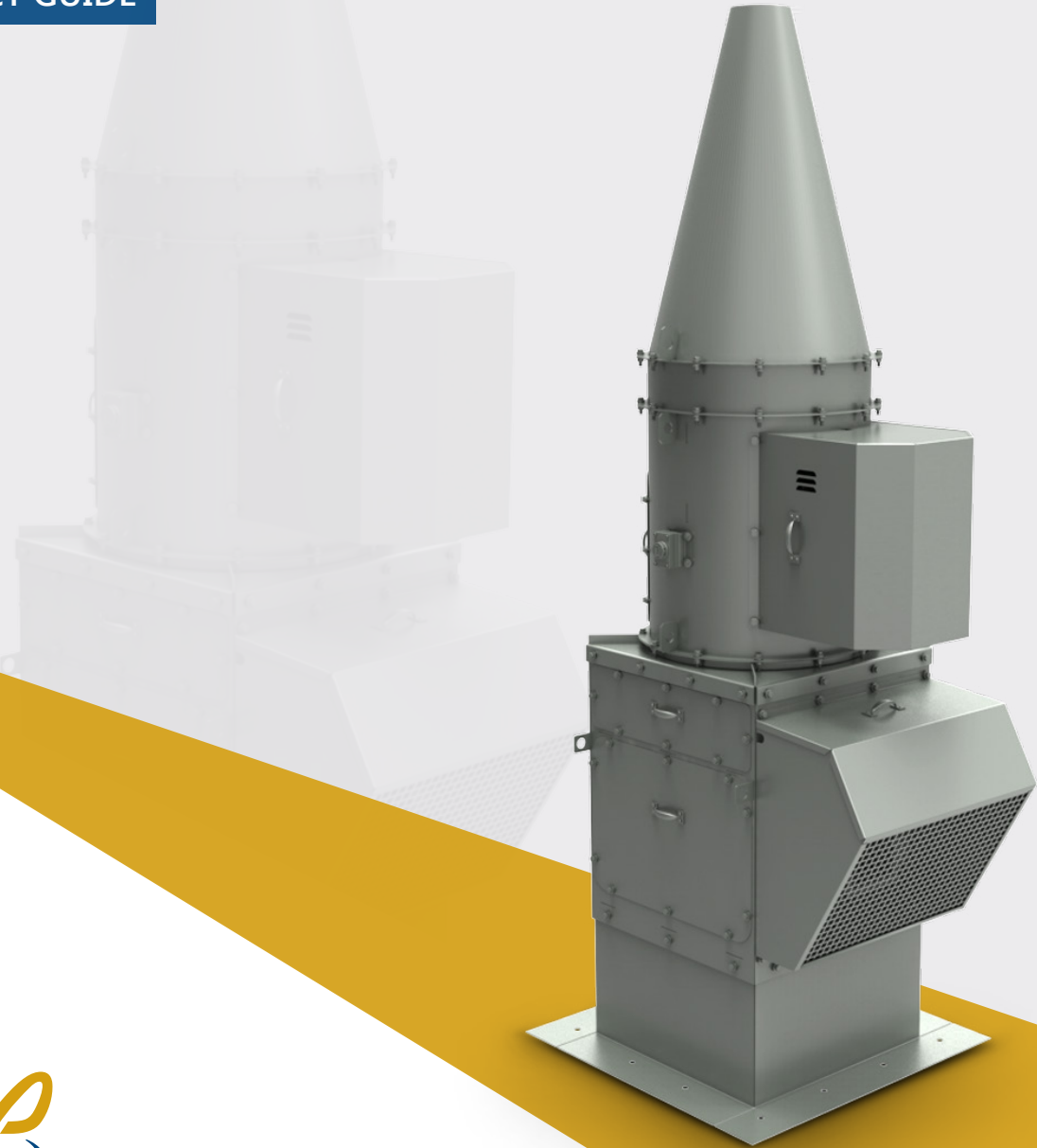


# vPlume™

Laboratory Exhaust System

PRODUCT GUIDE



PENNBARRY™

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# INTRODUCTION

## vPlume™

vPlume™ is a commercial lab exhaust fan that ensures a greater margin of safety by effectively dispersing unwanted exhaust, preventing re-entrainment by other ventilation systems.

