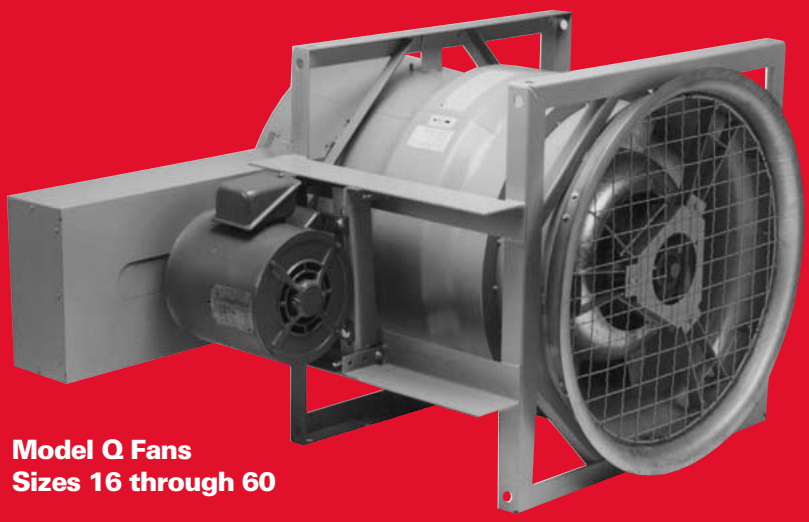
TRANE®

FAN-DS-2
August 2000

Model Q™ Fans
Sizes 16 through 60

Super Q II Fans
Sizes 16 through 44

FAN-DS-2



Model Q Fans
Sizes 16 through 60

Super Q II Fans
Sizes 16 through 44

Features and Benefits

Q Fan

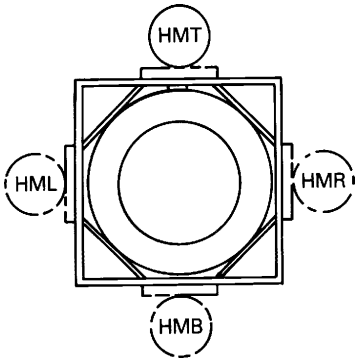
The Model Q™ fan is a quiet, airfoil, in-line fan specifically designed for air conditioning applications. This highly refined axial flow fan is available in 13 sizes from 1,000 through 80,000 cfm. Small and compact, the Q fan has proven to be the ideal air moving device for standalone applications and also for custom air handling units. It can be used for supply, return and exhaust systems.

Available in arrangement 1 (for floor mounting of larger units with heavier motors) and arrangement 9 (horizontal or vertical mounting), it can be selected in class 1, 2 and 3. Arrangement 9 permits factory mounting of the motor on top, bottom, or either side of the fan — see below.

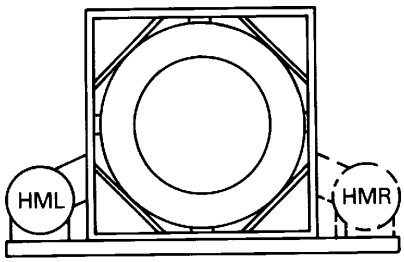
Benefits

- **The Q (Quiet) Fan**
  The Trane Model Q fan generates less low frequency noise (more difficult to attenuate) than any other type of fan in the HVAC industry. Sound level comparisons show common vaneaxial fans produce up to 23 db higher sound levels than the Model Q — significant in industrial applications. Being quieter than centrifugal fans allows for installations closer to building occupants.
- **Saves Mechanical Room Space**
  The compact quiet Q fan saves floor space, which reduces system first cost.
- **Easy To Install**
  Rigging and installation is so much quicker and easier that total installed cost savings are typically five percent or more.
- **Low Maintenance**
  Belt-driven with fixed blades, Model Q fan has very few moving parts. This design results in exceptionally low maintenance requirements. No fan teardowns need be scheduled. In fact, Q fans installed 25 years ago are still operating just as quietly as when they were installed.
- **Flexible Installation**
  The Model Q arrangement 9 can be set in any position, for horizontal discharge, angled discharge and vertical discharge either upblast or downflow. The only limitations placed on this arrangement are those dictated by good fan installation practice.
- Motor slide rails and drive guard are standard, at no extra cost.

Discharge End View



Arrangement 9



Arrangement 1

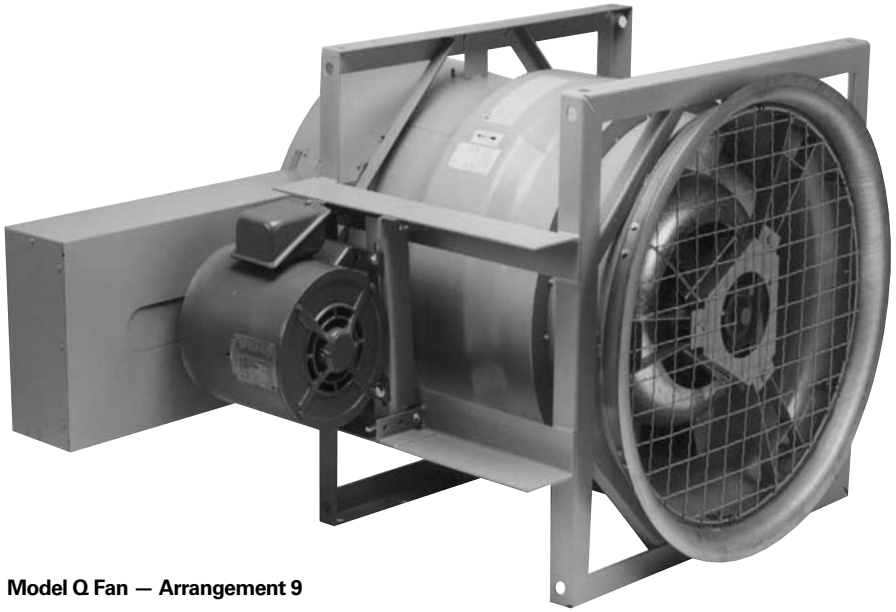
AMCA Licensed Ratings

The Trane Company certifies that the Model Q 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 comply with the requirements of the AMCA Certified Ratings Program.

Contents

Q Fan Accessories

- Inlet flange — for simplified, rigid connection of ductwork to inlet end of fan
- Inlet screen — safety accessory mounted to fan inlet. Heavy, plated steel wire
  Note: inlet screen and inlet flange are mutually exclusive.
- Inlet vanes — mechanically modulate fan capacity
- Inlet bellmouth — used with unducted or plenum applications. Improves air flow and reduces noise.
- Inlet silencer (long or short) — flex connected to Q fan
- Outlet flange — for simplified, rigid connection of ductwork to outlet end of fan
- Outlet screen — safety accessory mounted to fan outlet. Heavy, plated steel wire
  Note: outlet screen and outlet flange are mutually exclusive.
- Outlet duct diffuser (equalizer) — makes fan outlet diameter equal to inlet diameter
- Outlet flow stabilization screen — small mesh outlet screen. Helps offset effect of poor outlet airflow conditions
- Outlet silencer (short or long) — flex connected to Q fan
- Vertical mounting legs — used with arrangement 9 for vertical discharge floor and ceiling mounted
- Isolators — to eliminate vibrations for floor, ceiling and vertical installations
- Special coatings — to protect against alkyds, acids and corrosive environments
- Access door — available on sizes 49, 54 and 60 for easier service
- Drain — recommended to drain off the condensate where moisture-laden air is exhausted
- Copper grease lines — plastic lines are standard
- Double acoustic enhancement — insulation and perforated sheet metal to attenuate radiated sound
- Fan insulation — self-adhesive foam, applied on the outside of the fan shell to protect against moisture
- Variable frequency inverter balancing and reinforcement (frequency inverter by others). This option requires constant pitch drives.

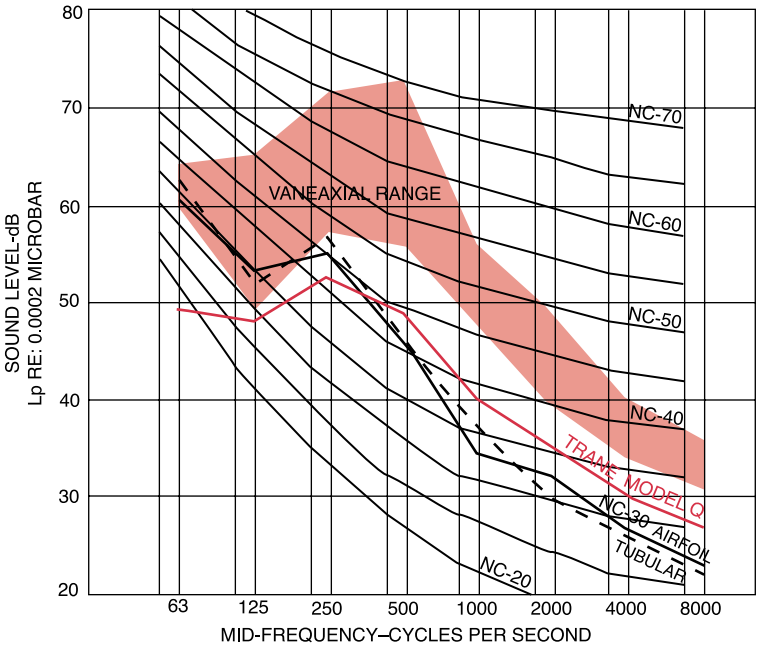


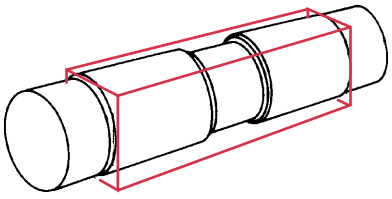
Model Q Fan — Arrangement 9

Features and Benefits

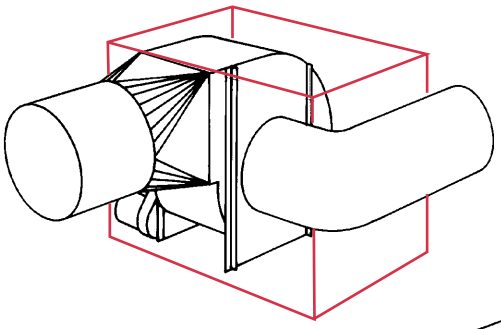
This chart shows a typical NC level comparison between common vaneaxials, tubular centrifugals, airfoil centrifugals and the Trane Model Q™ compact fan. The shaded area represents range of vaneaxials tested.

Trane Model Q fans require up to 85 percent less cubic space than airfoil centrifugal fans and 40 percent less than common vaneaxials of equivalent installed sound level. Floor space savings can be as much as 65 percent when compared to the common vaneaxial and airfoil centrifugal and 40 percent when compared to tubular centrifugals.

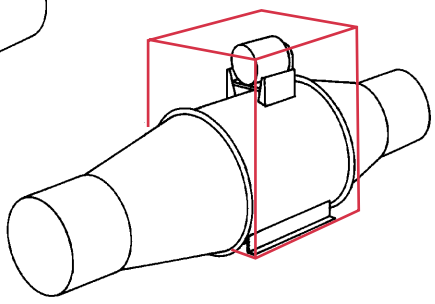




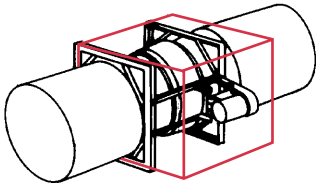
Vaneaxial Fan



Airfoil Centrifugal Fan



Tubular Centrifugal Fan



Trane Model Q Compact Fan

Features and Benefits

Super Q II Plus

More than twenty years after the introduction of the Model Q™, it still retains its reputation as one of the quietest HVAC fans in the world. This tradition of excellence continues with the introduction of a new Q fan acoustical enclosure and duct silencer so effective and so compact that we named it the Super Q II.

Super Q II Fan

Available with Model Q fans from 1,000 to 43,000 cfm, the Super Q II enclosure inhibits radiated fan and motor noise from entering the surrounding space. It internally isolates the fan on high deflection spring isolators so ductwork can be connected directly to the enclosure. It is uniquely designed to be floor or ceiling mounted with ease.

Although the Model Q needs very little maintenance, future maintenance requirements were considered by Super Q II designers. Every unit has the bearing grease lines extended through the casing and every unit has two full size access panels that provide complete access to all internal components.

Variable Air Volume Compatible

The Super Q fan is modulated for VAV with variable frequency drives (by others), not with inlet vanes. Variable speed inverter fan modulation offers exceptional energy saving and exceptionally quiet part load operation. VAV variable speed Q fans are structurally reinforced to handle the uneven harmonic loadings associated with variable speed fan operation. In addition, the factory gives variable speed Q fans a precise, 10-point balance to further help assure trouble-free operation. Only constant pitch drives should be used with variable frequency inverters.

Super Q II Accessories

- Inlet screen — safety accessory mounted to fan inlet. Heavy, plated steel wire
- Inlet bellmouth — used with unducted or plenum applications. Improves air flow and reduces noise.
- Inlet silencer (long or short) — rigid connection to Super Q fan
- Outlet flow stabilization screen — small mesh outlet screen. Helps offset effect of poor outlet airflow conditions
- Outlet silencer (short or long) — flex connected to Q fan
- Variable frequency inverter balancing and reinforcement (frequency inverter by others). This option requires constant pitch drives.
- Outlet screen — safety accessory mounted to fan outlet. Heavy, plated steel wire.

Super Q II

Features and Benefits

Trane Plus Duct Silencer

The Plus option is a high performance duct silencer. Designed specifically for the Super Q II and Model Q™, it has several unique features that reduce airborne noise and turbulence to exceptionally low levels. Briefly, the Plus option develops maximum static regain while simultaneously limiting objectionable mid and high frequency noise. The Plus option should be used whenever **quiet comfort** is desired and the duct system is acoustically unable to provide it.

Trane's Plus Silencer provides significant noise attenuation, up to 32 db at 1,000 Hz, without a significant increase in fan horsepower requirements.

By carrying the concept of noise source attenuation to its economic maximum, Trane has created a fan system that can move significant amounts of air without creating objectionable low frequency rumble. It provides proven acoustical performance with less design risk. In project after project, the Trane Model Q fan has been the key to creating NC 15 to NC 35 **quiet comfort** jobs.

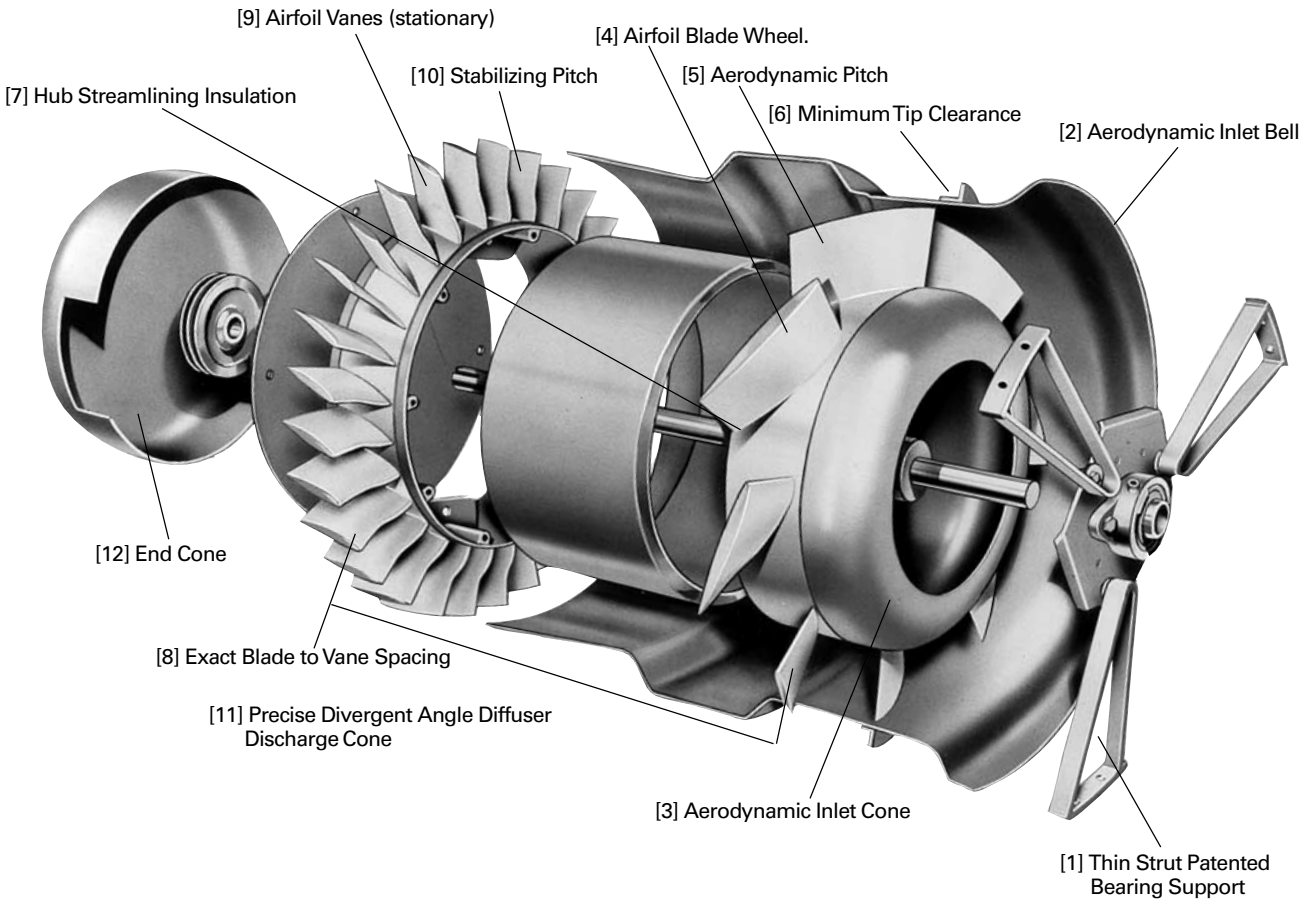
Beyond quiet, the Super Q II Plus system is small and compact. In fact, it is small and quiet enough that it can be successfully installed in ceiling plenums. Locating a Super Q II Plus in the plenum helps reduce and even eliminate the floor space needed for the mechanical room.

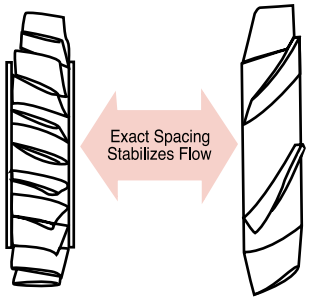
The modular, component design approach of the Super Q II air handling system makes it exceptionally well suited for renovation, retrofit and replacement projects. The Super Q II air handling system components (fan, silencers, filter/coil module, etc.) fit through most doors and elevators and can be easily field-assembled into any system configuration (blow-thru, draw-thru, etc.).

Plus Silencer

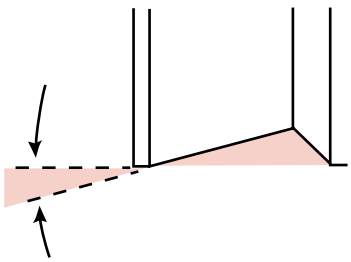
Features and Benefits

Low Sound Level, High Efficiency Provided by Unique Aerodynamic Features

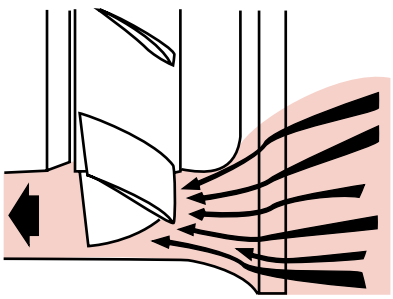




Precision cast fan wheel and diffuser for highly efficient aerodynamic performance. [8]



Precise divergent angle for maximum static regain. [11]



Aerodynamic inlet provides smooth airflow. [3]

Note: Call-out numbers shown above are referenced on page 8.

Features and Benefits

The low sound and high performance of the Trane Model Q™ fan are achieved by reducing noise-creating, energy-consuming turbulence within the fan. Airflow research and development techniques employed were similar to those used in perfecting today's high performance axial flow jet engine compressors. The resulting smooth air path has made the Model Q the first vaneaxial fan to provide quiet, efficient operation, suitable for air conditioning duty.

Aerodynamic Air Path
A component by component analysis of the Model Q points to 12 aerodynamic features which are keys to a smooth air path. Starting at the inlet, the struts [1] of the patented bearing support are precisely positioned in relation to the fan blades. Air passing over the struts strikes the blades in a pattern that prevents blade whine.

The aerodynamically shaped inlet bell [2] and inlet cone [3] provide uniform axial flow parallel to the fan shaft. Air is delivered equally to the leading edge of the fan blades — no crowding toward the fan tips.

Air separation is reduced by the precision cast aluminum airfoil cross section [4] of the fan blades. Blade pitch [5], using a variable angle of attack in the radial dimensions, is precisely controlled to prevent energy loss. Exceptionally close clearance [6] between the blade tips and housing reduces the eddy currents of fan tip recirculation. The reinforcing ring rigidizes the housing to maintain the tip clearance. The interior of the fan wheel is insulated to prevent hub strengthening protrusions from [7] windmilling in the airstream.

A precisely controlled space [8] between the fan blades and diffuser vanes is necessary to allow airflow stabilization ahead of the vanes. The vanes themselves are precision cast aluminum and have an airfoil cross section [9] and a precise radial pitch [10]. This provides smooth, spiral-free discharge.

The diffuser section design [11] is critical. A precisely determined diffusion angle produces the greatest possible static regain within the confines of the fan. An end cone [12] covers the fan drive assembly, thereby reducing the turbulence generated by air passing over exposed drives.

Precise Manufacturing Assures Performance — Advanced manufacturing techniques assure the same performance characteristics for each production Model Q fan.

- **Fin Struts** — The fin struts of the patented bearing support are precisely positioned in relation to the fan blade. Air passing over the struts strikes the plate in a pattern that prevents the irritating whine, from blade frequency, which is characteristic of industrial vaneaxials.
- **Inlet Bell and Cone** — The aerodynamically shaped inlet bell and inlet cone provide uniform axial flow into the fan parallel with the fan shaft. Air is delivered equally to the leading edge of the fan blades. This prevents crowding toward the blade tip.
- **Wheel** — The wheel consists of 8 precision cast blades with a twisted radially projected shape and airfoil cross section. This radial projection utilizes a variable angle of attack in the radial dimension and prevents radial movement as the air particles move through the wheel.
- **Tip Clearance** — Close clearance between the blade tips and housing reduces eddy currents due to tip recirculation. The reinforcing ring holds the housing in its precise shape to maintain proper clearance.
- **Vane Spacing** — Precise space between the fan blades and the diffuser vanes is necessary to allow flow stabilization ahead of the vanes. The 29 diffuser vanes also have an airfoil cross section and a twisted, radially projected shape. This provides smooth, spiral-free air discharge.
- **Precision Cast Aluminum Fan and Diffuser** — Being cast, blade and vane shapes are permanently and precisely fixed. They are not subject to misalignment or distortion as are welded, sheet metal forms.
- **Diffuser Section** — The diffuser section design is critical. A precisely determined flare angle at the diffuser end produces the greatest possible static regain within the confines of the fan. Thus, externally mounted diffuser accessories, common for industrial vaneaxials, are not necessary.
- **Hydraulically Expanded Flow-Formed Housing** — In this process, the cylindrical housing is drawn to its final form over an expansion die. The metal, expanded beyond its elastic limit, permanently retains the precision form imparted by the die.
- **Ductile Weld Technique** — This technique is required for the fan housing seam to guarantee success of the expansion forming process. The arc and "puddle" are submerged in molten flux that shields the weld material from oxidation. This prevents brittleness and also anneals the weld. The result is a flexible, ductile seam capable of being drawn and formed — another example of the advanced technology used in the Trane Model Q fan.

Features and Benefits

Saving Valuable Equipment Room Space

The Trane Model Q™ and Super Q II fans can help you maximize your building's usable floor space by using them in place of centrifugal fans. The smaller the equipment room, the more space left for tenants, merchandise, etc.

Return or Exhaust Applications
Figure F-1 shows a size 44, single width, low pressure airfoil centrifugal fan delivering 20,000 cfm of air. Because of its size and weight, it is floor mounted and connected to a return air plenum. In contrast, a 44-inch Model Q fan is used in Figure F-2 instead of a centrifugal fan. Its smaller size and lighter weight permits ceiling suspension and approximately 75 sq ft of floor space is freed up for other use.

Draw-Thru Supply Application (Small Capacity)
The fan system in Figure F-3 is a 27-inch, single width, medium pressure airfoil centrifugal fan rated at 9,000 cfm. Even though it is a relatively small fan, it is floor mounted beside the coil bank plenum. Figure F-4 shows a 27-inch Model Q substituted in place of the centrifugal. The small size and weight, plus the installation flexibility of the Model Q, permits mounting in a vertical position on top of the plenum. The space savings is about 25 sq ft.

Figure F-1

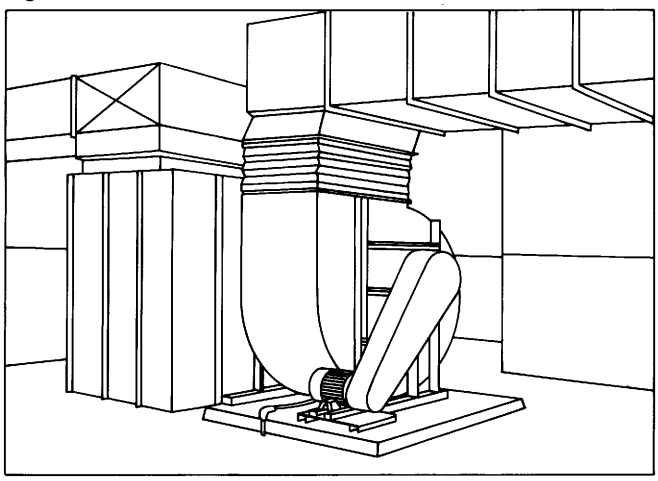


Figure F-2

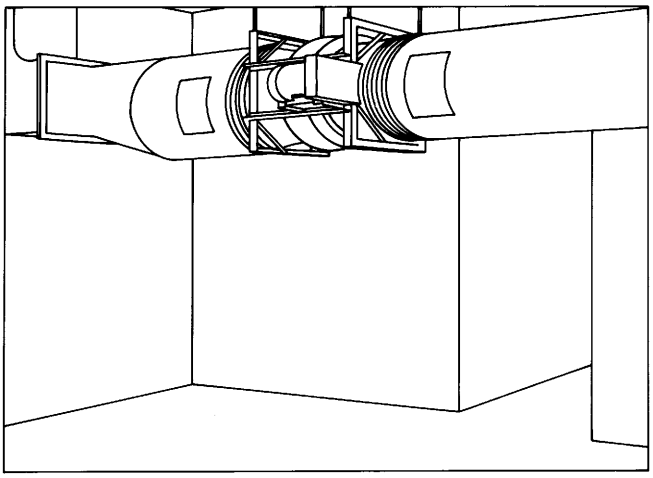


Figure F-3

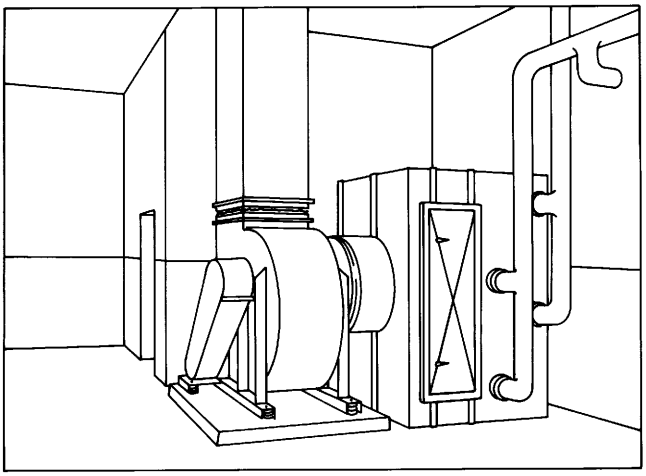
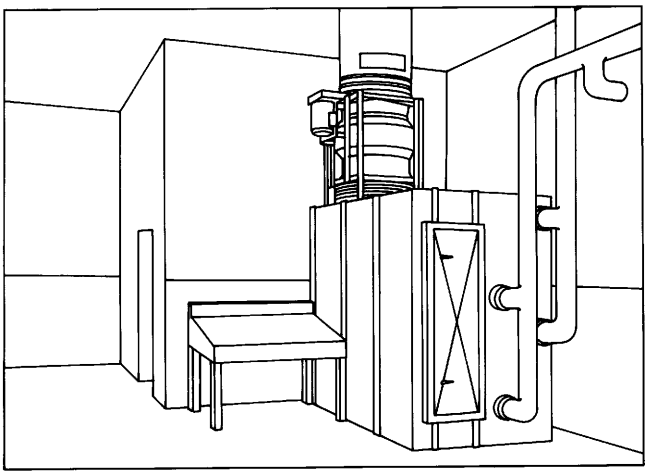


Figure F-4



Features and Benefits

Draw-Thru Supply Application (Large Capacity)
A 60-inch, single-width, medium pressure airfoil centrifugal fan is used in the system illustrated in Figure F-5 to supply 45,000 cfm of air. This capacity can be easily achieved by installing a pair of 40-inch Model Q™ fans in parallel as shown in Figure F-6. The resulting floor space savings is approximately 85 sq ft!

Blow-Thru Supply Application
Figure F-7 shows a typical medium pressure, built-up, blow-thru system. The fan, enclosed in a plenum, is a 33-inch, double width, airfoil centrifugal that delivers 30,000 cfm of air. The bulkiness of the plenum is dictated by the necessary clearances around the fan. To save floor space, a 44-inch Model Q replaces the centrifugal in Figure F-8. The suspended mounting of the Model Q frees about 70 sq ft for installation of pumps and other equipment.

Figure F-5

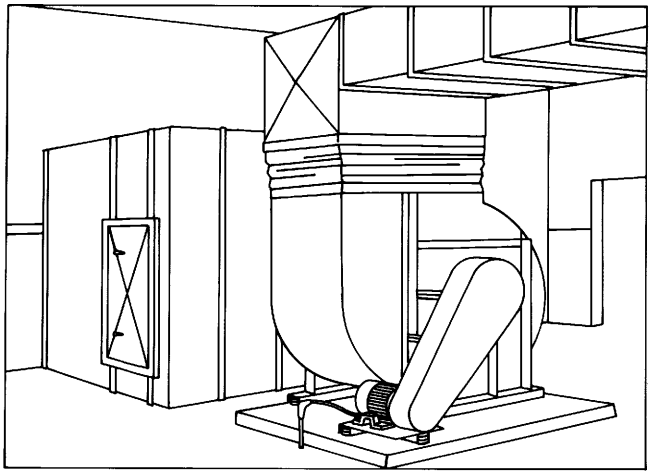
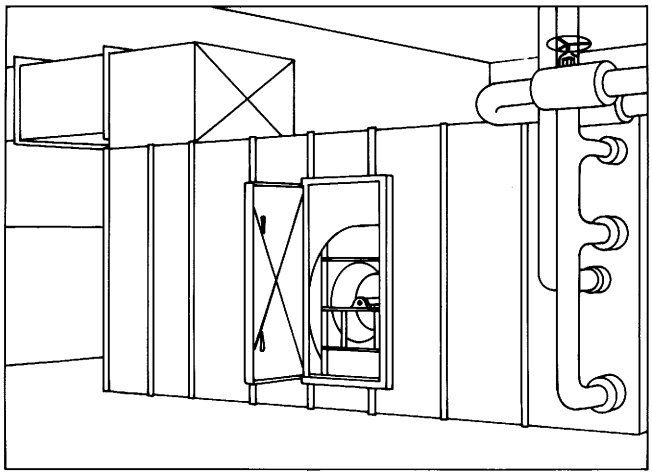


Figure F-7



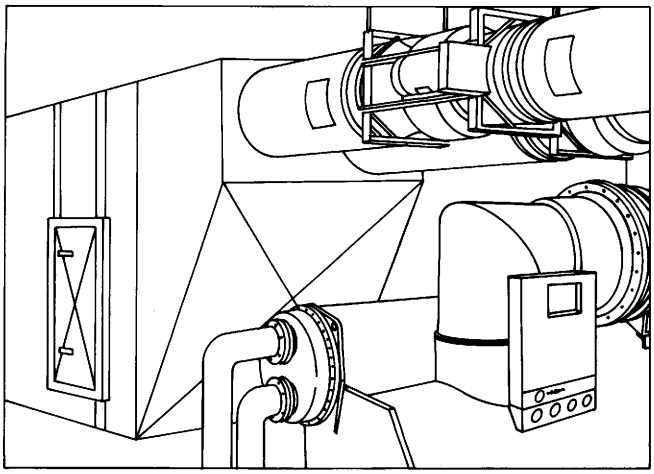


Figure F-6

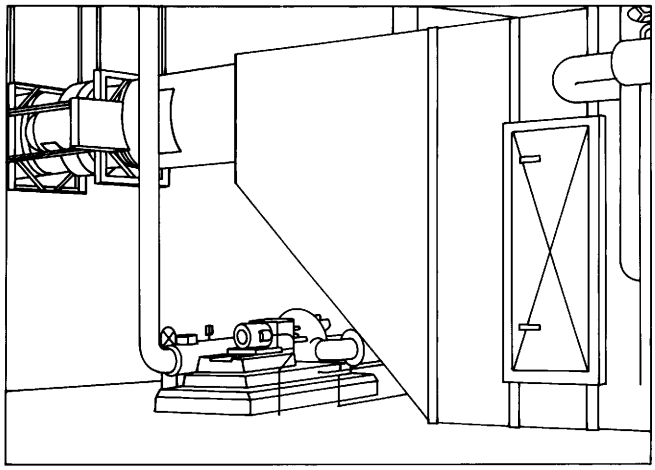


Figure F-8

Features and Benefits

Reduce Installed Cost By Up To 20 Percent

The Trane Model Q™ fan, with all its precision and quality, is still a cost effective fan. When all necessary system components are considered, it provides substantial installation cost savings. In addition, its small size and variable mounting positions allow more freedom to the designer and installer.

First Cost Comparisons
True first cost is the total cost of an operable installation. With the Trane Model Q, this consists of only the fan, drive and isolation. By comparison, the airfoil centrifugal typically requires these three components, plus an integral base. In addition, cost of isolation for the airfoil is greater because it is typically twice as heavy as the Model Q.

The common vaneaxial also requires more components in most applications. Besides the fan, drive and isolation, an inlet bell and diffuser are frequently necessary to meet cataloged performance. A sound attenuator is also required to reduce noise to a level equivalent to a Model Q fan without attenuation.

Lower Installation Costs
The Trane Model Q fan has fewer components to install and the advantage of lighter weight. With only half the weight of airfoil and tubular centrifugals, it requires less manpower for rigging and setting the fan in place. The result is reduced labor, with corresponding dollar savings on the typical job.

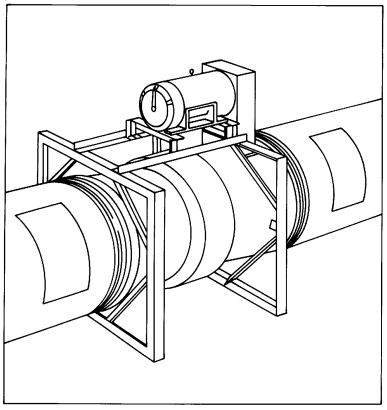
Lighter weight also reduces inertia pad requirements. With the Model Q, a pad has to be considered only on large Class III fans. Airfoil and tubular centrifugals, because of greater weight, often require pads for Class I and II to minimize the effect imposed by normal vibration.

Combined Saving Significant
A comparison of average total installed cost is shown in Table F-1. Average cost figures were developed based on estimates by experienced installing contractors. In all cases, the Trane Model Q represents a significant savings.

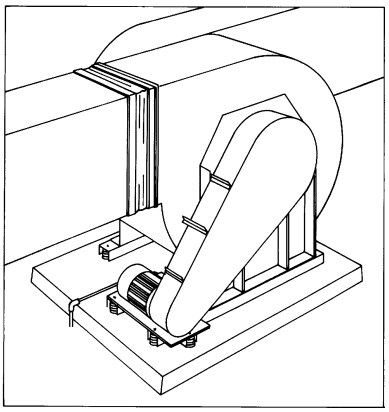
Table F-1 — Total Installed Cost Comparison

Item Required	Standard Centrifugal	Trane Model Q	Tubular Centrifugal	Vaneaxial
First Cost Requirement				
Fan	X	X	X	X
Belt Guard	X	X	X	
Integral Base	X			
Inlet Bell				X
Attenuation				X
Spring Isolators	X	X	X	X
Installation Cost Requirements				
Rigging	X	X	X	X
Install Attenuation				X
Mount Motor (Etc.)	X		X	
Install Isolation	X	X	X	X
Average Total Installed Cost	X	–5	+5	+15

Comparison is based on equal size fans of similar capacities. The airfoil centrifugal fan is used as base (100%) for comparative purposes. Figures are based on estimates by experienced installing contractors.



Arrangement 9 Trane Model Q fan requires purchase of motor, motor rails, belt guard and isolation in addition to the basic fan.



Arrangement 3 airfoil centrifugal fan requires purchase of motor, belt guard, motor slide rail, isolation and subbase in addition to basic fan.

