



The Industrial Choice.



HIGH EFFICIENCY PLUG FANS

Model CPG

High Efficiency Plug Fans



Class III w/4\"/>



Class II w/
OSHA Belt Guard

Model CPG

CPG plug fans from Aerovent are compact, versatile and offer the highest efficiency in the industry. Their versatility allows them to be used for air circulation in a variety of commercial and industrial applications including air curtains, air heaters, ceiling, wall, and floor panel plenums, degreasers, dryers, dust collectors, evaporators, freezers, kilns, ovens, packaged air handlers, parts washers, penthouses, smoke houses, space heaters, spray booths, and other high temperature applications.

Plug fans are housed in the customer's enclosure in applications where the system plenum acts as the fan housing. This configuration saves space since connecting ductwork and motor support pedestals are generally not needed. More space savings can be obtained by utilizing the wheel compartment as a pressurized chamber in lieu of a fan scroll. The use of multiple discharges from the pressurized chamber allows for additional savings by reducing ducting requirements.

CPG plug fans feature SWSI backward curved, non-overloading, single thickness airfoil type wheels. The unique wheel offers increased efficiency over competitor's airfoil blade designs yet can handle airstreams not conducive to traditional hollow airfoil shapes.

The plug fan's motor and drive are protected from high temperatures by the customer's chamber wall or the optional 4" or 6" insulated plug. The motor and drive are mounted to the plug panel which may be bolted or welded in place. The plug assembly may be mounted with the shaft in either the vertical or horizontal position for maximum flexibility. Horizontal construction is standard. Vertical mounting can be provided when specified. An all welded housing and an integral inlet cone are available as options.

Performance Comparison

Model CPG Plug Fans are designed to maximize efficiency. This is illustrated by the following chart which compares the new CPG Plug Fan and other manufacturers' airfoil (AF) and backward inclined (BI) fans.

Nominal 36" Wheel Diameter

CFM	SP	MANUFACTURER	RPM	BHP	SE%
23000	3.5"	Aerovent CPG	1057	16.39	77.3
		Manufacturer "A" AF	1107	16.60	76.3
		Manufacturer "A" BI	1005	17.50	72.4
		Manufacturer "B" AF	971	17.94	70.6
33000	5"	Aerovent CPG	1409	35.28	73.6
		Manufacturer "A" AF	1475	36.50	71.1
		Manufacturer "A" BI	1324	38.30	67.8
		Manufacturer "B" AF	1295	40.81	63.6

Nominal 44" Wheel Diameter

CFM	SP	MANUFACTURER	RPM	BHP	SE%
30000	2.5"	Aerovent CPG	717	15.28	77.2
		Manufacturer "A" AF	783	15.60	75.6
		Manufacturer "A" BI	713	16.50	71.5
		Manufacturer "B" AF	725	17.46	67.6
47000	4"	Aerovent CPG	1032	40.64	72.8
		Manufacturer "A" AF	1132	43.30	68.3
		Manufacturer "A" BI	1015	45.20	65.4
		Manufacturer "B" AF	1054	50.00	59.2

Construction Features

Plug Panel

Constructed of minimum 7-gauge steel with formed flanges to maintain flatness and rigidity. Panel is prepunched for bolt mounting. Panel assembly may also be welded in place. The “cross frame” bearing support is designed for maximum stability and load spreading. Bearings are serviceable without disassembly of panel or frame.

Plug Assembly

Available for both horizontal and vertical applications. Horizontal construction is standard. Vertical construction will be provided when specified.

Adjustable Motor Base

The motor base is standard with leveling and tension adjustment to ensure proper drive belt alignment. The motor base is heavy-gauge steel and prepunched to accept the standard motor frame specified.

Wheels

Wheels are assembled of die-formed, matched components, continuously welded to both back plate and rim. Wheels are statically and dynamically balanced.

Inlet Cones

Heavy-gauge and spun to match the wheel intake rim to insure smooth airflow. Inlet cone flange is prepunched for mounting. Inlet cones are shipped loose as standard. An integral inlet cone is optional.



Class III Adjustable Motor Base

Shafts

Standard shaft diameters are sized for plug thicknesses to 6 inches and 1000°F operation.

Bearings

Either ball or spherical roller, heavy duty, self-aligning, pillow block type bearings are provided. Bearing selection is based on L-10 minimum life of 40,000 hours or average life of 200,000 hours. Split roller bearings are not recommended.

Typical Installations

Mounting is accomplished by providing a hole larger than the wheel diameter through the chamber wall. The wheel, shaft, motor, and drive assembly is then positioned to the inlet cone (mounted in opposite wall) and secured in place. See Figure A.

Another method is to provide a hole sized only for the wheel drive shaft. The wheel is then positioned through the opening for the inlet cone after the drive and panel assembly has been securely mounted. See Figure B.

Plug fans may be applied with open wheel (unhoused) or with a housing as shown in Figure C. Performance data in this catalog is for unhoused wheel application.

Walls must be designed to support the dynamic loads of the fan without resonance to eliminate vibration and bearing failure.

Plenum System

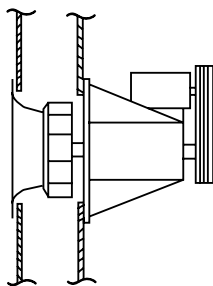
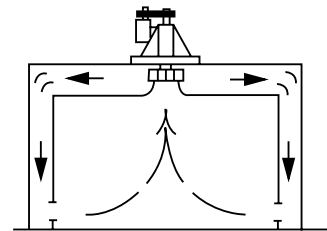


Figure A

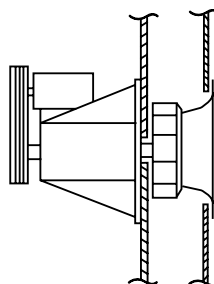


Figure B

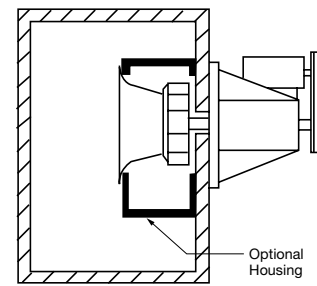


Figure C

Optional Construction

Variable Inlet Vanes

Vane blades are cantilever design or center supported, equipped with permanently lubricated bearings and ball joints for smooth and easy operation. Vane assemblies are external type for sizes 121 through 161 and nested for sizes 181 through 491. Standard inlet vanes are applicable to 300°F. Consult factory for higher temperatures.

