

USERS INFORMATION MANUAL

Upflow and Vertical Wall Mount Installation – Models Configured as DX or Chilled Water Cooling with Electric or Hot Water Heating

MODELS: B/S/H02 - B/S/H03 – WCW and WCW-HW SERIES

LIST OF SECTIONS – USERS INFORMATION MANUAL

1 – General	1	4 – Start Up & Shutdown Instructions	5
2 – Safety	2	5 – Owner Maintenance	5
3 – Owners Information & Seasonal Information	3		

LIST OF SECTIONS – SERVICE AND MAINTENANCE MANUAL

1 – Safety	7	5 – Trouble Shooting	12
2 – Air Handler Maintenance	8	6 – Blower Performance	14
3 – Air Handler Controls	9	7 – Accessory Parts List	15
4 – Sequence of Operation	10	8 – Replacement Parts Lists	15

LIST OF FIGURES

1 – Air Handler Examination Check Points	4	13 – Component Locations – Hydronic Heat Models	11
2 – Front Access Panel Circuit Breaker Locations	5	14 – Motor Speed Tap Isolation Relay - PSC Motors	12
3 – Home Owner / Users Cleaning Points	6	15 – Adjustable Time Delay Relay (TDR) Terminals	12
4 – Air Filter Location	6	16 – Electric Heater Contactor Terminal Designations	13
5 – Replacement Air Filter – Use 1” Standard Air Filter	6	17 – Blower Mounting Plate and Screw Locations - Electric	13
6 – Horizontal Return Grille – Wall or Closet Door	6	18 – Blower Mounting Plate and Screw Locations - Hydronic	14
7 – No Electric Heat Control Box	8	19 – B02-45/S02-45/ 18/24WCW Electric Heat Repair Parts Drawing	16
8 – Hydronic Heat Control Box	8	20 – B02-34 / S02-34 Electric Heat Repair Parts Drawing	17
9 – Electric Heat Control Box	8	21 – B03-42/S03-42/ 30/36WCW Electric Heat Repair Parts Drawing	18
10 – Blower Assembly and Mounting Screw Location - Electric	9	22 – H02-46 / 18/24WCW-HW Hydronic Heat Repair Parts Drawing	19
11 – Blower Assembly and Mounting Screw Location - Hydronic	9	23 – H02-37 Hydronic Heat Repair Parts Drawing	20
12 – Component Locations – Electric Heat Models	10	24 – H03-49/ 30/36WCW-HW Hydronic Heat Repair Parts Drawing	21

LIST OF TABLES

1 – 208 / 240 VAC Blower Motor Current Chart	13	7 – B02-34 / S02-34 Electric Heat Repair Parts List	17
2 – 120 VAC Blower Motor Current Chart	13	8 – B03-42 / S03-42 / 30/36WCW Electric Heat Repair Parts List	18
3 – B/S02 / B/S03 Blower Performance – PSC Motor – No Filters	14	9 – H02-46 / 18/24WCW-HW Hydronic Heat Repair Parts List	19
4 – H02/H03 Blower Performance – PSC Motor – No Filters	14	10 – H02-37 Hydronic Heat Repair Parts List	20
5 – Accessory Parts List and Factory Installed Options	15	11 – H03-49 / 30/36WCW-HW Hydronic Heat Repair Parts List	21
6 – B02-45 / S02-45 / 18/24WCW Electric Heat Repair Parts List	16		

CONTACT INFORMATION

Contact us by mail: Manufactured and Distributed by

Mortex Products Inc.
501 Terminal Rd
Fort Worth, TX 76106

www.mortx.com

SECTION I: GENERAL

The following list includes important facts and information regarding the air handler and its inclusions.

1. Air Handler is rated at 240 volts AC at 60 Hertz for electric heat models or 120 volts AC at 60 Hertz for hydronic models.
2. Air Handler is available in a small, medium, or large cabinet size.
3. All air handlers are equipped with a blower for A/C or Heat Pump operation.
4. Models are designed for upflow application only.
5. This air handler must not be operated without the doors installed.

NOTE: This air handler and its components are listed as a combination AC or Heat Pump system by ETL for sale in the United States and Canada.

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 or any other appliance

USERS MUST READ ALL INSTRUCTIONS IN THIS MANUAL AND THIS MANUAL MUST BE SAVED FOR FUTURE REFERENCE

SECTION II: SAFETY



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: indicated 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

Any adjustment, service or maintenance by the home owner 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 information on this appliance.

CAUTION

This product 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 appliance 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.

SAFETY REQUIREMENTS

1. This air handler must be kept clear and free of combustible materials, gasoline and other flammable vapors and liquids.
2. 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 appliance.
3. Follow the instructions exactly as shown in Startup and Shutdown Section in this manual to properly Startup or Shutdown this appliance.
4. If overheating occurs, turn off the power to the appliance and contact a qualified contractor, installer, or service agency.

DANGER

Do not use this appliance if any part has been under water. A flood damaged furnace 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.

5. NEVER - Store flammable materials of any kind near your appliance. Gasoline, solvents and other volatile liquids should be stored only in approved containers outside the home. These materials vaporize easily and are extremely dangerous.
6. NEVER – Store cleaning materials such as bleaches, detergents, powder cleaners, etc. near the appliance. These chemicals can cause corrosion of the air handler sheet metal and the electric heaters, the blower and the electrical controls.
7. NEVER – Use the area around the appliance as a storage area for items which could block or obstruct the normal air flow to the air handler or the space around the appliance. The 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 appliance rating plate for the air handler model number, for the operating specifications for safe operation.
9. Provide clearances for servicing ensuring service access is allowed for the control box, electric elements and the blower.
10. Failure to carefully read and follow all instructions in this manual can result in malfunction of the air handler, death, personal injury, and/or property damage.
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.

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 home owner **must never** try to perform service, repair or maintenance on this appliance.

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 appliance

12. These instructions cover minimum requirements and conform to existing national standards and safety codes. In some instances 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 appliance.

SECTION III: OWNERS INFORMATION AND SEASONAL INFORMATION

How The Air Handler Works – Heating Cycle

The appliance is equipped with the controls necessary for proper and safe operation. Circuit breaker location is shown in Figure 1.

The air handler is equipped with a relay(s), time delay relay, transformer, circuit breakers (Electric Heat Models Only), and a blower assembly. The transformer provides 24 VAC to the thermostat.

When the thermostat calls for heat on the electric heat models, the relay(s) energize sending 240 VAC thru the limit switches to the electric heaters causing them to get hot. The indoor fan motor is then energized on the selected heating speed tap after an “ON” time delay and the circulating blower draws cool air from the living space(s), passes it across the heater coils and circulates the warmed air through the duct work to the living space(s). When the thermostat is satisfied the electric heaters are de-energized. The blower is also de-energized after an “OFF” time delay, the heating cycle has ended and the air handler is ready for the next call for heat to start the next cycle.

When the thermostat calls for heat on the hydronic heating models Hydronic Control Board energizes the pump causing the flow of hot water thru the hot water heat coil. The indoor fan motor is energized by the hydronic control board on the heating (Low) speed tap after the selected “ON” time delay. The circulating blower then draws cool air from the living space(s), passes it across the hot water coil and circulates the

warmed air through the duct work to the living space(s). When the thermostat is satisfied the circulating pump is de-energized. The blower is also de-energized by the hydronic control board after the selected “OFF” time delay, the heating cycle has ended and the air handler is ready for the next call for heat to start the next cycle.

How The Air Handler Works – Cooling Cycle

When the thermostat calls for cooling, 24 VAC is sent to the compressor contactor causing it to close energizing the compressor and the outdoor fan motor. The indoor fan motor is then energized on the selected cooling speed tap after an “ON” time delay and the circulating blower draws air from the living space(s), passes it across the cooling coil in the air handler and circulates the cooled air through the duct work to the living space(s). When the thermostat is satisfied the compressor contactor is de-energized turning off the compressor and the outdoor fan motor. The blower is also de-energized. The hydronic models will have a selectable blower motor “OFF” time delay. The cooling cycle has ended and the air handler is ready for the next call for cooling to start the next cycle.

When the thermostat calls for heat pump, 24 VAC is sent to the compressor contactor causing it to close energizing the compressor and the outdoor fan motor. The reversing valve is energized causing the flow of the refrigerant to reverse and heat the coil inside the air handler. The indoor fan motor is then energized on the selected heat pump speed tap after an “ON” time delay and the circulating blower draws air from the living space(s), passes it across the coil in the air handler and circulates the warmed air through the duct work to the living space(s). When the thermostat is satisfied the compressor contactor is de-energized turning off the compressor and the outdoor fan motor. The blower is also de-energized. The hydronic models will have a selectable blower motor “OFF” time delay. The heat pump cycle has ended and the air handler is ready for the next call for heat pump to start the next cycle.

NOTE: Hydronic Models use a control board where the “Y” signal from the thermostat is connected to the “Y” terminal on the control board and the signal is passed through “CLin” terminal and the “Clout” terminal to the “CC” terminal. If a compressor lockout switch is not used a jumper wire must be placed across the “CLin” terminal and the “Clout” terminal to get a signal on the “CC” terminal. ***You must use the “Y” and “CC” terminals for the blower motor to operate during the cooling cycle.***

Examination of the air handler

The home owner should perform a visual examine the furnace every month for any defects or problems. The items to be inspected are:

1. The physical support of the furnace is sound without sagging cracks, gaps, etc. around the base so as to provide a seal between the support and the base.
2. The furnace casing for any obvious signs of deterioration from rust or corrosion.
3. The return and supply duct connections are physically sound and are sealed to the furnace casing.

4. The furnace must be serviced by qualified personnel annually, preferably at the start of each heating season.

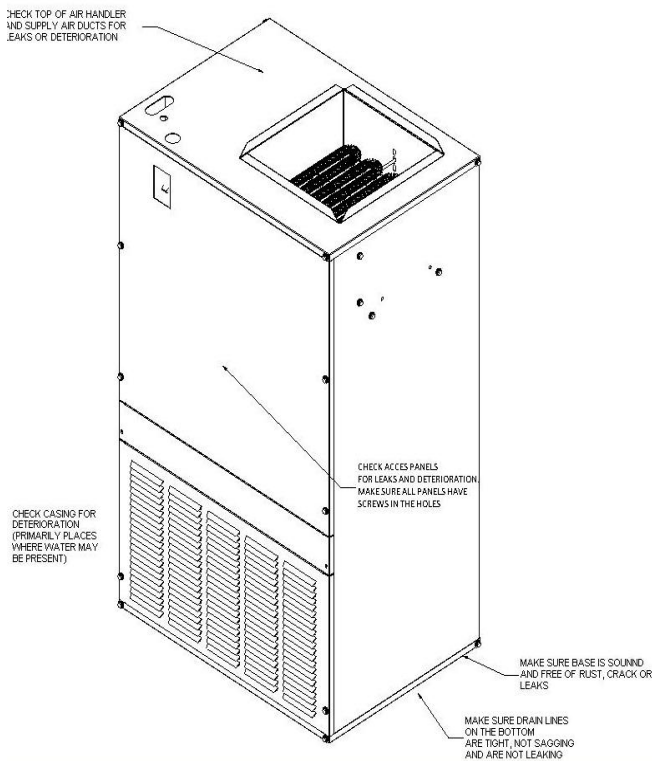


Figure 1: Air Handler Visual Check Points

The Service Technician

The air handler's best friend is a qualified service technician. If the appliance gives any indication of improper operation, call the service technician. The service technician is allowed to perform the normal routine care of your appliance. He can detect 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 and will add years of comfort.

Warranty and Responsibilities

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

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

Some specific examples of service calls which will be excluded from warranty reimbursement are:

1. Correcting faulty duct work in the home. This can be due to not enough ducts or ducts are too small to provide proper air flow through the air handler.
2. Correcting electrical wiring problems in the supply wiring to the air handler.

3. Resetting circuit breakers or on/off switches used for servicing.
4. Problems caused by installation and operation of any air conditioning unit, heat pump, or other air quality device which is not approved for use with this air handler.
5. Adjusting or calibrating the thermostat.
6. Problems caused by construction debris which has fallen into the air handler.
7. Replacement of fuses.
8. Problems caused by dirty air filters.
9. Problems caused by restrictions in the return or supply air flow causing low air flow.