- Top efficiency in elementary and high schools
- Widest range of available nozzles in the industry

## Benefits of vPlume

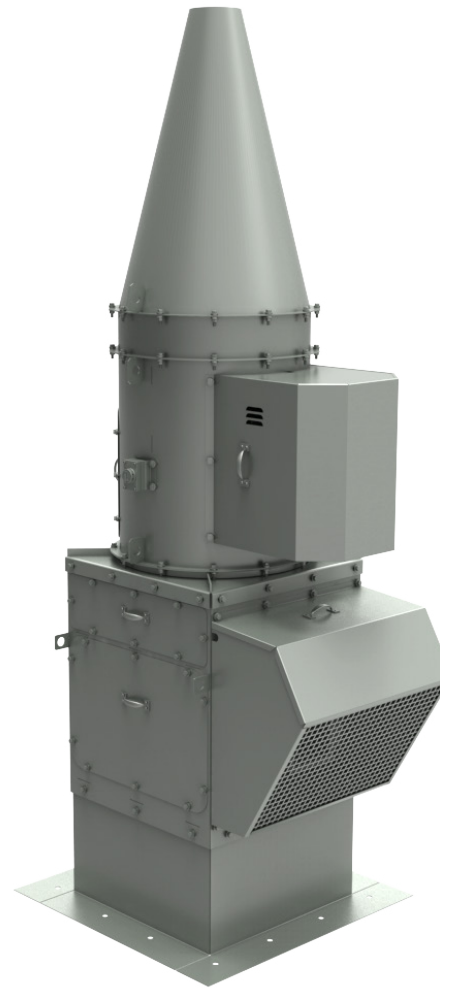
The vPlume provides a higher level of safety and health by propelling contaminated effluent higher into the air stream where it becomes diluted before contaminants settle back to building envelope or ground level.

- Licensed to bear the AMCA seal for sound and air performance.
- UL 705 certified
- Supplied with AMCA B Spark Resistant Construction
- Featured in a wide performance range (220-84,000 CFM)
- Configured in single, double, or triple fan ( or 1, 2, 3) systems
- Easily maintained via a large access door

## PennBarry Advantage

PennBarry vPlume is the only velocity stack fan featuring an aluminum non-overloading Airfoil wheel providing higher efficiency and performance.

The vPlume has better air and sound performance than competing brands.



# CERTIFICATIONS & LISTINGS



## AMCA CERTIFICATION

PennBarry certifies that the vPlume belt drive models shown herein are licensed to bear the AMCA seal. The ratings shown are based on tests and procedures performed in accordance with AMCA publication 211 and AMCA publication 311 and comply with the requirements of the AMCA Certified Ratings Program.



## cULus CERTIFICATION

vPlume carries the UL label, UL705, (ZACT / ZACT7), file #E28413.

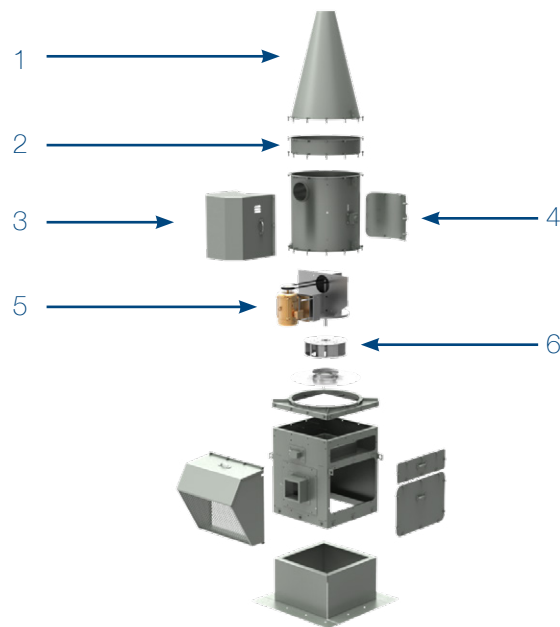


## High Velocity Hurricane Zone (HVHZ)

Miami-Dade NOA # 18-1205.04  
Florida Product Approval #21559

# STANDARD FEATURES AND FAN ASSEMBLY

- High velocity discharge nozzle (1)
- Stack extension (2)
- Weather cover (3)
- Large bolted access door for ease of service (4)
- Totally enclosed fan cooled motors (5)
- Aluminum Airfoil Wheel, non-overloading (6)
- AMCA type "B" Spark resistant construction
- NEMA 3R service switch mounted and pre-wired
- L10/100k concentric locking bearings w/ extended lube lines
- Minimum 12 gauge steel welded housing
- Reinforced curb cap
- Ability to withstand 125 mph winds
- Stainless Steel shaft
- Stainless Steel hardware
- Lifting lugs
- Fan Drain
- 1.5 Service Factor drives
- Airdry phenolic paint with UV Topcoat



# APPLICATIONS PERFORMANCE

Unit Size	Performance Range (CFM)		Nozzle Size Range	
	Minimum <sup>1</sup>	Maximum <sup>1</sup>	Minimum	Maximum
090	220	1,430	4	9
105	350	1,860	5	11
122	500	3,300	6	13
135	680	4,280	7	13
150	890	4,780	8	16
165	870	5,750	8	18
182	1,110	7,100	8	20
200	1,650	8,500	11	24
222	1,370	9,800	10	26
245	2,310	12,300	13	28
270	2,680	15,900	14	30
300	3,070	18,300	15	33
330	4,420	21,700	18	37
365	3,950	25,100	17	44
402	6,020	28,000	21	44

