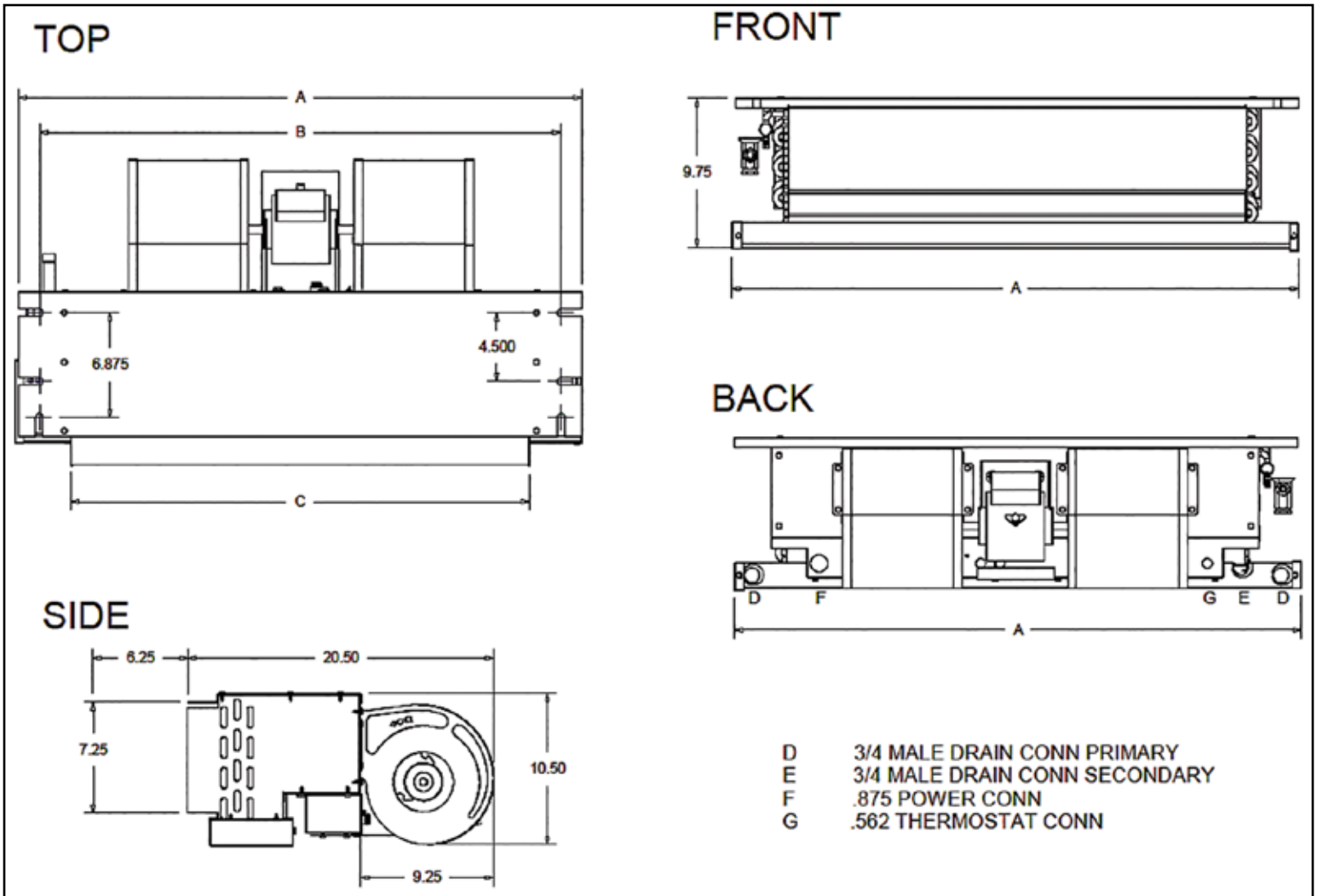

Figure 2: SEHX/ SCWE/ SDXW/ SCWW Dimensions - DX or Chilled Water Cooling With or Without Electric Heat

Model Number	Physical Dimensions						
	Liquid Line	Suction Line	Evap. Rows	A	B	C	Ship Weight
SEHX / SCWE / SDXW / SCWW - 18	3/8	3/4	3	37	34.25	30	60
SEHX / SCWE / SDXW / SCWW - 19	3/8	3/4	4	37	34.25	30	65
SEHX / SCWE / SDXW / SCWW - 24	3/8	3/4	3	37	34.25	30	60
SEHX / SCWE / SDXW / SCWW - 25	3/8	3/4	4	45	42.25	38	75
SEHX / SCWE / SDXW / SCWW - 30	3/8	3/4	3	45	42.25	38	70
SEHX / SCWE / SDXW / SCWW - 31	3/8	3/4	4	45	42.25	38	75
SEHX / SCWE / SDXW / SCWW - 34	3/8	3/4	3	49	46.25	42	74
SEHX / SCWE / SDXW / SCWW - 35	3/8	3/4	4	49	46.25	42	80
SEHX / SCWE / SDXW / SCWW - 36	3/8	3/4	3	56	53.25	49	85
SEHX / SCWE / SDXW / SCWW - 37	3/8	3/4	4	56	53.25	49	90

Table 2: SEHX/ SCWE/ SDXW/ SCWW Dimensional Data

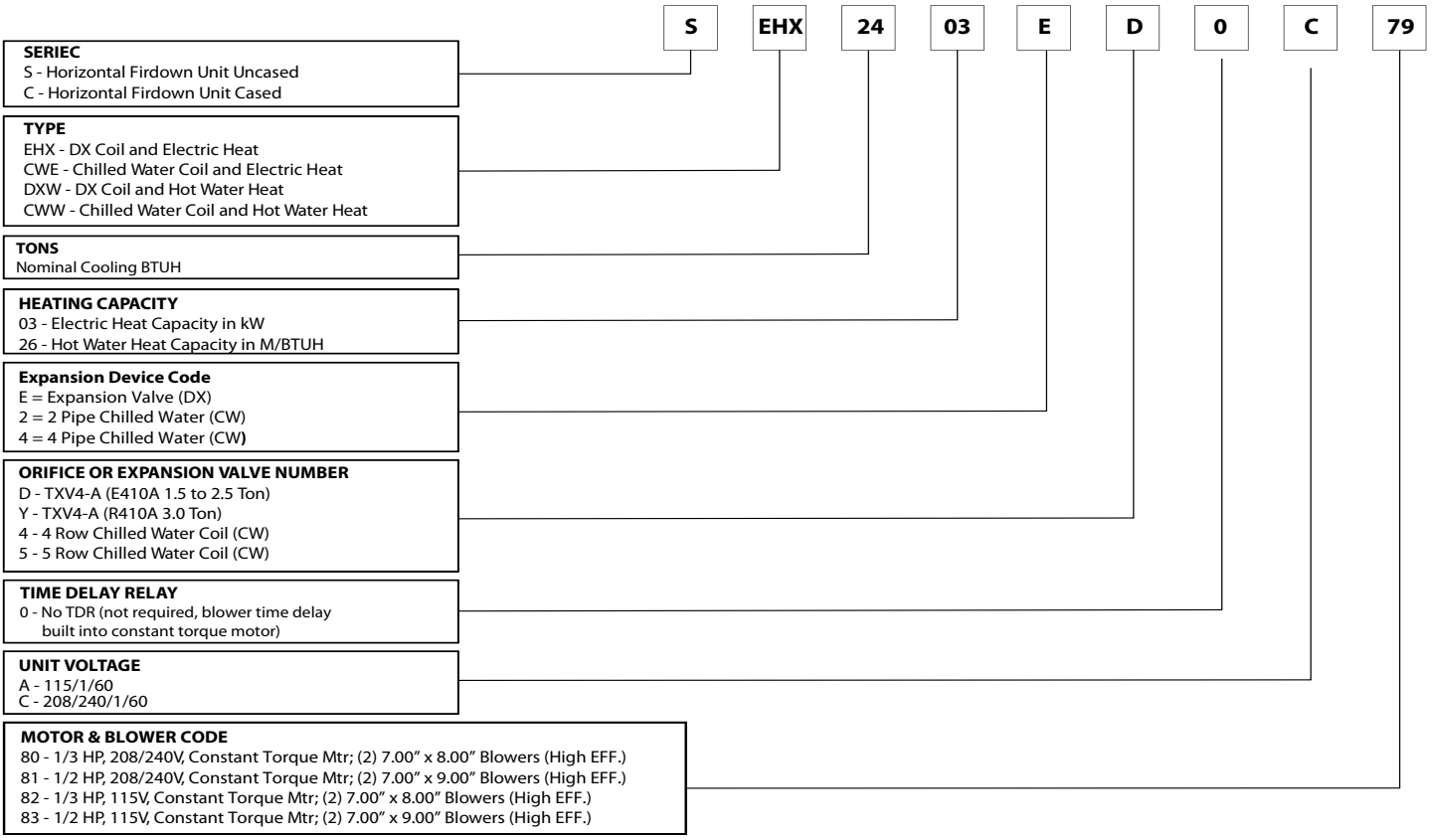

Table 3: SEHX/CEHX/SCWE/CCWE/SDXW/CDXW/SCWW/CCWW Model Number Nomenclature

SECTION 3: LOCATION AND CLEARANCES

Location

Access for servicing is an important factor when selecting the location of an air handler. Provide a minimum of 30 inches under the air handler for access to the control box, heating elements, water pump, blower, and air filters. The air handler can be serviced entirely from the bottom, including replacing the air filter on models equipped with a louvered ceiling access panel with an integrated filter rack.

NOTE: The air handler is designed for horizontal applications only and is therefore **not** designed to be installed in a closet or flush mounted in a wall in an upflow vertical position.

Location is usually predetermined. Check with the homeowner or general contractor for predetermined installation plans. If location has not been decided, consider the following in choosing a suitable location.

1. Select a location with adequate structural support, space for service access, and clearance for return and supply duct connections. The air handler is designed to fit in a 12" high drop down space (furred-in area).
2. Normal operating sound levels may be objectionable if the air handler is placed directly over or under some rooms such as bedrooms, study, etc.
3. Locate the air handler where the supply and return air ducts can provide even air distribution to and from the living spaces.
4. Locate the air handler where the electrical supply wiring can be easily routed from main electrical panel to the air handler and where electrical wiring will not be damaged.
5. Supply power wiring may be installed in a flexible conduit or armored cable. The installer must refer to National Electrical Code (NFPA 70), Canadian Electrical Code, Part I (CSA C22.2), ANSI/NFPA No. 70 and/or any local codes to ensure supply wiring complies with all applicable codes.
6. Locate appliance where thermostat wiring can be easily routed from the thermostat to the air handler and where the wiring will not be damaged. Make sure the wiring has enough length so it will not to block access to any components that may need to be replaced or serviced.
7. Locate the air handler where refrigerant lines can be easily routed from the air handler to the outdoor unit.
8. Primary and secondary drain lines must be routed so air filter replacement is not obstructed.
9. The blow-thru design of this air handler will cause the exterior surface of cabinet to sweat when installed in a non-conditioned space such as an attic or garage. The installer must provide protection such as a full size auxiliary drain pan under any unit installed in a non conditioned space to prevent damage to the building structure from condensation runoff.

Clearances

This air handler is approved for 0 inches of clearance to combustible material on any part of the air handler exterior casing and the inlet or outlet ducts (See Table 12). A clearance of 30 inches below the air handler is required for the service access panel to swing open (See Figure 3).

Top (inches)	Back (inches)	Sides (inches)	Supply Duct (inches)
0	0	0	0

Table 4: Clearance to Combustibles

SECTION 4: RETURN AND SUPPLY AIR REQUIREMENTS

RETURN AIR REQUIREMENTS

Provisions shall be made to permit air in the conditioned space to return to the air handler. Failure to provide means for adequate return air will result in reduced airflow through the air handler causing improper heating and cooling of the living space. Reduced airflow may also cause the cooling coil to freeze up and the electric heat limit(s) to cycle, resulting in premature heating element failure.

Uncased Air Handler – Return Air

If a louvered service access panel with an integral filter (See Figure 4) is not used, a return air duct should be routed between the ceiling joists from the furred-in area around the air handler to a return air filter grille located in the ceiling. The return air grille must never be located in a closet.

NOTE: The return air must be filtered to prevent a buildup of lint, dust, and debris on the coil surface.

Cased Air Handler – Return Air

A cased air handler can utilize a louvered ceiling access panel with an integral filter (See Figure 4) as a means of returning the conditioned air from the conditioned space to the air handler. A cased air handler may also utilize a non-louvered ceiling access panel with a return air duct attached to the return air opening in the air handler. If a return air duct is used, the return air opening knock-out must be removed to allow the return air to enter the air handler through the return air opening. The return air duct may consist of an elbow that drops directly into a return air filter grille in the ceiling or the return duct may be routed between the ceiling joists to a return air filter grille located in the ceiling away from the air handler.

NOTE: The return air must be filtered to prevent a buildup of lint, dust, and debris on the coil surface.

⚠ WARNING

NON-METALLIC RETURN DUCTS MAY NOT BE ALLOWED IN SOME STATES, COUNTIES, OR CITIES.
CHECK ALL STATE, LOCAL AND FIRE CODES TO DETERMINE IF NON-METTALIC RETURN DUCTS ARE ALLOWED.

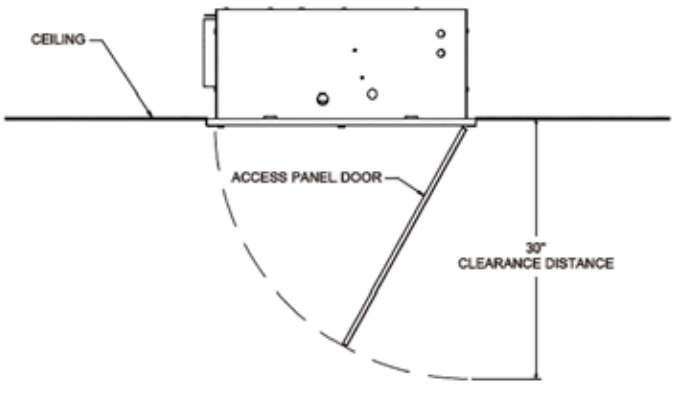

Figure 3: Clearance for Service Access

⚠ WARNING

FIRE HAZARD:
NON-METALIC DUCTS CAN COLLECT DUST AND DEBRIS WHICH CAN RESULT IN A FIRE HAZARD. BE SURE TO THOROUGHLY CLEAN THE DUCT SYSTEM ANNUALLY TO REMOVE ALL DUST AND DEBRIS.

Return Air Filter Location

Horizontal air handlers are not factory equipped with an air filter. The air filter can be installed in the filter rack of the louvered ceiling access panel (See Figure 4 and Table 13) or it may be located remotely in a ceiling mounted return air filter grille. If a return duct and return air filter grille is used, a non-louvered ceiling access panel will be required.

The louvered ceiling panel air filter size for the SEHX, CEHX, SCWE and the CCWE models is 20" x 20" x 1".

The recommended minimum filter sizes for a return air filter grille is shown below.

Standard Throw-Away Air Filter @ 300 ft/min or Less
600 CFM = 16" x 20" x 1"
700 CFM = 20" x 20" x 1"
800 CFM = 20" x 20" x 1"
900 CFM = 20" x 24" x 1"
1000 CFM = 20" x 24" x 1"

NOTE: Pleated filters are not recommended due to their higher pressure drop.

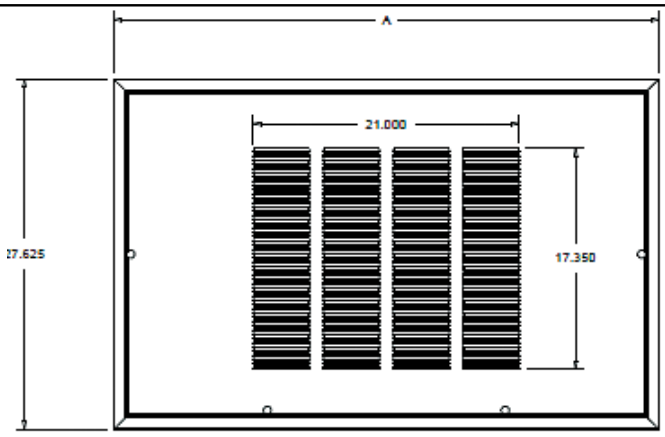

Figure 4: Ceiling Access Panel

⚠ IMPORTANT

USING A DUCTED RETURN WILL RESULT IN QUIETER OPERATION THAN USING A LOUVERED CEILING ACCESS PANEL USED FOR RETURN AIR.

⚠ WARNING

IMPACT HAZARD

Use extreme caution when removing the ceiling access panel screws. The panel is secured to the frame assembly with the thumb screws. Once the thumb screws have been removed, the ceiling access panel will swing down rapidly and can injure anyone standing underneath the panel. The panel must be supported from underneath as it swings downward to prevent injury.

The louvers can also have sharp edges which can cut hands or fingers. Wearing gloves is recommended when servicing the horizontal air handler.

SUPPLY AIR REQUIREMENTS

The horizontal air handler can be mounted into the ceiling to allow horizontal left supply air flow or horizontal right supply air flow. The supply air plenum is attached and secured to the air handler duct flanges using screws. Use a non-tape sealant such as mastic or an aerosol sealant to seal the plenum to the air handler to prevent air leakage. The supply plenum must be the same size as the supply air opening.

The entire supply duct system must be designed for a total of 0.20" W.C. static pressure drop or less and each individual duct must be sized to deliver the proper amount of air to each room of the conditioned space. Holes cut in the supply plenum for ducts must be the same size as the supply ducts. Use a duct starting collar to attach the ducts to the plenum. Use a non-tape sealant such as mastic or an aerosol sealant to seal the ducts to the plenum to prevent air leakage.

If the supply duct system is installed in an non-conditioned space, the duct system must be insulated and installed in accordance with local codes.

