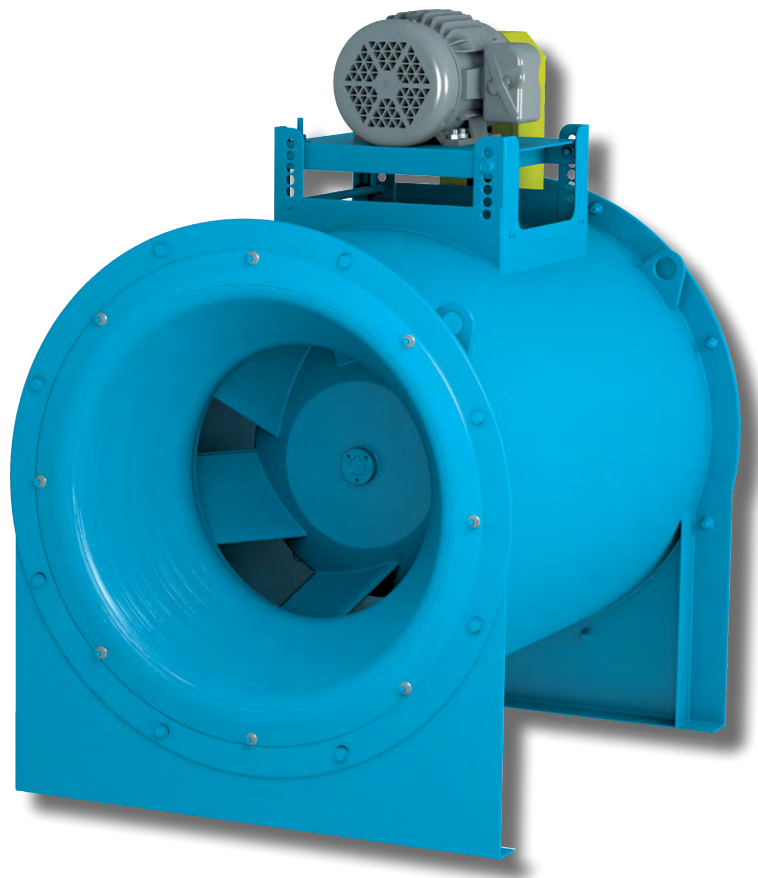




INDUSTRIAL PROCESS AND  
COMMERCIAL VENTILATION SYSTEMS

## MIXED FLOW FANS

QSL | QSLR | QSLSH



## Overview

QSL | QSLR | QSLSH



Arr. 9  
Model QSL

### Benefits of Mixed Flow Fans

Twin City Fan Model QSL Mixed Flow Fan combines the benefits of axial flow and centrifugal flow fans. The QSL has the advantage of the compact design and straight-through airflow as well as the preferred acoustic characteristics and high pressure capability. QSL fans offer superior air and sound performance and the AMCA certified rating seal for air and sound.

### Typical Applications Include

Data Center Exhaust, General HVAC, Generator Room Ventilation, Swimming Pool Exhaust, Kitchen Exhaust, Dishwasher Exhaust, Elevator Shaft Exhaust/Pressurization, Emergency Smoke Exhaust, Stairwell Pressurization

### Arrangements

Available in Arrangement 4, Direct Drive (QSL) & Arrangement 9, Belt Driven (QSL, QSLR, QSLSH)

### Wheel Type

Mixed Flow Airfoil

### Optional Construction

Clamshell Design, Swingout Design, Special Materials, Fumehood Design, Spark Resistant, UL 705, UL 762, UL Smoke & Heat, Seismic

### Certifications

AMCA Sound/Air and FEG, UL 705 Listed for Electrical, UL 762 Listed for Grease-Laden Air, UL Listed for Smoke Control Systems, OSHPD Seismic - OSP-0271-10

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

Model QSLR is UL/cUL 762 listed for the exhaust of grease-laden air as standard, File No. MH-25478.

Model QSLSH is UL/cUL listed for Smoke Control Systems as standard, File No. MH-29313, 500°F for 4 hours and 1000°F for 15 minutes.



Twin City Fan & Blower certifies that the Models QSL, QSLR and QSLSH Mixed Flow Fans shown herein are licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 211 and AMCA Publication 311 and comply with the requirements of the AMCA Certified Ratings Program. See Catalog 1061 for sound ratings.



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

## Overview

QSL | QSLR | QSLSH

### Product Applications

Mixed flow fans are becoming a popular choice on many air supply, return, general and grease-laden exhaust and laboratory exhaust applications in the HVAC industry for both constant or variable air volume systems. The efficiency and sound characteristics of the mixed flow fans are often desired in buildings such as hospitals, libraries, theaters, and general offices. The Twin City Fan heavy-duty construction of QSL fans also make them suitable for many industrial applications handling ambient air. Applications involving fumes, spray booth exhaust, particulate, heavy moisture content, or high temperature should be discussed with the factory for possible product modifications.

### General HVAC Fans

#### QSL

18.25" to 89" wheel diameters  
Airflow to 160,000 CFM  
Static pressure to 8" w.g.



### Restaurant Fans

#### QSLR

18.25" to 89" wheel diameters  
Airflow to 160,000 CFM  
Static pressure to 8" w.g.



### Smoke & Heat Fans

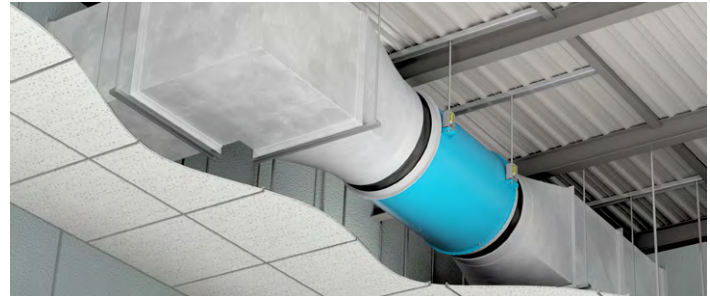
#### QSLSH

18.25" to 89" wheel diameters  
Airflow to 160,000 CFM  
Static pressure to 8" w.g.

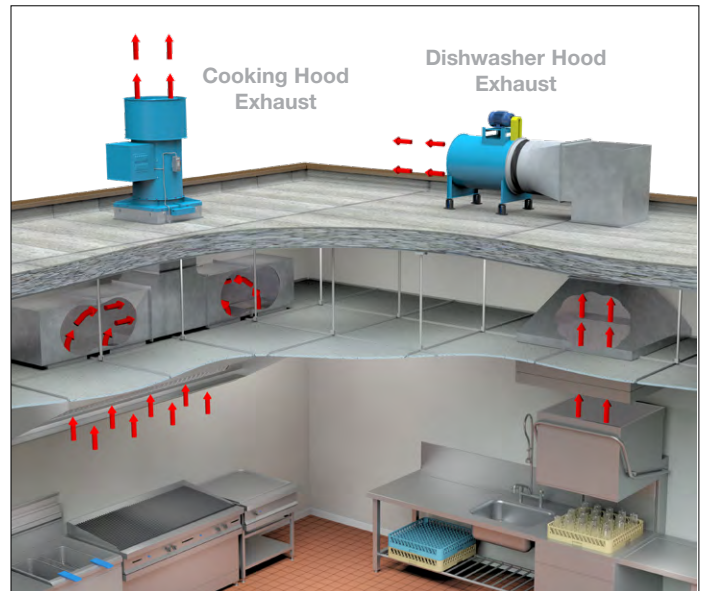


### Temperature Rating

500°F for 4 Hours  
1000°F for 15 Minutes



General HVAC (Model QSL)

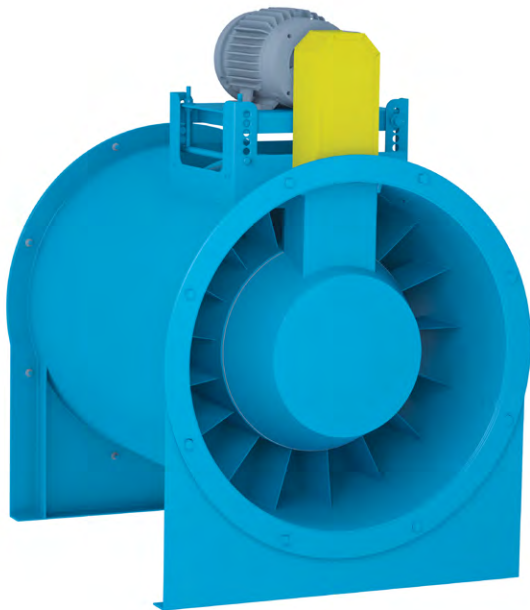


Kitchen Exhaust (Model QSLR)



Emergency Smoke Control (Model QSLSH)

## Model QSL



### General HVAC

Model QSL is available in both direct drive and belt driven. The QSL mounts both vertically and horizontally, allowing for numerous applications with multiple mounting arrangements. Sizes range from 150 - 730 and performance ranges from 1,300 - 160,000 CFM. Model QSL is UL/cUL 705 listed.

### Ultra Quiet

The AMCA Certified Ratings for Air and Sound applies to both inlet and outlet sound power levels. The table below displays sound and static efficiency differences between performance points for a comparable tubular centrifugal fan and a vaneaxial fan.

PERFORMANCE	SIZE	SOUND LwA (dB)		
		QSL Mixed Flow Fan	TSL Inline Centrifugal Fan	TCVA Vaneaxial Fan
5000 CFM @ 1" SP	QSL 245	72	77	79
10000 CFM @ 1" SP	QSL 330	72	81	82
25000 CFM @ 3" SP	QSL 402	86	92	98
50000 CFM @ 6" SP	QSL 490	95	102	112

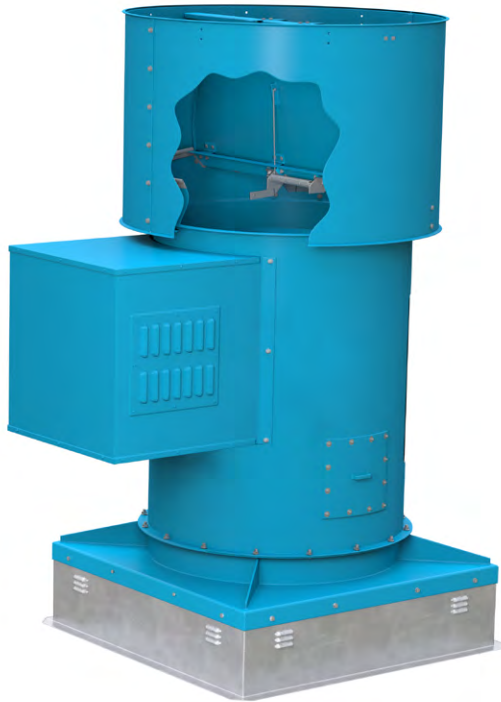
### Energy Savings

Mixed flow fans offer the economy of operation with a higher and broader efficiency range. The lower operating speed for a given performance provides longer and more reliable operation.

