

## Burner Application Details Packaged Versions

CYCLOMAX® Burners were designed for low to moderate temperature oven-type applications only. They may be used in any oven whose combustion chamber temperature is 800°F (427°C) or less.

**NOTE:** CYCLOMAX® Burners should not be used in any application where there is a static (no moving air) condition.

Packaged CYCLOMAX® Burners include a low horsepower combustion air blower in your choice of the voltages listed below.

Packaged CYCLOMAX® Burner Model	0.4M	0.8M	1.6M	2.7M	3.7M
Horsepower	1/2 HP	1/2 HP	3/4 HP	2 HP	3 HP
208-230/460/3/60	1/2 HP	1/2 HP	3/4 HP	2 HP	3 HP
575/3/60	1/2 HP	1/2 HP	3/4 HP	2 HP	3 HP

**IMPORTANT:** The combustion air blower must be in operation any time the air stream temperature is above 200°F (93°C). If not, damage to the blower, burner and piping is possible.

To adjust the Packaged burner, set the gas pressure according to the values shown in the table below. During adjustment, observe the flame if possible. The flame should be blue and it should be totally contained inside the combustion sleeve, especially at low firing rates. Blue flame outside of the combustion sleeve is caused by combustion that is either too rich or too lean and will result in high levels of CO. Yellow or orange flames are normally an indicator of a too-rich flame. Higher oven suction will require higher gas pressure to the burner for optimum performance. Higher back pressure will require less gas pressure to the burner for optimum performance. The values listed in the table below are for a near balanced condition.

**IMPORTANT:** The pilot must be interrupted in order to obtain the emissions listed in the following table. Continuous pilot is not recommended.

### Packaged CYCLOMAX® – Natural Gas Capacities and Specifications (60 Hz)

Burner Size	0.4M	0.8M	1.6M	2.7M	3.7M
Recommended Gas Pressure "w.c.	15.5	11.5	14.2	11.0	10.0
Maximum Capacity (1000's Btu/hr)	425	850	1600	2700	3700
Minimum Capacity (1000's Btu/hr)	30 - 45	56 - 70	107 - 133	180 - 225	247 - 308
Pilot Capacity (1000's Btu/hr)	15 - 35	60 - 70	50 - 100	70 - 150	100 - 150
Turndown	Up to 10:1	Up to 10:1	Up to 15:1	Up to 15:1	Up to 15:1
Emission Turndown based on high fire	15:1	15:1	3.5:1	6:1	4:1
Maximum Air Pressure "w.c.	5.5	5	5	8	8
Air Flow SCFM (Maximum)	105	210	400	670	930
NOx (corrected to 3% oxygen)	25	25	25	25	25
CO (corrected to 3% oxygen)	75	75	75	75	75
Sound Level (without silencer) dB(A)	83 - 89	83 - 89	83 - 89	86 - 90	86 - 90
Flame Length (ft)	0.5	0.5	1.0	2.0	1.5

**NOTE:** On the packaged unit, gas pressure is measured at the pressure tap on the gas valve body (not the backplate). The backplate pressure tap is for the EBMRV version.

## Burner Application Details

### EBMRV Versions

Maxon CYCLOMAX® Burners are available in four external blower versions. By using the specified external blower, it is possible to double the capacity of the burner over the Packaged version. Emissions are similar to the burner operating with a packaged fan. With the EBMRV versions, there is slightly more flame outside of the can and this makes the burner more sensitive to cross velocity.

The external blower versions are very similar to the packaged versions except they do not include gas or air internal control devices. A threaded EB Air Adapter allows the MICRO-RATIO® Valve to be mounted.

The recommended (minimum) FG Blower is shown in the chart below. If you use a butterfly style gas valve on the MICRO-RATIO® Valve, turndown could be affected. Poppet style gas valves should be used. If your air piping is unusually long and/or contains many fittings, please review your blower size to compensate for higher pressure drops through the air

piping. Set the MICRO-RATIO® Valve to obtain the gas and air pressures shown on the graphs on pages 2805 - 2808. The following table lists the recommended MICRO-RATIO® Valve and FG Blower selections.

The values in the table below are guidelines. To meet your capacity and turndown needs, pressures must be set to match the graphs on pages 2805 - 2808.

**IMPORTANT:** The EBMRV versions, like the packaged versions, should be operated with interrupted pilot. Emissions can be 20% higher if the pilot is left on continuously and combustion sleeve life is reduced.

**IMPORTANT:** Whenever the combustion chamber temperature is above 200°F (93°C), air should be flowing through the burner. If not, damage to gaskets in the burner could result and increase the chance for leaks.