Model Number Description

Valid Prod. Cat.	Selectable Item	Description
CYCLE	QSE	E-cycle 16-44 arr 9 cl 1&2 w/o mtr mtd
	QSE1	E-cycle 16-44 arr 9 cl1&2 w/mtr mtd
	QSQ	Q-cycle 16-44 arr 9 cl 1,2&3
	MTO	Std cycle 16-44 arr 1&9 cl 1,2&3 & SQ2
	MTO1	Std cycle 16-44 arr 1&9 w/unit coating
	MTO2	Std cycle 49-60 arr 9 cl 1&2
	MTO3	Std cycle 49-60 arr 9 w/unit coating
MODEL	QFNA	Q (Quiet) fan
TYPE	SQ2	Super Q2 fan
	QFAN	Q fan
SIZE	16	Fan size 16″ (400 mm)
	19	Fan size 19″ (475 mm)
	21	Fan size 21″ (525 mm)
	24	Fan size 24″ (600 mm)
	27	Fan size 27″ (675 mm)
	30	Fan size 30″ (750 mm)
	33	Fan size 33″ (825 mm)
	36	Fan size 36″ (900 mm)
	40	Fan size 40″ (1000 mm)
	44	Fan size 44″ (1100 mm)
	49	Fan size 49″ (1225 mm)
	54	Fan size 54″ (1350 mm)
	60	Fan size 60″ (1500 mm)
ARRG	9	Arrangement 9 fan
	1	Arrangement 1 fan
CLASS	1	Class 1 fan
	2	Class 2 fan
	3	Class 3 fan
UORT	UP	Upblast discharge
	DOWN	Downblast discharge
	H	Horizontal discharge
MTRS	TT	Trane supplied motor & Trane mounted
	FT	Field supplied motor & Trane mounted
	TF	Trane supplied motor & field mounted
	FF	Field supplied motor & field •mounted
TRES	WB	Thrust restraints WB (direct ship)
	NONE	No thrust restraints
DUCT	YES	Duct canvas
WBAL	FACT	Q fan inverter factory balancing
	FIELD	Inverter ready balanced by customer

Valid Prod. Cat.	Selectable Item	Description
MTHP	1	Motor hp 1 (.7 kW)
	1.5	Motor hp 1.5 (1 kW)
	2	Motor hp 2 (1.5 kW)
	3	Motor hp 3 (2 kW)
	5	Motor hp 5 (4 kW)
	7.5	Motor hp 7.5 (5.5 kW)
	10	Motor hp 10 (7 kW)
	15	Motor hp 15 (11 kW)
	20	Motor hp 20 (15 kW)
	25	Motor hp 25 (18 kW)
	30	Motor hp 30 (22 kW)
	40	Motor hp 40 (30 kW)
	50	Motor hp 50 (37 kW)
	60	Motor hp 60 (44 kW)
	75	Motor hp 75 (56 kW)
MTYP	HEOP18	ODP High eff mtr 1800 rpm 1S/1W
	ODP12	ODP High eff mtr 1800/ 1200 rpm 2S/2W
	ODP91	ODP High eff mtr 1800/ 900 rpm 2S/1W
	ODP92	ODP High eff mtr 1800/ 900 rpm 2S/2W
	PHOP18	ODP Prem Hi E+3 mtr 1800 rpm 1S/1W
	HETE18	TEFC High eff mtr 1800 rpm 1S/1W
	PHTE18	TEFC Prem Hi E+3 mtr 1800 rpm 1S/1W
VOLT	200	200 Volt 60 hertz 3 ph motor
	208	208 Volt 60 hertz 3 ph motor
	230	230 Volt 60 hertz 3 ph motor
	460	460 Volt 60 hertz 3 ph motor
	575	575 Volt 60 hertz 3 ph motor
MOLO	R	Motor location right hand drive
	L	Motor location left hand drive
	T	Motor location top drive
	B	Motor location bottom drive
GRSL	N	Nylon grease lines
	C	Copper grease lines
DTYP	C1.2	Constant pitch drive with 1.2 DSFT
	C1.4	Constant pitch drive with 1.4 DSFT
	C1.5	Constant pitch drive with 1.5 DSFT
	V1.2	Variable pitch drive with 1.2 DSFT
	V1.4	Variable pitch drive with 1.4 DSFT
	V1.5	Variable pitch drive with 1.5 DSFT

Valid Prod. Cat.	Selectable Item	Description
INSL	F	Fan insulation
	FA	Fan and accessories insulation
ENHA	DBLE	Double acoustic enhancement
COAT	BPI	Baked phenolic (heresite) inside
	BPIO	Baked phenolic (heresite) in/outside
	EI	Epoxy inside
	EIO	Epoxy inside/outside
	EPI	Epoxy phenolic (2 components) inside
	EPIO	Epoxy phenolic (2 components) inside/outside
	EPADI	Epoxy phenolic (air dry heresite) inside
	EPADIO	Epoxy phenolic (air dry heresite) inside/outside
	PEI	Polyester (sanitile) inside
	PEIO	Polyester (sanitile) inside/ outside
IOPT	IB	Inlet bell
	IF	Inlet flange
	ISC	Inlet screen
	IBSC	Inlet bell with inlet screen
	SH	Inlet silencer short
	L	Inlet silencer long
	IV	Inlet vanes
	NONE	No inlet options
OOPT	OFLG	Outlet flange
	OSCN	Outlet screen
	ODEQ	Outlet duct equalizer
	ODOF	Outlet duct equalizer w/ outlet flange
	SH	Outlet silencer short
	L	Outlet silencer long
	NONE	No outlet options
ISOL	SLF	Free standing spring floor isolators
	C	Housed spring floor isolators
	ND	Dbl deflection neoprene floor isolators
	RSL	Spring rail floor isolators
	MSL	Steel base w/spring floor isol
	KSL	Concrete inertia base w/spring floor isolators
	HD	Dbl deflection neoprene ceiling isolators
	HS	Spring ceiling isolators
	DNHS	Spring & neoprene ceiling isol
	WR	Neoprene wall isolators
ADOR	MS	Access door motor side
	OS	Access door opp. motor side
	9R	Access door 90° right of motor
	9L	Access door 90° left of motor
DRAN	YES	Drain
MTGL	IL	Inlet mounting legs
	OL	Outlet mounting legs

Application Considerations

This section assists the system designer in application and control of Trane Q and Super Q II fans. Satisfactory distribution of conditioned air requires a properly chosen fan and a well designed duct system.

Abbreviations

sp ..... static pressure (in. of water)
vp ..... velocity pressure (in. of water)
tp ..... total pressure (in. of water)
ov ..... outlet velocity (ft per minute)
rpm ... fan speed (revolutions per min.)
bhp ... brake horsepower
p ..... air density (lbs/ft^3)
db ..... decibel (sound power or sound pressure level)
cps .... cycles per second
cfm .... cubic feet of air per min. at any density
scfm .. cubic feet per min. of standard air clean, dry air with a density of 0.075 lbs/ft^3 at 70 F and a barometer reading of 29.92- inches Hg)

The System

An air system may consist of a fan, ductwork, air control dampers, cooling coils, heating coils, filters, diffusers, noise attenuation, turning vanes, etc. The fan is the component in the system which provides energy to the airstream to overcome the resistance to flow of the other components.

System Component Losses

Every system has a combined resistance to flow which is usually different from every other system and is dependent upon the individual components in the system. The determination of the "pressure loss" or "resistance to flow," for the individual components can be obtained from the component manufacturers. The determination of pressure losses for ductwork and branch piping design is well documented in standard handbooks such as the ASHRAE Handbook of Fundamentals.

System Curve

At a fixed volume flow rate (cfm) through a given air system, a corresponding pressure loss, or resistance to this flow, will exist. If the flow rate is changed, the resulting pressure loss, or resistance to flow, will also change. The relationship governing this change for most systems is:

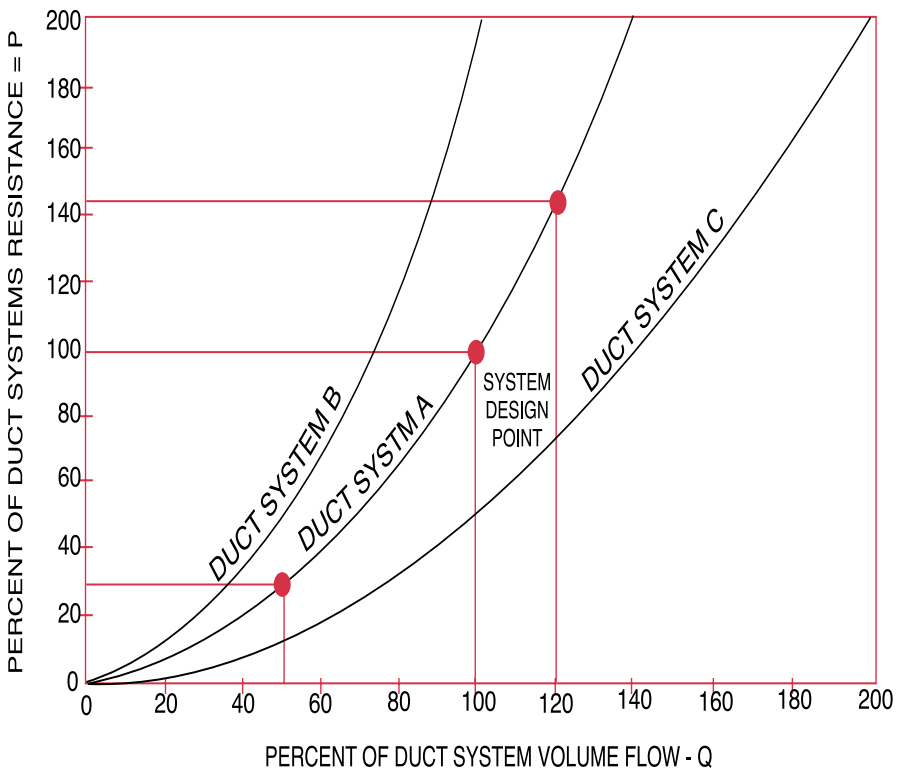
$$PRESSURE_c/PRESSURE = (CFM_c/CFM)^2$$

The characteristic curve of a typical "fixed system" plots as a parabola in accordance with the above relationship. Typical plots of the resistance to flow versus volume flow rate are shown with normalized duct system curves, Figure A-1.

For a fixed system, an increase or decrease in system resistance results from an increase or decrease in the volume flow rate along the given system curve only.

Refer to Duct System A, Figure A-1. Assume a system design point at 100 percent volume and 100 percent resistance. If the volume flow rate is increased to 120 percent of design volume, the system resistance will increase to 144 percent of the design resistance in accordance with the system equation. A further increase in volume results in a corresponding increase in system pressure. A decrease in volume flow to 50 percent results in a 75 percent reduction in design resistance.

Figure A-1 — Normalized Duct System Curves



Application Considerations

Performance Data Determination
The fan performance section of this catalog contains a fan performance table and fan curve for each fan size.

The performance data contained in this catalog was calculated from tests conducted in accordance with AMCA Standard 210 Laboratory Methods of Testing Fans for Rating.

The AMCA test procedure uses an open inlet and 10 wheel diameters of straight discharge ductwork to assure maximum static regain. The fan is direct driven by a dynamometer.

The fan performance tables in this catalog are based upon standard air: 0.075 lbs/ft^3 (70 F, barometric pressure 29.92-inches Hg).

Fan Performance Curves
A fan performance curve is a graphical presentation of the performance of a fan. Usually it covers the entire range from free delivery (wide open cfm, no obstruction to flow) to no delivery (blocked tight, an airtight system with no air flowing).

The point of intersection of the system curve and the fan performance curve determines the point of operation and actual flow volume. If the system resistance has been accurately determined and the fan properly selected, their performance curves will intersect at the design flow rate. Refer to Figure A-2. The normalized Duct System A from Figure A-1 has been plotted with a normalized fan performance curve.

Temperature and Altitude Corrections
The fan performance values in the tables and curves of this catalog are based on standard air (.075 lbs/ft^3). If the airflow requirement for a particular job is stated in terms of nonstandard air, a density correction needs to be made before selecting the fan. It is important to also note that most air friction charts for ducts, filters, coils, etc. are also based on standard air and corrections must be made to determine proper losses at other conditions.

Figure A-3 illustrates the ratio of air densities to standard air at various temperatures and elevations. A Q fan is designed for operation between -20 F and 150 F only.

Figure A-2 — Point of Operation — Interaction of the System Curve and the Fan Performance Curve

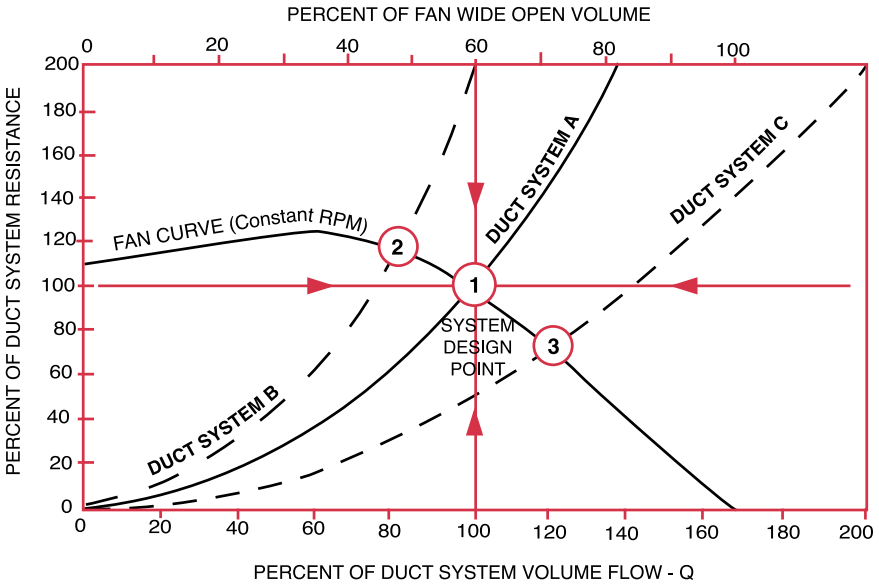
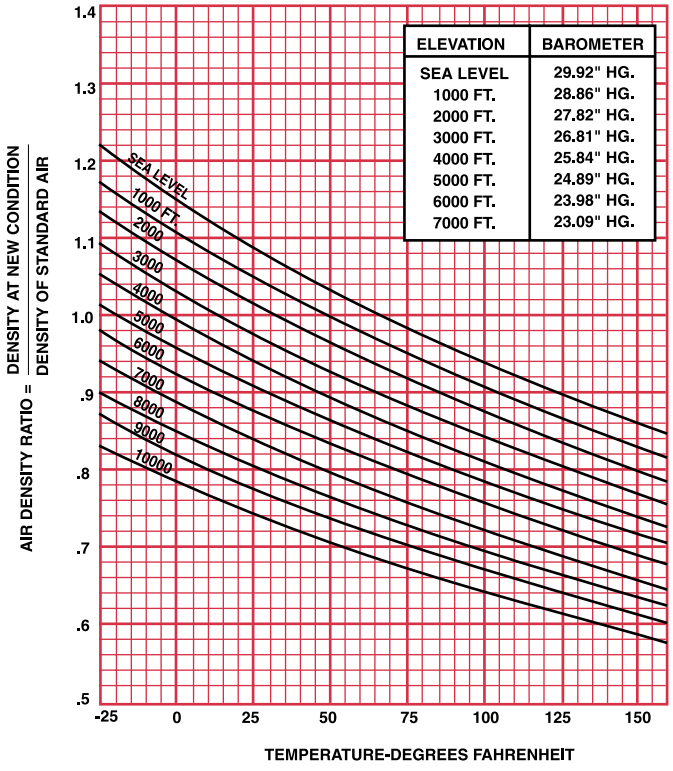


Figure A-3 — Air Density Corrections



Application Considerations

The following is the procedure to use when selecting a fan for elevations and temperatures other than standard:

1
Determine the air density from Figure A-3.

2
Divide static pressure at the non-standard condition by the air density ratio.

3
Use the actual cfm and corrected static pressure to determine rpm and bhp from the fan performance tables.

4
The rpm is correct as selected.

5
The bhp must be multiplied by the air density ratio determined in step one to get the actual operating bhp.

Option and Installation Kt Corrections
System effect losses due to less than ideal inlet or outlet configuration can be expressed in terms of velocity pressure by the following expression:

Inlet SP Loss =

$$Kti \left(\frac{\text{Inlet Velocity}}{4005}\right)^2$$

Where Kti =
Inlet Option Kt + Inlet Installation Kt
Outlet SP Loss =

$$Kto \left(\frac{\text{Outlet Velocity}}{4005}\right)^2$$

Where Kto = Outlet Option Kt + Outlet Installation Kt

Kt is the loss factor for the inlet or discharge condition being considered.

It is necessary to add all of the static pressure loss determined from the above equation to the component static pressure to determine the point of duty static pressure for selection of the fan.

Fan Option Kt Corrections
The fan static pressure should be adjusted for fan options. Option pressure drops are documented as Kt losses and are handled the same way as installation Kt effects (losses). Use Table A-1, Q Fan/Super Q II Fan Kt corrections, to determine the Kt values. Add these values to any installation Kt values. Use the result to select the fan.

Table A-1 — Q Fan/Super Q II Fan Installation Kt Corrections

Unducted (Plenum) Inlet*		**Unducted Outlet**	
Draw-Thru Type Design	0.0	Blow-Thru Type Design	+.8
Ducted Inlet		**Ducted Outlet**	
Turn > 3 Dia Upstream	-1.0	Turn > 2 Dia Downstream	0.0
Turn 2 Dia Upstream	+.8	Turn 1 Dia Downstream	+1.3
Turn 1 Dia Upstream	+1.3	Turn < 1 Dia Downstream	
Turn < 1 Dia Upstream			Not Recommended
	Not Recommended		

Figure A-4 — Ducted Turns Near Q Fan

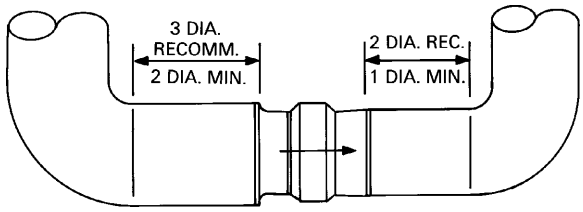


Table A-2 — Q Fan/Super Q II Fan Option Kt Corrections

Options	Use	Q-Fan	Super Q II Fan	Pressure Drop (Kt)
Inlet Flange	Connects to bolted inlet duct	X		0
Inlet Bellmouth*	Reduces Unducted Inlet Kt	X	X	-.1
Inlet Plus Silencer	Reduces inlet noise	X	X	+.1
Inlet Screen	Protects Unducted Inlets	X	X	+.1
Outlet Screen	Protects Unducted Outlets	X		+.5
Outlet Flange	Connects to bolted outlet duct	X		0
Outlet Equalizer (Diffuser)	Improves SE	X		0
Outlet Plus Silencer	Reduces Outlet Noise	X	X	+.1
Outlet Flow Stabilization Screen	Reduces Outlet swirl	X	X	+.8
Outlet Backdraft Damper	Isolates fan from duct	Special	Special	+.5
Frequency Drive Modulation	Modulates Q Fan quietly	Special	Special	0
Belt Guard	Protects drives/belts	X		0
Motor Rails	Allows motor to be mounted	X	Included	0
Standard Isolators	Isolates fan	X	Included	0
Seismic Isolators	Isolates fan	X	Special	0

*Note: Bellmouth effect included in unducted installation Kt correction. Fan sizes 49 through 60 fan curves are cataloged with inlet bells. For unducted inlets without bells on size 49 through 60 fans add .1 to the inlet Kt given above.

Inlet vane losses are covered in the Selection Procedure with air density corrections (page 20).

Application Considerations

Q and Super Q II Fan Modulation — AC Inverter Capacity Control
Q fans and Super Q II fans can be modulated with AC frequency drives. The Trane Company recommends Magnetek low noise inverter drives and Century high efficiency motors for optimum modulation performance.

Operating the Q or Super Q II fan on AC frequency drives requires the Q fan to be strengthened and balanced in the factory. This option "beefs up" the mechanical bracing of the Q fan inlet bearing assembly and calls for a precision factory balance. Precision balancing covers 10 operating points on the system curve from 10 percent load to full load.

Minimum cfm with AC inverters — Above 1.5" static pressure, the minimum cfm is the surge (do not select) line. Below 1.5" static pressure, it is 1000 cfm.

Q Fan Modulation — Inlet Vanes
Inlet vanes are a widely used form of fan modulation. As inlet vanes close, they impart a spin on the incoming air in the direction of the fan wheel rotation. This reduces airflow, static pressure and brake horsepower. However, inlet vanes do increase sound levels. If a job is acoustically sensitive, AC inverters are recommended for modulation. As shown in Figure A-5, a separate cfm static pressure curve (cfm-sp) is generated per each inlet vane position. Likewise, the figure shows brake horsepower curves that apply for various inlet vane positions.

Inlet vanes are controlled by placing a static pressure sensor in the downstream ductwork, typically about two-thirds of the way down the longest trunk duct. This sensor is set at a static pressure that will ensure sufficient pressure is available to move air from that point through the remaining duct work. The sensor will respond to duct pressure changes and signal the inlet vane operator to open or close the vanes to maintain the control setting at the sensor location.

As VAV terminal units begin to close in response to a decreasing cooling load, static pressure in the ductwork increases. This causes the fan operating point to temporarily move upward to the left on a constant rpm curve as shown in Figure A-5 (point A to point B). The static pressure sensor will detect an increase in duct pressure and signal the inlet vane operator to begin to close the vanes. The inlet vanes will close until the static pressure sensor is again satisfied, moving the operation point to C (Figure A-5). As the cooling load continues to decrease, the modulation curve will be formed (point C to D, and point D to E) on Figure A-5. This curve passes through the design point and through the static pressure sensor control point. The static pressure of any point on this curve can be calculated using the formula:

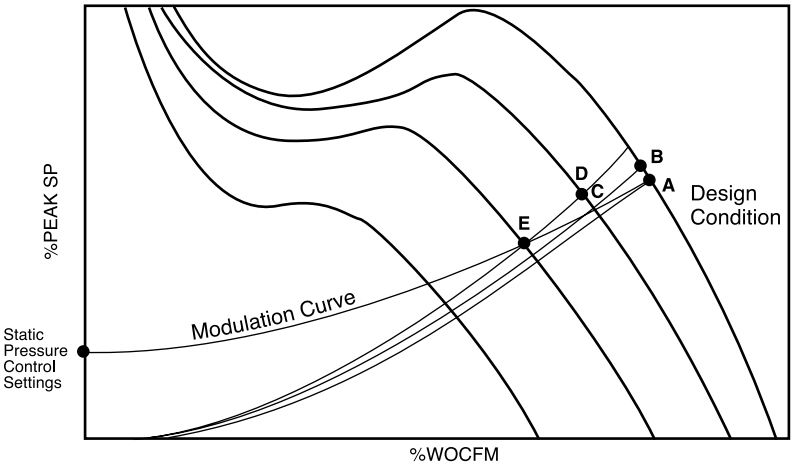
$Sp = (Cfm/Cfm_d)^2 \times (SP_d - SP_c) = SP_c$

SP_d = static pressure at design,
SP_c = static pressure control setting,
Cfm_d = cfm at design.

The VAV system modulation curve can be drawn using a Trane system modulation overlay. The axis of the overlay is placed on a static pressure control setting. The curve that intersects the design points is the system modulation curve.

Because the axes of the inlet vane performance graph are in terms of percent wide open cfm (wocfm) and percent peak static pressure, the first step in establishing the system modulation curve is to find the proper design points. By plotting the design point on the performance curve for the fan in question, one can easily determine the percent wocfm. Knowing this, plot a point on the cfm-sp curve (Figure A-6) for inlet vanes wide open, at the design point of wocfm. By tracing to the left, one can determine the percent of peak static pressure. By knowing the design cfm, static pressure and the percent of wide open cfm and percent peak static that these values represent, one can calculate wocfm and peak static pressure.

Figure A-5 – VAV System Modulation Curve



The control static pressure can then be expressed as a percent of peak static pressure and plotted. The system modulation curve is described by the curve on the modulation overlay that passes through the design point when the axis is placed on the control static pressure point.

The minimum inlet vane cfm can easily be determined after the system modulation has been established. It will be one of two things, either a) the point where the system modulation curve intersects the surge line, or b) 40 percent wocfm, whichever is greater. Forty percent wocfm is the minimum point a Q fan with inlet vanes can modulate, due to inherent instability that results when the vanes close to a certain angle.

A plot of part load cfm versus brake horsepower can also be made after the system modulation curve is established. At each intersection of the system modulation curve with a cfm-sp curve for a certain inlet vane opening, a vertical line is traced to the appropriate bhp-cfm curve. At each intersection of a bhp-cfm curve, a horizontal line is traced to the scale of percent brake horsepower. This will lead to a percent wocfm versus percent peak bhp plot.

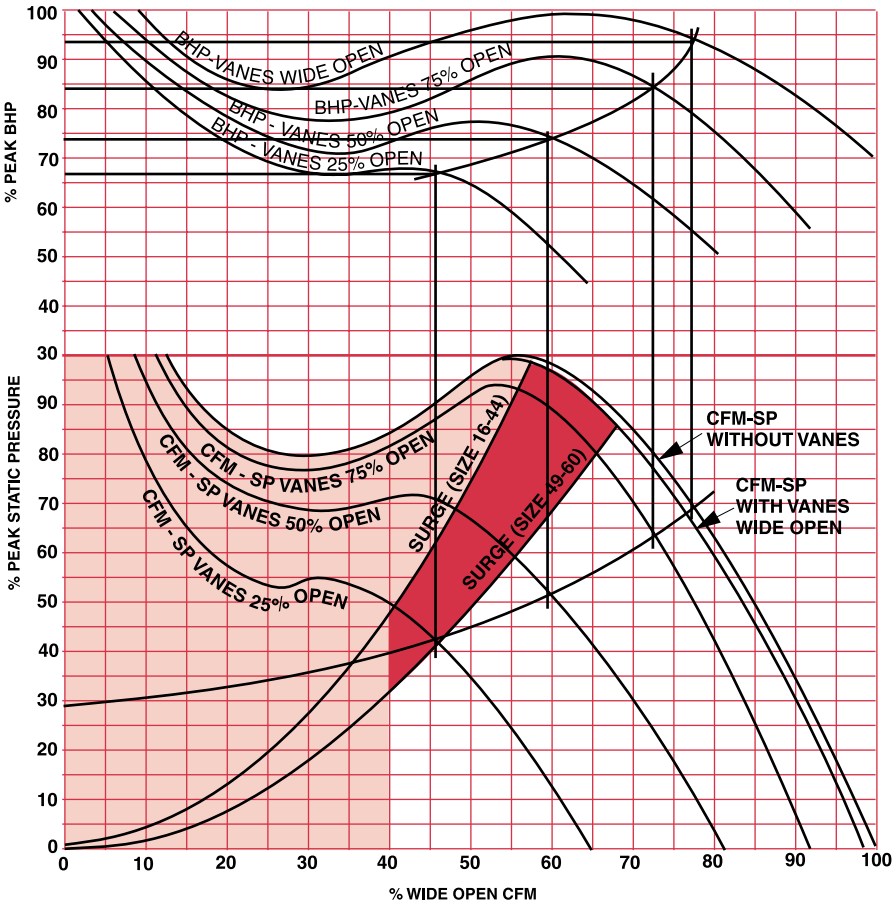
The design rpm and bhp need to be corrected to account for performance losses due to inlet vanes being in the air stream. **A correction of one percent to the rpm and three percent to the bhp is made in order to get to design conditions with the inlet vanes fully open.**

Part load fan power consumption with inlet vanes can be determined by entering Figure A-6 at the desired percent wide open cfm. (Wide open cfm is found on the fan curve by following the fan rpm to the right until it intersects the 0" static pressure axis.)

On Figure A-6, plot a system curve from the control static pressure through the point of operation defined as a calculated percent wide open cfm. Read vertically upward from the 25, 50 and 75 percent intersections to determine the percent bhp at part load.

Intermediate operating points are found by extrapolation. Inlet vanes increase Q fan sound levels. See Table A-5.

Figure A-6 – Inlet Vane Performance



NOTE: DO NOT USE INLET VANES TO MODULATE BELOW 35% WIDE OPEN CFM

Application Considerations

Table A-3 — Maximum Torque For Operation Of Inlet Vanes

Size	Class	Control Arm (In.)	Opening Torque (In.-Lb)	Closing Torque (In.-Lb)
	1		8	7
16	2	8.75	14	13
	3		23	22
	1		12	11
19	2	8.75	21	19
	3		34	31
	1		17	15
21	2	8.75	31	26
	3		32	44
	1		26	20
24	2	8.75	48	36
	3		79	61
	1		37	27
27	2	8.75	66	48
	3		109	79
	1		52	35
30	2	8.75	94	63
	3		155	104
	1		65	41
33	2	8.75	128	81
	3		212	134
	1		100	59
36	2	10.81	180	106
	3		298	175
	1		138	75
40	2	10.81	249	136
	3		412	225
	1		193	99
44	2	10.81	349	179
	3		576	295

Parallel Fan Operation

The Q fan performance curve has a characteristic shape where two different cfm's are possible at the same static pressure. Therefore, when selecting fans for multiple installation connected with either a common inlet, a common discharge or both, care must be taken to eliminate the possibility of fan paralleling.

Figure A-7 shows two typical cfm-sp performance curves for the Q fan. Fan paralleling can occur when multiple fans are selected in the shaded area.

The shaded area is determined by going straight across from the lowest point of the fan performance curve at the left of the surge line (A and A_1) to the same curve to the right of the surge line (B and B_1). Points B and B_1 fall on a constant system curve.

Table A-4 defines this constant system curve as a percent of wide-open cfm. If fans in parallel are always operated to the right of this constant system curve, fan paralleling will not occur.

Table A-4 — Parallel Operation

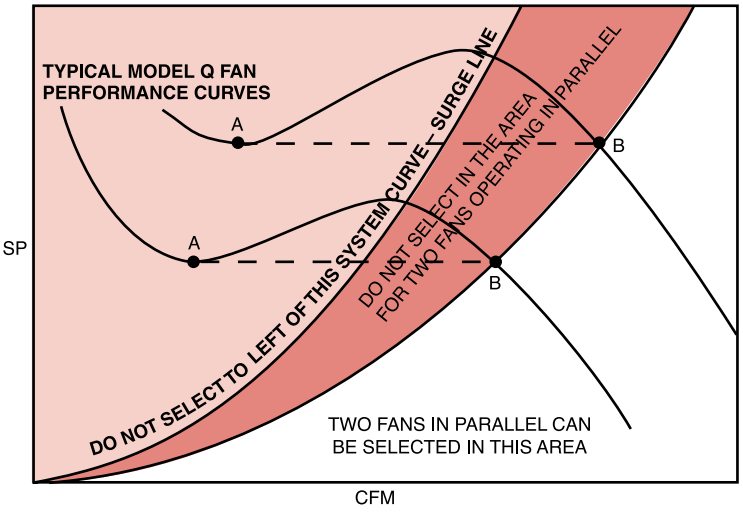
Fan Size	Minimum % of WOCFM For Two Model Q Fans In Parallel
16	80% WOCFM
19-21	81% WOCFM
24-30	83% WOCFM
33-44	73% WOCFM
49-60	85% WOCFM

Motor and Drive Selection

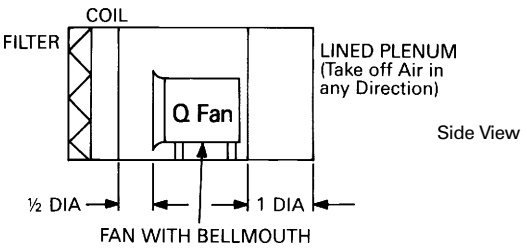
The Model Q fan has been designed for use with NEMA "T" Frame motors. Motor hp limits for Class I, II, and III construction are listed in the roughing-in Dimensional Data section of this catalog.

Minimizing belt tension forces increases bearing life and reduces fan noise. The Q fan and Super Q II fan drive selection is totally computerized by the factory to achieve quiet, long life operation. If Trane provides Q fan drives, all fan motor information must be made available to the Trane sales engineer.

Figure A-7 — Selecting Model Q Fans in Parallel

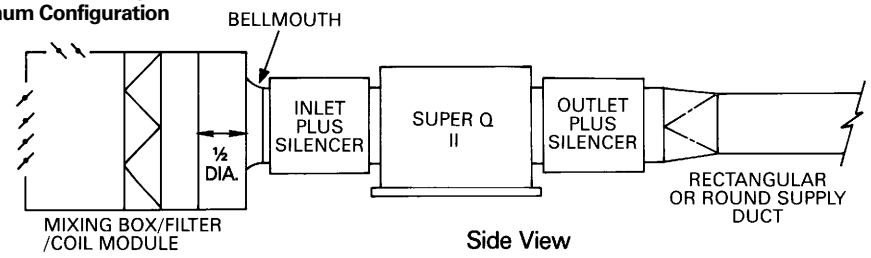


Recommended Q Fan Configuration Inside an Air Handler

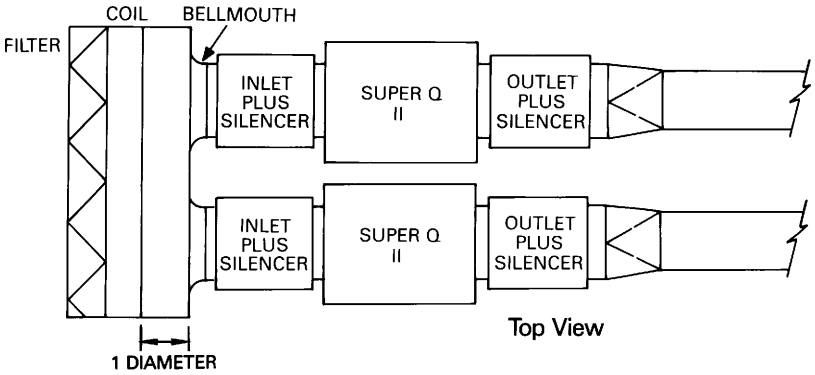


Application Considerations

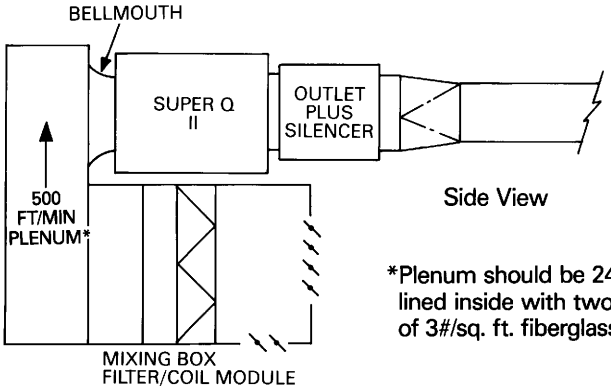
Recommended Super Q II (NC40)
Plenum Configuration



Recommended Super Q II Multiple Fan (NC40)
Low Height Plenum Configuration



Recommended Super Q II Quiet (NC35)
Floor-Mounted (Stacked) Configuration



*Plenum should be 24-inches deep and lined inside with two-inches of 3#/sq. ft. fiberglass.

Operating Cost/Efficiency
The quiet Q fan is a very efficient fan. The Q fan mixed-flow type airfoil thrust blades offer outstanding efficiency and operating cost savings over such fan types as plug fans. Designers can compare the Q fan efficiency with other fans by using the fan selection program and the Trane Customer Direct Service (C.D.S.™) Network FanMod program.

The Trane fan selection program provides accurate part load energy consumption no matter what fan modulation method is selected. The FanMod program compares two or more fans economically for one or more years. FanMod is an easy-to-use program for equipment life cycle cost analysis.

When comparing the Q fan performance with centrifugal fans, remember to recalculate the fan external static pressure. The in-line delivery of the Q fan often eliminates the need for a 90 degree turn right off the fan outlet. Turns directly downstream of the fan outlet consume energy and generate noise and, therefore, should be avoided whenever possible.

Application Considerations

Q Fan Sound Data
Trane Q fans are designed to be used in any installation where a standard airfoil centrifugal fan can be used. The sound level of the Q fan in the difficult to attenuate lower frequencies is lower than that produced by standard airfoil centrifugal fans with the same capacity. Sound levels in the higher octave bands compare favorably. Therefore, the Q fan will provide quieter sound levels in a typical installation.

Designing the system for lower static pressures and selecting the fan at high efficiency will result in quieter fan operation, as well as power savings.

The best method of acoustical design makes use of unit sound power levels in all eight octave bands. These sound power levels for each Trane Q fan can be obtained from the Trane computerized fan selection program.

In the past, it has been an industry practice to test air moving devices within a reverberating room to determine total sound power. This has presented the problem of distinguishing between inlet and discharge sound power ratings, where significant differences do exist.

Trane engineers solved this problem by locating the fan adjacent to the reverberating room and ducting to it. By turning the fan around, inlet and discharge sound power can be measured separately and accurately.

By ducting both the inlet and outlet, radiated shell sound power was determined. Using this method with the Trane reverberant room that conforms to ASHRAE standards, acoustical data on the Q fan is substantially more accurate than fan ratings made using conventional techniques. Tests covered all sizes and speeds over the entire performance range of the line. A computer program was then used to determine the precise relationship of speed, size, point of operation and frequency.

Trane Acoustics Program
Trane has a system level acoustics computer program that accurately converts fan sound power to room NC levels. This program uses ASHRAE approved algorithms and is the most complete and accurate sound predictive program in the HVAC industry. Use of the Trane acoustics program allows all sound paths to be checked and attenuated to achieve the desired room sound levels without costly overdesigning. Contact your Trane sales engineer for more details on this Customer Direct Service (C.D.S.) Network program.

Q Fan/Super Q II Plus Silencers
Trane has a unique silencer for the Q fan. This low turbulence, high attenuation silencer dramatically reduces airborne noise from the Q-Fan. A bulleted cylindrical silencer attenuates medium and high frequency noise generated by the Q Fan to a point where the Q Fan can be successfully installed in such sound sensitive applications as ceiling plenums successfully.

Trane's Plus silencer has a field repositionable bullet (center body) that can be relocated close to the Q Fan outlet. This unique feature eliminates low frequency turbulence and makes the Q fan quieter than plug fans or other axial or mixed flow fans. Pressure drop through the Plus silencer is approximately .1-inch sp. The Plus silencer has been used on many projects in the last five years to consistently create NC 15-35 spaces.

Plus silencer attenuation is shown in Tables S-1 and S-2. Use the Trane fan selection program to obtain precise Plus attenuation with regenerated noise included.

Trane ASA10B Sound Analyzer
Trane offers a low cost 10 octave band sound analyzer for sound measurements. Capable of measuring noise from 30 to 123 db sound pressure with flat, dbA and dbC sound LCb weightings this rugged meter permits comparative and absolute sound measurements to be taken.

Ideas On How To Use The ASA10B
The ASA10B can be used on existing jobs to measure equipment sound levels by octave bands. Compare this data with NC charts to determine what frequencies need to be attenuated and by how much. The type and cost of noise control options is a function of the problem *frequency and amplitude.*

On acoustical retrofits, the ASA10B can accurately compare before and after noise levels. Real measurements establish the benefit of the retrofit.