PERFORMANCE	SIZE	STATIC EFFICIENCY (%)		
		QSL Mixed Flow Fan	TSL Inline Centrifugal Fan	TCVA Vaneaxial Fan
5000 CFM @ 1" SP	QSL 245	70	55	61
10000 CFM @ 1" SP	QSL 330	70	63	63
25000 CFM @ 3" SP	QSL 402	72	68	65
50000 CFM @ 6" SP	QSL 490	71	69	64

## Models

QSLR | QLSH



### QLSH Smoke & Heat Fans (Belt Driven Only)

Twin City Fan & Blower offers a specially modified version of the QSL fan designated as "QLSH" (Mixed Flow Smoke and Heat Exhaust) for smoke control applications where temperatures can reach 1000°F. QLSH is available in sizes 150 through 730. Model QLSH is cULus 705 listed and cULus listed for smoke control systems for 500°F for 4 hours or 1000°F for 15 minutes. Vertical roof mounted configuration, with discharge cap, meets UL 793 Snow Load Test requirements for butterfly dampers. QLSH is licensed to bear the AMCA certified ratings seal for sound and air performance.

The QLSH fan is available in all configurations with the exception of vertical down (VDN, VDO and VDI).

#### Standard Product Features

- Belt guard, ventilated (weather cover for VRM)
- Belt tube, sealed
- Two-groove drive minimum with 2.0 SF
- Cooling fins on wheel
- Discharge cap with fusible link (for VRM)
- Continuously welded housing



### QSLR Restaurant Fans (Belt Driven Only)

Twin City Fan & Blower offers a specially modified version of the QSL fan designated as "QSLR" (Mixed Flow Restaurant Exhaust) for exhausting grease-laden air from kitchens, restaurants, cooking and dishwasher hoods. QSLR is available in sizes 150 through 730.

Model QSLR is cULus 762 listed for exhaust of grease-laden air. QSLR is licensed to bear the AMCA certified ratings seal for sound and air performance.

The QSLR fan is available in all configurations with the exception of vertical down (VDN, VDO and VDI).

#### Standard Product Features

- Belt guard, totally enclosed, ventilated (weather cover for VRM)
- Belt tube, sealed
- Two cleanout doors located 180° apart (90° from motor)
- 2" drain located 180° from motor (lowest point for horizontal) vertical at the funnel
- Cooling fins on wheel
- Housing sealed with Hi-Temp caulk



## Housings

All fans are constructed of heavy-gauge steel and continuously welded for strength and rigidity. All QSL fans are provided with punched inlet and outlet flanges as standard.

## Wheel

The QSL wheel is designed with true airfoil (double surface - hollow) die-formed, continuously-welded blades for a stable air performance throughout the operating range. The wheel is statically and dynamically balanced prior to assembly and rechecked for balance after assembly by Twin City Fan & Blower.



QSL Wheel

## Belt Guard

Totally enclosed, sealed belt guard is standard on Model QSL. Totally enclosed, non-sealed belt guard is standard on Models QSLR and QLSH.

## Inner Cylinder

The inner tube is rigidly constructed to support the shaft and bearings. The removable discharge cone provides full access to the shaft, bearings, and fan sheave. It is strongly recommended that an access door be provided in the ductwork adjacent to the discharge end of the fan for such service.

## Bearings

Standard bearings are selected to exceed the L-10 life of 40,000 hours at the maximum operating speed.

## Drives

V-belt drives or direct drive fans with motors and drives mounted by Twin City Fan & Blower are test run as a complete assembly and rechecked for balance.

## Straightening Vanes

Straightening vanes convert tangential velocity pressure into useful static pressure, reducing turbulence and increasing efficiency. Extensive testing of various shapes and locations has resulted in the most efficient aerodynamic design of the straightening vanes.

## Motor Mounting Platform

A heavy-duty motor mounting platform pivots to offer easy and positive adjustment of belt tension. The motor mounting platform is offered in eight standard locations to allow for motor accessibility and space requirements.

## Shaft

Shaft diameter sized so that maximum operating speed does not exceed 70% of first critical speed.

## OPTIONAL CONSTRUCTION

### Spark Resistant Construction

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

**Type A** - All parts of the fan in contact with the airstream must be made of nonferrous material — usually aluminum and limited to 200°F.

**Type B** - The fan shall have a nonferrous wheel and nonferrous rub ring about the opening through which the shaft passes — usually aluminum wheel and rub ring and limited to 200°F. Consult factory for availability.

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

### OSHPD Seismic Certification

Models QSL, QSLR and QLSH have been seismically tested and certified with the California Office of Statewide Health, Planning and Development (OSHPD) per OSP-0271-10. Seismic certification is limited to certain product options and configurations.

### Additional Options

- Clamshell & Swingout Designs (see page 7)
- Fume Hood Design (see page 7)
- UL 705



## Swingout Construction

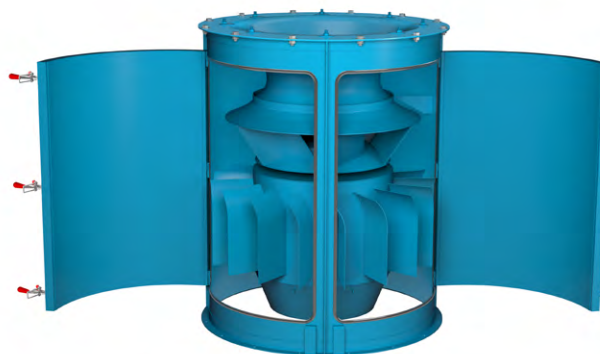
Provides full access to the wheel and inner casing. The entire wheel/shaft/bearing assembly is mounted on a large swingout door. Ideal for systems requiring frequent cleaning without removal of ductwork. Swingout construction is available for vertical mounting only. Available on sizes 182 to 600.

## Clamshell Design (Single & Double Door)

Clamshell style doors swing open wide to provide complete access to the interior of the fan for maintenance or cleaning without removal of ductwork. Heavy duty hinges, positive locking latches, and full gasketing provide a complete seal when doors are closed. An access door provides access to the bearings. All clamshell fans feature removable bearing covers. Available on all fan sizes, typically vertical mount.

## Accessories & Options

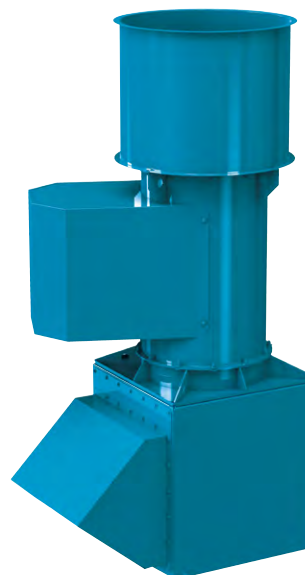
- Steel, aluminum and stainless steel construction available.
- FRP plastic inlet funnels available when aluminum is not suitable for spark resistant construction.
- Removable bearing cover plate is optional on axial swingout fans.
- Special coatings are available for corrosion resistance.
- OSHA belt guard available for all swingout & clamshell fans.

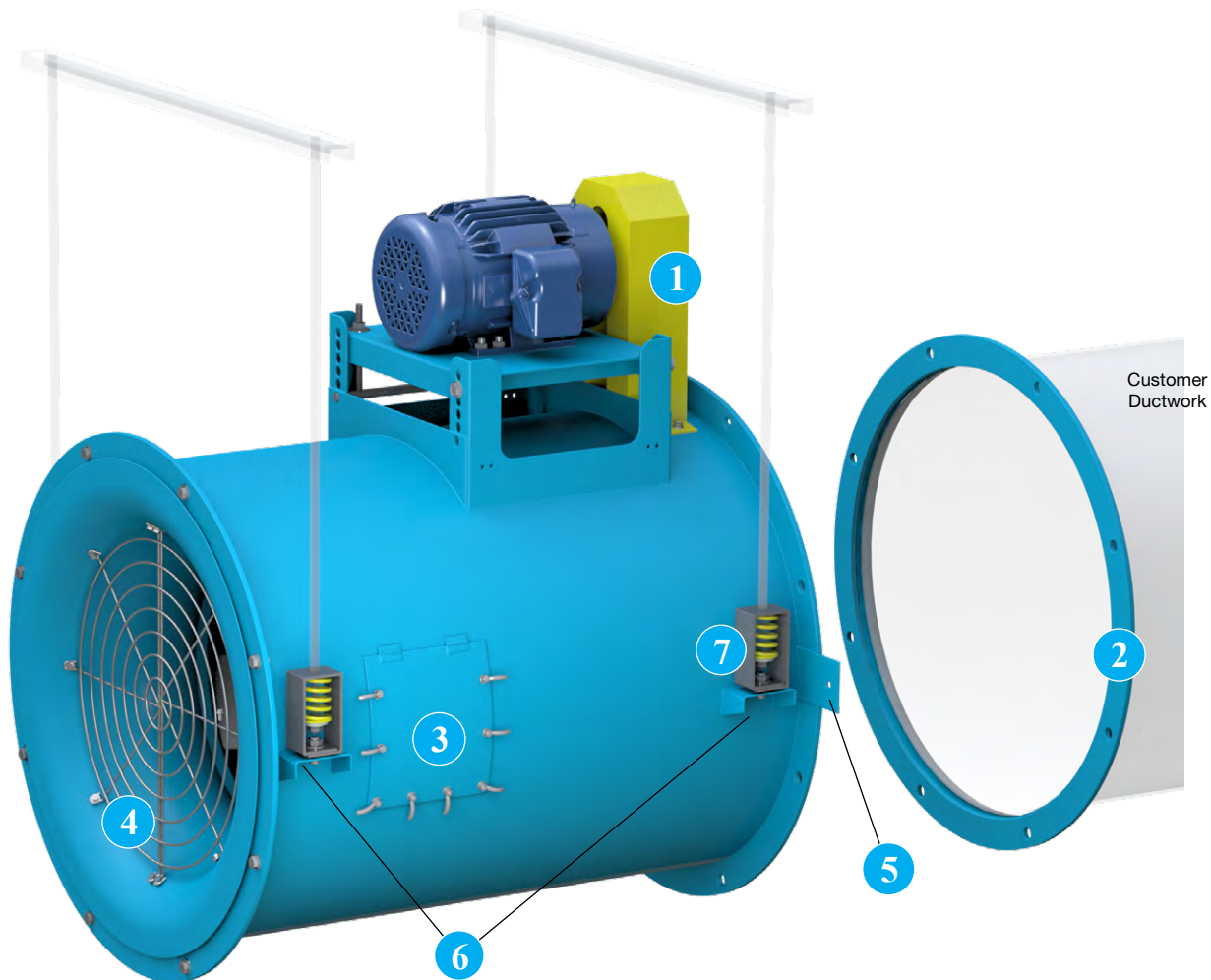


## Fumehood Exhaust Design

Twin City Fan & Blower offers a specially modified version of the QSL fan designated as "QFE" for laboratory fume hood exhaust applications, available in sizes 90 through 542. The QFE fan consists of a vertically mounted mixed flow fan with a reinforced curb cap and a modified discharge cap. The discharge cap includes an outlet venturi to permit the outlet velocity to meet the specific roof exhaust requirements. QFE fans in a standard configuration utilize an extended discharge with optional stack extensions available. The heavy duty curb cap will permit stack extensions for outlet height of 10 feet (120 inches) from the roof line without need for guide wires.

