

# SUBMITTAL

**Job Title:** DTNA Corp 6 CNG

**Job Site:** Daimler Trucks North America  
CNG/LNG/Propane Upgrade  
Portland, OR 97210  
United States

**Engineer:** MSE

**Contractor:** Hunter Davisson, Inc

**Elevation: (ft)** 108

**Date:** 09/24/13

**Submitted By:** Mike Morrison

**JOHNSON AIR PRODUCTS**  
2220 SE NINTH AVE  
PORTLAND, OR 97214-4661  
US

Phone: (503)234-5071

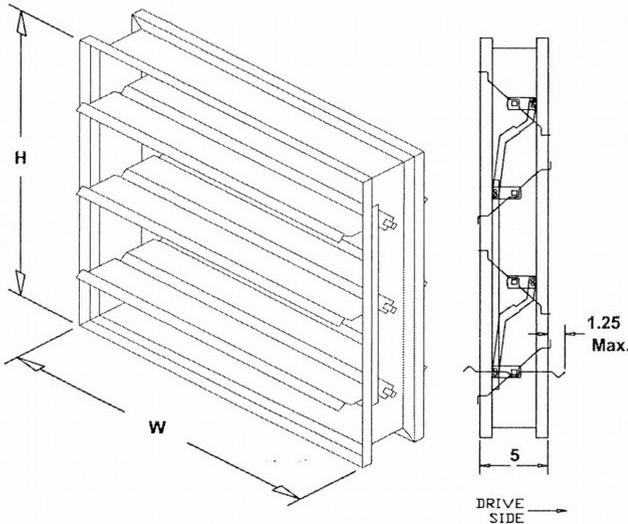
Fax: (503)233-0451

Email Address: chessick@johnsonair.com

<b>Mechanical Systems Engineering</b> 2982 NW Fairfax Terrace Portland, OR 97210 P: 503-695-0426 F: 503-961-1664	
<input checked="" type="checkbox"/> Approved	<input type="checkbox"/> Approved as Corrected
<input type="checkbox"/> Rejected	<input type="checkbox"/> Revise and Resubmit
<input type="checkbox"/> Submit Specified Item	
<small>This submittal review is only for general conformance with the design concept of the project and general compliance with the information given in the Contract Documents. Corrections or comments made on the shop drawings during this review do not relieve Contractor from compliance with the requirements of the plans and specifications. Approval of a specific item shall not include approval of an assembly of which the item is a component. Contractor is responsible for dimensions to be confirmed and correlated at the jobsite; information that pertains solely to the fabrication processes or to the means, methods, techniques, sequences and procedures of construction; coordination of the Work of all trades; and for performing all work in a safe and satisfactory manner.</small>	
<b>Rev. Date: P.E.</b>	<b>Date:</b> 09/25/13



P.O. Box 410 Schofield, WI 54476 (715) 359-6171 FAX (715) 355-2399 www.greenheck.com



# VCD-23

## Low Leakage Control Damper

### Application & Design

The model VCD-23 is a low leakage control damper for application as an automatic control or manual balancing damper. This model is intended for applications in low to medium pressure and velocity systems. A wide range of electric and pneumatic actuators are available. Non-jackshafted dampers will be supplied with a blade drive lever for internal actuator mounting. When external actuator mounting is specified in which case an extension pin with clip kit will be provided. Note: The extension pin with clip kit includes the extension pin and clip.

**RATINGS**  
Pressure: 5 in. wg  
Velocity: 3,000 ft/min  
Leakage: Class 1A @ 1 in. wg, Class 1 @ 4 in. wg  
Temperature: 250.0 F. Consult factory for higher temperatures.

Installation instructions available at [www.greenheck.com](http://www.greenheck.com).

Notes: All dimensions shown are in units of inches.

W & H furnished approximately 0.25 in. undersized and only refer to damper dimensions (sleeve thickness is not included).

Electrical accessory wiring terminates at the accessory.  
Field wiring is required to individual components.

### CONSTRUCTION FEATURES

<b>Blade Action:</b>	Opposed	<b>Frame Thickness (ga):</b>	16
<b>Frame Type:</b>	Channel	<b>Actuator Type:</b>	120 VAC
<b>Material:</b>	Galvanized	<b>Actuator Mount:</b>	External
<b>Axle Material:</b>	Steel	<b>Actuator Location:</b>	Left Side
<b>Axle Bearings:</b>	Synthetic	<b>Fail Position:</b>	Closed
<b>Linkage Material:</b>	Steel	<b>Cycle:</b>	60 Cycle
<b>Blade Seal:</b>	TPE	<b>Jackshafting:</b>	No Preference
<b>Jamb Seal Mat.:</b>	304 SS	<b>Temp. Rating (F):</b>	180
<b>Sizing:</b>	Nominal		



ID #	Tag	Qty	W (in.)	H (in.)	Drive Arr.	Actuator	Act. Qty.
4-1		2	36.000	36.000	Drive-CC-11-1FEL-0	MA6-418-500	1

---

## AMCA



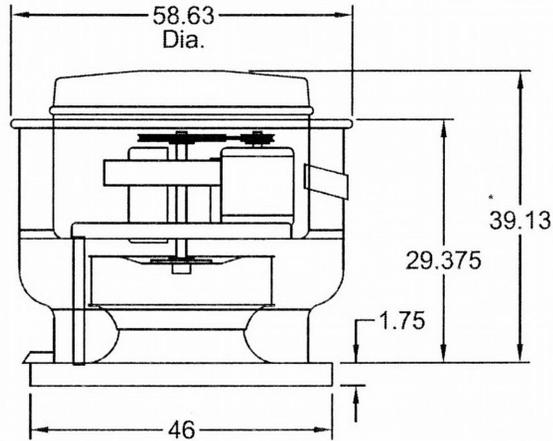
AMCA Licensed for Air Performance & Air Leakage

Greenheck Fan Corporation certifies that the model shown herein is licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 511 and comply with the requirements of the AMCA Certified Ratings Programs. The AMCA Certified Ratings Seal applies to Air Leakage and Air Performance ratings.

