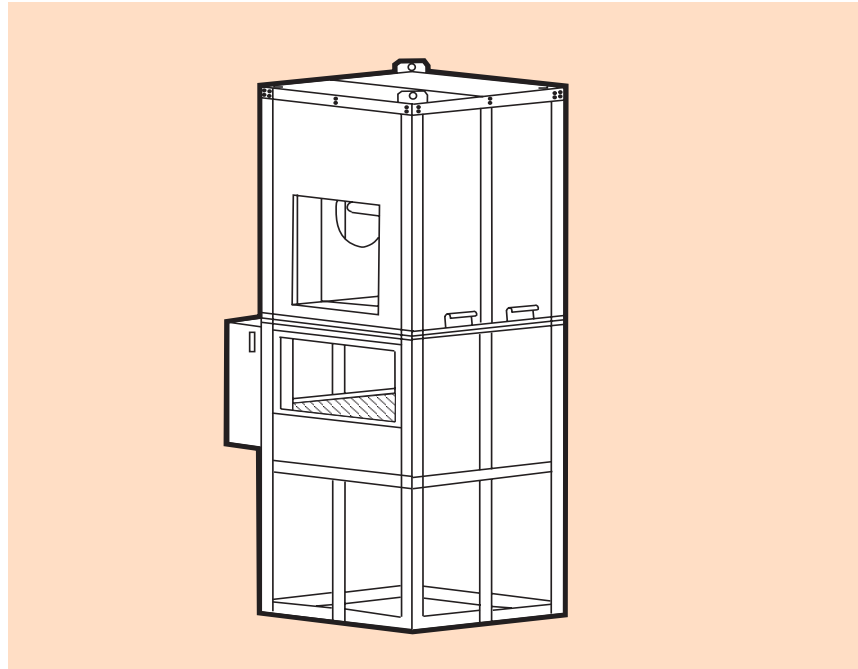
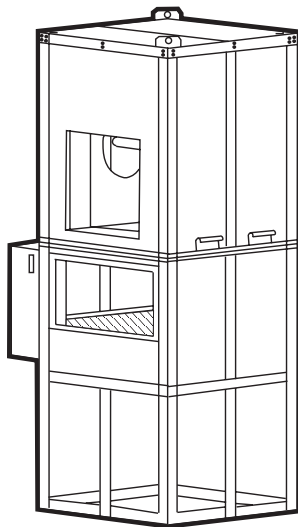


**COMMERCIAL/INDUSTRIAL INDOOR/OUTDOOR  
DIRECT-FIRED HEATERS**



- Six Sizes – Ranging from 250 – 3,000 MBH
- Vertical Configuration
- Horizontal Discharge (all sizes) and Vertical (up) Discharge (Sizes 109, 115 and 122)
- Square Cabinet Design for Modular Configuration
- Bottom Outside Air Inlet
- Indoor/Outdoor Installation
- Constant or Variable Outside Air Volume
- Combination Outside Makeup Air/Return Air Heating with Constant Air Volume or Automatic Building Pressurization
- American Gas Association (A.G.A.) certified to ANSI Z83.18
- Canadian Gas Association (C.G.A.) approved to CAN 1-3.12

**D  
V**

**COMMERCIAL/INDUSTRIAL INDOOR/OUTDOOR  
DIRECT-FIRED HEATERS****DV  
Configuration****Blower  
Section****Burner/Control  
Section****Optional  
Screened Inlet  
Base**

**WARNING: GAS-FIRED APPLIANCES ARE NOT DESIGNED FOR USE IN HAZARDOUS ATMOSPHERES CONTAINING FLAMMABLE VAPORS OR COMBUSTIBLE DUST, OR ATMOSPHERES CONTAINING CHLORINATED OR HALOGENATED HYDROCARBONS OR CONTAINING SILICONE.**

**NOTE: Not certified for residential use.**

**DESCRIPTION**

REZNOR® Model DV Series units are design-certified by the American Gas Association and approved by the Canadian Gas Association for direct-fired heating/makeup air systems designed for indoor or outdoor installation. Direct Fired units are shipped in sections to be field installed in a vertical configuration. Maximum heating capacity is 3,000,000 BTUH. Maximum air handling capacity is 22,000 CFM. Return air capability up to 80% of supply air is available.

Model DV cabinets may be custom selected to suit your application. Select outdoor cabinets with optional weatherization kit; select cabinets of single-wall, uninsulated construction, single-wall with insulation, or double-wall with insulation. A factory-built screened outside air inlet base (open, with filters, or with duct flange) is available. An outside air, V-bank filter cabinet section is available to be stacked between the inlet base and the burner/control section. The square cabinet design allows the discharge air and optional return air openings to be rotated during installation to any side of the system. (NOTE: If system has an optional return air opening, that opening will always be on the adjacent side to the right of the electrical box.)

The blower section includes a forward curved, centrifugal blower that is statically and dynamically balanced for vibration-free operation. A variety of motor types, sizes and drive packages are available. Motor packages include an IEC style contactor or starter and an adjustable belt drive.

The burner/control section includes a cast iron burner with drilled ports and stainless steel mixing plates. The burner is designed for high efficiency combustion and to meet ANSI CO and NO<sub>2</sub> requirements. Burner control is electronic modulating with burner turndown ratio of 25:1. Burner firing rate is modulated by a temperature selector and discharge air sensor. Pilot and flame monitoring devices are part of a hot surface intermittent ignition system with prepurge time delay. Other safety controls include fan starter interlock relays, high and low air flow proving switches, an energy cutoff device, and both operating and manual reset temperature limit controls.

The gas train includes main and pilot gas pressure regulators dual solenoid valves, and main and pilot manual shut off valves. All gas train manifolds meet ANSI requirements and are available with controls to meet FM and/or IRI requirements.

All electric controls are contained in an electrical control box (except for system switch and other remote controls). Electrical controls include a unit-mounted electronic circuit board with a 13-light diagnostic panel. A stepdown transformer and secondary fuse provide an entire 24-volt control system for protection of service personnel. A remotely located control console matching unit operation is an available option.

REZNOR® Direct Fired direct-fired makeup air units are self-contained, ready to operate, assembled and test-fired before shipment. In addition to the basic makeup air heater, optional features are available to meet the requirements of a variety of applications.

**STANDARD FEATURES**

- A.G.A. and C.G.A. certified to ANSI Z83.18 and CAN 1-3.12
- Cabinets with interlocking joint construction (U.S. Patent No. 5,373,673) designed for easy rigging and stacking with no fastening or caulking required
- Dynamically balanced, heavy duty centrifugal blowers
- EPACT-rated blower motor with IEC starter or contactor
- Adjustable belt drive
- Electronic modulated burner
- Nominal 25:1 turndown ratio
- Redundant safety and limit controls
- Hot surface ignition system (U.S. Patent No. 5,556,272)
- Diagnostic 13-light control panel
- Square cabinet design with bottom outside air entrance allowing vertical or horizontal discharge air opening, return air opening, and controls to be on any side of the unit, depending on the stacking position of the cabinets (Optional return air opening will always be on adjacent side to the right of controls.)

