

Installation and operating instructions

Application requirements

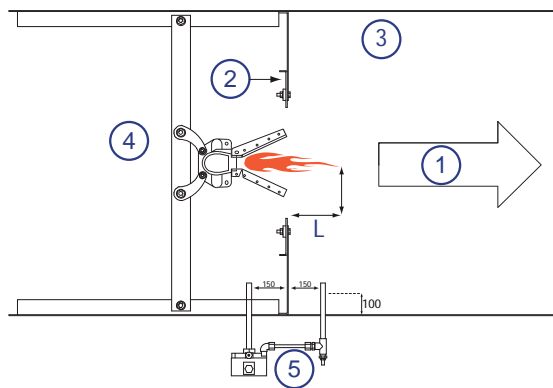
View port

A view port to observe burner flame is essential to inspect flame aspect. It is recommended to locate the view port downstream of the flame, such that the entire burner front can be observed, as well as the pilot burner.

Position of the burner in the process flow

Series "NP" and "RG" AIRFLO® burners are used only for heating of fresh air in motion. They should be mounted so as to direct their flames parallel to and in the same direction as the movement of the air (see sketch below)

- 1) Direction of air movement
- 2) Adjustable profile plate
- 3) Fixed profile plate
- 4) Universal support bracket
- 5) Differential pressure switch



Do not mount the burner so that the movement of air is across the face of the line burner, nor should it be mounted too near to a turn in the duct which may cause air to be directed at an angle over the burner.

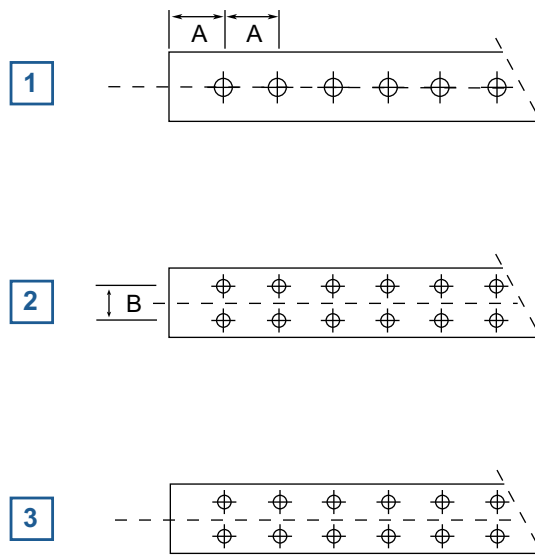
Velocity and flow of air at operating temperature must be uniform and not less than specified for the application (refer to diagrams on page 4-21.5-7 and page 4-21.5-8).

Drilling identification

- 1) **NP-I & RG-IV** drillings
d = \varnothing 0.078 in.
- 2) **NP-II** drillings
d = \varnothing 0.070 in.
- 3) **NP-III** drillings
d = \varnothing 0.078 in.

A = 0.37 in.

B = 0.25 in.



Installation

Storage

Series "NP" AIRFLO® and "RG" AIRFLO® burners should be stored dry (inside).

Do not discard packing material until all loose items are accounted for.

Handling

Series "NP" AIRFLO® and "RG" AIRFLO® burners may be shipped as complete burners, as well as in different burner parts.

Handle burners with care during transport, unpacking, lifting and installation.

Avoid bending or damaging the stainless steel mixing plates.

Use proper equipment . Any impact on the burner could result in damage.