Table A-5 — Inlet Vane Sound Data

		DB Addition For Vane Position Indicated			
Octave Band	Mid-Frequency	Wide Open	75% W/Open	50% W/Open	25% W/Open
1	63	+4	+8	+12	+14
2	125	+8	+9	+9	+10
3	200	+7	+8	+9	+9
4	500	+4	+5	+6	+6
5	1,000	0	0	0	0
6	2,000	0	0	0	0
7	4,000	0	0	0	0
8	8,000	0	0	0	0

Selection Procedure

1
Select the type of fan desired. The Super Q II should be used where fan radiation noise needs to be attenuated.
2
Position the Q fan to deliver air to the system and minimize adverse Kt effects. Straight-thru flow arrangements are best.
3
Select the desired Q fan or Super Q II fan options.
4
Compute the fan external static pressure and cfm requirements.
5
Determine which Kt effects apply to the Q fan installation.
6
If the Q fan is serving a VAV system, select AC frequency drive or inlet vane modulations. (AC frequency drive modulation is considerably quieter and more efficient than Q fan inlet vanes.) Super Q II fans use AC frequency drive modulation only.
7
Input the selection parameters into the Trane fan selection program and select the desired Q fan or proceed with a manual selection.
8
Manual Selection:
a
Determine the air density ratio if non-standard air is being handled by the Q fan.
b
Adjust the external sp by the air density ratio.
c
Use the inlet and outlet area of the fan to calculate the inlet and outlet velocities. Use these velocities and the inlet and outlet Kt to correct the external static pressure to the right value. Reselect the fan at the right value.
d
From the performance table, select the desired fan.
9
If inlet vane modulation was selected, increase the rpm by 1 percent and increase the bhp by 3 percent.
10
If the air density ratio is nonstandard (different than 1.00), the rpm is correct and the bhp must be multiplied by the air density ratio.
11
If the start-up air temperature is lower than the normal operating temperature, adjust the fan curve bhp for the starting temperature. The next larger nominal hp motor is the correct motor size.
12
If exceptional quiet is desired, choose a short or long Q fan plus duct silencer. The plus silencer is a low turbulence, low pressure drop, high attenuation duct silencer. Subtract the attenuations given in Tables S-1 and S-2 from the Q fan/Super Q II fan sound power projections. If silencer regenerated noise is a concern, contact your local Trane sales engineer for further information.

Table S-1 — Short Plus Silencer Attenuation (1D Length)*

	Q-Fan Sound Power By Octave Band At Nominal Cfm/SP							
Fan Size	63 Hz	125 HZ	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
16	2	3	10	16	19	20	13	12
19	2	3	10	16	19	19	13	12
21	2	4	10	16	19	19	13	11
24	3	4	10	16	19	19	13	10
27	3	5	10	16	19	19	13	9
30	4	5	10	16	19	17	13	9
36	4	6	10	16	19	15	13	9
40	5	6	11	16	19	14	12	9
44	5	6	11	16	19	14	11	9

Table S-2 — Long Plus Silencer Attenuation (2D Length)*

	Q-Fan Sound Power By Octave Band At Nominal Cfm/SP							
Fan Size	63 Hz	125 HZ	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
16	3	6	19	32	37	39	26	24
19	3	6	19	32	37	37	26	24
21	4	7	19	32	37	37	26	22
24	5	8	19	32	37	37	26	20
27	6	9	19	32	37	37	26	18
30	7	9	20	32	37	34	26	18
36	8	11	20	32	37	30	25	18
40	9	11	21	32	37	28	23	18
44	9	12	21	32	37	28	22	18

*Approximate attenuations. Use the Trane Fan Selection Program for attenuation predictions that include silencer regenerated self-noise.

NOTE: Super Q II not available with Class III fans.

Fan Size 16″

Wheel Dia.	16.5 inches	419 mm
Inlet Area	2.05 square feet	0.190 m^2
Outlet Area	1.70 square feet	0.158 m^2
Tip Speed	4.32 x RPM ft./minute	1.317 m/minute

Pressure Class Limits

Class	Maximum RPM
I	2585
II	3460
III	4660

Minimum Fan RPM (Without VFRB Option)

Motor	Minimum Fan RPM
1800 RPM	486
1200 RPM	324

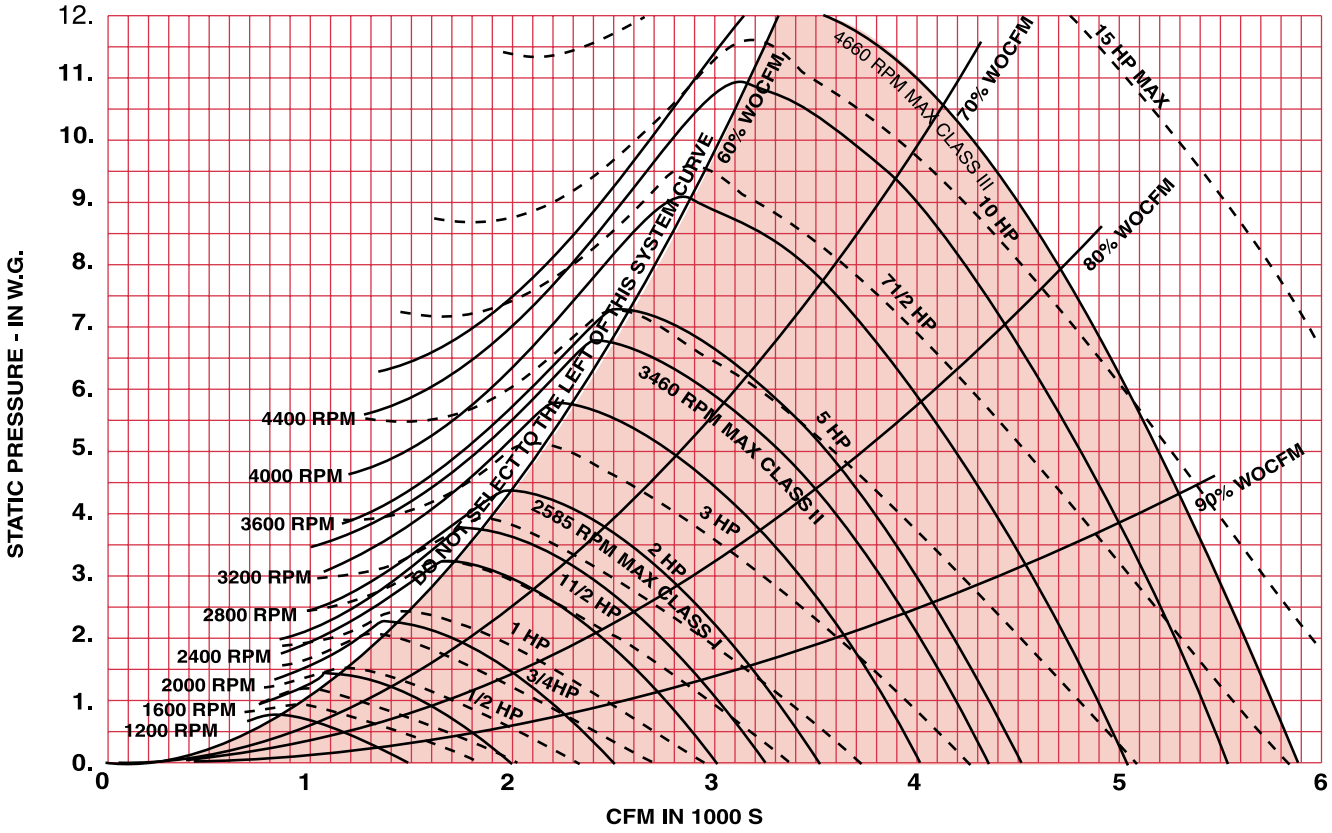
Table P-1 — Size 16 Q-Fan

CFM Std. Air	Outlet Vel.	Total Static Pressure 1/4″ RPM	BHP	3/8″ RPM	BHP	1/2″ RPM	BHP	5/8″ RPM	BHP	3/4″ RPM	BHP	1″ RPM	BHP	1 1/4″ RPM	BHP	1 1/2″ RPM	BHP	1 3/4″ RPM	BHP	2″ RPM	BHP
1000	588	934	0.08	1002	0.11	1068	0.13	1137	0.16	1204	0.19	1344	0.27								
1200	705	1071	0.12	1127	0.14	1184	0.17	1239	0.20	1295	0.24	1408	0.31	1523	0.39	1642	0.48				
1400	823	1214	0.16	1263	0.20	1311	0.231	1360	0.26	1408	0.29	1502	0.37	1601	0.45	1697	0.54	1796	0.64	1898	0.75
1600	941	1360	0.22	1404	0.26	1447	0.30	1489	0.33	1531	0.37	1617	0.45	1698	0.53	1785	0.62	1870	0.72	1953	0.82
1800	1058	1509	0.30	1548	0.34	1587	0.38	1626	0.42	1662	0.46	1739	0.54	1814	0.63	1886	0.73	1961	0.831	2039	0.93
2000	1176	1660	0.39	1695	0.43	1731	0.48	1766	0.52	1800	0.57	1867	0.65	1936	0.74	2004	0.84	2068	0.95	2135	1.06
2200	1294	1812	0.50	1844	0.54	1877	0.59	1909	0.64	1941	0.69	2002	0.78	2064	0.88	2127	0.99	2188	1.10	2249	1.21
2400	1411	1965	0.62	1995	0.68	2025	0.73	2054	0.78	2084	0.84	2142	0.94	2197	1.04	2254	1.15	2311	1.27	2369	1.38
2600	1529	2120	0.77	2147	0.83	2175	0.89	2202	0.94	2229	1.00	2283	1.12	2337	1.23	2387	1.34	2440	1.46	2493	1.58
2800	1647	2274	0.95	2300	1.01	2326	1.07	2351	1.13	2376	1.19	2427	1.32	2477	1.44	2526	1.57	2573	1.68	2622	1.81
3000	1764	2430	1.15	2454	1.21	2478	1.28	2501	1.34	2525	1.41	2573	1.54	2620	1.67	2666	1.81	2712	1.94	2755	2.06
3200	1882	2586	1.38	2608	1.44	2630	1.51	2653	1.58	2675	1.65	2720	1.79	2764	1.93	2808	2.08	2851	2.22	2894	2.36
3400	2000	2742	1.63	2763	1.70	2784	1.77	2805	1.85	2826	1.92	2868	2.07	2910	2.22	2951	2.37	2993	2.53	3033	2.68
3600	2117	2898	1.92	2918	1.99	2938	2.07	2958	2.15	2978	2.22	3018	2.38	3057	2.54	3096	2.70	3136	2.86	3174	3.02
3800	2235	3055	2.24	3074	2.32	3093	2.40	3112	2.48	3130	2.56	3168	2.72	3206	2.89	3243	3.06	3280	3.23	3317	3.40
4000	2352	3212	259	3230	2.68	3248	2.76	3266	2.84	3284	2.93	3319	3.10	3355	3.28	3391	3.45	3426	3.63	3461	3.81
4200	2470	3369	298	3386	3.07	3403	3.16	3420	3.25	3437	3.34	3471	3.52	3505	3.70	3539	3.88	3573	4.07	3607	4.25
4400	2588	3526	3.41	3543	3.50	3559	3.59	3575	3.69	3591	3.78	3624	3.97	3656	4.16	3689	4.35	3721	4.54	3754	4.74
4600	2705	3684	3.88	3699	3.98	3715	4.07	3730	4.17	3746	4.26	3777	4.46	3808	4.66	3839	4.86	3870	5.06	3901	5.26
4800	2823	3841	4.39	3856	4.49	3871	4.59	3886	4.69	3901	4.79	3931	5.00	3961	5.20	3990	5.41	4020	5.62	4050	5.83
5000	2941	3999	4.95	4013	5.05	4027	5.15	4042	5.26	4056	5.36	4085	5.57	4113	5.79	4142	6.00	4171	6.22	4199	6.44
5200	3058	4157	5.55	4170	5.65	4184	5.76	4198	5.87	4212	5.98	4239	6.20	4267	6.42	4294	6.64	4322	6.87	4349	7.09
5400	3176	4314	6.20	4328	6.31	4341	6.42	4354	6.53	4367	6.64	4394	6.87	4420	7.10	4447	7.33	4473	7.56	4500	7.80
5600	3294	4472	6.89	4485	7.01	4498	7.12	4511	7.24	4523	7.36	4549	7.59	4574	7.83	4600	8.06	4626	8.31	4651	8.55

CFM Std. Air	Outlet Vel.	Total Static Pressure 2 1/4″ RPM	BHP	2 1/2″ RPM	BHP	3″ RPM	BHP	3 1/2″ RPM	BHP	4″ RPM	BHP	4 1/2″ RPM	BHP	5″ RPM	BHP	5 1/2″ RPM	BHP	6″ RPM	BHP	6 1/2″ RPM	BHP
1600	941	2040	0.94	2129	1.06																
1800	1058	2112	1.04	2188	1.16	2343	1.42	2482	1.66												
2000	1176	2205	1.18	2274	1.30	2407	1.54	2546	1.82	2688	2.12										
2200	1294	2307	1.33	2369	1.45	2495	1.71	2616	1.98	2741	2.28	2869	2.60	2999	2.94						
2400	1411	2425	1.50	2478	1.63	2590	1.90	2705	2.18	2816	2.47	2930	2.78	3046	3.12	3164	3.48	3284	3.85		
2600	1529	2546	1.71	2598	1.84	2698	2.11	2801	2.40	2908	2.71	3013	3.02	3114	3.34	3220	3.69	3328	4.07	3438	4.46
2800	1647	2671	1.94	2720	2.07	2817	2.35	2909	2.65	3005	2.97	3104	3.29	3203	3.62	3296	3.96	3393	4.32	3492	4.71
3000	1764	2801	2.20	2846	2.34	2938	2.62	3028	2.93	3114	3.25	3203	3.58	3296	3.92	3387	4.28	3479	4.65	3565	5.01
3200	1882	2935	2.49	2977	2.63	3063	2.93	3149	3.24	3233	3.57	3313	3.91	3396	4.26	3481	4.63	3569	5.00	3655	5.39
3400	2000	3074	2.83	3112	2.96	3192	3.27	3272	3.59	3353	3.92	3433	4.27	3507	4.63	3586	5.00	3665	5.39	3748	5.77
3600	2117	3213	3.18	3251	3.34	3324	3.64	3400	3.97	3477	4.31	3553	4.66	3628	5.03	3698	5.41	3772	5.81	3847	6.21
3800	2235	3354	3.57	3390	3.74	3460	4.05	3532	4.39	3604	4.74	3677	5.10	3748	5.47	3819	5.86	3889	6.26	3955	6.67
4000	2352	3497	3.99	3531	4.17	3601	4.52	3666	4.85	3734	5.21	3803	5.58	3872	5.96	3940	6.35	4008	6.76	4074	7.18
4200	247C	3641	4.44	3674	4.63	3740	5.01	3806	5.38	3868	5.72	3933	6.10	3998	6.50	4064	6.89	4129	7.30	4193	7.72
4400	2588	3786	4.94	3818	5.13	3881	5.53	3944	5.92	4004	6.27	4066	6.67	4128	7.07	4190	7.48	4253	7.89	4315	8.32
4600	2705	3932	5.47	3963	5.67	4024	6.09	4085	6.50	4144	6.91	4201	7.27	4260	7.68	4319	8.11	4379	8.54	4438	8.98
4800	2823	4079	6.04	4109	6.25	4168	6.68	4226	7.12	4284	7.55	4341	7.97	4395	8.35	4452	8.78	4508	9.22	4565	9.67
5000	2941	4228	6.66	4256	6.88	4313	7.33	4369	7.78	4425	8.22	4480	8.67	4535	9.11	4586	9.50	4641	9.95		
5200	3058	4377	7.32	4404	7.55	4459	8.01	4513	8.48	4567	8.95	4620	9.41								
5400	3176	4526	8.03	4553	8.27	4605	8.75	4658	9.23												

CFM Std. Air	Outlet Vel.	Total Static Pressure 7″ RPM	BHP	7 1/2″ RPM	BHP	8″ RPM	BHP	8 1/2″ RPM	BHP	9″ RPM	BHP	9 1/2″ RPM	BHP	10″ RPM	BHP	10 1/2″ RPM	BHP	11″ RPM	BHP	11 1/2″ RPM	BHP
2600	1529	3548	4.86																		
2700	1588	3568	4.98	3674	5.40																
2800	1647	3593	5.11	3694	5.53	3797	5.97														
2900	1705	3622	5.25	3719	5.67	3817	6.11	3916	6.55	3980	6.85										
3000	1764	3656	5.41	3749	5.82	3843	6.26	3937	6.71	4033	7.17	4091	7.45								
3100	1823	3694	5.58	3783	5.99	3872	6.42	3963	6.87	4055	7.33	4147	7.80	4239	8.29						
3200	1882	3740	5.78	3821	6.17	3906	6.59	3993	7.04	4081	7.50	4169	7.97	4259	8.46	4348	8.96	4400	9.24		
3300	1941	3783	5.98	3866	6.39	3944	6.79	4027	7.23	4111	7.68	4196	8.16	4282	8.64	4368	9.14	4455	9.65	4501	9.92
3400	2000	3829	6.18	3909	6.60	3989	7.02	4065	7.43	4145	7.88	4227	8.35	4309	8.84	4392	9.33	4476	9.85	4560	10.37
3500	2058	3876	6.39	3954	6.81	4032	7.24	4106	7.65	4183	8.10	4261	8.56	4340	9.04	4420	9.54	4501	10.05	4582	10.57
3600	2117	3923	6.62	4001	7.04	4077	7.47	4153	7.91	4224	8.33	4299	8.79	4375	9.27	4452	9.76	4530	10.27	4608	10.79
3700	2176	3973	6.85	4049	7.27	4124	7.71	4198	8.15	4272	8.61	4340	9.04	4414	9.51	4487	10.00	4562	10.50	4637	11.02
3800	2235	4026	7.10	4097	7.53	4171	7.96	4244	8.41	4316	8.86	4388	9.33	4459	9.81	4526	10.26	4598	10.76		
3900	2294	4081	7.35	4149	7.78	4219	8.23	4292	8.67	4362	9.13	4433	9.60	4503	10.08	4572	10.57	4637	11.03		
4000	2352	4137	7.61	4203	8.05	4271	8.50	4339	8.95	4410	9.41	4478	9.88	4547	10.37	4615	10.86				
4100	2411	4198	7.88	4259	8.32	4324	8.78	4390	9.24	4457	9.71	4526	10.17	4593	10.66	4660	11.16				

Performance based on 0.075 lbs. per cubic foot density (air at 70 F and 29.92 Hg Bar). Performance shown is for installation Type B: free inlet, ducted outlet.
Power rating (BHP) does not include drive losses. Performance ratings do not include the effects of appurtenances in the airstream.
When inlet vanes are used increase rpm 1 percent and brake horsepower 3 percent.
Fan tables cover part of fan operating range; fan curves show full operating range.



—— Fan RPM Line
- - - Motor HP Line

Standard fans can be selected ONLY in the shaded area.
Thrust restrains are to be used with fans Class 3 or motors 40 hp and up.

Minimum and Maximum Motor HP Ranges

	Q Fan Size 16"			Super Q Fan Size 16"	
	Min - Max Motor HP Class 1	Min - Max Motor HP Class 2	Min - Max Motor HP Class 3	Min - Max Motor HP Class 1	Min - Max Motor HP Class 2
Arrangement 9	1 - 2	1.5 - 5	5 - 15	1 - 2	1.5 - 5
Arrangement 1	—	—	5 - 15	NA	NA

Performance Data

Q Fan and Super Q II Size 19

Fan Size 19″

Wheel Dia.	19.0 inches	483 mm
Inlet Area	2.61 square feet	0.242 m^2
Outlet Area	2.30 square feet	0.214 m^2
Tip Speed	4.97 x RPM ft./minute	1.515 m/minute

Pressure Class Limits

Class	Maximum RPM
I	2345
II	3145
III	4040

Minimum Fan RPM (Without VFRB Option)

Motor	Minimum Fan RPM
1800 RPM	417
1200 RPM	278

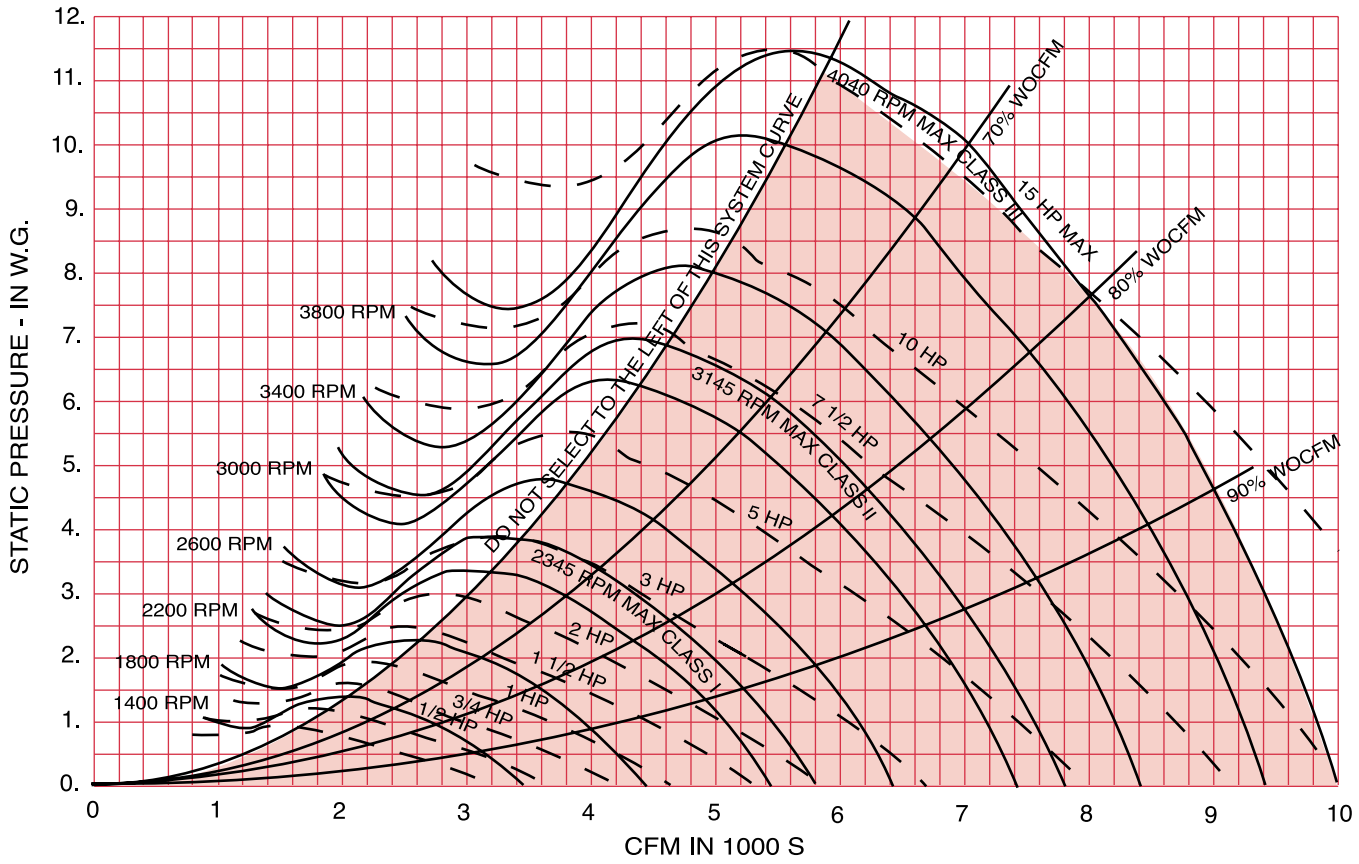
Table P-2 — Size 19 Q Fan

CFM	Out-	Total Static Pressure																			
Std.	let	1/4″		3/8″		1/2″		5/8″		3/4″		1″		1 1/4″		1 1/2″		1 3/4″		2″	
Air	Vel.	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
2000	869	907	0.15	962	0.19	1019	0.24	1074	0.29	1124	0.34	1235	0.45	1351	0.57						
2200	956	977	0.18	1026	0.23	1078	0.28	1129	0.33	1179	0.38	1272	0.49	1375	0.62	1481	0.75				
2400	1043	1049	0.22	1093	0.27	1140	0.32	1187	0.37	1234	0.43	1325	0.55	1409	0.67	1505	0.81	1602	0.95		
2600	1130	1123	0.26	1163	0.31	1205	0.36	1248	0.42	1292	0.48	1378	0.60	1456	0.73	1538	0.87	1627	1.02	1717	118
2800	1217	1198	0.31	1234	0.36	1272	0.42	1312	0.48	1352	0.54	1433	0.67	1512	0.80	1583	0.94	1660	1.09	1742	126
3000	1304	1273	0.36	1307	0.42	1342	0.48	1378	0.54	1415	0.60	1491	0.74	1566	0.88	1638	1.03	1704	1.17	1775	133
3200	1391	1350	0.42	1381	0.48	1413	0.54	1446	0.61	1481	0.67	1551	0.82	1622	0.97	1692	1.12	1759	1.27	1820	142
3400	1478	1427	0.49	1456	0.55	1486	0.62	1517	0.69	1548	0.75	1614	0.90	1681	1.06	1747	1.22	1812	1.38	1875	1.55
3600	1565	1504	0.57	1531	0.64	1559	0.70	1588	0.77	1617	0.84	1679	0.99	1741	1.15	1804	1.32	1867	1.49	1928	166
3800	1652	1582	0.66	1608	0.72	1634	0.79	1661	0.86	1688	0.94	1745	1.09	1804	1.26	1864	1.43	1923	1.61	1982	1.79
4000	1739	1660	0.75	1684	0.82	1709	0.89	1734	0.97	1760	1.04	1813	1.20	1868	1.37	1925	1.55	1982	1.74	2038	193
4200	1826	1738	0.86	1761	0.93	1785	1.00	1809	1.08	1833	1.16	1883	1.32	1934	1.50	1988	1.68	2042	1.87	2096	2.07
4400	1913	1817	0.97	1839	1.04	1861	1.12	1884	1.20	1907	1.28	1954	1.45	2002	1.63	2053	1.82	2104	2.01	2156	2.21
4600	1999	1896	1.09	1916	1.17	1938	1.25	1959	1.33	1981	1.42	2026	1.59	2071	1.78	2119	1.97	2168	2.16	2216	2.37
4800	2086	1974	1.23	1994	1.31	2015	1.39	2035	1.48	2056	1.56	2098	1.74	2142	1.93	2186	2.13	2233	2.33	2279	2.54
5000	2173	2053	1.37	2073	1.46	2092	1.54	2111	1.63	2131	1.72	2172	1.91	2213	2.10	2256	2.30	2299	2.51	2344	2.72
5200	2260	2133	1.53	2151	1.62	2169	1.71	2188	1.80	2207	1.89	2246	2.08	2285	2.28	2326	2.48	2367	2.69	2410	291
5400	2347	2212	1.70	2229	1.79	2247	1.88	2265	1.98	2283	2.07	2320	2.27	2358	2.47	2397	2.68	2436	2.90	2476	312
5600	2434	2291	1.88	2308	1.98	2325	2.07	2343	2.17	2360	2.26	2396	2.47	2432	2.67	2469	2.89	2506	3.11	2544	3.34
5800	2521	2371	2.08	2387	2.17	2404	2.27	2420	2.37	2437	2.47	2471	2.68	2506	2.89	2541	3.11	2577	3.34	2614	3.57
6000	2608	2450	2.29	2466	2.39	2482	2.49	2498	2.59	2514	2.69	2547	2.90	2580	3.12	2614	3.35	2649	3.58	2684	3.82
6200	2695	2530	2.51	2545	2.61	2560	2.72	2576	2.82	2592	2.93	2623	3.14	2655	3.37	2688	3.60	2721	3.83	2755	4.08
6400	2782	2610	2.75	2624	2.85	2639	2.96	2654	3.07	2669	3.18	2700	3.40	2731	3.63	2762	3.86	2794	4.10	2826	4.35
6600	2869	2689	3.00	2704	3.11	2718	3.22	2732	3.33	2747	3.44	2777	3.67	2806	3.90	2837	4.14	2868	4.39	2899	4.64

CFM	Out-	Total Static Pressure																			
Std.	let	2 1/4″		2 1/2″		3″		3 1/2″		4″		4 1/2″		5″		5 1/2″		6″		6 1/2″	
Air	Vel.	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
2800	1217	1826	1.42	1908	160																
3000	1304	1853	1.52	1930	170																
3200	1391	1887	1.60	1959	1.79	2105	2.17														
3400	1478	1931	1.70	1994	1.89	2130	2.30	2267	2.70												
3600	1565	1987	1.84	2040	2.01	2162	2.41	2290	2.85	2419	3.28										
3800	1652	2040	1.97	2096	2.16	2201	2.53	2320	2.98	2442	3.44	2564	3.90								
4000	1739	2094	2.11	2149	2.31	2249	2.68	2355	3.11	2470	3.59	2587	4.06	2702	4.56						
4200	1826	2150	2.27	2203	2.46	2306	2.87	2399	3.27	2503	3.73	2614	4.25	2725	4.74	2835	5.26				
4400	1913	2207	2.42	2259	2.63	2359	3.05	2449	3.46	2544	3.91	2647	4.42	2751	4.95	2858	5.46	2962	6.01		
4600	1999	2266	2.58	2316	2.80	2413	3.23	2507	3.68	2592	4.11	2684	4.59	2783	5.14	2883	5.70	2985	6.23	3085	6.80
4800	2086	2327	2.76	2374	2.98	2469	3.44	2561	3.89	2649	4.36	2729	4.81	2819	5.32	2915	5.91	3011	6.49	3108	7.04
5000	2173	2389	2.94	2434	3.17	2525	3.64	2615	4.11	2702	4.60	2786	5.08	2863	5.56	2949	6.10	3042	6.72	3134	7.32
5200	2260	2453	3.14	2496	3.37	2584	3.85	2671	4.35	2756	4.84	2839	5.35	2912	5.82	2992	6.35	3076	6.92	3166	7.57
5400	2347	2518	3.35	2559	3.59	2644	4.08	2728	4.59	2811	5.11	2892	5.61	2971	6.14	3040	6.63	3118	7.19	3199	7.79
5600	2434	2584	3.57	2624	3.81	2704	4.31	2786	4.84	2867	5.37	2946	5.89	3024	6.44	3099	6.99	3166	7.49	3241	8.08
5800	2521	2651	3.81	2690	4.05	2767	4.56	2846	5.10	2924	5.64	3001	6.20	3078	6.74	3152	7.31	3224	7.87	3288	8.40
6000	2608	2720	4.06	2756	4.31	2831	4.83	2906	5.37	2982	5.93	3058	6.50	3132	7.06	3205	7.64	3277	8.22	3339	8.76
6200	2695	2789	4.33	2824	4.58	2896	5.11	2968	5.66	3042	6.23	3115	6.81	3188	7.40	3260	7.98	3330	8.58	3398	9.19
6400	2782	2859	4.61	2893	4.86	2962	5.40	3031	5.96	3102	6.54	3174	7.13	3245	7.74	3315	8.35	3384	8.95	3452	9.57
6600	2869	2930	4.90	2963	5.16	3028	5.71	3096	6.28	3164	6.86	3234	7.47	3303	8.09	3371	8.72	3439	9.35	3505	9.96
6800	2956	3002	5.21	3033	5.48	3096	6.03	3162	6.61	3227	7.21	3294	7.82	3362	8.45	3428	9.10	3494	9.75	3560	10.37
7000	3043	3075	5.54	3104	5.81	3165	6.38	3227	6.96	3292	7.56	3356	8.19	3422	8.83	3487	9.49	3551	10.15	3615	10.82
7200	3130	3147	5.88	3176	6.16	3235	6.73	3295	7.33	3357	7.94	3419	8.57	3482	9.22	3546	9.89	3609	10.57	3672	11.26
7400	3217	3221	6.24	3249	6.53	3305	7.11	3363	7.71	3423	8.33	3483	8.97	3544	9.63	3605	10.31	3668	11.00	3729	11.70

CFM	Out-	Total Static Pressure																			
Std.	let	7″		7 1/2″		8″		8 1/2″		9″		9 1/2″		10″		10 1/2″		11″		11 1/2″	
Air	Vel.	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
4800	2086	3205	7.63																		
5000	2173	3227	7.93	3321	8.50	3412	9.15														
5200	2260	3254	8.20	3343	8.83	3434	9.42	3522	10.08												
5400	2347	3286	8.46	3371	9.12	3457	9.77	3544	10.38	3629	11.06										
5600	2434	3319	8.70	3403	9.40	3485	10.08	3567	10.76	3652	11.38	3734	12.08	3816	12.80						
5800	2521	3361	9.01	3436	9.65	3517	10.38	3596	11.08	3676	11.78	3758	12.43	3838	13.14	3916	13.88				
6000	2608	3407	9.35	3478	9.98	3551	10.65	3629	11.41	3706	12.13	3782	12.85	3860	13.58	3939	14.24				
6200	2695.	3458	9.73	3524	10.35	3593	11.00	3663	11.69	3739	12.47	3813	13.22	3887	13.97	3962	14.72				
6400	2782	3518	10.20	3575	10.76	3639	11.40	3705	12.07	3773	12.78	3847	13.58	3918	14.35						
6600	2869	3571	10.61	3635	11.26	3689	11.83	3752	12.49	3816	13.18	3882	13.91	3953	14.73						
6800	2956	3625	11.03	3688	11.69	3750	12.36	3802	12.95	3863	13.63	3925	14.34								
7000	3043	3679	11.47	3741	12.14	3803	12.83	3862	13.52	3913	14.11	3972	14.81								
7200	3130	3734	11.95	3796	12.61	3856	13.31	3916	14.01	3974	14.72										
7400	3217	3790	12.41	3850	13.12	3910	13.80	3969	14.52												
7600	3304	3847	12.89	3906	13.62	3965	14.31														
7800	3391	3905	13.38	3963	14.12	4020	14.87														

Performance based on 0.075 lbs. per cubic foot density (air at 70 F and 29.92 Hg Bar). Performance shown is for installation Type B: free inlet, ducted outlet.
Power rating (BHP) does not include drive losses. Performance ratings do not include the effects of appurtenances in the airstream.
When inlet vanes are used increase rpm 1 percent and brake horsepower 3 percent.
Fan tables cover part of fan operating range; fan curves show full operating range.



—— Fan RPM Line
- - - Motor HP Line

Standard fans can be selected ONLY in the shaded area.
Thrust restrains are to be used with fans Class 3 or motors 40 hp and up.

