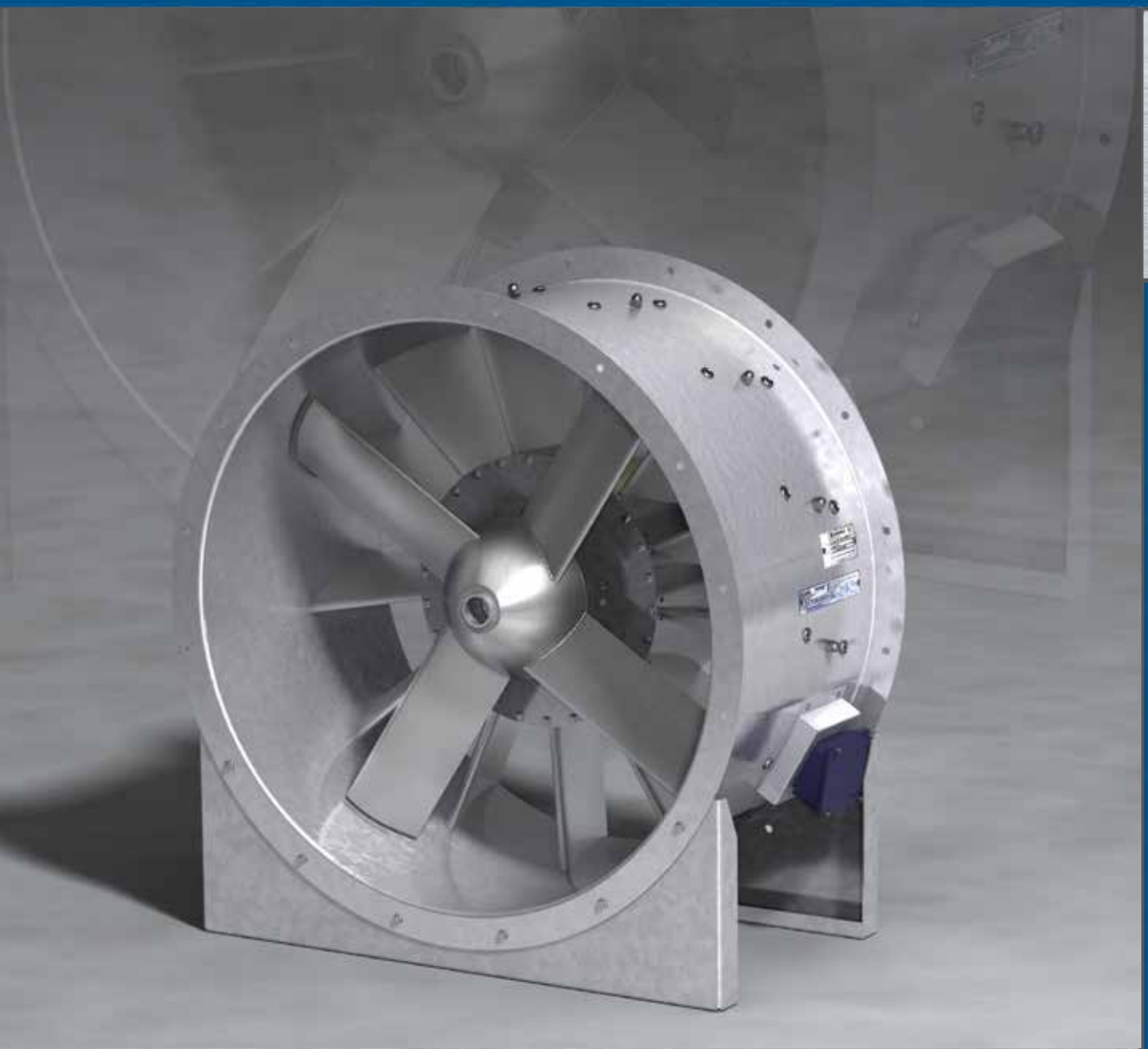
High Performance Vane Axial Fans

Model RA – Standard and High Temperature

Sustainable Solution with Trusted Performance



GREENHECK

Building Value in Air.