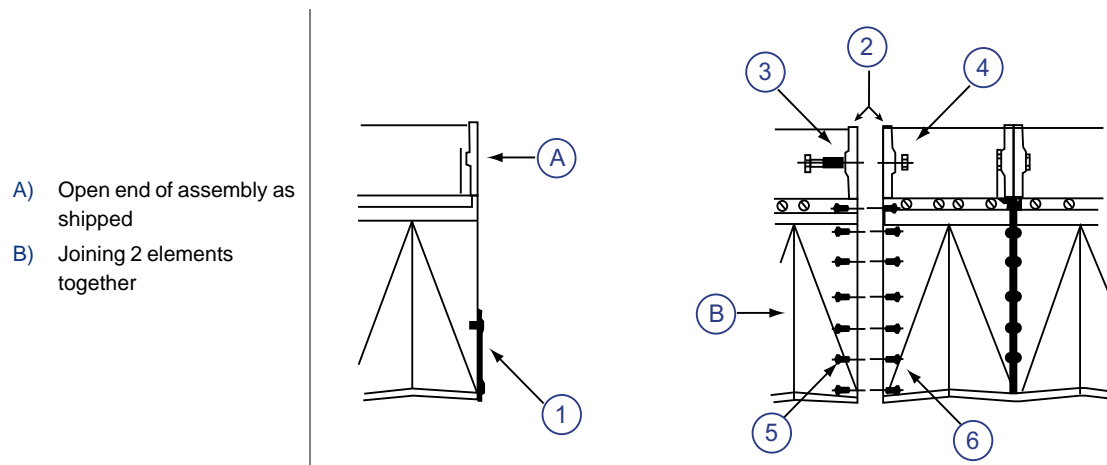
Contact MAXON in case of questions.

Assembly instructions for burners divided into sections

Generally, the burners will be supplied as complete pre-assembled units. In some cases however, the burner may be shipped as sub-assemblies, single sections may be supplied loose for shipping convenience (access of burner into the duct), or extra units of burner have been purchased to increase/ modify the capacity/ shape of the existing burner or as replacement items etc.

Follow the assembly instructions below. In case of doubt, please contact MAXON for assistance.

Before being reassembled the burner should be brought to the point of use. There, the burner should be arranged on the floor, mixing plates down, in the intended form. Reassemble as follows



- Study the above sketch to become familiar with the parts and reference letters.
- Check the supply of gaskets, bolts and nuts attached to the crate.
- Remove the protective shipping end plates (1).
- Add support brackets, if any.
- Bring ends of burner sections together, insert gaskets and bolts, and loosely assemble nuts (4) to bolts (3) (2x).
- Insert and assemble bolts (5), and nuts (6), snug but not tight. (5 each side for "NP" AIRFLO®, 7 each side for "RG" AIRFLO®).
- Tighten burner bolts (3), but ensure burner sections do not slip .
Recommended torque bolt and nuts : 3/8 - 16 x 1.1/2 = 55 Nm.
- Tighten screws (4), keeping mixing plate gaskets properly aligned.
- Examine all joints to ensure that sealing is complete.

Supporting the burner

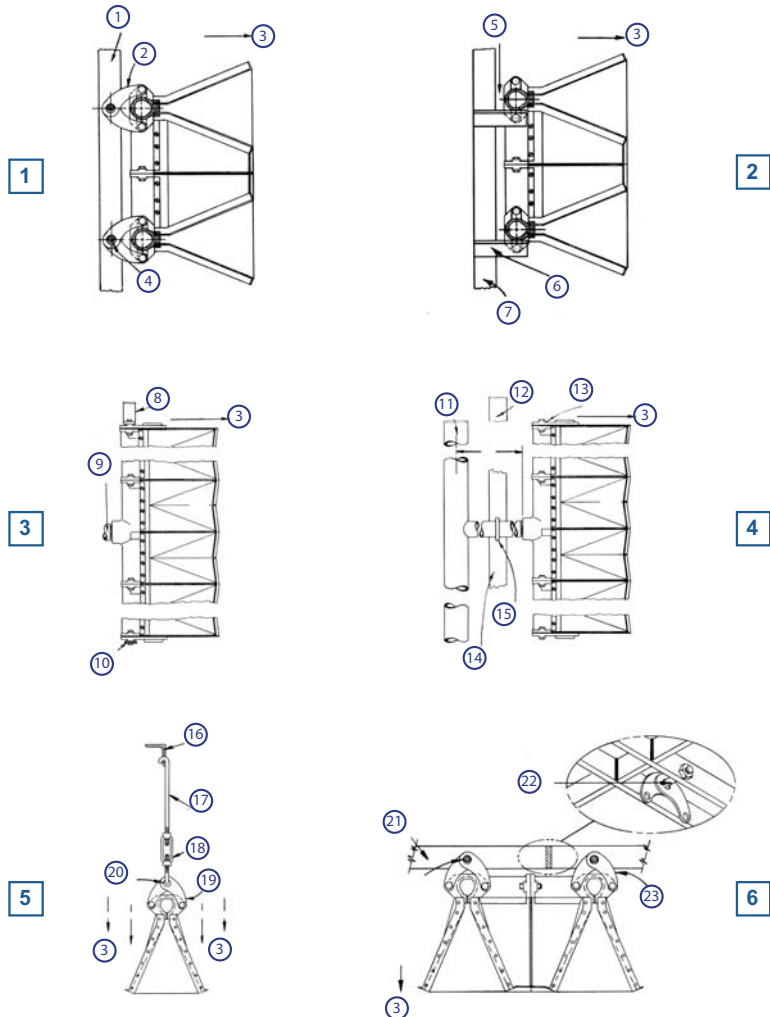
Series "NP" AIRFLO® and "RG" AIRFLO® burner assemblies must be adequately supported and positioned.

