

C6 SERIES

Water Source Replacement Unit Installation Operation and Maintenance



Shorefit® HVAC PO Box 1390 Easton MD 21601 USA 410-822-9200 www.shorefithvac.com

Thank you for choosing Shorefit® HVAC products. Our goal is to make sure you remain pleased with your decision to purchase. If you are in need of assistance that is not available or provided by your local installer/contractor feel free to give us a call, write or e-mail us at:

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Shorefit® C6 Water Source Heat Pumps

The Shorefit® C6 vertical-stacked water source heat pumps are terminal units that include a complete refrigeration circuit capable of providing heating or cooling in any zone, at any time.

The Shorefit® C6 units are installed inside furred-in cabinets that are field connected to a simple two pipe, closed loop, supply and return water circuit, and a condensate drain.

Compatibility

This Shorefit® C6 is a direct replacement for Climate Master '816' and '817' vertical stacked water source heat pump chassis. The Shorefit® C6 is dimensionally identical along with the same locations for water, drain, and electrical connection.

The Shorefit C6 chassis is available with flexible water hose connection for replacing 816 chassis having revision level A up to and including L. Accessory hose adapters PFCUNION2 (½ inch) and/or PFCUNION3 (¾ inch) will be required.

Before installation, check the nameplate of the old chassis and new Shorefit® C6 capacity and voltage. Be sure the proper replacement chassis is being installed. The new Shorefit® C6 will work with the original Climate Master blower and controls.

Notes

WARNING!!
 **RISK OF ELECTRIC SHOCK. CAN CAUSE INJURY OR DEATH: DISCONNECT ALL REMOTE ELECTRIC POWER SUPPLIES BEFORE SERVICING** 

DANGER!!
PREVENT ELECTRICAL SHOCK! DISCONNECT POWER BEFORE SERVICING EQUIPMENT.

CAUTION!!
 CONTAINS REFRIGERANT. SYSTEM CONTAINS OIL AND REFRIGERANT UNDER HIGH PRESSURE. RECOVER REFRIGERANT TO RELIEVE PRESSURE BEFORE OPENING THE SYSTEM. FAILURE TO FOLLOW PROPER PROCEDURES CAN RESULT IN PERSONAL ILLNESS OR INJURY OR SEVERE DAMAGE TO EQUIPMENT.

CAUTION!!
 To prevent air by-pass and coil frosting, the cabinet panels must be in place during operation.

USE COPPER SUPPLY WIRES

Filter MUST be cleaned periodically for parts warranty to be in effect

USE ON SINGLE OUTLET CIRCUIT ONLY

Assure correct water GPM is supplied.

Installer - General Information

We have designed and manufactured this unit to be safe and trouble free. As the installer of this unit, you play a major role in assuring intended performance and customer satisfaction. The important information provided here will help you install the unit correctly and eliminate call-backs.

ATTENTION! Please read these instructions carefully and completely before attempting installation. Unit should be installed by qualified service personnel only. **To prevent personal injury and/or death, ensure that all power is disconnected before servicing.**

IMPORTANT! Alterations and replacement parts: Altering the product or replacing parts with non-authorized parts will void the factory warranty and may result in adverse operational performance and/or a possible hazardous safety condition to service personnel and occupants. If you are in doubt as to how to service this unit or where to find factory replacement parts, call Shorefit® HVAC at 410-822-9200 for assistance.

These instructions give information specific to Shorefit® C6 vertical-stacked water source heat pump replacement units. **Local codes, if different from these instructions, must be followed and supplement or supersede these instructions.**

Unpacking and Inspection:

The Shorefit® C6 is shipped completely assembled and individually boxed. Peripheral hardware and wiring are not provided. Set aside these items during removal of the old unit for reuse provided their condition provides full functionality.

All goods are inspected at the factory and released to the freight company in operating condition. When received at the site, a visual inspection of all boxes and units must be made immediately and in the presence of the carrier's representative. Any evidence of rough handling or damage must be noted on the delivery receipt and a claim must be filed with the freight company immediately.

Job Site Storage:

These units are intended for indoor use only. To protect the unit from damage due to the elements and prevent it from possibly becoming a source of contamination causing IAQ problems, the unit should be stored indoors. If indoor storage is not possible, the following provisions must be met:

- 1). Place the unit on a dry surface or raise off the ground to assure adequate air circulation beneath the unit and to assure that no portion of the unit contacts standing water at any time.
- 2). Cover the unit with a water-repellent tarp for protection from the elements.
- 3). Make provisions for continuous venting of the covered unit to prevent moisture from condensing on the unit surfaces.

