SunTherm™ HEATING PRODUCTS

USER INFORMATION 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-4P
SDXW - DX Cooling w/ Hot Water Heat, Uncased
CDXW – DX Cooling w/ Hot Water Heat, Cased
SCWW – Chilled Water Cool w/Hot Water Heat, Uncased-2P
CCWW – Chilled Water Cool w/Hot Water Heat, Cased-4P

LIST OF SECTIONS

LIST OF SECTIONS – SERVICE AND MAINTENANCE MANUAL

LIST OF FIGURES

LIST OF TABLES

CONTACT INFORMATION

Contact us by mail: Manufactured and Distributed by:

Mortex Products Inc
501 Terminal Rd
Fort Worth, TX 76106

www.mortx.com

SECTION 1: GENERAL

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

1. Electric heat models are rated for 208-240 VAC/1-phase/60 Hz and hydronic heat models are rated for 115 VAC/1-phase/60 Hz.
2. This air handler is not designed to be operated on a 50 Hz power supply.
3. This air handler is designed for both A/C and heat pump applications.
4. This air handler is designed for horizontal applications only.
5. This air handler must not be operated without the access panels installed.
6. This air handler and its components listed are listed by ETL for the United States and Canada
7. This air handler is for use at elevations of 10,000 ft (3,048m) or less.
8. 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.

USERS MUST READ ALL INSTRUCTIONS IN THIS MANUAL.

THIS MANUAL MUST BE SAVED FOR FUTURE REFERENCE.

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

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.

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

⚠ WARNING

Any adjustment, service or maintenance by the homeowner and/or user may create a condition where the operation of the product could cause personal injury or property damage.

Only qualified service personnel, a contractor, or an installer may refer to the service and maintenance section of this manual for assistance or for additional service or repair information on this air handler.

⚠ CAUTION

This air handler requires periodic routine maintenance and cleaning of the exterior surfaces by the homeowner or user to remove dust and debris. Any additional service must be performed by qualified personnel. This air handler must be serviced and maintained as specified in these instructions and/or to any applicable local, state, and national codes including, but not limited to building, electrical, and mechanical codes.

⚠ DANGER

Do not use this air handler if any part has been under water. A flood damaged air handler is extremely dangerous. Attempts to use the air handler can result in a fire.

A qualified contractor, installer, or service agency must be contacted to inspect the air handler for any water damage and replace all components, control system parts, or electrical parts that have been damaged. If enough damage is present, the air handler may need to be replaced.

⚠ WARNING

FIRE OR ELECTRICAL HAZARD
Servicing heating/cooling equipment can be hazardous due to electrical components.

Only trained and qualified personnel can service or repair heating/cooling equipment. The homeowner must never try to perform service, repair or maintenance on this air handler.

Untrained service personnel can perform only basic maintenance functions such as cleaning of exterior surfaces and replacing the air filters.

Observe all precautions in the manuals and on the attached labels when working on this air handler.

Safety Requirements

1. This air handler must be kept clear and free of combustible materials, gasoline and other flammable vapors and liquids.
2. Never store flammable materials of any kind near this air handler. Gasoline, solvents and other volatile liquids should be stored only in approved containers outside the home. These materials vaporize easily and are extremely dangerous.
3. Insulating materials may be combustible. The air handler must be kept free and clear of insulating materials. The air handler area must be examined when installed in an insulated space or when insulation is added to be sure that the insulation material has been kept away from the air handler.
4. Follow the instructions exactly as shown in the **Section 4: Startup and Shutdown** section of this manual to properly startup or shutdown this air handler.
5. If overheating occurs, turn off the power to the air handler and contact a qualified contractor, installer, or service company.
6. Never store cleaning materials such as bleaches, detergents, powder cleaners, etc. near this air handler. These chemicals can cause corrosion of the air handler sheet metal and electric heaters, blower and electrical controls.
7. Never use the area around the air handler as a storage area for items which could block or obstruct the airflow to the space around the air handler. This flow of air is required for safe and proper operation. Never block or obstruct air openings used for ventilation and cooling of the air handler electrical components.

8. Refer to the air handler rating plate for requirements for safe operation.
9. Provide adequate clearance for service access to the control box, electric heat elements or hydronic coil, and blower.
10. Failure to carefully read and follow all instructions in this manual can result in malfunction of the air handler which can cause, death, personal injury, and/or property damage.
11. If the air handler is installed in a residential garage, it must be installed so that the electric heaters are located not less than 18 inches above the floor and the air handler must be located or protected to avoid physical damage by vehicles.
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 modular home and residential home construction practices. These instructions are to be followed and are the minimum requirement to perform service or repairs on this air handler.

SECTION 3: OWNERS INFORMATION AND SEASONAL INFORMATION

HOW THE AIR HANDLER WORKS

Electric Heat Models - Heating Cycle
When the thermostat calls for heat on a electric heat model, 24 VAC is sent through the limit controls to the heater contactor coil. The contactor electrical contacts close which sends 208 - 240 VAC to the electric heating elements causing them to get hot. The indoor fan motor is then energized on the selected heating speed tap and the circulating blower draws cool air from the living space, passes it across the heater elements, and pushes the warmed air through the duct work into the living space. When the thermostat is satisfied, the electric heating elements and indoor fan motor are de-energized. The heating cycle has ended and the air handler is in the stand-by mode until the thermostat initiates the next call for heat.

Hydronic Heat Models - Heating Cycle
When the thermostat calls for heat on a hydronic heating model, 24 VAC is sent to the "W" terminal on the electronic hydronic control board. If the air handler is equipped with a water pump, the control board will energize the pump causing hot water to flow through the hot water coil which causes the coil to get hot. The indoor fan motor is energized on the heating speed tap (speed tap connected to the LOW terminal on the hydronic control board) after the selected "ON" time delay and the circulating blower draws cool air from the living space, passes it across the hot water coil, and pushes the warmed air through the duct work into the living space. When the thermostat is satisfied, the circulating pump is de-energized and the blower is also de-energized after the selected "OFF" time delay. The heating cycle has ended and the air handler is in the stand-by mode until the thermostat initiates the next call for heat.

Electric and Hydronic Heat Models - Cooling Cycle
When the thermostat calls for cooling, 24 VAC is sent to the compressor contactor in the outdoor unit causing it to close which energize the compressor and the outdoor fan motor. The indoor fan motor is energized on the selected cooling speed tap after the selected "ON" time delay and the circulating blower draws air from the living space, passes it across the cold refrigerant coil in the air handler and pushes the cooled air through the duct work into the living space. When the thermostat is satisfied, the compressor, outdoor fan motor, and indoor blower motor are de-energized. The cooling cycle has ended and the air handler is in the stand-by mode until the thermostat initiates the next call for cooling.

Electric and Hydronic Heat Models – Heat Pump Heating Cycle
When the thermostat calls for the heat pump heating mode, 24 VAC is sent to the compressor contactor in the outdoor unit causing it to close which energizing the compressor and the outdoor fan motor. The position of the reversing valve in the outdoor unit is switched to the heating mode causing the flow of the refrigerant to heat the refrigerant coil inside the air handler. The indoor fan motor is energized on the selected speed tap (same as the cooling mode) after the selected "ON" time delay and the circulating blower draws air from the living space, passes it across the warm refrigerant coil in the air handler, and pushes the warmed air through the duct work into the living space. When the thermostat is satisfied, the compressor, outdoor fan motor, and indoor fan motor are de-energized. The heating cycle has ended and the air handler is in the stand-by mode until the thermostat initiates the next call for heat.

NOTE: For hydronic heat models, the YELLOW wire from the thermostat "Y" terminal must connect to the YELLOW air handler thermostat pigtail or the "Y" terminal on the electronic hydronic control board and the "Y" signal wire (typically YELLOW) from the outdoor unit compressor contactor must connect to the "CC" terminal on the control board. The thermostat "Y" signal is passed from the "CLin" terminal to the "CLout" terminal with a factory installed jumper wire. The CLout terminal is connected to the "CC" terminal internally in the control board. The jumper between the CLin and CLout terminals allows the "Y" signal to reach the CC terminal on applications without a compressor lockout switch. For applications where a compressor lock-out switch has been installed, this jumper is replaced with the two wires from the lock-out switch.

IMPORTANT NOTE FOR HYDRONIC AIR HANDLERS WITH CONSTANT TORQUE MOTORS: If the YELLOW wire from the thermostat "Y" terminal on a **hydronic air handler** is not connected to the YELLOW air handler thermostat pigtail (Y) on models with **constant torque motors**, the indoor blower motor will operate on the lower circulation fan speed instead of the higher cooling speed in the cooling mode which will result in insufficient airflow and frosting up of the indoor coil.

While Homeowner or User is Away
The air handler is equipped with safety shutoff devices which are designed to prevent the air handler from overheating in case of a malfunction. If the blower motor fails, the heating system will cycle on the safety shutoff devices while the temperature inside the home continues to drop. Water pipes will freeze once the temperature falls below 32°F.

If the homeowner or user is planning to be away for an extended period of time, someone should be asked to check on the home every day, especially when the outside temperature is expected to fall below 35°F, to ensure the air handler is operating properly and to prevent water pipes from freezing.

If Air Handler Fails to Operate Properly

If any abnormalities are observed while the air handler is operating normally, perform the following checks:

1. Check the setting on the thermostat to make sure the thermostat is set above the room temperature in the heating mode or below the room temperature in the cooling mode.
2. Check to see if the electrical power is turned on at the circuit breakers in the main electrical panel (circuit breaker box) or check to make sure the air handler service disconnect ON/OFF switch is turned to the ON position.
3. Make sure the air filters are clean, return grilles clean, are not obstructed, and supply air registers are open.

If the cause of the malfunction is not obvious, the homeowner or user must not attempt to repair the air handler. Call a qualified service company to repair the air handler.

Annual Inspection and Servicing of Air Handler

If the air handler gives any indication of improper operation, the homeowner should call a qualified service technician to inspect an diagnose and correct the problem. It is strongly recommended that the air handler be inspected and serviced by a qualified service technician annually, preferably at the start of each heating season. The technician can identify potential problems and make corrections before trouble develops. Preventative maintenance of this type will allow the air handler to operate with minimal concerns to the homeowner for many years.

The service technician should perform the following checks during the annual inspection.

1. Confirm the physical support of the air handler is sound with no sagging.
2. Confirm there are no loose fasteners.
3. Confirm the condensate drain lines and hot water lines (hydronic models) are not leaking or sagging.
4. Confirm the air handler casing and condensate drain pan have no obvious signs of deterioration from rust or corrosion.
5. Confirm the return and supply duct connections are physically sound and are sealed to the air handler casing.
6. Operate the air handler in all modes to assure proper functioning.

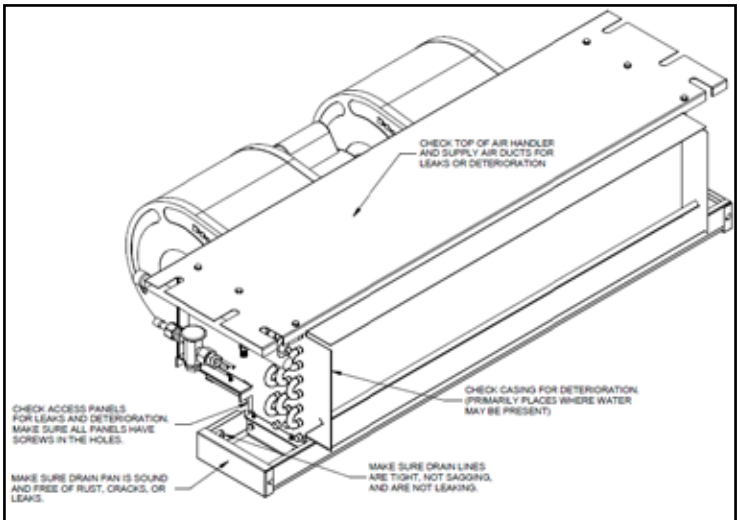

Figure 1: Air Handler Visual Check Points

Warranty and Responsibilities

It is the responsibility of the homeowner to make certain the air handler has been properly installed and adjusted to operate properly.

The manufacturer warrants the air handler to be free from defects in material or workmanship for a stated time in the warranty agreement. The manufacturer is not be responsible for any repair costs to correct problems due to improper setup, improper installation, improper adjustments, installing parts or components that are not listed for use with this air handler, improper operating procedures by the user, or repairs performed by the homeowner or user.

Some specific examples of service calls that are excluded from warranty reimbursement are:

1. Correcting faulty ductwork (too few ducts, ducts too small, leaking ducts, etc.) that was causing insufficient airflow.
2. Correcting electrical wiring problems in the supply wiring to the air handler.
3. Resetting circuit breakers or service disconnect switches used for servicing.
4. Correcting problems caused by installation and operation of the outdoor unit or air quality device not approved for use with this air handler.
5. Adjusting or calibrating the thermostat.
6. Correcting problems caused by construction debris which has been drawn into the air handler.
7. Replacing fuses.
8. Correcting problems caused by dirty air filters.
9. Correcting problems caused by return or supply air restrictions.

