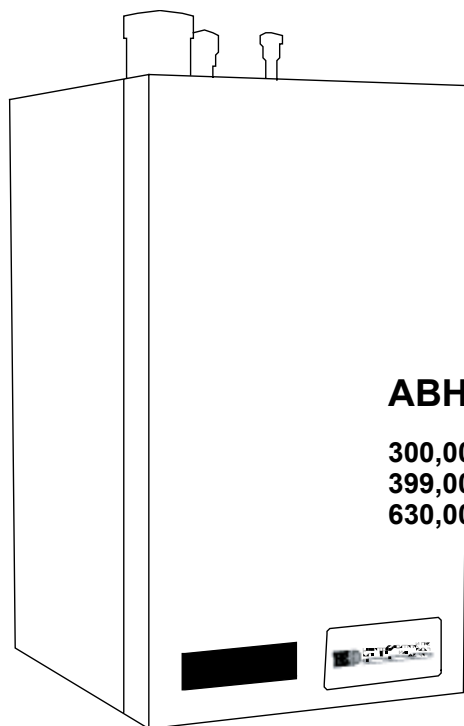




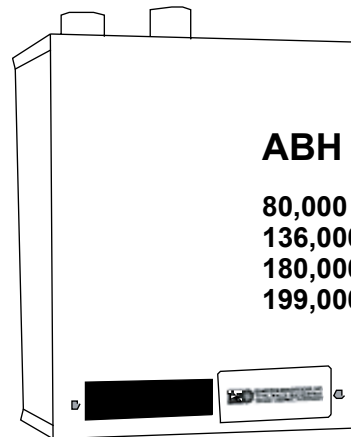
# **ABH 79 - 599**

## **Water Side Heat Exchanger Cleaning Procedure**



**ABH 299-599**

300,000 BTU/hr  
399,000 BTU/hr  
630,000 BTU/hr



**ABH 79-199**

80,000 BTU/hr  
136,000 BTU/hr  
180,000 BTU/hr  
199,000 BTU/hr



### **WARNING**

These appliances **MUST** be installed by a properly licensed individual in the City and State in 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.



# Water Side Heat Exchanger Cleaning Procedure

## 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 E6 lockouts (water heaters only) 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.

**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 Armstrong Hot Water, 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:

HW79 - HW199 (Micro): 1/3 (~1 lb.) of container per 4 - 5 gallons of hot water

HW199 - 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)

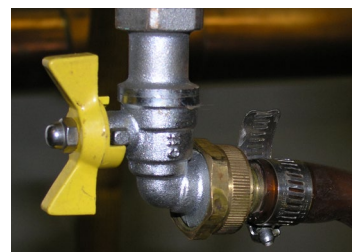
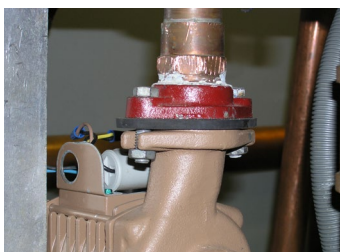


## Descaling Procedure (Using Ds40 Cleaning Kit)

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

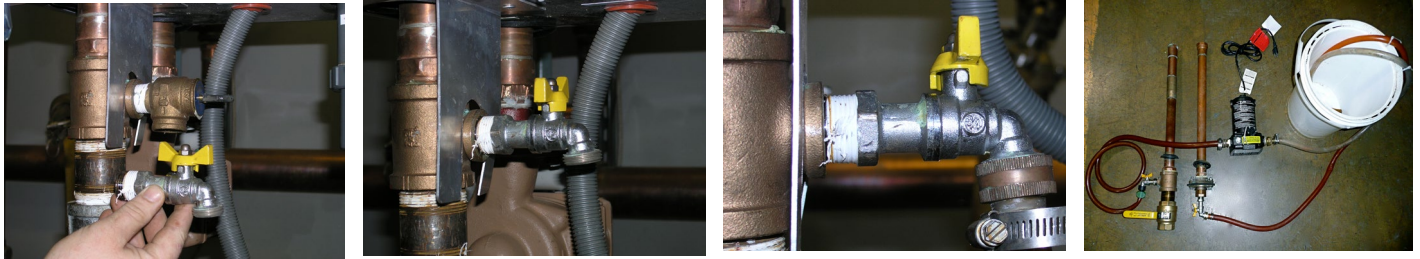
**NOTE: In some cases, you may want positive isolation of the cleaning solution from the rest of the system. Breaking the unions on the water lines, removing the nipples and fittings from the manifolds, and then capping the manifold openings will accomplish isolation. This would be done between steps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

3. Remove the circulation pump from the inlet side of the appliance
4. Where the pump was installed, install flange to hose connection adapter
5. Attach female end of hose to the adapter; the termination end of the hose will go into the acid solution bucket



# Water Side Heat Exchanger Cleaning Procedure

6. 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.

