Honeywell

MAXON

Maxon RADMAX® burners

OPERATING INSTRUCTIONS

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1 SAFETY

1.1 Please read and keep in a safe place

Please read through these instructions carefully before installing or operating. Following the installation, pass the instructions on to the operator. This unit must be installed and commissioned in accordance with the regulations and standards in force. These instructions can also be found at www.docuthek.com.

1.2 Explanation of symbols

1 , **2** , **3** , **a** , **b** , **c** = Action

➔ = Instruction

1.3 Liability

We will not be held liable for damage resulting from non-observance of the instructions and non-compliant use.

1.4 Safety instructions

Information that is relevant for safety is indicated in the instructions as follows:

⚠ DANGER
Indicates potentially fatal situations.

⚠ WARNING
Indicates possible danger to life and limb.

⚠ CAUTION
Indicates possible material damage.

All interventions may only be carried out by qualified gas technicians. Electrical interventions may only be carried out by qualified electricians.

1.5 Conversion, spare parts

All technical changes are prohibited. Only use OEM spare parts.

1.6 Instructions provided by the company

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.

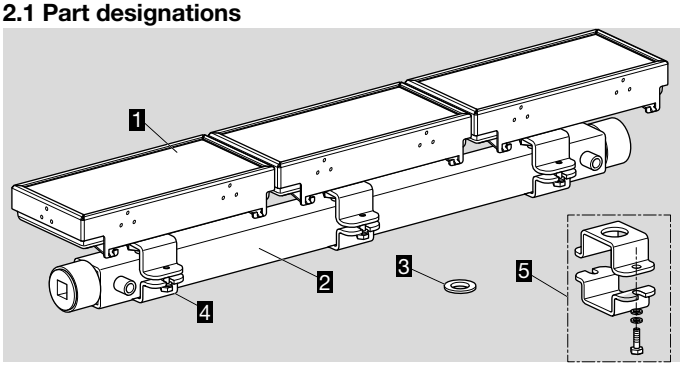
2 CHECKING THE USAGE

RadMax Burners are designed to deliver uniform, high intensity radiant energy for moisture removal in textile and paper ovens, paint drying, and powder coating, as well as many pre-heat, plastic forming, heat treating and annealing operations.

This function is only guaranteed when used within the specified limits – see page 4 (7 Technical data). Any other use is considered as non-compliant.

Metal fiber emitters may not be appropriate for certain down fired applications. Please contact sales engineering to verify their use in your application.

2.1 Part designations



1 Burner head
2 Manifold assembly
3 Fuel inlet gasket
4 Bottom clamp
5 Box clamp

3 ASSEMBLE BURNER HEADS

Upon receipt of your Maxon RadMax Burner, it may be necessary to install the burner heads to the burner manifold.

The burner heads are shipped completely assembled and only require two fasteners per head to attach them to the burner manifold.

➔ Following the illustrations below, mount the burner head to the manifold.

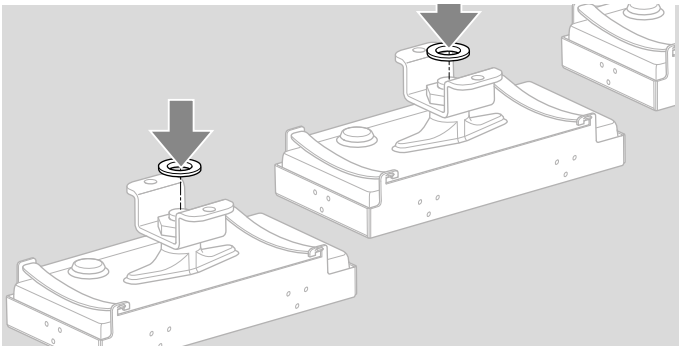
⚠ CAUTION

Incorrect installation!

Please observe the following to ensure that the RadMax Burner is not damaged during installation and operation:

– Dropping the device can cause permanent damage. In this event, replace the entire device and associated modules before use.

