

Model number**OXY-THERM® FH burners**

Burner model	Fuel flow SCFH	Connection type	Fuel	Block material	Burner block
OT FH	17	A	N	A	Y

Burner model

OT FH - OXY-THERM® FH burner

Block materialA - Alumina/Zirconia/Silica
N - None**Fuel flow - SCFH**17 - 17 SCFH (0.48 m³(st)/h)25 - 25 SCFH (0.71 m³(st)/h)**Burner block**Y - Yes
N - No**Connection type**A - ANSI threaded connection
I - ISO threaded connection**Fuel**N - Natural gas
X - Other gas (see Engineering)

Fuel flows are for natural gas. Contact MAXON for other fuels.

Specifications

Capacities

OXY-THERM® FH burners

Typical burner data			
Fuel: natural gas at 15°C with 10.9 kWh/Nm ³ HHV - sg = 0.6 [1]			
propane at 15°C with 26.8 kWh/Nm ³ HHV - sg 1.57 [1]			
Stated pressures are indicative. Actual pressures are a function of air humidity, altitude, type of fuel and gas quality.			
OXY-THERM® FH burners		OXY-THERM® FH burner size	
		FH 17	FH 25
Maximum capacity range	kW	5.0	7.3
Turndown		4 to 1	
Pressures required to burner inlet for maximum capacities	Oxygen	mbar	69
	Natural gas	mbar	69
	Propane		Contact MAXON
Typical oxygen to fuel volumetric ratios	To natural gas		2.05
	To propane		5.1
Approximate flame size	Width	mm	64
	Length	mm	305 - 356
			76
			406 - 455

[1] sg (specific gravity) = relative density to air (density air = 1.293 kg/Nm³)

Materials of construction

Burner part	Material
Block material	Alumina/Zirconia/Silica (AZS)
Burner insert assembly	304/310/321 stainless steel

Intended service and typical application

Application details

OXY-THERM® FH burners are designed for glass forehearth and other high temperature applications where self ignition and flame supervision are not required. Applications using oxygen-fuel burner technology can vary greatly. Design specifics for individual applications are provided by OEM or end user.

Process temperatures

OXY-THERM® FH burners may be applied at temperatures up to 3050°F (1680°C) with standard block materials. Minimum operating process temperature is 1382°F (750°C).

Removal of the burner nozzle is recommended when the burner is out of service in an operating forehearth or other application.

Cooling flow, either clean, dry air or oxygen, must be used whenever the burner assembly is in a high temperature atmosphere and is not firing. See installation and operating instructions for more details.



NOTE: Premium-quality materials have been used in the OXY-THERM® FH burner, but metal components can be destroyed by high temperatures if the burner is misused or disconnected from cooling flows. Because most oxygen-fuel burner applications operate at very high temperatures, these guidelines focus on enhancing burner performance and longevity.

Burner 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.

Ratio control requirements

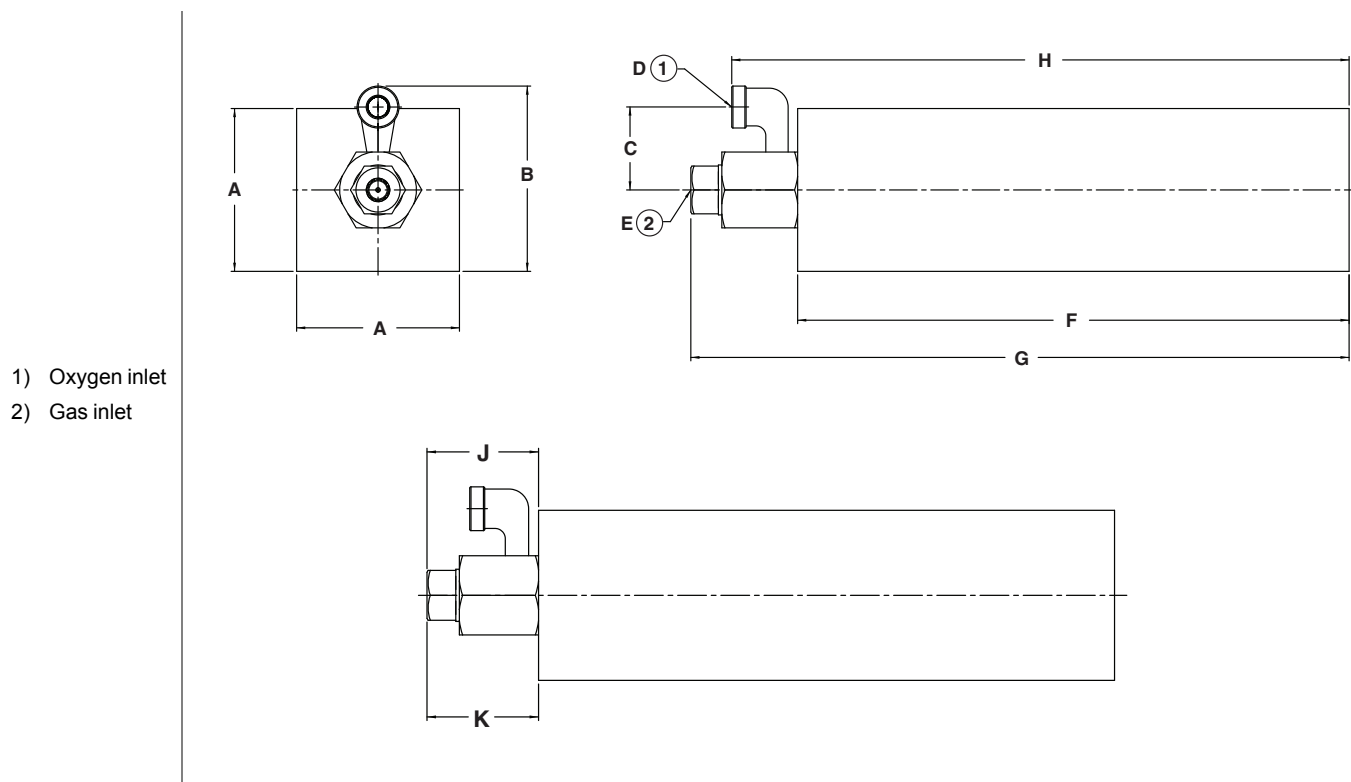
Oxygen-fuel burners require accurate control of both fuel and oxygen for optimum performance. MAXON recommends the use of SMARTLINK® electronic fuel/air ratio control system. Piping should include control valves for both oxygen and fuel. In addition, flow meters for oxygen and fuel capable of local or remote readout are recommended for proper burner adjustment.

