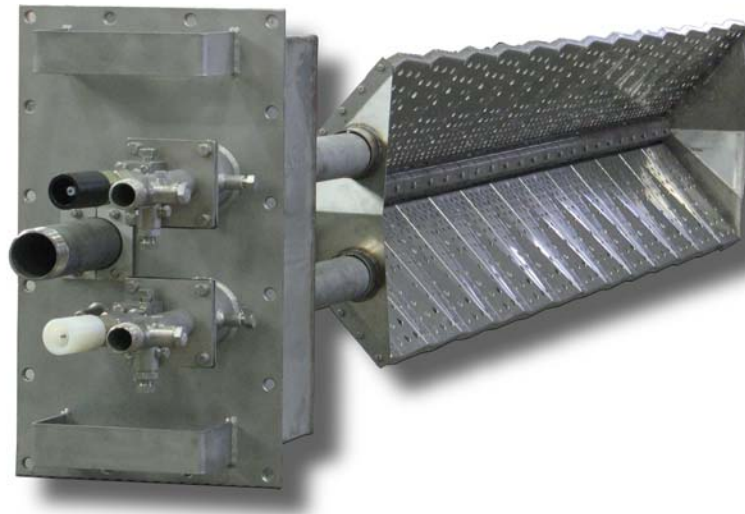


# "HC" AIRFLO®

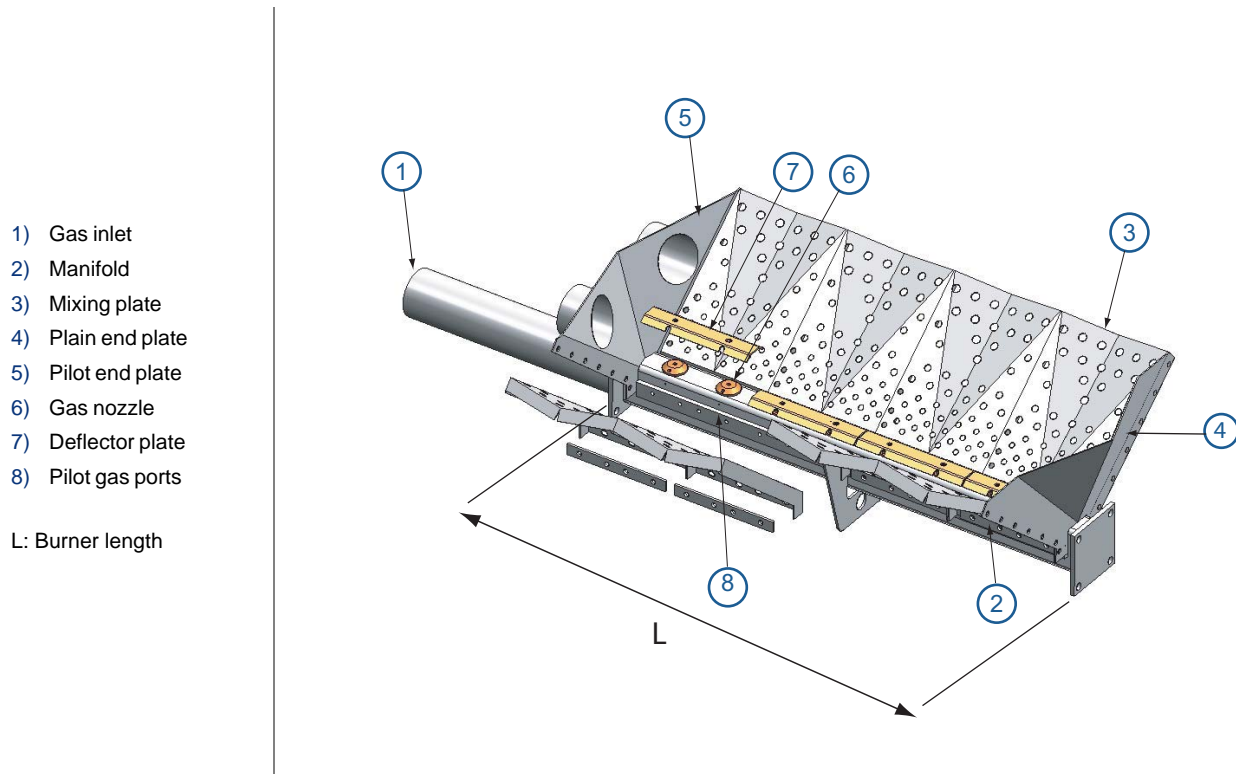
## In-duct firing line burner



- High heat release up to 2.5 MW per unit of burner length (305 mm)
- Clean combustion with low CO and NO<sub>x</sub> emission levels
- Minimal process air pressure drops locally across the burner as low as 0.5 mbar
- Operates in fresh air, preheated air (up to 600° C) or low oxygen turbine exhaust gases
- Fires on natural gas, H<sub>2</sub> and all mixtures. Special versions for propane, butane, LPG and refinery gases are available
- 100 % stainless steel construction for long life performance
- No external combustion air required
- Plug mounted in duct wall insures low installation costs
- Burner capacity independent of back pressure variations and uniform heat distribution along burner length due to high gas pressure

