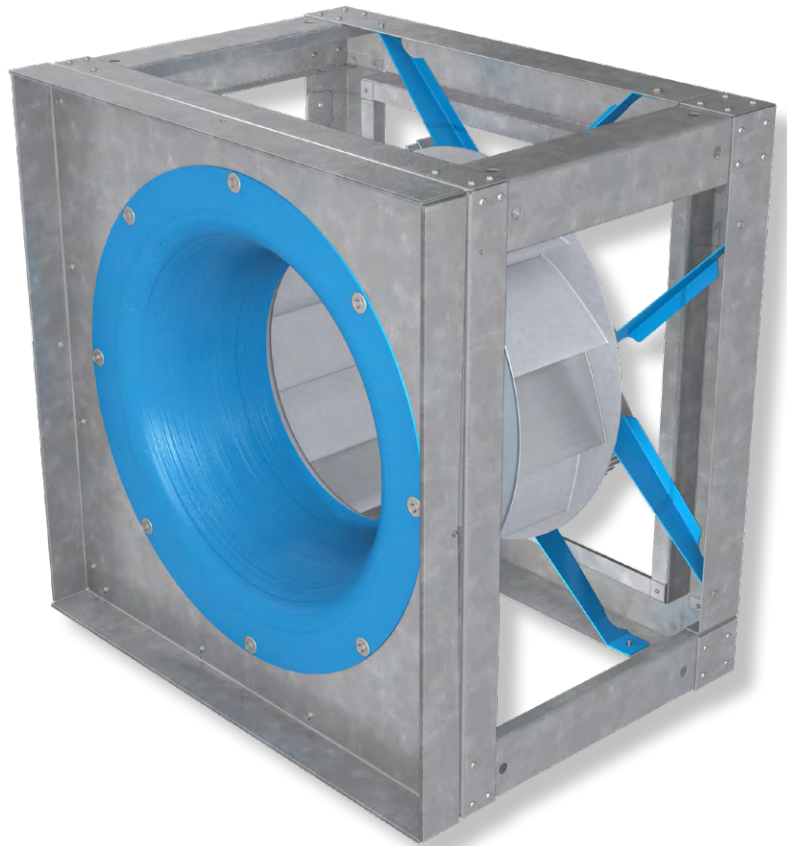




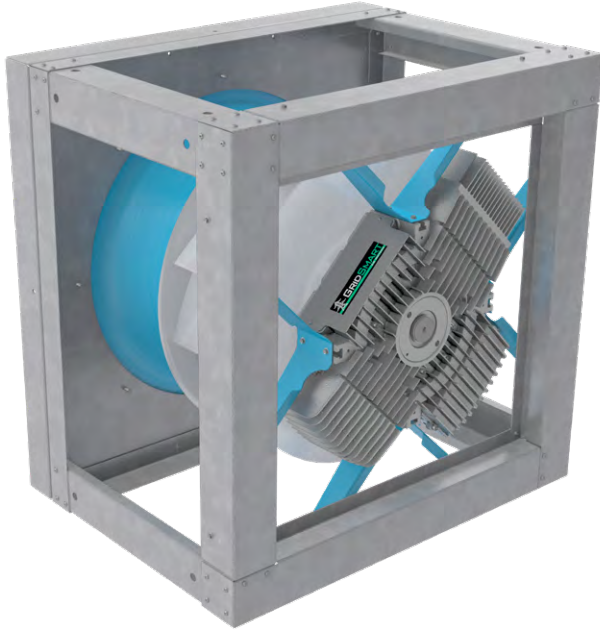
INDUSTRIAL PROCESS AND  
COMMERCIAL VENTILATION SYSTEMS

# COMPACT PLENUM FANS

ECLFN | ECLQN



# PLENUM FANS



## OVERVIEW

### ECLFN | ECLQN

Plenum fans are unshoused fans designed to operate inside of field-fabricated or factory-built air handling units.

The fan wheel pressurizes the entire surrounding air plenum in which the fan is installed, allowing air ducts from any direction to be directly connected to the air handling unit enclosure. This design generally saves space by eliminating the fan housing, transitions and diffusers within the air handling unit.

Plenum fans have found a ready acceptance in the air conditioning industry. In addition, the construction versatility, adaptability in the direction of the discharges, suitability for internal isolation and application of sound panels and generally lower cost makes it a very popular fan arrangement.



see page 4

#### Model ECLFN

16.5" to 27.00" wheel diameters  
Airflow to 19,465 CFM  
Static pressure to 7" w.g.

#### Model ECLQN

16.5" to 27.00" wheel diameters  
Airflow to 15,500 CFM  
Static pressure to 7" w.g.

#### Maximum Axial Length

SIZE	EPLFN	ECLFN
165	32.68	18.75
182	35.93	20.00
200	36.94	22.38
222	39.30	24.00
245	41.66	26.25
270	43.97	28.25

#### Configurations

Vertical and Horizontal

#### Wheel Type

Airfoil

#### Certifications

AMCA Sound/Air and FEG



Twin City Fan & Blower certifies that the Model ECLFN and Model ECLQN Plenum Fans shown herein are licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 211 and AMCA Publication 311 and comply with the requirements of the AMCA Certified Ratings Program.

See Fan Selector Program for sound power levels.



For complete product performance, drawings and available accessories, download our Fan Selector program at [tcf.com](http://tcf.com).

## APPLICATION

### ECLFN | ECLQN

#### Benefits of a Plenum Fan

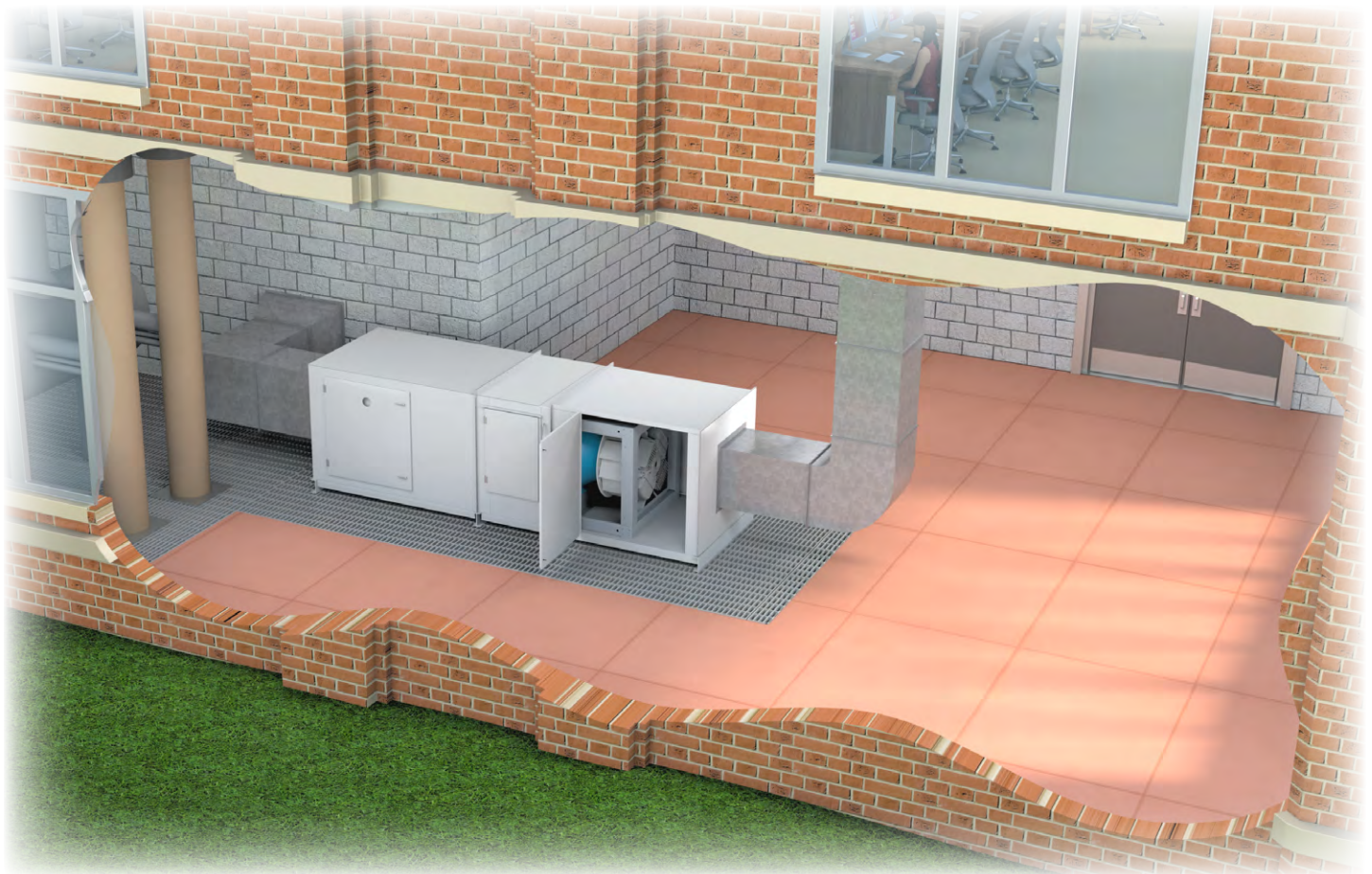
**Saves Space** – There are no housings, transitions or diffusers within the air handling unit. The EC series plenum fans utilize an axial flux motor that allows for an even greater reduction in the fan's footprint than traditional plenum fans.

**Efficiency** – Plenum fans can be as efficient or more efficient than scroll type fans at specific operating points towards the bottom of the fan curve. The Axial Flux motors on these fans have the added benefit of being constant efficiency motors, allowing for a greater efficiency even when the motor is not operating at the nominal RPM.

