



TriOx TRIPLE AIR STAGED ULTRA LOW NOx BURNER 3000 & 4000 SERIES



WARNING

These instructions are intended for use only by experienced, qualified combustion start-up personnel. Adjustment of this equipment and its components, by unqualified personnel, can result in fire, explosion, severe personal injury, or even death.

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These instructions are intended to serve as guidelines covering the installation, operation, and maintenance of Hauck equipment. While every attempt has been made to ensure completeness, unforeseen or unspecified applications, details, and variations may preclude covering every possible contingency. **WARNING: TO PREVENT THE POSSIBILITY OF SERIOUS BODILY INJURY, DO NOT USE OR OPERATE ANY EQUIPMENT OR COMPONENT WITH ANY PARTS REMOVED OR ANY PARTS NOT APPROVED BY THE MANUFACTURER.** Should further information be required or desired or should particular problems arise which are not covered sufficiently for the purchaser's purpose, contact Hauck Mfg. Co.



WARNING

This equipment is potentially dangerous with the possibility of serious personal injury and property damage. Hauck Manufacturing Company recommends the use of flame supervisory equipment and fuel safety shutoff valves. Furthermore, Hauck urges rigid adherence to National Fire Protection Association (NFPA) standards and insurance underwriter's requirements. Operation and regular preventative maintenance of this equipment should be performed only by properly trained and qualified personnel. Annual review and upgrading of safety equipment is recommended.

A. GENERAL INFORMATION

The TriOx burner utilizes an air-staged design for ultra low NOx emissions when firing with low excess air in furnace environments with temperatures up to 2700°F (1480°C). The 3000 and 4000 Series of the burner operate **only** in **Invisiflame™ Mode (Furnace Temperature in excess of 1,600°F (870°C) REQUIRED)**, which produces little to no visible flame, for ultra low NOx operation above 1600°F (870°C). The 3000 Series is intended for use with ambient combustion air, while the 4000 Series features insulation for use with preheated combustion air up to 900°F (482°C).

The TriOx burners fire any clean industrial fuel gas. Capacities range from 7.2 to more than 19 MMBtu/Hr (1900 - 5260 kW) at 14.8"wc (37 mbar) static air pressure. The 3000 and 4000 Series burners are capable of operating only in **Invisiflame™ Mode** and produce little to no visible flame under most conditions and UV supervision is **NOT** an option; however, the 3000 and 4000 Series maintain a heat release profile similar to the 1000 and 2000 Series burners fired in the **Invisiflame™ Mode**.

Turndown is approximately 7:1 on natural gas. If operating with excess air, thermal turndown is greater; however, NOx emissions will increase. Consult Hauck for mounting options and field installation recommendations.

B. RECEIVING & INSPECTION

Upon receipt, check each item on the bill of lading and/or invoice to determine that all equipment has been received. A careful examination of all parts should be made to ascertain if there has been any damage in shipment.



WARNING

Use care when handling as the equipment may be heavy, have sharp edges or dust/fibers from refractory or gasket material. Always wear personal protective gear and use appropriate equipment during handling and installation.

IMPORTANT

If the installation is delayed and the equipment is stored outside, provide adequate protection as dictated by climate and period of exposure. Special care should be given to all motors and bearings, if applicable, to protect them from rain or excessive moisture.

C. CAPACITIES

BURNER MODEL TriOx 3008

INVISIFLAME MODE⁵

NATURAL GAS, AMBIENT COMBUSTION AIR OPERATION

SPECIFICATIONS		OPERATIONAL INFORMATION			
Capacity (at 5% Excess Air)	(MMBTU/hr)	1.1	3.2	5.3	8.0
	(kW)	280	840	1,410	2,120
Air Capacity	(SCFH)	10,400	31,500	52,700	79,100
	(nm ³ /hr)	280	840	1,410	2,120
Air Pressure (Body)	(in.w.c.)	0.3	2.9	8.2	18.4
	(mbar)	0.8	7.2	20.3	45.7
Gas Inlet Pressure	(in.w.c.)	0.2	1.8	5.0	11.2
	(mbar)	0.5	4.4	12.3	27.8
Combustion Zone Length ⁴	(ft)	10.0	12.0	15.0	18.0
	(m)	3.0	3.7	4.6	5.5
Combustion Zone Diameter ⁴	(ft)	3.0	3.5	4.0	5.0
	(m)	0.9	1.1	1.2	1.5
Maximum Excess	(Air %)	500	750	1,000	1,500
	(Fuel %)	+30	+30	+30	+30