The home owner should establish a firm understanding of these responsibilities with the installer or Service Company so there will be no misunderstanding of what will be covered under warranty at a later date.

While you are away

The air handler is equipped with safety shutoff devices which are designed to prevent the appliance from overheating in case of a malfunction. For this reason it is never practical to assume the appliance will operate unattended for a long period of time. An example of a malfunction that can cause significant damage to the home would be:

If the blower motor fails the heaters will cycle on the safety shutoff devices while the temperature inside your home continues to drop. All of the water pipes will freeze once the temperature falls below 32°F.

If you are planning to be away from home for a long period of time, have someone check on your home everyday, especially when the outside temperatures will be below 35°F to ensure the air handler is operating properly. This may prevent water pipes from freezing.

The Air Handler Fails to Operate Properly

If any abnormalities are observed while the furnace 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.
2. Check to see if the electrical power is turned on at the circuit breakers at the main service circuit breaker box or check any on/off switches that may be used for service disconnect switches.
3. Check any inline fuses that may have been installed on the air handler to determine if it has blown.
4. 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 do not attempt to service the appliance yourself. Call a qualified service agency/company to repair the appliance.

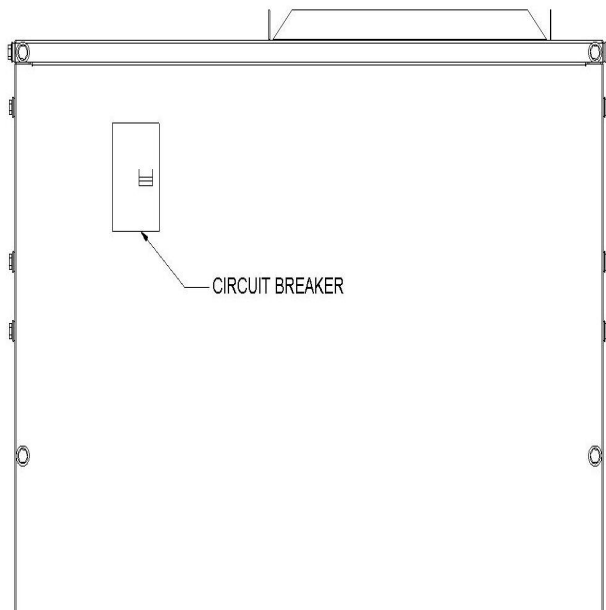


Figure2: Front Access Panel Circuit Breaker Locations

⚠ WARNING

AIR HANDLERS WITH ELECTRIC HEATERS
Should overheating occur turn the circuit breakers on the control box and the main electrical service entrance (Circuit Breaker Box) to the off position. Call qualified service personnel to troubleshoot and repair the appliance. **DO NOT** allow the air handler to continue to cycle on the limits.

When to Call For Service Assistance

Very often time can be saved if you give a service agency the information about the air handler ahead of time. This will enable the service agency to determine the specific components used and possibly identify the problem, thus arriving with the parts to fix the problem. Write down the model number, Serial Number and be prepared to describe what the air handler is or is not doing and what you have checked prior to calling.

SERVICE AGENCY INFORMATION

Fill in Below

MODEL NUMBER: _____

SERIAL NUMBER: _____

SERVICE COMPANY: _____

ADDRESS: _____

TELEPHONE (DAYTIME): _____

TELEPHONE (EMERGENCY): _____

NOTES: _____

SECTION IV: STARTUP AND SHUTDOWN INSTRUCTIONS

Read the instructions below before trying to start the appliance.

⚠ WARNING

If you do not follow these instructions exactly, a fire may result causing property damage, personal injury, and/or loss of life.

- A. **BEFORE OPERATING;** check around perimeter of the air handler to make sure there are no flammable materials in the area. If you smell vapors of any kind, **DO NOT** turn on the power to the appliance until vapors have been ventilated and removed from the area of the appliance.
- B. **CHECK THE FURNACE;** visually check the appliance for loose screws and/or panels that may be missing or have fallen off.
- C. **CHECK DUCT CONNECTIONS;** visually check the connections of the ducts to the appliance to make sure there are no gaps or holes and ducts are securely fastened to the furnace.

Turn On / Start the Appliance

1. **STOP!** Read the safety information above before proceeding.
2. Set the thermostat to the lowest setting.
3. Turn off all electrical power to the appliance at the main service disconnect box.
4. Remove the upper and lower access door.
5. Turn off the circuit breakers on the appliance control box.
6. Remove the control box cover.
7. Visually check the control box for loose wire connections and faulty or loose components.
8. Visually check the blower compartment for obstructions or loose debris.
9. Replace the control box cover.
10. Turn the circuit breakers to the on position.
11. Replace the upper and lower access door.
12. Turn the circuit breakers in the main service disconnect box to the on position.
13. Set the thermostat to the desired setting.

Shutting Down or Turning Off the Appliance

1. Set the thermostat to the lowest setting.
2. Turn off all electrical power to the appliance at the main service disconnect box.
3. Remove the upper access door.
4. Turn off the circuit breakers on the appliance control box.
5. Replace the upper access door.

SECTION V: OWNER MAINTENANCE

All appliances need annual maintenance in order 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 air filters. Air filters must be checked every month and replaced as needed. Figures 2 and 3 indicate the location of the air filters.

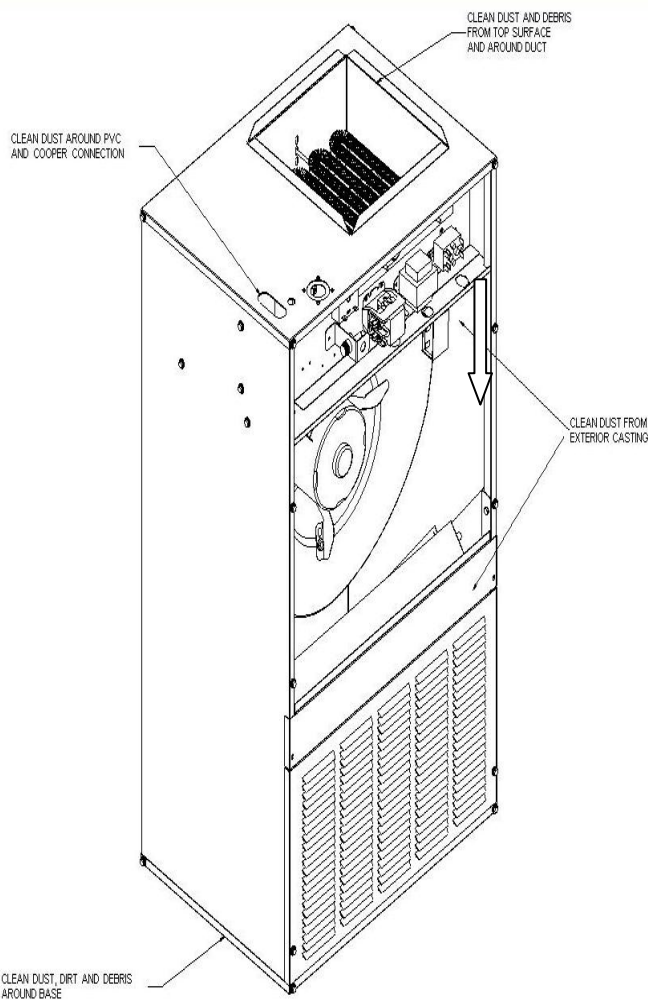


Figure 3: Home Owner / Users Cleaning Points

Upflow Air Filter Replacement – Accessory Filter Box Kit

Follow these easy steps to replace the air filters.

1. Follow the procedure **“To Turn Off the Appliance”** in the Startup and Shutdown Instructions section of these instructions.
2. Remove the white handled thumb screws on the front of the front of the appliance.
3. Pull the cover panel off by pulling it towards you and up.
4. Remove the air filter. The air filter is a disposable filter. **DO NOT** attempt to clean the filter and reuse it.
5. Check the size of the air filter that was removed to make sure it is replaced with a filter that is the same size.
6. Clean any access dirt or debris around the front area where the air filter is located. Be careful not to use any small vacuum cleaner parts or any small brushes to clean inside the filter box, around the filter track. These parts or brushes can hit the cooling coil causing damage to the coil or they can fall off or drop into the return duct causing a restriction of the return air flow.
7. Slide the air filter into the filter rack, push the door closed and tighten the thumb screw.
8. Follow the **“Turn On / Start the Appliance”** in the Startup and Shutdown Instructions section of these instructions.

NOTE: Make sure the flow arrows on the air filter are pointing towards the coil.

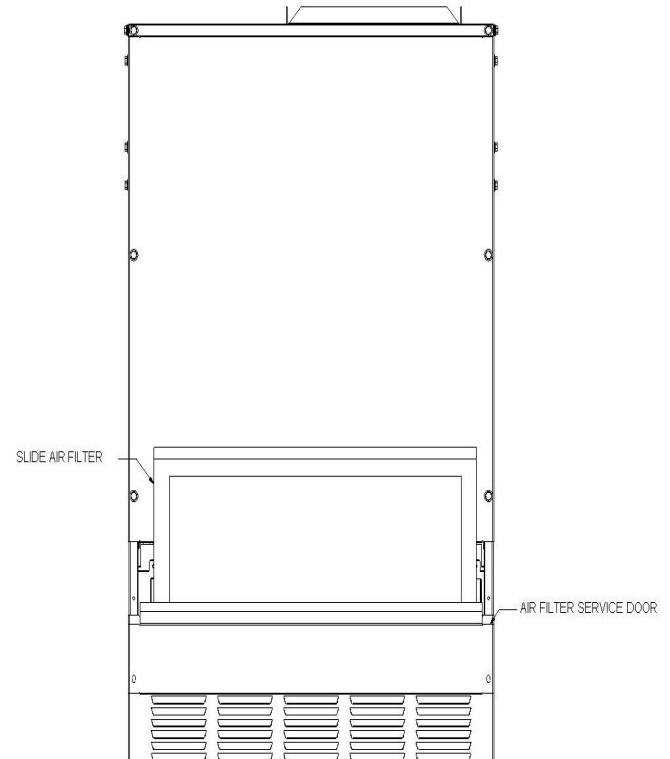


Figure 4: Air Filter Location



Figure 5: Air Filter – Use a 1” Standard Air Filter.



Figure 6: Horizontal Return Grille – Wall or Closet Door

SERVICE AND MAINTENANCE MANUAL

SECTION I: SAFETY

THE HOME OWNERS AND / OR APPLIANCE USERS MUST STOP HERE!

This section has been designed to assist a **qualified service agency** in performing service and maintenance on this appliance.

The homeowners and/or the appliance user must never attempt to perform any service or maintenance on the appliance especially when it involves the removal or adjustment of any parts and/or components.

WARNING

The manufacturer or distributor 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 and/or the appliance user.

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

The following safety rules must be followed when servicing this furnace.



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

WARNING

Improper 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.

SAFETY REQUIREMENTS

1. The air handlers with electric heaters may have a dual electrical supply circuit. Make sure you check each electrical circuit with a meter to be sure 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 exactly as shown in Startup and Shutdown Section in this manual to properly Startup or Shutdown this appliance.
4. Make sure all moving parts have come to a complete stop before attempting to perform any work once the appliance door has been removed. Moving parts can cause serious injury if clothing or body parts get caught in the moving part.

WARNING

ELECTRICAL SHOCK, FIRE HAZARD

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

- Before servicing, disconnect all electrical power to the appliance. Make sure you disconnect both power supplies if the appliance has a dual power supply circuit. Dual circuits may be used on the 15kW and 20kW models.
- When servicing controls, label all wires prior to disconnecting to aid in proper reconnection of wires.
- Verify proper operation after servicing by turning the thermostat above the room temperature for a brief period of time to ensure proper appliance operation

⚠ WARNING

FIRE HAZARD

NEVER PLACE A JUMPER BETWEEN "R" & "W"

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 II: AIR HANDLER MAINTENANCE

The interior sections of the air handler must be cleaned and adjusted by a qualified service contractor once a year or before the start of each heating or cooling season. The following items must be checked:

1. The blower wheel and motor for excessive dirt.
2. The electric heaters for wear, damage or corrosion.
3. The electrical components for excessive dust, dirt, wear, or deterioration.
4. The supply air duct system for excessive dust, dirt or debris
5. The return air duct system for excessive dust, dirt or debris
6. All electrical wiring for wear, insulation cracks and/or damage.
7. Check the air conditioning evaporator coil for dust, debris or damage.
8. Check the evaporator coil drain pan for proper drainage to prevent water backup into the unit.
9. The air handler casing and all interior sheet metal panels or dividers.