Refer to Catalog 1500 for selection and specifications.





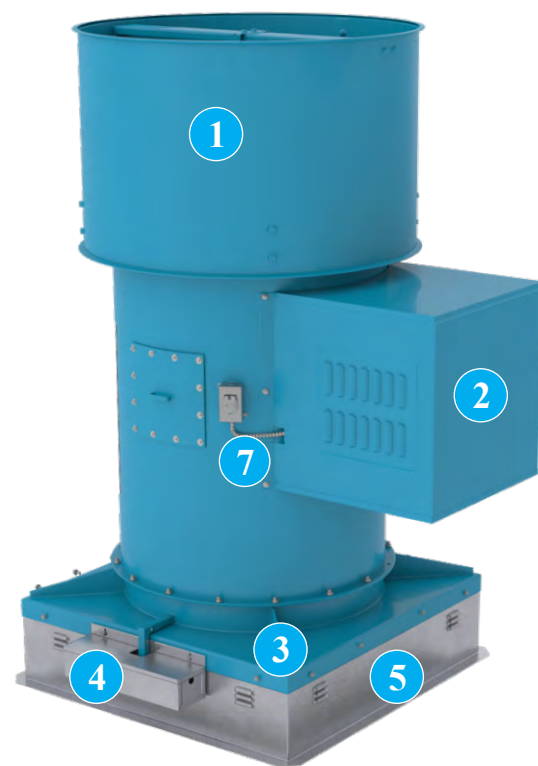
- 1 Belt Guard** Available in Arrangement 9 belt driven fans, the belt guard encloses the motor sheave and V-belts. The guard is easily removable for inspection and maintenance.
- 2 Companion Flanges** Flanges are rolled angle rings, drilled to match the fan's inlet or outlet flange.
- 3 Quick Open Access Door** For quick wheel inspection and maintenance. Access doors are specified where examination and cleaning of the fan interior is required. A bolted access door is also available.
- 4 Safety Screen** Safety screening can be provided for installation in the fan inlet, fan outlet.
- 5 Thrust Restraints** Steel brackets located near the outlet to mount thrust restraint isolators (supplied by others).
- 6 Suspension Clips** For horizontal flow with ceiling mounting, four clips of formed angle are welded to the fan housing for suspension via tie rods to the ceiling support structure.
- 7 Vibration Isolators** Spring type vibration isolation mounts are available to reduce the transmission of fan vibration in 1" or 2" deflection. Rubber-in-shear isolators are also available as an option.

## Other Accessories Include:

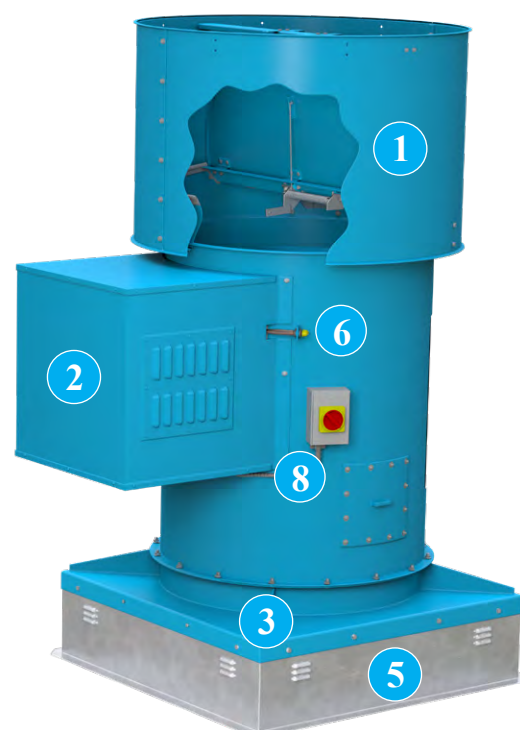
- Hinged Weather Cover
- Magnetic Damper latches
- Discharge Cap
- Piezometer Ring
- Pressure Transducers
- Shaft Seal
- Variable Inlet Vanes
- Curb Cap
- Insulated Roof Curb
- Vertical Support Legs
- Horizontal Support Legs
- Insulated Enclosure



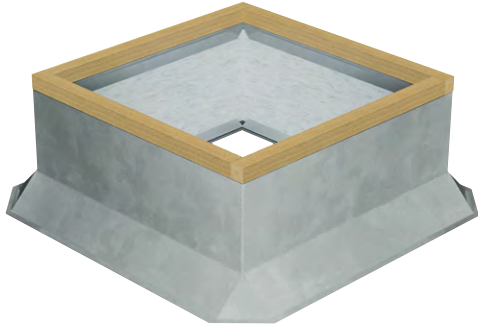
- 1 **Discharge Cap** Discharge caps are designed for vertical, rooftop discharge with butterfly type dampers to seal out the weather when the fan is shut off.
- 2 **Weather Cover** For outdoor installations, the weather cover completely encloses the motor and V-belt drive from the elements. Provided with slots for ventilation. Weather covers are available for either horizontal or vertical flow fans. Weather covers are standard on Model QLSH.
- 3 **Curb Cap** Attached to the fan's inlet flange for curb mounting. Standard accessory on vertical roof mounted configuration.
- 4 **Grease Box** The heavy gauge galvanized grease box is designed to trap the grease in and allow the water to run off onto the roof.
- 5 **Vented Roof Curb** Self-flashing style curbs with ventilation louvers allow ambient air in to cool and dilute grease- or smoke-laden airstreams. (See page 10 for additional curb options.)
- 6 **Extended Copper Lube Lines** Lube lines with grease fittings are extended to the outside of the fan housing. Nylon lube lines are standard on Model QSL. Copper lube lines are standard construction on Models QSLR and QLSH.
- 7 **NEMA 3R Disconnect Switch** QSL fans are provided with a NEMA 3R rain-tight disconnect switch, externally mounted when ODP or TEFC motors are used. Switch is available shipped loose for field mounting and wiring or factory mounted and wired.
- 8 **NEMA 4 Disconnect Switch** A NEMA 4 disconnect switches are mounted externally and is water and dust-tight. Switch is available shipped loose for field mounting and wiring or factory mounted and wired. (See page 11 for additional disconnect switch options.)



Model QSLR (Restaurant Fan)



Model QLSH (Smoke & Heat Fan)



## Canted Roof Curbs

- Constructed of 18-gauge galvanized steel with continuous welded seams
- Large 3" built-in 45° cant to accommodate roofing material to top of curb. Cant is beveled at corners for better support of roofing material
- Wood nailer (1½") secured to top ledge
- Lined with 1½" fiberglass fire-resistant, sound-absorbing insulation
- Damper shelf standard
- Not available on Models QSLR & QSLSH
- **Options:** Aluminum (16-gauge) construction, Burglar security bars, Metal liner (galvanized or aluminum), Special heights up to 24", Single or double pitched curbs for sloping roofs



## Self-Flashing & Straight Sided Roof Curbs

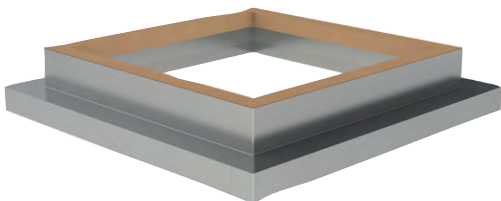
- Constructed of 18-gauge galvanized steel with continuous welded seams
- Wide base plate (flashing) to insure watertight seal to roof
- Top ledge covered with ¾" polystyrene gasket for weather seal and to reduce metal-to-metal conducted noise
- Lined with 1½" fiberglass fire-resistant, sound-absorbing insulation
- Damper shelf standard
- Straight-sided roof curbs are constructed with the same features as the self-flashing curbs, but are sized smaller to allow for field supplied cants and roofing material to be brought up to the top of the curb
- Not available on Models QSLR & QSLSH
- **Options:** Aluminum (16-gauge) construction, Burglar security bars, Metal liner (galvanized or aluminum), Special heights up to 24", Wood nailer (1½") secured to top ledge in lieu of polystyrene gasket, Single or double pitched curbs for sloping roofs



## Self-Flashing Vented Roof Curbs

### For High Temperature Applications

- Completely assembled unit, easier to install and less expensive than a field constructed curb
- Constructed of 18-gauge galvanized steel with continuous welded seams and wide base flashing for watertight seal to roof
- Meets NFPA-96 code requirements
- Top ledge covered with ¾" polystyrene gasket
- Furnished with ventilation slots



## Curb Adapters

- Constructed of heavy-gauge galvanized steel with continuous welded seams
- Top ledge covered with ¾" polystyrene gasket to reduce metal-to-metal conducted noise and act as a weather seal
- Available in enlarger or reducer (shown) models

Disconnect switches provide positive electrical shutoff during fan cleaning or maintenance.

### NEMA 1 Disconnect Switch (Standard)

A NEMA 1 disconnect switch is available shipped loose for field mounting and wiring or factory mounted and wired with ODP or TEFC motors. For indoor applications.

### NEMA 3R Disconnect Switch

A NEMA 3R, rain proof, disconnect is available shipped loose for field mounting and wiring or factory mounted and wired externally.

### NEMA 4 Disconnect Switch

A NEMA 4, water and dust tight, disconnect is available shipped loose for field mounting and wiring or factory mounted and wired externally.

### NEMA 7/9 Disconnect Switch

A NEMA 7/9 disconnect switch is recommended on fans with explosion proof motors. The NEMA 7/9 switch is designed for use with fans operating in hazardous environments. Available shipped loose for field mounting and wiring. (Not shown.)



