

WATER HEATING HEAT PUMP INSTALLATION CHECK OFF SHEET

READ ENTIRE MANUAL PRIOR TO START UP

INSTALLATION

Inspection

- Upon receipt of equipment, inspect for shortages and damage. Refer to Section 6.1 in the manual if this occurred.
- Check the electrical characteristics on nameplate of unit with the power supply.
- Remove all **red** shipping brackets and bracing applied to unit.

Mounting

- Compressor: Remove any shipping shims if present.
- Location: Position the heat pump so the unit can be easily serviced through access panels.
- Confirm Dimensions from walls and obstructions are within specifications.

Electrical

- Supply: Supply wiring is single point in the unit control panel.
- Control: Control wiring is single point in the unit control panel (shielded from power).
- Wire Size: Incoming line conductors must be sized according to national and local codes for the voltage, and amperage shown on the unit nameplate.
- If machine is equipped with a PLC, read PLC manual prior to start up.
- Have a copy of the wiring diagram to reference if needed.

Water Piping

- Source Water Circulating Pump: Source water circulating pump is to be appropriately sized for the source water system and is to be provided by others.

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- For proper heat pump operation it is important to plumb the water piping and storage tanks as indicated in the appropriate piping diagrams. **Refer to Colmac Engineering Bulletin 940126-0003.**
- Insulation: Hot water piping and storage tanks should be insulated.
- Pipe Sizing: System piping sized for the minimum allowable water flow rate required for the heat pump.
- Ensure water pH compatible with system components. Reference I & O M 940126-0001 for information on dissolved solids.
- Existing water tanks properly cleaned of contaminants.
- Ensure strainer/filter in place on source and potable water circuits.
- Ensure purge valves are installed on piping. Refer to Colmac Engineering Bulletin 940126-0003.

Booster Pump

- Is synchronized with operation of heat pump. In piping systems where the heat pump is located far away from the storage tanks.

Source & System Water Valves

- Sequenced to open to establish flow prior to heat pump operation.

Net Positive Suction Head (NPSH)

- Verify NPSH is adequate for internal circulation pumps.

Condensate Drain

- Normal operation of air source heat pumps. Pipe the condensate drain with a "P" trap to prevent drain system air from being drawn back into the unit.
- Check that the drain is not blocked.

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Aquastat

General: Heat pump water heaters that are controlled by a remote aquastat. (Provided by others. Colmac does not provide aquastats. PLC machines include tank temperature thermocouples for internal operation)

- Sensing Bulb: The use of a sensing bulb well with thermal mastic.
- Wiring: The aquastat will provide the heat pump run signal through a set of normally open non-powered contacts on the aquastat's output relay.
- It is critical to set the aquastat differential large enough so that the heat pump runs for at least 10 minutes once it starts.**
- Ensure location of probe to prevent compressor short cycling. Refer to Colmac Engineering Bulletin 940126-0003.

OPERATION

ELECTRICAL

- DO NOT** turn the machine on or push any of the controls until you have read and understood the Operating Instructions. See Section 7 of the Manual.
- Be familiar with all safety release switches.
- Use of the "Lockout-Tagout" method is required.**
- Check all electrical connections for tightness. Transportation may have caused threaded connections to loosen.

e-TCV (Electronic Temperature Control Valve)

- Motion of valve smooth and stable.
- Ensure valve has not locked open or closed after venting.

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Prior to Startup

Venting: Ensure the water side of the system has been vented at the system high point and the heat pump water piping is free from air. **Failure to do so can lead to pump failure. See Section 7.1.8 of the Manual.** If water source, both evaporator and condenser purging is required.

- Check incoming voltage at the heat pump disconnect to ensure the proper voltage is available and all phases are present.
- Have a clamp amp meter (or equivalent) available and ready to measure total amperage.
- Have thermometer available and ready to measure output temperature.
- Gauges: A standard set of refrigeration gauges should be installed on the suction and discharge lines to monitor the refrigeration side of the unit during startup. Low loss fittings are discouraged due to critical charged system.
- Multiple compressor units should be evaluated one at a time for proper start up operations.

Startup

- Energize the heat pump power source. The Power On light will illuminate.
- Ensure phase monitor is phase aligned.
- Check for rotation all three phase motors on three phase model heat pumps.
- If no phase monitor is present in the design, monitor rotation is primary indicator
- Check the line current with the amp probe, this value should be below the rated full load current stated on the heat pump wiring diagram and the heat pump serial tag.
- Monitor the temperature difference between source inlet and source outlet water. This value should be between 7°F (3°C) and 10°F (7°C) if the heat pump is operating correctly.
- On air source units (HPA), monitor the temperature difference between the inlet and out air. The leaving air temperature should be lower than the entering air temperature, typically 15°F (7-10°C).

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- On water source units (HPW), monitor the temperature difference between the inlet and outsource (sanitary) water. (The output temperature is adjustable.)
- Monitor the liquid refrigerant sight glass for clarity and indicator color.
- Warranty Registration Card: It is very important to fill out the Warranty Registration Card completely (including startup information) and send it in to the factory. This will allow the factory to document the successful startup.
- The scroll compressors that are delivered with threaded Rotalock shut off valves. ***It is strongly recommended to periodically re-torque all fixing connections to the original setting after the system has been put into operation. Initial re-torquing shall take place 7 days after initial startup.***
- Check to see if factory applied thread lock compound is present or appears to have been disturbed.
- It is very important to insure the HPA/HPW heat pump is operating with the proper amount of Suction Superheat. *NOTE: Suction Superheat should be between 10°F and 15°F (5.6°C and 8.5°C) during normal operating conditions. PLC units with electronic TXV valves should not require adjustment. Refer to PLC manual for reference.
- Units with high temperature source circuit option, ΔT must be checked for conditions. Consult factory id equipped with this feature.

MAINTENANCE

Air Filter (Air Source Units)

- The standard air filter is in place and covering evaporator coil.
- Evaporator fins should be straightened condition and free of contaminates.

Blower Belts and Bearings (Air Source Units)

- Pre lubricated at the factory. See maintenance schedule in the manual. Refer to Table 4 in Section 8.3 in the manual for lubrication intervals.



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- Check for Tension.

Source Water Strainer (Water Source Units)

- Y-strainers are to be flushed to remove any particulate that may accumulate.

Electrical Connections

- While the heat pump is de-energized all electrical connections should be checked to ensure they are tight.

Refrigerant Gauge Ports

- Replace port caps after access.

Access Panels

- Should be in place and secured.

POST START UP

Operator Training

- PLC: screens- alarms, settings.
- Electrical controls- controls, panel layout, time delays, electrical diagram, location of circuit components.
- Gauge ports, pressures, and refrigerant.

Maintenance Training

- Filters
- Bearings
- Heat Exchangers
- Pumps



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- Coil Maintenance
- Drains
- Electrical Components

Safety Training

- Electrical Danger and Lock Out-Tag Out Method
- Temperature Settings
- Pinch Hazards
- Confined Space Considerations
- Refrigeration Risks

Warranty Card Completion

- Fill out and return warranty card to factory
- Go over warranty card with customer
- Discuss Warranty procedures with customer

Owner's Manual

- Go over owner's manual with customer
- Ensure customer has owner's manuals and electrical drawings.
- Ensure customer has PLC manual if so equipped.