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Compressor Burn Out and Water Contamination Repair Procedure

SERVICE BULLETIN

Overview: This bulletin addresses the proper repair for EarthLinked® systems that have failed due to (1) compressor burn out and (2) water contamination of the system due to refrigerant to water heat exchanger rupture. The most common cause of heat exchanger rupture is due to inadequate freeze protection.

Models: The following compressor burn out procedure applies to all models of EarthLinked® compressor units. For water contamination due to heat exchanger rupture, this procedure applies to EarthLinked® models SCW, HCW and HWW compressor units and all EarthLinked® systems utilizing HWM hydronic water modules for radiant panel hydronic heating and/or chilled water cooling.

Field Service Procedure:

Guidelines for the repair of a contaminated EarthLinked® system

- An EarthLinked® system that has water contamination can be repaired by following the steps listed.
- Determine the source of contamination and correct it. Assessment of the compressor unit, earth loops, water modules, air handler, etc. will be necessary. Check for water, acid, water in lubricant, etc.
- Complete replacement of the compressor unit and/or hydronic water module may be necessary.
- Prior to start-up and re-commissioning the repaired system, the hydronic/chilled water circuit must be protected by (1) the model FP-1872 freeze protection thermostat on the heat exchanger and (2) a glycol anti-freeze solution appropriate for the application-specific temperature.

For water contamination, follow steps 1 through 4.

For compressor mechanical failure or burn out follow steps 2 through 4.

Step 1: Water contamination assessment

- If water has entered the compressor, active charge control (ACC), liquid flow control (LFC) or any of the heat exchangers, safely remove the damaged EarthLinked® component from the system by reclaiming all pressurized refrigerant. Cut each line set

connected to the component. Seal the unit by brazing all of the connections shut before properly discarding the damaged unit.

- Isolate each component (air handler, earth loops, water modules, etc.) and properly mark their line sets for future installation.

- Install service valves on the earth loop line set to later isolate them from the compressor unit. Protect the service valves from heat by wrapping each in a wet cloth before brazing. Close service valves after they have cooled.

- Locate and excavate earth loop manifolds. Remove each earth loop from the manifolds, using the proper protective equipment. Purge each loop of the system with approximately 400 psig dry nitrogen, entering the vapor line (larger diameter) and exiting the liquid line (smaller diameter) to thoroughly expel all the water and contamination from each earth loop. Reconnect the earth loops to the manifolds and pressurize to 400 psig before leak checking each joint. After completing this successfully**, go to Step 3.**

Step 2: Compressor replacement

- Safely reclaim all pressurized refrigerant. Remove and replace the damaged EarthLinked® compressor unit. Cut each line set connected to all other system components (to enable complete removal of the compressor unit from the system). Seal (braze) each line set to prevent further contamination.

- Isolate each component (air handler, earth loops, water modules, etc.) and properly mark their line sets for future re-installation.

Step 3: Purging and flushing

- Using the proper protective equipment, purge each portion of the system with approximately 400 psig dry nitrogen entering each vapor line (larger diameter) and exiting the liquid line (smaller diameter) to thoroughly expel all water and contamination from each component. Multiple purges may be required to expel all contamination. In a well ventilated area, capture all residue in a cloth inside an open container and dispose of properly.

- After purging all of the other system components, read and understand the instructions for the **Sporlan Flush Kit (Part # SFKIT2)** and **Parflush Solvent (32 Oz) Part # PF-2** before beginning the flushing process.

- Flush each part of the system separately using the proper protective equipment. In a well ventilated area, capture the residue and dispose of it after the flushing process is

completed and in accordance with local regulations.

- **Never inject flush solvent into a compressor or a compressor unit!**

- After flushing each component, apply approximately 400 psig dry nitrogen to eject all water and contaminated solvent from each component and line set, until the flush material coming out appears clean. Repeat process as necessary.

- Install service valves on each line set to later isolate each from the compressor unit. Protect the service valves by wrapping them with a wet cloth before brazing.

- Close service valves and evacuate each component circuit to below 400 microns. Then charge each circuit with dry nitrogen to 120 psig as a holding charge.

Step 4: Re-commissioning the compressor unit

- After all component circuits have been properly flushed, evacuated and pressurized, safely release the nitrogen pressure on each component.

- Install the compressor unit and re-connect all components correctly.

- Install the new filter dryer supplied with the flush kit, replacing the one inside the compressor unit.

- **Purge with dry nitrogen during the brazing process!**

- Verify all service valves are open and insert a trace amount of the correct system refrigerant. Finish filling the entire system with dry nitrogen to a pressure of 150 psig.

- Leak check the system. After a successful leak check, release the pressurized trace gas and nitrogen into a well ventilated area.

- After the pressure is released, install an accurate digital micron gage on the earth loop liquid line service valve access port. Be sure it has a shut off valve so it can be isolated later in the process. Install a quality vacuum pump (with a minimum capacity of 6 cfm) to the system.

- The time to achieve the required vacuum varies due to system size and volume. Expect a minimum time of 10 to 12 hours to complete the evacuation procedure.

- It may be necessary to change the lubricant in the vacuum pump multiple times during the evacuation process, due to contamination of the lubricant. If this is the case, purge the system with dry nitrogen to slightly above atmospheric pressure between lubricant changes. Release the pressure and re-start the evacuation process.

- Evacuate the system to 230 microns, isolate the vacuum pump, and verify that the pressure does not exceed 280 microns within 5 minutes. If it exceeds 280 microns, continue the evacuation process until the requirement is met.

- After completing the evacuation process, shut off a gages, remove the vacuum pump and isolate the micron gage before removal.

- **Do not remove the micron gage while the system is under vacuum!**

- Follow the **System Start-Up** procedure detailed in the *EarthLinked® Heating and Cooling System Installation, Operation and Maintenance Manual.*

- Prior to start-up and re-commissioning the repaired system, the hydronic/chilled water circuit must be protected by (1) the model FP-1872 freeze protection thermostat on the heat exchanger and (2) a glycol anti-freeze solution appropriate for the application-specific temperature.

Warranty: To be eligible for in-warranty coverage, ETI Technical Support must formally authorize such coverage on the *EarthLinked Technical Support Request (LIT-166)* at the time of diagnosis and prior to proceeding with the system repair. In-warranty coverage will be in accordance with *In-Warranty Allowances for EarthLinked® Components and DIRECT AXXESS® Earth Loops, (LIT-66),* current at the time of ETI authorization to proceed with the system repair.

Contact: ETI Customer Support at 863-701-0096.