**OPTIONAL FEATURES**

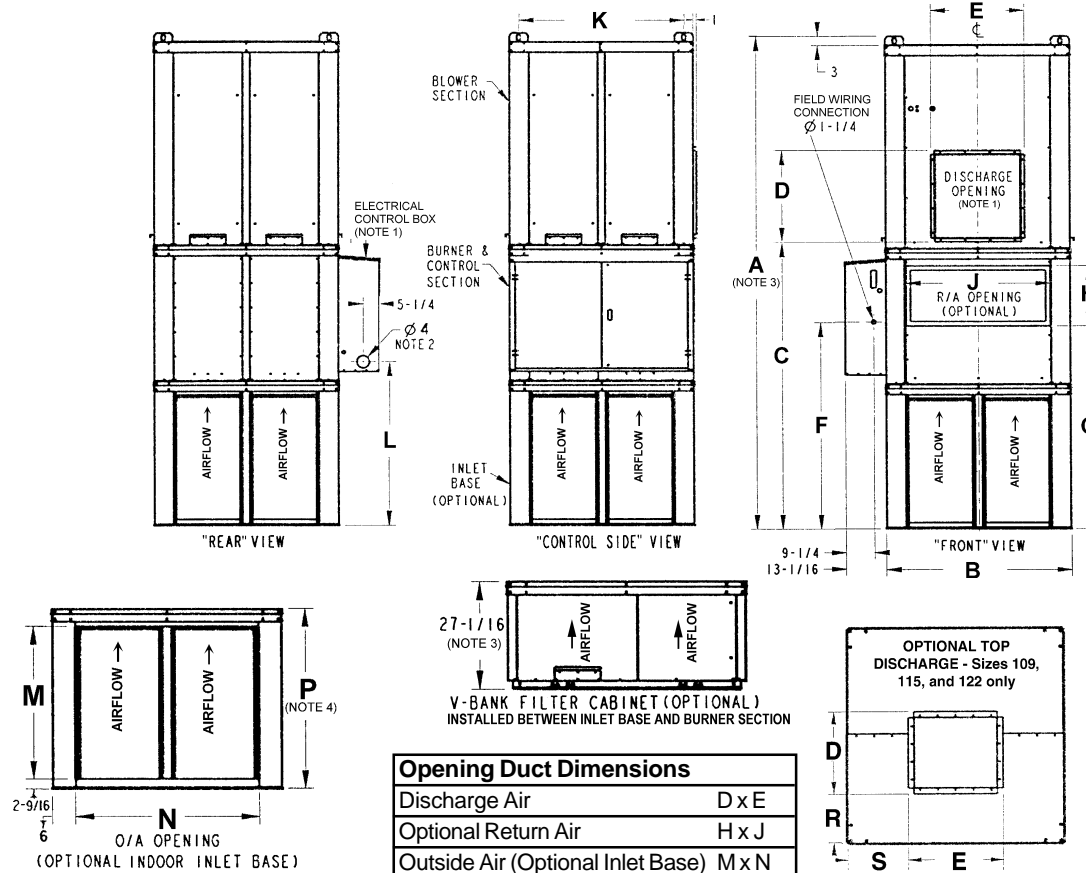
- Natural or propane gas
- Up to 160°F discharge temperature (120°F maximum temperature rise)
- 115, 208, 230, 460, or 575 unit supply voltage (single and three phase)
- Manifold components to meet ANSI, FM and/or IRI requirements
- Motor and drive options to meet CFM requirements
- EPACT-rated open dripproof, TEFC, premium efficiency, and 2-speed motors (heat/cool only)
- Space temperature or pressure controls
- DDC gas controls
- High and low gas pressure switches
- Constant or variable outside air volume; 20% outside/80% return air volume (Sizes 115-125); variable outside air and return air volumes (Sizes 115-125)
- Remotely located pressure sensor air controls
- DDC air controls
- High ambient limit control
- Interlocking relays
- Firestat and/or freeze-stat
- Convenience outlet
- Outdoor kit for weatherizing cabinets
- Weatherized, single connection quick connect wiring harness for connecting blower and control sections
- Cabinet insulation - 1", 1 ½ lb. density
- Double-wall construction with insulation
- Discharge damper, two-position
- Vertical (top) discharge (Sizes 109, 115, 122)
- Screened inlet base - open all sides, side openings with 2" permanent filters, or three closed sides with duct flange
- Outside air filter cabinet with filters (1" or 2" permanent or pleated) (2" disposable)
- Vibration isolated blower motor and canvas duct connection
- Outside air water separator with screen (for use with inlet base with duct flange or inlet to building for wall mounting)
- Remote control console
- Remote overhead door switch to activate unit
- Photoelectric air duct smoke detector
- Disconnect switch

Model		109	112	115	118	122	125
MBH Input	Minimum	250	250	250	250	500	750
	Maximum	500	750	1,000	1,750	2,500	3,000
CFM	Minimum	750	2,000	4,000	5,000	8,000	12,000
	Maximum	2,250	4,000	7,000	12,000	16,500	22,000
Horsepower	Minimum	1/4	1/2	1-1/2	2	1-1/2	3
	Maximum	2	5	7-1/2	20	20	20
Blower Size and Type		A9" x 7"A Class 1	A12" x 9"A Class 1	A15" x 15"A Class 1	A18" x 18"A Class 2	A22" x 22"H Class 1	A25" x 25"H Class 1
Maximum Temperature Rise (°F)		120°	120°	120°	120°	120°	120°
Maximum Discharge Temperature (°F)		160°	160°	160°	160°	160°	160°
Maximum Gas Pressure (psi)		5	5	5	5	5	5
*Approximate Ship Weight (lbs.)		810	810	1080	1080	1670	1670
**Unit Amps (less motor)	All Sizes	115V - 4.2 A; 208V - 2.4 A; 230V - 2.1 A; 460V - 1.1A; 575V - 0.9 A					

\*Weight of basic system; actual weight may vary significantly due to option selection.

\*\*Unit amps listed here are maximum unit full load amps for manifold and damper options available. For total full load amps, add blower motor amps to the unit amps listed. (For motor amps, refer to the direct-fired product catalog or Form RGM S-FLA.)

## DV DIMENSIONS



### NOTES:

- 1) Cabinets are square. Cabinets may be stacked with the discharge opening and the electrical control box on any side (optional return air opening will always be on adjacent side to the right of the control box). Top discharge is available on Sizes 109, 115, and 122.
- 2) Gas Connection (Pipe diameter is determined by option selection.)
- 3) If optional filter cabinet is ordered, add 27-1/16" to Dimensions A, C, F, G, and L. The filter cabinet sets on the inlet base.
- 4) If field-supplied base is used, height must be no less than "P" with minimum square feet of inlet air opening equal to maximum CFM divided by 500.

Size	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S
109	106-5/16	40-1/2	69-1/2	13	11-15/16	39-13/16	--	--	--	34-1/8	25-5/8	12-1/8	28-1/2	19-1/4	11-7/16	14-5/16
112	106-5/16	40-1/2	71-1/7	16-3/16	15	39-13/16	--	--	--	34-1/8	25-5/8	12-1/8	28-1/2	19-1/4	--	--
115	124-5/16	48-1/2	80-11/16	18-5/8	21-3/8	47-13/16	51-1/2	14-7/8	34-3/4	42-1/8	33-5/8	20-1/8	36-1/2	27-1/4	11	13-9/16
118	124-5/16	48-1/2	82-5/8	21-5/8	24-5/8	47-13/16	45-1/2	20-7/8	34-3/4	42-1/8	33-5/8	20-1/8	36-1/2	27-1/4	--	--
122	161-1/8	60	94	29-15/16	30-1/4	67-5/8	66-3/8	19-7/8	46-3/4	53-11/16	53-1/2	40	48	47-1/8	9-3/4	14-7/8
125	161-1/8	60	94	33-15/16	30-1/4	67-5/8	61-3/8	24-7/8	46-3/4	53-11/16	53-1/2	40	48	47-1/8	--	--

In keeping with our policy of continuous product improvement, we reserve the right to alter, at any time, the design, construction, dimensions, weights, etc., of equipment information shown here.