Part Number	Overall Frame Dimensions	Type	SunTherm Horizontal Fan Coil Models	Ship Weight
CPL1	27.5 x 43	Louvered	SCWE/CCWE/SDXW/CDXW/CCWW-12, SCWE/CCWE/SDXW/CDXW/CCWW-18 SCWE/CCWE/SDXW/CDXW/CCWW-19, SCWE/CCWE/SDXW/CDXW/CCWW-24, SCWE/CCWE/CCWW-25	18
CPNL1	27.5 x 43	Non-Louvered		18
CPL2	27.5 x 49	Louvered	SCWE/CCWE/SDXW-25 SCWE/CCWE/SDXW/CDXW/CCWW-30, SCWE/CCWE/SDXW/CDXW/CCWW-31	20
CPNL2	27.5 x 49	Non-Louvered		20
CPL3	27.5 x 55.5	Louvered	SCWE/CCWE/SDXW/CDXW/CCWW-34, SCWE/CCWE/SDXW/CDXW/CCWW-35	21
CPNL3	27.5 x 55.5	Non-Louvered		21
CPL4	27.5 x 62.5	Louvered	SCWE/CCWE/SDXW/CDXW/CCWW-36, SCWE/CCWE/SDXW/CDXW/CCWW-37	22
CPNL4	27.5 x 62.5	Non-Louvered		22

Table 5: Optional Ceiling Access Panels

NOTE: Cased air handlers require return and supply transition ducts to assure proper airflow. Uncased air handlers only require a supply duct transition. See Figure 5 below for factory recommendations.

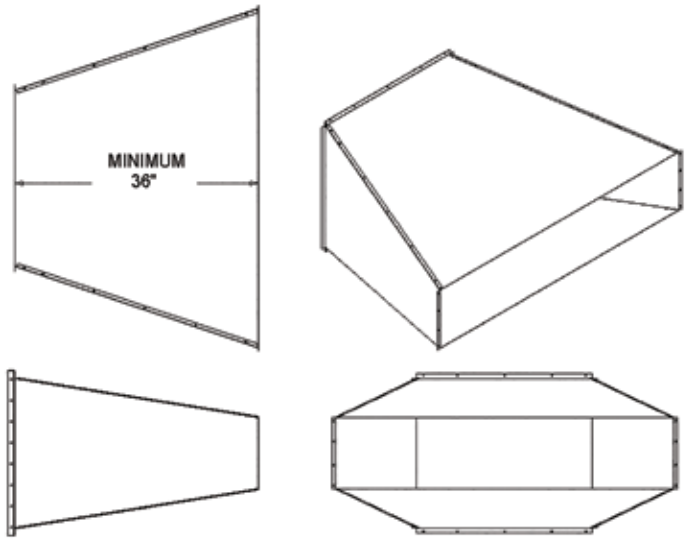

Figure 5: Supply and Return Duct Transitions

SECTION 5: AIR HANDLER INSTALLATION

Ceiling Installation

The area in the ceiling where the air handler is to be located should have a framed in structure so the air handler can be properly mounted and secured. The inside height of the area must be 12 inches. Prior to installing the air handler, holes must be cut into the frame for the refrigerant tubing, drain line(s), electrical wiring, thermostat wiring, and outdoor unit control wiring to enter the air handler. The air handler must be level in both directions to allow proper condensate drainage.

⚠ WARNING

Extreme caution must be taken that no internal damage will result if screws or holes are drilled into the cabinet.

⚠ WARNING

The air handler and enclosure must be covered during the drywall installation, texturing, and painting process to prevent spray and debris from collecting on and entering the air handler and enclosure.

Cased Air Handler

The following steps are required to properly install a cased air handler.

1. Remove the top shipping cover and corner posts.
2. Remove the bottom shipping cover.
3. Use screws to secure the 4 straps to the ceiling joists where the air handler will be installed (See Figure 6). The straps must be located so the hooks in the straps line up with the slots in the base of the air handler.
4. Raise the air handler into place and place the hooks into the slots in the base. Bend the hooks back to keep the hooks from slipping out of the slots in the base.
5. Connect the supply air plenum to the air handler supply air duct flanges as described in **SUPPLY DUCT REQUIREMENTS** found in **SECTION 3** of these instructions.
6. **New Installations Only:**
   a. If a non-louvered ceiling access panel is being used, connect the return air duct to the air handler as described in **RETURN AIR REQUIREMENTS / Cased Air Handler** found in **SECTION 3** of these instructions.
   b. After the air handler is mounted, a 2x2 or 2x4 frame must be installed around the base of the air handler to create an air tight seal and support the ceiling access panel frame.
   c. Install the ceiling access panel.
   NOTE: The ceiling access panel is sold separately. It is not included with the air handler.
7. Remove the thumb screws that secure the ceiling access panel and slowly swing the panel down.
8. Remove the control box cover.
9. Connect the electrical supply wires and the thermostat control wires to the appropriate terminal block and pigtails in the control box as described in **SECTIONS 8 and 9** of these instructions.
   NOTE: An ON/OFF switch must be installed in the supply circuit to disconnect the power to the air handler during servicing. The switch must be easily accessible and clearly identified.
10. Connect the refrigerant lines or chilled water lines to the coil as described in **SECTIONS 6 and 7** of these instructions.

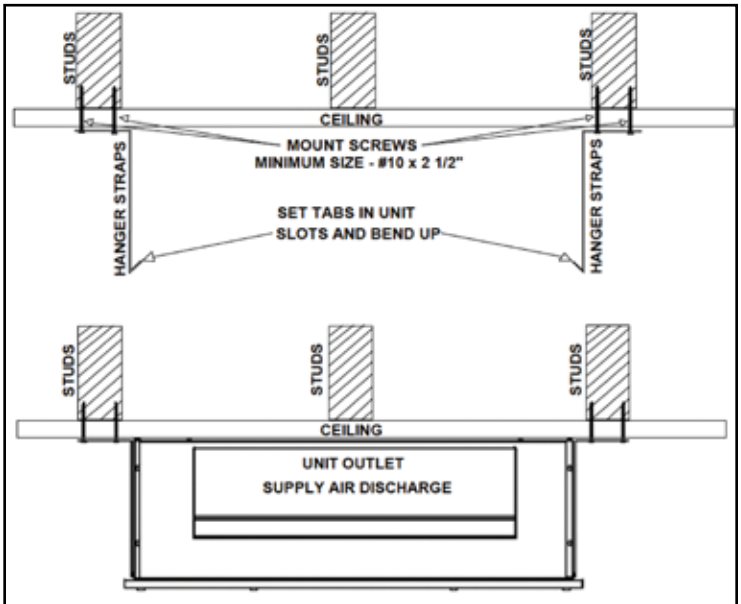

Figure 6: Cased Air Handler Mounting

11. Make the necessary blower motor speed changes as described in **SECTION 10** of these instructions.
12. Install the control box cover.
13. Raise the ceiling access panel into place and secure with the thumbscrews.
14. Turn the power on to the unit by following the procedure found in **SECTION 11** of these instructions and in the Users Information Manual to place the air-handler into service.
15. Set the thermostat to the desired operating mode and temperature.

Uncased Air Handler

The following steps are required to properly install an uncased air handler.

1. Remove the top shipping cover and corner posts.
2. Remove the screws from the control box cover and remove the cover.
3. Remove the bottom shipping cover.
4. Raise the air handler into place and install the lag bolts with washers through the slots in the top cover. Tighten the lag bolts until the air handler is securely fastened to the ceiling.
5. Connect the supply air plenum to the air handler supply air duct flanges as described in **SUPPLY DUCT REQUIREMENTS** found in **SECTION 3** of these instructions.
6. New Installations Only:
   a. If a non-louvered ceiling access panel is being used, install the return air duct as described in **RETURN AIR REQUIREMENTS / Uncased Air Handler found in SECTION 3** of these instructions.
   b. After the air handler is mounted, a 2x2 or 2x4 frame must be installed around the base of the air handler to create an air-tight seal and support the ceiling access panel frame.
   c. Install the ceiling access panel.
   NOTE: The ceiling access panel is sold separately. It is not included with the air handler.
7. Remove the thumb screws that secure the ceiling access panel and slowly swing the panel down.
8. Remove the control box cover.
9. Connect the electrical supply wires and the thermostat control wires to the appropriate terminal block and pigtails in the control box as described in **SECTIONS 8 and 9** of these instructions.
   NOTE: An ON/OFF switch must be installed in the supply circuit to disconnect the power to the air handler during servicing.

SECTION 6: REFRIGERANT PIPING, TXV, FLOWRATOR, CONDENSATE DRAIN

DX Cooling / Chilled Water Cooling

DX Refrigerant Piping:
Air handlers with DX type evaporator coils require liquid and suction piping sized in accordance with the outdoor unit manufacturer's instructions. The DX coil has sweat copper connections. Refrigerant lines should be soldered with silver solder or high temperature brazing alloy. The suction line must be insulated to prevent condensate from forming and dripping off. Armaflex (or equivalent) with 3/8" (1 cm) minimum wall thickness is recommended. In severe conditions, such as hot or high humidity areas, insulation with 1/2" (1.3 cm) minimum wall thickness may be required. If the outdoor unit is installed above air handler, oil traps are required at equal intervals along suction line (See Figure 7). Horizontal suction lines should slope downward 1 inch for every 20 feet toward the outdoor unit. Flow dry nitrogen through refrigerant lines during the soldering operation to prevent oxidation of the inside surface of the copper tubing which can result in debris plugging the TXV or orifice screen.

- Install 1 oil trap for a height difference of 15 ft to 25 ft (4.6 m to 7.6 m) between indoor and outdoor units.
- Install 2 oil trap for a height difference of 26 ft to 50 ft (7.9 m to 15.2 m) between indoor and outdoor units.
- Install 3 oil trap for a height difference of 51 ft to 100 ft (15.5 m to 39.5 m) between indoor and outdoor units.
- Install 4 oil trap for a height difference of 101 ft to 150 ft (30.8 m to 45.7 m) between indoor and outdoor units.

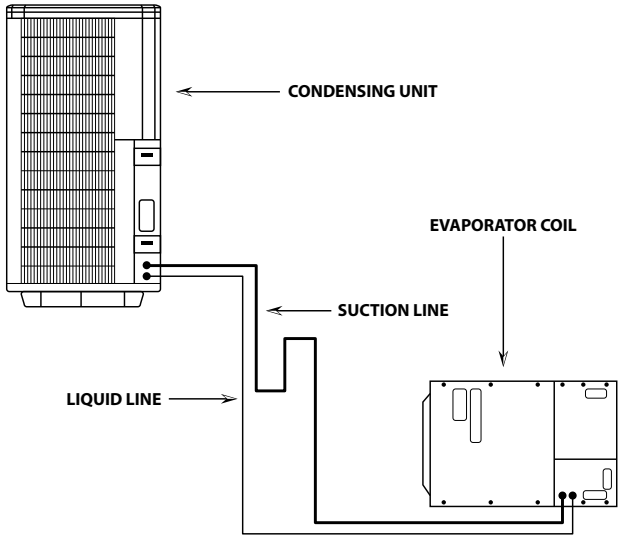

Figure 7: Piping for Air Handler Below Outdoor Unit

SPECIAL INSTRUCTIONS FOR COILS WITH THERMAL EXPANSION VALVES (TXV)

The thermal expansion valve (TXV) used in this air handler has a built-in check valve making it heat pump capable. The external equalizer line attached to the TXV has a female flare nut with built in Schrader valve depressor that attaches to the Schrader valve port located on the coil suction manifold.

A TXV has a thermostatic element separated from the valve body by a diaphragm designed to regulate the rate at which refrigerant flows into the evaporator.

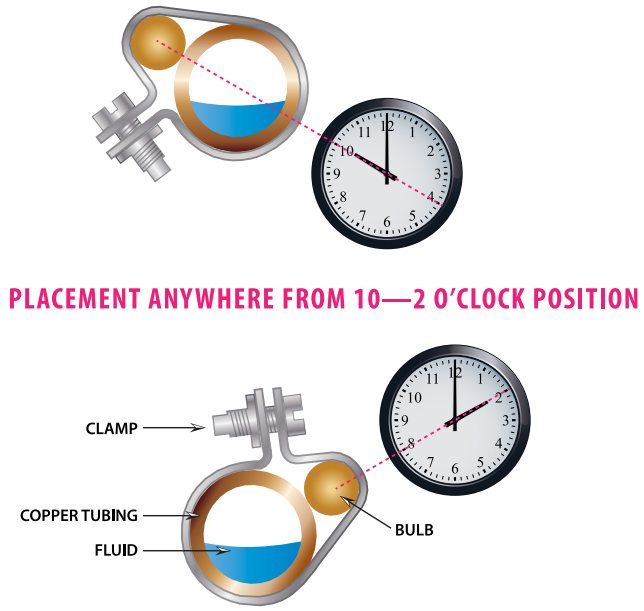

Figure 8: TXV Sensing Bulb Placement

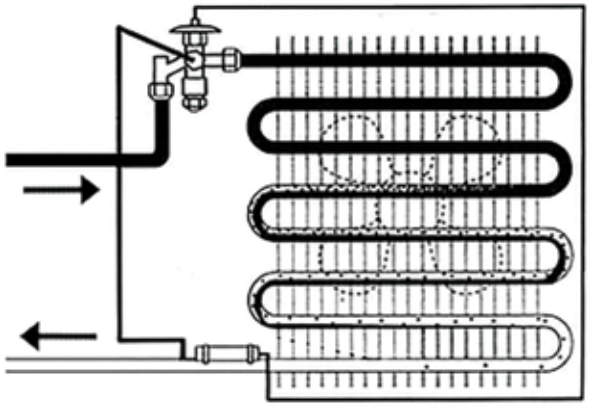

Figure 9: TXV Sensing Bulb Location

The best location for the TXV sensing bulb is on a horizontal section of the suction line tube and positioned between 10 o'clock and 2 o'clock on the tube. (See Figures 8 and 9).

NOTE: The sensing bulb must never be located at the bottom of the suction line due to the possibility of oil and refrigerant laying in the bottom of the pipe causing false signals.

The sensing bulb must be able to sense the temperature of the superheated suction vapor and must therefore not be located in a position that will expose it to extraneous heat/cold. The sensing bulb must be insulated to isolate it from the surrounding air. The TXV must be the proper size and type to achieve the performance ratings of the system.

NOTE: If a non-bleed type TXV is used, the outdoor unit may require a hard start kit to allow the compressor to start under load.

How the TXV Controls Superheat
The TXV is a precision device designed to regulate the rate at

which liquid refrigerant flows into the evaporator. This controlled flow is necessary to provide optimum performance and to prevent the return of liquid refrigerant to the compressor.

The TXV separates the high pressure and low-pressure sides of a refrigeration or air conditioning system. Liquid refrigerant enters the TXV under high pressure, but the pressure is reduced when the flow of the refrigerant is restricted by an internal moving pin and port.

It is important to remember that the TXV only controls the level of superheat of the refrigerant in the suction line. The TXV is not designed to control air temperature, head pressure, capacity, suction pressure, or humidity. Attempts to adjust the TXV to control any of these system variables will lead to poor system performance and possible compressor failure.

The TXV responds to the temperature of refrigerant gas as it leaves the evaporator. This temperature is detected by the sensing bulb which is located near the evaporator outlet. The TXV also responds to the refrigerant pressure within the evaporator, which is transmitted to the TXV by an equalizer tube connected to the coil suction manifold. By responding to these variables, the TXV maintains a predetermined superheat level exiting the evaporator which maintains proper system stability, performance, and reliability.

TXV TROUBLESHOOTING

The thermostatic expansion valve (TXV) is like the carburetor in a car engine. It opens and closes to allow the correct amount of refrigerant flow through the system. When the TXV isn't working properly, the capacity and efficiency of the system is reduced. If a faulty TXV is suspected, perform the following tests:

Connect refrigerant gauges to the system and check that the refrigerant pressures, liquid subcooling and suction superheat levels are correct according to the outdoor unit charging chart. Subcooling at the outdoor unit liquid service valve is normally around 10°F and superheat at the outdoor unit suction service valve is normally between 8-12°F, but these can vary depending on the manufacturer and model of the outdoor unit.

Check to see if the indoor airflow through the system is correct. Check to see if the indoor and outdoor coils and indoor air filters are dirty. Clean dirty coils and clean/replace dirty air-filters as necessary before measuring air-flow and checking pressures, superheat, and subcooling.

Make sure the refrigerant charge in the system is correct. This step may require weighing the refrigerant in the system. Once refrigerant charge weight has been adjusted as necessary, recheck the pressures, subcooling and superheat. If these values are still not correct, the TXV may be defective or the TXV inlet strainer or the liquid line filter dryer is plugged with debris.

A good way to determine if the TXV is defective is to remove the TXV's sensing bulb from the suction line and check the pressures, subcooling, superheat again. No change in the pressures, subcooling, and superheat levels is an indication the TXV is defective. Another test that can be performed is to place the sensing bulb in ice water and recheck the pressures, superheat, and subcooling levels. If these values don't change, the TXV is likely defective.

Additional TXV Troubleshooting Information

Low Suction Pressure – High Superheat

POSSIBLE CAUSES:

1. Undersized TXV
2. TXV superheat adjustment too high
3. High indoor coil pressure drop due to internal restriction
4. TXV sensing bulb installed on bottom of suction line
5. Restricted or capped TXV external equalizer tube
6. Improper TXV external equalizer location (must be located on suction manifold after the last feeder tube)
7. Low refrigerant charge
8. Plugged liquid line filter dryer
9. Plugged TXV inlet strainer
10. Low outdoor ambient temperature

High Suction Pressure – Low Superheat

POSSIBLE CAUSES:

1. Oversized TXV
2. TXV seat leakage
3. TXV superheat adjustment too low
4. Improper TXV sensing bulb installation
   a. Poor thermal contact with suction line (loose clamp)
   b. Uninsulated sensing bulb
   c. Warm location
5. Bad compressor (low capacity)
6. Incorrectly located external equalizer line (must be located on suction manifold after the last feeder tube)

Low Suction Pressure – Low Superheat

POSSIBLE CAUSES:

1. Low system load:
   a. Insufficient indoor airflow
   b. Dirty indoor air filters
   c. Return air too cold
   d. Indoor coil icing or frosting
2. Poor air distribution over indoor coil
3. Improper indoor/outdoor coil internal volume balance on heat pump systems (improper air handler/outdoor unit match up; indoor coil too big or too small causing incorrect refrigerant charge balance between cooling and heating modes.
4. Oil trapped in indoor coil

Things to Check Before Replacing TXV

1. Slowly loosen the flare nut on the TXV external equalizer connected to the suction line port with a flare nut. If there is a large pressure release when the nut has been loosened, tighten the nut. If this results in a slight pressure release or no pressure release; the Schrader valve stem is not being depressed. Install an anti-blow back fitting to the external equalizer line of the TXV to depress the Schrader valve stem and check for proper operation of the TXV.
2. Remove the sensing bulb from the suction line and hold in a warm hand. The high side pressure should drop and low side pressure should increase as the TXV opens. Place the sensing bulb in ice water. The high side pressure should increase and the low side pressure should decrease as the TXV closes. If the pressures do not change when these tests are conducted, the TXV is faulty.

