HEAT EXCHANGER CLEANING INSTRUCTIONS
DMG/UCS - 240, 380
FOR UCS & DMG 240/380 BOILERS

Kit installation shall be completed by qualified agency.

⚠ WARNING

Fire, explosion, asphyxiation and electrical shock hazard. Improper installation could result in death or serious injury. Read this instruction and understand all requirements, including requirements of authority having jurisdiction, before beginning installation. Installation not complete until appliance operation verified per Installation, Operation & Maintenance Manual provided with boiler.

⚠ CAUTION

Laceration, burn hazard. Metal edges and parts may have sharp edges and/or may be hot. Use appropriate personal protection equipment to include safety glasses and gloves when installing or servicing this boiler. Failure to follow these instructions could result in minor or moderate injury.

1. Follow instructions TO TURN OFF GAS TO APPLIANCE found on Operating Instructions label on boiler or in Installation, Operation & Maintenance Manual. Verify all electrical power to boiler is turned off.

⚠ WARNING

Electrical shock hazard. Turn OFF electrical power supply at service panel.

2. Turn power and gas off to the boiler.
3. Remove screws from front of jacket cover. Lift jacket off Boiler.

⚠ WARNING

Burn hazard. Verify heat exchanger, igniter, and flame sensor have Burn, Scald hazard. Turn Off water to boiler Verify unit has cooled before servicing. Use appropriate personal protection equipment.

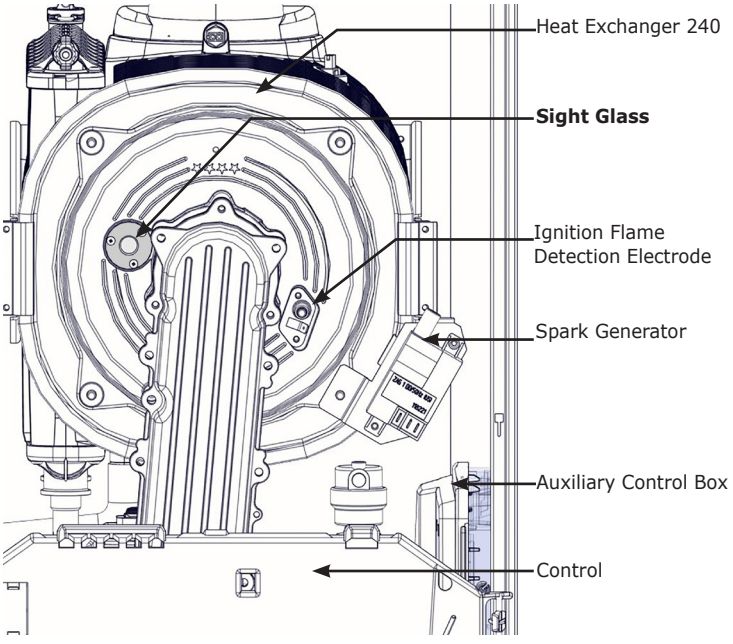
4. Inspect combustion chamber through sight glass. Verify flame is not present. See Figures 1 and 2.
5. Allow Boiler to cool.
6. Press tabs and place control panel in down position. See Figure 3.
7. 380 - remove four (4) screws securing control support bracket. Place control securely aside, within boiler cabinet. See Figure 4.
8. Disconnect hose to top of condensate trap drain inside boiler. Place a recepticle (ie: cup, bucket) under hose to collect debris and cleaning fluid. See Figure 5.

⚠ WARNING

Combustion chamber insulation in this product contains ceramic fiber material. Ceramic fibers can be converted to cristobalite in very high temperature applications. The International Agency for Research on Cancer (IARC) has concluded, Crystalline silica inhaled in the form of quartz or cristobalite from occupational sources is carcinogenic to humans (Group1). Avoid breathing dust and contact with skin and eyes. Use NIOSH certified dust respirator (N95). This type of respirator is based on the OSHA requirements for cristobalite at the time this document was written. Other types of respirators may be needed depending on the job site conditions. Current NIOSH recommendations can be found on the NIOSH website athttp://www.cdc.gov/niosh/homepage.html. NIOSH approved respirators, manufacturers, and phone numbers are also listed on this website. Wear long-sleeved, loose fitting clothing, gloves, and eye protection. Apply enough water to the combustion chamber lining to prevent dust. Wash potentially contaminated clothes separately from other clothing. Rinse clothes washer thoroughly.