Spark Resistant Construction

Fan applications may involve the handling of potentially explosive or flammable particles, fumes or vapors. Such applications require careful consideration by the system designer to insure the safe handling of such gases. Aerovent offers the following classifications of spark resistant construction per AMCA Standard 99-0401-86. It is the specifier or the user's responsibility to specify the type of spark resistant construction with full recognition of the potential hazards and the degree of protection required.

Type C - The fan shall be so constructed that a shift of the wheel or shaft will not permit two ferrous parts of the fan to rub or strike.

Shallow Depth Inlet Cone

The shallow inlet cone can shorten the overall length of the plug fan, providing extra space where needed. See dimensional data on page 14 for comparison between standard inlet cone and the shallow depth cone. Fan performance in smaller sizes must be derated for the modification. See Table 3 on page 5 for performance derates.

High Temperature Construction

301-500°F: Includes high temperature grease, expansion and non-expansion bearings, ceramic shaft seal and shaft cooler.

501-800°F: Includes the modifications above with the addition of high temperature aluminum paint. Minimum 4" insulation is required and is available as an optional item from Aerovent. Be sure to apply derating factors for high temperature construction.

801-1000°F: Includes the modifications above with the addition of 316 stainless steel wheel and shaft. Also includes shaft extension for the required 6" insulation. 6" insulated plug is available as an optional item. Be sure to apply stainless steel derating factors for temperature.

Insulated Plug

Protects motor and drive components from heat. An insulated plug is recommended for temperatures above 300°F. Available in 2", 4" and 6" thicknesses. Special thicknesses to match customer's insulated wall are available. Plug is assembled to mounting panel when ordered. See Table 1 on page 5 for maximum RPMs.

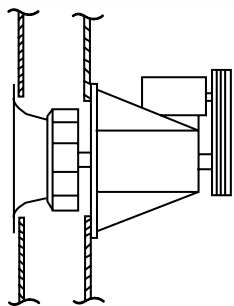
All Welded Housing

Heavy-gauge steel housing is provided with wheel opening on each side and weld studs on the inlet side for cone mounting. Specify rotation and discharge as viewed from drive side to insure proper stud placement. Housing supports and attachments for wall mounting to be provided by others. See page 14 for dimensions.

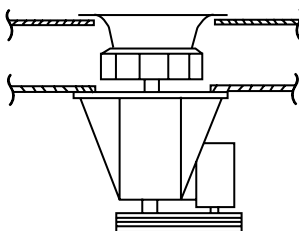
Integral Inlet Cone Assembly

Includes four pieces of angle, welded to the insulated plug or mounting panel, which serve to pre-align the inlet funnel within the wheel. The entire unit can be installed or removed through the same hole in the customer's enclosure, without the need for additional mounting or alignment of the inlet cone.

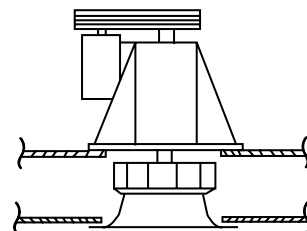
Mounting Arrangements



Horizontal



Vertical Down



Vertical Up

To ensure proper motor selection, consideration must be given to starting torque requirements (fan wheel inertia WR^2) along with the operating BHP. Table 1 lists the WR^2 factors for different wheel sizes to be used in evaluating the capability of a selected motor.

In some cases it may be necessary to provide a larger horsepower motor, even though it may not be dictated by the operating BHP, to bring the fan to speed.

Table 1. Maximum Fan RPMs, Wheel Weights and WR^2

FAN SIZE	CLASS II					CLASS III				
	MAXIMUM RPM			WHEEL WT. (LBS.)	WR^2 (LBS-FT ²)	MAXIMUM RPM			WHEEL WT. (LBS.)	WR^2 (LBS-FT ²)
	NO PLUG	4" PLUG	6" PLUG			NO PLUG	4" PLUG	6" PLUG		
121	3778	3000	3000	21	3	-	-	-	-	-
141	3352	3000	2875	24	4	-	-	-	-	-
161	2975	2975	2425	32	7	-	-	-	-	-
181	2644	2644	2275	52	13	3557	3000	3000	62	14
201	2380	2380	2200	58	18	3202	3000	2900	70	20
221	2125	2125	1850	75	31	2859	2859	2650	84	33
251	1889	1889	1700	96	50	2541	2541	2303	111	51
281	1676	1676	1676	140	94	2255	2255	1936	156	104
321	1487	1487	1487	173	152	2001	2001	1729	195	167
351	1322	1322	1322	211	241	1779	1779	1483	236	266
391	1190	1190	1190	254	376	1601	1601	1578	283	413
441	1062	1062	1062	361	613	1429	1429	1429	482	880
491	952	952	952	465	1025	1281	1281	1281	613	1450

Table 2. Bare Fan and Accessory Weights

FAN SIZE	APPROXIMATE WEIGHTS (LBS.)				
	BARE FAN		INSULATED PLUG	HOUSING	INLET VANES
	CLASS II	CLASS III			
121	140	-	25	24	45
141	145	-	25	30	52
161	185	-	32	44	58
181	208	444	32	65	29
201	221	470	32	79	33
221	235	513	35	97	38
251	240	594	35	117	40
281	323	756	40	143	45
321	388	990	55	287	50
351	430	1118	55	350	50
391	575	1467	75	428	55
441	639	1745	75	522	60
491	950	1900	95	634	65

Table 3. Shallow Inlet Cone Derates

FAN SIZE	INCREASE DESIGN SPEED BY	INCREASE DESIGN BHP BY
121 - 141	Not Available	Not Available
161 - 201	2%	4%
221 - 491	0%	0%

NOTE: Maximum RPMs in Table 1 cannot be exceeded.

