Installation and operating instructions

Application requirements

View port

Furnace observation ports should be located to provide a view of the flame. This will simplify burner start-up and adjustment.

Installation instructions

Storage of Series 300 OXY-THERM® burners

Series 300 OXY-THERM® burners shall be stored dry (inside). Burner blocks have been cured carefully before shipment and shall be kept dry. Wetting of the blocks could result in premature failures.

Handling of Series 300 OXY-THERM® burners

Series 300 OXY-THERM® burners are shipped as complete units. Handle burners with care during unpacking, transport, lifting and installation. Use proper equipment. Any impact on the burner could result in damage.

Seal burner to the installation

Use proper gasketing and/or insulation to seal burner into the installation. Retighten all bolts after first firing and regularly after commissioning.

Bolting and piping

- Fuel and oxygen piping must be supported to prevent undue stress and damage to burner block and components.
- If multiple burners are fed from a single fuel train, care should be taken to minimize pressure drop and give maximum uniformity.
- Every component that comes in contact with oxygen must be cleaned for oxygen service.

Burner mounting

The primary objective is to seal all openings between the burner and furnace wall and to support the weight of any system piping. The burner block sits on the sill or wall.

The block must rest flat on the sill or furnace wall without rocking to allow the weight to be evenly distributed. Failure to do so could result in cracking or block failure. If burner/furnace openings are too large, shims may be used to align the burner. Avoid applying any compressive or tensile forces to the ceramic portions of the burner as this may cause premature failure.

The opening of the furnace should provide a minimum 1/16” clearance on all three sides. High temperature furnace sealant or gasketing should be used between the burner and furnace wall.

Orientation

Series 300 OXY-THERM® burners can fire in any direction. However, avoid orientations which might permit an idle burner to collect debris.

Blocks

The material used in the refractory block is an alumina/zirconia/silica composition. It is the responsibility of the user to assure its compatibility with the user’s process.

Cooling air flow

Cooling flow, either clean, dry air, nitrogen, or oxygen, must be used whenever the burner assembly is in a high temperature atmosphere and is not firing. Typical compressed air systems contain lubrication oils, which will contaminate oxygen-clean environments and cannot be used for cooling flows without special treatment. Cooling air provided by plant process air fans is one possible source.

To provide cooling flow to the burner assembly, MAXON recommends installing a 3-way ball valve immediately upstream from the combustion oxygen connection on the burner. Connect cooling source and combustion oxygen source to the valve.

Ratio adjustment

Oxygen-fuel burners require accurate control of both fuel and oxygen for optimum performance. MAXON can supply state-of-the-art electronic or manual oxygen/fuel ratio control valves. Piping to the individual burners should include control valves for both oxygen and fuel. In addition, flow meters for oxygen and fuel capable of local or remote readout are required for proper burner adjustment.

Cold installation procedure

Read the entire installation procedure before proceeding with the installation of oxygen-fuel burners.

Failure to follow the proper installation sequence noted below could result in damage or destruction of vital burner components. Cooling oxygen or air flows should be present at all times when the burner housing and metal components are mounted to a hot furnace.

- Visually inspect the burner. The burner is shipped fully assembled, and is designed for installation as a complete unit.
- Confirm that cooling air or oxygen is available at the individual burner ports and control stations before installing the burner.
- Install the burner assembly into the furnace wall. Refer to the information below for Hot Installation Procedures. Refer to page 3-18.7-8 and 9 for burner mounting dimensions and refer to page 3-18.7-10 for burner mounting instructions.
- Complete connections for fuel, oxygen and electrical (if burner is supplied with direct spark feature).
- Verify flow of clean, dry cooling air if the furnace will be heated up with another burner. Improper flows or no cooling flows could damage or destroy the burner during heat-up.
- The UV scanner must be field-supported if the UV scanner is connected to the OXY-THERM® burner.
- Burner installation is complete.
- Other system safeguards and approvals must be completed before the burner can be lit. These safeguards include, but are not limited to:
  Furnace operating temperature at the burner location must exceed the ignition temperature of the fuel being used (for burners without the direct spark feature).
  Oxygen/fuel control must be functional and characterized to provide the proper oxygen/fuel ratio to the burner.

Hot installation procedure

Read the entire Cold Installation Procedure (as a reference) before proceeding with the installation of oxygen-fuel burners.

Failure to follow the proper installation sequence noted below could result in damage or destruction of vital burner components. Cooling oxygen or air flows should be present at all times when the burner housing and metal components are mounted to a hot furnace.

- Temporarily remove the insulation block from burners that have the direct spark feature. Failure to do so could cause the insulator to melt. It should be re-installed just prior to burner light off.
- All moisture within the burner block should be removed before starting installation. Preheating burner block to remove moisture and reduce thermal shock is advised.
- Where the new burner block contacts older or hot materials, silica paper should be used as a thermal buffer. The furnace opening should be clean and free of debris.
- Insert the burner block into the furnace wall.
- The burner block should be slightly recessed inward from the inner furnace wall, and can be recessed by as much as 3 inches.
- Attach burner assembly to block, ensuring cooling air or oxygen flows are established to protect metal components.
- Allow the new burner block to heat up to near ambient temperatures (usually about one half to three-quarters of an hour).
- Resume normal operations as described in Cold Installation Procedure.

Start-up instructions for Series 300 OXY-THERM® burners

Instructions provided by the company or individual responsible for the manufacture and/or overall installation of a complete system incorporating MAXON burners take precedence over the installation and operating instructions provided by MAXON. If any of the instructions provided by MAXON are in conflict with local codes or regulations, please contact MAXON before initial start-up of equipment.

Read the combustion system manual carefully before initiating the start-up and adjustment procedure. Verify that all of the equipment associated with and necessary to the safe operation of the burner system has been installed correctly, that all pre-commissioning checks have been carried out successfully and that all safety related aspects of the installation are properly addressed.

Initial adjustment and light-off should be undertaken only by a trained commissioning engineer.

First firing or restart after shut-down

During first start-up of the burner, and after every longer installation shut-down, the temperature rise shall be limited. Allow the burner to fire on low fire for some time to allow the parts to heat-up slowly.

Checks during and after start-up

During and after start-up, check the integrity of the system. Check all bolted connections after first firing (first time on temperature) and retighten if necessary.

Main burner ignition

Set correct gas and oxygen flow for burner minimum capacity before attempt of main burner ignition. Flow meters for oxygen and gas flow measurement should be used for proper burner adjustment.
After ignition of main burner, allow some time on minimum capacity to allow the burner parts to heat up slowly.

Maintenance & inspection instructions

Safety requirements

Regular inspection, testing and recalibration of combustion equipment according to the installation manual is an integral part of its safety. Inspection activities and frequencies shall be carried out as specified in the installation manual.

Visual inspections

Regular visual inspection of all connections (oxygen and gas piping to the burner) and burner flame size and aspect are essential.

Spare parts

It is not recommended to keep local stock of burner parts unless burner is critical to continued process operations. Consult installation manual for burner spare parts and system accessories.