Burner Size	EB2MRV CM	EB3MRV CM	EB4MRV CM	EB5MRV CM
Maximum Capacity (Btu/hr)	1,600,000	3,200,000	5,400,000	7,400,000
MICRO-RATIO® Valve	1"-P x M-3"	1.5"-P x M-4"	2.5"-P x M-6"	2.5"-P x M-6"
Minimum FG Blower Recommended	C-2370-16	C-4520-16	C-9180-24	C-11220-24

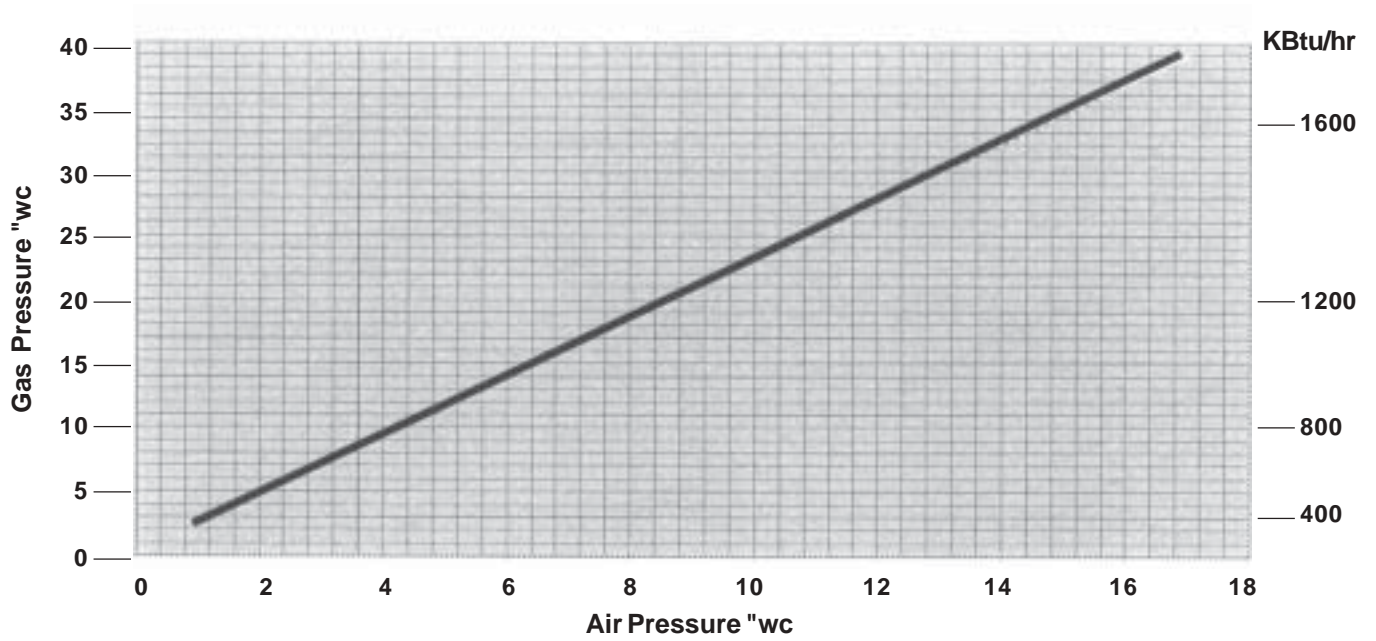
#### CYCLOMAX® EB Versions – Natural Gas Capacities and Specification (60 Hz)

Burner Size	EB2MRV CM	EB3MRV CM	EB4MRV CM	EB5MRV CM
Maximum Capacity (Btu/hr)	1,600,000	3,200,000	5,400,000	7,400,000
Minimum Capacity (Btu/hr)	100,000	180,000	200,000	180,000
Pilot Capacity (Btu/hr)	100,000	150,000	180,000	200,000
Gas Pressure at Maximum Firing Rate ("w.c.)	34	40	38.5	35.5
Air Pressure at Maximum Firing Rate ("w.c.)	15	15	28.5	30
Turndown	15:1	15:1	15:1	15:1
Emission Turndown based on high fire	15:1	13:1	15:1	12:1
Air Flow at Maximum (SCFM)	400	800	1350	1850
Typical Gas Pressure Upstream of MICRO-RATIO® Valve (psi)	1.5 to 2	2 to 3	2 to 2.5	2.5 to 3.5
Typical NOx 3% O <sub>2</sub> (low cross velocity)	<25	<25	<25	<25
Typical CO 3% O <sub>2</sub> (low cross velocity)	<75	<75	<75	<75
Typical NOx 3% O <sub>2</sub> (high cross velocity)	<25	<25	<25	<25
Typical CO 3% O <sub>2</sub> (high cross velocity)	<100	<100	<200	<100
Flame Length (ft)	1.0	1.5	2.0	1.5

