



# **PROFIRE® V SERIES BURNERS**

**1.3 - 16.8 MMBTU/HR**

**High-efficiency burner technology for the most stringent emissions requirements.**

# Innovative Technology.

## Forced draft dual fuel burner.

Suitable for firetube, firebox, commercial watertube and cast iron boilers; the V series features a unique aerodynamic air damper design which permits accurate air-to-fuel settings for maximum combustion efficiency. The V series, available in uncontrolled, and low NOx configurations offers multi-fuel versatility to meet the toughest air quality standards.

**Minimize emissions while **MAXIMIZING** efficiency, now *that's* something worth talking about.**



### **Unique Air Damper**

Dual blade configuration offers precise control of combustion air flow throughout the entire firing range. The unique profile of the damper blades restricts air flow at low firing ranges leading to increased turndown capability.

### **Efficient Gas Combustion**

Gas is introduced through orifices ahead of the diffuser providing superior mixing of gas and air with excellent flame retention at all firing rates. The gas manifold is standard on all oil burners for future gas firing.

### **High Turndown**

Up to 10:1 turndown with natural gas and up to 5:1 with the low NOx option. High turndown allows for reduced heat loss due to short cycling, faster response times to meet load demands and less mechanical cycling.

### **Low Blower Motor HP**

Highly efficient backward-curved aluminum impeller with the ability to maintain it's original balance by avoiding the dust collection that is common with forward curved blowers.

### **Parallel Positioning Option**

The use of parallel positioning systems eliminates the need for linkage and reduces setup time. Better control throughout the firing range is also achieved with the use of a parallel positioning system. High accuracy and resolution with repeatable actuator positions increase the efficiency of the burner. Digital positioning feedback from actuators ensure precise control, repeatability, reliability and independent ignition position for greater flexibility.

# The V Burner Explained:

The V series burner offers: natural gas, propane gas, pressure atomized #2 oil and combination gas and oil fuel options from 1.3 to 16.8 MM BTU per hour. The LNV burner, capable of <30 PPM NOx emissions offers: natural gas, propane gas, pressure atomized #2 oil and combination gas and oil fuel options from 1.3 to 14.7 MM BTU per hour.

## V/ LNV Burner



**Cam Trim** 14-point adjustment range available

**Parallel Positioning** available for optimal control throughout the firing range

**Dual Blade Air Damper** offers precise control of combustion air flow throughout firing range

**Gas Manifold** on oil burners standard for easy upgrade to combination units

**Combustion Air Fan** is an air-foil blade design providing smooth air release from the blades, allowing for increased blower efficiency

**Induced FGR** FGR modulating valve and shutoff valve (LNV)

**No. 2 Oil** capability for back-up fuel

**Panel Mount Options** includes top or rear mount flexibility

**Inverted Configuration** available in lieu of standard configuration to meet space requirements

**UL & cUL** listed

Emissions	Frame	Model Range	Boiler HP	Capacities		Mode of Operation	Fuel
				MBH	GPH		
Uncontrolled	Size 1	13 - 34	30 - 80	1,300 - 3,400	9.3 - 24.3	On-Off <sup>1</sup>	Gas, Oil, Comb.
Uncontrolled	Size 2	35 - 55	83 - 130	3,500 - 5,500	25.0 - 39.3	Low-High-Off <sup>2</sup>	Gas, Oil, Comb.
Uncontrolled	Size 3	60 - 110	143 - 262	6,000 - 11,000	42.4 - 78.6	Low-High-Off/ Full Mod <sup>3</sup>	Gas, Oil, Comb.
Uncontrolled	Size 4	120 - 168	286 - 400	12,000 - 16,800	85.7 - 120.0	Full Mod	Gas, Oil, Comb.

<sup>1</sup> Low-high and full modulation optional

<sup>2</sup> Full modulation optional

<sup>3</sup> Full modulation is standard on models V70 and above

Emissions	Frame	Model Range	Boiler HP	Capacities		Mode of Operation	Fuel
				MBH	GPH		
<30 PPM	Size 1	13 - 25	30 - 60	1,300 - 2,500	9.3 - 17.9	Full Mod <sup>1</sup>	Gas, Comb.
<30 PPM	Size 2	30 - 50	71 - 119	3,000 - 5,000	21.4 - 35.7	Full Mod	Gas, Comb.
<30 PPM	Size 3	54 - 90	129 - 214	5,400 - 9,000	38.6 - 64.3	Full Mod	Gas, Comb.
<30 PPM	Size 4	100 - 147	238 - 350	10,000 - 14,700	71.4 - 105.0	Full Mod	Gas, Comb.

<sup>1</sup> Low-high optional

## Uncontrolled Emissions Configuration (VL, VG, VLG)

Burner Model Number & Frame Size	13-1	15-1	17-1	20-1	21-1	25-1	30-1	34-1	35-2	40-2	42-2	45-2	50-2	54-2
Gas Input (MBtu/hr)	1,300	1,500	1,700	2,000	2,100	2,500	3,000	3,400	3,500	4,000	4,200	4,500	5,000	5,400
Oil Input (US gph)	9.3	10.7	12.1	14.3	15.0	17.9	21.4	24.3	25.0	28.6	30.0	32.1	35.7	38.6
Boiler HP @ 80% Eff.	31	36	40	48	50	60	71	81	83	95	100	107	119	129
Blower Motor HP	1/2	1/2*	1/2*	3/4*	3/4*	3/4*	3/4*	3/4*	1*	1*	1 1/2*	2*	2	3
Furnace Pressure ("w.c)	0.4	0.5	0.7	0.9	1.0	1.2	1.4	1.8	1.9	1.2	1.3	1.4	1.8	2.1
Shipping Weight (lbs.)	450	450	450	450	450	450	450	450	600	600	600	600	700	700

