

Fans & Blowers

# Twin City

Turning Air Into Solutions.



## AXIFAN® VANEAXIAL FANS

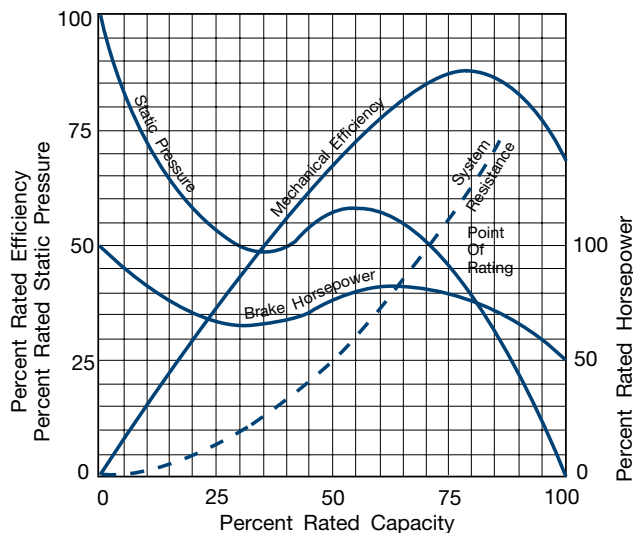
MODEL TCVA

# Vaneaxial Fans



AXIFAN Cast Aluminum Wheel

## Typical Performance/System Curve For Direct Drive TCVA AXIFAN®



Twin City Fan & Blower certifies that the model TCVA AXIFANS® 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 comply with the requirements of the AMCA Certified Ratings Program.

## Model TCVA

The heart of the TCVA AXIFAN® fan lies in its wheel. Cast of high strength aluminum alloy, the one-piece TCVA AXIFAN® wheel has been developed to maximize the highest efficiency possible. Attention to detail in blade and hub design have created what is felt to be the most efficient and reliable axial fan on the market today. With the wide range of hub-to-tip ratios available, there is a TCVA AXIFAN® to meet any air movement requirements.

### Hub-To-Tip Ratio

The multitude of TCVA AXIFAN® wheels evolves from nine basic castings. Each casting is machined and cut to the proper diameter. By cutting the same model casting to one of several different diameters, different hub-to-tip ratios are created. Since each hub ratio has slightly different pressure/efficiency characteristics, the freedom of having several wheels (different hub ratios) for a set diameter provides the opportunity to maximize efficiency at the required point of rating.

### Housing

TCVA AXIFAN® housings are one-piece, heavy-gauge, hot-rolled steel construction. Flanges on both the inlet and outlet are integrally rolled and punched for attachment to ductwork or accessories as necessary. The sheet seam is continuously welded and ground smooth to assure efficient airflow through the housing. On Arrangement 4 direct drive units neither the wheel nor the motor protrudes beyond the housing, allowing for an easy mount into existing ductwork.

### Guide Vanes

The fan housing is fitted with aerodynamically designed stationary straightening guide vanes on the air discharge side of the wheel. The guide vanes are welded to both the inner cylinder and the fan housing interior and function to aid in the elimination of swirl and turbulence downstream of the fan thereby recovering rotational energy losses, improving efficiency and static pressure capability, and reducing fan noise generation.

### Sizes

12" to 60" inch wheel diameters

### Performance

Airflow to 103,000 CFM  
Static pressure to 7" w.g.



Model TCVA is available with the UL/cUL 705 listing for electrical, File No. E158680.

## Arrangement 9 Belt Driven

For applications that require the motor to be out of the airstream or the versatility of a belt driven fan, the Arrangement 9 TCVA AXIFAN® is the perfect choice. Driven through either a fixed or adjustable V-belt drive system, the exact point of rating can be achieved. Any future change in rating can be accomplished through a simple sheave change. Good for operation up to 200°F as standard, the Arrangement 9 TCVA AXIFAN® can be customized to handle even the most severe of conditions. Performance tables for belt driven TCVA AXIFAN® units are located on pages 10 through 18. Selection examples are found on page 8.

### Shaft and Bearings/Inner Cylinder

Shafts for belt driven TCVA AXIFAN® units are ground and polished steel construction machined to a suitable diameter to allow the rotating assembly to operate well below the first critical speed.

Bearings are flange mounted ball or roller type selected for a minimum average life of 200,000 hours. Bearing life is determined in accordance with standards set forth by AFBMA (Anti-Friction Bearing Manufacturers Association). All bearings are provided with extended lubrication lines terminating at the housing exterior.

The complete shaft and bearing assembly is mounted within the inner cylinder, safely isolating these components from the high velocity airstream.

### Belt Fairing

The V-belt drive assembly is extended through a two-piece belt fairing. The belt fairing is an aerodynamically designed tube, welded continuously to both the inner cylinder (bearing housing) and the fan housing, thus protecting the V-belts from the direct blast of the airstream.

### Motor

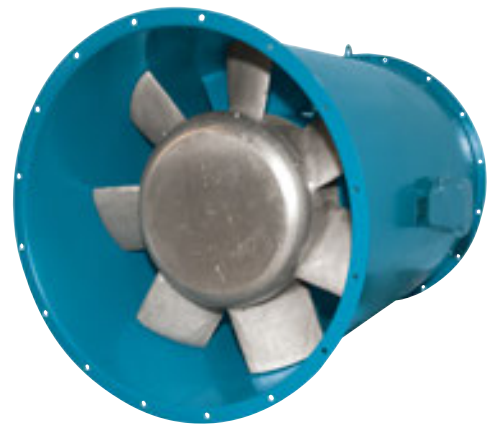
Motors for TCVA AXIFAN® Arrangement 9 fans are standard foot-mounted NEMA design. All of the various enclosures (open drip-proof, totally enclosed, explosion proof, etc.) can be accommodated through the use of an adjustable motor base. This motor mounting platform pivots at several locations to offer infinite adjustment for belt tension.

## Arrangement 4 Direct Drive

Where space constraints require the use of a complete “in line” fan or the desire is for a simple, dependable fan with minimum maintenance requirements, the direct drive Arrangement 4 TCVA AXIFAN® is the logical choice. Constructed with the fan wheel mounted directly on the motor shaft, this fan provides premium efficiency with minimal obstructions in the airstream. Performance tables for direct drive TCVA AXIFAN® units are located on pages 19 and 20.



TCVA Arr. 9



TCVA Arr. 4

### Motor

Motors for TCVA AXIFAN® direct drive fans are foot-mounted, NEMA standard, totally enclosed fan cooled (TEFC), continuous duty, ball bearing type with Class “F” insulation and of cast iron construction when commercially available. Motors which are equipped with grease lubricated bearings have extended lube lines to the housing exterior. For ease of wiring the motor, wiring connections are extended to an external conduit box mounted on the fan exterior. The fan housing exterior has a duplicate motor nameplate mounted adjacent to the fan nameplate.



# Accessories



Inlet Bell



Inlet/Outlet Cones



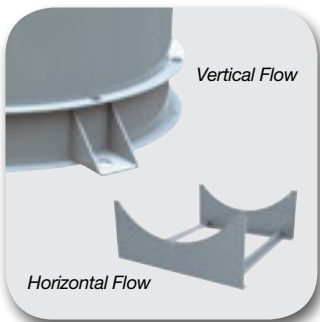
Companion Flanges



Variable Inlet Vanes



Sound Attenuation



Support Legs



Suspension Clips



Vibration Isolation

## Inlet Bell

For systems with no ductwork on the fan inlet, it is advantageous to install an inlet bell to avoid inlet losses. The inlet bell is a toroidal shape to provide a smooth entrance to the fan. Inlet bells are flanged, drilled, and bolted to the fan's flanged inlet.

## Inlet/Outlet Cones

Transition pieces, called cones, can be provided for both the inlet and outlet. Cones are flanged on both ends and drilled to match the fan's flange. Cones are available with an access door if required.

Outlet cones can be utilized to provide static pressure regain, transforming velocity pressure losses into static pressure. A greater discussion of this is provided on page 7.

## Companion Flanges

For ease of installation to adjacent ductwork, companion flanges can be provided. Flanges are rolled angle rings, drilled to match the fan's inlet or outlet flange.

## Variable Inlet Vanes

For frequent or continuous volume control, variable inlet vanes can be provided. Variable inlet vanes are available for each specific fan size and are bolted to the fan's flanged inlet. The vane action during dampening works to spin the air in the direction of the wheel rotation thus resulting in lower power consumption. The vane operator mechanism is outside of the airstream and is controlled by a single lever.

Variable inlet vanes can be set up for manual or automatic operation. The variable inlet vane's inlet is flanged and drilled to accept ductwork or an inlet bell as the system requires.

## Sound Attenuation

For applications requiring quiet operation, custom built attenuation packages can be provided on the fan inlet or outlet. Attenuators are aerodynamically and acoustically matched to the specific system requirements and are designed to significantly reduce noise while adding only minor resistance to airflow.

## Support Legs

**Horizontal Flow** — For horizontal flow with floor mounting, support legs are welded to the fan flange with bolt holes aligned for connection of ductwork.

**Vertical Flow** — For vertical flow with either floor or ceiling mounting, support legs are welded to the fan housing for four-point support.

## Suspension Clips

For horizontal flow with ceiling mounting, clips of formed angle are welded to the fan housing for suspension via tie rods to the ceiling support structure.

## Vibration Isolation

All TCVA AXIFAN® fans can be provided with spring or rubber-in-shear isolators as an option. Spring isolators are standard 1-inch in deflection and can be provided for floor mount or ceiling (hung) orientation. It should be noted that use of a loosely fitting flex connector on the fan inlet must be avoided as inlet obstructions and loss of rating may occur.

## Belt Guard

Available for Arrangement 9 belt driven fans, the belt guard encloses the motor sheave and V-belts. The guard is easily removable for inspection and maintenance.

## Weather Cover

For outdoor installations with Arrangement 9 belt driven fans, the weather cover completely encloses the motor and V-belt drive from the elements. Provided with slots for ventilation, the cover is easily removable for inspection and maintenance. Weather covers are available for either horizontal or vertical flow fans.

## Screening

Safety screening can be provided for installation to the fan inlet, fan outlet, cone or bell.

## Clamshell Construction

Clamshell construction provides complete accessibility to the internal components of the fan. A further description is available on page 6.

## Shaft Seal

To limit the air entering the inner cylinder and avoid contact of airstream contaminants with the bearing and V-belt drive, a shaft seal can be provided. The shaft seal consists of a non-asbestos rubbing ring at the wheel end of the inner cylinder held in place by a cover plate. Please note that a shaft seal does not make the inner cylinder gas-tight.

## Housing Door

**General Observation** — For inspection and maintenance of the internal section (V-belt drive area) of TCVA AXIFAN® units a general observation access door can be provided. Doors are 5" x 5" for fans sizes 12" to 18" and 8" x 8" for all others. Doors are gasketed, single skinned and bolted in place to the housing exterior. As standard, doors are located adjacent to the motor base (for belt driven fans) or adjacent to the motor conduit box (for direct drive).

**Wheel Area** — Similar in size and attachment to the general observation access door, a wheel area access door is also available. Wheel area doors differ from general observation doors in that they are double skinned to maintain a flush surface to the housing interior, thus eliminating the pressure losses resulting from a single skinned door in this critical pressure developing area.

## Spark-Resistant Construction

Belt driven TCVA AXIFAN® units are available with spark-resistant construction. Various grades of spark resistance are as dictated by AMCA, Types A, B, and C.

## Discharge Cap

All TCVA AXIFAN® units can be provided with a discharge cap for rooftop mounting. Discharge caps are designed for vertical discharge with a backdraft damper to seal out the weather when the fan is shut off. See minimum CFM requirements on page 9.

## Curb Cap

TCVA AXIFAN® units can be supplied with a base (curb cap), to attach to the fan flange for curb mounting. The combination of a curb cap and discharge cap creates an upblast style, power roof ventilator (see page 6 for further explanation).



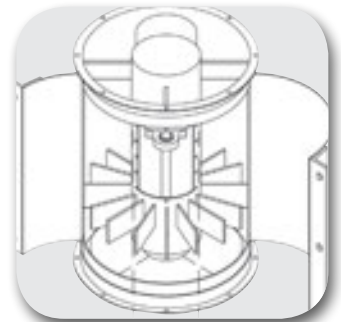
Belt Guard



Weather Cover



Screening



Clamshell Construction



Shaft Seal



Housing Door



Discharge Cap



Curb Cap

# Applications



Ventilation



Industrial Process



Upblast Style Power  
Roof Ventilator



Clamshell

## Ventilation

Whether duct mounted or provided with an inlet bell for open inlets, the TCVA AXIFAN® is the logical choice for almost any ventilating system. Available as either a supply or return fan, the magnitude of fan/wheel combinations to choose from insures the user of a high efficient, economical, quiet, long-running fan.

## Industrial Process

Designed for rugged industrial service, the TCVA AXIFAN® is an ideal component for most industrial air systems. The heavy duty housing construction and large diameter shaft/bearing combinations can handle the toughest of airstreams.