Nozzle Data		Effective Stack Height*		
Size (in)	Outlet Area (ft <sup>2</sup> )	Exit Velocity		
		3000	3500	4000
4	0.09	13.4	14.0	14.5
5	0.14	14.3	15.0	15.7
6	0.20	15.1	16.0	16.8
7	0.27	16.0	17.0	18.0
8	0.35	16.8	18.0	19.1
9	0.44	17.7	18.9	20.2
10	0.55	18.5	19.9	21.4
11	0.66	19.4	20.9	22.5
12	0.79	20.2	21.9	23.6
13	0.92	21.1	22.9	24.8
14	1.07	21.9	23.9	25.9
15	1.23	22.8	24.9	27.0
16	1.40	23.6	25.9	28.2
17	1.58	24.5	26.9	29.3
18	1.77	25.3	27.9	30.5
19	1.97	26.2	28.9	31.6
20	2.18	27.0	29.9	32.7
21	2.41	27.9	30.9	33.9
22	2.64	28.8	31.9	35.0
23	2.89	29.6	32.9	36.1
24	3.14	30.5	33.9	37.3
25	3.41	31.3	34.9	38.4
26	3.69	32.2	35.9	39.5
27	3.98	33.0	36.8	40.7
28	4.28	33.9	37.8	41.8
29	4.59	34.7	38.8	43.0
30	4.91	35.6	39.8	44.1
31	5.24	36.4	40.8	45.2
32	5.59	37.3	41.8	46.4
33	5.94	38.1	42.8	47.5
34	6.31	39.0	43.8	48.6
35	6.68	39.8	44.8	49.8
36	7.07	40.7	45.8	50.9
37	7.47	41.5	46.8	52.0
38	7.88	42.4	47.8	53.2
39	8.30	43.2	48.8	54.3
40	8.73	44.1	49.8	55.5
41	9.17	44.9	50.8	56.6
42	9.62	45.8	51.8	57.7
43	10.08	46.6	52.8	58.9
44	10.56	47.5	53.8	60.0



\*Effective stack height values assume system height of 10 feet, wind speed of 10 mph. vPlume rise calculated assuming a 10 mph crosswind. (3,000 ft/min. is the minimum recommended outlet velocity per ANSI Z9.5)

<sup>1</sup>Minimum based on 2500 ft/min., maximum based on largest outlet velocity at 0.5 in.-wc.

# OPTIONS & ACCESSORIES

## Bypass Plenum

Mixing plenum allows the introduction of outside air into the exhaust stream in order to provide dilution or to increase the total airflow and achieve required velocities.

## Isolation Damper

Aluminum isolation damper prevents backflow when fan is not running and allows for a system with redundant fans installed. Damper may be parallel-blade gravity backdraft or opposed-blade actuated control.

## Bypass Damper

Aluminum damper brings in ambient air to be used for dilution or additional plume rise. Damper is opposed-blade actuated control.

## Shaft

Fan shaft fabricated from 304 Stainless Steel. Additionally, 316 Stainless Steel is available.

## Bearings

Bearings have a minimum L10 life rating of 100,000 hours. Concentric lock mechanism allows better grip on shaft and reduced vibration than set screw lock bearings. Extended lube lines allow for easy relubrication.

## Rain Diverter

The rain diverter directs water towards drain during rain events. Rain mitigation below the fan is required for complete mitigation of water.

## Service Switch

Nema 3R service switch which is factory mounted and wired to motor, allows power to be disconnected from the unit for any required maintenance.

## Drives

Belt drives are available in constant or adjustable configuration. Standard 1.50 service factor ensures safety and extends belt life. Additionally, 2.00 service factor drives are available.