Electric Air Handler Cleaning Procedure

1. Follow the instructions exactly as shown in Startup and Shutdown Section in this manual to properly shutdown this appliance.
2. Remove the upper access door on the front of the air handler by removing the 10 screws that secure the panel to the casing then lifting up and out.
3. Unplug the wires from the 6 pin plug at the left side of the blower deck.
4. Remove the three screws on the left, middle and right side panel above the blower that secures the blower deck to the panel.
5. Slide the blower deck out of the front of the air handler.
6. Place a piece of cardboard on top of the evaporator coil to prevent dirt or debris from falling onto the coil. Use a vacuum cleaner and a small brush to remove any dirt and debris from the blower and evaporator coil compartments.
7. Check the evaporator condensate drain pan for any debris and ensure the pan is properly draining by pouring water into the drain to check it.
8. Remove any excess water that may have spilled from checking the evaporator condensate drain.

9. Check in the area above the blower compartment where the heater elements are located and remove any dust, dirt or debris from around the heater elements. Be careful not to damage the heater elements with the vacuum hose or the brush.
10. Slide the blower back into the air handler and install the screws that were removed in Step 4.
11. Plug the wires on the 6 pin male plug back into the 6 pin female plug that was removed in Step 3.
12. Install the access panel that was removed in Step 2.
13. Follow the instructions exactly as shown in Startup and Shutdown Section in this manual to properly startup this appliance.

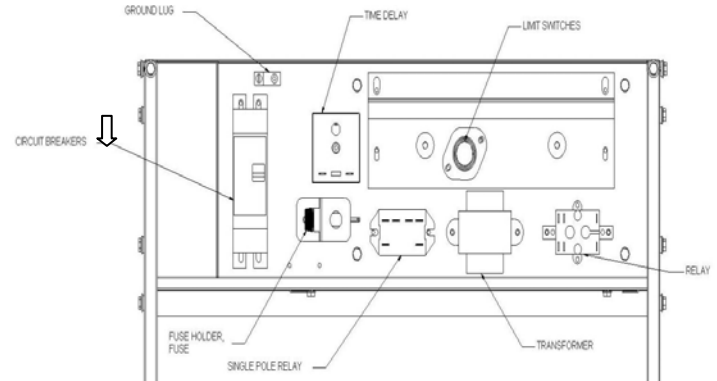


Figure 7: No Electric Heat Control Box

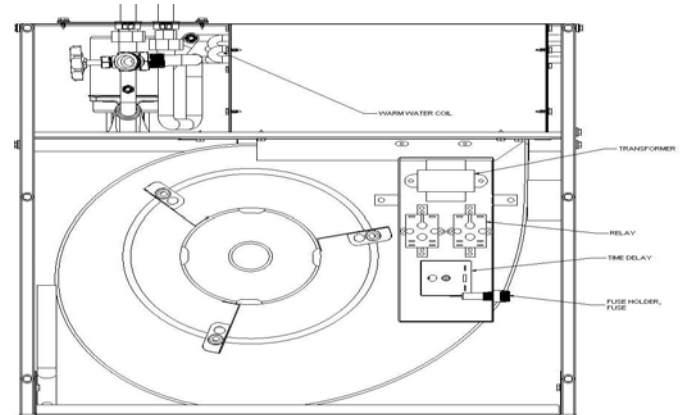


Figure 8: Hydronic Heat Control Box – No Pump

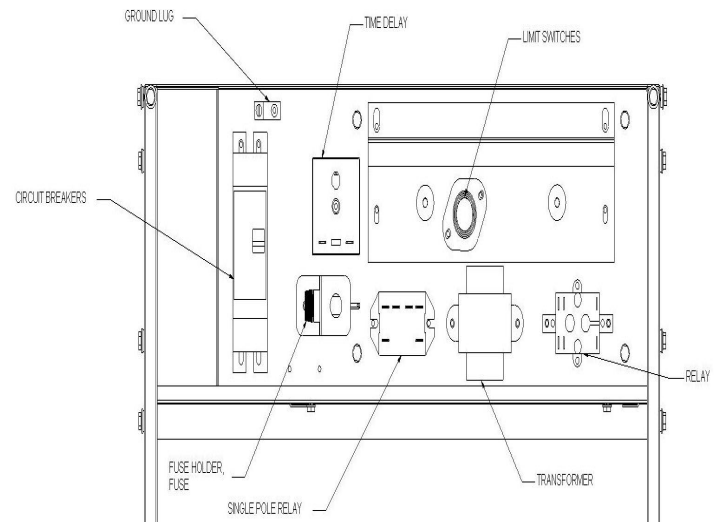


Figure 9: Electric Heat Control Box

Hydronic Air Handler Cleaning Procedure

1. Follow the instructions exactly as shown in Startup and Shutdown Section in this manual to properly shutdown this appliance.
2. Remove the upper access door on the front of the air handler by removing the 10 screws that secure the panel to the casing then lifting up and out.
3. Unplug the wires from the 6 pin plug at the left side of the control box located on the right side of the blower housing.
4. Remove the two screws on the top and bottom of the box that secure the control box cover to the control box and remove the cover.
5. Remove the screws that secure the control box to the blower assembly and move the control box off to the side of the unit.
6. Remove the three screws on the left, middle and right side panel above the blower that secures the blower deck to the panel.
7. Slide the blower deck out of the front of the air handler.
8. Place a piece of cardboard on top of the evaporator coil to prevent dirt or debris from falling onto the coil. Use a vacuum cleaner and a small brush to remove any dirt and debris from the blower and evaporator coil compartments.
9. Check the evaporator condensate drain pan for any debris and ensure the pan is properly draining by pouring water into the drain to check it.
10. Remove any excess water that may have spilled from checking the evaporator condensate drain.
11. Check in the area above the blower compartment where the heater elements are located and remove any dust, dirt or debris from around the heater elements. Be careful not to damage the heater elements with the vacuum hose or the brush.
12. Slide the blower back into the air handler and install the screws that were removed in Step 7.
13. Plug the wires on the 6 pin male plug back into the 6 pin female plug that was removed in Step 6.
14. Install the screws that were removed in Step 5 that secure the control box to the blower housing.
15. Install the screws that were removed in Step 4 that secure the control box cover to the control box.
16. Plug the wires from the 6 pin plug back into the left side of the control box located on the right side of the blower housing that was removed in Step 3.
17. Install the access panel that was removed in Step 2.
18. Follow the instructions exactly as shown in Startup and Shutdown Section in this manual to properly startup this appliance.

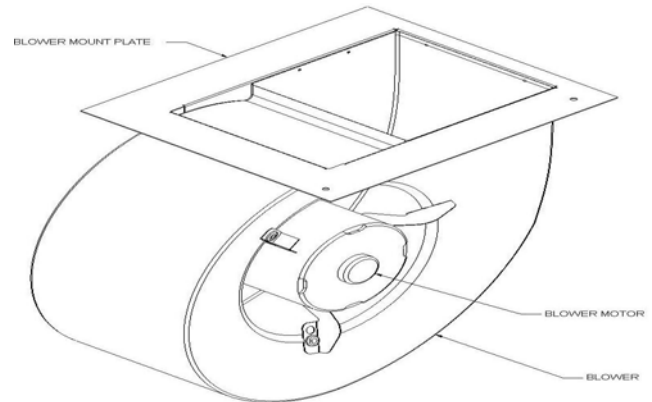


Figure 10: Blower Assembly and Mounting Screw Location – B/S02 / B/S03 / WCW

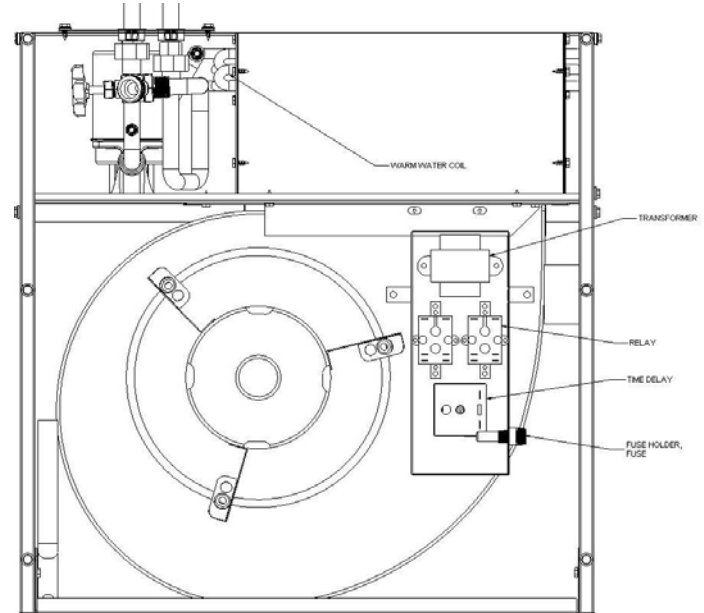


Figure 11: Blower Assembly and Mounting Screw Location – H02 / H03 / WCW-HW

SECTION III: AIR HANDLER CONTROLS

Electric Heat Models

This section discusses the air handler controls and how they operate. Refer to Figure 9 for component locations.

1. **The Limit Controls** – Each electric heater 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. **The Heater Contactors** – The electric heater contactors simply turn the heater elements on and off. The contactors are controlled by the thermostat. On a call for heat 24 VAC is sent to the relay(s) 24 VAC coil energizing the relay. When the call for heat has been satisfied the 24 VAC is removed from the relays 24 VAC coil de-energizing the relay(s).
3. **Cooling Time Delay Relay (TDR)** – The cooling sequencer relay is used only on models with a PSC motor. When the thermostat calls for cooling or the fan switch on the thermostat is moved from the “AUTO” to the “ON” position, 24 VAC is placed on the “G” terminal from the thermostat to the 24 VAC coil on the time delay relay. The relay controls the blower ON time delay and is

adjustable from 0.4 to 30 seconds. The time delay relay has a 0 second OFF delay.

4. **Circuit breakers** – The circuit breakers are designed as over-current protection for the air handler internal electrical components. Field wiring must be protected by field supplied circuit breakers or fuses sized to protect the wire connected to the air handler circuit breakers.
5. **Transformer** – The transformer is used to step down voltage from 208/240 VAC to 24 VAC. The transformer has a maximum power output of 40 VA which equals a maximum current flow of 1.667 amps and provides the required 24 VAC for the system control circuit.
6. **Blower Motor Isolation Relay** - This relay is used to load the TDR and for isolation between the high and low speeds of a motor. The wiring has been designed so that the normally closed contacts are used for heating and the normally open contacts are used for cooling. When the thermostat has a call from the “G” terminal the TDR contacts will close after the selected time delay then 24 VAC is sent to the time isolation relay coil. The normally closed contacts on the isolation relay open and the normally open contacts close, energizing the motor on the selected cooling speed.

Hydronic Heat Models

This section discusses the air handler controls and how they operate. Refer to Figure 10 for component locations.