1 Place the gasket on the air/gas inlet on the underside of the burner head.

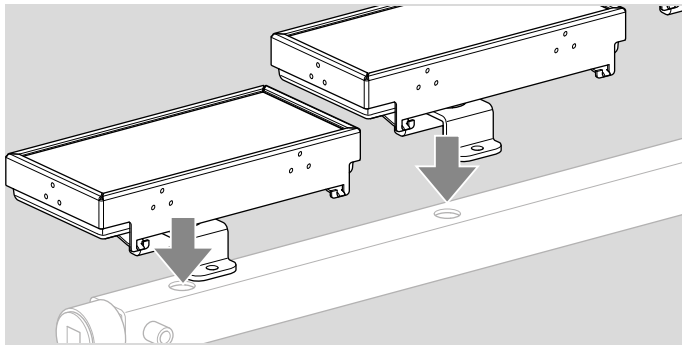


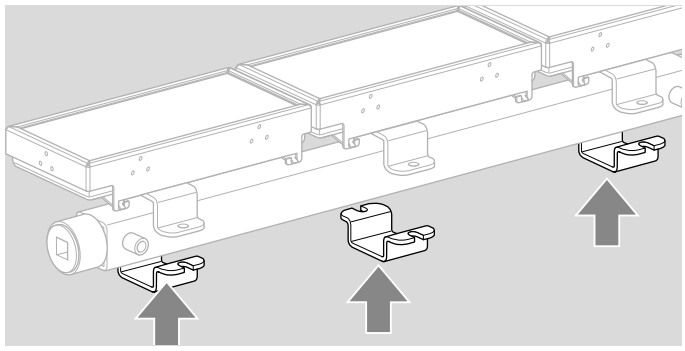
⚠ DANGER

Risk of explosion!

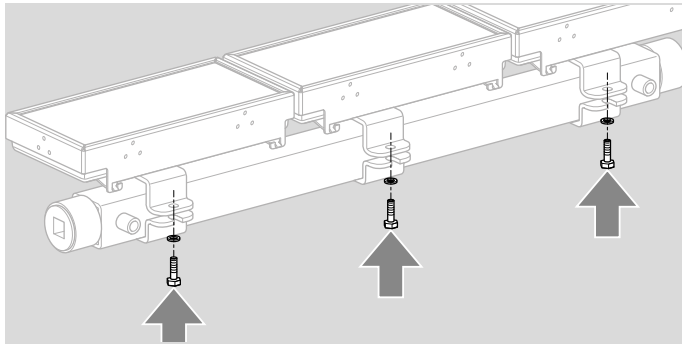
– This gasket is used to help provide a gas tight seal and must be installed.

2 Place the head on the manifold such that the plug mates up with the hole in the manifold.





3 Use two M8 screws and two M8 washers to attach the bottom clamp against the manifold and securely fasten the head. Alternate the tightening of the bolts to ensure an even clamping force.



4 Repeat for the remainder of the burner heads. Make sure the "face" or tile sides of the heads are relatively flush with each other before final tightening of the fasteners to 3–5 foot-lbs (4.1–6.8 Nm).

4 COMMISSIONING

⚠ CAUTION

Incorrect installation and adjustment

Please observe the following to ensure that the unit is not damaged during installation and operation:

– Initial adjustment and light-off should be undertaken only by trained and experienced personnel familiar with combustion systems, with control/flame safeguard circuitry and with knowledge of the overall installation.
– Equipment installation and operating procedures should comply with all applicable international, federal, state, local codes and standards.

1 Close all burner fuel valves and gas cocks. Make preliminary adjustment to fuel gas regulator(s) to establish adequate fuel pressure.

⚠ WARNING

Risk of injury!

Please observe the following to ensure that no damage occurs:

– Electric shocks can be fatal! Before working on possible live components, ensure the unit is disconnected from the power supply.

2 Verify that all control devices, flame safeguard, and interlocks are operable and functioning within their respective settings/ranges.