**Model: CUBE-360-20**

Belt Drive Upblast Centrifugal Roof Exhaust Fan

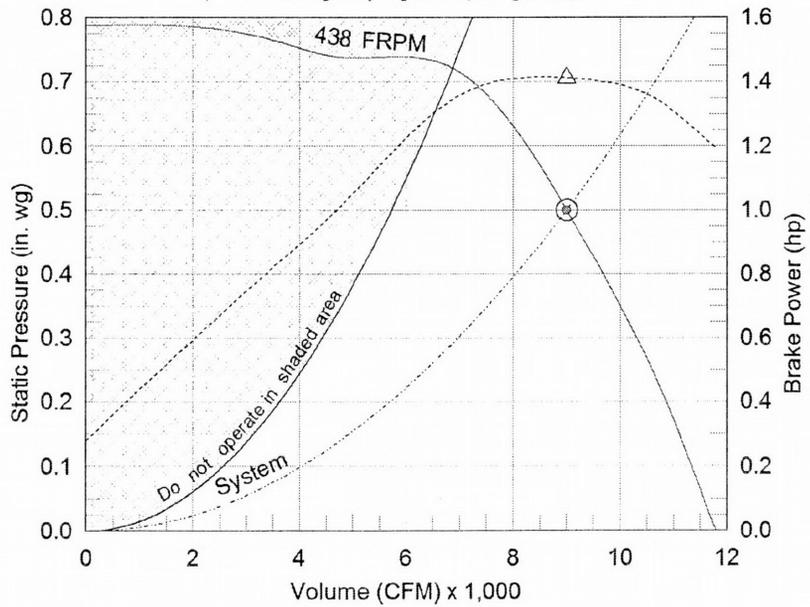
Dimensional	
Quantity	2
Weight w/o Acc's (lb)	270
Weight w/ Acc's (lb)	413
Max T Motor Frame Size	213
Optional Damper (in.)	36 x 36
Roof Opening (in.)	38.5 x 38.5



Reference assembly view drawings for actual dimensions with mounted accessories

\*Overall height may be greater depending on motor

Performance	
Requested Volume (CFM)	9,000
Actual Volume (CFM)	9,000
External SP (in. wg)	0.5
Total SP (in. wg)	0.5
Fan RPM	438
Operating Power (hp)	1.41
Elevation (ft)	108
Airstream Temp.(F)	70
Air Density (ft3)	0.075
Drive Loss (%)	5.4
Tip Speed (ft/min)	4,123
Static Eff. (%)	53



- △ Operating Bhp point
- Operating point at Total SP
- Operating point at External SP
- Fan curve
- System curve
- Brake horsepower curve

Motor	
Motor Mounted	Yes
Size (hp)	2
V/C/P	460/60/3
Enclosure	EXP
Motor RPM	1725
Windings	1
NEC FLA* (Amps)	3.4

**Sound Power by Octave Band**

Sound Data	62.5	125	250	500	1000	2000	4000	8000	LwA	dBA	Sones
Inlet	84	85	74	66	66	60	53	48	73	62	12.8

**Notes:**

All dimensions shown are in units of in..  
\*FLA - based on tables 150 or 148 of National Electrical Code 2002. Actual motor FLA may vary, for sizing thermal overload, consult factory.  
LwA - A weighted sound power level, based on ANSI S1.4  
dBA - A weighed sound pressure level, based on 11.5 dB attenuation per Octave band at 5.0 ft - dBA levels are not licensed by AMCA International  
Sones - calculated using AMCA 301 at 5.0 ft



---

## Model: CUBE-360-20

### Belt Drive Upblast Centrifugal Roof Exhaust Fan

#### Standard Construction Features:

- Aluminum housing - Backward inclined aluminum wheel - Curb cap with prepunched mounting holes - Motor and drives isolated on shock mounts - Drain trough - Ball bearing motors - Adjustable motor pulley - Adjustable motor plate - Fan shaft mounted in ball bearing pillow blocks - Bearings meet or exceed temperature rating of fan - Static resistant belts - Corrosion resistant fasteners - Internal lifting lugs

#### Options & Accessories:

NEMA Premium Efficient Motor - meets NEMA Table 12-12  
Motor with Thermal Overload  
Automatic Belt Tensioner  
UL/cUL 705 Listed - "Power Ventilators"  
Switch, NEMA-7 and 9, Toggle, Junction Box Mounted & Wired, Division 1 Wiring  
Roof Curb, GPI-46-G12, Under Sized 1.5 in. Total  
Curb Seal (Attached)  
Damper, VCD-23-PB-36X36 (Loose), Not Coated  
Damper Actuator, 115 VAC-EXP Actuated  
Birdscreen: Galvanized  
Bearings with Grease Fittings, L10 life of 100,000 hrs (L50 avg. life 500,000 hrs)  
Aluminum Rub Ring

## Disconnect Switch

Enclosure Rating: NEMA-7 and 9

### Standard Construction Features:

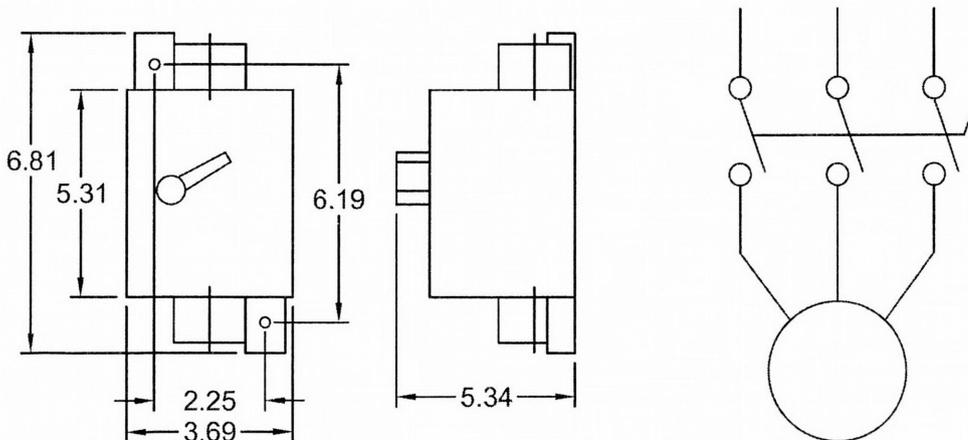
Enclosures are for indoor use in locations classified as Class I (flammable gases), Group A, B, C, or D and Class II (combustible dust), Group E, F, or G, as defined by the National Electrical Code. Enclosures shall be capable of preventing the entrance of dust and withstanding the pressure resulting from an internal explosion or specified gases. It shall contain such an explosion sufficiently so that an explosive gas-air mixture existing in the atmosphere surrounding the enclosure will not be ignited. Enclosed heat generating devices shall not cause external surfaces to reach temperatures capable of igniting or discoloring dust on the enclosure or igniting dust-air mixtures in the surrounding area. Enclosures shall meet designed tests for dust, explosion, hydrostatic, temperature, and aging gaskets. Enclosure is equipped with provision to lockout in the off position with customer supplied lock.

