A Watts Water Technology Company

TECHNICAL INSTRUCTIONS

KC 1000 Low NOx Boiler & Hot Water Heater
12 & 24 Month Maintenance Kits:

- **58020-05: 12 Month Maintenance Kit for KC 1000 Boilers & Water Heaters**
- **58020-06: 24 Month Maintenance Kit for KC 1000 Boilers**
- **58020-07: 24 Month Maintenance Kit for KC 1000 Water Heaters**

12 & 24 Month Maintenance Kit Contents

ITEM	QTY.	P/N	DESCRIPTION	58020-05	58020-06	58020-07
1	1	124570	IGNITOR, KC1000 LOW NOX	✓	✓	✓
2	1	124837	FLAME DETECTOR ASSEMBLY	✓	✓	✓
3	1	124839	COMBUSTION CHAMBER LINER, LOW NOX		✓	✓
4	1	GP-122537	EXHAUST MANIFOLD TO COMBUSTION CHAMBER GASKET		✓	✓
5	1	GP-18900	MANIFOLD TO TUBE SHEET GASKET		✓	✓
6	1	124834	UPPER BURNER GASKET, KC1000 LOW NOX		✓	✓
7	1	124749	LOWER BURNER GASKET, KC1000 LOW NOX		✓	✓
8	1	GP-122406	GAS TRAIN O-RING		✓	✓
9	1	GP-18532	HEAD GASKET			✓
10	1	GP-18556	HEAD RELEASE GASKET			✓
11	1	GP-122760	BTU HOT WATER ORIFICE			✓
12	1	GP-122401	BTU COLD WATER ORIFICE			✓
13	1	69126	LWCO/CAPACITOR ASSEMBLY KIT			✓

Created 05/20/2015

Disclaimer

1. INTRODUCTION

This Technical Instruction Document (TID) provides instructions for performing recommended annual and 24 month maintenance on KC 1000 Low NOx Boilers and Water Heaters.

2. LIST OF TOOLS

The following tools are used in the installation of these kits:

- Torque wrench, 50 in-lbs. up to 200 in-lbs.
- Flat-head screwdriver or 5/16" nut driver
- Phillips head screwdriver #2
- Various size Socket and/or Open End wrenches, 3/8" to 1.0"
- Anti-seize compound

3. INSTALLATION INSTRUCTIONS

3.1 Preparing the Unit

Complete the following steps to prepare the unit for the installation of the kits:

Preparing the Unit for Installation

1. Set the **ON/OFF** switch on the control panel to the **OFF** position and then disconnect AC power from the unit.

WARNING!

IT IS REQUIRED THAT ALL POWER IS REMOVED FROM THE UNIT BEFORE PERFORMING THE PROCEDURES DESCRIBED BELOW. SERIOUS PERSONAL INJURY OR DEATH MAY OCCUR IF THIS WARNING IS NOT OBSERVED.

2. Turn off the supply gas upstream to the unit.
3. Remove the left side panel and left rear cover from the unit to expose the Ignitor and Flame Detector.

WARNINGS

1. Adhere to all local codes regarding lock-out, tag-out procedures.
2. The Ignitor and Flame Detector may be hot. Take care to avoid burns. It is suggested that you allow the unit to cool to room temperature before starting these instructions.

3.2 Installing the 12 Month Maintenance Kit # 58020-05

3.2.1 Removing the Ignitor and Flame Detector

The instructions below remove the existing Ignitor and Flame Detector assembly. They apply to both KC 1000 Boilers and KC 1000Water Heaters.

Removing the Ignitor & Flame Detector

1. Disconnect the Igniter cable from the Igniter.
2. Using a 15/16" open-end wrench, remove the Igniter from the burner shell.

NOTE

Repeated carbon build-up on the Igniter is an indication that combustion settings should be checked. See the relevant AERCO User Manual (OMM-0019 for Boilers or OMM-0029 for Water heaters) for instructions.

CAUTION!

Do not rotate the smaller lock nut on the bushing, as it may loosen the ceramic electrode.