## Upblast Style Power Roof Ventilator

Fitted with a discharge cap, curb cap, and a weather cover, the TCVA AXIFAN® makes an ideal upblast style power roof ventilator. The broad band high efficiency range makes this fan ideal for installation both with and without ductwork attached.

## Clamshell

For tough industrial systems requiring frequent cleaning and maintenance with a minimal degree of downtime, the clamshell construction TCVA AXIFAN® is the right fan for the job. Manufactured with two large doors running the full length of the fan housing and opening 180°, the clamshell fan unit provides complete accessibility to the shaft, bearings, V-belt drive and wheel assembly, all without removal of any ductwork.

Fans & Blowers  
**Twin City**

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## The Fan Rating

A fan's point of rating is the intersection of the independent system resistance curve and the fan's characteristic performance curve (refer to page 2 for a typical performance/system curve).

The resistance of the system is determined from the airflow requirements and the ductwork elements through which this airflow must pass. This ductwork creates resistance to flow and is measured in terms of pressure.

The total resistance for a system is the sum of the "total system resistances" at the specified flow rate (CFM) for each of the elements found in the system. This value is the total pressure for which a fan is selected.

## The Total Pressure Concept

Fans are utilized to develop the total pressure required to produce the specified flow rate within a system. Total pressure can be separated into the components of static pressure (analogous to the potential energy of the airstream) and velocity pressure (analogous to the kinetic energy of the airstream) at any point within the system; where total pressure is equal to the sum of the static pressure and velocity pressure (refer to formulas on page 8).

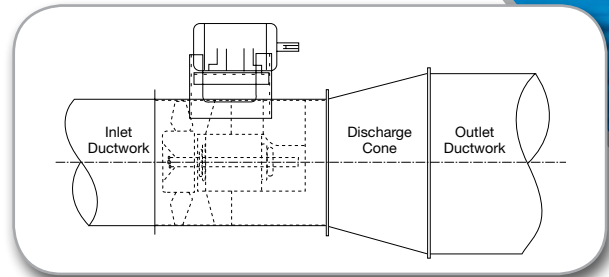
It is a common industry practice to specify a system resistance in terms of static pressure. This system static pressure value is obtained by subtracting the velocity pressure from the system total pressure.

This velocity pressure is calculated based on the velocity of the specified airflow at the designated cross-sectional area.

TCVA AXIFAN® ratings are established from tests with the data corrected to the cross-sectional area of the fan outlet. It is important to note that to maintain accuracy the specified system static pressure should be calculated at the same cross-sectional area as that of the fan outlet.

If the system does not have a cross-sectional area the same as the fan outlet, the true static pressure capability of the fan will be greater or less than the cataloged rating. This is due to a portion of the velocity pressure being converted to (or from) static pressure, with the total pressure remaining constant.

Due to industry preferences, TCVA AXIFAN® ratings are displayed in this catalog in static pressure (at the fan outlet area) only. In order to properly rate axial flow fans on a static pressure basis, the system cross-sectional area must be considered and the total pressure concept should be used.



## Use of an Outlet Cone

As displayed above, fan outlet cones can be utilized to transition an axial fan to ductwork with a diameter larger than that of the fan. A cone of this type allows the velocity of the airstream at the fan outlet to that of the cone outlet, thus converting or regaining much of the velocity pressure to static pressure. This velocity pressure is said to be static pressure regained. The advantage of using an outlet cone is that a system that requires 1.5" of static pressure to overcome the duct friction losses may be able to use a fan supplying 1.25" static pressure at the fan outlet with the additional 0.25" being produced by the static pressure regain.

When a cone is used, the static pressure regain is defined as the increase in static pressure developed from the conversion of velocity pressure at the cone outlet minus the velocity pressure at the fan outlet.

$$SP \text{ regain (ideal)} = VP \text{ fan} - VP \text{ cone}$$

Although several quick rules of thumb are available to estimate this amount, upon final selection the actual SP regain for the specific fan size must be calculated and deducted from the rated static pressure.

The same principles can be used to adapt a fan outlet to any cone diameter larger or smaller. Given the same principles, additional velocity pressure can be imparted to a system by using a smaller diameter cone.

Please note that this simplified explanation does not take into account any inherent ductwork or energy conversion losses. It should be further noted that static pressure regain calculations are approximate and are not part of the AMCA certified ratings program.

The cone dimensions shown below are for the Twin City Fan & Blower standard cones which are the equivalent of the next fan size larger with an angle of divergence of 10 degrees. To aid in the calculation of SP regain this chart displays inside dimensions and outlet areas for TCVA AXIFAN® units and the Twin City Fan & Blower standard cone.

### Outlet Cone Dimensions

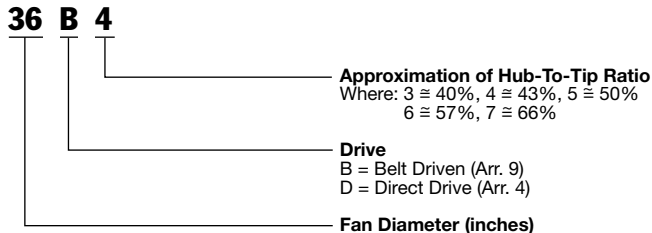
FAN SIZE	12	15	18	21	24	28	32	36	42	48	54	60
FAN I.D. (in.)	12.16	15.16	18.16	21.19	24.19	28.25	32.25	36.25	42.38	48.38	54.38	60.38
CONE I.D. (in.)	15.16	18.16	21.19	24.19	28.25	32.25	36.25	42.38	48.38	54.38	60.38	66.44
FAN AREA (ft²)	0.807	1.253	1.799	2.448	3.191	4.353	5.672	7.166	9.793	12.76	16.12	19.87
CONE AREA (ft²)	1.253	1.799	2.448	3.191	4.353	5.672	7.166	9.793	12.76	16.12	19.87	24.08



# FanSelection

## Model Nomenclature

TCVA AXIFAN® model numbers are represented as follows. Refer to page 2 for an explanation of hub-to-tip ratios.



## Useful Formulas

Total Pressure (TP) =  
Static Pressure (SP) + Velocity Pressure (VP)

$$\text{Velocity (Vel.)} = \frac{\text{CFM}}{\text{Area in ft}^2}$$

$$\text{Velocity Pressure (VP)} = \left( \frac{\text{Vel.}}{1096.7} \right)^2 \times \text{Density in lb/ft}^3$$

$$\text{Efficiency} = \frac{\text{CFM} \times \text{Pressure (in. w.g.)}}{6356 \times \text{Brake Horsepower}}$$

Where total (or mechanical) efficiency is calculated using total pressure and static efficiency is calculated using static pressure.

## Performance Tables

Performance tables in this catalog are based on standard air density which is defined by AMCA as that of dry air at 70°F and sea level pressure (29.92 inches of mercury). This is equal to a density value of 0.075 lb/ft<sup>3</sup>.

When required performance is at other than standard conditions, the values must be converted to equivalent standard values before the fan can be selected from the performance tables, and then reconverted back to the actual conditions after the specific selection is made. The table of temperature and altitude density ratios on page 9 should be used for this purpose with example 2 below displaying this procedure.

## Sample Selections

The following examples illustrate conditions that may be encountered with TCVA AXIFAN® units. For additional performance corrections refer to the Twin City Fan & Blower Fan Selector Program.

**Example 1:** Select the most efficient Arr. 9 TCVA AXIFAN® for 10,000 CFM @ 1.5" SP at standard conditions (0.075 lb/ft<sup>3</sup> density). The performance tables direct us to the 32" fan size. Turning to page 15 for specifics on the 32" fan size we find there are four different hub-to-tip ratios to choose from: 32B4, 32B5, 32B6, 32B7. We compare each performance of the four hub-to-tip ratios to determine the most efficient (lowest horsepower) selection. Consequently, our fan selection is 32B6 @ 1047 RPM @ 3.56 BHP. The static efficiency is 66.2%.

**Example 2:** Select an Arr. 9 TCVA AXIFAN® for 10,000 CFM @ 1.5" @ 150°F and 10,000 ft elevation. Using the "Temperature & Altitude Density Ratio" chart on page 9, we find a factor of 0.598. Divide the operating static pressure by this factor (1.5 ÷ 0.598) = 2.5" SP equivalent static at standard air and density. The performance tables direct us to the 28" fan size. Turning to page 14 for specifics we find four hub-to-tip ratios. Comparing each we select the 28B6 as the most efficient selection at 1542 RPM and 5.92 BHP.

This is the brake horsepower required at standard air density (often referred to as cold, or starting horsepower). However, actual BHP at the operating conditions of 150°F and 10,000 ft altitude will be 5.92 x 0.598 = 3.54.

Selection: 28B6 @ 1542 RPM @ 3.54 BHP.

**Example 3:** If the operating density is known, this same air density ratio can be calculated by:  
Operating density ÷ 0.075 = Factor

This factor is then used as in Example 2.

**Example 4:** Select the most economic Arr. 9 TCVA AXIFAN® for 10,000 CFM @ 1.5" SP at standard conditions (0.075 lb/ft<sup>3</sup> density). In evaluating first cost it should be noted that fan versus fan, the smaller the hub ratio the less the cost of a fan. For example, a Model 36B4 is less expensive than a 36B5, a 36B5 is less expensive than a 36B6, and so on. With this in mind, we start with our premium efficient selection (32B6) and compare with the smallest hub ratio for each diameter smaller.

Fan Size	RPM	BHP
32B6	1047	3.56
28B4	1519	3.72
24B4	2045	4.33
21B4	2859	5.36

An educated review can now be made based on first cost (including cone cost if applicable), power consumption, space allotment, tip speed, outlet velocity, and of course, total pressure considerations.



### Temperature & Altitude Density Ratios

AIR TEMP. °F	ALTITUDE IN FEET ABOVE SEA LEVEL												
	0	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000	15000	20000
	BAROMETRIC PRESSURE IN INCHES OF MERCURY												
	29.92	28.86	27.82	26.82	25.84	24.90	23.98	23.09	22.22	21.39	20.58	16.89	13.75
70	1.000	0.964	0.930	0.896	0.864	0.832	0.801	0.772	0.743	0.714	0.688	0.564	0.460
100	0.946	0.912	0.880	0.848	0.818	0.787	0.758	0.730	0.703	0.676	0.651	0.534	0.435
150	0.869	0.838	0.808	0.770	0.751	0.723	0.696	0.670	0.646	0.620	0.598	0.490	0.400
200	0.803	0.774	0.747	0.720	0.694	0.668	0.643	0.200	0.596	0.573	0.552	0.453	0.369
250	0.747	0.720	0.694	0.669	0.645	0.622	0.598	0.576	0.555	0.533	0.514	0.421	0.344

### Bare Fan Weights (lb)

FAN SIZE	ARR. 9
12B6	61
12B7	79
15B5	79
15B6	98
15B7	121
18B4	93
18B5	112
18B6	135
18B7	158
21B4	128
21B5	150
21B6	173
21B7	224
24B4	195
24B5	218
24B6	269
24B7	335
28B4	254
28B5	305
28B6	370
28B7	444

FAN SIZE	ARR. 9
32B4	346
32B5	412
32B6	485
32B7	646
36B4	461
36B5	534
36B6	695
36B7	875
42B4	728
42B5	889
42B6	1068
48B4	1007
48B5	1186
54B3	1092
54B4	1272
60B3	1357

FAN SIZE	ARR. 4
12D7	65
15D6	86
15D7	97
18D5	103
18D6	115
18D7	130
21D4	133
21D5	137
21D6	149
21D7	176
24D4	173
24D5	193
24D6	215
24D7	261
28D4	227
28D5	260
28D6	300
28D7	347

FAN SIZE	ARR. 4
32D4	298
32D5	343
32D6	391
32D7	493
36D4	391
36D5	438
36D6	541
36D7	670
42D4	619
42D5	722
42D6	851
48D4	841
48D5	970
54D3	930
54D4	1056
60D3	1132

### Housing Gauges

SIZE	HOUSING GAUGE
12	14
15	12
18	12
21	12
24	10
28	10
32	10
36	10
42	7
48	7
54	7
60	7

### Accessory Weights (lb)

FAN SIZE	BELT GUARD	WEATHER COVER	INLET/ OUTLET SCREEN	INLET BELL	INLET/ OUTLET CONE	COMPANION FLANGE	SUPPORT LEGS		VARIABLE INLET VANES	DIS-CHARGE CAP	CURB CAP
							HORIZ. FLOW	VERT. FLOW			
12	4	7	3	8	9	5	10	10	42	30	15
15	6	11	3	10	11	8	12	10	45	40	16
18	8	18	4	12	16	10	12	10	60	55	17
21	10	21	5	13	21	11	20	10	62	65	23
24	11	23	7	20	30	13	24	17	68	78	26
28	12	26	8	22	40	15	32	17	71	98	34
32	14	32	10	25	54	17	47	17	80	120	45
36	16	34	11	52	82	19	58	17	89	165	51
42	18	40	13	62	100	25	83	19	98	230	64
48	21	45	18	70	114	33	97	19	107	288	72
54	25	56	24	76	128	37	126	26	116	384	82
60	30	68	33	86	139	41	265	26	134	400	133

