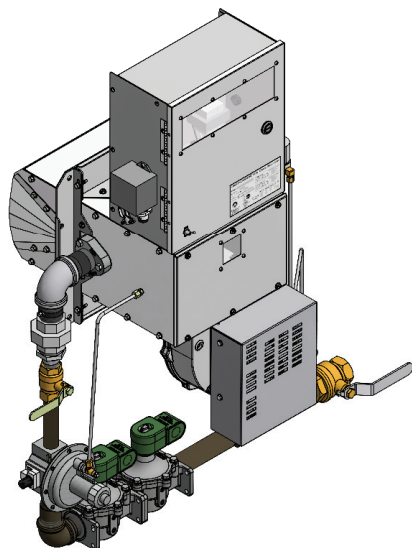




## Unipower VA Series Application Guide



### VA Burners (Variable Air)

Models V1 to V10

Max Input at 10" W.C. 670 MBH to 3,800 MBH

- In the United States, installation must conform with local codes or in the absence of local codes, with the National Fuel Gas Code, ANSI Z223.1-latest edition available from American National Standard Institute. Further reference should be made to the recommendation of your fuel supplier.
- In Canada, installation must conform with local codes or in the absence of local codes, with Installation Codes for Gas Burning Appliances and Equipment, Standard CAN/CGA 1-B-149.1 or 2.
- ⚠ WARNING: Additions, changes, conversions and service must be performed by an authorized Midco representative, service agency or the fuel supplier. Use only MIDCO specified and approved parts.**
- INSTALLER: Inform and demonstrate to the user the correct operation and maintenance of the gas utilization equipment. Inform the user of the hazards of storing flammable liquids and vapors in the vicinity of this gas utilization equipment and remove such hazards. Affix this manual and associated literature to the burner.
- CODE COMPLIANCE IS THE SOLE RESPONSIBILITY OF THE INSTALLER.
- USER: Retain this manual for future reference. If other than routine service or maintenance as described in this manual and associated literature is required, contact a qualified service agency. DO NOT ATTEMPT REPAIRS. An inadvertent service error could result in a dangerous condition.

Agency Approvals	UL Listed	
Control Options	24Volt	Honeywell S8670J - OBS
	120Volt	Honeywell 7800 Series - OBS
	120Volt	Siemens LME7 Series
Valve Train Options	Low Pressure (less than 14" W.C.)	
	High Pressure (Less than 5 PSI)	
	NFPA 86	
	GE GAP (IRI)	



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**SAFETY INFORMATION TERMS:** The following terms are used to identify hazards, safety precaution of special notations and have standard meanings throughout this manual. They are printed in all capital letters using a bold type face as shown below, and preceded by the exclamation mark symbol. When you see the safety alert symbol and one of the safety information terms as shown below, be aware of the hazard potential.



**DANGER:** Identifies the most serious hazards which will result in severe personal injury or death.  
**WARNING:** Signifies a hazard that could result in personal injury or death.  
**CAUTION:** Identifies unsafe practices which would result in minor personal injury or product and property damage.



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# Specifications Unipower VA Series

## I Specifications <sup>1</sup>

The VA Series, Models V1 to V6 are standard with intermittent spark ignited pilots and the V7 to V10 come with interrupted pilots. They are adaptable to most gas utilization equipment, including gravity and forced circulation furnaces, heat exchangers and process ovens. They are particularly recommended for firing high efficiency and high turndown applications