**SHAFT DEFLECTION**

All blowers provided with the Direct Fired Unit will incorporate blower shafts with a maximum run out of .002 inches per foot of shaft length when measured in accordance to Lau Process Specification #11013-PI.

**VIBRATION**

All blowers provided on the Direct Fired Unit will be balanced by the supplier to minimize vibratory effects of an unbalanced system. The vibration limits for the blowers, measured at the blower bearings, will be maintained within the following limits:

Velocity (in/sec)	
Peak	RMS
.025 to .100	.018 to .071

Displacement (mils-peak to peak) by Blower RPM				
1800 RPM	1200 RPM	900 RPM	720 RPM	600 RPM
.3 to 1.1	.4 to 1.6	.5 to 2.1	.7 to 2.7	.8 to 3.2

All vibration values are specified and tested in accordance to ISO-3945.

STATIC PRESSURE DROPS (inches w.c.)

Size	CFM	Cabinet with Filters (clean)			Inlet Base			Discharge Dampers	Return Air Dampers <sup>2</sup>	Screened Water Separator	Inlet Damper	External Ductwork	Total ESP
		2" Disposable	2" Permanent	2" Pleated	3 Sides Closed	4 Sides w/filters <sup>1</sup>	Open w/o filters						
109	750	0.03	0.01	0.02	0.05	0.20	0.00	0.04	N/A	0.01	0.01		
	1,000	0.03	0.01	0.02	0.06	0.20	0.00	0.06	N/A	0.02	0.01		
	1,250	0.04	0.01	0.02	0.06	0.20	0.00	0.08	N/A	0.04	0.02		
	1,750	0.04	0.02	0.02	0.07	0.20	0.00	0.14	N/A	0.05	0.04		
	2,000	0.05	0.02	0.03	0.07	0.21	0.00	0.18	N/A	0.07	0.05		
2,250	0.06	0.03	0.04	0.08	0.21	0.00	0.22	N/A	0.08	0.06			
112	2,000	0.05	0.02	0.03	0.07	0.21	0.00	0.09	N/A	0.07	0.05		
	2,500	0.06	0.03	0.04	0.09	0.22	0.00	0.13	N/A	0.09	0.07		
	3,000	0.07	0.04	0.05	0.11	0.22	0.00	0.17	N/A	0.15	0.09		
	3,500	0.09	0.04	0.08	0.14	0.23	0.00	0.22	N/A	0.25	0.10		
	4,000	0.10	0.05	0.10	0.20	0.24	0.00	0.28	N/A	0.30	0.16		
115	4,000	0.06	0.02	0.03	0.05	0.20	0.00	0.13	0.03	0.05	0.05		
	5,000	0.07	0.02	0.04	0.06	0.20	0.00	0.19	0.04	0.08	0.07		
	6,000	0.08	0.03	0.05	0.07	0.22	0.00	0.26	0.06	0.09	0.09		
	7,000	0.10	0.04	0.08	0.08	0.22	0.00	0.33	0.08	0.16	0.11		
118	5,000	0.07	0.02	0.04	0.06	0.20	0.00	0.11	0.04	0.08	0.07		
	6,000	0.08	0.03	0.05	0.07	0.21	0.00	0.16	0.06	0.09	0.09		
	7,000	0.10	0.04	0.08	0.08	0.22	0.00	0.21	0.08	0.16	0.11		
	8,000	0.12	0.07	0.13	0.09	0.22	0.00	0.26	0.09	0.25	0.14		
	10,000	0.15	0.10	0.18	0.13	0.23	0.00	0.38	0.14	0.32	0.21		
	12,000	0.18	0.12	0.26	0.20	0.24	0.00	0.52	0.19	0.43	0.28		
122	8,000	0.07	0.02	0.04	0.06	0.18	0.00	0.09	0.02	0.03	0.02		
	10,000	0.08	0.03	0.05	0.07	0.18	0.00	0.14	0.03	0.06	0.04		
	12,000	0.10	0.05	0.10	0.07	0.19	0.00	0.19	0.04	0.08	0.06		
	14,000	0.12	0.07	0.15	0.08	0.19	0.00	0.26	0.05	0.09	0.07		
	16,500	0.13	0.09	0.18	0.11	0.20	0.00	0.33	0.06	0.15	0.09		
125	12,000	0.10	0.05	0.10	0.07	0.19	0.00	0.13	0.04	0.08	0.06		
	14,000	0.12	0.07	0.15	0.08	0.19	0.00	0.16	0.05	0.09	0.07		
	16,000	0.13	0.09	0.18	0.10	0.20	0.00	0.20	0.06	0.14	0.09		
	18,000	0.16	0.10	0.23	0.13	0.21	0.00	0.25	0.07	0.17	0.10		
	20,000	0.18	0.12	0.27	0.16	0.23	0.00	0.29	0.09	0.26	0.10		
	22,000	0.22	0.14	0.31	0.20	0.24	0.00	0.35	0.11	0.30	0.15		

<sup>1</sup> 2" aluminum permanent filters (clean)<sup>2</sup> Pressure drop is at maximum return air flow

Model DV 109 (1) - A9" x 7A" CLASS 1 BLOWER							
"w.c.	CFM	750	1,000	1,250	1,750	2,000	2,250
0.00	RPM	705	755	822	990	1,092	1,202
	HP	0.10	0.18	0.28	0.59	0.84	1.20
0.25	RPM	852	876	931	1,073	1,159	1,255
	HP	0.14	0.22	0.33	0.67	0.91	1.25
0.45	RPM		991	1,030	1,157	1,232	1,316
	HP		0.26	0.39	0.75	1.00	1.30
0.65	RPM		1,101	1,124	1,237	1,306	1,382
	HP		0.32	0.44	0.83	1.10	1.40
0.85	RPM			1,216	1,312	1,377	1,448
	HP			0.51	0.90	1.20	1.50
1.05	RPM			1,305	1,383	1,445	1,512
	HP			0.57	0.98	1.30	1.60
1.25	RPM			1,393	1,453	1,510	1,574
	HP			0.64	1.10	1.40	1.70
1.45	RPM				1,521	1,573	
	HP				1.20	1.50	

Maximum Blower RPM is 1600, Maximum HP is 2.  
NOTE: A Class 2 Blower is Available for Special Applications with Higher Static Pressure Consult the Factory

Model DV 112 (1) - A12" x 9A" CLASS 1 BLOWER						
"w.c.	CFM	2,000	2,500	3,000	3,500	4,000
0.00	RPM	551	610	739	846	971
	HP	0.35	0.57	1.00	1.60	2.30
0.25	RPM	663	699	798	908	1,026
	HP	0.46	0.70	1.10	1.70	2.50
0.50	RPM	725	752	858	972	1,081
	HP	0.53	0.78	1.30	1.90	2.70
0.75	RPM	801	823	962	1,036	1,137
	HP	0.63	0.90	1.50	2.10	3.00
1.00	RPM	970	983	1,005	1,100	1,193
	HP	0.85	1.20	1.60	2.30	3.20
1.25	RPM		1,026	1,100	1,162	1,249
	HP		1.30	1.80	2.50	3.40
1.50	RPM		1,123	1,139	1,222	1,304
	HP		1.50	1.90	2.70	3.60
1.75	RPM		1,188	1,202	1,279	1,358
	HP		1.60	2.10	2.90	3.90
2.00	RPM		1,227	1,319	1,335	1,409
	HP		1.70	2.40	3.10	4.10
2.25	RPM			1,374	1,389	1,489
	HP			2.60	3.30	4.40
2.75	RPM			1,460	1,471	1,528
	HP			2.90	3.60	4.60
3.00	RPM			1,502	1,549	1,565
	HP			3.00	3.90	4.80

Maximum Blower RPM is 1578, Maximum HP is 5.