7. **Transformer** – The transformer is used to step down voltage from 208/240 VAC to 24 VAC. The transformer has a maximum power output of 40 VA which equals a maximum current flow of 1.667 amps and provides the required 24 VAC for the system control circuit.
1. **Hydronic Control** – This control board has a pump relay output terminal that is not used on all hydronic models. This hydronic control board pump relay energizes the water pump on a call for heat. The 24 VAC coil is connected to the thermostat “W” terminal. The coil is energized on a call for heat closing the normally open terminals sending 120 VAC to the water pump motor. Once the call for heat has been satisfied, the 24 VAC is removed from the thermostat “W” terminal de-energizing the pump relay and opening the contacts to the water pump motor.
2. **Hydronic Control and PSC Blower Motor** – The hydronic control board has 3 terminals for blower speed control. When the thermostat has a call from the “G” terminal the hydronic control board will energize the blower motor on the HI speed terminal after the selected ON time delay. When there is a call for “W” the hydronic Control will energize the blower motor on the LOW speed terminal after the selected ON time delay. When there is a call for “G” from the thermostat and a call for “DHM” from the thermostat the hydronic control board will energize the blower motor on the MED speed terminal after the selected ON time delay. The blower motor will de-energize on all 3 speeds after the selected OFF time delay. The ON and OFF delays are set via the jumper pins located on the upper left hand corner of the control board.

SECTION IV: SEQUENCE OF OPERATION

Continuous Blower – Electric Heat Models

The thermostat has a manual fan switch that can be moved to the “On” position or it can be programmed for **continuous** fan operation. This setting causes the thermostat to complete the circuit between “R” and “G” terminals causing the time delay relay to start the time delay cycle. Once the time delay relay has completed the on-delay cycle the contacts will close sending voltage to the isolation relay coil. The isolation relay will close the normally open contacts (Terminals #2 and #4) sending voltage to selected indoor blower motor speed tap connected to terminal #4. The normally closed contacts (Terminals #5 and #6) will open.

The indoor blower will operate continuously until the fan switch on the thermostat has been switched from on to auto. When the thermostat is switched back to auto the blower will de-energize immediately because there is no OFF time delay.

Continuous Blower – Hydronic Heat Models

The thermostat has a manual fan switch that can be moved to the “On” position or it can be programmed for **continuous** fan operation. This setting causes the thermostat to complete the circuit between “R” and “G” terminals sending 24 VAC to the “G” terminal on the hydronic control board. The hydronic control board will energize the blower motor on the HI speed terminal.

The indoor blower will operate continuously until the fan switch on the thermostat has been switched from on to auto. When the thermostat is switched back to auto the blower will de-energize after the selected OFF time delay

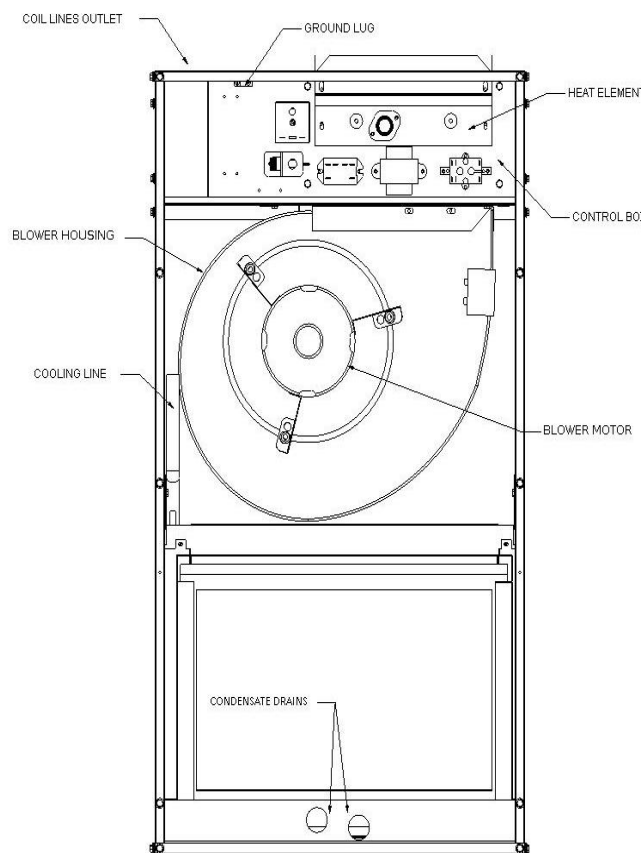


Figure 12: Component Locations – Electric Heat Models

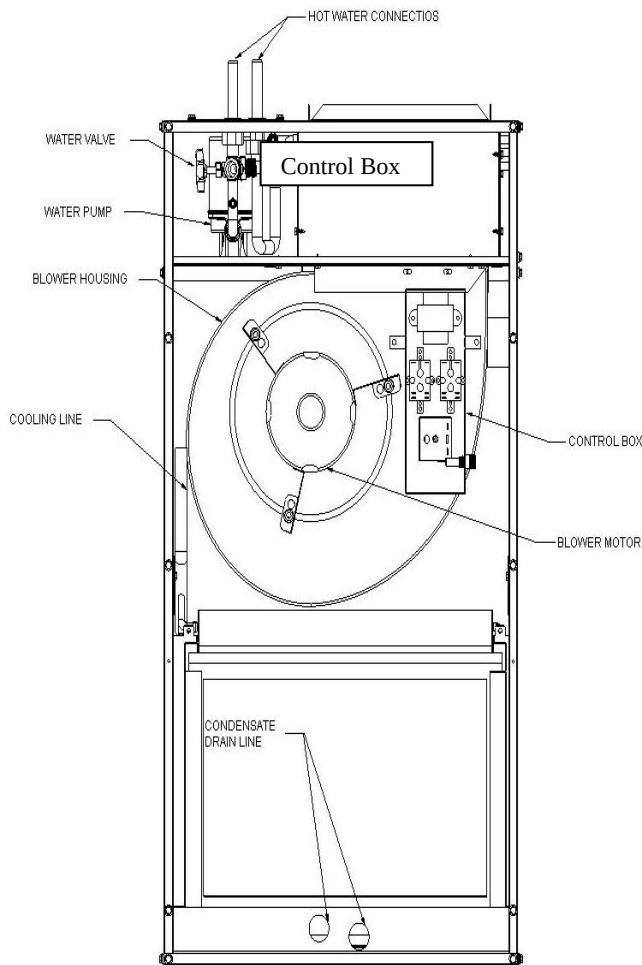


Figure 13: Component Locations – Hydronic Heat Models

Intermittent Blower – Cooling Electric Heat Models

The thermostat has a manual fan switch that can be moved to the “Auto” position or it can be programmed for **auto** fan operation. When the thermostat calls for cooling, a circuit is completed between the “R”, “Y” and “G” Terminals. The indoor fan motor is energized from the “G” terminal on the thermostat causing the time delay relay to start the on-time delay. The time delay relay contacts will close the circuit to the isolation relay coil after the on- delay is complete. The isolation relay normally open contacts (Terminals #2 and #4) will close and the motor will operate on the selected speed tap that has been placed on terminal #4.

When the thermostat is satisfied the circuit between “R”, “Y” and “G” will open. The time delay relay will open the circuit to the isolation relay and the PSC blower motor will turn off.

Hydronic Heat Models

The thermostat has a manual fan switch that can be moved to the “Auto” position or it can be programmed for **auto** fan operation. When the thermostat calls for cooling, a circuit is completed between the “R”, “Y” and “G” terminals sending 24 VAC to the hydronic control board thru the “Y” and “G” terminals. The blower motor will be energized on the HI speed terminal after the selected ON time delay. When the thermostat is satisfied the circuit between “R”, “Y” and “G” will open. The Hydronic control board will open the HI speed

relay on the board and the PSC blower motor will turn off after the selected OFF time delay. The blower is now in the standby mode waiting for the next cooling cycle

The Heating Cycle

Electric Heat Models

When the thermostat is in the HEAT mode and the fan switch on the thermostat is set to AUTO. The call for heat closes the thermostat circuit between the “R” and “W” terminals. 24 VAC is sent from the “W” terminal on the thermostat, through the white thermostat wire, to the white pigtail wire on the air handler, to the 24 VAC coil on the first heater contactor. This signal energizes the heater contactor coil, closing the contacts and sending 240 VAC to the heaters. The blower motor low speed wire is also connected to the heater contactor output T1 terminal on the first heater contactor so the blower is energized at the same time as the heater. The blower will continue to operate until the thermostat is satisfied. When the call for heat has been removed the “W” terminal is de-energized and the heater contactor opens turning off the heater and the blower motor.

Some models have a black pigtail wire that is connected to the 24 VAC coil on the second heater contactor. This pigtail wire is to be used for second stage heat. It is connected to the thermostat “W2” terminal. You must have a thermostat that has the second stage heating feature “W2” to use this feature. The second stage heat cycle is enabled when the room temperature typically falls more than 3 degrees below the thermostat set point. The thermostat energizes the second heater to aid in heating the room back to the thermostat set point. Once the room is within 1 degree of the thermostat set point the second stage heater is de-energized until the thermostat calls for second stage heat “W2” again.

Hydronic Heat Models

When the thermostat is in the HEAT mode and the fan switch on the thermostat is set to AUTO. The call for heat closes the thermostat circuit between the “R” and “W” terminals. 24 VAC is sent from the “W” terminal on the thermostat, through the white thermostat wire to the white pigtail wire that is connected to the “W” terminal on the air handler hydronic control board. The hydronic control board energizes the relay on the board for the water pump which sends 24 VAC to the pump terminal. This will energize the water pump and start circulation of hot water through the water coil.

At the same time the hydronic control board energizes LOW speed relay on the control board, after the selected time delay, sending 120 VAC to the LOW speed terminal on the control board energizing the blower motor on the low speed wire. The blower will continue to operate until the thermostat is satisfied. When the call for heat has been removed, the “W” terminal is de-energized and the control board pump relay and LOW speed blower motor relay open turning off the water pump. The blower motor will de-energize after the selected OFF time delay..

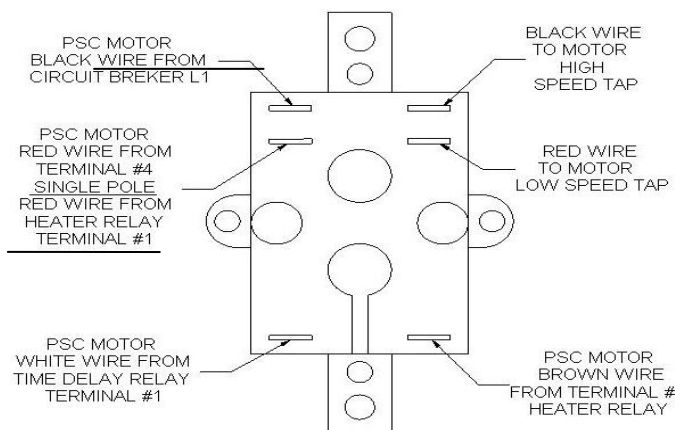


Figure 14: Motor Speed Tap Isolation Relay – PSC Motors

⚠ WARNING

For personal safety be sure to turn the electrical power “OFF” at the main entrance (Circuit Breaker Box) and at the control box circuit breakers before attempting any service or maintenance operations. Home owners should never attempt to perform any maintenance which requires opening the air handler control box door.

SECTION V: TROUBLE SHOOTING

The following checks should be made before trouble shooting the air handler controls for a no heat issue.

1. Check all of the circuit breakers. Make sure they are turned to the “ON” position and have not tripped.
2. Check all fuses, especially any supply line fuses that were installed during installation. If the fuse is blown, check the wiring with an OHM meter for a short to ground. If shorted, repair the short, and then replace the fuse.
3. Check any electrical switches that are external to the furnace to make sure they are turned on.
4. Check all wiring connections, especially on any of the components, to ensure they are securely fastened.

Electric Heat Models

If you have electric heaters and there is 240 volts coming out of the control box circuit breakers and you have 24 volts between to the “R” wire on the fuse and ground, then continue on through the rest of the checks.

Hydronic Heat Models

If you have hydronic heat you have a hydronic control board. There is 120 volts between the terminal block L1 and L2/N terminals and 120 VAC between the XFMR and L2/N terminals on the control board. There should also be 24 VAC on the “Rin” and “C” terminals on the control boards. Also check to make sure you have 24 volts between to the “R” terminal and “C” terminal on the control board. If you do have 24 VAC on “Rin” but do not on “R” check the fuse, if you do have 24 VAC on both then continue on through the rest of the checks.

PSC Motor Check – Electric Heat Models

If the motor is not running, check for 240 volts at the motor speed tap terminal. If the 240 volts is present at the motor

speed tap terminal but the motor is not operating, then replace the motor.

