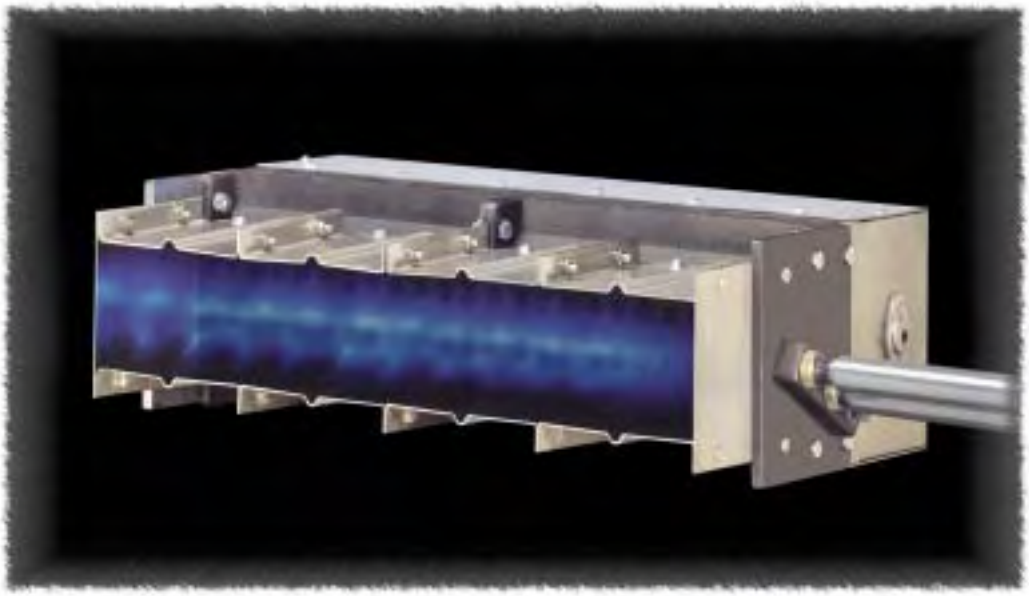
Maxon CROSSFIRE® Line Burner



- **Operational flexibility**
  - High moisture air streams
  - Low O_2 air streams
  - Highly inert air streams
  - Parallel velocities up to 4000 fpm, cross velocities up to 3000 fpm
- **Extremely low emissions** - NO_X levels of 25 ppm and CO levels of 250 ppm at 3% O_2 are possible. Contact your Maxon sales representative about your specific application.
- **Temperature uniformity** to enhance product quality
- **Up to 25:1 turndown** for process flexibility
- **High firing capacity** - up to 2,500,000 Btu/hr/ft (732 kW/ft)
- **Nozzle-mixing line burner** for use with low pressure natural gas firing
- **Also available in stainless steel housings and nickel-plated body versions**

MAXON®
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Design and Application Details

Maxon CROSSFIRE® Burners are nozzle-mixing, modular line burners designed for a variety of fresh and recirculated air process heating applications. The burner is available in a variety of arrangements, including straight, grid and ladder sections. An external blower supplies combustion air.

The CROSSFIRE® Burner is primarily used for in-duct firing. The CROSSFIRE® Burner can be designed within a system to allow for up to 2,500,000 Btu/hr/ft (732 kW/ft). The maximum fuel pressures and air pressures required for varying maximum firing loads are described in the table below.

Test Connection Pressures

Maximum Capacity MMBtu/hr/ft	Required Air Pressure (inches w.c.)*	Required Fuel Pressure (inches w.c.)*
1.00	2.9	7.4
1.25	4.5	11.4
1.50	6.2	16.4
1.75	8.2	22.1
2.00	10.5	28.8
2.25	12.9	36.3
2.50	15.7	44.8

*Differential pressures measured at test connection. Air and gas DP is differential over system static pressure.

Test Connection Pressures (metric)

Maximum Capacity kW/ft	Required Air Pressure (mbar)*	Required Fuel Pressure (mbar)*
300	7.2	18.4
375	11.2	28.4
450	15.4	40.9
525	20.4	55.0
600	26.2	71.7
660	32.1	90.4
732	39.1	111.6

*Differential pressures measured at test connection. Air and gas DP is differential over system static pressure.

Principle of Operation

The design of the CROSSFIRE® burner allows for extremely low emissions of both NO_X and CO. Impingement of a series of jets containing a substantially homogeneous mixture of fuel and air creates stability and extremely short flame lengths. The high excess air translates into low NO_X levels. The inherently stable design allows operation of the burner in a fuel lean condition without creating high levels of CO.

The burner performs optimally at a specific fuel/air ratio throughout the firing range. Deviation from the optimum fuel/air ratio will result in trade-off between NO_X and CO emissions. For example, a fuel lean setting (in reference to optimum fuel/air ratio) will result in lower NO_X emissions but higher CO emissions. Conversely, a fuel rich setting, again in reference to the optimum fuel/air ratio, will result in higher NO_X emissions with lower CO levels.

The fuel/air ratio is controlled by a Maxon MICRO-RATIO® Valve throughout the operating range. The MICRO-RATIO® Valve allows for a variable fuel ramp corresponding to the chosen maximum lineal firing duty. The MICRO-RATIO® Valve is sized according to the fuel and air flow requirements for the entire combustion system. For MICRO-RATIO® Valve sizing information, see Sections 7000 and 7100 of the Maxon product catalog.

For optimum performance and emissions control in applications with variable process flow, use Maxon's SMARTFIRE™ Intelligent Combustion Control System. See Maxon catalog section 7200 for more details.

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