FLOWRATOR TO TXV CONVERSION

While thermal expansion valves can be factory installed, they are normally available in kit form for field installation. Follow the installation instructions provided with the TXV kit. The TXV must

be installed before system is charged with refrigerant. Installation of the TXV requires no cutting or brazing.

IMPORTANT NOTE: The flowrator piston must be removed from the flowrator distributor prior to the installation of the TXV (See Figure 11).

Field Installed TXV Kit Information
R72DB0053HX: R-410A, 1.5 – 2.5 Ton, 15% Bleed, Inlet: Male Rotolock. Outlet: Female Swivel Nut
R72DB0054HX: R-410A, 3.0 – 5.0 Ton, 15% Bleed, Inlet: Male Rotolock, Outlet: Female Swivel Nut

⚠ WARNING

The indoor coil is pressurized with nitrogen. Relieve pressure before installing TXV by depressing Schrader valve on coil suction manifold.

Field Installed TXV Installation Procedure

1. Remove the cap on Schrader valve port on coil suction manifold.
2. Depress the Schrader valve to relieve the pressure inside the coil.
3. Only after coil pressure has been relieved, turn the female swivel nut counter-clockwise to separate it from the distributor.
4. Remove the piston orifice from the flowrator distributor assembly using a small diameter wire or paper clip.
5. As shown in Figure 10, the TXV assembly must be installed between the distributor and the liquid line connector.
6. Attach the TXV by connecting the female swivel nut on TXV outlet to the flowrator distributor (aligning Teflon seal first) and ***torque swivel nut to 10-30 ft. lbs.***
7. Attach the liquid line connector with female swivel nut to male rotalock fitting on TXV inlet (aligning Teflon seal first) and ***torque swivel nut to 10-30 ft. lbs.***
8. Attach equalizer tubing with 1/4" female flare nut that includes depressor to the male Schrader port on the coil suction manifold and ***torque nut to 10-30 ft. lbs.***
9. Install the TXV bulb to the suction line using the two bulb clamps furnished with kit.
   a. The sensing bulb should be installed on a horizontal run of the suction line if possible and should be positioned between 10 o'clock and 2 o'clock as shown in Figure 8.
   b. If the sensing bulb is installed on a vertical run of the suction line, the bulb should be located at least 6 inches away from any bend and on the side of the tube that is above the inside of the bend. On vertical run bulb installations, the bulb should be positioned with the bulb capillary tube at the top.
   c . The bulb should be insulated using thermal insulation to protect it from the effect of the surrounding ambient temperature.
10. After completing the TXV installation, leak check all TXV fittings and thoroughly evacuate the coil through the service access fittings on the outdoor unit liquid and suction service valves prior to charging the system with refrigerant.

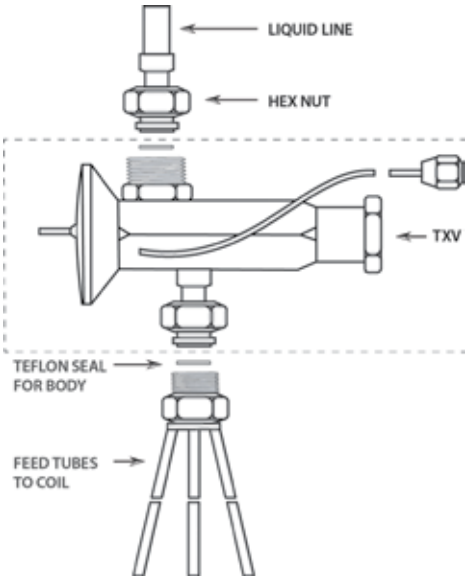

Figure 10: Typical TXV Connections

SPECIAL INSTRUCTIONS FOR COILS WITH FLOWRATOR DISTRIBUTOR ASSEMBLIES

The sizing of the orifice piston should be based on the rated capacity of the outdoor unit and air handler match-up.

Summit provides capacity performance ratings that match both same size and upsized air handlers with specific manufacturer's outdoor units. Consult the local Summit distributor for the proper size orifice piston to be used for a specific outdoor unit model number. The factory installed orifice piston size is marked on the flowrator distributor assembly and the air handler carton.

Failure to install the proper size orifice piston can lead to poor system performance and possible compressor damage. A variation of one piston size smaller or larger is not normally critical. Mortex/Summit reserves the right to substitute a factory installed piston one size smaller or greater if the piston size ordered is out of stock. A selection of replacement orifice pistons is available from the local Summit distributor.

ORIFICE PISTON REPLACEMENT

If the flowrator is being used instead of a TXV, the piston must be installed oriented as shown in Figure 11 in the distributor body and the existing liquid line attached to the flowrator distributor.

1. Remove the cap on Schrader valve port on coil manifold.
2. Depress the Schrader valve to relieve the pressure inside the coil.
3. Only after coil pressure has been relieved, turn the female swivel nut counter-clockwise to separate it from the distributor.
4. Replace the orifice piston with the correct size piston for the application. Make sure the tapered end of the piston is facing the feeder tubes on the distributor body.
5. Turn the female swivel nut on clockwise the flowrator distributor (aligning Teflon seal first) ***and torque swivel nut to 10-30 ft. lbs.***
6. After completing the installation of the correct size orifice piston, leak check the flowrator distributor fitting and thoroughly evacuate the system through the service fittings on the outdoor unit liquid and suction service valves.

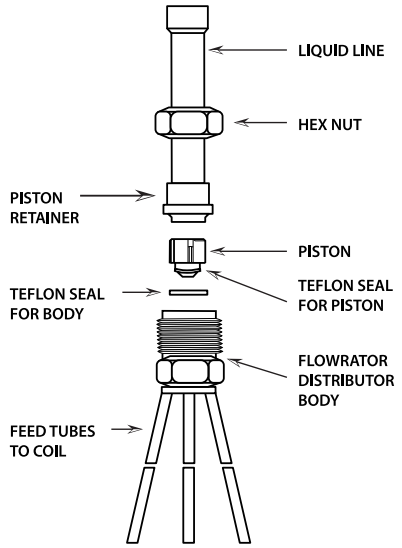

Figure 11: Flowrator Distributor Assembly

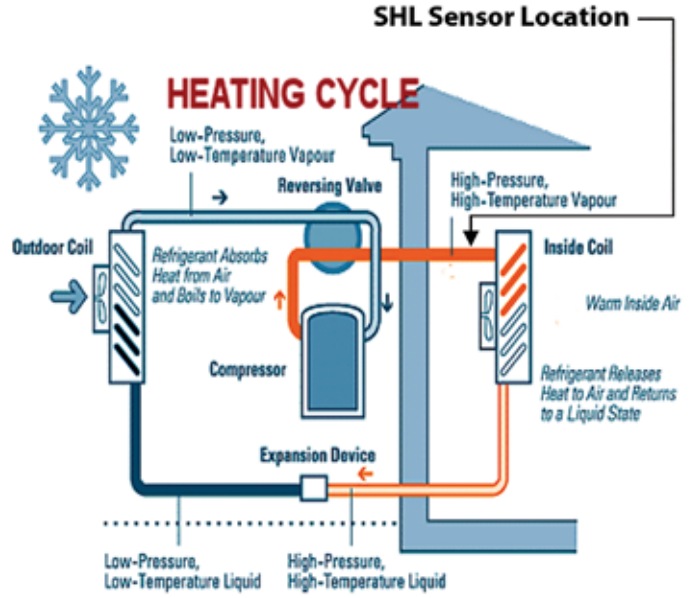

Figure 12: Supplemental Heat Lockout (SHL) Temperature Sensor Location

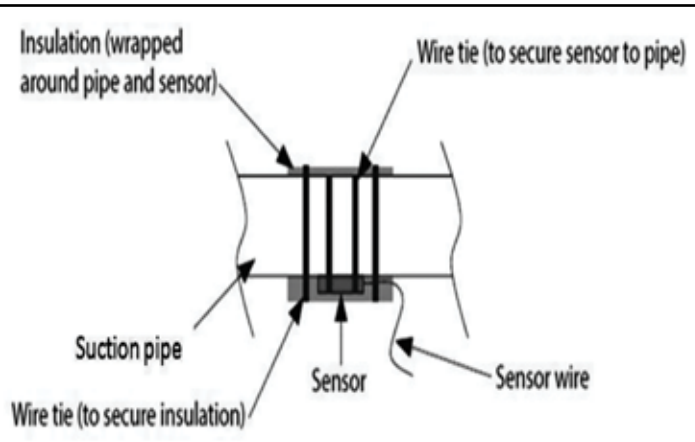

Figure 13: Supplemental Heat Lockout (SHL) Temperature Sensor Mounting

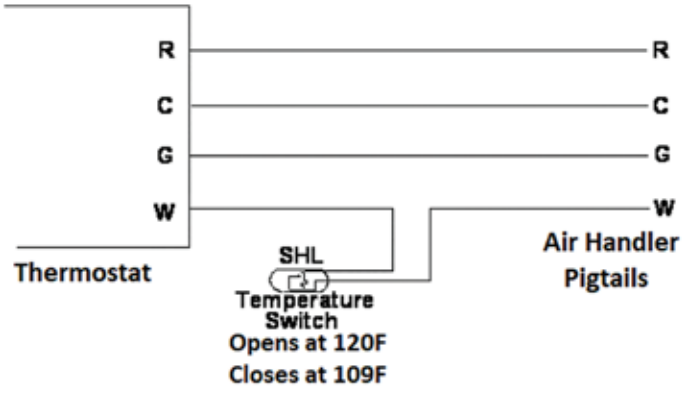

Figure 14: Supplemental Heat Lockout (SHL) Switch Wiring

FIELD INSTALLED SUPPLEMENTAL HEAT LOCKOUT (SHL) KIT

A field installed supplemental heat lockout (SHL) kit must be used with SEHX and CEHX models equipped with electric heat when used in a heat pump system. The purpose of the SHL is to prevent excessive refrigerant pressures due to the indoor coil being located downstream of the electric heating elements. If the electric heater is energized while the heat pump is operating in the heat mode, the additional heat imparted to the indoor coil by the electric heater elements can cause the refrigerant pressures to be excessively high. The SHL temperature switch contacts will open and lock out the electric heat when the hot gas line temperature entering the indoor coil reaches approximately 120°F. The contacts will close when the hot gas line temperature falls to approximately 109°F which will allow the electric heat to operate.

Installation of the SHL Kit

After brazing and leak testing of the refrigerant lines is completed and the lines have sufficiently cooled, mount the SHL temperature sensor securely to the suction/hot gas refrigerant line that connects to the coil manifold (larger line; suction in cooling mode; hot gas in heating mode) with the 2 plastic wire ties provided in the kit assuring that the temperature switch has good contact with the refrigerant line and is not located where it may be damaged. Wrap the sensor on the refrigerant line using the insulation tape provided in the kit and secure with the insulation with the 2 plastic wire ties provided in the kit (See Figure 12).

SHL Switch Wiring:

One of the SHL switch pigtail leads is connected to the air handler white pigtail wire with a wire nut (See Figure 13). The other SHL switch pigtail lead is connected to the white thermostat wire from the thermostat W terminal and secured with a wire nut. Check the outdoor unit and thermostat wiring diagrams to assure the SHL will prevent the supplemental electric heat from being energized when the switch contacts are open.

CONDENSATE DRAIN PIPING

The blow-through coil design of this air handler will create positive pressure in the condensate drain system. To prevent air from being blown out of the condensate drain, it is recommended that a trap with an anti-siphon air vent be installed as shown in Figure 15. Piping from the condensate drain connection must have a 2-inch minimum trap and must provide adequate slope for drainage to a visible area.

NOTE: A condensate trap may be required by local codes.

Installing a trapped secondary drain line is also recommended to prevent condensate pan overflow should the primary drain become clogged. A secondary drain float switch that will shut the cooling system off should the primary drain become clogged may be installed instead of a secondary drain line.

NOTE: Do not pipe the primary and secondary drains together. If the secondary drain is not used, it must be capped.

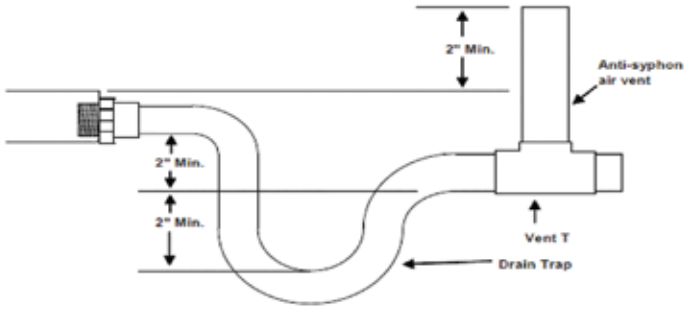

Figure 15: Typical Condensate Trap

The air handler cooling DX coil condensate drain pan has one ¾" NPT female primary and one ¾" NPT female secondary connection located on the same side as the refrigerant line connections (See Figure 16). The other side of the condensate drain pan has one ¾" NPT female primary drain connection and no secondary drain connection.

NOTE: The condensate drain connections are located on the condensate drain pan inside the cabinet of a cased air handler. Condensate drain piping must enter through the holes in the cabinet and then connect to the drain pan connections within the cabinet. Refer to Figure1 for condensate drain pipe entrances.

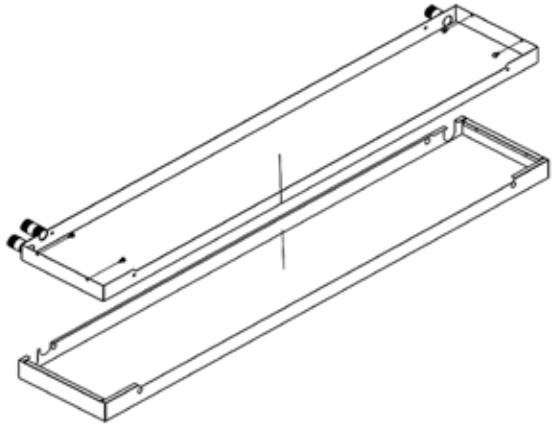

Figure 16: Condensate Drain Pan

⚠ WARNING

This air handler must not be located where water can cause damage to the adjacent area if the condensate drain pan should overflow or if any condensate drain connections should leak.

When such locations can't be avoided, a suitable auxiliary drain pan must be installed under the air handler and connected to an adequate drain. The auxiliary drain pan should be at least 2" greater in length and width than the air handler dimensions and should be at least 1.5" deep.

The manufacturer of this air handler is not liable for any water damage related to the air handler.

SECTION 7: HOT AND CHILLED WATER

Hot Water Piping

All water piping must be supported independent of the air handler to prevent vibration and stress on the coil headers. Swing joints or flexible fittings must be provided to absorb expansion and contraction of the piping. Rigid piping reduces the effectiveness of vibration isolators. Water pipes must be adequately vented in order to prevent air binding. The air handler is equipped with manual air vents mounted on the coil manifold.

Total hot water piping length should not exceed 140 feet. All hot water piping to the coil should be 3/4 inch ID (7/8 inch OD) copper. CPVC and PEX piping may also be used in applications where the water temperature does not exceed 150°F. It is recommended a water isolation valve and a union be placed in the water lines to and from the coil, near the coil, for serviceability, repair or replacement of the coil. A thermal expansion tank is recommended on any closed loop system to relieve thermal expansion due to pressure increase.

After piping has been installed, allow the system to fill with water and check connections for leaks. To ensure complete filling of the system, follow the Filling Hydronic Heating System With Water, Purging Air From System, and System Startup procedure found in SECTION 11: Final System Checkout and Startup in these instructions.

"Massachusetts requires an electronically controlled pump timer that activates the pump every 6 hours for 60 seconds and limits the distance between the water heater and the air handler to 50 feet max."

Chilled Water Piping

Supply and return chilled water piping to the coil should be ¾ inch ID for models with a capacity up to 42,000 BTU/H and 1 inch on models with a capacity greater than 42,000 BTU/H. Water piping must always be connected so that the entering water is on the leaving side of the coil for best performance.

⚠ WARNING

Toxic chemicals used for treatment of boilers or non-potable water heating appliances shall never be introduced into a potable water space heating system.

⚠ WARNING

The air handler must not be located where water will cause damage to the adjacent area should any water connection leak.

When such locations can't be avoided, a suitable auxiliary drain pan must be installed under the air handler and connected to an adequate drain. The auxiliary drain pan should be at least 2 inches greater in length and width than the air handler dimensions and should be at least 1.5 inches deep.

The manufacturer of this air handler is not liable for any water damage related to the air handler.

⚠ WARNING

When system requires water at temperatures higher than required for other uses, a means such as a mixing valve must be installed to temper the water temperature for those uses in order to reduce the potential of a scald hazard.

⚠ WARNING

Hot water from a boiler used to satisfy heating requirements can be heated to temperatures of 180°F. Parts containing water this hot can scald very quickly. Use extreme caution when servicing or performing maintenance on any parts containing hot water.

