

Start-up Instructions

Read complete instructions before proceeding and familiarize yourself with all the system's equipment and components. Verify that all equipment has been installed in accordance with the original manufacturer's current instructions.

CAUTION: 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.

Initial RadMax™ Burner start-up:

1. **Close all burner fuel valves and gas cocks.**
Make preliminary adjustment to fuel gas regulator(s) to establish adequate fuel pressure.
2. **Check all electric circuitry.** 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 "Capacities and Specifications" table on page 1400-S-2. 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 on Page 1400-S-2). 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 the table on Page 1400-S-2.) 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 shut-off 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 desired operating temperature within the range stated in the "Capacities and Specifications" table on Page 1400-S-2. 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 "Capacities and Specifications" table. 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.

Start-up Instructions

Capacities and Specifications

RadMax™ Type 13/25/50 Burner Head

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	1050-1483	1110-1537	1130-1569	1150-1590	1173-1611	1200-1659

Direct Spark/Flame Sensor Port

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

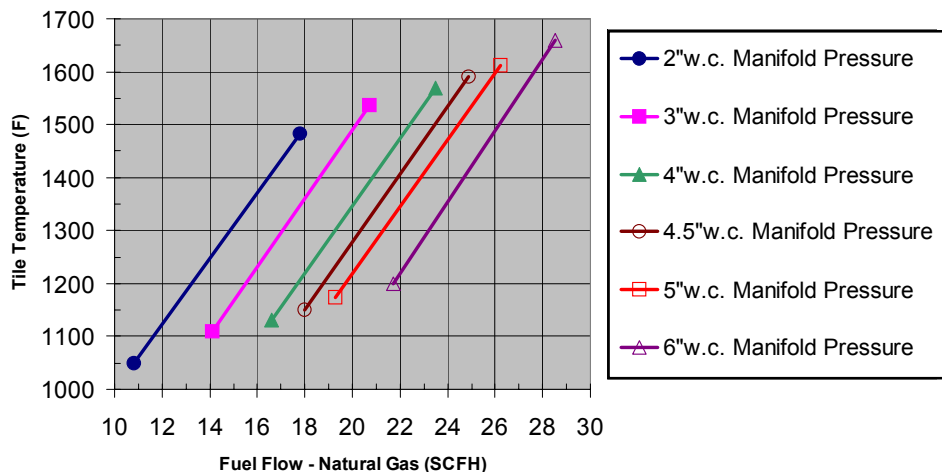
RadMax™ Type 13/25/50 Burner Head (metric data)

Manifold Pressure	mbar	5.0	7.5	10.0	11.2 (nominal)	12.4	14.9
Combustion Air Flow	(n)m³/hr	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	(n)m³/hr	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	(n)m³/hr	0.31	0.40	0.47	0.51	0.55	0.61
Face Temperature Range	°C	566-806	599-836	610-854	621-866	634-877	649-904

Direct Spark/Flame Sensor Port

Manifold Pressure	mbar	5.0	7.5	10.0	11.2 (nominal)	12.4	14.9
Combustion Air Flow	(n)m³/hr	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	(n)m³/hr	0.15	0.18	0.20	0.21	0.22	0.24

Face Temperature Range for Various Firing Rates



NOTE: 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.