Before installation of the air handler, the homeowner or user should work with the installer to gain a good understanding of what will and will not be covered under the warranty to prevent future misunderstanding.

When to Call For Service Assistance

Providing the service company with information about the air handler in advance of their service call will often result in the repairs being completed sooner. This includes the model number, serial number, and a description of the problem being experienced. This information will enable the service company to possibly identify the source of the problem prior to the service call and arrive with the correct parts to fix the problem.

SERVICE AGENCY INFORMATION

Fill in Below

MODEL NUMBER: _____

SERIAL NUMBER: _____

SERVICE COMPANY: _____

ADDRESS: _____

TELEPHONE (DAYTIME): _____

TELEPHONE (EMERGENCY): _____

NOTES: _____

⚠ WARNING

AIR HANDLERS WITH ELECTRIC HEATERS
Should cycling of the electric heater over-temperature limit switches occur, turn the circuit breakers to the air handler in the main electrical panel (circuit breaker box) to the OFF position and call a qualified service company to troubleshoot and repair the air handler. DO NOT allow the electric heaters to cycle on the limit switches for an extended period of time.

SECTION 4: STARTUP AND SHUTDOWN INSTRUCTIONS

The following instructions should be read before trying to start the air handler.

A. **BEFORE OPERATING:** Check around perimeter of the air handler to make sure there are no flammable materials in the area. If flammable materials or flammable vapors are smelled or otherwise detected, **DO NOT** turn the power to the air handler on until the vapors have been ventilated and removed from the area around the air handler.

B. **CHECK THE FURNACE**: Visually check the air handler for loose screws and access panels that may be missing or have fallen off.

C. **CHECK DUCT CONNECTIONS:** Visually check the connections of the air ducts to the air handler to make sure there are no gaps or holes and that the ducts are securely fastened to the air handler and sealed.

⚠ WARNING

Failure to following the Start-Up and Shutdown instructions below may result in a fire may result causing property damage, personal injury, and/or loss of life.

Turning On / Starting the Air handler

1. **STOP!** Read the safety information above before proceeding.
2. Set the thermostat HEAT/COOL switch to the OFF position and FAN switch to the AUTO position.
3. Turn on the electrical power to the air handler at the main electrical panel (circuit breaker box).
4. Turn the air handler electrical service disconnect switch for the air handler to the ON position.
5. Close the ceiling access panel if it is open.
6. Set the thermostat HEAT/COOL switch, FAN switch, and temperature set point to the desired settings.

Shutting Down / Turning Off the Air handler

1. Set the thermostat HEAT/COOL switch to the OFF position and FAN switch to the AUTO position.
2. Turn the air handler electrical service disconnect switch to the OFF position.
3. Turn off the electrical power to the air handler at the main electrical panel (circuit breaker box).

SECTION 5: OWNER MAINTENANCE

Air handlers require regular maintenance in order for them to continue to operate properly. The annual service must be performed by qualified service personnel. The homeowner is expected to perform general cleaning of the exterior surfaces and replacement of the return air filter. The return air filter must be checked every 1 to 3 months and replaced as required. The air filter will either be located in a louvered ceiling access panel underneath the air handler or in a return air filter grille located on a wall or ceiling near the air handler. Figure 3 shows a louvered ceiling access panel and Figure 5 shows a return air filter grille.

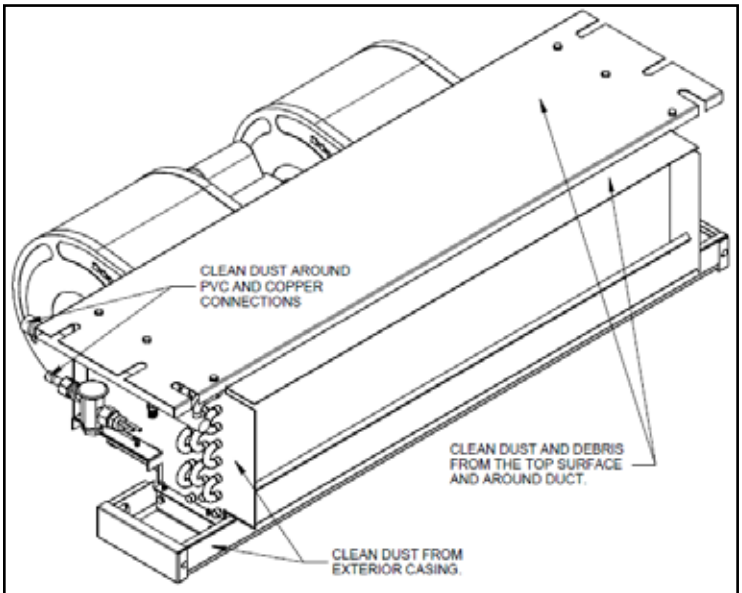

Figure 2: Homeowner / User Cleaning Points

Louvered Ceiling Access Panel Air Filter Replacement

Most horizontal air handlers have an air filter located in a louvered access panel in the ceiling directly under the air handler. The louvered ceiling access panel has an air filter rack designed to retain a standard 1" thick disposable air filter. Below are the required steps to replace the air filter in a louvered ceiling access panel.

1. Follow the procedure **"Shutting Down / Turning Off the Air handler" in SECTION 4: Startup and Shutdown Instructions** on page 5 of these instructions.
2. Remove the thumb screws on the louvered ceiling access panel.
   CAUTION: Be very careful when removing the last thumb screw
   because the panel can swing down quickly and cause injury.
3. Allow the access panel to rotate downward and hang vertically.
4. Remove the old air filter from the filter rack.
   NOTE: The air filter is disposable. **DO NOT** attempt to clean the filter and reuse it.
5. Clean any dust or debris from both sides for the louvers and around the area where the filter is placed before the new air filter is installed.
6. Place a new standard disposable 24" x 20" x 1" filter into the filter rack.
   NOTE: Make sure the flow arrows on the air filter are pointing away from the louvers in the access panel.
7. Lift the access panel into the closed position and tighten the thumb screws until the panel is securely fastened to the frame assembly.
8. Follow the "**Turning On / Starting the Air handler" in SECTION 4: Startup and Shutdown Instructions** on page 5 of these instructions.

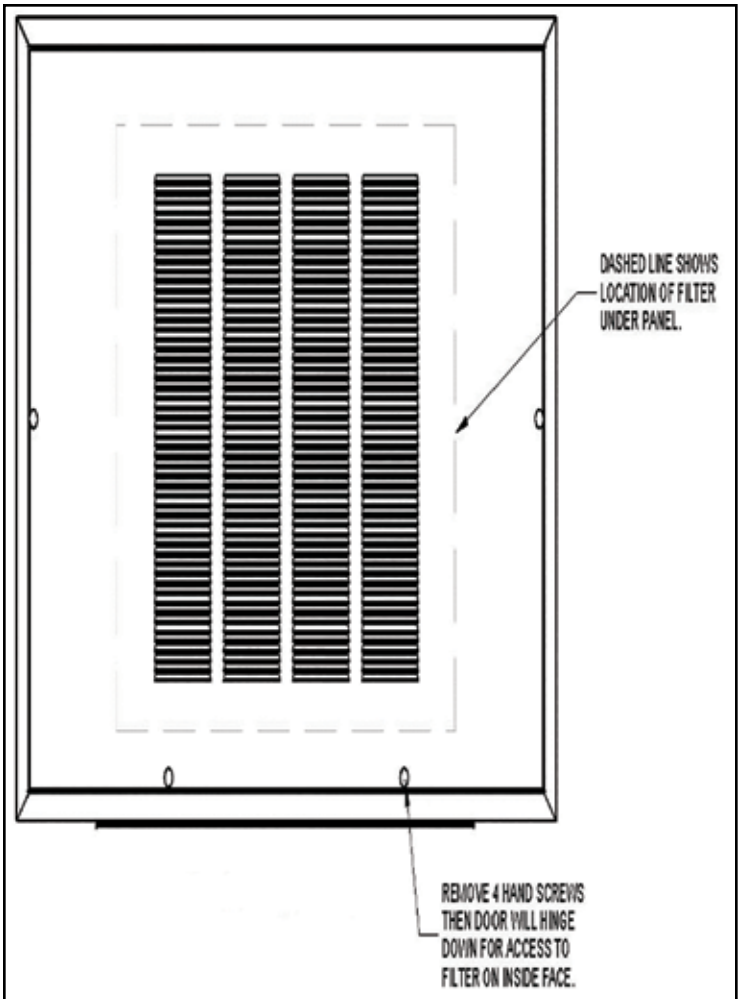

Figure 3: Ceiling Access Panel & Air Filter Location

⚠ WARNING

IMPACT HAZARD

Use extreme caution when removing the ceiling access panel thumbscrews that secure the access panel to the frame assembly. Once the last thumb screws has been removed, the access panel will swing down very quickly and strike a person standing under it unless it is properly supported by a free hand.

The louvers on the ceiling access panel have sharp edges which can cut hands or fingers. The use of gloves is recommended when handling the access panel to prevent injury.

Air Filter Replacement – Optional Filter Grille

If a non-louvered ceiling access panel is used, the air filter(s) for the air handler will be located in one or more return air filter grille(s) on a wall or in the ceiling near the air handler. Below are the required steps to replace the air filter in a return air filter grille.

1. Follow the procedure **"Shutting Down / Turning Off the Air handler" in SECTION 4: Startup and Shutdown Instructions** on page 5 of these instructions.
2. Remove the thumb screws or pull the tabs out on the front of the filter grille that secure the grille to the frame.
3. Pull the grille outward (wall mount) or downward (ceiling mount).
4. Remove the air filter.
   NOTE: The air filter is disposable. **DO NOT** attempt to clean the filter and reuse it.
5. Clean any access dirt or debris around the front area where the air filter is located.
6. Slide a new disposable filter the same size as the one removed \ into the filter rack.
   NOTE: Make sure the flow arrows on the air filter are pointing away from the louvers in the filter grille.
7. Push the grille into the frame and tighten the thumb screws or push the tabs in to secure the grille to the frame.
8. Follow the **"Turning On / Starting the Air handler" in SECTION 4: Startup and Shutdown Instructions** on page 5 of these instructions.

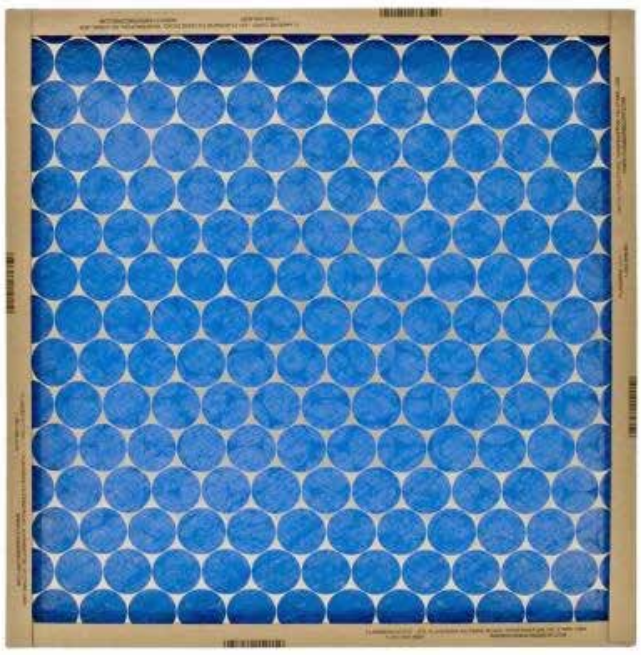

Figure 4: Standard Disposable 1" Thick Air Filter

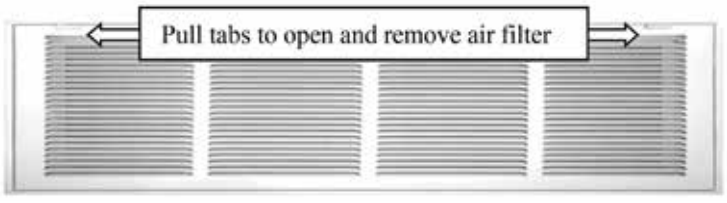

Figure 5: Optional Return Air Filter Grille

SERVICE AND MAINTENANCE MANUAL

SECTION 1: SAFETY

This section has been designed to assist qualified service personnel in performing service and maintenance on this air handler.

The homeowner or user must never attempt to perform any service or maintenance on the air handler that involves the removal or adjustment of any parts or components.

⚠ WARNING

The manufacturer or wholesale distributer will not be responsible for any repairs due to removal of parts or improper parts changes, improper maintenance, improper adjustments or improper modifications to this air handler that were performed by the homeowner or user.