### Disconnect Switch Configuration

Type:	Toggle	Motor Size:	2 hp	Voltage:	460	UL Listed:	Yes
Manufacturer:	Killark	Cycle:	60	Amperage:	30	CSA Approved:	Yes
Overload Protection:	None	Phase:	3	Switch Pole(s):	3	Rating:	5 hp
Mounting:	Mounted and Wired	RPM:	1725	Wiring (Exp. Resist.):	Division 1		

### Electrical Drawing Details

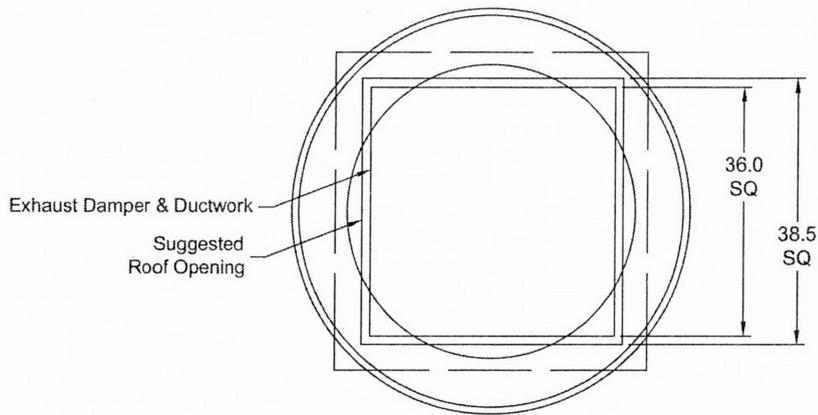
### Wiring Schematic



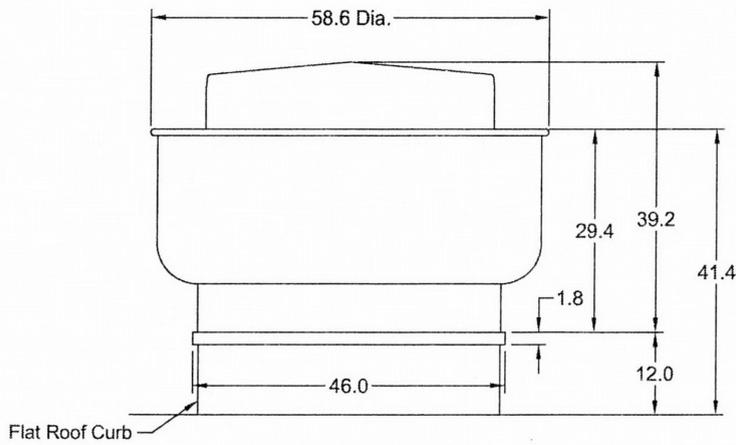
Notes: All dimensions shown are in units of in.

## Assembly Drawing

Type: Belt Drive Upblast Centrifugal Roof Exhaust Fan



TOP VIEW



FRONT VIEW

Notes: All dimensions shown are in units of in..

## Control Damper

Model: VCD-23

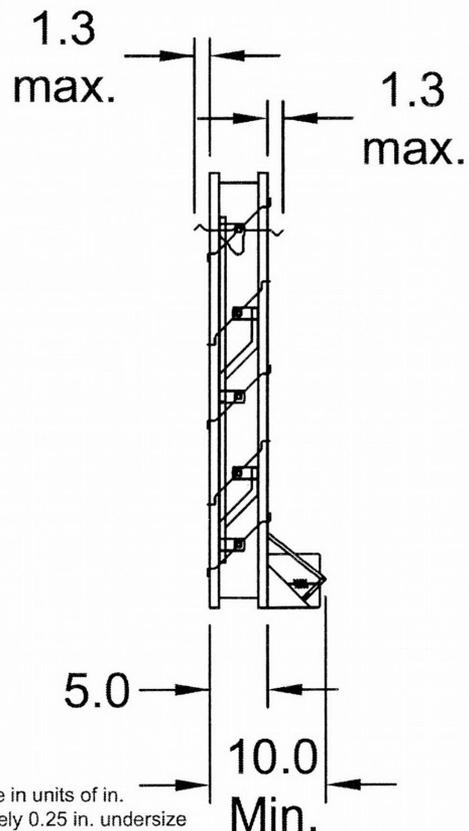
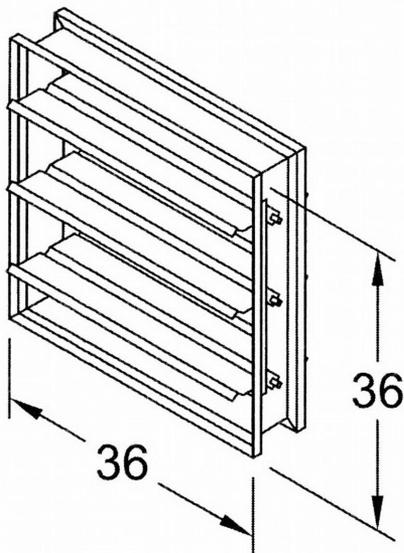
### Standard Construction Features:

