HUMONGOUS FAN

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CUSTOMER GUIDE

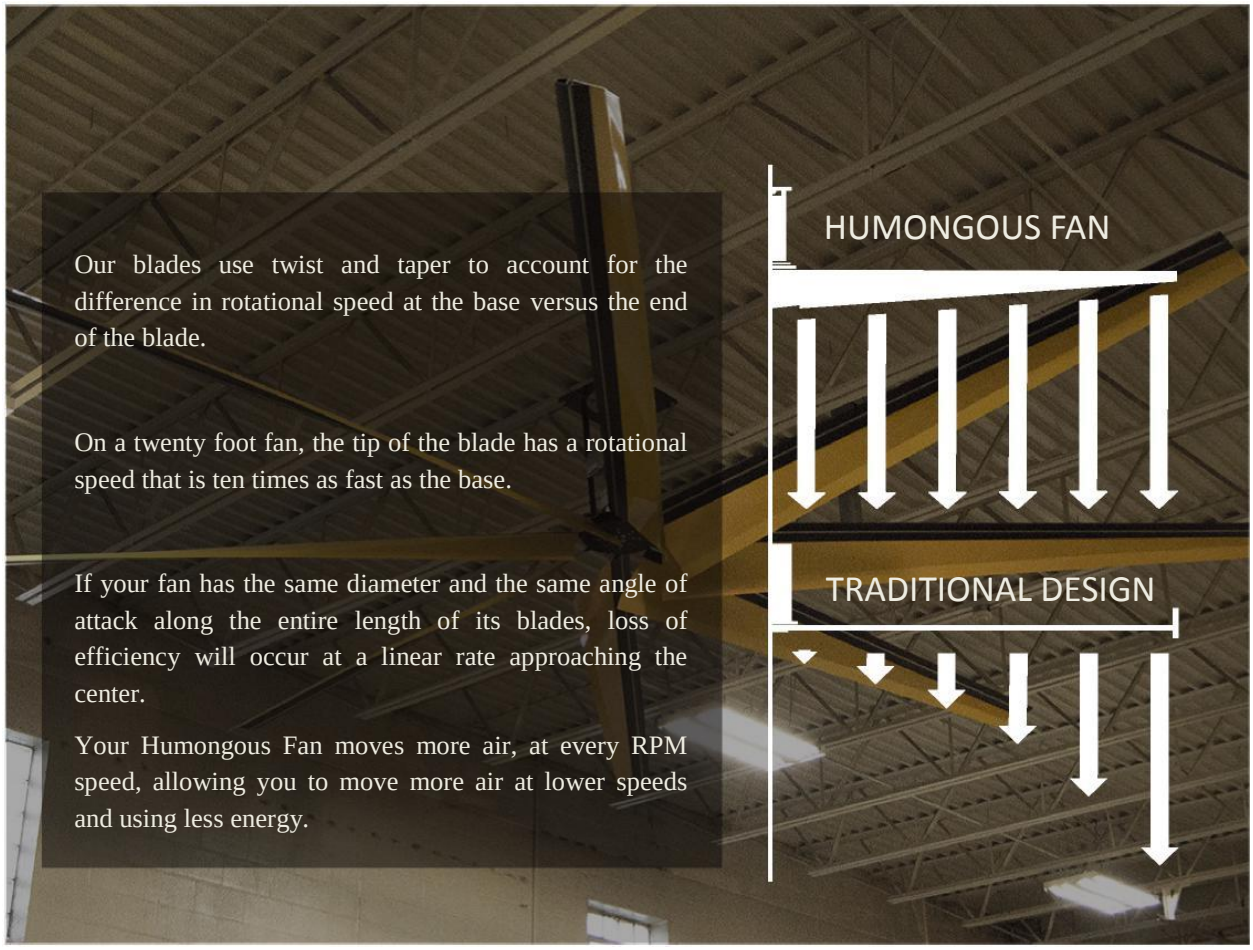
TO CUTTING YOUR COSTS USING HVLS FANS

ENGINEERING THE BEST

The end of a ten foot fan blade has a rotational speed 10 times greater than that of its base.