3 Check that all duct and chambers are clear and that their dampers operate freely. Adjust all dampers to their proper start-up positions. Open the manual pet-cock valves on all burner Direct-Spark/Flame-Sensing Ports.

4 Start process fan(s) and combustion blower(s) and purge the entire unit in accordance with the appropriate codes and standards.

5 Adjust combustion air pressure to establish the proper burner manifold pressure per the table page 4 (7 Technical data).

➔ A test connection is provided on the burner manifold for set-up adjustment purposes.

Required manifold pressures are differential pressures relative to the firing chamber.

For on/off (single firing rate) operation, adjust air to establish the proper manifold differential pressure required for the desired firing rate.

For variable firing rate operation, refer to the following procedure:

a Set low fire combustion air flow. Position combustion air flow control device to establish burner manifold pressure required for the desired minimum firing rate, per table page 4 (7 Technical data). Manifold differential pressure should never be less than 2.0” w.c.

b Set high fire combustion air flow. Position combustion air flow control device to establish burner manifold pressure required for the desired maximum firing rate, per table page 4 (7 Technical data). Manifold differential pressure should not exceed 6.0” w.c.

c Return air flow control device to minimum.

6 Adjust fuel/air mixing device to the recommended initial settings. Refer to the appropriate start-up instructions provided by the manufacturer for this equipment.

7 Ignite the burner. (Direct spark applications only; refer to appropriate manufacturers instructions for piloted systems.)

a Verify combustion air blower is running.

b Set air flow control device to minimum.

c Open main gas shut-off valve(s).

d Initiate trial for ignition sequence and verify spark ignitor is arcing properly.

e If burner does not ignite, close main gas shutoff valve(s) and re-purge unit before attempting to ignite the burner again.

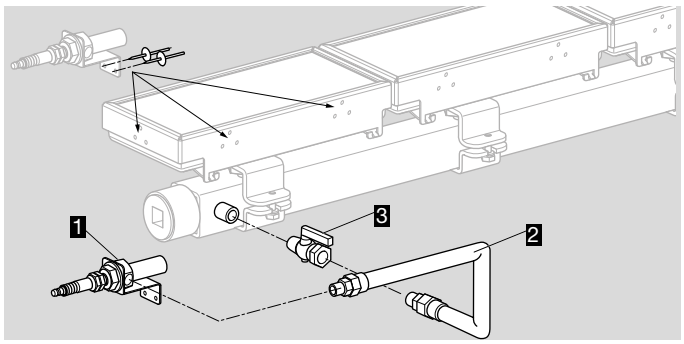
8 Adjust burner minimum firing rate. Allow burners to come up to stable operating temperature. With the air flow control device at minimum, adjust the fuel flow to establish the desire operating temperature within the range stated in the table page 4 (7 Technical data). If a slight blue haze is present on the face of the burner, this is an indication that the mixture is too lean. To correct, increase fuel flow until the blue haze is no longer present. If you notice a yellow blanket of flame on the burner surface, this is an indication the mixture is too rich. To correct, decrease fuel flow until the yellow haze is no longer present.

9 Adjust burner maximum firing rate. Slowly increase combustion air flow and fuel flow in small increments as allowed by the fuel/air ratio controller. Hold at each step and allow the burner to come up to a stable operating temperature. Make adjustments to fuel flow as necessary to establish the desired operating temperature within the range stated in the table page 4 (7 Technical data). Continue to increase the fuel/air ratio controller in small increments and make adjustments at each step until the desired high firing rate is established.

10 Verify settings. After establishing high and low fire settings, cycle the burner from high to low fire several times to confirm the repeatability of fuel/air settings. Shut down the burner and re-ignite to confirm reliability of ignition system and light-off settings. Check all safety interlocks and limits and confirm proper settings and operation.

11 Verify temperatures. Confirm desired face temperature is achieved. Also, confirm oven/chamber temperature does not exceed 500°F. Verify that sufficient process circulation exists to prevent localized hot spots in excess of 500°F on burner bodies.