**Lower Cost** – These motors do not require a VFD to control the speed, resulting in initial cost savings. In addition, the higher efficiencies of these motors, compared to standard motors, grants continual cost savings.



Vertical Configuration



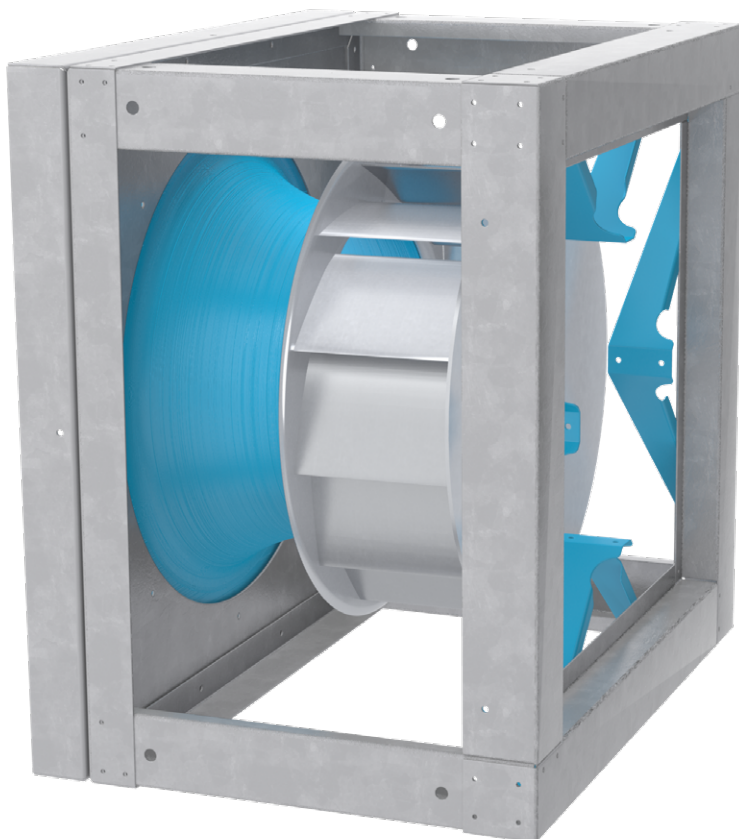
# ELECTRONICALLY COMMUTATED MOTORS



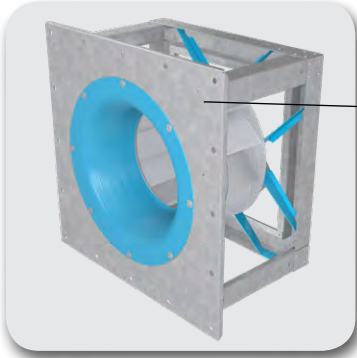
Twin City Fan & Blower offers its own line of custom engineered Electronically Commutated (EC) motors. Electronic commutation is the latest motor technology to be used in direct drive fans. Also known in the industry as Brush Free or Brushless DC, the EC motors utilize an electronic circuit board to control the functionality of the motor. The motor operates off of three phase AC power, which is converted to DC power within the motor's circuitry. TCF has motor options available for 230V or 460V three phase electrical power for motors of 5HP and below and 460V three phase electrical power for motors of 7.5HP and above. The result is a highly efficient motor, even at part load, with an expanded speed control range and a variety of speed control options from which to choose.

## Benefits

- Efficiencies up to 91%
- IP2X motor enclosure
- Constant efficiency as the motor speed is varied
- Up to 66% energy savings over traditional PSC motors
- Performance range comparable to a belt drive fan with reduced maintenance benefits of a direct drive fan
- 80% usable turndown range as compared with 40% maximum on PSC motors
- Soft start gives fans smooth, quiet start
- Lower operating temperatures result in longer life and reduces energy consumption
- Heavy-duty ball bearings are permanently lubricated
- Elimination of VFD results in lower initial cost
- The reduced size of the motor allows for the footprint of the fan to be drastically reduced.



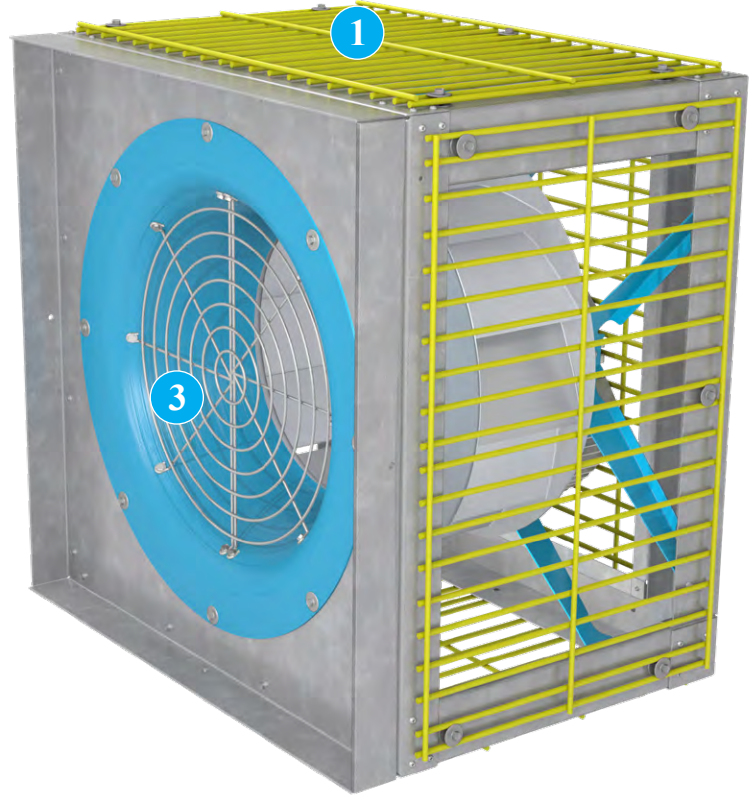
*Available with 0-10VDC control lead  
for the ECLFN & ECLQN models*



Inlet Mounting Panel



Piezometer Ring



**1 Protective Enclosure** Grill style protective enclosure completely encloses all sides and the back of the fan wheel to protect personnel from moving fan parts. The panels are individually removable to provide access to the wheel for service or inspection. Enclosures are available with or without a panel to enclose the bottom of the fan. Protective enclosures are plated wire.

**2 Inlet Mounting Panel** Designed to support the fan when mounting directly to a wall or other mounting surface, the inlet mounting plate includes pre-punched mounting holes. The mounting panel extends beyond the outside frame dimensions of the fan.

**3 Inlet Screen** Heavy-gauge screen mounted to fan inlet for easy removal.

**4 Piezometer Ring** The system consists of a piezometer ring mounted at the throat and a static pressure tap mounted on the face of the inlet cone. The pressure drop is measured from the tap located on the face of the inlet cone to the piezometer ring in the throat. The inlet tap is connected to the high pressure side of the transducer and the piezometer ring is connected to the low-pressure side.

**Other Accessories Include:**

- RIS & Spring Isolators
- Seismic Isolators (Restrained Isolators)
- Pressure Transducer/Transmitter w/ Display (Available with or without NEMA 4 Enclosure)



## Location and Placement of Fans in Air Handlers

1. Center the fan inlets in both the horizontal and vertical planes.
2. For inlet clearance, see Figure 1. The flow should converge at an angle not greater than  $45^\circ$  when approaching the opening for the fan inlet. A minimum of one fan wheel diameter clearance is recommended.
3. In the fan outlet plenum, a minimum wall clearance of one-half fan wheel diameter to the periphery of the fan wheel is recommended.
4. Figure 1 shows that the minimum clearance between the back of the fan wheel and the nearest component downstream (Dim. E) should be one wheel diameter. Small clearances do not allow the flow to equalize behind the fan wheel and the pressure drop of the downstream component is increased.
5. When the flow enters the inlet plenum perpendicular to the fan/motor shaft, large system effect losses can occur. See Figure 2 for a recommended flow baffle or a vortex breaker that may help preserve rated fan performance.
6. When two or more fans are installed in a plenum, divide the plenum into imaginary cells of equal area. Center the fan inlets on each cell. See Figure 3.

## Installation Recommendations

1. Install the fan so the flexible connector on the inlet remains uncollapsed during operation.
2. Install thrust restraints (snubbers) to maintain the axial position of the fan when it is generating pressure.
3. Peripheral equipment, such as electrical components, inverters, control panels, etc., should be positioned away from the high velocity air entering or leaving the fan.
4. Adjust springs on the isolation base so that spring deflection is approximately equal for all isolators.
5. Follow safety, installation, start-up and maintenance instructions supplied with each fan.