NIOSH stated First Aid. Eye: Irrigate immediately. Breathing: Fresh air.

Figure 1 - 240 Heat Exchanger - Front of Boiler



Illustrations are a depiction of boiler for general location of parts and are subject to change without notice.

9. Loosen nut securing gas valve to mixer assembly. Set gasket aside for reuse. See Figures 2 and 4.

10. Remove wire harnesses from blower assembly. See Figure 2.

11. Remove ground wire and plug from ignition/flame detection electrode.

12. 240 - Remove four (4) screws from heat exchanger cover. 380 - Remove six (6) screws from heat exchanger cover. Set cover assembly gently aside where it is secure.

13. Cover gas line with piece of duct tape.

14. Examine burner, ignition electrode and burner cover gasket, clean or replace if necessary.

15. Cover all components below heat exchanger to prevent them from getting wet, potentially damaging them.

16. Place protector for target wall insulation securely at rear of heat exchanger compartment.

17. Vacuum all loose debris from heat exchanger.

18. Brush heat exchanger with wire brush, vacuum accumlated debris and dust.

19. Spray entire heat exchanger thoroughly with 16 oz. of 50/50 mix of white vinegar and water. Let set for 10 minutes.

20. Brush and vacuum entire surface again. Repeat this step until you have used all solution.

21. Rinse entire heat exchanger with water thoroughly.

22. Assure condensate trap is not blocked. Remove any deposits from trap. Clean with water as necessary.

Figure 2 - 380 - Heat Exchanger - Front of Boiler

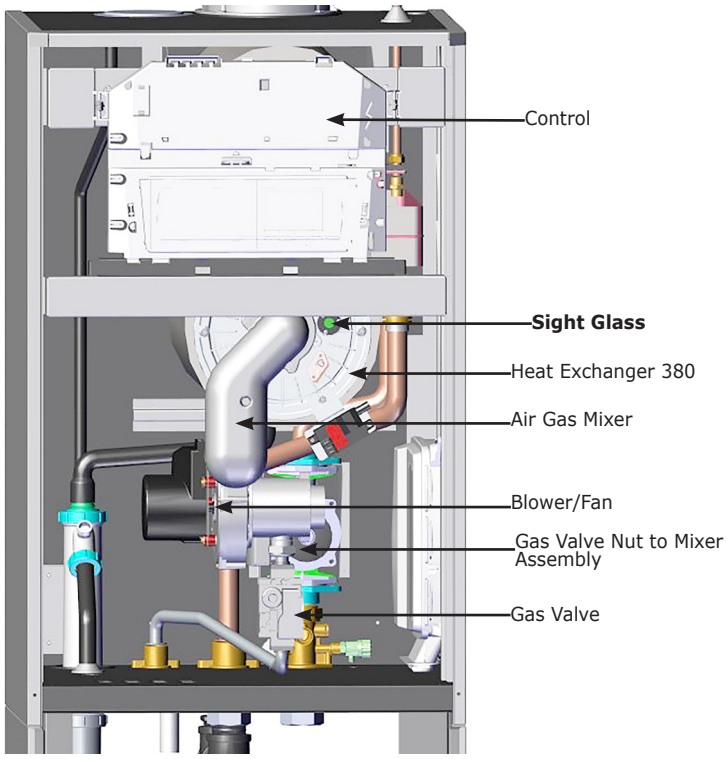


Figure 3 - Control Panel and Tab (240 shown)