Model DV 118 (1) - A18" x 18A" CLASS 2 BLOWER							
"w.c.	CFM	5,000	6,000	7,000	8,000	10,000	12,000
0.00	RPM	362	433	505	578	721	867
	HP	0.77	1.30	2.10	3.20	6.10	10.70
0.25	RPM	449	507	569	634	766	905
	HP	1.10	1.70	2.50	3.60	6.70	11.40
0.50	RPM	525	575	629	688	811	943
	HP	1.40	2.00	2.90	4.10	7.30	12.10
0.75	RPM	593	636	685	739	853	980
	HP	1.70	2.40	3.30	4.60	7.90	12.80
1.00	RPM	656	694	737	705	878	1,001
	HP	2.00	2.80	3.80	5.10	8.30	13.20
1.25	RPM	714	768	780	841	935	1,050
	HP	2.30	3.30	4.10	5.60	9.10	14.20
1.50	RPM	761	818	827	878	958	1,071
	HP	2.60	3.70	4.60	6.00	9.40	14.60
1.75	RPM	772	847	882	927	1,011	1,104
	HP	2.90	3.90	5.10	6.60	10.30	15.30
2.00	RPM		910	917	961	1,033	1,150
	HP		4.50	5.40	7.00	10.60	16.30
2.25	RPM		937	967	1,997	1,069	1,169
	HP		4.70	6.00	7.60	11.20	16.70
2.50	RPM			1,000	1,045	1,118	1,200
	HP			6.30	8.10	12.10	17.40
2.75	RPM			1,039	1,077	1,138	1,250
	HP			6.80	8.50	12.50	18.60
3.00	RPM			1,083	1,110	1,171	1,273
	HP			7.30	9.10	13.10	19.20
3.25	RPM			1,099	1,154	1,223	1,297
	HP			8.00	9.60	14.10	19.80
3.50	RPM				1,182	1,248	
	HP				10.10	14.60	
3.75	RPM				1,235	1,273	
	HP				10.00	15.10	

Maximum Blower RPM is 1450, Maximum HP is 20.

Model DV 122 (1) - A22" x 22H" CLASS 1 BLOWER						
"w.c.	CFM	8,000	10,000	12,000	14,000	16,500
0.00	RPM	270	337	413	480	555
	HP	1.10	2.10	3.70	5.80	9.20
0.25	RPM	334	390	457	518	588
	HP	1.50	2.60	4.30	6.50	10.00
0.50	RPM	390	437	498	554	620
	HP	1.90	3.10	4.90	7.20	10.90
0.75	RPM	442	482	536	589	650
	HP	2.40	3.60	7.90	11.70	10.30
1.00	RPM	492	524	573	622	679
	HP	2.90	4.20	6.20	8.70	12.50
1.25	RPM	540	565	609	653	708
	HP	3.40	4.80	6.90	9.40	13.40
1.50	RPM		605	644	685	736
	HP		5.40	7.60	10.20	14.30
1.75	RPM		644	678	715	763
	HP		6.10	8.30	11.00	15.20
2.00	RPM		670	712	745	789
	HP		6.60	9.00	11.80	16.10
2.25	RPM			744	774	816
	HP			9.80	12.70	17.00

Maximum Blower RPM is 930, Maximum HP is 20.

Model DV 125 (1) - A25" x 25H" CLASS 1 BLOWER							
"w.c.	CFM	12,000	14,000	16,000	18,000	20,000	22,000
0.00	RPM	305	342	386	442	492	540
	HP	2.40	3.50	5.20	7.60	10.40	13.80
0.25	RPM	343	384	423	474	522	567
	HP	2.90	4.20	6.00	8.50	11.40	14.90
0.50	RPM	396	408	458	506	551	594
	HP	3.70	4.70	6.80	9.40	12.40	16.00
0.75	RPM	429	460	492	536	578	619
	HP	4.20	5.80	7.70	10.30	13.50	17.20
1.00	RPM	477	482	524	565	605	644
	HP	5.10	6.20	8.60	11.30	14.60	18.30
1.25	RPM		530	556	504	631	668
	HP		7.50	9.50	12.30	15.70	19.50
1.50	RPM		551	586	622	657	692
	HP		8.00	10.50	13.40	16.80	20.00
1.75	RPM			616	640	682	
	HP			11.40	14.50	17.90	
2.00	RPM			645	676	707	
	HP			12.40	15.60	19.10	
2.25	RPM			663	702	731	
	HP			13.10	16.70	20.00	

Maximum Blower RPM is 790, Maximum HP is 20.

D  
V

## CFM and BTUH SELECTION

### 1. Determine makeup air CFM based on

Total exhaust CFM - either from rating plates of exhaust equipment or measured

Infiltration CFM = (Building volume in square feet x the desired air rate change) ÷ 60

Type (negative or positive) of building or "spot" pressure desired

- **For negative pressure** - add the exhaust CFM and the infiltration CFM and multiply by <1 (usually .9)
- **For positive pressure** - add the exhaust CFM and the infiltration CFM and multiply by >1 (usually 1.1)

### 2. Determine makeup air BTUH based on $H = Q \times K \times \Delta T$

**H** = Heat **output** of the makeup air equipment

**Q** = Required makeup air CFM (as determined in Step 1)

**K** = Constant of 1.085

**ΔT** = Discharge air temperature minus outdoor design temperature (also identified as the temperature rise)

To determine BTUH input, divide **H** by .92.

### 3. Calculate the Total Adjusted Pressure Drop for the specific application (see Page 46). With the CFM and pressure drop, determine the HP from the RPM/HP Chart.

### 4. With this information, determine which size of system will most efficiently provide the required CFM and BTUH. Select the options that meet the specification requirements.

#### Capacity

Model	CFM Range	MBH Range	Blower Size and Class	HP Range	RPM Range
DV 109	750 - 2,250	250 - 500	9" x 7" Class 1	1/4 - 2	700 - 1,570
DV 112	2,000 - 4,000	250 - 750	12" x 9" Class 1	1/2 - 5	550 - 1,560
DV 115	4,000 - 7,000	250 - 1,000	15" x 15" Class 1	1-1/2 - 7-1/2	420 - 1,300
DV 118	5,000 - 12,000	250 - 1,750	18" x 18" Class 2	2 - 20	360 - 1,300
DV 122	8,000 - 16,500	500 - 2,500	22" x 22" Class 1	1-1/2 - 20	270 - 810
DV 125	12,000 - 22,000	750 - 3,000	25" x 25" Class 1	3 - 20	300 - 730