### Motor Weights (lb)

FRAME	48	56	143T	145T	182T	184T	213T	215T	254T
ODP	7	11	33	44	71	82	124	144	185
TE	9	14	40	53	85	98	149	173	222

FRAME	256T	284T	286T	324T	326T	364T	365T	404T	405T
ODP	214	266	310	404	452	620	680	869	938
TE	257	319	372	485	542	744	816	1043	1126

### Discharge Cap Limits

SIZE	MINIMUM CFM TO OPEN		MAXIMUM CFM
	STAINLESS	ALUMINUM	
12	1390	1065	2450
15	1885	1440	3320
18	3130	2395	5525
21	4190	3205	7390
24	5455	4170	9625
28	8520	6515	15035
32	9779	7480	17506
36	12525	9580	22100
42	16850	12885	29730
48	21950	16765	38690
54	27670	21160	48825
60	34880	26050	60140

## TCVA | Size 12B6

Wheel Dia.: 12"

Tip Speed: 3.14 x RPM

Outlet Area: 0.807 ft<sup>2</sup>

Fan Efficiency Grade: FEG71

CFM	OV	0.25" SP		0.5" SP		0.75" SP		1" SP		1.25" SP		1.5" SP		1.75" SP		2" SP		2.5" SP		3" SP		3.5" SP	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
900	1115	1517	0.09	1743	0.14	1957	0.19																
1000	1239	1635	0.10	1844	0.16	2041	0.22	2232	0.29														
1200	1487	1884	0.15	2062	0.22	2233	0.28	2397	0.36	2558	0.43	2718	0.52										
1400	1735	2144	0.22	2295	0.29	2448	0.37	2593	0.44	2734	0.53	2875	0.61	3010	0.70	3147	0.80						
1600	1983	2411	0.31	2541	0.38	2675	0.46	2808	0.55	2936	0.64	3059	0.74	3182	0.83	3305	0.93	3542	1.14				
1800	2230	2682	0.42	2797	0.50	2914	0.58	3033	0.68	3152	0.78	3266	0.88	3377	0.99	3486	1.09	3705	1.31	3915	1.55		
2000	2478	2956	0.56	3059	0.64	3163	0.73	3270	0.83	3377	0.94	3484	1.05	3588	1.17	3689	1.28	3885	1.51	4083	1.76	4273	2.01
2200	2726	3232	0.72	3326	0.81	3420	0.91	3515	1.01	3612	1.13	3710	1.25	3807	1.37	3903	1.50	4086	1.74	4265	2.00	4444	2.26
2400	2974	3509	0.92	3595	1.02	3681	1.12	3768	1.23	3856	1.35	3945	1.47	4035	1.60	4124	1.73	4299	2.01	4466	2.28	4630	2.55
2600	3222	3788	1.15	3867	1.26	3947	1.37	4027	1.48	4107	1.60	4188	1.73	4270	1.86	4353	2.00	4518	2.30	4678	2.59	4832	2.88
2800	3470	4067	1.42	4141	1.53	4215	1.65	4289	1.77	4363	1.90	4438	2.03	4513	2.16	4590	2.31	4743	2.61	4896	2.93	5044	3.25

## TCVA | Size 12B7

Wheel Dia.: 12"

Tip Speed: 3.14 x RPM

Outlet Area: 0.807 ft<sup>2</sup>

Fan Efficiency Grade: FEG71

CFM	OV	0.75" SP		1" SP		1.25" SP		1.5" SP		1.75" SP		2" SP		2.5" SP		3" SP		3.5" SP		4" SP		4.5" SP	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
900	1115	1933	0.20	2079	0.25	2217	0.31	2343	0.36														
1000	1239	2055	0.23	2187	0.29	2318	0.35	2443	0.41	2557	0.47	2676	0.54										
1200	1487	2324	0.32	2432	0.39	2540	0.45	2650	0.52	2760	0.59	2868	0.66	3061	0.81	3265	0.97						
1400	1735	2612	0.45	2704	0.51	2796	0.58	2888	0.65	2982	0.73	3076	0.81	3264	0.97	3441	1.14	3602	1.32	3777	1.51		
1600	1983	2910	0.60	2991	0.67	3072	0.74	3153	0.82	3233	0.90	3314	0.99	3479	1.16	3644	1.35	3806	1.54	3955	1.74	4096	1.94
1800	2230	3215	0.80	3288	0.87	3361	0.95	3433	1.03	3505	1.12	3576	1.21	3720	1.40	3865	1.59	4012	1.80	4159	2.01	4302	2.23
2000	2478	3526	1.04	3592	1.12	3658	1.20	3723	1.29	3788	1.38	3853	1.47	3981	1.67	4110	1.88	4241	2.09	4373	2.32	4506	2.55
2200	2726	3841	1.33	3901	1.41	3961	1.50	4021	1.60	4080	1.69	4139	1.79	4257	2.00	4374	2.21	4491	2.44	4609	2.67	4729	2.91
2400	2974	4159	1.67	4214	1.76	4269	1.86	4324	1.96	4378	2.06	4433	2.16	4541	2.37	4649	2.60	4756	2.84	4864	3.09	4972	3.34
2600	3222	4479	2.07	4530	2.17	4581	2.27	4631	2.38	4682	2.48	4732	2.59	4833	2.81	4933	3.05	5032	3.30	5131	3.55	5230	3.82
2800	3470	4801	2.54	4848	2.64	4896	2.75	4943	2.86	4990	2.97	5037	3.09	5130	3.32	5223	3.56	5316	3.82	5408	4.08	5500	4.36

## TCVA | Size 15B5

Wheel Dia.: 15"

Tip Speed: 3.93 x RPM

Outlet Area: 1.254 ft<sup>2</sup>

Fan Efficiency Grade: FEG75

CFM	OV	0.5" SP		0.75" SP		1" SP		1.25" SP		1.5" SP		1.75" SP		2" SP		2.5" SP		3" SP		3.5" SP		4" SP	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1400	1117																						
1800	1437	1662	0.27																				
2200	1756	1882	0.37			2184	0.62																
2600	2075	2121	0.51	2034	0.49	2380	0.79	2503	0.93														
3000	2394	2373	0.69	2486	0.84	2598	0.99	2711	1.16	2818	1.32	2926	1.49										
3400	2713	2632	0.92	2732	1.07	2832	1.24	2931	1.42	3031	1.60	3128	1.79	3221	1.98								
3800	3033	2898	1.20	2987	1.37	3076	1.55	3165	1.74	3254	1.93	3343	2.14	3432	2.34	3600	2.76	3779	3.22				
4200	3352	3167	1.53	3248	1.72	3329	1.91	3409	2.11	3490	2.32	3570	2.54	3651	2.76	3811	3.22	3963	3.68	4120	4.17		
4600	3671	3439	1.93	3513	2.13	3587	2.34	3660	2.55	3734	2.77	3808	3.00	3881	3.24	4028	3.72	4174	4.23	4313	4.73	4454	5.26
5000	3990	3713	2.41	3781	2.62	3849	2.84	3917	3.07	3985	3.30	4053	3.54	4120	3.79	4255	4.30	4391	4.83	4526	5.38		
5400	4310	3989	2.95	4052	3.18	4115	3.42	4178	3.66	4241	3.91	4304	4.16	4367	4.42	4492	4.95						

## TCVA | Size 15B6

Wheel Dia.: 15"

Tip Speed: 3.93 x RPM

Outlet Area: 1.254 ft<sup>2</sup>

Fan Efficiency Grade: FEG75

CFM	OV	1" SP		1.25" SP		1.5" SP		1.75" SP		2" SP		2.5" SP		3" SP		3.5" SP		4" SP		4.5" SP		5" SP	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1400	1117																						
1800	1437	1831	0.48	1974	0.59																		
2200	1756	2000	0.61	2120	0.74	2240	0.87	2357	1.01														
2600	2075	2206	0.79	2304	0.92	2405	1.07	2507	1.22	2609	1.38	2808	1.71										
3000	2394	2434	1.02	2518	1.17	2603	1.32	2689	1.48	2776	1.64	2953	1.99	3127	2.37	3299	2.77						
3400	2713	2675	1.31	2749	1.46	2822	1.62	2897	1.80	2972	1.97	3125	2.34	3281	2.73	3437	3.15	3589	3.58	3740	4.03		
3800	3033	2925	1.66	2990	1.83	3056	2.00	3122	2.18	3188	2.36	3322	2.75	3459	3.16	3598	3.59	3738	4.04	3877	4.52	4012	5.00
4200	3352	3181	2.08	3240	2.26	3299	2.45	3358	2.64	3418	2.83	3537	3.24	3658	3.67	3782	4.12	3907	4.58	4033	5.07	4160	5.58
4600	3671	3441	2.58	3495	2.77	3548	2.97	3602	3.17	3656	3.38	3765	3.81	3874	4.26	3985	4.72	4097	5.21	4211	5.71	4326	6.23
5000	3990	3704	3.17	3754	3.37	3803	3.58	3853	3.80	3902	4.01	4002	4.47	4102	4.94	4202	5.42	4304	5.93	4406	6.45	4510	6.99
5400	4310	3971	3.85	4016	4.06	4062	4.29	4107	4.51	4153	4.74	4245	5.22	4337	5.71	4430	6.22	4523	6.74				

## TCVA | Size 15B7

Wheel Dia.: 15"

Tip Speed: 3.93 x RPM

Outlet Area: 1.254 ft<sup>2</sup>

Fan Efficiency Grade: FEG75

CFM</
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## TCVA | Size 18B4

Wheel Dia.: 18"  
Outlet Area: 1.799 ft<sup>2</sup>

Tip Speed: 4.71 x RPM  
Fan Efficiency Grade: FEG85

CFM	OV	0.5" SP		0.75" SP		1" SP		1.25" SP		1.5" SP		1.75" SP		2" SP		2.5" SP		3" SP		3.5" SP		4" SP		
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM
2000	1112																							
2500	1390																							
3000	1668	1406	0.32																					
3500	1946	1546	0.41	1706	0.58	1855	0.76																	
		1705	0.53	1842	0.71	1979	0.90	2109	1.11															
4000	2223	1875	0.68	1994	0.87	2115	1.08	2235	1.29	2351	1.53	2461	1.77											
4500	2501	2052	0.86	2159	1.06	2265	1.28	2372	1.52	2479	1.76	2585	2.02	2686	2.29									
5000	2779	2233	1.08	2332	1.30	2427	1.53	2523	1.78	2619	2.03	2715	2.30	2811	2.58	2995	3.17							
5500	3057	2418	1.34	2509	1.57	2597	1.82	2684	2.08	2771	2.35	2858	2.63	2946	2.92	3120	3.54	3286	4.19					
6000	3335	2605	1.66	2690	1.90	2772	2.15	2852	2.43	2932	2.71	3011	3.01	3091	3.31	3252	3.95	3411	4.62	3564	5.33	3710	6.08	
6500	3613	2795	2.02	2873	2.27	2951	2.54	3026	2.83	3100	3.13	3173	3.44	3246	3.76	3394	4.42	3543	5.12	3689	5.85	3832	6.62	
7000	3891	2986	2.44	3060	2.71	3132	2.99	3203	3.28	3273	3.59	3341	3.92	3409	4.25	3545	4.94	3683	5.67	3821	6.42	3957	7.21	
7500	4169	3179	2.91	3248	3.20	3316	3.49	3383	3.80	3449	4.12	3514	4.46	3577	4.80	3704	5.53	3832	6.28	3961	7.06			
8000	4447	3373	3.46	3438	3.75	3502	4.06	3565	4.38	3628	4.72	3689	5.06	3750	5.42	3869	6.17	3988	6.96					
8500	4725	3568	4.07	3629	4.38	3690	4.70	3750	5.04	3809	5.38	3868	5.74	3926	6.11									
9000	5003	3764	4.75	3822	5.08	3879	5.41	3936	5.76															
9500	5281	3961	5.51																					