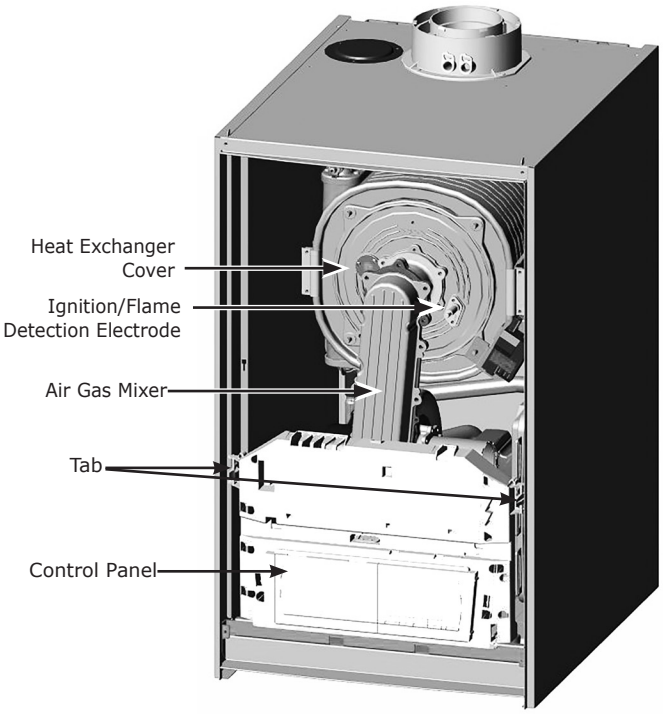


Figure 4 - 380- Support Bracket and Control

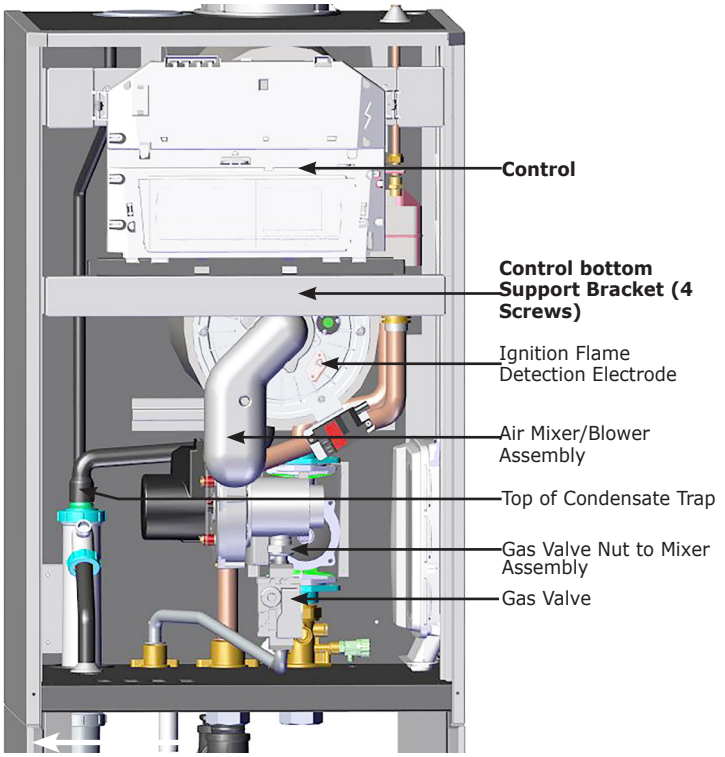
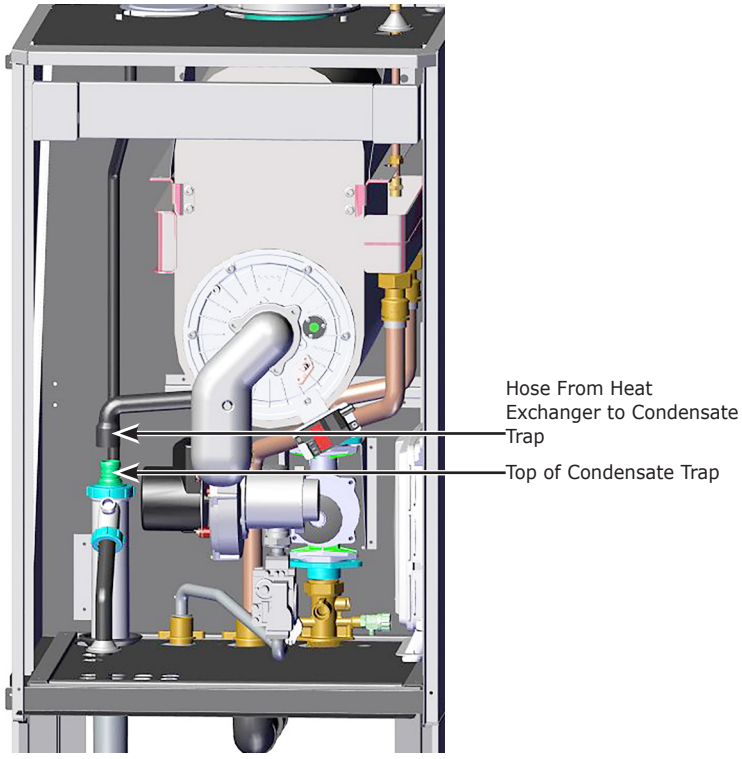