Minimum and Maximum Motor HP Ranges

	Q Fan Size 19"			Super Q Fan Size 19"	
	Min - Max Motor HP Class 1	Min - Max Motor HP Class 2	Min - Max Motor HP Class 3	Min - Max Motor HP Class 1	Min - Max Motor HP Class 2
Arrangement 9	1 - 3	3 - 7.5	7.5 - 15	1 - 3	3 - 7.5
Arrangement 1	—	—	7.5 - 15	NA	NA

Performance Data

Q Fan and Super Q II Size 21

Fan Size 21″

Wheel Dia.	21.5 inches	546 mm
Inlet Area	3.31 square feet	0.308 m^2
Outlet Area	2.88 square feet	0.268 m^2
Tip Speed	5.63 x RPM ft./minute	1.716 m/minute

Pressure Class Limits

Class	Maximum RPM
I	2070
II	2780
III	3740

Minimum Fan RPM (Without VFRB Option)

Motor	Minimum Fan RPM
1800 RPM	380
1200 RPM	253

Table P-3 — Size 21 Q-Fan

CFM Std. Air	Outlet Vel.	Total Static Pressure																			
		1/4″		3/8″		1/2″		5/8″		3/4″		1″		1 1/4″		1 1/2″		1 3/4″		2″	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
2600	902	810	0.20	859	0.25	908	0.31	957	0.38	1001	0.44	1096	0.58	1197	0.74						
2800	972	859	0.23	903	0.29	949	0.35	995	0.42	1039	0.48	1121	0.62	1214	0.79	1308	0.96				
3000	1041	909	0.26	949	0.33	991	0.39	1034	0.46	1077	0.53	1155	0.67	1236	0.83	1323	1.02	1411	1.20		
3200	1111	959	0.30	996	0.37	1035	0.44	1075	0.51	1116	0.58	1194	0.74	1265	0.89	1344	1.07	1426	1.27	1507	1.46
3400	1180	1011	0.35	1045	0.41	1081	0.48	1118	0.56	1156	0.64	1231	0.80	1302	0.96	1369	1.13	1445	1.34	1523	1.53
3600	1250	1062	0.40	1094	0.47	1128	0.54	1163	0.61	1198	0.70	1270	0.86	1339	1.04	1401	1.21	1469	1.40	1541	1.62
3800	1319	1115	0.45	1145	0.52	1176	0.60	1208	0.68	1242	0.76	1309	0.93	1376	1.11	1440	1.30	1499	1.48	1564	1.69
4000	1388	1167	0.51	1196	0.59	1225	0.66	1255	0.74	1286	0.83	1350	1.01	1415	1.20	1477	1.39	1537	1.58	1592	1.78
4200	1458	1220	0.58	1247	0.65	1274	0.73	1303	0.82	1332	0.90	1393	1.09	1454	1.28	1515	1.48	1573	1.68	1626	1.88
4400	1527	1273	0.65	1299	0.73	1325	0.81	1352	0.90	1379	0.99	1436	1.17	1495	1.37	1553	1.58	1610	1.79	1665	2.01
4600	1597	1327	0.73	1351	0.81	1376	0.89	1401	0.98	1427	1.07	1481	1.27	1536	1.47	1593	1.69	1648	1.91	1702	2.12
4800	1666	1380	0.81	1403	0.90	1427	0.98	1451	1.07	1476	1.17	1527	1.37	1580	1.58	1633	1.80	1687	2.02	1739	2.25
5000	1736	1434	0.90	1456	0.99	1479	1.08	1502	1.17	1525	1.27	1573	1.47	1624	1.69	1675	1.91	1727	2.15	1778	2.38
5200	1805	1488	1.00	1509	1.09	1531	1.18	1553	1.28	1575	1.38	1621	1.59	1669	1.80	1718	2.03	1767	2.27	1817	2.52
5400	1875	1542	1.11	1562	1.20	1583	1.30	1604	1.39	1625	1.50	1669	1.71	1715	1.93	1762	2.16	1809	2.41	1857	2.66
5600	1944	1596	1.22	1616	1.32	1636	1.41	1656	1.52	1676	1.62	1718	1.84	1761	2.06	1806	2.30	1852	2.55	1898	2.81
5800	2013	1651	1.34	1669	1.44	1688	1.54	1708	1.65	1727	1.75	1768	1.97	1809	2.21	1852	2.45	1895	2.70	1940	296
6000	2083	1705	1.47	1723	1.57	1741	1.68	1760	1.78	1779	1.89	1817	2.12	1857	2.36	1898	2.60	1940	2.86	1982	3.13
6200	2152	1759	1.61	1777	1.71	1795	1.82	1813	1.93	1831	2.04	1868	2.27	1906	2.52	1945	2.77	1986	3.03	2026	3.30
6400	2222	1814	1.76	1831	1.86	1848	1.97	1865	2.09	1883	2.20	1919	2.44	1955	2.68	1993	2.94	2031	3.21	2071	3.48
6600	2291	1869	1.91	1885	2.02	1902	2.14	1918	2.25	1935	2.37	1970	2.61	2005	2.86	2041	3.12	2078	3.39	2116	3.67
6800	2361	1923	2.08	1939	2.19	1955	2.31	1971	2.43	1988	2.55	2021	2.79	2055	3.05	2090	3.32	2125	3.59	2162	3.87
7000	2430	1978	2.25	1993	2.37	2009	2.49	2025	2.61	2041	2.73	2073	2.99	2106	3.25	2139	3.52	2173	3.80	2208	4.09
7200	2500	2033	2.44	2048	2.56	2063	2.68	2078	2.80	2093	2.93	2125	3.19	2156	3.45	2189	3.73	2222	4.01	2256	4.31

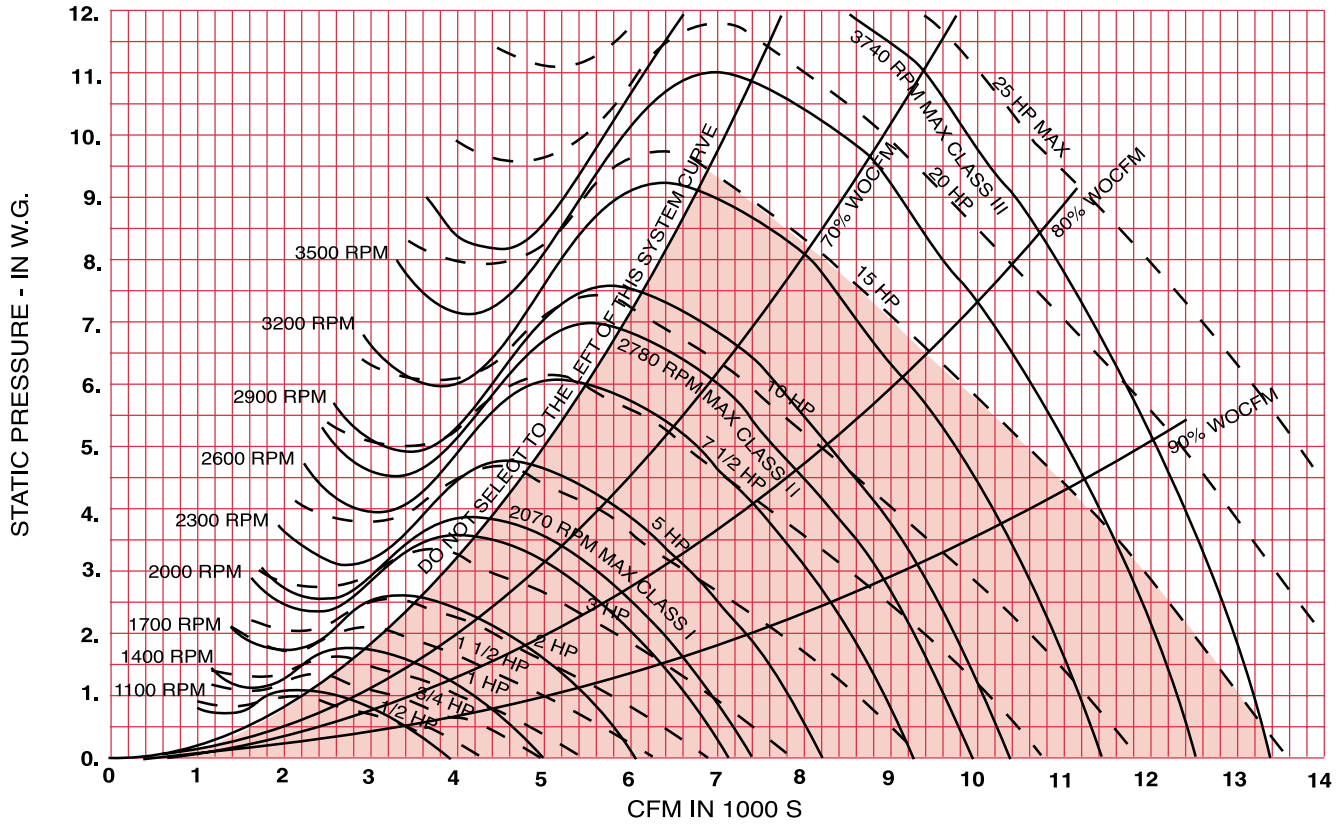
CFM Std. Air	Outlet Vel.	Total Static Pressure																			
		2 1/4″		2 1/2″		3″		3 1/2″		4″		4 1/2″		5″		5 1/2″		6″		6 1/2″	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
3600	1250	1615	1.83	1687	2.06																
3800	1319	1633	1.92	1703	2.14																
4000	1388	1656	2.01	1721	2.25	1852	2.73														
4200	1458	1682	2.10	1743	2.35	1868	2.85														
4400	1527	1715	2.21	1769	2.44	1887	2.97	2007	3.49												
4600	1597	1754	2.35	1801	2.56	1910	3.08	2023	3.64	2137	4.19										
4800	1666	1791	2.48	1840	2.72	1935	3.19	2043	3.77	2153	4.33	2261	4.94								
5000	1736	1828	2.62	1877	2.86	1966	3.34	2067	3.91	2170	4.51	2276	5.09								
5200	1805	1866	2.77	1914	3.01	2001	3.50	2092	4.04	2192	4.66	2292	5.29	2394	5.90						
5400	1875	1904	2.92	1951	3.17	2042	3.69	2124	4.20	2215	4.80	2312	5.46	2410	6.09	2507	6.76				
5600	1944	1944	3.07	1989	3.34	2078	3.87	2158	4.39	2243	4.97	2335	5.63	2428	6.31	2522	6.96	2615	7.66		
5800	2013	1984	3.23	2029	3.51	2116	4.06	2199	4.62	2275	5.16	2359	5.79	2449	6.50	2539	7.20	2631	7.87	2720	8.61
6000	2083	2026	3.40	2069	3.68	2153	4.26	2236	4.83	2310	5.38	2388	5.99	2471	6.66	2559	7.41	2646	8.14	2735	8.83
6200	2152	2067	3.58	2109	3.87	2192	4.46	2273	5.04	2351	5.65	2421	6.22	2499	6.88	2582	7.62	2666	8.37	2751	9.12
6400	2222	2111	3.77	2151	4.06	2231	4.66	2311	5.26	2388	5.88	2461	6.51	2529	7.11	2606	7.81	2688	8.60	2769	9.37
6600	2291	2154	3.96	2193	4.26	2272	4.87	2349	5.50	2425	6.12	2498	6.77	2563	7.37	2635	8.05	2710	8.79	2791	9.62
6800	2361	2199	4.17	2236	4.47	2312	5.09	2388	5.74	2462	6.37	2535	7.03	2604	7.70	2667	8.33	2738	9.05	2815	9.87
7000	2430	2244	4.38	2281	4.69	2354	5.32	2428	5.98	2500	6.65	2572	7.31	2641	7.99	2702	8.62	2769	9.33	2839	10.09
7200	2500	2290	4.61	2325	4.92	2396	5.56	2468	6.23	2539	6.91	2609	7.59	2678	8.29	2744	8.99	2803	9.64	2869	10.39
7400	2569	2336	4.85	2371	5.16	2439	5.81	2509	6.49	2579	7.19	2647	7.90	2715	8.59	2780	9.31	2844	10.04	2901	10.71
7600	2638	2384	5.09	2416	5.41	2483	6.07	2550	6.76	2619	7.47	2686	8.20	2752	8.90	2817	9.64	2880	10.38	2936	11.06
7800	2708	2431	5.35	2463	5.67	2528	6.34	2593	7.04	2659	7.76	2725	8.50	2790	9.25	2855	9.98	2917	10.74	2978	11.50
8000	2777	2479	5.62	2510	5.95	2573	6.63	2636	7.33	2701	8.06	2765	8.82	2829	9.58	2892	10.32	2954	11.10	3014	11.88
8200	2847	2528	5.90	2558	6.24	2619	6.92	2680	7.64	2742	8.38	2806	9.14	2868	9.92	2930	10.71	2991	11.47	3051	12.26

CFM Std. Air	Outlet Vel.	Total Static Pressure																			
		7″		7 1/2″		8″		8 1/2″		9″		9 1/2″		10″		10 1/2″		11″		11 1/2″	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
6000	2083	2821	9.60																		
6200	2152	2836	9.84	2919	10.64																
6400	2222	2851	10.15	2934	10.89	3015	11.71														
6600	2291	2870	10.42	2951	11.16	3030	11.98	3108	12.83												
6800	2361	2891	10.68	2967	11.51	3046	12.27	3123	13.11	3199	13.99										
7000	2430	2914	10.95	2988	11.79	3063	12.64	3139	13.43	3214	14.29										
7200	2500	2937	11.18	3011	12.08	3083	12.95	3155	13.82	3230	14.62										
7400	2569	2966	11.49	3033	12.32	3105	13.25	3175	14.15												
7600	2638	2997	11.83	3061	12.64	3127	13.50	3197	14.47												
7800	2708	3031	12.19	3092	12.99	3154	13.84	3222	14.80												
8000	2777	3073	12.66	3125	13.37	3184	14.21														
8200	2847	3110	13.07	3160	13.78	3217	14.60														
8400	2916	3146	13.48	3203	14.30																
8600	2986	3183	13.90	3239	14.74																
8800	3055	3220	14.32																		
9000	3125	3258	14.76																		

Performance based on 0.075 lbs. per cubic foot density (air at 70 F and 29.92 Hg Bar). Performance shown is for installation Type B: free inlet, ducted outlet.
Power rating (BHP) does not include drive losses. Performance ratings do not include the effects of appurtenances in the airstream.
When inlet vanes are used increase rpm 1 percent and brake horsepower 3 percent.
Fan tables cover part of fan operating range; fan curves show full operating range.

Performance Data

Q Fan and Super Q II Size 21



—— Fan RPM Line
- - - Motor HP Line

Standard fans can be selected ONLY in the shaded area.
Thrust restrains are to be used with fans Class 3 or motors 40 hp and up.

Minimum and Maximum Motor HP Ranges

	Q Fan Size 21"			Super Q Fan Size 21"	
	Min - Max Motor HP Class 1	Min - Max Motor HP Class 2	Min - Max Motor HP Class 3	Min - Max Motor HP Class 1	Min - Max Motor HP Class 2
Arrangement 9	1 - 5	3 - 10	10 - 15	1 - 5	3 - 10
Arrangement 1	—	—	10 - 15	NA	NA

Performance Data

Q Fan and Super Q II Size 24

Fan Size 24"

Wheel Dia.	24.5 inches	622 mm
Inlet Area	4.32 square feet	0.401 m^2
Outlet Area	3.73 square feet	0.347 m^2
Tip Speed	6.41 x RPM ft./minute	1.954 m/minute

Pressure Class Limits

Class	Maximum RPM
I	1772
II	2380
III	3200

Minimum Fan RPM (Without VFRB Option)

Motor	Minimum Fan RPM
1800 RPM	535
1200 RPM	356

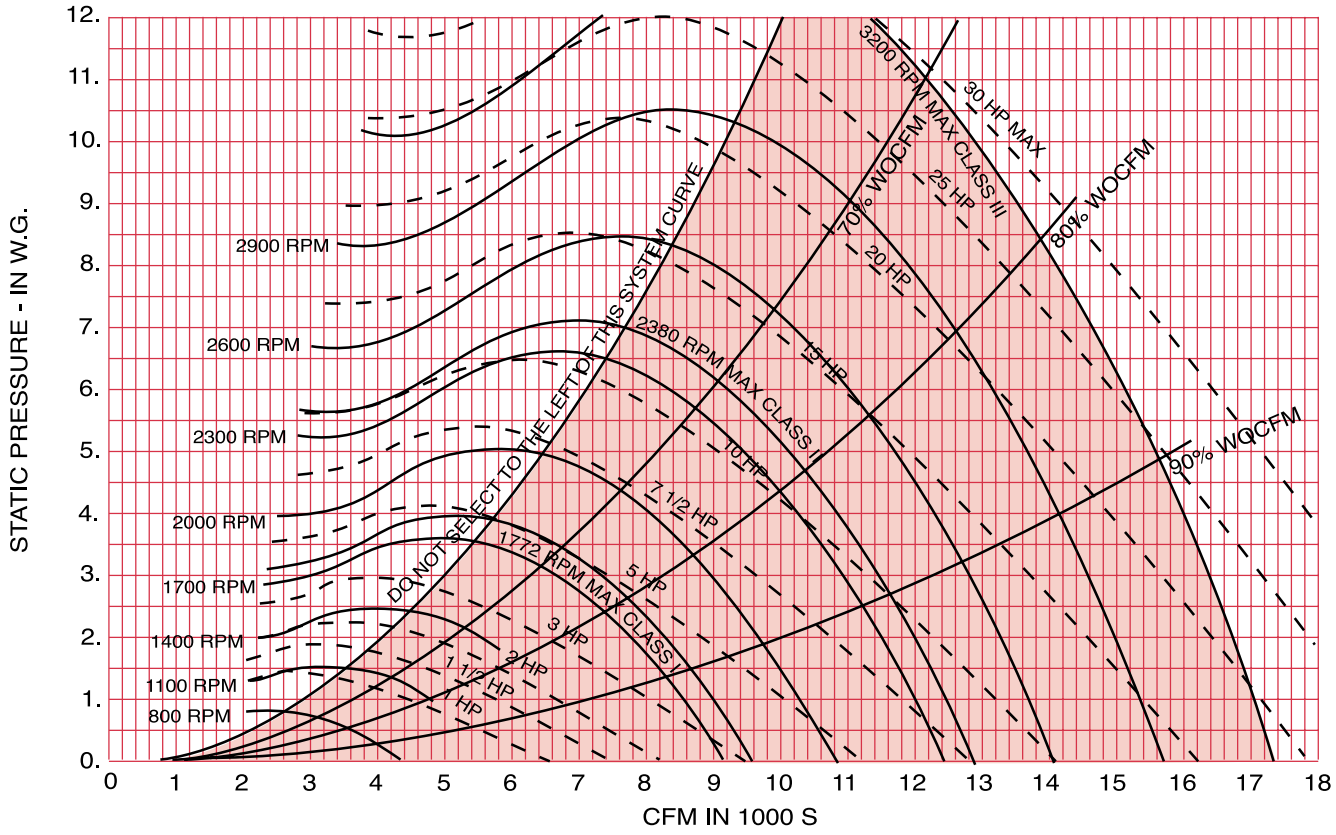
Table P-4 — Size 24 Q-Fan

CFM Std. •Air	Out-let Vel.	Total Static Pressure 1/4" RPM	BHP	3/8" RPM	BHP	1/2" RPM	BHP	5/8" RPM	BHP	3/4" RPM	BHP	1" RPM	BHP	1 1/4" RPM	BHP	1 1/2" RPM	BHP	1 3/4" RPM	BHP	2" RPM	BHP
3000	804	639	0.2	685	0.3	730	0.3	773	0.4	817	0.5	908	0.7								
3400	911	703	0.3	741	0.3	782	0.4	822	0.5	861	0.6	937	0.7	1018	0.9						
3800	1018	769	0.3	803	0.4	837	0.5	874	0.6	910	0.7	978	0.8	1048	1.0	1120	1.3				
4200	1126	836	0.4	867	0.5	897	0.6	929	0.7	962	0.8	1027	1.0	1088	1.2	1151	1.4	1215	1.6	1282	1.9
4600	1233	905	0.5	933	0.6	961	0.7	989	0.8	1018	0.9	1078	1.1	1136	1.3	1192	1.5	1249	1.8	1308	2.0
5000	1340	974	0.6	1000	0.7	1026	0.8	1052	0.9	1077	1.0	1132	1.2	1186	1.4	1240	1.7	1291	1.9	1344	2.2
5400	1447	1044	0.7	1068	0.8	1092	0.9	1116	1.0	1139	1.2	1188	1.4	1239	1.6	1290	1.9	1340	2.1	1387	2.4
5800	1554	1114	0.9	1137	1.0	1159	1.1	1181	1.2	1204	1.3	1248	1.6	1295	1.8	1342	2.1	1389	2.3	1435	2.6
6200	1662	1185	1.0	1206	1.2	1227	1.3	1248	1.4	1269	1.5	1310	1.8	1352	2.0	1397	2.3	1441	2.5	1485	2.8
6600	1769	1256	1.2	1276	1.3	1296	1.5	1315	1.6	1335	1.7	1374	2.0	1413	2.2	1453	2.5	1495	2.8	1537	3.1
7000	1876	1328	1.4	1346	1.6	1365	1.7	1383	1.8	1402	1.9	1439	2.2	1475	2.5	1512	2.8	1551	3.1	1591	3.4
7400	1983	1399	1.7	1417	1.8	1434	1.9	1452	2.1	1470	2.2	1505	2.5	1540	2.8	1574	3.1	1609	3.4	1646	3.7
7800	2091	1471	1.9	1488	2.1	1505	2.2	1521	2.3	1538	2.5	1571	2.8	1605	3.1	1638	3.4	1670	3.7	1704	4.0
8200	2198	1544	2.2	1559	2.3	1575	2.5	1591	2.6	1607	2.8	1639	3.1	1670	3.4	1702	3.7	1732	4.1	1764	4.4
8600	2305	1616	2.5	1631	2.7	1646	2.8	1661	3.0	1676	3.1	1706	3.4	1737	3.8	1767	4.1	1797	4.5	1826	4.8
9000	2412	1688	2.8	1703	3.0	1717	3.2	1731	3.3	1746	3.5	1775	3.8	1804	4.2	1833	4.5	1861	4.9	1890	5.2
9400	2520	1761	3.2	1775	3.4	1788	3.5	1802	3.7	1816	3.9	1844	4.2	1871	4.6	1899	4.9	1927	5.3	1954	5.7
9800	2627	1833	3.6	1847	3.8	1860	4.0	1873	4.1	1886	4.3	1913	4.7	1939	5.0	1966	5.4	1992	5.8	2019	6.2
10200	2734	1906	4.0	1919	4.2	1932	4.4	1944	4.6	1957	4.8	1982	5.1	2008	5.5	2033	5.9	2059	6.3	2084	6.7
10600	2841	1979	4.5	1991	4.7	2003	4.9	2016	5.1	2028	5.2	2052	5.6	2077	6.0	2101	6.4	2126	6.8	2150	7.2
11000	2949	2052	5.0	2064	5.2	2075	5.4	2087	5.6	2099	5.8	2122	6.2	2146	6.6	2170	7.0	2193	7.4	2217	7.8
11400	3056	2125	5.6	2136	5.7	2147	5.9	2159	6.1	2170	6.3	2193	6.7	2216	7.2	2238	7.6	2261	8.0	2284	8.4
11800	3163	2198	6.1	2209	6.3	2220	6.5	2231	6.7	2242	6.9	2264	7.4	2286	7.8	2308	8.2	2330	8.7	2352	9.1
12200	3270	2271	6.7	2281	7.0	2292	7.2	2303	7.4	2313	7.6	2334	8.0	2356	8.4	2377	8.9	2398	9.3	2420	9.8

CFM Std. Air	Out-let Vel.	Total Static Pressure 2 1/4" RPM	BHP	2 1/2" RPM	BHP	3" RPM	BHP	3 1/2" RPM	BHP	4" RPM	BHP	4 1/2" RPM	BHP	5" RPM	BHP	5 1/2" RPM	BHP	6" RPM	BHP	6 1/2" RPM	BHP
5000	1340	1397	2.5	1451	2.8																
5400	1447	1435	2.7	1484	3.0	1585	3.6														
5800	1554	1479	2.9	1524	3.2	1615	3.8	1710	4.5	1806	5.2										
6200	1662	1528	3.1	1571	3.4	1654	4.1	1739	4.8	1828	5.5	1918	6.3								
6600	1769	1578	3.4	1619	3.7	1697	4.4	1776	5.1	1857	5.8	1940	6.6	2025	7.4						
7000	1876	1630	3.7	1669	4.0	1745	4.7	1818	5.4	1894	6.1	1969	6.9	2048	7.7	2128	8.6				
7400	1983	1684	4.0	1721	4.3	1794	5.0	1866	5.8	1935	6.5	2006	7.3	2078	8.1	2152	9.0	2227	9.9	2303	10.8
7800	2091	1740	4.4	1775	4.7	1845	5.4	1914	6.2	1980	6.9	2047	7.7	2114	8.5	2182	9.4	2252	10.3	2324	11.2
8200	2198	1797	4.7	1831	5.1	1898	5.8	1964	6.6	2029	7.4	2091	8.1	2155	9.0	2220	9.9	2284	10.8	2350	11.7
8600	2305	1856	5.1	1887	5.5	1952	6.2	2016	7.0	2079	7.8	2141	8.7	2200	9.5	2260	10.4	2322	11.3	2383	12.2
9000	2412	1918	5.6	1947	5.9	2008	6.7	2069	7.5	2130	8.3	2190	9.2	2249	10.1	2305	10.9	2363	11.8	2421	12.8
9400	2520	1980	6.0	2008	6.4	2064	7.2	2124	8.0	2182	8.8	2240	9.7	2297	10.6	2354	11.6	2407	12.4	2463	13.4
9800	2627	2045	6.6	2070	6.9	2124	7.7	2179	8.6	2236	9.4	2292	10.3	2347	11.2	2402	12.2	2456	13.1	2507	14.1
10200	2734	2110	7.1	2135	7.5	2185	8.3	2237	9.2	2292	10.0	2345	10.9	2399	11.9	2452	12.8	2505	13.8	2557	14.8
10600	2841	2175	7.6	2199	8.1	2247	8.9	2296	9.8	2347	10.7	2400	11.6	2452	12.5	2503	13.5	2554	14.5	2605	15.5
11000	2949	2241	8.2	2264	8.7	2311	9.6	2357	10.4	2405	11.3	2456	12.3	2506	13.2	2556	14.2	2606	15.2	2655	16.3
11400	3056	2307	8.9	2330	9.3	2375	10.2	2419	11.1	2465	12.1	2512	13.0	2562	14.0	2610	15.0	2658	16.0	2705	17.1
11800	3163	2374	9.6	2396	10.0	2440	10.9	2483	11.9	2526	12.8	2571	13.8	2617	14.8	2665	15.8	2711	16.8	2758	17.9
12200	3270	2441	10.3	2462	10.7	2505	11.7	2547	12.7	2588	13.6	2631	14.6	2675	15.6	2721	16.6	2766	17.7	2811	18.8
12600	3378	2509	11.0	2529	11.5	2571	12.5	2612	13.5	2651	14.5	2692	15.5	2734	16.5	2777	17.6	2822	18.6	2865	19.7
13000	3485	2577	11.8	2597	12.3	2637	13.3	2677	14.3	2716	15.4	2754	16.4	2795	17.5	2835	18.5	2877	19.6	2921	20.7
13400	3592	2645	12.7	2664	13.2	2703	14.2	2742	15.2	2781	16.3	2819	17.4	2856	18.4	2895	19.5	2935	20.7	2976	21.8
13800	3699	2714	13.5	2733	14.1	2770	15.1	2808	16.2	2845	17.3	2883	18.4	2919	19.5	2956	20.6	2995	21.7	3033	22.9
14200	3806	2783	14.5	2801	15.0	2838	16.1	2874	17.2	2911	18.3	2947	19.4	2984	20.6	3018	21.7	3055	22.8	3092	24.0

CFM Std. Air	Out-let Vel.	Total Static Pressure 7" RPM	BHP	7 1/2" RPM	BHP	8" RPM	BHP	8 1/2" RPM	BHP	9" RPM	BHP	9 1/2" RPM	BHP	10" RPM	BHP	10 1/2" RPM	BHP	11" RPM	BHP	11 1/2" RPM	BHP
8600	2305	2446	13.2	2510	14.3	2575	15.3	2640	16.4												
9000	2412	2480	13.8	2539	14.8	2600	15.9	2662	16.9	2724	18.0	2787	19.2								
9400	2520	2519	14.4	2574	15.4	2631	16.5	2689	17.6	2748	18.7	2808	19.8	2867	21.0	2927	22.2				
9800	2627	2561	15.1	2614	16.1	2667	17.2	2722	18.3	2777	19.4	2833	20.5	2890	21.6	2947	22.9	3004	24.1		
10200	2734	2605	15.8	2657	16.8	2708	17.9	2760	19.0	2811	20.1	2864	21.3	2917	22.5	2971	23.7	3026	24.8	3081	26.1
10600	2841	2655	16.6	2702	17.6	2751	18.6	2800	19.7	2850	20.9	2899	22.0	2950	23.2	3001	24.5	3052	25.7	3104	27.0
11000	2949	2703	17.4	2752	18.5	2796	19.5	2844	20.6	2891	21.7	2939	22.9	2986	24.1	3035	25.3	3084	26.6	3133	27.8
11400	3056	2753	18.2	2800	19.3	2846	20.4	2890	21.5	2935	22.6	2981	23.8	3027	25.0	3074	26.2	3119	27.4	3166	28.7
11800	3163	2804	19.0	2849	20.2	2895	21.3	2940	22.5	2984	23.6	3026	24.7	3070	25.9	3114	27.2	3159	28.4		
12200	3270	2856	19.9	2900	21.1	2945	22.2	2989	23.4	3032	24.6	3075	25.8	3115	26.9	3158	28.2				
12600	3378	2909	20.9	2952	22.0	2995	23.2	3038	24.4	3081	25.7	3123	26.9	3165	28.1						
13000	3485	2963	21.9	3005	23.0	3047	24.2	3089	25.5	3131	26.7	3172	28.0								
13400	3592	3018	22.9	3059	24.1	3100	25.3	3141	26.5	3182	27.8										
13800	3699	3073	24.1	3115	25.2	3154	26.4	3194	27.7												
14200	3806	3130	25.2	3171	26.4																
14600	3914	3189	26.4																		

Performance based on 0.075 lbs. per cubic foot density (air at 70 F and 29.92 Hg Bar). Performance shown is for installation Type B: free inlet, ducted outlet.
Power rating (BHP) does not include drive losses. Performance ratings do not include the effects of appurtenances in the airstream.
When inlet vanes are used increase rpm 1 percent and brake horsepower 3 percent.
Fan tables cover part of fan operating range; fan curves show full operating range.



—— Fan RPM Line
- - - Motor HP Line

Standard fans can be selected ONLY in the shaded area.
Thrust restrains are to be used with fans Class 3 or motors 40 hp and up.

Minimum and Maximum Motor HP Ranges

	Q Fan Size 24"			Super Q Fan Size 24"	
	Min - Max Motor HP Class 1	Min - Max Motor HP Class 2	Min - Max Motor HP Class 3	Min - Max Motor HP Class 1	Min - Max Motor HP Class 2
Arrangement 9	1 - 5	5 - 15	15-30	1 - 5	5 - 10
Arrangement 1	—	—	15 - 30	NA	NA

Performance Data

Q Fan and Super Q II Size 27

Fan Size 27"

Wheel Dia.	27.0 inches	686 mm
Inlet Area	5.20 square feet	0.483 m^2
Outlet Area	4.54 square feet	0.422 m^2
Tip Speed	7.07 x RPM ft./minute	2.155 m/minute

Pressure Class Limits

Class	Maximum RPM
I	1610
II	2160
III	2908

Minimum Fan RPM (Without VFRB Option)

Motor	Minimum Fan RPM
1800 RPM	437
1200 RPM	291

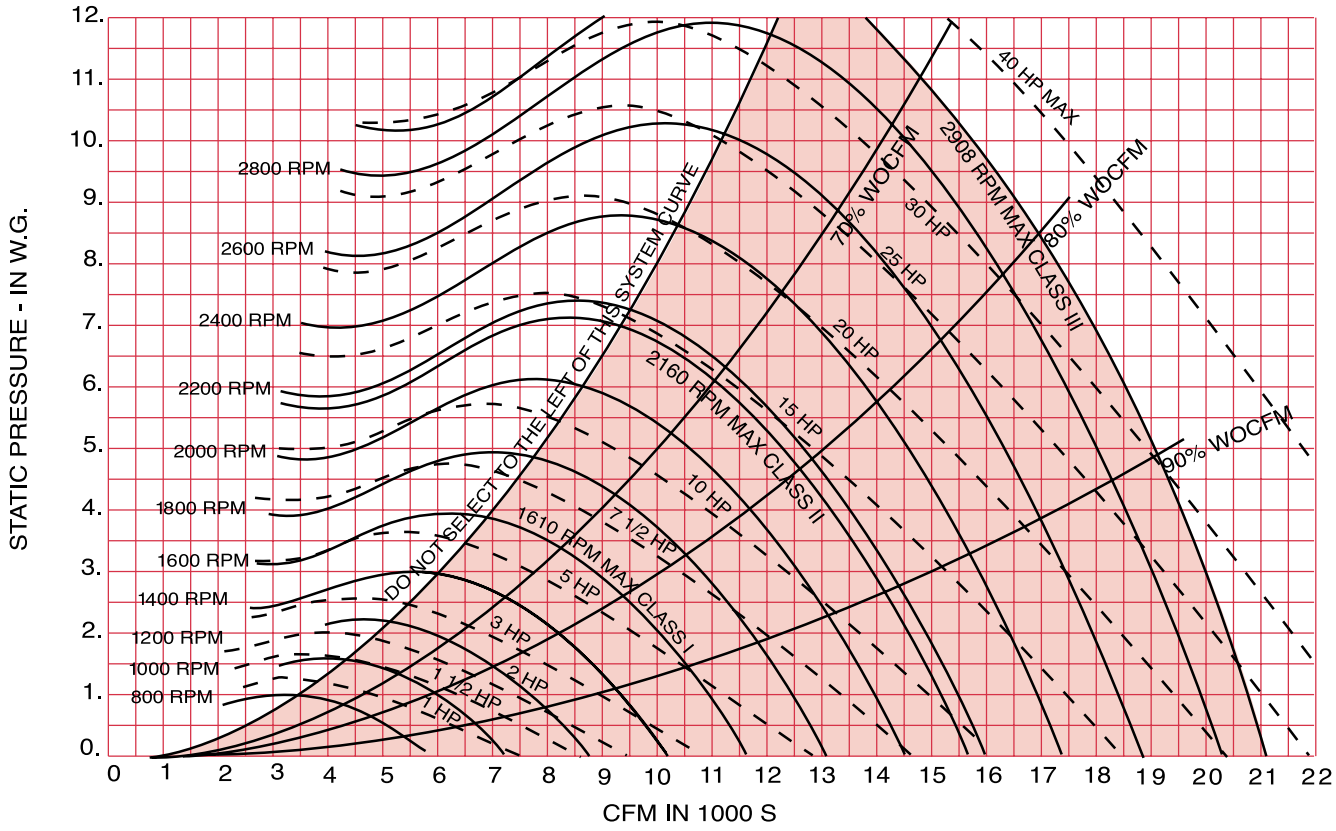
Table P-5 — Size 27 Q-Fan

CFM Std. Air	Out-let Vel.	Total Static Pressure 1/4" RPM	BHP	3/8" RPM	BHP	1/2" RPM	BHP	5/8" RPM	BHP	3/4" RPM	BHP	1" RPM	BHP	1 1/4" RPM	BHP	1 1/2" RPM	BHP	1 3/4" RPM	BHP	2" RPM	BHP
3000	660	510	0.2	559	0.3	607	0.3	657	0.4												
3500	770	564	0.2	607	0.3	649	0.4	690	0.5	731	0.6										
4000	881	623	0.3	658	0.4	697	0.5	734	0.6	769	0.7	842	0.9	918	1.1						
4500	991	684	0.4	715	0.5	747	0.6	781	0.7	815	0.8	878	1.0	943	1.2	1011	1.5				
5000	1101	746	0.5	775	0.6	803	0.7	832	0.8	863	0.9	923	1.1	979	1.4	1038	1.6	1098	1.9	1160	2.2
5500	1211	810	0.6	836	0.7	862	0.8	887	0.9	914	1.0	970	1.3	1023	1.5	1075	1.8	1127	2.1	1182	2.4
6000	1321	874	0.7	898	0.8	922	1.0	945	1.1	969	1.2	1020	1.4	1070	1.7	1119	2.0	1166	2.3	1214	2.6
6500	1431	939	0.9	961	1.0	983	1.1	1005	1.2	1027	1.4	1072	1.6	1119	1.9	1165	2.2	1210	2.5	1253	2.9
7000	1541	1005	1.1	1026	1.2	1046	1.3	1067	1.4	1087	1.6	1127	1.9	1170	2.2	1214	2.5	1256	2.8	1298	3.1
7500	1651	1071	1.3	1090	1.4	1109	1.5	1129	1.7	1148	1.8	1185	2.1	1224	2.4	1264	2.7	1305	3.1	1345	3.4
8000	1762	1138	1.5	1156	1.6	1174	1.8	1191	1.9	1209	2.1	1245	2.4	1280	2.7	1317	3.0	1355	3.4	1393	3.7
8500	1872	1205	1.7	1221	1.9	1238	2.0	1255	2.2	1272	2.4	1306	2.7	1338	3.0	1372	3.4	1407	3.7	1443	4.1
9000	1982	1272	2.0	1287	2.2	1303	2.4	1319	2.5	1335	2.7	1367	3.0	1399	3.4	1430	3.7	1462	4.1	1495	4.5
9500	2092	1339	2.4	1354	2.5	1369	2.7	1384	2.9	1399	3.0	1429	3.4	1459	3.8	1489	4.1	1518	4.5	1549	4.9
10000	2202	1406	2.7	1420	2.9	1435	3.1	1449	3.2	1463	3.4	1492	3.8	1521	4.2	1549	4.6	1577	5.0	1605	5.4
10500	2312	1474	3.1	1487	3.3	1501	3.5	1515	3.6	1528	3.8	1555	4.2	1583	4.6	1610	5.0	1637	5.5	1663	5.9
11000	2422	1541	3.5	1554	3.7	1567	3.9	1580	4.1	1593	4.3	1619	4.7	1645	5.1	1671	5.5	1697	6.0	1723	6.4
11500	2533	1609	4.0	1622	4.2	1634	4.4	1646	4.6	1659	4.8	1684	5.2	1709	5.6	1734	6.1	1758	6.5	1783	7.0
12000	2643	1677	4.5	1689	4.7	1701	4.9	1713	5.1	1725	5.3	1748	5.8	1772	6.2	1796	6.7	1820	7.1	1844	7.6
12500	2753	1745	5.0	1756	5.3	1768	5.5	1779	5.7	1791	5.9	1813	6.4	1836	6.8	1859	7.3	1882	7.8	1905	8.3
13000	2863	1813	5.6	1824	5.9	1835	6.1	1846	6.3	1857	6.5	1879	7.0	1901	7.5	1923	8.0	1945	8.5	1967	9.0
13500	2973	1881	6.3	1892	6.5	1902	6.7	1913	7.0	1923	7.2	1944	7.7	1966	8.2	1987	8.7	2008	9.2	2029	9.7
14000	3083	1949	7.0	1959	7.2	1969	7.4	1980	7.7	1990	7.9	2010	8.4	2031	8.9	2051	9.4	2072	10.0	2092	10.5
14500	3193	2017	7.7	2027	7.9	2037	8.2	2047	8.4	2057	8.7	2076	9.2	2096	9.7	2116	10.3	2136	10.8	2155	11.3

CFM Std. Air	Out-let Vel.	Total Static Pressure 2 1/4" RPM	BHP	2 1/2" RPM	BHP	3" RPM	BHP	3 1/2" RPM	BHP	4" RPM	BHP	4 1/2" RPM	BHP	5" RPM	BHP	5 1/2" RPM	BHP	6" RPM	BHP	6 1/2" RPM	BHP
6000	1321	1263	3.0	1313	3.3																
6500	1431	1298	3.2	1342	3.6	1435	4.3														
7000	1541	1338	3.5	1380	3.8	1463	4.6	1549	5.4												
7500	1651	1384	3.8	1421	4.1	1498	4.9	1576	5.8	1657	6.6	1740	7.6								
8000	1762	1430	4.1	1467	4.5	1538	5.3	1611	6.1	1684	7.0	1760	7.9	1837	9.0						
8500	1872	1479	4.5	1514	4.9	1584	5.7	1650	6.5	1718	7.4	1787	8.4	1858	9.4	1931	10.4				
9000	1982	1529	4.9	1563	5.3	1629	6.1	1694	7.0	1757	7.9	1821	8.9	1886	9.9	1953	10.9	2021	12.0	2090	13.2
9500	2092	1581	5.3	1613	5.7	1677	6.6	1739	7.5	1799	8.4	1859	9.4	1921	10.4	1982	11.5	2045	12.6	2110	13.7
10000	2202	1635	5.8	1665	6.2	1726	7.1	1786	3.0	1845	9.0	1901	9.9	1959	11.0	2017	12.0	2075	13.2	2135	14.3
10500	2312	1691	6.3	1719	6.7	1777	7.6	1835	8.6	1891	9.6	1948	10.6	2001	11.6	2056	12.7	2111	13.8	2166	14.9
11000	2422	1748	6.9	1774	7.3	1828	8.2	1885	9.2	1939	10.2	1993	11.2	2047	12.3	2097	13.4	2150	14.5	2202	15.7
11500	2533	1808	7.5	1832	7.9	1882	8.9	1936	9.8	1989	10.9	2041	11.9	2092	13.0	2143	14.2	2191	15.2	2241	16.4
12000	2643	1868	8.1	1890	8.5	1938	9.5	1988	10.5	2039	11.6	2090	12.7	2139	13.8	2189	14.9	2238	16.1	2284	17.2
12500	2753	1928	8.8	1951	9.3	1995	10.2	2042	11.3	2091	12.3	2140	13.4	2188	14.6	2236	15.8	2283	17.0	2330	18.2
13000	2863	1989	9.5	2011	10.0	2053	11.0	2098	12.1	2143	13.2	2191	14.3	2238	15.4	2284	16.6	2330	17.9	2375	19.1
13500	2973	2051	10.2	2072	10.8	2114	11.8	2155	12.9	2198	14.0	2242	15.2	2289	16.3	2333	17.5	2378	18.8	2422	20.1
14000	3083	2113	11.0	2133	116	2174	12.7	2213	13.8	2254	14.9	2296	16.1	2341	17.3	2384	18.5	2427	19.8	2470	21.1
14500	3193	2175	11.9	2195	12.5	2234	13.6	2274	14.8	2312	15.9	2352	17.1	2393	18.3	2436	19.5	2477	20.8	2519	22.1
15000	3303	2238	12.8	2257	13.4	2295	14.6	2333	15.8	2370	16.9	2408	18.1	2447	19.4	2487	20.7	2529	21.9	2569	23.3
15500	3414	2301	13.8	2320	14.4	2357	15.6	2394	16.6	2430	18.0	2466	19.2	2503	20.5	2541	21.8	2580	23.1	2620	24.4
16000	3524	2365	14.8	2383	15.4	2419	16.6	2455	17.9	2490	19.2	2524	20.4	2560	21.7	2596	23.0	2633	24.4	2673	25.7
16500	3634	2429	15.9	2446	16.5	2481	17.8	2516	19.0	2550	20.3	2585	21.7	2618	23.0	2653	24.3	2688	25.7	2724	27.1
17000	3744	2493	17.0	2510	17.6	2544	18.9	2578	20.3	2611	21.6	2645	22.9	2677	24.3	2710	25.6	2744	27.0	2779	28.5
17500	3854	2558	18.2	2574	18.9	2607	20.2	2640	21.5	2672	22.9	2705	24.3	2738	25.7	2768	27.0	2801	28.5	2835	29.9

CFM Std. Air	Out-let Vel.	Total Static Pressure 7" RPM	BHP	7 1/2" RPM	BHP	8" RPM	BHP	8 1/2" RPM	BHP	9" RPM	BHP	9 1/2" RPM	BHP	10" RPM	BHP	10 1/2" RPM	BHP	11" RPM	BHP	11 1/2" RPM	BHP
10000	2202	2196	15.4	2258	16.7	2319	18.0														
10500	2312	2223	16.2	2280	17.4	2339	18.6	2398	19.9												
11000	2422	2255	16.9	2309	18.1	2363	19.4	2419	20.6	2475	22.0	2531	23.4								
11500	2533	2292	17.6	2342	18.9	2393	20.2	2445	21.5	2498	22.9	2551	24.2	2605	25.6	2659	27.1				
12000	2643	2331	18.5	2380	19.7	2428	21.0	2476	22.3	2526	23.7	2576	25.1	2627	26.6	2678	27.9	2730	29.4	2781	31.0
12500	2753	2374	19.3	2420	20.6	2466	21.9	2513	23.3	2558	24.6	2606	26.0	2654	27.5	2702	29.0	2751	30.4	2800	31.9
13000	2863	2420	20.4	2463	21.6	2507	22.9	2551	24.2	2596	25.6	2640	27.0	2685	28.5	2731	30.0	2777	31.5	2823	33.0
13500	2973	2466	21.4	2509	22.7	2552	24.0	2592	25.3	2635	26.7	2678	28.1	2721	29.5	2763	31.0	2807	32.6	2851	34.1
14000	3083	2513	22.4	2555	23.8	2597	25.1	2638	26.5	2677	27.8	2718	29.2	2759	30.7	2801	32.2	2841	33.7	2883	35.3
14500	3193	2561	23.5	2602	24.9	2642	26.3	2683	27.7	2723	29.1	2760	30.4	2800	31.9	2839	33.4	2879	34.9		
15000	3303	2609	24.6	2650	26.0	2689	27.5	2729	28.9	2768	30.4	2807	31.9	2842	33.2	2881	34.7				
15500	3414	2659	25.8	2698	27.2	2737	28.7	2776	30.2	2814	31.7	2852	33.2	2890	34.7						
16000	3524	2711	27.1	2748	28.5	2786	30.0	2824	31.5	2861	33.0	2898	34.6								
16500	3634	2763	28.4	2799	29.9	2836	31.4	2873	32.9												
17000	3744	2814	29.9	2851	31.3	2887	32.8														
17500	3854	2868	31.4	2902	32.9																

Performance based on 0.075 lbs. per cubic foot density (air at 70 F and 29.92 Hg Bar). Performance shown is for installation Type B: free inlet, ducted outlet.
Power rating (BHP) does not include drive losses. Performance ratings do not include the effects of appurtenances in the airstream.
When inlet vanes are used increase rpm 1 percent and brake horsepower 3 percent.
Fan tables cover part of fan operating range; fan curves show full operating range.