Removal of Old Chassis:

- 1). **Shut off all power first! Failure to shut off power supplies can result in electric shock and death!**
- 2). Remove the return air panel that provides access to the "816" chassis.
- 3). Disconnect the chassis power supply quick connect plug at the control box.
- 4). Shut off both water valves to isolate the unit from the water loop and disconnect the water connections at the unit connection points. Take note of, and record, the valve position so that the same settings may be used when the new Shorefit® C6 unit is installed. Tag water inlet and outlet to be certain they are connected to the new unit correctly.

Disconnect the drain connection (if required). Pipes should be capped until the new unit is in place and ready to be connected to the system.

- 5). Carefully remove the old chassis from the cabinet. Dispose of properly.

Before Installing the New Chassis

1). Electrical Wiring:

WARNING: To prevent personal injury and/or death, ensure that all power is disconnected before servicing. All electrical connections and wiring should be installed by qualified electricians only and conform to the national electrical code and all local codes having jurisdiction. It is the personal responsibility of the customer to retain said electrician conformance with the latest edition of the national electrical code and/or local codes having jurisdiction.

Use only recommended wiring ampacity as specified on the cabinet unit nameplate and install a single outlet branch circuit. All wiring must comply with all local and national electrical codes.

2). IMPORTANT: MINIMUM AIRFLOW! The new Shorefit® C6 chassis is designed to work with the original unit blower most efficiently at its rated CFM. Over time however, blower/airflow performance will deteriorate due to dirt accumulation in the blower, cabinet, ducts, or registers; loose insulation, air leaks, and/or weak or worn motors. **ANY AIRFLOW DEFICIENCIES MUST BE BROUGHT TO STANDARD BEFORE THE NEW UNIT IS PLACED INTO SERVICE!** Confirm that the minimum airflow delivery is provided using a velometer or other precision airflow-measuring device. Be sure a clean air filter and all panels are in place and that supply registers are open before taking readings. Failure to meet the minimums specified will result in performance and reliability problems and **VOID THE WARRANTY.**

| Cabinet Model | Shorefit® Model | Rated CFM | Min. CFM |
|---------------|-----------------|-----------|----------|
| 10 | 03 | 320 | 220 |
| 15 | 04 | 420 | 280 |
| 20 | 06 | 690 | 470 |
| 28 | 08 | 920 | 650 |
| 30 | 10 | 1000 | 680 |
| 36 | 12 | 1170 | 780 |

3). Fuse/Circuit Breaker:

Use the Shorefit® replacement unit electrical information* on the label along with the cabinet electrical loads to calculate the overcurrent protection requirement



Electrical Label Example

***Chassis compressor electrical information only – Does not include fan/motor or electric heat loads. Use Shorefit® replacement unit electrical information on the label along with the cabinet electrical loads to calculate minimum power supply circuit ampacity (Clause 37.14 of UL 1995 4th Ed) and maximum current rating of overcurrent protection (Clause 37.15 of UL 1995 4th Ed).**

4). Grounding:

WARNING: To prevent possible property damage, personal injury or death, the unit must be used in a cabinet having a grounded power supply.

- 5). Shorefit® C6 units are rated for 208/230V power supply circuits. Unit performance and service life depends on a supply voltage that is maintained between 197V minimum and 252V maximum. Inadequate wiring and/or improper electrical supply will likely result in failure of the compressor and other electrical components and voids the warranty. Units rated for 265V must be maintained between 239V minimum and 292V maximum.
- 6). Inspect the cabinet and duct work and take this opportunity to fix any damaged, broken, or bent parts. Permanently block off any air leaks in the cabinet, especially leaks that will by-pass the air coil of the Shorefit® C6 unit.
- 7). Check the drain line for cuts, kinks or blockage. Repair or replace as necessary.
- 8). Clean dust and dirt from the return air panel.

Operating Limits

Ensure conformance with the operation limits in the chart below.

| Mode | Ambient Air °F | | Entering Air °F | | | | Entering Fluid °F | |
|---------|----------------|-----|-----------------|-----|-----|-----|----------------------|-----|
| | Min | Max | Min | Max | Min | Max | Standard Range (TXV) | |
| | DB | DB | DB | DB | DB | DB | Min | Max |
| Cooling | 60 | 100 | 75 | 63 | 100 | 83 | 60 | 120 |
| Heating | 60 | 80 | 60 | - | 80 | - | 60 | 90 |

Caution: Fluid temperatures listed above refer to pure water. Do not supply water at a temperature below the minimum. Extended range applications require insulated risers and design-condition antifreeze solution.