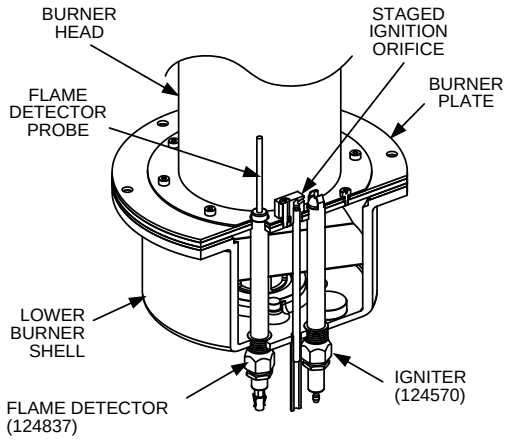

Figure 1: Spark Igniter and Flame Detector Location

3. Disconnect the Flame Detector wire lead.
4. Using a 15/16" open-end wrench, loosen and remove the Flame Detector from the burner shell.

NEXT STEP:

- If you are installing the **12 Month Maintenance Kit**, proceed to section 3.2.2 Reinstalling the Ignitor and Flame Detector.
- If you are installing either of the **24 Month Maintenance Kits**, skip the instructions in the next section and proceed to section 3.3.

3.2.2 Reinstalling the Ignitor and Flame Detector

The instructions below install the new Ignitor (p/**n 124570**) and Flame Detector assembly (p/n **124837**) in both KC 1000 Boilers and Water Heaters.

Reinstalling the Ignitor & Flame Detector

1. Prior to installing the Ignitor, mark it so it can be rotated to the proper clocking position, as shown in Figure 1. One of the tabs must face the burner so that the open spark area faces the staged ignition orifice.
2. Apply a conductive anti-seize compound to the Igniter threads. This step is required.
3. Install the new Igniter (p/n 124570) in the burner shell. Do **NOT** over-tighten; a slight snugging up is sufficient.
4. Reconnect the Igniter cable.
5. Install the new Flame Detector (p/n 124837) in the burner shell. Do **NOT** over-tighten; a slight snugging up is sufficient.
6. Reconnect the Flame Detector wire lead.

3.3 Installing the 24 Month Maintenance Kits

The presence of even trace amounts of chlorides and/or sulfur in the combustion air and fuel sources, can lead to the formation of deposits on the inside of the heat exchanger tubes, exhaust manifold, and/or the condensate cup. The degree of deposition is influenced by the extent of the condensing operation and the chloride and sulfur levels, which vary significantly.

The instructions below perform a water-side and fire-side inspection. They apply to both KC 1000 Boilers and Water Heaters. This procedure replaces the following parts:

Kit # 58020-06 & 58020-07

124839	COMBUSTION CHAMBER LINER, LOW NOX
GP-122537	EXHAUST MANIFOLD TO COMBUSTION CHAMBER GASKET
GP-18900	MANIFOLD TO TUBE SHEET GASKET
124834	UPPER BURNER GASKET, KC1000 LOW NOX
124749	LOWER BURNER GASKET, KC1000 LOW NOX
GP-122406	GAS TRAIN O-RING
124839	COMBUSTION CHAMBER LINER, LOW NOX

Complete the instructions below to install Kit # 58020-06 and 58020-07:

Installing the 24 Month Maintenance Kits

1. Complete the instructions in section 3.2.1, above, to remove the Ignitor and Flame Detector assembly.
2. Disconnect the plastic tubing from the condensate cup to drain and remove the rear covers.
3. Remove the condensate cup from under the unit and then disconnect the condensate drain tubing from the exhaust manifold.
4. Remove the grounding terminal from the burner by loosening the upper screw and sliding the connector from the grounding rod. (See Figure 2).

Installing the 24 Month Maintenance Kits – *Continued*

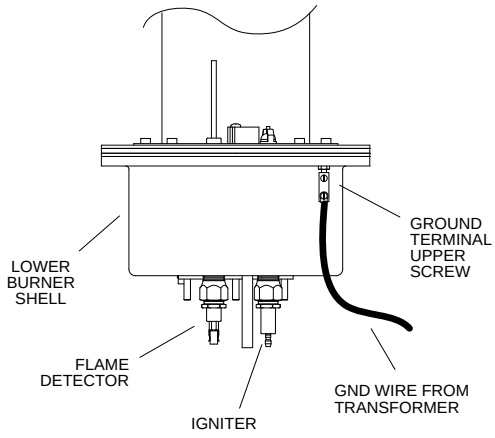

Figure 2: Grounding Terminal Location

5. Loosen the 1/4” NPT union on the Ignition assembly (Figure 3).
6. Disconnect the staged ignition assembly 1/8” elbow from the 3” long NPT nipple at the bottom of the burner shell.
7. Remove the 3” long NPT nipple and 1/4” O.D. tube (Figure 3) from the burner shell.

