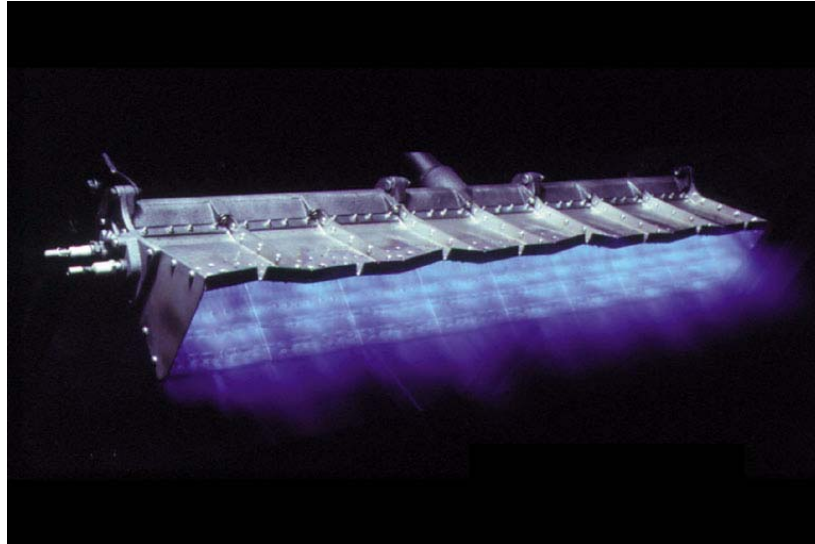


# "NP" & "RG" AIRFLO®

## In-duct firing line burner

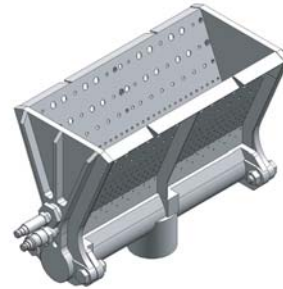
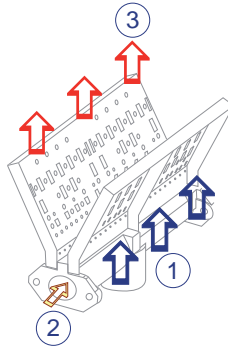


- For direct fired fresh air heating applications
- Operates economically (100 % thermal efficiency) and installs easily
- Burns clean and odor-free with most gaseous fuels, meeting or exceeding most known standards for direct-fired make-up air and space-heating applications
- High turndown, up to 25 : 1
- Modular design configured within your duct for optimal temperature distribution
- No need for a combustion air blower
- Extremely low maintenance cost thanks to robust design (no moving parts) and high quality materials

## Product description

### "NP" AIRFLO® principle

- 1) Fresh air
- 2) Fuel / gas
- 3) Hot air



MAXON Series "NP" & "RG" AIRFLO® burners consist of a robust cast-iron or aluminum burner-body (which serve as the gas manifold) drilled to discharge the gaseous fuel between diverging stainless steel mixing plates.

The burners are mounted directly into the air stream being heated. Gaseous fuel is injected into the process air stream. The unique designed V-shaped burner mixing plates are intimately mixing both gas and process air together.

All available heat from the gaseous fuel is released directly into the air stream.

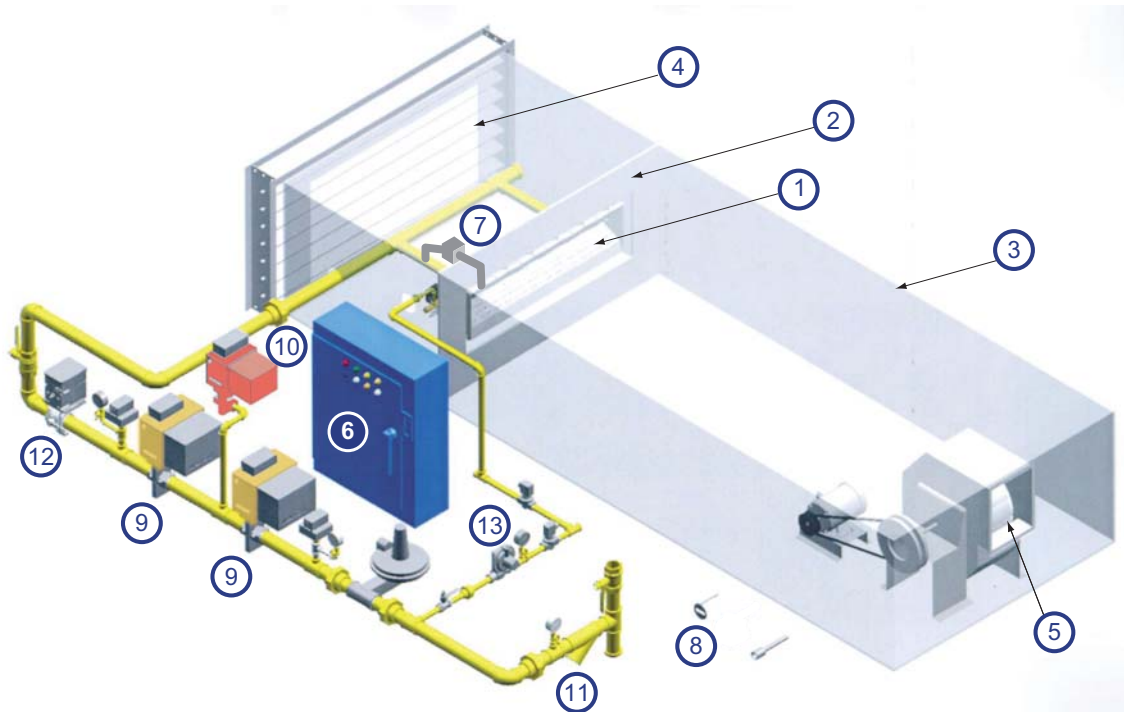
The required oxygen for the combustion is progressively drawn from the process air stream.