## Piezometer Ring

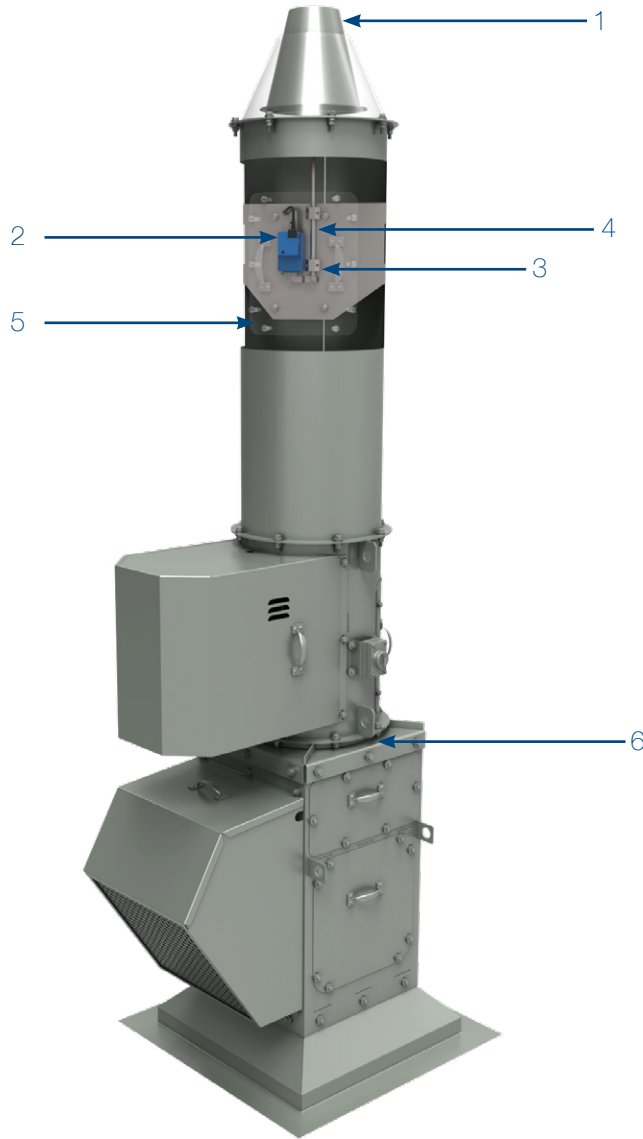
Piezometer ring measures the pressure differential across the fan inlet which can be converted to an airflow measurement. An optional transducer with digital display is available to quickly read performance or connect to a control system.

## Miami-Dade Construction

Miami-Dade construction vPlume fans (NOA 18-1205.04) are specifically designed for high wind hurricane zones (HWHZ). The vPlume models are designed to withstand 150 MPH winds in accordance with Miami-Dade and Florida Building Code standards. The units are 3rd party tested and certified through a 3rd party Professional Engineer (P.E.) to meet these strict standards. Installation details are provided and since there are no tie downs or external braces required for attaching the unit to the roof or curb this makes installation simple and easy. Miami-Dade is offered on single, dual and triple systems, sizes 090-182.

# VARIABLE NESTED NOZZLE

The variable nested nozzle when allows the discharge of the fan to change geometry based on real time flow conditions to maintain a safe outlet velocity. Duct flow and pressure are monitored while the fan speed is controlled with a variable frequency drive and the outlet area modulates. The nested nozzle design maintains an optimal air path regardless of nozzle position. Benefits include energy efficiency by reduced fan speeds and minimizing bypass flow, increased life of fan due to lower speeds and a reduction in sound.



- Variable nested nozzle with no friction points to bind up in inclement weather (1)
- Linear actuator sealed in enclosure for corrosive environments (2)
- Maintenance free stainless steel bearings for highly contaminated environments (3)
- Stainless steel shaft and linkages (4)
- Large access door for actuator and bearings (5)
- Piezometer ring flow measuring station (6)

VARIABLE NESTED NOZZLE AREAS			
SIZE	NOZZLE	MIN AREA (SQ FT)	MAX AREA (SQ FT)
90	VV	0.09	0.15
90	XV	0.11	0.22
90	HV	0.17	0.35
90	MV	0.19	0.44
90	LV	0.25	0.66
105	VV	0.09	0.19
105	XV	0.13	0.35
105	HV	0.26	0.55
105	MV	0.25	0.66
105	LV	0.28	0.79
122	HV	0.20	0.55
122	MV	0.28	0.79
122	LV	0.35	1.07
135	HV	0.25	0.66
135	MV	0.31	0.92
135	LV	0.33	1.23
150	HV	0.34	0.79
150	MV	0.38	1.07
150	LV	0.40	1.40
165	HV	0.35	0.92
165	MV	0.42	1.23
165	LV	0.48	1.77
182	HV	0.35	1.07
182	MV	0.51	1.58
182	LV	0.74	2.18
200	HV	0.55	1.58
200	MV	0.75	2.41
200	LV	1.03	3.14
222	HV	0.54	1.77
222	MV	0.90	2.64
222	LV	1.21	3.69
245	HV	0.86	2.18
245	MV	1.08	3.14
245	LV	1.53	4.28
270	HV	1.03	2.64
270	MV	1.33	3.69
270	LV	1.76	4.91
300	HV	1.23	3.14
300	MV	1.58	4.59
300	LV	2.18	5.94
330	HV	1.24	3.69
330	MV	2.12	5.24
330	LV	2.84	7.47
365	XV	1.55	4.91
365	HV	2.31	6.31
365	MV	3.38	7.88
365	LV	4.48	10.56
402	XV	2.30	5.59
402	HV	2.81	6.68
402	MV	3.38	7.88
402	LV	4.77	10.56

# LAB FAN CONTROLLER

PennBarry's lab fan controller maintains a safe outlet velocity based on real time flow conditions. The controller works in tandem with static pressure sensors, flow monitoring stations, VFDs (optional), the Variable Nested Nozzle (optional), and the building management system to adjust the dampers and fan speeds to the optimal safe and efficient set points.