### CFM Range and Burner Inputs Available with Air Controls for 100% Outside Air (Options AR 1, 19, 20, 33, 35, 36)

Burner Input and Configuration	109	112	115	118	122	125
BL1 250 MBH 6" linear	750-2,225	2,000-4,000	4,000-5,000	5,000	■	■
BL2 500 MBH 12" linear	2,000-2,225	2,000-4,000	4,000-7,000	5,000-10,000	8,000-10,000	■
BL3 750 MBH 18" linear	■	4,000	4,000-7,000	5,000-12,000	8,000-16,000	12,000-16,000
BL4 1000 MBH 24" linear	■	■	6,000-7,000	6,000-12,000	8,000-16,500	12,000-21,000
BL5 1250 MBH 30" linear	■	■	■	8,000-12,000	8,000-16,500	12,000-22,000
BL36 1500 MBH 36" "H"-shape	■	■	■	9,000-12,000	9,000-16,500	12,000-22,000
BL37 1750 MBH 42" "H"-shape	■	■	■	10,000-12,000	10,000-16,500	12,000-22,000
BL38 2000 MBH 48" "H"-shape	■	■	■	■	12,000-16,500	12,000-22,000
BL39 2250 MBH 54" "H"-shape	■	■	■	■	14,000-16,500	14,000-22,000
BL40 2500 MBH 60" "H"-shape	■	■	■	■	16,000-16,500	16,000-22,000
BL41 2750 MBH 66" "U"-shape	■	■	■	■	■	17,000-22,000
BL42 3000 MBH 72" "H"-shape	■	■	■	■	■	19,000-22,000

### CFM Range and Burner Inputs Available with Air Control for 80% Return and 20% Outside Air (Options AR 22, 23, 32, 34, 37)

Burner Input and Configuration	109	112	115	118	122	125
BL1 250 MBH 6" linear	■	■	4,000-5,000	5,000	■	■
BL2 500 MBH 12" linear	■	■	5,000-7,000	5,000-12,000	8,000-10,000	■
BL3 750 MBH 18" linear	■	■	7,000	7,000-12,000	8,000-16,000	12,000-16,000
BL4 1000 MBH 24" linear	■	■	■	8,000-12,000	8,000-16,500	12,000-21,000
BL5 1250 MBH 30" linear	■	■	■	10,000-12,000	10,000-16,500	12,000-22,000
BL36 1500 MBH 36" "H"-shape	■	■	■	9,000-12,000	9,000-16,500	12,000-22,000
BL37 1750 MBH 42" "H"-shape	■	■	■	10,000-12,000	10,000-16,500	12,000-22,000
BL38 2000 MBH 48" "H"-shape	■	■	■	■	12,000-16,500	12,000-22,000
BL39 2250 MBH 54" "H"-shape	■	■	■	■	14,000-16,500	14,000-22,000
BL40 2500 MBH 60" "H"-shape	■	■	■	■	16,000-16,500	16,000-22,000
BL41 2750 MBH 66" "U"-shape	■	■	■	■	■	17,000-22,000
BL42 3000 MBH 72" "H"-shape	■	■	■	■	■	19,000-22,000

NOTE: Minimum CFM is determined by either temperature rise, usage or physical restriction of the burner.

All manifold arrangements include two main manual shutoff valves; a pilot manual shutoff valve; a pilot pressure regulator; and a pilot solenoid valve. Manifold arrangements BM62-66 and 53 include two solenoid valves.

(KEY: X = available; ■ = not available)

Direct fired		109	112	115	118	122	125
Manifold to meet <b>ANSI</b> requirements up to <b>750 MBH</b> ; <b>FM</b> approval to <b>400 MBH</b> ; for <b>IRI</b> and <b>C.G.A.</b> approval to <b>400 MBH</b> , order <b>BP4</b> . 1" manifold; 1/2 psi rating.	<b>BM62</b>	X	X	X	X	X	X
Manifold to meet <b>ANSI and FM</b> requirements for inputs up to <b>750 MBH</b> . For <b>IRI and C.G.A.</b> , order <b>BP4</b> . 3/4" manifold; 5 psi rating.	<b>BM63</b>	X	X	X	X	X	X
Manifold to meet <b>ANSI and FM</b> requirements for inputs <b>750 to 1000 MBH</b> . For <b>IRI and C.G.A.</b> , order <b>BP4</b> . 1" manifold, 5 psi rating.	<b>BM64</b>	■	■	X	X	X	X
Manifold to meet <b>ANSI and FM</b> requirements for inputs <b>1000 to 2500 MBH</b> . 1-1/4" manifold; 5 psi rating	<b>BM65</b>	■	■	X	X	X	X
Manifold to meet <b>IRI and C.G.A.</b> requirements on units with <b>greater than 1000 MBH but less than or equal to 2500 MBH</b> . Includes vent valve, high gas pressure switch, and low gas pressure switch. 1-1/4" manifold; 5 psi rating.	<b>BM53</b>	■	■	X	X	X	X
Manifold to meet <b>ANSI, FM, IRI, and C.G.A.</b> requirements on units from <b>2000 to 3000 MBH</b> . Includes vent valve, high gas pressure switch, and low gas pressure switch. 2" manifold; 5 psi rating.	<b>BM66</b>	■	■	■	■	X	X
Manifold to meet <b>ANSI and special State</b> requirements on units with <b>greater than 1000 MBH to 2500 MBH</b> . Includes high gas pressure switch, low gas pressure switch and <b>two safety shutoff valves with valve seal overtravel</b> . 1-1/4" manifold; 5 psi rating.	<b>BM67</b>	■	■	X	X	X	X
Manifold to meet <b>ANSI and special State</b> requirements on units with <b>greater than 2000 MBH to 3000 MBH</b> . Includes high gas pressure switch, low gas pressure switch and <b>two safety shutoff valves with valve seal overtravel</b> . 2" manifold; 5 psi rating.	<b>BM68</b>	■	■	■	■	X	X

**D  
V**

**Input Rate VS CFM and Temperature Rise**

CFM	Temperature Rise (°F)								
	40	50	60	70	80	90	100	110	120
750	35,150	43,937	52,725	61,512	70,300	79,087	87,874	96,662	105,445
1,000	46,866	58,583	70,300	82,016	93,733	105,449	117,166	128,883	140,599
2,000	93,733	117,166	140,599	164,032	187,465	210,899	234,332	257,765	281,198
3,000	140,599	175,749	210,899	246,048	281,198	316,348	351,498	386,648	421,797
4,000	187,465	234,332	281,198	328,065	374,931	421,797	468,664	515,530	562,396
5,000	234,332	292,915	351,498	410,081	468,664	527,247	585,830	644,413	702,995
6,000	281,198	351,498	421,797	492,097	562,396	632,696	702,995	773,295	846,595
7,000	328,065	410,081	492,097	574,113	656,129	738,145	820,161	902,178	984,194
8,000	374,931	468,664	562,396	656,129	749,862	843,595	937,327	1,031,060	1,124,793
9,000	421,797	527,247	632,696	738,145	843,595	949,044	1,054,493	1,159,943	1,265,392
10,000	468,664	585,830	702,995	820,161	937,327	1,054,493	1,171,659	1,288,825	1,405,991
11,000	515,530	644,413	773,295	902,178	1,031,060	1,159,943	1,288,825	1,417,708	1,546,590
12,000	562,396	702,995	843,595	984,194	1,124,793	1,265,392	1,405,991	1,546,590	1,687,189
13,000	609,263	761,578	913,894	1,066,210	1,218,525	1,370,841	1,523,157	1,675,493	1,827,788
14,000	656,129	820,161	984,194	1,148,226	1,312,258	1,476,291	1,640,323	1,804,355	1,968,387
15,000	702,995	878,744	1,054,493	1,230,242	1,405,991	1,581,740	1,757,489	1,933,238	2,108,986
16,000	749,862	937,327	1,124,793	1,312,258	1,499,724	1,687,189	1,874,655	2,062,120	2,249,586
16,500	773,295	966,619	1,159,943	1,353,266	1,546,590	1,739,914	1,933,238	2,126,561	2,319,885
17,000	796,728	995,910	1,195,092	1,394,274	1,593,456	1,792,638	1,991,821	2,191,003	2,390,185
18,000	843,595	1,054,493	1,265,392	1,476,291	1,687,189	1,898,088	2,108,986	2,319,885	2,530,784
19,000	890,461	1,113,076	1,335,691	1,558,307	1,780,922	2,003,537	2,226,152	2,448,768	2,671,383
20,000	937,327	1,171,659	1,405,991	1,640,323	1,874,655	2,108,986	2,343,318	2,577,650	2,811,982
21,000	984,194	1,230,242	1,476,291	1,722,339	1,968,387	2,214,436	2,460,484	2,706,533	2,952,581
22,000	1,031,060	1,288,825	1,546,590	1,804,355	2,062,120	2,319,885	2,577,650	2,835,415	3,004,090