Emission performance

Emissions performance will vary by application. Contact MAXON for information on installation-specific estimates and guaranteed values. No guarantee of emissions is intended or implied without specific, written guarantee from MAXON.

Dimensions and weights

OXY-THERM® FH burners



Dimensions in mm unless stated otherwise													
A	B	C	D		E		F	G	H	J [1]	K [2]	Burner weight kg	Block weight kg
			ANSI	ISO	ANSI	ISO							
76	86	38	1/8-27 NPT	Rc 1/8-28	1/8-27 NPT	Rc 1/8-28	254	302	284	224	260	0.5	4

[1] Burner removal clearance required

[2] Burner gas tube removal clearance required

Installation instructions



Please read the operating and mounting instructions before using the equipment. Install the equipment in compliance with the prevailing regulations.

Bedrijfs- en montagehandleiding voor gebruik goed lezen! Apparaat moet volgens de geldende voorschriften worden geïnstalleerd.

Lire les instructions de montage et de service avant utilisation! L'appareil doit impérativement être installé selon les réglementations en vigueur.

Betriebs- und Montageanleitung vor Gebrauch lesen! Gerät muß nach den geltenden Vorschriften installiert werden.

Storage

OXY-THERM® FH 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

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

Piping

- Use care when connecting fuel tubing/piping to the burner fuel connection. Fuel connection is not designed to support fuel piping. Fuel and oxygen piping must be supported to prevent undue stress and damage to burner block and components.
- Flexible connections are recommended. Refer to recommended piping and support diagram.
- If multiple burners are fed from a single fuel and oxygen train, care should be taken to equalize fuel and oxygen delivery to each burner.
- Every component that comes in contact with oxygen must be cleaned for oxygen service.

Burner mounting



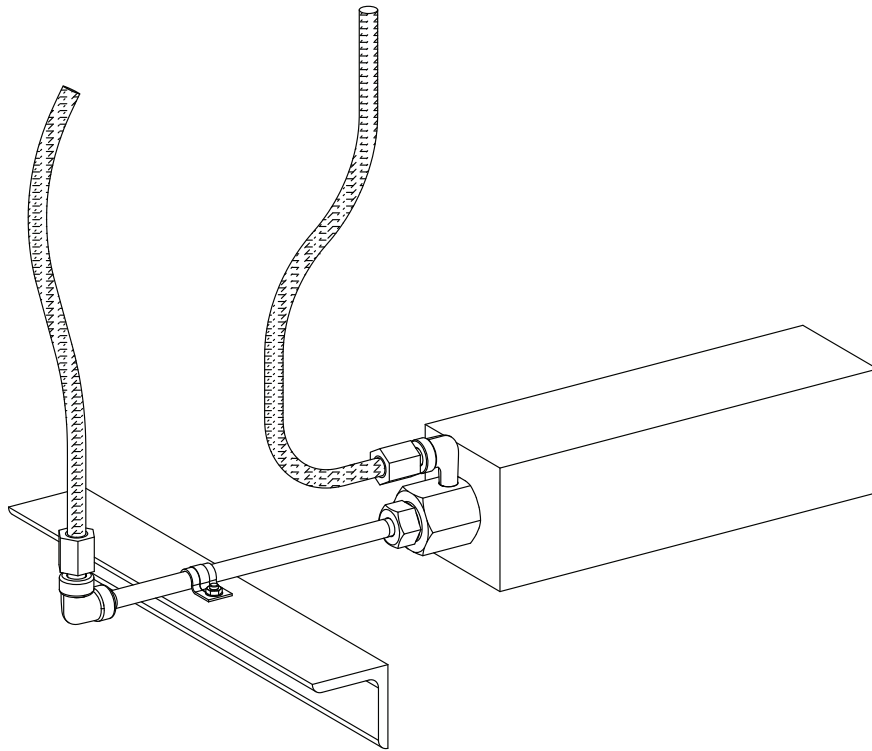
The primary objective is to seal all openings between the burner and wall and to support the weight of any system piping. The burner block sits on the sill or wall.