Figure 5 - Hose Removed From Top of Condensate Trap (380 Shown)



23. Re-install hose to condensate trap. See Figure 5.

24. Gently remove cover used to protect components from debris and cleaning fluid.

25. Remove duct tape from gas line.

26. Remove protector from target wall insulation in rear of heat exchanger chamber.

27. Inspect heat exchanger gasket replace if necessary.

28. Place Combustion chamber cover assembly back into place. Tighten nuts securely (4 nuts-240, 6 nuts -380).

29. Place gasket between gas valve and mixer. Tighten nut securing gas valve to mixer.

30. Re-connect ground and wire to ignition/flame detection electrode.

31. Re-connect wire harnesses to blower assembly. See Figure 2.

32. 380 - reattach supporting bracket and control. Tighten four (4) screws securing bracket. See Figure 4.

33. Place control in up position.

34. Turn power and gas on.

35. Check for leaks in gas line.

36. Replace front panel. Secure with screws.

37. Adjust Parameters as indicated A-D:

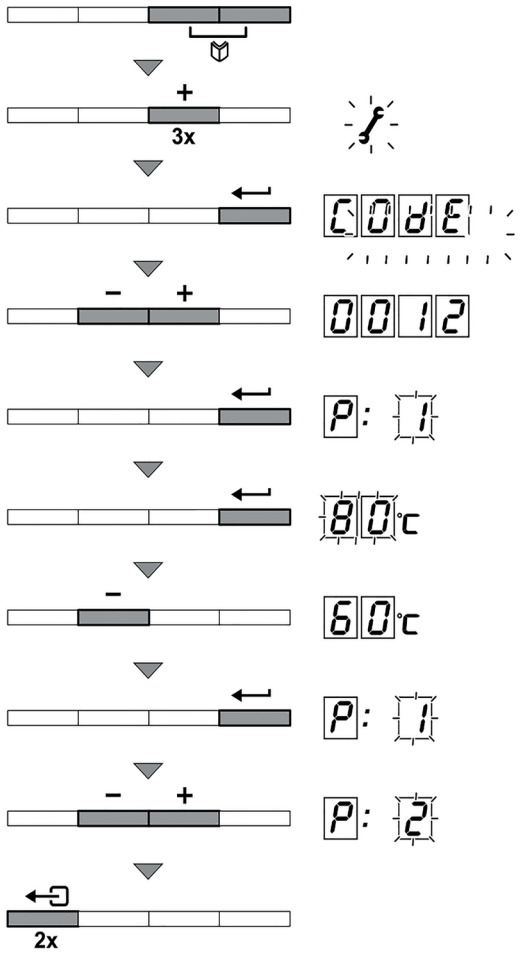
A - Installer Level Parameters

Parameters **P17** to **dF** (error code history) must only be modified by a qualified installer.

To prevent unwanted settings, some parameter settings can only be changed after special access code **0012** is entered.

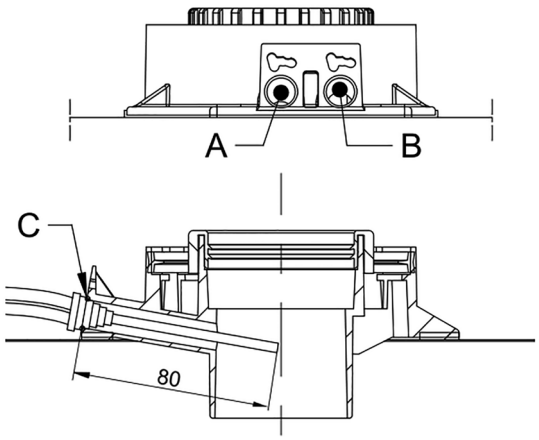
- Press the two Menu buttons simultaneously and then (+) button until the symbol flashes on the menu bar.
- Select the INSTALLER menu using the ⟵ button. "**CODE**" appears on the display.
- Use (-) or (+) button to input the installer code "**0012**".
- Confirm using ⟵ button, "**P1**" is displayed with "**1**" flashing.
- Press ⟵ button a second time, the value will appear and flashes, for example [80°C (176°F)].
- Change the value by pressing the [**-**] or [**+**] button. [In this example using [**-**] button to change the value to 60 ºC (140 °F).]
- Confirm the value with the ⟵ button, "**P1**" is displayed with 1 flashing. Button, "P1" is displayed with 1 flashing. If necessary, set other parameters by selecting them using the (**-**) or (**+**) button.
- Press ⟵ button 2 times to return to current operating mode.