Heating Mode

If 24 VAC is present on the “W” terminal and the heat relay coil is energized then check the line voltage motor terminals. If 240 volts is not present at the motor check between the Heat Relay Terminal #4 and L2. If 240 volts is present, check isolation relay between terminal #6 and L2, if 240 volts is present replace the motor. If 240 volts is not present change the relay.

Cooling Mode

If 24 VAC is not present check the thermostat “G” wire. If 24 VAC is not present check the thermostat or the thermostat wire. If 24 VAC is present at terminals #1 and #3 on the relay, but the relay is not energized change the relay. If the relay is energized but the blower motor is not operating check Terminal #2 and L2 for 240 volts. If 240 volts is present, check isolation relay terminal #4 and L2 for 240 volts, if 240 volts is present replace the motor. If 240 volts is not present between Terminal #4 and L2, replace the relay.

PSC Motor Check – Hydronic Heat Models

If the motor is not running, check for 120 volts at the terminal block to determine if there is 120 volts to the unit then check the following items on the hydronic control board to determine if the blower motor is bad.

Heating Mode

If the thermostat “W” terminal is energized and there is 24 VAC on the “W” terminal on the hydronic control board check for 120 volts between the LOW terminal and the L2/N terminal. If the 120 volts is present at the hydronic control board LOW terminal but the motor is not operating, then replace the motor.

Cooling Mode

If the thermostat “G” terminal is energized and there is 24 VAC on the “G” terminal on the hydronic control board check for 120 volts between the HI terminal and the L2/N terminal. If the 120 volts is present at the hydronic control board HI terminal but the motor is not operating, then replace the motor.

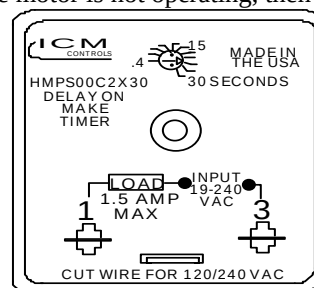


Figure 15: Adjustable Time Delay Relay (TDR) Terminals

⚠ 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.

Heater Element Is Not On

Check for 240 VAC between each of the heater elements. If 240 VAC is present, check the current draw on each heater. If

there is almost no current draw check the limit for that heater. If the limit is good but there still is no current flow then, check to see if the heater is defective.

The heater amps are as follows:

5 kW Heater = 20.8 amps
10 kW Heater = 41.6 amps
15 kW Heater = 50.0 amps

The heater design is as follows:

The 5 kW model has one 5 kW heater element.

The 10 kW model has one heater with two 5 kW elements

The 15 kW model has one heater with two 5 kW elements (top heater) and one heater with one 5 kW element (bottom heater) or it may be a single three 5 kW element heater.

If 240 VAC is not present at the heater element but there is 240 VAC present between the line terminal of the heater contactor and L2 circuit breaker but not at the load side of heater contactor then, check the contactor coil for 24 VAC. If 24 VAC is present on the coil then replace the contactor. If 24 Vac is not present then check the limit control for an open limit and replace the open limit control. If the limit controls are not open then check the thermostat to make sure there is a call for heat and thermostat wire for a broken or grounded wire.

DP - Double Pole Contactor

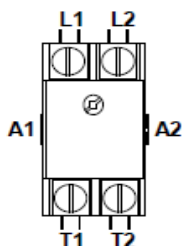


Figure 16: Heater Contactor Terminal Designations

MODEL	HP	PSC
B/S02	1/4	1.70
B/S02	1/3	2.80
B/S03	1/3	3.20

Table 1: 208 / 240 Volt Blower Motor FLA

MODEL	HP	PSC
H02	1/4	2.60
H02	1/3	5.60
H03	1/3	5.60

Table 2: 120 Volt Blower Motor FLA

Replacing the Blower Motor

1. Follow the instructions exactly as shown in Startup and Shutdown Section in this manual to properly shutdown this appliance.
2. Remove the upper access door on the front of the air handler by removing the 10 screws that secure the panel to the casing then lifting up and out.
3. Unplug the wires from the 6 pin plug at the left side of the blower deck.
4. Remove the three screws on the left, middle and right side panel above the blower that secures the blower deck to the panel.
5. Slide the blower deck out of the front of the air handler.

6. Loosen the set screw on the blower wheel hub that secures the wheel to the motor shaft. Make sure the wheel slides freely up and down the shaft. If it doesn't push the wheel against the motor housing as far as it will go. Locate the burr's that are on the shaft and file the burr from the shaft until the shaft is smooth.
7. Remove the bolts that secure the motor to the blower housing and remove the blower motor.
8. Slide the new blower motor shaft through the hub in the blower wheel until the mounts are setting on the blower housing.
9. Turn the motor until the holes in the rubber motor mounts line up with the screw holes in the blower housing.
10. Insert the screws into the screw holes and tighten all three screws until the motor is securely fastened to the blower housing.
11. Set the blower wheel so it is positioned in the middle of the housing and tighten the set screw to the flat side of the motor shaft. Make sure the blower wheel setscrew is sitting ONLY on the flat side of the motor shaft.
12. Slide the blower back into the air handler and install the screws that were removed in Step5.
13. Install the screws that were removed in Step 4 that secure the control box to the blower housing.
14. Install the screws that were removed in Step 4 that secure the control box cover to the control box.
15. Plug the wires from the 6 pin plug back into the left side of the control box located on the right side of the blower housing that was removed in Step 3.
16. Install the access panel that was removed in Step 2.
17. Follow the instructions exactly as shown in Startup and Shutdown Section in this manual to properly startup this appliance.

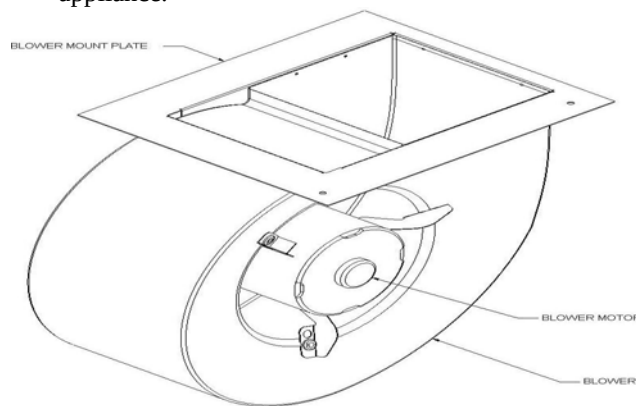


Figure 17: Blower Assembly and Mounting Screw Location – B/S02 / B/S03 / WCW

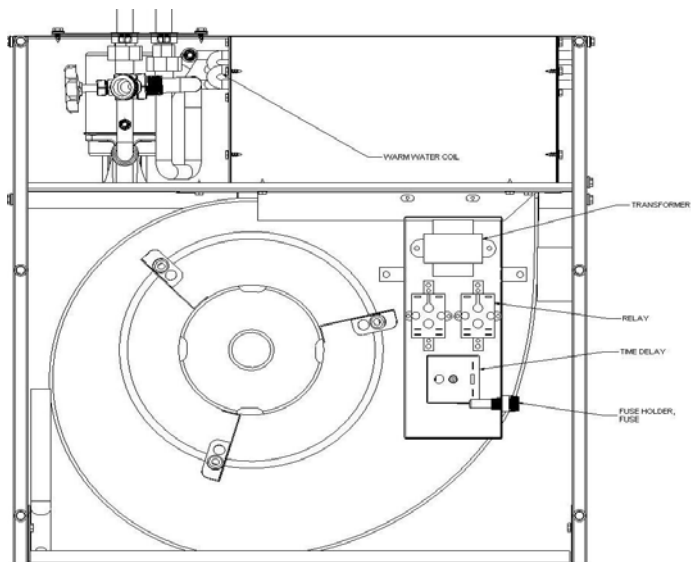


Figure 18: Blower Assembly and Mounting Screw Location – H02 / H03 / WCW-HW

WARNING

To avoid personal injury take precautions 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

SECTION VI: BLOWER PERFORMANCE

Model Number	Nominal Tons	Motor HP @ 230 VAC	Blower Speed	CFM vs Static Pressure inwc				
				0.10	0.20	0.30	0.40	0.50
B/S02-45 / 18/24WCW	1.5-2.0	1/4	High	890	850	830	810	800
			Medium	870	830	800	770	750
			Low	830	780	740	710	-
B/S02-34	2.5	1/3	High	1050	1000	950	920	900
			Medium	1020	970	930	900	870
			Low	1000	950	900	870	830
B/S03-42 / 30/36WCW	3	1/3	High	1250	1200	1120	1060	1000
			Medium	1070	1020	970	920	860
			Low	900	870	840	790	720

Table 3: B/S02 / B/S03 / WCW Blower Performance Chart – CFM Data with a PSC Motor -Without Air Filters

Model Number	Nominal Tons	Motor HP @ 230 VAC	Blower Speed	CFM vs Static Pressure inwc				
				0.10	0.20	0.30	0.40	0.50
H02-46-26 / H02-46-30 / 18/24WCW-HW	1.5-2.0	1/4	High	820	800	770	730	710
			Medium	800	760	730	690	650
			Low	760	730	680	650	-
H02-46-36	1.5-2.0	1/4	High	795	780	750	700	690
			Medium	770	720	700	660	640
			Low	730	700	660	620	-
H02-37-34	2.5	1/3	High	1040	985	940	920	900
			Medium	1020	970	930	900	870
			Low	1010	950	900	870	830
H02-37-39 / 30WCW-HW	2.5	1/3	High	1000	960	920	880	840
			Medium	980	930	880	850	800
			Low	960	900	850	810	770
H03-49-43 / 36WCW-HW	3	1/3	High	1234	1150	1110	1080	1050
			Medium	1100	1055	1010	950	905
			Low	1080	1015	975	915	-

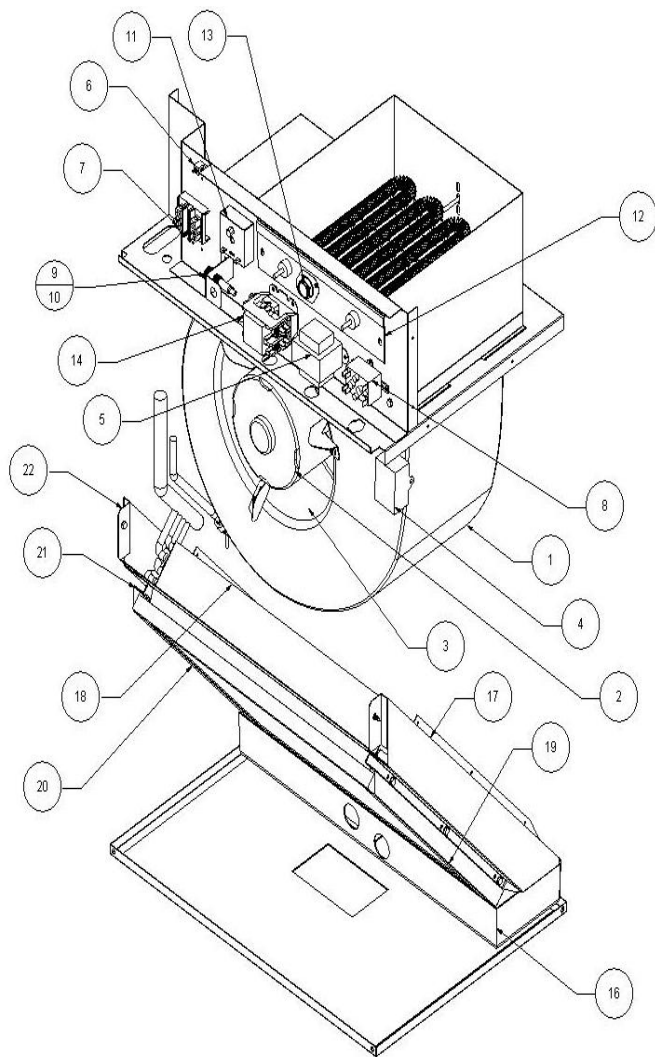
Table 4: H02/H03/WCW-HW Blower Performance Chart – CFM Data with a PSC Motor -Without Air Filters