Carefully controlled aeration patterns provide progressive mixing, superior cross-ignition, flame retention and odor-free combustion.

Air velocities across the burner (the key to successful operation) are established by the use of profile plates. Optimum performance demands that air velocities be uniform across the entire burner.

### System components normally used in conjunction with a MAXON "NP" AIRFLO® or "RG" AIRFLO® burner application

- 1) AIRFLO® burner
- 2) Profile plate
- 3) Combustion chamber
- 4) Intake louvers
- 5) Main volume fan
- 6) Sequencing control panel
- 7) Differential air pressure switch
- 8) High temperature protection
- 9) Safety shut-off valves
- 10) Vent valve
- 11) Gas filter
- 12) Control valve
- 13) Pilot gas train



## Available product sizes

Several variations are offered, each optimized for a specific type of application. All are raw-gas burners, intended for use in fresh air streams.

### For make-up air heating

**NP-I** and **NP-II** AIRFLO® burner types provide a nominal capacity of 150 kW per foot.

Turndown of 25 : 1. With staged burner configuration turndown may exceed 50 : 1. Optimum air stream velocity is 15 m<sub>(st)</sub>/s.

**NP-II** AIRFLO® burners are selected when gas supply pressure is too low for **NP-I** AIRFLO® burners. **NP-II** AIRFLO® burners will cover the same applications with a turndown of 20 : 1.

### For process air heating

**NP-I** and **NP-II** AIRFLO® burners may be used if temperature rise does not exceed 450° C.

**NP-III** AIRFLO® burners provide a nominal capacity of 300 kW per foot at an optimum air stream velocity of 20 m<sub>(st)</sub>/s for temperatures up to 650° C with a turndown of 20 : 1.

**NP-I** AIRFLO® burners can be supplied with special aluminum alloy bodies having stainless steel fasteners and aluminum back-up bars for corrosive applications.

### For 2-speed air handling systems

Usually make-up air applications.

**RG-IV** AIRFLO® burners (for natural gas only) may be used for a nominal capacity of 150 kW per foot at an optimum velocity of 15 m<sub>(st)</sub>/s or 75 kW per foot at a velocity of 7.5 m<sub>(st)</sub>/s.

### Materials of construction

Refer to page 4-21.5-10 of "Specifications of "NP" & "RG" AIRFLO® burners" for more information on choices of material.

Note that **NP-I** & **RG-IV** AIRFLO® burners can be supplied with special aluminum alloy bodies having stainless steel fasteners and aluminum back-up bars for corrosive applications.

Typical burner data						
Fuel : natural gas with 10.9 kWh/Nm <sup>3</sup> HHV - sg = 0.6 [1]						
Combustion air : 15° C - 21 % O <sub>2</sub> - 50 % Humidity - sg = 1.0 [1]						
Stated pressures are indicative. Actual pressures are a function of air humidity, altitude, type of fuel and gas quality.						
Burner size			NP-I	NP-II	NP-III	RG-IV
Maximum capacity per foot	[2] [5]	kW HHV	150	150	300	75-150
Minimum capacity per foot	[3] [5]	kW HHV	6	7	50	7
Natural gas pressure required	[2]	mbar	12-14	6-7	12-14	12-14
Flame length	[2]	mm	250-300	250-300	700-800	300-350
Air velocity required	[4]	m/s	15	15	20	8-16
Pressure drop process air	[4]	mbar	1.5	1.5	2.5	0.4-1.5
Turndown			25:1	20:1	6:1	20:1
Fuel gas			natural gas, propane, propane air mixture			natural gas

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

[2] Higher gas pressure will result in higher heat release per unit and longer flame length. Contact MAXON for more information and performance limits in your particular application. Also see note (3).

[3] Absolute min. capacity at optimal air flow (velocity and distribution).

Min. capacity influenced by air velocity and burner application. Contact MAXON for your specific installation.