## TCVA | Size 18B5

Wheel Dia.: 18"  
Outlet Area: 1.799 ft<sup>2</sup>

Tip Speed: 4.71 x RPM  
Fan Efficiency Grade: FEG85

CFM	OV	0.75" SP		1" SP		1.25" SP		1.5" SP		2" SP		2.5" SP		3" SP		3.5" SP		4" SP		4.5" SP		5" SP	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
2000	1112																						
2500	1390																						
3000	1668	1539	0.58	1673	0.75																		
3500	1946	1666	0.71	1786	0.90	1904	1.11																
4000	2223	1813	0.88	1912	1.07	2017	1.29	2122	1.52														
4500	2501	1973	1.09	2057	1.29	2145	1.51	2238	1.75	2424	2.28												
5000	2779	2137	1.34	2214	1.56	2291	1.79	2370	2.03	2537	2.57	2704	3.17										
5500	3057	2305	1.64	2377	1.87	2447	2.11	2516	2.37	2662	2.92	2816	3.53	2967	4.18	3105	4.83						
6000	3335	2476	2.00	2544	2.24	2609	2.49	2672	2.76	2801	3.32	2937	3.94	3079	4.62	3218	5.33	3347	6.03				
6500	3613	2649	2.40	2713	2.66	2774	2.93	2834	3.21	2951	3.79	3072	4.42	3199	5.10	3330	5.84	3459	6.61	3581	7.38		
7000	3891	2824	2.87	2884	3.15	2942	3.43	2999	3.72	3109	4.33	3218	4.97	3331	5.66	3450	6.40	3572	7.20	3692	8.02	3808	8.85
7500	4169	3000	3.41	3057	3.70	3112	3.99	3166	4.30	3271	4.93	3372	5.60	3475	6.30	3582	7.05	3693	7.85	3806	8.69	3919	9.57
8000	4447	3178	4.01	3231	4.31	3284	4.63	3335	4.94	3435	5.61	3532	6.30	3627	7.02	3723	7.78	3824	8.58	3928	9.43		
8500	4725	3358	4.69	3408	5.01	3457	5.33	3506	5.67	3602	6.36	3694	7.08	3784	7.82	3874	8.60	3965	9.41				
9000	5003	3538	5.45	3585	5.78	3632	6.12	3679	6.47	3771	7.19	3859	7.93	3945	8.71								
9500	5281	3719	6.29	3764	6.63	3809	6.99	3853	7.35	3941	8.11												

## TCVA | Size 18B6

Wheel Dia.: 18"  
Outlet Area: 1.799 ft<sup>2</sup>

Tip Speed: 4.71 x RPM  
Fan Efficiency Grade: FEG80

CFM	OV	1.5" SP		1.75" SP		2" SP		2.5" SP		3" SP		3.5" SP		4" SP		4.5" SP		5" SP		5.5" SP		6" SP	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
2000	1112																						
2500	1390																						
3000	1668																						
3500	1946	1893	1.30	1984	1.50																		
4000	2223	2008	1.52	2094	1.74	2177	1.97																
4500	2501	2139	1.80	2214	2.03	2290	2.27	2440	2.78														
5000	2779	2287	2.14	2351	2.37	2417	2.62	2553	3.15	2689	3.71	2816	4.30										
5500	3057	2444	2.53	2501	2.78	2558	3.03	2678	3.57	2802	4.16	2926	4.77	3045	5.42								
6000	3335	2607	3.00	2659	3.25	2711	3.52	2816	4.07	2927	4.67	3041	5.31	3155	5.97	3266	6.66	3371	7.37				
6500	3613	2773	3.53	2822	3.80	2870	4.07	2966	4.65	3064	5.26	3166	5.90	3271	6.59	3377	7.31	3481	8.05	3581	8.80	3677	9.57
7000	3891	2941	4.13	2988	4.41	3034	4.71	3123	5.31	3213	5.94	3304	6.60	3399	7.30	3496	8.03	3594	8.79	3691	9.57	3787	10.38
7500	4169	3112	4.81	3157	5.11	3200	5.42	3285	6.05	3368	6.70	3451	7.38	3537	8.09	3625	8.83	3715	9.60	3806	10.40		
8000	4447	3284	5.57	3327	5.89	3368	6.21	3449	6.87	3528	7.56	3606	8.26	3684	8.98	3764	9.74						
8500	4725	3459	6.43	3499	6.76	3538	7.10	3616	7.79	3692	8.51	3765	9.23										
9000	5003	3635	7.38	3673	7.73	3710	8.08	3785	8.80														
9500	5281	3812	8.42																				

## TCVA | Size 18B7

Wheel Dia.: 18"  
Outlet Area: 1.799 ft<sup>2</sup>

Tip Speed: 4.71 x RPM  
Fan Efficiency Grade: FEG80

CFM	OV	2" SP		2.5" SP		3" SP		3.5" SP		4" SP		4.5" SP		5" SP		5.5" SP		6" SP		6.5" SP		7" SP	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
2000	1112																						
2500	1390																						
3000	1668	1929	1.43																				
3500	1946	2038	1.68	2185	2.08																		
4000	2223	2175	1.99	2301	2.41	2429	2.86	2558	3.34														
4500	2501	2326	2.37	2440	2.81	2552	3.27	2665	3.76	2779	4.28	2894	4.83										
5000	2779	2484	2.80	2591	3.28	2693	3.77	2794	4.														







## TCVA | Size 28B4

Wheel Dia.: 28"

Tip Speed: 7.33 x RPM

Outlet Area: 4.353 ft<sup>2</sup>

Fan Efficiency Grade: FEG85

CFM	OV	0.5" SP		0.75" SP		1" SP		1.25" SP		1.5" SP		1.75" SP		2" SP		2.5" SP		3" SP		3.5" SP		4" SP	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
6000	1378	892	0.75	1008	1.10																		
7000	1608	966	0.92	1069	1.30	1168	1.72																
8000	1838	1047	1.12	1140	1.53	1229	1.97	1315	2.45														
9000	2068	1132	1.36	1217	1.80	1298	2.27	1378	2.78	1455	3.31	1530	3.86										
10000	2297	1222	1.65	1299	2.12	1374	2.63	1447	3.16	1519	3.72	1589	4.30	1657	4.90								
11000	2527	1316	2.00	1385	2.49	1454	3.02	1522	3.59	1589	4.17	1654	4.78	1718	5.41	1842	6.73						
12000	2757	1412	2.42	1474	2.92	1538	3.48	1602	4.08	1664	4.69	1725	5.33	1785	5.99	1902	7.37	2015	8.81				
13000	2986	1509	2.89	1567	3.42	1625	3.99	1685	4.62	1743	5.27	1800	5.93	1856	6.62	1967	8.06	2074	9.56	2179	11.14		
14000	3216	1609	3.45	1662	3.99	1715	4.58	1770	5.22	1825	5.91	1879	6.61	1932	7.32	2036	8.81	2138	10.38	2238	12.02	2335	13.70
15000	3446	1709	4.08	1758	4.64	1808	5.25	1859	5.91	1910	6.61	1961	7.35	2012	8.11	2110	9.65	2207	11.27	2302	12.97	2394	14.71
16000	3676	1810	4.79	1856	5.38	1903	6.01	1950	6.68	1998	7.41	2046	8.16	2094	8.95	2187	10.55	2279	12.23	2370	14.00		
17000	3905	1912	5.59	1956	6.21	1999	6.86	2043	7.55	2087	8.27	2133	9.06	2178	9.87	2268	11.56	2355	13.29	2441	15.09		
18000	4135	2015	6.48	2056	7.13	2097	7.81	2138	8.51	2180	9.26	2222	10.05	2265	10.88	2350	12.63	2434	14.44				
19000	4365	2118	7.47	2157	8.15	2195	8.84	2234	9.57	2274	10.35	2313	11.14	2353	11.98	2434	13.78						
20000	4595	2222	8.57	2258	9.27	2295	10.00	2332	10.75	2369	11.54	2406	12.35										
22000	5054	2430	11.09																				

## TCVA | Size 28B5

Wheel Dia.: 28"

Tip Speed: 7.33 x RPM

Outlet Area: 4.353 ft<sup>2</sup>

Fan Efficiency Grade: FEG85

CFM	OV	0.75" SP		1" SP		1.25" SP		1.5" SP		2" SP		2.5" SP		3" SP		3.5" SP		4" SP		4.5" SP		5" SP	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
6000	1378	924	1.09																				
7000	1608	983	1.29	1070	1.69																		
8000	1838	1049	1.52	1130	1.96	1207	2.42	1281	2.90														
9000	2068	1123	1.80	1195	2.27	1266	2.76	1335	3.27	1467	4.35												
10000	2297	1203	2.14	1267	2.62	1332	3.14	1396	3.69	1519	4.83												
11000	2527	1287	2.54	1345	3.04	1403	3.58	1462	4.15	1578	5.37	1689	6.65	1796	7.98								
12000	2757	1374	3.01	1427	3.53	1480	4.09	1533	4.67	1641	5.95	1746	7.30	1847	8.70	1945	10.15						
13000	2986	1463	3.55	1512	4.09	1561	4.67	1610	5.28	1709	6.59	1808	8.01	1904	9.48	1997	10.99	2088	12.56				
14000	3216	1555	4.18	1599	4.73	1645	5.34	1690	5.96	1781	7.31	1873	8.76	1965	10.31	2054	11.90	2141	13.54	2226	15.23		
15000	3446	1647	4.88	1689	5.47	1731	6.08	1773	6.73	1858	8.12	1944	9.62	2030	11.21	2115	12.87	2198	14.58	2279	16.33	2359	18.13
16000	3676	1741	5.67	1780	6.28	1819	6.92	1859	7.60	1938	9.02	2018	10.56	2098	12.18	2179	13.90	2259	15.69	2337	17.52	2413	19.37
17000	3905	1835	6.56	1872	7.20	1909	7.86	1946	8.55	2021	10.03	2096	11.61	2171	13.26	2247	15.02	2323	16.87	2398	18.76		
18000	4135	1930	7.54	1965	8.21	2000	8.90	2035	9.61	2105	11.12	2176	12.75	2247	14.46	2318	16.24	2390	18.12				
19000	4365	2026	8.63	2059	9.33	2092	10.04	2125	10.78	2192	12.35	2259	14.01	2326	15.76	2393	17.59						
20000	4595	2123	9.85	2154	10.56	2186	11.32	2217	12.08	2280	13.68	2343	15.37										
22000	5054	2317	12.61	2346	13.40	2374	14.19	2403	15.02														

## TCVA | Size 28B6

Wheel Dia.: 28"

Tip Speed: 7.33 x RPM

Outlet Area: 4.353 ft<sup>2</sup>

Fan Efficiency Grade: FEG80

CFM	OV	1.5" SP		1.75" SP		2" SP		2.5" SP		3" SP		3.5" SP		4" SP		4.5" SP		5" SP		5.5" SP		6" SP	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
6000	1378																						
7000	1608																						
8000	1838	1208	2.85	1272	3.32																		
9000	2068	1266	3.24	1325	3.75	1382	4.26																
10000	2297	1331	3.69	1385	4.22	1438	4.77	1542	5.92														
11000	2527	1403	4.21	1452	4.76	1501	5.34	1597	6.55	1691	7.81												
12000	2757	1479	4.81	1524	5.38	1569	5.98	1659	7.25	1747	8.57	1833	9.95	1918	11.38								
13000	2986	1559	5.49	1601	6.10	1642	6.71	1725	8.01	1808	9.40	1889	10.83	1969	12.32	2048	13.87						
14000	3216	1642	6.26	1681	6.89	1719	7.53	1796	8.87	1873	10.29	1950	11.80	2026	13.36	2100	14.94	2173	16.57	2246	18.27		
15000	3446	1728	7.14	1764	7.79	1800	8.45	1871	9.83	1943	11.30	2015	12.84	2087	14.46	2157	16.10	2227	17.80	2296	19.55	2364	21.33
16000	3676	1816	8.13	1849	8.78	1883	9.48	1950	10.91	2017	12.42	2084	13.99	2152	15.65	2219	17.36	2285	19.11	2351	20.92	2416	22.76
17000	3905	1905	9.21	1936	9.89	1968	10.61	2031	12.09	2094	13.64	2157	15.26	2221	16.96	2284	18.70	2347	20.51	2410	22.38		
18000	4135	1996	10.43	2025	11.13	2055	11.87	2114	13.38	2174	14.99	2234	16.67	2293	18.38	2353	20.17	2413	22.03				
19000	4365	2088	11.77	2116	12.51	2143	13.24	2199	14.81	2256	16.46	2313	18.19	2369	19.95	2426	21.79						
20000	4595	2181	13.24	2207	13.99	2233	14.76	2286	16.37	2340	18.07	2393	19.81										
22000	5054	2369	16.59	2393	17.41	2417	18.24																

## TCVA | Size 28B7

Wheel Dia.: 28"

Tip Speed: 7.33 x RPM

Outlet Area: 4.353 ft<sup>2</sup>

Fan Efficiency Grade: FEG80

CFM	OV	2" SP		2.5" SP		3" SP		3.5" SP		4" SP		4.5" SP		5" SP		5.5" SP		6" SP		6.5" SP		7" SP	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP</														