Minimum GPM/Ton is 2.0

Maximum GPM/Ton is 3.0

Water Loop Piping

- 1). The performance and reliability of the new Shorefit® C6 unit depends on proper water flow rate and water quality. Inadequate water flow rate and/or poor water quality or contamination will result in poor performance and may shorten unit service life. Failure to provide adequate flow and properly maintained water quality may void the new unit Limited Warranty.

WARNING: The condenser water system must be clean and contain minimum oxygen levels to prevent corrosion. Condenser water pH, total dissolved solids and total suspended solids must be maintained within proper limits to prevent equipment failure. Total dissolved solids should not exceed 1000 ppm for a glycol system and 300 ppm for a water-only system. Total suspended solids should not exceed 75 ppm. PH should be between 6.8 and 8.4.

- 2). General: Water lines must be installed in accordance with local and national codes. Care must be taken by the installing contractor to prevent dirt or foreign matter from entering the pipes or piping components during construction/installation. The water lines should not interfere with access to the unit or with filter removal. The use of a 2 or 3 foot flexible hose with a swivel type fitting may simplify the connections and prevent vibration. It is recommended, at minimum, that a combination balancing and close-off (ball) valve be installed at the return and a gate or ball valve be installed at the supply. The return valve can be adjusted to obtain the proper water flow.

Installing the New Chassis

- 1). Support the wiring and water lines so that they are clear and not susceptible to damage as the chassis is moved into position. Carefully move the new chassis into

position inside the cabinet. **Do NOT use the Shorefit® C6 water tubing for a handle.**

- 2). Connect water lines to the water connection points on the new Shorefit® C6 unit, being careful to connect properly and to the correct IN and OUT connection points. If pipe thread fittings are used, use Teflon thread tape or pipe dope. When tightening the water connections use a wrench to support the fittings. Open the water valves to the water loop and set them in the original position as recorded during removal of the old unit. **Check for leaks!**
- 3). Connect the electrical power supply pigtail/ quick connect at the control/power connection. Be sure all wiring is in accordance with the requirements outlined above.
- 4). Replace all cabinet panels.
- 5). Turn on the electrical power at the source.

Use of new Remote Thermostats

The Shorefit® C6 unit uses the same operating logic as the original and is designed to work with the existing blower, controls and thermostat. If you are upgrading to a new thermostat be sure to use a thermostat that has the same signal logic as the original. Proper temperature control and unit operation depends on proper thermostat selection and location. Refer to the thermostat manufacturer's installation instructions for specific recommendations. Good practice is to avoid outside walls, locations where the sun may shine directly on the thermostat, and locations where the air from supply registers or unit outlets blow on the thermostat. Also avoid locations where the thermostat could be jarred by a closing door.

WARNING: The reversing valve must be energized during the applicable mode (could be cooling or heating depending on model) and must remain energized until the opposite mode is engaged. Verification of this thermostat feature must be completed by the installer.

WARNING: The thermostat and/ or ClimateMaster cabinet control system MUST provide anti-short cycle protection to prevent rapid ON/OFF cycling of the compressor in the Shorefit® C6 unit. A delay of at least 5 minutes is required. Assuring this delay is active is the responsibility of the installer. Not to do so **VOIDS THE WARRANTY.**

Pre-Start Quick Check List

Before proceeding with the start-up of individual units, the following should be verified:

- Has the water loop system been flushed and cleaned of construction debris?
- Is the water flow established and circulating through all units?
- Has the water loop system been balanced to design flow rates?
- Is the water temperature and flow rate within the normal operational ranges?
- Has anti-freeze fluid been added to the water system in the proper mix to prevent freezing in a closed system that could, under any condition, fall below the freezing point of water during either the heat pump operating cycle or the down cycle? Refer to the building water/fluid system design specification. The Shorefit® C6 must be the correct model for such application.
- Is the unit properly sized, located, and level with proper clearances?
- If the water lines are hoses, are they reinstalled with a gentle bend radius and not kinked or pinched? Are they in good condition?
- Are water valves open, and no leaks?
- Is the air filter in place and the correct size?
- Is the field wiring properly sized and run according to the unit wiring diagram?
- Are all wiring connections tight including those in unit and compressor electrical boxes?
- Has the unit been properly grounded and fused with the recommended fuse size?
- Has the air conditioning system been checked at the

service ports for refrigerant charge, and leak tested if necessary?