Table 4. High Temperature Applications

TEMP. RANGE	BEARING TYPE	LUBRICATION	OTHER REQUIREMENTS
TO 300°F	BALL OR ROLLER	GREASE	STANDARD CONSTRUCTION
301 TO 500°F	EXPANSION AND NON-EXPANSION	HIGH TEMPERATURE GREASE	CERAMIC SHAFT SEAL, SHAFT COOLER
501 TO 800°F	EXPANSION AND NON-EXPANSION	HIGH TEMPERATURE GREASE	HIGH TEMPERATURE ALUMINUM PAINT 4" MINIMUM INSULATION REQUIRED BY AEROVENT OR CUSTOMER CERAMIC SHAFT SEAL, SHAFT COOLER
801 TO 1000°F	EXPANSION AND NON-EXPANSION	HIGH TEMPERATURE GREASE	316 STAINLESS STEEL WHEEL AND SHAFT 6" MINIMUM INSULATION REQUIRED BY AEROVENT OR CUSTOMER HIGH TEMPERATURE ALUMINUM PAINT CERAMIC SHAFT SEAL, SHAFT COOLER

Figure 1. Wheel and Plenum Arrangement

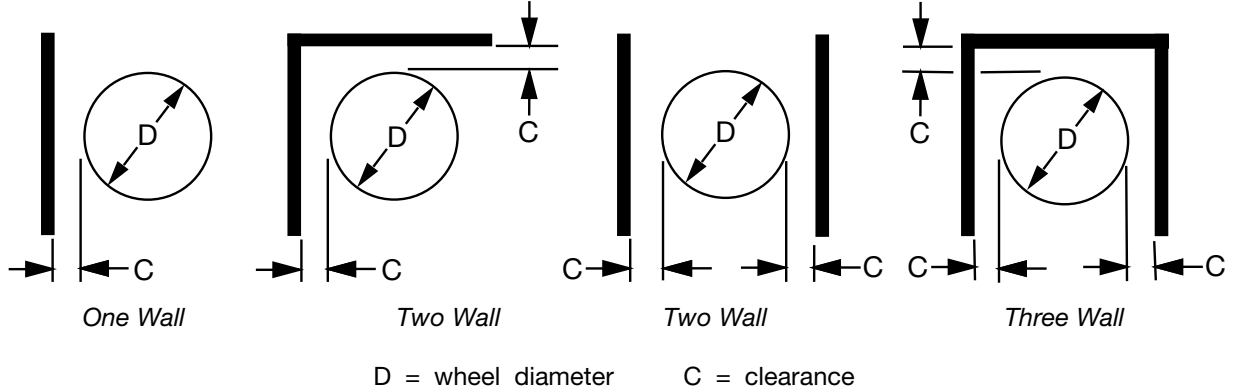


Table 5. Wall Proximity Factors

% WOV	FACTOR	C = D/8			C = D/4			C = D/2		
		ONE WALL	TWO WALL	THREE WALL	ONE WALL	TWO WALL	THREE WALL	ONE WALL	TWO WALL	THREE WALL
95	RPM	1.02	1.03	1.09	1.01	1.02	1.06	1.01	1.01	1.03
	BHP	1.06	1.08	1.29	1.04	1.06	1.20	1.02	1.02	1.08
85	RPM	1.02	1.02	1.08	1.01	1.02	1.06	1.01	1.01	1.03
	BHP	1.05	1.07	1.26	1.03	1.05	1.18	1.02	1.02	1.08
75	RPM	1.01	1.02	1.07	1.01	1.02	1.05	1.00	1.01	1.02
	BHP	1.04	1.06	1.23	1.03	1.05	1.16	1.01	1.02	1.07
65	RPM	1.01	1.02	1.06	1.01	1.01	1.04	1.00	1.01	1.02
	BHP	1.04	1.06	1.19	1.03	1.04	1.14	1.01	1.02	1.06
55	RPM	1.01	1.02	1.05	1.01	1.01	1.04	1.00	1.01	1.02
	BHP	1.03	1.05	1.16	1.02	1.03	1.12	1.01	1.02	1.05
45	RPM	1.01	1.01	1.04	1.01	1.01	1.03	1.00	1.00	1.01
	BHP	1.02	1.04	1.13	1.02	1.03	1.09	1.01	1.01	1.04

Table 6. WOV Factors

SIZE	WOV FACTOR	D
121	1.08	12.40
141	1.55	13.98
161	2.22	15.75
181	3.42	17.72
201	4.68	19.68
221	6.58	22.05
251	9.37	24.80
281	14.31	27.95
321	20.47	31.50
351	31.51	35.43
391	43.24	39.37
441	60.73	44.09
491	84.44	49.21

Table 7. Temperature and Altitude Correction Factors

AIR TEMP °F	ALTITUDE IN FEET ABOVE SEA LEVEL											
	0	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000	15000
	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
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
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
150	0.869	0.838	0.808	0.770	0.751	0.723	0.696	0.671	0.646	0.620	0.598	0.490
200	0.803	0.774	0.747	0.720	0.694	0.668	0.643	0.620	0.596	0.573	0.552	0.453
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
300	0.697	0.672	0.648	0.624	0.604	0.580	0.558	0.538	0.518	0.498	0.480	0.393
400	0.616	0.594	0.573	0.552	0.532	0.513	0.493	0.476	0.458	0.440	0.424	0.347
500	0.552	0.532	0.513	0.495	0.477	0.459	0.442	0.426	0.410	0.394	0.380	0.311
600	0.500	0.482	0.469	0.448	0.432	0.416	0.400	0.386	0.372	0.352	0.344	0.282
700	0.457	0.441	0.425	0.410	0.395	0.380	0.366	0.353	0.340	0.326	0.315	0.258
800	0.420	0.404	0.389	0.375	0.362	0.350	0.336	0.323	0.311	0.300	0.290	0.237
900	0.389	0.376	0.363	0.349	0.336	0.324	0.312	0.300	0.289	0.279	0.268	0.220
1000	0.363	0.350	0.338	0.325	0.314	0.302	0.291	0.280	0.270	0.259	0.250	0.205

Table 8. Derating Factors For High Temperature

TEMP. (°F)	STEEL			STAINLESS STEEL	
	CLASS II		CLASS III	CLASS II	CLASS III
	121-281	321-491			
70	1.00	1.00	1.00	1.00	1.00
200	0.99	0.97	0.97	1.00	0.98
250	0.98	0.96	0.96	1.00	0.96
300	0.97	0.95	0.95	1.00	0.94
400	0.96	0.93	0.93	1.00	0.91
500	0.93	0.90	0.90	0.97	0.87
600	0.90	0.87	0.87	0.94	0.84
700	0.88	0.84	0.84	0.90	0.80
800	0.83	0.81	0.81	0.87	0.78
1000	N/A	N/A	N/A	0.81	0.75

When operating fans at elevated temperatures, the maximum RPMs of the fan from Table 1 on page 5 must be corrected to the safe operating RPM limit for the application using the factors listed in the Table 8.