## TCVA | Size 32B4

Wheel Dia.: 32"  
Outlet Area: 5.672 ft<sup>2</sup>

Tip Speed: 8.38 x RPM  
Fan Efficiency Grade: FEG85

CFM	OV	0.5" SP		0.75" SP		1" SP		1.5" SP		2" SP		2.5" SP		3" SP		3.5" SP		4" SP		4.5" SP		5" SP	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
8000	1410	779	1.00	877	1.47																		
9000	1587	827	1.17	918	1.67	1003	2.20																
10000	1763	880	1.36	963	1.89	1043	2.46																
11000	1939	936	1.59	1012	2.14	1087	2.74	1228	4.04														
12000	2116	993	1.84	1065	2.43	1134	3.05	1267	4.41														
13000	2292	1053	2.14	1119	2.75	1184	3.40	1310	4.83	1429	6.36												
14000	2468	1115	2.49	1176	3.11	1237	3.80	1355	5.27	1469	6.87	1578	8.57										
15000	2645	1178	2.88	1235	3.52	1292	4.23	1403	5.75	1512	7.42	1616	9.18	1717	11.03								
16000	2821	1243	3.32	1295	3.98	1348	4.70	1454	6.29	1557	8.01	1657	9.83	1753	11.73								
17000	2997	1308	3.82	1357	4.49	1407	5.24	1507	6.88	1605	8.65	1700	10.53	1793	12.50	1883	14.55						
18000	3173	1374	4.37	1420	5.06	1467	5.83	1562	7.53	1655	9.35	1746	11.28	1835	13.31	1922	15.43	2007	17.62				
20000	3526	1507	5.64	1548	6.39	1590	7.19	1675	8.96	1760	10.90	1844	12.95	1926	15.09	2007	17.34	2086	19.65	2163	22.02	2239	24.47
22000	3879	1642	7.18	1679	7.97	1717	8.82	1793	10.65	1871	12.69	1948	14.86	2024	17.11	2099	19.46	2173	21.89	2246	24.41	2317	26.97
24000	4231	1778	8.99	1812	9.85	1847	10.75	1916	12.65	1987	14.76	2058	17.03	2129	19.42	2199	21.88	2267	24.39	2336	27.05		
26000	4584	1915	11.12	1947	12.04	1979	12.99	2042	14.97	2107	17.15	2173	19.51	2239	22.01	2304	24.59	2368	27.22				
28000	4937	2053	13.58	2083	14.57	2112	15.56	2171	17.66	2231	19.91	2291	22.31	2352	24.89								

## TCVA | Size 32B5

Wheel Dia.: 32"  
Outlet Area: 5.672 ft<sup>2</sup>

Tip Speed: 8.38 x RPM  
Fan Efficiency Grade: FEG85

CFM	OV	0.75" SP		1" SP		1.5" SP		2" SP		2.5" SP		3" SP		3.5" SP		4" SP		4.5" SP		5" SP		5.5" SP	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
8000	1410	814	1.45																				
9000	1587	854	1.65	931	2.17																		
10000	1763	897	1.88	970	2.44																		
11000	1939	945	2.14	1012	2.72	1140	3.99																
12000	2116	996	2.44	1057	3.04	1178	4.38	1292	5.80														
13000	2292	1050	2.78	1106	3.41	1219	4.79	1327	6.29														
14000	2468	1105	3.17	1157	3.81	1262	5.24	1366	6.82	1464	8.45												
15000	2645	1163	3.61	1211	4.27	1309	5.74	1407	7.37	1502	9.10	1592	10.86										
16000	2821	1222	4.10	1267	4.79	1358	6.29	1450	7.96	1541	9.76	1628	11.60	1713	13.53								
17000	2997	1282	4.66	1324	5.36	1410	6.92	1496	8.61	1583	10.47	1667	12.40	1748	14.37	1828	16.43						
18000	3173	1343	5.27	1383	6.00	1463	7.58	1544	9.32	1626	11.21	1708	13.24	1786	15.28	1863	17.40	1938	19.58				
20000	3526	1467	6.69	1502	7.45	1575	9.14	1648	10.98	1721	12.93	1794	15.01	1868	17.23	1940	19.50	2010	21.81	2078	24.15	2146	26.59
22000	3879	1593	8.38	1625	9.20	1691	10.97	1757	12.89	1823	14.94	1889	17.08	1956	19.37	2023	21.76	2090	24.26	2154	26.74	2218	29.32
24000	4231	1721	10.38	1750	11.25	1810	13.11	1870	15.10	1931	17.25	1992	19.51	2052	21.83	2114	24.32	2175	26.88				
26000	4584	1850	12.71	1877	13.64	1932	15.60	1988	17.70	2043	19.90	2099	22.24	2155	24.68	2211	27.21						
28000	4937	1980	15.40	2005	16.39	2056	18.45	2108	20.65	2159	22.93	2211	25.36										

## TCVA | Size 32B6

Wheel Dia.: 32"  
Outlet Area: 5.672 ft<sup>2</sup>

Tip Speed: 8.38 x RPM  
Fan Efficiency Grade: FEG80

CFM	OV	1.5" SP		1.75" SP		2" SP		2.5" SP		3" SP		3.5" SP		4" SP		4.5" SP		5" SP		5.5" SP		6" SP	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
8000	1410																						
9000	1587																						
10000	1763	1047	3.56																				
11000	1939	1083	3.93	1138	4.57																		
12000	2116	1123	4.34	1175	5.01	1225	5.70																
13000	2292	1167	4.79	1215	5.49	1263	6.22	1355	7.72														
14000	2468	1213	5.28	1258	6.00	1303	6.76	1391	8.33	1477	9.99												
15000	2645	1262	5.83	1304	6.57	1347	7.37	1430	8.99	1511	10.69	1591	12.48										
16000	2821	1314	6.46	1353	7.21	1393	8.02	1472	9.71	1549	11.47	1625	13.31	1700	15.22								
17000	2997	1368	7.15	1405	7.93	1442	8.75	1516	10.47	1590	12.30	1663	14.21	1734	16.17	1804	18.19						
18000	3173	1423	7.90	1458	8.71	1493	9.55	1562	11.29	1633	13.18	1702	15.14	1771	17.18	1838	19.26	1904	21.40				
20000	3526	1537	9.62	1568	10.47	1600	11.36	1662	13.19	1725	15.14	1788	17.20	1851	19.34	1914	21.58	1975	23.84	2035	26.14	2095	28.52
22000	3879	1655	11.67	1683	12.56	1712	13.50	1769	15.44	1826	17.48	1883	19.60	1940	21.81	1998	24.16	2055	26.55	2111	28.98		
24000	4231	1776	14.07	1802	15.02	1828	15.99	1880	18.02	1932	20.14	1984	22.35	2037	24.67	2089	27.04	2142	29.54				
26000	4584	1900	16.87	1923	17.84	1947	18.87	1995	20.99	2043	23.20	2091	25.51	2139	27.89								
28000	4937	2025	20.06	2047	21.11	2069	22.18	2113	24.38														

## TCVA | Size 32B7

Wheel Dia.: 32"  
Outlet Area: 5.672 ft<sup>2</sup>

Tip Speed: 8.38 x RPM  
Fan Efficiency Grade: FEG75

CFM	OV	2" SP		2.5" SP		3" SP		3.5" SP		4" SP		4.5" SP		5" SP		5.5" SP		6" SP		6.5" SP		7" SP	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
8000	1410																						
9000	1587																						
10000	1763	1105	4.74																				
11000	1939	1144	5.24	1230	6.5																		

## TCVA | Size 36B4

Wheel Dia.: 36"

Tip Speed: 8.38 x RPM

Outlet Area: 7.166 ft<sup>2</sup>

Fan Efficiency Grade: FEG85

CFM	OV	0.5" SP		0.75" SP		1" SP		1.5" SP		2" SP		2.5" SP		3" SP		3.5" SP		4" SP		4.5" SP		5" SP	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
10000	1395	682	1.25	769	1.84																		
11000	1535	715	1.41	797	2.03	874	2.70																
12000	1675	751	1.60	827	2.24	900	2.94																
13000	1814	788	1.80	860	2.48	929	3.21																
14000	1954	827	2.03	894	2.73	960	3.50	1084	5.14														
15000	2093	868	2.29	931	3.03	992	3.80	1111	5.52														
16000	2233	909	2.58	968	3.33	1027	4.15	1140	5.92	1247	7.83												
18000	2512	995	3.26	1048	4.06	1100	4.93	1203	6.82	1302	8.85	1397	11.01										
20000	2791	1084	4.10	1131	4.93	1178	5.85	1272	7.85	1364	10.01	1452	12.29	1538	14.69								
22000	3070	1175	5.11	1217	5.97	1260	6.93	1346	9.04	1430	11.29	1513	13.71	1594	16.25	1672	18.86	1748	21.56				
24000	3349	1268	6.30	1306	7.21	1344	8.18	1423	10.38	1501	12.75	1578	15.27	1655	17.96	1728	20.67	1800	23.51	1871	26.45		
26000	3628	1361	7.67	1396	8.63	1432	9.67	1504	11.93	1576	14.40	1648	17.03	1719	19.79	1790	22.71	1858	25.66	1925	28.71	1990	31.81
28000	3907	1456	9.27	1488	10.28	1521	11.36	1587	13.67	1655	16.27	1722	19.01	1788	21.85	1854	24.84	1920	27.98	1983	31.13	2046	34.41
30000	4186	1551	11.09	1581	12.16	1611	13.27	1673	15.68	1735	18.31	1799	21.20	1861	24.16	1923	27.25	1985	30.48	2046	33.80	2105	37.15
32000	4466	1646	13.14	1675	14.29	1703	15.45	1760	17.93	1819	20.66	1878	23.60	1937	26.70	1995	29.88	2053	33.17	2111	36.61	2168	40.12
34000	4745	1742	15.46	1769	16.66	1796	17.89	1849	20.45	1904	23.25	1959	26.24	2015	29.45	2070	32.76	2125	36.17	2180	39.70	2234	43.30

## TCVA | Size 36B5

Wheel Dia.: 36"

Tip Speed: 8.38 x RPM

Outlet Area: 7.166 ft<sup>2</sup>

Fan Efficiency Grade: FEG85

CFM	OV	0.75" SP		1" SP		1.5" SP		2" SP		2.5" SP		3" SP		3.5" SP		4" SP		4.5" SP		5" SP		5.5" SP	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
10000	1395	720	1.81																				
11000	1535	748	2.01	818	2.65																		
12000	1675	777	2.22	844	2.91																		
13000	1814	809	2.46	872	3.18	991	4.72																
14000	1954	842	2.72	902	3.47	1015	5.07																
15000	2093	878	3.02	933	3.78	1042	5.46	1144	7.25														
16000	2233	916	3.36	967	4.13	1070	5.87	1168	7.73														
18000	2512	994	4.13	1039	4.95	1131	6.77	1222	8.78	1309	10.88												
20000	2791	1076	5.07	1116	5.92	1198	7.82	1281	9.92	1363	12.19	1441	14.51	1517	16.92								
22000	3070	1160	6.18	1197	7.08	1271	9.06	1346	11.24	1422	13.62	1496	16.11	1567	18.64	1636	21.24						
24000	3349	1246	7.48	1280	8.44	1348	10.51	1416	12.76	1485	15.19	1554	17.79	1622	20.50	1688	23.27	1752	26.09	1815	28.98		
26000	3628	1334	9.00	1365	10.00	1427	12.14	1490	14.49	1554	17.03	1617	19.67	1681	22.51	1744	25.44	1805	28.40	1865	31.44	1924	34.55
28000	3907	1423	10.75	1452	11.81	1509	14.02	1568	16.48	1626	19.06	1685	21.81	1744	24.70	1803	27.73	1862	30.88	1919	34.06	1975	37.29
30000	4186	1513	12.74	1539	13.83	1593	16.17	1647	18.67	1702	21.38	1757	24.22	1811	27.14	1867	30.29	1922	33.51	1977	36.86	2031	40.27
32000	4466	1603	14.98	1628	16.13	1678	18.56	1729	21.16	1780	23.93	1831	26.85	1883	29.93	1934	33.08	1986	36.40	2038	39.85	2089	43.35
34000	4745	1694	17.49	1718	18.73	1765	21.26	1813	23.96	1860	26.77	1908	29.78	1957	32.96	2005	36.20	2053	39.55	2102	43.07	2151	46.71

## TCVA | Size 36B6

Wheel Dia.: 36"

Tip Speed: 8.38 x RPM

Outlet Area: 7.166 ft<sup>2</sup>

Fan Efficiency Grade: FEG80

CFM	OV	1.5" SP		1.75" SP		2" SP		2.5" SP		3" SP		3.5" SP		4" SP		4.5" SP		5" SP		5.5" SP		6" SP	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
10000	1395																						
11000	1535																						
12000	1675	903	4.26																				
13000	1814	928	4.62	977	5.39																		
14000	1954	954	4.99	1001	5.80	1046	6.62																
15000	2093	983	5.41	1027	6.24	1071	7.11																
16000	2233	1014	5.86	1056	6.72	1097	7.60	1178	9.46														
18000	2512	1082	6.92	1119	7.81	1156	8.74	1230	10.71	1302	12.78	1373	14.95										
20000	2791	1155	8.16	1189	9.11	1222	10.07	1289	12.13	1355	14.30	1420	16.56	1485	18.95								
22000	3070	1232	9.61	1262	10.58	1293	11.62	1354	13.76	1415	16.03	1475	18.40	1535	20.88	1594	23.44	1652	26.08				
24000	3349	1312	11.28	1340	12.32	1368	13.39	1424	15.63	1480	17.98	1536	20.46	1591	23.02	1646	25.68	1700	28.41	1754	31.24	1807	34.12
26000	3628	1395	13.23	1420	14.29	1446	15.42	1498	17.76	1549	20.18	1601	22.75	1653	25.43	1704	28.18	1755	31.03	1805	33.93	1855	36.93
28000	3907	1479	15.43	1503	16.56	1527	17.73	1575	20.16	1623	22.71	1671	25.35	1718	28.06	1766	30.91	1814	33.87	1862	36.93	1909	40.02
30000	4186	1566	17.97	1588	19.14	1610	20.35	1654	22.84	1699	25.49	1744	28.24	1788	31.04	1833	33.99	1878	37.03	1922	40.11	1967	43.35
32000	4466	1653	20.78	1674	22.02	1694	23.25	1735	25.83	1777	28.56	1819	31.40	1861	34.34	1903	37.37	1945	40.48	1987	43.69	2029	46.99
34000	4745	1742	23.96	1761	25.23	1780	26.52	1819	29.22	1858	32.03	1897	34.93	1937	37.99	1976	41.09	2016	44.32				