BURNER MODEL TriOx 4008

INVISIFLAME MODE⁵

NATURAL GAS, 900°F / 482°C COMBUSTION AIR OPERATION

SPECIFICATIONS		OPERATIONAL INFORMATION			
Capacity (at 5% Excess Air)	(MMBTU/hr)	0.6	2.0	3.3	5.1
	(kW)	170	520	870	1,360
Air Capacity	(SCFH)	6,400	19,400	32,500	50,600
	(nm ³ /hr)	170	520	870	1,360
Air Pressure (Body)	(in.w.c.)	0.3	2.9	8.1	19.8
	(mbar)	0.8	7.2	20.3	49.1
Gas Inlet Pressure	(in.w.c.)	0.1	1.0	2.9	6.9
	(mbar)	0.3	2.5	7.1	17.3
Combustion Zone Length ⁴	(ft)	8.0	10.0	12.0	15.0
	(m)	2.4	3.0	3.7	4.6
Combustion Zone Diameter ⁴	(ft)	2.5	3.0	3.5	4.0
	(m)	0.8	0.9	1.1	1.2
Maximum Excess	(Air %)	250	500	750	1,000
	(Fuel %)	+30	+30	+30	+30

NOTES:

1. Capacities based on Natural Gas with HHV of 1034 BTU/ft³ (Standard), and LHV of 10.21 kWh/nm³ (Metric), 0.59 S.G., and a stoichiometric ratio of 9.74:1 with burner firing into chamber under no pressure at 5% excess air.
2. Air and fuel flows based on STP operating conditions at sea level and industry standard air and gas piping practices.
3. Flame detection is not possible on the 3000 and 4000 Invisiflame™ Mode only versions of the burner.
4. The combustion zone when operating Invisiflame™ Mode is not visible unless used with preheated combustion air.
5. Invisiflame™ Mode is suitable for furnace or chamber temperatures above 1600°F or 870°C only. For temperatures less than 1600°F or 870°C the TriOx burner must be used in Firing Mode only.

Table 1. 3008 through 4008 Series Capacities

C. CAPACITIES (Continued)

BURNER MODEL TriOx 3012

INVISIFLAME MODE⁵

NATURAL GAS, AMBIENT COMBUSTION AIR OPERATION

SPECIFICATIONS		OPERATIONAL INFORMATION			
Capacity (at 5% Excess Air)	(MMBTU/hr)	2.1	6.4	10.7	14.9
	(kW)	560	1,690	2,830	3,950
Air Capacity	(SCFH)	20,800	63,200	105,700	147,600
	(nm ³ /hr)	560	1,690	2,830	3,950
Air Pressure (Body)	(in.w.c.)	0.3	2.9	8.2	15.9
	(mbar)	0.8	7.3	20.3	39.6
Gas Inlet Pressure	(in.w.c.)	0.4	4.1	11.5	22.5
	(mbar)	1.1	10.2	28.7	55.9
Combustion Zone Length ⁴	(ft)	8.0	12.0	15.0	18.0
	(m)	2.4	3.7	4.6	5.5
Combustion Zone Diameter ⁴	(ft)	3.0	3.5	4.0	5.0
	(m)	0.9	1.1	1.2	1.5
Maximum Excess	(Air %)	500	750	1,000	1,500
	(Fuel %)	+30	+30	+30	+30