Burner Model	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10
Maximum <sup>2,3</sup> Input MBH at 10" w.c.	670	1,250	2,000	2,000	2,500	2,500	3,000	3,000	3,800	3,800
Maximum <sup>2,3</sup> Input MBH at 7" w.c.	550	1,150	1,890	1,890	2,500	2,500	2,800	2,800	3,300	3,300
Minimum <sup>2,3</sup> Input MBH	36	48	80	80	100	100	120	120	150	150
Turndown	19-1	26-1	25-1	25-1	25-1	25-1	25-1	25-1	25-1	25-1
Inlet Gas <sup>4</sup> pressure " w.c. for maximum firing rate(NG)	10.0"	10.0"	10.0"	10.0"	10.0"	10.0"	10.0"	10.0"	10.0"	10.0"
Manifold Gas Pressure for Maximum Input (NG) " w.c. <sup>2,3</sup>	4.9"	3.5"	4.1"	4.1"	4.3"	4.3"	4.4"	4.4"	5.1"	5.1"
Approx. Air Delivery at Zero Draft (CFM)	115	210	360	360	440	440	620	620	720	720
Flame Length at High Fire	25"	42"	42"	42"	42"	42"	42"	42"	42"	42"

### Minimum Recommended Chamber Size

Burner Model	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10
Width in inches	18	24	34	28	42	30	48	36	54	36
Height in inches	18	24	26	28	26	36	28	42	28	42
Depth in inches	42	48	54	54	60	60	66	66	72	72

*Table 1. Burner Specifications*

<sup>1</sup> Standard burners are shipped as NATURAL gas models. Contact Midco for PROPANE gas burners.

<sup>2</sup> 1 MBH = 1,000 Btu/hr

<sup>3</sup> All Ratings Based on 1000 BTU/Cu. Ft. NATURAL, 2500 BTU/Cu. Ft. PROPANE at sea level. Derate burner for altitude over 2,000 feet by 4% for each 1,000 feet above sea level.

<sup>4</sup> Lower gas inlet pressure may be used when maximum input is not required.

# Specifications and Process Flows / Temperature Limits

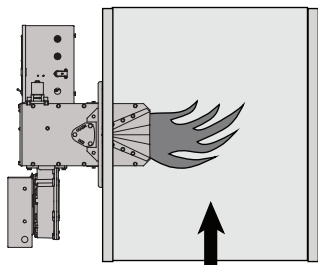
## Motor and Amperage Specifications

Burner Model	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10
Motor Power (HP)	0.32	0.50	1.10	1.10	1.10	1.10	1.75	1.75	1.75	1.75
Max. Static Pressure "w.c.	7.2"	6.2"	7.8"	7.8"	6.5"	6.5"	7.3"	7.3"	7.1"	7.1"
Max. Air Flow (CFM)	115	210	360	360	440	440	620	620	720	720
Max. Blower RPM	8400	5730	5700	5700	5700	5700	4800	4800	4800	4800
Motor Amps	3.5	4.0	10.5	10.5	10.5	10.5	13	13	13	13
Control Amps	1.3	1.6	1.5	1.5	2	2	2.1	2.1	2.1	2.1
Total Amps	4.8	5.6	12	12	12.5	12.5	15.1	15.1	15.1	15.1

Table 2. Motor and Amperage Specifications

## Process Flows and Temperature Limits

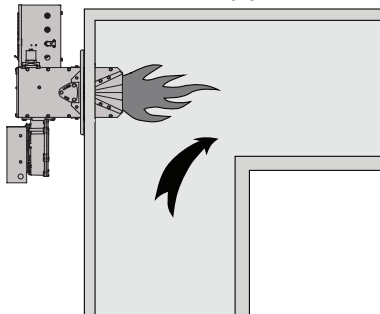
Cross Velocity Flow  
(Wall Mounted)



Min/Max Velocity: 400 - 1200 fpm

Figure 1

Corner Mounted  
Duct Pressure: +0.2" to - 0.5" W.C.  
+0.5" to - 1.2 mbar



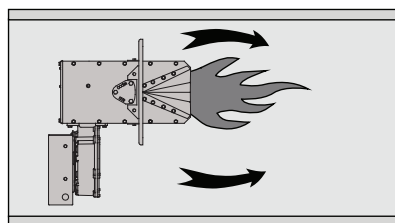
Min/Max Velocity: 400 - 1200 fpm

Figure 2

Min Velocity	400 fpm
Max Velocity	1200 fpm
Max Upstream Process Air Temperature	750° F
Max Downstream Process Air Temperature	750° F
Maximum Process Pressures W.C.	+1.0" to -0.5"