—— Fan RPM Line
- - - Motor HP Line

Standard fans can be selected ONLY in the shaded area.
Thrust restrains are to be used with fans Class 3 or motors 40 hp and up.

Minimum and Maximum Motor HP Ranges

	Q Fan Size 27"			Super Q Fan Size 27"	
	Min - Max Motor HP Class 1	Min - Max Motor HP Class 2	Min - Max Motor HP Class 3	Min - Max Motor HP Class 1	Min - Max Motor HP Class 2
Arrangement 9	1 - 7.5	5 -15	15 - 40	1 - 7.5	5-15
Arrangement 1	—	5 -15	15 - 40	NA	NA

Performance Data

Q Fan and Super Q II Size 30

Fan Size 30"

Wheel Dia.	30.0 inches	762 mm
Inlet Area	6.45 square feet	0.599 m^2
Outlet Area	5.60 square feet	0.520 m^2
Tip Speed	7.85 x RPM ft./minute	2.393 m/minute

Pressure Class Limits

Class	Maximum RPM
I	1448
II	1940
III	2618

Minimum Fan RPM (Without VFRB Option)

Motor	Minimum Fan RPM
1800 RPM	365
1200 RPM	243

Table P-6 — Size 30 Q-Fan

CFM Std. Air	Outlet Vel.	Total Static Pressure 1/4" RPM	BHP	3/8" RPM	BHP	1/2" RPM	BHP	5/8" RPM	BHP	3/4" RPM	BHP	1" RPM	BHP	1 1/4" RPM	BHP	1 1/2" RPM	BHP	1 3/4" RPM	BHP	2" RPM	BHP
5000	892	566	0.4	597	0.5	631	0.6	664	0.7	696	0.8	761	1.1	828	1.4						
5500	982	610	0.5	639	0.6	669	0.7	699	0.8	729	0.9	787	1.2	846	1.5	908	1.8				
6000	1071	656	0.6	682	0.7	708	0.8	736	0.9	764	1.1	819	1.3	872	1.6	926	2.0	983	2.3		
6500	1160	702	0.7	726	0.8	750	0.9	775	1.0	801	1.2	852	1.5	901	1.8	951	2.1	1001	2.5	1053	2.9
7000	1250	748	0.8	771	0.9	794	1.1	816	1.2	839	1.3	888	1.6	935	2.0	980	2.3	1026	2.7	1072	3.1
7500	1339	796	0.9	817	1.1	838	1.2	859	1.4	880	1.5	925	1.8	969	2.2	1013	2.5	1055	2.9	1098	3.3
8000	1428	843	1.1	863	1.2	883	1.4	903	1.5	922	1.7	963	2.0	1005	2.4	1047	2.7	1088	3.1	1126	3.5
8500	1517	891	1.2	910	1.4	928	1.6	947	1.7	966	1.9	1003	2.2	1042	2.6	1082	3.0	1121	3.4	1159	3.8
9000	1607	939	1.4	957	1.6	974	1.8	992	1.9	1010	2.1	1044	2.5	1081	2.9	1118	3.2	1156	3.7	1192	4.1
9500	1696	987	1.7	1004	1.8	1021	2.0	1038	2.2	1054	2.4	1088	2.7	1121	3.1	1156	3.5	1192	3.9	1227	4.4
10000	1785	1036	1.9	1052	2.1	1068	2.3	1084	2.4	1100	2.6	1131	3.0	1162	3.4	1195	3.8	1229	4.3	1263	4.7
10500	1874	1085	2.2	1100	2.3	1115	2.5	1130	2.7	1145	2.9	1176	3.3	1205	3.7	1235	4.2	1267	4.6	1300	5.1
11000	1964	1134	2.4	1148	2.6	1162	2.8	1177	3.0	1191	3.2	1220	3.7	1249	4.1	1277	4.5	1307	5.0	1338	5.4
11500	2053	1183	2.8	1196	3.0	1210	3.2	1224	3.4	1238	3.6	1266	4.0	1293	4.5	1320	4.9	1348	5.4	1376	5.9
12000	2142	1232	3.1	1245	3.3	1258	3.5	1271	3.7	1285	4.0	1311	4.4	1338	4.9	1364	5.3	1390	5.8	1416	6.3
12500	2232	1281	3.5	1293	3.7	1306	3.9	1319	4.1	1332	4.3	1357	4.8	1383	5.3	1408	5.8	1433	6.3	1458	6.8
13000	2321	1330	3.8	1342	4.1	1354	4.3	1367	4.5	1379	4.8	1403	5.3	1428	5.8	1452	6.3	1477	6.8	1500	7.3
13500	2410	1379	4.3	1391	4.5	1403	4.7	1415	5.0	1426	5.2	1450	5.7	1474	6.2	1497	6.8	1521	7.3	1544	7.8
14000	2500	1429	4.7	1440	5.0	1451	5.2	1463	5.5	1474	5.7	1497	6.2	1520	6.8	1542	7.3	1565	7.8	1588	8.4
14500	2589	1478	5.2	1489	5.5	1500	5.7	1511	6.0	1522	6.2	1544	6.8	1566	7.3	1588	7.9	1610	8.4	1632	9.0
15000	2678	1528	5.7	1538	6.0	1549	6.3	1559	6.5	1570	6.8	1591	7.3	1612	7.9	1634	8.5	1655	9.0	1676	9.6
15500	2767	1577	6.3	1587	6.6	1598	6.8	1608	7.1	1618	7.4	1639	7.9	1659	8.5	1680	9.1	1700	9.7	1721	10.3
16000	2857	1627	6.9	1637	7.2	1647	7.4	1656	7.7	1666	8.0	1686	8.6	1706	9.2	1726	9.8	1746	10.4	1766	11.0
16500	2946	1676	7.5	1686	7.8	1696	8.1	1705	8.4	1715	8.7	1734	9.3	1753	9.9	1773	10.5	1792	11.1	1811	11.7

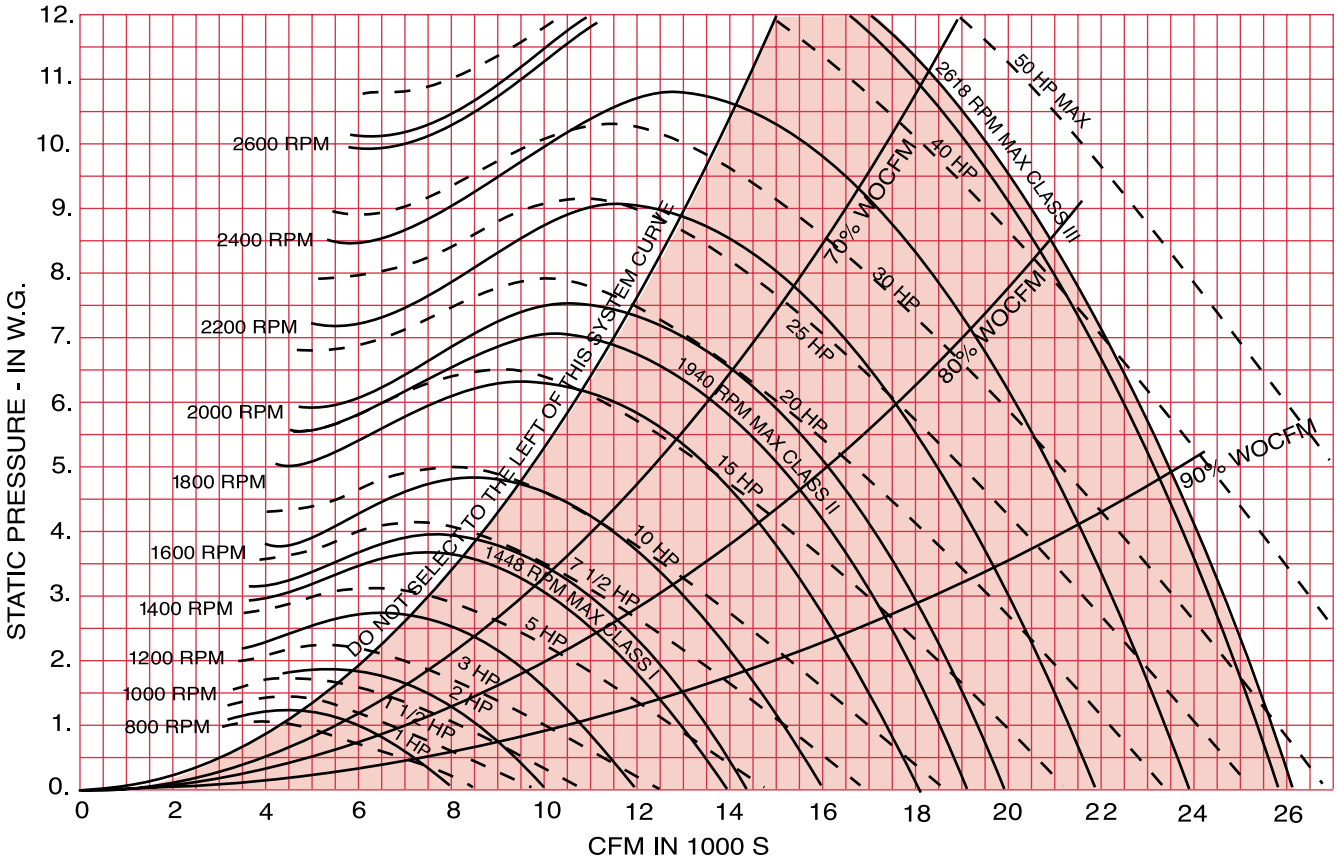
CFM Std. Air	Outlet Vel.	Total Static Pressure 2 1/4" RPM	BHP	2 1/2" RPM	BHP	3" RPM	BHP	3 1/2" RPM	BHP	4" RPM	BHP	4 1/2" RPM	BHP	5" RPM	BHP	5 1/2" RPM	BHP	6" RPM	BHP	6 1/2" RPM	BHP
8000	1428	1167	3.9	1207	4.4	1291	5.3														
8500	1517	1196	4.2	1234	4.7	1310	5.6	1390	6.6												
9000	1607	1229	4.5	1263	5.0	1334	5.9	1407	6.9	1483	8.0										
9500	1696	1262	4.8	1296	5.3	1362	6.2	1430	7.3	1500	8.4	1572	9.5								
10000	1785	1296	5.2	1329	5.7	1392	6.6	1456	7.7	1521	8.8	1588	9.9	1657	11.1						
10500	1874	1332	5.5	1363	6.0	1426	7.1	1485	8.1	1547	9.2	1609	10.4	1672	11.6	1738	12.9				
11000	1964	1368	5.9	1399	6.4	1459	7.5	1518	8.6	1574	9.6	1633	10.8	1692	12.1	1754	13.4	1816	14.7		
11500	2053	1406	6.4	1435	6.9	1493	7.9	1550	9.0	1605	10.1	1660	11.3	1716	12.6	1773	13.9	1832	15.3	1892	16.6
12000	2142	1444	6.8	1473	7.3	1529	8.4	1584	9.6	1638	10.7	1690	11.9	1743	13.1	1797	14.5	1852	15.8	1908	17.2
12500	2232	1484	7.3	1510	7.8	1565	8.9	1618	10.1	1671	11.3	1723	12.5	1772	13.7	1824	15.0	1875	16.4	1928	17.9
13000	2321	1525	7.8	1550	8.4	1602	9.5	1654	10.6	1705	11.9	1755	13.1	1803	14.4	1852	15.7	1902	17.1	1951	18.5
13500	2410	1567	8.4	1590	8.9	1640	10.0	1690	11.2	1740	12.5	1789	13.8	1837	15.1	1882	16.4	1930	17.8	1978	19.2
14000	2500	1609	8.9	1632	9.5	1678	10.7	1727	11.9	1775	13.1	1823	14.5	1870	15.8	1916	17.2	1960	18.5	2006	20.0
14500	2585	1653	9.6	1674	10.1	1719	11.3	1765	12.5	1812	13.8	1858	15.2	1904	16.5	1949	18.0	1994	19.4	2036	20.7
15000	2678	1697	10.2	1718	10.8	1760	12.0	1803	13.3	1849	14.6	1894	15.9	1939	17.3	1982	18.7	2026	20.2	2069	21.7
15500	2767	1741	10.9	1762	11.5	1801	12.7	1843	14.0	1887	15.3	1931	16.7	1974	18.1	2017	19.6	2059	21.1	2101	22.6
16000	2857	1786	11.6	1806	12.3	1844	13.5	1884	14.8	1925	16.2	1968	17.5	2010	18.9	2052	20.4	2093	22.0	2135	23.5
16500	2946	1830	12.4	1850	13.0	1888	14.3	1925	15.7	1965	17.0	2006	18.4	2047	19.8	2088	21.3	2128	22.9	2168	24.5
17000	3035	1876	13.2	1894	13.8	1932	15.2	1968	16.5	2005	17.9	2044	19.3	2085	20.8	2124	22.3	2164	23.8	2203	25.4
17500	3125	1921	14.0	1939	14.7	1975	16.1	2010	17.4	2047	18.9	2084	20.3	2122	21.8	2162	23.3	2200	24.9	2238	26.5
18000	3214	1967	14.9	1984	15.6	2020	17.0	2055	18.4	2089	19.8	2125	21.3	2161	22.8	2200	24.3	2237	25.9	2274	27.5
18500	3303	2013	15.8	2030	16.5	2064	17.9	2098	19.4	2131	20.9	2166	22.4	2201	23.9	2237	25.5	2275	27.0	2311	28.7
19000	3392	2059	16.7	2075	17.5	2109	18.9	2142	20.4	2176	22.0	2208	23.5	2242	25.0	2276	26.6	2313	28.2	2348	29.8
19500	3482	2105	17.7	2121	18.5	2154	20.0	2187	21.5	2219	23.1	2250	24.6	2283	26.2	2316	27.8	2350	29.5	2386	31.1

CFM Std. Air	Outlet Vel.	Total Static Pressure 7" RPM	BHP	7 1/2" RPM	BHP	8" RPM	BHP	8 1/2" RPM	BHP	9" RPM	BHP	9 1/2" RPM	BHP	10" RPM	BHP	10 1/2" RPM	BHP	11" RPM	BHP	11 1/2" RPM	BHP
13000	2321	2002	20.0	2054	21.5	2106	23.0	2159	24.7												
13500	2410	2025	20.7	2074	22.2	2124	23.8	2174	25.4	2225	27.0	2276	28.8								
14000	2500	2052	21.5	2098	23.0	2145	24.6	2192	26.2	2241	27.8	2290	29.5	2339	31.3						
14500	2589	2080	22.2	2124	23.8	2168	25.4	2214	27.0	2260	28.7	2306	30.5	2354	32.1	2401	33.9	2448	35.8		
15000	2678	2109	23.1	2152	24.7	2195	26.3	2238	27.9	2282	29.6	2326	31.3	2371	33.1	2416	34.8	2462	36.7	2508	38.6
15500	2767	2141	24.0	2182	25.6	2223	27.2	2265	28.8	2306	30.5	2348	32.3	2391	34.1	2434	35.9	2478	37.6	2522	39.5
16000	2857	2175	25.1	2213	26.5	2253	28.2	2293	29.8	2333	31.5	2373	33.3	2414	35.1	2455	36.9	2497	38.8	2539	40.7
16500	2946	2208	26.1	2248	27.7	2284	29.2	2323	30.9	2362	32.6	2401	34.3	2440	36.1	2479	37.9	2519	39.8	2559	41.7
17000	3035	2242	27.1	2280	28.7	2319	30.4	2354	32.0	2391	33.7	2429	35.4	2467	37.2	2505	39.1	2543	40.9	2581	42.9
17500	3125	2276	28.1	2314	29.8	2351	31.5	2388	33.2	2423	34.8	2459	36.6	2496	38.4	2533	40.2	2569	42.1	2606	44.1
18000	3214	231	29.2	2348	30.9	2385	32.7	2421	34.4	2457	36.2	2490	37.8	2526	39.6	2561	41.5	2597	43.4		
18500	3303	2347	30.4	2383	32.1	2419	33.9	2455	35.6	2490	37.5	2525	39.3	2557	40.9	2592	42.8				
19000	3392	2384	31.6	2419	33.3	2454	35.1	2489	36.9	2523	38.7	2558	40.6	2592	42.5						
19500	3482	2421	32.8	2455	34.6	2489	36.4	2523	38.2	2557	40.1	2591	42.0								
20000	3571	2458	34.1	2492	35.9	2525	37.7	2559	39.5	2592	41.4										
20500	3660	2496	35.5	2529	37.2	2562	39.1	2595	40.9												

Performance based on 0.075 lbs. per cubic foot density (air at 70 F and 29.92 Hg Bar). Performance shown is for installation Type B: free inlet, ducted outlet.
Power rating (BHP) does not include drive losses. Performance ratings do not include the effects of appurtenances in the airstream.
When inlet vanes are used increase rpm 1 percent and brake horsepower 3 percent.
Fan tables cover part of fan operating range; fan curves show full operating range.

Performance Data

Q Fan and Super Q II Size 30



—— Fan RPM Line
- - - Motor HP Line

Standard fans can be selected ONLY in the shaded area.
Thrust restrains are to be used with fans Class 3 or motors 40 hp and up.

Minimum and Maximum Motor HP Ranges

	Q Fan Size 30"			Super Q Fan Size 30"	
	Min - Max Motor HP Class 1	Min - Max Motor HP Class 2	Min - Max Motor HP Class 3	Min - Max Motor HP Class 1	Min - Max Motor HP Class 2
Arrangement 9	1 - 7.5	7.5 - 20	15 - 50	1 - 7.5	7.5 - 20
Arrangement 1	—	7.5 - 20	15 - 50	NA	NA

Performance Data

Q Fan and Super Q II Size 33

Fan Size 33"

Wheel Dia.	33.0 inches	838 mm
Inlet Area	7.78 square feet	0.723 m^2
Outlet Area	6.78 square feet	0.630 m^2
Tip Speed	8.64 x RPM ft./minute	2.633 m/minute

Pressure Class Limits

Class	Maximum RPM
I	1358
II	1822
III	2455

Minimum Fan RPM (Without VFRB Option)

Motor	Minimum Fan RPM
1800 RPM	490
1200 RPM	326

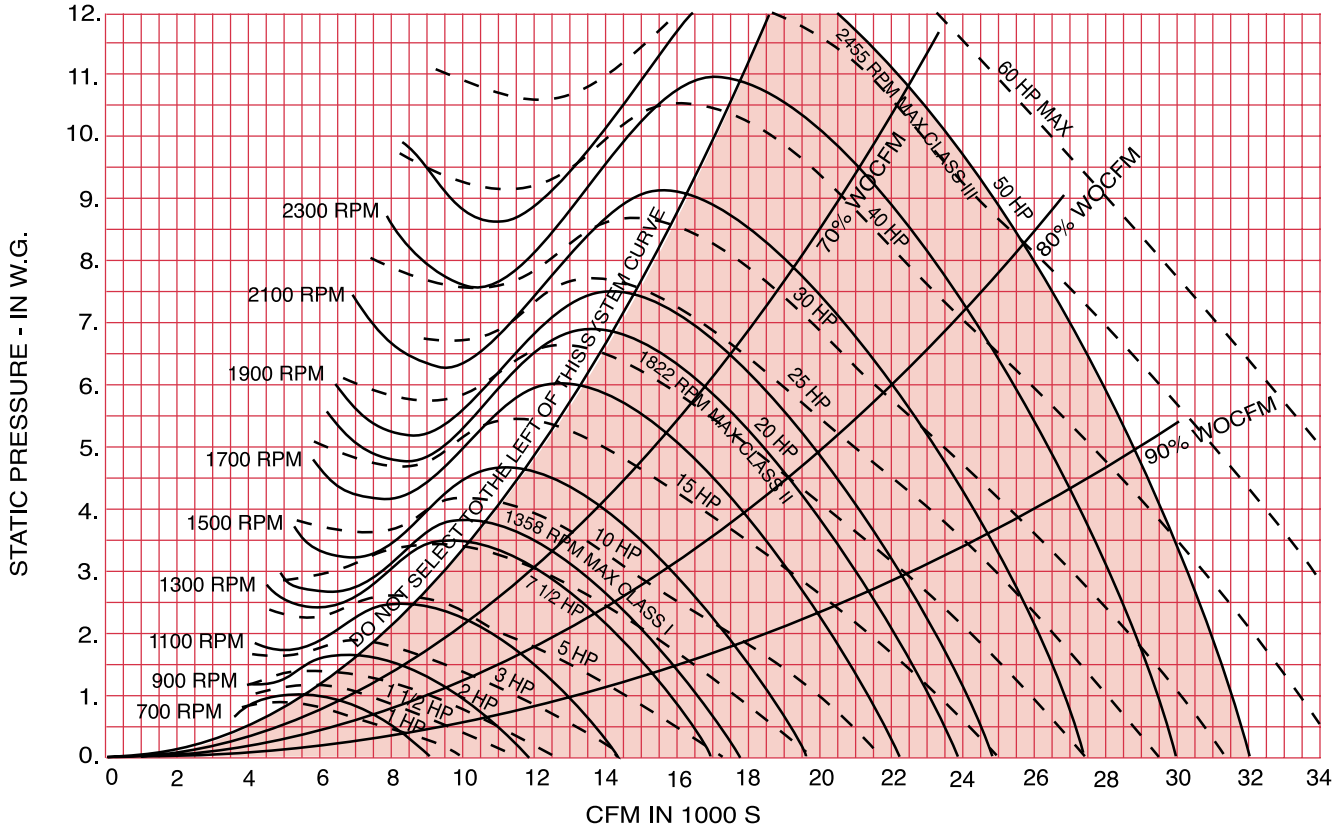
Table P-7 — Size 33 Q-Fan

CFM Std. Air	Outlet Vel.	Total Static Pressure 1/4" RPM	BHP	3/8" RPM	BHP	1/2" RPM	BHP	5/8" RPM	BHP	3/4" RPM	BHP	1" RPM	BHP	1 1/4" RPM	BHP	1 1/2" RPM	BHP	1 3/4" RPM	BHP	2" RPM	BHP
6000	884	521	0.4	554	0.6	588	0.7	620	0.8	651	1.0	713	1.3								
6600	973	560	0.5	590	0.6	621	0.8	652	0.9	681	1.1	737	1.4	793	1.8	8.54	2.2				
7200	1061	601	0.6	628	0.7	656	0.9	684	1.1	712	1.2	764	1.6	816	1.9	868	2.3	923	2.8		
7800	1150	643	0.7	667	0.9	693	1.0	719	1.2	745	1.4	795	1.7	843	2.1	890	2.5	938	2.9	989	3.4
8400	1238	686	0.8	708	1.0	731	1.2	755	1.4	779	1.5	827	1.9	873	2.3	916	2.7	960	3.1	1005	3.6
9000	1327	729	1.0	749	1.2	770	1.3	792	1.5	814	1.7	860	2.1	903	2.5	946	2.9	987	3.4	1027	3.8
9600	1415	772	1.2	791	1.3	810	1.5	830	1.7	851	1.9	893	2.3	936	2.8	976	3.2	1016	3.7	1054	4.1
10200	1504	816	1.3	833	1.5	851	1.7	870	1.9	889	2.1	929	2.6	969	3.0	1008	3.5	1046	3.9	1082	4.4
10800	1592	860	1.6	876	1.7	893	1.9	910	2.1	928	2.3	965	2.8	1003	3.3	1040	3.8	1077	4.3	1113	4.8
11400	1681	904	1.8	920	2.0	935	2.2	952	2.4	968	2.6	1003	3.1	1038	3.6	1074	4.1	1109	4.6	1144	5.1
12000	1769	948	2.0	963	2.2	978	2.4	993	2.7	1009	2.9	1041	3.4	1075	3.9	1108	4.4	1142	5.0	1176	5.5
12600	1858	993	2.3	1007	2.5	1021	2.7	1036	3.0	1050	3.2	1080	3.7	1112	4.2	1144	4.8	1176	5.3	1209	5.9
13200	1946	1038	2.6	1051	2.8	1064	3.1	1078	3.3	1092	3.5	1120	4.0	1150	4.6	1180	5.1	1211	5.7	1242	6.3
13800	2035	1083	3.0	1095	3.2	1108	3.4	1121	3.7	1134	3.9	1161	4.4	1189	4.9	1218	5.5	1247	6.1	1276	6.8
14400	2123	1128	3.3	1140	3.6	1152	3.8	1164	4.0	1177	4.3	1202	4.8	1229	5.4	1256	6.0	1284	6.6	1312	7.2
15000	2212	1173	3.7	1184	4.0	1196	4.2	1208	4.5	1220	4.7	1244	5.2	1269	5.8	1295	6.4	1321	7.1	1348	7.7
15600	2300	1218	4.2	1229	4.4	1240	4.7	1251	4.9	1263	5.2	1286	5.7	1310	6.3	1334	6.9	1359	7.5	1385	8.2
16200	2389	1263	4.6	1274	4.9	1284	5.1	1295	5.4	1306	5.7	1328	6.2	1351	6.8	1375	7.4	1398	8.1	1423	8.8
16800	2477	1308	5.1	1318	5.4	1329	5.6	1339	5.9	1350	6.2	1371	6.8	1393	7.4	1415	8.0	1438	8.6	1461	9.3
17400	2566	1353	5.6	1363	5.9	1373	6.2	1383	6.5	1393	6.7	1414	7.3	1435	8.0	1456	8.6	1478	9.3	1500	10.0
18000	2654	1399	6.2	1408	6.5	1418	6.8	1428	7.1	1437	7.3	1457	7.9	1477	8.6	1498	9.2	1519	9.9	1540	10.6
18600	2743	1444	6.8	1453	7.1	1463	7.4	1472	7.7	1481	8.0	1500	8.6	1520	9.2	1540	9.9	1560	10.6	1580	11.3
19200	2831	1490	7.5	1498	7.7	1507	8.0	1516	8.3	1526	8.7	1544	9.3	1563	9.9	1582	10.6	1601	11.3	1621	12.0
19800	2920	1535	8.1	1544	8.4	1552	8.7	1561	9.1	1570	9.4	1588	10.0	1606	10.7	1624	11.4	1643	12.1	1662	12.8

CFM Std. Air	Outlet Vel.	Total Static Pressure 2 1/4" RPM	BHP	2 1/2" RPM	BHP	3" RPM	BHP	3 1/2" RPM	BHP	4" RPM	BHP	4 1/2" RPM	BHP	5" RPM	BHP	5 1/2" RPM	BHP	6" RPM	BHP	6 1/2" RPM	BHP
9000	1327	1069	4.3	1112	4.9																
9600	1415	1092	4.6	1131	5.1	1212	6.3														
10200	1504	1118	4.9	1155	5.5	1228	6.6	1306	7.9												
10800	1592	1147	5.3	1181	5.8	1249	6.9	1320	8.2	1394	9.6										
11400	1681	1178	5.6	1210	6.2	1275	7.3	1339	8.5	1407	9.9	1478	11.5								
12000	1769	1208	6.0	1240	6.6	1302	7.7	1363	9.0	1425	10.3	1490	11.8								
12600	1858	1240	6.5	1271	7.0	1332	8.2	1389	9.5	1447	10.8	1508	12.2	1569	13.8	1634	15.5				
13200	1946	1273	6.9	1303	7.5	1362	8.7	1417	10.0	1474	11.3	1529	12.7	1587	14.2	1646	15.9	1707	17.7		
13800	2035	1306	7.4	1335	8.0	1392	9.2	1448	10.5	1500	11.9	1554	13.3	1607	14.7	1663	16.4	1719	18.1	1778	20.0
14400	2123	1340	7.9	1369	8.5	1424	9.8	1478	11.1	1529	12.5	1581	13.9	1632	15.4	1683	16.9	1736	18.6	1790	20.4
15000	2212	1375	8.4	1403	9.0	1457	10.4	1509	11.7	1560	13.1	1609	14.6	1658	16.1	1706	17.6	1756	19.2	1807	21.0
15600	2300	1411	8.9	1437	9.6	1490	11.0	1541	12.4	1590	13.8	1639	15.3	1686	16.8	1733	18.4	1779	20.0	1827	21.7
16200	2389	1448	9.5	1473	10.2	1523	11.6	1573	13.1	1621	14.5	1669	16.0	1716	17.6	1760	19.2	1806	20.8	1851	22.5
16800	2477	1485	10.1	1509	10.8	1557	12.3	1606	13.8	1654	15.4	1700	16.8	1746	18.4	1789	20.0	1833	21.7	1877	23.4
17400	2566	1523	10.7	1546	11.4	1593	13.0	1640	14.5	1686	16.1	1731	17.6	1776	19.3	1820	20.9	1861	22.5	1904	24.3
18000	2654	1562	11.3	1584	12.1	1629	13.7	1674	15.3	1719	16.9	1764	18.6	1807	20.1	1850	21.8	1892	23.5	1932	25.2
18600	2743	1601	12.1	1622	12.8	1665	14.4	1709	16.1	1753	17.8	1796	19.5	1839	21.2	1881	22.8	1922	24.5	1963	26.3
19200	2831	1641	12.8	1661	13.6	1703	15.2	1744	16.9	1787	18.6	1830	20.4	1871	22.1	1912	23.8	1953	25.6	1993	27.4
19800	2920	1681	13.6	1700	14.4	1740	16.1	1781	17.8	1822	19.5	1863	21.3	1904	23.1	1945	24.9	1984	26.6	2023	28.5
20400	3008	1721	14.4	1740	15.2	1778	16.9	1818	18.7	1857	20.5	1897	22.3	1938	24.1	1977	26.0	2016	27.9	2054	29.6
21000	3097	1762	15.3	1780	16.1	1817	17.8	1855	19.6	1894	21.4	1932	23.3	1971	25.2	2010	27.1	2048	29.0	2085	30.8
21600	3185	1804	16.2	1821	17.1	1856	18.8	1893	20.5	1930	22.5	1968	24.4	2005	26.3	2044	28.2	2081	30.2	2118	32.2
22200	3274	1845	17.2	1862	18.0	1896	19.8	1931	21.6	1968	23.5	2004	25.4	2040	27.4	2078	29.4	2114	31.4	2151	33.5
22800	3362	1887	18.2	1903	19.1	1936	20.8	1970	22.6	2006	24.6	2041	26.6	2076	28.6	2112	30.6	2148	32.7	2184	34.8

CFM Std. Air	Outlet Vel.	Total Static Pressure 7" RPM	BHP	7 1/2" RPM	BHP	8" RPM	BHP	8 1/2" RPM	BHP	9" RPM	BHP	9 1/2" RPM	BHP	10" RPM	BHP	10 1/2" RPM	BHP	11" RPM	BHP	11 1/2" RPM	BHP
16000	2359	1890	24.0	1938	25.9	1987	27.9	2037	30.1												
16600	2448	1912	24.8	1957	26.7	2004	28.6	2050	30.7	2099	32.9	2148	35.2								
17200	2536	1938	25.8	1980	27.5	2024	29.5	2068	31.5	2113	33.6	2159	35.8	2207	38.2						
17800	2625	1964	26.7	2006	28.6	2046	30.4	2088	32.4	2131	34.5	2175	36.6	2219	38.9	2264	41.3				
18400	2713	1992	27.7	2032	29.6	2072	31.5	2111	33.4	2152	35.4	2193	37.5	2236	39.8	2278	42.1	2321	44.5	2366	47.0
19000	2802	2020	28.8	2059	30.7	2098	32.6	2138	34.6	2175	36.5	2214	38.6	2254	40.8	2295	43.0	2336	45.4	2377	47.9
19600	2890	2052	30.0	2088	31.8	2126	33.7	2164	35.7	2202	37.8	2238	39.7	2276	41.9	2315	44.1	2354	46.4	2394	48.8
20200	2979	2082	31.1	2119	33.1	2154	34.9	2191	36.9	2228	39.0	2265	41.1	2300	43.1	2337	45.3	2374	47.6	2412	49.9
20800	3067	2112	32.3	2149	34.3	2186	36.3	2220	38.2	2255	40.3	2291	42.4	2327	44.5	2362	46.7	2396	48.8	2433	51.1
21400	3156	2143	33.6	2180	35.6	2216	37.6	2251	39.6	2284	41.6	2318	43.8	2353	45.9	2388	48.1	2423	50.4		
22000	3244	2176	35.0	2211	36.9	2246	38.9	2281	41.0	2315	43.1	2347	45.2	2381	47.4	2415	49.6	2448	51.8		
22600	3333	2208	36.4	2243	38.5	2277	40.4	2311	42.5	2345	44.6	2378	46.8	2409	48.9	2442	51.1				
23200	3421	2241	37.8	2275	39.9	2308	41.8	2342	44.0	2375	46.1	2408	48.3	2441	50.6						
23800	3510	2274	39.2	2307	41.4	2341	43.5	2373	45.5	2406	47.7	2439	49.9								
24400	3598	2307	40.6	2340	42.9	2373	45.1	2406	47.3	2437	49.3										
25000	3687	2341	42.1	2374	44.4	2406	46.7	2438	49.0												

Performance based on 0.075 lbs. per cubic foot density (air at 70 F and 29.92 Hg Bar). Performance shown is for installation Type B: free inlet, ducted outlet.
Power rating (BHP) does not include drive losses. Performance ratings do not include the effects of appurtenances in the airstream.
When inlet vanes are used increase rpm 1 percent and brake horsepower 3 percent.
Fan tables cover part of fan operating range; fan curves show full operating range.



—— Fan RPM Line
- - - Motor HP Line

Standard fans can be selected ONLY in the shaded area.
Thrust restrains are to be used with fans Class 3 or motors 40 hp and up.