Figure 1. Recommended Location of Fan in Plenum

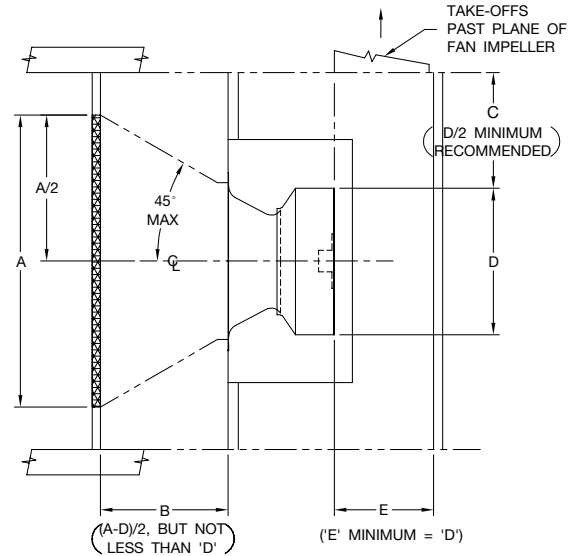


Figure 2. Flow Baffle and Vortex Spin Breaker Location

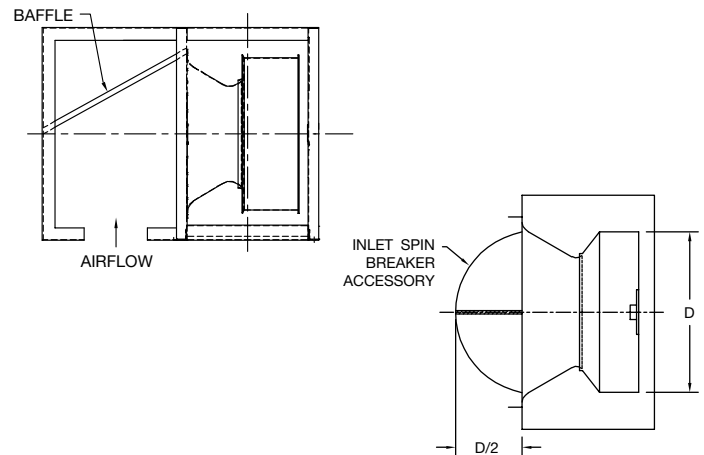
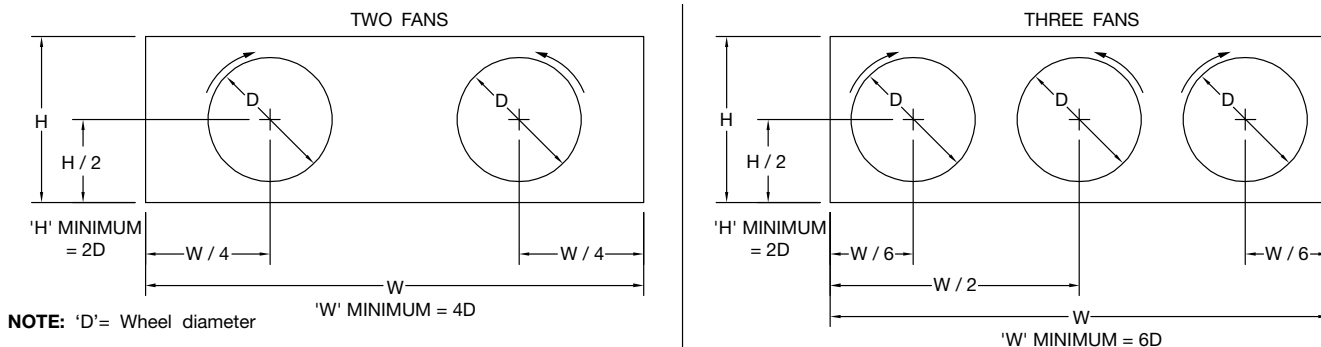


Figure 3. Location of Counter-Rotating Fans



To achieve the air velocity in the discharge duct and overcome the loss associated with the air entering the ductwork, additional resistance must be added to the external static pressure (ESP) requirements of the fan. Different types of duct entrances and locations will require varying correction factors. Therefore, prior to selecting a fan, make the following correction, depending upon the type of duct and its location.



ADDITIONAL DUCT ENTRANCE LOSS TO BE ADDED TO FAN ESP	
DISCHARGE TYPE	CORRECTION FACTOR
<ul style="list-style-type: none"> <li>• Radial and ducted with bellmouth</li> <li>• Radial and ducted without bellmouth</li> <li>• Radial without duct or bellmouth</li> <li>• Flow parallel to shaft and ducted with bellmouth</li> <li>• Flow parallel to shaft and ducted without bellmouth</li> <li>• Flow parallel to shaft without duct or bellmouth</li> </ul>	<ul style="list-style-type: none"> <li>1.1 x Duct Velocity Pressure</li> <li>1.4 x Duct Velocity Pressure</li> <li>1.8 x Duct Velocity Pressure</li> <li>1.6 x Duct Velocity Pressure</li> <li>1.9 x Duct Velocity Pressure</li> <li>2.4 x Duct Velocity Pressure</li> </ul>

**Example:** A system requires 30,000 CFM at 5" SP at standard air density with one 4 ft diameter duct with bellmouth placed in a radial discharge. Determine RPM and brake horsepower:

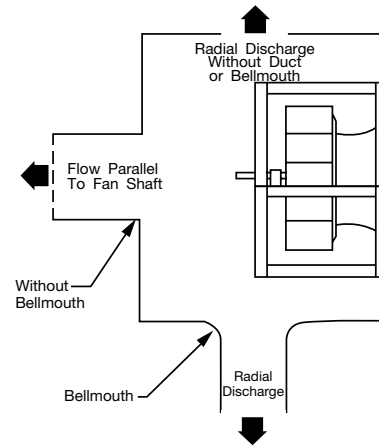
Duct area =  $(4^2 \times \rho) \div 4 = 12.57 \text{ ft}^2$

Duct velocity =  $30,000 \div 12.57 = 2387 \text{ FPM}$

Duct velocity pressure =  $(2387 \div 4005)^2 = 0.355 \text{ @ std. cond.}$

Entrance loss correction factor =  $1.1 \times \text{duct velocity pressure}$   
 =  $1.1 \times 0.355 = 0.39$

Thus, select the fan for =  $5" + 0.39" = 5.39" \text{ SP}$



## ENGINEERING DATA

### Maximum RPM, Wheel Weights & WR<sup>2</sup>

SIZE	WHEEL DIA. (IN.)	ECLFN			ECLQN		
		MAX RPM (70°F)	WT. (LB.)	WR <sup>2</sup> (LB.-FT <sup>2</sup> )	MAX RPM (70°F)	WT. (LB.)	WR <sup>2</sup> (LB.-FT <sup>2</sup> )
165	16.50	3468	17	4.4	3468	20	5.3
182	18.25	2930	18	6.1	2930	20	7.2
200	20.00	2674	21	7.4	2674	24	8.4
222	22.25	2403	30	12	2403	34	14
245	24.50	2183	35	21	2183	39	24
270	27.00	1981	40	29	1981	46	35

### Bare Fan Weights

SIZE	WHEEL DIA. (IN.)	WEIGHT (LB.)				MOTOR
		HORIZONTAL STD. MOUNT		VERTICAL STD. MOUNT		
		ECLFN	ECLQN	ECLFN	ECLQN	
165	16.50	70	72	70	72	60
182	18.25	86	88	86	88	60
200	20.00	108	110	108	110	60
222	22.25	141	145	141	145	60
245	24.50	159	163	159	163	60
270	27.00	183	189	183	189	60

**165 ECLFN (9-Blade)**

Wheel Diameter: 16.50"

Fan Efficiency Grade = FEG75

FAN SIZE	FAN/MOTOR RPM	MOTOR HP	0.5" SP		1" SP		1.5" SP		2" SP		2.5" SP		3" SP		4" SP		5" SP		6" SP		7" SP		
			CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM
165	1500	5	3142	0.65	2737	0.77	2340	0.85															
	1800		3917	1.06	3577	1.21	3248	1.34	2926	1.44	<u>2509</u>	<u>1.47</u>											
	2100		4668	1.61	4388	1.79	4091	1.97	3811	2.12	3545	2.25	3237	2.33									
	2400			5168	2.55	4914	2.76	4654	2.95	4408	3.13	4177	3.28	3651	3.48								
	2800			6179	3.88	5971	4.12	5752	4.36	5528	4.59	5309	4.81										
	1350	7-1/2	2741	0.50	2307	0.59	<u>1726</u>	<u>0.61</u>															
	1600		3404	0.77	3019	0.90	2665	1.00	<u>2200</u>	<u>1.03</u>													
	1850		4043	1.14	3714	1.30	3389	1.44	3085	1.55	<u>2714</u>	<u>1.60</u>											
	2100		4668	1.61	4388	1.79	4091	1.97	3811	2.12	3545	2.25	3237	2.33									
	2400			5168	2.55	4914	2.76	4654	2.95	4408	3.13	4177	3.28	3651	3.48								
	2674			5863	3.42	5642	3.65	5411	3.87	5178	4.09	4955	4.29	4538	4.63	4049	4.82	3285	4.69				
	2930			6502	4.40	6306	4.65	6099	4.90	5886	5.15	5674	5.38	5277	5.80	4892	6.15	4439	6.34	<u>3805</u>	<u>6.27</u>		
	3200				6992	5.90	6808	6.17	6617	6.44	6422	6.71	6037	7.21									
	1450	10	3010	0.60	2596	0.71	2165	0.77															
	1700		3662	0.91	3299	1.05	2962	1.17	2592	1.24													
	2000		4419	1.41	4121	1.58	3811	1.74	3527	1.88	3232	1.98	<u>2868</u>	<u>2.02</u>									
	2400			5168	2.55	4914	2.76	4654	2.95	4408	3.13	4177	3.28	3651	3.48								
	2674			5863	3.42	5642	3.65	5411	3.87	5178	4.09	4955	4.29	4538	4.63	4049	4.82	3285	4.69				
	2930			6502	4.40	6306	4.65	6099	4.90	5886	5.15	5674	5.38	5277	5.80	4892	6.15	4439	6.34	3805	6.27		
	3200					6992	5.90	6808	6.17	6617	6.44	6422	6.71	6037	7.21	5685	7.65	5329	8.02	4918	8.24		
	3468					7664	7.35	7498	7.65	7326	7.94	7148	8.24	6788	8.81	6441	9.33	6120	9.80				

MAXIMUM WHEEL RPM: 3468

Outlet Area = 2.036 ft<sup>2</sup>

Max. BHP = 0.252 x (RPM / 1000)<sup>3</sup>

**165 ECLQN (12-Blade)**

Wheel Diameter: 16.50"