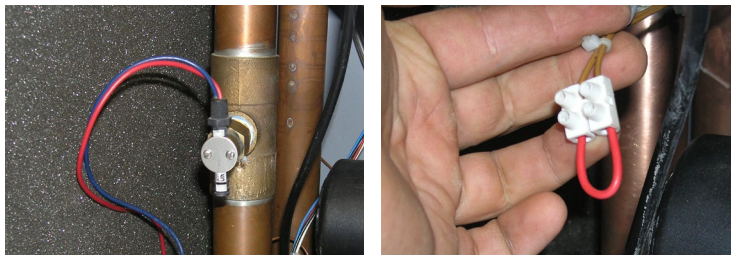


7. Pour water into plastic, chemical and heat resistant 5-10 gallon container (depending on size of appliance). Add cleaning solution. See 'Descaling Solution' above for required amounts. Prime the pump.

8. Turn on pump and circulate solution (this is the reverse of normal flow)

9. After circulation is established:

A. Bypass water flow switch (to bypass H1 error).

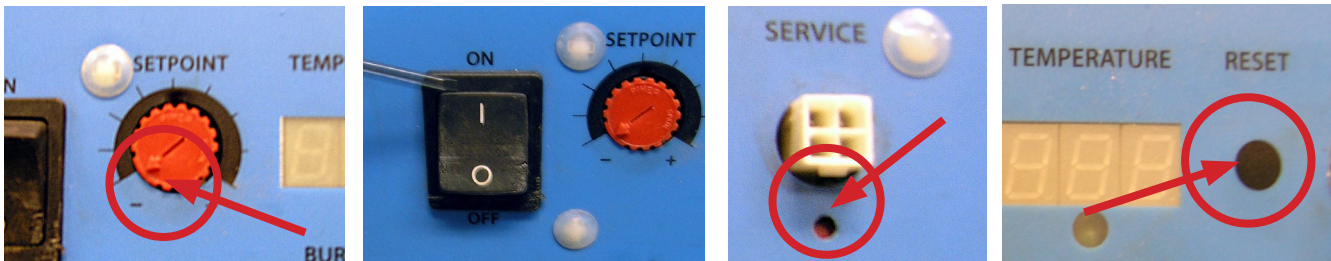


B. Turn RED temperature set dial all the way to the left (min. position).

C. Turn power switch ON; the number 50 will be displayed.

D. Use a pen to press micro switch below SERVICE computer connection port ONCE. Heater will fire up and stay in LOW fire.

E. Press RESET button to monitor solution temperature (180° - 160°F required for efficient descaling).



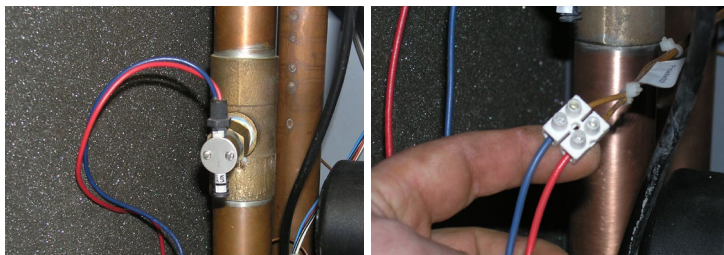
F. If, within 15-30 minutes of starting, the clean solution turns GREEN (an indication it's cleaning power is exhausted), additional DS40 System Cleaner needs to be added.

**Armstrong Hot Water, 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.**

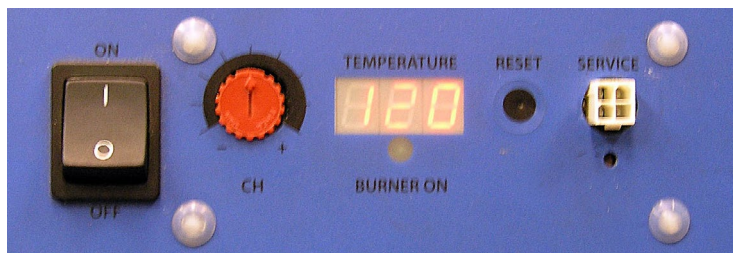
10. Turn the power switch to OFF.

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 water flow switch.



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 the Armstrong High Efficiency Water Heaters And Heating Boilers Installation & Operations 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 Armstrong Hot Water, Inc. for exchanger replacement. Water quality issues are not covered by warranty.**