NEMA 1  
Disconnect Switch



NEMA 3R  
Disconnect Switch



NEMA 4  
Disconnect Switch

## INSTALLATION PHOTOS



Biofilter Exhaust



Paint Spray Booth



General HVAC



Smoke Control (Stadium)

# ARRANGEMENTS & MOUNTING CONFIGURATIONS



FAN SIZE	ARR. 3 OVERALL LENGTH (TA)	LENGTH SAVINGS (IN.)
182	26.75	7.13
200	28.81	8.38
222	30.88	9.25
245	33.94	10.38
270	36.50	12.31
300	40.88	13.69
330	44.94	14.94
365	49.44	16.94
402	54.31	18.69
445	59.06	21.88
490	64.06	24.94
542	71.38	27.38

## Arrangement 3

Where space is a premium, the QSL Arrangement 3 is available to shorten the overall fan length. The table above shows the overall savings in length versus an Arrangement 9 fan. Consult factory for further information.



## Arrangement 4 (Direct Drive)

The arrangement 4 QSL is constructed with the fan wheel mounted directly on the motor shaft, this fan provides premium efficiency with minimal obstructions in the airstream. Only available on Model QSL.



## Arrangement 9 (Belt Driven)

Designed for mounting the motor on outside of casing in one of the standard locations shown below. For horizontal and vertical discharge.

## MOUNTING CONFIGURATIONS

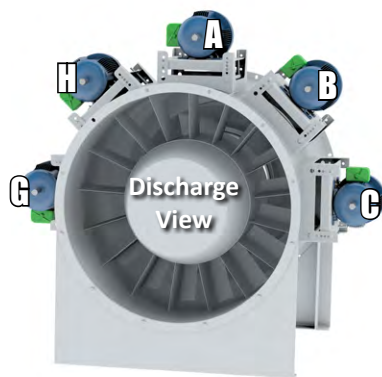
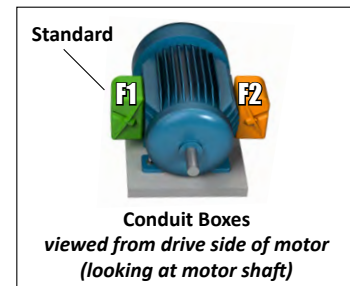
### Horizontal Construction

Horizontal construction is available in sizes 150 through 730.

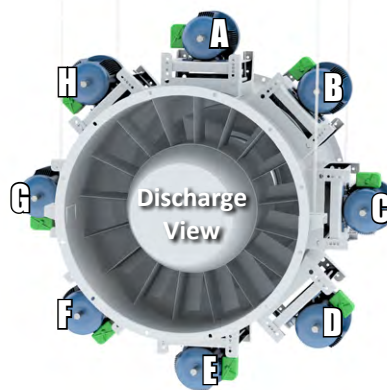
Horizontal Base Mounted (HBM) — Support legs are provided at each end of the fan for floor mounting.

Horizontal Ceiling Hung (HCH) — For duct mounted fans, four suspension clips are welded to the fan casing to allow ceiling suspension using rod hangers.

Horizontal (HOR) — For mounting configurations where support legs and suspension clips are not required.



**HBM**  
*Horizontal Base Mounted*



**HCH**  
*Horizontal Ceiling Hung*



**HOR**  
*Horizontal No Mounting Brackets*

## Vertical Construction

Vertical construction is available in sizes 150 through 542. Consult factory for larger sizes.

Floor or Ceiling Mounted (VUI/VUO/VDI/VDO) — Four vertical brackets are welded to either end of the fan housing. Bracket location is determined by airflow direction and support details (see below).

Roof Mounted (VRM) — A curb cap provides weathertight seal for roof curb mounted fans. A discharge cap and weather cover are also available for the upblast style roof ventilator.

Vertical (VUN/VDN) — For mounting configurations where support brackets are not required.

Available Discharges by Model

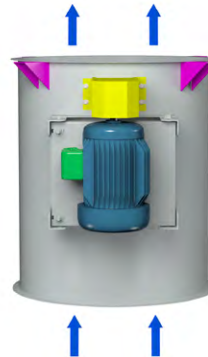
QSL	QSLSH	QSLR
HBM	HBM	HBM
HCH	HCH	HCH
HOR	HOR	HOR
VDI	N/A	N/A
VDN	N/A	N/A
VDO	N/A	N/A
VUI	VUI	VUI
VUN	VUN	VUN
VUO	VUO	VUO
VRM	VRM	VRM



**VRM**  
*Vertical Roof Mounted*



**VUI**  
*Vertical Discharge Up, Floor Mount Support Brackets On Inlet*



**VUO**  
*Vertical Discharge Up, Ceiling Hung Support Brackets On Outlet*



**VUN**  
*Vertical Up No Brackets*



**VDI**  
*Vertical Discharge Down, Ceiling Hung Support Brackets On Inlet*



**VDO**  
*Vertical Discharge Down, Floor Mount Support Brackets On Outlet*



**VDN**  
*Vertical Down No Brackets*



Table 1. Maximum RPM, Wheel Weights, and  $WR^2$  (moment of inertia in  $lb-ft^2$ )

FAN SIZE	CLASS I			CLASS II		
	MAX. RPM	WEIGHT LB	$WR^2$ LB-FT <sup>2</sup>	MAX. RPM	WEIGHT LB	$WR^2$ LB-FT <sup>2</sup>
150	2721	24	5.5	3558	28	7.1
165	2483	32	8.0	3247	36	10.3
182	2232	38	12	2918	44	15
200	2027	48	20	2650	52	23
222	1839	57	29	2405	62	34
245	1655	69	45	2165	75	52
270	1505	82	66	1968	90	76
300	1360	140	133	1779	150	145
330	1234	167	197	1613	179	215
365	1116	233	320	1459	247	347
402	1013	324	588	1325	324	588
445	915	393	883	1197	393	883
490	828	478	1321	1082	478	1321
542	752	591	1934	984	591	1934
600	680	715	2893	890	715	2893
660	615	867	4334	804	867	4334
730	558	1064	6396	730	1064	6396

Table 2. Bare Fan Weights (lb)

FAN SIZE	ARRANGEMENT 9	
	CLASS I	CLASS II
150	168	175
165	202	210
182	215	227
200	257	267
222	303	315
245	367	377
270	434	450
300	660	690
330	802	821
365	1019	1048
402	1332	1357
445	1595	1627
490	1992	2008
542	2504	2537
600	3006	3034
660	3880	3979
730	4719	4758

Table 3. Temperature and Altitude Density Ratios

AIR TEMP °F	ALTITUDE IN FEET ABOVE SEA LEVEL											
	0	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000	15000
	BAROMETRIC PRESSURE IN INCHES OF MERCURY											
	29.92	28.86	27.82	26.82	25.84	24.90	23.98	23.09	22.22	21.39	20.58	16.89
-50	1.293	1.247	1.201	1.159	1.116	1.076	1.036	0.997	0.960	0.924	0.889	0.729
0	1.152	1.111	1.071	1.032	0.995	0.959	0.923	0.889	0.856	0.824	0.792	0.650
70	1.000	0.964	0.930	0.896	0.864	0.832	0.801	0.772	0.743	0.714	0.688	0.564
100	0.946	0.912	0.880	0.848	0.818	0.787	0.758	0.730	0.703	0.676	0.651	0.534
150	0.869	0.838	0.808	0.770	0.751	0.723	0.696	0.671	0.646	0.620	0.598	0.490
200	0.803	0.774	0.747	0.720	0.694	0.668	0.643	0.620	0.596	0.573	0.552	0.453

Table 4. Bearing Specifications

FAN SIZE	CLASS I			CLASS II		
	SHAFT DIA. (IN.)	HORIZ.	VERT.	SHAFT DIA. (IN.)	HORIZ.	VERT.
150	1.000	SDB	SDB	1.187	SDB	SDB
165	1.000	SDB	SDB	1.437	SDB	SDB
182	1.000	SDB	SDB	1.437	HDB	HDB
200	1.187	SDB	SDB	1.437	HDB	HDB
222	1.187	SDB	SDB	1.437	HDB	HDB
245	1.437	SDB	SDB	1.687	HDB	HDB
270	1.437	SDB	SDB	1.687	HDB	RB
300	1.437	HDB	HDB	1.937	HDB	RB
330	1.687	HDB	HDB	2.187	HDB	RB
365	1.937	HDB	HDB	2.187	RB	RB
402	1.937	HDB	RB	2.187	RB	RB
445	1.937	HDB	RB	2.437	RB	RB
490	2.187	HDB	RB	2.437	RB	RB
542	2.437	HDB	RB	2.687	RB	RB
600	2.687	HDB	—	2.937	RB	—
660	2.937	HDB	—	3.437	RB	—
730	2.937	HDB	—	3.937	RB	—

**NOTES:**

- BEARINGS CODES:  
 SDB — Standard-Duty Ball such as Dodge SCAH or SKF SY Series  
 HDB — Heavy-Duty Ball such as Dodge SCMAH or SKF SYM Series  
 RB — Roller Bearing such as Dodge S2000 or SKF SYR Series
- Standard bearings are selected to exceed L-10 life of 40,000 hours at the maximum operating speed.