[4] Air velocity for optimal burner performance. The burner will be able to operate within a given range of air velocity. The higher the velocity at a given gas pressure, the shorter the flame length, and the higher the pressure differential of the process air across the burner.

[5] 1 foot = 305 mm

W W W . M A X O N C O R P . C O M

COMBUSTION SYSTEMS FOR INDUSTRY

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## Applications

Series "NP" AIRFLO® and "RG" AIRFLO® line burners are designed for direct heating of fresh, clean air for low and medium temperature air heating applications.

Typical low temperature applications include humidity-controlled dual stage paint spray booths, general make-up air applications, packaged units, door heaters, grain drying, malt drying, etc.

Typical high temperature process air applications include spray dryers, chemical dryers, fresh air oven heating, drying, baking and curing operations, metal parts finishing and all fresh air heating applications up to 650° C.

These burners can also be mounted downstream of a steam or hot water coil thus bringing the air to a higher temperature. This can boost the capacity of an existing installation.

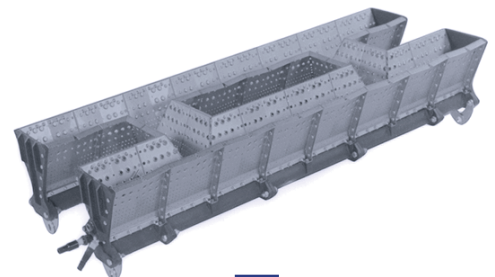


Direct air heating with NP- III AIRFLO® burners in continuous flow dryers for grain.

- 1) NP-I AIRFLO® burner of 1 foot (150 kW) with end plates, bottom gas inlet, spark ignitor, pilot and flame rod
- 2) NP-I AIRFLO® burner of 1500 kW complete with spark ignitor, pilot and flame rod



1



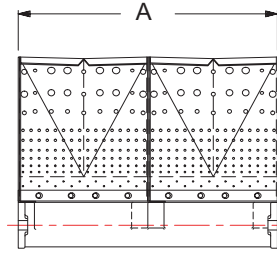
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## Dimensions and weights

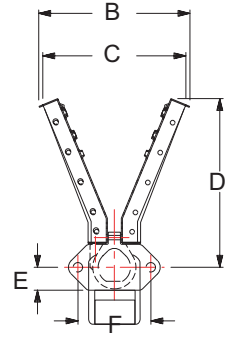
- 1) NP-I / II / III AIRFLO®
- 2) NP-\*-12 straight section
- 3) Typical end view
- 4) RG-IV AIRFLO®
- 5) RG-IV-12 straight section
- 6) Typical end view



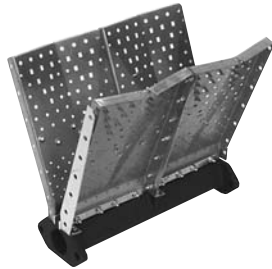
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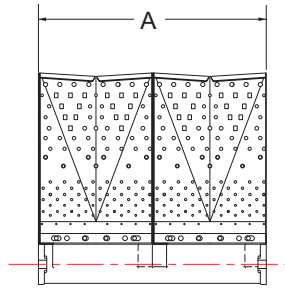
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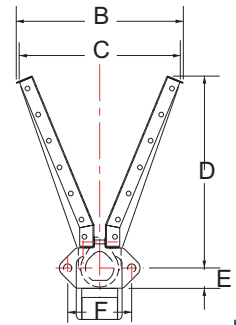
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6

Dimensions in mm unless stated otherwise								
Burner size		A	B	C	D	E	F	Weight [2]
NP-*-12 straight section	[1]	305	178	168	198	27	86	4.1 kg
RG-IV-12 straight section	[1]	305	222	216	257	27	86	4.4 kg

[1] 12 (inch) = 1 unit = 305 mm

Refer to "Specifications of "NP" & "RG" AIRFLO® burners" for other burner sections (T-sections, L-sections, back inlet sections etc).

[2] Weight of "NP" & "RG" AIRFLO® burner section with cast iron body.

## Typical emissions (burners only)

MAXON Series "NP" AIRFLO® & "RG" AIRFLO® burners are especially designed to meet the high demands of most of the local standards on air quality of direct fired make-up air and space heating applications worldwide.

If correctly used within the performance limits as described on page 4-21.5-3, both CO and NO<sub>x</sub> will remain far below the limits as determined in most standards.

Example: NP-I firing on natural gas in make-up air heating at 150 kW/ftwith  $\Delta T$  of 60 K and uniform air velocity of 15 m/s: CO << 7 ppm/NO << 4 ppm NO<sub>2</sub> << 1 ppm (as measured dry)

Note that incorrect use or use outside the performance limits may seriously affect emissions.

Exact emissions performance may vary in your application. Contact MAXON for information on installation specific estimates or guarantees. No guarantee of emissions is intended or implied without specific written guarantee from MAXON.

*Read "Specifications of "NP" & "RG" AIRFLO® burners" for complete information on these burner types.*