Fan Efficiency Grade = FEG71

FAN SIZE	FAN/MOTOR RPM	MOTOR HP	0.5" SP		1" SP		1.5" SP		2" SP		2.5" SP		3" SP		4" SP		5" SP		6" SP		7" SP		
			CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM
165	1500	5	2974	0.69	2625	0.81	2181	0.85	1548	0.81													
	1800		3683	1.13	3416	1.28	3111	1.40	2746	1.46	<u>2315</u>	<u>1.48</u>											
	2100			4155	1.91	3917	2.08	3653	2.22	3352	2.30	3010	2.34										
	2400			4868	2.72	4670	2.93	4458	3.12	4229	3.28	3976	3.39	3389	3.49	2630	3.39						
	2800			5797	4.13	5634	4.39	5463	4.64	5284	4.86												
	1350	7-1/2	2609	0.53	2188	0.61	<u>1604</u>	<u>0.62</u>															
	1600		3213	0.82	2898	0.95	2512	1.02	<u>2030</u>	<u>1.04</u>													
	1850		3799	1.21	3542	1.38	3251	1.51	2908	1.57	<u>2508</u>	<u>1.61</u>	1987	1.54									
	2100			4155	1.91	3917	2.08	3653	2.22	3352	2.30	3010	2.34										
	2400			4868	2.72	4670	2.93	4458	3.12	4229	3.28	3976	3.39	3389	3.49	2630	3.39						
	2674			5507	3.64	5334	3.89	5153	4.11	4961	4.32	4756	4.50	4295	4.73	3756	4.84	<u>3095</u>	<u>4.76</u>				
	2930					5941	4.96	5780	5.22	5612	5.46	5436	5.69	5054	6.06	4614	6.25	4117	6.36	<u>3525</u>	<u>6.32</u>		
	3200				6571	6.28	6427	6.58	6278	6.86	6124	7.12	5795	7.60	5433	7.95	5024	8.15	4571	8.27			
	1450	10	2854	0.64	2484	0.74	<u>2005</u>	<u>0.77</u>															
	1700		3449	0.97	3160	1.11	2821	1.20	2407	1.24	1875	1.21											
	2000			3912	1.68	3656	1.84	3366	1.95	3029	2.00	<u>2647</u>	<u>2.03</u>										
	2400			4868	2.72	4670	2.93	4458	3.12	4229	3.28	3976	3.39	3389	3.49	2630	3.39						
	2674			5507	3.64	5334	3.89	5153	4.11	4961	4.32	4756	4.50	4295	4.73	3756	4.84	<u>3095</u>	<u>4.76</u>				
	2930					5941	4.96	5780	5.22	5612	5.46	5436	5.69	5054	6.06	4614	6.25	4117	6.36	<u>3525</u>	<u>6.32</u>		
	3200					6571	6.28	6427	6.58	6278	6.86	6124	7.12	5795	7.60	5433	7.95	5024	8.15	4571	8.27		
	3468							7058	8.15	6924	8.47	6786	8.77	6496	9.32	6183	9.81						

MAXIMUM WHEEL RPM: 3468

Outlet Area = 2.036 ft<sup>2</sup>

Max. BHP = 0.254 x (RPM / 1000)<sup>3</sup>

Performance certified is for installation Type A; Free inlet, Free outlet.  
 Power rating (BHP) does not include transmission losses.  
 Performance ratings do not include the effects of appurtenances (accessories).  
 Underlined figures indicate Maximum Static Efficiency.



**182 ECLFN (9-Blade)**

Wheel Diameter: 18.25"

Fan Efficiency Grade = FEG80

FAN SIZE	FAN/MOTOR RPM	MOTOR HP	0.5" SP		1" SP		1.5" SP		2" SP		2.5" SP		3" SP		4" SP		5" SP		6" SP		7" SP				
			CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	
182	1500	5	5178	1.11	4622	1.32	4027	1.45	<u>3307</u>	<u>1.50</u>	4449	2.56	3815	<u>2.58</u>											
	1800		6405	1.80	5962	2.07	5489	2.30	4999	2.46	4449	2.56	3815	<u>2.58</u>											
	2100				7234	3.07	6846	3.37	6438	3.63	6022	3.83	5583	3.99	4543	<u>4.11</u>									
	2400				8468	4.35	8138	4.72																	
	1350		7-1/2	4547	0.85	3915	1.01	3183	1.09																
	1600	5591		1.32	5079	1.54	4534	1.71	3921	1.80	<u>3178</u>	<u>1.80</u>													
	1850	6606		1.94	6178	2.22	5721	2.46	5248	2.64	4732	2.76	4131	<u>2.81</u>											
	2100				7234	3.07	6846	3.37	6438	3.63	6022	3.83	5583	3.99	4543	<u>4.11</u>									
	2400				8468	4.35	8138	4.72	7795	5.06	7439	5.35	7077	5.61	6313	5.98	5406	<u>6.13</u>							
	2674			9575	5.81	9284	6.24	8984	6.64	8674	7.01	8355	7.34												
	1450	10	4970	1.02	4390	1.21	3759	1.32	<u>2983</u>	<u>1.35</u>															
	1700		6000	1.55	5525	1.80	5018	1.99	4480	2.12	<u>3841</u>	<u>2.18</u>													
	2000				6816	2.71	6402	2.98	5970	3.21	5526	3.39	5034	3.50											
	2400				8468	4.35	8138	4.72	7795	5.06	7439	5.35	7077	5.61	6313	5.98	5406	<u>6.13</u>							
	2674				9575	5.81	9284	6.24	8984	6.64	8674	7.01	8355	7.34	7704	7.89	7008	8.28	6206	8.47			<u>5291</u>	<u>8.40</u>	
2930					10333	7.93	10065	8.39	9789	8.82	9505	9.22	8920	9.92											

MAXIMUM WHEEL RPM: 2930

Outlet Area = 2.59 ft<sup>2</sup>

Max. BHP = 0.444 x (RPM / 1000)<sup>3</sup>

**182 ECLQN (12-Blade)**

Wheel Diameter: 18.25"

Fan Efficiency Grade = FEG75

FAN SIZE	FAN/MOTOR RPM	MOTOR HP	0.5" SP		1" SP		1.5" SP		2" SP		2.5" SP		3" SP		4" SP		5" SP		6" SP		7" SP				
			CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	
182	1500	5	4859	1.08	4379	1.28	3869	1.44	<u>3287</u>	<u>1.54</u>	4329	2.59	<u>3807</u>	<u>2.67</u>											
	1800		5994	1.74	5616	2.01	5205	2.24	4782	2.44	4329	2.59	<u>3807</u>	<u>2.67</u>											
	2100				6790	2.98	6456	3.28	6102	3.54	5741	3.78	5371	3.98	4525	<u>4.23</u>									
	2400				7931	4.21	7649	4.58	7354	4.92															
	1350		7-1/2	4277	0.83	3728	0.99	3125	1.11																
	1600	5241		1.28	4800	1.50	4327	1.69	3822	1.82	<u>3210</u>	<u>1.88</u>													
	1850	6180		1.87	5815	2.16	5418	2.40	5008	2.61	4579	2.77	4098	<u>2.88</u>											
	2100				6790	2.98	6456	3.28	6102	3.54	5741	3.78	5371	3.98	4525	<u>4.23</u>									
	2400				7931	4.21	7649	4.58	7354	4.92	7044	5.22	6728	5.50	6084	5.98	5356	<u>6.28</u>	4421	6.28					
	2674			8955	5.62	8707	6.05	8451	6.45	8184	6.82	7907	7.16												
	1450	10	4666	0.99	4165	1.18	3630	1.33	<u>2988</u>	<u>1.40</u>															
	1700		5619	1.50	5212	1.75	4771	1.95	4316	2.12	<u>3804</u>	<u>2.23</u>	3151	2.24											
	2000				6403	2.63	6047	2.91	5670	3.15	5289	3.36	4884	3.53	3906	<u>3.66</u>									
	2400				7931	4.21	7649	4.58	7354	4.92	7044	5.22	6728	5.50	6084	5.98	5356	<u>6.28</u>	4421	6.28					
	2674				8955	5.62	8707	6.05	8451	6.45	8184	6.82	7907	7.16	7340	7.77	6757	8.28	6112	8.64			<u>5350</u>	<u>8.76</u>	
2930					9678	7.68	9449	8.13	9213	8.56	8969	8.97	8459	9.70											

MAXIMUM WHEEL RPM: 2930

Outlet Area = 2.59 ft<sup>2</sup>

Max. BHP = 0.458 x (RPM / 1000)<sup>3</sup>

Performance certified is for installation Type A; Free inlet, Free outlet.  
 Power rating (BHP) does not include transmission losses.  
 Performance ratings do not include the effects of appurtenances (accessories).  
 Underlined figures indicate Maximum Static Efficiency.