- Model VCD-23 is a well built low leakage control damper for automatic control or manual balancing applications - Galvanized 16 ga channel frame - Galvanized blades with reinforcements - Side mounted steel linkage is concealed in the frame to prevent additional pressure drop - Axles are steel and 0.5 in. dia.- Synthetic axle bearings - Width and height furnished approximately 0.25 in. undersized - Field wiring is required to individual components

### Damper Configuration:

Actuator Type: 115 VAC-EXP

End Switch: No



Notes: All dimensions shown are in units of in.  
Width And height furnished approximately 0.25 in. undersize

## Roof Curb

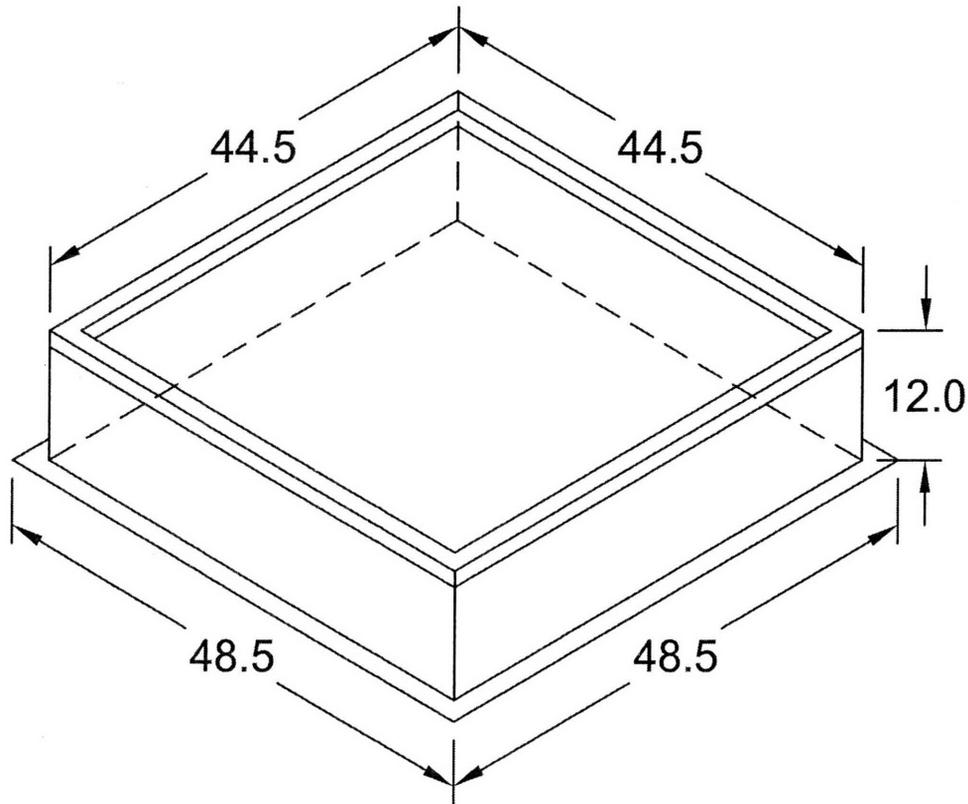
Model: GPI

### Standard Construction Features:

- Roof Curb fits between the building roof and the fan mounted directly to the roof support structure - Constructed of either 18 ga galvanized steel or 0.064 in. aluminum - Straight Sided without a cant - 2 in. mounting flange - 1 in. thick 3 lb density insulation - Height - Available from 8 in. to 42 in. as specified in 0.5 in. increments.

### Notes:

- The Maximum roof opening dimension should not be greater than the "Actual" top outside dimension minus 2 in..
- The minimum roof opening dimension should be at least 2.5 in. more than the damper dimension or recommended duct size.
- The Roof Opening Dimension may NOT be the Structural Opening Dimension.
- Damper Tray is optional and must be specified. Tray size is same as damper size.
- Security bars are optional and must be specified. Frames and gridwork are all 10 ga steel. Gridwork is welded to the frame and the frame is welded to the curb. To prevent corrosion, they are coated with Greenheck's high performance Permatector coating.



ISOMETRIC VIEW

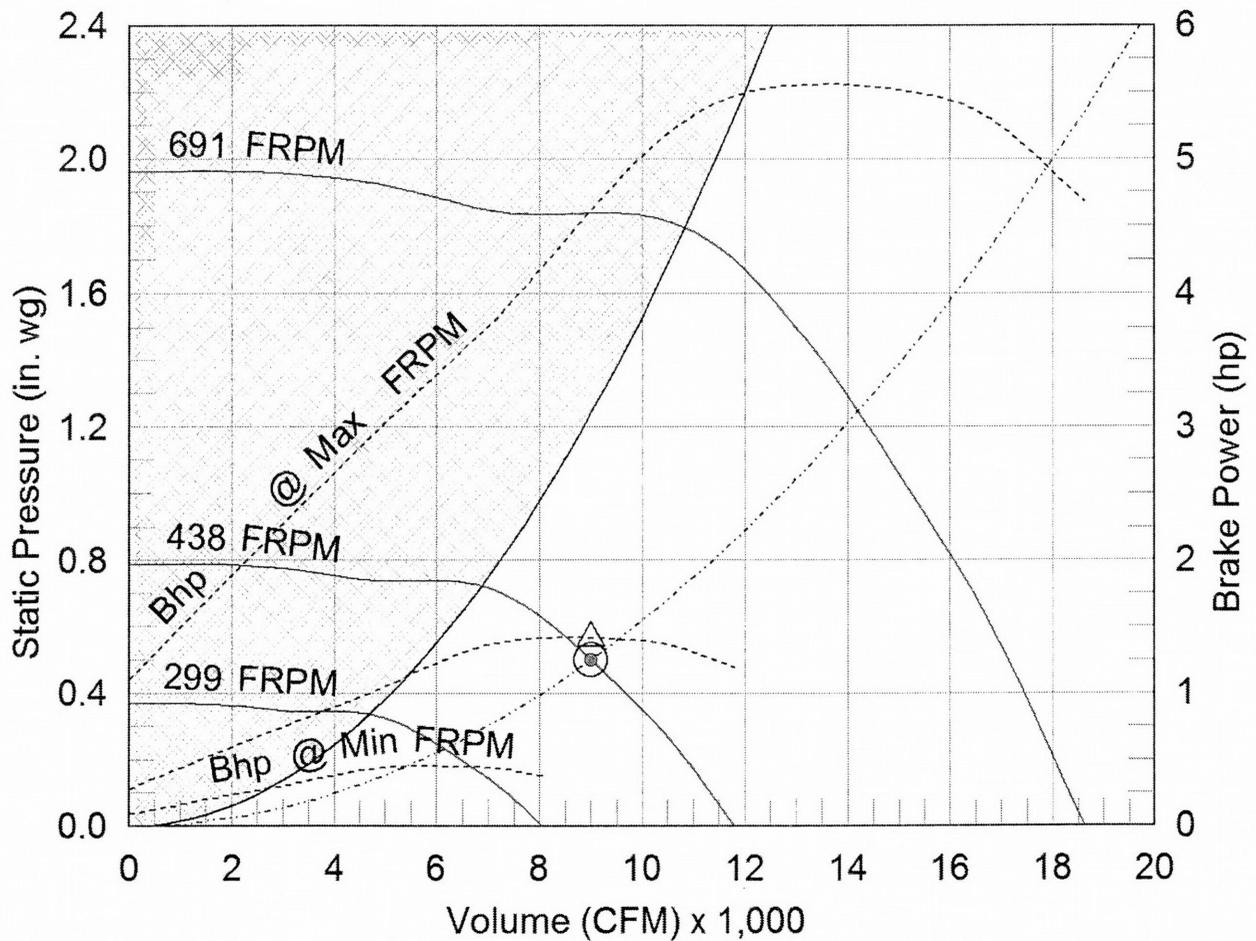
Notes: All dimensions shown are in units of in.