Table 3. (Figure 1 and Figure 2) Process Temperature and Pressures

Parallel Flow (In Duct)



Min/Max Velocity: 400 - 1200 fpm

Figure 3

Min Velocity	400 fpm
Max Velocity	1200 fpm
Max Upstream Process Air Temperature	100° F
Max Downstream Process Air Temperature	750° F
Maximum Process Pressures W.C.	+1.870" to -1.0"

Table 4. (Figure 3) Process Temperature and Pressures

## II Process Flows and Temperature Limits

# Performance Graphs

## III Combustion Performance

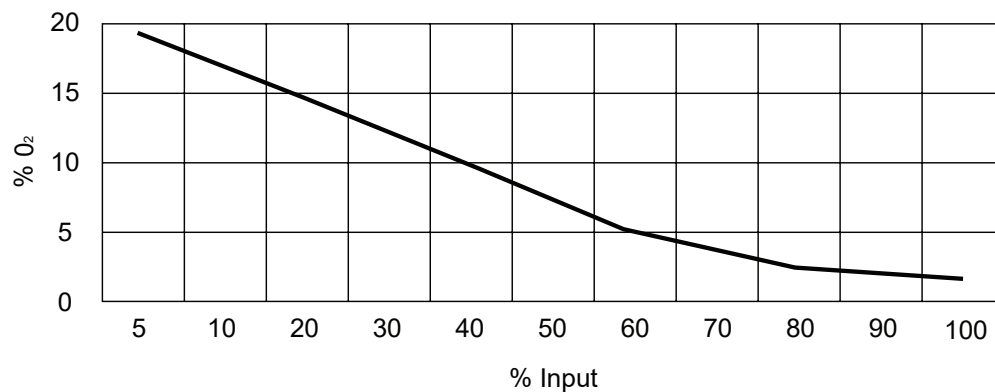


Chart 1 - O<sub>2</sub> % vs Input % (Typical)