BURNER MODEL TriOx 4012

INVISIFLAME MODE⁵

NATURAL GAS, 900°F / 482°C COMBUSTION AIR OPERATION

SPECIFICATIONS		OPERATIONAL INFORMATION			
Capacity (at 5% Excess Air)	(MMBTU/hr)	1.3	4.0	6.6	9.2
	(kW)	340	1,050	1,750	2,450
Air Capacity	(SCFH)	12,800	39,100	65,400	91,300
	(nm ³ /hr)	340	1,050	1,750	2,450
Air Pressure (Body)	(in.w.c.)	0.3	2.9	8.2	15.9
	(mbar)	0.8	7.3	20.3	39.5
Gas Inlet Pressure	(in.w.c.)	0.2	1.5	4.2	8.2
	(mbar)	0.4	3.8	10.5	20.4
Combustion Zone Length ⁴	(ft)	7.0	10.0	12.0	15.0
	(m)	2.1	3.0	3.7	4.6
Combustion Zone Diameter ⁴	(ft)	2.5	3.0	3.5	4.0
	(m)	0.8	0.9	1.1	1.2
Maximum Excess	(Air %)	250	500	750	1,000
	(Fuel %)	+30	+30	+30	+30

NOTES:

1. Capacities based on Natural Gas with HHV of 1034 BTU/ft³ (Standard), and LHV of 10.21 kWh/nm³ (Metric), 0.59 S.G., and a stoichiometric ratio of 9.74:1 with burner firing into chamber under no pressure at 5% excess air.
2. Air and fuel flows based on STP operating conditions at sea level and industry standard air and gas piping practices.
3. Flame detection is not possible on the 3000 and 4000 Invisiflame™ Mode only versions of the burner.
4. The combustion zone when operating Invisiflame™ Mode is not visible unless used with preheated combustion air.
5. Invisiflame™ Mode is suitable for furnace or chamber temperatures above 1600°F or 870°C only. For temperatures less than 1600°F or 870°C the TriOx burner must be used in Firing Mode only.

Table 2. 3012 through 4012 Series Capacities

C. CAPACITIES (Continued)

BURNER MODEL TriOx 3014

INVISIFLAME MODE⁵

NATURAL GAS, AMBIENT COMBUSTION AIR OPERATION

SPECIFICATIONS		OPERATIONAL INFORMATION			
Capacity (at 5% Excess Air)	(MMBTU/hr)	2.9	8.8	14.7	20.9
	(kW)	770	2,340	3,910	5,540
Air Capacity	(SCFH)	28,600	87,200	145,800	206,900
	(nm ³ /hr)	770	2,340	3,910	5,540
Air Pressure (Body)	(in.w.c.)	0.3	2.9	8.2	16.4
	(mbar)	0.8	7.3	20.3	40.9
Gas Inlet Pressure	(in.w.c.)	0.5	4.6	12.8	25.9
	(mbar)	1.2	11.4	31.9	64.3
Combustion Zone Length ⁴	(ft)	8.0	13.0	15.0	18.0
	(m)	2.4	4.0	4.6	5.5
Combustion Zone Diameter ⁴	(ft)	3.0	5.0	5.5	6.0
	(m)	0.9	1.5	1.7	1.8
Maximum Excess	(Air %)	500	750	1,000	1,500
	(Fuel %)	+30	+30	+30	+30

BURNER MODEL TriOx 4014

INVISIFLAME MODE⁵

NATURAL GAS, 900°F / 482°C COMBUSTION AIR OPERATION

SPECIFICATIONS		OPERATIONAL INFORMATION			
Capacity (at 5% Excess Air)	(MMBTU/hr)	1.8	5.5	9.1	13.0
	(kW)	470	1,450	2,420	3,430
Air Capacity	(SCFH)	17,700	54,000	90,300	128,100
	(nm ³ /hr)	470	1,450	2,420	3,430
Air Pressure (Body)	(in.w.c.)	0.3	2.9	8.1	16.4
	(mbar)	0.8	7.2	20.3	40.8
Gas Inlet Pressure	(in.w.c.)	0.2	1.8	5.1	10.3
	(mbar)	0.5	4.6	12.7	25.6
Combustion Zone Length ⁴	(ft)	7.0	11.0	13.0	15.0
	(m)	2.1	3.4	4.0	4.6
Combustion Zone Diameter ⁴	(ft)	2.5	3.0	4.0	4.0
	(m)	0.8	0.9	1.2	1.2
Maximum Excess	(Air %)	250	500	750	1,000
	(Fuel %)	+30	+30	+30	+30