## Product description

MAXON Series "HC" AIRFLO® burners consist of a stainless steel burner manifold which not only serves as a burner frame but also transports the fuel gas to the gas nozzles and supports the diverging Hastelloy mixing plates.



## Principle of operation

The burner is mounted directly into the process air stream being heated. Thanks to the unique design of the V-shaped mixing plates, the high velocity injected fuel and the process air are intensively mixed. The required oxygen for combustion is progressively drawn from the process air stream.

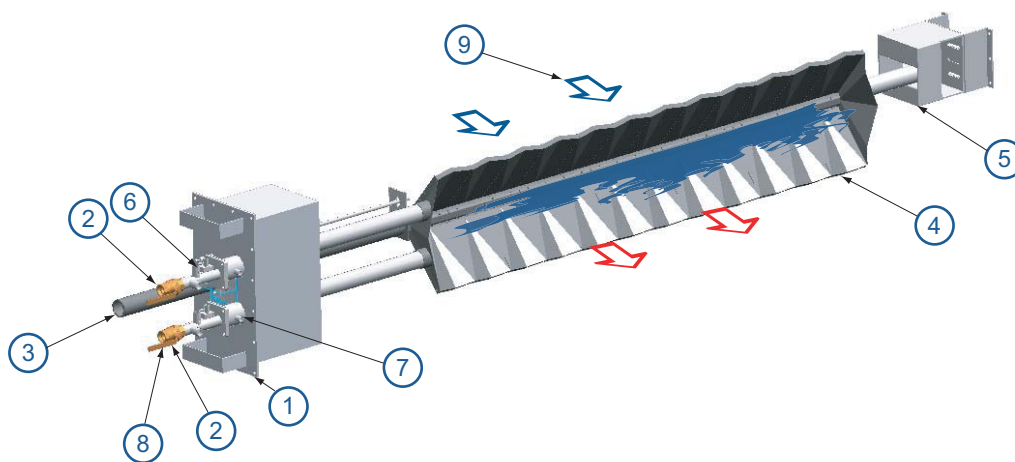
The special designed aeration patterns in the mixing plates insure progressive mixing, superior cross ignition, reliable flame retention, clean combustion over the full capacity range and increased flammability on low O<sub>2</sub> applications.

A small part of the process air stream to be heated is forced through the burner mixing plate holes and is used as primary combustion air. This primary combustion air is mixed with the gas flow injected through the pilot gas ports. The flames retain on the inside of the mixing plates and serve to ignite the high velocity fuel jets injected through the gas nozzles. These jets create large recirculating areas in the flame. This thorough mixing guarantees high capacity clean combustion, avoiding hot spots in the flame and thus reducing thermal NO<sub>x</sub> formation.

This unique principle of operation allows "HC" AIRFLO® burners to operate with both low NO<sub>x</sub> and low CO, over the complete turndown.

## Complete burner assembly

- 1) Mounting plug
- 2) LVDT/HC pilot burner  
(see section 4-22.4 for detailed information)
- 3) Gas inlet 2"
- 4) Mixing plates
- 5) Mounting support
- 6) Test connection  
(upstream process air pressure)
- 7) Test connection on LVDT/HC pilot burner  
(downstream process air pressure)
- 8) UV scanner connection
- 9) Process air flow direction



All "HC" AIRFLO® burners include a stainless steel mounting plug which not only supports the burner but also carries the pilot burners and accessories such as ignition transformers, UV scanners etc. A stainless steel mounting support to carry the weight of the burner is standard included. Thus the burner comes as a complete package, allowing easy installation on site.

## Available "HC"-AIRFLO® sizes

"HC" AIRFLO® burners are always supplied as "slide-in-units" with a mounting plug which can be easily flanged onto the duct. They are custom-built to fit into your duct, with a flame-spread (= burner length) starting from 1 ft going up to 14 ft in steps of 0.5 ft. (1 ft = 305 mm)

Three types are available, depending on burner length and duct width:

"HC" AIRFLO® Type	Burner length	Max. duct width (mm) [1]
Type S	1 ft to 7.5 ft	4000
Type M	4 ft to 10 ft	6000 [2] [3]
Type L	8 ft to 14 ft	6000 [2] [3]

[1] valid for upstream temperatures up to 600° C.