SECTION VII: ACCESSORY PARTS LIST

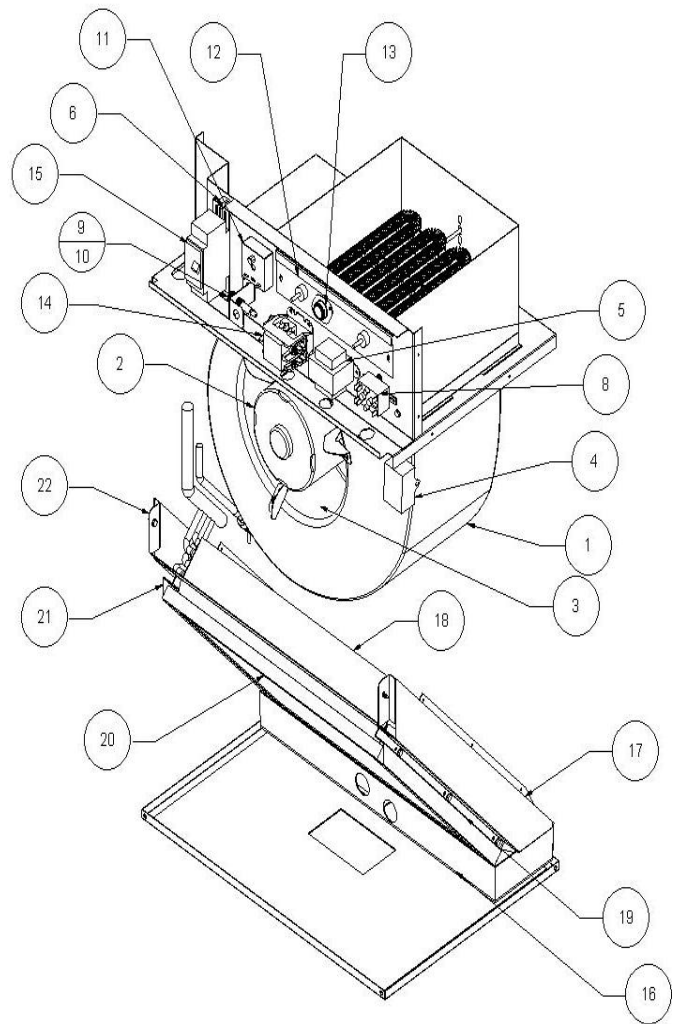
Part Number	Description
R72DB0001	Field Installed TXV (R-22) - 1.5-3.0 Ton
R72DB0002	Field Installed TXV (R-22) - 3.0-5.0 Ton
R72DB0003	Field Installed TXV (R-410) - 1.5-2.5 Ton
R72DB0004	Field Installed TXV (R-410) - 3.0-5.0 Ton
68AC0002	Field Installed Replacement Pump Timer for Hydronic Coil Purge
RPA-01	Remote Pump Assembly 4 GPM 1/2" Pipe
RPA-02	Remote Pump Assembly 4 GPM 3/4" Pipe
RPA-03	Remote Pump Assembly 7 GPM 3/4" Pipe
WPD02	Wall Panel Door for 02 Models
WPD03	Wall Panel Door for 03 Models
LCD02	Wall Panel Door for 02 Models
LCD02	Louvered Coil Door for 03 Models
WPD02	Louvered Coil Door for 02 Models
BRP02	Bottom Return Air Panel for 02 Models
BRP03	Bottom Return Air Panel for 03 Models
WB	Wall Mounting Brackets

Table 5: B/S02 / B/S03 / WCW / H02 / H03 / WCW-HW Field Installed Accessory Parts and Factory Installed Options

SECTION VIII: REPLACEMENT PARTS LISTS



S02 / 18/24WCW

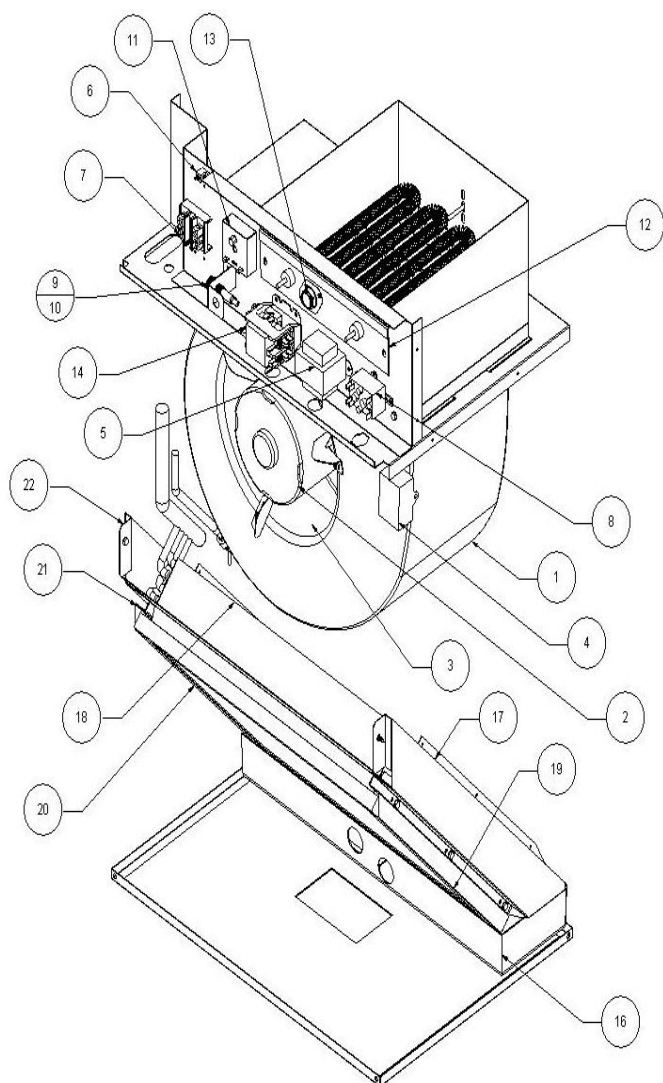


B02 / 18/24WCW

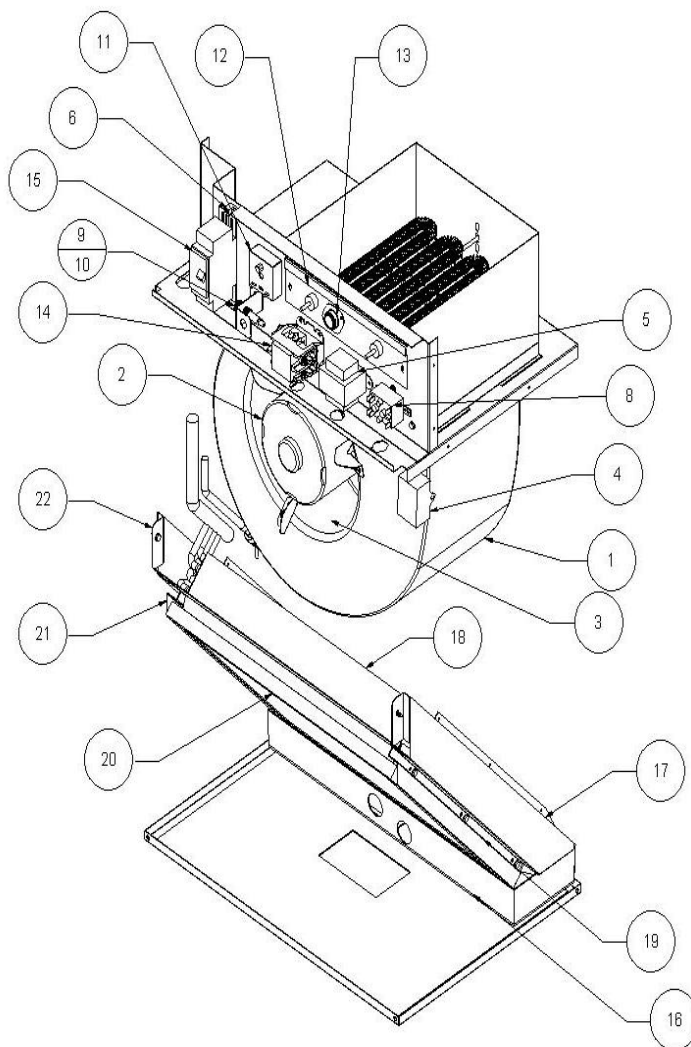
Figure 19: B/S02-45 / 18,24WCW Electric Heat Air Handler Repair Parts Schematic

B/S02-45 / 18/24WCW ELECTRIC HEAT MODELS			
Item #	Qty.	Part #	Description
1	1	R86HM0045	45-1/4-230-10 X 6 Blower Assembly (Complete Assembly)
2	1	R65BP0016	1/4 HP 208/240V PSC Motor 208/240V
3	1	R69AC0001	10 x 6 Blower Wheel 1/2" Hub - CW Rotation
4	1	R68DE0006	Black Plastic 5 MFD/370V Capacitor
5	1	R68AA0003	208/240-24V Transformer
6	1	R68DC0001	Ground Lug
7	1	R68AC0009	TDR ADJ TYPE Delay On Make Relay - HMPS00C2X30
8	1	R68DC0018	Power Terminal Block - S02/S03/WCW Only
9	1	R73MH0001	3 Amp Fuse
10	1	R73MHA001	Fuse Holder
11	1	R68AB0001	Fan Relay for PSC Motor
5 KW Electric Heat			
12	1	R67AB0015	5 KW Element
13	1	R68CA0002	130°F Limit Switch (Opens at 130°F - Closes at 100°F)
14	1	R68AB0019	Double Pole Electric Heat Contactor - 50 Amp Resistive
15	1	R68BAD013	30 Amp 230 SQD Circuit Breaker - B02/B03 Only
8 KW Electric Heat			
12	1	R67AB0016	8 KW Element
13	1	R68CA0002	130°F Limit Switch (Opens at 130°F - Closes at 100°F)
14	1	R68AB0019	Double Pole Electric Heat Contactor - 50 Amp Resistive
15	1	R68BAD016	45 Amp 245 SQD Circuit Breaker - B02/B03 Only
10 KW Electric Heat MS**18,24			
12	1	R67AB0017	10 KW Element
13	2	R68CA0002	130°F Limit Switch (Opens at 130°F - Closes at 100°F)
14	1	R68AB0019	Double Pole Electric Heat Contactor - 50 Amp Resistive
15	1	R68BAD018	60 Amp 260 SQD Circuit Breaker - B02/B03 Only
DRAIN PANS (PLASTIC)			
18	1	R71AA0042	21.00" W x 5.355" D - Horizontal (71AA0042)

