



## FABER BURNER ROUTINE MAINTENANCE

Version 2015

The Faber burner is designed for minimal maintenance; however, the frequency and quantity of maintenance that is required depends upon many factors which vary from plant to plant. These factors include: the fuel being fired, how often the burner is being used, and the firing rate. For example, natural gas is a very clean fuel and minimal maintenance is required. On the other hand, #6 fuel oil is inherently more problem oriented and requires more attention in the maintenance area. Following are some recommended routine maintenance items to ensure proper burner operation, the highest possible efficiency, and overall satisfactory results. Good judgment should always be used when performing any type of maintenance on any fired equipment or burner system. Refer to the installation and operating manuals for the specific burner components supplied on this job. The manufacturers' specific information for any piece of equipment on the system takes precedence over any general information given in these operating instructions.

All service must be performed by qualified personnel while the equipment is in a safe lockout/tagout state according to the user's policies. Follow proper lockout/tagout procedure before performing any maintenance. If there is any doubt about how to properly perform any maintenance, consult Faber Burner Company. Contact Faber Burner Company annually to ensure that you have the latest version of this document.

### 1.1 Flame Scanner

The flame scanner should be checked a minimum of once each day while the burner is firing at low fire and at off-peak loads. This can be accomplished by removing the scanner from its mounted position and holding the scanner down towards the floor. The burner should trip within four seconds, per standards in the 2011 edition of NFPA 85. At this time the scanner lens should be wiped clean with a soft, lint-free cloth. The scanner lens should be treated in the same manner as you would treat your eyeglasses. This is a precision lens and is sensitive to scratching and corrosion damage if not cared for properly.

### 1.2 Safety Limits

All of the safety limits should be verified at a minimum of once per week, making sure that each safety limit trip causes a burner shutdown. Testing methods should be tailored to specific equipment and plant conditions. The safety limits are an important means of ensuring the safety of personnel and equipment.



### **1.3 Faber Oil Guns**

The oil guns should be cleaned at regular intervals because a dirty gun results in poor fuel atomization, which may cause additional problems with a unit. A recommended practice is once every eight (8) hour shift, but due to varying plant conditions and oil quality, the cleaning interval should be reduced or can be extended to meet plant demands. In general, fuels that contain a high concentration of contaminants such as ash or vanadium will require more frequent cleaning. Plant experience will determine the amount of time a burner can be operated efficiently without cleaning. Tips and mixing plugs can be cleaned with kerosene or other type of suitable solvent. A brass wire brush may be used if necessary to remove any buildup or debris. Do not use a steel wire brush, screwdriver, or any other hardened tool to clean or even pull apart the tip. If you do, inspect the tip before reusing. Use the customer data sheet, drawings, and bill of material to be sure the correct components are installed. The edges of the drillings on each component should be sharp, not worn. Any visible signs of wear indicate the component needs to be replaced. If a component is damaged, replace it to avoid the hazards of poor atomization. It is recommended to apply high temperature anti-seize compound to the threads of the atomizer adapter prior to assembly. Refer to the atomizer assembly drawing for details on how to assemble after cleaning and inspection.

### **1.4 Strainers and Filters**

All strainers and filters should be cleaned at a minimum of once per week. Based on fuel quality or plant conditions, the cleaning interval should be reduced or can be extended to meet plant demands. A clogged strainer or filter can result in lower efficiencies and hazardous burner conditions.

### **1.5 Steam Trap/Separator**

The steam trap should be checked for proper operation at a minimum of once per shift. Water in the steam is undesirable and will cause firing problems, which if left untreated, could become serious. Consult the manufacturer's installation and maintenance instructions for a testing procedure.

### **1.6 Pressure Readings**

All pressure readings on the burner should be monitored and recorded once each hour (or more often). The monitoring and comparison of these pressures could give an early indication to a problem that is so far undetected.



### **1.7 Pilot Assembly**

Check the igniter for proper operation at a minimum of once per week. Remove and inspect the pilot assembly semiannually. First, lock out or disable energy to the ignition transformer. To remove the pilot assembly from the register, remove the two nuts on either side of the assembly and disconnect the stainless steel pilot gas supply hose at the union connection. The igniter cable must also be removed. Care should be taken when removing the igniter so that damage to the porcelain insulators on the electrode is avoided. Inspection points include: the igniter spark gap (this should be set at 1/8"), the condition of the porcelain insulators, and checking to ensure that all connections are tight. Replace any porcelain insulators that appear to be cracked. Refer to the pilot assembly drawing for details.