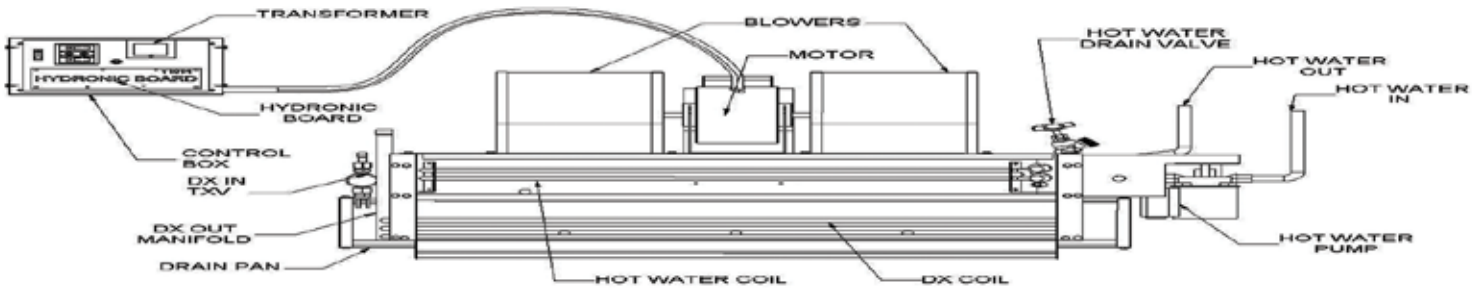

Figure 17: Components and Water Connections

Model Number	Evaporator Coil Number of Rows	Type Of Blower Motor	Chilled Water Capacities @ Entering Water Temperatures				CFM	GPM	Pressure Drop Water (Ft Water)	Pressure Drop Air (IN WC)
			80° F/67° F/45° F		80° F/67 ° F/42° F					
			Total	Sensible	Total	Sensible				
SCWE/CCWE 18-XX-24-OC 80	4	C.T.	14,700	12,900	15,800	13,400	600	2.0	1.2	0.29
			18,100	14,600	19,700	15,300		3.0	2.6	
			20,600	15,800	22,700	16,600		4.0	4.4	
			22,600	16,700	25,000	17,600		5.0	6.8	
			24,200	17,300	26,822	18,400		6.0	9.6	
SCWE/CCWE 19-XX-25-OC 80	5	C.T.	17,900	14,500	19,400	15,000	600	2.0	2.1	0.35
			21,500	16,000	23,500	16,900		3.0	4.6	
			24,100	17,100	26,600	18,200		4.0	7.9	
			26,000	17,900	28,800	19,100		5.0	12.0	
			27,400	18,500	30,400	19,900		6.0	17.0	
SCWE/CCWE 24-XX-24-OC 80	4	C.T.	16,400	15,000	17,500	15,800	800	2.0	1.2	0.44
			20,400	17,500	22,100	18,300		3.0	2.6	
			23,500	19,000	26,000	20,000		4.0	4.4	
			25,800	20,100	28,300	21,200		5.0	6.8	
			27,700	21,000	30,600	22,200		6.0	9.7	
SCWE/CCWE5 25-XX-25-OC 81	5	C.T.	20,300	17,200	21,800	18,000	800	2.0	2.1	0.55
			24,700	19,500	26,750	20,400		3.0	4.6	
			27,800	20,900	30,500	22,000		4.0	7.9	
			30,300	22,000	33,300	23,300		5.0	12.0	
			32,100	22,800	35,600	24,300		6.0	17.0	
SCWE/CCWE 30-XX-24-OC 81	4	C.T.	19,500	17,800	20,800	18,700	1000	2.0	1.3	0.40
			24,500	21,200	26,500	22,200		3.0	2.8	
			28,300	23,200	30,700	24,300		4.0	4.9	
			31,200	24,600	31,190	25,900		5.0	7.5	
			33,800	25,700	37 ,000	27,200		6.0	10.6	
SCWE/CCWE 31-XX-25-OC 81	5	C.T.	24,300	20,500	25,800	21,400	1000	2.0	2.4	0.53
			29,600	23,600	31,800	24,700		3.0	5.2	
			33,500	25,500	36,300	26,800		4.0	9.0	
			36,500	26,900	40,000	28,400		5.0	13.6	
			38,800	27,900	42,900	29,700		6.0	19.2	
SCWE/CCWE 34-XX-24-OC 81	4	C.T.	20,900	19,100	22,400	20,100	1200	2 .0	1.4	0.41
			26,500	22,900	28,500	24,100		3 .0	3.0	
			30,500	25,200	33,100	26,400		4 .0	5.1	
			33,800	26,800	37,000	28,200		5.0	7.8	
			36,400	28,000	40,000	29,600		6.0	11.1	
SCWE/CCWE 35-XX-25-OC 81	5	C.T.	26,100	21,900	27,700	22,900	1200	2.0	2.6	0.52
			31,900	25,600	34,200	26,700		3.0	5.6	
			36,100	27,700	39,200	29,100		4.0	9.5	
			39,400	29,200	43,100	30,800		5.01	4.4	
			42,000	30,300	46,300	32,200		6.0	20.3	
SCWE/CCWE 36-XX-24-OC 81	4	C.T.	22,300	19,900	23,700	20,900	1200	2.0	1.5	0.31
			28,000	23,800	30,200	24,900		3.0	3.2	
			32,300	26,100	35,100	27,300		4.0	5.6	
			35,800	27,800	39,100	29,200		5.0	8.5	
			38,600	29,100	42,350	30,700		6.0	12.0	
SCWE/CCWE 37-XX- 25 - OC 81	5	C.T.	27,400	22,600	29,100	23,600	1200	2.0	2.9	0.40
			33,400	26,300	35,900	27,500		3.0	6.1	
			37,800	28,600	41,000	29,950		4.0	10.4	
			41,300	30,100	45,200	31,800		5.0	15.9	
			43,850	31,200	48,500	33,250		6.0	22.3	

Table 6: SCWE/CCWE Chilled Water Capacity; 4 & 5 Row Chilled Water Coil; 18 - 37 BTU/H Models; 208/240 VAC; PSC Blower Motor; With or Without Electric Heat

NOTE: These models are capable of using the chilled water coil for hot water heat as well as chilled water cooling using a valve on the hot water line and a valve on the chilled water line to isolate the hot water from the chilled water.
CAUTION: Never operate air handler with hot water heat and electric heat energized at the same time.

Model Number	Evaporator Coil Number of Rows	Type Of Blower Motor	Chilled Water Capacities @ Entering Water Temperatures				CFM	GPM	Pressure Drop Water (Ft Water)	Pressure Drop Air (IN WC)
			80° F/67° F/45° F		80° F/67 ° F/42° F					
			Total	Sensible	Total	Sensible				
SCWE/CCWE 18-XX-24-OC 80	4	C.T.	14,700	12,900	15,800	13,400	600	2.0	1.2	0.29
			18,100	14,600	19,700	15,300		3.0	2.6	
			20,600	15,800	22,700	16,600		4.0	4.4	
			22,600	16,700	25,000	17,600		5.0	6.8	
			24,200	17,300	26,822	18,400		6.0	9.6	
SCWE/CCWE 19-XX-25-OC 80	5	C.T.	17,900	14,500	19,400	15,000	600	2.0	2.1	0.35
			21,500	16,000	23,500	16,900		3.0	4.6	
			24,100	17,100	26,600	18,200		4.0	7.9	
			26,000	17,900	28,800	19,100		5.0	12.0	
			27,400	18,500	30,400	19,900		6.0	17.0	
SCWE/CCWE 24-XX-24-OC 80	4	C.T.	16,400	15,000	17,500	15,800	800	2.0	1.2	0.44
			20,400	17,500	22,100	18,300		3.0	2.6	
			23,500	19,000	26,000	20,000		4.0	4.4	
			25,800	20,100	28,300	21,200		5.0	6.8	
			27,700	21,000	30,600	22,200		6.0	9.7	
SCWE/CCWE5 25-XX-25-OC 81	5	C.T.	20,300	17,200	21,800	18,000	800	2.0	2.1	0.55
			24,700	19,500	26,750	20,400		3.0	4.6	
			27,800	20,900	30,500	22,000		4.0	7.9	
			30,300	22,000	33,300	23,300		5.0	12.0	
			32,100	22,800	35,600	24,300		6.0	17.0	
SCWE/CCWE 30-XX-24-OC 81	4	C.T.	19,500	17,800	20,800	18,700	1000	2.0	1.3	0.40
			24,500	21,200	26,500	22,200		3.0	2.8	
			28,300	23,200	30,700	24,300		4.0	4.9	
			31,200	24,600	31,190	25,900		5.0	7.5	
			33,800	25,700	37 ,000	27,200		6.0	10.6	
SCWE/CCWE 31-XX-25-OC 81	5	C.T.	24,300	20,500	25,800	21,400	1000	2.0	2.4	0.53
			29,600	23,600	31,800	24,700		3.0	5.2	
			33,500	25,500	36,300	26,800		4.0	9.0	
			36,500	26,900	40,000	28,400		5.0	13.6	
			38,800	27,900	42,900	29,700		6.0	19.2	
SCWE/CCWE 34-XX-24-OC 81	4	C.T.	20,900	19,100	22,400	20,100	1200	2 .0	1.4	0.41
			26,500	22,900	28,500	24,100		3 .0	3.0	
			30,500	25,200	33,100	26,400		4 .0	5.1	
			33,800	26,800	37,000	28,200		5.0	7.8	
			36,400	28,000	40,000	29,600		6.0	11.1	
SCWE/CCWE 35-XX-25-OC 81	5	C.T.	26,100	21,900	27,700	22,900	1200	2.0	2.6	0.52
			31,900	25,600	34,200	26,700		3.0	5.6	
			36,100	27,700	39,200	29,100		4.0	9.5	
			39,400	29,200	43,100	30,800		5.01	4.4	
			42,000	30,300	46,300	32,200		6.0	20.3	
SCWE/CCWE 36-XX-24-OC 81	4	C.T.	22,300	19,900	23,700	20,900	1200	2.0	1.5	0.31
			28,000	23,800	30,200	24,900		3.0	3.2	
			32,300	26,100	35,100	27,300		4.0	5.6	
			35,800	27,800	39,100	29,200		5.0	8.5	
			38,600	29,100	42,350	30,700		6.0	12.0	
SCWE/CCWE 37-XX- 25 - OC 81	5	C.T.	27,400	22,600	29,100	23,600	1200	2.0	2.9	0.40
			33,400	26,300	35,900	27,500		3.0	6.1	
			37,800	28,600	41,000	29,950		4.0	10.4	
			41,300	30,100	45,200	31,800		5.0	15.9	
			43,850	31,200	48,500	33,250		6.0	22.3	

Table 7: SCWE/CCWE Chilled Water Capacity; 4 & 5 Row Chilled Water Coil; 18 - 37 BTU/H Models; 208/240 VAC; Constant Torque Blower Motor; With or Without Electric Heat

NOTE: These models are capable of using the chilled water coil for hot water heat as well as chilled water cooling using a valve on the hot water line and a valve on the chilled water line to isolate the hot water from the chilled water.
CAUTION: Never operate air handler with hot water heat and electric heat energized at the same time.

Model Number	Evaporator Coil Number of Rows	Type Of Blower Motor	Hot Water Capacities @ 65 °F Entering Model Number Water Temperature				CFM	GPM	Pressure Drop Water (Ft Water)	Pressure Drop Air (IN WC)
			140°F	160°F	170°F	180° F				
SCWE/CCWE 18-XX-24-OC 79	4	PSC	33,998	41,000	45,400	49,850	600	2.0	1.2	0.29
			38,103	46,000	50,900	55,870		3.0	2.6	
			39,658	48,785	53,900	58,150		4.0	4.4	
			41,718	50,400	55,790	61,170		5.0	6.8	
			42,639	51,500	57,000	62,520		6.0	9.6	
SCWE/CCWE 19-XX-25-OC 79	5	PSC	36,801	44,420	49,200	53,960	600	2.0	2.1	0.35
			41,108	49,690	54,980	60,275		3.0	4.6	
			43,307	52,370	57,935	63,500		4.0	7.9	
			44,596	53,945	59,660	65,390		5.0	12.0	
			45,428	54,950	60,780	66,610		6.0	17.0	
SCWE/CCWE 24-XX-24-OC 79	4	PSC	39,154	47,200	52,300	57,410	800	2.0	1.2	0.44
			45,193	54,510	60,380	66,265		3.0	2.6	
			48,695	58,765	65,080	71,400		4.0	4.4	
			50,945	61,510	68,100	74,700		5.0	6.8	
			52,494	63,400	70,190	76,970		6.0	9.7	
SCWE/CCWE 25-XX-25-OC 65	5	PSC	42,645	51,515	57,025	62,530	800	2.0	2 .1	0.55
			49,288	59,550	65,910	72,270		3.0	4 .6	
			52,974	64,020	70,845	77,675		4.0	7.9	
			55,249	66,740	73,900	81,010		5.0	12.0	
			56,766	68,640	75,940	83,235		6.0	17.0	
SCWE/CCWE 30-XX-24-OC 65	4	PSC	45,183	54,530	60,390	66,250	1000	2.0	1.3	0.40
			53,517	64,600	71,530	78,470		3.0	2.8	
			58,509	70,640	78,210	85,790		4.0	4.9	
			61,769	74,600	82,580	90,570		5.0	7.5	
			64,036	77,365	85,630	93,895		6.0	10.6	
SCWE/CCW E 31-XX-25-OC 65	5	PSC	48,695	58,880	65,140	71,400	1000	2.0	2.4	0.53
			58,048	70,170	77,640	85,115		3.0	5.2	
			63,494	76,750	84,910	93,100		4.0	9.0	
			66,904	80,900	89,501	98,100		5.0	13.6	
			69,216	83,715	92,600	101,490		6.0	19.2	
SCWE/CCWE 34-XX-24-OC 65	4	PSC	49,281	59,500	65,880	72,260	1200	2.0	1.4	0.41
			59,617	72,020	79,745	87,415		3.0	3.0	
			66,120	79,835	88,390	96,950		4.0	5.1	
			70,437	85,075	94,175	103,280		5.0	7.8	
			73,492	88,785	98,270	107,760		6.0	11.1	
SCWE/CCWE 35-XX-25-OC 65	5	PSC	52,804	63,880	70,660	77,425	1200	2.0	2.6	0.52
			64,592	78,100	86,410	94,710		3.0	5.6	
			71,787	86,800	96,030	105,260		4.0	9.5	
			76,466	92,470	102,300	112,120		5.01	4.4	
			79,692	96,380	106,615	116,850		6.0	20.3	
SCWE/CCWE 36-XX-24-OC 65	4	PSC	50,563	61,100	67,620	74,140	1200	2.0	1.5	0.31
			61,448	74,220	82,150	90,100		3.0	3.2	
			68,173	82,370	91,160	99,960		4.0	5.6	
			72,633	87,780	97,140	106,500		5.0	8.5	
			75,770	91,585	101,340	111,100		6.0	12.0	
SCWE/CCW E 37-XX-25-OC 65	5	PSC	53,731	65,045	71,920	78,785	1200	2.0	2.9	0.40
			66,031	79,890	88,350	96,820		3.0	6.1	
			73,506	88,925	98,350	107,780		4.0	10.4	
			78,324	94,760	104,800	114,845		5.0	15.9	
			81,612	98,740	109,200	119,665		6.0	22.3	

Table 8: SCWE/CCWE Hot Water Capacity; 4 & 5 Row Chilled Water Coil; 18 - 37 BTU/H Models; 208/240 VAC; PSC Blower Motor; With or Without Electric Heat

NOTE: These models are capable of using the chilled water coil for hot water heat as well as chilled water cooling using a valve on the hot water line and a valve on the chilled water line to isolate the hot water from the chilled water.
CAUTION: Never operate air handler with hot water heat and electric heat energized at the same time.

Model Number	Evaporator Coil Number of Rows	Type Of Blower Motor	Hot Water Capacities @ 65 °F Entering Model Number Water Temperature				CFM	GPM	Pressure Drop Water (Ft Water)	Pressure Drop Air (IN WC)
			140°F	160°F	170°F	180° F				
SCWE/CCWE 18-XX-24-OC80	4	C.T.	33,998	41,000	45,400	49,850	600	2.0	1.2	0.29
			38,103	46,000	50,900	55,870		3.0	2.6	
			39,658	48,785	53,900	58,150		4.0	4.4	
			41,718	50,400	55,790	61,170		5.0	6.8	
			42,639	51,500	57,000	62,520		6.0	9.6	
SCWE/CCWE 19-XX-25-OC80	5	C.T.	36,801	44,420	49,200	53,960	600	2.0	2.1	0.35
			41,108	49,690	54,980	60,275		3.0	4.6	
			43,307	52,370	57,935	63,500		4.0	7.9	
			44,596	53,945	59,660	65,390		5.0	12.0	
			45,428	54,950	60,780	66,610		6.0	17.0	
SCWE/CCWE 24-XX-24-OC80	4	C.T.	39,154	47,200	52,300	57,410	800	2.0	1.2	0.44
			45,193	54,510	60,380	66,265		3.0	2.6	
			48,695	58,765	65,080	71,400		4.0	4.4	
			50,945	61,510	68,100	74,700		5.0	6.8	
			52,494	63,400	70,190	76,970		6.0	9.7	
SCWE/CCWE 25-XX-25-OC81	5	C.T.	42,645	51,515	57,025	62,530	800	2.0	2 .1	0.55
			49,288	59,550	65,910	72,270		3.0	4 .6	
			52,974	64,020	70,845	77,675		4.0	7.9	
			55,249	66,740	73,900	81,010		5.0	12.0	
			56,766	68,640	75,940	83,235		6.0	17.0	
SCWE/CCWE 30-XX-24-OC81	4	C.T.	45,183	54,530	60,390	66,250	1000	2.0	1.3	0.40
			53,517	64,600	71,530	78,470		3.0	2.8	
			58,509	70,640	78,210	85,790		4.0	4.9	
			61,769	74,600	82,580	90,570		5.0	7.5	
			64,036	77,365	85,630	93,895		6.0	10.6	
SCWE/CCWE 31-XX-25-OC81	5	C.T.	48,695	58,880	65,140	71,400	1000	2.0	2.4	0.53
			58,048	70,170	77,640	85,115		3.0	5.2	
			63,494	76,750	84,910	93,100		4.0	9.0	
			66,904	80,900	89,501	98,100		5.0	13.6	
			69,216	83,715	92,600	101,490		6.0	19.2	
SCWE/CCWE 34-XX-24-OC81	4	C.T.	49,281	59,500	65,880	72,260	1200	2.0	1.4	0.41
			59,617	72,020	79,745	87,415		3.0	3.0	
			66,120	79,835	88,390	96,950		4.0	5.1	
			70,437	85,075	94,175	103,280		5.0	7.8	
			73,492	88,785	98,270	107,760		6.0	11.1	
SCWE/CCWE 35-XX-25-OC81	5	C.T.	52,804	63,880	70,660	77,425	1200	2.0	2.6	0.52
			64,592	78,100	86,410	94,710		3.0	5.6	
			71,787	86,800	96,030	105,260		4.0	9.5	
			76,466	92,470	102,300	112,120		5.01	4.4	
			79,692	96,380	106,615	116,850		6.0	20.3	
SCWE/CCWE 36-XX-24-OC81	4	C.T.	50,563	61,100	67,620	74,140	1200	2.0	1.5	0.31
			61,448	74,220	82,150	90,100		3.0	3.2	
			68,173	82,370	91,160	99,960		4.0	5.6	
			72,633	87,780	97,140	106,500		5.0	8.5	
			75,770	91,585	101,340	111,100		6.0	12.0	
SCWE/CCWE 37-XX-25-OC81	5	C.T.	53,731	65,045	71,920	78,785	1200	2.0	2.9	0.40
			66,031	79,890	88,350	96,820		3.0	6.1	
			73,506	88,925	98,350	107,780		4.0	10.4	
			78,324	94,760	104,800	114,845		5.0	15.9	
			81,612	98,740	109,200	119,665		6.0	22.3	

Table 9: SCWE/CCWE Hot Water Capacity; 4 & 5 Row Chilled Water Coil; 208/240 VAC; 18 - 37 BTU/H Models; Constant Torque Blower Motor; With or Without Electric Heat

NOTE: These models are capable of using the chilled water coil for hot water heat as well as chilled water cooling using a valve on the hot water line and a valve on the chilled water line to isolate the hot water from the chilled water.
CAUTION: Never operate air handler on hot water heat and electric heat at the same time.

