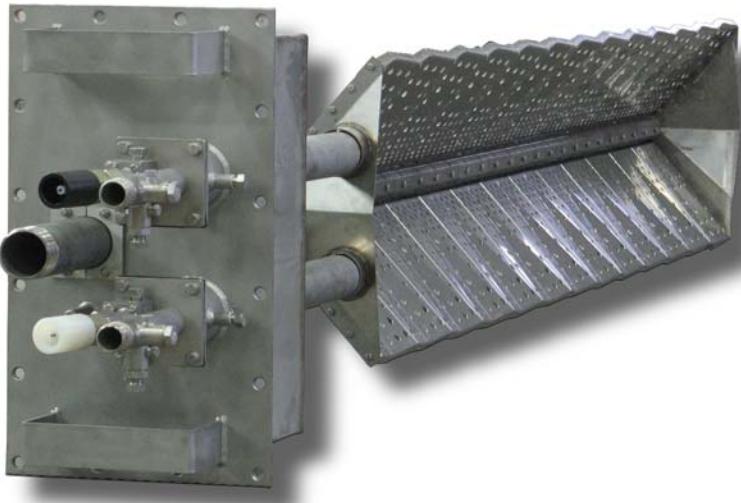


"HC" AIRFLO®

In-duct firing line burner



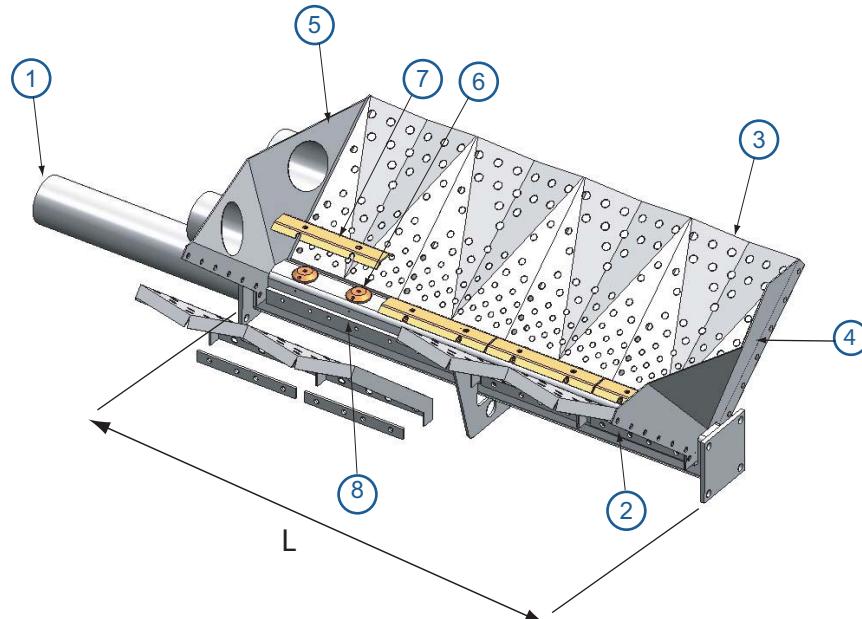
- High heat release up to 8.5 MBtu/h per unit of burner length (12 in.)
- Clean combustion with low CO and NO_x emission levels
- Minimal process air pressure drops locally across the burner as low as 0.2 "wc
- Operates in fresh air, preheated air (up to 1100 °F) or low oxygen turbine exhaust gases
- Fires on natural gas, H₂ 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.

- 1) Gas inlet
- 2) Manifold
- 3) Mixing plate
- 4) Plain end plate
- 5) Pilot end plate
- 6) Gas nozzle
- 7) Deflector plate
- 8) Pilot gas ports

L: Burner length



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.