## TCVA | Size 36B7

Wheel Dia.: 36"

Tip Speed: 8.38 x RPM

Outlet Area: 7.166 ft<sup>2</sup>

Fan Efficiency Grade: FEG75

CFM	OV	2" SP		2.5" SP		3" SP		3.5" SP		4" SP		4.5" SP		5" SP		5.5" SP		6" SP		6.5" SP		7" SP	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
10000	1395																						
11000	1535																						
12000	1675	965	5.73																				
13000	1814	990	6.19																				
14000	1954	1019	6.71	1092	8.31																		
15000	2093	1052	7.31	1120	8.94	1188	10.70																
16000	2233	1087	7.97	1150	9.61	1214	11.41	1279	13.35														
18000	2512	1163	9.49	1220	11.25	1276	13.08	1332	15.02	1389	17.11	1447	19.33										
20000	2791	1242	11.21	1295	13.12	1347	15.09	1397															





## TCVA | Size 48B5

Wheel Dia.: 48"

Tip Speed: 12.57 x RPM

Outlet Area: 12.76 ft<sup>2</sup>

Fan Efficiency Grade: FEG85

CFM	OV	0.75" SP		1" SP		1.5" SP		2" SP		2.5" SP		3" SP		3.5" SP		4" SP		4.5" SP		5" SP		5.5" SP		
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	
20000	1567	566	3.66	618	4.82																			
22000	1724	591	4.10	641	5.36																			
24000	1881	619	4.60	665	5.91	752	8.69																	
26000	2038	648	5.16	691	6.51	774	9.46																	
28000	2194	680	5.83	719	7.19	797	10.25	871	13.51															
30000	2351	712	6.54	748	7.94	822	11.11	893	14.53	961	18.13													
32000	2508	745	7.33	780	8.82	848	12.02	917	15.63	982	19.35													
34000	2665	780	8.25	812	9.76	876	13.04	941	16.73	1004	20.62	1064	24.62											
36000	2821	815	9.25	845	10.79	905	14.15	967	17.94	1027	21.94	1086	26.16	1142	30.43									
38000	2978	850	10.33	879	11.93	936	15.40	994	19.22	1052	23.37	1108	27.67	1163	32.15	1216	36.72							
42000	3292	922	12.83	948	14.51	1000	18.17	1052	22.15	1105	26.49	1157	31.04	1209	35.85	1258	40.63	1307	45.64	1355	50.78			
46000	3605	996	15.81	1020	17.61	1067	21.42	1114	25.56	1162	30.04	1210	34.78	1258	39.79	1305	44.94	1351	50.21	1396	55.58	1441	61.16	
50000	3918	1071	19.30	1093	21.20	1136	25.18	1179	29.48	1223	34.13	1267	39.03	1311	44.16	1355	49.55	1399	55.16	1442	60.86	1484	66.64	
54000	4232	1147	23.34	1167	25.34	1207	29.53	1247	34.01	1287	38.79	1328	43.90	1368	49.13	1409	54.68	1450	60.47	1491	66.48	1531	72.56	
58000	4545	1224	28.00	1242	30.07	1279	34.45	1316	39.09	1354	44.11	1391	49.29	1429	54.80	1467	60.50	1505	66.41					
62000	4859	1301	33.26	1318	35.45	1352	40.01	1387	44.88	1422	50.01	1457	55.41	1492	61.03	1528	67.00							

## TCVA | Size 54B3

Wheel Dia.: 54"

Tip Speed: 14.14 x RPM

Outlet Area: 16.12 ft<sup>2</sup>

Fan Efficiency Grade: FEG85

CFM	OV	0.5" SP		0.75" SP		1" SP		1.5" SP		2" SP		2.5" SP		3" SP		3.5" SP		4" SP		4.5" SP		5" SP	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
22000	1365	481	2.71	544	4.01																		
24000	1489	502	3.02	561	4.37																		
28000	1737	547	3.75	600	5.22	650	6.80																
32000	1985	596	4.65	644	6.25	689	7.92	777	11.68														
36000	2233	646	5.69	691	7.46	733	9.28	812	13.17	889	17.51												
40000	2481	700	7.00	739	8.80	779	10.81	852	14.92	923	19.44	992	24.33										
44000	2730	755	8.57	790	10.41	827	12.54	896	16.96	962	21.68	1026	26.75	1089	32.19								
48000	2978	811	10.40	843	12.31	877	14.51	942	19.23	1004	24.20	1063	29.39	1122	35.00	1180	40.94						
52000	3226	869	12.58	898	14.55	928	16.74	990	21.77	1048	26.96	1104	32.40	1159	38.16	1213	44.21	1267	50.65	1319	57.22		
56000	3474	927	15.05	954	17.12	982	19.39	1039	24.54	1095	30.11	1148	35.79	1199	41.66	1250	47.89	1301	54.50	1350	61.22	1399	68.27
60000	3722	986	17.89	1011	20.05	1036	22.34	1089	27.60	1142	33.43	1194	39.53	1243	45.69	1290	51.97	1338	58.72	1385	65.67	1431	72.82
64000	3970	1045	21.09	1068	23.32	1092	25.74	1141	31.07	1191	37.10	1241	43.55	1288	49.99	1333	56.52	1378	63.38	1422	70.42		
68000	4218	1104	24.65	1127	27.09	1149	29.56	1194	34.95	1241	41.10	1288	47.74	1334	54.59	1378	61.49	1421	68.57				
72000	4467	1164	28.68	1185	31.17	1206	33.76	1249	39.36	1293	45.60	1337	52.37	1381	59.51	1424	66.78						
76000	4715	1225	33.22	1244	35.75	1264	38.45	1304	44.16	1345	50.45	1387	57.39	1430	64.90								
80000	4963	1285	38.14	1304	40.86	1323	43.67	1361	49.59	1399	55.91	1439	62.99										

## TCVA | Size 54B4

Wheel Dia.: 54"

Tip Speed: 14.14 x RPM

Outlet Area: 16.12 ft<sup>2</sup>

Fan Efficiency Grade: FEG85

CFM	OV	0.5" SP		0.75" SP		1" SP		1.5" SP		2" SP		2.5" SP		3" SP		3.5" SP		4" SP		4.5" SP		5" SP	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
22000	1365	450	2.74	509	4.04																		
24000	1489	469	3.05	525	4.42																		
28000	1737	511	3.78	561	5.27	608	6.86																
32000	1985	557	4.69	601	6.28	645	8.03	726	11.73														
36000	2233	606	5.80	646	7.52	684	9.32	760	13.33	831	17.60												
40000	2481	657	7.16	692	8.92	728	10.90	797	15.09	864	19.67	928	24.51										
44000	2730	710	8.80	741	10.61	774	12.69	837	17.08	900	21.94	960	27.02	1018	32.35								
48000	2978	763	10.69	792	12.61	821	14.71	880	19.37	938	24.39	995	29.77	1050	35.37	1103	41.15						
52000	3226	818	12.94	844	14.92	871	17.11	925	21.93	979	27.16	1033	32.81	1085	38.66	1135	44.66	1184	50.88	1232	57.31		
56000	3474	873	15.50	897	17.58	922	19.84	972	24.81	1023	30.33	1073	36.12	1122	42.19	1170	48.50	1217	55.02	1263	61.73	1308	68.62
60000	3722	928	18.38	951	20.60	974	22.94	1021	28.10	1068	33.76	1115	39.77	1161	46.02	1207	52.61	1252	59.41	1296	66.38	1339	73.51
64000	3970	984	21.68	1006	24.05	1027	26.45	1071	31.76	1115	37.58	1159	43.81	1203	50.33	1246	57.06	1289	64.11	1331	71.32		
68000	4218	1041	25.44	1061	27.87	1081	30.39	1122	35.84	1163	41.78	1205	48.27	1246	54.95	1287	61.90	1328	69.18				
72000	4467	1097	29.54	1116	32.09	1135	34.73	1174	40.40	1212	46.41	1252	53.10	1291	60.03	1330	67.22						
76000	4715	1154	34.16	1172	36.82	1190	39.57	1226	45.35	1263	51.63	1300	58.36	1337	65.48								
80000	4963	1211	39.24	1228	42.01	1245	44.87	1280	50.95	1314	57.26												

## TCVA | Size 60B3

Wheel Dia.: 60"

Tip Speed: 15.71 x RPM

Outlet Area: 19.87 ft<sup>2</sup>

Fan Efficiency Grade: FEG85

CFM	OV	0.25" SP		0.5" SP		0.75" SP		1" SP		1.25" SP		1.5" SP		2" SP		2.5" SP		3" SP		3.5" SP		4" SP	
		RPM	B																				

### TCVA | Size 12D7

Wheel Dia.: 12"

Outlet Area: 0.807 ft<sup>2</sup>

Tip Speed: 3.14 x RPM

Fan Efficiency Grade: FEG80

PROP	RPM	0.25" SP		0.5" SP		0.75" SP		1" SP		1.25" SP		1.5" SP		2" SP		2.5" SP		3" SP		4" SP		5" SP	
		CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP
12D7	1750	1011	0.13	920	0.14	796	0.15																
	3500	2150	0.92	2108	0.96	2065	0.99	2022	1.02	1977	1.04	1932	1.07	1840	1.12	1734	1.16	1591	1.20				

### TCVA | Size 15D6, D7

Wheel Dia.: 15"

Outlet Area: 1.254 ft<sup>2</sup>

Tip Speed: 3.93 x RPM

Fan Efficiency Grade: FEG80 (15D6), FEG75 (15D7)

PROP	RPM	0.25" SP		0.5" SP		0.75" SP		1" SP		1.25" SP		1.5" SP		2" SP		2.5" SP		3" SP		4" SP		5" SP	
		CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP
15D6	1750	2250	0.32	2113	0.36	1948	0.40	1758	0.43														
	3500	4685	2.34	4625	2.43	4564	2.51	4501	2.59	4435	2.68	4368	2.76	4225	2.92	4068	3.06	3895	3.20	3517	3.41		
15D7	1750	2141	0.39	2020	0.42	1882	0.44	1712	0.46	1480	0.47												
	3500	4448	2.89	4394	2.96	4339	3.03	4283	3.09	4225	3.16	4165	3.22	4041	3.34	3908	3.45	3764	3.55	3424	3.68	2960	3.72

### TCVA | Size 18D5, D6, D7

Wheel Dia.: 18"

Outlet Area: 1.799 ft<sup>2</sup>

Tip Speed: 4.71 x RPM

Fan Efficiency Grade: FEG85 (18D5), FEG85 (18D6), FEG85 (18D7)

PROP	RPM	0.25" SP		0.5" SP		0.75" SP		1" SP		1.25" SP		1.5" SP		2" SP		2.5" SP		3" SP		4" SP		5" SP	
		CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP
18D5	1170	2743	0.22	2110	0.25																		
	1750	4463	0.64	4180	0.70	3828	0.77	3412	0.83														
18D6	1170	2834	0.25	2402	0.29																		
	1750	4523	0.75	4297	0.81	4040	0.88	3745	0.94	3403	1.00												
18D7	1170	2671	0.25	2355	0.29	1885	0.32																
	1750	4209	0.74	4038	0.82	3849	0.89	3635	0.95	3390	1.00	3098	1.05										
	3500	8656	5.44	8578	5.60	8498	5.77	8417	5.93	8335	6.09	8250	6.24	8075	6.55	7892	6.84	7698	7.11	7269	7.60	6781	8.04

### TCVA | Size 21D4, D5, D6, D7

Wheel Dia.: 21"

Outlet Area: 2.448 ft<sup>2</sup>

Tip Speed: 5.50 x RPM

Fan Efficiency Grade: FEG85 (21D4), FEG85 (21D5), FEG90 (21D6), FEG85 (21D7)