NOTES:

- Capacities based on Natural Gas with HHV of 1034 BTU/ft³ (Standard), and LHV of 10.21 kWh/nm³ (Metric), 0.59 S.G., and a stoichiometric ratio of 9.74:1 with burner firing into chamber under no pressure at 5% excess air.
- Air and fuel flows based on STP operating conditions at sea level and industry standard air and gas piping practices.
- Flame detection is not possible on the 3000 and 4000 Invisiflame™ Mode only versions of the burner.
- The combustion zone when operating Invisiflame™ Mode is not visible unless used with preheated combustion air.
- Invisiflame™ Mode is suitable for furnace or chamber temperatures above 1600°F or 870°C only. For temperatures less than 1600°F or 870°C the TriOx burner must be used in Firing Mode only.

Table 3. 3014 through 4014 Series Capacities

D. DIMENSIONS

See appropriate Dimension sheet for detailed dimensional information.

E. INSTALLATION

 **WARNING**

Use care when handling as the equipment may be heavy, have sharp edges or dust/fibers from refractory or gasket material. Always wear personal protective gear and use appropriate equipment during handling and installation. Be sure your installation conforms to appropriate safety guidelines for your application such as NFPA 86 or EN746.

1. The furnace shell plate must be provided with studs to match the tile mounting plate as shown on Hauck's dimension sheet TriOx-3.1. Hauck TriOx burners must be mounted on properly braced, rigid furnace structures capable of supporting the burner and tile weight (see Table 7).

Burner Model	Approx. Burner Net Wt.	Approx. Tile Net Wt.
TriOx-_008	lb (kg)	280 lb (127 kg)
TriOx-_012	lb (kg)	410 lb (186 kg)
TriOx-_014	lb (kg)	580 lb (255 kg)

Table 4. TriOx Burner and Tile Weights

2. Furnish an opening in the furnace shell 1/2" (13 mm) to 3/4" (19 mm) larger than the burner tile outside diameter.

 **WARNING**

Refractory can be heavy and laden with dust or fibers, use care in lifting and always wear appropriate personal protective gear such as a respirator or dust mask around refractory or gasket material.

3. For installation in an existing refractory wall, refer to Figure 1. From inside the furnace, remove rammed, cast or brick refractory as required to allow for installation of the port block using cast or rammed refractory.