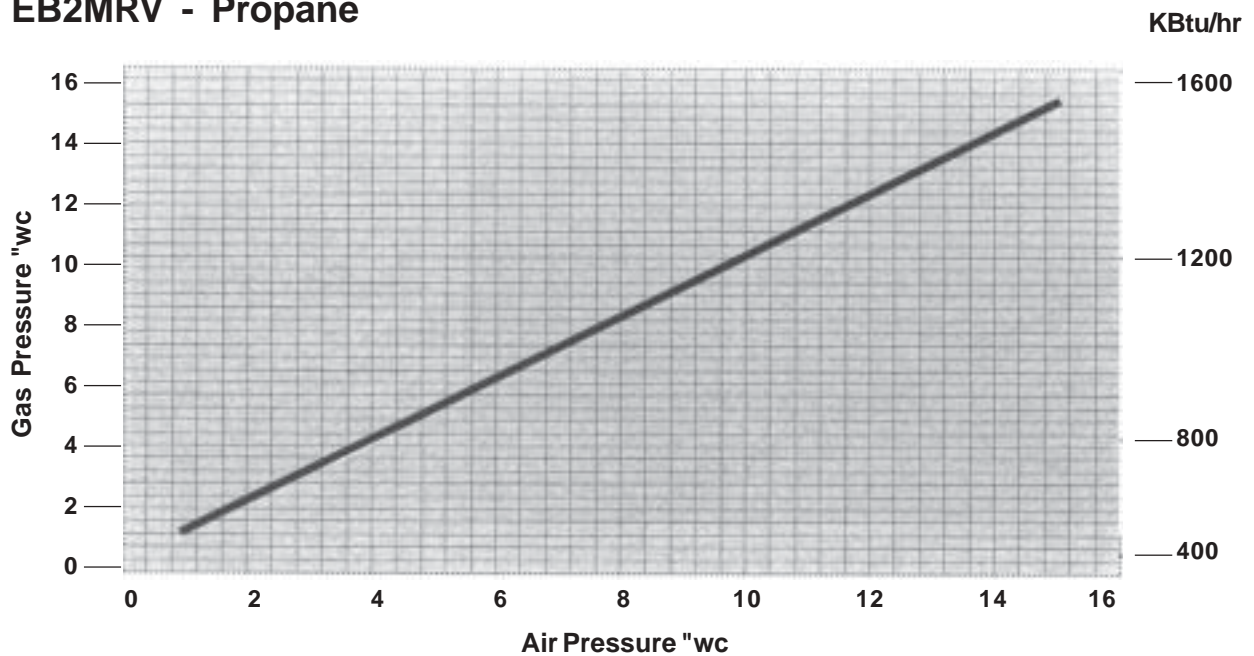
NOTE: Operation above the recommended gas pressure for a given air pressure will result in higher NOx and lower CO. Operation below the recommended gas pressure curves will result in lower NOx and higher CO. Use of propane as a fuel will result in higher emissions. Oven cross velocities and back pressures have a slight affect on the optimum pressures to set.