The performance tables in this catalog are based on fans handling standard air at a density of 0.075 pounds per cubic foot. This is equivalent to air at 70°F at sea level (29.92 Hg barometric pressure). When specified performance is at a density different than standard, it must be converted to the equivalent standard conditions before the fan can be selected from the performance tables. The performance data and examples in this catalog are for unshoused CPG fans.

$$\% \text{ WOV} = \frac{17000 \times 100}{1478 \times 15.19} = 75.7$$

Step 4. By interpolation from Table 5 on page 6, for the two wall column of $D \div 4$ at 75.7% WOV, we find the RPM factor of 1.02 and the BHP factor of 1.05.

Corrected unshoused performance for 17000 CFM at 3" SP standard air is:

$$\begin{aligned} \text{RPM} &= 1478 \times 1.02 = 1508 \\ \text{BHP} &= 11.33 \times 1.05 = 11.90 \end{aligned}$$

Example 1. Standard Density

Given: 17000 CFM at 3" TSP (system). Installation is a two-wall arrangement with a wheel-to-wall clearance of 7".

Step 1. Entering the performance tables we find that a 281 CPG plug fan will deliver 17000 CFM at 3" SP operating at 1478 RPM with 11.33 BHP.

Step 2. Catalog performance must be corrected for wheel-to-wall arrangement. Determine the wheel and plenum type from the arrangements shown in Figure 1 on page 6. Determine the clearance "C" based upon the closest wall. Performance will not be affected by any additional walls spaced greater than $C \times 3$ from the wheel.

The selected 281 CPG fan has a wheel diameter of 27.95" ("D"). Application is two walls with 7" clearance ("C"). Therefore, $C \div D = 7 \div 27.95 = 0.25$ or $\frac{1}{4}$ " which is equivalent to $D \div 4$.

Step 3. Next, determine the Percent of Wide Open Volume (% WOV) at which the fan is to operate. From Table 6 on page 6 find that the WOV factor is 15.19 for a 281 CPG fan.

Example 2. Nonstandard Density

Given: 17000 CFM at 3" TSP (system), 300°F, 4000 ft. altitude. Installation is a two-wall arrangement with a wheel-to-wall clearance of 7".

Step 1. To enter the performance tables the operating SP must be corrected to equivalent standard conditions. From Table 7 on page 6 find the correction factor of 0.604 for 300°F and 4000 feet altitude. The corrected equivalent static pressure is equal to:

$$\text{SP (Catalog)} = \frac{3" \text{ TSP (system)}}{0.604} = 5.0$$

Fan selection is then made for 17000 CFM at 5" SP. Entering the performance tables, we find that a 281 CPG fan will deliver 17000 CFM at 1638 RPM with 17.29 BHP. It must be remembered that this BHP is cataloged at standard 70°F air at sea level.

Steps 2, 3, & 4. Continue the correction procedure with Steps 2, 3 and 4 as shown in Example 1. Wall arrangement = $D \div 4$, % WOV = 60.0, RPM = 1654, and BHP = 17.90.

PerformanceData

CPG | Size 121

Wheel Dia.: 12.40"

Max. BHP = $0.07 \times (\text{RPM} \div 1000)^3$

CFM	0.5" 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		6" SP		
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	
700	1155	0.09	1522	0.21																					
800	<u>1201</u>	<u>0.10</u>	1563	0.23	1842	0.36																			
900	<u>1261</u>	<u>0.11</u>	1602	0.24	1881	0.39	2119	0.55																	
1000	1327	0.13	1637	0.26	1923	0.42	2156	0.59	2367	0.77															
1200	1473	0.17	<u>1738</u>	<u>0.30</u>	1996	0.47	2239	0.66	2444	0.86	2631	1.07	2807	1.29	2972	1.51									
1400	1627	0.22	1868	0.35	<u>2087</u>	<u>0.52</u>	2309	0.72	2525	0.95	2713	1.18	2884	1.42	3044	1.66	3196	1.91	3343	2.16	3482	2.42			
1600	1784	0.29	2010	0.43	2211	0.60	<u>2401</u>	<u>0.79</u>	2595	1.02	2789	1.28	2966	1.54	3126	1.81	3275	2.08	3417	2.35	3553	2.63	3685	2.92	
1800	1945	0.38	2161	0.53	2346	0.70	<u>2522</u>	<u>0.89</u>	2691	1.11	2862	1.36	3037	1.64	3205	1.94	3358	2.24	3500	2.54	3634	2.84	3762	3.14	
2000	2109	0.48	2316	0.64	2492	0.82	2655	1.02	<u>2812</u>	<u>1.24</u>	<u>2964</u>	<u>1.48</u>	3116	1.75	3273	2.05	3430	2.37	3578	2.70	3716	3.03			
2200	2276	0.60	2473	0.78	2643	0.97	2796	1.17	2944	1.39	3086	1.64	3224	1.90	3362	2.19	3503	2.50	3647	2.84					
2400	2444	0.74	2633	0.93	2798	1.14	2945	1.35	3083	1.57	3218	1.82	<u>3348</u>	<u>2.08</u>	<u>3476</u>	<u>2.37</u>	<u>3602</u>	<u>2.68</u>	3729	3.00					
2600	2615	0.91	2795	1.12	2954	1.33	3098	1.55	3230	1.78	3356	2.03	3481	2.30	<u>3602</u>	<u>2.59</u>	<u>3720</u>	<u>2.89</u>							
2800	2787	1.09	2959	1.32	3113	1.55	3253	1.78	3382	2.03	3502	2.28	3619	2.55	3735	2.84									
3000	2960	1.31	3125	1.55	3273	1.79	3410	2.04	3536	2.30	3653	2.56	3765	2.84											
3200	3134	1.55	3293	1.81	3436	2.07	3568	2.33	3692	2.60															
3400	3310	1.83	3462	2.11	3600	2.38	3728	2.65																	
3600	3486	2.13	3632	2.43	3766	2.72																			
3800	3663	2.47																							
4000																									

Maximum RPM @ 70°F:

Class II — 3778

Must derate for temperature and plug wall thickness.