[2] can be increased to 8000 mm when inlet temperature does not exceed 550° C.

[3] can be increased to 8000 mm with max inlet temperatures up to 650° C when higher grade materials are used for burner supports.

Contact MAXON for larger duct widths, and/or burner lengths.

### Typical burner data

The data given in this table apply for nominal burner capacities of 1500 kW per foot. In some specific applications the actual maximum capacities can be considerably higher (up to 2500 kW per foot). Refer to specifications for further details.

Typical burner data						
Fuel : natural gas with 10.9 kWh/Nm <sup>3</sup> HHV) - sg = 0.6 [1]						
Stated pressures are indicative. Actual pressures are a function of air humidity, altitude, type of fuel and gas quality						
Application			Boiler firing		Process Firing	
			TEG-Firing [2]	AUX-Firing [3]	High temp. (T <sub>in</sub> > 100° C)	Low temp. (T <sub>in</sub> < 100° C)
Nominal capacity per foot	[4][8]	kW HHV	1500	1500	1500	1500
Min. capacity per foot	[8]	kW HHV	200	200	200	150
Max. upstream temperature	[5]	°C	600	40	600	100
Max. downstream temperature		°C	950	750 [5]	950	950
Fuel pressure at nominal capacity	[6]	bar	1	1	1	1
Flame length at 50 % capacity or up	[7]	m	3.5... 5	2.5... 4.5	3.5... 5	2.5... 4.5

[1] sg (specific gravity) = relative density to air (density air = 1.293 kg/Nm<sup>3</sup> ).

[2] TEG = turbine exhaust gas

[3] AUX = auxiliary firing

[4] Maximum capacity will depend on application boundary conditions such as acceptable flame length, required emissions, available oxygen, up/downstream temperatures, duct lay-out, process air differential pressure, ...). Therefore, the actual maximum capacity might be lower than 1500 kW per foot or could be up to and even above 2500 kW per foot in specific applications.

[5] Upstream temperatures up to 650° C are possible with higher grade materials (contact MAXON).

Limitation on downstream temperature from 950 °C down to 750 °C is due to possible risk of higher NO<sub>x</sub> emissions when this limit is crossed.

[6] The stated pressures are valid for burner sizes up to 4 ft. For larger burners, the gas inlet pressures will be higher. Refer to specifications for detailed information. Stated pressures are measured at burner gas inlet tube.

[7] Flame length is only given as a guideline. Actual flame length depends on a number of parameters such as process air oxygen level, process air pressure drop across burner. (contact MAXON for specific information).

[8] 1 ft = 305 mm.

## Applications

MAXON Series "HC" AIRFLO® burners are designed for fresh and recirculating process air heating applications. It is possible to operate the "HC" AIRFLO® burner in a process air stream with 12 vol% or less O<sub>2</sub> content, provided adequate inlet temperatures are available. The burner design ensures that requirements of space, capacity and low pressure drops of any application are met.

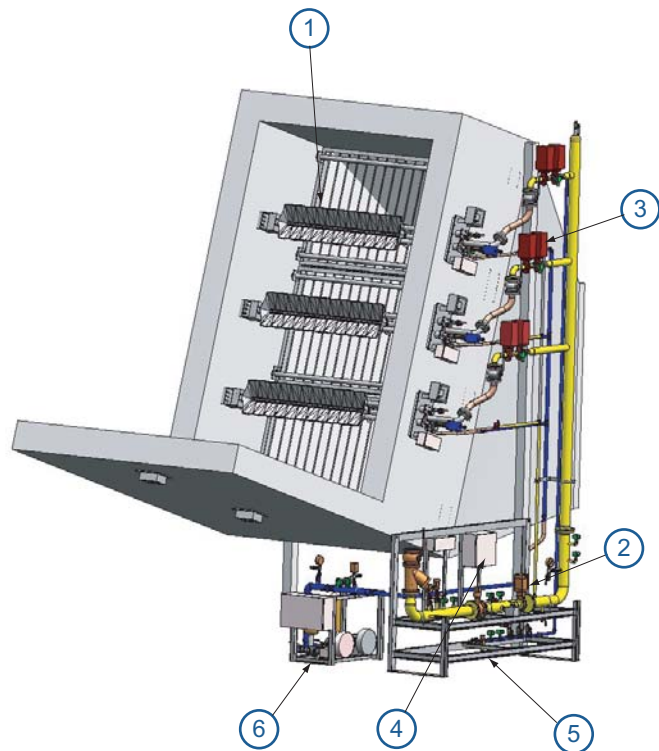
### Typical applications

- Turbine exhaust gas (TEG) reheat applications, where low process air pressure drops, high capacities and high quality combustion are required.
- TEG/AUX installations where clean reheating of TEG is combined with high capacity fresh air firing operation.
- Start-up burners for fluidized bed combustion.
- Large incinerators.
- Processes where (recirculating) air has to be heated, with oxygen levels down to 12 % if sufficiently preheated.
- High capacity fresh air heating.