Minimum and Maximum Motor HP Ranges

	Q Fan Size 33"			Super Q Fan Size 33"	
	Min - Max Motor HP Class 1	Min - Max Motor HP Class 2	Min - Max Motor HP Class 3	Min - Max Motor HP Class 1	Min - Max Motor HP Class 2
Arrangement 9	1 - 10	7.5 - 25	20 - 50	1 - 10	7.5 - 20
Arrangement 1	1.5 - 10	7.5 - 25	20 - 60	NA	NA

Performance Data

Q Fan and Super Q II Size 36

Fan Size 36"

Wheel Dia.	36.5 inches	927 mm
Inlet Area	9.52 square feet	0.884 m^2
Outlet Area	8.30 square feet	0.771 m^2
Tip Speed	9.56 x RPM ft./minute	2.914 m/minute

Pressure Class Limits

Class	Maximum RPM
I	1228
II	1647
III	2217

Minimum Fan RPM (Without VFRB Option)

Motor	Minimum Fan RPM
1800 RPM	400
1200 RPM	266

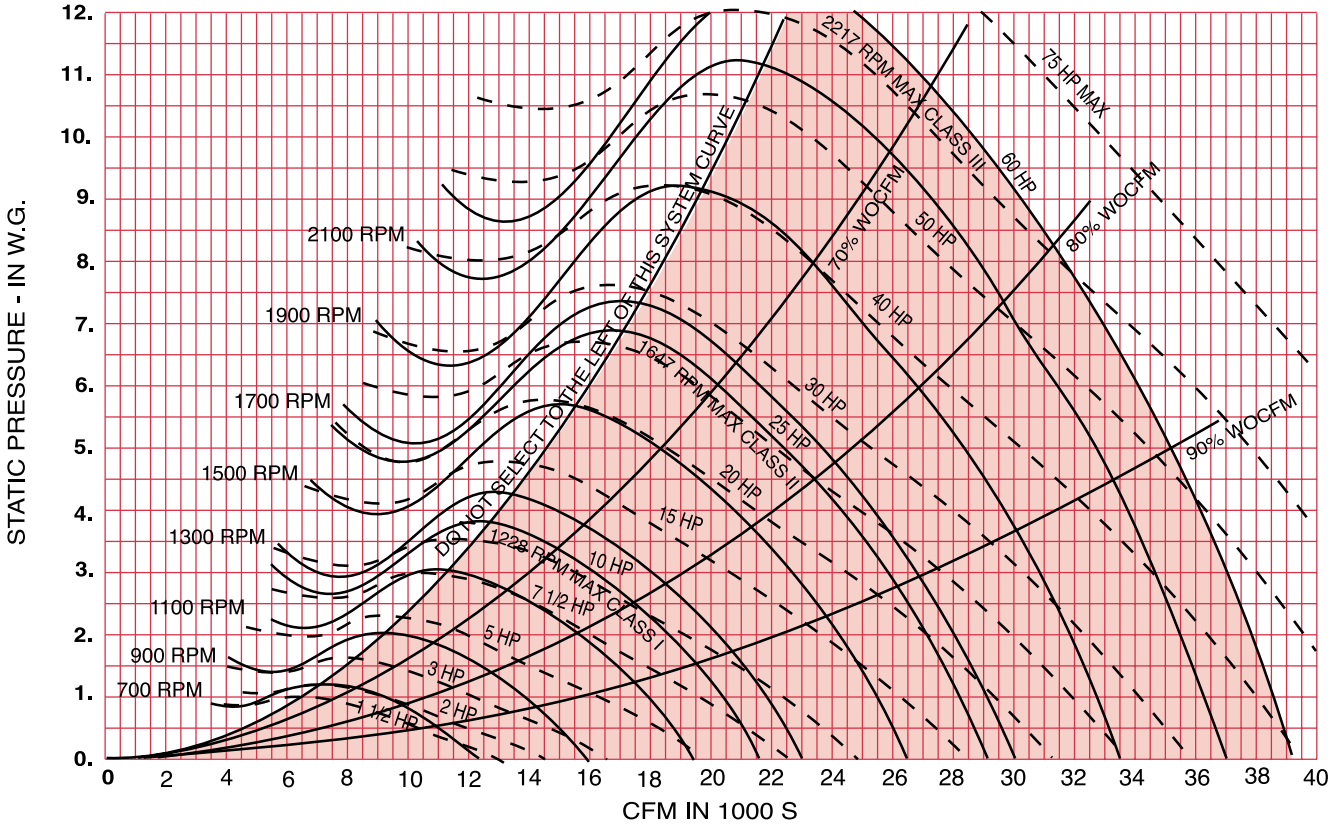
Table P-8 — Size 36 Q-Fan

CFM Std. Air	Out-let Vel.	Total Static Pressure 1/4" RPM	BHP	3/8" RPM	BHP	1/2" RPM	BHP	5/8" RPM	BHP	3/4" RPM	BHP	1" RPM	BHP	1 1/4" RPM	BHP	1 1/2" RPM	BHP	1 3/4" RPM	BHP	2" RPM	BHP
6000	722	409	0.4	446	0.5	481	0.6	515	0.8	550	1.0										
6800	819	445	0.5	4.78	0.6	510	0.8	541	0.9	571	1.1	633	1.5								
7600	915	483	0.5	512	0.7	542	0.9	570	1.1	598	1.2	651	1.6	708	2.1						
8400	1012	523	07	549	08	575	1.0	602	1.2	628	1.4	677	1.8	725	2.2	776	2.8				
9200	1108	564	08	586	10	611	1.2	635	1.4	659	1.6	706	2.0	750	2.5	795	3.0	841	3.5		
10000	1204	605	1.0	626	1.2	647	1.4	670	1.6	692	1.8	736	2.3	779	2.7	819	3.2	860	3.7	902	4.3
10800	1301	648	1.2	666	1.4	686	1.6	706	1.8	727	2.0	769	2.5	809	3.0	847	3.5	885	4.1	922	4.6
11600	1397	690	1.4	708	1.6	725	1.8	744	2.0	763	2.3	802	2.8	840	3.3	877	3.8	912	4.4	948	5.0
12400	1493	733	1.6	749	1.8	766	2.1	783	2.3	800	2.6	836	3.1	873	3.7	908	4.2	943	4.8	975	5.4
13200	1590	777	1.9	792	2.1	807	2.4	823	2.6	839	2.9	872	3.4	906	4.0	940	4.6	973	5.2	1006	5.8
14000	1686	820	2.2	834	2.4	849	2.7	863	2.9	878	3.2	909	3.8	941	4.4	973	5.0	1005	5.7	1036	6.3
14800	1783	864	2.6	877	2.8	891	3.1	904	3.3	918	3.6	947	4.2	977	4.8	1007	5.5	1038	6.1	1068	6.8
15600	1879	908	2.9	920	3.2	933	3.5	946	3.7	959	4.0	986	4.6	1014	5.3	1042	5.9	1071	6.6	1100	7.3
16400	1975	952	3.4	964	3.6	976	3.9	988	4.2	1000	4.5	1026	5.1	1052	5.7	1079	6.4	1106	7.2	1134	7.9
17200	2072	996	3.8	1008	4.1	1019	4.4	1030	4.7	1042	5.0	1066	5.6	1090	6.3	1116	7.0	1142	7.7	1168	8.5
18000	2168	1041	4.3	1051	4.6	1062	4.9	1073	5.2	1084	5.5	1107	6.2	1130	6.8	1154	7.6	1178	8.4	1203	9.1
18800	2265	1085	4.9	1095	5.2	1106	5.5	1116	5.8	1127	6.1	1148	6.8	1170	7.5	1192	8.2	1215	9.0	1239	9.8
19600	2361	1130	5.5	1139	5.8	1149	6.1	1159	6.4	1169	6.7	1190	7.4	1211	8.1	1232	8.9	1254	9.7	1276	10.5
20400	2457	1174	6.1	1183	6.4	1193	6.8	1202	7.1	1212	7.4	1232	8.1	1251	8.9	1272	9.6	1293	10.4	1314	11.3
21200	2554	1219	6.8	1228	7.1	1237	7.5	1246	7.8	1255	8.2	1274	8.9	1293	9.6	1312	10.4	1332	11.2	1352	12.1
22000	2650	1263	7.6	1272	7.9	1281	8.3	1290	8.6	1298	9.0	1316	9.7	1335	10.5	1353	11.3	1372	12.1	1391	13.0
22800	2746	1308	8.4	1316	8.7	1325	9.1	1333	9.4	1342	9.8	1359	10.6	1377	11.4	1394	12.2	1412	13.0	1431	13.9
23600	2843	1353	9.2	1361	9.6	1369	10.0	1377	10.3	1385	10.7	1402	11.5	1419	12.3	1436	13.1	1453	14.0	1471	14.9
24400	2939	1398	10.2	1405	10.5	1413	10.9	1421	11.3	1429	11.7	1445	12.5	1461	13.3	1478	14.2	1494	15.0	1511	15.9

CFM Std. Air	Out-let Vel.	Total Static Pressure 2 1/4" RPM	BHP	2 1/2" RPM	BHP	3" RPM	BHP	3 1/2" RPM	BHP	4" RPM	BHP	4 1/2" RPM	BHP	5" RPM	BHP	5 1/2" RPM	BHP	6" RPM	BHP	6 1/2" RPM	BHP
12000	1445	996	5.8	1029	6.4	1100	7.9														
12800	1542	1022	6.2	1054	6.9	1118	8.2	1185	9.8												
13600	1638	1052	6.7	1081	7.3	1142	8.7	1202	10.2	1266	12.0										
14400	1734	1082	7.2	1111	7.9	1167	9.3	1223	10.8	1282	12.4	1342	14.2								
15200	1831	1113	7.8	1141	8.4	1195	9.9	1249	11.4	1302	13.0	1358	14.8	1415	16.7						
16000	1927	1145	8.4	1172	9.1	1225	10.5	1276	12.1	1327	13.7	1378	15.4	1431	17.3	1485	19.3				
16800	2024	1178	9.0	1204	9.7	1256	11.2	1306	12.8	1354	14.4	1403	16.2	1451	18.0	1501	19.9	1553	22.1	1606	24.4
17600	2120	1211	9.6	1237	10.4	1287	12.0	1335	13.6	1382	15.2	1428	17.0	1475	18.8	1521	20.7	1569	22.8	1618	25.0
18400	2216	1245	10.3	1270	11.1	1319	12.8	1366	14.4	1412	16.1	14S6	17.9	1501	19.7	1544	21.6	1589	23.6	1635	25.8
19200	2313	1281	11.0	1304	11.9	1351	13.6	1398	15.3	1442	17.0	1486	18.9	1528	20.7	1571	22.6	1612	24.6	1655	26.7
20000	2409	1317	11.8	1340	12.6	1385	14.4	1430	16.3	1473	18.0	1516	19.9	1558	21.8	1598	23.7	1639	25.7	1679	27.7
20800	2506	1354	12.6	1376	13.5	1419	15.3	1462	17.2	1505	19.1	1546	20.9	1587	22.9	1628	24.9	1666	26.9	1705	29.0
21600	2602	1392	13.4	1412	14.4	1454	16.2	1496	18.2	1537	20.2	1578	22.1	1618	24.0	1657	26.1	1694	28.1	1732	30.2
22400	2698	1430	14.3	1449	15.3	1489	17.2	1529	19.2	1570	21.2	1610	23.3	1648	25.2	1687	27.3	1725	29.4	1760	31.5
23200	2795	1469	15.3	1488	16.2	1526	18.3	1564	20.3	1604	22.4	1642	24.5	1680	26.6	1717	28.6	1754	30.8	1791	33.0
24000	2891	1508	16.3	1526	17.3	1563	19.3	1600	21.4	1637	23.6	1675	25.7	1713	27.9	1749	30.1	1785	32.2	1821	34.4
24800	2987	1548	17.4	1565	18.4	1600	20.4	1636	22.6	1672	24.8	1709	27.0	1745	29.3	1781	31.5	1816	33.8	1851	35.9
25600	3084	1589	18.6	1605	19.6	1638	21.6	1673	23.8	1708	26.1	1743	28.4	1779	30.7	1814	33.0	1848	35.3	1882	37.5
26400	3180	1629	19.8	1645	20.8	1677	22.9	1710	25.1	1744	27.4	1778	29.8	1812	32.1	1847	34.5	1880	36.9	1914	39.3
27200	3277	1670	21.1	1686	22.1	1716	24.2	1748	26.5	1781	28.8	1814	31.2	1847	33.6	1880	36.1	1913	38.5	1946	41.0
28000	3373	1712	22.5	1726	23.5	1756	25.7	1787	27.9	1818	30.3	1850	32.7	1882	35.2	1914	37.7	1947	40.2	1979	42.8
28800	3469	1753	23.9	1767	25.0	1796	27.1	1826	29.4	1856	31.8	1887	34.3	1918	36.8	1949	39.4	198O	42.0	2012	44.5
29600	3566	1795	25.4	1809	26.5	1836	28.7	1865	31.0	1894	33.4	1924	35.9	1954	38.5	1984	41.1	2014	43.8	2045	46.4
30400	3662	1837	27.0	1850	28.1	1877	30.3	1905	32.7	1933	35.1	1961	37.6	1991	40.3	2020	42.9	2049	45.6	2079	48.3

CFM Std. Air	Out-let Vel.	Total Static Pressure 7" RPM	BHP	7 1/2" RPM	BHP	8" RPM	BHP	8 1/2" RPM	BHP	9" RPM	BHP	9 1/2" RPM	BHP	10" RPM	BHP	10 1/2" RPM	BHP	11" RPM	BHP	11 1/2" RPM	BHP
19000	2289	16.95	28.7	1740	31.1	1787	33.6														
19800	2385	1714	29.6	1757	32.0	1800	34.4	1845	37.0	1891	39.7										
20600	2481	1737	30.8	1777	33.0	1818	35.4	1860	37.9	1902	40.6	1946	43.3								
21400	2578	1764	32.1	1801	34.2	1839	36.6	1878	39.0	1918	41.6	1958	44.3	2000	47.1	2042	50.1				
22200	2674	1790	33.4	1827	35.7	1863	37.9	1900	40.3	1937	42.8	1976	45.4	2014	48.2	2054	51.1	2094	54.0		
23000	2771	1818	34.8	1854	37.1	1889	39.4	1925	41.8	1959	44.2	1996	46.8	2032	49.4	2070	52.2	2107	55.2	2145	58.2
23800	2867	1848	36.3	1881	38.6	1916	40.9	1950	43.4	1985	45.8	2018	48.2	2053	50.9	2088	53.6	2124	56.5	2160	59.4
24600	2963	1878	37.9	1912	40.2	1944	42.5	1977	45.0	2011	47.5	2044	50.0	2076	52.5	2109	55.2	2143	58.0	2178	60.8
25400	3060	1908	39.5	1941	41.9	1974	44.3	2005	46.7	2037	49.2	2070	51.8	2102	54.4	2133	56.9	2165	59.6	2198	62.5
26200	3156	1939	41.1	1971	43.6	2004	46.0	2036	48.5	2065	51.0	2097	53.6	2128	56.2	2160	58.9	2191	61.7		
27000	3253	1970	43.1	2002	45.3	2034	47.8	2065	50.4	2096	53.0	2125	55.5	2155	58.1	2186	60.9	2216	63.6		
27800	3349	2002	44.9	2034	47.4	2064	49.7	2095	52.3	2126	55.0	2156	57.6	2184	60.2	2213	62.9				
28600	3445	2035	46.7	2065	49.3	2096	51.9	2126	54.3	2156	57.0	2185	59.7	2215	62.4						
29400	3542	2067	48.6	2098	51.3	2128	54.0	2157	56.4	2186	59.1	2215	61.9								
30200	3638	2101	50.6	2130	53.3	2160	56.1	2189	58.8												
31000	3734	2134	52.6	2164	55.4	2192	58.2														

Performance based on 0.075 lbs. per cubic foot density (air at 70 F and 29.92 Hg Bar). Performance shown is for installation Type B: free inlet, ducted outlet.
Power rating (BHP) does not include drive losses. Performance ratings do not include the effects of appurtenances in the airstream.
When inlet vanes are used increase rpm 1 percent and brake horsepower 3 percent.
Fan tables cover part of fan operating range; fan curves show full operating range.



—— Fan RPM Line
- - - Motor HP Line

Standard fans can be selected ONLY in the shaded area.
Thrust restrains are to be used with fans Class 3 or motors 40 hp and up.

Minimum and Maximum Motor HP Ranges

	Q Fan Size 36"			Super Q Fan Size 36"	
	Min - Max Motor HP Class 1	Min - Max Motor HP Class 2	Min - Max Motor HP Class 3	Min - Max Motor HP Class 1	Min - Max Motor HP Class 2
Arrangement 9	1.5 - 15	10 - 30	25 - 50	1.5 - 15	10 - 30
Arrangement 1	1.5 - 15	10 - 30	25 - 75	NA	NA

Performance Data

Q Fan and Super Q II Size 40

Fan Size 40"

Wheel Dia.	40.3 inches	1022 mm
Inlet Area	11.56 square feet	1.074 m^2
Outlet Area	10.09 square feet	0.937 m^2
Tip Speed	10.54 x RPM ft./minute	3.213 m/minute

Pressure Class Limits

Class	Maximum RPM
I	1110
II	1492
III	2050

Minimum Fan RPM (Without VFRB Option)

Motor	Minimum Fan RPM
1800 RPM	301
1200 RPM	200

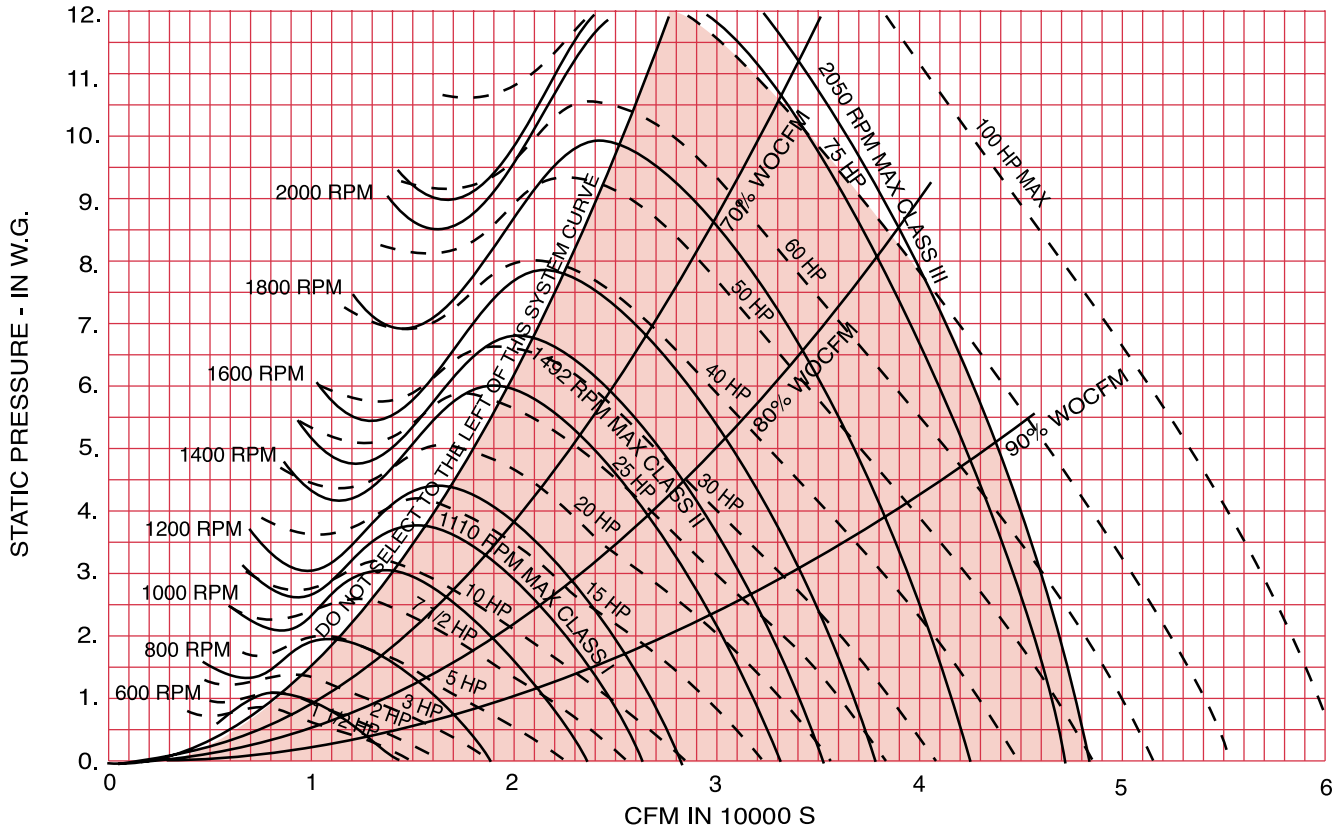
Table P-9 — Size 40 Q Fan

CFM Std. Air	Outlet Vel.	Total Static Pressure 1/4" RPM	BHP	3/8" RPM	BHP	1/2" RPM	BHP	5/8" RPM	BHP	3/4" RPM	BHP	1" RPM	BHP	1 1/4" RPM	BHP	1 1/2" RPM	BHP	1 3/4" RPM	BHP	2" RPM	BHP
8000	792	395	0.5	426	0.7	455	0.9	483	1.1	511	1.3	571	1.8								
8800	872	422	0.6	450	0.8	478	1.0	505	1.2	530	1.4	582	1.9								
9600	951	451	0.7	477	0.9	502	1.1	528	1.3	552	1.6	599	2.1	647	2.6						
10400	1030	481	0.8	504	1.1	528	1.3	552	1.5	575	1.7	619	2.2	662	2.8	707	3.4				
11200	1110	512	1.0	532	1.2	554	1.4	576	1.7	598	1.9	641	2.5	681	3.0	721	3.6	763	4.3		
12000	1189	543	1.1	562	1.4	582	1.6	602	1.9	623	2.2	663	2.7	701	3.2	739	3.9	777	4.5	816	5.2
12800	1268	574	1.3	592	1.6	610	1.8	629	2.1	648	2.4	687	3.0	724	3.5	759	4.1	795	4.8	830	5.5
13600	1347	606	1.5	622	1.8	639	2.0	657	2.3	675	2.6	711	3.2	747	3.8	781	4.5	814	5.1	848	5.8
14400	1427	638	1.8	653	2.0	669	2.3	685	2.6	702	2.9	736	3.5	771	4.2	804	4.8	836	5.5	867	6.2
15200	1506	670	2.0	684	2.3	699	2.5	714	2.8	730	3.1	762	3.8	795	4.5	827	5.2	858	5.9	888	6.6
16000	1585	702	2.3	716	2.6	730	2.8	744	3.1	759	3.5	789	4.1	820	4.9	851	5.6	881	6.3	910	7.0
16800	1665	735	2.6	748	2.9	761	3.2	774	3.5	788	3.8	817	4.5	846	5.2	876	6.0	905	6.8	933	7.5
17600	1744	767	2.9	780	3.2	792	3.5	805	3.8	818	4.2	845	4.9	872	5.6	901	6.4	929	7.2	957	8.0
18400	1823	800	3.3	812	3.6	824	3.9	836	4.2	848	4.6	873	5.3	900	6.1	926	6.9	954	7.7	980	8.5
19200	1902	833	3.7	844	4.0	855	4.3	867	4.7	878	5.0	902	5.7	927	6.5	953	7.4	979	8.2	1005	9.1
20000	1982	866	4.1	876	4.4	887	4.8	898	5.1	909	5.5	932	6.2	956	7.0	980	7.9	1005	8.8	1030	9.7
20800	2061	899	4.6	909	4.9	919	5.3	930	5.6	940	6.0	962	6.7	985	7.5	1008	8.4	1031	9.3	1055	10.3
21600	2140	932	5.1	942	5.4	952	5.8	962	6.1	972	6.5	993	7.3	1014	8.1	1036	9.0	1059	9.9	1081	10.9
22400	2220	965	5.6	974	6.0	984	6.3	994	6.7	1003	7.1	1023	7.9	1044	8.7	1065	9.6	1086	10.6	1108	11.5
23200	2299	998	6.2	1007	6.5	1016	6.9	1026	7.3	1035	7.7	1054	8.5	1074	9.4	1094	10.3	1114	11.2	1136	12.2
24000	2378	1031	6.8	1040	7.2	1049	7.5	1058	7.9	1067	8.3	1085	9.2	1104	10.0	1123	11.0	1143	11.9	1163	13.0
24800	2457	1064	7.4	1073	7.8	1081	8.2	1090	8.6	1099	9.0	1117	9.8	1135	10.8	1153	11.7	1172	12.7	1191	13.7
25600	2537	1098	8.1	1106	8.5	1114	8.9	1123	9.3	1131	9.8	1148	10.6	1165	11.5	1183	12.5	1201	13.5	1220	14.5
26400	2616	1131	8.9	1139	9.3	1147	9.7	1155	10.1	1163	10.5	1180	11.4	1196	12.4	1214	13.3	1231	14.3	1249	15.4

CFM Std. Air	Outlet Vel.	Total Static Pressure 2 1/4" RPM	BHP	2 1/2" RPM	BHP	3" RPM	BHP	3 1/2" RPM	BHP	4" RPM	BHP	4 1/2" RPM	BHP	5" RPM	BHP	5 1/2" RPM	BHP	6" RPM	BHP	6 1/2" RPM	BHP
15000	1486	913	7.2	942	8.0	1004	9.7	1069	11.7												
15800	1565	933	7.7	962	8.5	1019	10.1	1078	12.0												
16600	1645	956	8.2	982	9.0	1037	10.7	1091	12.5	1149	14.6										
17400	1724	978	8.7	1005	9.5	1056	11.2	1107	13.0	1161	15.0	1216	17.3								
18200	1803	1001	9.2	1027	10.1	1076	11.8	1126	13.6	1175	15.6	1227	17.7	1280	20.1						
19000	1883	1024	9.8	1049	10.6	1099	12.4	1146	14.3	1192	16.2	1241	18.3	1290	20.7	1342	23.2				
19800	1962	1049	10.4	1073	11.3	1121	13.1	1166	15.0	1212	17.0	1257	19.0	1304	21.3	1351	23.7	1401	26.4		
20600	2041	1073	11.0	1097	12.0	1143	13.8	1189	15.7	1232	17.7	1276	19.8	1319	22.0	1364	24.4	1410	27.0	1458	29.7
21400	2120	1098	11.7	1121	12.6	1167	14.6	1211	16.5	1253	18.5	1295	20.7	1338	22.9	1379	25.2	1423	27.7	1467	30.4
22200	2200	1124	12.4	1146	13.3	1191	15.4	1234	17.3	1276	19.4	1316	21.5	1357	23.8	1396	26.0	1438	28.5	1480	31.1
23000	2279	1150	13.1	1171	14.1	1215	16.2	1257	18.3	1298	20.3	1338	22.5	1377	24.7	1416	27.1	1454	29.4	1494	32.0
23800	2358	1177	13.8	1198	14.9	1240	17.0	1281	19.2	1321	21.3	1360	23.5	1397	25.7	1436	28.1	1474	30.6	1511	33.0
24600	2438	1204	14.6	1224	15.7	1265	17.8	1305	20.1	1344	22.3	1383	24.5	1420	26.9	1456	29.2	1493	31.7	1530	34.2
25400	2517	1232	15.4	1251	16.5	1290	18.8	1329	21.0	1368	23.4	1405	25.6	1442	28.0	1479	30.4	1513	32.8	1549	35.4
26200	2596	1260	16.2	1279	17.4	1316	19.7	1354	22.0	1392	24.4	1429	26.8	1465	29.1	1501	31.6	1534	34.0	1569	36.6
27000	2675	1288	17.1	1306	18.3	1343	20.6	1379	23.1	1416	25.5	1453	28.0	1488	30.3	1523	32.8	1557	35.4	1590	37.9
27800	2755	1317	18.1	1334	19.2	1370	21.7	1405	24.1	1441	26.6	1477	29.2	1512	31.7	1546	34.1	1579	36.7	1613	39.4
28600	2834	1346	19.1	1363	20.2	1397	22.7	1431	25.2	1466	27.8	1501	30.4	1535	33.0	1569	35.4	1602	38.1	1635	40.8
29400	2913	1376	20.1	1392	21.3	1425	23.8	1458	26.4	1492	29.0	1526	31.6	1560	34.3	1593	37.0	1625	39.5	1657	42.2
30200	2993	1406	21.3	1421	22.4	1453	24.9	1485	27.6	1518	30.2	1551	32.9	1584	35.7	1616	38.4	1649	41.2	1680	43.8
31000	3072	1436	22.4	1451	23.6	1481	26.1	1513	28.8	1544	31.5	1576	34.3	1609	37.0	1641	39.9	1672	42.7	1703	45.4
31800	3151	1466	23.6	1480	24.8	1510	27.4	1541	30.1	1571	32.8	1602	35.6	1634	38.5	1665	41.4	1696	44.3	1727	47.2
32600	3230	1496	24.9	1511	26.1	1539	28.7	1568	31.3	1599	34.2	1629	37.1	1659	40.0	1690	42.9	1720	45.9	1750	48.9
33400	3310	1527	26.2	1541	27.5	1568	30.0	1597	32.7	1626	35.6	1656	38.6	1685	41.5	1715	44.5	1745	47.5	1774	50.6

CFM Std. Air	Outlet Vel.	Total Static Pressure 7" RPM	BHP	7 1/2" RPM	BHP	8" RPM	BHP	8 1/2" RPM	BHP	9" RPM	BHP	9 1/2" RPM	BHP	10" RPM	BHP	10 1/2" RPM	BHP	11" RPM	BHP	11 1/2" RPM	BHP
23000	2279	1535	34.8	1576	37.7	1619	40.7														
23800	2358	1549	35.7	1589	38.5	1629	41.5	1670	44.7												
24600	2438	1566	36.8	1603	39.5	1641	42.5	1680	45.6	1720	48.8										
25400	2517	1585	38.1	1619	40.7	1655	43.5	1692	46.6	1730	49.8	1768	53.1	1807	56.6						
26200	2596	1604	39.3	1638	42.0	1672	44.7	1707	47.7	1743	50.8	1779	54.1	1816	57.5	1854	61.1				
27000	2675	1623	40.6	1657	43.4	1690	46.2	1723	49.0	1757	52.1	1792	55.3	1827	58.6	1862	62.1	1899	65.7		
27800	2755	1644	42.0	1677	44.8	1709	47.6	1740	50.4	1773	53.4	1806	56.6	1840	59.8	1874	63.3	1908	66.8	1944	70.5
28600	2834	1667	43.5	1697	46.2	1729	49.1	1760	52.1	1791	54.9	1823	58.0	1855	61.2	1887	64.6	1921	68.1	1954	71.7
29400	2913	1689	45.0	1718	47.8	1749	50.7	1780	53.6	1811	56.7	1840	59.6	1871	62.7	1902	66.1	1934	69.5	1966	73.0
30200	2993	1711	46.6	1742	49.5	1770	52.3	1800	55.3	1830	58.3	1860	61.4	1890	64.6	1919	67.7	1949	71.0	1980	74.5
31000	3072	1733	48.2	1764	51.1	1793	54.1	1821	57.0	1851	60.0	1880	63.2	1909	66.4	1938	69.7	1966	72.8		
31800	3151	1756	49.9	1786	52.8	1815	55.8	1844	58.9	1871	61.8	1900	65.0	1928	68.2	1957	71.5	1985	74.9		
32600	3230	1780	51.8	1809	54.6	1838	57.6	1866	60.7	1895	63.9	1921	66.9	1949	70.1	1976	73.4				
33400	3310	1804	53.6	1832	56.4	1860	59.5	1889	62.6	1916	65.8	1944	69.0	1969	72.1						
34200	3389	1828	55.5	1856	58.6	1883	61.5	1911	64.6	1939	67.8	1966	71.1	1993	74.4						
35000	3468	1852	57.3	1880	60.5	1907	63.7	1934	66.6	1961	69.9	1988	73.2								

Performance based on 0.075 lbs. per cubic foot density (air at 70 F and 29.92 Hg Bar). Performance shown is for installation Type B: free inlet, ducted outlet.
Power rating (BHP) does not include drive losses. Performance ratings do not include the effects of appurtenances in the airstream.
When inlet vanes are used increase rpm 1 percent and brake horsepower 3 percent.
Fan tables cover part of fan operating range; fan curves show full operating range.



—— Fan RPM Line
- - - Motor HP Line

Standard fans can be selected ONLY in the shaded area.
Thrust restrains are to be used with fans Class 3 or motors 40 hp and up.