5 ACCESSORIES



1 Direct spark/flame sensing port (DS/FS)
2 CSST corrugated tubing 1/4" I.D. x 18" long
3 Valve for DS/FS port

6 SPARE PARTS

The PartDetective web app for selecting spare parts is available at www.adlatus.org.

7 TECHNICAL DATA

7.1 Type 13RM (end-to-end) – imperial

Type	Inlet size	Number of burner heads	Nominal capacity (Btu/hr)	Face width (inches)	Manifold size (inches)
213RM	1-1/2"	2	50,000	31.62	2 x 2
313RM	1-1/2"	3	75,000	47.46	2 x 2
413RM	1-1/2"	4	100,000	63.31	2 x 2
513RM	1-1/2"	5	125,000	79.15	2 x 2
613RM	1-1/2"	6	150,000	94.99	2 x 2
713RM	1-1/2"	7	175,000	110.84	2 x 2
813RM	1-1/2"	8	200,000	126.68	2 x 2
913RM	2"	9	225,000	142.53	2 x 3
1013RM	2"	10	250,000	158.37	2 x 3

7.2 Type 25RM (end-to-end) – imperial

Type	Inlet size	Number of burner heads	Nominal capacity (Btu/hr)	Face width (inches)	Manifold size (inches)
325RM	1-1/2"	3	75,000	33.57	2 x 2
425RM	1-1/2"	4	100,000	44.82	2 x 2
525RM	1-1/2"	5	125,000	56.07	2 x 2
625RM	1-1/2"	6	150,000	67.32	2 x 2
725RM	1-1/2"	7	175,000	78.57	2 x 2
825RM	1-1/2"	8	200,000	89.82	2 x 2
925RM	2"	9	225,000	101.07	2 x 3
1025RM	2"	10	250,000	112.32	2 x 3
1125RM	2"	11	275,000	123.57	2 x 3
1225RM	2"	12	300,000	134.82	2 x 3
1325RM	2"	13	325,000	146.07	2 x 3
1425RM	2-1/2"	14	350,000	157.32	2 x 4
1525RM	2-1/2"	15	375,000	168.57	2 x 4

7.3 Type 50 (side-to-side) – imperial

Type	Inlet size	Number of burner heads	Nominal capacity (Btu/hr)	Face width (inches)	Manifold size (inches)
350RM	1-1/2"	3	75,000	16.45	2 x 2
450RM	1-1/2"	4	100,000	21.98	2 x 2
550RM	1-1/2"	5	125,000	27.52	2 x 2
650RM	1-1/2"	6	150,000	33.05	2 x 2
750RM	1-1/2"	7	175,000	38.58	2 x 2
850RM	1-1/2"	8	200,000	44.11	2 x 2
950RM	2"	9	225,000	49.64	2 x 3
1050RM	2"	10	250,000	55.17	2 x 3
1150RM	2"	11	275,000	60.70	2 x 3
1250RM	2"	12	300,000	66.23	2 x 3
1350RM	2"	13	325,000	71.77	2 x 3
1450RM	2-1/2"	14	350,000	77.30	2 x 4
1550RM	2-1/2"	15	375,000	82.83	2 x 4
1650RM	2-1/2"	16	400,000	88.36	2 x 4
1750RM	2-1/2"	17	425,000	93.89	2 x 4
1850RM	2-1/2"	18	450,000	99.42	2 x 4
1950RM	3"[1)]	19	475,000	104.95	2 x 5
2050RM	3"[1)]	20	500,000	110.48	2 x 5
2150RM	3"[1)]	21	525,000	116.02	2 x 5
2250RM	3"[1)]	22	550,000	121.55	2 x 5
2350RM	3"[1)]	23	575,000	127.08	2 x 5
2450RM	3"[1)]	24	600,000	132.61	2 x 5
2550RM	3"[1)]	25	625,000	138.14	2 x 5
2650RM	3"[1)]	26	650,000	143.67	2 x 5

1) Maximum inlet size for bottom inlet is 2-1/2" NPT.