BUILDING VALUE IN AIR.

October 2018

Model RA
High Performance Vane Axial Fans

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RA high performance, direct-driven vane axial fans are ideal for inline air ventilation in commercial, institutional or industrial buildings. The casing design and construction are well suited for indoor or outdoor applications and can be easily installed in ducted or non-ducted systems. The RA fan is designed to significantly reduce operating costs with peak total efficiency ranging from 70-88%.

Typical Installations

- Stairwell pressurization
- Tunnel ventilation
- Parking garage exhaust
- Storage facility exhaust
- Emergency smoke and heat exhaust
- Industrial process ventilation
- Supply and return fans for air handling equipment

Benefits

- Higher efficiency and lower sound levels than other axial inline fans models
- Lower maintenance than other axial inline fans

Pressurization

Car Park Ventilation

Fire & Smoke Control

Model RA
High Performance Vane Axial Fans

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Model Comparison																							
	Location		Mounting						Airflow				Application				Drive Type		Impeller Type			Performance	
Model	Outdoor	Indoor	Horizontal Base/Floor	Horizontal Ceiling	Vertical Base/Floor	Vertical Ceiling	Vertical Wall	Roof Curb	Exhaust	Supply	Reversible	Recirculate	Mid/High Rise Apartments	Office Buildings	Parking Garages	Metros	Belt	Direct	Centrifugal	Propeller/Axial	Mixed Flow	Maximum Volume (cmh)	Maximum Static Pressure (Pa)
RA	X	X	X	X	X	X	X	X	X	X			X	X	X	X		X		X		200,000	1,700

With fan energy consumption quickly becoming a growing concern and regulations changing across the globe, ensure that you're optimizing your fan selection by selecting a Greenheck RA fan. Model RA is the most efficient inline fan manufactured by Greenheck. Rely on our expertise in air movement technology to assist you in improving the operational efficiency of your system.

- Model RA is available in 15 sizes that cover a broad range of volumetric flow and pressure conditions.
- Capacities range for volumes up to 200,000 cmh (117,715 cfm) and external static pressures to 1,700 Pa (7 in. wg).

- Licensed to bear the AMCA Seal for Fan Efficiency Grade (FEG) Certification. This fan was designed to meet a minimum Fan Efficiency Grade (FEG) of 75. This exceeds the requirement adopted by the IGCC (International Green Construction Code) for stand-alone supply, return and exhaust fans of a FEG greater than or equal to FEG 71.
- Licensed to bear the AMCA Sound & Air seal.

Greenheck India Pvt. Ltd. certifies that the RA models 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.

Certifications, Design & Testing

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High Temperature Certification

Greenheck understands that designing products for life safety applications is an important and serious matter. Products that limit the spread of smoke and fire need to be reliable, utilizing quality components to ensure and promote safety. That's why Greenheck's model RA fans are certified in accordance with EN12101-3:2015 at Applus Laboratory headquarters in Barcelona, Spain. Additionally, our fans are certified to carry the CE marking.

Greenheck offers the following temperature classifications for our RA fans:

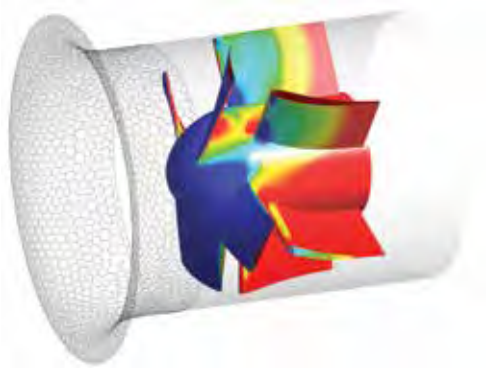
- **300ºC / 2 Hrs *(572ºF / 2 Hrs)* (F300 Certificate 370-CPR-1745)**
- **400ºC / 2 Hrs *(752ºF / 2 Hrs)* (F400 Certificate 370-CPR-1848)**

Units are suitable for both smoke reservoir and nonsmoke reservoir applications, certified to be used either inside or outside the reservoir. Additionally, our high temperature fans are certified for dual purpose ventilation, meaning they can be used for smoke extraction as well as normal, day-to-day ventilation.