Table 5. Minimum CFM Required to Open Discharge Cap

FAN SIZE	CFM
150	1051
165	1707
182	2532
200	3527
222	3527
245	4693
270	6574
300	7605
330	8712
365	11158
402	15891
445	15891
490	20904
542	26613















**660 QSL**

Wheel Dia.: 80.75"  
Outlet Dia.: 89.31"

Max. BHP = 342.30 (RPM ÷ 1000)<sup>3</sup>  
Tip Speed FPM = 21.14 x RPM

Outlet Area: 43.50 ft<sup>2</sup>  
Fan Efficiency Grade: FEG80

CFM	OV	0.5" SP		1" SP		1.5" SP		2" SP		2.5" SP		3" SP		4" SP		5" SP		6" SP		7" SP		8" SP	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
33000	759	222	3.65	280	7.44	328	11.60																
37000	851	236	4.28	289	8.19	335	12.65	377	17.45														
41000	943	251	5.01	298	8.96	344	13.80	384	18.93	421	24.24												
45000	1035	266	5.80	309	9.90	353	14.93	392	20.37	428	26.11	461	31.84										
50000	1150	286	6.97	326	11.39	365	16.47	403	22.22	437	28.21	470	34.68										
55000	1265	306	8.26	344	13.08	379	18.27	415	24.25	448	30.52	480	37.39	538	51.45								
60000	1380	326	9.70	363	15.01	394	20.20	427	26.29	460	33.04	491	40.17	547	55.01	598	70.18						
67500	1552	358	12.40	391	18.09	421	23.96	450	30.26	479	37.10	508	44.48	562	60.21	612	77.10	659	94.61	702	111.79		
75000	1725	390	15.60	421	21.79	450	28.42	476	34.98	501	41.81	527	49.33	580	66.23	628	83.99	673	102.71	715	121.64	755	140.76
82500	1897			452	26.10	479	33.29	504	40.49	527	47.66	550	55.27	598	72.37	645	91.10	688	110.45	730	131.33	769	152.17
90000	2069			483	30.97	508	38.55	532	46.43	555	54.43	576	62.29	619	79.56	663	98.76	706	119.47	746	140.85	784	162.96
97500	2242			514	36.48	539	44.79	562	53.35	583	61.67	604	70.37	643	87.90	683	107.31	724	128.67	763	150.80	800	173.75
105000	2414			546	42.92	569	51.41	591	60.48	612	69.75	632	78.96	669	97.35	705	116.72	743	138.39	781	161.53		
112500	2587					601	59.31	622	68.85	642	78.68	661	88.50	697	108.15	730	127.75	765	149.70	800	172.88		
120000	2759					632	67.73	652	77.61	672	88.24	690	98.57	725	119.55	757	140.27	789	162.24				
127500	2932					664	77.35	684	87.92	702	98.52	720	109.69	754	132.10	785	153.94						

MAXIMUM RPM: Class I — 615 Class II — 804

**730 QSL**

Wheel Dia.: 89.00"  
Outlet Dia.: 98.81"

Max. BHP = 556.14 (RPM ÷ 1000)<sup>3</sup>  
Tip Speed FPM = 23.30 x RPM

Outlet Area: 53.25 ft<sup>2</sup>  
Fan Efficiency Grade: FEG80

CFM	OV	0.5" SP		1" SP		1.5" SP		2" SP		2.5" SP		3" SP		4" SP		5" SP		6" SP		7" SP		8" SP	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
40000	752	202	4.47	254	9.03	298	14.13																
45000	846	214	5.19	262	9.93	304	15.37	342	21.20														
50000	940	228	6.10	271	10.96	312	16.75	349	23.13	382	29.49												
57500	1081	250	7.71	287	12.79	325	18.95	360	25.73	392	32.92	422	40.32										
65000	1222	272	9.53	307	15.23	340	21.53	373	28.65	404	36.38	432	44.23	485	60.85								
72500	1364	295	11.71	328	18.03	357	24.47	387	31.85	417	40.03	444	48.31	496	66.65	542	84.86						
80000	1505	318	14.23	349	21.09	377	28.17	403	35.51	430	43.74	457	52.69	507	71.83	553	92.19	595	112.50				
87500	1646	342	17.28	371	24.59	398	32.35	422	40.03	446	48.31	471	57.48	520	77.64	564	98.76	605	120.69	644	143.15	681	165.88
95000	1787	366	20.77	394	28.63	419	36.85	442	45.06	464	53.56	487	62.98	533	83.54	576	105.50	616	128.59	654	152.57	690	176.78
102500	1928			417	33.09	441	41.93	463	50.73	484	59.71	505	69.27	547	89.94	589	112.81	628	136.70	666	162.51	701	188.15
110000	2069			440	38.01	463	47.37	485	57.11	505	66.58	524	76.16	563	97.27	603	120.81	641	145.42	678	172.00	712	198.61
120000	2257			472	45.79	493	55.50	514	66.09	534	76.79	552	87.05	587	108.47	623	132.25	659	157.73	695	185.35	728	213.00
130000	2445			504	54.66	524	64.92	544	76.22	563	87.77	580	98.71	614	121.83	646	145.53	679	171.44	713	199.74		
140000	2633					555	75.44	574	87.29	592	99.51	609	111.71	641	135.93	672	161.19	702	187.36				
150000	2821					587	87.61	605	99.94	622	112.69	639	126.10	670	152.20	699	178.30	727	205.14				
160000	3009					619	101.14	636	113.86	653	127.58	668	140.88	699	169.47	727	197.09						

MAXIMUM RPM: Class I — 558 Class II — 730

**Legend:**

Class I = Regular face to left of Class II

Class II = Regular face in light shaded area

Performance certified is for installation Type B: Free inlet, ducted outlet.

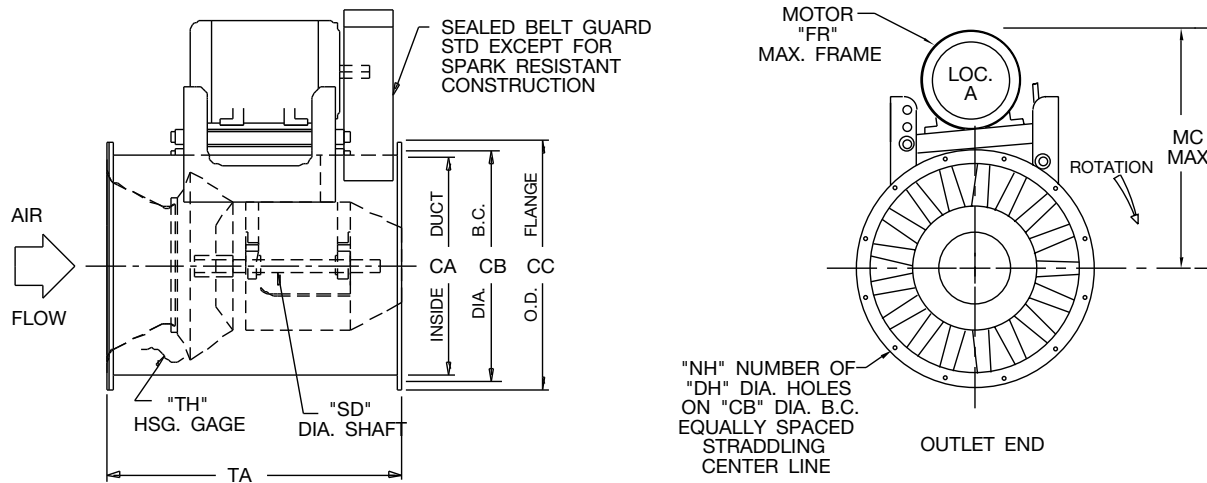
Power rating (BHP) does not include transmission losses.

Performance ratings do not include the effects of appurtenances (accessories).

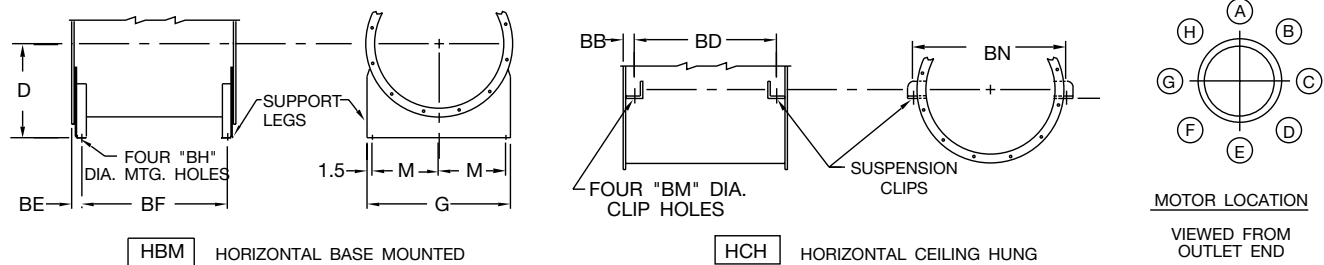
Underlined figures indicate maximum static efficiency.



Models QSL, QSLR, QSLSH  
Arr. 9, Horizontal



TYPE "QSL" HORIZONTAL DISCHARGE



**HBM** HORIZONTAL BASE MOUNTED

**HCH** HORIZONTAL CEILING HUNG

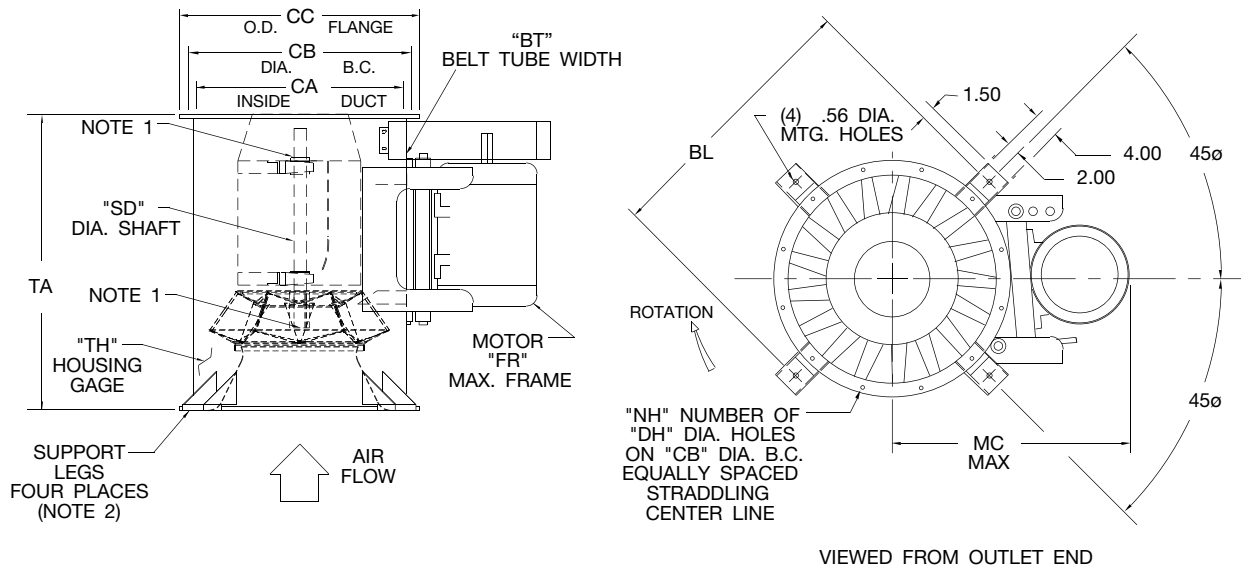
MOTOR LOCATION  
VIEWED FROM  
OUTLET END