### **1.8 Refractory Throat Assembly**

The condition of the refractory throat should be checked frequently. Special care should be taken so that the refractory does not come away from its mounting plate. This will overheat the refractory mounting plate, and possibly damage the burner body. Hairline cracks in the refractory are common and do not require any special attention.

### **1.9 Forced Draft Fan**

Inspect the condition of the forced draft fan inlet control damper and linkage periodically for tightness and signs of wear. The fan internals should be inspected and cleaned on a monthly basis. A dirty fan can result in lower efficiencies and hazardous burner conditions. Refer to the fan manufacturer's cut sheets for more information on maintenance. All service must be performed by qualified personnel while equipment is in a safe lockout/tagout state according to the user's policies.

### **1.10 Air Flow Element**

The air flow element should be inspected for clean hole openings and condensation on a monthly basis. A clogged air flow element can result in incorrect readings and hazardous burner conditions. Based on air quality or plant conditions, the cleaning interval should be reduced or can be extended to meet plant demands. All service must be performed by qualified personnel while equipment is in a safe lockout/tagout state according to the user's policies.



### 1.11 Good Practices

- Keep linkage nuts tight and joints operating freely.
- Inspect electrical controls periodically, looking for loose, dirty, or corroded connections. This is especially critical in the safety limits and flame scanner.
- Keep air ducts and passages free of dirt and moisture. Be particularly conscientious of dampers and other moving parts.

### 1.12 Additional Recommendations

Consult the fired equipment operating and maintenance manual and the relevant NFPA standards for additional recommendations. Specific component information from the manufacturer takes precedence over any general recommendations supplied in these operating instructions. Based on plant conditions, maintenance intervals should be reduced or extended to meet plant demands.

If applicable, the user is responsible for ensuring that the burner and system are isolated from any hydrostatic testing being conducted.

### 1.13 Other Checks & Inspections

The following list of recommended checks and inspections acts as a supplement to the maintenance instructions found in the fired equipment operating and maintenance manual and in the relevant NFPA standards, as well as this manual.

#### 1 Each Shift

- a Check pressure and temperature readings to make sure conditions are normal. Compare to the as-commissioned data.
- b Change oil gun tips (if applicable).
- c Perform visual inspections of all equipment and components.
- d Check the fuel strainers and drip legs for debris and clogging.

#### 2 Daily

- a Clean lens of scanner and check flame failure cutout by removing scanner and aiming at floor.

#### 3 Weekly

- a Check the igniter operation.
- b Check all safety limits.
- c Check burner operation.



**4 Monthly**

- a Check the piping, wiring, connections, and operation of all safety interlocks and shutoff valves.
- b Verify the set point of temperature, pressure, or flow devices used as safety interlocks.
- c Check all fuel safety shutoff valves for valve seat leakage.
- d Check all fuel vent valves and return line valves for valve seat leakage (if applicable).

**5 Semi-Annually**

- a Remove the pilot assembly for cleaning and inspection.
- b Clean and inspect inside of furnace for deterioration of refractory.
- c Check all dampers and fuel control elements for proper operation through full range of motion.
- d Check all linkages for tightness and integrity, including control valve feedback linkages.
- e Check all burner components and flame failure system components.
- f Check the calibration of instrumentation and combustion control system.
- g Clean the combustion air equipment.

**6 Annually**

- a Verify that all designed safety interlocks are present and have not been bypassed or rendered ineffective.
- b Test all pressure relief valves in accordance with applicable codes and regulations to ensure they are functioning properly.
- c Perform leak testing of all piping, manifolds, and valves in accordance with manufacturers' instructions.
- d Lubricate all lubricated parts (plug valves, bearings, etc.) per the manufacturers' schedule and subsequently leak test for valve closure.
- e Document safety device testing at least annually. Records of inspection, testing, and maintenance activities should be retained for a period of one year or until the next inspection, testing, or maintenance activity, whichever is longer.
- f Replace all flex hoses in kind as supplied by Faber Burner Company as listed in the spare parts list.
- g Contact Faber Burner Company to ensure that you have the latest version of this document.