The block must rest flat on the sill or wall without rocking to allow the weight to be evenly distributed. Failure to do so could result in cracking or block failure. If burner 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 burner opening should provide a minimum of 1/16" clearance on all three sides. High temperature furnace sealant or packing should be used between the burner and wall.

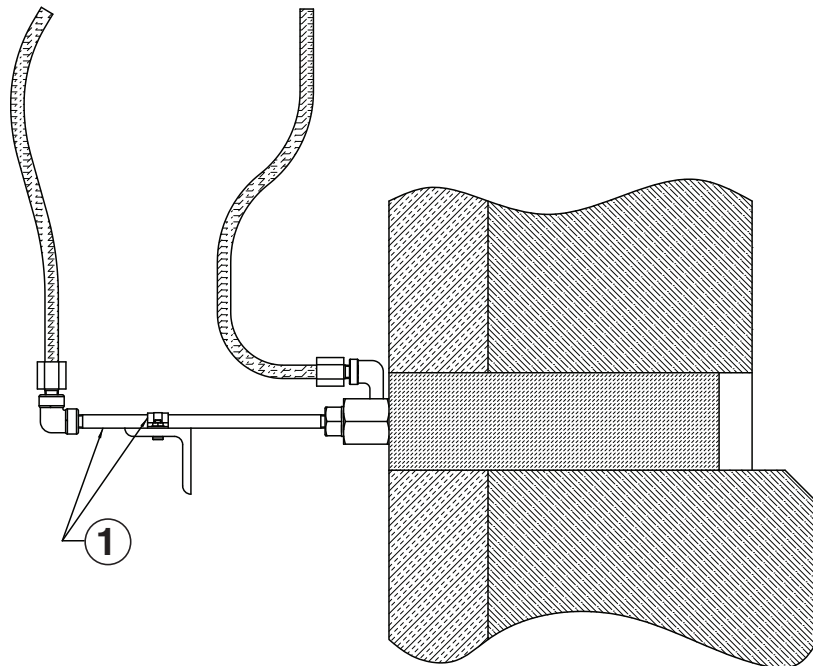
OXY-THERM® FH burners are designed to fire horizontally and should be mounted accordingly.

Typical burner mounting arrangement



Note: Wall structure removed from above illustration for clarity

- 1) Use pipe and clamp on fuel gas line to keep nozzle pressed into block opening



Cooling air flow

Removal of the burner nozzle is recommended when the burner is out of service. If removal is not possible, or not chosen, cooling flow, either clean, dry air, nitrogen or oxygen, must be used. 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.

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 should include control valves for both oxygen and fuel. In addition, flow meters for oxygen and fuel capable of local or remote readout are suggested 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 forehearth.

- Visually inspect the burner.
- Refer to page 3-18.5-6 for burner mounting dimensions and refer to page 3-18.5-7 and 8 for burner mounting instructions.
- Install burner block into opening.
- Complete connections for fuel and oxygen.
- If the burner nozzles will be installed during heat up, confirm that cooling air or oxygen is available at the individual burner ports and control stations before installing the burner.
- If burner nozzles are not installed, place ceramic wool into the burner block opening to prevent hot gases from escaping during heat-up procedure.
- Install the burner nozzle assembly into the opening.
- 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: 1) furnace operating temperature at the burner location must exceed the ignition temperature of the fuel being used; and 2) 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 nozzle is inserted.

- 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 burner opening should be clean and free of debris.
- Insert the burner block into the burner opening.
- Insert burner nozzle into 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.

Operating instructions

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.

Start-up

Checks during and after start-up

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

Burner ignition



CAUTION: The OXY-THERM® FH burner does not have self ignition capability. It is the responsibility of the end user and service personnel attempting start-up to confirm that ignition temperatures appropriate for the fuel used are present inside the furnace where the burner is located. In cases where manual ignition from the outside is required, provisions shall be made in the furnace wall adjacent to the burner. Burners should be started up at minimum fuel and oxygen flows (see capacity table on page 3-18.5-4) to prevent sudden pressure rise in the fired chamber.

Set correct gas and oxygen flow before attempt of burner ignition. Flow meters for oxygen and gas flow measurement should be used for proper burner adjustment.



CAUTION: Oxygen should only be used with approved materials, properly cleaned pipe and equipment, and specially designed systems. Ordinary materials can be extremely flammable in the presence of oxygen and air enriched with oxygen.

Maintenance 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 recommended to keep local stock of burner spare parts if burner is critical to continued process operations. Consult your MAXON sales representative for burner spare parts and system accessories.