- Does the indoor blower turn freely without rubbing, and tight on the shaft?
- Has all work been done in accordance with applicable local and national codes?
- Are all covers and access panels in place to prevent air loss and safety hazards?

WARNING: Bodily injury can result from high voltage electrical components. If operating checks must be performed with the unit operating, it is the technician's responsibility to recognize the hazards and proceed safely. Failure to do so could result in severe personal injury or death due to electrical shock or contact with moving parts.

Important: Unit should not be operated during the construction phase of any project until dry wall is complete. The coil will clog and warranty will be void.

Operating Instructions

Operation of the unit is automatic and will provide cooling and heating depending on the settings of the thermostat.

Cooling Operation:

- 1). Set the switch on the wall thermostat or unit control panel to the 'cool' position.
- 2). Set the desired temperature by moving the temperature setting lever or dial on the thermostat. If the room is warmer than the setting, the unit will turn on and begin to blow cool air after a few minutes. Note that a warm humid room or building may take several hours of continuous operation to cool to the thermostat set point the first time. Once the set temperature is reached the unit will cycle ON and OFF.
- 3). Set the 'Fan' switch on the thermostat to 'AUTO' if the fan is to be run only when cooling is needed or to 'ON' if continuous air circulation is desired. The 'ON' setting of the fan generally provides better temperature control by eliminating stagnant air.
- 4). Observe unit operation. The unit should be supplying cool air to the conditioning space momentarily. Blower operation should provide smooth air flow with no mechanical knocking; and no frost observed on the air coil face.

- 5). **IMPORTANT!** Wait at least 5 minutes after turning the air conditioner off before trying to restart. This gives the unit the time needed to stabilize before restarting. Failure to do so may damage the unit.
- 6). A properly installed and sized unit will not cycle more than 10 times per hour. If you notice more frequent starts call your service contractor.

Heating Operation:

The Shorefit® C6 heat pumps are designed to also provide heating. Setting the thermostat to the 'Heat' position and setting the desired temperature activates heating operation. Adjust the temperature set point above the room temperature. Warm air should be supplied momentarily. Blower operation should provide smooth air flow with no mechanical knocking.

Final Inspection:

Do a final visual inspection of the entire installation and complete any final details and clean up. **Verify there are no water leaks!**

Maintenance and Service

Water system integrity – Important!

Attention to the water system is critical to avoid leakage and the resulting property damage.

1. After installation or maintenance, the valves and water line connections should be observed closely for leaks. Hoses, if used, must be inspected for cracks and/or leaks and replaced immediately if evident.
2. On a semi-annual basis, inspect hoses, if used, for cracks and/or leaks and replace immediately if evident. Otherwise, replacement is recommended after 5 years of service.

Semi-Annual Maintenance Recommendations

Unit performance is maintained at optimum level and maintenance of the unit simplified by implementing the following preventive measures on a semi-annual basis:

- 1) Hoses, if used – inspect for cracks and/or leaks, replace immediately if evident.
- 2). The heat pump is furnished with a permanent, cleanable or a fiberglass throwaway type air filter. The unit should not be operated without this filter installed. Filters should be inspected at least every three months, and replaced or cleaned when dirty. Unit operation becomes very inefficient with dirty filters. Unit warranty is void if filters are not maintained properly.
- 3). Condensate drains can pick up lint and dirt, especially with dirty filters. Inspect, and if dirty, clean the condensate drain pan twice a year to avoid the possibility of overflow (see section "Inspecting and Cleaning Drain Pans).

- 4). Microbial growth can occur in water source heat pumps anywhere in the air stream where moisture exists. ASHRAE standards 62-89 recommends that these surfaces be inspected and cleaned to limit contamination. This typically includes surfaces beginning at the finned coil, drain pan, insulation, and fan/blowers.
- 5). It is important to check the cleanliness of the water-to-refrigerant heat exchanger. Should it become contaminated with dirt and scaling as a result of poor water quality treatment, the heat exchanger will have to be back-flushed and cleaned with a chemical that will remove the scale. This service should be performed by an experienced service technician.
- 6). A strainer (20 mesh or greater) may be used to keep debris from entering the system and to help ensure a clean system. This is highly recommended on open well and open tower systems.
- 7). Check the tightness of the various wiring connections within the control panel.
- 8). Confirm proper operation of the cabinet fan/blower.