FIGURE 5 - Installer Level Parameters



Natural Gas				Propane			
Venturi		Nozzle		Venturi		Nozzle	
in	mm	in	mm	in	mm	in	mm
1 3/16	30	7/32	5.3	1.18	30	5/32	4

FIGURE 6 - Combustion Air Sample Ports



B - Boiler has two dedicated built in test ports. See Figure 6.

One connection port is connected to exhaust flue (**A**), and allows monitoring of the quality of combustion products and combustion efficiency.

Other is connected to combustion air intake (**B**), used to check for recycling products for combustion.

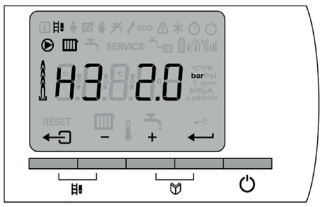
The following can be measured at exhaust flue test port:

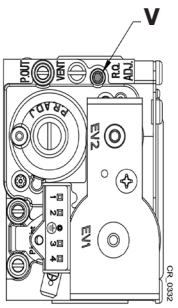
- temperature of combustion products
- oxygen (O_2) or carbon dioxide (CO_2) concentration;
- carbon monoxide (CO) concentration.

Temperature of combustion air must be measured on air intake test port (**B**) by inserting measurement sensor approximately 3-3/16" (80.00 mm) (**C**).

C - Combustion Setup (High-Fire)

- Unscrew exhaust port plug at exhaust flue test port. See Figure 6.
- Insert combustion analyzer into exhaust flue test port. Verify opening around combustion analyzer probe is completely sealed when taking measurements.
- Set boiler to high-fire by pressing two buttons simultaneously. Display will show **H3** and the symbol will appear.
- Measure percentage of O_2 or CO_2 in flue gases.
- Compare the measured values with values in table below. Remove front panel when comparing values.
- Adjust gas/air ratio using high-fire adjustment screw (**V**) if needed. Turn screw clockwise to reduce CO_2 level and counterclockwise to increase it.



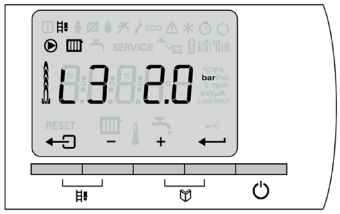


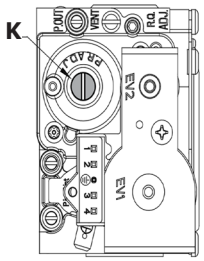
O_2/CO_2 Values at High Fire Natural Gas			
Nominal value		**Permitted value**	
O_2 %	CO_2%	O_2 %	CO_2%
4.3	9.3	3.9 - 4.7	9.1 - 9.5

O_2/CO_2 Values at High-Fire Propane Gas			
Nominal value		**Permitted value**	
0_2 %	CO_2%	0_2 %	CO_2%
5.7	10.0	5.4 - 6.0	9.8 - 10.2

D - Combustion Setup (Low-Fire)

- Unscrew exhaust port plug at exhaust flue test port.
- Insert combustion analyzer into exhaust flue test port. Verify the opening around combustion analyzer probe is completely sealed when taking measurements.
- Set boiler to low-fire by pressing two buttons simultaneously. If the boiler is already in combustion setup mode for high fire, press the (-) button several time until **L3** is displayed on the screen.
- Measure percentage of O_2 or CO_2 in flue gases.
- Compare the measured values with values in table below. Remove front panel when comparing values.
- Adjust gas/air ratio using low-fire adjustment screw (**K**) if needed. Turn screw clockwise to increase CO_2 level and counterclockwise to decrease it.





K - Screw cover shown. Adjustment screw is located under cover.

O_2/CO_2 Values at Low-Fire Natural Gas			
Nominal value		**Permitted value**	
O_2 %	CO_2%	O_2 %	CO_2%
5.7	8.5	5.4 - 6.1	8.3 - 8.7

O_2/CO_2 Values at Low-Fire Propane Gas			
Nominal value		**Permitted value**	
0_2 %	CO_2%	0_2 %	CO_2%
6.4	9.6	6.1 - 6.70	9.4 - 9.8

38. Follow instructions in boiler's Installation, Operation & Maintenance Manual for proper startup and verification procedures.

39. Verify proper operation.