\*This table was generated at sea level (29.92" Hg) and standard air temperature (70°F) and density (.074856) using the formula:  
 Input Rate = (Discharge CFM x Temperature Rise ΔT °F x Discharge Air Density x .240 x 60) ÷ .92

For applications other than at sea level or 70°F discharge air temperature, use:  
 Discharge Air Density = [Barometric Pressure Hg ÷ (460 + Discharge Temperature °F)] x 1.326

Model						(KEY: X = available; ■ = not available)	
109	112	115	118	122	125	Option	Description
X	X	X	X	X	X	AR1	<b>100% OUTSIDE</b> makeup ( <b>CONSTANT</b> supply air volume)
■	■	X	X	X	X	AR19	<b>100% OUTSIDE air with variable supply air volume (minimum 20% rated air supply).</b> Discharge and bypass dampers with modulating actuators. Control of discharge damper from a manually set (0-135 ohm) <b>POTENTIOMETER</b> . Discharge damper assembly and control are shipped separately.
■	■	X	X	X	X	AR20	<b>100% OUTSIDE air with variable supply air volume (minimum 20% rated air supply).</b> Discharge and bypass dampers with modulating actuators. Control of discharge damper from a remotely located <b>PRESSURE SENSOR</b> . Discharge damper assembly and control are shipped separately.
■	■	X	X	X	X	AR22	<b>COMBINATION outside makeup and bypass return air</b> (maximum 80% return air). Outside air, bypass, and return air dampers with modulating actuators. Control of return air damper from a manually set <b>POTENTIOMETER</b> . Control is shipped separately.
■	■	X	X	X	X	AR23	<b>COMBINATION outside makeup and bypass return air</b> (maximum 80% return air). Outside air, bypass, and return air dampers with modulating actuators. Control of return air damper from a remotely located <b>PRESSURE SENSOR</b> . Control is shipped separately.
■	■	X	X	X	X	AR32	<b>Two-position OUTSIDE AND RETURN air system.</b> Outside, bypass, and return air dampers with two-position actuator. Change between 100% outside air to 20% outside/80% return air. Control is with an SPDT toggle switch mounted on a 4x4 box (or, if ordered, the switch is mounted on a remote console, Option RC 13 or 14). Switch or console is shipped separately.
■	■	X	X	X	X	AR33	<b>100% OUTSIDE air with variable supply air volume</b> (minimum 20% rated air supply). Discharge and bypass dampers with modulating actuators. Control of discharge damper from a <b>FIELD-SUPPLIED 0-10 VDC or 4-20 milliamp signal</b> (specify when ordering). Discharge damper assembly is shipped separately.
■	■	X	X	X	X	AR34	<b>COMBINATION outside makeup and bypass return air</b> (maximum 80% return air). Outside air, bypass, and return air dampers with modulating actuators. Control of return air damper from a <b>FIELD-SUPPLIED 0-10 VDC or 4-20 milliamp signal</b> (specify when ordering).
X	X	X	X	X	X	AR35	<b>Two-position inlet shutoff damper.</b> Mount in the field on indoor screened base ( <b>Option AVA1 must be ordered</b> ). Inlet damper assembly is shipped separately.
■	■	X	X	X	X	AR36	<b>100% OUTSIDE air with variable supply air volume</b> (minimum 20% rated air supply). Discharge and bypass dampers with modulating actuators. Control of discharge damper from a remotely located <b>PHOTOHELIC PRESSURE SENSOR</b> . Discharge damper assembly and sensor are shipped separately.
■	■	X	X	X	X	AR37	<b>COMBINATION outside makeup and bypass return air</b> (maximum 80% return air). Outside air, bypass, and return air dampers with modulating actuators. Control of return air damper from a remotely located <b>PHOTOHELIC PRESSURE SENSOR</b> Sensor is shipped separately.

• **Outside Air Inlet Base**

- Inlet base
  - with screened sides,
  - with side openings with 2" permanent filters around the perimeter (for mild climates only), or
  - with closed sides and duct flange (indoor installation)
- Weatherized construction
- Floor flanges for mounting
- Internal lifting lugs

• **Outside Air Screened Water Separator**

- Applies to 100% outside air units installed indoors; designed for use with inlet base with duct flange or to be mounted to the building wall at the inlet opening
- Shipped separately for field installation

• **Outside Air Filter Cabinet with V-Bank Filter Rack and Filters**

- With 2" disposable, 1" or 2" permanent, or 1" or 2" disposable pleated filters
- Filter access panels
- Weatherized double-wall insulated construction
- Internal lifting lugs



**DISCHARGE AIR LOCATION AND ACCESSORIES**

**• Discharge Air Location**

- Vertical (up) discharge - available on Sizes 109, 115, and 122
- Horizontal discharge - depending on how the cabinet is turned when stacking, horizontal discharge may be on any side

**• 2-Position Discharge Damper**

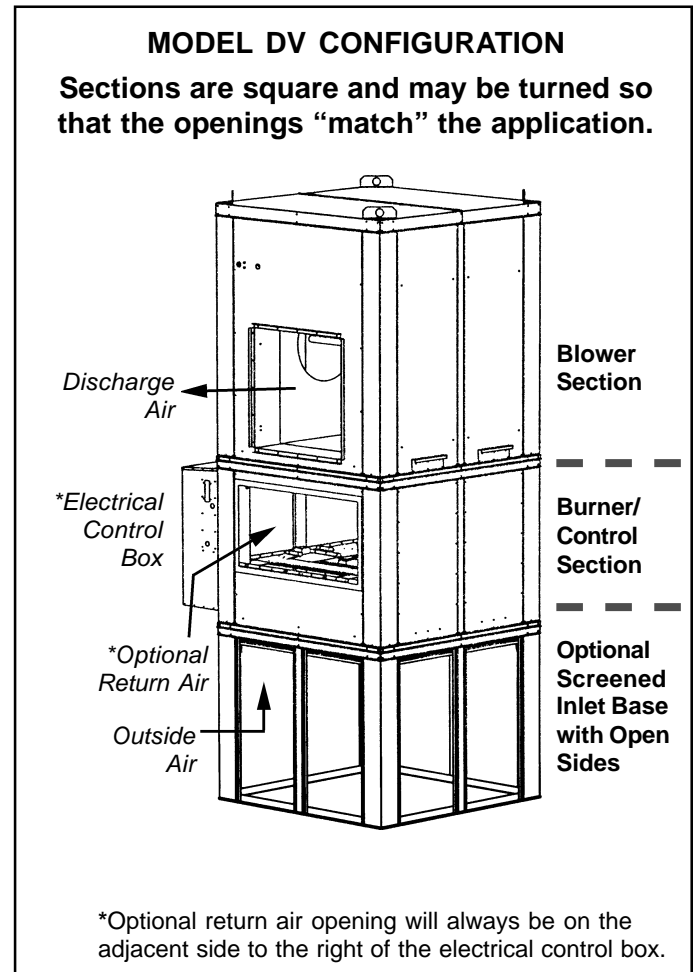
- Open and closed discharge damper
- Isolates the unit from the building atmosphere when system is not operating