Underlined figures indicate maximum static efficiency.

Power rating (BHP) does not include transmission losses.

CPG | Size 281

Wheel Dia.: 27.95" Max. BHP = 4.26 x (RPM ÷ 1000)³

Table with 13 columns for CFM (1" SP to 12" SP) and 2 rows per CFM for RPM and BHP. Data includes values for CFM 6000 to 26000.

Maximum RPM @ 70°F:

Class II — 1676 Class III — 2255

Must derate for temperature and plug wall thickness.

CPG | Size 321

Wheel Dia.: 31.50" Max. BHP = 7.75 x (RPM ÷ 1000)³

Table with 13 columns for CFM (1" SP to 12" SP) and 2 rows per CFM for RPM and BHP. Data includes values for CFM 8000 to 34000.

Maximum RPM @ 70°F:

Class II — 1487 Class III — 2001

Must derate for temperature and plug wall thickness.

CPG | Size 351

Wheel Dia.: 35.43" Max. BHP = 14.21 x (RPM ÷ 1000)³

Table with 13 columns for CFM (1" SP to 12" SP) and 2 rows per CFM for RPM and BHP. Data includes values for CFM 9000 to 44000.

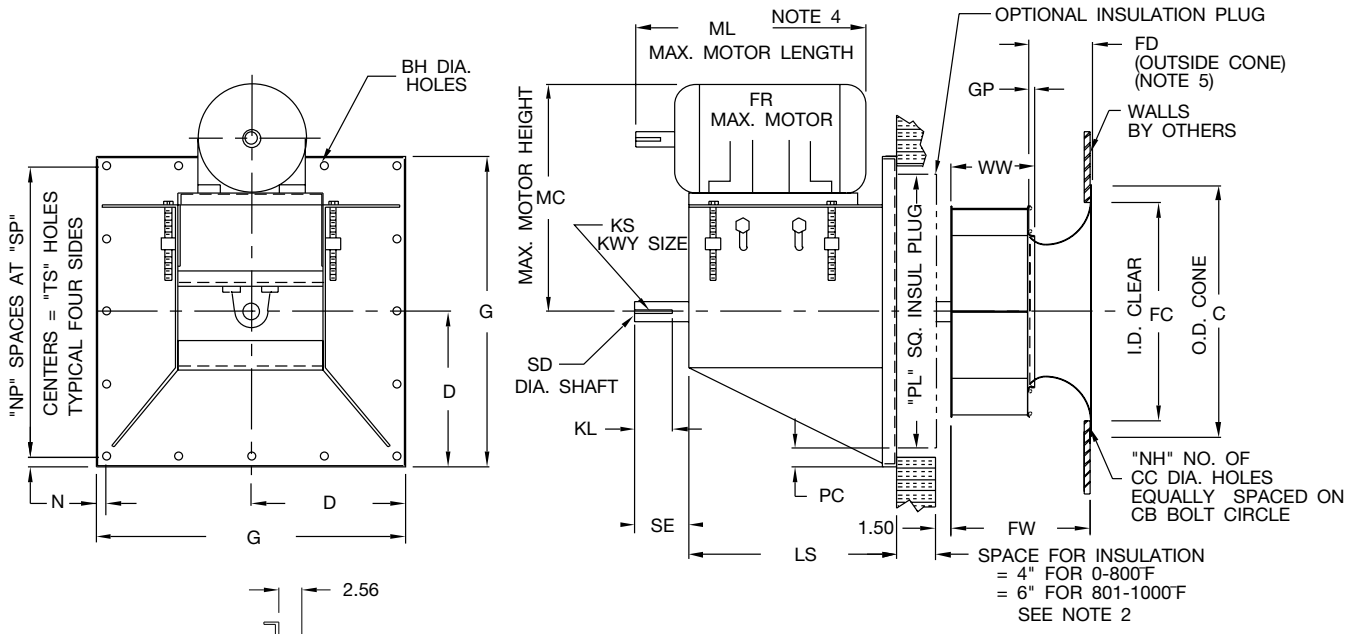
Maximum RPM @ 70°F:

Class II — 1322 Class III — 1779

Must derate for temperature and plug wall thickness.

Underlined figures indicate maximum static efficiency. Power rating (BHP) does not include transmission losses.

Class II



NOTES:

1. Dimensions apply to unboxed assembly only.
2. When specified, the shaft length can be extended an additional 2 inches for 6 inches of insulation, for operation to 800°F, without changes to the shaft diameter. See Detail "A" for shaft cooler recess cone and shaft seal on fans over 300°F with 4 inches or larger insulation plug.
3. CW rotation is standard. CCW rotation is optional.
4. To insure selected motor will fit standard assembly, compare the maximum motor length, dimension "ML," to overall motor length.
5. Dimensions are subject to change based on accessories. See page 14 for accessory options.
6. Dimensions shown are in inches unless otherwise indicated.