7.4 Burner head (Type 13/25/50) – imperial

Manifold pressure	"w.c.	2	3	4	4.5 (nominal)	5	6
Combustion air flow	SCFH	205	252	291	308	326	357
Maximum capacity	Btu/hr	17,800	20,700	23,500	24,925	26,200	28,500
Fuel flow at maximum	SCFH	17.8	20.7	23.5	24.9	26.2	28.5
Minimum capacity	Btu/hr	10,800	14,100	16,600	18,000	19,300	21,700
Fuel flow at minimum	SCFH	10.8	14.1	16.6	18.0	19.3	21.7
Face temperature range	°F	1168–1454	1110–1537	1130–1569	1137–1630	1173–1611	1166–1677

7.5 Burner head (Type 13/25/50) – metric

Manifold pressure	mbar	5	7.5	10	11.2 (nominal)	12.4	14.9
Combustion air flow	m^3/h	5.80	7.15	8.25	8.72	9.23	10.12
Maximum capacity	kW	5.2	6.1	6.9	7.3	7.7	8.4
Fuel flow at maximum	m^3/h	0.50	0.59	0.67	0.71	0.74	0.81
Minimum capacity	kW	3.2	4.1	4.9	5.3	5.7	6.4
Fuel flow at minimum	m^3/h	0.311	0.40	0.47	0.51	0.55	0.61
Face temperature range	°C	631-790	599-836	610-854	614-888	634-877	630-914

7.6 Direct spark/Flame sensor port – imperial

Manifold pressure	"w.c.	2	3	4	4.5 (nominal)	5	6
Combustion air flow	SCFH	66	77	87	93	97	106
Maximum capacity	Btu/hr	5,340	6,210	7,050	7,478	7,860	8,550
Fuel flow at maximum	SCFH	5.3	6.2	7.1	7.5	7.9	8.6

7.7 Direct spark/Flame sensor port – metric

Manifold pressure	mbar	5	7.5	10	11.2 (nominal)	12.4	14.9
Combustion air flow	m^3/h	1.88	2.18	2.48	2.63	2.76	3.00
Maximum capacity	kW	1.6	1.8	2.1	2.2	2.3	2.5
Fuel flow at maximum	m^3/h	0.15	0.18	0.20	0.21	0.22	0.24

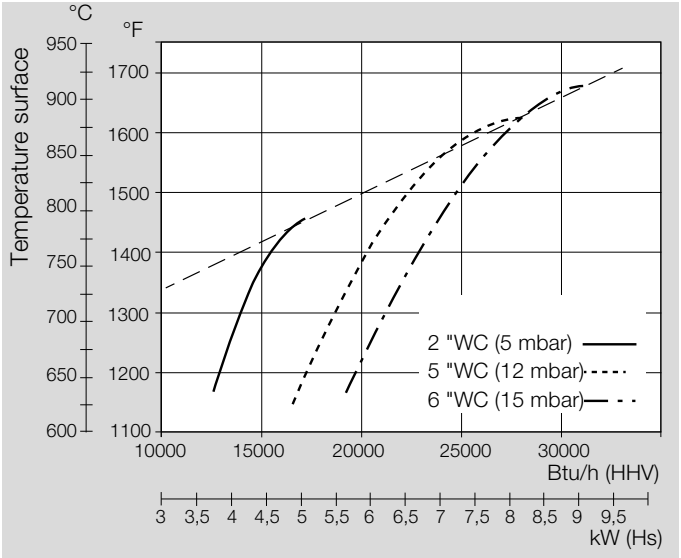
7.8 Approximate shipping weight - imperial

Type	13RM	25RM	50RM
Burner head weight [lbs]	9.1	8.8	8.8
Manifold weight per head [lbs]			
2 x 2" manifold	5.7	4.1	2.0
2 x 3" manifold	7.4	5.2	2.6
2 x 4" manifold	9.1	6.4	3.2
2 x 5" manifold	10.8	7.6	3.8

7.9 Emitter surface temperature

Most systems are designed to nominal capacities.