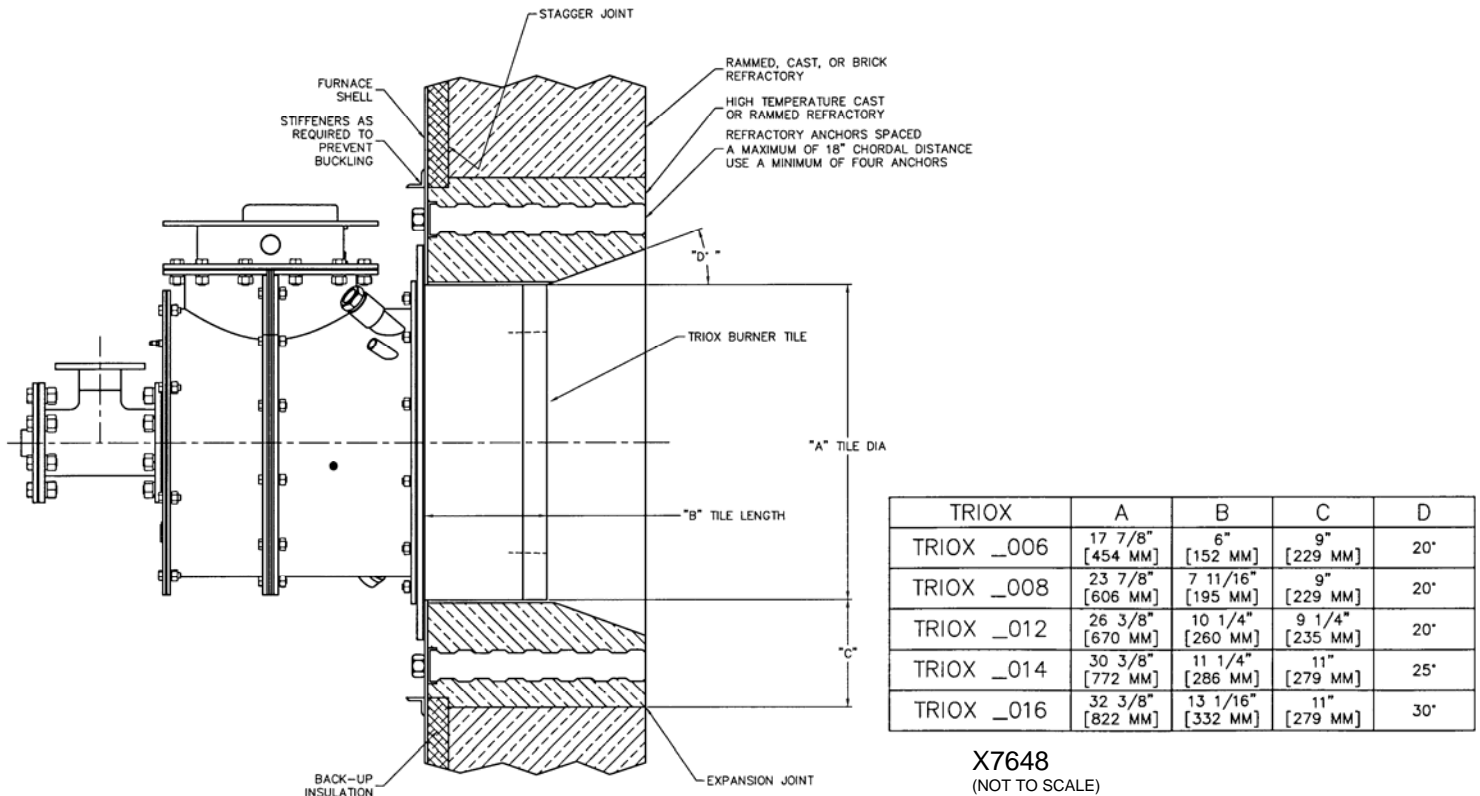


Figure 1. Burner Mounting and Refractory Installation

4. Mount the self-supporting burner tile to the furnace shell plate using 3/4" (19 mm) studs positioned as shown on Hauck's dimension sheet TriOx-3.1. Place the tile mounting flange gasket over the studs and then the burner tile assembly. Secure with lock washers and hex nuts.
5. Wrap the cylinder of the tile with one layer of 1/4" (6 mm) fiber paper rated for a higher temperature than the furnace. Secure fiber paper with tape to retain the fiber during casting or pouring of refractory port block.
6. Install refractory anchors to the furnace shell to secure the refractory port block to the furnace shell. Refer to Figure 1 for spacing of anchors and provision for expansion joints, or follow the refractory manufacturer's recommendations. The refractory wall must exert no stress on the burner tile when the furnace is hot or cold.
7. Form the burner port block per the indicated dimensions using wood or metal mandrels centered on the I.D. of the burner tile. Ensure that the mandrel includes sufficient draft or taper for easy removal.
8. Cast or ram refractory into the port block mandrel. Hauck recommends use of a quality refractory with a temperature rating of 2400°F (1315°C), or 400°F (222°C) above the maximum furnace design temperature, whichever is higher.
9. After the refractory has set properly, remove the burner port mandrel. Any remaining gaps or openings should be packed with fiber to ensure hot gases cannot reach the burner tile shell or furnace shell. **Re-pack all gaps with refractory fiber or similar material after initial firing.**

