YORK

Service Information

File In/With: N/A	SI0348 New 517
Equipment Affected: Centrifugal Chillers with VSD	
VSD Cleaning Procedure	

GENERAL

This is the process used to clean the internal cooling loop of a Variable Speed Drive (VSD) or Solid State Starter (SSS) unit when the current inhibitor has been compromised by bacteria or a biological growth. If the current inhibitor has a strong ammonia odor, a moldy bread yeast smell, floating mold inside the reservoir, or looks like a brown soupy mixture, these procedures must be followed.

Items Required

- ☐ External pump to assist with filling
- ☐ Plastic tubing
- ☐ Rubber gloves
- ☐ Gallon(s) of distilled water to enable three (3) system flushes
- ☐ JCI Cleaner – 5 gallon container (P/N-013-03909-000)
- ☐ JCI Inhibitor – 5 gallon container (P/N-013-03908-000)
- ☐ JCI Inhibitor – 1 gallon container to top off cooling loop if necessary (P/N 013-02987-000)
- ☐ 5 gallon bucket to contain fluids drained from VSD

NOTE: Inhibitors P/N-013-03908-000 and P/N 013-02987-000 are the same product, just different quantities.

Supporting Documents

- ☐ MSDS sheets for the Cleaner – should be included with shipment
- ☐ MSDS sheets for the Inhibitor – should be included with shipment
- ☐ SI0270 How to Drain, Fill, and Vent the Raptyr VSD Coolant Loop
- ☐ Optional: Set-up instructions for external pump and reservoir
- ☐ Optional: Instructions for 120 VAC Powering of OptiView with VSD De-energized

Work on this equipment should only be done by properly trained personnel who are qualified to work on this type of equipment. Failure to comply with this requirement could expose the worker, the equipment and the building and its inhabitants to the risk of injury or property damage.

The instructions on this service bulletin are written assuming the individual who will perform this work is a fully trained HVAC & R journeyman or equivalent, certified in refrigerant handling and recovery techniques, and knowledgeable with regard to electrical lock out/tag out procedures. The individual performing this work should be aware of and comply with all Johnson Controls, national, state and local safety and environmental regulations while carrying out this work. Before attempting to work on any equipment, the individual should be thoroughly familiar with the equipment by reading and understanding the associated service literature applicable to the equipment. If you do not have this literature, you may obtain it by contacting a Johnson Controls Service Office.

Should there be any question concerning any aspect of the tasks outlined in this bulletin, please consult a Johnson Controls Service Office prior to attempting the work. Please be aware that this information may be time sensitive and that Johnson Controls reserves the right to revise this information at any time. Be certain you are working with the latest information.

Product Technical Support

DAY 1 – Site prep, VSD prep, drain contaminated inhibitor, fill with cleaner and run overnight

1. The mechanical room should be prepped in order to maintain a neat and organized operation. All fluids drained from the VSD should be collected and disposed of in accordance with local policy and regulations.
2. De-energize the VSD, and utilizing the SI0270 procedure drain the contaminated inhibitor from the VSD/SSS. If necessary, the use of low pressure air can be utilized to purge the contaminated inhibitor. To avoid rupturing any seals that will result in internal coolant leaks, apply no more than 5 psig to purge the system.
3. Utilizing the SI0270 procedure fill and vent the system to normal operating levels with the JCI Cleaning Solution.
    a. Operate pump and check for leaks.
    b. Circulate the cleaning solution for approximately 24 hours by manually engaging the VSD pump.

Do not operate the VSD or run the chiller with the cleaning solution in the cooling loop.

Do not leave the cleaning solution in the VSD overnight without continuous run of the pump.