The manufacturer will not be responsible if the homeowner or user uses this section of these instructions in an attempt to perform maintenance or repairs to the air handler. This practice is very dangerous and may result in property damage, personal injury, loss of life and/or will void the air handler warranty.

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.

SAFETY REQUIREMENTS

1. Air handlers with electric heaters have a 2 pole terminal block or line voltage pigtails for connecting the electrical supply wires and a 2-pole heater contactor. It is important to check each electrical circuit with a meter to assure the power has been disconnected.
2. Insulating materials may be combustible. The air handler must be kept free and clear of insulating materials.
3. Follow the instructions as shown in the **SECTION 4: Startup and Shutdown in the User Information Manual** (page 5) to properly start or shut down this air handler.
4. Make sure all moving parts have come to a complete stop before attempting to perform any work on this air handler. Clothing or body parts can get caught in moving parts and cause serious injury.

⚠ WARNING

Improper adjustment, service or maintenance may create a condition where the operation of the product could cause personal injury or property damage.

Refer to this manual for assistance or for additional information consult the Technical Support Group.

⚠ CAUTION

This product must be serviced and maintained as specified in these instructions and/or to any applicable local, state, and national codes including, but not limited to building, electrical, and mechanical codes.

⚠ 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.

⚠ WARNING

ELECTRICAL SHOCK, FIRE HAZARD

Failure to follow the safety warnings and improper servicing may result in fire, dangerous operation, serious injury, property damage, and/or death.

- **Before servicing, disconnect all electrical power to the air handler at the main electrical panel (circuit breaker box) and turning the air handler service disconnect switch to the OFF position. Disconnect electrical power to any accessories that may be powered by a separate power supply.**
- **When servicing controls, label all wires prior to disconnecting to aid in proper reconnection of wires.**
- **Verify proper operation after servicing by adjusting the thermostat set point above the room temperature (heating) or below the room temperature (cooling) for a brief period of time to ensure proper air handler operation.**

⚠ WARNING

FIRE HAZARD

NEVER CONNECT A JUMPER BETWEEN THE "R" & "W" THERMOSTAT WIRES

Placing jumper wire between the RED and WHITE thermostat wires at the air handler in order to override the thermostat and energize the heater elements is an extremely dangerous practice that can result in damage to the thermostat, dangerous operation, serious injury, property damage and/or death.

SECTION 2: AIR HANDLER MAINTENANCE

The interior of this air handler must be cleaned and adjusted by a qualified service contractor annually or prior to each heating or cooling season. The following items should be checked:

1. Blower wheel and motor for excessive dirt.
2. Electric heaters for wear, damage or corrosion.
3. Electrical components for excessive dust, dirt, wear, or deterioration.
4. Supply air duct system for excessive dust, dirt or debris.
5. Return air duct system for excessive dust, dirt or debris.
6. Electrical wiring for wear, insulation cracks and/or damage.
7. Indoor coil(s) for dust, debris or damage.
8. Condensate drain pan for proper drainage to prevent water backup into the air handler.
9. Air handler casing and interior sheet metal panels or dividers.

Air Handler Cleaning Procedure

1. Follow the instructions in **SECTION 4: Startup and Shutdown of the User Information Manual** (page 5) to properly shut down the air handler.
2. Open the ceiling access panel by removing the thumb screws. **CAUTION:** Be very careful when removing the last thumb screw as the panel can swing down quickly and cause injury.
3. Blower Removal
   a) Disconnect the wires connected to the motor controller terminal block.
   NOTE: Write down the terminal block position for each wire before disconnecting the wires.
   b) Remove the screws that secure the blower assembly to the air handler chassis located on each side and at the top center of the blower mounting plate.
   c) Grasp the blower assembly and lift it up while pulling out on the bottom. Lower the blower assembly out of the blower compartment and set assembly on a table or the floor.

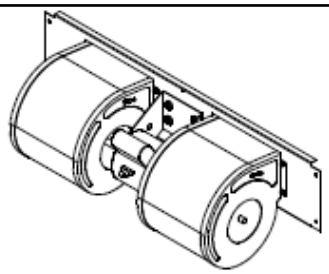

Figure 6: Blower Assembly

4. Use a vacuum cleaner and a small brush to remove any dirt and debris from the blower and evaporator coil compartments.
5. Check the condensate drain pan for any debris and check to see if the drain pan is draining properly by pouring water into it. Remove any excess water that may have spilled from checking the condensate drain drainage.
6. Pour ½ cup of chlorine bleach in the drain pipe to kill any fungus that may be growing inside the pipe to prevent the condensate drain from plugging up.
7. Check in the area in the discharge of the blowers where the heating elements are located and remove any dust, dirt or debris from around the heating elements. Be careful not to damage the heating elements with the vacuum hose or the brush.
8. Check both blower wheels for dust and debris. Use the brush and the vacuum cleaner to remove any dust or debris from the wheels. Be careful not the accidentally move or remove the blower wheel balance weights located on the wheel blade. If any weight is moved or removed, the blower wheel will vibrate. If the blower wheel is vibrating, it must be replaced.
9. Check the blower motor for dust and debris. Clean the openings in the motor housing. These openings are for cooling the motor. Plugged motor housing openings will cause the motor to run hotter than normal and will shorten the life of the motor.
10. Clean dust in the supply and return ducts with a brush and vacuum cleaner as far as can be reached. If the ducts have an excessive amount of dust, dirt or debris, recommend that the homeowner or user call a professional duct cleaning service to properly clean the duct system.
    NOTE: Dust is flammable and can cause a fire.
11. Check and clean any dust, dirt, or debris from the controls and surfaces inside the control box. Dust or dirt on the components can cause the controls to overheat and fail prematurely.
12. Check the indoor coil for dust or dirt buildup. If dirty, use a non-corrosive spray specifically designed to clean air-conditioning coils. Remove the electric heating elements (electric heat models) before cleaning the coil so the coil cleaner doesn't get on the elements. Follow the procedure found later on this page for removing the electric heating elements. After the heating elements have been removed (if applicable), spray the entire surface of the coil. Rinsing the coil is unnecessary as the condensate will rinse the coil when the system is operated in the cooling mode.
13. Reinstall the electric heating elements as described in the procedure for reinstalling the electric heating elements in the next column on this page.
14. Lift the blower assembly into place while pushing in on the bottom and pulling down to set the blower mounting plate into place.
15. Replace the screws on the blower mounting plate that were removed in Step 3.
16. Reconnect the blower motor leads that were disconnected in Step 3.
17. Reattach the motor guard to the control box and reinstall the control box cover on models equipped with a PSC motor.
18. Close the ceiling access panel and secure the panel with the thumb screws.
19. Follow the instructions in **SECTION 4: Startup and Shutdown of the User Information Manual** (page 5) to properly start the air handler.

Removing and Reinstalling the Electric Heating Elements

1. Follow the instructions in **SECTION 4: Startup and Shutdown of the User Information Manual** on page 5 of these instructions to properly shut down the air handler.
2. Open the ceiling access panel by removing the thumb screws. **CAUTION**: Be very careful when removing the last thumb screw as the panel can swing down quickly and cause injury.
3. Remove the control box cover.
4. Unplug the blower motor female plug (BMFP) from the mating plug located on the control box.
5. Disconnect the electrical supply wires and ground wire from the terminal block and ground lug. Remove the strain relief that is securing these wires and remove the wires from the control box.
6. Remove the 5 screws that secure the control box to the air handler and remove the control box. The electric heating elements are attached to the control box and will come out with the control box.
   NOTE: Take care not to damage the heating elements when removing the control box.
7. Remove the wires from the heating element screw terminals.
8. Remove the 2 screws that secure the limit control to the heating element mounting plate and remove the limit control.
9. Remove the 4 screws that secure the heating element to the control box and remove the element.
10. Insert the new heating element into the control box and secure it with the screws that were removed in Step 10.
11. Install the limit control in the hole in the heating element mounting plate and secure it with the 2 screws removed in Step 8.
12. Reconnect the wiring that were removed in Step 7.
13. Reinstall the control box and secure it the air handler with the screws that were removed in Step 6.
    NOTE: Take care not to damage the heating elements when installing the control box.
14. Reconnect the wiring that was removed in Steps 4 and 5.
15. Reinstall the control box cover.
16. Close the ceiling access panel and secure it to the frame assembly with the thumb screws.
17. Follow the instructions in **SECTION 4: Startup and Shutdown of the User Information Manual** on page 5 of these instructions to properly start the air handler.

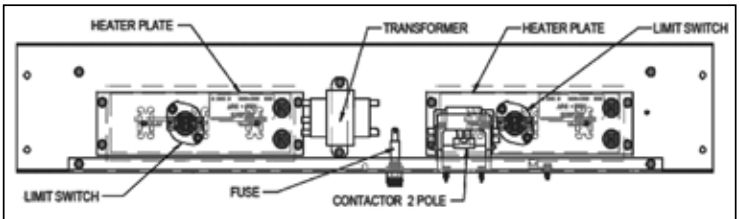

Figure 7: Electric Heat Control Box

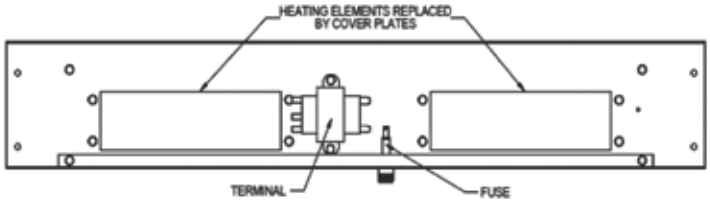

Figure 8: No Electric Heat Control Box Models

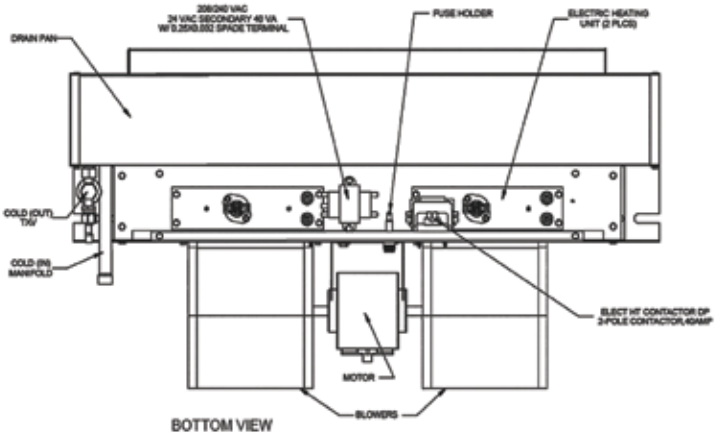

Figure 9: Component Locations – Electric Heat Models

SECTION 3: AIR HANDLER CONTROLS

Electric Heat Models

This section explains how the electric heat air handler controls operate. Refer to Figures 7 - 9 for component locations.

1. **Limit Controls** – Each electric heating element has a limit control directly in front of it to sense overheating of the element and open if the temperature gets above the set point of the limit control.

2. **Heater Contactor** – The electric heater contactor turns the heating elements on and off and is controlled by the thermostat. On a call for heat, 24 VAC is sent to the contactor's 24 VAC coil which closes the contactor electrical contacts. When the call for heat has been satisfied, 24 VAC is removed from the contactor coil which opens the contactor's electrical contacts.

3. **Transformer** – The transformer is used to step the incoming line voltage down from 208/240 VAC to 24 VAC which is used for the system control circuit.

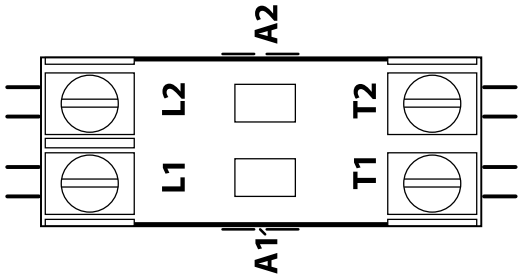

Figure 10: Electric Heater Contactor

Hydronic Heat Models

This section explains how the hydronic air handler controls operate. Refer to Figures 11 and 12 for component locations.

1. **Transformer** – The transformer is used to step the incoming line voltage down from 115 VAC to 24 VAC which is used for the system control circuit.
2. **Hydronic Control Board** – The hydronic heat models are equipped with a hydronic control board to control the operation of air handler components.
3. **Water Pump**: The water pump power leads are connected to the "PUMP" terminals on the hydronic control board. When there is a call for heat, a 24 VAC signal from the thermostat "W" terminal to the "W" terminal on the hydronic control board energizes the pump and starts the flow of water to the heating coil. When the call for heat has been satisfied, the pump is de-energized and the flow of water to the coil stops. The air handler is now in the standby mode awaiting the next call for heat.
4. **Blower Motor**: The hydronic control board has 3 speed terminals for the blower motor. The "HI" terminal is energized with 24VAC in the normal cooling mode and the "MED" terminal is energized with 24VAC in the cooling dehumidification mode. The "LOW" terminal is energized in the heating mode. The FAN CIR terminal is energized with 24VAC in the continuous mode when there is no call for cooling or heating. The hydronic control board has two jumper pins for selecting the blower motor "ON" and "OFF" delays. The blower "ON" and "OFF" delays can be set independently at 0, 15, or 30 seconds.