SIZE	BB	BD	BE	BF	BH	BM	BN	BT	CA	CB	CC	D	DH	FR	G	M	MC	NH	SD		TA	TH
																			CL I	CL II		
150	1.00	25.78	1.06	25.65	0.44	0.56	23.50	6.50	20.25	22.13	23.38	14.00	0.56	215T	23.38	10.19	25.73	8	1.000	1.187	27.78	10
165	1.00	28.63	1.06	28.50	0.44	0.56	25.88	6.50	22.31	24.38	25.75	15.00	0.69	215T	25.75	11.25	27.79	8	1.000	1.437	30.62	10
182	1.50	30.89	1.06	31.76	0.44	0.56	27.75	6.50	24.69	26.75	28.00	16.00	0.69	256T	28.00	12.50	34.45	12	1.000	1.437	33.89	12
200	1.50	34.18	1.06	35.05	0.56	0.56	30.13	7.25	27.06	29.13	30.31	18.00	0.81	256T	30.31	13.66	36.20	12	1.187	1.437	37.18	12
222	1.50	37.19	1.31	37.57	0.56	0.56	33.13	8.00	30.06	32.13	33.38	20.00	0.81	256T	33.38	15.19	37.65	12	1.187	1.437	40.19	12
245	1.50	41.31	1.31	41.69	0.56	0.81	36.25	8.93	33.13	35.13	36.38	21.00	0.81	286T	36.38	16.69	37.8	12	1.437	1.687	44.31	12
270	1.50	45.83	1.31	46.20	0.56	0.81	39.63	9.75	36.50	38.50	39.75	23.00	0.81	286T	39.75	18.38	42.16	12	1.437	1.687	48.83	12
300	1.50	51.52	1.31	51.89	0.56	0.81	43.75	10.93	40.56	43.13	44.88	25.00	0.81	326T	44.88	20.94	45.13	16	1.437	1.937	54.52	10
330	1.50	56.90	1.31	57.28	0.56	0.81	47.88	12.00	44.63	47.25	49.00	27.00	0.81	326T	49.00	23.00	46.56	16	1.687	2.187	59.90	10
365	2.00	62.37	1.56	63.25	0.81	0.81	52.56	13.25	49.38	52.00	53.75	29.00	0.81	365T	53.75	25.38	51.50	16	1.937	2.187	66.37	10
402	2.00	69.00	1.69	69.63	0.81	0.81	57.56	14.75	54.38	57.50	59.75	33.00	0.81	365T	59.75	28.38	59.77	16	1.937	2.187	73.00	10
445	2.00	76.92	1.69	77.54	0.81	0.81	63.38	16.25	60.19	63.25	65.50	36.00	0.81	405T	65.50	31.25	62.22	16	1.937	2.437	80.92	10
490	2.00	84.99	1.69	85.62	0.81	0.81	69.44	18.00	66.25	69.38	71.63	39.00	0.81	405T	71.63	34.31	67.68	24	2.187	2.437	88.99	10
542	2.00	94.71	2.44	93.84	0.81	1.06	76.56	19.88	73.38	77.00	79.75	43.00	0.81	445T	79.75	38.38	71.57	24	2.437	2.687	98.71	10
600	2.50	103.74	2.44	103.87	0.81	1.06	85.38	22.13	81.19	84.75	87.50	47.00	0.81	445T	87.50	42.25	78.47	24	2.687	2.937	108.74	10
660	2.50	115.11	2.44	115.24	1.06	1.06	93.56	24.25	89.31	92.88	95.63	52.00	0.81	445T	95.63	46.37	82.77	24	2.937	3.437	120.11	10
730	2.50	127.71	2.44	127.84	1.06	1.06	102.94	26.88	98.75	104.38	107.13	57.00	0.81	445T	107.13	52.06	87.75	24	2.937	3.937	132.77	10

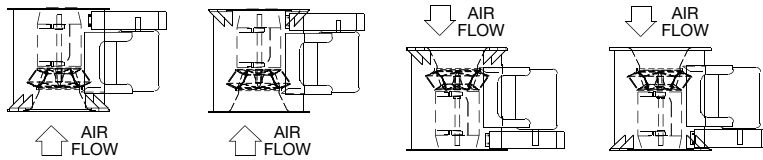
QSL-AC1000023E  
QSLR-AC1001672A  
QSLSH-AC1001666B

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

**Models QSL, QSLR, QLSH  
Arr. 9, Vertical**



TYPE "QSL" VERTICAL UP DISCHARGE WITH FLOOR MOUNT SUPPORT LEGS



**NOTES:**

1. One locking collar and wheel hub cap included to prevent shifting of components.
2. Support legs shown are provided as an accessory.

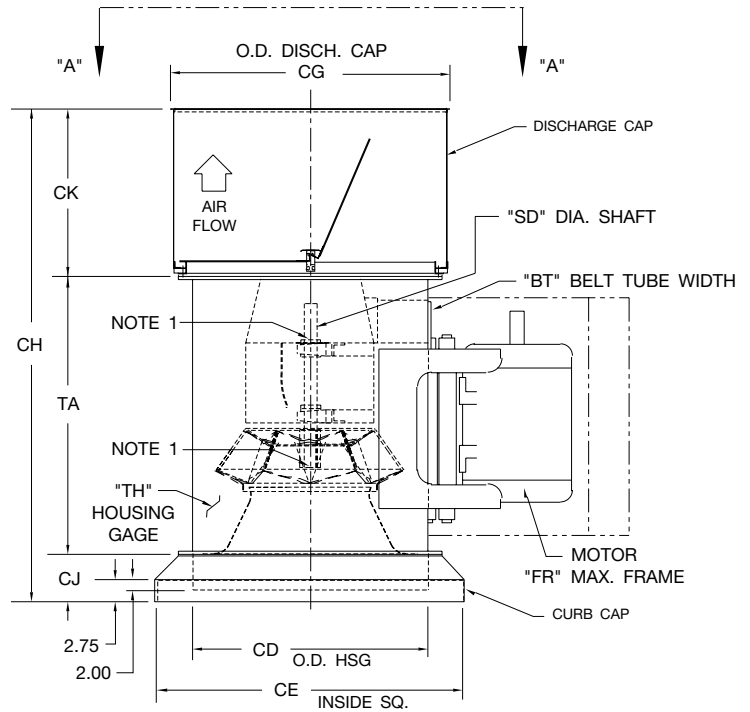
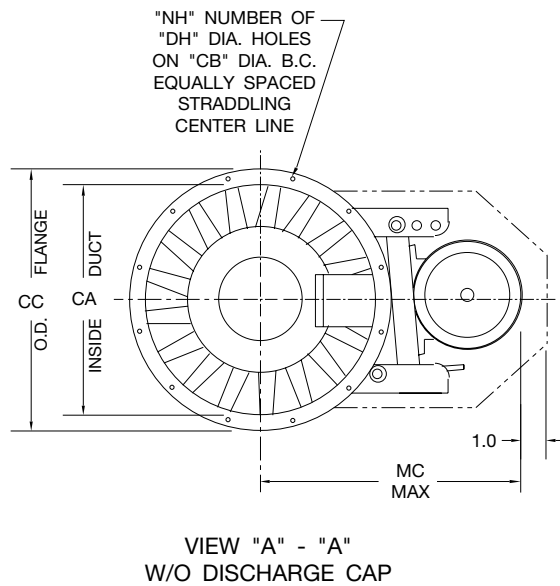
**VUI** DISCHARGE UP FLOOR MOUNT    **VUO** DISCHARGE UP CEILING HUNG    **VDI** DISCH. DOWN CEILING HUNG    **VDO** DISCH. DOWN FLOOR MOUNT

SIZE	BL	BT	CA	CB	CC	DH	FR	MC	NH	SD		TA	TH
										CLI	CLII		
150	25.38	6.50	20.25	22.13	23.38	0.56	215T	25.73	8	1.000	1.187	27.75	10
165	27.94	6.50	22.31	24.38	25.75	0.69	215T	27.73	8	1.000	1.437	30.36	10
182	33.00	6.50	24.69	26.75	28.00	0.69	256T	34.45	12	1.000	1.437	33.88	12
200	35.38	7.25	27.06	29.13	30.31	0.81	256T	36.20	12	1.187	1.437	37.19	12
222	38.00	8.00	30.06	32.13	33.38	0.81	256T	37.65	12	1.187	1.437	40.19	12
245	41.38	8.93	33.13	35.13	36.38	0.81	286T	37.86	12	1.437	1.687	44.31	12
270	44.75	9.75	36.50	38.50	39.75	0.81	286T	42.16	12	1.437	1.687	48.81	12
300	49.88	10.93	40.56	43.13	44.88	0.81	326T	45.13	16	1.437	1.937	54.56	10
330	54.00	12.00	44.63	47.25	49.00	0.81	326T	46.56	16	1.687	2.187	59.88	10
365	58.75	13.25	49.38	52.00	53.75	0.81	365T	51.50	16	1.937	2.187	66.38	10
402	64.75	14.75	54.38	57.50	59.75	0.81	365T	59.77	16	1.937	2.187	73.00	10
445	70.50	16.25	60.19	63.25	65.50	0.81	405T	62.22	16	1.937	2.437	80.94	10
490	76.63	18.00	66.25	69.38	71.63	0.81	405T	67.68	24	2.187	2.437	88.00	10
542	84.75	19.88	73.38	77.00	79.75	0.81	445T	71.51	24	2.437	2.687	98.69	10

QSL-AC1000024F  
QSLR-AC1001675B  
QLSH-AC1001667C

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

Models QSL, QSLR, QSLSH  
Arr. 9, Vertical Roof



TYPE "QSL" VERTICAL DISCHARGE WITH DISCHARGE CAP AND CURB CAP

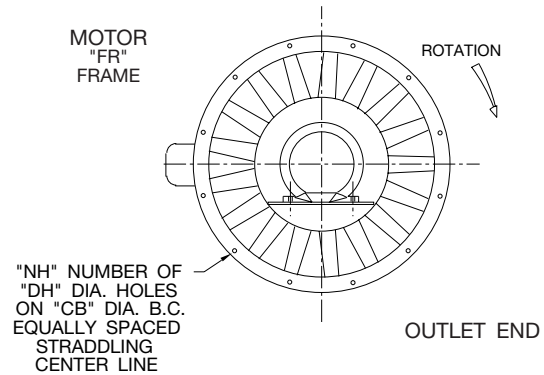
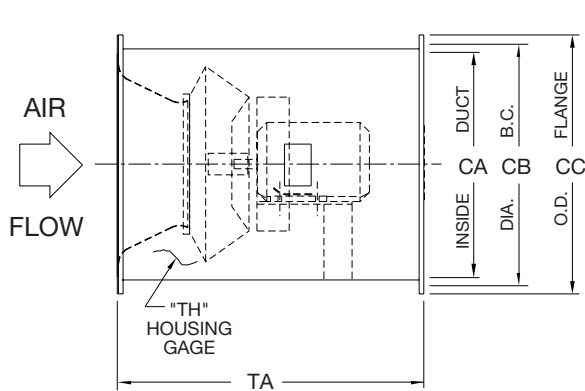
- NOTES:  
 1. One locking collar and wheel hub cap included to prevent shifting of components.  
 2. Discharge cap and curb cap are optional accessories.