**• Ductwork Smoke Detector**

- Photoelectric air duct smoke detector

**• Vibration Isolation**

- Canvas boot for connection of discharge duct
- Vibration isolation for the blower motor



**ELECTRONIC MODULATION GAS CONTROL SYSTEMS - All Sizes**

Option	Description
<b>AG30</b>	<b>Discharge air temperature control (55-90° F).</b> Includes discharge air sensor, amplifier, and remote manual temperature selector and control switch mounted on separate 4x4 boxes.
<b>AG31</b>	<b>Discharge air temperature control (55-90° F) with space override.</b> Same as AG30 with the addition of a space override thermostat.
<b>AG32*</b>	<b>Discharge air temperature control (80-130° F).</b> Includes discharge air sensor, amplifier, and remote manual temperature selector and control switch mounted on separate 4x4 boxes.
<b>AG33*</b>	<b>Compensated discharge air temperature (20-120° F) control reset from space temperature.</b> Includes discharge air sensor, amplifier, and remote Selectrastat (55-90° F) (shipped separately)
<b>AG35*</b>	<b>Discharge air temperature control (120-160° F).</b> Includes discharge air sensor, amplifier, and remote manual temperature selector and control switch mounted on separate 4x4 boxes.
<b>AG36*</b>	<b>For Paint Booth application.</b> Includes digital readout, two remote temperature selectors (Dry Selector 80-160°F and Spray Selector 60-90°F), Amplifier, two switches (dry/spray and summer/off/winter) - all mounted on a remote console
<b>AG37*</b>	Maxitrol A200 signal conditioner ( <b>used with customer-supplied 4-20MA or 0-10V input signal</b> ) (conditioner is factory installed)

\*Product Selection Cross-Reference NOTE: Options AG 35, 36, and 37 require double-wall construction (Option AY3); Options AG32 and 33 require an insulated cabinet (Option AY2 or AY3).

The following sound values have been accessed using a model of sound propagation from a point source into the hemispheric free field per AMCA 303-79. The dBA values provided are to be used for reference only. All values shown are based on the sound generated from the air moving device only and not any additional sound generation source from any section of the equipment. This constitutes an exception to any specification or guarantee requiring a dBA value or sound data in any form other than sound power level ratings (swl). All data is shown for standard air density at sea level.

**DV-109**

CFM	RPM	ESP	Octave Band No. and Centre Frequency (Hz)										
			1	2	3	4	5	6	7	8			
<b>750</b>	<b>705</b>	<b>0"w.c.</b>	63	125	250	500	1000	2000	4000	8000	A-weighted swl in duct 62 dB	10 ft with open inlet or outlet 45 dBA	10 ft with ducted inlet and outlet 30 dBA
Specific swl (dB)		50	50	40	33	33	28	23	18				
10 Log Q + 20 Log T.P. (dB)		22	22	22	22	22	22	22	22				
BFI (dB)		0	0	0	2	0	0	0	0				
Off-Peak Corr. (dB)		1	1	1	1	1	1	1	1				
Total Fan swl (dB)		73	73	63	58	56	51	46	41				

**DV-109**

CFM	RPM	ESP	Octave Band No. and Centre Frequency (Hz)										
			1	2	3	4	5	6	7	8			
<b>2250</b>	<b>1574</b>	<b>1.25"w.c.</b>	63	125	250	500	1000	2000	4000	8000	A-weighted swl in duct 91 dB	10 ft with open inlet or outlet 73 dBA	10 ft with ducted inlet and outlet 58 dBA
Specific swl (dB)		50	50	40	33	33	28	23	18				
10 Log Q + 20 Log T.P. (dB)		41	41	41	41	41	41	41	41				
BFI (dB)		0	0	0	0	2	0	0	0				
Off-Peak Corr. (dB)		10	10	10	10	10	10	10	10				
Total Fan swl (dB)		101	101	91	84	86	79	74	69				

**DV-112**

CFM	RPM	ESP	Octave Band No. and Centre Frequency (Hz)										
			1	2	3	4	5	6	7	8			
<b>2000</b>	<b>663</b>	<b>.25"w.c.</b>	63	125	250	500	1000	2000	4000	8000	A-weighted swl in duct 76 dB	10 ft with open inlet or outlet 59 dBA	10 ft with ducted inlet and outlet 44 dBA
Specific swl (dB)		50	50	40	33	33	28	23	18				
10 Log Q + 20 Log T.P. (dB)		33	33	33	33	33	33	33	33				
BFI (dB)		0	0	0	2	0	0	0	0				
Off-Peak Corr. (dB)		4	4	4	4	4	4	4	4				
Total Fan swl (dB)		87	87	77	72	70	65	60	55				

**DV-112**

CFM	RPM	ESP	Octave Band No. and Centre Frequency (Hz)										
			1	2	3	4	5	6	7	8			
<b>4000</b>	<b>1565</b>	<b>3.0"w.c.</b>	63	125	250	500	1000	2000	4000	8000	A-weighted swl in duct 92 dB	10 ft with open inlet or outlet 74 dBA	10 ft with ducted inlet and outlet 59 dBA
Specific swl (dB)		50	50	40	33	33	28	23	18				
10 Log Q + 20 Log T.P. (dB)		50	50	50	50	50	50	50	50				
BFI (dB)		0	0	0	0	2	0	0	0				
Off-Peak Corr. (dB)		2	2	2	2	2	2	2	2				
Total Fan swl (dB)		102	102	92	85	87	80	75	70				

**DV-115**

CFM	RPM	ESP	Octave Band No. and Centre Frequency (Hz)										
			1	2	3	4	5	6	7	8			
<b>4000</b>	<b>661</b>	<b>.75"w.c.</b>	63	125	250	500	1000	2000	4000	8000	A-weighted swl in duct 80 dB	10 ft with open inlet or outlet 63 dBA	10 ft with ducted inlet and outlet 48 dBA
Specific swl (dB)		50	50	40	33	33	28	23	18				
10 Log Q + 20 Log T.P. (dB)		37	37	37	37	37	37	37	37				
BFI (dB)		0	0	0	2	0	0	0	0				
Off-Peak Corr. (dB)		4	4	4	4	4	4	4	4				
Total Fan swl (dB)		91	91	81	76	74	69	64	59				

**DV-115**

CFM	RPM	ESP	Octave Band No. and Centre Frequency (Hz)										
			1	2	3	4	5	6	7	8			
<b>7000</b>	<b>1305</b>	<b>3.25"w.c.</b>	63	125	250	500	1000	2000	4000	8000	A-weighted swl in duct 93 dB	10 ft with open inlet or outlet 75 dBA	10 ft with ducted inlet and outlet 60 dBA
Specific swl (dB)		50	50	40	33	33	28	23	18				
10 Log Q + 20 Log T.P. (dB)		52	52	52	52	52	52	52	52				
BFI (dB)		0	0	0	0	2	0	0	0				
Off-Peak Corr. (dB)		1	1	1	1	1	1	1	1				
Total Fan swl (dB)		103	103	93	86	88	81	76	71				

## DV-118

CFM	RPM	ESP
5000	656	1.0"w.c.