Table 6: B/S02-45 / 18/24WCW Electric Heat Air Handler Repair Parts List



S02-34

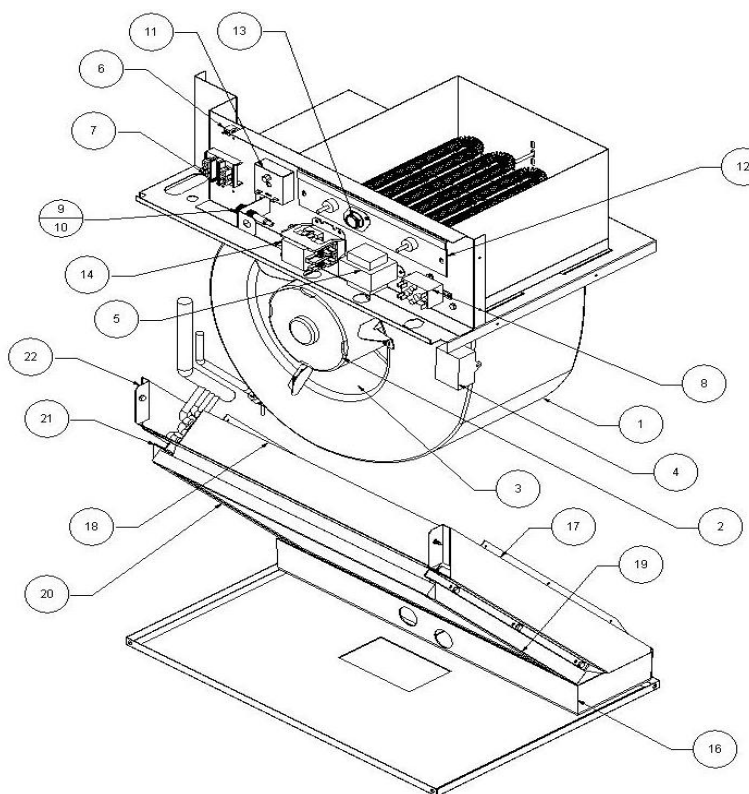


B02-34

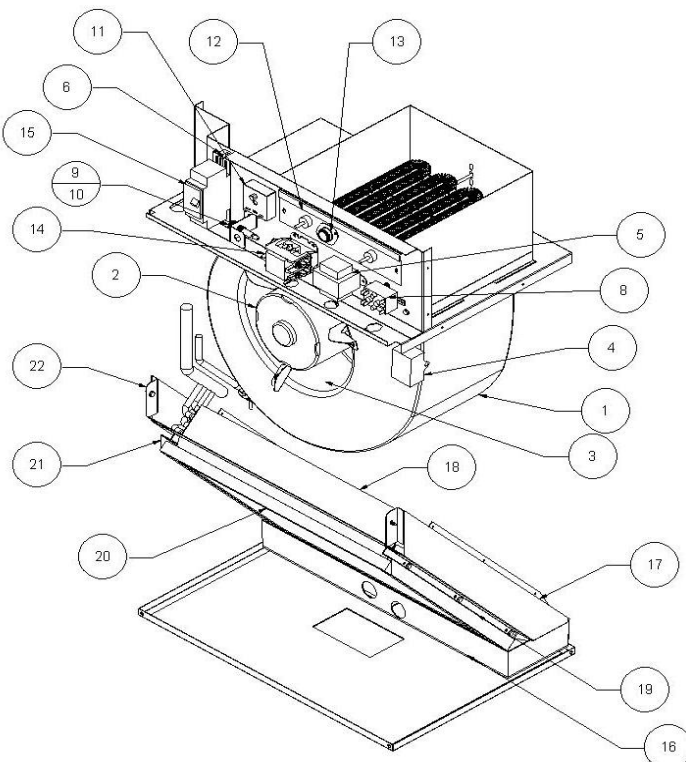
Figure 20: B02-34 / S02-34 Electric Heat Air Handler Repair Parts Schematic

B/S02-34 ELECTRIC HEAT MODELS			
Item #	Qty.	Part #	Description
1	1	R86HM0034	34-1/3-230-10 X 7 Blower Assembly (Complete Assembly)
2	1	R65BP0014	1/3 HP 208/240V PSC Motor 208/240V
3	1	R69AC0002	10 x 7 Blower Wheel 1/2" Hub - CW Rotation
4	1	R68DE0006	Black Plastic 5 MFD/370V Capacitor
5	1	R68AA0003	208/240-24V Transformer
6	1	R68DC0001	Ground Lug
7	1	R68AC0009	TDR ADJ TYPE Delay On Make Relay - HMPS00C2X30
8	1	R68DC0018	Power Terminal Block - S02/S03/WCW Only
9	1	R73MH0001	3 Amp Fuse
10	1	R73MHA001	Fuse Holder
11	1	R68AB0001	Fan Relay for PSC Motor
5 KW Electric Heat			
12	1	R67AB0015	5 KW Element
13	1	R68CA0002	130°F Limit Switch (Opens at 130°F - Closes at 100°F)
14	1	R68AB0019	Double Pole Electric Heat Contactor - 50 Amp Resistive
15	1	R68BAD013	30 Amp 230 SQD Circuit Breaker - B02/B03 Only
8 KW Electric Heat			
12	1	R67AB0016	8 KW Element
13	1	R68CA0002	130°F Limit Switch (Opens at 130°F - Closes at 100°F)
14	1	R68AB0019	Double Pole Electric Heat Contactor - 50 Amp Resistive
15	1	R68BAD016	45 Amp 245 SQD Circuit Breaker - B02/B03 Only
10 KW Electric Heat			
12	1	R67AB0017	10 KW Element
13	2	R68CA0002	130°F Limit Switch (Opens at 130°F - Closes at 100°F)
14	1	R68AB0019	Double Pole Electric Heat Contactor - 50 Amp Resistive
15	1	R68BAD018	60 Amp 260 SQD Circuit Breaker - B02/B03 Only
DRAIN PANS (PLASTIC)			
18	1	R71AA0042	21.00" W x 5.355" D - Horizontal (71AA0042)

Table 7: B02-34 / S02-34 Electric Heat Air Handler Repair Parts List



S03-42 / 30/36WCW



B03-42 / 30/36WCW

Figure 21: B03-42 / S03-42 / 30/36WCW Electric Heat Air Handler Repair Parts Schematic

B/S03-42 / 30/36WCW ELECTRIC HEAT MODELS			
Item #	Qty.	Part #	Description
1	1	R86HM0042	42-1/3-230-10 X 7 Blower Assembly (Complete Assembly)
2	1	R65BP0014	1/3 HP 208/240V PSC Motor 208/240V
3	1	R69AC0002	10 x 7 Blower Wheel 1/2" Hub - CW Rotation
4	1	R68DE0006	Black Plastic 5 MFD/370V Capacitor
5	1	R68AA0003	208/240-24V Transformer
6	1	R68DC0001	Ground Lug
7	1	R68AC0009	TDR ADJ TYPE Delay On Make Relay - HMPS00C2X30
8	1	R68DC0018	Power Terminal Block - S02/S03/WCW Only
9	1	R73MH0001	3 Amp Fuse
10	1	R73MHA001	Fuse Holder
11	1	R68AB0001	Fan Relay for PSC Motor
5 KW Electric Heat B/S03-42 / 30/36WCW			
12	1	R67AB0015	5 KW Element
13	1	R68CA0002	130°F Limit Switch (Opens at 130°F - Closes at 100°F)
14	1	R68AB0019	Double Pole Electric Heat Contactor - 50 Amp Resistive
15	1	R68BAD013	30 Amp 230 SQD Circuit Breaker - B03 Only
8 KW Electric Heat B/S03-42 / 30/36WCW			
12	1	R67AB0016	8 KW Element
13	1	R68CA0002	130°F Limit Switch (Opens at 130°F - Closes at 100°F)
14	1	R68AB0019	Double Pole Electric Heat Contactor - 50 Amp Resistive
15	1	R68BAD016	45 Amp 245 SQD Circuit Breaker - B03 Only
10 KW Electric Heat B/S03-42 / 30/36WCW			
12	1	R67AB0017	10 KW Element
13	2	R68CA0002	130°F Limit Switch (Opens at 130°F - Closes at 100°F)
14	1	R68AB0019	Double Pole Electric Heat Contactor - 50 Amp Resistive
15	1	R68BAD018	60 Amp 260 SQD Circuit Breaker - B03 Only
12 KW Electric Heat B03-42 / 30/36WCW			
12	1	R67AB0018	12 KW Element
13	2	R68CA0002	130°F Limit Switch (Opens at 130°F - Closes at 100°F)
14	2	R68AB0019	Double Pole Electric Heat Contactor - 50 Amp Resistive
		R68BAD015	40 Amp 240 SQD Circuit Breaker - B03 Only
15	1	R68BAD014	35 Amp 235 SQD Circuit Breaker - B03 Only
15 KW Electric Heat B03-42 / 30/36WCW			
12	1	R67AB0017	10 KW Element
13	1	R67AB0015	5 KW Element
14	3	R68CA0002	130°F Limit Switch (Opens at 130°F - Closes at 100°F)
15	2	R68AB0019	Double Pole Electric Heat Contactor - 50 Amp Resistive
16	1	R68BAD018	60 Amp 260 SQD Circuit Breaker - B03 Only
17	1	R68BAD013	30 Amp 230 SQD Circuit Breaker - B03 Only
DRAIN PANS (PLASTIC)			
18	1	R71AA0042	21.00" W x 5.355" D - Horizontal (71AA0042)

Table 8: B03-42 / S03-42 / 30/36WCW Electric Heat Air Handler Repair Parts List

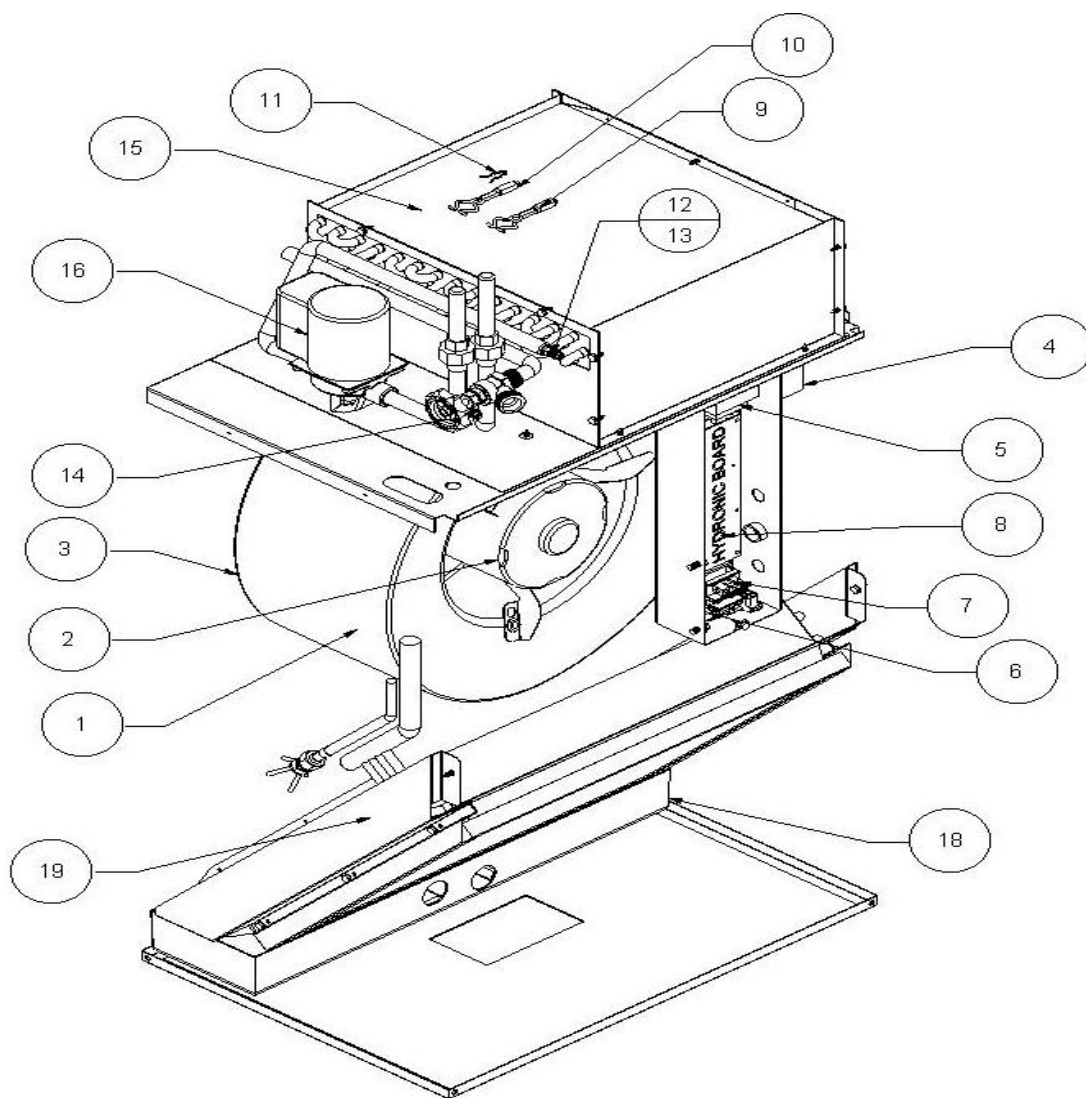


Figure 22: H02-46 / 18-24WCW-HW Hydronic Heat Air Handler Repair Parts Schematic

H02-46 / 18-24WCW-HW HYDRONIC HEATING MODELS			
Item #	Qty.	Part #	Description
1	1	R86HM0046	46-1/4-115-10 X 6 Blower Assembly (Complete Assembly)
2	1	R65BP0015	1/4 HP 120V PSC Motor
3	1	R69AC0001	10 x 6 Blower Wheel 1/2" Hub - CW Rotation
4	1	R68DE0003	5 MFD/370V Capacitor
5	1	R68AA0002	120-24V Transformer
6	1	R68DC0001	Ground Lug
7	1	R68DC0018	Power Terminal Block
8	1	R68AE0010	ICM AY1014 Hydronic Control Board for PSC Blower Motors
9	1	R68DD0005	White Wire Freeze Protector
10	1	R68DD0006	Yellow Wire Compressor Lockout Switch
11	1	R66AB0006	Sensor Clip HW/AH
12	1	R74BA0004	Valve - Air Bleed Body
13	1	R74BA0005	Valve - Air Bleed Core
14	1	R74BB0001	1/2" Boiler Drain
15	1	R86CB0004	3 Row Hot Water Coil 14 x 12.5
16	1	R78AA0007	4 GPM Taco Circulating Pump 120V
DRAIN PANS (PLASTIC)			
18	1	R71AA0042	21.00" W x 5.355" D - Horizontal (71AA0042)