# Burner Application Details

## EB2MRV - Natural Gas

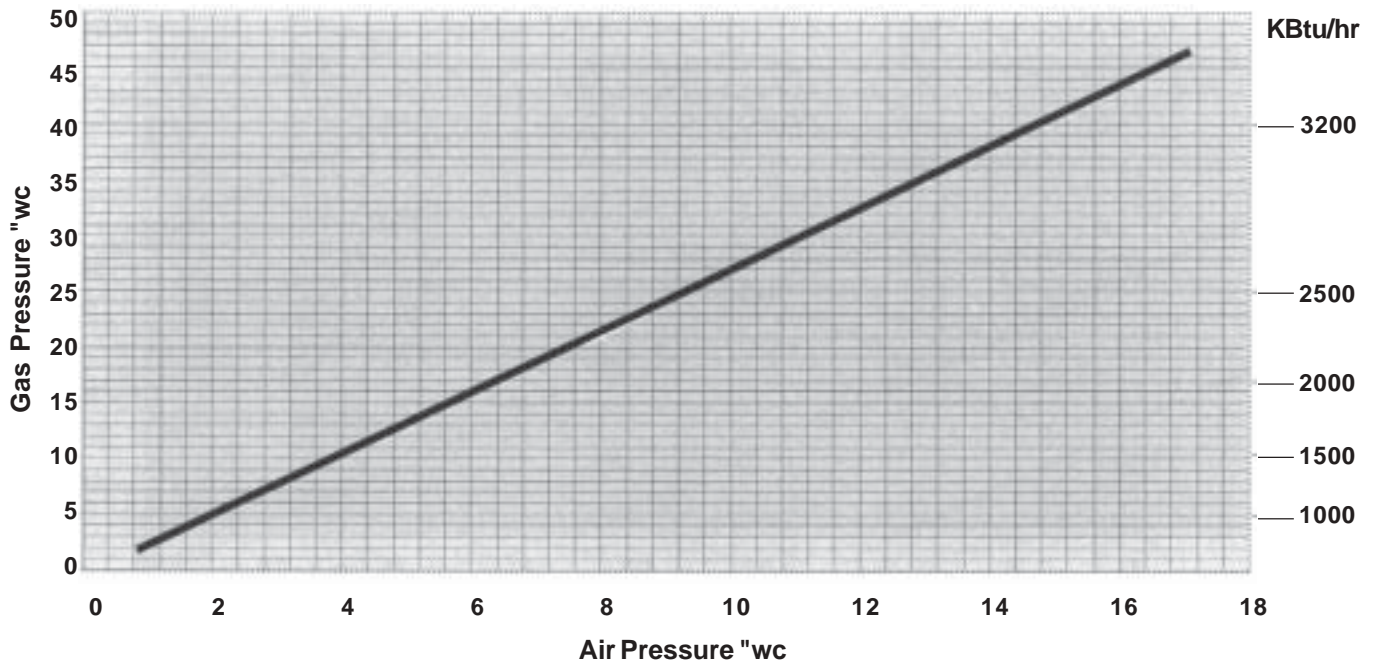


## EB2MRV - Propane

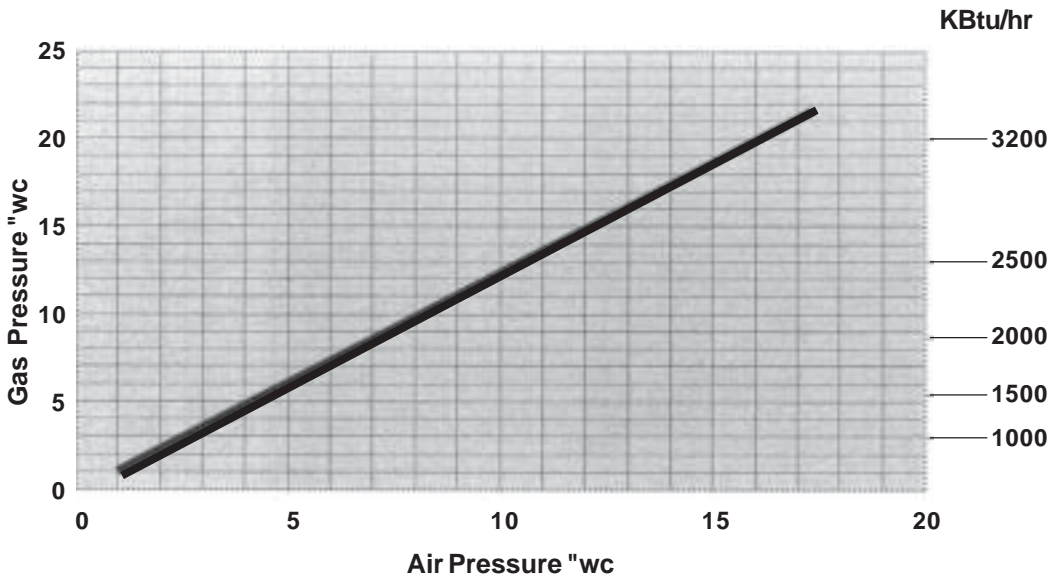


## Burner Application Details

### EB3MRV - Natural Gas

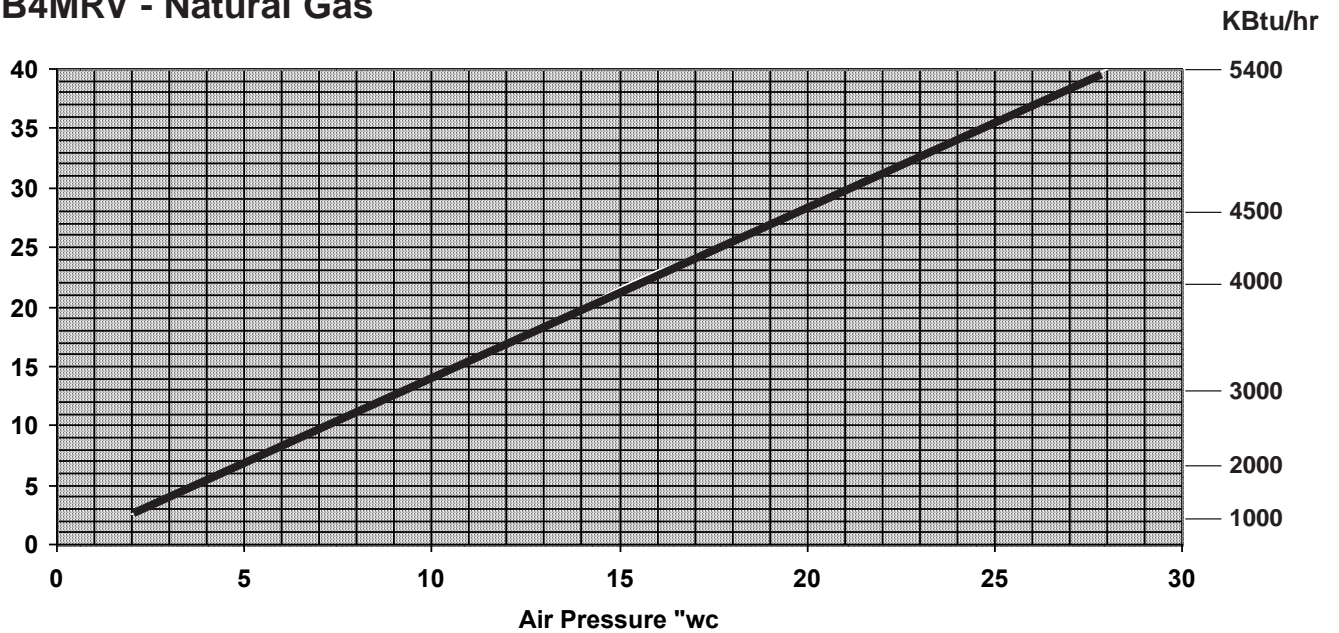


### EB3MRV - Propane

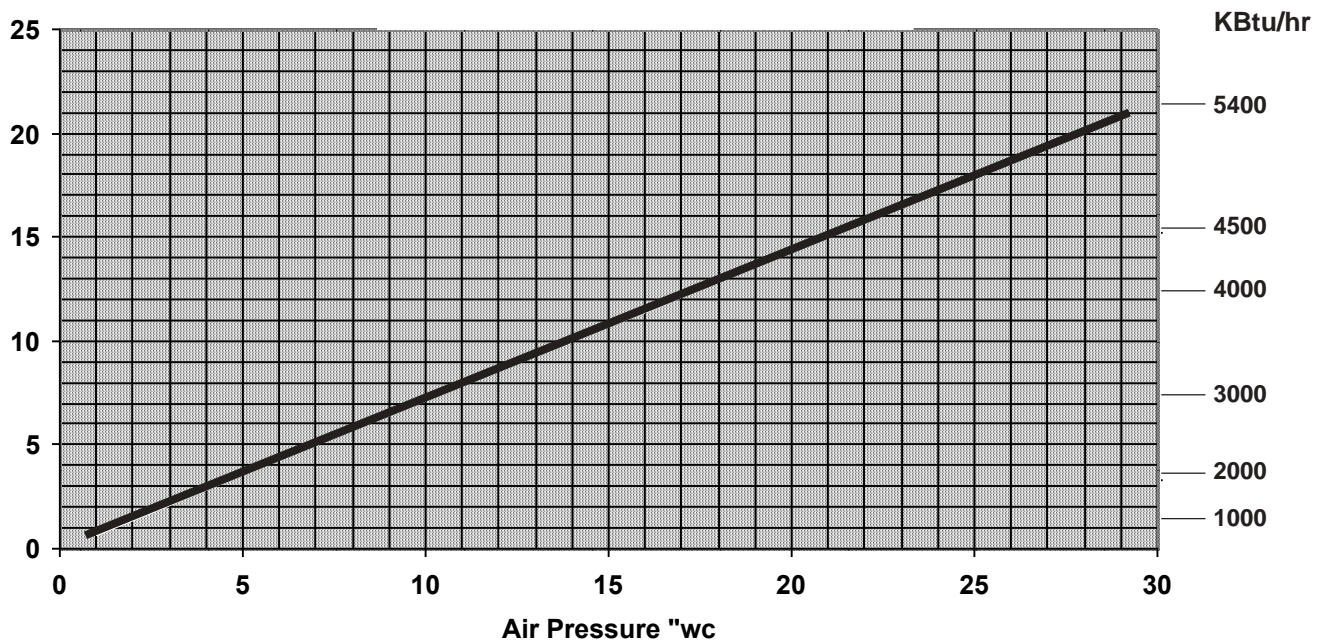