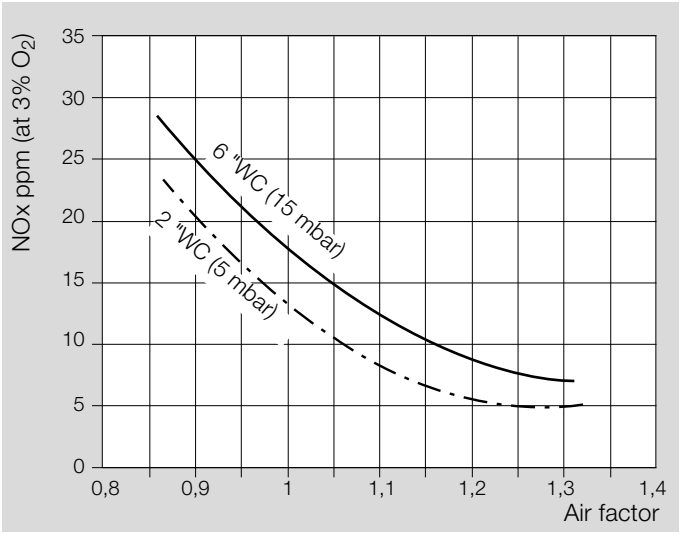
➔ Reduced or extended capacities are possible. RadMax should not be installed in ovens/chambers above 500°F. Contact Maxon for more information.



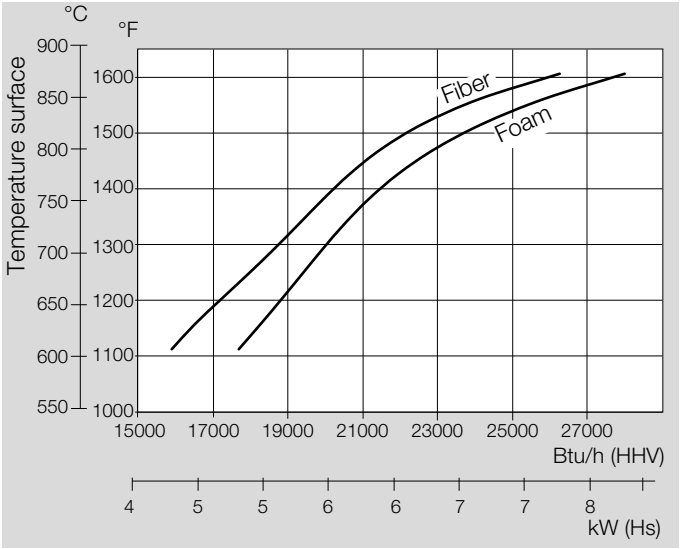
1) RadMax utilized metal foam emitters prior to 2022.

7.10 NOx Emission

This chart represents the relationship between NOx emissions and face temperature versus percent of excess air. Actual readings may vary according to operating conditions.



7.11 Metal fiber (current) vs. metal foam performance



8 CERTIFICATION

8.1 Eurasian Customs Union

EAC

The products RadMax meet the technical specifications of the Eurasian Customs Union.

9 DISPOSAL

Devices with electronic components:

WEEE Directive 2012/19/EU – Waste Electrical and Electronic Equipment Directive

At the end of the product life (number of operating cycles reached), dispose of the packaging and product in a corresponding recycling centre. Do not dispose of the unit with the usual domestic refuse. Do not burn the product. On request, old units may be returned carriage paid to the manufacturer in accordance with the relevant waste legislation requirements.

FOR MORE INFORMATION

The Honeywell Thermal Solutions family of products includes Honeywell Combustion Safety, Eclipse, Exothermics, Hauck, Kromschröder and Maxon. To learn more about our products, visit ThermalSolutions.honeywell.com or contact your Honeywell Sales Engineer.

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