In order to make the most of every rotation, a blade must have a deeper angle of attack where it is moving slower. This is the shape used by Humongous Fans and is the innovation responsible for a lighter fan that moves more air with lower horsepower and at a lower RPM.

By comparison, an HVLS fan without the twist an taper can only, efficiently, push air at the end of its blades. To compensate, the fan must operate at higher RPM, and a higher horsepower gear motor assembly. However, its airflow pattern will remain uneven, comparatively turbulent, and the range of usage will suffer, especially at the critical low-speed settings.



WHERE TO START

Every application is unique in its opportunities, challenges and outcomes. Despite the endless variety of unique scenarios and settings in which we find our products, we have found four consistent broad categories for which we provide solutions: cooling without A/C, cooling with A/C, destratification/winter comfort, and air quality control.

THE PLAN

THE FAN

"WE INSTALLED TWO 12' HUMONGOUS FANS […] THE FAN PERFORMANCE HAS BEEN EXCELLENT. THEY ARE SUPER QUIET AND THE AIR FLOW IS VERY PLEASING. LAST WEEK THEATER ARTS PERFORMED, "MARY POPPINS." WHILE THE OUTSIDE TEMPERATURE WAS OVER 85 DEGREES, THE 400+ PEOPLE INSIDE ENJOYED THE SHOW IN THE COMFORT THAT THE FANS CREATED."

-Director of Facilities, Primary Education Building, Los Angeles, CA.

COOLING WITHOUT CLIMATE CONTROL

Productivity Loss due to Heat

Apparent °F	Relative Productivity	Productivity Loss
71	99.9%	~0%
80	96.23%	3.77%
85	92.07%	7.93%
90	87.40%	12.60%
95	83.03%	16.97%
100	79.77%	20.23%
105	78.41%	21.59%

**source: Seppanen, O., Fisk, W.J. and Lei, Q.H. (2006)*

The Problem:

Overheating means lost productivity, increased mistakes, and lower morale, and the numbers prove it, but we've run the math in the table to the left so you don't have to.

How HVLS Fans Solve My Problem:

A 3-5 mph breeze can reduce apparent temperature by as much as 10°F. And HVLS fans work smarter, not harder: they get results quietly using small amounts of electricity without taking up floor space and last a very long time.

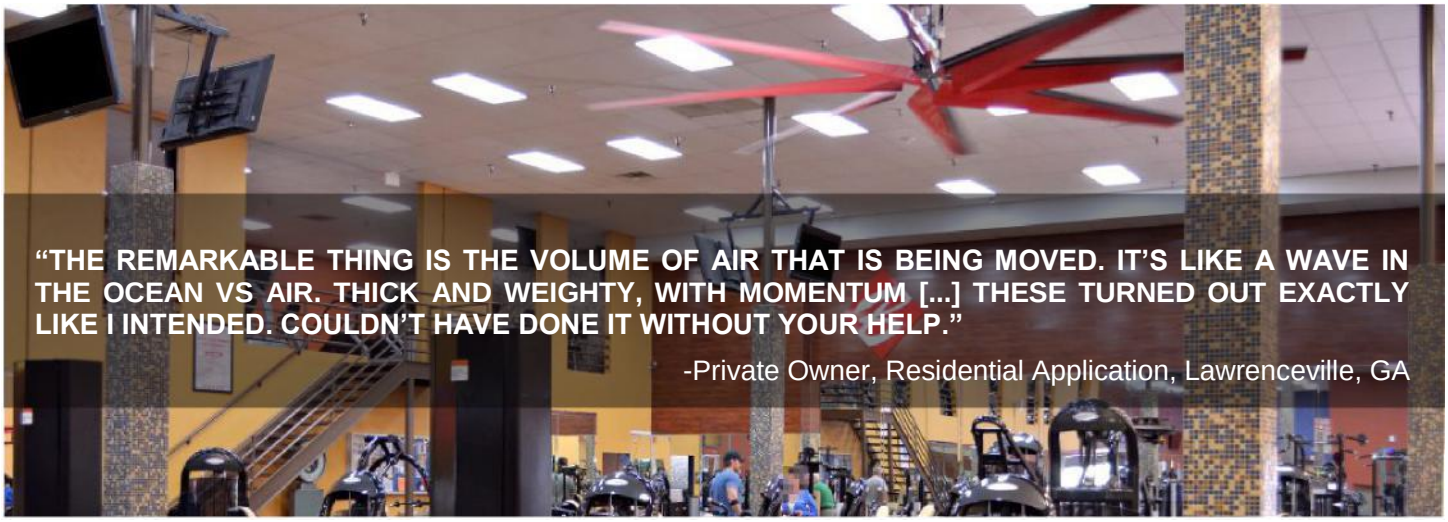
How to Begin Planning:

The first step is to find out where most of the people spend most of their time, and to take a measurement of that space.

Then, consider the direct breeze region associated with each size fan. As a rule of thumb, each fan will produce a 3-5 mile per hour breeze in a space equal to 3-4 times its diameter, depending on the size and number of obstructions present.

Therefore, if employees spend most of their day in a space which is 80' across, the optimal solution is a single 20' fan positioned roughly in the center of this space.

COOLING WITH CLIMATE CONTROL



The Problem:

You have a building A/C system that keeps occupants comfortable but that comfort comes with a price not limited to power draw. Breakdowns, replacements, ineffiency and maintenance all grow your bills. Fortunately, HVLS fans are a cost-effective solution to all of those problems.

How HVLS Fans Solve My Problem:

Humongous Fans reduce the apparent temperature experienced by the people working or playing beneath them. This allows owners, managers, and designers to leave the A/C system at a higher set-point without compromising comfort.

Savings can be as much as 6 percent per degree, and green energy credits are also available for air quality (see Tools and Resources, p. 11).

How to Begin Planning:

Determine the regions of your facility where people spend most of their time working or playing. Measure the dimensions of these locations, and size the best fan by its effective breeze region (see Technical Specs, p.9). For low traffic or diffused-presence areas refer to the maximum effective square footage specifications.

Why Humongous Fan:

The breeze pattern produced by our airfoils is bigger and more consistent at slower speeds with less turbulence. For the user this means more air can be moved more slowly in sensitive environments, giving you an added degree of control and better results across the continuum of usage, from zero to one hundred.

Add the savings gained through power efficiency over competing models and the choice becomes clear.

DESTRATIFICATION

Destratification will always result in big savings, especially over time. However the optimal solution is as much about your goals as it is about your space. The two broadest categories are outlined below.

A: COMPLETE DESTRATIFICATION

Ex: temperature sensitive products on tall shelving.

The ideal solution balances your work environment's airspeed tolerance with the fan's specified maximum square footage. If airspeed is not a problem your solution will use fewer fans running faster. A larger number of fans may be required if airspeeds must be kept low.

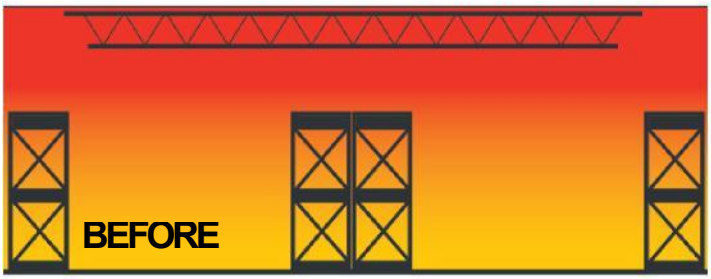
The savings will come primarily for less HVAC usage at a lower intensity, less spoilage and a lower setpoint.