**200 ECLFN (9-Blade)**

Wheel Diameter: 20.00"

Fan Efficiency Grade = FEG80

FAN SIZE	FAN/MOTOR RPM	MOTOR HP	0.5" SP		1" SP		1.5" SP		2" SP		2.5" SP		3" SP		4" SP		5" SP		6" SP		7" SP		
			CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM
200	1500	5	6930	1.70	6336	1.98	5703	2.20	5010	2.33	<u>4188</u>	<u>2.36</u>											
	1800		8523	2.77	8046	3.14	7541	3.46	7015	3.73	6469	3.92	5859	4.05									
	2100		9686	4.68	9270	5.10	8835	5.47	8386	5.79	7929	6.06	6927	6.42	<u>5737</u>	<u>6.48</u>							
	1350	7-1/2	6116	1.29	5438	1.53	4706	1.68	<u>3816</u>	<u>1.72</u>													
	1600		7466	2.02	6917	2.33	6331	2.58	5719	2.76	5013	2.86	<u>4188</u>	<u>2.85</u>									
	1850		8323	3.37	7836	3.71	7326	3.99	6803	4.21	6231	4.37	<u>4862</u>	<u>4.41</u>	4862	4.41							
	2100		9686	4.68	9270	5.10	8835	5.47	8386	5.79	7929	6.06	6927	6.42	<u>5737</u>	<u>6.48</u>							
	2400		11286	6.68	10930	7.18																	
	1450	10	6660	1.56	6041	1.82	5381	2.02	4632	2.13													
	1700		7996	2.37	7486	2.72	6943	3.00	6380	3.23	5770	3.38	<u>5060</u>	<u>3.44</u>									
	2000		9145	4.12	8703	4.51	8240	4.85	7765	5.13	7276	5.35	6149	5.60									
	2400		11286	6.68	10930	7.18	10563	7.65	10184	8.08	9794	8.46	8996	9.09	8129	9.52	<u>7121</u>	<u>9.69</u>					
2674	12411		9.53																				

MAXIMUM WHEEL RPM: 2674

Outlet Area = 3.11 ft<sup>2</sup>

Max. BHP = 0.701 x (RPM / 1000)<sup>3</sup>

**200 ECLQN (12-Blade)**

Wheel Diameter: 20.00"

Fan Efficiency Grade = FEG75

FAN SIZE	FAN/MOTOR RPM	MOTOR HP	0.5" SP		1" SP		1.5" SP		2" SP		2.5" SP		3" SP		4" SP		5" SP		6" SP		7" SP		
			RPM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM
200	1500	5	6493	1.65	5983	1.93	5432	2.16	4854	2.35	<u>4178</u>	<u>2.44</u>											
	1800		7561	3.05	7126	3.37	6667	3.65	6201	3.90	5700	4.09	4460	4.21									
	2100		9077	4.53	8721	4.95																	
	1350	7-1/2	5740	1.25	5154	1.49	4530	1.68	<u>3804</u>	<u>1.78</u>													
	1600		6989	1.95	6519	2.27	6009	2.53	5485	2.75	4912	2.91	<u>4228</u>	<u>2.97</u>									
	1850		7817	3.27	7397	3.61	6953	3.91	6502	4.17	6029	4.38	<u>4903</u>	<u>4.59</u>	4903	4.59							
	2100		9077	4.53	8721	4.95	8345	5.33	7954	5.66	7558	5.97	6725	6.47	<u>5738</u>	<u>6.70</u>							
	2400		10558	6.46	10254	6.96	9941	7.43															
	1450	10	6244	1.51	5710	1.78	5138	1.99	4522	2.15	<u>3771</u>	<u>2.21</u>											
	1700		7480	2.29	7044	2.64	6574	2.93	6085	3.18	5576	3.39	<u>5009</u>	<u>3.53</u>									
	2000		8576	3.99	8198	4.38	7796	4.72	7382	5.03	6963	5.31	6047	5.70	4855	5.75							
	2400		10558	6.46	10254	6.96	9941	7.43	9613	7.86	9273	8.26	8580	8.97	7859	9.55	<u>7054</u>	<u>9.92</u>	<u>6079</u>	<u>10.00</u>			
2674	11624		9.22	11348	9.77																		

MAXIMUM WHEEL RPM: 2674

Outlet Area = 3.11 ft<sup>2</sup>

Max. BHP = 0.724 x (RPM / 1000)<sup>3</sup>

**222 ECLFN (9-Blade)**

Wheel Diameter: 22.25"

Fan Efficiency Grade = FEG80

FAN SIZE	FAN/MOTOR RPM	MOTOR HP	0.5" SP		1" SP		1.5" SP		2" SP		2.5" SP		3" SP		4" SP		5" SP		6" SP		7" SP		
			CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	
222	1500	5	9936	2.69	9287	3.12	8617	3.48	7909	3.79	7138	4.01	6263	4.07									
	1800					11624	4.95																
	2100																						
	1350	7-1/2	8807	2.04	8079	2.40	7310	2.70	6469	2.91	5498	2.96											
	1600		10681	3.20	10076	3.66	9455	4.08	8806	4.43	8123	4.73	7371	4.90									
	1850		12005	5.31	11477	5.83	10938	6.30	10381	6.71	9804	7.09	8538	7.58	<u>7083</u>	<u>7.57</u>							
	2100		13893	7.41																			
	1450	10	9562	2.46	8888	2.87	8188	3.21	7445	3.49	6617	3.66	5691	3.66									
	1700		10854	4.27	10274	4.73	9676	5.13	9051	5.48	8388	5.75	6868	5.92									
2000	13142		6.51	12656	7.09	12163	7.62	11660	8.11	11140	8.55	10046	9.29	8807	9.64	7409	9.50						

MAXIMUM WHEEL RPM: 2403

Outlet Area = 3.84 ft<sup>2</sup>

Max. BHP = 1.207 x (RPM / 1000)<sup>3</sup>

**222 ECLQN (12-Blade)**

Wheel Diameter: 22.25"

Fan Efficiency Grade = FEG80

FAN SIZE	FAN/MOTOR RPM	MOTOR HP	0.5" SP		1" SP		1.5" SP		2" SP		2.5" SP		3" SP		4" SP		5" SP		6" SP		7" SP	
			CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP
222	1500	5	9211	2.76	8678	3.19	8156	3.56	7605	3.87	7008	4.13	6368	4.30								
	1350		8177	2.09	7589	2.46	6996	2.76	6341	3.00	5626	3.15										
	1600			9393	3.75	8902	4.16	8404	4.52	7867	4.83	7290	5.08	<u>5862</u>	<u>5.23</u>							
	1850		11152	5.44	10720	5.97	10297	6.43	9870	6.85	9419	7.23										
	1450	10	8868	2.52	8317	2.93	7776	3.27	7194	3.57	6559	3.79	<u>5869</u>	<u>3.92</u>								
	1700		10102	4.38	9636	4.83	9175	5.23	8689	5.59	8171	5.90	7040	6.30								
2000	12192		6.67	11791	7.26	11396	7.80	11005	8.28	10607	8.72	9750	9.50									

MAXIMUM WHEEL RPM: 2403

Outlet Area = 3.84 ft<sup>2</sup>

Max. BHP = 1.287 x (RPM / 1000)<sup>3</sup>

Performance certified is for installation Type A; Free inlet, Free outlet.  
 Power rating (BHP) does not include transmission losses.  
 Performance ratings do not include the effects of appurtenances (accessories).  
 Underlined figures indicate Maximum Static Efficiency.

**245 ECLFN (9-Blade)**

Wheel Diameter: 24.50"

Fan Efficiency Grade = FEG85

FAN SIZE	FAN/MOTOR RPM	MOTOR HP	0.5" SP		1" SP		1.5" SP		2" SP		2.5" SP		3" SP		4" SP		5" SP		6" SP		7" SP			
			RPM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP
245	1500	5			12395	4.68																		
	1350	7-1/2	11633	3.14	10853	3.57	10030	3.97	9240	4.28	8388	4.52	<u>7341</u>	<u>4.63</u>										
	1600				13402	5.54	12731	6.04	12035	6.51	11358	6.91	10696	7.26	9113	<u>7.68</u>	6576	7.26						
	1450	10	12603	3.82	11886	4.29	11126	4.73	10370	5.11	9638	5.42	8804	5.65	6389	5.54								
	1700				14398	6.51	13776	7.05	13126	7.56	12473	8.03	11848	8.43	10510	9.05	<u>8759</u>	<u>9.22</u>						

MAXIMUM WHEEL RPM: 2183

Outlet Area = 4.66 ft<sup>2</sup>

Max. BHP = 1.88 x (RPM / 1000)<sup>3</sup>

**245 ECLQN (12-Blade)**

Wheel Diameter: 24.50"

Fan Efficiency Grade = FEG80

FAN SIZE	FAN/MOTOR RPM	MOTOR HP	0.5" SP		1" SP		1.5" SP		2" SP		2.5" SP		3" SP		4" SP		5" SP		6" SP		7" SP		
			RPM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM
245	1500	5			12021	4.79																	
	1350	7-1/2	11250	3.18	10551	3.68	9831	4.14	9149	4.51	8476	4.80	7625	5.00									
	1600				12985	5.65	12389	6.24	11781	6.79	11187	7.26											
	1450	10			11535	4.40	10868	4.91	10205	5.36	9593	5.72	8939	6.01	7054	6.18							
	1700				13938	6.62	13383	7.24	12812	7.85	12242	8.40	11698	8.86	10631	9.61	<u>9207</u>	<u>10.00</u>					

MAXIMUM WHEEL RPM: 2183

Outlet Area = 4.66 ft<sup>2</sup>

Max. BHP = 2.04 x (RPM / 1000)<sup>3</sup>

**270 ECLFN (9-Blade)**

Wheel Diameter: 27.00"

Fan Efficiency Grade = FEG80

FAN SIZE	FAN/MOTOR RPM	MOTOR HP	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		
			RPM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM
270	1350	7-1/2			14849	5.51	13991	6.11	13098	6.62	12185	7.02	11188	7.32	10037	7.48	8342	7.32					
	1450	10			16187	6.61	15401	7.29	14583	7.88	13744	8.38	12883	8.79	11940	9.09	<u>10872</u>	<u>9.26</u>	9437	9.19			
	1700				19466	9.98																	