Avoid rigid mounting. Burner assembly expands and contracts with temperature variations.

Maintain smooth, even air flow over the burner by designing supports to provide minimum interference, deflection and turbulence.

The sketches below show typical installation and support methods:

- 1) Strap iron frame
- 2) MAXON support bracket
- 3) Air movement
- 4) Bolt or rod (long enough to permit brackets to move)
- 5) Allow space for burner expansion
- 6) Angle iron support
- 7) Strap iron frame
- 8) Strap iron to top of duct
- 9) Gas inlet
- 10) Strap iron brace to side of duct
- 11) Gas manifold independently supported
- 12) Strap iron to top of duct
- 13) Ends free to move
- 14) Strap iron to bottom of duct
- 15) Oversize U-bolt drawn up loosely
- 16) Angle iron support
- 17) Rod
- 18) Turn-buckle
- 19) Support brackets
- 20) 3/4" hole
- 21) Strap iron frame
- 22) Bolt or rod (long enough to permit brackets to move)
- 23) Support brackets



Sketch 1 shows the burner suspended from a strap iron frame using Maxon USB support brackets. Note that rigid mounting is avoided by the bracket hole which slips loosely over a bolt or steel rod attached to the support. Gas piping would need independent support.

Sketch 2 shows the burner assembly resting upon angle iron brackets and not attached to them in any way. Be sure the angle iron supports allow the burner flanges to expand and contract. Gas manifolding would be independently supported and prevent forward movement of the burner.

Sketch 3 shows simple strap iron used to support the burner. Note that narrow edge of strap faces air flow to avoid undue turbulence.

Sketch 4 shows gas manifolding used to support the burner. If there are multiple inlets, you must avoid rigid connection by using the oversize U-bolt (loosely drawn up) illustrated.

Support for down-fired burners can be accomplished as shown in the illustration above. Always avoid rigid mounting.

Sketch 5 shows Maxon USB support brackets suspending the burner from an overhead angle iron.

Sketch 6 shows an alternate arrangement which offers the advantage of more controlled positioning.

Start-up 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

Initial adjustment and light-off should be undertaken only by a trained commissioning engineer.

First firing or restart after shut-down

Before start-up, or after a longer period shut-down, integrity of the system should be checked by an authorized combustion engineer. Besides the general mechanical installation of burner and piping (rigidity, flanged and threaded connections, tightness of piping and burner body, ..), it is advised to check the condition of mixing plates and burner body drillings.

Check all bolted connections of the burner after first firing (first time on temperature) and retighten if necessary.

Check of safety interlocks



Guarantee that all the required safety locks as described in the applicable local codes or regulations, or extra requested for safe operation of the overall installation are working properly and resulting in a positive safety-lock of the burner. Do not bypass any of these safety interlocks. This will result in unsafe conditions.

Process air flow

Series "NP" and "RG" AIRFLO® burners are raw gas burners. This means that the required oxygen for combustion is drawn from the available process air flow across the burner.

A correct fresh air flow across the burner is essential for safe operation of the burner, and should be safeguarded by a safety-interlock (pressure switch or flow switch) as described in the applicable local codes or regulations.

Refer to "Specifications" on page 4-21.5-7 for more details or contact MAXON if you require further support.

