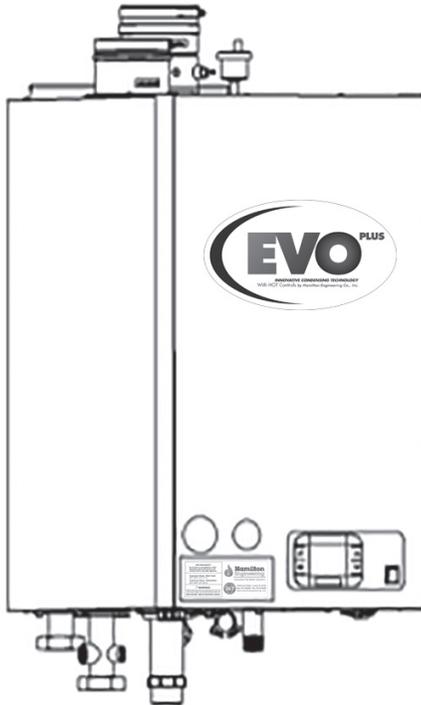


# WATER SIDE HEAT EXCHANGER CLEANING PROCEDURE

## EVO 299-599



**EVO 299.2/.3-599.2/.3**

**300,000 BTU/hr**

**399,000 BTU/hr**

**630,000 BTU/hr**

### **WARNING**

These appliances **MUST** be installed by a properly licensed individual in the City and State which the unit is being installed. All start up adjustments and subsequent service work must be done by a similarly licensed contractor or a factory trained service individual. Failure to comply could result in loss of warranty and or severe personal injury, death and or substantial property damage.

## INTRODUCTION

All high efficiency condensing appliances will require more maintenance (cleaning) than their non-condensing counterparts. Failure to properly maintain these units may result in damage to the appliance that is not covered under warranty. Failure to follow all of the instructions contained in this manual may also cause premature product failure that may not be covered under warranty.

Normal descaling can be accomplished in two hours per unit, and (except under the most severe conditions) should not require more than four hours. **DS40 FERNOX** is the descaling solution recommended by our stainless steel manufacturer.

## WHEN TO CLEAN

In some extreme applications (hard water and/or higher than normal operating temperatures) the heat exchanger may require chemical cleaning. If you are experiencing H11 lockouts that cannot be attributed to pump related problems or remedied by back flushing the heater with city water pressure, chemical cleaning of the heater is likely your maintenance solution.

Additionally, if your heating boiler or water heater is experiencing 'popping', 'banging', or 'knocking' noise and shaking as a result of the water boiling as it circulates through the heat exchanger and it can not be attributed to the circulating pump, chemical cleaning of the heat exchanger may be required.

**PLEASE NOTE:** If any of these noises are heard, the appliance should not be operated until the cause is identified and resolved!

Chemical cleaning of the heat exchanger should only be done at the direction of Hamilton Engineering Company, Inc. Failure to follow the prescribed cleaning procedure will result in voiding any warranty of the heat exchanger.

## DESCALING SOLUTION



**DS40** is a highly effective, heat activated descaling solution. It must be heated to 160°–180°F to clean efficiently! Follow instructions listed below.

Kit (P/N HEX 61102) includes 3.3 lb. (1.5 kg) container of DS40 and a pack of neutralizer, which is used to neutralize the used cleaning solution before discarding it. 3.3 lb (1.5 kg) will treat up to 20 gallons of water.

### MIX RATIO:

HW299–HW599 (Duo): 1/2 (~1.6 lb.) of container per 8–10 gallons of hot water.

Add hot water, agitate until dissolved.

For additional information, consult manual inside box or go to [www.fernox.com](http://www.fernox.com)

## DESCALING PROCEDURE

(using DS40 cleaning kit)

1. Shut off gas at appliance
2. Shut off water to and from appliance (isolate via ball valves); drain water

**NOTE:** In some cases, you may want positive isolation of the cleaning solution from the rest of the system. Breaking the unions on the water lines, removing the nipples and fittings from the manifolds, and then capping the manifold openings will accomplish isolation. This would be done between steps 2 & 3.