Minimum and Maximum Motor HP Ranges

	Q Fan Size 40"			Super Q Fan Size 40"	
	Min - Max Motor HP Class 1	Min - Max Motor HP Class 2	Min - Max Motor HP Class 3	Min - Max Motor HP Class 1	Min - Max Motor HP Class 2
Arrangement 9	1.5 - 15	10 - 40	30 - 50	1.5 - 15	10 - 40
Arrangement 1	1.5 - 15	10 - 40	30 - 75	NA	NA

Performance Data

Q Fan and Super Q II Size 44

Fan Size 44"

Wheel Dia.	44.5 inches	1130 mm
Inlet Area	14.14 square feet	1.314 m^2
Outlet Area	12.33 square feet	1.145 m^2
Tip Speed	11.65 x RPM ft./minute	3.551 m/minute

Pressure Class Limits

Class	Maximum RPM
I	1070
II	1352
III	1922

Minimum Fan RPM (Without VFRB Option)

Motor	Minimum Fan RPM
1800 RPM	289
1200 RPM	192

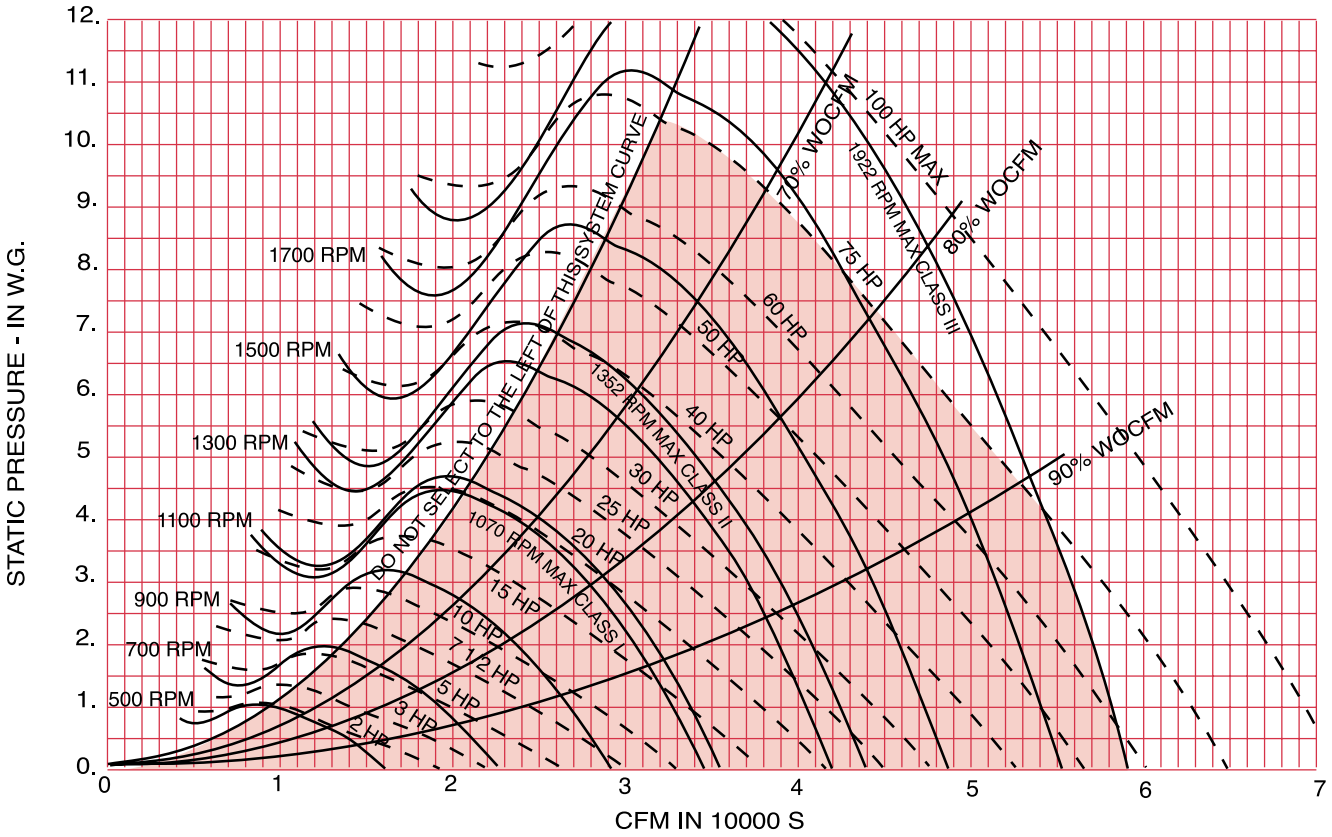
Table P-10 — Size 44 Q-Fan

CFM Std. Air	Outlet Vel.	Total Static Pressure 1/4" RPM	1/4" BHP	3/8" RPM	3/8" BHP	1/2" RPM	1/2" BHP	5/8" RPM	5/8" BHP	3/4" RPM	3/4" BHP	1" RPM	1" BHP	1 1/4" RPM	1 1/4" BHP	1 1/2" RPM	1 1/2" BHP	1 3/4" RPM	1 3/4" BHP	2" RPM	2" BHP
9000	729	335	0.5	364	0.7	392	1.0	420	1.2	451	1.5										
10000	811	360	0.7	385	0.9	412	1.1	437	1.3	463	1.6	517	2.2								
11000	892	386	0.8	409	1.0	433	1.2	457	1.5	480	1.8	526	2.4								
12000	973	413	0.9	434	1.2	456	1.4	478	1.7	499	2.0	542	2.6	585	3.3						
13000	1054	440	1.1	460	1.3	480	1.6	500	1.9	520	2.2	559	2.8	598	3.5	639	4.2				
14000	1135	468	1.2	487	1.5	505	1.8	523	2.1	542	2.4	580	3.0	616	3.7	652	4.5	691	5.4	729	6.3
15000	1216	496	1.4	514	1.7	531	2.0	548	2.4	565	2.7	600	3.3	635	4.0	669	4.8	702	5.6	738	6.5
16000	1297	525	1.7	541	2.0	557	2.3	574	2.6	590	3.0	622	3.7	655	4.4	687	5.2	719	6.0	750	6.8
17000	1378	554	1.9	569	2.2	584	2.6	600	2.9	615	3.3	645	4.0	676	4.7	707	5.5	736	6.4	767	7.3
18000	1459	583	2.2	597	2.5	612	2.9	626	3.2	641	3.6	669	4.4	698	5.2	727	6.0	756	6.8	784	7.7
19000	1540	612	2.5	626	2.9	639	3.2	653	3.6	667	4.0	694	4.8	721	5.6	748	6.4	776	7.3	804	8.2
20000	1622	641	2.9	654	3.2	667	3.6	681	4.0	694	4.4	719	5.2	745	6.1	771	6.9	797	7.8	824	8.7
21000	1703	671	3.2	683	3.6	696	4.0	708	44	721	4.8	745	5.7	770	6.6	794	7.4	819	8.4	844	9.3
22000	1784	701	3.6	712	4.0	724	4.4	736	4.8	748	5.3	772	6.2	795	7.1	818	8.0	842	9.0	866	9.9
23000	1865	730	4.1	742	4.5	753	4.9	764	5.3	776	5.8	798	6.7	821	7.7	843	8.6	865	9.6	888	10.6
24000	1946	760	4.6	771	5.0	782	5.4	793	5.9	804	6.3	825	7.3	847	8.2	869	9.3	890	10.3	911	11.3
25000	2027	790	5.1	800	5.5	811	6.0	821	6.4	832	6.9	853	7.9	873	8.9	894	9.9	915	11.0	935	12.0
26000	2108	820	5.7	830	6.1	840	6.6	850	7.0	860	7.5	880	8.5	900	9.5	920	10.6	940	11.7	960	12.8
27000	2189	850	6.3	860	6.7	869	7.2	879	7.7	889	8.2	908	9.2	927	10.3	947	11.4	966	12.5	985	13.7
28000	2270	880	6.9	889	7.4	899	7.9	908	8.4	917	8.9	936	9.9	955	11.0	973	12.2	992	13.3	1010	14.5
29000	2351	910	7.6	919	8.1	928	8.6	937	9.1	946	9.6	964	10.7	982	11.8	1000	13.0	1018	14.2	1036	15.4
30000	2433	941	8.4	949	8.9	958	9.4	966	9.9	975	10.4	992	11.5	1010	12.7	1027	13.9	1045	15.1	1062	16.3
31000	2514	971	9.2	979	9.7	987	10.2	996	10.7	1004	11.3	1021	12.4	1038	13.6	1055	14.8	1072	16.0	1088	17.3
32000	2595	1001	10.0	1009	10.6	1017	11.1	1025	11.6	1033	12.2	1050	13.4	1066	14.6	1082	15.8	1099	17.1	1115	18.4

CFM Std. Air	Outlet Vel.	Total Static Pressure 2 1/4" RPM	2 1/4" BHP	2 1/2" RPM	2 1/2" BHP	3" RPM	3" BHP	3 1/2" RPM	3 1/2" BHP	4" RPM	4" BHP	4 1/2" RPM	4 1/2" BHP	5" RPM	5" BHP	5 1/2" RPM	5 1/2" BHP	6" RPM	6" BHP	6 1/2" RPM	6 1/2" BHP
16000	1297	784	7.8	818	8.9																
17000	1378	796	8.2	828	9.2																
18000	1459	813	8.7	841	9.6	901	11.9														
19000	1540	830	9.2	857	10.2	911	12.3	969	14.8												
20000	1622	849	9.7	874	10.7	925	12.8	978	15.2	1033	18.0										
21000	1703	869	10.3	893	11.3	942	13.5	990	15.7	1043	18.5	1094	21.3								
22000	1784	890	10.9	914	12.0	960	14.1	1005	16.4	1053	18.9	1103	21.9								
23000	1865	911	11.6	934	12.6	978	14.9	1023	17.2	1067	19.6	1113	22.4	1161	25.5						
24000	1946	933	12.3	955	13.4	999	15.6	1041	18.0	1083	20.5	1126	23.1	1170	26.0	1216	29.4				
25000	2027	956	13.1	977	14.2	1019	16.4	1060	18.9	1101	21.4	1141	23.9	1182	26.8	1225	29.9	1270	33.4		
26000	2108	979	13.9	999	15.0	1040	17.3	1080	19.8	1119	22.3	1158	25.0	1197	27.7	1237	30.7	1279	34.0	1322	37.6
27000	2189	1004	14.8	1023	15.9	1061	18.3	1101	20.7	1139	23.3	1176	26.0	1214	28.9	1251	31.7	1290	34.8	1331	38.4
28000	2270	1029	15.7	1047	16.8	1084	19.3	1122	21.7	1159	24.4	1195	27.1	1231	30.0	1268	32.9	1304	35.8	1342	39.2
29000	2351	1054	16.6	1072	17.9	1107	20.3	1143	22.9	1180	25.5	1215	28.3	1250	31.1	1285	34.1	1320	37.2	1355	40.3
30000	2433	1079	17.6	1096	18.9	1130	21.4	1165	24.0	1201	26.6	1235	29.4	1270	32.4	1303	35.4	1337	38.5	1370	41.5
31000	2514	1105	18.6	1122	19.9	1154	22.5	1188	25.2	1222	28.0	1256	30.7	1290	33.7	1322	36.7	1355	39.9	1388	43.1
32000	2595	1131	19.7	1147	21.0	1180	23.8	1211	26.4	1244	29.2	1277	32.0	1310	35.0	1342	38.1	1373	41.3	1405	44.5
33000	2676	1157	20.8	1173	22.2	1205	25.0	1235	27.7	1267	30.6	1298	33.5	1331	36.4	1362	39.5	1394	42.8	1424	46.0
34000	2757	1184	22.0	1199	23.4	1230	26.3	1260	29.2	1290	32.0	1321	35.0	1352	37.9	1383	41.1	1414	44.3	1443	47.6
35000	2838	1211	23.2	1226	24.6	1255	27.6	1285	30.6	1314	33.5	1343	36.5	1373	39.6	1404	42.6	1434	45.9	1464	49.3
36000	2919	1238	24.5	1252	25.9	1281	29.0	1310	32.0	1338	35.0	1367	38.1	1396	41.2	1425	44.3	1455	47.6	1484	51.0
37000	3000	1265	25.8	1279	27.3	1307	30.4	1335	33.5	1363	36.7	1390	39.7	1419	42.9	1447	46.2	1476	49.4	1504	52.8
38000	3081	1293	27.2	1306	28.8	1334	31.9	1361	35.1	1388	38.3	1415	41.4	1442	44.7	1469	48.0	1497	51.4	1525	54.7
39000	3163	1320	28.7	1334	30.3	1360	33.4	1387	36.7	1413	40.0	1440	43.3	1466	46.5	1492	49.9	1519	53.4	1547	56.7

CFM Std. Air	Outlet Vel.	Total Static Pressure 7" RPM	7" BHP	7 1/2" RPM	7 1/2" BHP	8" RPM	8" BHP	8 1/2" RPM	8 1/2" BHP	9" RPM	9" BHP	9 1/2" RPM	9 1/2" BHP	10" RPM	10" BHP	10 1/2" RPM	10 1/2" BHP	11" RPM	11" BHP	11 1/2" RPM	11 1/2" BHP
28000	2270	1381	42.9	1420	46.7	1458	50.6														
29000	2351	1392	43.7	1430	47.6	1468	51.6	1505	55.6												
30000	2433	1405	44.9	1440	48.5	1476	52.3	1514	56.6	1550	60.7										
31000	2514	1420	46.2	1453	49.7	1488	53.4	1522	57.4	1559	61.8	1594	66.0								
32000	2595	1437	47.9	1468	51.1	1501	54.7	1534	58.6	1568	62.6	1603	67.2	1637	71.5						
33000	2676	1455	49.5	1486	52.9	1516	56.2	1547	59.9	1579	63.9	1612	68.1	1646	72.7						
34000	2757	1473	51.1	1503	54.6	1533	58.2	1562	61.5	1593	65.4	1624	69.4	1655	73.7						
35000	2838	1492	52.7	1521	56.3	1550	59.9	1580	63.6	1608	67.1	1637	71.0								
36000	2919	1512	54.5	1540	58.1	1568	61.7	1597	65.5	1625	69.3	1652	72.8								
37000	3000	1532	56.3	1560	60.0	1587	63.6	1615	67.4	1642	71.3										
38000	3081	1553	58.2	1580	61.9	1607	65.6	1633	69.4	1660	73.3										
39000	3163	1574	60.2	1601	63.9	1627	67.7	1652	71.4												
40000	3244	1595	62.3	1621	66.0	1647	69.8	1673	73.7												
41000	3325	1616	64.7	1642	68.2	1668	72.0														
42000	3406	1638	66.9	1664	70.5	1689	74.3														
43000	3487	1661	69.3	1685	73.1																

Performance based on 0.075 lbs. per cubic foot density (air at 70 F and 29.92 Hg Bar). Performance shown is for installation Type B: free inlet, ducted outlet.
Power rating (BHP) does not include drive losses. Performance ratings do not include the effects of appurtenances in the airstream.
When inlet vanes are used increase rpm 1 percent and brake horsepower 3 percent.
Fan tables cover part of fan operating range; fan curves show full operating range.



—— Fan RPM Line
- - - Motor HP Line

Standard fans can be selected ONLY in the shaded area.
Thrust restrains are to be used with fans Class 3 or motors 40 hp and up.

Minimum and Maximum Motor HP Ranges

	Q Fan Size 44"			Super Q Fan Size 44"	
	Min - Max Motor HP Class 1	Min - Max Motor HP Class 2	Min - Max Motor HP Class 3	Min - Max Motor HP Class 1	Min - Max Motor HP Class 2
Arrangement 9	3 - 20	15 - 40	40 - 50	3 - 20	15 - 40
Arrangement 1	3 - 20	15 - 40	40 - 75	NA	NA

Performance Data

Q Fan Size 49

Fan Size 49"

Wheel Dia.	49.0 inches	1245 mm
Inlet Area	14.96 square feet	1.390 m^2
Outlet Area	14.96 square feet	1.390 m^2
Tip Speed	12.83 x RPM ft./minute	3.911 m/minute

Pressure Class Limits

Class	Maximum RPM
I	949
II	1274

Minimum Fan RPM (Without VFRB Option)

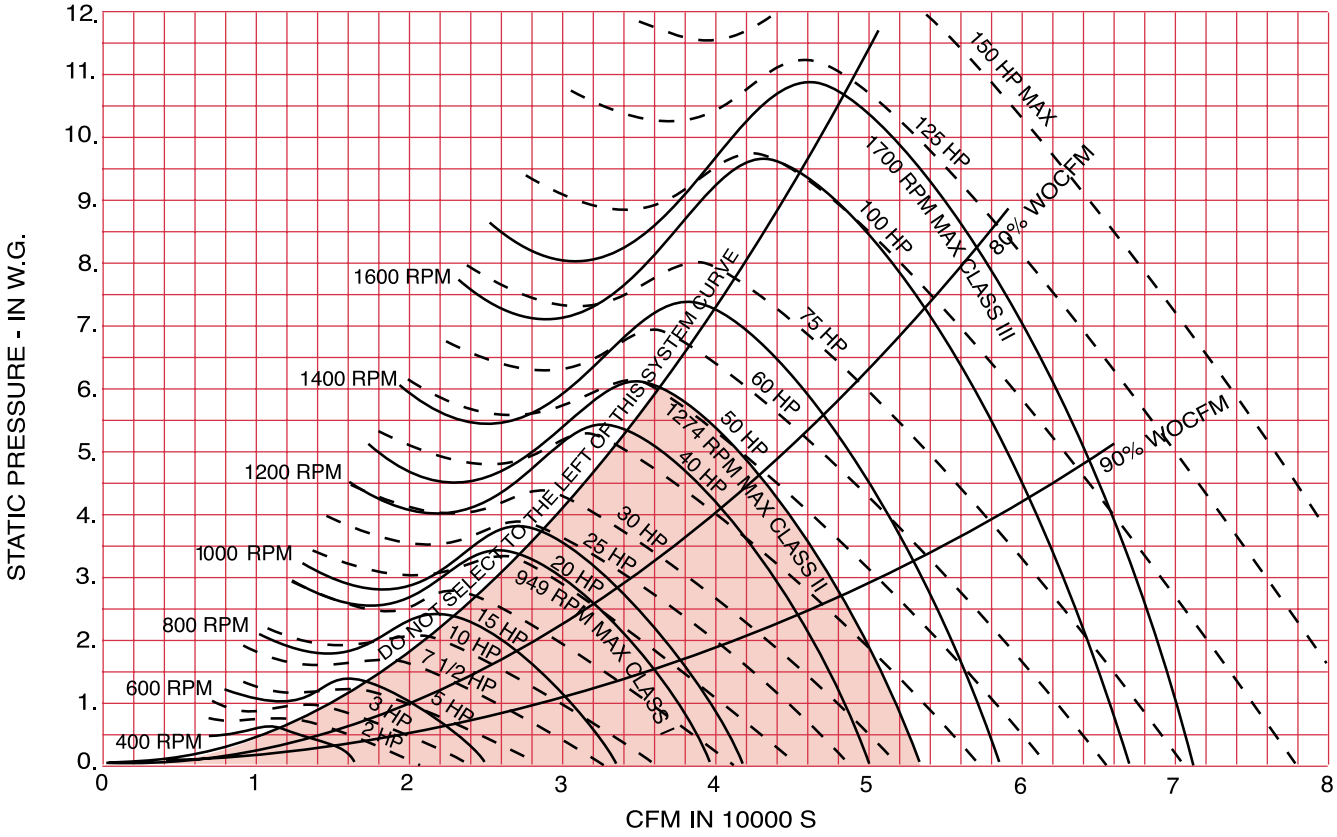
Motor	Minimum Fan RPM
1800 RPM	301
1200 RPM	201

Table P-11 — Size 49 Q-Fan

CFM Std. Air	Out-let Vel.	Total Static Pressure 1/4" RPM	BHP	3/8" RPM	BHP	1/2" RPM	BHP	5/8" RPM	BHP	3/4" RPM	BHP	1" RPM	BHP	1 1/4" RPM	BHP	1 1/2" RPM	BHP	1 3/4" RPM	BHP	2" RPM	BHP
13000	868	353	1.0	376	1.2	400	1.6	425	1.9	451	2.3										
•14000	935	373	1.1	395	1.4	417	1.7	439	2.1	463	2.4										
15000	1002	394	1.3	414	1.6	435	1.9	455	2.3	476	2.6	521	3.5								
•16000	1069	415	1.4	434	1.8	453	2.1	472	2.5	492	2.9	532	3.7								
17000	1136	437	1.6	454	2.0	472	2.4	490	2.7	508	3.1	545	4.0	585	4.9						
18000	1203	458	1.9	475	2.2	492	2.6	509	3.0	525	3.4	560	4.3	596	5.2						
19000	1270	480	2.1	496	2.5	511	2.9	528	3.3	544	3.7	576	4.6	610	5.6	645	6.6				
20000	1336	503	2.4	517	2.8	532	3.2	547	3.6	563	4.1	593	4.9	624	5.9	657	7.0	691	8.1		
21000	1403	525	2.7	539	3.1	552	3.5	567	3.9	582	4.4	611	5.3	640	6.3	671	7.4	702	8.5		
22000	1470	548	3.0	560	3.4	574	3.9	587	4.3	601	4.8	629	5.8	657	6.7	685	7.8	715	9.0	745	10.2
23000	1537	570	3.4	582	3.8	595	4.2	608	4.7	621	5.2	648	6.2	674	7.2	701	8.3	729	9.5	757	10.7
•24000	1604	593	3.7	605	4.2	616	4.6	629	5.1	641	5.6	667	6.7	692	7.7	718	8.8	744	10.0	771	11.2
25000	1671	616	4.2	627	4.6	638	5.1	650	5.6	662	6.1	686	7.2	711	8.3	735	9.3	760	10.5	785	11.8
26000	1737	639	4.6	649	5.1	660	5.6	671	6.1	682	6.6	706	7.7	730	8.8	753	9.9	777	11.1	801	12.4
27000	1804	662	5.1	672	5.6	682	6.1	693	6.6	704	7.1	726	8.2	749	9.4	772	10.6	794	11.8	817	13.0
28000	1871	685	5.6	695	6.1	704	6.6	715	7.1	725	7.7	746	8.8	768	10.0	790	11.3	812	12.5	834	13.7
29000	1938	708	6.1	717	6.6	727	7.2	737	7.7	746	8.3	767	9.5	788	10.7	809	12.0	830	13.2	851	14.5
30000	2005	731	6.7	740	7.2	749	7.8	759	8.3	768	8.9	788	10.1	808	11.4	828	12.7	849	14.0	869	15.3
31000	2072	754	7.3	763	7.9	772	8.4	781	9.0	790	9.6	809	10.8	828	12.1	848	13.5	868	14.8	888	16.2
32000	2139	777	8.0	786	8.6	794	9.1	803	9.7	812	10.3	830	11.6	848	12.9	867	14.2	887	15.6	906	17.1
33000	2205	801	8.7	809	9.3	817	9.9	826	10.5	834	11.1	851	12.4	869	13.7	887	15.1	906	16.5	925	18.0
34000	2272	824	9.4	832	10.0	840	10.6	848	11.2	856	11.9	873	13.2	890	14.5	908	15.9	926	17.4	944	18.9
35000	2339	847	10.2	855	10.8	863	11.4	871	12.1	879	12.7	895	14.1	911	15.4	928	16.9	946	18.4	964	19.9
36000	2406	871	11.0	878	11.7	886	12.3	893	13.0	901	13.6	917	15.0	933	16.4	949	17.8	966	19.3	983	20.9

CFM Std. Air	Out-let Vel.	Total Static Pressure 2 1/4" RPM	BHP	2 1/2" RPM	BHP	3" RPM	BHP	3 1/2" RPM	BHP	4" RPM	BHP	4 1/2" RPM	BHP	5" RPM	BHP	5 1/2" RPM	BHP	6" RPM	BHP	6 1/2" RPM	BHP
23000	1537	787	12.0																		
24000	1604	798	12.6	827	13.9																
25000	1671	811	13.1	838	14.5																
26000	1737	825	13.8	851	15.2	903	18.1														
27000	1804	840	14.4	864	15.8	913	18.8														
28000	1871	856	15.1	879	16.5	925	19.5	974	22.8												
29000	1938	873	15.8	894	17.3	939	20.3	985	23.6												
30000	2005	890	16.6	910	18. 1	953	21.2	996	24.4	1042	27.9										
31000	2072	907	17.5	927	18.9	968	22.0	1009	25.3	1053	28.8										
32000	2139	925	18.4	944	19.8	983	22.9	1023	26.3	1064	29.7	1107	33.5								
33000	2205	944	19.4	962	20.8	999	23.9	1038	27.3	1077	30.8	1118	34.5								
34000	2272	962	20.4	980	21.9	1016	24.9	1053	28.3	1091	31.9	1129	35.6	1170	39.5						
35000	2339	981	21.4	999	23.0	1033	26.0	1069	29.4	1105	33.0	1143	36.8	1181	40.6	1221	44.8				
36000	2406	1000	22.5	1017	24.1	1051	27.2	1085	30.5	1120	34.2	1156	38.0	1192	41.9	1230	46.0				
37000	2473	1020	23.6	1036	25.2	1069	28.4	1102	31.7	1136	35.4	1171	39.2	1206	43.2	1242	47.3				
38000	2540	1039	24.8	1055	26.4	1088	29.8	1120	33.0	1152	36.6	1186	40.5	1220	44.5	1254	48.6				
39000	2606	1058	25.9	1075	27.6	1106	31.1	1137	34.4	1169	38.0	1201	41.9	1234	45.9						
40000	2673	1078	27.1	1094	28.9	1125	32.4	1155	35.8	1186	39.4	1217	43.3	1249	47.4						
41000	2740	1099	28.4	1114	30.2	1144	33.8	1174	37.5	1203	40.9	1234	44.8	1264	48.9						
42000	2807	1119	29.8	1133	31.6	1163	35.3	1193	39.0	1221	42.5	1251	46.4								
43000	2874	1140	31.2	1154	33.0	1183	36.8	1211	40.6	1240	44.3	1268	48.0								
44000	2941	1160	32.6	1174	34.5	1202	38.3	1230	42.2	1258	46.1										
45000	3008	1181	34.2	1195	36.0	1222	39.8	1250	43.8												
46000	3074	1202	35.7	1215	37.6	1241	41.5	1269	45.5												

Performance based on 0.075 lbs. per cubic foot density (air at 70 F and 29.92 Hg Bar).
Performance shown is for installation Type B: free inlet, ducted outlet.
Power rating (BHP) does not include drive losses.
Performance ratings do not include the effects of appurtenances in the airstream.
When inlet vanes are used increase rpm 1 percent and brake horsepower 3 percent.
Fan tables cover part of fan operating range; fan curves show full operating range.



—— Fan RPM Line
- - - Motor HP Line

Standard fans can be selected ONLY in the shaded area.
Thrust restrains are to be used with fans Class 3 or motors 40 hp and up.
Super Q II fans are NOT available in size 49.
Horizontal fans only, for vertical units contact marketing in Lexington.

Minimum and Maximum Motor HP Ranges

	Q Fan Size 49"			Super Q Fan Size 49"	
	Min - Max Motor HP Class 1	Min - Max Motor HP Class 2	Min - Max Motor HP Class 3	Min - Max Motor HP Class 1	Min - Max Motor HP Class 2
Arrangement 9	2 - 20	20 - 50	—	NA	NA
Arrangement 1	—	—	—	NA	NA

Performance Data

Q Fan Size 54

Fan Size 54"

Wheel Dia.	54.3 inches	1378 mm
Inlet Area	18.37 square feet	1.707 m^2
Outlet Area	18.37 square feet	1.707 m^2
Tip Speed	14.20 x RPM ft./minute	4.328 m/minute

Pressure Class Limits

Class	Maximum RPM
I	857
II	1151

Minimum Fan RPM (Without VFRB Option)

Motor	Minimum Fan RPM
1800 RPM	292
1200 RPM	195

Table P-12 — Size 54 Q-Fan

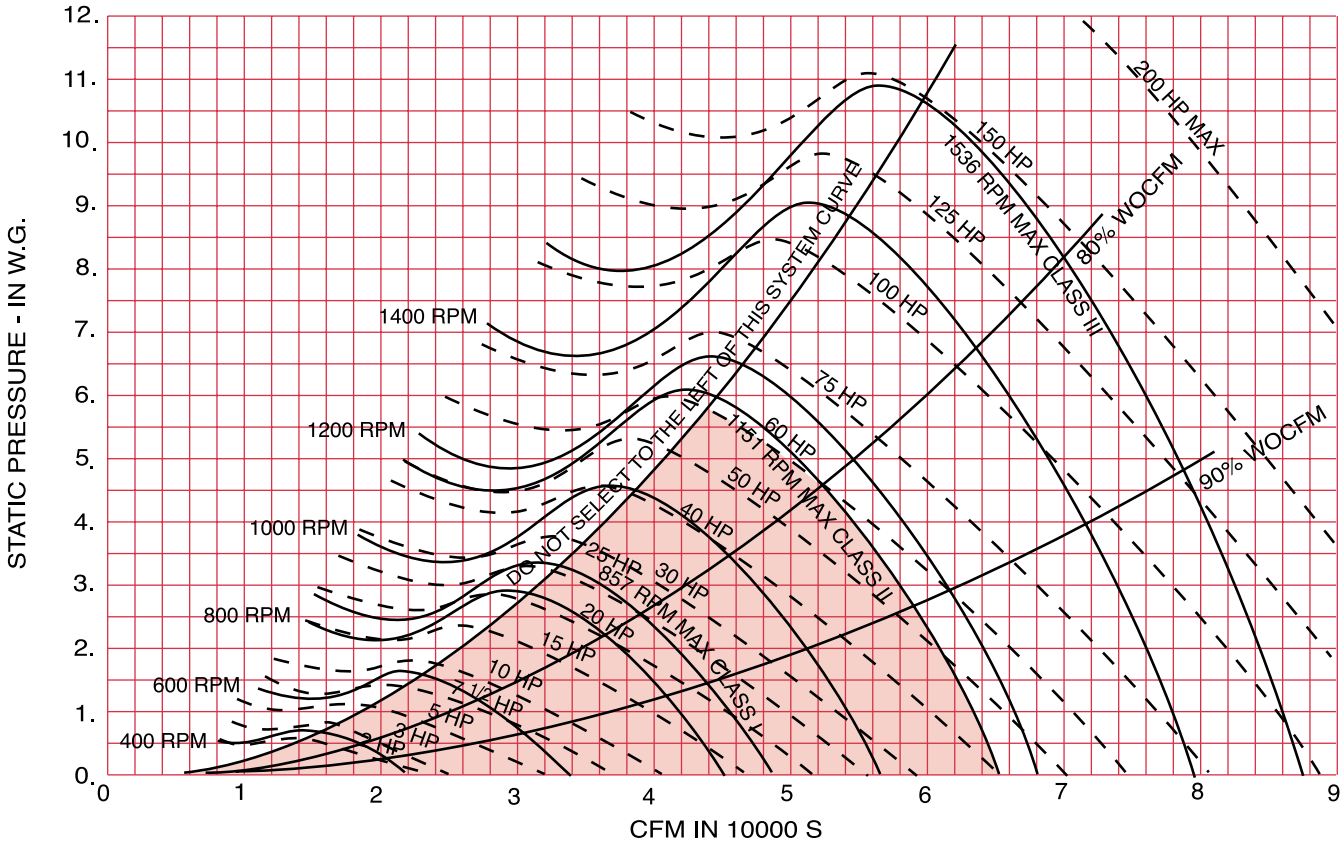
CFM Std. Air	Out-let Vel.	Total Static Pressure																			
		1/4"		3/8"		1/2"		5/8"		3/4"		1"		1 1/4"		1 1/2"		1 3/4"		2"	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
16200	881	323	1.2	344	1.6	365	1.9	387	2.4	410	2.8										
17600	958	344	1.4	363	1.8	382	2.2	402	2.6	422	3.1										
19000	1034	365	1.7	383	2.1	401	2.5	419	2.9	437	3.4	475	4.4								
20400	1110	387	1.9	403	2.3	420	2.8	437	3.2	454	3.7	488	4.8								
21800	1186	410	2.2	425	2.7	440	3.1	456	3.6	471	4.1	503	5.2	536	6.3						
23200	1262	432	2.6	446	3.0	460	3.5	475	4.0	490	4.5	519	5.6	550	6.8	582	8.1				
24600	1339	455	3.0	468	3.4	481	3.9	495	4.5	509	5.0	537	6.1	565	7.3	594	8.6	625	10.0		
26000	1415	479	3.4	491	3.9	503	4.4	516	4.9	529	5.5	555	6.6	581	7.8	608	9.2	636	10.6	666	12.1
27400	1491	502	3.8	513	4.3	525	4.9	537	5.4	549	6.0	574	7.2	599	8.4	624	9.8	650	11.2	677	12.7
28800	1567	525	4.3	536	4.9	547	5.4	558	6.0	570	6.6	594	7.9	617	9.1	641	10.5	665	11.9	690	13.5
30200	1643	549	4.9	559	5.5	569	6.0	580	6.6	591	7.2	613	8.6	636	9.9	658	11.2	681	12.7	705	14.2
31600	1720	572	5.5	582	6.1	592	67	602	7.3	612	7.9	633	9.3	655	10.7	676	12.0	698	13.5	720	15.0
33000	1796	596	6.2	605	6.8	615	7.4	624	8.0	634	8.7	654	10.0	675	11.5	696	12.9	716	14.4	737	15.9
34400	1872	620	6.9	629	7.5	638	8.1	647	8.8	656	9.5	675	10.9	695	12.4	715	13.9	734	15.3	754	16.9
35800	1948	644	7.7	652	8.3	661	8.9	669	9.6	678	10.3	696	11.8	715	13.3	734	14.9	753	16.4	772	17.9
37200	2025	668	8.5	676	9.1	684	9.8	692	10.5	701	11.2	718	12.7	736	14.2	754	15.9	773	17.5	791	19.2
38600	2101	691	9.4	699	10.1	707	10.8	715	11.5	723	12.2	740	13.7	757	15.3	775	17.0	792	18.7	810	20.4
40000	2177	715	10.3	723	11.0	731	11.7	738	12.5	746	13.2	762	14.8	778	16.4	795	18.1	812	19.9	829	21.6
41400	2253	739	11.4	747	12.1	754	12.8	761	13.6	769	14.3	784	15.9	800	17.6	816	19.3	833	21.1	849	22.9
42800	2329	763	12.4	770	13.2	778	13.9	785	14.7	792	15.5	807	17.1	822	18.8	837	20.6	853	22.4	869	24.3
44200	2406	788	13.6	794	14.4	801	15.1	808	15.9	815	16.8	829	18.4	844	20.2	858	21.9	873	23.8	889	25.7
45600	2482	812	14.8	818	15.6	825	16.4	831	17.2	838	18.1	852	19.8	866	21.5	880	23.4	894	25.3	909	27.2
47000	2558	836	16.1	842	17.0	849	17.8	855	18.6	862	19.5	875	21.2	888	23.0	902	24.9	916	26.8	930	28.8
48400	2634	860	17.5	866	18.4	872	19.2	879	20.1	885	20.9	898	22.7	911	24.6	924	26.5	937	28.4	951	30.4

CFM Std. Air	Out-let Vel.	Total Static Pressure																			
		2 1/4"		2 1/2"		3"		3 1/2"		4"		4 1/2"		5"		5 1/2"		6"		6 1/2"	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
29000	1578	717	15.2	744	16.9																
30400	1654	730	16.0	755	17.7																
31800	1731	745	16.8	767	18.5	815	22.2														
33200	1807	760	17.7	782	19.5	826	23.1														
34600	1883	777	18.7	797	20.5	838	24.2	882	28.2												
36000	1959	794	19.8	813	21.6	852	25.3	893	29.3												
37400	2035	811	20.9	830	22.7	867	26.5	906	30.5	946	34.8										
38800	2112	830	22.2	847	23.9	883	27.7	920	31.8	957	36.1	997	40.6								
40200	2188	849	23.6	865	25.2	900	29.0	935	33.2	970	37.5	1007	42.0								
41600	2264	868	25.0	884	26.8	917	30.5	950	34.6	985	39.0	1019	43.5	1056	48.3						
43000	2340	888	26.4	903	28.3	935	32.0	967	36.1	999	40.6	1033	45.2	1067	49.9	1103	55.0				
44400	2416	907	27.9	923	29.8	953	33.6	984	37.7	1015	42.2	1047	46.9	1080	51.6	1113	56.7				
45800	2493	927	29.4	942	31.5	972	35.5	1001	39.5	1032	43.9	1062	48.6	1094	53.5	1125	58.5				
47200	2569	948	31.1	962	33.1	991	37.3	1019	41.3	1048	45.8	1078	50.5	1108	55.4						
48600	2645	968	32.7	982	34.9	1010	39.2	1038	43.3	1066	47.7	1094	52.4	1123	57.4						
50000	2721	988	34.5	1002	36.7	1030	41.1	1057	45.5	1084	49.8	1111	54.5	1139	59.5						
51400	2798	1010	36.4	1023	38.6	1050	43.1	1076	47.7	1102	52.0	1129	56.7								
52800	2874	1031	38.4	1043	40.6	1070	45.2	1095	49.9	1121	54.5	1146	59.0								
54200	2950	1052	40.4	1064	42.7	1090	47.4	1115	52.1	1140	56.9										
55600	3026	1074	42.6	1086	44.8	1110	49.5	1135	54.5												
57000	3102	1096	44.8	1107	47.1	1130	51.9														
58400	3179	1118	47.1	1129	49.5	1151	54.3														
59800	3255	1140	49.5	1151	51.9																

Performance based on 0.075 lbs. per cubic foot density (air at 70 F and 29.92 Hg Bar).
Performance shown is for installation Type B: free inlet, ducted outlet.
Power rating (BHP) does not include drive losses.
Performance ratings do not include the effects of appurtenances in the airstream.
When inlet vanes are used increase rpm 1 percent and brake horsepower 3 percent.
Fan tables cover part of fan operating range; fan curves show full operating range.

Performance Data

Q Fan Size 54



—— Fan RPM Line
- - - Motor HP Line

Standard fans can be selected ONLY in the shaded area.
Thrust restrains are to be used with fans Class 3 or motors 40 hp and up.
Super Q fans are NOT available in size 54.
Horizontal fans only, for vertical units contact marketing in Lexington.