Burner Model Number & Frame Size	55-2	60-3	63-3	70-3	80-3	84-3	90-3	100-3	105-3	110-3	120-4	126-4	147-4	168-4
Gas Input (MBtu/hr)	5,500	6,000	6,300	7,000	8,000	8,400	9,000	10,000	10,500	11,000	12,000	12,600	14,700	16,800
Oil Input (US gph)	39.3	42.9	45.0	50.0	57.1	60.0	64.3	71.4	75.0	78.6	85.7	90.0	105.0	120.0
Boiler HP @ 80% Eff.	131	143	150	167	190	200	214	238	250	262	286	300	350	400
Blower Motor HP	3	5	5	5	5	7 1/2	7 1/2	10	10	10	15	15	15	15
Furnace Pressure ("w.c)	2.2	2.7	1.8	2.2	2.8	3.1	3.5	2.7	2.8	3.0	3.6	4.3	4.3	1.0
Shipping Weight (lbs.)	700	700	700	700	700	700	800	800	800	800	1,450	1,450	1,450	1,450

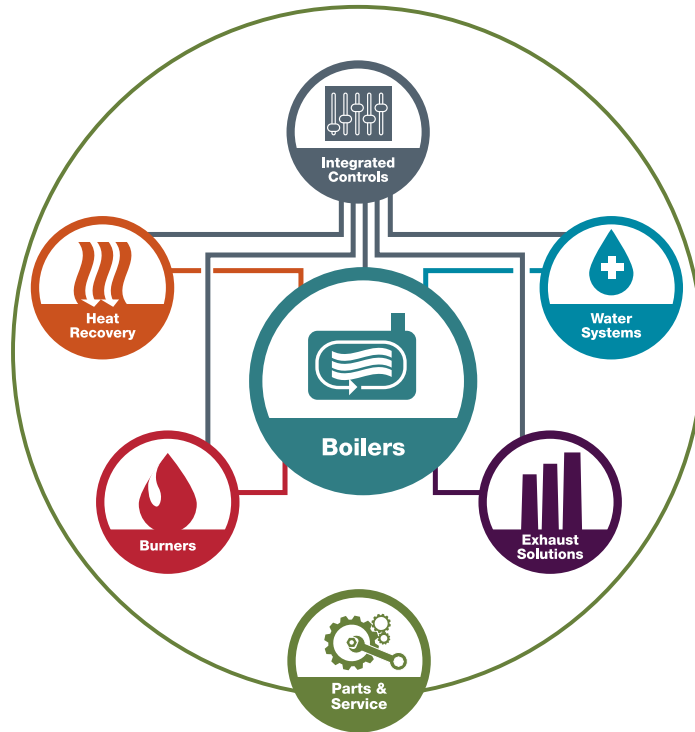
## <30 PPM Low NOx Configuration (LNVG, LNVLG)

Burner Model Number & Frame Size	13-1	15-1	17-1	20-1	21-1	25-1	30-2	34-2	35-2	40-2	42-2	45-2	50-2	54-3
Gas Input (MBtu/hr)	1,300	1,500	1,700	2,000	2,100	2,500	3,000	3,400	3,500	4,000	4,200	4,500	5,000	5,400
Oil Input (US gph)	9.3	10.7	12.1	14.3	15.0	17.9	21.4	24.3	25.0	28.6	30.0	32.1	35.7	38.6
Boiler HP @ 80% Eff.	31	36	40	48	50	60	71	81	83	95	100	107	119	129
Blower Motor HP	3/4	3/4*	3/4*	3/4*	3/4*	3/4*	2*	3*	3*	3*	3*	3*	3	5
Furnace Pressure ("w.c)	0.5	0.6	0.7	1.0	1.1	1.4	1.5	1.9	2.0	1.4	1.5	1.6	2.0	2.4
Shipping Weight (lbs.)	550	550	550	550	550	550	600	600	700	700	700	700	700	800

Burner Model Number & Frame Size	55-3	60-3	63-3	70-3	80-3	84-3	90-3	100-4	105-4	110-4	120-4	126-4	147-4
Gas Input (MBtu/hr)	5,500	6,000	6,300	7,000	8,000	8,400	9,000	10,000	10,500	11,000	12,000	12,600	14,700
Oil Input (US gph)	39.3	42.9	45.0	50.0	57.1	60.0	64.3	71.4	75.0	78.6	85.7	90.0	105.0
Boiler HP @ 80% Eff.	131	143	150	167	190	200	214	238	250	262	286	300	350
Blower Motor HP	5	5	5	7 1/2	7 1/2	7 1/2	10	15	15	15	15	15	15
Furnace Pressure ("w.c)	2.5	3.0	2.0	2.5	3.2	3.5	4.0	3.2	3.4	3.6	4.2	4.8	4.8
Shipping Weight (lbs.)	800	800	800	800	800	800	800	1,550	1,550	1,550	1,550	1,550	1,550

\* Fan motor size may vary for dual fuel firing applications.

Input is based on fuel Btu content and altitude of 2,000 feet or less. If altitude > 2,000 feet and < 8,000 feet, derate capacity 4% per 1,000 feet over 2,000. Consult factory for higher altitudes. Gas input is based on natural gas with 1,000 Btu/cu.ft., 0.60 gravity, 0 "w.c. furnace pressure and the aforementioned conditions. Oil input based on 140,000 Btu/gal and the aforementioned conditions.



## Total integration doesn't stop with the burner.

Only Cleaver-Brooks offers complete boiler systems, from fuel inlet to stack outlet, that are completely designed, engineered, manufactured, integrated, and serviced by one company. That integration starts with the burner, and Cleaver-Brooks has been perfecting this integral element of the boiler system through innovation and expert engineering for more than 80 years.



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