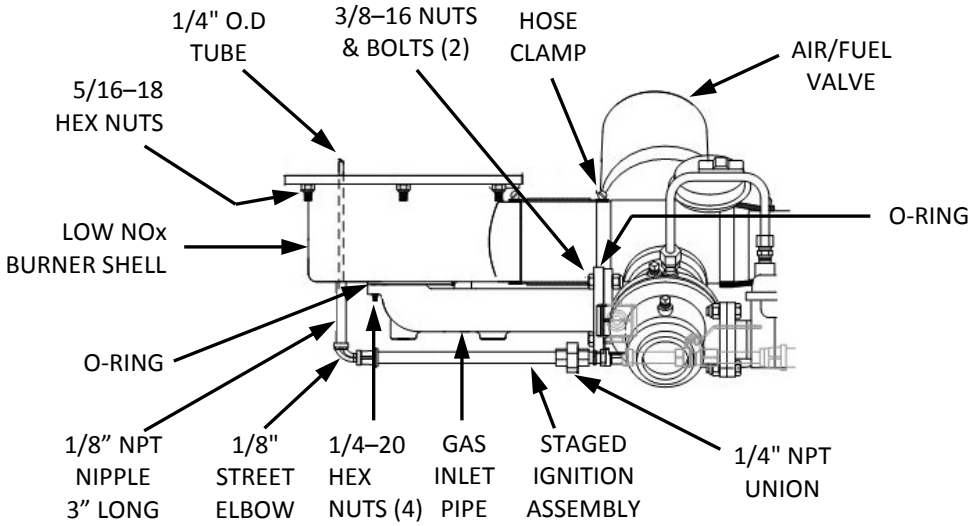

Figure 3: Burner Disassembly Diagram

8. Using a 7/16” socket or open end wrench, remove the four 1/4-20 nuts on the gas inlet pipe flange at the burner.
9. Using two 9/16” wrenches, remove the two 3/8-16 hex nuts and bolts on the gas inlet pipe flange at the air/fuel valve (Figure 3). Remove the gas inlet pipe.
10. Loosen the hose clamp on the air/fuel valve outlet (Figure 3).
11. Using a 1/2” socket wrench, remove the six 5/16-18 hex nuts supporting the burner (Figure 3).

Installing the 24 Month Maintenance Kits – *Continued*

12. Lower the burner while sliding the air hose off the air/fuel valve. Remove the burner through the rear of the unit. Due to space limitations, it is necessary to separate the burner head and shell during the removal process.
13. Remove the flue venting from the exhaust manifold.
14. To prevent damage and simplify handling of the exhaust manifold, remove the exhaust manifold insulation. Using a 7/16" wrench or socket, remove the 3 bolts and fender washers securing the insulation to the exhaust manifold (Figure 4).
15. Loosen the three 1-1/16" nuts that hold the manifold. Remove the two side nuts**. DO NOT REMOVE THE FRONT NUT** (see Figure 4).
16. Carefully pull the manifold down and back, removing it through the back of the unit.
17. Inspect the manifold and exhaust tubes and clean out any debris, as necessary.
18. Inspect the combustion chamber and remove the combustion chamber liner (p/n 124839); it will be replaced during reassembly.

NOTE:

During reassembly, install the combustion chamber liner ***before*** reinstalling the exhaust manifold.

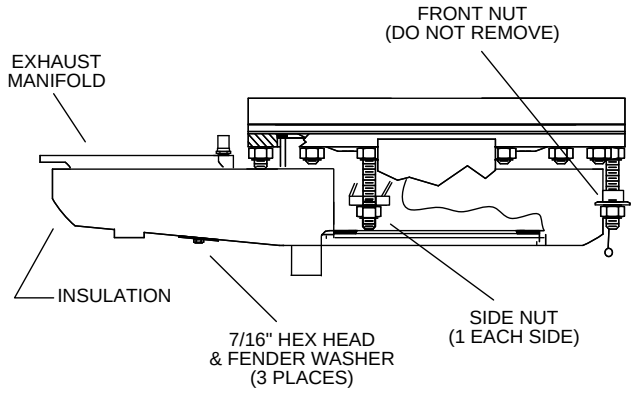

Figure 4: Manifold Nut and Bolt Locations

19. Replace the gasket between the manifold and the combustion chamber (p/n GP-122537). The use of Permatex or a similar gasket adhesive is recommended.
20. Replace the gasket between the manifold and tubesheet (p/n GP-18900). Do not use any gasket adhesive; this gasket has an adhesive backing.
21. Beginning with the manifold, reinstall all the components in the reverse order that they were removed.
22. Complete the instructions in section 3.2.2, above, to install the new Ignitor and Flame Detector.