CUBE-360-20

Min/Max Fan Curve

Performance

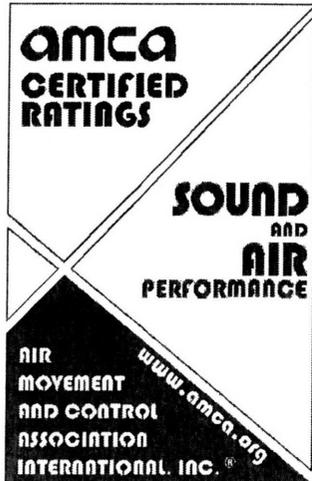
Requested Volume (CFM)	Actual Volume (CFM)	External SP (in. wg)	Total SP (in. wg)	Fan RPM	Operating Power (hp)
9,000	9,000	0.5	0.5	438	1.41



- △ Operating Bhp point
- Operating point at Total SP
- Operating point at External SP
- Fan curve
- - - System curve
- - - Brake horsepower curve

---

## AMCA



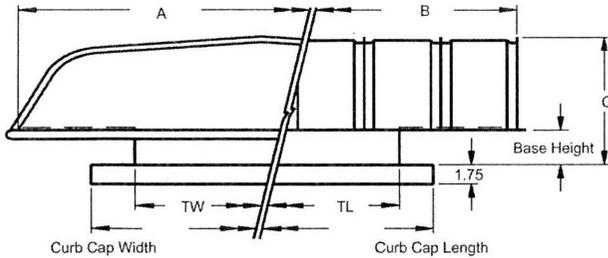
AMCA Licensed for Sound and Air Performance. Power rating (BHP/kW) includes transmission losses.

Greenheck Fan Corporation certifies that the model shown herein is 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. Performance certified is for installation type A: Free inlet, Free outlet. Power rating (BHP/kW) includes transmission losses. Performance ratings do not include the effects of appurtenances (accessories). The sound ratings shown are loudness values in fan sones at 5 ft. (1.5 m) in a hemispherical free field calculated per AMCA Standard 301. Values shown are for installation type A: free inlet hemispherical sone levels. dBA levels are not licensed by AMCA International. The AMCA Certified Ratings Seal applies to sone ratings only.

## FGI

### Hooded Gravity Intake

#### STANDARD CONSTRUCTION FEATURES



- Precision formed locked rib construction. • Available in aluminum or galvanized steel construction. • 0.5 in. galvanized steel mesh birdscreens. • Heavy gauge galvanized steel support members. • Hood can be removed completely from the base or hinged open.
- Units with a throat size exceeding 60 in. x 120 in. will have 12 in. galvanized bases as standard.
- Recommended roof opening dimension is at least 2.5 in. larger than the damper size.

#### SELECTED OPTIONS & ACCESSORIES

- Aluminum Birdscreen in lieu of Galvanized
- Aluminum Housing
- Curb GPI-G12
- Rubber Curb Cap Stripping

NOTE: All dimensions shown are in units of inches

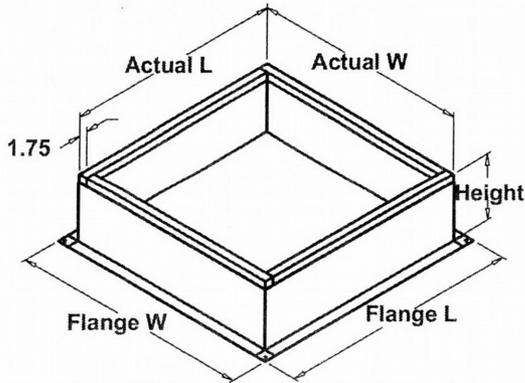
#### DIMENSIONS

ID #	Tag	Qty	"TW" Throat Width (in.)	"TL" Throat Length (in.)	A (in.)	B (in.)	C (in.)	Curb Cap Width (in.)	Curb Cap Length (in.)	Opt. Damper Width (in.)	Opt. Damper Length (in.)	Wt. (lb)	Base Height (in.)	Ship Assembled
3-1	RF-1, 2	2	36	36	65	60	19	42	42	36	36	75	5	Yes

#### PERFORMANCE

ID #	Tag	Qty	Volume (CFM)	SP (in. wg)	Throat Area (ft <sup>2</sup> )	Throat Velocity (ft/min)
3-1	RF-1, 2	2	9,000	0.132	9	1,000

## GPI Roof Curb



### STANDARD CONSTRUCTION FEATURES

- Welded Aluminum (0.064 in.) or galvanized (18 ga) construction
- Straight sided
- 2 in. roof mounting flange
- 1 in. 3# density insulation
- Wood nailer.