Model Number	Coil Rows	CFM	Type Of Blower Motor	Heating Capacities Entering Water Temperature						Heating GPM	(2) Max. Fuse
				130°F	140°F	150°F	160° F	170° F	180° F		
SCWW/CCWW-18-21-0A-0A78	2	600	PSC	18,000	21,000	24,200	27,300	30,500	33,600	3.0	3.3
SCWW/CCWW-19-22-0E-0A78	2	600	PSC	19,200	22,500	25,800	29,100	32,400	35,800	3.0	3.3
SCWW/CCWW-23-21-09-0A78	2	800	PSC	19,300	22,700	26,000	29,400	32,700	36,100	3.0	3.3
SCWW/CCWW-25-23-09-0A70	2	800	PSC	19,300	22,700	26,000	29,400	32,700	36,100	3.0	3.3
SCWW/CCWW-30-27-0J-0A70	2	1000	PSC	23,700	27,800	32,000	36,000	40,100	44,300	3.0	3.7
SCWW/CCWW-31-28-05-0A70	2	1000	PSC	23,900	28,000	32,200	36,300	40,500	44,600	3.0	3.7
SCWW/CCWW-34-30-0K-0A70	2	1200	PSC	25,300	29,600	33,900	38,300	42,700	47,100	3.0	3.7
SCWW/CCWW-35-30-0K-0A70	2	1200	PSC	25,400	29,800	34,000	38,500	42,900	47,300	3.0	3.7
SCWW/CCWW-36-32-0K-0A70	2	1200	PSC	27,200	31,800	36,500	41,200	45,900	50,600	3.0	4.2
SCWW/CCWW-37-32-01-0A70	2	1200	PSC	27,500	32,200	36,900	41,600	46,300	51,100	3.0	4.2

Table 10: SCWW/CCWW Hot Water Capacity; 2 Row Hot Water Coil; 18 - 37 BTU/H Models; 115 VAC; PSC Blower Motor

Model Number	Coil Rows	CFM	Type Of Blower Motor	Heating Capacities Entering Water Temperature						Heating GPM	(2) Max. Fuse
				130°F	140°F	150°F	160° F	170° F	180° F		
SCWW/CCWW-18-21-0A-0A82	2	600	PSC	18,000	21,000	24,200	27,300	30,500	33,600	3.0	3.3
SCWW/CCWW-19-22-0E-0A82	2	600	PSC	19,200	22,500	25,800	29,100	32,400	35,800	3.0	3.3
SCWW/CCWW-23-21-09-0A82	2	800	PSC	19,300	22,700	26,000	29,400	32,700	36,100	3.0	3.3
SCWW/CCWW-25-23-09-0A83	2	800	PSC	19,300	22,700	26,000	29,400	32,700	36,100	3.0	3.3
SCWW/CCWW-30-27-0J-0A83	2	1000	PSC	23,700	27,800	32,000	36,000	40,100	44,300	3.0	3.7
SCWW/CCWW-31-28-05-0A83	2	1000	PSC	23,900	28,000	32,200	36,300	40,500	44,600	3.0	3.7
SCWW/CCWW-34-30-0K-0A83	2	1200	PSC	25,300	29,600	33,900	38,300	42,700	47,100	3.0	3.7
SCWW/CCWW-35-30-0K-0A83	2	1200	PSC	25,400	29,800	34,000	38,500	42,900	47,300	3.0	3.7
SCWW/CCWW-36-32-0K-0A83	2	1200	PSC	27,200	31,800	36,500	41,200	45,900	50,600	3.0	4.2
SCWW/CCWW-37-32-01-0A83	2	1200	PSC	27,500	32,200	36,900	41,600	46,300	51,100	3.0	4.2

Table 11: SCWW/CCWW Hot Water Capacity; 2 Row Hot Water Coil; 18 - 37 BTU/H Models; 115 VACc Constant Torque Blower Motor

SECTION 8: LINE VOLTAGE WIRING

Power Supply Wiring
General wire and breaker sizes are shown in Tables 26-29. If sheathed cable is used, refer to NEC National Electrical Code (NFPA 70) or the Canadian Electrical Code, Part I (CSA C22.1) and local codes for additional requirements concerning supply circuit wiring. Electrical data can be found in Tables 26-29.

IMPORTANT - All field wiring must be rated for 60ºC or higher. Refer to the wiring diagram on the air handler or the tables in these instructions for more information.
Refer to the NEC National Electrical Code (NFPA 70) or the Canadian Electrical Code, Part I (CSA C22.1) and local codes for wiring material requirements.

Refer to the NEC National Electrical Code (NFPA 70) or the Canadian Electrical Code, Part I (CSA C22.1) and local codes for wiring material requirements.

⚠ WARNING

To prevent accidental electrical shock, turn the electrical power "OFF" at the main electrical panel (circuit breaker box) and at the local service disconnect before removing the ceiling access panel to perform installation, maintenance and service on this air handler. Homeowners should never attempt to perform any maintenance which requires opening the ceiling access panel. Refer to Figures 3 and 4 for images of the ceiling access panel.

Line Voltage Wiring Connections
The air handler internal wiring is complete except for the power supply and the thermostat wires. See Tables 26-29 for required wire size, fuse/circuit breaker size, and ground wire sizes. The use of cable connectors on incoming power supply wires to relieve strain on wiring is required. Follow the steps below to connect the power supply wires.

1. Remove the thumb screws that secure ceiling access panel and slowly swing the panel down to access the air handler.
2. Remove the control box cover.
3. Install the cable connector in the 7/8 inch diameter hole on the bottom right side of the control box.
4. Strip ½ inch of the insulation off the end of each wire.
5. Insert the wires through the cable connector located in the 7/8 inch diameter hole in the air handler control box.
6. Connect the power supply wires to the power supply terminal block or pigtails located on the right side of the control box as follows.
   a. Insert the BLACK line voltage wire into the L1 screw terminal on the power supply terminal block and tighten the set screw to clamp down on the wire or connect it to the BLACK line voltage pigtail with a wire nut or suitable electrical connector rated for the wire size.
   b. Insert the WHITE neutral (115 VAC) wire or RED line voltage wire (208/240 VAC) into the L2 screw terminal on the power supply terminal block and tighten the set screw to clamp down on the wire or connect the RED line voltage wire (208/240 VAC) to the RED line voltage pigtail with a wire nut or suitable electrical connector rated for the wire size.
7. Insert the GREEN ground wire into the ground lug inside the control box and tighten the set screw.
   NOTE: Casing or cabinet must be permanently grounded in accordance with the National Electrical Code or other applicable codes.

ELECTRICAL DATA - ELECTRIC HEAT

							Electric Heater Data					Total Load					Minimum Circuit Ampacity					Maximum Overcurrent Protection					Short-Circuit Current Rating	
Furnace Model	Motor Code	Motor HP	Volts 1 Ph	Motor Type	Motor Amps 240V	Motor Amps 208V	No Circuits	KW 240V	KW 208V	KW Amps 240V	KW Amps 208V	Amps 115V	Amps 208V	Amps 208V	Amps 240V	Amps 240V	MCA 115V	MCA 208V	MCA 208V	MCA 240V	MCA 240V	MOCP 115V	MOCP 208V	MOCP 208V	MOCP 240V	MOCP 240V	"SCCR"	
												Cr 1	Cr 1	Cr 1	Cr 1	Cr 1	Cr 1	Cr 1	Cr 1	Cr 1	Cr 1	Cr 1	Cr 1	Cr 1	Cr 1	Cr 1	kA rms symmetrical	V maximum
SEHX-18/19/24	Code	1/4	208/240	PSC	1.20	1.02	1	0.0	0.0	0.0	0.0	-	1.02	-	1.20	-	-	1.28	-	1.50	-	-	15	-	15	-	n/a	n/a
								3.0	2.3	12.5	10.9	-	11.9	-	13.7	-	-	14.9	-	17.1	-	-	15	-	20	-	n/a	n/a
								5.0	3.8	20.8	18.2	-	19.2	-	22.0	-	-	24.0	-	27.5	-	-	25	-	30	-	n/a	n/a
								6.0	4.5	25.0	21.9	-	22.9	-	26.2	-	-	28.7	-	32.8	-	-	30	-	35	-	n/a	n/a
								8.0	6.0	33.3	29.2	-	30.2	-	34.5	-	-	37.8	-	43.1	-	-	40	-	45	-	n/a	n/a
								10.0	7.5	41.6	36.5	-	37.5	-	42.8	-	-	46.9	-	53.5	-	-	50	-	60	-	n/a	n/a
SEHX-25/30/31	-1C81	1/2	208/240	CT	0.82	0.94	1	0.0	0.0	0.0	0.0	-	0.94	-	0.82	-	-	1.18	-	1.03	-	-	15	-	15	-	n/a	n/a
								3.0	2.3	12.5	10.9	-	11.8	-	13.3	-	-	14.8	-	16.7	-	-	15	-	20	-	n/a	n/a
								5.0	3.8	20.8	18.2	-	19.1	-	21.6	-	-	23.9	-	27.0	-	-	25	-	30	-	n/a	n/a
								6.0	4.5	25.0	21.9	-	22.8	-	25.8	-	-	28.6	-	32.3	-	-	30	-	35	-	n/a	n/a
								8.0	6.0	33.3	29.2	-	30.1	-	34.1	-	-	37.7	-	42.7	-	-	40	-	45	-	n/a	n/a
								10.0	7.5	41.6	36.5	-	37.4	-	42.4	-	-	46.8	-	53.0	-	-	50	-	60	-	n/a	n/a
SEHX-34/35	-1C81	1/2	208/240	CT	1.13	1.30	1	0.0	0.0	0.0	0.0	-	1.30	-	1.13	-	-	1.62	-	1.41	-	-	15	-	15	-	n/a	n/a
								3.0	2.3	12.5	10.9	-	12.2	-	13.6	-	-	15.2	-	17.0	-	-	20	-	20	-	n/a	n/a
								5.0	3.8	20.8	18.2	-	19.5	-	21.9	-	-	24.4	-	27.4	-	-	25	-	30	-	n/a	n/a
								6.0	4.5	25.0	21.9	-	23.2	-	26.1	-	-	29.0	-	32.7	-	-	30	-	35	-	n/a	n/a
								8.0	6.0	33.3	29.2	-	30.5	-	34.4	-	-	38.1	-	43.0	-	-	40	-	45	-	n/a	n/a
								10.0	7.5	41.6	36.5	-	37.8	-	42.7	-	-	47.2	-	53.4	-	-	50	-	60	-	n/a	n/a
SEHX-36/37	-1C81	1/2	208/240	CT	1.09	1.25	1	0.0	0.0	0.0	0.0	-	1.25	-	1.09	-	-	1.57	-	1.36	-	-	15	-	15	-	n/a	n/a
								3.0	2.3	12.5	10.9	-	12.2	-	13.6	-	-	15.2	-	17.0	-	-	20	-	20	-	n/a	n/a
								5.0	3.8	20.8	18.2	-	19.5	-	21.9	-	-	24.3	-	27.4	-	-	25	-	30	-	n/a	n/a
								6.0	4.5	25.0	21.9	-	23.2	-	26.1	-	-	28.9	-	32.6	-	-	30	-	35	-	n/a	n/a
								8.0	6.0	33.3	29.2	-	30.5	-	34.4	-	-	38.1	-	43.0	-	-	40	-	45	-	n/a	n/a
								10.0	7.5	41.6	36.5	-	37.8	-	42.7	-	-	47.2	-	53.4	-	-	50	-	60	-	n/a	n/a

ELECTRICAL DATA - HOT WATER HEAT

							Electric Heater Data					Total Load					Minimum Circuit Ampacity					Maximum Overcurrent Protection					Short-Circuit Current Rating	
Furnace Model	Motor Code	Motor HP	Volts 1 Ph	Motor Type	Motor Amps 115V	Pump Amps 115V	No Circuits	KW 240V	KW 208V	KW Amps 240V	KW Amps 208V	Amps 115V	Amps 208V	Amps 208V	Amps 240V	Amps 240V	MCA 115V	MCA 208V	MCA 208V	MCA 240V	MCA 240V	MOCP 115V	MOCP 208V	MOCP 208V	MOCP 240V	MOCP 240V	"SCCR"	
												Cr 1	Cr 1	Cr 1	Cr 1	Cr 1	Cr 1	Cr 1	Cr 1	Cr 1	Cr 1	Cr 1	Cr 1	Cr 1	Cr 1	Cr 1	kA rms symmetrical	V maximum
SDXW-12/18/19/24	-1A82	1/3	115	CT	3.40	0.52	-	-	-	-	-	3.92	-	-	-	-	4.90	-	-	-	-	15	-	-	-	-	n/a	n/a
SDXW-25/30/31	-1A83	1/2	115	CT	5.00	0.52	-	-	-	-	-	5.52	-	-	-	-	6.90	-	-	-	-	15	-	-	-	-	n/a	n/a
SDXW-34/35	-1A83	1/2	115	CT	5.00	0.52	-	-	-	-	-	5.52	-	-	-	-	6.90	-	-	-	-	15	-	-	-	-	n/a	n/a
SDXW-36/37	-1A83	1/2	115	CT	5.00	0.52	-	-	-	-	-	5.52	-	-	-	-	6.90	-	-	-	-	15	-	-	-	-	n/a	n/a

Table 12: Electrical Data – Electric and Hot Water Heat

ELECTRIC HEATER SIZES						
		3 kW	5 kW	6 kW	8 kW	10 kW
240 VAC, 60 HZ, PH	BTU	10,236	17,061	20,473	27,297	34,121
	kW	3	5	6	8	10
230 VAC, 60 HZ, PH	BTU	9.539	15,989	19,078	25.437	31,767
	kW	2.7956	4.6593	5.5912	7.4549	9.3186
220 VAC, 60 HZ, PH	BTU	8,859	14,765	17,718	23,624	29,530
	kW	2.5964	4.3273	5.1927	6.9236	8.6545
HEATING ELEMENT CAPACITY	BTU	10,236	17,061	20,473	27,297	34,121
	kW	3	5	6	8	10

Table 13: Electric Heater Heating Capacity

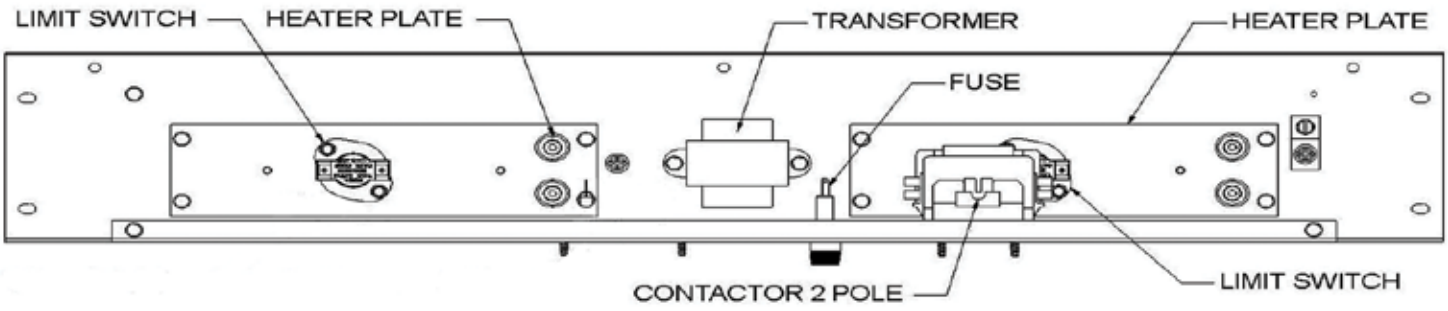

Figure 18: Component Locations – Electric Heat Control Box

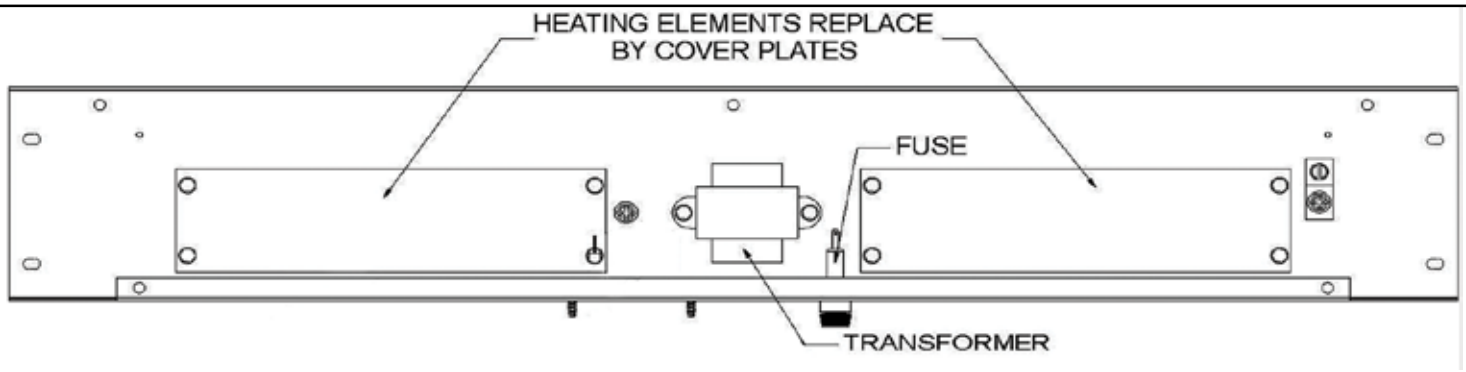

Figure 19: Component Locations – No Heat Control Box

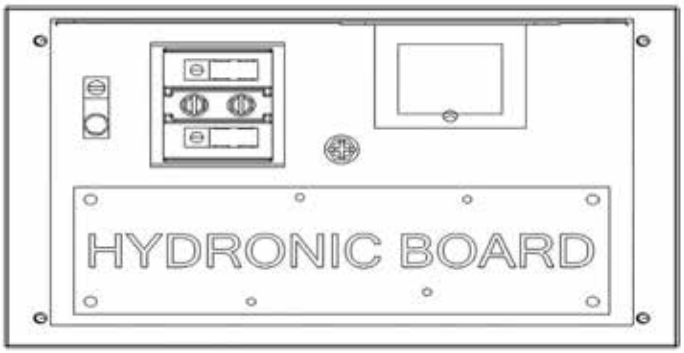

Figure 20: Component Locations – Hydronic Heat Control Box

SECTION 9: THERMOSTAT WIRING AND CONNECTIONS

Max. Thermostat Wire Length	Thermostat Wire Gauge	Thermostat Wire Maximum Current
0 - 100 Feet	22	3.0 Amps
0 - 125 Feet	20	3.0 amps
0 - 250 Feet	18	3.0 amps

Table 14: Low Voltage Wire Gauge and Max Lengths

Thermostat Wiring

Thermostat wires must be no smaller than 22 gauge. Refer to Table 30 for recommended wire gauge, lengths and maximum current for each wire gauge. Thermostat wires enter through the side of a cased air handler. Cable connectors must be installed when bringing wiring through the side of a cased air handler to hold the wiring in place and to relieve strain on the wiring.