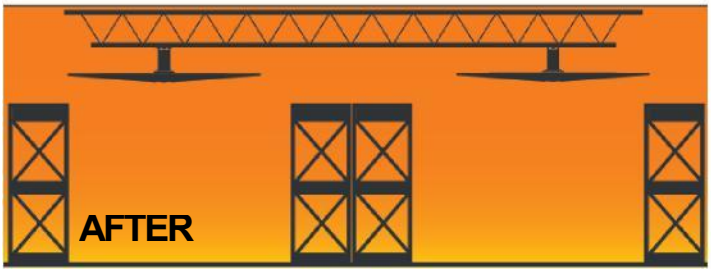
B: LOCAL DESTRATIFICATION

Ex: maintain employee comfort while cutting costs

The most efficient solution is to place the fewest number of the largest possible fans above the spaces where most of the people spend most of their time and to focus on redirecting heated air from the ceiling directly to the people below.

The savings will come primarily from dropping your setpoint and allowing the fan(s) to direct warm air to the floor.





AIR QUALITY CONTROL

The Problem:

Ceiling-located HVAC systems' intake and return vents can struggle to efficiently and evenly distribute the benefits of climate control building occupants.

This results in increased burden on your system as it tries to compensate for inefficiency. This causes more frequent repairs and a higher cost of usage.

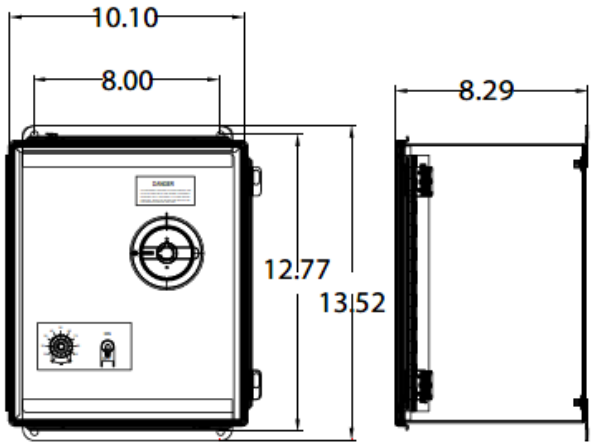
How HVLS Fans Solve My Problem:

HVLS fans can dramatically reduce HVAC air intake by circulating and destratifying climate controlled air volumes. The result is lower operational costs, stable indoor air quality, and reduced maintenance needs.

HARDWARE OPTIONS

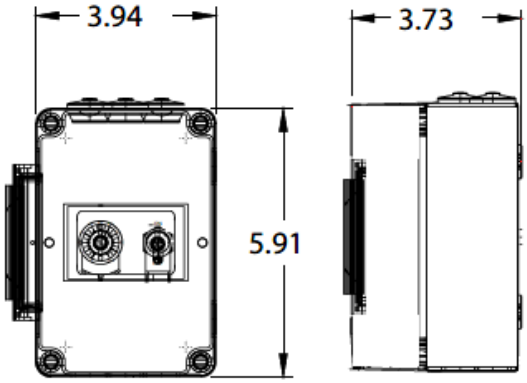
Single Fan Controller

Ships standard with every fan.