Roof Opening - The Maximum roof opening dimension should not be greater than the "Actual" top outside dimension minus 2 in.. With dampers, the Minimum roof opening dimension should be at least 2.5 in. more than the damper dimension.

**NOTES:**

\* The Roof Opening Dimension may NOT be the Structural Opening Dimension.

\* Maximum single piece shipping length is 76".

\* Security Bars are optional and must be specified. Frames and gridwork are all 10 ga steel. Gridwork is welded to the frame and the frame is welded to the curb. To prevent corrosion, they are coated with Greenheck's high performance Permator coating.

NOTES: All dimensions shown are in units of inches

Mark	Qty.	Cap W x L	Actual W x L	Flange W x L	Height	Damper Tray W x L
RF-1, 2 - 1	2	42 x 42	40.5 x 40.5	44.5 x 44.5	12	

---

Damper Drive Arrangements Job Summary -Start-

---

Drive Arrangement: Drive-CC-11-1FEL-0



---

Damper Drive Arrangements Job Summary -End-

---

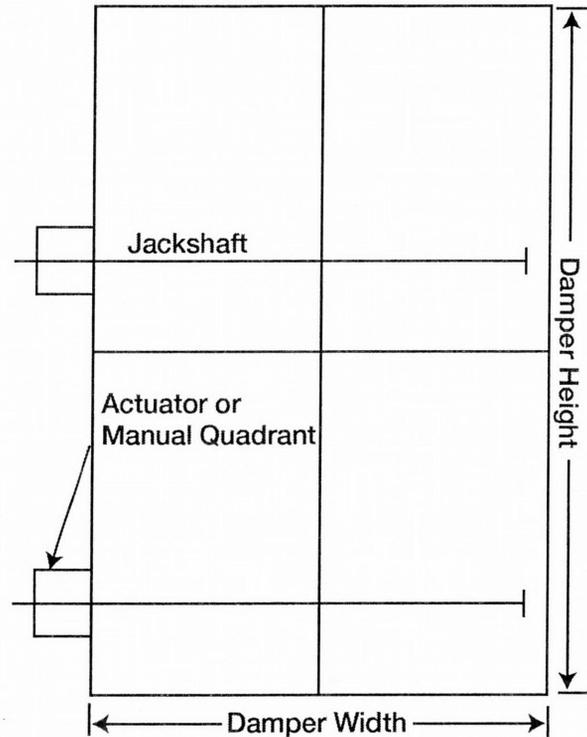
# Drive Arrangement Definition

On multi-blade dampers (except vertical blade and Face & Bypass), they are given a drive arrangement code that helps describe the construction of the damper. The following breaks down what each number and letter represents.

## 22-2FEL-2

① ② ③④ ⑤ ⑥ ⑦

- ① Number of sections wide
- ② Number of sections high
- ③ Number of actuators or manual quadrants
- ④ Who supplies the actuators or manual quadrants  
F - Factory  
C - Customer Supplied (field mounted)
- ⑤ Actuator or manual quadrant mounting  
E - External  
I - Internal  
B - Both internal and external
- ⑥ Actuator or manual quadrant location  
L - Left hand drive  
R - Right hand drive  
B - Both right and left
- ⑦ Number of jackshafts



On vertical blade and face & bypass dampers, they are given a configuration ID number that helps describe the construction of the damper. See the following examples:

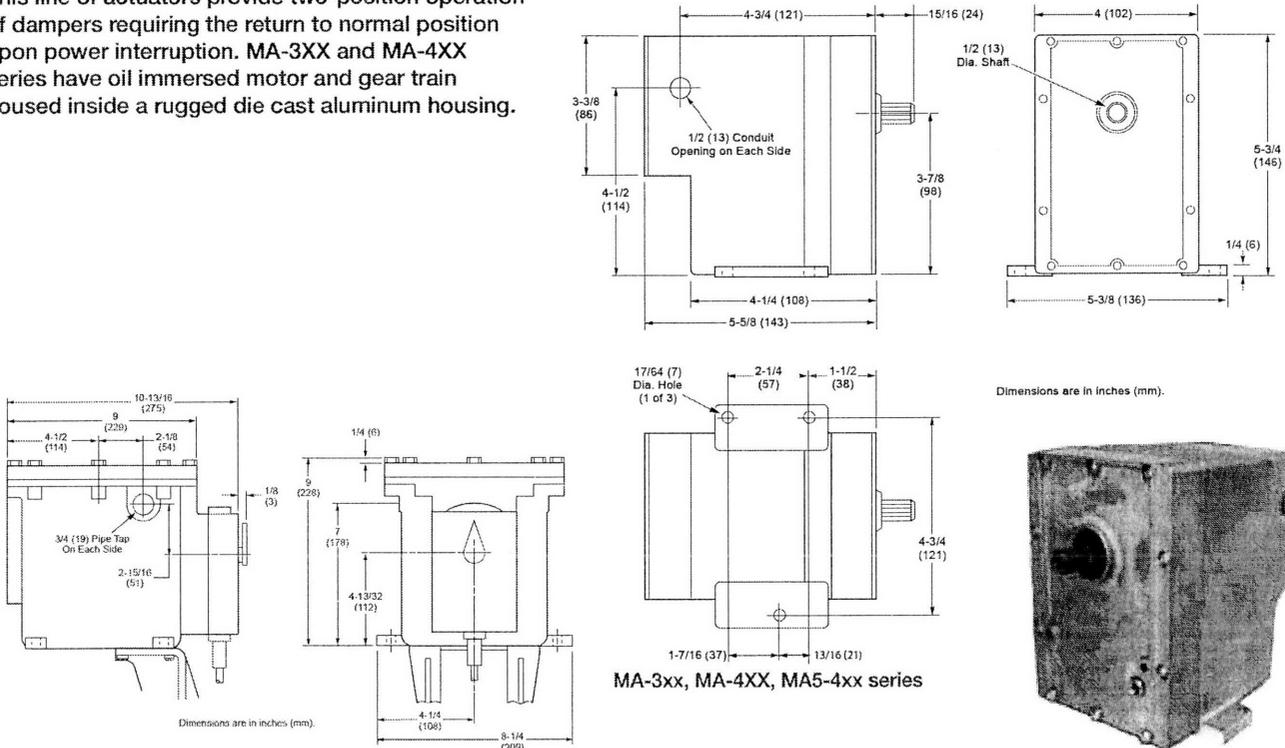
Model	Drive Arrangement Prefix
AMD-23, 33, 42	AMD
AMD-42V	VB
DFD-210, 230; DFDAF-310; DFDTF-210; SEDFD-210	MLS
FBH & FBV	FB
FSD, OFSD, CFSD, SMD, SEFSD, SSFSD, SESMD, SSSMD series (except vertical blade models)	MLS
FSD-311V, SMD-301V	VB
GFSD series	GFSD
ICD series	CC
IMO series	MLS
MBD-15 & VCD series (except vertical blade models)	CC
VCD-xxV (vertical blade models)	VB