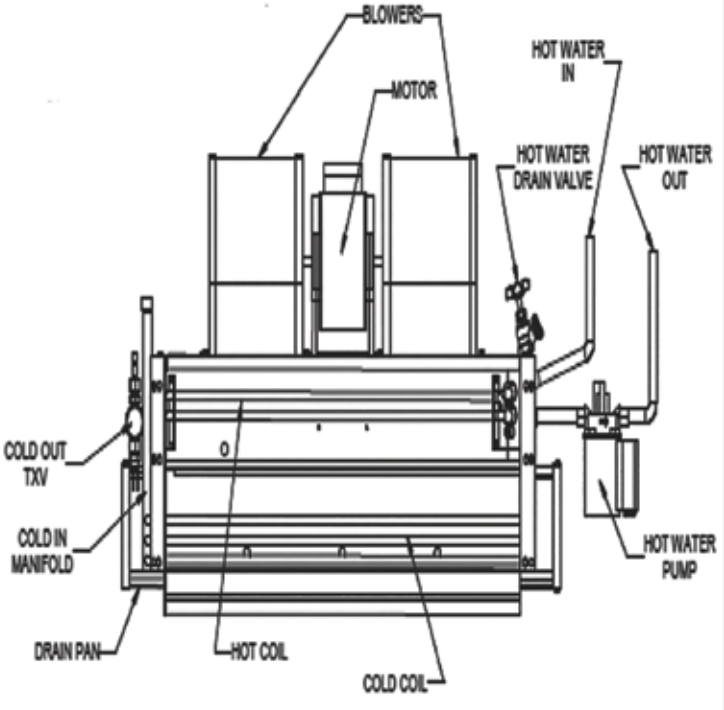

Figure 11: Component Locations – Hydronic Heat Models

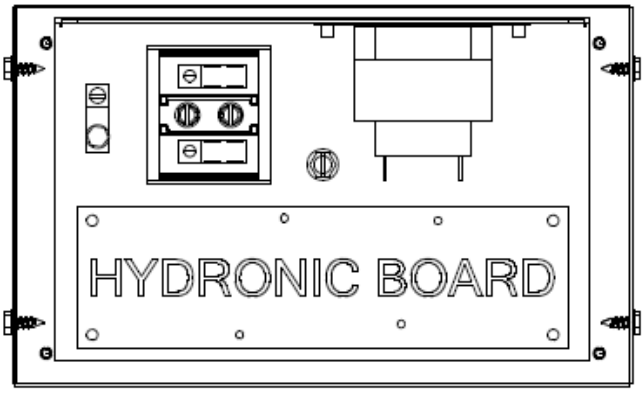

Figure 12 : Hydronic Heat Control Box – No Pump

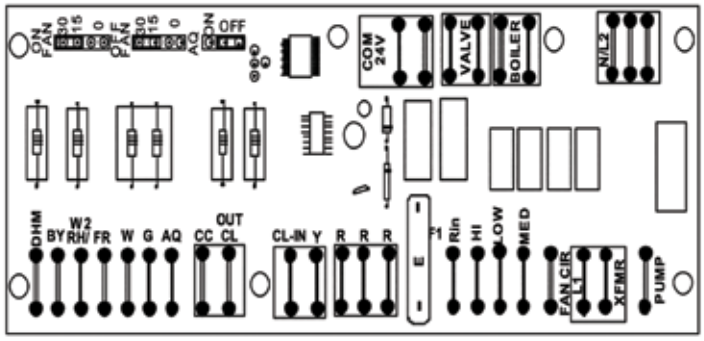

Figure 13: AY1015 Hydronic Control Board for Constant Torque Motors

Hydronic Control Board Terminals and Descriptions

ICM AY1015 - Mortex Part No. 68AE0011 - The terminals and functions are explained below.

Line Voltage Terminals AY1015

L1 – Supply Voltage (115 VAC) to the control
L2 – Supply Neutral (115 Neutral) to the control
XFMR and L2 – 115 VAC supply to transformer
Pump and L2 – 115 VAC to the water pump

24 VAC Terminals AY1015:

Rin – 24 VAC supply from the transformer
24V COM – 24 VAC common from the transformer
R – Fused 24 VAC output connections
Y – Connect to the thermostat Y terminal
CC – Connect CC and **24V COM** to the compressor contactor on the outdoor unit.
CLin & Clout – connection between Y and CC
AQ – 24 VAC from aquastat temperature switch
G – 24 VAC from thermostat G terminal
W – 24 VAC from thermostat W terminal
FR – 24 VAC from freeze protection switch
RH/W2 – 24 VAC from thermostat W2 terminal
BY – 24 VAC from the priority switch on tank less heater
DHM – 24 VAC from thermostat DHM terminal
VALVE – 24 VAC and 24V COM to zone valve
BOILER – switch, connect to "T" terminals on boiler aquastat

HI & COM – 24 VAC cooling speed tap to blower motor.
MED & COM - 24 VAC dehumidification speed tap to blower motor.
LO & COM - 24 VAC heating speed tap to blower motor.
FAN CIR & COM – 24 VAC continuous fan speed tap to blower motor.

CLin and CLout – These terminals must be connected to transfer 24 VAC from the Y terminal to the CC terminal. When the compressor lockout switch is used, the switch is secured to the water coil. The two yellow wires are connected to the CLin and the CLout terminals. When the temperature of the water coil reaches 38°F, the switch opens which de-energizes the CC terminal on the control board. When the water temperature has risen above 42°F the compressor lockout switch will close. The control will send 24 VAC to the CC terminal on the control board.

NOTE: If the compressor lockout switch is not used, place a jumper wire between CLin and CLout to get 24 VAC from the Y terminal to the CC terminal. The indoor blower will not be energized in the cooling mode until the CC terminal has 24 VAC at the terminal.
AQ – The aquastat switch is placed on the hot water line exiting side of the air handler coil. The aquastat is connected to the R terminal and the AQ terminal on the control board.
The AQ jumper pin shown in Figure 13 must be in the ON position to use this feature. When there is a call for heat (24 VAC on the W terminal) and the water line temperature reaches the aquastat switch setting, the switch will close sending 24 VAC to the AQ terminal turning on the blower motor. The blower motor will not energize until the aquastat switch is closed. When the call for heat has been satisfied, the indoor blower will be de-energized after the selected OFF delay.

VALVE – There are two terminals used to power a 24 VAC zone valve or solenoid valve. The terminal closest to the 24V COM terminals is a 24VAC common terminal to the valve. See Figure 13. The other terminal is the 24 VAC output to the valve. When there are 24 VAC to the W terminal the control board will send 24 VAC to the valve terminals. The VALVE terminals de-energize when the 24 VAC is removed from the W terminal.

BOILER - There are two terminals that are connected to a switch. The terminals do not output any voltage and are dry contacts. The BOILER switch is designed to be connected to the "T" terminals on a boiler aquastat to energize the boiler when the control board has a call for heat (24 VAC on W).

G – When 24 VAC is placed on the G terminal the control will energize the indoor blower by the FAN CIR terminal with NO delay. When the 24 VAC signal has been removed from the G terminal, the indoor blower will be de-energized with NO delay. If there is a call for heat (24 VAC on the W terminal) while 24 VAC is present on the G terminal, the control will energize the pump, valve and boiler and the indoor fan motor will be de-energized. The indoor fan motor will be energized by the LOW terminal after the selected ON delay. When the call for heat has been satisfied, the control will de-energize the valve, pump and boiler and the indoor fan motor will switch to the FAN CIR speed terminal after the selected OFF delay. If there is a call for cooling while there is 24 VAC on the G terminal, the control will switch the indoor blower speed to the HI terminal. When the call for cooling has been satisfied, the control will switch the indoor blower back to the FAN CIR speed.

W - When 24 VAC is present on the W terminal, the control will energize the pump, valve and boiler and the indoor fan will be energized by the LOW terminal after the selected ON delay. When the call for heat has been satisfied, the control will de-energize the valve, pump and boiler and the indoor fan motor will be de-energized after the selected OFF delay.

FR – The FR terminal energizes the control board freeze protection. The freeze protection switch is secured to the water coil. The two white wires are connected to the R terminal and to the FR terminal on the control board. When the temperature of the coil is below 38°F, the freeze protection switch closes and sends 24 VAC to the FR terminal. The control will energize the pump, valve and boiler. The control will not energize the indoor fan motor even when there is a call for heat with 24 VAC on the W terminal. When the water temperature has risen above 42°F, the freeze protection switch will open. The control will de-energize the pump, valve and boiler, if there is not a call for heat. If there is a call for heat at the time FR is de-energized, the pump, valve and boiler will remain ON and the control will energize the indoor fan motor with the LOW terminal after the selected ON delay.

RH/W2 – RH is only used for the reheat mode with a thermostat that has the reheat function.

BY – Bypass terminal is used when the heating and domestic hot water system are managed with the same tankless hot water system. The domestic water line has a normally open flow switch that is connected to the R and the BY terminals on the control board. When the domestic water flow switch detects the flow of water, the switch closes sending 24 VAC to the BY terminal. The control will de-energize the PUMP, VALVE, BOILER terminals and the indoor blower. When the domestic water flow has stopped the domestic water flow switch will open and the PUMP, VALVE, and BOILER terminals will resume normal operation. The indoor blower will be energized after the selected ON delay.

Y – When there is a call for cooling (24 VAC is placed on the Y terminal), the control will energize the indoor blower with the HI terminal after the selected ON delay. When the call or cooling has been satisfied, the indoor blower will be de-energized after the selected OFF delay.

DHM – Dehumidification mode can be used with any thermostat that has dehumidification terminal. The dehumidification terminal must send 24 VAC to the DHM terminal on the control board to put the control in dehumidification mode. When 24 VAC is present on the Y terminal (call for cooling) and there is 24 VAC is present on the DHM terminal, the control will energize the indoor blower with the MED terminal after the selected ON delay as long as there is a motor speed tap connected to the MED terminal. If the control has the indoor blower operating on the HI terminal when 24 VAC is placed on the DHM terminal, the control will de-energize the HI terminal and energize the MED terminal with NO delays. If the control has the indoor blower motor operating on the MED speed terminal when 24 VAC is removed from the DHM terminal, the control will energize the HI terminal and de-energize the MED terminal with NO delay.

IMPORTANT NOTE: A motor speed tap wire must be connected to the MED terminal for the dehumidification mode to work. Otherwise, the indoor blower will be de-energized upon call for dehumification while the compressor is operating, resulting in the indoor coil freezing up.

SECTION 4: SEQUENCE OF OPERATION

Continuous Blower – Electric Heat Models
Moving the thermostat FAN switch to the "ON" position (continuous fan mode) completes the circuit between "R" and "G" terminals and sends 24 VAC to the GREEN air handler pigtail which is connected to the selected indoor blower motor speed tap for the cooling and continuous fan modes. The indoor blower will operate continuously until the thermostat FAN switch is moved to the "AUTO" position.

Continuous Blower – Hydronic Heat Models
Moving the thermostat FAN switch to the "ON" position (continuous fan mode) completes the circuit between "R" and "G" terminals and sends 24 VAC to the "G" terminal on the hydronic control board. Once the selected control board blower "on-delay" is complete, the control board will send 24 VAC to the "FAN CIR" terminal on the control board and energize the motor's continuous fan speed (motor speed tap 1). The indoor blower will operate continuously until the thermostat FAN switch is moved to the AUTO position.

Intermittent Blower/Cooling Cycle For Electric Heat Models
When the thermostat FAN switch is in the AUTO position and the thermostat calls for cooling, the circuit between the "R", "Y" and "G" Terminals is completed and sends 24 VAC to the GREEN air handler pigtail wire which is connected to the selected indoor blower motor speed tap for the cooling and continuous fan modes. The thermostat also sends 24 VAC to the "Y" thermostat wire to the outdoor unit which closes the compressor contactor and energizes the compressor and outdoor fan motor. When the thermostat is satisfied, the circuit between "R", "Y" and "G" opens which will de-energize the blower motor, compressor, and the outdoor fan motor. The system is now in the standby mode awaiting the next cooling cycle.

Intermittent Blower/Cooling Cycle For Hydronic Heat Models
When the thermostat FAN switch is in the AUTO position and the thermostat calls for cooling, the circuit between the "R", "Y" and "G" Terminals is completed and sends 24 VAC to the G and Y terminals on the hydronic control board. The hydronic control board sends 24 VAC to the "Y" thermostat wire to the outdoor unit which closes the compressor contactor and energizes the compressor and outdoor fan motor. The hydronic control board also energizes the indoor blower with the HI terminal after the selected ON delay. When the thermostat is satisfied, the circuit between "R", "Y" and "G" opens, the compressor contactor opens and the indoor blower is de-energized after the selected OFF delay. The system is now in the standby mode awaiting the next cooling cycle.