Minimum and Maximum Motor HP Ranges

	Q Fan Size 54"			Super Q Fan Size 54"	
	Min - Max Motor HP Class 1	Min - Max Motor HP Class 2	Min - Max Motor HP Class 3	Min - Max Motor HP Class 1	Min - Max Motor HP Class 2
Arrangement 9	2 -25	20 - 60	—	NA	NA
Arrangement 1	—	—	—	NA	NA

Performance Data

Q Fan Size 60

Fan Size 60″

Wheel Dia.	60.0 inches	1524 mm
Inlet Area	22.38 square feet	2.079 m^2
Outlet Area	22.38 square feet	2.079 m^2
Tip Speed	15.71 x RPM ft./minute	4.788 m/minute

Pressure Class Limits

Class	Maximum RPM
I	775
II	1040

Minimum Fan RPM (Without VFRB Option)

Motor	Minimum Fan RPM
1800 RPM	314
1200 RPM	209

Table P-13 — Size 60 Q-Fan

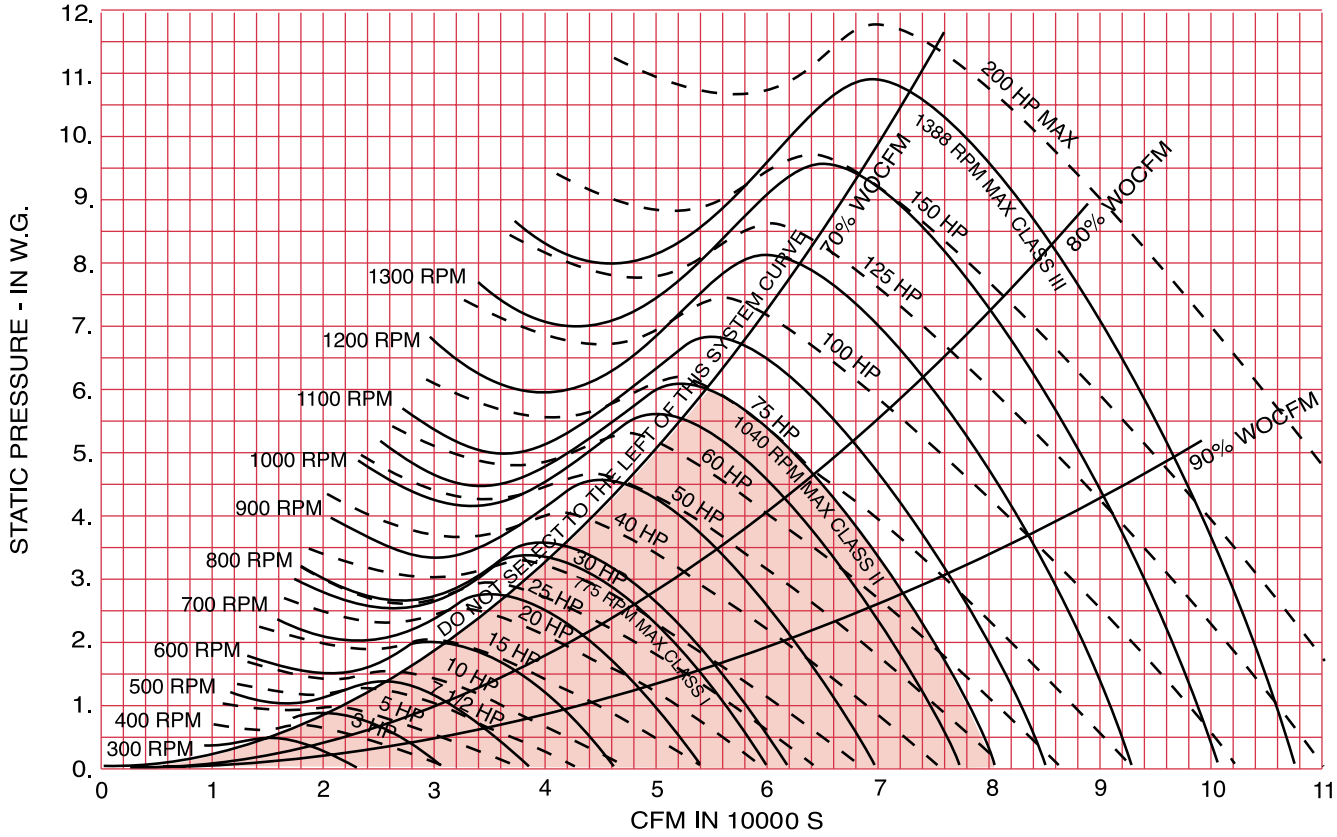
CFM Std. Air	Out-let Vel.	Total Static Pressure 1/4″ RPM	1/4″ BHP	3/8″ RPM	3/8″ BHP	1/2″ RPM	1/2″ BHP	5/8″ RPM	5/8″ BHP	3/4″ RPM	3/4″ BHP	1″ RPM	1″ BHP	1 1/4″ RPM	1 1/4″ BHP	1 1/2″ RPM	1 1/2″ BHP	1 3/4″ RPM	1 3/4″ BHP	2″ RPM	2″ BHP
19800	884	291	1.5	311	1.9	330	2.4	350	2.9	370	3.5										
21400	956	309	1.7	327	2.2	344	2.6	362	3.2	381	3.7										
23000	1027	327	2.0	344	2.5	360	3.0	376	3.5	393	4.1	428	5.3								
24600	1099	346	2.3	361	2.8	376	3.3	391	3.9	407	4.4	439	5.7								
26200	1170	365	2.6	379	3.2	393	3.7	407	4.3	422	4.9	451	6.2	482	7.6						
27800	1242	384	3.0	397	3.6	410	4.1	424	4.7	437	5.3	464	6.7	493	8.1	523	9.7				
29400	1313	403	3.4	415	4.0	428	4.6	441	5.2	453	5.9	479	7.2	505	8.7	532	10.3				
31000	1385	423	3.9	434	4.5	446	5.1	458	5.7	470	6.4	494	7.8	519	9.3	544	10.9	570	12.6		
32600	1456	442	4.4	453	5.0	464	5.6	475	6.3	487	7.0	510	8.5	533	9.9	557	11.6	581	13.3	606	15.1
34200	1528	462	4.9	472	5.6	482	6.2	493	6.9	504	7.7	526	9.2	548	10.6	570	12.3	593	14.1	616	15.9
35800	1599	482	5.5	491	6.2	501	6.9	511	7.6	521	8.3	543	9.9	563	11.4	585	13.1	606	14.9	628	16.8
37400	1671	502	6.2	511	6.9	520	7.6	530	8.3	539	9.1	560	10.7	580	12.3	600	14.0	620	15.7	641	17.7
39000	1742	522	6.9	530	7.6	539	8.3	548	9.1	558	9.9	576	11.5	596	13.2	615	14.9	634	16.7	654	18.6
40600	1814	542	7.7	550	8.4	559	9.1	567	9.9	576	10.7	594	12.4	613	14.2	631	16.0	650	17.7	668	19.6
42200	1885	562	8.5	570	9.2	578	10.0	586	10.8	595	11.6	612	13.4	630	15.2	648	17.1	665	18.8	683	20.8
43800	1957	582	9.4	590	10.1	597	10.9	605	11.8	613	12.6	630	14.4	647	16.2	664	18.2	681	20.1	698	22.0
45400	2028	602	10.3	610	11.1	617	11.9	625	12.8	632	13.7	648	15.5	664	17.4	681	19.3	698	21.3	714	23.3
47000	2100	622	11.3	630	12.2	637	13.0	644	13.9	651	14.8	666	16.6	682	18.5	698	20.6	714	22.6	730	24.7
48600	2171	643	12.4	650	13.3	656	14.1	663	15.0	671	15.9	685	17.8	700	19.8	715	21.8	731	24.0	746	26.0
50200	2243	663	13.6	670	14.4	676	15.3	683	16.2	690	17.2	704	19.1	718	21.1	733	23.2	748	25.4	763	27.6
51800	2314	683	14.8	690	15.7	696	16.6	703	17.5	709	18.5	723	20.5	736	22.5	750	24.7	765	26.9	780	29.2
53400	2386	704	16.1	710	17.0	716	17.9	722	18.9	729	19.9	742	21.9	755	24.0	768	26.2	782	28.4	797	30.8
55000	2457	724	17.5	730	18.4	736	19.4	742	20.4	748	21.4	761	23.4	776	25.6	787	27.8	800	30.1	814	32.4
56600	2529	744	18.9	750	19.9	756	20.9	762	21.9	768	22.9	780	25.0	792	27.2	805	29.5	818	31.8	831	34.2

CFM Std. Air	Out-let Vel.	Total Static Pressure 2 1/4″ RPM	2 1/4″ BHP	2 1/2″ RPM	2 1/2″ BHP	3″ RPM	3″ BHP	3 1/2″ RPM	3 1/2″ BHP	4″ RPM	4″ BHP	4 1/2″ RPM	4 1/2″ BHP	5″ RPM	5″ BHP	5 1/2″ RPM	5 1/2″ BHP	6″ RPM	6″ BHP	6 1/2″ RPM	6 1/2″ BHP
35000	1563	645	18.3																		
36600	1635	656	19.2	679	21.3																
38200	1706	668	20.1	689	22.2																
39800	1778	681	21.2	701	23.3	742	27.7														
41400	1849	694	22.2	713	24.4	752	28.9														
43000	1921	708	23.4	726	25.6	763	30.1	801	35.0												
44600	1992	723	24.6	740	26.8	775	31.4	811	36.3												
46200	2064	738	26.0	754	28.1	788	32.8	822	37.7	858	42.9										
47800	2135	754	27.4	769	29.6	801	34.2	834	39.2	868	44.4	903	50.0								
49400	2207	770	29.1	785	31.1	816	35.7	847	40.8	879	46.1	912	51.6								
51000	2278	786	30.6	801	32.9	830	37.4	860	42.5	891	47.8	922	53.3	955	59.3						
52600	2350	803	32.3	817	34.6	845	39.1	874	44.2	904	49.6	934	55.3	965	61.1	997	67.3				
54200	2421	819	34.0	833	36.4	860	41.0	888	46.0	917	51.5	946	57.2	975	63.0	1006	69.2				
55800	2493	836	35.8	850	38.2	877	43.1	903	48.0	931	53.4	959	59.2	987	65.2	1016	71.3				
57400	2564	853	37.6	866	40.1	893	45.2	918	50.1	945	55.5	972	61.3	999	67.4	1027	73.5				
59000	2636	870	39.5	883	42.1	909	47.3	934	52.3	960	57.7	985	63.5	1012	69.6	1039	75.9				
60600	2707	888	41.5	900	44.2	925	49.5	950	54.9	974	60.0	1000	65.8	1025	72.0						
62200	2779	905	43.6	917	46.3	942	51.8	966	57.3	990	62.5	1014	68.3	1039	74.4						
63800	2850	923	45.8	935	48.5	959	54.1	982	59.7	1006	65.1	1029	70.9								
65400	2922	941	48.1	952	50.8	976	56.5	999	62.3	1022	68.1										
67000	2993	959	50.5	970	53.3	992	59.0	1016	64.9	1038	70.8										
68600	3065	978	53.0	988	55.8	1010	61.6	1032	67.6												
70200	3136	996	55.6	1006	58.4	1027	64.3														
71800	3208	1015	58.3	1025	61.2																

Performance based on 0.075 lbs. per cubic foot density (air at 70 F and 29.92 Hg Bar).
Performance shown is for installation Type B: free inlet, ducted outlet.
Power rating (BHP) does not include drive losses.
Performance ratings do not include the effects of appurtenances in the airstream.
When inlet vanes are used increase rpm 1 percent and brake horsepower 3 percent.
Fan tables cover part of fan operating range; fan curves show full operating range.

Performance Data

Q Fan Size 60



—— Fan RPM Line
- - - Motor HP Line

Standard fans can be selected ONLY in the shaded area.
Thrust restrains are to be used with fans Class 3 or motors 40 hp and up.
Super Q fans are NOT available in size 60.
Horizontal fans only, for vertical units contact marketing in Lexington.

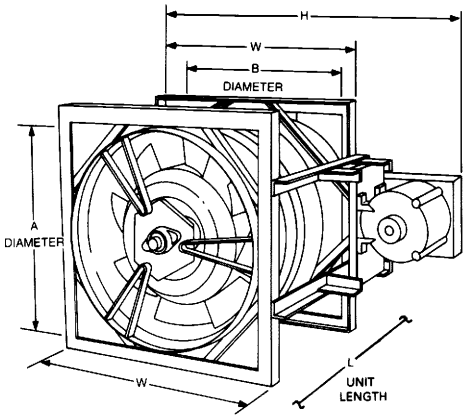
Minimum and Maximum Motor HP Ranges

	Q Fan Size 60"			Super Q Fan Size 60"	
	Min - Max Motor HP Class 1	Min - Max Motor HP Class 2	Min - Max Motor HP Class 3	Min - Max Motor HP Class 1	Min - Max Motor HP Class 2
Arrangement 9	3 - 30	25 - 75	—	NA	NA
Arrangement 1	—	—	—	NA	NA

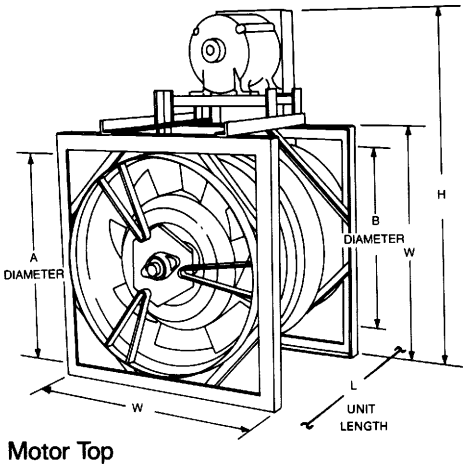
Dimensional Data and Weights

Roughing-In Dimensions

Arrangement 9



Motor Left



Motor Top

Arrangement 9 Dimensions

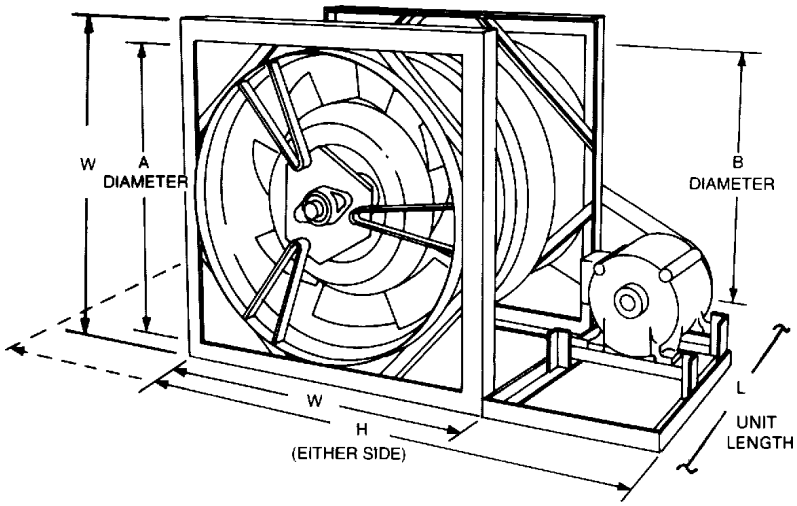
Size		In A	Out B	L	W	H Max.	Drive Shaft Dia.	Unit Net Wt. Lbs.
16	Class I	19 3/8	17 7/8	28 3/8	23 5/8	45	15/16	115
16	Class II	19 3/8	17 7/8	28 3/8	23 5/8	45	15/16	115
16	Class III	19 3/8	17 7/8	28 3/8	23 5/8	45	1 3/16	120
19	Class I	21 7/8	20 1/2	28 7/8	26 1/8	48 1/4	15/16	135
19	Class II	21 7/8	20 1/2	28 7/8	26 1/8	48 1/4	15/16	135
19	Class III	21 7/8	20 1/2	28 7/8	26 1/8	48 1/4	1 3/16	140
21	Class I	24 5/8	23 1/8	32 3/4	29	51 3/8	15/16	175
21	Class II	24 5/8	23 1/8	32 3/4	29	51 3/8	1 3/16	180
21	Class III	24 5/8	23 1/8	32 3/4	29	51 3/8	1 3/16	185
24	Class I	28 1/8	26 3/8	35 3/8	32 7/8	55 1/4	1 3/16	215
24	Class II	28 1/8	26 3/8	35 3/8	32 7/8	55 1/4	1 3/16	220
24	Class III	28 1/8	26 3/8	35 3/8	32 7/8	55 1/4	1 11/16	225
27	Class I	30 7/8	29	38	35 3/4	58 1/8	1 3/16	275
27	Class II	30 7/8	29	38	35 3/4	58 1/8	1 7/16	290
27	Class III	30 7/8	29	38	35 3/4	58 1/8	1 15/16	305
30	Class I	34 3/8	32 1/4	41 1/8	39 1/8	61 5/8	1 3/16	350
30	Class II	34 3/8	32 1/4	41 1/8	39 1/8	61 5/8	1 7/16	360
30	Class III	34 3/8	32 1/4	41 1/8	39 1/8	61 5/8	1 15/16	375
33	Class I	37 3/4	35 1/2	45	42 5/8	65 1/8	1 3/16	440
33	Class II	37 3/4	35 1/2	45	42 5/8	65 1/8	1 7/16	450
33	Class III	37 3/4	35 1/2	45	42 5/8	65 1/8	2 3/16	485
36	Class I	41 3/4	39 1/4	49 1/2	47 5/8	69 5/8	1 7/16	575
36	Class II	41 3/4	39 1/4	49 1/2	47 5/8	69 5/8	1 11/16	580
36	Class III	41 3/4	39 1/4	49 1/2	47 5/8	69 5/8	2 7/16	630
40	Class I	46	43 1/4	53 3/4	51 7/8	77	1 7/16	710
40	Class II	46	43 1/4	53 3/4	51 7/8	77	1 11/16	720
40	Class III	46	43 1/4	53 3/4	51 7/8	77	2 15/16	800
44	Class I	50 7/8	47 3/4	60 5/8	56 3/4	82	1 11/16	830
44	Class II	50 7/8	47 3/4	60 5/8	56 3/4	82	1 15/16	850
44	Class III	50 7/8	47 3/4	60 5/8	56 3/4	82	3 7/16	950

Approximate weights are without motor and drive.
Motor position should be determined from the outlet side.

Dimensional Data and Weights

Roughing-In Dimensions

Arrangement1



Arrangement 1 Dimensions

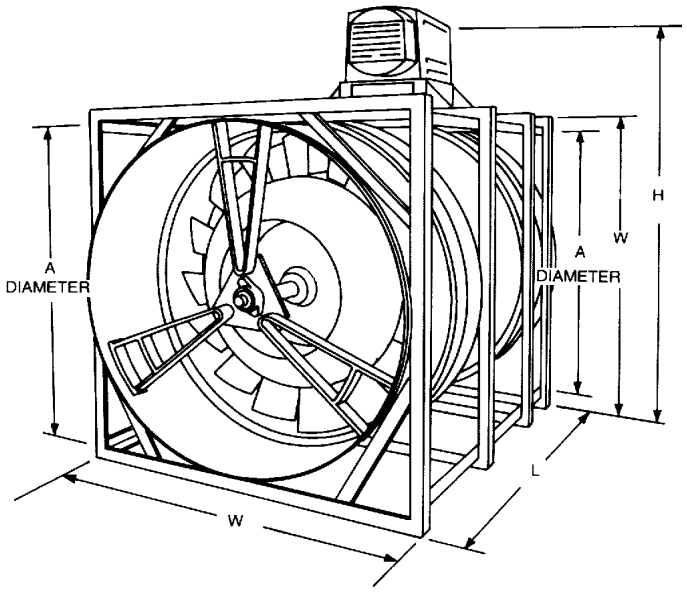
Size		In A	Out B	L	W	H Max.	Drive Shaft Dia.	Unit Net Wt. Lbs.
16	Class III	19 3/8	17 7/8	28 3/8	23 5/8	45	1 3/16	120
19	Class III	21 7/8	20 1/2	28 7/8	26 1/8	47 1/2	1 3/16	140
21	Class III	24 5/8	23 1/8	32 3/4	29	52 1/4	1 3/16	185
24	Class III	28 1/8	26 3/8	35 3/8	32 7/8	56 1/8	1 11/16	225
27	Class II	30 7/8	29	38	35 3/4	57 1/8	1 7/16	290
27	Class III	30 7/8	29	38	35 3/4	62 3/4	1 15/16	305
30	Class II	34 3/8	32 1/4	41 1/8	39 1/8	60 1/2	1 7/16	360
30	Class III	34 3/8	32 1/4	41 1/8	39 1/8	66 1/8	1 15/16	375
33	Class I	37 3/4	35 1/2	45	42 5/8	61 3/8	1 3/16	440
33	Class II	37 3/4	35 1/2	45	42 5/8	65 7/8	1 7/16	450
33	Class III	37 3/4	35 1/2	45	42 5/8	73 7/8	2 3/16	485
36	Class I	41 3/4	39 1/4	49 1/2	47 5/8	69	1 7/16	575
36	Class II	41 3/4	39 1/4	49 1/2	47 5/8	70 5/8	1 11/16	580
36	Class III	41 3/4	39 1/4	49 1/2	47 5/8	78 7/8	2 7/16	630
40	Class I	46	43 1/4	53 3/4	51 7/8	73 1/4	1 7/16	710
40	Class II	46	43 1/4	53 3/4	51 7/8	78 7/8	1 11/16	720
40	Class III	46	43 1/4	53 3/4	51 7/8	88 5/8	2 15/16	800
44	Class I	50 7/8	47 3/4	60 5/8	56 3/4	78 1/8	1 11/16	830
44	Class II	50 7/8	47 3/4	60 5/8	56 3/4	83 3/4	1 15/16	850
44	Class III	50 7/8	47 3/4	60 5/8	56 3/4	93 1/2	3 7/16	950

Arrangement 1, Class I and II require an integral base (supplied by others). Class III should be mounted on an inertia pad (no integral base required with inertia pad).
Approximate weights are without motor and drive.

Dimensional Data and Weights

Roughing-In Dimensions

Arrangement 9



Arrangement 9 Dimensions

Size		A	L	W	H Max.	Drive Shaft Dia.	Unit Net Wt. Lbs.
49	Class I	52 3/8	76	57 1/8	79 7/8	1 11/16	1020
49	Class II	52 3/8	76	57 1/8	85 1/2	2 3/16	1075
54	Class I	58	81 7/8	62 3/4	85 1/2	1 15/16	1090
54	Class II	58	81 7/8	62 3/4	91 1/4	2 7/16	1140
60	Class I	64 1/8	92	69 3/4	96 1/4	2 3/16	1730
60	Class II	64 1/8	92	69 3/4	108 1/4	2 11/16	1830

Approximate weights are without motor and drive.

Figure D-1 — Q Fan Inlet Vanes

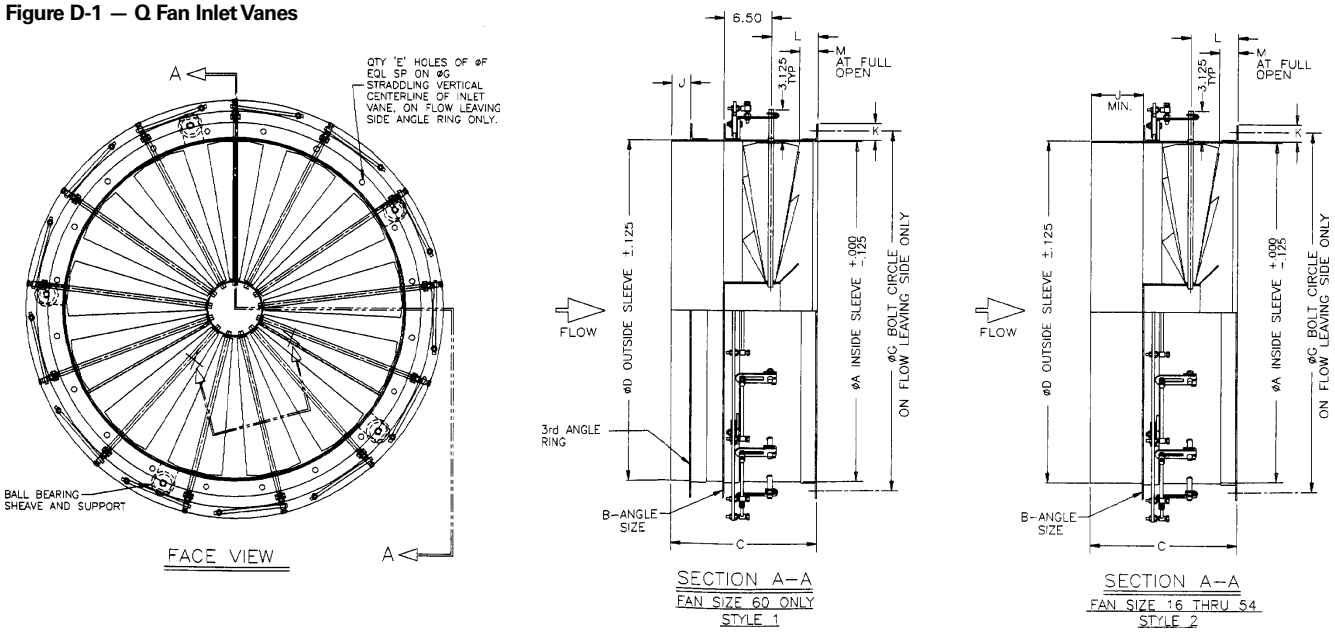


Table D-1 — Inlet Vane Dimensions

Fan Size	A	C	Number of blades	Approx. Wt. Lbs.
16	19.562	11.625	9	85
19	22.062	12.500	11	110
21	24.875	12.375	11	120
24	28.312	12.000	11	140
27	31.125	12.375	11	150
30	34.562	12.375	11	175
33	38.000	12.813	15	185
36	42.062	14.250	15	245
40	46.312	17.250	15	300
44	51.188	18.438	17	353
49	52.562	18.188	17	391
54	58.250	19.000	17	478
60	64.250	20.750	17	558

Figure D-2 — Q Fan Duct Outlet Diffuser, Sizes 16-44

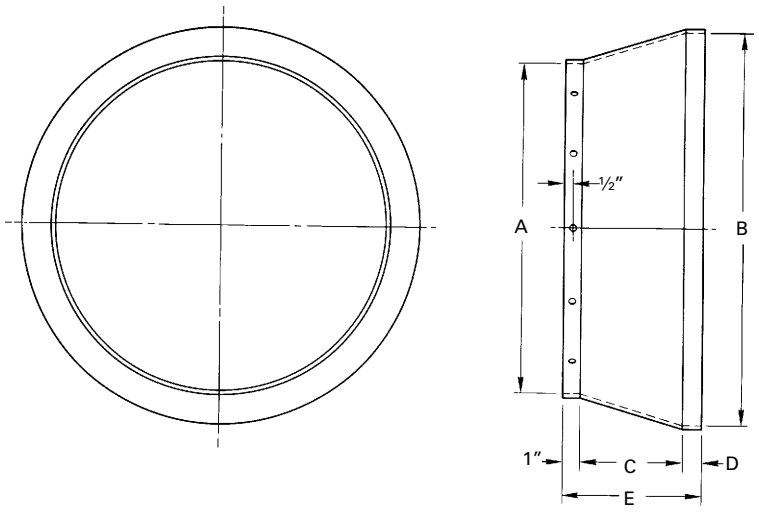


Table D-2 — Outlet Diffuser (Equalizer) Dimensions

Fan Size	A	B	C	D	E
16	17 7/8	19 1/4	3	1 1/8	5 1/8
19	20 1/2	21 5/8	3 1/2	1	5 1/2
21	23 1/4	24 1/2	4	1 1/4	6 1/8
24	26 3/8	27 7/8	4 1/2	1 1/8	6 5/8
27	29 1/8	30 3/4	5	1 1/8	7
30	32 1/4	34 1/4	5 1/2	1 1/4	7 3/4
33	35 1/2	37 5/8	6	1 1/4	8 1/4
36	39 1/4	41 5/8	6 5/8	1 1/4	8 7/8
40	43 1/4	45 7/8	7 3/8	1 1/8	9 3/8
44	47 3/4	50 3/4	8 1/8	1 1/4	10 3/8

Figure D-3 — Super Q II 16-44 Sizes

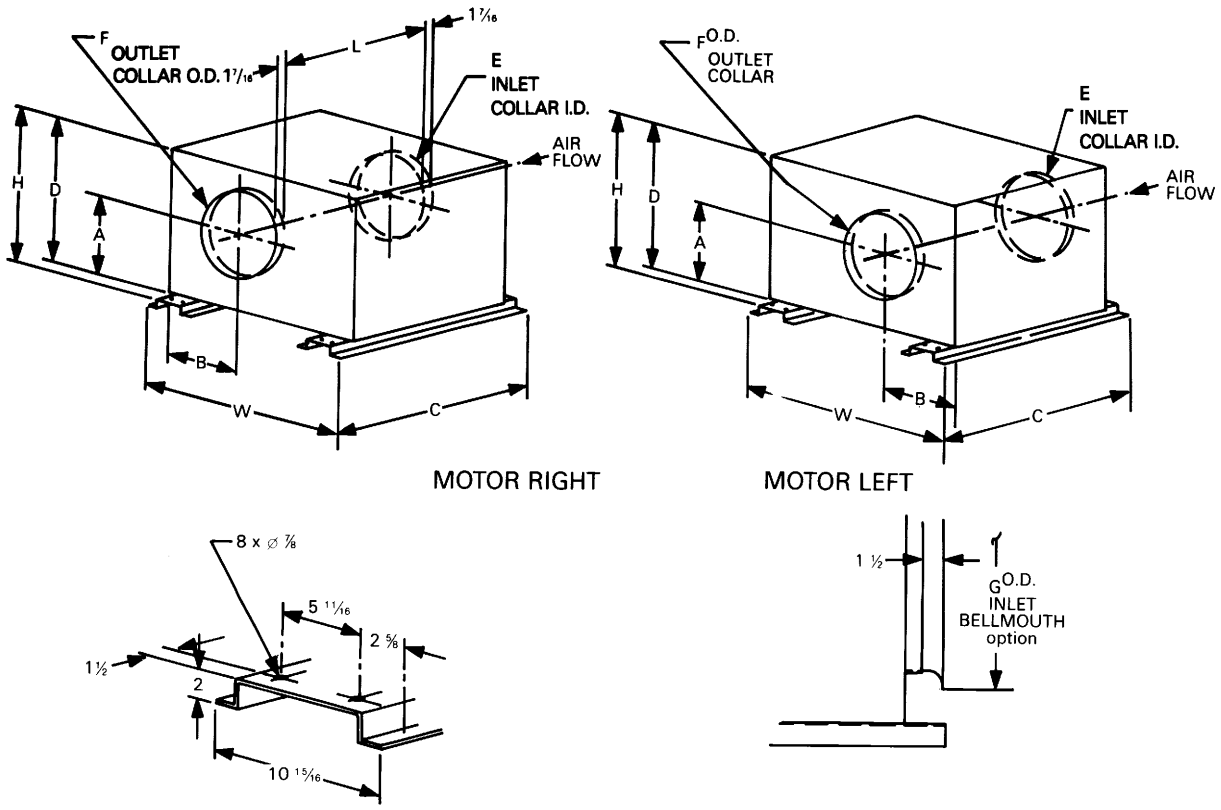


Table D-3

Unit Size	A	B	C	D	E	Inlet Area Sq. Ft.	F	Outlet Area Sq. Ft.	G	H	L	W	Unit Weights*
16	11 7/8	15 1/4	45 3/8	28	20 1/8	2.2	17 7/8	1.8	24	30	39 1/2	44 1/4	411
19	13 1/8	16 1/2	45 7/8	30 1/2	22 1/8	2.6	19 7/8	2.2	26	32 1/2	40	46 7/8	451
21	14 1/2	17 7/8	49 3/4	33 3/8	26 1/8	3.7	22 7/8	2.9	30	35 3/8	43 7/8	50	537
24	16 1/2	19 3/4	52 3/8	37 1/4	28 1/8	4.3	25 7/8	3.7	32	39 1/4	46 3/8	55	634
27	17 7/8	21 1/4	55	40 1/8	32 1/8	5.6	28 7/8	4.6	36	42 1/8	49 1/8	57 7/8	742
30	19 7/8	23	58 1/8	43 3/4	34 1/8	6.3	31 7/8	5.6	38	45 3/4	52 1/4	63 1/2	881
33	21 3/8	24 5/8	61 7/8	47 1/8	38 1/8	7.9	35 7/8	7.0	42	49 1/8	56	70 1/2	1048
36	24 1/8	27 1/8	66 1/2	53	42 1/8	9.2	39 7/8	8.7	46	55	60 5/8	75 1/4	1375
40	26 1/4	29 1/4	70 3/4	56 1/2	46 1/8	11.6	43 7/8	10.6	50	58 1/2	64 7/8	81 7/8	1567
44	28 7/8	31 3/4	77 5/8	62 1/4	52 1/8	14.9	47 7/8	12.6	56	64 1/4	71 3/4	86 3/4	1858

*** Approximate weights are without motor and drive.**

fFigure D-4 — Q Fan/Super Q II Plus Outlet Silencers

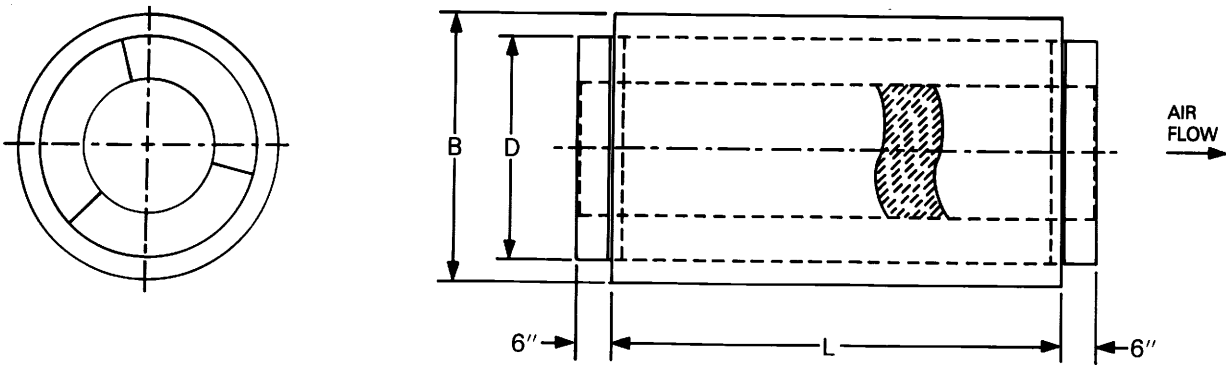


Table D-4 — Short Outlet Plus Silencer

Fan Size	D	B	L	Approx. Weight
16″	18″	26″	18″	68
19″	20″	28″	20″	82
21″	23″	31″	23″	102
24″	26″	34″	26″	130
27″	29″	37″	29″	166
30″	32″	40″	32″	182
33″	36″	44″	36″	260
36″	40″	48″	40″	315
40″	44″	52″	44″	426
44″	48″	56″	48″	534
49″	52″	60″	52″	652
54″	58″	66″	58″	850
60″	64″	72″	64″	1050

Note: Silencer center body is adjustable. D dimension is nominal duct size on entering air end and fitting size on leaving air end.

Table D-5 — Long Outlet Plus Silencer

Fan Size	D	B	L	Approx. Weight
16″	18″	26″	36″	136
19″	20″	28″	40″	164
21″	23″	31″	46″	204
24″	26″	34″	52″	260
27″	29″	37″	58″	332
30″	32″	40″	64″	364
33″	36″	44″	72″	520
36″	40″	48″	80″	630
40″	44″	52″	88″	852
44″	48″	56″	96″	1068
49″	52″	60″	104″	1304
54″	58″	66″	116″	1700
60″	64″	72″	128″	2100

Note: Silencer center body is adjustable. D dimension is nominal duct size on entering air end and fitting size on leaving air end.

Figure D-5 — Q Fan/Super Q II Plus Inlet Silencers

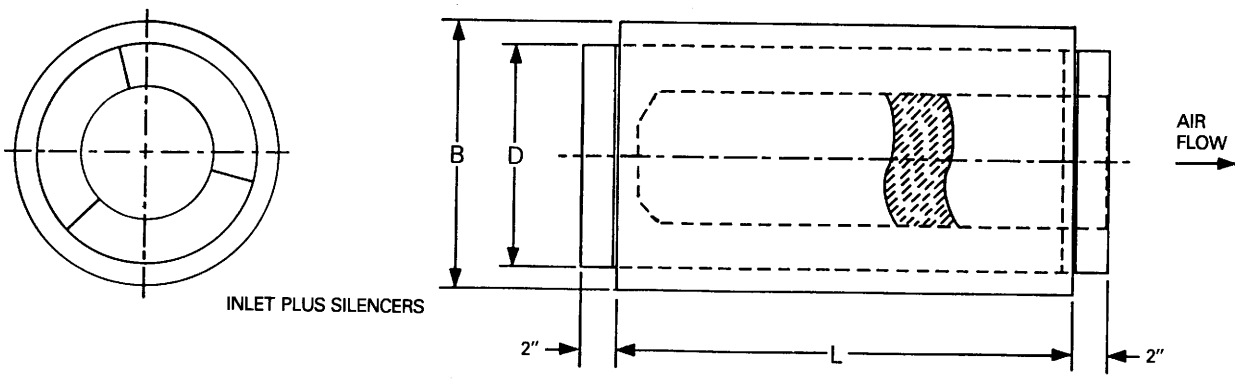


Table D-6 — Short Inlet Plus Silencer

Fan Size	D	B	L	Approx. Weight
16″	20″	28″	20″	49
19″	22″	30″	22″	59
21″	26″	34″	26″	85
24″	28″	36″	28″	98
27″	32″	40″	32″	128
30″	34″	42″	34″	148
33″	38″	46″	38″	185
36″	42″	50″	42″	228
40″	46″	54″	46″	317
44″	52″	60″	52″	378
49″	52″	60″	52″	444
54″	58″	66″	58″	680
60″	64″	72″	64″	852

Note: Silencer center body is fixed in position.

Table D-7 — Long Inlet Plus Silencer

Fan Size	D	B	L	Approx. Weight
16″	20″	28″	40″	97
19″	22″	30″	44″	117
21″	26″	34″	52″	170
24″	28″	36″	56″	196
27″	32″	40″	64″	256
30″	34″	42″	68″	296
33″	38″	46″	76″	370
36″	42″	50″	84″	455
40″	46″	54″	92″	634
44″	52″	60″	104″	755
49″	52″	60″	104″	888
54″	58″	66″	116″	1359
60″	64″	72″	128″	1704

Note: Silencer center body is fixed in position.

Mechanical Specifications

Q FAN ASSEMBLY

Housing
Housings are 14-gauge steel hydraulically expanded to form integral inlet bell and diffuser sections. Hydraulically expanded stiffening ring welded in area of wheel raceway. On VAV variable speed fan units, fan inlet supports are structurally reinforced to handle extra stresses of variable speed fan modulation and fan is balanced at ten different fan speeds over the desired operating range.

Inlet/Outlet Shells
Fan has tapered inlet and outlet shells over fan hub assembly. Shells uniformly accelerate air through blade area. End bell covers fan drive assembly, thereby reducing flow turbulence. Eight fan blades are precision aluminum casting with airfoil cross sections. Blade to shell clearance is in the range of 30 mils.

Fan Wheel
Fans size 16-44 have fan wheel of precision aluminum casting with eight radially projected blades with air-foil cross sections.

Fans size 49-60 have fan wheel of sixteen precision cast and machined aluminum blades mounted on a steel wheel plate.

All wheels are dynamically balanced and keyed to fan shaft.

Diffuser
Cast aluminum diffuser with 29 radially projected straightening vanes with airfoil cross sections. Leading edge of vanes are curved to reduce tone noise generation. Clips on almost every other vane eliminate harmonic ring potential.

Shaft
Solid AISI-C1040 hot-rolled steel, turned and polished. Close tolerances maintained where shaft makes contact with bearings.

Bearings
Precision, flange-mounted, self-aligning ball bearings at inlet and discharge. Bearings on all sizes are grease lubricated and selected for a minimum average life (AFBMA L-50) in excess of 200,000 hours at maximum cataloged operating conditions. Bearing greaselines are extended out through fan shell for easy servicing.

Drives
Mechanical drives are computer selected for low noise, low maintenance operation. Center distance and arc of contact is maintained within prefixed limits. Constant speed fans use variable or constant pitch drives; variable speed modulated fans use fixed drives only.

SUPER QUIET II FANS

Trane Super Quiet II (SQ2) fans include fan housing, wheel, shaft, bearings, diffuser section, motor mounting support, ODP standard or high efficiency motor, drives, spring isolation in acoustically-treated casing in a factory-assembled unit. Fan motors are outside of airstream.

Constant volume units (SQ2C) are equipped with variable or constant pitch drives. Variable air volume units (SQ2V) use adjustable frequency inverters for fan capacity modulation and must have constant pitch drives. Inlet vanes are NOT available for Super Q II fans.

ENCLOSURE

Fans are internally isolated on four height saving spring isolators and then flex connected inside of an airtight acoustical enclosure. Walls are 16-gauge steel, internally lined with two-inch thick three-pound per square foot density fiberglass. Airside surface of acoustical lining is coated with black matte faced lining to prevent scuffing.

Enclosure has two large full size side access panels. Access panels are fully gasketed and mechanically attached to casing for easy removal. Enclosure has access panel positioning feet to insure easy access panel replacement after removal.

Duct connections in enclosure end panels slip connect to standard U.S. round duct sizes.

Fan grease lines are extended through enclosure for easy servicing of fan. Optional fan motor leads are extended through casing for easier installation.

Two rails support the entire enclosure. Rails can be rested on floor or hung from the ceiling with steel rods. Ducts can be directly connected to enclosure since fan is internally isolated.

Enclosure is rated for four-inch negative or five-inch positive pressure.

Mechanical Specifications

ACCESSORIES

Inlet Screen (Q, SQ2)
Heavy-gauge steel wire mesh.

Inlet Bellmouth (Q, SQ2)
On unducted inlets, the radius bellmouth uniformly accelerates air into the fan, reducing noise and energy requirements.

Plus Duct Silencer (Q, SQ2)
Significantly attenuates fan airborne sound levels. Center body of round silencer is dimensional matched to Q-fan hub. Center body is field adjustable in the direction of airflow. This allows hub to be located close to Q-fan, thereby reducing flow generated turbulence and noise. Silencers can be on inlet and/or outlet and come in short and long length versions. Silencers are flex connected to Q fans and slip connected directly to Super Q II enclosures. **Silencers are shipped loose for field installation.**

Inlet Flange (Q)
Rolled steel ring, factory-mounted, for flanged duct connection. Sizes 16 to 21 one-inch flanges, sizes 27 to 44 are 1½-inch flanges.

Adjustable Inlet Vanes
11 steel vanes operated by a positive peripheral control mechanism located out of the airstream. Each vane is supported at both ends by a precision bronze bearing. The control arm is suitable for manual or automatic operation. **Inlet vanes are shipped loose for field installation.**

Outlet Flange (Q)
Rolled steel ring, factory-mounted, for flanged duct connection.

Outlet Diffuser (Equalizer) (Q)
Steel spinning with 30 degree included diffusion angle. Permit same size slip-duct connection on discharge as inlet.

Outlet Screen (Q)
Heavy-gauge steel wire mesh.

Outlet Flow Stabilization Screen (Q, SQ2)
Similar to outlet screen, but openings are much smaller. Designed to act as an airflow stabilization device on the outlet of each fan.

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Library	**Product Literature**
Product Section	**Air Handling**
Product	**Fans**
Model	**000**
Literature Type	**Data Sales Catalog**
Sequence	**2**
Date	**August 2000**
File No.	**PL-AH-FAN-000-DS-2-0800**
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