## Burner Application Details

### EB4MRV - Natural Gas



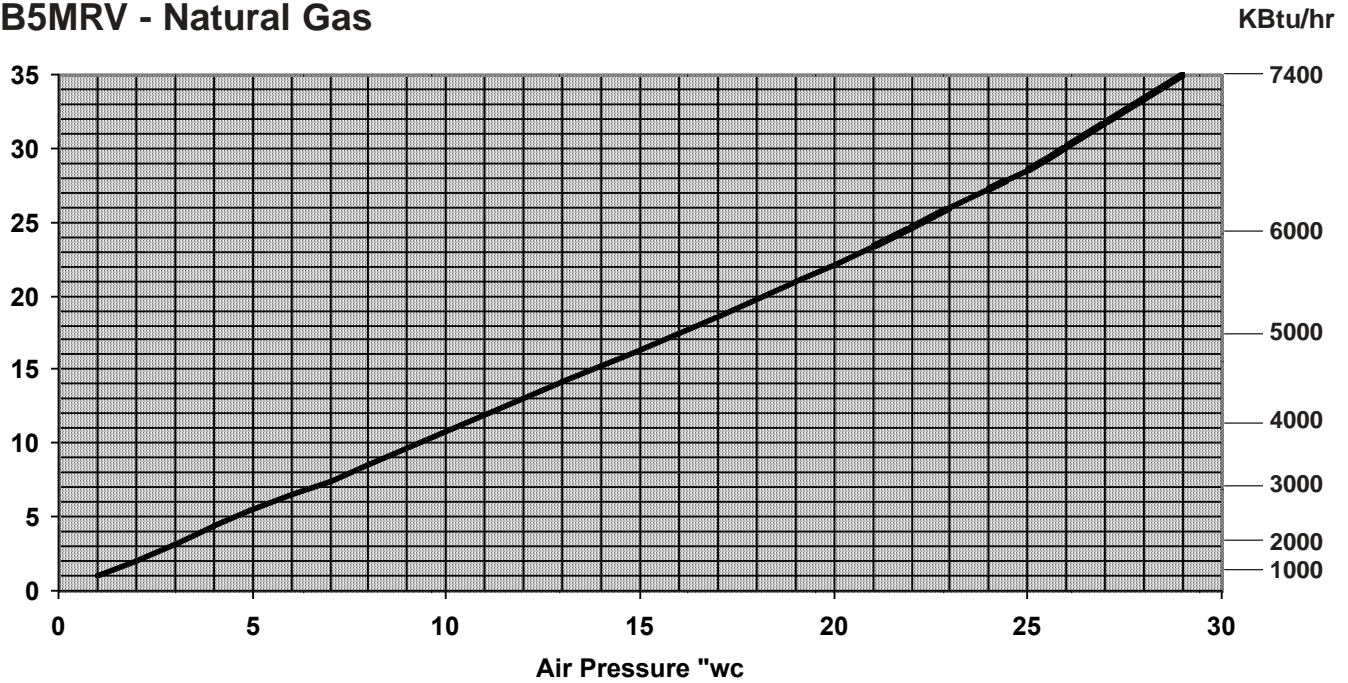
### EB4MRV - Propane



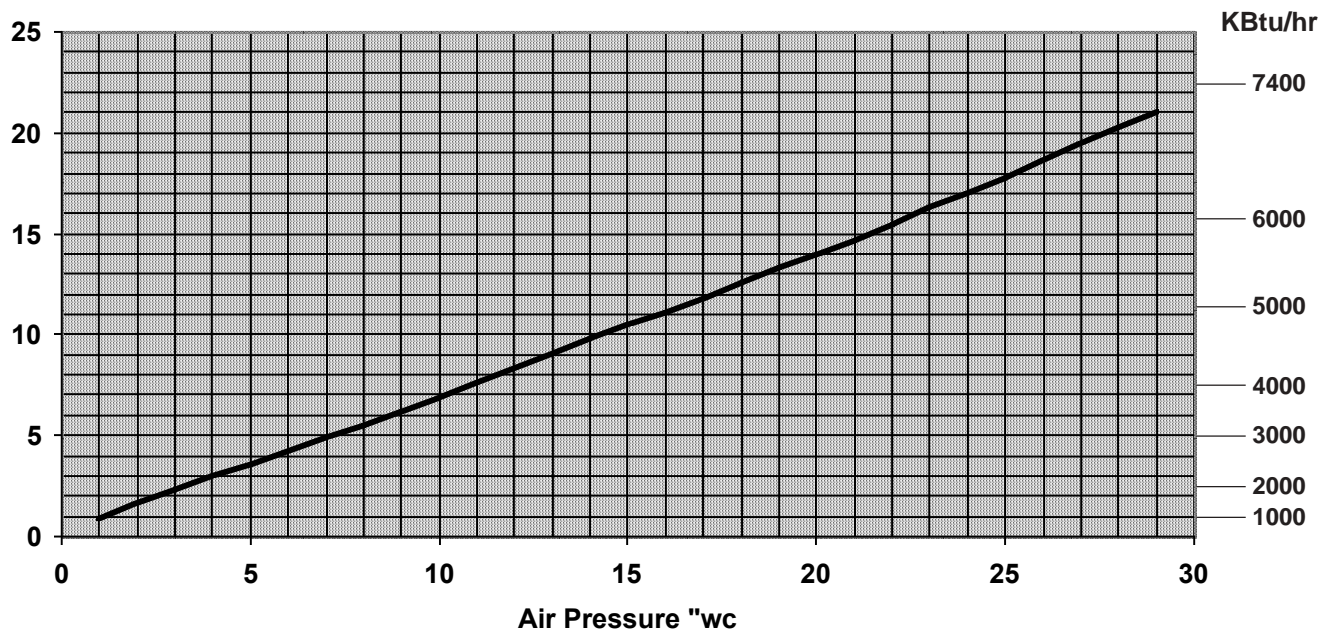


### Burner Application Details

#### EB5MRV - Natural Gas

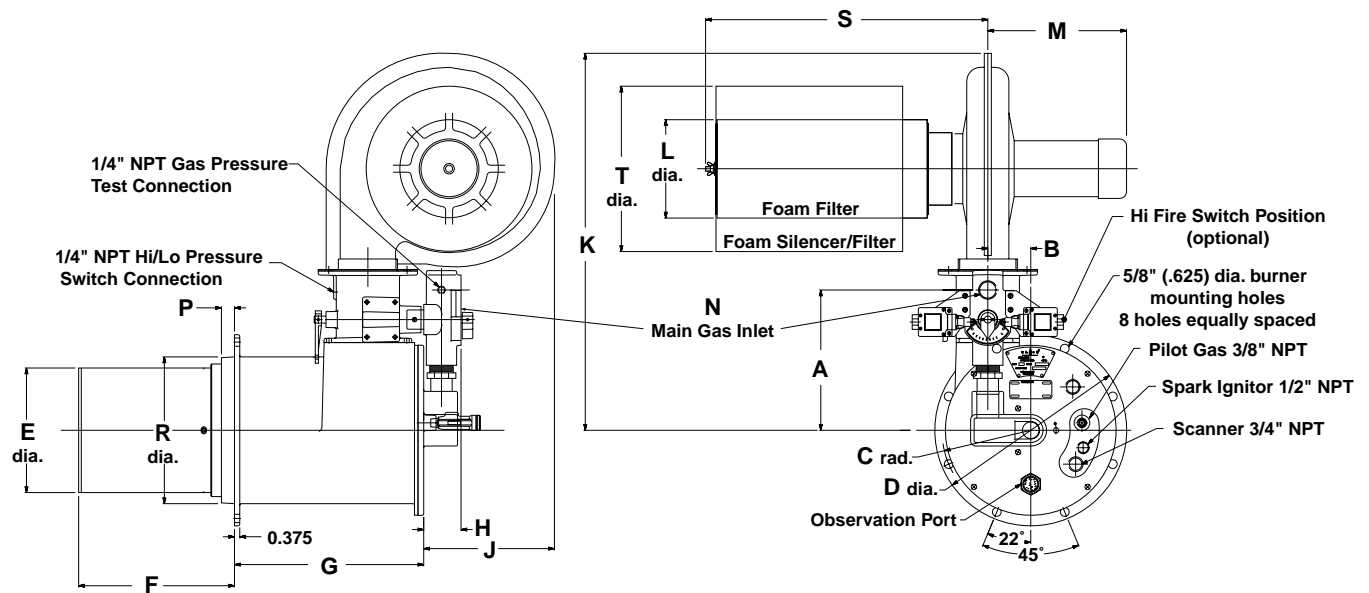