Intermittent Blower/Cooling Cycle For Electric Heat Models With Constant Torque Motors
When the thermostat FAN switch is in the AUTO position and the thermostat calls for cooling, the circuit between the "R", "Y" and "G" Terminals is completed and sends 24 VAC to the GREEN air handler pigtail wire which is connected to the selected indoor blower motor speed tap for the cooling and continuous fan modes. The thermostat also sends 24 VAC to the "Y" thermostat wire to the outdoor unit which closes the compressor contactor and energizes the compressor and outdoor fan motor. When the thermostat is satisfied, the circuit between "R", "Y" and "G" opens which will de-energize the blower motor, compressor, and the outdoor fan motor. The system is now in the standby mode awaiting the next cooling cycle.

Intermittent Blower/Heating Cycle For Electric Heat Models
When the thermostat FAN switch is in the AUTO position and the thermostat calls for heat, the thermostat circuit between the "R" and "W" terminals is completed. This sends 24 VAC from the "W" terminal to the WHITE air handler pigtail wire to the heater contactor coil. This signal closes the heater contactor contacts which sends 208-240 VAC to the heating elements. The 24 VAC signal from the thermostat "W" terminal also energizes selected indoor blower heating speed (WHITE wire) at the same time the heater contactor coil is energized. When the call for heat has been satisfied, the 24 VAC signal will be removed from the thermostat "W" terminal which de-energizes the heating elements and indoor blower motor. The air handler is now in the standby mode awaiting the next heating cycle.

Intermittent Blower/Heating Cycle For Hydronic Heat Models
When the thermostat FAN switch is in the AUTO position and the thermostat calls for heat, the thermostat circuit between the "R" and "W" terminals is completed. 24 VAC is sent from the "W" terminal on the thermostat to the hydronic control board. The hydronic control board will energize the water pump and start circulation of hot water through the water coil. The hydronic control board will also energize the indoor blower with the LOW terminal. When the call for heat has been satisfied, the "W" terminal is de-energized and the hydronic control board will de-energize the water pump and with also de-energize the indoor blower after the selected OFF delay. The air handler is now in standby mode waiting for the next heating cycle.

SECTION 5: TROUBLESHOOTING

The following checks should be made before further troubleshooting of the air handler controls when the blower does not operate or there is a no-heat or no-cooling issue. The electric heat models use relays to control the blower motor and a contactor to control the electric heat. The hydronic heat models use a hydronic control board to control the operation of all the components.

⚠ WARNING

To avoid personal injury, take precautions to not come into contact with non-insulated electrical components.

Avoid wearing loose clothing or any items that can come in contact with moving parts, such as the blower wheel. This can cause serious personal injury .

⚠ WARNING

For personal safety be sure to turn the electrical power "OFF" at the main electrical panel (circuit breaker box) and at the service disconnect switch before attempting any service or maintenance operations. The homeowners or user should never attempt to perform any maintenance which requires opening the air handler control box cover.

⚠ 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 unit.

Initial Troubleshooting Checks

1. Check all circuit breakers in the main electrical panel (circuit breaker box). Make sure they are turned to the "ON" position and have not tripped.
2. Check to make sure the service disconnect switch is in the "ON" position. The service disconnect switch is often mistaken for a light switch and is turned off.
3. Check any supply line fuses that were installed during installation are not blown. Check the wiring with an ohmmeter for a short to ground. If shorted, repair the short and replace the fuse(s).
4. Check to make sure there is 24 VAC between the RED (R) air handler thermostat pigtail and ground. If 24 VAC is not present, check the low voltage inline fuse in the air handler control box or on the hydronic control board to see if it is blown. If the fuse is not blown and there is 208-240 VAC between the transformer primary wires, replace the transformer.
5. Check to make sure there is 24 VAC between the R and C terminals of the thermostat. If 24 VAC is not present, check the low voltage wiring and connections between the air handler and the thermostat.
6. Check to make sure there is 24 VAC between the G and C terminals of the thermostat when there is a call for cooling or continuous fan and between W and C when there is a call for heat. If 24 VAC is present between the R and C terminals, but 24 VAC is not present between the C and G terminals (cooling and continuous fan) or between W and C terminals (heating), replace the thermostat.
7. Check to make sure there is 24 VAC between the GREEN (G) air handler thermostat pigtail and ground when there is a call for cooling or continuous fan and between the WHITE (W) pigtail when there is a call for heat. If 24 VAC is present in either of these cases and the thermostat and transformer were found to be OK in steps 4 and 6 above, check the low voltage wiring and wiring connections between the thermostat and air handler.
8. Check all wiring connections to the air handler components to ensure they are securely connected.

TROUBLESHOOTING ELECTRIC HEAT MODELS

NOTE: Be sure to perform the Initial **Troubleshooting Checks** before performing the following checks.

Heating Mode Constant Torque Motor Check Electric Heat Models

If 24 VAC is not present between the air handler WHITE thermostat pigtail and ground when the thermostat is calling for heat, check the wiring and wiring connections from the thermostat "W" terminal to the air handler WHITE thermostat pigtail. If 24 VAC is present at the WHITE thermostat pigtail, check all of the wiring and wiring connections from the WHITE thermostat pigtail to the blower motor terminal block. If 24 VAC is present between the BLUE (common) and WHITE (heating speed) wires connected to the motor terminal block (See Figure 14 and Table 1) and there is 208-240 VAC between the RED and BLACK wires connected to the N and L motor terminals, replace the motor.

Cooling/Continuous Fan Mode Constant Torque Motor Check - Electric Heat Models

If 24 VAC is present between the GREEN air handler thermostat pigtail and ground, but the blower motor is not running when there is a call for cooling or continuous fan, check all of the wiring and wiring connections between the GREEN air handler thermostat pigtail and the motor terminal block and between the heater contactor L1 and L2 terminals and the motor terminal block. If 24 VAC is present between the BLUE (common) and BLACK (cooling/ continuous fan speed) wires connected to the motor terminal block and there is 208-240 VAC between the RED and BLACK wires connected to the N and L motor terminals, replace the motor.

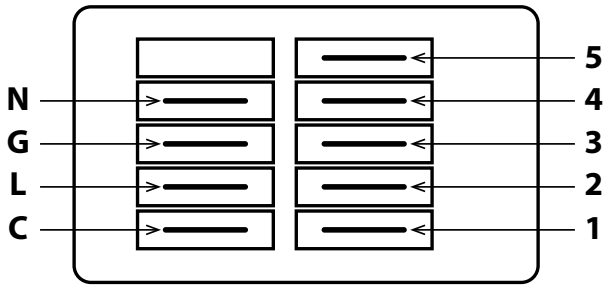

Figure 14: Constant Torque Motor Control Module Terminals

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 1: Constant Torque Motor Terminals – Electric Heat and No Heat Models

Electric Heat Models – No Heat
Check for 24 VAC between the WHITE (W) air handler low voltage pigtail and ground when the thermostat is set to the HEAT mode and the temperature is set below the room temperature. If 24 VAC is present on the WHITE air handler pigtail, check for 208- 240 VAC between the heater elements power terminals on each heating element. If 208-240 VAC is not present at the heating element terminals, check for 24 VAC across the heater contactor coil. If 24 VAC is present across the heater contactor coil, but 208-240 VAC is not present across heater contactor terminals T1 and T2, replace the contactor. If 24 VAC is not present across the heater contactor coil, use an ohmmeter to check for continuity across the terminals of the two heater limit controls. If the contacts on either of the limit control are open when the heating elements are cool, replace that limit control. If 208-240 VAC is present across the heating element terminals, check the current draw for each heating element. If there is no current or the current is not close to what is shown below, the heating element is defective and must be replaced.

The correct electric heating element amperages are as follows: 3 kW Heater = 12.5 amps, 5 kW Heater = 20.8 amps
6 kW Heater = 25.0 amps, 8 kW Heater = 33.3 amps,
10 kW Heater = 41.6 amps

NOTE:
The 3 kW model has two 1.5 kW heating elements.
The 5 kW model has two 2.5 kW heating elements.
The 6 kW model has two 3.0 kW heating elements.
The 8 kW model has two 4.0 kW heating elements.
The 10 kW model has two 5.0 kW heating elements.

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 2: Constant Torque Motor Terminals – Hydronic Heat Models

TROUBLESHOOTING HYDRONIC HEAT MODELS

NOTE: Be sure to perform the Initial Troubleshooting Checks before performing the following checks.

Constant Torque Motor Checks - Hydronic Heat Models
If the motor is not running when there is a call for heat, cooling, or continuous fan, check for 115 VAC between the L and N motor terminals (See Figure 14 and Table 2) and check for 24 VAC between the "COM/24V" terminal and either the "HI" (cooling), "MED" (cooling/dehumidification), "LO" (heating), or "FAN CIR" (continuous fan) terminal on the control board (See Figure 13). If 115 VAC is present between motor terminals L and N and 24 VAC is present between the "COM/24V" terminal and either the "HI", "MED", "LO", or "FAN CIR" terminal on the control board, but the motor is not operating, check the connections at the motor terminals and the motor connector plugs BMMP and BMFP. If these connections are secure and there is 24 VAC between the C motor terminal and any of the wires connected to terminals 1 – 5 on the motor, replace the motor. Refer to Figure 14 and Table 2 for terminal locations and definitions. If 115 VAC is present between motor terminals L and N, but 24 VAC is not present between the "COM/24V" terminal and either the "HI", "MED", "LO", or "FAN CIR" terminal on the control board when there is a call for heat, cooling, or continuous fan, replace the control board.

Hydronic Control Board Checks
If 24 VAC is present between the Rin and COM/24V terminals on the control board, but 24 VAC is not present between the R and COM/24V terminals (See Figures 15 and 16), check the fuse on the control board to see if it is blown. If 24 VAC is present between the "W" and "24V COM" terminals on the control board when there is a call for heat, check the AQ jumper to make sure it is in the "OFF" position unless it is in the "ON" position with an aquastat installed. If so equipped, check to see if the aquastat is closed when the water line is cold. If the aquastat is open when the water line is cold, replace it. If 24 VAC is present between the "W" and "24V COM" terminals on the control board when there is a call for heat and 115 VAC is not present between the L2/N and PUMP terminals on the control board, replace the control board.

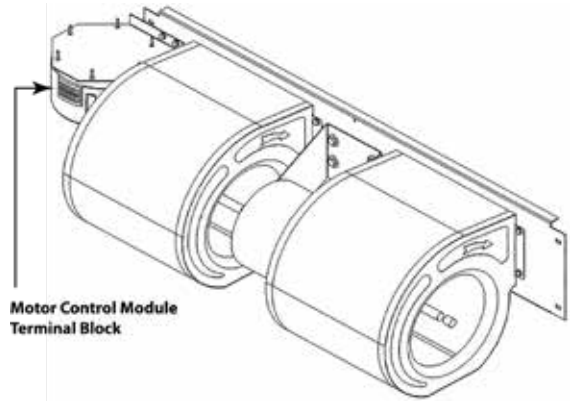

Figure 15: Constant Torque Blower Assembly

REPLACING THE BLOWER ASSEMBLY
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 wires connected to the motor controller terminal block.
   NOTE: Write down the terminal block position for each wire before disconnecting the wires.
4. Remove the screws that secure the blower assembly to the air handler chassis located on each side and at the top center of the blower mounting plate.
5. Grasp the blower assembly and lift it up while pulling out on the bottom. Lower the blower from the blower compartment and set it aside.
6. Lift the replacement blower assembly into place inside the blower compartment and push in at the bottom.

7. Install the screws that secure the blower mounting plate to the air handler chassis that were removed in Step 4.
8. Connect the wiring removed from the motor controller terminal block that were removed in Step 3.
   NOTE: Refer to the air handler wiring diagram to confirm all wiring connections are correct.
9. 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.
10. Set the thermostat to the desired operating mode and temperature set point.

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:

1. Connect refrigerant gauges to the system and check that 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:
2. 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.
3. 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.
4. 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 drier is plugged with debris.
5. 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 the suction manifold after the last feeder tube)
7. Low refrigerant charge
8. Plugged liquid line filter drier
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 the 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 (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.