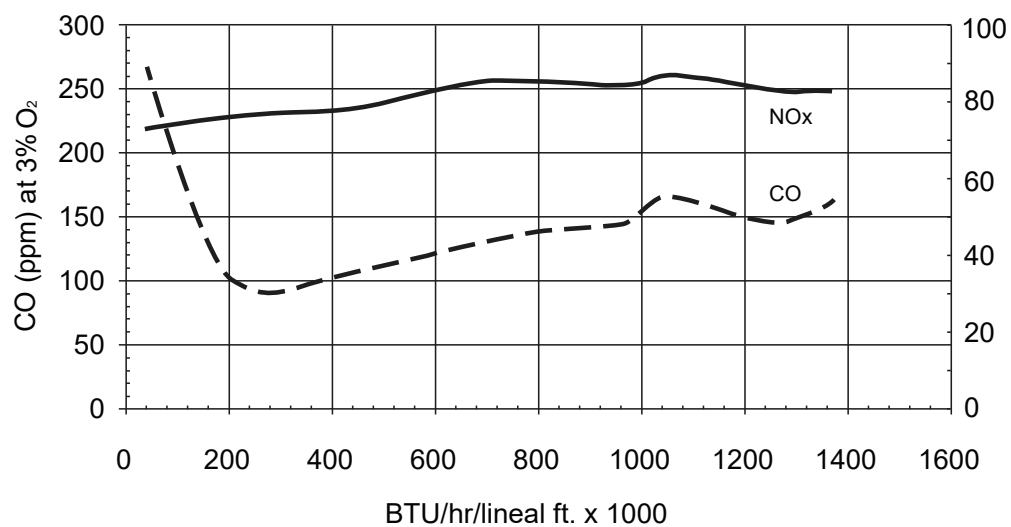


Chart 2 - NO<sub>x</sub> and CO Emission Data

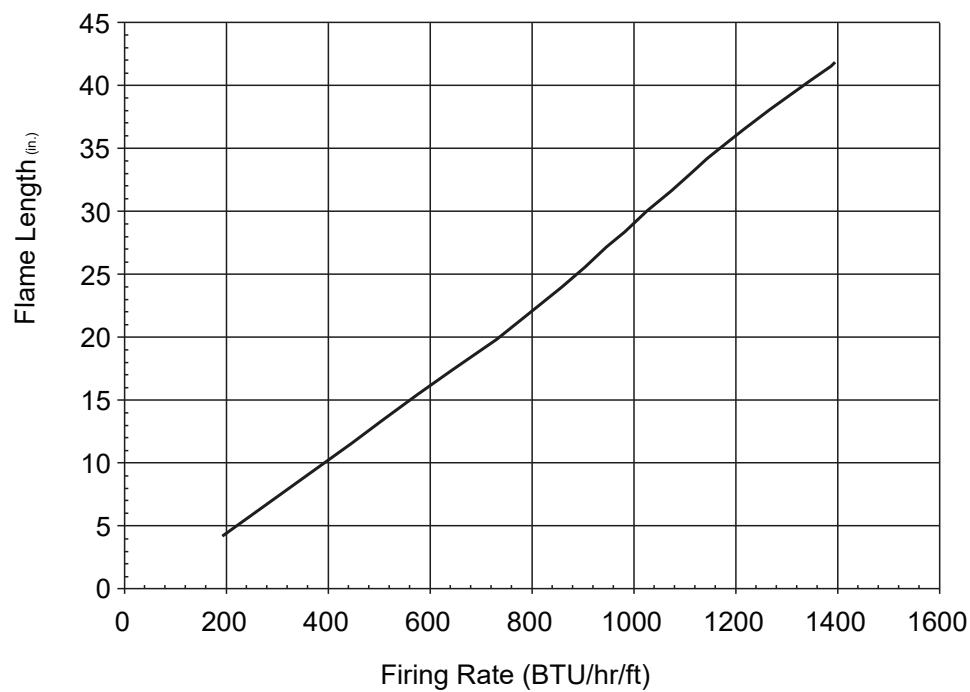


Chart 3 - Flame Length vs. Firing Rate

Emissions are influenced by the following:

- Chamber conditions
- Fuel Type
- Firing rate

CO emissions are largely affected by the following chamber conditions:

- Air flow
- Air velocity
- Chamber pressures

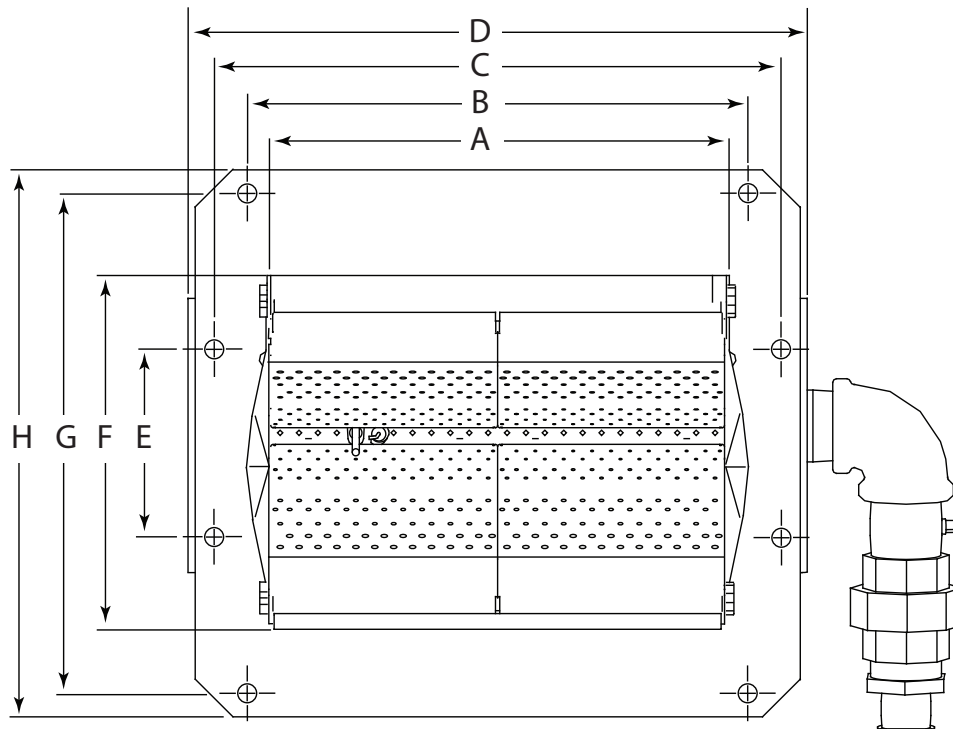


Figure 4 - Dimensions: V1, V2, V3, V5, V7 and V9

Burner Model	V1	V2	V3	V5	V7	V9
A	6.25"	12.25"	18.25"	24.25"	30.25"	36.25"
B	7.25"	13.25"	19.25"	25.25"	31.25"	37.25"
C	9.00"	15.00"	N/A	N/A	N/A	N/A
D	10.27"	16.35"	22.29"	28.27"	34.24"	40.35"
E	5.00"	5.00"	N/A	N/A	N/A	N/A
F	8.94"	8.94"	8.94"	8.94"	8.94"	8.94"
G	13.31"	13.31"	13.31"	13.31"	13.31"	13.31"
H	14.69"	14.81"	14.83"	14.84"	14.81"	14.81"