CE Mark

The CE mark is a mandatory conformity marking for certain products sold within the European Economic Area (EEA). Greenheck declares conformity to the legal requirements necessary to achieve the CE marking.

CE



Extensive Research & Development (R&D) and Performance Testing

Greenheck engineers used Computational Fluid Dynamics (CFD) and Finite Element Analysis (FEA) programs to design the RA fans. The RA aerodynamic design and structural endurance were further tested in our state-of-the art R&D facilities and performance testing labs.

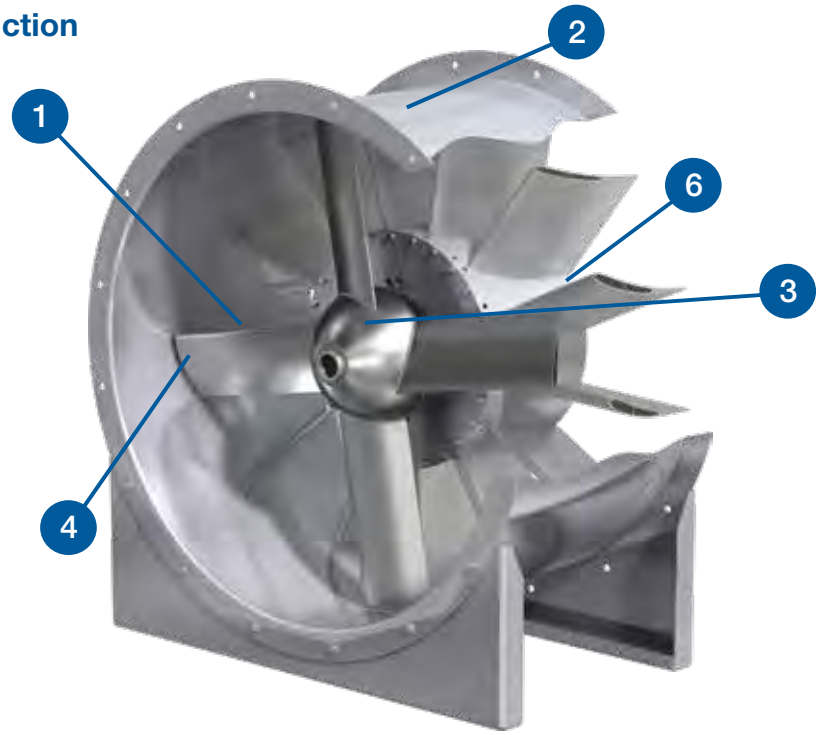
World Class Manufacturing Process

The success of the design relies on the ability of the manufacturing processes to produce accurate parts that are consistent and fit together properly. To manufacture the RA fan, Greenheck utilizes a combination of world-sourced modern technology and custom-built equipment to achieve repeatable performance and product quality.

The management system governing the manufacture of this product is ISO 9001:2015 and ISO 14001:2015 certified.

Value Added Features

Standard Construction Features



1. High Performance Propeller

Propellers are high efficiency, airfoil aluminum. The unique design of the RA welded propeller with varying tip and root pitches for sizes up to 800 is intended to move high volumes of air with less power, saving on energy costs and total cost of ownership. Sizes 800 and above are constructed of cast propellers which allow for easy adjustment in the field.

2. Robust Casing

Model RA vane axial fan casings are constructed of continuously welded galvanized steel to prevent air leakage. Rolled inlet and outlet flanges are provided with mounting holes for easy, airtight ductwork connections.

3. Hubs

A wide selection of hub diameters further optimizes the fan performance in a cost-effective manner by choosing the right hub for the required volume and performance.

4. Blades

Tight tip clearance improves overall efficiency and in turn overall sound levels. For quieter operation, blades are engineered for wide blade shapes and unique blade count. The asymmetrical rotor and stator combination reduces the blade pass frequency tones while generating a smoother sound spectrum.

5. Fan Testing and Vibration Analysis

Assembled fans are test run at the factory with motor amp, speed and voltage measurements taken to ensure proper operation.