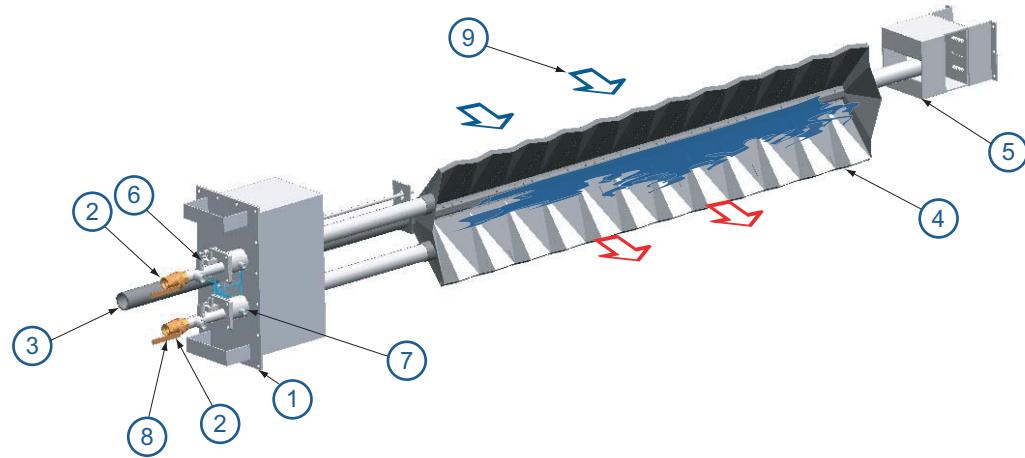
The special designed aeration patterns in the mixing plates insure progressive mixing, superior cross ignition, reliable flame retention, clean combustion over the full capacity range and increased flammability on low O₂ applications.

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_x formation.

This unique principle of operation allows "HC" AIRFLO® burners to operate with both low NO_x 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.

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

"HC" AIRFLO® Type	Burner length	Max. duct width (in.) [1]
Type S	1 ft to 7.5 ft	160
Type M	4 ft to 7.5 ft	140 [2] [3]
Type L	8 ft to 14 ft	140 [2] [3]

[1] valid for upstream temperatures up to 1100° F.

[2] can be increased to 315 in. when inlet temperature does not exceed 1000° F.

[3] can be increased to 315 in. with max inlet temperatures up to 1200° F 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 5.12 MBtu/h per foot. In some specific applications the actual maximum capacities can be considerably higher (up to 8.5 MBtu/h per foot). Refer to specifications for further details.

Typical burner data					
Fuel : natural gas with 1000 Btu/ft³ 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 _{in} > 212° F)	Low temp. (T _{in} < 212° F)
Nominal capacity per foot [4]	MBtu/h HHV	5.12	5.12	5.12	5.12
Min. capacity per foot	MBtu/h HHV	0.68	0.68	0.68	0.50
Max. upstream temperature [5]	°F	1100	100	1100	210
Max. downstream temperature	°F	1750	1400 [5]	1750	1750
Fuel pressure at nominal capacity [6]	psi	14.5	14.5	14.5	14.5
Flame length at 50 % capacity or up [7]	ft	11 ... 16	8 ... 15	11 ... 16	8 ... 15

[1] sg (specific gravity) = relative density to air (density air = 0.0763 lbs/ft³(st)).

[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 5.12 MBtu/h per foot or could be up to and even above 8.5 MBtu/h per foot in specific applications.

[5] Upstream temperatures up to 1200° F are possible with higher grade materials (contact MAXON).

Limitation on downstream temperature from 1750 °F down to 1400 °F is due to possible risk of higher NO_x 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).

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 O₂ 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.