SECTION 6: BLOWER PERFORMANCE (WITHOUT FILTERS)

Minimum CFM for Electric Heat: 3kW = 195 CFM; 5kW = 325 CFM; 6kW = 390 CFM; 8kW = 520 CFM; 10kW = 650 CFM

SEHX / CEHX / SCWE / CCWE	Blower Motor			No. of Blowers	Blower Wheel Si ze	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 3: SEHX/CEHX/SCWE/CCWE Blower Performance – Constant Torque Motor – Speed Tap 5

SEHX / CEHX / SCWE / CCWE	Blower Motor			No. of Blowers	Blower Wheel Si ze	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	842	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 4: SEHX/CEHX/SCWE/CCWE Blower Performance – Constant Torque Motor – Speed Tap 4

SEHX / CEHX / SCWE / CCWE	Blower Motor			No. of Blowers	Blower Wheel Si ze	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 5: SEHX/CEHX/SCWE/CCWE Blower Performance – Constant Torque Motor – Speed Tap 3

SEHX / CEHX / SCWE / CCWE	Blower Motor			No. of Blowers	Blower Wheel Si ze	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 6: 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 7: SDXW/CCXW/SCWW/CCWW 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 8: 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 9: 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	1062	1027	967	916
35-30-**-1A83	1/2	C.T.	120	2	7.00 x 9.00	4	1144	1040	1062	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 10: 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
37-32-**-1A83	1/2	C.T.	120	2	7.00 x 9.00	4	1084	1022	1000	969	906	852

Table 11: 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 12: SDXW/CCXW/SCWW/CCWW Blower Performance Chart – Constant Torque Motor – Speed Tap 1

SECTION 7: ACCESSORIES

Part Number	Description
CPL1	SEHX-12, SEHX-18, SEHX-19, SEHX-24 - LOUVERED - 27.5" x 43"
CPNL1	SEHX-12, SEHX-18, SEHX-19, SEHX-24 - NON-LOUVERED - 27.5" x 43"
CPL2	SEHX-25, SEHX-30, SEHX-31 - LOUVERED - 27.5" x 49"
CPNL2	SEHX-25, SEHX-30, SEHX-31 - NON-LOUVERED - 27.5" x 49"
CPL3	SEHX-34 AND SEHX-35 - LOUVERED - 27.5" x 55.5"
CPNL3	SEHX-34 AND SEHX-35 - NON-LOUVERED - 27.5" x 55.5"
CPL4	SEHX-36 AND SEHX-37 - LOUVERED - 27.5" x 62.5"
CPNL4	SEHX-36 AND SEHX-37 - NON-LOUVERED - 27.5" x 62.5"
RAP30	SEHX/SDXW/SCWE/SCWW-18-19-24 RETURN AIR PLENUM FD 30
RAP38	SEHX/SDXW/SCWE/SCWW-25-30-31 RETURN AIR PLENUM FD 38
RAP42	SEHX/SDXW/SCWE/SCWW-34-35 RETURN AIR PLENUM FD 42
RAP49	SEHX/SDXW/SCWE/SCWW-36-37 RETURN AIR PLENUM FD 49

Table 13: Accessory List

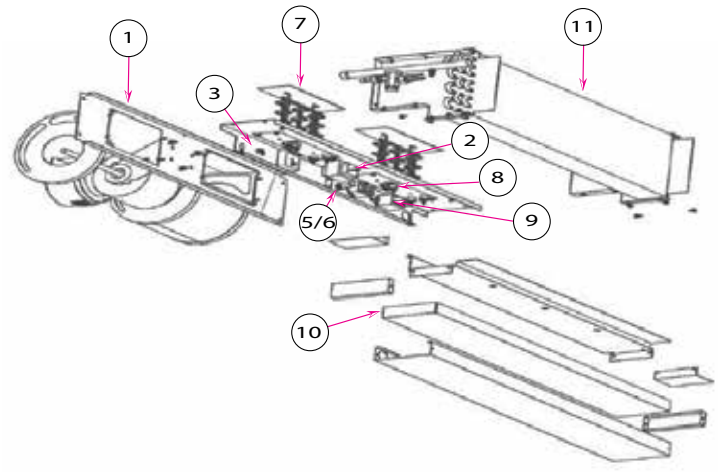

Figure 16: SEHX/ CEHX/ SCWE/ CCWE 18-24 Electric Heat Air Handler Replacement Parts Schematic

SEHX/CEHX/SCWE/CCWE-18-24 ELECTRIC HEAT MODELS			
Item #	Qty.	Part #	Description
1	1		Blower Assembly - Contact factory rep to obtain the correct blower assembly.
2	1	R68AA0003	208/240-24V Transformer
3	1	R68DC0001	Ground Lug
4	1	R68DC0018	Power Terminal Block
5	1	R73MH0001	3 Amp Fuse
6	1	R73MHA001	Fuse Holder
3 KW Electric Heat			
7	1	R86CJ1070	3 kW Element (Kit - 2 EA. 1.5 kW Heater Elements with Limits)
8	1	R68CA0001	140°F Limit Switch (Opens at 140°F - Closes at 110°F)
9	1	R68AB0019	Double Pole Electric Heat Contactor - 50 Amp Resistive
5 KW Electric Heat			
7	1	R86CJ1072	5 kW Element (Kit - 2 EA. 2.5 kW Heater Elements with Limits)
8	1	R68CA0001	140°F Limit Switch (Opens at 140°F - Closes at 110°F)
9	1	R68AB0019	Double Pole Electric Heat Contactor - 50 Amp Resistive
6 KW Electric Heat			
7	1	R86CJ1073	6 kW Element (Kit - 2 EA. 3.0 kW Heater Elements with Limits)
8	1	R68CA0001	140°F Limit Switch (Opens at 140°F - Closes at 110°F)
9	1	R68AB0019	Double Pole Electric Heat Contactor - 50 Amp Resistive
8 KW Electric Heat			
7	1	R86CJ1074	8 kW Element (Kit - 2 EA. 4.0 kW Heater Elements with Limits)
8	1	R68CA0001	140°F Limit Switch (Opens at 140°F - Closes at 110°F)
9	1	R68AB0019	Double Pole Electric Heat Contactor - 50 Amp Resistive
10 KW Electric Heat			
7	1	R86CJ1075	10 kW Element (Kit - 2 EA. 5.0 kW Heater Elements with Limits)
8	2	R68CA0001	140°F Limit Switch (Opens at 140°F - Closes at 110°F)
9	1	R68AB0019	Double Pole Electric Heat Contactor - 50 Amp Resistive
DRAIN PAN			
10	1	R86CJ0040	Galvanized G90 Drain Pan With Coating for F.D. 30
DX COIL			
11	1	CF019SCF2EB	5-Row, 8.00" x 30.00", 3/8", Rifled, Lanced, 12 FPI
CHILLED WATER COILS			
11	CHILLED WATER COILS - There are too many chilled water coil models to list. Contact factory sales rep to obtain the correct coil.		

Table 14: SEHX/ CEHX/ SCWE/ CCWE 18-24 Electric Heat Air Handler Replacement Parts List

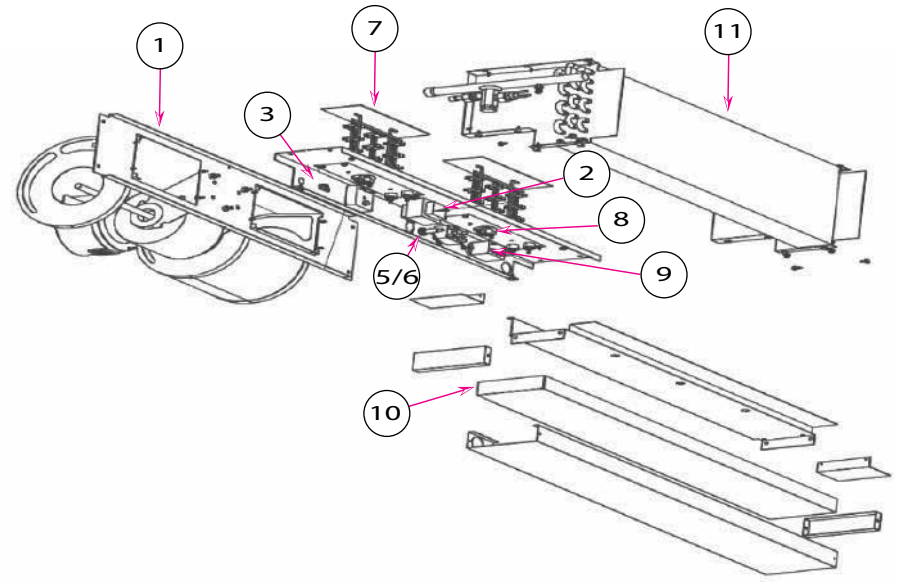

Figure 17: SEHX/ CEHX/ SCWE/ CCWE 25-30-31 Electric Heat Air Handler Replacement Parts Schematic

SEHX/CEHX/SCW E/CCW E-25-30-31 ELECTRIC HEAT MODELS			
Item #	Qty.	Part #	Description
1	1		Blower Assembly - Contact factory rep to obtain the correct blower assembly.
2	1	R68AA0003	208/240-24V Transformer
3	1	R68DC0001	Ground Lug
4	1	R68DC0018	Power Terminal Block
5	1	R73MH0001	3 Amp Fuse
6	1	R73MHA001	Fuse Holder
3 KW Electric Heat			
7	1	R86CJ1070	3 kW Element (Kit - 2 EA. 1.5 kW Heater Elements with Limits)
8	1	R68CA0001	140°F Limit Switch (Opens at 140°F - Closes at 110°F)
9	1	R68AB0019	Double Pole Electric Heat Contactor - 50 Am p Resistive
5 KW Electric Heat			
7	1	R86CJ1072	5 kW Element (Kit - 2 EA. 2.5 kW Heater Elements with Limits)
8	1	R68CA0001	140°F Limit Switch (Opens at 140°F - Closes at 110°F)
9	1	R68AB0019	Double Pole Electric Heat Contactor - 50 Amp Resistive
6 KW Electric Heat			
7	1	R86CJ1073	6 kW Element (Kit - 2 EA. 3.0 kW Heater Elements with Limits)
8	1	R68CA0001	140°F Limit Switch (Opens at 140°F - Closes at 110°F)
9	1	R68AB0019	Double Pole Electric Heat Contactor - 50 Amp Resistive
8 KW Electric Heat			
7	1	R86CJ1074	8 kW Element (Kit - 2 EA. 4.0 kW Heater Elements with Limits)
8	1	R68CA0001	140°F Limit Switch (Opens at 140°F - Closes at 110°F)
9	1	R68AB0019	Double Pole Electric Heat Contactor - 50 Amp Resistive
10 KW Electric Heat			
7	1	R86CJ1070	10 kW Element (Kit - 2 EA. 5.0 kW Heater Elements with Limits)
8	2	R68CA0001	140°F Limit Switch (Opens at 140°F - Closes at 110°F)
9	1	R68AB0019	Double Pole Electric Heat Contactor - 50 Amp Resistive
DRAIN PAN			
10	1	R86CJ0041	Galvanized G90 Drain Pan With Coating for F.D. 38
DX COIL			
11	1	CF025SDF2EB	5-Row, 8.00" x 38.00", 3/8", Rifled, Lanced, 12 FPI
CHILLED WATER COILS			
11	CHILLED WATER COILS - There are too many chilled water coil models to list. Contact factory sales rep to obtain the correct coil.		

Table 15: SEHX/ CEHX/ SCWE/ CCWE 25-30-31 Electric Heat Air Handler Replacement Parts List

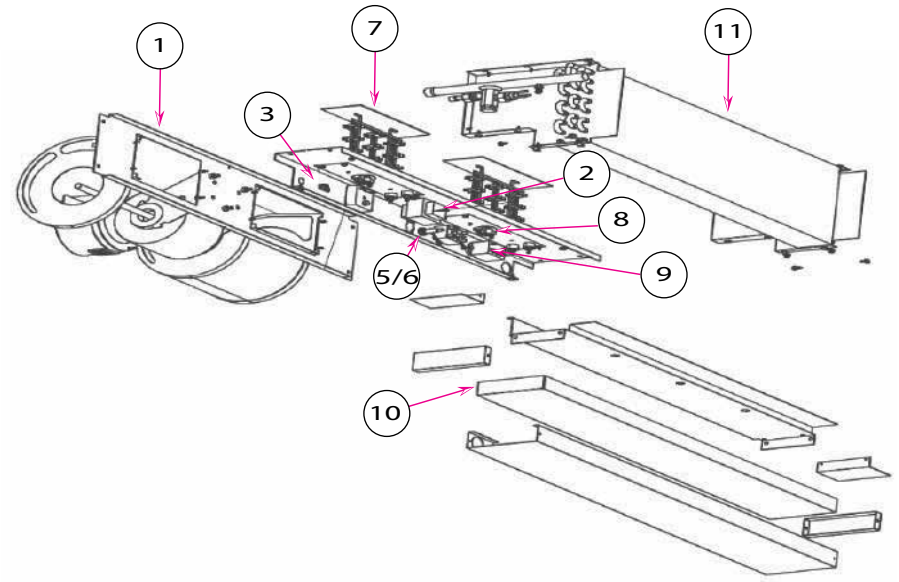

Figure 18: SEHX/ CEHX/ SCWE/ CCWE 34-35 Electric Heat Air Handler Replacement Parts Schematic