# Dimensions and Specifications

## IV Mounting Dimensions Continued

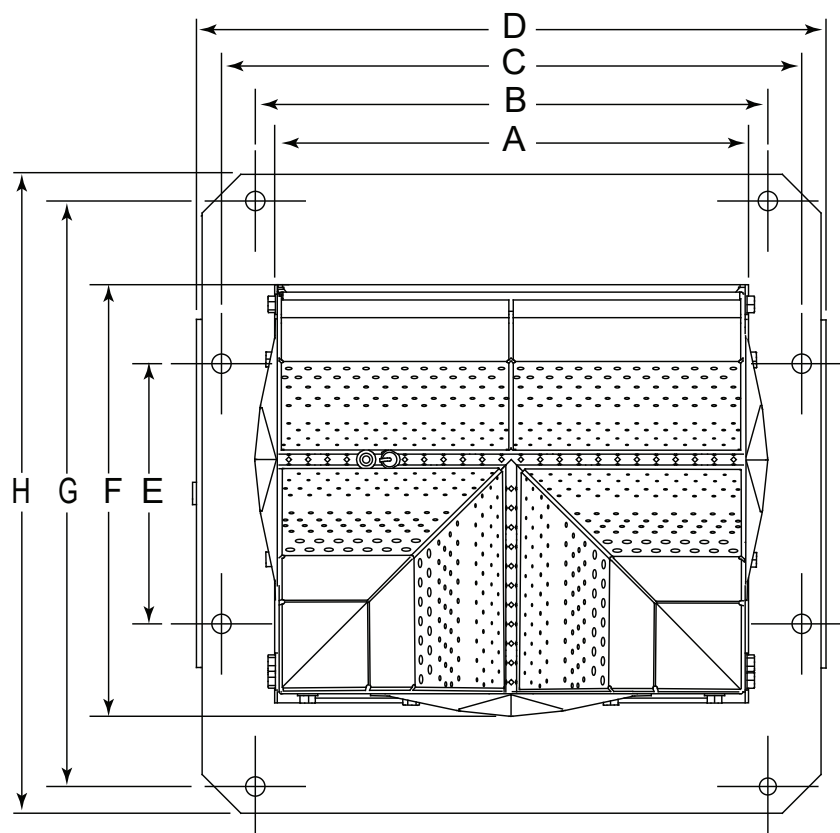
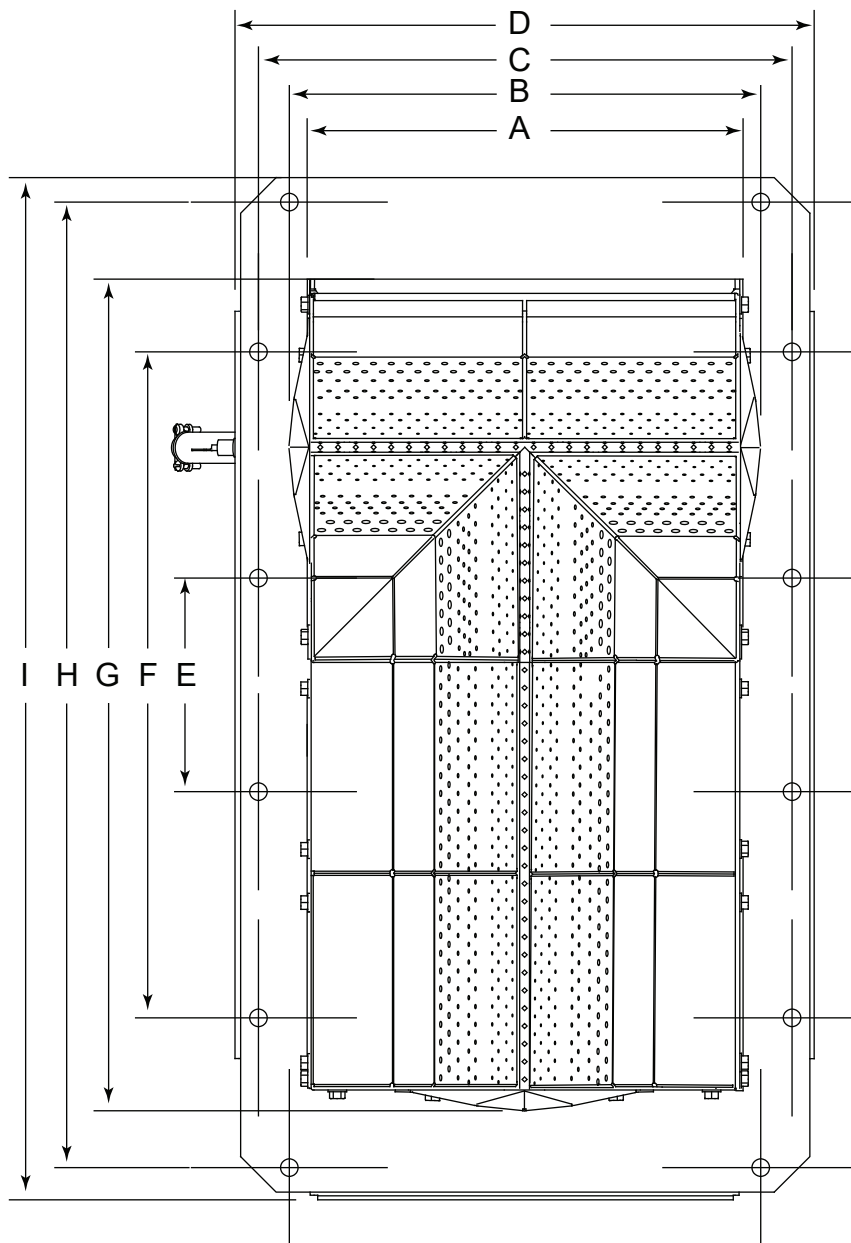


Figure 5 - Dimensions: V4, and V6

Burner Model	V4	V6
A	12.25"	12.25"
B	13.25"	13.25"
C	15.00"	15.00"
D	16.28"	16.28"
E	6.72"	6.36"
F	11.15"	17.12"
G	15.12"	21.12"
H	16.54"	22.57"