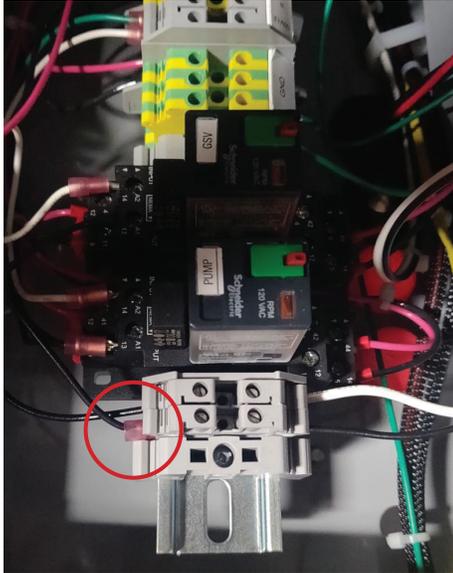
3. Attach a hose to the drain on the ball valve below the pump if so equipped. If your heater does not have a drain, remove the pump and attach a water spigot to a flange and install where the pump was.



4. Attach female end of hose to the adapter; the termination end of the hose will go into the acid solution bucket.
5. Attach the female end of the other hose to the drain valve connection on the outlet side of boiler, then attach the opposite end to the chemical pump.
6. Pour water into plastic, chemical and heat resistant 5–10 gallon container (depending on size of appliance). Add cleaning solution. See 'Descaling Solution' above for required amounts. Prime the pump.
7. Turn on pump and circulate solution (this is the reverse of normal flow).
8. On models HW 299.2, HW 399.2 & HW 599.2 you will need to change parameters S14 and S15 from 1 to 0. This will allow you to fire the heater in service mode without tripping faults. **See the next line for .3 models.**

On models HW 299.3, HW 399.3 and HW 599.3 it will be necessary to bypass the flow switch. Remove the two black wires that are next to each other on connector, use a wire nut to connect the two black wires to each other. See area circled in photo below.

9. The DS40 needs to be heated to between 160°F and 180°F. To heat the solution put the heater in service mode and fire the heater at low fire. Monitor the temperature via the display and once the solution is up to temp



take the heater out of service and continue to pump the solution, if the temperature drops below 160°F fire the heater again.

Put the heater into service mode by pressing the down arrow to get into setup, then press the check mark to select.

Press the down arrow to get to service, then the check mark to select.

Press the down arrow to get to burner, then press the check mark to select.

Press the check mark to select start. Press down arrow to go to service. Then the check mark to select.

Burner will come up press the check mark.

Press the down arrow to speed, then press the check mark you should then be able to change speeds using the up and down arrows.

After circulation is established:

- A. If, within 15–30 minutes of starting, the clean solution turns GREEN (an indication it's cleaning power is exhausted), additional DS40 System Cleaner needs to be added.

Hamilton Engineering Company, Inc. recommends that chemical cleaning should be done for no longer than 4 hours, changing direction of the flow in the middle of operation. Timing will depend on the condition of the system and circulation rate.

10. Turn the power switch to OFF.
11. Flush heater with clear water. Circulate clear water through pump and lines. Add acid neutralizer to the used solution. The color will change from red to yellow/green (solution is ready for discard). Rinse plastic container.
12. Reconnect flow switch on models HW 299.3, HW 399.3 & HW 599.3.

On models HW 299.2, HW 399.2 & HW 599.2 change parameters S14 and S15 from back to 1 from 0.

13. Return heater to service.

## **BE SURE APPLIANCE IS FILLED WITH WATER BEFORE TURNING POWER ON!**

Follow Start-Up Procedures covered in Part 6 of *D118980, Installing, Operating & Maintaining EVO 299.2/.3–599.2/.3 High Efficiency Water Heaters and Heating Boilers Manual*.

**NOTE:** In the case of a completely plugged heat exchanger, chemical cleaning is almost impossible because of absence of flow. Appliance must be returned to Hamilton Engineering for exchanger replacement. Water quality issues are not covered by warranty.