SEHX/CEHX/SCW E/CCW E-34-35 ELECTRIC HEAT MODELS			
Item #	Qty.	Part #	Description
1	1		Blower Assembly - Contact factory rep to obtain the correct blower assembly.
2	1	R68AA0003	208/240-24V Transformer
3	1	R68DC0001	Ground Lug
4	1	R68DC0018	Power Terminal Block
5	1	R73MH0001	3 Amp Fuse
6	1	R73MHA001	Fuse Holder
3 KW Electric Heat			
7	1	R86CJ1070	3 kW Element (Kit - 2 EA. 1.5 kW Heater Elements with Limits)
8	1	R68CA0001	140˚F Limit Switch (Opens at 140˚F - Closes at 110˚F)
9	1	R68AB0019	Double Pole Electric Heat Contactor - 50 Amp Resistive
5 KW Electric Heat			
7	1	R86CJ1072	5 kW Element (Kit - 2 EA. 2.5 kW Heater Elements with Limits)
8	1	R68CA0001	140˚F Limit Switch (Opens at 140˚F - Closes at 110˚F)
9	1	R68AB0019	Double Pole Electric Heat Contactor - 50 Amp Resistive
6 KW Electric Heat			
7	1	R86CJ1073	6 kW Element (Kit - 2 EA. 3.0 kW Heater Elements with Limits)
8	1	R68CA0001	140˚F Limit Switch (Opens at 140˚F - Closes at 110˚F)
9	1	R68AB0019	Double Pole Electric Heat Contactor - 50 Amp Resistive
8 KW Electric Heat			
7	1	R86CJ1074	8 kW Element (Kit - 2 EA. 4.0 kW Heater Elements with Limits)
8	1	R68CA0001	140˚F Limit Switch (Opens at 140˚F - Closes at 110˚F)
9	1	R68AB0019	Double Pole Electric Heat Contactor - 50 Amp Resistive
10 KW Electric Heat			
7	1	R86CJ1070	10 kW Element (Kit - 2 EA. 5.0 kW Heater Elements with Limits)
8	2	R68CA0001	140˚F Limit Switch (Opens at 140˚F - Closes at 110˚F)
9	1	R68AB0019	Double Pole Electric Heat Contactor - 50 Amp Resistive
DRAIN PAN			
10	1	R86CJ0042	Galvanized G90 Drain Pan With Coating for F.D. 42
DX COIL			
11	1	CF035SGF2EB	5-Row, 8.00" x 42.00", 3/8", Rifled, Lanced, 12 FPI
CHILLED WATER COILS			
11	CHILLED WATER COILS - There are too many chilled water coil models to list. Contact factory sales rep to obtain the correct coil.		

Table 16: SEHX/ CEHX/ SCWE/ CCWE 34-35 Electric Heat Air Handler Replacement Parts List

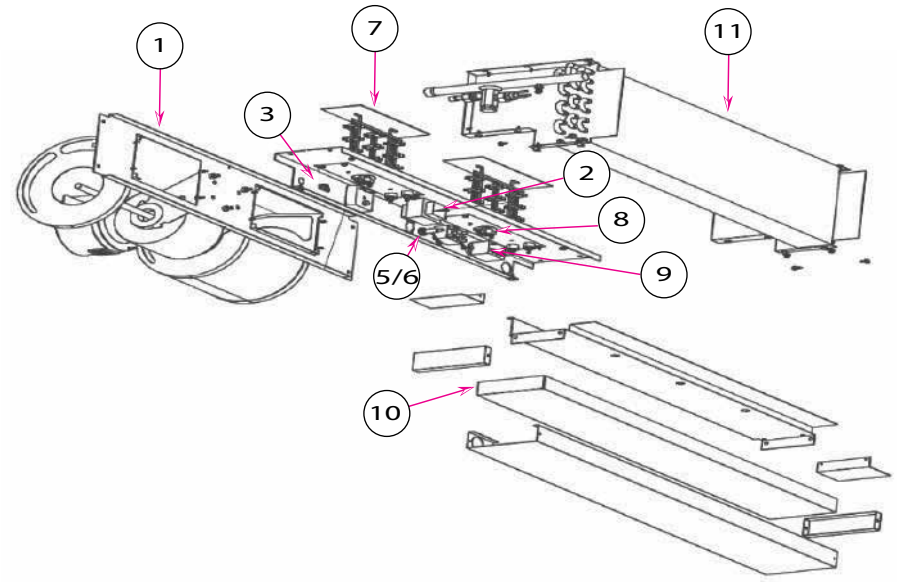

Figure 19: SEHX/ CEHX/ SCWE/ CCWE 36-37 Electric Heat Air Handler Replacement Parts Schematic

SEHX/CEHX/SCW E/CCW E-36-37 ELECTRIC HEAT MODELS			
Item #	Qty.	Part #	Description
1	1		Blower Assembly - Contact factory rep to obtain the correct blower assembly.
2	1	R68AA0003	208/240-24V Transformer
3	1	R68DC0001	Ground Lug
4	1	R68DC0018	Power Terminal Block
5	1	R73MH0001	3 Amp Fuse
6	1	R73MHA001	Fuse Holder
3 KW Electric Heat			
7	1	R86CJ1070	3 kW Element (Kit - 2 EA. 1.5 kW Heater Elements with Limits)
8	1	R68CA0001	140°F Limit Switch (Opens at 140°F - Closes at 110°F)
9	1	R68AB0019	Double Pole Electric Heat Contactor - 50 Amp Resistive
5 KW Electric Heat			
7	1	R86CJ1072	5 kW Element (Kit - 2 EA. 2.5 kW Heater Elements with Limits)
8	1	R68CA0001	140°F Limit Switch (Opens at 140°F - Closes at 110°F)
9	1	R68AB0019	Double Pole Electric Heat Contactor - 50 Amp Resistive
6 KW Electric Heat			
7	1	R86CJ1073	6 kW Element (Kit - 2 EA. 3.0 kW Heater Elements with Limits)
8	1	R68CA0001	140°F Limit Switch (Opens at 140°F - Closes at 110°F)
9	1	R68AB0019	Double Pole Electric Heat Contactor - 50 Amp Resistive
8 KW Electric Heat			
7	1	R86CJ1074	8 kW Element (Kit - 2 EA. 4.0 kW Heater Elements with Limits)
8	1	R68CA0001	140°F Limit Switch (Opens at 140°F - Closes at 110°F)
9	1	R68AB0019	Double Pole Electric Heat Contactor - 50 Amp Resistive
10 KW Electric Heat			
7	1	R86CJ1070	10 kW Element (Kit - 2 EA. 5.0 kW Heater Elements with Limits)
8	2	R68CA0001	140°F Limit Switch (Opens at 140°F - Closes at 110°F)
9	1	R68AB0019	Double Pole Electric Heat Contactor - 50 Amp Resistive
DRAIN PAN			
10	1	R86CJ0043	Galvanized G90 Drain Pan With Coating for F.D. 49
	DX COIL		
11	1	CF037SEF2EB	5-Row, 8.00" x 49.00", 3/8", Rifled, Lanced, 12 FPI
CHILLED WATER COILS			
11	CHILLED WATER COILS - There are too many chilled water coil models to list. Contact factory sales rep to obtain the correct coil.		

Table 17: SEHX/ CEHX/ SCWE/ CCWE 36-37 Electric Heat Air Handler Replacement Parts List

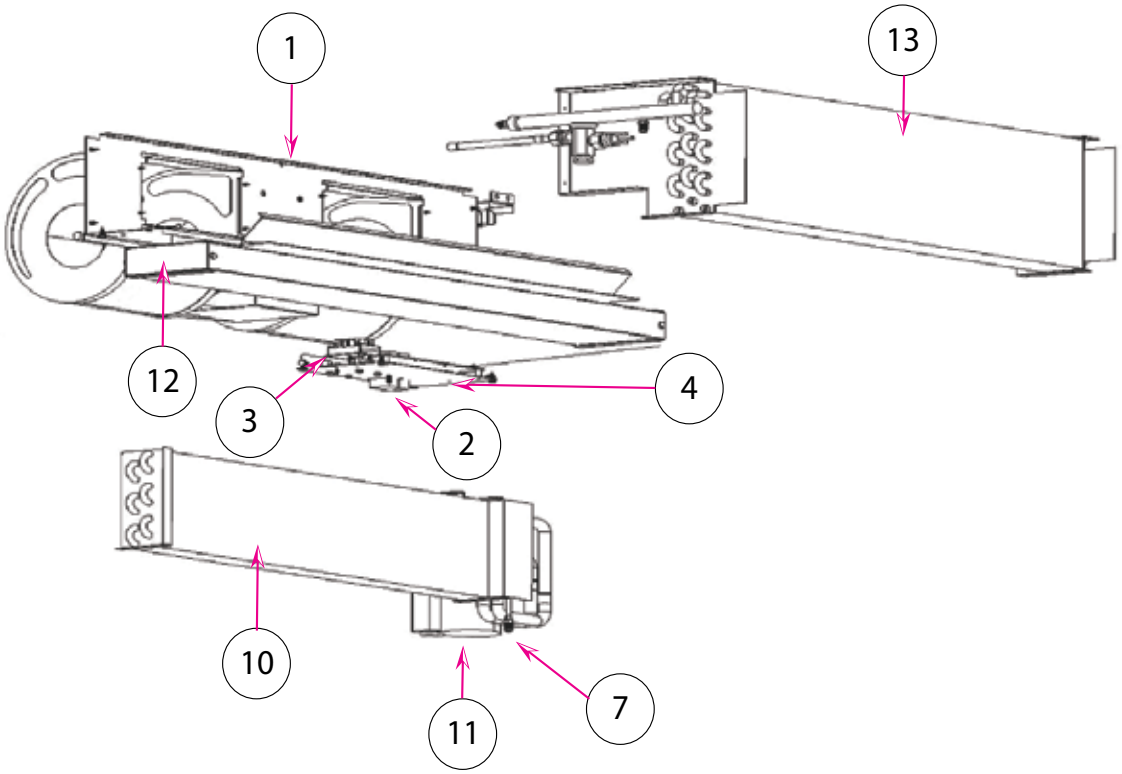

Figure 20: SDXW/ CDXW/ SCWW/ CCWW 18-24 Hydronic Heat Air Handler Replacement Parts Schematic

SDXW/CDXW/SCWW/CCWW-18-24 HYDRONIC HEAT MODELS			
Item #	Qty.	Part #	Description
1	1		Blower Assembly - Contact factory rep to obtain the correct blower assembly.
2	1	R68AA0002	120-24V Transformer
3	1	R68DC0001	Ground Lug
4	1	R68AE0011	ICM AY1015 Hydronic Control Board for Constant Torque Blower Motors
5	1	R68DD0005	White Wire Freeze Protector
6	1	R66AB0006	Sensor Clip HW/AH
7	1	R74BA0004	Valve - Air Bleed Body
8	1	R74BA0005	Valve - Air Bleed Core
9	1	R74BB0001	1/2" Boiler Drain
10	1	R86BC0001	2 Row Hot Water Coil 6 x 27
11	1	R78AA0007	4 GPM Taco Circulating Pump 120V - 1/2" Inlet and Outlet
DRAIN PAN			
12	1	R86CJ0040	Galvanized G90 Drain Pan With Coating for F.D. 30
DX COIL			
13	1	CF019SCF2EB	5 ROW, 8.00" x 30.00", 3/8", Rifled, Lanced, 12 FPI
CHILLED WATER COILS			
13	CHILLED WATER COILS - There are too many chilled water coil models to list. Contact factory sales rep to obtain the correct coil.		