#### EB5MRV - Propane



# Dimensions (in inches)

## Dimensions – Packaged Versions



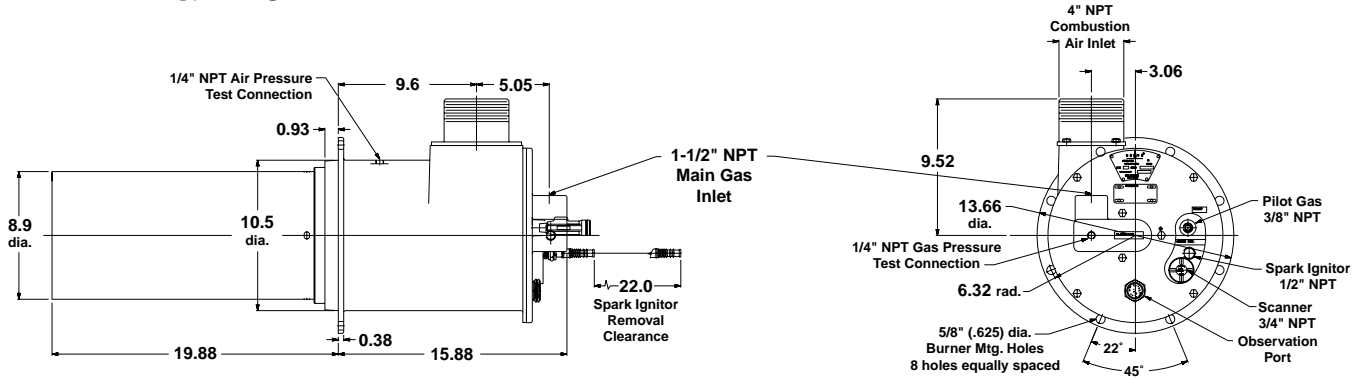
Dimensions (in inches)

Burner Size	A	B	C	D	E	F	G	H	J	K	L	M	N NPT	P	R	S	T
0.4M	10.03	3.06	6.32	13.66	8.90	19.88	13.47	2.66	4.65	26.95	7.03	9.88	1"	.937	10.3	20.27	11.82