### Application example

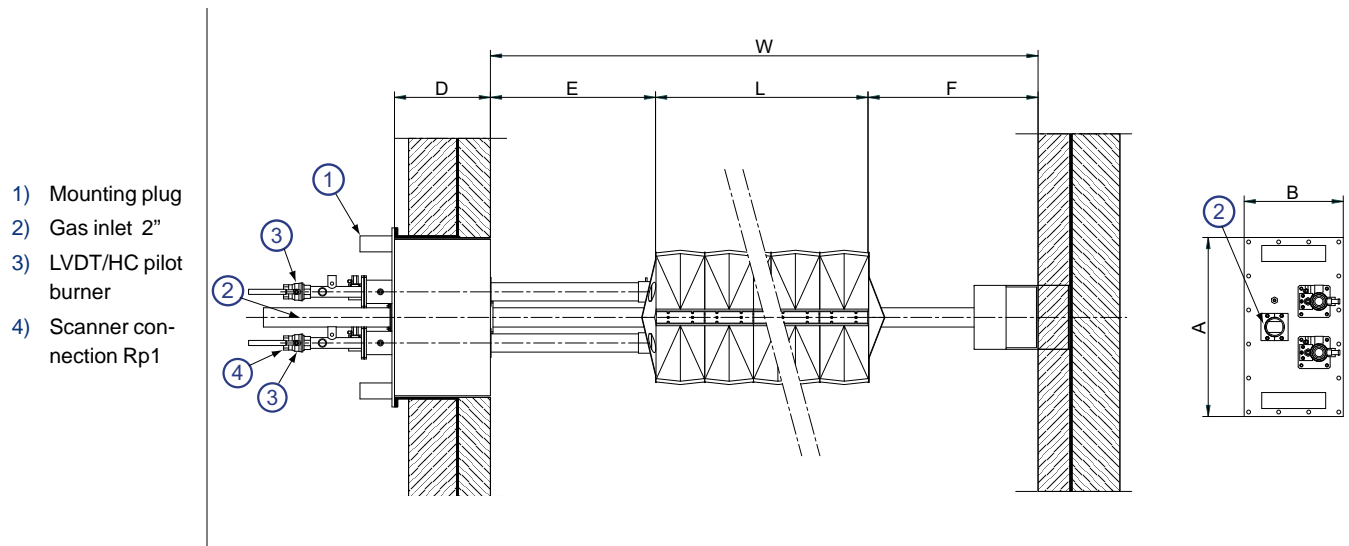
MAXON "HC" AIRFLO® burner installed in an upwards inclined duct: supplementary firing of turbine exhaust gases in a co-generation installation.

- 1) HC-S 5.5 ft burner
- 2) SMARTLINK® fuel control valve
- 3) Series 8000 pneumatic safety shut-off valves
- 4) Control panel
- 5) Gas pipe-train
- 6) Cooling air skid



## Dimensions and weights

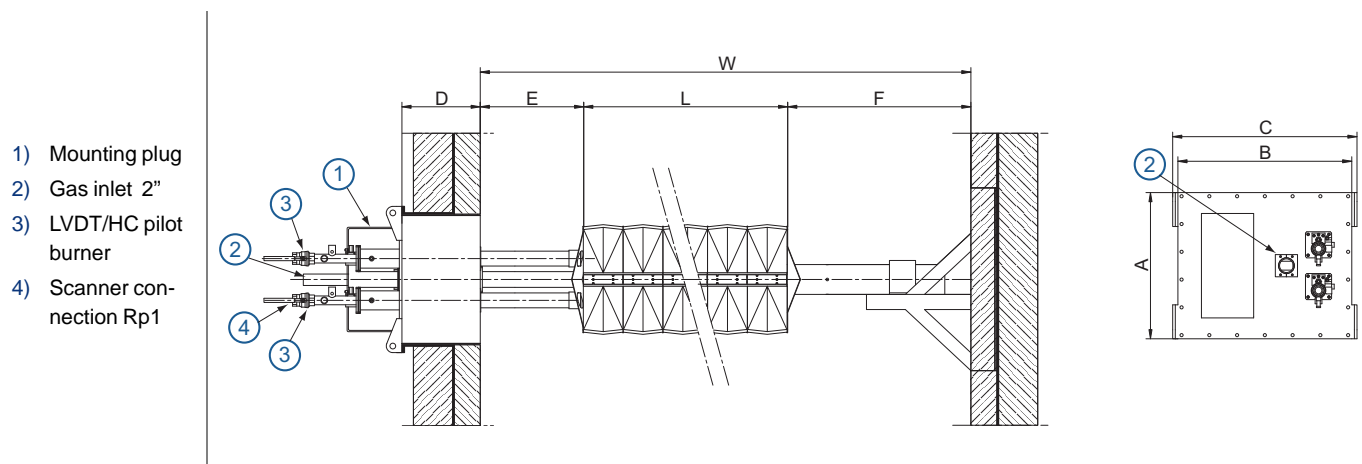
### "HC" AIRFLO® type S (1 ft – 7.5 ft)