NEXT STEP(S):

- If you are installing **Kit # 58020-06** on a KC 1000 Boiler, skip sections 3.4 and 3.5 and proceed to section 3.6 - Putting the Unit Back In Service.
- If you are installing **Kit # 58020-07** on a KC 1000 Water Heater, complete sections 3.4 and 3.5, below.

3.4 Installing the BTU Cold Water Orifice & BTU Hot Water Orifice

The instructions in this section install the BTU Cold Water Orifice (p/n GP-122401) and BTU Hot Water Orifice (p/n GP-122760) on KC 1000 Water Heaters; they apply only to KC 1000 Water Heaters.

Installing the BTU Cold Water & BTU Hot Water Orifice

1. Shut the water inlet, outlet and recirculation valves to the unit.
2. Open the drain valve on the unit.

CAUTION!

You ***MUST*** vent the shell before draining the unit! A vacuum in the unit may displace the liner causing serious damage not covered by warranty.

3. Slowly open the pressure relief valve to allow air-flow into the unit.
4. Fully drain the unit.
5. Remove the 4 screws holding the BTU transmitter pump to the impeller housing. Remove and set the pump aside (see Figure 5).

NOTE:
It is not necessary to disconnect the electrical wires to the pump.

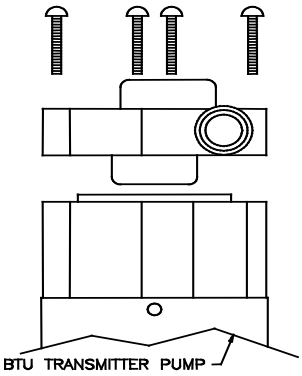

Figure 5: BTU Transmitter Pump Disassembly

6. Using a 5/8” and 9/16” wrench, loosen the 4 compression fittings holding the lower tubing assembly in place (see Figure 6).

Installing the BTU Cold Water & BTU Hot Water Orifice – *Continued*

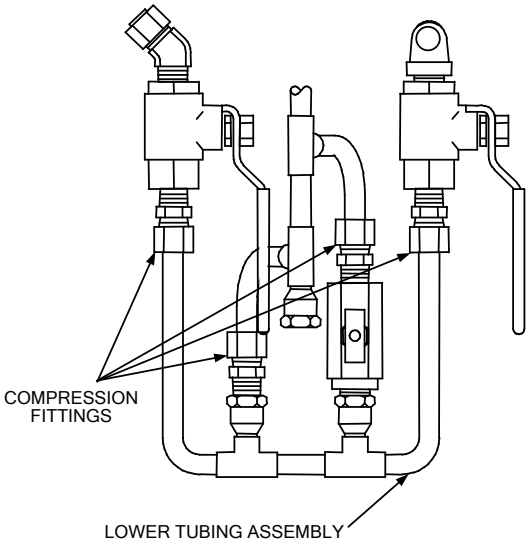

Figure 6: Compression Fitting Locations

7. Carefully remove the lower tubing assembly, then remove and dispose of both the BTU Cold Water and BTU Hot Water Orifice (see Figure 6); they will be replaced during reassembly.

NOTE:

The BTU Cold Water Orifice (P/N GP-122401) is slightly larger than the BTU Hot Water Orifice (P/N GP-122760). Each orifice must be correctly installed for proper temperature control.

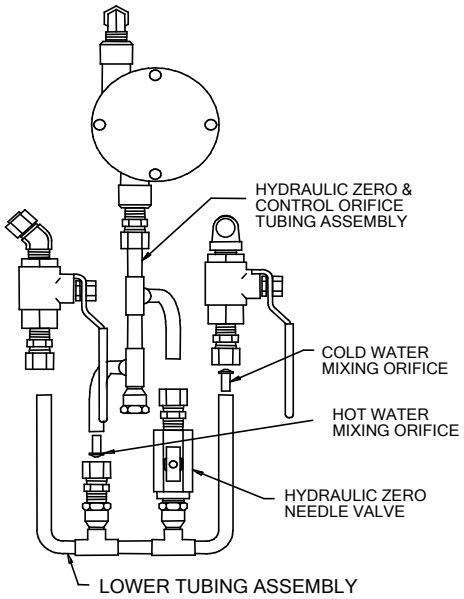

Figure: 7 BTU Transmitter Disassembly

Installing the BTU Cold Water & BTU Hot Water Orifice – *Continued*

8. Reassemble in the reverse order (see Figure 6), installing the BTU Cold Water Orifice (p/n GP-122401) and the BTU Hot Water Orifice (p/n GP-122760) removed in step 8.