10. Mount the burner to the self-supporting tile mounting plate as follows:
 - a. Position the main air inlet in the desired orientation (6 or 12 o'clock positions possible).
 - b. Place the mounting plate gasket provided over the burner mounting studs.
 - c. Place the tile cushion gasket in place inside the tile, tape or mortar in place to ensure the gasket does not move or block the stage 3 air slots during assembly.
 - d. Gently position the burner on its mounting studs and insert the body into the burner tile. Check to make sure the main air inlet is positioned in the desired direction and ensure that the large stage 3 air slots through the burner refractory line up with the corresponding stage 3 air slots in the refractory tile.
 - e. Position lock washers and mounting nuts on studs and tighten.

Air & Fuel Connections – 3000 and 4000 Series Only

1. Install the main air line at the burner body air inlet flange using the gasket provided. A companion flange is supplied when ordering the metric version of the burner.
2. If necessary, the gas connection can be rotated in 45° increments as follows:
 - a. Remove the hex nuts and washers holding the gas tee to the main air body.
 - b. Rotate the gas tee to the desired position.
 - c. Make sure the gaskets between the gas tee and the main air body are properly seated.
 - d. Replace washers, hex nuts and tighten.

IMPORTANT

All piping must be properly supported and aligned to avoid stresses on the burner and associated equipment. Hauck recommends that unions and flexible connections be used on all air and fuel lines. The unions will allow the burner to be more easily serviced when required, and the flexible connections will help isolate the burner from piping movement due to expansion, contraction and vibration.

3. Install and connect the gas line.
4. **Inspect all bolted joints on the burner and tile. Be sure all fasteners are tight. Re-inspect and re-tighten ALL bolts after initial firing.**

CAUTION

In order to ensure an adequate seal, it is important that the burner backplate bolts be sufficiently tight. **Before any attempt is made to start the burner, check to ensure that the bolts are sufficiently tight and conduct a gas leak test. Failure to check and ensure that a satisfactory seal exists by conducting a leak test could result in the formation of a hazardous gas leakage condition.** Whenever burner internals are removed for cleaning or replacement, **be sure to tighten the backplate bolts and conduct a gas leak test.**



WARNING

Adjustment of this equipment, and its components, by unqualified personnel, can result in fire, explosion, severe personal injury, or even death.

CAUTION

All cast refractory burner components are porous and therefore subject to moisture absorption. Refractory components should not be stored or exposed to damp conditions potentially reducing their normal expected life. Care **must** be taken at initial startups and after extended idle times to assure refractory components have been sufficiently dried prior to normal firing conditions. It is highly recommended that **low fire drying for at least 6-8 hours at 50 to 100% excess air** occur at initial startups prior to exposing refractory components to normal firing operation. Thereafter, if the refractory components are exposed to excessive moisture, condensation, or high humidity for extended periods, **allow at least 30 minutes of low fire drying** before beginning normal operation. Failure to do so may cause any moisture present to expand rapidly resulting in refractory spalling and/or premature failure.

IMPORTANT

After furnace has reached operating temperatures, re-tighten all furnace mounting nuts, as loosening may occur during heat-up.

F. IGNITION – 3000 and 4000 Series Only

The 3000 and 4000 Series TriOx burners do not have any provisions for ignition are intended for use in **Invisiflame™ Mode only for operation above 1600°F (870°C)**. The control system **MUST** ensure that the air and fuel are accurately supplied and metered to the burner in the appropriate Air:Fuel ratio (typically stoichiometric to slightly fuel lean) to ensure proper auto ignition of the reactants. It is recommended that ignition take place at Low Fire (see Section C Capacity Tables).