## Constant Flow Systems

The bypass damper modulates to maintain constant flow through the fan creating a constant velocity at the discharge. This mode offers energy savings to the building as unconditioned air is used to maintain flow but fan energy is constant without staging.

## Variable Flow Systems

The controller interfaces with variable frequency drives to adjust fan speed and flow based on building conditions while maintaining a safe outlet velocity. The use of a Variable Nested Nozzle allow further turndown while maintaining velocity giving maximum realized energy savings.

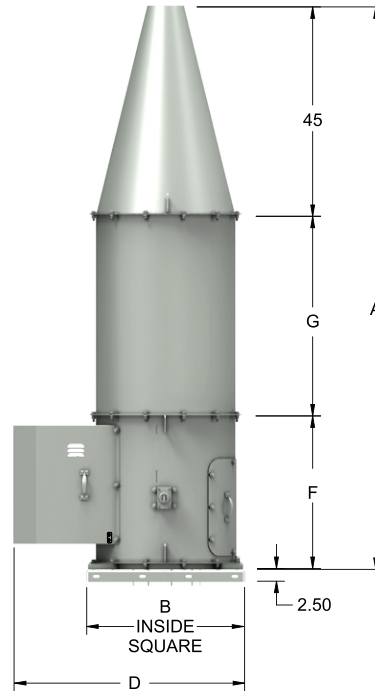
## Multiple Fan Systems

Fans are staged to optimize energy savings based on building flow while maintaining a safe outlet velocity. Redundant fans are activated upon automatic detection of a fan failure and are cycled to prevent damage from disuse.



# DIMENSIONAL DRAWINGS

## 1x1 No Plenum



DIMENSIONAL & WEIGHT DATA						
MODEL	A	B	D	F	G	WEIGHT* (LBS)
90	122	22	39 ½	27 ¼	49 ¾	341
105	122	22	39 ½	27 ¼	49 ¾	341
122	122	22	39 ½	27 ¼	49 ¾	341
135	122	24	43	29 ¼	47 ¾	393
150	122	26	45	31 ¼	45 ¾	430
165	122	28	45	31 ½	45 ½	472
182	122	34	50 ¾	33 ½	43 ½	573
200	122	36	53	35	42	659
222	122	40	57 ¼	39	38	667
245	122	46	62 ¾	43	34	767
270	122	50	69 ¾	47 ½	29 ½	914
300	122	59	77 ¼	53	24	1059
330	122	60 ¾	77 ¾	59 ½	17 ½	1105
365	122	63 ¾	82	66	11	1372
402	122	70 ¾	90 ¾	73	4	1593

All dimensions are in inches.

A = Overall system height (without curb)

B = Width of Curb

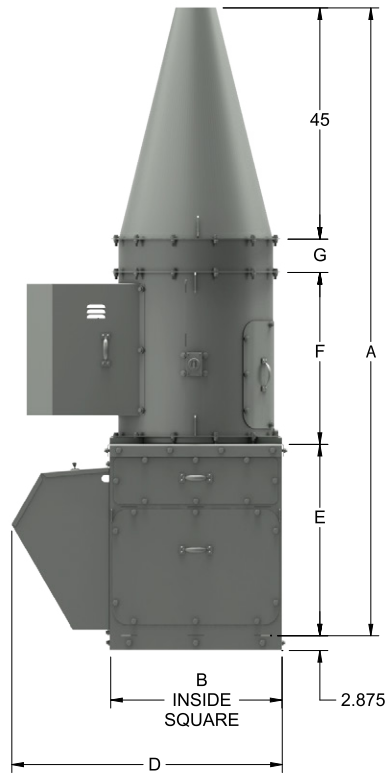
D = Overall width of the system

F = Height of fan

G = Height of stack extension

# DIMENSIONAL DRAWINGS

## 1x1 Plenum



DIMENSIONAL & WEIGHT DATA							
MODEL	A	B	D	E	F	G	WEIGHT*(LBS)
90	122	21 1/2	41	34 1/4	27 1/4	15 1/2	499
105	122	21 1/2	41	34 1/4	27 1/4	15 1/2	499
122	122	21 1/2	41	34 1/4	27 1/4	15 1/2	500
135	122	23 1/2	43	37 1/4	29 1/4	10 1/2	588
150	122	25 1/2	45	38 1/4	31 1/4	7 1/2	660
165	122	27 1/2	47	39	31 1/2	6 1/2	719
182	122	33 1/2	53	37	33 1/2	6 1/2	867
200	123	35 1/2	59	43	35	-	885
222	127	39 1/2	62 1/4	43	39	-	959
245	139	45 1/2	71	51	43	-	1167
270	144	49 1/2	75	51 1/2	47 1/2	-	1368
300	151	58 1/4	85 3/4	53	53	-	1722
330	164	60	89 1/2	59 1/2	59 1/2	-	2018
365	170	63	92 1/2	59	66	-	2307
402	181	70	99 1/2	63	73	-	2711

All dimensions are in inches.