Octave Band No. and Centre Frequency (Hz)								
1	2	3	4	5	6	7	8	
63	125	250	500	1000	2000	4000	8000	
Specific swl (dB)	50	50	40	33	33	28	23	18
10 Log Q + 20 Log T.P. (dB)	40	40	40	40	40	40	40	40
BFI (dB)	0	0	0	2	0	0	0	0
Off-Peak Corr. (dB)	0	0	0	0	0	0	0	0
Total Fan swl (dB)	90	90	80	75	73	68	63	58

A-weighted swl in duct	10 ft with open inlet or outlet	10 ft with ducted inlet and outlet
79 dB	62 dBA	47 dBA

## DV-118

CFM	RPM	ESP
12000	1297	3.25"w.c.

Octave Band No. and Centre Frequency (Hz)								
1	2	3	4	5	6	7	8	
63	125	250	500	1000	2000	4000	8000	
Specific swl (dB)	50	50	40	33	33	28	23	18
10 Log Q + 20 Log T.P. (dB)	56	56	56	56	56	56	56	56
BFI (dB)	0	0	0	0	2	0	0	0
Off-Peak Corr. (dB)	3	3	3	3	3	3	3	3
Total Fan swl (dB)	109	109	99	92	94	87	82	77

A-weighted swl in duct	10 ft with open inlet or outlet	10 ft with ducted inlet and outlet
99 dB	81 dBA	66 dBA

## DV-122

CFM	RPM	ESP
8000	270	0"w.c.

Octave Band No. and Centre Frequency (Hz)								
1	2	3	4	5	6	7	8	
63	125	250	500	1000	2000	4000	8000	
Specific swl (dB)	50	50	40	33	33	28	23	18
10 Log Q + 20 Log T.P. (dB)	29	29	29	29	29	29	29	29
BFI (dB)	0	2	0	0	0	0	0	0
Off-Peak Corr. (dB)	15	15	15	15	15	15	15	15
Total Fan swl (dB)	94	96	84	77	77	72	67	62

A-weighted swl in duct	10 ft with open inlet or outlet	10 ft with ducted inlet and outlet
84 dB	66 dBA	51 dBA

## DV-122

CFM	RPM	ESP
16500	816	2.25"w.c.

Octave Band No. and Centre Frequency (Hz)								
1	2	3	4	5	6	7	8	
63	125	250	500	1000	2000	4000	8000	
Specific swl (dB)	50	50	40	33	33	28	23	18
10 Log Q + 20 Log T.P. (dB)	53	53	53	53	53	53	53	53
BFI (dB)	0	0	0	2	0	0	0	0
Off-Peak Corr. (dB)	3	3	3	3	3	3	3	3
Total Fan swl (dB)	106	106	96	91	89	84	79	74

A-weighted swl in duct	10 ft with open inlet or outlet	10 ft with ducted inlet and outlet
95 dB	78 dBA	63 dBA

## DV-125

CFM	RPM	ESP
12000	305	0"w.c.

Octave Band No. and Centre Frequency (Hz)								
1	2	3	4	5	6	7	8	
63	125	250	500	1000	2000	4000	8000	
Specific swl (dB)	50	50	40	33	33	28	23	18
10 Log Q + 20 Log T.P. (dB)	38	38	38	38	38	38	38	38
BFI (dB)	0	0	2	0	0	0	0	0
Off-Peak Corr. (dB)	9	9	9	9	9	9	9	9
Total Fan swl (dB)	97	97	89	80	80	75	70	65

A-weighted swl in duct	10 ft with open inlet or outlet	10 ft with ducted inlet and outlet
86 dB	69 dBA	54 dBA

## DV-125

CFM	RPM	ESP
22000	692	1.5"w.c.

Octave Band No. and Centre Frequency (Hz)								
1	2	3	4	5	6	7	8	
63	125	250	500	1000	2000	4000	8000	
Specific swl (dB)	50	50	40	33	33	28	23	18
10 Log Q + 20 Log T.P. (dB)	55	55	55	55	55	55	55	55
BFI (dB)	0	0	0	2	0	0	0	0
Off-Peak Corr. (dB)	2	2	2	2	2	2	2	2
Total Fan swl (dB)	107	107	97	92	90	85	80	75

A-weighted swl in duct	10 ft with open inlet or outlet	10 ft with ducted inlet and outlet
96 dB	79 dBA	64 dBA

**GENERAL**

Provide packaged makeup air units, direct fired as manufactured as the Reznor brand of Thomas & Betts Corporation. Units shall be design certified by the American Gas Association (A.G.A.) to meet ANSI standards Z83-18 and Canadian Gas Association (C.G.A) certified to meet CAN 1-3.12. Provide with output capacities as shown on drawings. Units are for (indoor/outdoor) installation with vertical cabinet configuration. Units shall be fueled by (natural/propane) gas.

The unit(s) shall be supplied by a manufacturer with no less than 10 years experience in building direct fired products. Manufacturer shall have certifying agency approved laboratory for testing of such products. The unit(s) must be supplied by an ISO 9001 registered manufacturer.

Units shall be assembled and test fired by manufacturer before shipment.

**CABINET**

Cabinet(s) shall be fully weatherized for outdoor installation. Frame of cabinet(s) shall be of (single-wall/single-wall with insulation/double-wall with insulation) construction.

An inlet air base (screened/with filters/with duct flange) is required. (This base may be provided by manufacturer or fabricated on site.)

(An optional outside air, V-bank filter section stacked between the inlet air base and burner section may be provided.)

**BURNER SECTION**

The burner shall be of cast iron with drilled ports and stainless steel mixing plates. The burner shall be designed for high efficiency combustion to meet ANSI CO and NO<sub>2</sub> requirements.

**CONTROLS**

Burner control shall be electronic modulation with burner turn-down ratio of 25:1. Pilot and flame monitoring devices shall be incorporated with an electronic ignition system and electronic flame safety controller. Ignition of burner shall be accomplished with 24 volt hot surface ignition with two-try electronically controlled circuit. The burner firing rate shall be modulated by a temperature selector and discharge air sensor.

Provide the following options: (Remote overhead door switch to activate unit) (Photoelectric air duct smoke detector).

**GAS TRAIN**

The gas train shall include main and pilot gas pressure regulators, dual solenoid valves and main and pilot manual shut off valves. All gas train manifolds shall meet (ANSI) (FM) (IRI) requirements.

Provide the following options: (DDC gas controls) (high/low/high-low gas pressure safety switches).

**BLOWER SECTION**

The blower section shall include a forward curved, centrifugal blower that is statically and dynamically balanced for vibration-free operation.

Each blower section shall be modular and be able to be rotated during installation for discharge air to be supplied in any of the 4 directions.

The blower motor shall be (single speed/2-speed) EPACT rated (open dripproof/TEFC/premium efficiency) with IEC (starter/contacter).

**AIR CONTROLS**

Air controls shall be (space temperature/air pressure) sensitive. Provide (constant/variable) outside air volume.

Provide the following options: (DDC air controls) (Two position discharge damper) (vertical-top discharge) (Outside air-water separator with screen).

**ELECTRIC CONTROLS**

All electric controls shall be contained in an electrical control box (except for system switch and other remote controls). Electric controls shall include a unit-mounted electronic circuit board with a 13-light diagnostic panel.

Provide the following options: (Remote control console) (Disconnect switch).

**WARRANTY**

Manufacture shall warrant to the original owner-user that the product shall be free from defects in material or workmanship. This warranty shall be limited to twelve (12) months from the date of original installation, whether or not actual use begins on that date, or eighteen (18) months from date of shipment by manufacturer, whichever occurs first.