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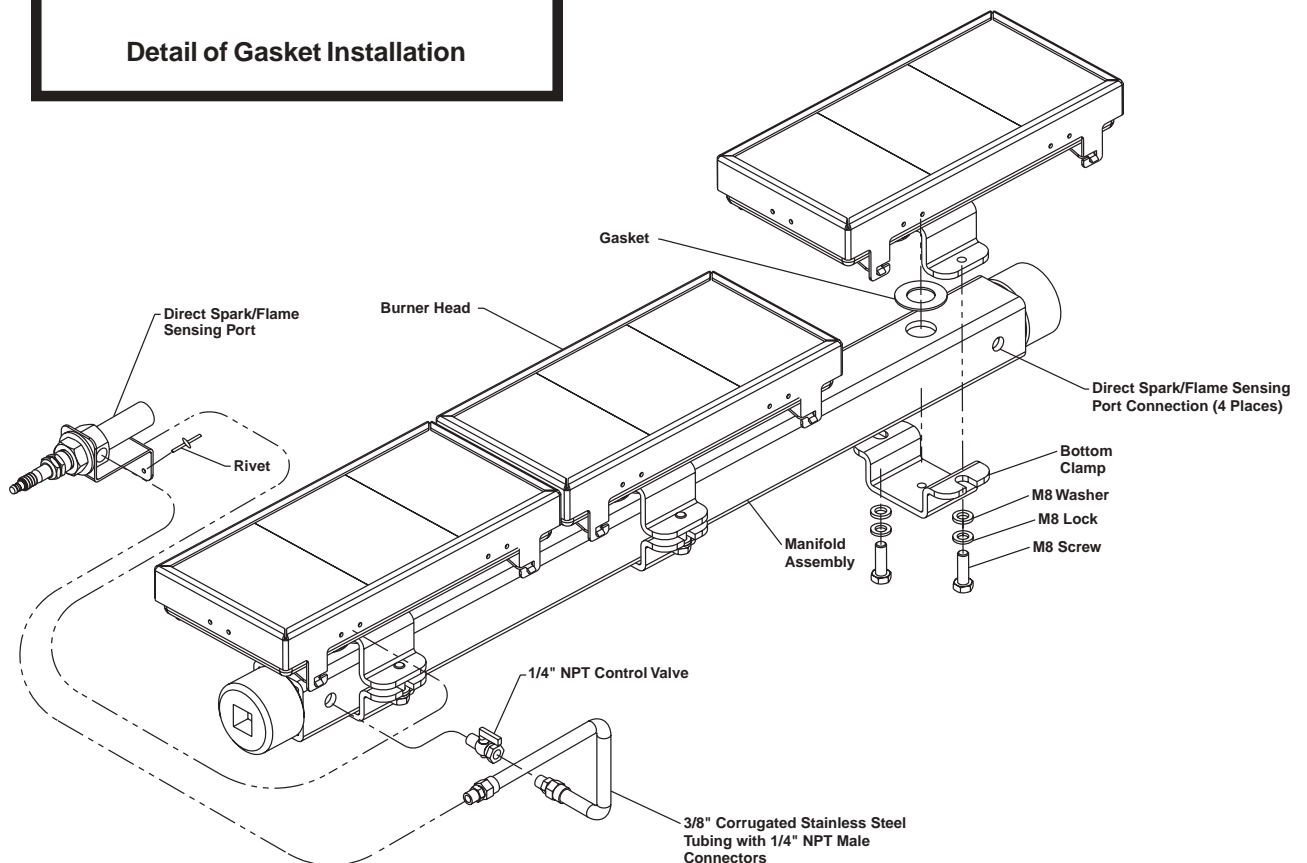
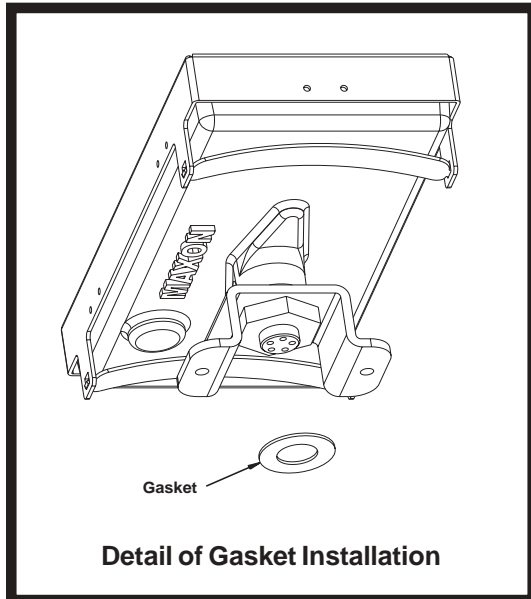
INDUSTRIAL COMBUSTION EQUIPMENT AND VALVES

Assembly Instructions

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:

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



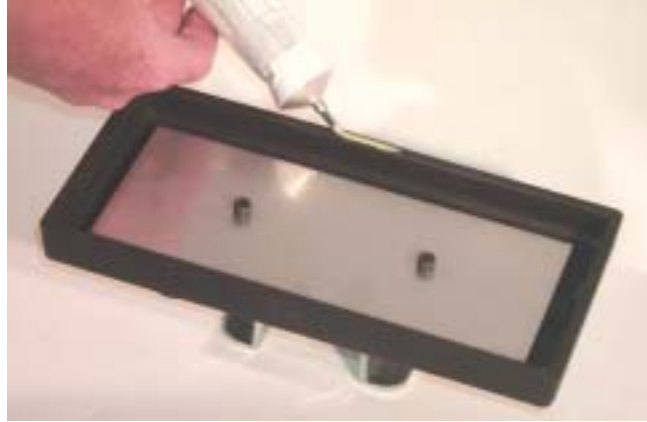
Maintenance Instructions

Installing Replacement Burner Tiles

– Step 1

Coat the tile support face of the body casting with a thin film of gasket adhesive.

Figure 1



– Step 2

Install the burner body gasket. Be careful to ensure gasket is installed squarely and use care to avoid tearing gasket material. Allow gasket to set for 5-10 minutes before installing tiles.

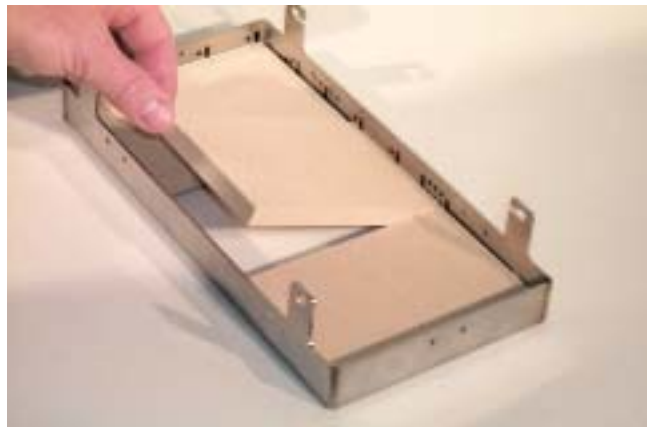
Figure 2



– Step 3

Place tile retainer frame face down on a flat surface. Install 3 burner tiles into tile retainer, making sure that no gaps exist between tiles and that tiles are properly centered in tile retainer.

Figure 3



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INDUSTRIAL COMBUSTION EQUIPMENT AND VALVES

Maintenance Instructions

– Step 4

Place burner body casting face down into tile retainer frame, with burner body gasket resting on top of burner tiles (along inside edge of tile retainer frame).

Figure 4



– Step 5

Install spring clips to secure the tile retainer frame.

Figure 5



Notes



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