G. INITIAL SETUP – 3000 and 4000 Series Only

TriOx burners typically operate with automatic control systems. The burners are capable of proportional control over their entire capacity range.

CAUTION

Initial adjustment and burner start-up should be undertaken only by trained and experienced personnel familiar with combustion systems, control and safety circuitry and overall installation procedures. Avoid burns from flame, high surface temperature, hot components and exhaust gas. Verify proper installation and condition of gaskets & seals. In addition to heat and noise; burning paint (solvents or sealing material), exhaust leaks, carbon monoxide (CO) and other by-products of the combustion process may be present at or near the combustion equipment. Always wear appropriate clothing and personal protective gear (gloves, ear plugs, safety glasses, respirator, etc.) when working with equipment in operation.

CAUTION

Ensure that all safety equipment and limits are working properly before proceeding.

CAUTION

Under no circumstances should the 3000 or 4000 Series of the TriOx be operated in a furnace below 1600°F (870°C).

1. Once installed, the burner is ready for initial set-up. The specific operation of the burner will depend on the individual system components in the entire combustion system. Refer to the instruction sheets that accompany the individual components.
2. Combustion air pressure should be set at the burner Stage 3 combustion air tap (located on the burner backplate). Typical combustion air pressures range from a minimum of approximately 0.3"wc (0.8 mbar) to a maximum of 14.8"wc (37 mbar) static pressure at the burner static pressure test points provided. Because the burner does not light in the traditional sense, but rather combustion takes place in the hot furnace, the 3000 and 4000 Series burners can be started at any time the furnace is above 1,600°F (870°C), but Low Fire ignition is highly recommended (refer to the appropriate capacity sheet for burner air flow at low fire conditions).
3. Gas pressure should be set at the gas control valve (typically limiting gas valve located near burner inlet). Nominal natural gas pressure required at the burner inlet is approximately 20"wc (50 mbar). Actual gas pressure required may vary (refer to the appropriate capacity sheet for burner gas flow and pressure at desired conditions).
4. Above 1600°F (870°C), the combustion air flow can be increased to high fire and gas flow started and controlled to whatever capacity is required (refer to appropriate capacity sheet for burner air flow at high fire conditions).
5. When all burners are ignited, increase the combustion air to the high fire position (refer to appropriate capacity sheet for burner air flow at high fire conditions).
6. When high fire combustion air is set, adjust the gas control valve (limiting gas valve or zone control valve) to achieve the desired gas flow at high fire (refer to appropriate capacity sheet for burner gas flow/input at high fire conditions).
7. Verify air/fuel ratio using orifice meters in the air and gas lines. Static air pressure at the burner air inlet can be related to air flows if an air orifice meter is not available. For best NOx emissions, a 5% excess air condition should be maintained throughout operation.
8. Drive the burner to the low fire position and verify that the settings are consistent. Repeat steps 4 through 7 as necessary until high and low fire settings remain constant.
9. When burners are not firing, a minimum flow rate of combustion air should be maintained through the burner to prevent overheating of the internal components. Under most conditions, a burner static air inlet pressure of 0.1"wc (above furnace pressure) should be sufficient to keep the burner cool, but it is recommended that the burner shell temperatures be checked and air flow adjusted accordingly.
10. To shut down the burner system:
 - a. Return the burner to the low fire position.
 - b. Close all fuel shutoff valves.
 - c. Allow the furnace to cool to 800°F or less before shutting off the combustion air blower.

H. OPERATION – 3000 and 4000 Series Only

Once properly installed, ignited and fired, the burner is ready for operation. The operation of the burner will depend on the specific items in the combustion control system and the application of the burners. Refer to the instruction sheet that accompanies each item. **Note the burner MUST be shut-off if at any time the combustion chamber drops below 1,600°F (870°C). Provisions in the furnace control system are required to incorporate this safety feature in addition to only allowing ignition above 1,600°F (870°C).**

IMPORTANT

If the refractory in the burner is exposed to excessive moisture or extended periods of dampness, **allow at least 30 minutes of low fire drying before beginning normal operation. Failure to do so can cause moisture present to expand rapidly, causing damage to the refractory.**

I. MAINTENANCE

Hauck TriOx burners have been engineered to provide dependable performance while requiring low maintenance. As with any product, it is very important to follow operating instructions and all procedures carefully to obtain optimum performance. Please refer to the applicable TriOx Parts List to become familiar with the various burner components and assemblies.