Pilot ignition

Adjust pilot gas regulator to correct set point before pilot ignition attempt. Turn adjustable orifice screw out (counter-clockwise) several turns from its fully seated position. Refine during lighting of the pilot to a hard/blue flame and/or strongest stable flame signal.

Main burner ignition

Adjust the main gas regulator at the correct set-point before igniting the main burner. Ensure that the control valve is in the start-position when lighting the main burner.

Note that operating characteristics of some regulators may require additional adjustment while firing the burner. Ensure operating pressure to the burner under operating conditions matches those shown on page 4-21.5-7, page 4-21.5-8 and page 4-21.5-9.

Minimum capacity and cross-ignition

Adjust the minimum burner capacity while carefully observing the flame. Ensure that the flame remains stable over the entire burner front.

The minimum capacity of the burner may be influenced by the process air distribution across the burner, the air stream velocity and the position - distribution - and number of gas inlets of the burner.

If the burner is ignited at minimum capacity, verify (by several repeats) that the flame is smoothly cross-igniting over the entire burner front.

Ratio adjustment

Slightly open the gas control valve while observing the flame. Especially observe that the flame is well divided over the entire burner surface, and going straight forward in the direction of the process air flow. Check that no damage is caused to duct-walls, filters, blowers etc.

Limit the min. and max. position in a safe way to guarantee stable flame over the entire burner front at min. position, and to protect the burner for overfiring at max. position.

Flame supervision

Only use the standard connections provided on the endplates for correct flame safeguarding. Use proper flame detection equipment (flame rod or UV scanner).

Refer to the local codes and regulations to determine the number of flame sensors and their position. Be advised that some codes may require proving of cross-ignition by sensing flame on both ends of long burners.

Maintenance and inspection

Safety requirements

Regular inspection, testing and recalibration of combustion equipment according to the installation's manual is an integral part of its safety. Inspection activities and frequencies shall be carried out as required by the local codes or regulations, and as specified by the overall installation user-manual.

Visual inspections

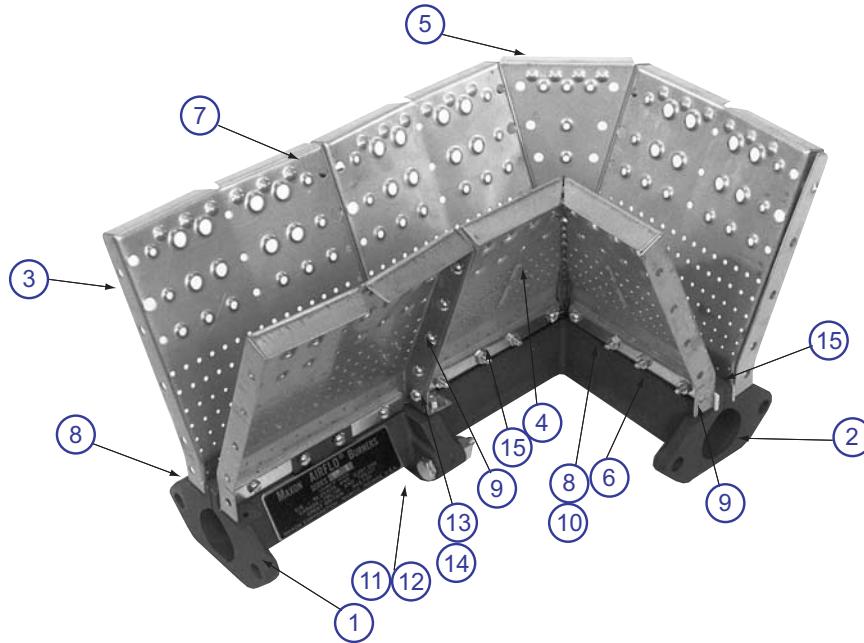
Regular visual inspection of all connections (gas manifold, bolting of the burner into the duct, condition of profile plate, burner mixing plates and burner body drillings) and burner flame shape and aspect are essential for safe operation.

Recommended spare parts

Keep local stock of spark ignitor and flame sensor. For other spare parts, please refer to the component identification page 4-21.5-33 and page 4-21.5-34. For assistance with parts, please contact MAXON.