PROP	RPM	0.25" SP		0.5" SP		0.75" SP		1" SP		1.25" SP		1.5" SP		2" SP		2.5" SP		3" SP		4" SP		5" SP	
		CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP
21D4	880	2674	0.17																				
	1170	4163	0.36	3333	0.42																		
	1750	6705	1.05	6328	1.18	5852	1.28	5291	1.38	4603	1.43												
21D5	880	3085	0.21																				
	1170	4550	0.44	3945	0.51																		
	1750	7195	1.34	6885	1.44	6532	1.55	6115	1.66	5651	1.76	5074	1.83										
21D6	880	3222	0.22																				
	1170	4623	0.46	4162	0.54	3532	0.60																
	1750	7221	1.40	6976	1.51	6706	1.62	6392	1.74	6027	1.86	5620	1.95										
21D7	880	3089	0.24	2522	0.29																		
	1170	4353	0.51	4024	0.59	3619	0.65	3057	0.69														
	1750	6750	1.56	6558	1.68	6353	1.80	6132	1.91	5889	2.01	5621	2.10	4982	2.26								

### TCVA | Size 24D4, D5, D6, D7

Wheel Dia.: 24"

Outlet Area: 3.191 ft<sup>2</sup>

Tip Speed: 6.28 x RPM

Fan Efficiency Grade: FEG85 (24D4), FEG90 (24D5), FEG90 (24D6), FEG85 (24D7)

PROP	RPM	0.25" SP		0.5" SP		0.75" SP		1" SP		1.25" SP		1.5" SP		2" SP		2.5" SP		3" SP		4" SP		5" SP	
		CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP
24D4	880	4462	0.33																				
	1170	6513	0.69	5724	0.80	4662	0.87																
	1750	10244	2.08	9844	2.27	9391	2.45	8846	2.60	8237	2.75	7552	2.88										
24D5	880	4866	0.36	3700	0.43																		
	1170	6910	0.75	6306	0.87	5483	0.98																
	1750	10735	2.31	10415	2.48	10062	2.65	9656	2.83	9164	3.02	8621	3.18	7282	3.37								
24D6	880	5025	0.41	4238	0.49																		
	1170	7019	0.88	6567	0.99	5992	1.10	5276	1.19														
	1750	10827	2.74	10564	2.90	10282	3.07	9978	3.23	9639	3.40	9257	3.58	8384	3.87	7200	4.04						
24D7	880	4765	0.45	4207	0.52	3381	0.57																
	1170	6602	0.96	6249	1.08	5842	1.18	5360	1.27	4744	1.34												
	1750	10142	2.97	9927	3.16	9701	3.35	9464	3.53	9212	3.69	8942	3.85	8337	4.12	7623	4.36	6639	4.51				

### TCVA | Size 28D4, D5, D6, D7

Wheel Dia.: 28"

Outlet Area: 4.353 ft<sup>2</sup>

Tip Speed: 7.33 x RPM

Fan Efficiency Grade: FEG90 (28D4), FEG90 (28D5), FEG85 (28D6), FEG85 (28D7)

PROP	RPM	0.25" SP		0.5" SP		0.75" SP		1" SP		1.25" SP		1.5" SP		2" SP		2.5" SP		3" SP		4" SP		5" SP	
		CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP
28D4	880	7383	0.60	5856	0.72																		
	1170	10393	1.25	9605	1.46	8487	1.62	7107	1.71														
	1750	16076	3.81	15651	4.13	15184	4.43	14656	4.73	14008	5.02	13254	5.27	11562	5.64								
28D5	880	8063	0.72	6968	0.87																		
	1170	11182	1.56	10567	1.74	9768	1.94	8796	2.10	7530	2.18												
	1750	17173	4.91	16814	5.17	16430	5.44	16015	5.71	15558	5.98	15030	6.28	13798	6.83	12360	7.20						
28D6	880	8246	0.82	7430	0.96	6321	1.07																
	1170	11347	1.80	10840	1.98	10248	2.16	9530	2.34	8698	2.48	7562	2.56										
	1750	17357	5.71	17048	5.97	16724	6.23	16382	6.49	16020	6.75	15630	7.02	14731	7.59	13698	8.08	12476	8.44				
28D7	880	7961	0.90	7328	1.03	6529	1.14	5356															

**TCVA | Size 32D4, D5, D6, D7** Wheel Dia.: 32" Outlet Area: 5.672 ft<sup>2</sup> Tip Speed: 8.38 x RPM  
 Fan Efficiency Grade: FEG90 (32D4), FEG90 (32D5), FEG85 (32D6), FEG85 (32D7)

PROP	RPM	0.25" SP		0.5" SP		0.75" SP		1" SP		1.25" SP		1.5" SP		2" SP		2.5" SP		3" SP		4" SP		5" SP	
		CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP
32D4	880	11546	1.13	10135	1.35	8170	1.47																
	1170	15941	2.43	15156	2.73	14147	3.02	12871	3.27	11382	3.43												
32D5	880	12324	1.35	11258	1.56	9803	1.75																
	1170	16886	2.97	16225	3.23	15459	3.51	14494	3.81	13396	4.05	12104	4.22										
32D6	880	12560	1.53	11706	1.72	10590	1.93	9184	2.07														
	1170	17129	3.39	16563	3.65	15936	3.91	15208	4.19	14354	4.46	13415	4.69										
32D7	880	11915	1.71	11269	1.92	10519	2.10	9626	2.26	8469	2.38												
	1170	16184	3.78	15734	4.08	15254	4.36	14737	4.63	14168	4.87	13542	5.08	12061	5.48								
	1750	24563	12.09	24276	12.55	23982	13.00	23680	13.44	23369	13.87	23050	14.29	22378	15.11	21653	15.86	20862	16.55	19053	17.81	16675	18.73

**TCVA | Size 36D4, D5, D6, D7** Wheel Dia.: 36" Outlet Area: 7.166 ft<sup>2</sup> Tip Speed: 9.42 x RPM  
 Fan Efficiency Grade: FEG90 (36D4), FEG90 (36D5), FEG85 (36D6), FEG80 (36D7)

PROP	RPM	0.25" SP		0.5" SP		0.75" SP		1" SP		1.25" SP		1.5" SP		2" SP		2.5" SP		3" SP		4" SP		5" SP	
		CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP
36D4	880	16908	2.01	15599	2.32	13758	2.59	11408	2.72														
	1170	23101	4.39	22281	4.81	21339	5.23	20147	5.64	18741	6.00	17177	6.27										
36D5	880	17812	2.36	16739	2.65	15304	2.96	13573	3.19														
	1170	24226	5.25	23510	5.63	22719	6.01	21811	6.41	20711	6.83	19494	7.20	16518	7.65								
36D6	880	18039	2.76	17189	3.04	16189	3.33	14978	3.61	13544	3.83												
	1170	24434	6.21	23844	6.58	23212	6.95	22530	7.33	21773	7.71	20919	8.11	18967	8.78	16345	9.17						
36D7	880	16937	3.01	16260	3.32	15513	3.61	14667	3.85	13701	4.08	12550	4.27										
	1170	22887	6.74	22404	7.18	21899	7.59	21368	7.99	20804	8.37	20200	8.72	18847	9.33	17252	9.89	15076	10.23				
	1750	34618	21.75	34307	22.41	33990	23.06	33667	23.71	33337	24.34	33000	24.97	32303	26.18	31571	27.35	30796	28.44	29085	30.39	27127	32.15

**TCVA | Size 42D4, D5, D6** Wheel Dia.: 42" Outlet Area: 9.793 ft<sup>2</sup> Tip Speed: 11.00 x RPM  
 Fan Efficiency Grade: FEG85 (42D4), FEG90 (42D5), FEG85 (42D6)

PROP	RPM	0.25" SP		0.5" SP		0.75" SP		1" SP		1.25" SP		1.5" SP		2" SP		2.5" SP		3" SP		4" SP		5" SP	
		CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP
42D4	880	26744	3.91	25325	4.43	23435	4.91	21092	5.30	18321	5.51												
	1170	36280	8.64	35328	9.35	34282	10.05	33100	10.73	31654	11.37	29964	11.94	26183	12.78								
42D5	880	28687	4.93	27528	5.38	26173	5.85	24459	6.36	22520	6.76	20179	7.01										
	1170	38756	11.13	37949	11.72	37088	12.33	36158	12.93	35137	13.56	33958	14.22	31200	15.48	27995	16.32						
42D6	880	29062	5.70	28090	6.14	27015	6.59	25775	7.06	24331	7.53	22727	7.91										
	1170	39168	12.96	38476	13.54	37751	14.12	36986	14.71	36174	15.31	35301	15.91	33289	17.19	30979	18.31	28259	19.14				

**TCVA | Size 48D4, D5** Wheel Dia.: 48" Outlet Area: 12.76 ft<sup>2</sup> Tip Speed: 12.57 x RPM  
 Fan Efficiency Grade: FEG90 (48D4), FEG90 (48D5)

PROP	RPM	0.25" SP		0.5" SP		0.75" SP		1" SP		1.25" SP		1.5" SP		2" SP		2.5" SP		3" SP		4" SP		5" SP	
		CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP
48D4	880	40854	7.65	39370	8.42	37659	9.17	35471	9.89	32915	10.52	30051	10.98										
	1170	55107	17.19	54071	18.22	52968	19.25	51782	20.26	50490	21.25	49016	22.24	45388	24.07	41326	25.49	36478	26.21				
48D5	880	43198	9.41	41930	10.08	40530	10.76	38926	11.47	36985	12.23	34832	12.89	29600	13.70								
	1170	58123	21.43	57221	22.31	56275	23.21	55278	24.10	54221	25.01	53091	25.93	50452	27.90	47305	29.82	43864	31.26				

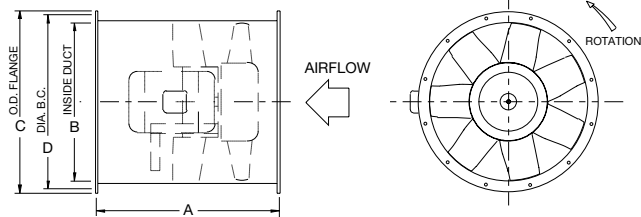
**TCVA | Size 54D3, D4** Wheel Dia.: 54" Outlet Area: 16.12 ft<sup>2</sup> Tip Speed: 14.14 x RPM  
 Fan Efficiency Grade: FEG85 (54D3), FEG90 (54D4)

PROP	RPM	0.25" SP		0.5" SP		0.75" SP		1" SP		1.25" SP		1.5" SP		2" SP		2.5" SP		3" SP		4" SP		5" SP	
		CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP
54D3	880	55364	11.29	53573	12.61	51547	13.81	49065	14.81	45991	15.55	42671	16.25	35015	16.95								
	1170	74569	25.14	73310	26.96	71977	28.72	70555	30.40	69024	32.00	67340	33.48	63143	35.75	58315	37.66	52894	39.19				
54D4	880	59058	13.90	57481	14.97	55747	16.04	53785	17.09	51385	18.13	48608	19.08	42352	20.44								
	1170	79378	31.56	78255	33.00	77079	34.43	75841	35.85	74531	37.27	73135	38.67	69916	41.45	65914	44.11	61581	46.33	50902	48.57		

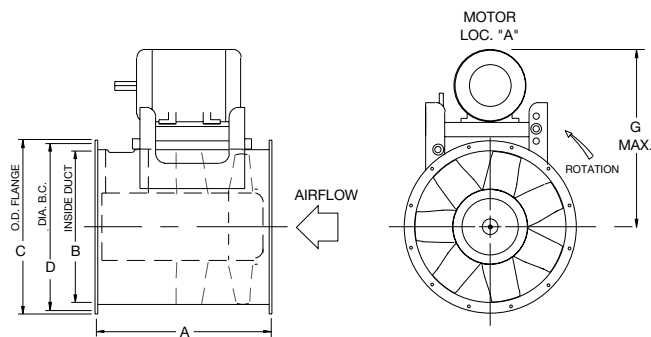
**TCVA | Size 60D3** Wheel Dia.: 60" Outlet Area: 19.88 ft<sup>2</sup> Tip Speed: 15.71 x RPM  
 Fan Efficiency Grade: FEG85

PROP	RPM	0.25" SP		0.5" SP		0.75" SP		1" SP		1.25" SP		1.5" SP		2" SP		2.5" SP		3" SP		4" SP		5" SP	
		CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP
60D3	880	76383	18.69	74454	20.52	72341	22.26	69975	23.85	67109	25.15	63696	26.16	56146	27.99								
	1170	102607	41.98	101230	44.50	99790	46.95	98279	49.33	96683	51.63	94988	53.83	91138	57.76	86292	60.71	80962	63.33	68815	67.10		

Performance certified is for installation Type B: Free inlet, ducted outlet.  
 Performance ratings do not include the effects of appurtenances (accessories).