Additionally, all Greenheck RA fans endure a complete mechanical vibration test after assembly. Our proprietary balancing system uses two tri-axial sensors, one located on the shaft end and one located opposite the shaft end, to measure the vibration on six planes at the design operating speed. A permanent record for each fan's performance is kept on file and is available upon request.

The standard vibration levels attained meet the requirements of Fan Application BV-3 as defined in AMCA Standard 204-05 "Balance Quality and Vibration Levels for Fans."

6. Motors

Motors are IEC design, located in the airstream. Single or two-speed motors are available in 50 or 60 Hz.

7. Certified Performance

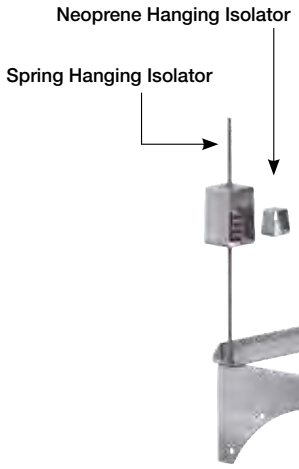
The entire line of RA fans are licensed to bear the AMCA Air & Sound Seal so you can ensure your fan will perform as expected.

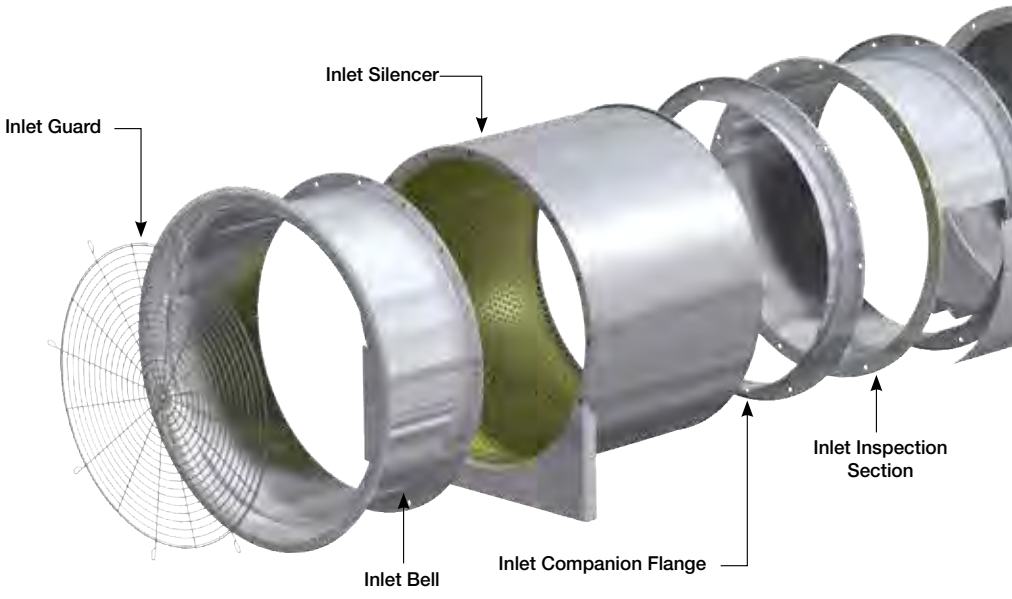
Standard Features

- Aluminum airfoil blades: 315-1600mm
- Integral straightening vanes: 315-1600mm
- Galvanized casing: 315-1600mm
- Extended motor leads: Wired to external junction box with terminal blocks
- Integral punched inlet and outlet flanges: Prevent air leakage. Pitch circle diameter, number of holes and hole sizes are standard in accordance with Eurovent 1/2.