Table 9: H02-46 / 18-24WCW-HW Hydronic Heat Air Handler Repair Parts List

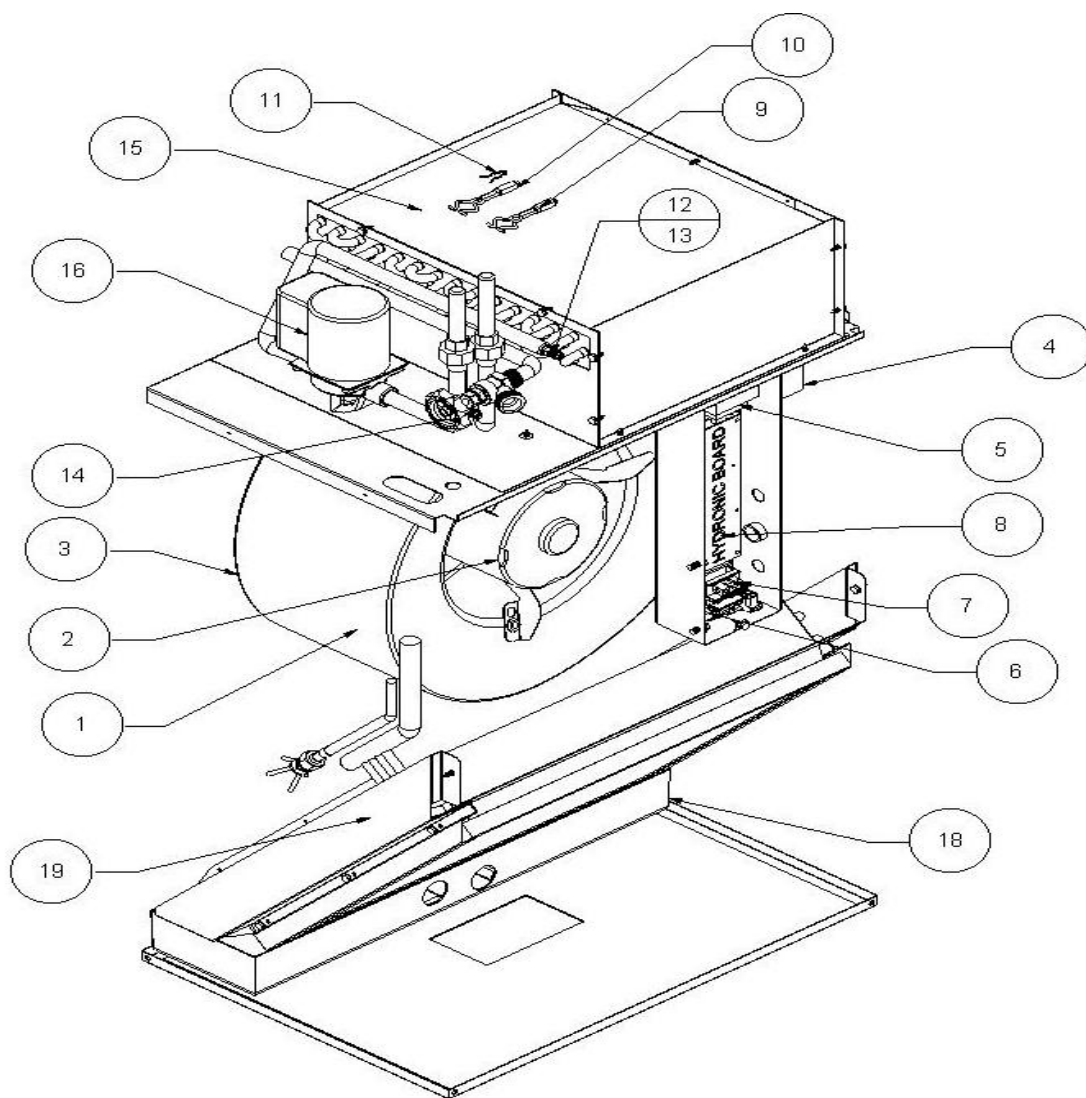


Figure 23: H02-37 Hydronic Heat Air Handler Repair Parts Schematic

H02-37 HYDRONIC HEATING MODELS			
Item #	Qty.	Part #	Description
1	1	R86HM0037	37-1/3-115-10 X 7 Blower Assembly (Complete Assembly)
2	1	R65BP0013	1/3 HP 120V PSC Motor
3	1	R69AC0002	10 x 7 Blower Wheel 1/2" Hub - CW Rotation
4	1	R68DE0003	5 MFD/370V Capacitor
5	1	R68AA0002	120-24V Transformer
6	1	R68DC0001	Ground Lug
7	1	R68DC0018	Power Terminal Block
8	1	R68AE0010	ICM AY1014 Hydronic Control Board for PSC Blower Motors
9	1	R68DD0005	White Wire Freeze Protector
10	1	R68DD0006	Yellow Wire Compressor Lockout Switch
11	1	R66AB0006	Sensor Clip HW/AH
12	1	R74BA0004	Valve - Air Bleed Body
13	1	R74BA0005	Valve - Air Bleed Core
14	1	R74BB0001	1/2" Boiler Drain
15	1	R86CB0004	3 Row Hot Water Coil 14 x 12.5
16	1	R78AA0007	4 GPM Taco Circulating Pump 120V
DRAIN PANS (PLASTIC)			
18	1	R71AA0042	21.00" W x 5.355" D - Horizontal (71AA0042)

Table 10: H02-37 Hydronic Heat Air Handler Repair Parts List

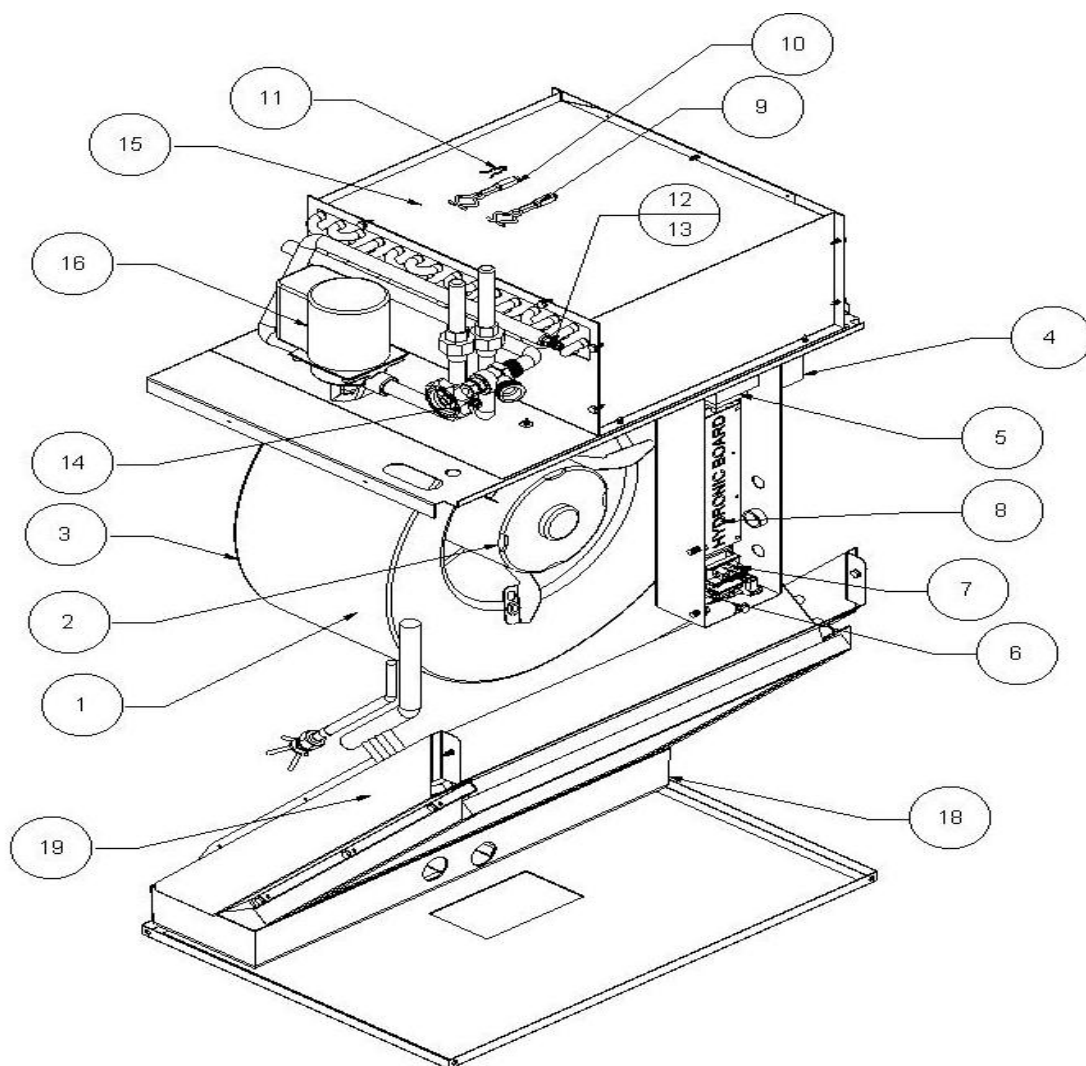


Figure 24: H03-49 / 30-36WCW-HW Hydronic Heat Air Handler Repair Parts Schematic

H03-49 / 30-36WCW-HW HYDRONIC HEATING MODELS			
Item #	Qty.	Part #	Description
1	1	R86HM0049-03	49-1/3-115-10 x 8 Blower Assembly (Complete Assembly)
2	1	R65BP0013	1/3 HP 120V PSC Motor
3	1	R69AC0002	10 x 7 Blower Wheel 1/2" Hub - CW Rotation
4	1	R68DE0003	5 MFD/370V Capacitor
5	1	R68AA0002	120-24V Transformer
6	1	R68DC0001	Ground Lug
7	1	R68DC0018	Power Terminal Block
8	1	R68AE0010	ICM AY1014 Hydronic Control Board for PSC Blower Motors
9	1	R68DD0005	White Wire Freeze Protector
10	1	R68DD0006	Yellow Wire Compressor Lockout Switch
11	1	R66AB0006	Sensor Clip HW/AH
12	1	R74BA0004	Valve - Air Bleed Body
13	1	R74BA0005	Valve - Air Bleed Core
14	1	R74BB0001	1/2" Boiler Drain
15	1	R86CKC101	4 Row Hot Water Coil 16 x 12.5
16	1	R78AA0007	4 GPM Pump 120V
DRAIN PANS (PLASTIC)			
18	1	R71AA0042	21.00" W x 5.355" D - Horizontal (71AA0042)

Table 11: H03-49 / 30-36WCW-HW Hydronic Heat Air Handler Repair Parts List

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61BA0071
Supersedes: 61BF0006 and 61BF0007