A = Overall system height (without curb)

B = Width of Curb

D = Overall width of the system

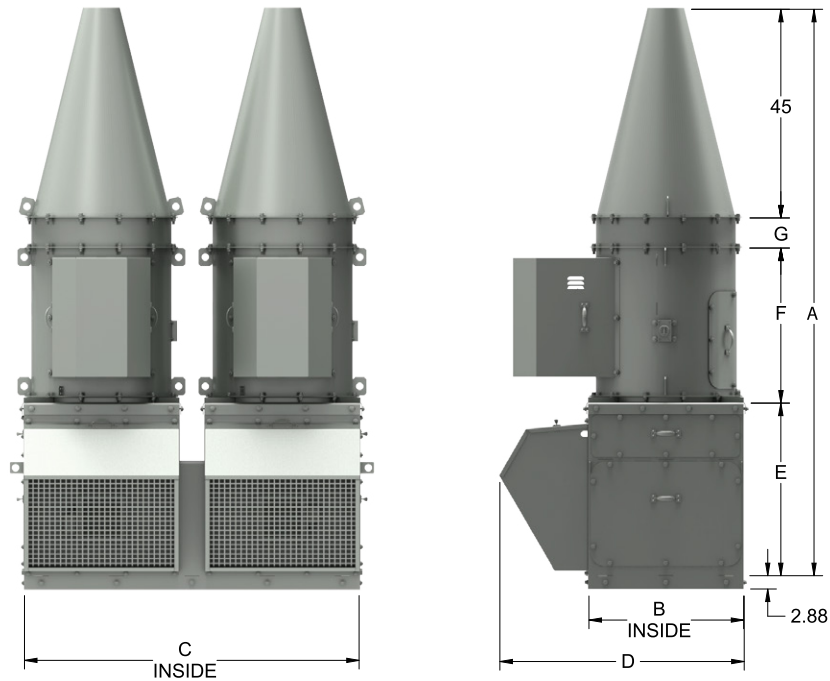
E = Height of plenum

F = Height of fan

G = Height of stack extension

# DIMENSIONAL DRAWINGS

With Plenum 2x1



DIMENSIONAL & WEIGHT DATA								
MODEL	A	B	C	D	E	F	G	WEIGHT*(LBS)
90	122	21 1/2	48 1/4	41	34 1/4	27 1/4	15 1/2	942
105	122	21 1/2	48 1/4	41	34 1/4	27 1/4	15 1/2	942
122	122	21 1/2	48 1/4	41	34 1/4	27 1/4	15 1/2	943
135	122	23 1/2	52 1/4	43	37 1/4	29 1/4	10 1/2	1107
150	122	25 1/2	56 1/4	45	38 1/4	31 1/4	7 1/2	1237
165	122	27 1/2	60 1/4	47	39	31 1/2	6 1/2	1348
182	122	33 1/2	72 1/4	53	37	33 1/2	6 1/2	1639
200	123	35 1/2	76 1/4	59	43	35	-	1720
222	127	39 1/2	84 1/4	62 1/4	43	39	-	1860
245	139	45 1/2	96 1/4	71	51	43	-	2248
270	144	49 1/2	104 1/4	75	51 1/2	47 1/2	-	2642
300	151	58 1/4	122	85 3/4	53	53	-	3338
330	164	60	125 3/4	89 1/2	59 1/2	59 1/2	-	3862
365	170	63	131 1/2	92 1/2	59	66	-	4431
402	181	70	145 1/2	99 1/2	63	73	-	5196

All dimensions are in inches.