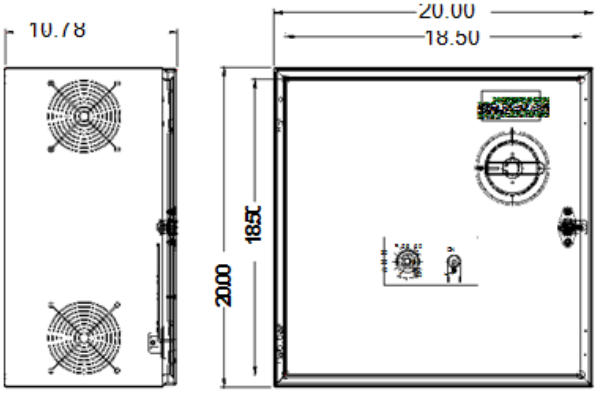
Remote Operator Station

Controller with key-lockout for space sensitive locations



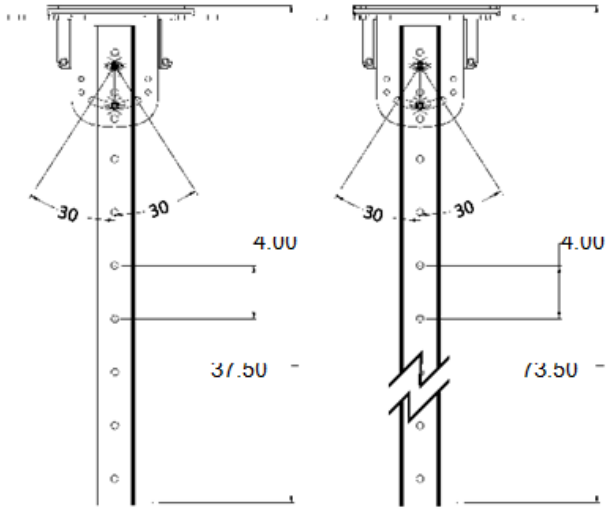
Multi-Fan Control Unit

Control up to 4 fans from a single unit

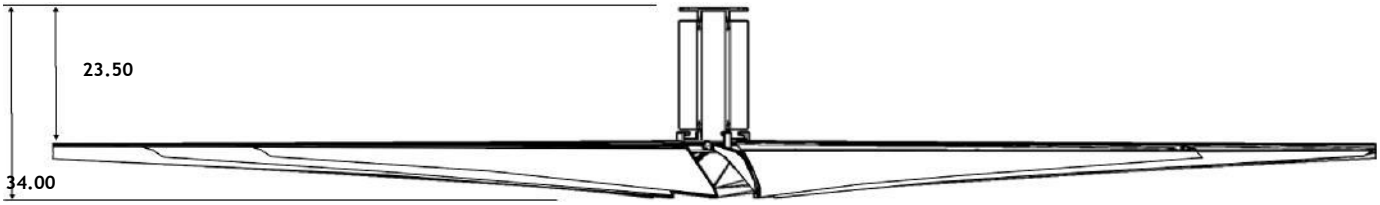


Mounting Extension Kits

3' and 6' Drop Kits Stock, Modification to Order



TECHNICAL SPECIFICATIONS



Fan Diameter	8 ft.	12 ft.	16 ft.	20 ft.
Number of Airfoils	8 Airfoils			
Fan Weight	91 lbs.	109 lbs.	127 lbs.	161 lbs.
Motor Enclosure	Totally Enclosed Fan-Cooled			
Motor Power	0.5 HP			1.0 HP
Maximum RPM	44 RPM	44 RPM	44 RPM	39 RPM
Maximum CFM*	~45,000 CFM	~90,100 CFM	~123,000 CFM	~197,000 CFM
Sound Level (dBA)**	<57 dBA	<57 dBA	<57 dBA	59 dBA
Direct Breeze Region ***	28 - 32 ft. diameter	42 - 48 ft. diameter	56 - 64 ft. diameter	70 - 80 ft. diameter
Best Industrial Spacing ****	42 ft.	63 ft.	84 ft.	105 ft.
Max Square. Footage ****	4,250 sq. ft.	8,500 sq. ft.	12,750 sq. ft.	19,750 sq. ft.
Input Power	110-120V, 1φ: 10.25 A 208-240V, 1φ: 5.13A 208-240V, 3φ: 3.00 A 460-480V, 3φ: 1.50 A			208-240V, 1φ: 10.00 A 208-240V, 3φ: 5.70 A 460-480V, 3φ: 2.85 A
Motor Maximum Full Load Amps	208-240V: 1.90 A 460-480V: 0.95 A			208-240V: 3.66 A 460-480V: 1.83 A
Minimum Airfoil Clearances	Sides: 2 ft. Ceiling Deck: 4 ft.	Sides: 2 ft. Ceiling Deck: 5 ft.	Sides: 2ft. Ceiling Deck: 6 ft.	Sides: 2 ft. Ceiling Deck 6 ft.
Standard Mount	I-Beam/Z-Purlins/Open Joist			
Extensions	3 ft. and 6 ft. Mounting Extensions Available			
Controller	NEMA 1 Wall Mounted VFD w/Safety Disconnect, On/Off Toggle and Speed Pot			
Safety Features	Safety Cable, Hub Clips, Hub Retainer, Dual-Method Fastening of all Joined Components, Integrated Sprinkler Shut-Off			
Warranty	5 Years All Parts			