MAXIMUM WHEEL RPM: 1981

Outlet Area = 5.67 ft<sup>2</sup>

Max. BHP = 3.04 x (RPM / 1000)<sup>3</sup>

**270 ECLQN (12-Blade)**

Wheel Diameter: 27.00"

Fan Efficiency Grade = FEG80

FAN SIZE	FAN/MOTOR RPM	MOTOR HP	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		
			RPM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM
270	1350	7-1/2			14232	5.58	13498	6.21	12761	6.77	11980	7.27											
	1450	10			15501	6.69	14809	7.39	14132	8.03	13430	8.61	12694	9.12	11905	9.55	<u>11021</u>	<u>9.83</u>	9994	9.93	8720	9.72	

MAXIMUM WHEEL RPM: 1981

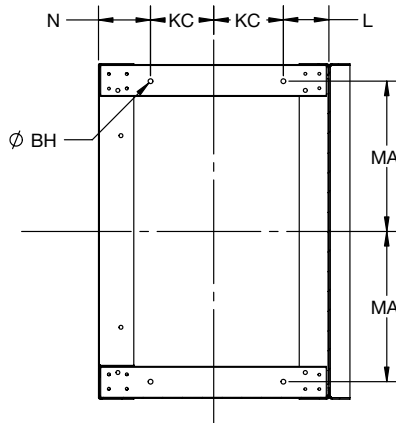
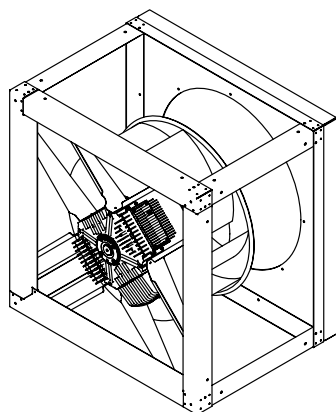
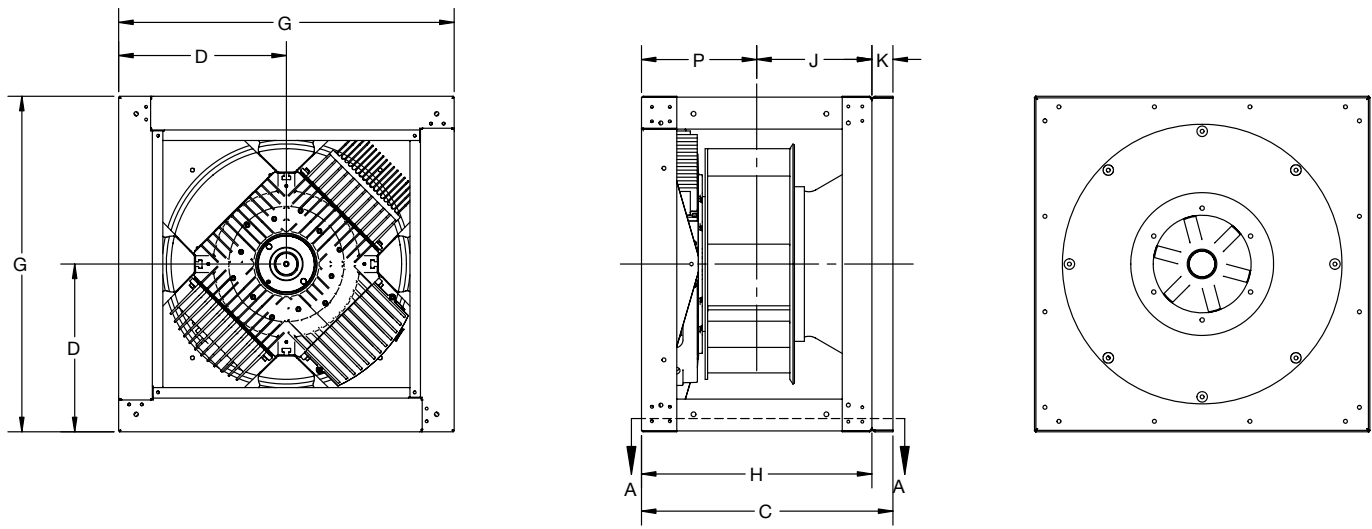
Outlet Area = 5.67 ft<sup>2</sup>

Max. BHP = 3.25 x (RPM / 1000)<sup>3</sup>

Performance certified is for installation Type A; Free inlet, Free outlet.  
 Power rating (BHP) does not include transmission losses.  
 Performance ratings do not include the effects of appurtenances (accessories).  
 Underlined figures indicate Maximum Static Efficiency.



Arrangement 4  
Horizontal – Standard Mount



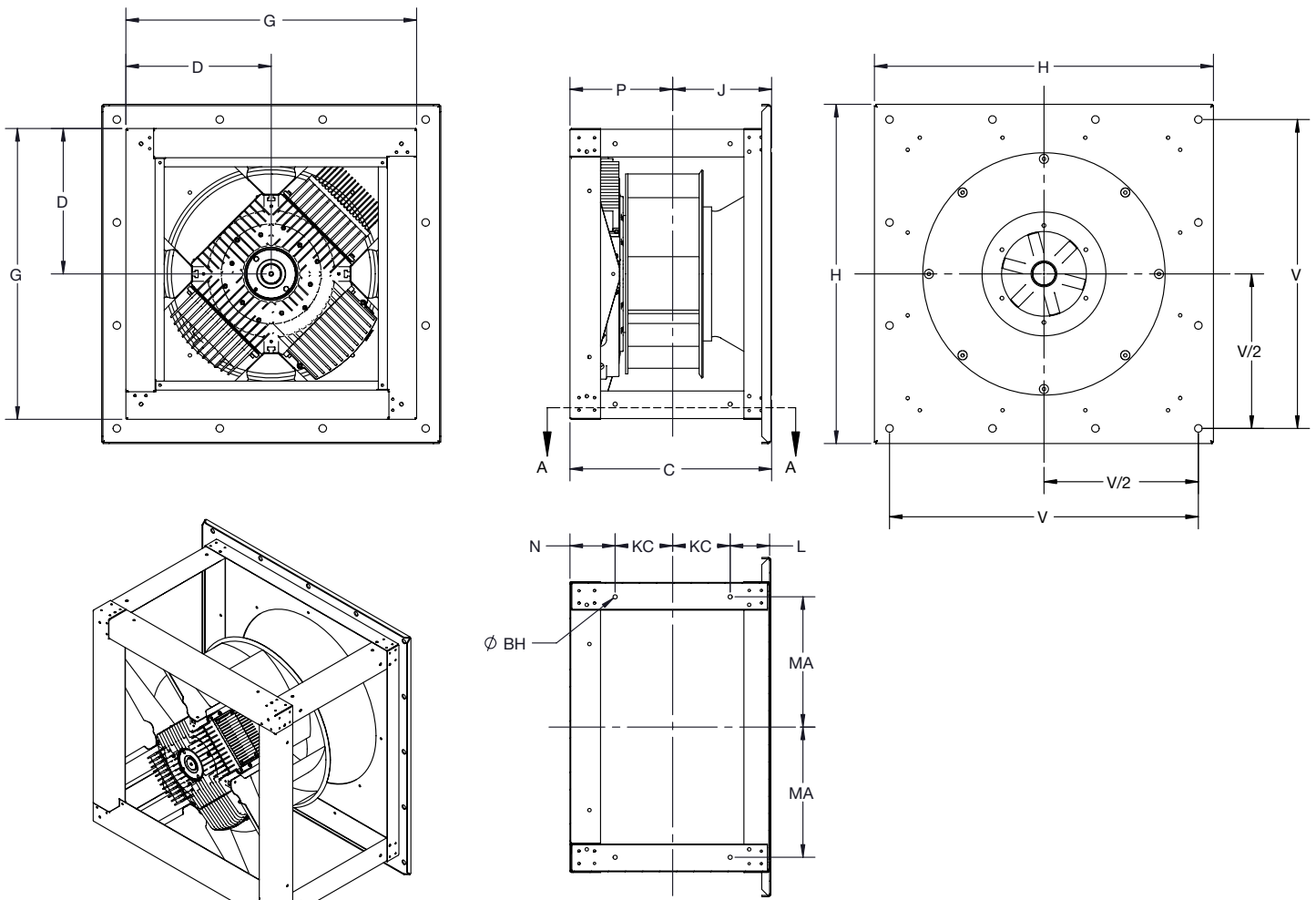
SECTION A-A

FAN SIZE	BH	C	D	FR	G	H	J	K	KC	L	MA	N	P
165	0.34	18.75	12.00	186XW & 187XW	24.00	17.25	8.38	1.50	5.13	3.25	10.75	3.75	8.85
182	0.34	20.00	13.00	186XW & 187XW	26.00	18.25	8.88	1.75	5.50	3.38	11.75	3.88	9.35
200	0.34	22.38	14.50	186XW & 206XW	29.00	20.13	9.44	2.25	6.25	3.19	13.00	4.44	10.67
222	0.34	24.00	16.00	186XW & 206XW	32.00	21.75	10.27	2.25	7.00	3.27	14.50	4.48	11.48
245	0.34	26.25	17.00	186XW & 206XW	34.00	23.75	11.27	2.50	7.50	3.77	15.50	4.98	12.48
270	0.34	28.25	19.00	186XW & 206XW	38.00	25.75	12.27	2.50	8.50	3.77	17.50	4.98	13.48

BC1007395

DIMENSIONS ARE SUBJECT TO CHANGE. CERTIFIED DRAWINGS AVAILABLE ON REQUEST.