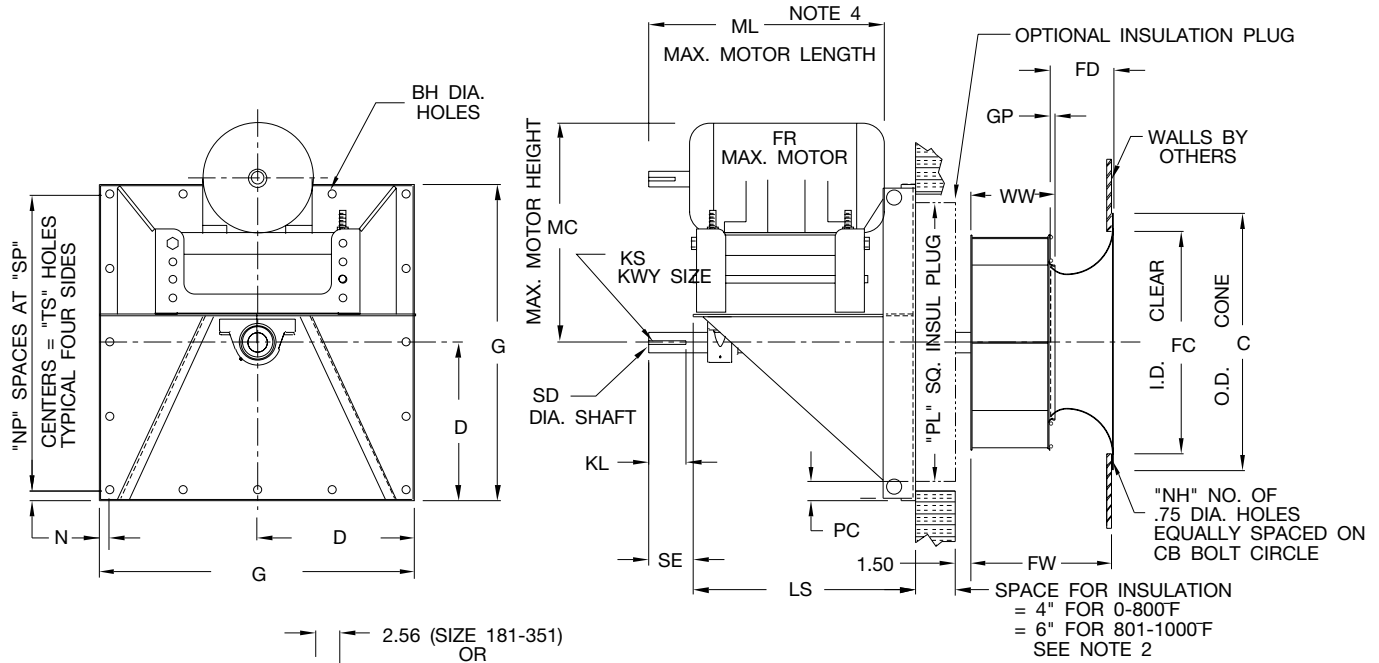
SIZE	BH	C	CB	CC	D	FC	FD	FW	G	GP	KL	KS	LS
121	0.56	17.13	15.88	0.69	11.38	13.75	3.72	8.48	22.75	0.25	4.00	.38x.19	17.50
141	0.56	18.91	17.63	0.69	11.38	15.50	4.19	9.55	22.75	0.25	4.00	.38x.19	18.50
161	0.56	20.88	19.59	0.88	14.81	17.75	4.72	10.75	29.63	0.25	4.00	.38x.19	18.50
181	0.56	22.84	21.56	0.88	14.81	20.00	5.31	12.16	29.63	0.31	4.50	.50x.25	21.00
201	0.56	25.19	23.94	0.88	14.81	22.00	5.88	13.39	29.63	0.31	4.50	.50x.25	21.00
221	0.56	27.97	26.69	0.88	16.00	24.50	6.59	15.01	32.00	0.31	4.50	.50x.25	22.50
251	0.56	31.13	29.84	1.00	16.00	27.50	7.44	16.93	32.00	0.50	4.50	.50x.25	22.50
281	0.69	34.66	33.38	1.00	18.31	30.75	8.38	19.06	36.63	0.50	5.00	.50x.25	23.00
321	0.69	39.59	37.84	1.00	21.81	35.00	9.44	21.40	43.63	0.56	5.00	.50x.25	24.50
351	0.69	43.53	41.78	1.00	21.81	39.25	10.63	24.08	43.63	0.63	5.50	.63x.31	24.50
391	0.69	48.31	46.53	1.00	27.50	43.50	11.75	26.77	55.00	0.63	5.50	.63x.31	27.50
441	0.69	53.41	51.66	1.00	27.50	48.50	13.19	29.96	55.00	0.75	5.50	.63x.31	27.50
491	0.69	59.31	57.56	1.00	28.50	54.25	14.63	33.40	57.00	0.78	5.50	.63x.31	27.50

SIZE	MC	ML	N	NH	NP	PC	PL	SD	SE	SP	TS	WW	MAX. MTR. FRAME
121	24.75	19.13	1.00	8	4	1.75	19.25	1.687	5.00	5.19	20.75	5.07	213T
141	26.25	20.13	1.00	8	4	1.75	19.25	1.687	5.00	5.19	20.75	5.67	215T
161	26.25	20.13	1.06	8	4	1.81	26.00	1.687	5.00	6.88	27.50	6.34	215T
181	29.50	24.13	1.06	16	4	1.81	26.00	1.937	5.50	6.88	27.50	7.24	254T
201	29.50	24.13	1.06	16	4	1.81	26.00	1.937	5.50	6.88	27.50	7.90	254T
221	29.50	25.50	1.13	16	4	1.88	28.25	1.937	5.50	7.44	29.75	8.80	256T
251	29.50	25.50	1.13	16	4	1.88	28.25	1.937	5.50	7.44	29.75	10.06	256T
281	31.50	26.63	1.25	16	6	2.25	32.13	2.187	6.00	5.69	34.13	11.25	284T
321	33.50	28.13	1.38	16	6	2.38	38.88	2.187	6.00	6.81	40.88	12.63	286T
351	33.50	28.13	1.38	16	6	2.38	38.88	2.437	6.50	6.81	40.88	14.19	286T
391	34.00	31.25	1.25	24	6	3.38	48.25	2.437	6.50	8.75	52.50	15.75	326T
441	36.00	31.25	1.25	24	6	3.38	48.25	2.687	6.50	8.75	52.50	17.63	326T
491	36.00	31.25	1.31	24	6	2.50	52.00	2.687	6.50	9.06	54.38	19.66	326T

Dimensions are not to be used for construction. Certified drawings are available upon request.

R-1004964

Class III



NOTES:

1. Dimensions apply to unboxed assembly only.
2. When specified, the shaft length can be extended an additional 2 inches for 6 inches of insulation, for operation to 800°F, without changes to the shaft diameter. See Detail 'A' for details of recess cone for shaft cooler and shaft seal on fans over 300°F with 4 inches or larger insulation plug.
3. CW rotation is standard. CCW rotation is optional.
4. To insure selected motor will fit standard assembly, compare the maximum motor length, dimension "ML," to overall motor length.
5. Dimensions are subject to change based on accessories. See page 14 for accessory options.
6. Dimensions shown are in inches unless otherwise indicated.