Options and Accessories

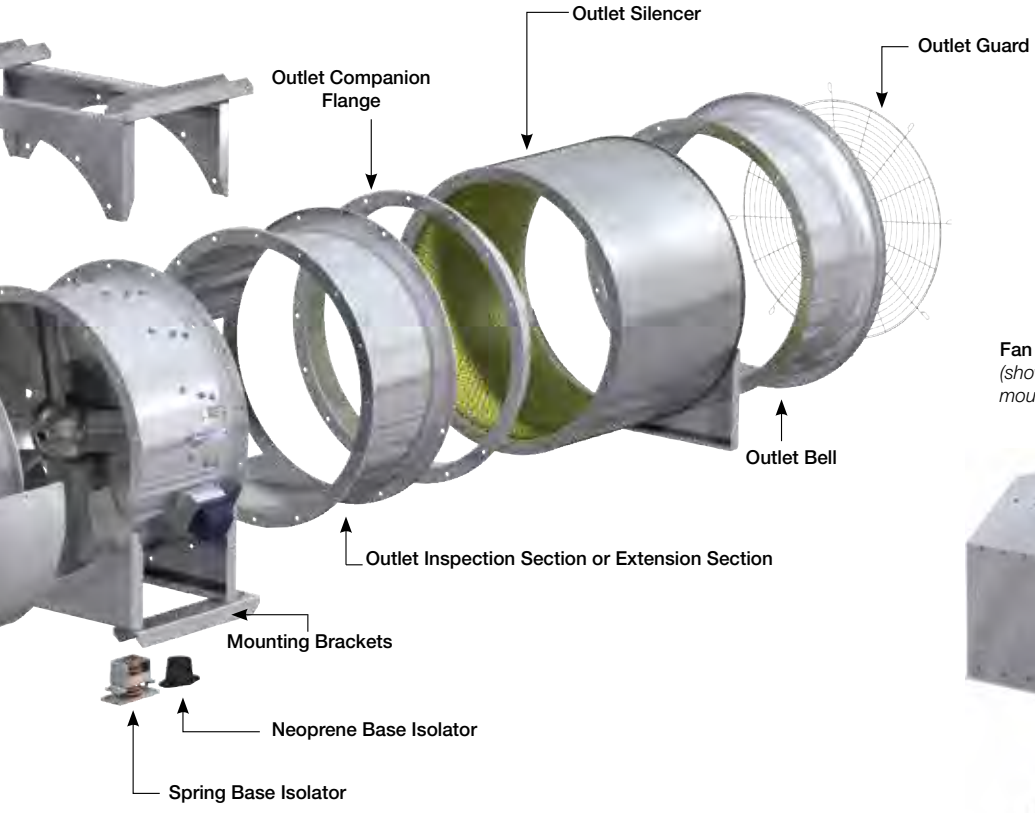
- **Mounting Brackets:** Allows for horizontal ceiling or base mount applications. The brackets also provide an attachment point for any vibration isolation devices.
- **Inlet and Outlet Bells:** Minimizes entry losses into the fan from free (non-ducted) inlet conditions to ensure rated performance.
- **Companion Flanges:** Aides the connection of the fan casing flange to ductwork. Flanges are prepunched to match the bolt hole dimensions.
- **Inlet and Outlet Guards:** Protects personnel and equipment in ducted or non-ducted installations. Guards are removable for routine fan maintenance.
- **Isolators:** Available in either neoprene or spring mounts. The isolators are furnished in sets of four and are sized to match the total weight of each fan, motor and accessory combination.
- **Silencers:** Length equivalent to either one fan diameter (1D) or two diameters (2D) are available. The silencers are designed to reduce noise from the fan inlet and/or outlet in sound sensitive applications.
- **Fan Hood:** Constructed of galvanized steel and are available for upblast and downblast, roof mount configurations.





Options and Accessories (cont.)

- **Inspection Sections:** Allows access to the fan for cleaning or visual inspection of the propeller or motor. Inspection sections are available for the inlet, outlet, or both. When required, adding an inspection section will completely encase your motor.
- **Disconnect Switch:** High temperature disconnect switches are available for positive electrical shut-off at the fan. (Not pictured)
- **Flexible Duct Connectors:** Flexible, air-tight joint used to isolate vibration and minimize noise between the fan and duct system; CE Certified together with the fan for 400ºC / 2 Hours operation in accordance with EN12101:3.
- **Emergency Temperature Options:** High temperature performance certified in accordance with EN12101-3:2015 for design time and temperatures used in emergency heat and smoke extract applications.
    - 300ºC / 2 Hours (572˚F/2 Hrs) (F300 Certificate 370-CPR-1745)
    - 400ºC / 2 Hours (752°F/2 Hrs) (F400 Certificate 370-CPR-1848)



Mounting Configurations

Universal Mounting Configurations

For ease of installation, fans for horizontal and vertical orientation each have Universal Mounting Configurations which allow for ceiling or base mounting. These supports can be removed and reinstalled on another end of the housing, allowing for multiple positions and mounting configurations on supply or exhaust applications.