Arrangement 4  
Horizontal – Panel Mount



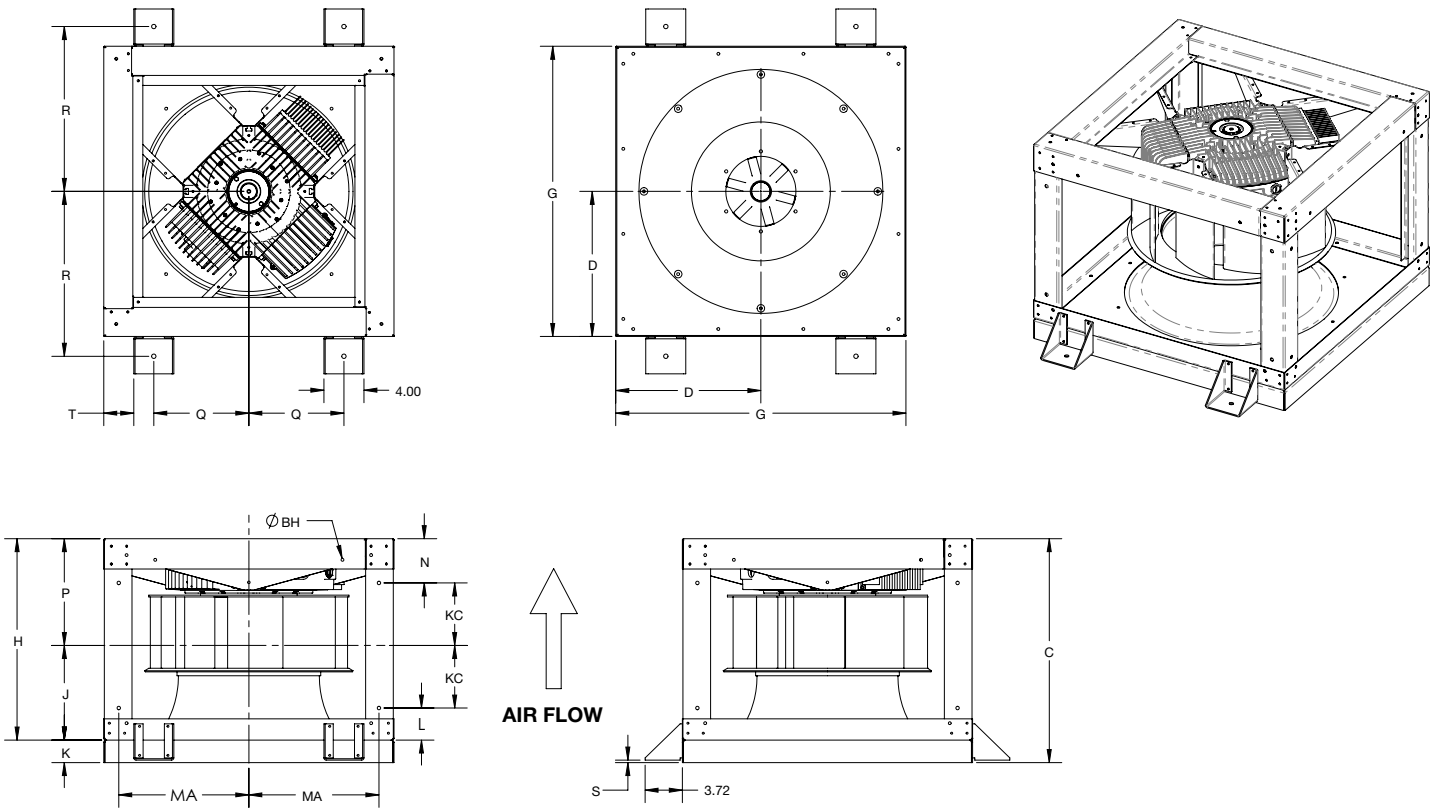
SECTION A-A

FAN SIZE	BH	C	D	FR	G	H	J	KC	L	MA	N	P	V
165	0.34	17.34	12.00	186XW & 187XW	24.00	28.00	8.49	5.13	3.25	10.75	3.75	8.85	25.50
182	0.34	18.34	13.00	186XW & 187XW	26.00	30.00	8.99	5.50	3.38	11.75	3.88	9.35	27.50
200	0.34	20.23	14.50	186XW & 206XW	29.00	33.00	9.56	6.25	3.19	13.00	4.44	10.67	30.50
222	0.34	21.88	16.00	186XW & 206XW	32.00	36.00	10.40	7.00	3.27	14.50	4.48	11.48	33.50

BC1007396

DIMENSIONS ARE SUBJECT TO CHANGE. CERTIFIED DRAWINGS AVAILABLE ON REQUEST.

Arrangement 4V  
Vertical Up – Standard Mount



Notes:

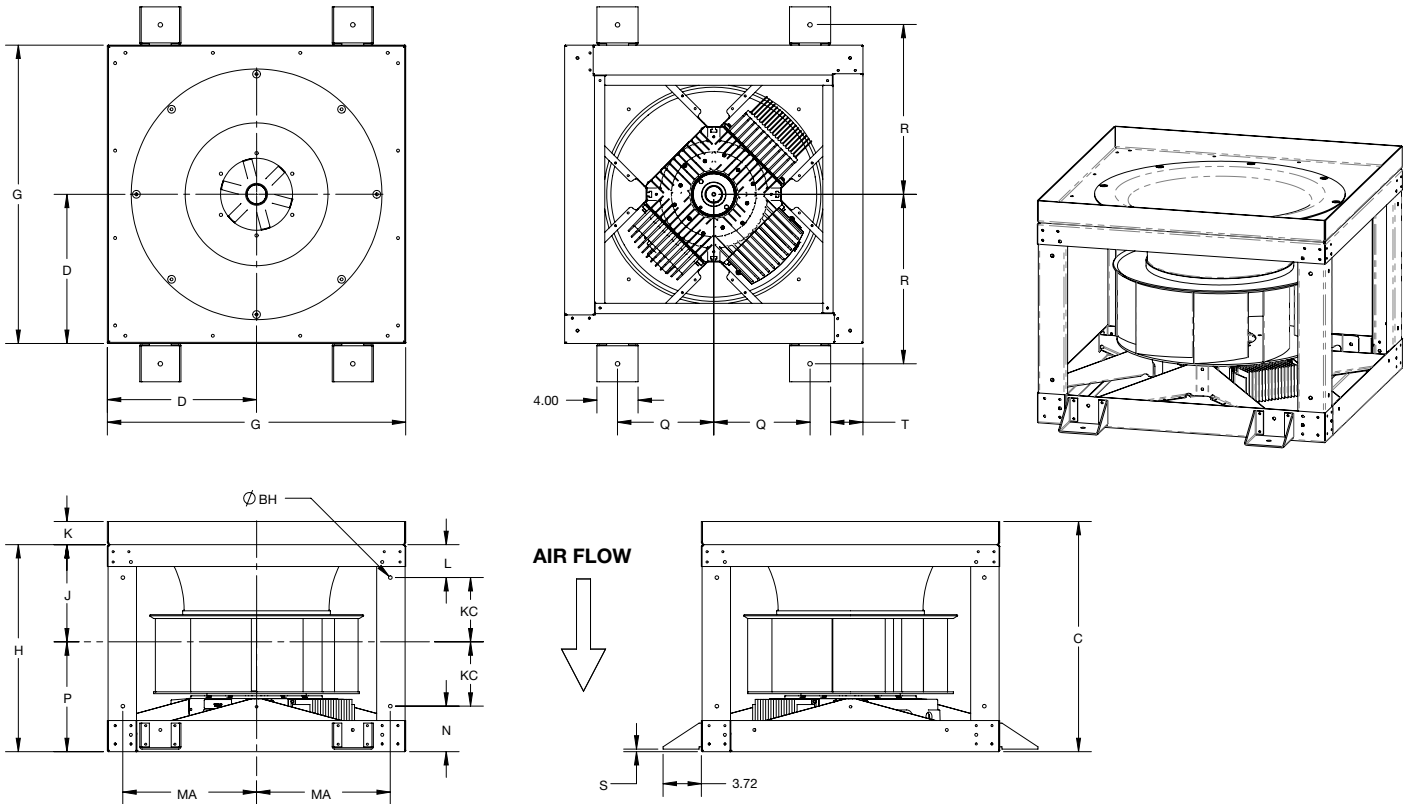
1. CW rotation (shown) is standard.  
CCW rotation (not shown) is optional.
2. Rotation is determined by viewing from the drive end.
3. Vertical Up applications only.

FAN SIZE	BH	C	D	FR	G	H	J	K	KC	L	MA	N	P	Q	R	S	T
165	0.34	18.75	12.00	186XW & 187XW	24.00	17.25	8.38	1.50	5.13	3.25	10.75	3.75	8.85	7.50	13.97	0.00	2.50
182	0.34	20.00	13.00	186XW & 187XW	26.00	18.25	8.88	1.75	5.50	3.38	11.75	3.88	9.35	8.50	14.97	0.00	2.50
200	0.34	22.38	14.50	186XW & 206XW	29.00	20.13	9.44	2.25	6.25	3.19	13.00	4.44	10.67	9.50	16.47	0.25	3.00
222	0.34	24.00	16.00	186XW & 206XW	32.00	21.75	10.27	2.25	7.00	3.27	14.50	4.48	11.48	11.00	17.97	0.25	3.00
245	0.34	26.25	17.00	186XW & 206XW	34.00	23.75	11.27	2.50	7.50	3.77	15.50	4.98	12.48	12.00	18.97	0.50	3.00
270	0.34	28.25	19.00	186XW & 206XW	38.00	25.75	12.27	2.50	8.50	3.77	17.50	4.98	13.48	14.00	20.97	0.50	3.00

BC1007509

DIMENSIONS ARE SUBJECT TO CHANGE. CERTIFIED DRAWINGS AVAILABLE ON REQUEST.