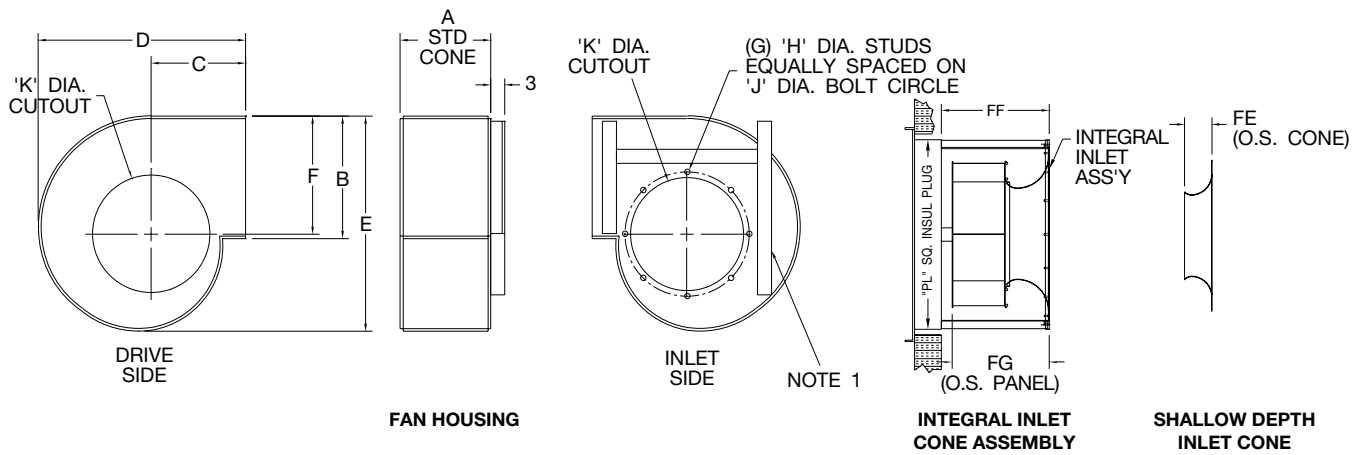
SIZE	BH	C	CB	CC	D	FC	FD	FW	G	GP	KL	KS	LS
181	0.56	22.84	21.56	0.88	14.81	20.00	5.31	12.24	29.63	0.31	4.50	.63x.31	25.00
201	0.56	25.19	23.94	0.88	14.81	22.00	5.88	13.46	29.63	0.31	5.50	.63x.31	27.50
221	0.56	27.97	26.69	0.88	16.00	24.50	6.59	15.08	32.00	0.31	5.50	.63x.31	27.50
251	0.56	31.13	29.84	1.00	16.00	27.50	7.44	16.93	32.00	0.50	6.00	.63x.31	30.50
281	0.69	34.66	33.38	1.00	18.31	30.75	8.38	19.12	36.63	0.50	6.00	.63x.31	30.63
321	0.69	39.59	37.84	1.00	21.81	35.00	9.44	21.46	43.63	0.56	6.50	.63x.31	32.38
351	0.69	43.53	41.78	1.00	21.81	39.25	10.63	24.15	43.63	0.63	8.00	.63x.31	37.88
391	0.69	48.31	46.53	1.00	27.50	43.50	11.75	26.83	55.00	0.63	8.00	.75x.38	38.38
441	0.69	53.41	51.66	1.00	27.50	48.50	13.19	30.09	55.00	0.75	8.00	.88x.44	38.38
491	0.69	59.31	57.56	1.00	28.50	54.25	14.63	33.46	57.00	0.78	8.00	.88x.44	38.38

SIZE	MC	ML	N	NH	NP	PC	PL	SD	SE	SP	TS	WW	MAX. MTR. FRAME
181	26.50	25.75	1.06	16	4	1.81	26.00	2.687	4.50	6.88	27.50	7.31	256T
201	28.00	28.88	1.06	16	4	1.81	26.00	2.687	5.50	6.88	27.50	7.97	284T
221	28.00	28.88	1.13	16	4	1.88	28.25	2.687	6.00	7.44	29.75	8.88	286T
251	32.00	32.00	1.13	16	4	1.88	28.25	2.687	6.00	7.44	29.75	10.06	324T
281	32.00	32.00	1.25	16	6	2.25	32.13	2.687	6.50	5.69	34.13	11.31	326T
321	34.00	34.38	1.38	16	6	2.38	38.88	2.687	8.00	6.81	40.88	12.69	365T
351	38.00	41.25	1.38	16	6	2.38	38.88	2.687	8.00	6.81	40.88	14.25	405T
391	38.00	41.25	1.25	24	6	3.38	48.25	2.937	8.00	8.75	52.50	15.81	405T
441	38.00	41.25	1.25	24	6	3.38	48.25	3.437	8.00	8.75	52.50	17.75	405T
491	38.00	41.25	1.31	24	6	2.50	52.00	3.437	8.00	8.75	54.38	19.72	405T

R-1004965

Dimensions are not to be used for construction. Certified drawings are available upon request.

Accessories



- NOTES:**
1. Inlet side frame angle on sizes 391, 441, and 491 only.
 2. Dimensions shown are in inches unless otherwise indicated.

SIZE	A	B	C	D	E	F	G	H
121	10.00	13.81	12.56	25.13	23.69	13.19	8	3/8-16
141	11.00	15.63	13.69	27.88	26.69	14.88	8	3/8-16
161	12.19	17.56	14.81	30.81	30.00	16.75	8	3/8-16
181	13.63	19.75	16.13	34.13	33.75	18.81	16	3/8-16
201	14.88	22.00	17.50	37.50	37.50	20.88	16	3/8-16
221	16.44	24.69	19.00	41.38	42.06	23.44	16	3/8-16
251	18.38	27.75	20.81	45.94	47.25	26.31	16	3/8-16
281	20.44	31.25	23.94	52.25	53.25	29.63	16	3/8-16
321	22.81	35.19	26.44	58.38	59.88	33.38	16	3/8-16
351	25.50	39.56	29.44	65.31	67.38	37.50	16	3/8-16
391	28.13	43.94	29.56	69.44	74.88	41.69	24	1/2-13
441	31.25	49.25	32.63	77.25	83.88	46.69	24	1/2-13
491	34.69	54.94	35.88	85.69	93.50	52.06	24	1/2-13