3.5 Installing the LWCO/Capacitor Assembly Kit

The instructions in this section apply only to KC 1000 Water heaters.

KC Water Heaters feature a Low Water Cutoff (LWCO) sensor probe, part of the LWCO Capacitor Assembly Kit (p/n 69126, see Figure 8), which should be replaced every 24 months to ensure proper operation.

Complete the instructions below to replace the LWCO sensor probe:

Installing the LWCO Sensor Probe

1. The LWCO sensor probe is installed near the top of the heat exchanger. From the end of the LWCO sensor probe, unscrew the plastic acorn nut and first hex nut, then remove the wire lug.
2. Unscrew the brass coupling in which the sensor probe is installed and remove the probe/coupling assembly from the recess. See Figure 8 for a picture of the sensor probe installed and uninstalled (shown with brass coupling attached and wire/hardware removed).

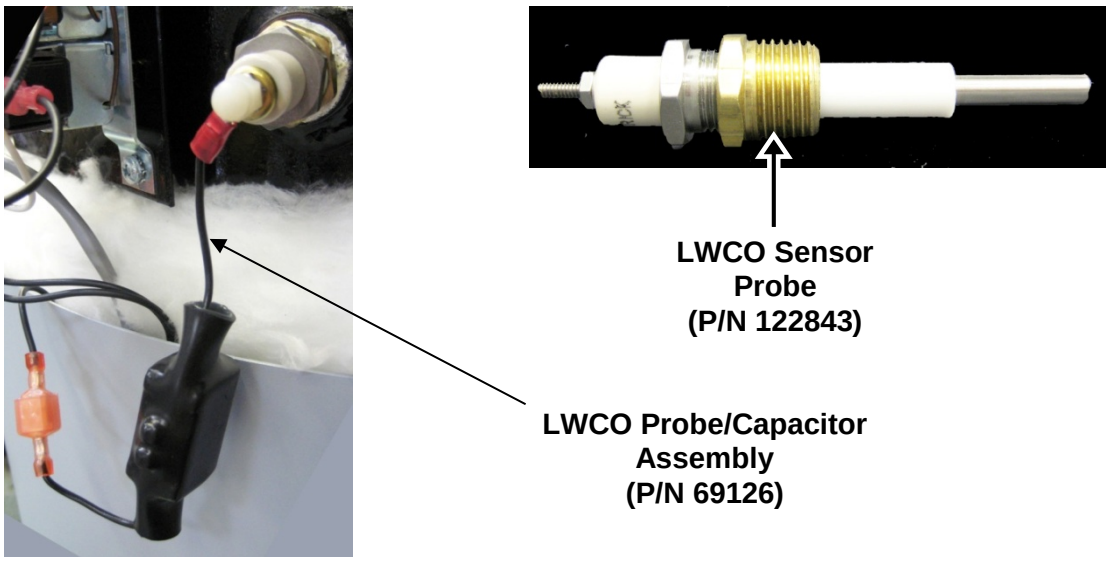

Figure 8: Low Water Cutoff Probe and Brass Coupling

3. Install the new sensor probe in place of the old sensor probe.
4. Cut the old lug from wire (removed earlier from probe tip) and crimp onto the male crimp of the capacitor assembly. If replacing a probe that already has the capacitor assembly attached, then there is already a male crimp instead of a lug; it may simply be inserted into the female crimp on the new probe/capacitor assembly.
5. Close the shell vent valve and refill the Water Heater system with water.

3.6 Putting the Unit Back in Service

Once you have completed the instructions above, the instructions in this section complete the installation of all three maintenance kits

Returning the Unit to Service

1. Replace all covers on the unit.
2. Reapply AC power to the unit using the local electrical disconnect.
3. Start the unit and check that combustion is operating properly.
4. Test to ensure the new LWCO probe is working properly.

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Change Log:

Date	Description	Changed By
05/20/2015	Rev A: Initial release. Reference PIR 934-73	Chris Blair

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