A = Overall system height (without curb)

B = Width of Curb

C = Length of Curb

D = Overall width of the system

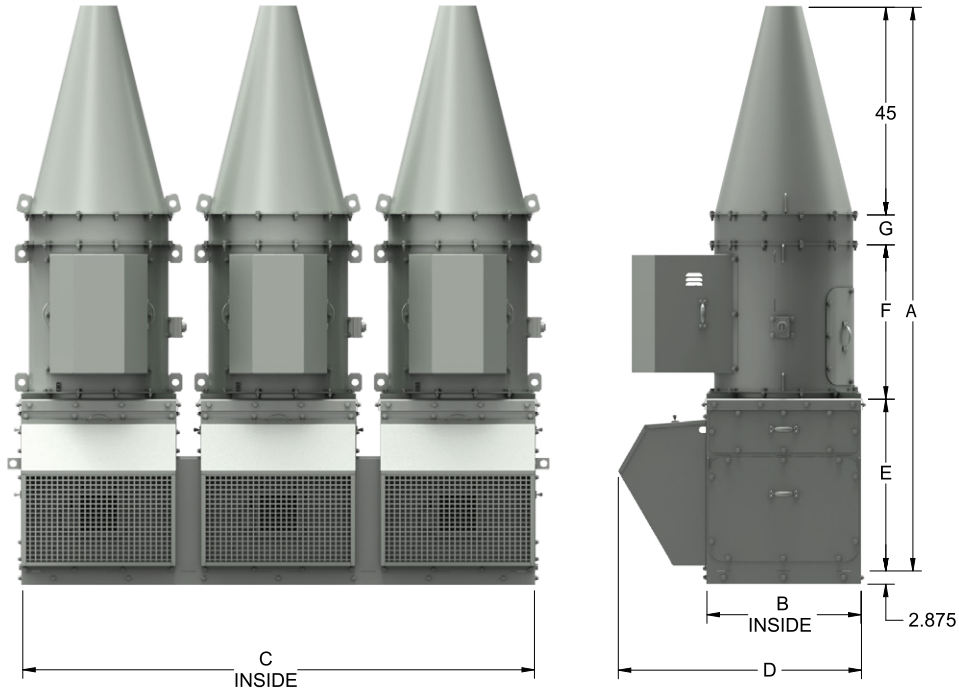
E = Height of plenum

F = Height of fans

G = Height of stack extension

# DIMENSIONAL DRAWINGS

With Plenum 3x1



DIMENSIONAL & WEIGHT DATA								
MODEL	A	B	C	D	E	F	G	WEIGHT* (LBS)
90	122	21 1/2	75	41	34 1/4	27 1/4	15 1/2	1400
105	122	21 1/2	75	41	34 1/4	27 1/4	15 1/2	1400
122	122	21 1/2	75	41	34 1/4	27 1/4	15 1/2	1402
135	122	23 1/2	81	43	37 1/4	29 1/4	10 1/2	1645
150	122	25 1/2	87	45	38 1/4	31 1/4	7 1/2	1838
165	122	27 1/2	93	47	39	31 1/2	6 1/2	2002
182	122	33 1/2	119	53	37	33 1/2	6 1/2	2431
200	123	35 1/2	117	59	43	35	-	2433
222	127	39 1/2	129	62 1/4	43	39	-	2701
245	139	45 1/2	147	71	51	43	-	3316
270	144	49 1/2	159	75	51 1/2	47 1/2	-	3889
300	151	58 1/4	185 3/4	85 3/4	53	53	-	4923
330	164	60	191 1/4	89 1/2	59 1/2	59 1/2	-	5564
365	170	63	200 1/4	92 1/2	59	66	-	6538
402	181	70	221	99 1/2	63	73	-	7664

All dimensions are in inches.

- A = Overall system height (without curb)
- B = Width of Curb
- C = Length of Curb
- D = Overall width of the system
- E = Height of plenum
- F = Height of fans
- G = Height of stack extension

# FAN SELECTIONS

## Model

vPlume

## Construction

<p><b>Application</b> E = Exhaust/relief</p> <p><b>Application Flow</b> &lt;enter value&gt;</p> <p><b>Application Static Pressure</b> &lt;enter value&gt;</p> <p><b>Crating Option</b> 0 = Standard 1 = Premium 1 2 = Premium 2</p> <p><b>System Arrangement</b> 1 = 1x1 2 = 2x1 3 = 3x1</p>	<p><b>Drive Kit Option</b> 0 = None A = Adjustable drive kit B = Adjustable drive kit 2.0 service factor C = Constant drive kit E = Constant drive kit 2.0 service factor L = Life safety X = Special Note: Service factor is at the closed position of the adjustable sheave</p> <p><b>Unit size</b> 090, 105, 122, 135, 150, 165, 182, 200, 222, 245, 270, 300, 330, 365, 402</p>	<p><b>Arrangement</b> P = Arr. 9 Vertical Upblast</p> <p><b>Fan RPM</b> &lt;####&gt;</p>
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## Motor