SIZE	J	K	FE		FF		FG	
			STANDARD INLET CONE	SHALLOW INLET CONE	STANDARD INLET CONE	SHALLOW INLET CONE	STANDARD INLET CONE	SHALLOW INLET CONE
121	15.88	14.13	3.75	-	10.19	-	8.69	-
141	17.63	15.94	4.19	-	11.19	-	9.69	-
161	19.59	17.88	4.75	3.44	12.38	11.06	10.88	9.56
181	21.56	19.88	5.31	3.75	13.81	12.25	12.31	10.75
201	23.94	22.19	5.88	4.13	15.06	13.31	13.56	11.81
221	26.69	25.00	6.63	4.50	16.63	14.56	15.13	13.06
251	29.84	28.13	7.44	4.88	18.56	15.94	17.06	14.44
281	33.38	31.69	8.38	5.19	20.63	17.44	19.13	15.94
321	37.84	35.63	9.44	5.50	23.06	19.13	21.56	17.63
351	41.78	39.56	10.63	6.50	25.69	21.56	24.19	20.06
391	46.53	44.31	11.75	7.25	28.38	23.88	26.88	22.38
441	51.66	49.44	13.19	8.25	31.44	26.50	29.94	25.00
491	57.56	55.31	14.63	9.25	34.94	29.56	33.44	28.06

Dimensions are not to be used for construction. Certified drawings are available upon request.

R-1004966

BeltCenters

MOTOR FRAME SIZE	CLASS II								CLASS III											
	121-161		181-251		281-351		391-491		181		201-221		251-281		321		351-391		441-491	
	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX
56	13	16.5	14	17.5	14.5	18	16	19.5	9.4	13.4	9.4	13.4	9.3	13.3	9.3	13.3	9.3	13.3	9.8	13.8
143-145	13	16.5	14	17.5	14.5	18	16	19.5	9.4	13.4	9.4	13.4	9.3	13.3	9.3	13.3	9.3	13.3	9.8	13.8
182-184	14	17.5	15	18.5	15.5	19	17	20.5	10.4	14.4	10.4	14.4	10.3	14.3	10.3	14.3	10.3	14.3	10.8	14.8
213-215	14.8	18.3	15.8	19.3	16.3	19.8	17.8	21.3	11.2	15.2	11.2	15.2	11	15	11.1	15.1	11.1	15.1	11.6	15.6
254-256	—	—	16.8	20.3	17.3	20.8	18.8	22.3	14.8	18.8	14.8	18.8	14.6	18.6	14.7	18.7	14.7	18.7	15.2	19.2
284-286	—	—	—	—	18	21.5	19.5	23	—	—	15.6	19.6	15.4	19.4	15.4	19.4	15.4	19.4	15.9	19.9
324-326	—	—	—	—	—	—	20.5	24	—	—	—	—	17.6	22.6	17.6	22.6	17.6	22.6	18.1	23.1
364-365	—	—	—	—	—	—	—	—	—	—	—	—	—	—	18.6	23.6	18.6	23.6	19.1	24.1
404-405	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	20.8	25.8	21.3	26.3	—

Model CPG

Fans shall be Model CPG Single Thickness Airfoil, as manufactured by Aerovent, Minneapolis, Minnesota.

PERFORMANCE — Fans shall be tested and rated in accordance with industry accepted test codes and shall be guaranteed by the manufacturer to deliver rated published performance levels.

PLUG PANEL — Plug panel shall be of minimum 7 gauge steel with formed flanges to maintain flatness and rigidity. Panel shall be prepunched for bolt mounting. The "Cross Frame" bearing support shall be designed for maximum stability and load spreading. Bearings shall be serviceable without disassembly of panel or frame. Plug assembly is available for both horizontal and vertical application. Horizontal construction is standard. Vertical construction must be specified.

WHEEL — CPG wheels shall be backward curved, non-overloading, single thickness airfoil type, designed for maximum efficiency and quiet operation. Wheels shall be constructed of heavy gauge steel, continuously welded to a flat wheel cone and backplate. Partial welding will not be acceptable.

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

BEARINGS — Bearings shall be either ball or spherical roller, heavy duty, self-aligning, pillow block type. Bearing selection is based upon L-10 minimum life of 40,000 hours or L-50 minimum life of 200,000 hours.

OPTIONAL ALL WELDED HOUSING — Housing shall be of heavy gauge steel. Housing shall be provided with wheel opening on each side and weld studs on inlet side for cone mounting. Specify rotation and discharge as viewed from drive side to insure proper stud placement. Housing supports and attachments for wall mounting to be provided by others.

ADJUSTABLE MOTOR BASE — Adjustable motor base is standard and shall have a four point leveling and tension adjustment to insure proper drive belt alignment. The motor base shall be heavy gauge steel and prepunched to accept standard motor frame specified.

OPTIONAL INLET VANES — Inlet vane blades are cantilever design or with centered supports equipped with permanently lubricated needle bearings and ball joints for smooth and easy operation. Vane assemblies are external type for sizes 121 through 161 and nested for sizes 181 through 491. Standard inlet vanes are applicable to 300°F. Consult factory for higher temperatures.

FACTORY RUN TEST — All fans prior to shipment shall be completely assembled and test run as a unit at the specified operating speed or maximum RPM allowed for the particular construction type. 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 CPG Single Blade Airfoil Plug Fans for at least one (1) year from startup or eighteen (18) months from shipment, whichever occurs first.



**PROPELLER FANS | TUBEAXIAL & VANEAXIAL FANS | CENTRIFUGAL FANS & BLOWERS | ROOF VENTILATORS
INDUSTRIAL AIR HANDLERS | AIR MAKE-UP | FIBERGLASS FANS | CUSTOM FANS**



AEROVENT
A Twin City Fan Company

Aerovent

The Aerovent logo features the word 'Aerovent' in a bold, white, sans-serif font. The letter 'O' is replaced by a red circle with a white outline. The text is set against a red, wavy background that resembles a fan blade or a stylized 'A'.

WWW.AEROVENT.COM

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