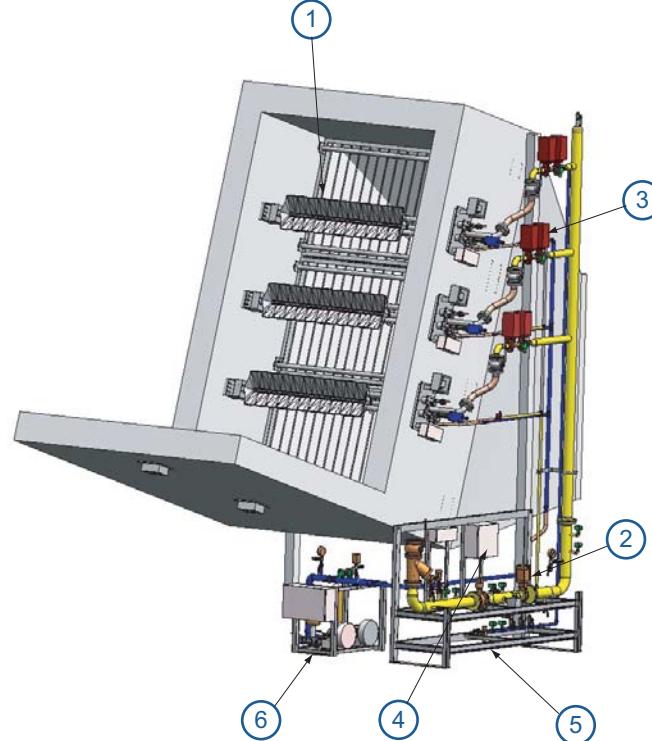
Typical applications

- 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

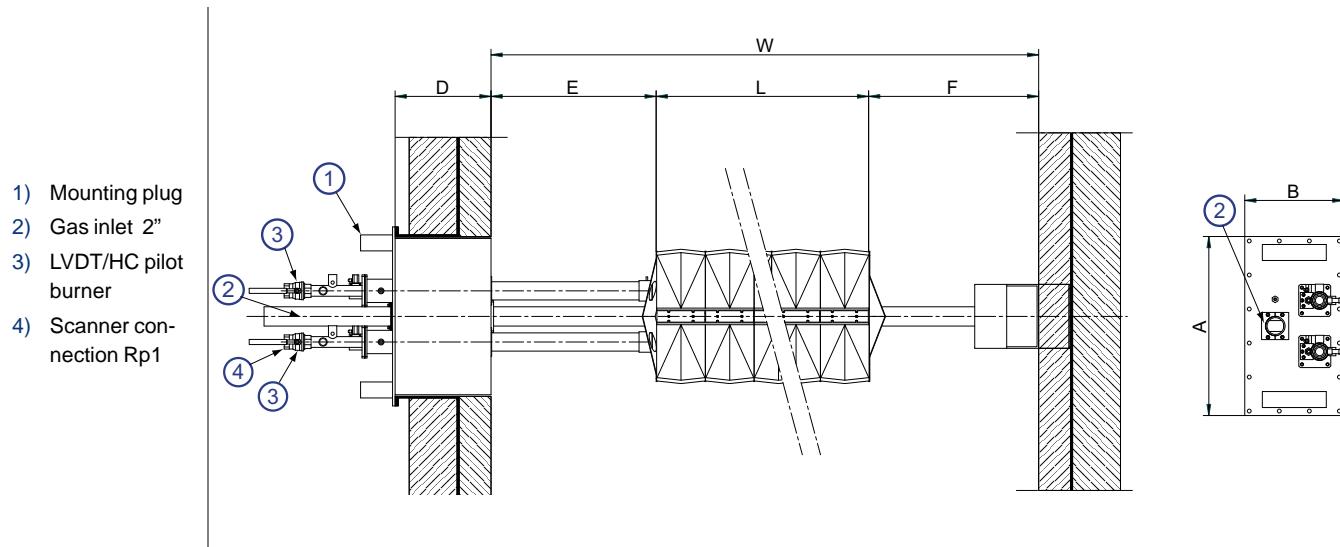
MAXON "HC" AIRFLO® burner installed in an upwards inclined duct: supplementary firing of turbine exhaust gases in a co-generation installation.

- 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)