# Arrangement 4V Vertical Down – Standard Mount



**Notes:**

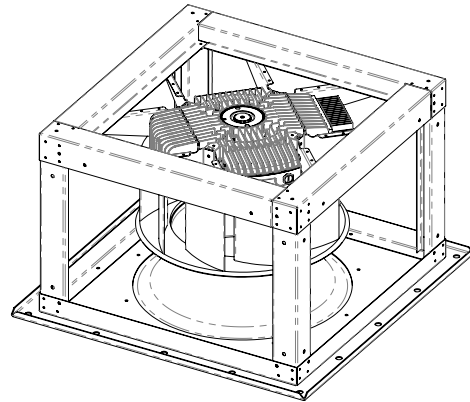
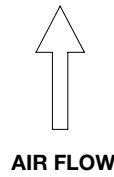
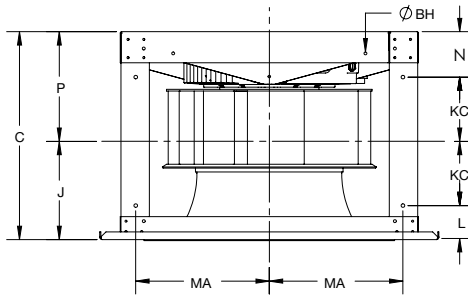
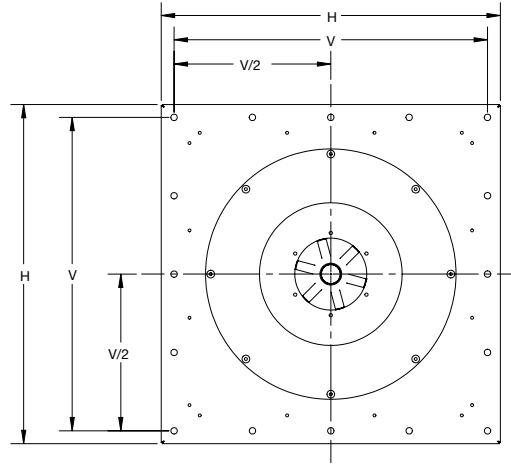
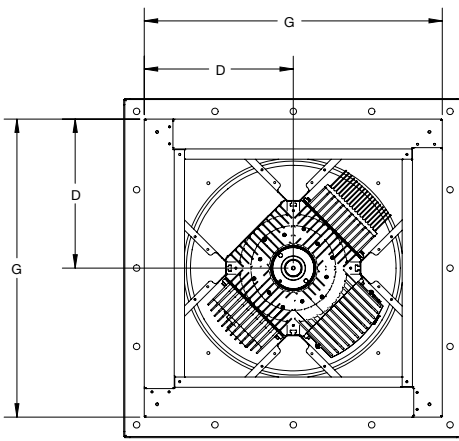
1. CW rotation (shown) is standard.  
CCW rotation (not shown) is optional.
2. Rotation is determined by viewing from the drive end.
3. Vertical Down applications only.

FAN SIZE	BH	C	D	FR	G	H	J	K	KC	L	MA	N	P	Q	R	S
165	0.34	18.75	12.00	186XW & 187XW	24.00	17.25	8.38	1.50	5.13	3.25	10.75	3.75	8.85	6.86	13.97	0.00
182	0.34	20.00	13.00	186XW & 187XW	26.00	18.25	8.88	1.75	5.50	3.38	11.75	3.88	9.35	7.86	14.97	0.00
200	0.34	22.38	14.50	186XW & 206XW	29.00	20.13	9.44	2.25	6.25	3.19	13.00	4.44	10.67	9.35	16.47	0.25
222	0.34	24.00	16.00	186XW & 206XW	32.00	21.75	10.27	2.25	7.00	3.27	14.50	4.48	11.48	10.86	17.97	0.25
245	0.34	26.25	17.00	186XW & 206XW	34.00	23.75	11.27	2.50	7.50	3.77	15.50	4.98	12.48	11.85	18.97	0.25
270	0.34	28.25	19.00	186XW & 206XW	38.00	25.75	12.27	2.50	8.50	3.77	17.50	4.98	13.48	13.85	20.97	0.25

BC1007510

DIMENSIONS ARE SUBJECT TO CHANGE. CERTIFIED DRAWINGS AVAILABLE ON REQUEST.

Arrangement 4V  
Vertical Up – Panel Mount



Notes:

1. CW rotation (shown) is standard.  
CCW rotation (not shown) is optional.
2. Rotation is determined by viewing from the drive end.
3. Vertical Up applications only.

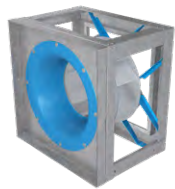
FAN SIZE	BH	C	D	FR	G	H	J	KC	L	MA	N	P	V
165	0.34	17.34	12.00	186XW & 187XW	24.00	28.00	8.49	5.13	3.25	10.75	3.75	8.85	25.50
182	0.34	18.34	13.00	186XW & 187XW	26.00	30.00	8.99	5.50	3.38	11.75	3.88	9.35	27.50
200	0.34	20.23	14.50	186XW & 206XW	29.00	33.00	9.56	6.25	3.19	13.00	4.44	10.67	30.50
222	0.34	21.88	16.00	186XW & 206XW	32.00	36.00	10.40	7.00	3.27	14.50	4.48	11.48	33.50
245	0.34	23.88	17.00	186XW & 206XW	34.00	39.00	11.40	7.50	3.77	15.50	4.98	12.48	29.20
270	0.34	25.88	19.00	186XW & 206XW	38.00	43.00	12.40	8.50	3.77	17.50	4.98	13.48	32.40

BC1007508

DIMENSIONS ARE SUBJECT TO CHANGE. CERTIFIED DRAWINGS AVAILABLE ON REQUEST.







## Model ECLFN

Fans shall be Model ECLFN cost effective centrifugal plenum (plug) type, as manufactured by Twin City Fan & Blower, Minneapolis, Minnesota.

**PERFORMANCE** — Performance ratings shall conform to AMCA Standard 205 (fan efficiency grade), 211 (air performance) and 311 (sound 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 both sound and air, and fan efficiency grade (FEG).

Fans shall have a sharply rising pressure characteristic extending through the operating range and continuing to rise beyond the peak efficiency to ensure quiet and stable operation. Fans shall have a non-overloading design with self-limiting horsepower characteristics and shall reach a peak in the normal selection area. All fans shall be capable of operating over the minimum pressure class limits as specified in AMCA Standard 99.

**CONSTRUCTION** — Fans shall be unhooused and incorporate a non-overloading type backward inclined airfoil blade wheel, heavy-gauge galvanized steel frame and inlet plate.

**FRAME AND INLET PANEL** — Inlet plates shall be of heavy-gauge galvanized construction. The inlet plate incorporates a removable spun inlet cone designed for smooth airflow into the accompanying inlet retaining ring of the fan wheel. A square, formed lip suitable for attachment of a boot connector shall surround the unit.

**WHEEL** — Wheels shall have a spun non-tapered style blade retaining ring on the inlet side to allow higher efficiencies over the performance range of the fan. All wheels on direct drive arrangement 4 fans shall have airfoil shaped, extruded aluminum blades. All wheels shall be continuously welded around all edges. ECLFN wheels shall have nine blades for high efficiencies. All wheels shall be statically and dynamically balanced on precision electronic balancers to a level of G6.3 (per ANSI 2-19) or better.

**FINISH AND COATING** — Fan shall be constructed of corrosion resistant galvanized or finish painted steel. Aluminum components shall be unpainted.

**ACCESSORIES** — When specified, accessories shall be provided by Twin City Fan & Blower to maintain one source responsibility.

**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. Records shall be maintained and a written copy shall be available upon request.

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



## Model ECLQN

Fans shall be Model ECLQN cost effective centrifugal plenum (plug) type, as manufactured by Twin City Fan & Blower, Minneapolis, Minnesota.

**PERFORMANCE** — Performance ratings shall conform to AMCA Standard 205 (fan efficiency grade), 211 (air performance) and 311 (sound 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 both sound and air, and fan efficiency grade (FEG).

Fans shall have a sharply rising pressure characteristic extending through the operating range and continuing to rise beyond the peak efficiency to ensure quiet and stable operation. Fans shall have a non-overloading design with self-limiting horsepower characteristics and shall reach a peak in the normal selection area. All fans shall be capable of operating over the minimum pressure class limits as specified in AMCA Standard 99.

**CONSTRUCTION** — Fans shall be unhooused and incorporate a non-overloading type backward inclined airfoil blade wheel, heavy-gauge galvanized frame and inlet plate.

**FRAME AND INLET PANEL** — Inlet plates shall be of heavy-gauge galvanized construction. The inlet plate incorporates a removable spun inlet cone designed for smooth airflow into the accompanying inlet retaining ring of the fan wheel. A square, formed lip suitable for attachment of a boot connector shall surround the unit.

**WHEEL** — Wheels shall have a spun non-tapered style blade retaining ring on the inlet side to allow higher efficiencies over the performance range of the fan. All wheels on direct drive arrangement fans shall have airfoil shaped, extruded aluminum blades. All wheels shall be continuously welded around all edges. ECLQN wheels shall have twelve blades for better sound quality. All wheels shall be statically and dynamically balanced on precision electronic balancers to a level of G6.3 (per ANSI 2-19) or better.

**FINISH AND COATING** — Fan shall be constructed of corrosion resistant galvanized or finish painted steel. Aluminum components shall be unpainted.

**ACCESSORIES** — When specified, accessories shall be provided by Twin City Fan & Blower to maintain one source responsibility.

**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. Records shall be maintained and a written copy shall be available upon request.

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

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