SIZE	BL	BT	CA	CB	CC	CD	CE	CG	CH	CJ	CK	DH	FR	MC	NH	SD		TA	TH
																CLI	CLII		
150	25.38	6.50	20.25	22.13	23.38	20.50	27.38	30.00	48.75	6.00	15.00	0.56	215T	25.73	8	1.000	1.187	27.75	10
165	27.94	6.50	22.31	24.38	25.75	22.56	30.88	32.00	54.94	6.31	18.00	0.69	215T	27.73	8	1.000	1.437	30.36	10
182	33.00	6.50	24.69	26.75	28.00	24.88	34.88	34.00	58.50	6.63	18.00	0.69	256T	34.45	12	1.000	1.437	33.88	12
200	35.38	7.25	27.06	29.13	30.31	27.25	37.38	40.00	64.94	6.75	21.00	0.81	256T	36.20	12	1.187	1.437	37.19	12
222	38.00	8.00	30.06	32.13	33.38	30.25	40.38	40.00	67.94	6.75	21.00	0.81	256T	37.65	12	1.187	1.437	40.19	12
245	41.38	8.93	33.13	35.13	36.38	33.31	43.38	46.00	75.31	7.00	24.00	0.81	286T	37.86	12	1.437	1.687	44.31	12
270	44.75	9.75	36.50	38.50	39.75	36.69	46.75	46.00	80.06	7.25	24.00	0.81	286T	42.16	12	1.437	1.687	48.81	12
300	49.88	10.93	40.56	43.13	44.88	40.81	51.00	53.00	89.31	7.75	27.00	0.81	326T	45.13	16	1.437	1.937	54.56	10
330	54.00	12.00	44.63	47.25	49.00	44.88	55.13	59.00	97.63	7.75	30.00	0.81	326T	46.56	16	1.687	2.187	59.88	10
365	58.75	13.25	49.38	52.00	53.75	49.63	59.88	60.00	104.13	7.75	30.00	0.81	365T	51.50	16	1.937	2.187	66.38	10
402	64.75	14.75	54.38	57.50	59.75	54.63	64.88	67.00	114.00	8.00	33.00	0.81	365T	59.77	16	1.937	2.187	73.00	10
445	70.50	16.25	60.19	63.25	65.50	60.44	69.63	73.00	125.44	8.50	36.00	0.81	405T	62.22	16	1.937	2.437	80.94	10
490	76.63	18.00	66.25	69.38	71.63	66.50	78.00	80.00	138.00	9.00	40.00	0.81	405T	67.68	24	2.187	2.437	88.00	10
542	84.75	19.88	73.38	77.00	79.75	73.63	88.75	86.50	157.56	9.25	49.63	0.81	445T	71.51	24	2.437	2.687	98.69	10

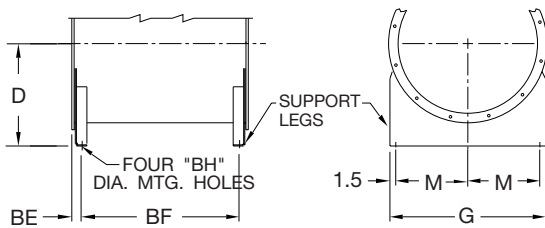
QSL-AC1000567B  
 QSLR-AC1001673B  
 QSLSH-AC1001674B

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

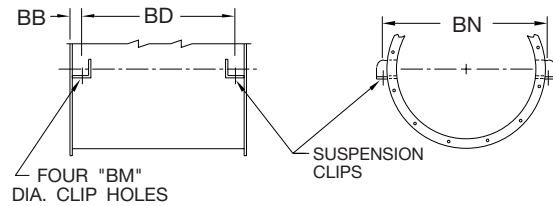
**Model QSL  
Arr. 4, Horizontal**



**TYPE "QSL" HORIZONTAL DISCHARGE**



**HBM** HORIZONTAL BASE MOUNTED



**HCH** HORIZONTAL CEILING HUNG

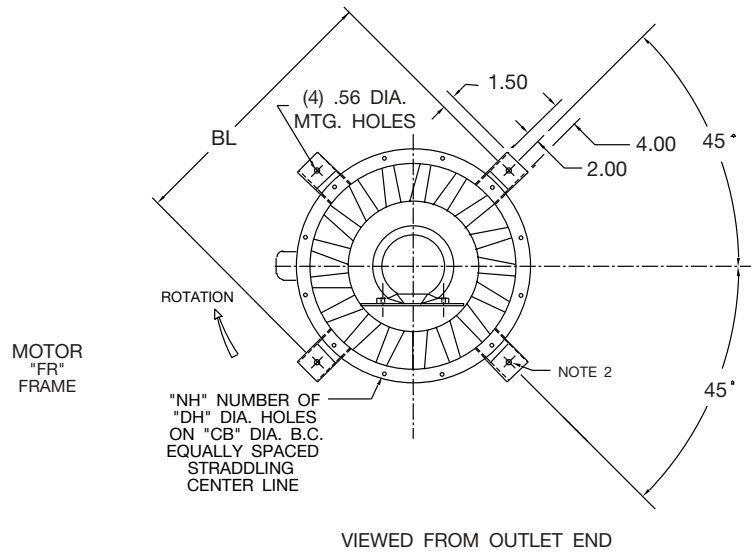
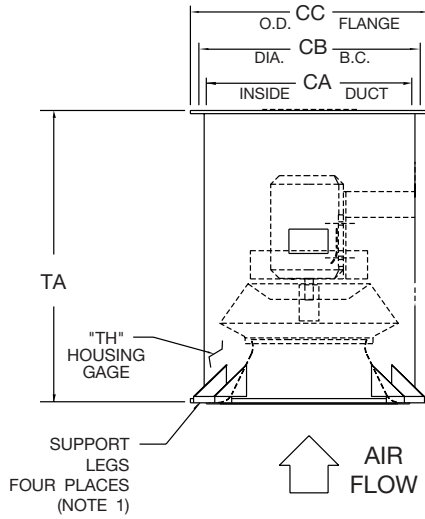
SIZE	BB	BD	BE	BF	BH	BM	BN	CA	CB	CC	D	DH	FR		G	M	NH	TA	TH
													MIN.	MAX.					
150	1.00	25.75	1.06	25.63	0.44	0.56	23.50	20.25	22.13	23.38	14.00	0.56	56	145T	23.38	10.19	8	27.75	10
165	1.00	28.63	1.06	28.50	0.44	0.56	25.88	22.25	24.38	25.75	15.00	0.69	56	184T	25.75	11.25	8	30.63	10
182	1.50	30.88	1.06	31.75	0.44	0.56	27.75	24.69	26.75	28.00	16.00	0.69	56	215T	28.00	12.50	12	33.88	12
200	1.50	34.19	1.06	35.06	0.56	0.56	30.13	27.06	29.13	30.31	18.00	0.81	56	254T	30.31	13.66	12	37.19	12
222	1.50	37.19	1.31	37.56	0.56	0.56	33.13	30.06	32.13	33.38	20.00	0.81	56	256T	33.38	15.19	12	40.19	12
245	1.50	41.31	1.31	41.69	0.56	0.81	36.25	33.13	35.13	36.38	21.00	0.81	56	286T	36.38	16.69	12	44.31	12
270	1.50	45.81	1.31	46.19	0.56	0.81	39.63	36.50	38.50	39.75	23.00	0.81	143T	286T	39.75	18.38	12	48.81	12
300	1.50	51.56	1.31	51.94	0.56	0.81	43.75	40.56	43.13	44.88	25.00	0.81	182T	326T	44.88	20.94	16	54.56	10
330	1.50	56.88	1.31	57.25	0.56	0.81	47.88	44.63	47.25	49.00	27.00	0.81	184T	326T	49.00	23.00	16	59.88	10
365	2.00	62.38	1.56	63.25	0.56	0.81	52.56	49.38	52.00	53.75	29.00	0.81	184T	405T	53.75	25.38	16	66.38	10
402	2.00	69.00	1.69	69.63	0.81	0.81	57.56	54.38	57.50	59.75	33.00	0.81	213T	405T	59.75	28.38	16	73.00	10
445	2.00	76.94	1.69	77.56	0.81	0.81	63.38	60.19	63.25	65.50	36.00	0.81	215T	445T	65.50	31.25	16	80.94	10
490	2.00	85.00	1.69	85.63	0.81	0.81	69.44	66.25	69.38	71.63	39.00	0.81	254T	445T	71.63	34.31	24	89.00	10
542	2.00	94.69	2.44	93.81	0.81	1.06	76.56	73.38	77.00	79.75	43.00	0.81	256T	445T	79.75	38.38	24	98.69	10
600	2.50	103.75	2.44	103.88	0.81	1.06	85.38	81.19	84.75	87.50	47.00	0.81	284T	445T	87.50	42.25	24	108.75	10
660	2.50	115.13	2.44	115.25	1.06	1.06	93.56	89.31	92.88	95.63	52.00	0.81	324T	445T	95.63	46.31	24	120.13	10
730	2.50	127.69	2.44	127.81	1.06	1.06	102.94	98.75	104.38	107.13	57.00	0.81	326T	445T	107.13	52.06	24	132.69	10

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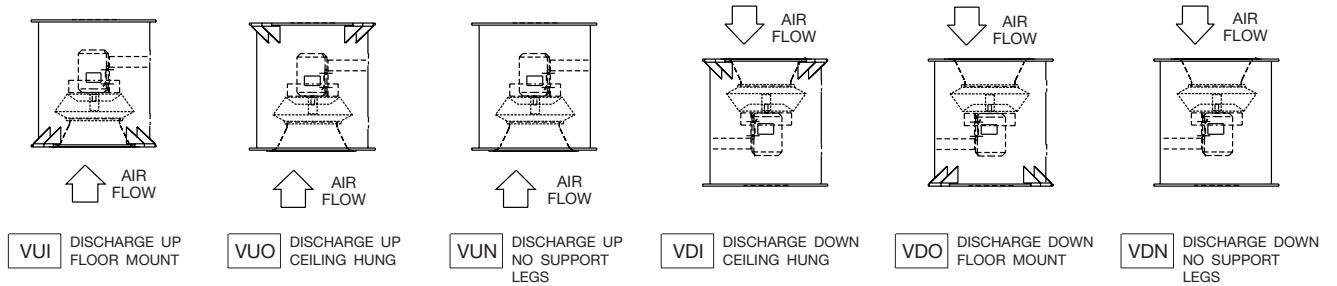
DIMENSIONS ARE SUBJECT TO CHANGE. CERTIFIED DRAWINGS AVAILABLE ON REQUEST.