Table 18: SDXW/ CDXW/ SCWW/ CCWW 18-24 Hydronic Heat Air Handler Replacement Parts List

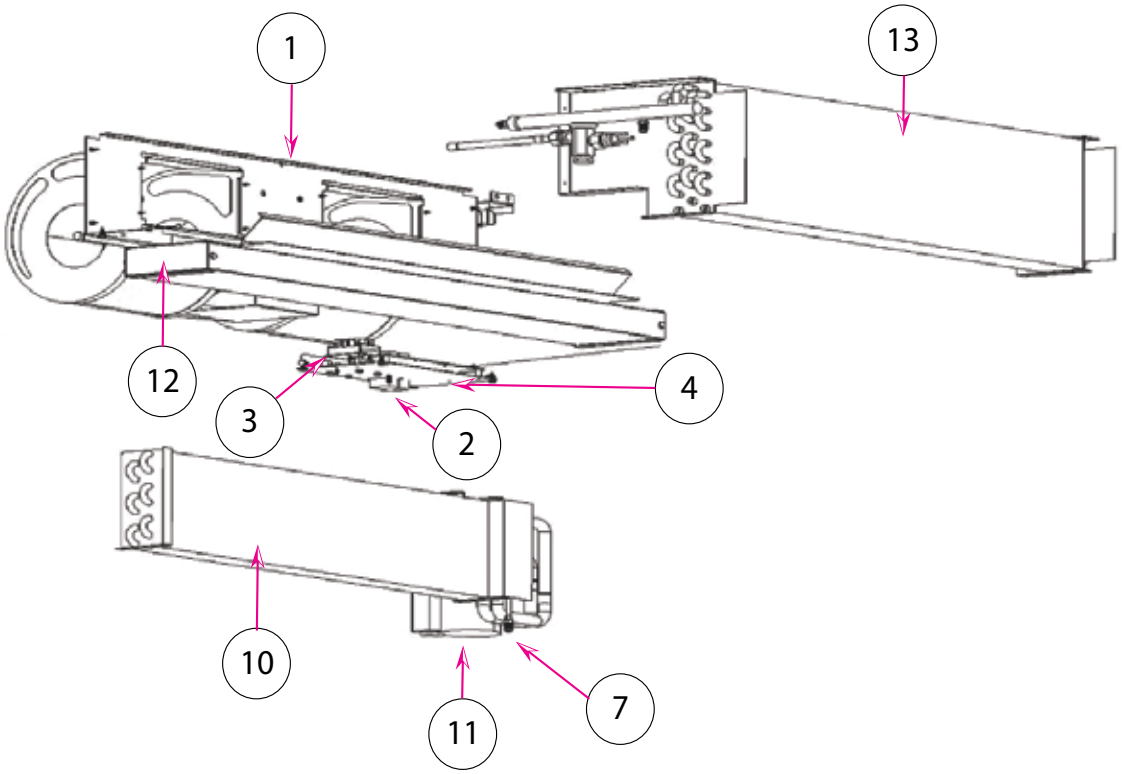

Figure 21: SDXW/ CDXW/ SCWW/ CCWW 25-30-31 Hydronic Heat Air Handler Replacement Parts Schematic

SDXW/CDXW/SCWW/CCWW-25-30-31 HYDRONIC HEAT MODELS			
Item #	Qty.	Part #	Description
1	1		Blower Assembly - Contact factory rep to obtain the correct blower assembly.
2	1	R68AA0002	120-24V Transformer
3	1	R68DC0001	Ground Lug
4	1	R68AE0011	ICM AY1015 Hydronic Control Board for Constant Torque Blower Motors
5	1	R68DD0005	White Wire Freeze Protector
6	1	R66AB0006	Sensor Clip HW/AH
7	1	R74BA0004	Valve - Air Bleed Body
8	1	R74BA0005	Valve - Air Bleed Core
9	1	R74BB0001	1/2" Boiler Drain
10	1	R86BC0002	2 Row Hot Water Coil 6 x 35
11	1	R78AA0007	Standard 4 GPM Circulating Pump 120V - 1/2" Inlet and Outlet
11	1	R78AA0008	Optional 7 GPM Pump 120V - 3/4" Inlet and Outlet
11	1	R78AA0007	Standard 4 GPM Circulating Pump 120V - 1/2" Inlet and Outlet
11	1	R78AA0008	Optional 7 GPM Pump 120V - 3/4" Inlet and Outlet
DRAIN PAN			
12	1	R86CJ0041	Galvanized G90 Drain Pan With Coating for F.D. 38
DX COIL			
15	1	CF025SDF2EB	5 ROW, 8.00" x 38.00", 3/8", Rifled, Lanced, 12 FPI
CHILLED WATER COILS			
13	CHILLED WATER COILS - There are too many chilled water coil models to list. Contact factory sales rep to obtain the correct coil.		

Table 19: SDXW/ CDXW/ SCWW/ CCWW 25-30-31 Hydronic Heat Air Handler Replacement Parts List

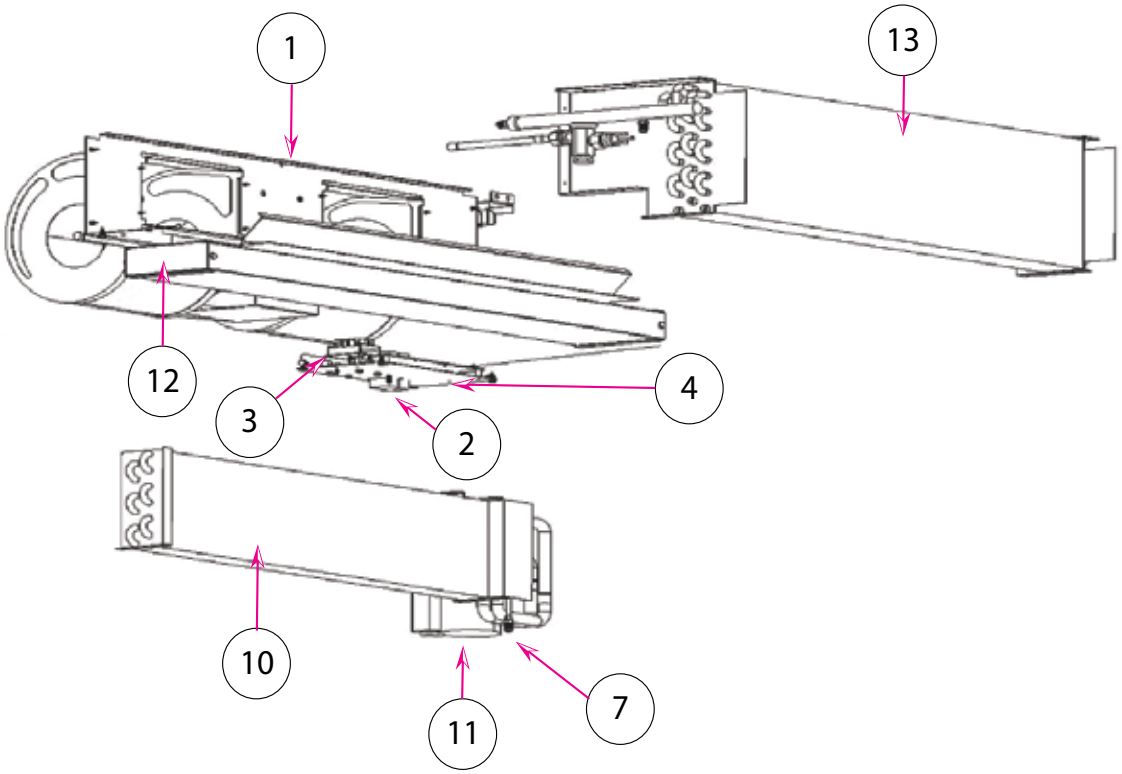

Figure 22: SDXW/ CDXW/ SCWW/ CCWW 34-35 Hydronic Heat Air Handler Replacement Parts Schematic

SDXW/CDXW/SCWW/CCWW-34-35 HYDRONIC HEAT MODELS			
Item #	Qty.	Part #	Description
1	1		Blower Assembly - Contact factory rep to obtain the correct blower assembly.
2	1	R68AA0002	120-24V Transformer
3	1	R68DC0001	Ground Lug
4	1	R68AE0011	ICM AY1015 Hydronic Control Board for Constant Torque Blower Motors
5	1	R68DD0005	White Wire Freeze Protector
6	1	R66AB0006	Sensor Clip HW/AH
7	1	R74BA0004	Valve - Air Bleed Body
8	1	R74BA0005	Valve - Air Bleed Core
9	1	R74BB0001	1/2" Boiler Drain
10	1	R86BC0004	2 Row Hot Water Coil 6 x 39
11	1	R78AA0007	Standard 4 GPM Circulating Pump 120V - 1/2" Inlet and Outlet
11	1	R78AA0008	Optional 7 GPM Pump 120V - 3/4" Inlet and Outlet
11	1	R78AA0007	Standard 4 GPM Circulating Pump 120V - 1/2" Inlet and Outlet
11	1	R78AA0008	Optional 7 GPM Pump 120V - 3/4" Inlet and Outlet
DRAIN PAN			
12	1	R86CJ0042	Galvanized G90 Drain Pan With Coating for F.D. 42
DX COIL			
13	1	CF035SGF2EB	5 ROW, 8.00" x 42.00", 3/8", Rifled, Lanced, 12 FPI
CHILLED WATER COILS			
13	CHILLED WATER COILS - There are too many chilled water coil models to list. Contact factory sales rep to obtain the correct coil.		

Table 20: SDXW/ CDXW/ SCWW/ CCWW 34-35 Hydronic Heat Air Handler Replacement Parts List

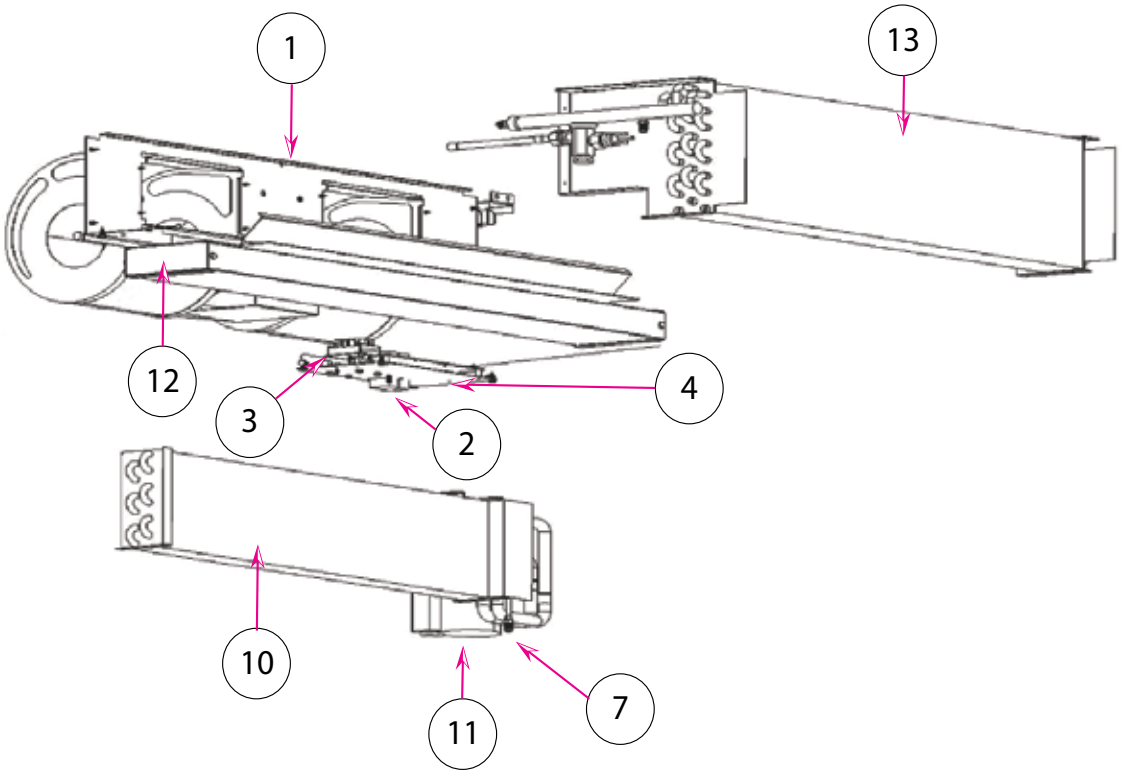

Figure 23: SDXW/ CDXW/ SCWW/ CCWW 36-37 Hydronic Heat Air Handler Replacement Parts Schematic

SDXW/CDXW/SCWW/CCWW-36-37 HYDRONIC HEAT MODELS			
Item #	Qty.	Part #	Description
1	1		Blower Assembly - Contact factory rep to obtain the correct blower assembly.
2	1	R68AA0002	120-24V Transformer
3	1	R68DC0001	Ground Lug
4	1	R68AE0011	ICM AY1015 Hydronic Control Board for Constant Torque Blower Motors
5	1	R68DD0005	White Wire Freeze Protector
6	1	R66AB0006	Sensor Clip HW/AH
7	1	R74BA0004	Valve - Air Bleed Body
8	1	R74BA0005	Valve - Air Bleed Core
9	1	R74BB0001	1/2" Boiler Drain
10	1	R86BC0004	2 Row Hot Water Coil 6 x 46
11	1	R78AA0007	Standard 4 GPM Circulating Pump 120V - 1/2" Inlet and Outlet
11	1	R78AA0008	Optional 7 GPM Pump 120V - 3/4" Inlet and Outlet
11	1	R78AA0007	Standard 4 GPM Circulating Pump 120V - 1/2" Inlet and Outlet
11	1	R78AA0008	Optional 7 GPM Pump 120V - 3/4" Inlet and Outlet
DRAIN PAN			
12	1	R86CJ0043	Galvanized G90 Drain Pan With Coating for F.D. 42
DX COIL			
13	1	CF037SEF2EB	5 ROW, 8.00" x 49.00", 3/8", Rifled, Lanced, 12 FPI
CHILLED WATER COILS			
13	CHILLED WATER COILS - There are too many chilled water coil models to list. Contact factory sales rep to obtain the correct coil.		

Table 21: SDXW/ CDXW/ SCWW/ CCWW 36-37 Hydronic Heat Air Handler Replacement Parts List