* CFM measurements are an approximation derived from several factors. AMCA does not certify CFM ratings for fans larger than 8' in diameter.
** dBA measurements taken directly beneath units running at 3/4 speed in an active work environment.

*** For applications in which breeze production/ventilation is the foremost consideration, applies to operation at 1/2 max speed with a clear floor.
**** For applications in which heating/cooling cost reduction is the foremost consideration

CUSTOMIZATION OPTIONS

8 Stock Colors

No surcharge applied, available with every fan

FREQUENTLY ASKED QUESTIONS

Q: What speeds will I be running this fan at?

A: The only speeds we know for sure that you won't be using are 0% and 100%

Longer A: We run our own Humongous Fans at about 33Hz (out of 60Hz max) during the summertime. During the winter we run it at closer to 11Hz, when the goal is not to create a breeze but to bring that nice warm air off the ceiling where it's just melting snow.

Q: Is it possible to run these fans backward?

A: No. We have made the deliberate design choice not to implement reverse rotation. The reason is that running HVLS fans in reverse is inefficient and counterproductive for your goals.

Longer A: For one, these blades are not the same shape as standard ceiling fan blades. They function on the same aerodynamic principles as airplane blades, or propellers.

Second, it's lose-lose no matter what season you're in. By running HVLS fans backward you are failing to maximize the evaporative-cooling effect in the summer. During the winter you are doing the most work for the least destratification.

If it's a cold draft you are worried about, you have only to turn up the speed until you feel the breeze, then turn it down slightly. You'll get all the benefits of destratification without getting any chills. This is possible because our VFD (Variable Frequency Drive) input controllers are infinitely adjustable, in speed: no big jumps in air-speed with which to contend, as with your standard ceiling fans.

Q: Why doesn't your fan have winglets?

A: They are unnecessary and costly and represent an additional point of potential failure.

Longer A: You see winglets on airplanes all the time. But how many helicopters do you see that have them? Part of the reason is that rotating airfoils are constantly moving through each other's wake, meaning that the vortex-minimizing properties of winglets are not in appreciable effect. This is why few helicopters sport them, except for those designed with highly specialized purposes in mind, such as noise reduction.

But you don't have to take it from us. NASA and the US Army conducted research which led to the same conclusion: winglets, paddles, rails, and other air-diversion structures do not provide any significant improvement on the performance of rotor systems. Additionally, winglets and rails on fixed-system rotor blades (fans) must work to divert (heavy) air which is already flowing in a column (and has inertia). This work creates additional torque on the fan blade, which reduces its efficiency without proportionally increasing airflow.

If you would like to pay for that, we are sorry to say that we don't offer it.

Q: Can I get a quote?

A: Absolutely!

Longer A: Call or email us and we'll prepare a full quote for you as quickly as we can.

ADDITIONAL PLANNING RESOURCES

LEED

EQ Prerequisite 1 - Minimum Indoor Air Quality Strategies

EA Credit 1 - Enhanced Indoor Air Quality Strategies

EQ Credit 5 - Thermal Comfort

EQ Prerequisite 2 - Minimum Energy Performance

EA Credit 2 - Optimize Energy Performance

EA Credit 4 - Demand Response

A Credit 6 - Enhanced Refrigerant Management

IN Credit 1 - Innovation

Living Building Challenge

Imperative 06 - Net Positive Energy
Imperative 08 - Healthy Indoor Environment
Imperative 10 - Red List

Green Globes

Section 3.30 - Energy, Path B

Section 3.71 - Ventilation Requirements

State Incentives Database

http://www.dsireusa.org