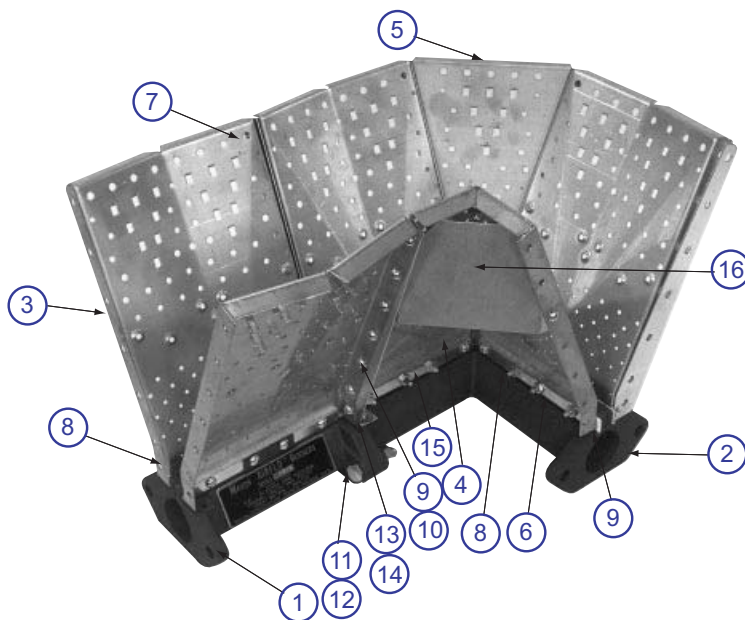
Maintenance and component identification series "NP" AIRFLO® burners



Item n°	Part description	NP-I			NP-II		NP-III		NP-I		NP-I	
		Cast iron bodies with AISI 430 mixing plates and carbon steel fasteners			Alu bodies with AISI 321 mixing plates and carbon steel fasteners		Alu bodies with AISI 321 mixing plates and carbon steel fasteners		Alu bodies with AISI 321 mixing plates and stainless steel fasteners		Alu bodies with AISI 321 mixing plates and stainless steel fasteners	
		Designation										
1	Burner body	6 in. straight section	NP-I-6	NP-II-6	NP-III-6	NP-I-6 (AL)	NP-I-6 (ALSS)					
		12 in. straight section	NP-I-12	NP-II-12	NP-III-12	NP-I-12 (AL)	NP-I-12 (ALSS)					
		18 in. straight section	NP-I-18	NP-II-18	NP-III-18	-	-					
		24 in. straight section	NP-I-24	NP-II-24	NP-III-24	-	-					
		12 in. back inlet section	NP-I-12B	NP-II-12B	NP-III-12B	NP-I-12B (AL)	NP-I-12B (ALSS)					
		36 in. back inlet section	NP-I-36B	NP-II-36B	NP-III-36B	NP-I-36B (AL)	NP-I-36B (ALSS)					
		12 in. x 6 in. T-section	NP-I-T	NP-II-T	NP-III-T	NP-I-T (AL)	NP-I-T (ALSS)					
2	Burner body	6 in. x 6 in. elbow section	NP-I-L	NP-II-L	NP-III-L	-	-					