<p><b>Motor and Drives</b> F = Factory supplied L = Less motor, less drive N = Customer supplied motor, factory mounted X = Special</p> <p><b>Motor Enclosure</b> 2 = TE w/o Overload 5 = EXP C2D1 7 = TE w/ SGR X = Special</p> <p><b>Horsepower</b> 0.250 = 1/4 0.333 = 1/3 0.500 = 1/2 0.750 = 3/4 01.00 = 1 01.50 = 1 1/2 02.00 = 2 03.00 = 3 05.00 = 5 07.50 = 7 1/2 10.00 = 10 15.00 = 15 20.00 = 20 X = Special</p>	<p><b>Voltage/Phase/Cycle</b> B = 110V/1PH/50HZ* C = 115V/1PH/60HZ F = 208V/1PH/60HZ G = 208V/3PH/60HZ H = 220V/1PH/50HZ* J = 220V/3PH/50HZ* K = 230V/1PH/60HZ L = 230V/3PH/60HZ M = 240V/1PH/50HZ* N = 240V/3PH/50HZ* Q = 380V/3PH/50HZ* R = 380V/3PH/60HZ* S = 400V/3PH/50HZ* T = 415V/3PH/50HZ* U = 440V/3PH/50HZ* V = 460V/3PH/60HZ W = 480V/3PH/60HZ* X = Special Y = 575V/3PH/60HZ</p> <p>* Non-standard offering subject to longer lead times and price adjustment</p>	<p><b>Motor Frame</b> FS = Factory Supplied 01 = 48 02 = 56 03 = 56H 04 = 56HZ 05 = 143T 06 = 145T 07 = 182T 08 = 184T 09 = 213T 10 = 215T 11 = 254T 12 = 256T 13 = 284T 14 = 286T X = Special</p> <p><b>Motor Pole</b> 1 = 1800 4 pole motor 2 = 3600 2 pole motor 3 = 3000 2 pole motor 4 = 1500 4 pole motor 5 = 1200 6 pole motor 6 = 1000 6 pole motor 7 = 0870 8 pole motor X = Special</p>
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# FAN SELECTIONS

## Electrical Accessories

### Switches/Sensors

0 = None  
 G = Piezo ring w/ readout module  
 H = Piezo ring only

### Controllers

0 = None  
 V = VFD  
 Note: All VFDs ordered separately on all PLOP's

### Service Switches and ITW\*

0 = None\*  
 F = NEMA 3R - mounted and wired  
 X = Special  
 \* ITW - Internal wiring not provided on explosion proof motors

## Options and Accessories

### Bearings

D = 100K  
 X = Special

### Paint / Coating

Q = Airdry phenolic with UV protection  
 X = Special

### Paint Color

01 = Standard color (gray)  
 X = Special

### Special Construction

B = Spark resistance (AMCA B)  
 E = Spark resistance (AMCA B) + high wind (Miami-Dade)

### Construction Accessories

Q = Access door bolted plus drain

### Weather/Motor Cover

C = Weather/motor cover

### Nozzle Outlet Diameter

04  
 05  
 06  
 07  
 08  
 09  
 10  
 11  
 12  
 13  
 14  
 15  
 16  
 17  
 18  
 20

### Curb and Caps

A = Curb cap  
 B = Curb cap and curb  
 P = Curb cap and plenum box side inlet  
 Q = Curb cap, plenum box side inlet and curb  
 V = Curb cap, plenum box bottom inlet and curb  
 W = Curb cap and plenum box bottom inlet  
 X = Special

### Stainless Steel

S = 304SS Shaft  
 U = 316SS Shaft  
 X = Special

### Plenum Box

0 = None  
 A = Isolation actuated damper  
 G = Isolation gravity damper  
 X = Special  
 Note: Actuated bypass damper always included  
 G only available on a 1x1 system

### Shaft Seal

C = Ceramic

### Extended Lube Lines

L = Extended lube lines

### Type of Roof Anchoring

A = Concrete Deck Anchoring  
 B = Timber Anchoring  
 C = Steel Anchoring - Self Tapping  
 D = Steel Anchoring - Thru bolt

# PENNBARRY PRODUCT SOLUTIONS



## Commercial

- Roof & wall exhaust centrifugal fans
- Ceiling, wall, & inline centrifugal fans
- Roof supply centrifugal fans
- Square & round centrifugal fans
- Wall mounted axial fans
- Hooded roof axial fans
- Upblast roof axial fans
- Gravity ventilators
- Roof curbs



## Industrial

- Freestanding centrifugal fans
- Industrial & material handling fans
- Tubular centrifugal inline fans
- Mixed flow centrifugal fans
- Plug & plenum fans
- Wall mounted propeller fans
- Tube axial fans
- Vane axial fans
- Bifurcator fans
- Lab exhaust



## Kitchen ventilation

- Make-up air units
- Exhaust fans



## Energy recovery

- Outdoor units
- Indoor units

PennBarry is proud to be your preferred manufacturer of commercial and industrial fans and blowers. Learn how PennBarry can assist you in your next application by contacting your PennBarry Representative or visiting us on the web at [www.pennbarry.com](http://www.pennbarry.com)

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