Inspecting and Cleaning Drain Pans

Note: Standing water in drain pans can promote microbial growth (mold) which may cause unpleasant odors and serious health related indoor air quality problems. If microbial growth is found, it must be removed immediately and the unit must be properly cleaned and sanitized. The condensate drain pan and drain line must be checked to ensure that the condensate is draining freely. This inspection should occur a minimum of every six months or more often if necessary.

If evidence of standing water or condensate overflow is found, steps should be taken to identify and repair the cause immediately. Refer to the troubleshooting section of this manual for possible cause and solutions. If microbial growth in the drain pan is observed, it should be cleaned and removed immediately. Drain pans should be cleaned using the following procedure:

- 1). Disconnect all electrical power to the unit.
- 2). Wear the appropriate personal protective equipment.
- 3). Remove all standing water.
- 4). Use a scraper or other tool to remove any solid matter. Remove solid matter with a vacuum device that utilizes High Efficiency Particulate Arresting (HEPA) filters.
- 5). Thoroughly clean the contaminated areas with a mild bleach and water solution or an EPA approved sanitizer specifically designed for HVAC use. Carefully

follow the sanitizer manufacturer's instructions regarding this product.

- 6). Immediately rinse the drain pan thoroughly with fresh water to prevent potential corrosion from the cleaning solution, the drain pan and drain line components.
- 7). Determine and correct the cause of the microbial contamination.
- 8). Be careful that the contaminated material does not come into contact with other areas of the unit or building. Properly dispose of all contaminated materials and used cleaning solution. Store unused solutions according to solution manufacturer's directions.
- 9). Allow the unit to dry thoroughly before putting the system back into service.

Inspecting and Cleaning Finned Air Coils:

Air coils become externally fouled as a result of normal operation. Dirt on the surface of the air coil reduces its ability to transfer heat which can result in comfort problems, increased resistance to airflow and result in increased operating energy costs. If the dirt on the surface of the air coil becomes wet, such as commonly occurs with cooling coils, microbial growth can result which may cause unpleasant odors and serious health related indoor air quality problems.

Air coils should be inspected at least every six months or more often as necessary. The frequency of the required inspection/cleaning is dependent on the operating hours of the system, filter maintenance and efficiency, and cleanliness of the conditioned space.

The following is the suggested method of cleaning air coils:

- 1). **Disconnect all electrical power to the unit.**
- 2). Wear the appropriate personal protective equipment.
- 3). Gain access to the air coil section of the unit (both sides).
- 4). Using a soft brush, remove loose debris from both sides of the air coil.
- 5). Mix a high quality coil cleaning detergent with water according to the manufacturers instructions. If the detergent is strongly alkaline after mixing (8.5 pH or higher), it must contain a corrosion inhibitor. Carefully follow the cleaning solution manufacturer's instructions regarding the use of the product.
- 6). Placed the mixed solution in a pump sprayer or high pressure sprayer. If a high pressure spryer is used, note the following:
 - A. Maintain a minimum nozzle spray angle of 15

degrees.

- B. Spray perpendicular to the coil face.
 - C. Protect other areas of the chassis and controls from contact with moisture or the cleaning solution.
 - D. Keep the nozzle at least 6 inches from the air coil.
 - E. Do **NOT** exceed 600psi.
- 7). Spray the leaving air side of the air coil first, then the entering air side. Use a block-off to prevent spray from going through the air coil and into a dry section of the unit and/or system duct-work. Carefully follow the cleaning solution manufacturer's usage instructions.
 - 8). Thoroughly rinse both sides of the air coil and the drain pan with cool, clean water.
 - 9). Repeat steps 7 and 8 as necessary.
 - 10). Straighten any air coil fins that may have been damaged during the cleaning process. Use a fin comb.
 - 11). Confirm that the drain line remains open following the cleaning process.
 - 12). Replace all panels and parts.
 - 13). Allow the unit to dry before putting unit back in service. Restore electrical power to the unit.
 - 14). Be careful that the contaminated material does not come into contact with other areas of the unit or building. Properly dispose of all contaminated materials and used cleaning solution. Store unused solutions according to solution manufacturer's directions.

Before Calling for Factory Assistance

A call to the factory is sometimes necessary for technical support or service/troubleshooting. We are happy to help! Before calling please gather and record the following information so that we are best able to help.