# T.A.C. (Invensys) MA-3XX and MA-4XX Two Position Spring Return Damper Actuator

## Application

This line of actuators provide two-position operation of dampers requiring the return to normal position upon power interruption. MA-3XX and MA-4XX series have oil immersed motor and gear train housed inside a rugged die cast aluminum housing.

## DIMENSIONAL DATA



MA7-4XX-500 and MA6-4XX-500 series

TAC Model No.	Power Supply		Aux. <sup>a</sup> Switch	NEMA Rating	Input Watts	VA Running/ Holding	Rated Torque lb. - in. (N-m)	Shaft Rotation
	VAC	Hz						
MA-305	24	60	No	4	25	56/56	16 (1.8)	CW 180°
MA305-500			Yes					
MA-405	120		No	7		48/48		
MA-405-500			Yes					
MA6-405-500*	Yes							
MA-318	24		No	4	70 running 25 holding	92/32	60 (6.8)	CW 170°
MA-318-500			Yes					
MA6-318-500*	Yes		7					
MA-418	120		No	4				
MA-418-500			Yes	4				
MA6-418-500*	Yes	7						
MA-419	240	No	4					
MA-419-500		Yes	4					
MA6-419-500*	Yes	7						
MA7-419-500*	Yes	7						
MA5-419	240	50	No	4	120/39	60 (6.8)	CW 170°	
MA5-419-500			Yes	4				

<sup>a</sup> 2 FLA, 12 LRA at 24/120 Vac; 1 FLA, 6 LRA 2 240 Vac.

\* Models are supplied with factory enclosure/actuator assembly for hazardous locations.

Due to continuous product improvement, the actuator manufacturer reserves the right to change specifications without notice. For the most up-to-date information and maintenance, go to [www.us.tac.com](http://www.us.tac.com)

## Pressure Drop Data

## VCD-18, 23 & SEVCD-23

This pressure drop testing was conducted in accordance with AMCA Standard 500-D using the three configurations shown. All data has been corrected to represent standard air at a density of .075 lb/ft<sup>3</sup> (1.2 kg/m<sup>3</sup>).

Actual pressure drop found in any HVAC system is a combination of many factors. This pressure drop information along with an analysis of other system influences should be used to estimate actual pressure losses for a damper installed in a given HVAC system.

### AMCA Test Figures

**Figure 5.3** Illustrates a fully ducted damper. This configuration has the lowest pressure drop of the three test configurations because entrance and exit losses are minimized by straight duct runs upstream and downstream of the damper.

**Figure 5.2** Illustrates a ducted damper exhausting air into an open area. This configuration has a lower pressure drop than Figure 5.5 because entrance losses are minimized by a straight duct run upstream of the damper.

**Figure 5.5** Illustrates a plenum mounted damper. This configuration has the highest pressure drop because of extremely high entrance and exit losses due to the sudden changes of area in the system.

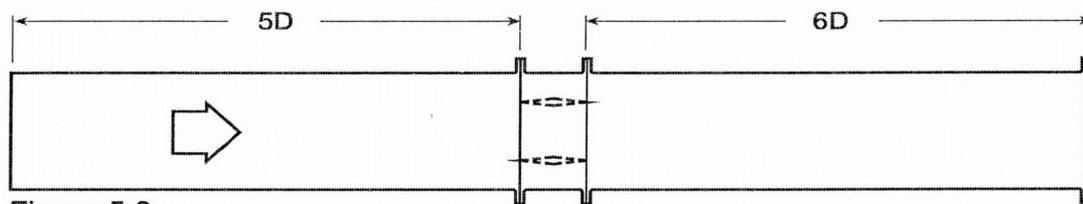


Figure 5.3

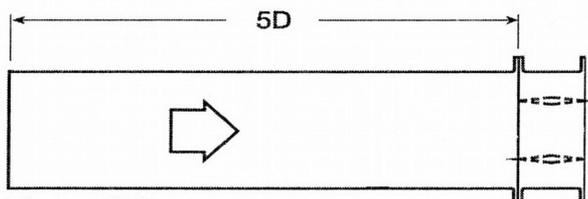


Figure 5.2

$$D = \sqrt{\frac{4(W)(H)}{3.14}}$$

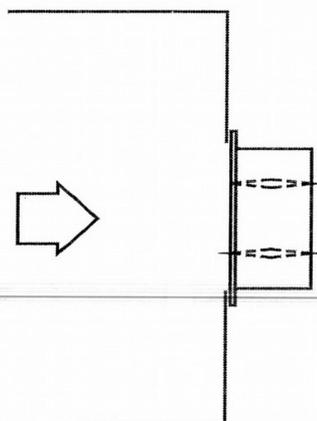


Figure 5.5

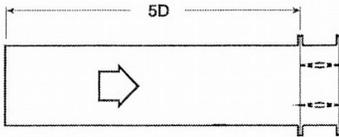
# AMCA Certified Pressure Drop Data

# VCD-18, 23 & SEVCD-23



Greenheck Fan Corporation certifies that the model VCD-18, 23 and SEVCD-23 shown herein is licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 511 and comply with the requirements of the AMCA Certified Ratings Programs. The AMCA Certified Ratings Seal applies to Air Leakage and Air Performance ratings.