0.8M	10.03	3.06	6.32	13.66	8.90	19.88	13.47	2.66	4.65	26.95	7.03	9.88	1"	.937	10.3	20.27	11.82
1.6M	10.03	3.06	6.32	13.66	8.90	19.88	13.47	2.66	4.65	26.95	7.03	9.88	1"	.937	10.3	20.27	11.82
2.7M	13.02	3.40	7.73	16.5	11.72	18.47	20.21	3.67	11.64	34.0	9.03	14.12	1-1/4"	.930	13.25	27.52	16.38
3.7M	13.02	3.40	7.73	16.5	11.72	28.57	20.21	3.67	11.64	34.0	9.03	14.12	1-1/2"	.930	13.25	27.52	16.38

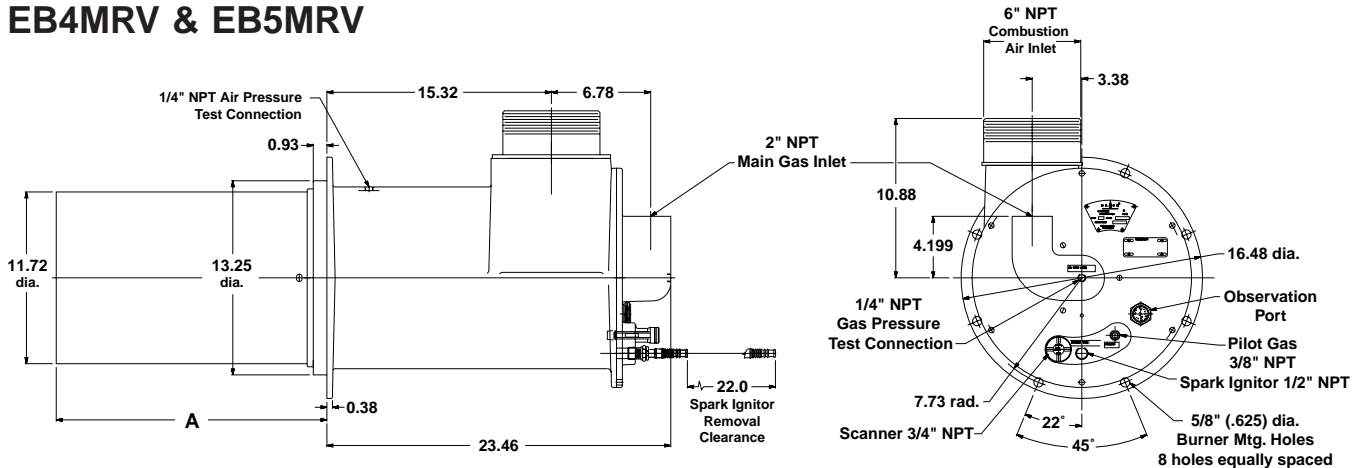
# Dimensions (in inches)

## Dimensions – EBMRV Version

### EB2MRV & EB3MRV



### EB4MRV & EB5MRV



Dimension "A" 18.47 for EB4MRV  
28.57 for EB5MRV