**ARR. 4 - HORIZONTAL**



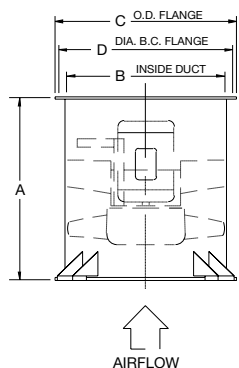
**ARR. 9 - HORIZONTAL**

**HORIZONTAL DISCHARGES**

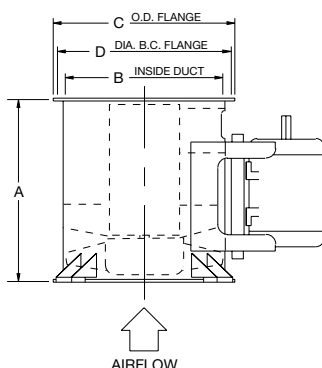
**HOR** = Horizontal - No Clips or Legs

**HCH** = Horizontal Ceiling Hung with Suspension Clips

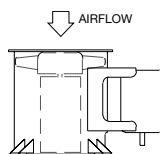
**HBM** = Horizontal Base Mounted with Support Legs



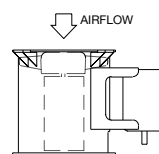
**ARR. 4 - VERTICAL**



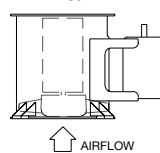
**ARR. 9 - VERTICAL**



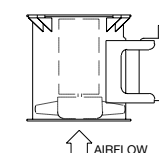
**VDO/VDN**



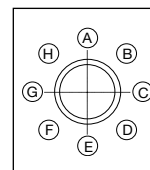
**VDI**



**VUI/VUN**



**VUO**



**HORIZONTAL MOTOR LOCATIONS (VIEWED FROM FAN OUTLET)**

**VERTICAL DISCHARGES**

**VDO** = Vertical Down Floor Mounted With Legs

**VDN** = Vertical Down Discharge Without Legs

**VDI** = Vertical Down Ceiling Hung With Legs

**VUI** = Vertical Up Floor Mounted With Legs

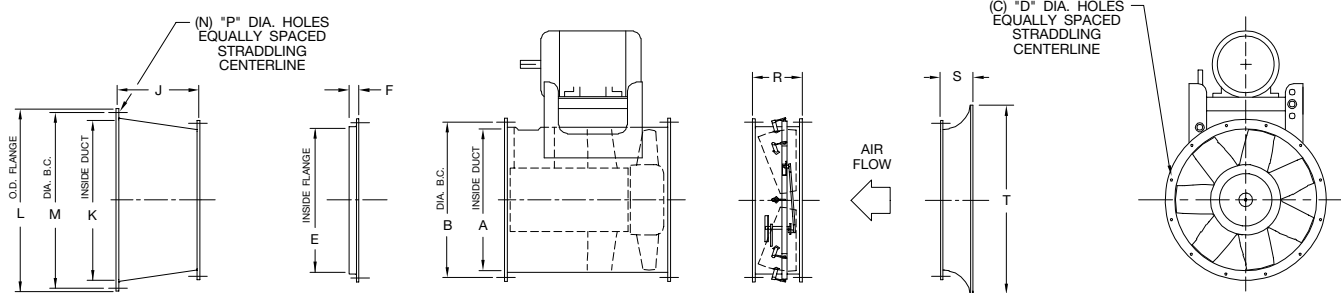
**VUN** = Vertical Up Discharge Without Legs

**VUO** = Vertical Up Ceiling Hung With Legs

FAN SIZE	A				B	C	D	G (MAX.)	MAXIMUM MOTOR FRAME										
	ARR. 9 HUB RATIO		ARR. 4 HUB RATIO						ARR. 9 - HUB RATIO					ARR. 4 - HUB RATIO					
	3-5	6-7	3-5	6-7					3	4	5	6	7	3	4	5	6	7	
12	NA	24.50	NA	24.50	12.16	15.16	13.88	19.25	NA	NA	NA	184T	184T	NA	NA	NA	NA	145T	145T
15	22.00	27.00	NA	27.00	15.16	18.16	16.88	20.50	NA	NA	215T	215T	215T	NA	NA	NA	145T	184T	215T
18	24.50	28.00	24.50	28.00	18.16	21.16	19.88	27.50	NA	215T	215T	215T	215T	NA	NA	145T	184T	215T	215T
21	27.00	32.00	27.00	32.00	21.19	24.19	22.88	31.75	NA	256T	256T	256T	256T	NA	145T	184T	215T	215T	215T
24	28.00	36.25	28.00	36.25	24.19	27.19	25.88	34.50	NA	256T	256T	256T	256T	NA	184T	215T	215T	215T	256T
28	32.00	40.25	32.00	40.25	28.25	31.25	30.00	38.25	NA	286T	286T	286T	286T	NA	215T	215T	256T	286T	286T
32	36.25	47.00	36.25	47.00	32.25	35.25	34.00	41.00	NA	286T	286T	286T	286T	NA	215T	256T	286T	365T	365T
36	40.25	53.25	40.25	53.25	36.25	39.25	38.00	45.25	NA	326T	326T	326T	326T	NA	256T	286T	365T	405T	405T
42	47.00	53.25	47.00	53.25	42.38	46.38	44.63	49.50	NA	326T	326T	326T	326T	NA	286T	365T	405T	NA	NA
48	53.25	NA	53.25	NA	48.38	52.38	50.63	53.25	NA	326T	326T	NA	NA	NA	365T	405T	NA	NA	NA
54	53.25	NA	53.25	NA	54.38	58.38	56.63	59.00	365T	365T	NA	NA	NA	365T	405T	NA	NA	NA	NA
60	53.25	NA	53.25	NA	60.38	64.38	63.38	60.25	365T	NA	NA	NA	NA	405T	NA	NA	NA	NA	NA

DIMENSIONS ARE NOT TO BE USED FOR CONSTRUCTION. CERTIFIED DRAWINGS AVAILABLE UPON REQUEST.





**CONE**

**COMPANION  
FLANGE**

**VARIABLE  
INLET VANE**

**INLET BELL**

FAN SIZE	COMPANION FLANGE		CONE							VARIABLE INLET VANE	INLET BELL		FAN AREA (FT <sup>2</sup> )	CONE AREA (FT <sup>2</sup> )
	D	E	F	J	K	L	M	N	P		R	S		
12	0.56	12.16	1.50	8.50	15.16	18.44	16.88	8	0.56	5.50	2.52	15.19	0.81	1.25
15	0.56	15.16	1.50	8.50	18.16	21.44	19.88	8	0.56	6.50	3.12	19.77	1.25	1.80
18	0.56	18.16	1.50	8.50	21.19	24.50	22.88	8	0.56	7.50	3.71	23.72	1.80	2.45
21	0.56	21.19	1.50	8.50	24.19	27.50	25.88	12	0.56	8.75	4.31	27.67	2.45	3.19
24	0.56	24.19	1.50	11.50	28.25	31.56	30.00	12	0.56	10.00	4.96	31.63	3.19	4.35
28	0.56	28.25	1.50	11.50	32.25	35.56	34.00	12	0.56	11.50	5.75	36.90	4.35	5.67
32	0.56	32.25	1.50	11.50	36.25	39.56	38.00	12	0.56	13.00	6.54	42.17	5.67	7.17
36	0.56	36.25	1.50	17.00	42.38	46.81	44.63	16	0.69	10.00	7.39	47.44	7.17	9.80
42	0.69	42.38	2.00	17.00	48.38	52.81	50.63	16	0.69	11.75	8.59	55.34	9.80	12.77
48	0.69	48.38	2.00	17.00	54.38	58.69	56.63	16	0.69	13.25	9.76	63.25	12.77	16.13
54	0.69	54.38	2.00	17.00	60.38	64.94	63.38	20	0.69	14.75	10.98	71.16	16.13	19.88
60	0.69	60.38	3.00	17.00	66.44	70.94	69.38	24	0.69	16.25	12.20	79.06	19.88	24.08

DIMENSIONS ARE NOT TO BE USED FOR CONSTRUCTION. CERTIFIED DRAWINGS AVAILABLE UPON REQUEST.



Fans shall be Model TCVA AXIFAN® Vaneaxial Fans as manufactured by Twin City Fan & Blower, Minneapolis, Minnesota. Fans shall be Arrangement 9, V-belt driven with the wheel mounted on a separate shaft and bearings supported completely within an enclosed tube isolated from the high velocity airstream or Arrangement 4, with the propeller mounted directly on the motor shaft and with the propeller and motor assembly enclosed entirely within the fan casing.

**PERFORMANCE** — Performance ratings shall conform to AMCA Standard 205 (fan efficiency grade) and 211 (air performance). Fans shall be tested in accordance with ANSI/AMCA Standard 210 (air performance) and 300 (sound performance) in an AMCA accredited laboratory. Fans shall be licensed to bear the AMCA certified ratings seal for air and fan efficiency grade (FEG).

Model TCVA shall be available UL 705 listed. Fans shall bear a permanently attached nameplate displaying model and serial number of the unit for future identification.

**HOUSING** — Fan housings shall be welded of 14-gauge ASTM A-569 hot rolled steel on size 12, 12-gauge hot rolled steel on sizes 15 through 21, 10-gauge hot rolled steel on sizes 24 through 36, and 7-gauge hot rolled steel on sizes 42 through 60. Inlet and outlet flanges are standard.

**GUIDE VANES** — Fan housings shall be fitted with aerodynamically designed stationary straightening guide vanes on the air discharge side of the wheel. The guide vanes shall be welded to both the inner cylinder and the fan housing interior and function to aid in the elimination of swirl and turbulence downstream thereby recovering rotational energy losses, improving efficiency and static pressure capability, and reducing fan noise generation.

**WHEEL** — The fan wheel shall be a solid one-piece sand casting of A356 - T6 Aluminum and shall contain seven blades and an integral center hub. The wheel shall have blades of airfoil shape designed with a variable hub ratio system to allow the selected fan to operate at the highest efficiency possible. Wheels shall be machined to the proper diameter so that blade tip clearance shall be within tolerance necessary to insure certified fan performance. The wheel shall be secured to the fan/motor shaft with a Trantorque® or taperlock bushing.

**SHAFT (ARR. 9)** — Shafts shall be AISI 1040 or 1045 hot rolled steel, accurately turned, ground, polished, and ring gauged for accuracy. Shafts shall be sized for the first critical speed of at least 1.43 times the maximum speed.

**BEARINGS (ARR. 9)** — Bearings shall be heavy duty, grease lubricated, anti-friction ball or roller, self-aligning, pillow block type and selected for a minimum average bearing life (AFBMA L-50) in excess of 200,000 hours at the maximum fan RPM. All bearings are provided with pre-filled factory extended lubrication lines terminating at the housing exterior.

**DRIVE (ARR. 9)** — The fan shall be equipped with a (fixed/adjustable) pitch V-belt drive selected to operate the fan at the correct operational RPM. The V-belt drive shall consist of cast iron sheaves and anti-static conducting belts and shall be selected with a (1.2/1.5) safety factor based upon the required brake horsepower of the fan.

The complete fan shaft and bearing assembly is mounted within a steel fabricated inner cylinder. The V-belt drive assembly is extended through a two-piece belt fairing. The belt fairing shall be an aerodynamically shaped tube designed to maximize fan efficiency. The belt fairing is welded continuously to both the inner cylinder that houses the fan shaft and bearings and the fan housing.

**MOTOR** — Motors for Arrangement 9 fans shall be manufactured in accordance with current applicable standards of IEEE and NEMA and, where applicable, shall meet current EPACT standards. Motors shall be foot-mounted, NEMA standard (ODP, TEFC, Explosion-Proof), continuous duty, ball bearing type with class (B, F) insulation and of cast iron construction when commercially available.

Motors for Arrangement 4 fans shall be foot-mounted, NEMA standard, totally enclosed fan cooled (TEFC), continuous duty, ball bearing type with class "F" insulation and of cast iron construction when commercially available. For ease in wiring the motor, wiring connections shall be extended to an exterior conduit box located on the exterior of the fan housing. A duplicate motor nameplate shall be mounted on the exterior of the fan adjacent to the fan nameplate. External grease fittings with pre-filled factory extended grease leads shall be supplied for lubrication of the motor bearings on all motors that provide grease fittings.

**FINISH** — The entire fan assembly, excluding the shaft, shall be thoroughly degreased and deburred before application of a rust-preventative primer. After the fan is completely assembled, a finish coat of paint shall be applied to the entire assembly. The fan shaft shall be coated with a petroleum-based rust protectant. Aluminum components shall be unpainted.

**FACTORY RUN TEST** — All fans with motors and drives mounted by Twin City Fan & Blower shall be completely assembled and test run as a unit at the specified operating speed prior to shipment. Each wheel shall be statically and dynamically balanced in accordance with ANSI/AMCA 204-96 "Balance Quality and Vibration Levels for Fans" to Fan Application Category BV-3, Balance Quality Grade G6.3. Balance readings shall be taken by electronic type equipment in the axial, vertical, and horizontal directions on each of the bearings. Records shall be maintained and a written copy shall be available upon request.

**GUARANTEE** — The manufacturer shall guarantee the workmanship and materials for its TCVA AXIFAN® vaneaxial fans at least one (1) year from startup or eighteen (18) months from shipment, whichever occurs first.

# INDUSTRIAL & COMMERCIAL FANS

Centrifugal Fans | Utility Sets | Plenum & Plug Fans | Inline Centrifugal Fans

Mixed Flow Fans | Tubeaxial & Vaneaxial Fans | Propeller Wall Fans | Propeller Roof Ventilators

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