## AMCA 5.2



12 in. x 12 in. (305mm x 305mm)

Velocity (fpm)	Pressure Drop (in. wg)
500	0.01
1000	0.05
1500	0.11
2000	0.19
2500	0.29
3000	0.41
3500	0.55
4000	0.72

24 in. x 24 in. (610mm x 610mm)

Velocity (fpm)	Pressure Drop (in. wg)
500	0.01
1000	0.03
1500	0.06
2000	0.10
2500	0.16
3000	0.23
3500	0.30
4000	0.40

36 in. x 36 in. (914mm x 914mm)

Velocity (fpm)	Pressure Drop (in. wg)
500	0.01
1000	0.02
1500	0.05
2000	0.09
2500	0.14
3000	0.19
3500	0.27
4000	0.35

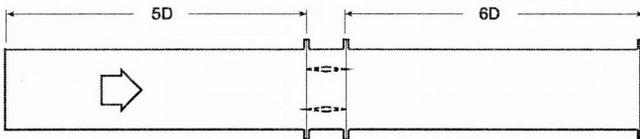
12 in. x 48 in. (305mm x 1219mm)

Velocity (fpm)	Pressure Drop (in. wg)
500	0.01
1000	0.04
1500	0.08
2000	0.15
2500	0.22
3000	0.32
3500	0.43
4000	0.56

48 in. x 12 in. (1219mm x 305mm)

Velocity (fpm)	Pressure Drop (in. wg)
500	0.01
1000	0.03
1500	0.07
2000	0.12
2500	0.16
3000	0.26
3500	0.36
4000	0.47

## AMCA 5.3



12 in. x 12 in. (305mm x 305mm)

Velocity (fpm)	Pressure Drop (in. wg)
500	0.01
1000	0.03
1500	0.08
2000	0.13
2500	0.20
3000	0.29
3500	0.40
4000	0.51

24 in. x 24 in. (610mm x 610mm)

Velocity (fpm)	Pressure Drop (in. wg)
500	0.01
1000	0.02
1500	0.04
2000	0.07
2500	0.11
3000	0.16
3500	0.21
4000	0.28

36 in. x 36 in. (914mm x 914mm)

Velocity (fpm)	Pressure Drop (in. wg)
500	0.01
1000	0.02
1500	0.03
2000	0.06
2500	0.09
3000	0.13
3500	0.19
4000	0.25

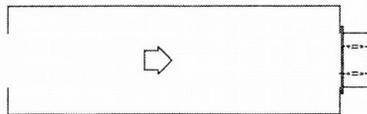
12 in. x 48 in. (305mm x 1219mm)

Velocity (fpm)	Pressure Drop (in. wg)
500	0.01
1000	0.03
1500	0.07
2000	0.12
2500	0.18
3000	0.26
3500	0.36
4000	0.46

48 in. x 12 in. (1219mm x 305mm)

Velocity (fpm)	Pressure Drop (in. wg)
500	0.01
1000	0.03
1500	0.06
2000	0.10
2500	0.16
3000	0.22
3500	0.30
4000	0.39

## AMCA 5.5



12 in. x 12 in. (305mm x 305mm)

Velocity (fpm)	Pressure Drop (in. wg)
500	0.03
1000	0.13
1500	0.30
2000	0.53
2500	0.82
3000	1.19
3500	1.62
4000	2.10

24 in. x 24 in. (610mm x 610mm)

Velocity (fpm)	Pressure Drop (in. wg)
500	0.03
1000	0.12
1500	0.26
2000	0.47
2500	0.75
3000	1.04
3500	1.41
4000	1.90

36 in. x 36 in. (914mm x 914mm)

Velocity (fpm)	Pressure Drop (in. wg)
500	0.02
1000	0.10
1500	0.22
2000	0.40
2500	0.62
3000	0.90
3500	1.23
4000	1.62

12 in. x 48 in. (305mm x 1219mm)

Velocity (fpm)	Pressure Drop (in. wg)
500	0.03
1000	0.12
1500	0.27
2000	0.47
2500	0.75
3000	1.07
3500	1.45
4000	1.91

48 in. x 12 in. (1219mm x 305mm)

Velocity (fpm)	Pressure Drop (in. wg)
500	0.03
1000	0.12
1500	0.28
2000	0.49
2500	0.77
3000	1.12
3500	1.53
4000	2.01

## AMCA Certified Leakage Data

## VCD-18, 23 & SEVCD-23

Air leakage is based on operation between 32°F (0°C) and 120°F (49°C).

Tested for leakage in accordance with ANSI/AMCA Standard 500-D, Figure 5.5.

Tested for air performance in accordance with ANSI/AMCA Standard 500-D, Figures 5.2, 5.3 and 5.5.

### Torque

Data are based on a torque of 5.0 in.lb./ft<sup>2</sup> (0.56 N·m) applied to close and seat the damper during the test.

VCD-18, 23 SEVCD-23	Leakage Class*	
Maximum Damper Width	1 in. wg (0.25 kPa)	4 in. wg (1 kPa)
48 in. (1219mm)	1A	1



Greenheck Fan Corporation certifies that the model VCD-18, 23 and SEVCD-23 shown herein is licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 511 and comply with the requirements of the AMCA Certified Ratings Programs. The AMCA Certified Ratings Seal applies to Air Leakage and Air Performance ratings.

### \*Leakage Class Definitions

The *maximum* allowable leakage is defined by AMCA as the following:

- Leakage Class 1A - 3 cfm/ft<sup>2</sup> @ 1 in. wg (class 1A is only defined at 1 in. wg).
- Leakage Class 1
  - 4 cfm/ft<sup>2</sup> @ 1 in. wg
  - 8 cfm/ft<sup>2</sup> @ 4 in. wg
  - 11 cfm/ft<sup>2</sup> @ 8 in. wg
  - 12.6 cfm/ft<sup>2</sup> @ 10 in. wg