DAY 2 - Draining cleaner, flushing system, restoring to run condition

1. De-energize the VSD, and utilizing the SI0270 procedure drain the ***cleaning solution*** from the VSD/SSS. If necessary, the use of low pressure air can be utilized to purge the contaminated inhibitor. To avoid rupturing any seals that will result in internal coolant leaks, apply no more than 5 psig to purge the system.
2. **First Flushing:** Utilizing the SI0270 procedure fill and vent the system to normal operating levels with flush water (distilled or deionized water).
    a. Operate pump and check for leaks.
    b. Circulate the flush water solution for approximately 1-1/2 hours by manually engaging the VSD pump.

Do not operate the VSD or run the chiller with the flush water in the cooling loop.

3. De-energize the VSD, and utilizing the SI0270 procedure drain the ***first flushing*** from the VSD/SSS. If necessary, the use of low pressure air can be utilized to purge the contaminated inhibitor. To avoid rupturing any seals that will result in internal coolant leaks, apply no more than 5 psig to purge the system.
4. **Second Flushing:** Utilizing the SI0270 procedure fill and vent the system to normal operating levels with flush water (distilled or deionized water).

5. Operate pump and check for leaks.
   a. Circulate the flush water solution for approximately 1-1/2 hours by manually engaging the VSD pump.

Do not operate the VSD or run the chiller with the flush water in the cooling loop.

6. De-energize the VSD, and utilizing the SI0270 procedure, drain the ***second flushing*** into a storage container for disposal according to local regulations. If necessary, use very low pressure air to purge the system. To avoid rupturing any seals that will result in internal coolant leaks, apply no more than 5 psig to purge the system.
7. **Third Flushing:** Utilizing the SI0270 procedure fill and vent the system to normal operating levels with flush water (distilled or deionized water).
8. Operate pump and check for leaks.
   a. Circulate the flush water solution for approximately 1-1/2 hours by manually engaging the VSD pump.

Do not operate the VSD or run the chiller with the flush water in the cooling loop.

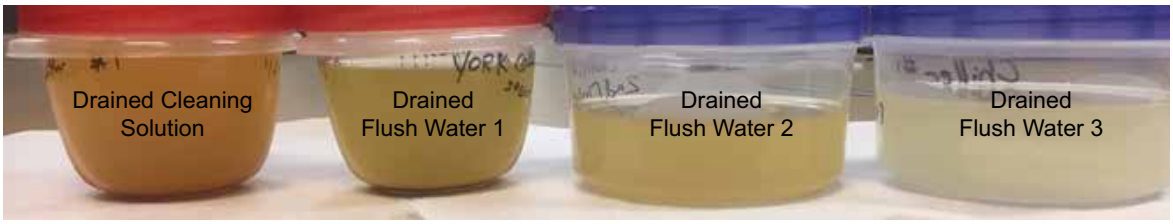
9. De-energize the VSD, and utilizing the SI0270 procedure drain the ***third flushing*** from the VSD/SSS. If necessary, the use of low pressure air can be utilized to purge the contaminated inhibitor. To avoid rupturing any seals that will result in internal coolant leaks, apply no more than 5 psig to purge the system.

Do not operate the VSD or run the chiller with the flush water in the cooling loop.

10. Remove the external pump and any additional equipment utilized during the cleaning process. Discard any transfer tubing or hoses used during the cleaning procedure. Be sure to clean the VSD reservoir with a small amount of cleaning solution or bleach prior to refilling the unit with inhibitor.
11. **New Inhibitor:** Utilizing the SI0270 procedure fill and vent the system to normal operating levels with the new inhibitor.

This is the end of the cleaning process. See the following page for images of fluid sample progression and Follow-Up instructions.

In the image below, notice the color of the fluid samples taken after each draining process (1-3) defined above. During the cleaning process it is not uncommon for the cleaning solution or the flush water to appear discolored. However, as the cleaning process progresses with flushing, the clarity of the water should improve.



FOLLOW-UP

1. At 3 months, 6 months and 12 months after replacing the inhibitor, confirm the effectiveness of the cleaning procedure by removing a small sample of the VSD inhibitor solution and checking for clarity.