A five conductor cable from the thermostat to the air handler and a two or three conductor cable from the air handler to the outdoor unit is recommended for typical heating/cooling applications. Typical heat/cool thermostat wire colors and connections are shown in Tables 32 and 33.

A seven conductor cable from the thermostat to the air and a five conductor cable from the air handler to the outdoor unit is recommended for a typical heat pump application. Typical heat pump thermostat wire colors and connections are shown in Table 34.

Thermostat Installation

The thermostat heat anticipator must be set at 0.4 amps if the thermostat has a manual heat anticipator adjustment. This setting should be checked at the time of installation. The thermostat may be a "self-setting" type in which no heat anticipator setting will be found on the thermostat, eliminating the need for field adjustment.

The thermostat should be located on an inside wall in an open area or hallway to more closely sense average room air, preferably where there is air movement back to air handler. The thermostat should not be located within 3 feet of from any windows or supply air registers and should be 52 to 66 inches above the floor.

Maintenance, operating, and/or programming instructions are in the envelope shipped with the thermostat. The envelope should be given to the homeowner or user after the thermostat installation is completed.

⚠ IMPORTANT

Do not locate thermostat within three feet of any of the following items:

1 Supply air registers
2 Lights or heat lamps
3 Aquariums
4 Televisions, stereo, amplifiers, surround sound systems
5 Stoves or any cooking appliance
6 Refrigerator
7 Washer and/or dryer
8 Hot water tank
9 Sink or near any hot water
10 Within 15 feet of any electric space

Separate Heating and Cooling System Using Same Thermostat
If both the air handler and the outdoor unit have transformers, it is necessary to use a thermostat with isolated heating and cooling contacts "RC" and "RH" to prevent interconnection of the two 24 VAC systems. Most newer thermostats have separate heating and cooling contacts for use with an air handler and outdoor unit that each have a 24 VAC transformer. These thermostats have a "RC" terminal for cooling and a "RH" terminal for heating. Connect the RED thermostat wire ("R" circuit) from the outdoor unit to the "RC" terminal on the thermostat and the RED wire ("R" circuit) from the air handler to the "RH" terminal on the thermostat. Refer to Figures 21 - 25 for typical low voltage wire connections.

If the air handler and outdoor unit both have transformers and the thermostat does not have the "RC" and "RH" terminals, connecting the RED wires from the air handler and outdoor unit to the same "R" terminal on the thermostat can result in transformer burnout or it can cause either the air handler or outdoor unit control systems to enter lockout mode. If the thermostat does not have the "RC" and "RH" terminals, purchase a new thermostat with these terminals.

Separate Heating and Outdoor Units, Separate Thermostats
If the application has a central heating and cooling system, but the hydronic heat and DX cooling are controlled by separate thermostats, the use of a thermostat interlock switch is required in order to prevent heating and cooling from operating at the same time.

⚠ CAUTION

When using separate heating and cooling thermostats, a thermostat interlock system must be provided to prevent simultaneous operation of heating and cooling operation. Simultaneous operation can result in equipment overheating, equipment damage, and wasted energy.

<u>Do Not</u> connect the YELLOW wire (cooling) to the thermostat unless an outdoor unit is installed.

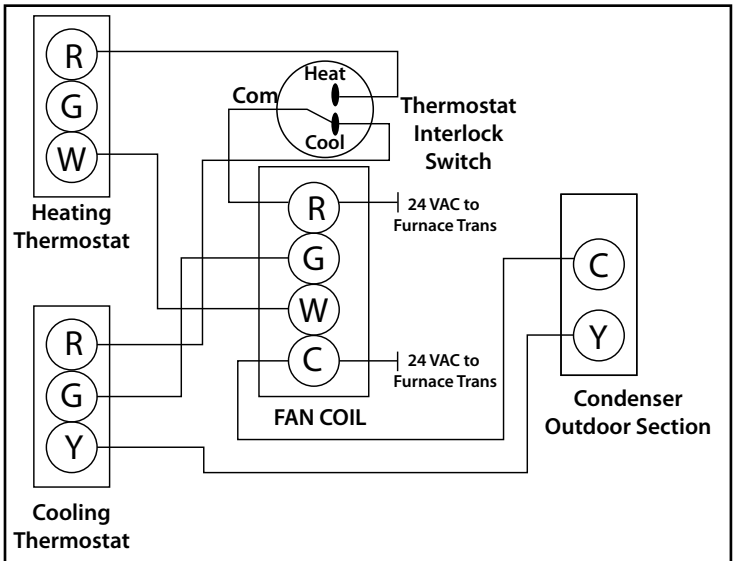

Figure 21: Heat/Cool Thermostat Connections - Separate Thermostats & Single Transformer in Air Handler

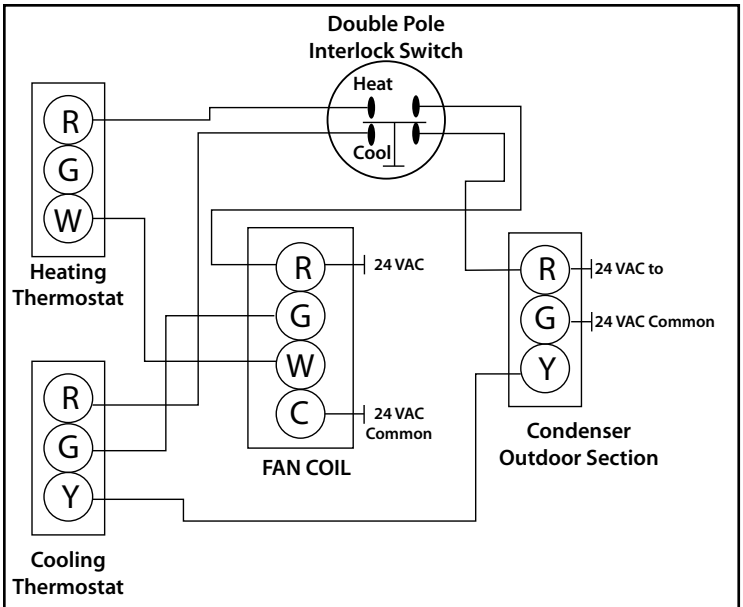

Figure 22: Heat/Cool Thermostat Connections - Separate Thermostats & Separate Transformers in Air Handler and Outdoor Unit

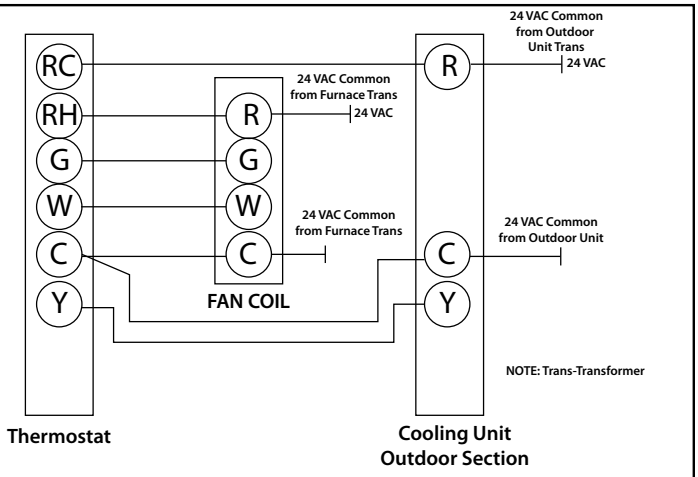

Figure 23: Heat/Cool Thermostat Connections – Single Thermostat & Separate Transformers in Air Handler & Outdoor Unit

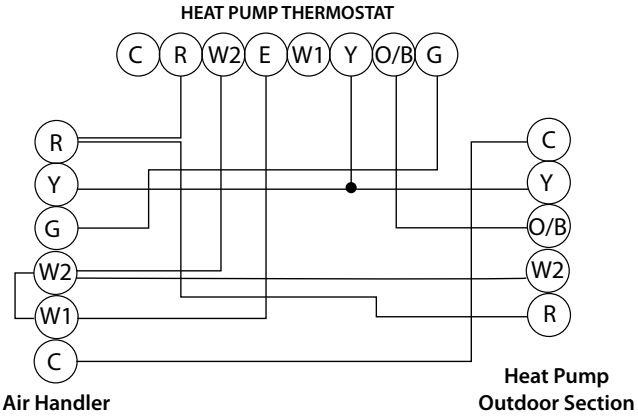

Figure 25: Heat Pump Thermostat Connections - Single Thermostat & Single Transformer in Air Handler

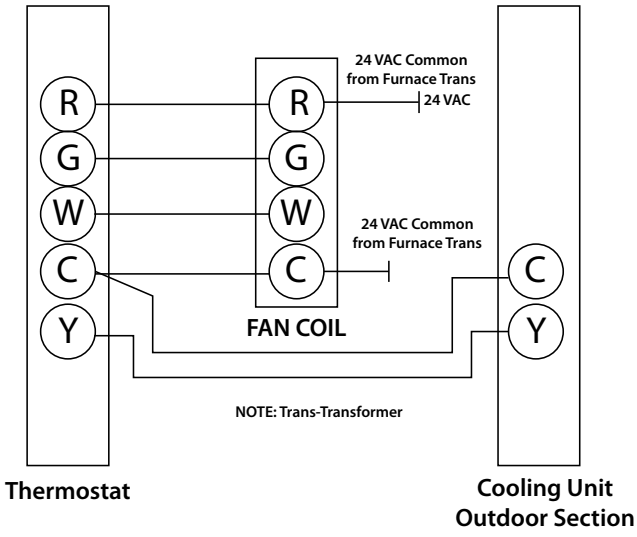

Figure 24: Heat/Cool Thermostat Connections - Single Thermostat & Single Transformer in Air Handler

Terminal	Description
0/B	Changover valve for heat pump energized constantly in cooling and off/heating
Y2	2nd Stage Compressor
Y	Compressor Relay
G	Fan Relay
RC	Power for Cooling
C	Common wire from secondary side of cooling (Optional). Required for fault indication, continuous backlight operation or remote temperature sensor operation 6 Powered closed 3rd wire for 3-wire zone valve
W/E	Heat Relay/Emergency Heat Relay (Stage 1) (3rd Stage Heat in HP2)
W2	2nd Stage Heat (4th Stage Heat in HP2)
–	Common (DC) to remote temperature sensor
S	Frequency signal from remote temperature sensor
+	Power (DC) to remote temperature sensor
A1	Economizer/Time of Day Output energized in occupied (Morn, Day, and Eve) periods, powered by RC or RH terminal
L	Compressor diagnostic indicator for systems with diagnostic connection typically found on Heat Pump systems or with Copeland's Comfort Alert

Table 15: Thermostat Terminal Designations

WIRE COLOR	DESCRIPTION	LETTER CODE	THERMOSTAT CONNECTION
RED	24 VAC	RED / R	R
WHITE	Heat (1st Stage Heat)	WHT / W	W or W 1
GREEN	Indoor Fan	GRN / G	G
YELLOW	24 VAC Common (Electric Heat Models)	YEL / C	C
BROWN	24 VAC Common (Hydronic Heat Models)	BRN / C	C

Table 16: Air Handler Low Voltage Pigtail Wire Colors and Connections

WIRE COLOR	DESCRIPTION	LETTER CODE	THERMOSTAT CONNECTION
RED	24 VAC	RED / R	R
WHITE	Heat (1st Stage Heat)	WHT / W	W or W 1
GREEN	Indoor Fan	GRN / G	G
YELLOW	Cooling	YEL / C	Y or Y1
BROWN	24 VAC Common	BRN / C	C

Table 17: Typical Heat/Cooling Outdoor Unit Thermostat Wire Color Codes and Connections

WIRE COLOR	DESCRIPTION	LETTER CODE	THERMOSTAT CONNECTION
RED	24 VAC	RED / R	R
WHITE	Heat (1st Stage Heat)	WHT / W	W or W 1
GREEN	Indoor Fan	GRN / G	G
YELLOW	Cooling	YEL / C	Y or Y1
BROWN	24 VAC Common	BRN / C	C
ORANGE	Heat Pump Reversing Valve Solenoid (Most Brands)	ORN / O	O
BLUE	Heat Pump Reversing Valve Solenoid (Some Brands)	BLU / B	B

Table 18: Typical Heat Pump Outdoor Unit Thermostat Wire Color Codes and Connections

Typical Heating/ Cooling Wiring Connections

1. Open the ceiling access panel.
2. Remove the control box cover.
3. Install a grommet or a strain relief in the 9/16 inch diameter hole on the top and the left side of the air handler to protect the thermostat wire cable.
4. Strip 1/2 inch of the insulation off the end of each wire.
5. Insert the wire cable from the thermostat thru the 9/16 inch hole into the control box and place the thermostat wire cable next to the low voltage pigtails. Secure the thermostat wire cable with a strain relief to prevent wire connections from being pulled apart.
6. Connect the RED (24 VAC) thermostat wire to the RED air handler low voltage pigtail wire with a wire nut.
7. Connect the WHITE (1st stage heating) thermostat wire to the WHITE air handler low voltage pigtail wire with a wire nut.
8. Connect the GREEN (indoor fan) thermostat wire to the GREEN air handler low voltage pigtail wire with a wire nut.
9. Connect the YELLOW (cooling) wire from the thermostat to the YELLOW (cooling) wire from the outdoor unit compressor contactor coil with a wire nut.
   NOTE: For models with hydronic heat, also connect these two YELLOW wires to the YELLOW air handler low voltage pigtail wire.
10. Connect the BROWN (24 VAC common) wire from the thermostat to the air handler low voltage pigtail (YELLOW for electric heat; BROWN for hydronic heat) wire and to the BROWN (24 VAC common) wire from the compressor contactor on the outdoor unit. Fasten the 3 wires together securely with a wire nut.

Typical Heat Pump Wiring Connections

1. Open the ceiling access panel.
2. Remove the control box cover.
3. Install a grommet or a strain relief in the 9/16 inch diameter hole on the top and the left side of the air handler to protect the thermostat wire cable.
4. Strip ½ inch of the insulation from the end of each wire.
5. Insert the wire cable from the thermostat thru the 9/16 inch hole into the control box and place the thermostat wire cable next to the low voltage pigtails. Secure the thermostat wire cable with a strain relief to prevent wire connections from being pulled apart.
6. Connect the RED (24 VAC) wire from the thermostat to the RED air handler low voltage pigtail wire and the RED wire from the "R" terminal on the outdoor unit. Fasten the three wires together securely with a wire nut.
7. Connect the WHITE (1st stage heating) wire from the thermostat to the WHITE air handler low voltage pigtail wire and the WHITE wire from the "E" terminal on the outdoor unit. Fasten the three wires together securely with a wire nut.
8. Connect the GREEN (indoor fan) wire from the thermostat to the GREEN air handler low voltage pigtail wire with a wire nut.
9. Connect the YELLOW (cooling) wire from the thermostat to the YELLOW wire from the outdoor unit compressor contactor coil with a wire nut.
   NOTE: For models with hydronic heat, also connect these two YELLOW wires to the YELLOW air handler low voltage pigtail wire.
10. Connect the BROWN (24 VAC common) wire from the thermostat to the air handler low voltage pigtail (YELLOW for electric heat; BROWN for hydronic heat) wire and to the BROWN (24 VAC common) wire from the "C" terminal on the outdoor unit. Fasten the 3 wires together securely with a wire nut.
11. Connect the BROWN (24 VAC common) wire from the thermostat to the air handler low voltage pigtail (YELLOW for electric heat; BROWN for hydronic heat) wire and to the BROWN (24 VAC common) wire from the "C" terminal on the outdoor unit. Fasten the 3 wires together securely with a wire nut.
12. Connect the ORANGE (reversing valve solenoid) wire from the thermostat "O" terminal to the ORANGE wire from the "O" terminal on the outdoor unit. Fasten the two wires together securely with a wire nut.
    NOTE: If the outdoor unit has a "B" terminal instead of an "O" terminal, connect the BLUE (reversing valve solenoid) wire from the thermostat "B" terminal to the outdoor unit.