CAUTION

Be sure burner internals have cooled sufficiently before attempting to disassemble any components. Use care when separating gasket surfaces to avoid damage to the gaskets. All maintenance work should be accomplished by trained and experienced personnel only.

1. The gas body assembly should be checked periodically and cleaned, if necessary, by:
 - a. Disconnect the gas line.
 - b. Remove front set of hex bolts from air body backplate.
 - c. Remove gas tee assembly from burner.
 - d. Loosen the packing nut and remove the center gas tube assembly from the burner.
 - e. Inspect internal parts. Clean the interior walls of gas body assembly and gas tube assembly of any residue.
 - f. Reinsert gas tube assembly. Ensure that the gasket is properly seated and inlets are properly repositioned.
 - g. Replace gas inlet tee and securely tighten hex bolts.
 - h. Reconnect the gas line.

2. Replacement of Internal Baffle
In order to replace the internal baffle, use the following procedure:
 - a. Disconnect the gas line.
 - b. Loosen the backplate bolts and remove the backplate and gas tee assembly, taking care not to damage any internal burner insulation. Note the center gas tube will pull out as part of the sub-assembly.
 - c. Remove burner internals after breaking the seal between the center refractory baffle and the outer refractory ring. Be careful not to damage the internal body liners (TriOx 4000 Series only)
 - d. Coat the outside of the new baffle with high temperature coating cement (Hauck recommends Fiberfrax QF-150 or equivalent), taking care not to block baffle air openings.

- e. Install the new baffle in the burner refractory ring being sure to align the baffle key with the inner refractory ring keyway to ensure proper alignment of parts. Ensure the baffle air openings are not blocked.
- f. Reinstall the burner backplate, use a new gasket if necessary. Ensure that the burner internal fiber linings (4000 Series only) are securely in place to protect the burner shell from overheating. Tighten all flange bolts securely.
- g. Reinstall all gas piping and check for gas leaks before restarting burner.

CAUTION

Failure to check and ensure that a satisfactory seal exists by conducting a gas leak test could result in a hazardous condition.



WARNING

Use care when handling as the equipment may be heavy, have sharp edges or dust/fibers from refractory or gasket material. Always wear personal protective gear and use appropriate equipment during handling and installation. Verify proper installation and condition of gaskets & seals. Damaged gaskets or seals could allow the escape of hot gases or eject hot material.

3. Replacement of Self-Supporting Refractory Tile

Refractory tiles should be checked for damage. If this cannot be done from inside the furnace, it will be necessary to gain access to the tile by removing the burner backplate assembly as described in step 2. Should it ever become necessary to replace the burner refractory tile, use the following procedure:

- a. If applicable, complete steps 2.a. through 2.c. above. Note the entire burner assembly can be removed as a single unit if replacing the burner tile only.
- b. Disconnect the air line.
- c. Support the burner weight before loosening burner shell mounting nuts.
- d. Loosen the burner shell mounting nuts from the burner tile mounting studs and remove the burner assembly from the furnace.
- e. Loosen and remove the 7/8" (22 mm) tile mounting plate studs.
- f. Remove the existing burner tile from the furnace wall and clean the tile port opening.
- g. Inspect the refractory in the area surrounding the tile and repair any damage.
- h. Replace the burner tile mounting gasket, if necessary.
- i. Mount the new burner refractory tile.
- j. Replace tile mounting nuts and tighten.
- k. Scrape off any excess mortar from the face of the burner.
- l. Repeat steps 1 through 10 in Section E of these instructions.