*Figure 6 - Dimensions: V8*

Burner Model	V8
A	12.25"
B	13.25"
C	15.00"
D	16.35"
E	6.00"
F	18.71"
G	23.35"
H	27.12"
I	28.75"

# Dimensions and Specifications

## IV Mounting Dimensions Continued

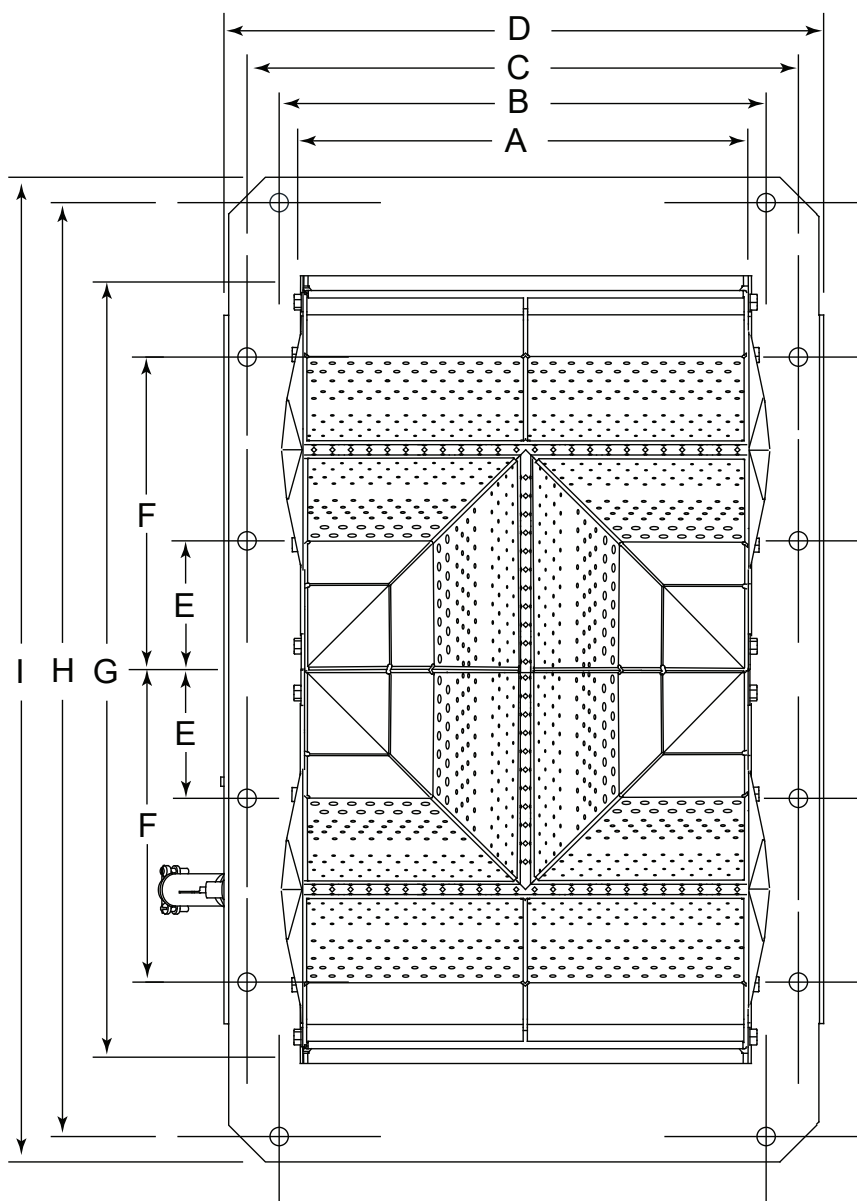


Figure 6 - Dimensions: V10

Burner Model	V10
A	12.25"
B	13.25"
C	15.00"
D	16.35"
E	3.50"
F	8.50"
G	21.08"
H	25.40"
I	26.78"