SEHX / CEHX / SCWE / CCWE	Blower Motor			No. of Blowers	Blower Wheel Size	DX Rows	CFM@ 0.10" W.C.	CFM@ 0.20" W.C.	CFM@ 0.25" W.C.	CFM@ 0.30" W.C.	CFM@ 0.40" W.C.	CFM@ 0.50" W.C.
	HP	Type	Volts									
19-**-**-1C80	1/3	C. T	208/240	2	7.00 x 8.00	5	921	876	859	842	788	742
25-**-**-1C81	1/2	C. T.	208/240	2	7.00 x 9. 00	5	1110	1047	1005	993	925	873
35-**-**-1C81	1/2	C. T.	208/240	2	7.00 x 9. 00	5	1369	1307	1262	1226	1157	1089
37-**-**-1C81	1/2	C. T.	208/240	2	7.00 x 9. 00	5	1415	1364	1321	1287	1220	1155

Table 19: SEHX/CEHX/SCWE/CCWE Blower Performance – Constant Torque Motor – Speed Tap 5

SEHX / CEHX / SCWE / CCWE	Blower Motor			No. of Blowers	Blower Wheel Size	DX Rows	CFM@ 0.10" W.C.	CFM@ 0.20" W.C.	CFM@ 0.25" W.C.	CFM@ 0.30" W.C.	CFM@ 0.40" W.C.	CFM@ 0.50" W.C.
	HP	Type	Volts									
19-**-**-1C80	1/3	C.T.	208/240	2	7. 00 x 8. 00	5	821	777	754	738	689	640
25-**-**-1C81	1/2	C.T.	208/240	2	7. 00 x 9. 00	5	1010	932	896	877	821	758
35-**-**-1C81	1/2	C.T.	208/240	2	7.00 x 9. 00	5	1262	1200	1162	1135	1077	1010
37-**-**-1C81	1/2	C.T.	208/240	2	7.00 x 9. 00	5	1277	1215	1204	1166	1098	1045

Table 20: SEHX/CEHX/SCWE/CCWE Blower Performance – Constant Torque Motor – Speed Tap 4

SEHX / CEHX / SCWE / CCWE	Blower Motor			No. of Blowers	Blower Wheel Size	DX Rows	CFM@ 0.10" W.C.	CFM@ 0.20" W.C.	CFM@ 0.25" W.C.	CFM@ 0.30" W.C.	CFM@ 0.40" W.C.	CFM@ 0.50" W.C.
	HP	Type	Volts									
19-**-**-1C80	1/3	C.T.	208/240	2	7.00 x 8. 00	5	761	722	697	676	626	578
25-**-**-1C81	1/2	C.T.	208/240	2	7.00 x 9. 00	5	896	818	789	777	694	641
35-**-**-1C81	1/2	C.T.	208/240	2	7.00 x 9. 00	5	1173	1095	1065	1035	965	889
37-**-**-1C81	1/2	C.T.	208/240	2	7.00 x 9. 00	5	1177	1122	1093	1063	1001	934

Table 21: SEHX/CEHX/SCWE/CCWE Blower Performance – Constant Torque Motor – Speed Tap 3

SEHX / CEHX / SCWE / CCWE	Blower Motor			No. of Blowers	Blower Wheel Size	DX Rows	CFM@ 0.10" W.C.	CFM@ 0.20" W.C.	CFM@ 0.25" W.C.	CFM@ 0.30" W.C.	CFM@ 0.40" W.C.	CFM@ 0.50" W.C.
	HP	Type	Volts									
19-**-**-1C80	1/3	C.T.	208/240	2	7. 00 x 8. 00	5	640	583	557	530	478	465
25-**-**-1C81	1/2	C.T.	208/240	2	7. 00 x 9. 00	5	749	680	646	625	550	492
35-**-**-1C81	1/2	C.T.	208/240	2	7. 00 x 9. 00	5	1059	971	951	910	822	749
37-**-**-1C81	1/2	C.T.	208/240	2	7. 00 x 9. 00	5	1069	1001	961	920	855	777

Table 22: SEHX/CEHX/SCWE/CCWE Blower Performance – Constant Torque Motor – Speed Tap 2

SEHX / CEHX / SCWE / CCWE	Blower Motor			No. of Blowers	Blower Wheel Size	DX Rows	CFM@ 0.10" W.C.	CFM@ 0.20" W.C.	CFM@ 0.25" W.C.	CFM@ 0.30" W.C.	CFM@ 0.40" W.C.	CFM@ 0.50" W.C.
	HP	Type	Volts									
19-**-**-1C80	1/3	C.T.	208/240	2	7. 00 x 8. 00	5	562	502	478	453	402	352
25-**-**-1C81	1/2	C.T.	208/240	2	7. 00 x 9. 00	5	611	540	497	486	410	352
35-**-**-1C81	1/2	C.T.	208/240	2	7. 00 x 9. 00	5	978	896	852	814	732	677
37-**-**-1C81	1/2	C.T.	208/240	2	7. 00 x 9. 00	5	987	913	870	840	760	698

Table 23: SEHX/CEHX/SCWE/CCWE Blower Performance – Constant Torque Motor – Speed Tap 1

SDXW / CDXW / SCWW / CCWW	Blower Motor			No. of Blowers	Blower Wheel Size	DX Rows	CFM@ 0.10" W.C.	CFM@ 0.20" W.C.	CFM@ 0.25" W.C.	CFM@ 0.30" W.C.	CFM@ 0.40" W.C.	CFM@ 0.50" W.C.
	HP	Type	Volts									
18-21-**-1A82	1/3	C.T.	120	2	7.00 x 8.00	3	917	881	861	840	792	746
19-21-**-1A82	1/3	C.T.	120	2	7.00 x 8.00	4	917	881	861	840	792	746
24-23-**-1A82	1/3	C.T.	120	2	7.00 x 8.00	3	917	881	861	840	792	746
25-33-**-1A83	1/2	C.T.	120	2	7.00 x 9.00	4	1075	1023	1000	973	919	862
30-27-**-1A83	1/2	C.T.	120	2	7.00 x 9.00	3	1072	1023	1000	973	919	862
31-28-**-1A83	1/2	C.T.	120	2	7.00 x 9.00	4	1072	1023	1000	973	919	862
34-30-**-1A83	1/2	C.T.	120	2	7.00 x 9.00	3	1294	1245	1214	1182	1117	1041
35-30-**-1A83	1/2	C.T.	120	2	7.00 x 9.00	4	1294	1245	1214	1182	1117	1041
36-35-**-1A83	1/2	C.T.	120	2	7.00 x 9.00	3	1362	1311	1287	1253	1202	1142
37-32-**-1A83	1/2	C.T.	120	2	7.00 x 9.00	4	1362	1311	1287	1253	1202	1142

Table 24: SDXW/CCXW/SCWW/CCWW Blower Performance – Constant Torque Motor - Speed Tap 5

SDXW / CDXW / SCWW / CCWW	Blower Motor			No. of Blowers	Blower Wheel Size	DX Rows	CFM@ 0.10" W.C.	CFM@ 0.20" W.C.	CFM@ 0.25" W.C.	CFM@ 0.30" W.C.	CFM@ 0.40" W.C.	CFM@ 0.50" W.C.
	HP	Type	Volts									
18-21-**-1A82	1/3	C.T.	120	2	7.00 x 8.00	3	810	773	758	734	696	657
19-21-**-1A82	1/3	C.T.	120	2	7.00 x 8.00	4	810	773	758	734	696	657
24-23-**-1A82	1/3	C.T.	120	2	7.00 x 8.00	3	810	773	758	734	696	657
25-33-**-1A83	1/2	C.T.	120	2	7.00 x 9.00	4	976	922	900	869	813	756
30-27-**-1A83	1/2	C.T.	120	2	7.00 x 9.00	3	976	922	900	869	813	756
31-28-**-1A83	1/2	C.T.	120	2	7.00 x 9.00	4	976	922	900	869	813	756
34-30-**-1A83	1/2	C.T.	120	2	7.00 x 9.00	3	1239	1181	1154	1127	1070	1009
35-30-**-1A83	1/2	C.T.	120	2	7.00 x 9.00	4	1239	1181	1154	1127	1070	1009
36-35-**-1A83	1/2	C.T.	120	2	7.00 x 9.00	3	1301	1253	1223	1197	1150	1099
37-32-**-1A83	1/2	C.T.	120	2	7.00 x 9.00	4	1301	1253	1223	1197	1150	1099

Table 25: SDXW/CCXW/SCWW/CCWW Blower Performance – Constant Torque Motor – Speed Tap 4

SDXW / CDXW / SCWW / CCWW	Blower Motor			No. of Blowers	Blower Wheel Size	DX Rows	CFM@ 0.10" W.C.	CFM@ 0.20" W.C.	CFM@ 0.25" W.C.	CFM@ 0.30" W.C.	CFM@ 0.40" W.C.	CFM@ 0.50" W.C.
	HP	Type	Volts									
18-21-**-1A82	1/3	C.T.	120	2	7.00 x 8.00	3	765	725	700	683	638	595
19-21-**-1A82	1/3	C.T.	120	2	7.00 x 8.00	4	765	725	700	683	638	595
24-23-**-1A82	1/3	C.T.	120	2	7.00 x 8.00	3	765	725	700	683	638	595
25-33-**-1A83	1/2	C.T.	120	2	7.00 x 9.00	4	888	829	800	769	704	647
30-27-**-1A83	1/2	C.T.	120	2	7.00 x 9.00	3	888	829	800	769	704	647
31-28-**-1A83	1/2	C.T.	120	2	7.00 x 9.00	4	888	829	800	769	704	647
34-30-**-1A83	1/2	C.T.	120	2	7.00 x 9.00	3	1144	1040	1162	1027	967	916
35-30-**-1A83	1/2	C.T.	120	2	7.00 x 9.00	4	1144	1040	1162	1027	967	916
36-35-**-1A83	1/2	C.T.	120	2	7.00 x 9.00	3	1178	1156	1133	1104	1052	997
37-32-**-1A83	1/2	C.T.	120	2	7.00 x 9.00	4	1178	1156	1133	1104	1052	997

Table 26: SDXW/CCXW/SCWW/CCWW Blower Performance Chart – Constant Torque Motor – Speed Tap 3

SDXW / CDXW / SCWW / CCWW	Blower Motor			No. of Blowers	Blower Wheel Size	DX Rows	CFM@ 0.10" W.C.	CFM@ 0.20" W.C.	CFM@ 0.25" W.C.	CFM@ 0.30" W.C.	CFM@ 0.40" W.C.	CFM@ 0.50" W.C.
	HP	Type	Volts									
18-21-**-1A82	1/3	C.T.	120	2	7.00 x 8.00	3	616	585	562	540	492	446
19-21-**-1A82	1/3	C.T.	120	2	7.00 x 8.00	4	616	585	562	540	492	446
24-23-**-1A82	1/3	C.T.	120	2	7.00 x 8.00	3	616	585	562	540	492	446
25-33-**-1A83	1/2	C.T.	120	2	7.00 x 9.00	4	746	678	647	604	561	504
30-27-**-1A83	1/2	C.T.	120	2	7.00 x 9.00	3	746	678	647	604	561	504
31-28-**-1A83	1/2	C.T.	120	2	7.00 x 9.00	4	746	678	647	604	561	504
34-30-**-1A83	1/2	C.T.	120	2	7.00 x 9.00	3	1052	987	957	925	860	799
35-30-**-1A83	1/2	C.T.	120	2	7.00 x 9.00	4	1052	987	957	925	860	799
36-35-**-1A83	1/2	C.T.	120	2	7.00 x 9.00	3	1084	1022	1000	969	906	852

Table 27: SDXW/CCXW/SCWW/CCWW Blower Performance Chart – Constant Torque Motor – Speed Tap 2

SDXW / CDXW / SCWW / CCWW	Blower Motor			No. of Blowers	Blower Wheel Size	DX Rows	CFM@ 0.10" W.C.	CFM@ 0.20" W.C.	CFM@ 0.25" W.C.	CFM@ 0.30" W.C.	CFM@ 0.40" W.C.	CFM@ 0.50" W.C.
	HP	Type	Volts									
18-21-**-1A82	1/3	C.T.	120	2	7.00 x 8.00	3	554	505	481	455	403	356
19-21-**-1A82	1/3	C.T.	120	2	7.00 x 8.00	4	554	505	481	455	403	356
24-23-**-1A82	1/3	C.T.	120	2	7.00 x 8.00	3	554	505	481	455	403	356
25-33-**-1A83	1/2	C.T.	120	2	7.00 x 9.00	4	613	536	500	466	398	337
30-27-**-1A83	1/2	C.T.	120	2	7.00 x 9.00	3	613	536	500	466	398	337
31-28-**-1A83	1/2	C.T.	120	2	7.00 x 9.00	4	613	536	500	466	398	337
34-30-**-1A83	1/2	C.T.	120	2	7.00 x 9.00	3	946	883	852	812	751	684
35-30-**-1A83	1/2	C.T.	120	2	7.00 x 9.00	4	946	883	852	812	751	684
36-35-**-1A83	1/2	C.T.	120	2	7.00 x 9.00	3	1004	943	911	881	819	754
37-32-**-1A83	1/2	C.T.	120	2	7.00 x 9.00	4	1004	943	911	881	819	754

Table 28: SDXW/CCXW/SCWW/CCWW Blower Performance Chart – Constant Torque Motor – Speed Tap 1

SECTION 11: BLOWER MOTOR SPEED SELECTION

NOTICE: The factory blower motor speed tap settings are appropriate for most applications. Refer to Section 10: Blower Performance before changing the motor speed from the factory setting.

⚠ WARNING

To avoid personal injury or property damage, make certain that the motor leads cannot come into contact with non-insulated metal components of the air handler.

CONSTANT TORQUE MOTOR

The high efficiency constant torque motor operates on 208/240 VAC for electric heat models and 115 VAC for hydronic heat models. The motor speed tap inputs are 24 VAC. The speed taps can be changed by removing the BLACK wire from the blower motor control module terminal 5 or the RED wire from the blower motor control module terminal 1 and connecting the wires to blower motor terminals 2, 3 or 4. Figure 26, Table 48, and Table 49 show the constant torque motor terminals and the connection definitions.

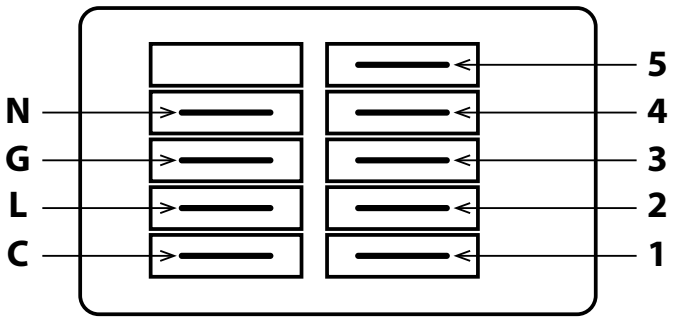

Figure 26: Constant Torque Motor Control Module Terminals

TERMINAL	CONNECTION
C	Speed Tap Common - 24 VAC Common
L	Supply Voltage – 208/240 VAC – Line 1
G	Ground Connection
N	Supply Voltage – 208/240 VAC – Line 2
1	Low Speed Tap - 24 VAC Input
2	Medium - Low Speed Tap - 24 VAC Input
3	Medium Speed Tap - 24 VAC Input
4	Medium - High Speed Tap - 24 VAC Input
5	High Speed Tap - 24 VAC Input

Table 29: Constant Torque Motor Terminals – Electric Heat Models

TERMINAL	CONNECTION
C	Speed Tap Common - 24 VAC Common
L	Supply Voltage - 115 VAC
G	Ground Connection
N	Supply Voltage - Neutral
1	Low Speed Tap - 24 VAC Input
2	Medium - Low Speed Tap - 24 VAC Input
3	Medium Speed Tap - 24 VAC Input
4	Medium - High Speed Tap - 24 VAC Input
5	High Speed Tap - 24 VAC Input

Table 30: Constant Torque Motor Terminals – Hydronic Heat Models

Changing Motor Speeds – Constant Torque Motor

1. Turn off all electrical supply circuits to the air handler at the main electrical panel (circuit breaker box) and turn the local air handler service disconnect to the OFF position.
2. Loosen the ceiling access panel thumbscrews and lower access panel.
3. Disconnect the speed tap wire(s) connected to blower motor control module terminals 1 through 5 (See Figure 26) and reconnect to the desired terminal(s).

   Constant Torque Motor Speed Tap Wire Color Code: ORANGE - Cooling Speed; **WHITE** - Heating Speed; **YELLOW** (hydronic models only) – Continuous Fan Speed

   NOTE: Motor speed tap terminal 1 is the lowest speed and 5 is the highest speed. The cooling speed should be higher than the heating speed.

4. Close the ceiling access panel and secure the panel with the thumb screws.
5. Turn on all electrical supply circuits to the air handler at the main electrical panel (circuit breaker box) and turn the local air handler service disconnect to the ON position.
6. Set the thermostat to the desired operating mode and temperature.

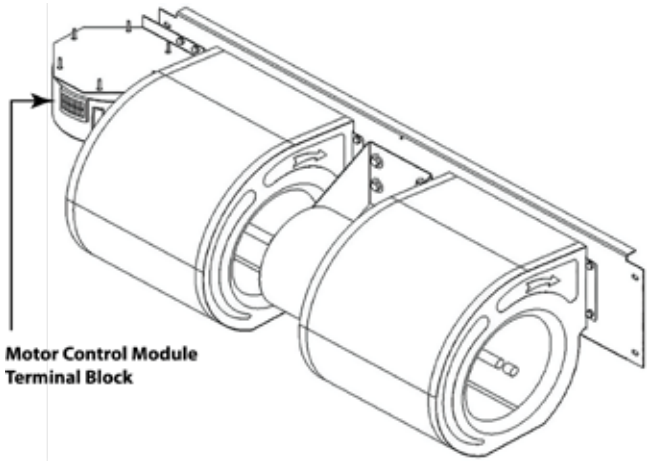

Figure 27: Constant Torque Blower Assembly

SECTION 12: FINAL SYSTEM CHECKOUT AND STARTUP

1. Refer to appropriate wiring diagram and recheck all wiring connections. Ensure that all wiring connections are tight.
2. Check blower motor connectors to make sure they are not damaged or loose.
3. If the control box cover was removed; reinstall control box cover.
4. Swing the service access panel into place and secure with the thumbscrews.
5. Switch the air handler circuit breakers in the main electrical panel to the ON position.
6. Switch the air handler service disconnect switch to the ON position.
7. Set the thermostat FAN Switch to the ON position to enable the continuous fan mode.
8. Check for air leaks at all duct connections and seal any leaks that are found.
9. Set the thermostat FAN switch to the AUTO position.
10. Set the thermostat HEAT/COOL switch to the COOL position and adjust the set point below the room temperature to enable the cooling mode.
11. Check for proper cooling operation per the outdoor unit installation and operating instructions.
12. **Electric Heat Models Only:** Switch the thermostat HEAT/COOL switch to the HEAT position and adjust the set point above the room temperature to enable the heating mode.
    a. Check for proper heating operation.
    b. Set the thermostat to the desired operating mode and adjust the temperature setting for comfort conditions.
13. **Hydronic Heat Models Only:** Switch the thermostat HEAT/COOL switch to the OFF position. The heating mode in models with hydronic heating system should not be switched on until system is filled and air is purged from hot water coil using the following procedure.