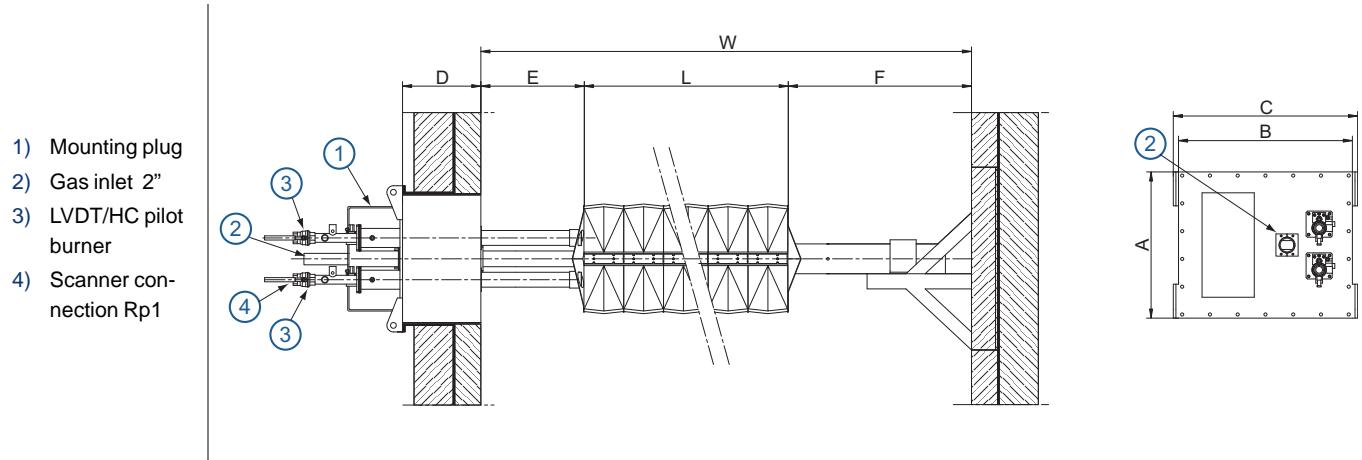
Dimensions in in. unless stated otherwise

A	B	D	E [1]	L	F [1]	W [2]	weight (lbs)
22	12	7.8 (min) to 23.6 (max)	8 (min)	burner length	12 (min)	157 (max)	143 + (11 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 20 in.

[2] Contact Maxon for larger duct widths W.

"HC" AIRFLO® type M (4 ft – 7.5 ft)



Dimensions in in. unless stated otherwise

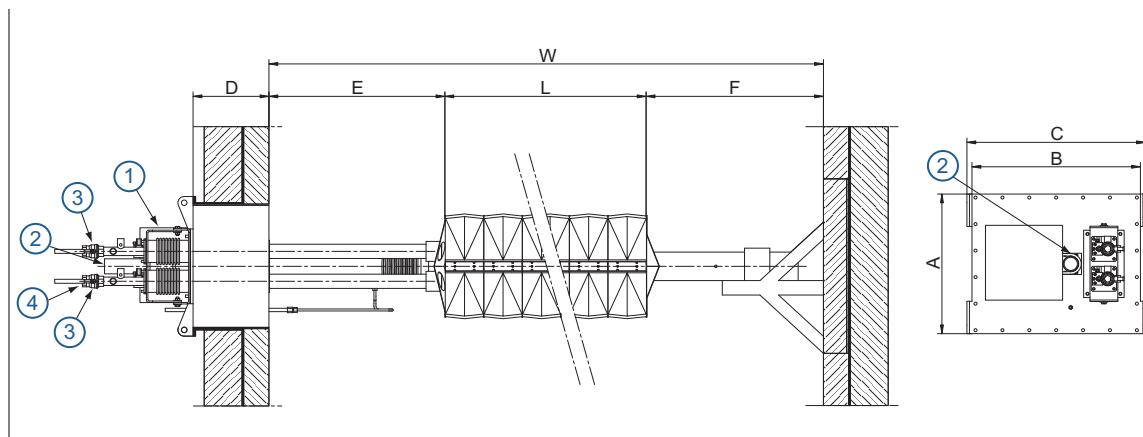
A	B	C	D	E [1]	L	F [1]	W [2]	weight (lbs)
22	26	28	7.8 (min) to 23.6 (max)	8 (min)	burner length	16 (min)	314 (max)	388 + (15 x burner length in ft)

[1] Valid when duct has internal insulation (without cladding). In case of sheet metal wall, E and F should be at least 20 in.

[2] Contact Maxon for larger duct widths W.

"HC" AIRFLO® type L (8 ft – 14 ft)

- 1) Mounting plug
- 2) Gas inlet 2"
- 3) LVDT/HC pilot burner
- 4) Scanner connection Rp1



Dimensions in in. unless stated otherwise

A	B	C	D [1]	E [1]	L	F [1]	W [2]	weight (lbs)
22	26	28	7.8 (min) to 23.6 (max)	28-D (min)	burner length	16 (min)	314 (max)	452 + (15 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 20 in.

[2] Contact Maxon for larger duct widths W.

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_x for the entire burner firing rate.

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