1.0 ANNUAL MAINTENANCE AND INSPECTION

This unit must be inspected at the beginning of every heating season by a Qualified Technician.

**Annual Inspection Checklist**

- 1. Lighting is smooth and consistent, and the combustion fan is noise & vibration free.
- 2. The condensate drain freely flows, and is cleaned of sediment.
- 3. Relief Valve and air vents are not weeping.
- 4. Low water cut off is tested (remove and clean a minimum of once every 5 years, see Section 10.0)
- 5. Examine all venting for evidence of leaks. Ensure vent screens are cleaned and clear of debris.
- 6. Check the burner plate for signs of leaking.
- 7. The combustion chamber must be inspected and if necessary cleaned.
- 8. Keep boiler area clear and free from combustible materials, gasoline, and other flammable vapors and liquids.
- 9. Ensure there is nothing obstructing the flow of combustion and ventilation air.
- 10. Listen for water flow noises indicating a drop in boiler water flow rate.

  **Important** - The hydronic system may need to be flushed to eliminate hard water scale

  (Use Fernox DS-40 Descaler, NTI PN: 83450).

- 11. Verify proper operation after servicing.

**CAUTION**

**Wiring Labels** - Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation.

**IMPORTANT**

**Cleansers and Potable Water** - Boiler system cleansers and corrosion inhibitors must not be used to flush contaminants from water heaters or potable water systems.

**Combustion Chamber Cleaning Procedure**

NTI recommends having the combustion chamber cleaned after the first year of operation, with subsequent cleanings scheduled based on the condition of the combustion chamber at the time. Units operating with LP Gas or in an industrial environment may require more frequent cleanings.

**IMPORTANT**

**Crystalline Silica** - Read carefully the warnings and handling instructions pertaining to Refractory Ceramic Fibers before commencing any service work in the combustion chamber. Take all necessary precautions and use recommended personal protective equipment as required.

**Cleaning Checklist**

- 1. Remove the demand for heat, allow the post-purge cycle to finish, turn gas and power supply off.
- 2. Working inside the cabinet, disconnect the cabling to the combustion blower, gas valve, spark igniter and flame sensor; then remove the air-inlet piping and Gas Valve/Venturi assembly (gas line is disconnected at the factory supplied union fitting).
- 3. Once the combustion chamber has cooled, remove the combustion blower followed by the burner plate – be careful not to damage the insulation disc located underneath the burner plate.
- 4. Use a vacuum with a high efficiency filter to remove any loose debris or dust.
- 5. Remove the condensate trap from the bottom of the boiler and place a drain under the boiler condensate drain.
- 6. Wet the inside of the combustion chamber with warm water (do not use any chemicals). Use a garden hose with a trigger nozzle to direct pressurized water through the heat exchanger tubes; the water will exit via the condensate drain on the bottom. Continue process until the tubes are clear and the water runs clean. Use dry rags or plastic to protect electrical components from being damaged by dripping or spraying water.
- 7. Disassemble the condensate trap and thoroughly clean it; then reassemble and securely connect it to the boiler condensate drain, see Section 6.0.
- 8. Remove the burner from the burner plate; clean if necessary using compressed air. Reattach the burner; ensure the gasket is in perfect condition and is reinstalled (replace if necessary).
- 9. Inspect the insulation disc located on the under-side of the burner plate. Replace if damaged.
- 10. Re-install the burner plate; be sure the insulation disc is properly aligned. Reinstall remaining components in the opposite order they were removed.
- 11. Perform the Start-up and Operational Checklist detailed in the previous section.

**WARNING**

Replace any gaskets or insulation discs that show any signs of damage and do not re-use. Failure to follow these instructions may result in fire, property damage or death.
**Refractory Ceramic Fibers (RFC)**

**IMPORTANT**  
**Personal Protective Equipment Recommended** - Read the following warnings and handling instructions carefully before commencing any service work in the combustion chamber. The insulating material on the inside of the burner plate contains *Refractory Ceramic Fibers* and should not be handled without personal protective equipment.

**WARNING**  
**Potential Carcinogen** - Use of *Refractory Ceramic Fibers* in high temperature applications (above 1000°C) can result in the formation of Crystalline Silica (cristobalite), a respirable silica dust. Repeated airborne exposure to crystalline silica dust may result in chronic lung infections, acute respiratory illness, or death. Crystalline silica is listed as a (potential) occupational carcinogen by the following regulatory organizations: International Agency for Research on Cancer (IARC), Canadian Centre for Occupational Health and Safety (CCOHS), Occupational Safety and Health Administration (OSHA), and National Institute for Occupational Safety and Health (NIOSH). Failure to comply with handling instructions in Table 15-1 may result in serious injury or death.

**WARNING**  
**Crystalline Silica** - Certain components confined in the combustion chamber may contain this potential carcinogen. Improper installation, adjustment, alteration, service or maintenance can cause property damage, serious injury (exposure to hazardous materials) or death. Refer to Table 15-1 for handling instruction and recommended personal protective equipment. Installation and service must be performed by a qualified installer, service agency or the gas supplier (who must read and follow the supplied instructions before installing, servicing, or removing this boiler. This boiler contains materials that have been identified as carcinogenic, or possibly carcinogenic, to humans).

**Table 15-1 Handling Instructions for Refractory Ceramic Fibers (RCF)**

<table>
<thead>
<tr>
<th>Reduce the Risk of Exposure</th>
<th>Precautions and Recommended Personal Protective Equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avoid contact with skin and eyes</td>
<td>• Wear long-sleeved clothing, gloves, and safety goggles or glasses.</td>
</tr>
<tr>
<td>Avoid breathing in silica dust</td>
<td>• Wear a respirator with an N95-rated filter efficiency or better.†</td>
</tr>
<tr>
<td></td>
<td>• Use water to reduce airborne dust levels when cleaning the combustion chamber.</td>
</tr>
<tr>
<td></td>
<td>• Do not dry sweep silica dust. Pre-wet or use a vacuum with a high efficiency filter.</td>
</tr>
<tr>
<td>Avoid transferring contamination</td>
<td>• When installing or removing RFCs, place the material in a sealable plastic bag.</td>
</tr>
<tr>
<td></td>
<td>• Remove contaminated clothing after use. Store in sealable container until cleaned.</td>
</tr>
<tr>
<td></td>
<td>• Wash contaminated clothing separately from other laundry.</td>
</tr>
<tr>
<td>First Aid Measures</td>
<td>If irritation persists after implementing first aid measures consult a physician.</td>
</tr>
<tr>
<td></td>
<td>• <strong>Skin</strong> - Wash with soap and water.</td>
</tr>
<tr>
<td></td>
<td>• <strong>Eyes</strong> - Do not rub eyes; flush with water immediately.</td>
</tr>
<tr>
<td></td>
<td>• <strong>Inhalation</strong> – Breathe in fresh air; drink water, sneeze or cough to clear irritated passage ways.</td>
</tr>
</tbody>
</table>

**Notes:**

† Respirator recommendations based on CCOHS and OSHA requirements at the time this document was written. Consult your local regulatory authority regarding current requirements for respirators, personal protective equipment, handling, and disposal of RFCs.

For more information on Refractory Ceramic Fibers, the risks, recommended handling procedures and acceptable disposal practices contact the organization(s) listed below:

**Canada (CCOHS):** Telephone directory listing under Government Blue Pages Canada—Health and Safety—Canadian Centre for Occupational Health and Safety; or website http://www.ccohs.ca.

**United States (OSHA):** Telephone directory listing under United States Government—Department of Labor—Occupational Safety and Health Administration; or website http://www.osha.gov.

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