Dimensions in mm unless stated otherwise							
A	B	D	E [1]	L	F [1]	W	weight (kg)
560	310	200(min) to 600(max)	200(min)	burner length	300(min)	4000(max)	65 + (5 x burner length in ft)

[1] Valid when duct has internal insulation (without cladding).  
In case of sheet metal wall, E and F should be at least 500 mm

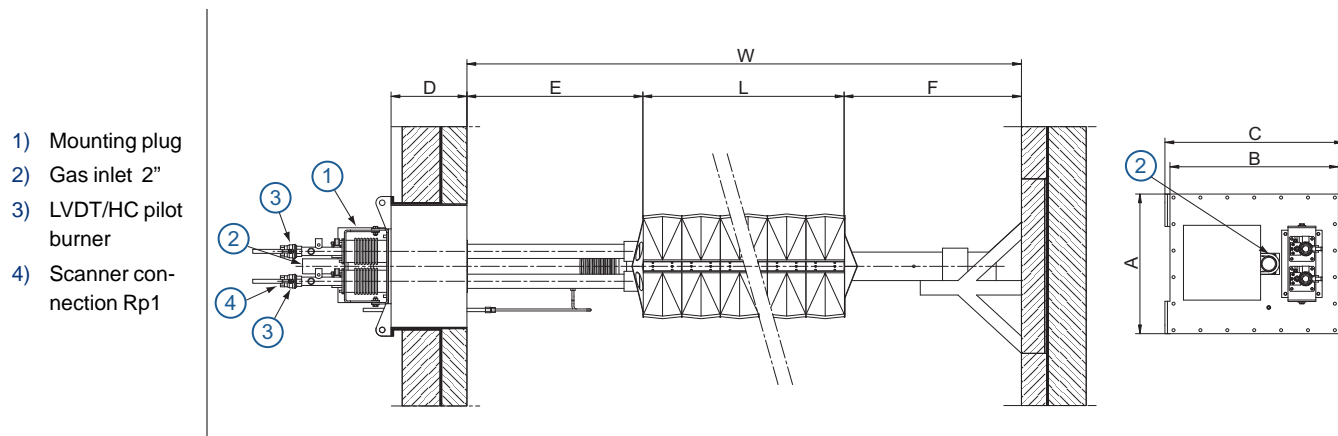
### "HC" AIRFLO® type M (4 ft – 10 ft)



Dimensions in mm unless stated otherwise								
A	B	C	D	E [1]	L	F [1]	W	weight (kg)
560	666	706	200(min) to 600(max)	200(min)	burner length	400(min)	8000 (max)	176 + (7 x burner length in ft)

[1] Valid when duct has internal insulation (without cladding).  
In case of sheet metal wall, E and F should be at least 500 mm

"HC" AIRFLO® type L (8 ft – 14 ft)



Dimensions in mm unless stated otherwise								
A	B	C	D [1]	E [1]	L	F [1]	W	weight (kg)
560	666	706	200 (min) to 600(max)	700-D (min)	burner length	400 (min)	8000 (max)	205 + (7 x burner length in ft)

[1] Valid when duct has internal insulation (without cladding).  
In case of sheet metal wall, E and F should be at least 500 mm

**Typical emissions (burners only)**

Thanks to the unique mixing plate design, the "HC" AIRFLO® burner creates large recirculating flame patterns which combine high burner capacities with low emissions on both CO and NO<sub>x</sub> for the entire burner firing rate.

*Read "Specifications of "HC" AIRFLO® burners" for correct and complete information on "HC" AIRFLO® burners.*