Filling Hydronic Heating System With Water, Purging Air From System, and System Startup

1. The thermostat HEAT/COOL switch must be in the OFF position.
2. Fill and pressurize the water heater and water coil.
3. Check for water leaks and seal any leaks that are found.
4. Turn the water heater on and set water temperature at 130°F for now.
5. Vent air from the water tank by opening a hot water spigot or faucet.
6. Vent and flush the supply and return water lines by attaching a hose to the volume purge valve and running purge water to a safe location. Run approximately 5 gallons of water at a high flow rate to purge.
7. Switch the air handler circuit breaker in the main electrical panel to the ON position if it is not already in the ON position.
8. Switch the air handler service disconnect switch to the ON position if it is not already in the ON position.
9. Set the thermostat HEAT/COOL switch to the HEAT position and adjust the set point above the room temperature to call for heat. The fan and pump should start simultaneously. The water coil should be warm after a few minutes of operation.
10. The air-handler is rated for water temperatures of 130°-180°F. Set water heater temperature at design temperature and take proper safeguards for water usage at supply points per local codes and safety considerations.
    NOTE: If CPVC or PEX hot water tubing is used, do not set the water temperature above 150°F.
11. Set thermostat HEAT/COOL switch to the desired operating mode and temperature.

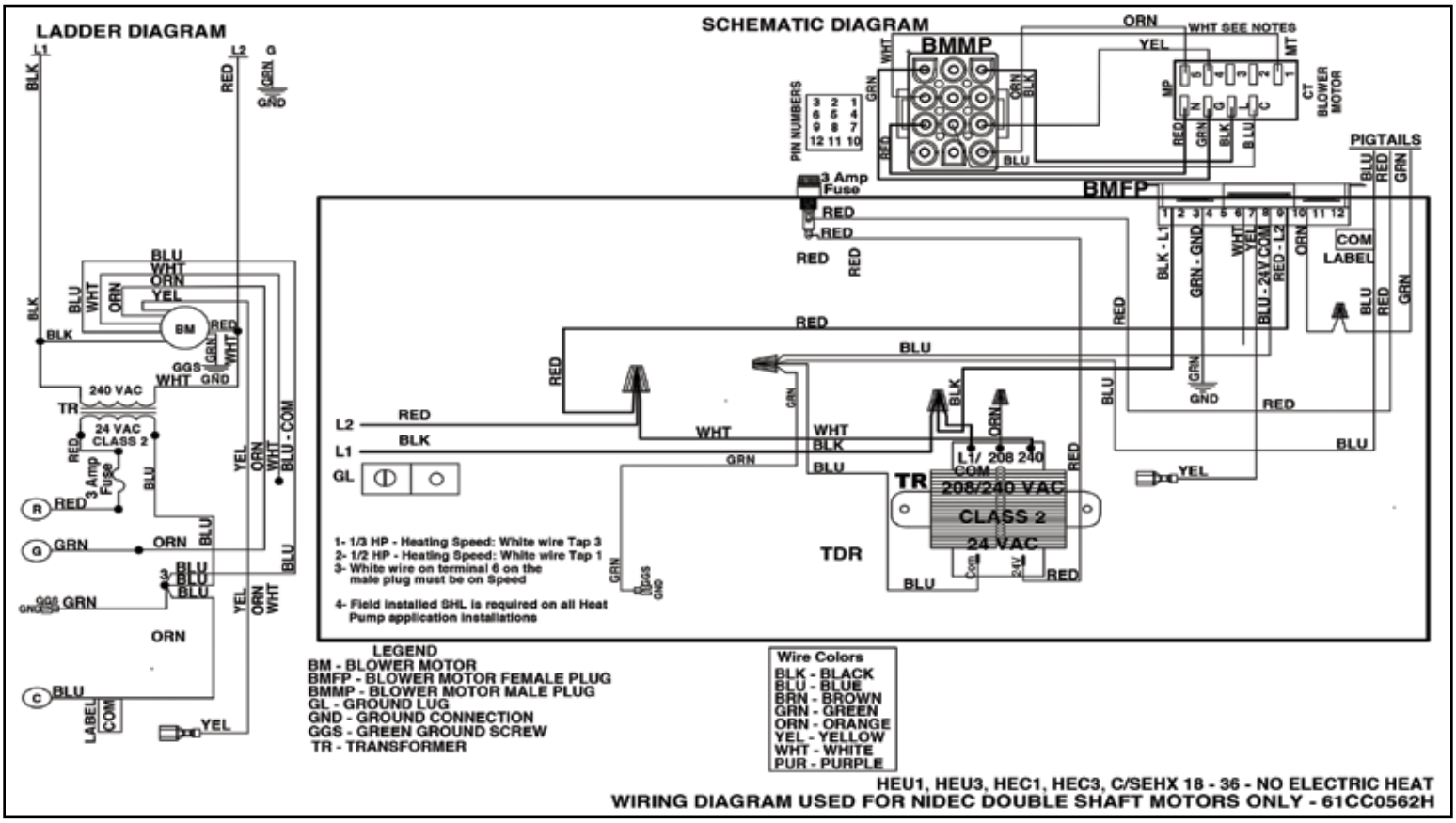

Figure 28: SEHX, CEHX, SCWE, CCWE; 12 – 37 BTU/H; No Electric Heat; Constant Torque Blower Motor

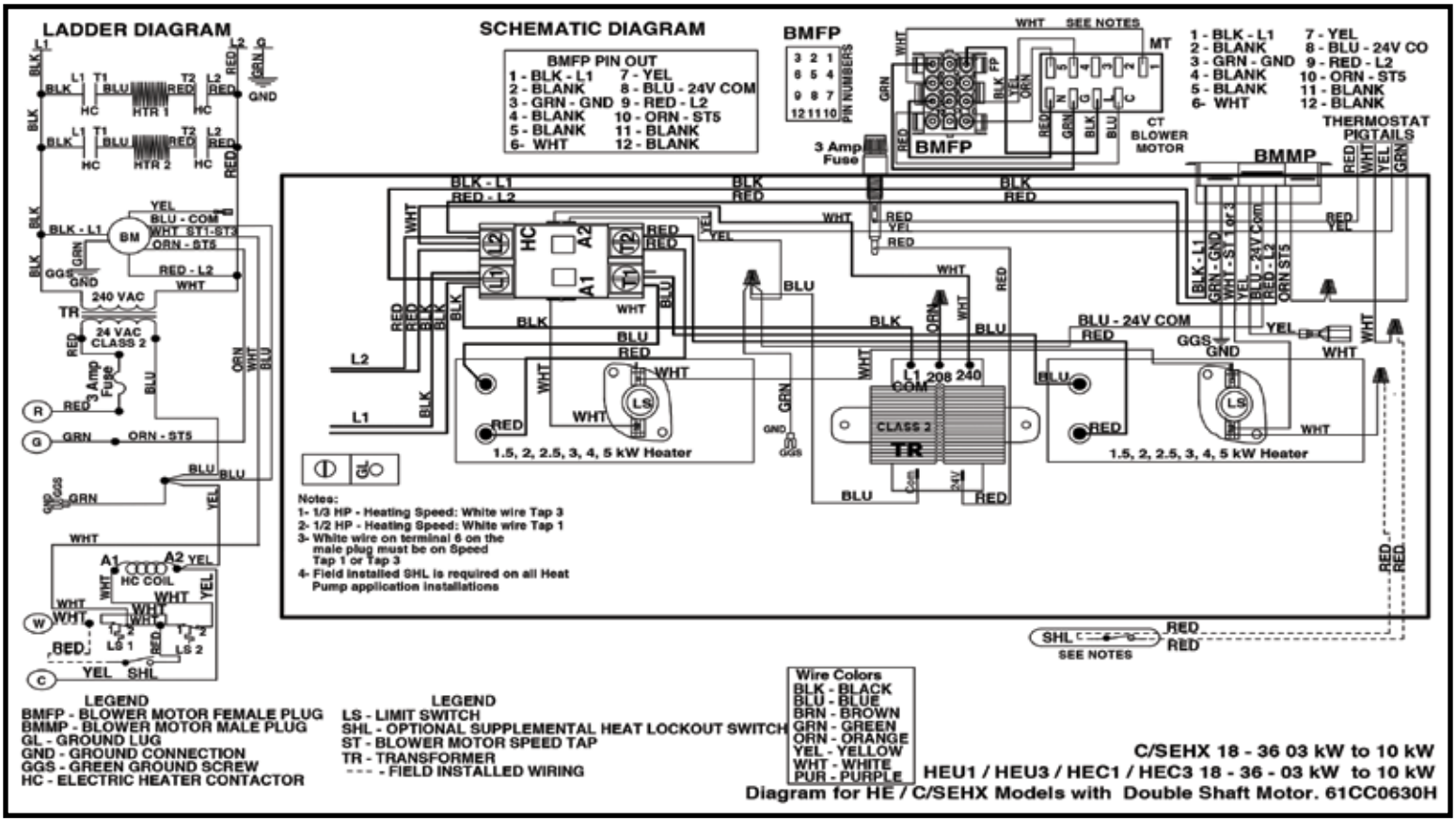

Figure 29: SEHX, CEHX, SCWE, CCWE; 12 – 37 BTU/H; 03kW - 10kW Electric Heat; Constant Torque Blower Motor; With Field Installed Electric Heat Lockout Switch

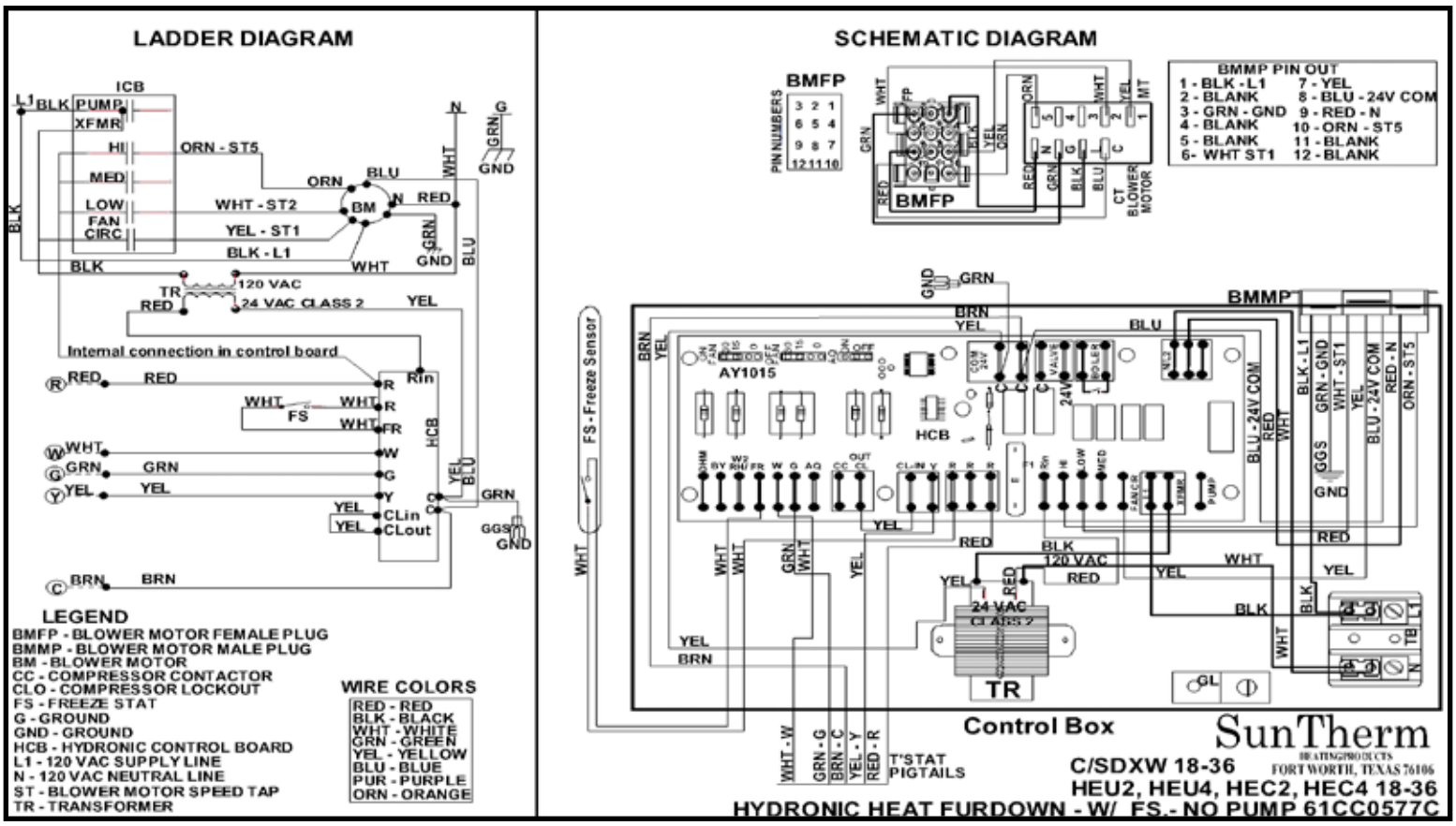

Figure 30: SDXW, CDXW, SCWW, CCWW; 18 – 37 BTU/H; Hydronic Heat; Constant Torque Blower Motor; With Freeze Switch; No Water Pump

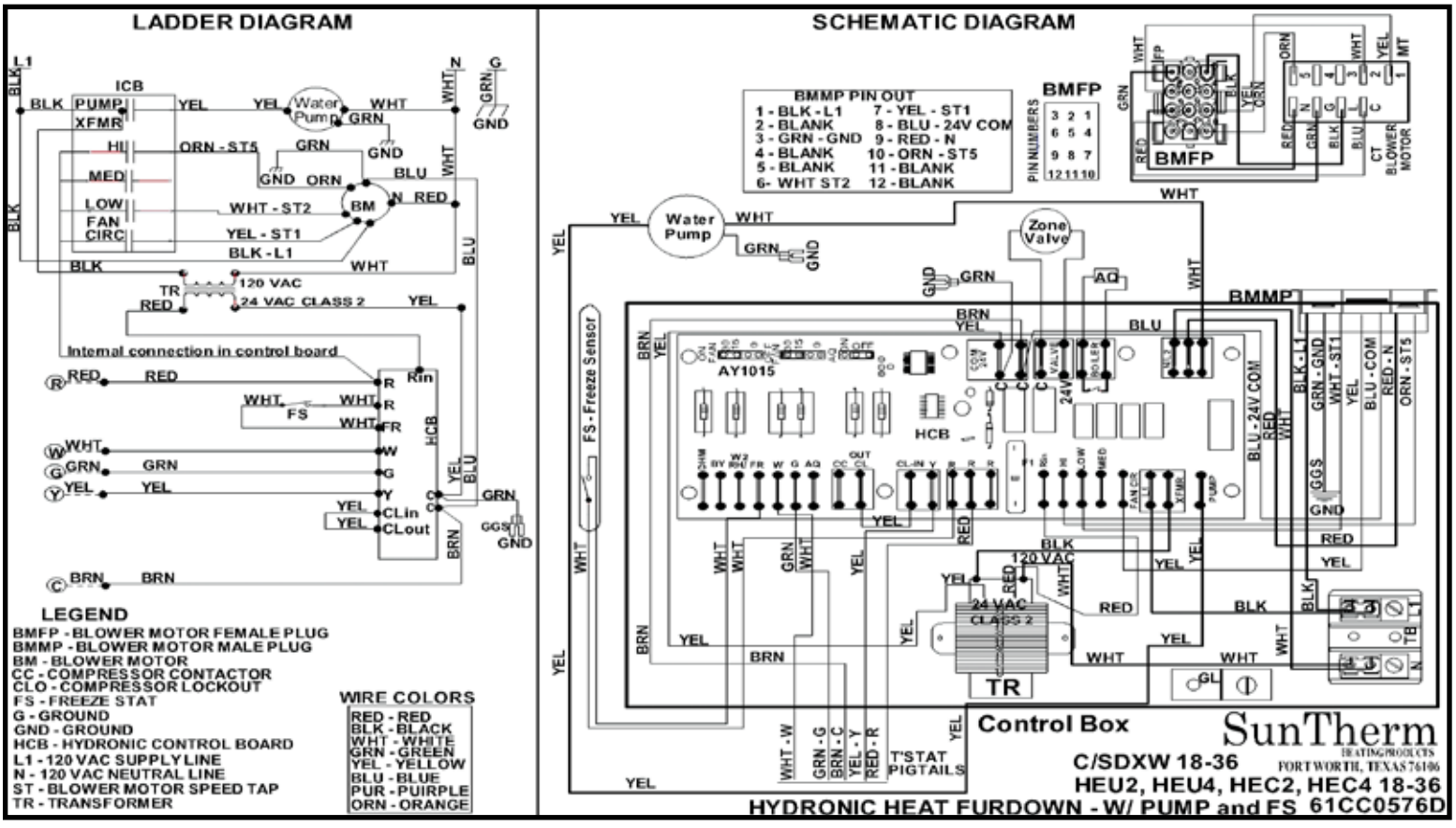

Figure 31: SDXW, CDXW, SCWW, CCWW; 18 – 37 BTU/H; Hydronic Heat; Constant Torque Blower Motor; With Freeze Switch and Water Pump