Shorefit® HVAC
PO Box 1390
Easton, MD 21601
410-822-9200
sales@shorefithvac.com

- ___ Unit Model Number
- ___ Unit Serial Number
- ___ Name of Job or Installation
- ___ Your Name
- ___ Your Company's Name
- ___ Your Company's Address
- ___ Your Company's Phone, Fax, and e-mail
- ___ Room Temperature -DB/WB

Continued on following page

- ___ Entering Water Temperature
- ___ Leaving Water Temperature
- ___ Suction Pressure
- ___ Discharge pressure
- ___ Suction Superheat
- ___ Voltage @ contactor
- ___ Amp Reading (clamp-on)
- ___ Your Diagnosis or Question
- ___ Photo of electrical plug(s) (please email)

Records:

Date of Installation _____
 Model number _____
 Serial number _____
 Installing Contractor _____
 Address _____
 Phone No. _____

Service/Maintenance

| Date | Work Performed | BY |
|-------|----------------|-------|
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |

Notes: _____

TROUBLESHOOTING CHART

The troubleshooting chart that follows is provided to serve as an aid for identifying malfunctions that may occur.

Troubleshooting must only be performed by qualified and/or licensed technicians.

Within the chart are three columns.

1. The **Problems** column describes what the unit is doing.
2. The **Cause** column identifies the most likely sources of the problem.
3. The **Correction** column describes what should be done to correct the problem.

| Problem | Heating | Cooling | Cause | Correction | |
|-------------------------------------|---------|---------|---|---|--------------------------------|
| No response to thermostat setting | X | X | Main power off | Check fuses | |
| | X | X | Defective control transformer | Replace | |
| | X | X | Broken or loose connection | Repair | |
| | X | X | Defective thermostat | Replace | |
| Unit short cycles | X | X | Thermostat or sensor improperly located | Relocate | |
| | X | X | Defective thermostat or cabinet controls | Replace | |
| Blower runs but compressor does not | X | X | Defective compressor overload | Replace (if external) | |
| | X | X | Defective compressor contactor | Replace | |
| | X | X | Supply voltage too low | Correct | |
| | X | X | Defective compressor capacitor | Replace | |
| | X | X | Defective windings | Replace | |
| | X | X | Limit switches open | Check cause/replace or repair | |
| | X | X | Dirty Filter | Replace/clean | |
| | X | X | Blower RPM too low (PSC motor only) | Correct | |
| | X | X | Conditioned air loss due to ductwork leak | Repair leaks | |
| | | | X | Introduction of excessively hot return air | Correct |
| | X | | | Introduction of excessively cold return air | Correct |
| | X | X | | Low on refrigerant charge | Locate leak, repair & recharge |
| | X | X | | Restricted metering device | Replace |
| | X | X | | Defective reversing valve | Check/replace |
| | X | X | | Thermostat improperly located | Relocate |
| | X | X | | Unit undersized | Recalculate heat gains/losses |
| | X | X | | Inadequate water flow | Increase GPM |
| | X | X | | Scaling in coil | Clean or replace |
| | | | X | Water too hot | Decrease water temperature |
| | X | | | Water too cold | Increase water temperature |
| High pressure switch open | | X | Inadequate GPM | Increase | |
| | | X | Water too hot | Decrease temperature | |
| | X | | Inadequate air flow | Check, clean blower and coil | |
| | X | | Dirty filter | Clean/replace | |
| | X | X | Overcharged with refrigerant | Decrease charge | |
| | X | X | Defective pressure switch | Check/replace | |

| | | | | |
|---|---|---|------------------------------|--|
| High head pressure | X | X | Contaminated water/ clogs | Backflush |
| | | X | Low water flow | Increase GPM |
| | X | | Overcharge of refrigerant | Decrease charge |
| | X | X | Non-condensable in system | Evacuate and recharge |
| | X | X | Water too hot | Decrease temperature |
| | X | X | Dirty filter | Clean/replace |
| | X | X | Inadequate air flow | Check, clean blower and coil |
| Low suction pressure | X | X | Undercharged | Locate leak, repair & recharge |
| | X | X | Restricted metering device | Repair/replace |
| | | X | Inadequate air flow | Check, clean blower and coil |
| | | X | Dirty filter | Clean/replace |
| | X | | Inadequate GPM | Increase |
| Freezes- tat open or temperature sensor shuts ---off unit | X | | Inadequate GPM | Increase |
| | X | | Water too cold | Increase |
| | | X | Defective | Replace |
| | | X | Heat transfer fluid too cold | Replace The replacement freeze stat or sensor must be specified per the building water/fluid system design. |