# Model QSL Arr. 4, Vertical



TYPE "QSL" VERTICAL UP DISCHARGE WITH FLOOR MOUNT SUPPORT LEGS (NOTE 1)



NOTE:  
1. Support legs shown are provided as an accessory.

SIZE	BL	CA	CB	CC	DH	FR		NH	TA	TH
						MIN.	MAX.			
150	25.38	20.25	22.13	23.38	0.56	56	145T	8	27.75	10
165	27.94	22.25	24.38	25.75	0.69	56	184T	8	30.63	10
182	33.00	24.69	26.75	28.00	0.69	56	215T	12	33.88	12
200	35.38	27.06	29.13	30.31	0.81	56	254T	12	37.19	12
222	38.00	30.06	32.13	33.38	0.81	56	256T	12	40.19	12
245	41.38	33.13	35.13	36.38	0.81	56	286T	12	44.31	12
270	44.75	36.50	38.50	39.75	0.81	143T	286T	12	48.81	12
300	49.88	40.56	43.13	44.88	0.81	182T	326T	16	54.56	10
330	54.00	44.63	47.25	49.00	0.81	184T	326T	16	59.88	10
365	58.75	49.38	52.00	53.75	0.81	184T	405T	16	66.38	10
402	64.75	54.38	57.50	59.75	0.81	213T	405T	16	73.00	10
445	70.50	60.19	63.25	65.50	0.81	215T	445T	16	80.94	10
490	76.63	66.25	69.38	71.63	0.81	254T	445T	24	89.00	10
542	84.75	73.38	77.00	79.75	0.81	256T	445T	24	98.69	10

QSL-AC1002377B

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



## Model QSL

Fans shall be Model QSL (standard mixed flow) of the non-overloading design, as manufactured by Twin City Fan & Blower, Minneapolis, Minnesota.

**PERFORMANCE** — Performance ratings shall conform to AMCA Standard 205 (fan efficiency grade), 211 (air performance) and 311 (sound performance). Fans shall be tested in accordance with ANSI/AMCA Standard 210 (air performance) and 300 (sound performance) in an AMCA accredited laboratory. Fans shall be licensed to bear the AMCA certified ratings seal for both sound and air, and fan efficiency grade (FEG). Sound certification shall apply to both inlet and outlet sound power levels.

Fans shall be designed for maximum efficiency. Fans shall have a sharply rising pressure characteristic extending through the operating range and continuing to rise well beyond the efficiency peak to assure quiet and stable operation under all conditions. Horsepower characteristics shall be truly self-limiting and shall reach a peak in the normal selection area.

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

**HOUSING** — Housings shall be cylindrical and welded steel throughout. Inlets shall be fully streamlined. Housings shall be suitably braced to prevent vibration or pulsation. Totally enclosed belt guard shall enclose motor sheave and V-belt drives. Punched inlet and outlet flanges shall be equipped for duct mounting. Extended lube lines shall be provided for ease of lubrication. Model QSL shall include bolted access door for inspection and maintenance of wheel.

**WHEEL** — Fan wheels shall have die-formed hollow airfoil blades designed for maximum efficiency, and quiet and stable operation. Blades shall be continuously welded to the back plate and wheel cone. Wheels shall be statically and dynamically balanced and the complete fan assembly including motor and drive shall be test balanced at or near the operating speed at the factory prior to shipment.

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

**BEARINGS (Arr. 9 Only)** — Bearings shall be heavy duty, grease lubricated, anti-friction ball or roller, self-aligning, pillow block type and selected for a minimum L-10 life of 40,000 hours at the maximum fan RPM. Bearings shall be equipped with extended lubrication lines with grease fittings outside of the fan housing.

**DRIVE (Arr. 9 Only)** — Motor sheaves shall be cast iron, variable pitch on applications 10 HP and smaller, and fixed pitch on 15 HP and larger.

**INLET VANES** — Inlet vanes, where specified, shall be of the nested design. Inlet vanes shall be designed for economical, stable, and efficient air volume control at partial load conditions.

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

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

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



## Model QSLR

Fans shall be Model QSLR (restaurant) of the non-overloading design, as manufactured by Twin City Fan & Blower, Minneapolis, Minnesota.

**PERFORMANCE** — Performance ratings shall conform to AMCA Standard 205 (fan efficiency grade), 211 (air performance) and 311 (sound performance). Fans shall be tested in accordance with ANSI/AMCA Standard 210 (air performance) and 300 (sound performance) in an AMCA accredited laboratory. Fans shall be licensed to bear the AMCA certified ratings seal for both sound and air, and fan efficiency grade (FEG). Sound certification shall apply to both inlet and outlet sound power levels.

Fans shall be designed for maximum efficiency. Fans shall have a sharply rising pressure characteristic extending through the operating range and continuing to rise well beyond the efficiency peak to assure quiet and stable operation under all conditions. Horsepower characteristics shall be truly self-limiting and shall reach a peak in the normal selection area.

Model QSLR shall be UL 762 listed for the exhaust of grease-laden air. Fans shall bear a permanently attached nameplate displaying model and serial number of the unit for future identification.

**HOUSING** — Housings shall be cylindrical and welded steel throughout. Inlets shall be fully streamlined. Housings shall be suitably braced to prevent vibration or pulsation. Totally enclosed belt guard shall enclose motor sheave and V-belt drives. Punched inlet and outlet flanges shall be equipped for duct mounting. Extended lube lines shall be provided for ease of lubrication. Model QSLR shall include a belt tube, 2 wheel cleanout doors (located 180° apart) for inspection and maintenance of the wheel and a 2" drain.

**WHEEL** — Fan wheels shall have die-formed hollow airfoil blades designed for maximum efficiency, and quiet and stable operation. Blades shall be continuously welded to the back plate and wheel cone. Wheels shall be statically and dynamically balanced and the complete fan assembly including motor and drive shall be test balanced at or near the operating speed at the factory prior to shipment. Wheels on model QSLR shall have cooling fins to draw cool air over shaft and bearings.

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

**BEARINGS** — Bearings shall be heavy duty, grease lubricated, anti-friction ball or roller, self-aligning, pillow block type and selected for a minimum L-10 life of 40,000 hours at the maximum fan RPM. Bearings shall be equipped with extended lubrication lines with grease fittings outside of the fan housing.

**DRIVE** — Motor sheaves shall be cast iron, variable pitch on applications 10 HP and smaller, and fixed pitch on 15 HP and larger.

**INLET VANES** — Inlet vanes, where specified, shall be of the nested design. Inlet vanes shall be designed for economical, stable, and efficient air volume control at partial load conditions.

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

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

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

# TYPICAL SPECIFICATIONS



## Model QSLSH

Fans shall be Model QSLSH (smoke and heat) of the non-overloading design, as manufactured by Twin City Fan & Blower, Minneapolis, Minnesota.

**PERFORMANCE** — Performance ratings shall conform to AMCA Standard 205 (fan efficiency grade), 211 (air performance) and 311 (sound performance). Fans shall be tested in accordance with ANSI/AMCA Standard 210 (air performance) and 300 (sound performance) in an AMCA accredited laboratory. Fans shall be licensed to bear the AMCA certified ratings seal for both sound and air, and fan efficiency grade (FEG). Sound certification shall apply to both inlet and outlet sound power levels.

Fans shall be designed for maximum efficiency. Fans shall have a sharply rising pressure characteristic extending through the operating range and continuing to rise well beyond the efficiency peak to assure quiet and stable operation under all conditions. Horsepower characteristics shall be truly self-limiting and shall reach a peak in the normal selection area.

Model QSLSH shall be UL listed for Smoke Control Systems (500°F for 4 hours and 1000°F for 15 minutes). Fans shall bear a permanently attached nameplate displaying model and serial number of the unit for future identification.

**HOUSING** — Housings shall be cylindrical and welded steel throughout. Inlets shall be fully streamlined. Housings shall be suitably braced to prevent vibration or pulsation. Totally enclosed belt guard shall enclose motor sheave and V-belt drives. Punched inlet and outlet flanges shall be equipped for duct mounting. Extended lube lines shall be provided for ease of lubrication. Model QSLSH shall include a belt tube for the protection of belts and drive components from the airstream and bolted access door.

**WHEEL** — Fan wheels shall have die-formed hollow airfoil blades designed for maximum efficiency, and quiet and stable operation. Blades shall be continuously welded to the back plate and wheel cone. Wheels shall be statically and dynamically balanced and the complete fan assembly including motor and drive shall be test balanced at or near the operating speed at the factory prior to shipment. Wheels on model QSLSH shall have cooling fins to draw cool air over shaft and bearings.

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

**BEARINGS** — Bearings shall be heavy duty, grease lubricated, anti-friction ball or roller, self-aligning, pillow block type and selected for a minimum L-10 life of 40,000 hours at the maximum fan RPM. Bearings shall be equipped with extended lubrication lines with grease fittings outside of the fan housing.

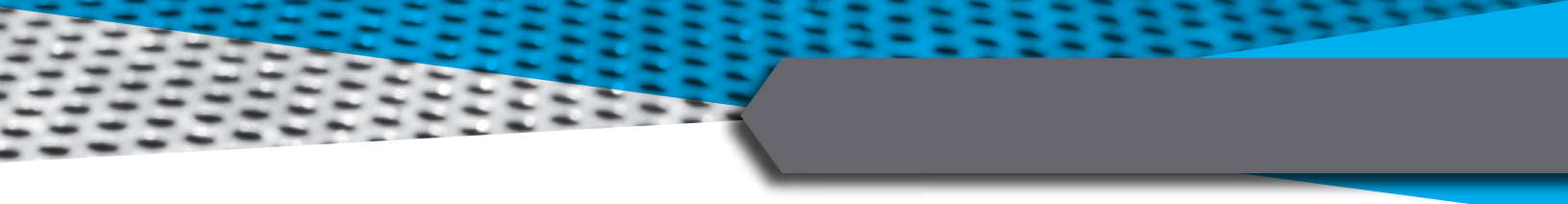
**DRIVE** — Motor sheaves shall be cast iron, variable pitch on applications 10 HP and smaller, and fixed pitch on 15 HP and larger. Model QSLSH shall be equipped with a two-groove drive minimum.

**INLET VANES** — Inlet vanes, where specified, shall be of the nested design. Inlet vanes shall be designed for economical, stable, and efficient air volume control at partial load conditions.

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

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

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



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