Item n°	Part description	Designation	Quantity required for indicated section							
			6" str.	12" str.	18" str.	24" str.	12"x6" Tee	6"x6" elbow	12" B.I.	36" B.I.
3	Mixing plate	6" MIXING PLATE NP SS430	2	4	6	8	2	2	4	4
4	Mixing plate : inside corner	INS.CORNER MIXING PLATE 430 SS	-	-	-	-	2	1	-	4
5	Mixing plate : wedge	MIXING PLATE WEDGE SS 430	-	-	-	-	-	1	-	-
6	back up bar	BACK UP BAR 'OUTSIDE' FOR RG	2	4	6	8	2	2	4	4
7	gasket / support bracket (metal)	GASKET-SUPPORT BRACKET NP	2	4	6	8	4	4	4	8
8	#10-24 x 1-3/8" round head mach. screw "Sems"	SCR.RD SEMS PLTD 10-24X1-3/8	4	8	12	16	12	8	8	24
9	#10-24 x 1/2" round head mach. screw "Sems"	MACH.SCREW SEMS 10-24X1/2	12	24	36	48	29	22	24	48
10	#10-24 hex nut	NUT 10-24 ZINC PLATED	14	28	42	56	37	28	28	64
11	3/8"-16 z 1-1/2" hex head cap screw	HEX HD CAP SCR.3/8-16X1-1/2 PL	2	2	2	2	4	2	2	4
12	3/8"-16 hex nut	HEX NUT 3/8-16 ZINC PLATED	2	2	2	2	4	2	2	4
13	10-24 x 3/8" hex head mach. screw	10-24X3/8 IND HEX HD SCREW PL	2	4	6	8	4	2	4	8
14	washer	WASHER	2	4	6	8	4	2	4	8
15	back up bar (inside)	BACK UP BAR 'INSIDE' FOR RG	-	-	-	-	4	2	-	8

Maintenance and component identification Series "RG" AIRFLO® burners



Item n°	Part description	RG-IV	RG-IV	RG-IV	
		Cast iron bodies with AISI 430 mixing plates and carbon steel fasteners	Alu bodies with AISI 321 mixing plates and carbon steel fasteners	Alu bodies with AISI 321 mixing plates and stainless steel fasteners	
		Designation			
1	Burner body	6 in. straight section	RG-IV-6	RG-IV-6 (AL)	RG-IV-6 (ALSS)
		12 in. straight section	RG-I-V12	RG-IV-12 (AL)	RG-IV-12 (ALSS)
		18 in. straight section	RG-I-V18	-	-
		24 in. straight section	RG-IV-24	-	-
		12 in. back inlet section	RG-IV-L	-	-
		36 in. back inlet section	RG-IV-T	RG-IV-T (AL)	RG-IV-T (ALSS)
		12 in. x 6 in. T-section	RG-IV-12B	RG-IV-12B (AL)	RG-IV-12B (ALSS)
2	Burner body	6 in. x 6 in. elbow section	RG-IV-36B	RG-IV-36B (AL)	RG-IV-36B (ALSS)

Item n°	Part description	Designation	Quantity required for indicated section							
			6" str.	12" str.	18" str.	24" str.	12"x6" Tee	6"x6" elbow	12" B.I.	36" B.I.
3	Mixing plate	6" MIXING PLATE STRAIGHT RG	2	4	6	8	2	2	4	4
4	Mixing plate : inside corner	INSIDE CORNER MIX.PLATE-RG-IV	-	-	-	-	2	1	-	4
5	Mixing plate : wedge	MIXING PLATE 'WEDGE'	-	-	-	-	-	1	-	-
6	back up bar	BACK UP BAR 'OUTSIDE' FOR RG	2	4	6	8	2	2	4	4
7	gasket / support bracket (metal)	GASKET-SUPPORT BRACKET RG/A-66	2	4	6	8	4	4	4	8
8	#10-24 x 1-3/8" round head mach. screw "Sems"	SCR.RD SEMS PLTD 10-24X1-3/8	4	8	12	16	12	8	8	24
9	#10-24 x 1/2" round head mach. screw "Sems"	MACH.SCREW SEMS 10-24X1/2	16	32	48	64	39	30	32	64
10	#10-24 hex nut	NUT 10-24 ZINC PLATED	18	36	54	72	47	36	36	80
11	3/8"-16 z 1-1/2" hex head cap screw	HEX HD CAP SCR.3/8-16X1-1/2 PL	2	2	2	2	4	2	2	4
12	3/8"-16 hex nut	HEX NUT 3/8-16 ZINC PLATED	2	2	2	2	4	2	2	4
13	10-24 x 3/8" hex head mach. screw	10-24X3/8 IND HEX HD SCREW PL	2	4	6	8	4	2	4	8
14	washer	WASHER	2	4	6	8	4	2	4	8
15	back up bar (inside)	BACK UP BAR 'INSIDE' FOR RG	-	-	-	-	4	2	-	8
16	deflector plate	DEFLECTOR PLATE AL STL	-	-	-	-	2	1	-	4