Motor positions are viewed from the discharge end of the fan.

Horizontal Base Mount

Vertical Base Mount

Vertical Wall Mount

Horizontal Ceiling Mount*
*Shown with Flexible Duct Connectors

Vertical Ceiling Mount

Curb Cap Mount

Horizontal Mounting

Base mount or ceiling hung fans in horizontal configuration are provided with two identical rigid steel supports, which allows the configuration to easily be changed between base mount and ceiling hung in the field.

- **Base Mount:** Fan is supported horizontally from the floor.
- **Ceiling Hung:** Fan is suspended horizontally from the ceiling.

Vertical Mounting

Vertical mounting configurations, upblast and downblast, are provided with a heavy duty bracket.

- **Base Mount:** Fan is supported vertically from the floor via the ring mounting bracket.
- **Ceiling Hung:** Fan is suspended vertically from the ceiling, connected to the ring mounting bracket under the fan.
- **Wall Mount:** Fan is supported vertically on the ring mounting bracket bolted to the wall mount accessory.
- **Curb Cap:** Fan is mounted to the roof curb by the curb cap mounting bracket. This is the most common arrangement mounting with a fan hood.

Building Segments

We are known worldwide as a leading manufacturer that provides high quality air movement and control equipment. Today, our HVAC (heating, ventilation, air-conditioning) products are efficiently moving air in High Rise Residential, Mixed Use, Commercial Buildings, Schools & Universities, Hospitals & Clinics, Airports, Metro Stations, Shopping Mall, Hotels throughout Middle East & Asia.

Mixed Use Buildings

Hospitals

Commercial Offices

Metro Stations

Shopping Centres

Schools/Universities

Model Number Code

RA - 500 - 225 - 4 - 40-20 - 4

RA - Round Axial

Fan Size

315	630	900-500
355	630-325	1000-500
400	630-375	1120-500
450	710	1120-630
500	710-325	1250-630
500-325	710-375	1400-630
560	800	1600-630
560-325	800-325	
560-375	800-375	

Hub Diameter

190	400
225	533
275	

Motor Speed

2 - 2 Pole
4 - 4 Pole
6 - 6 Pole
8 - 8 Pole

Blade Pitch (degrees)

Number of Blades

3, 4, 6, 8, 9, 12

RA Dimensional Data

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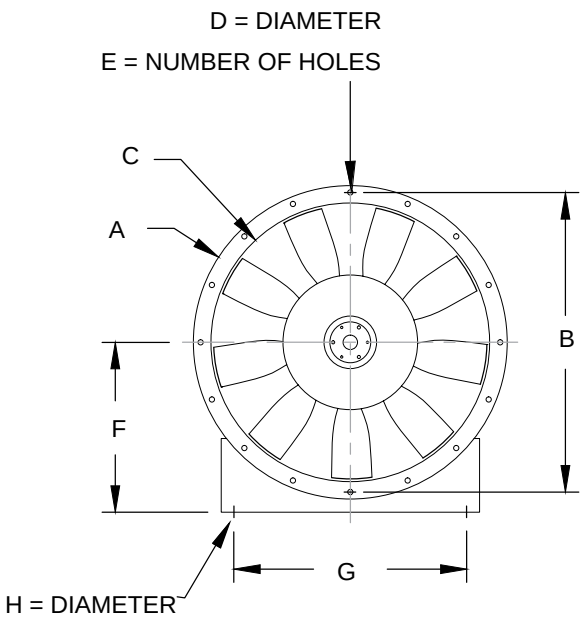
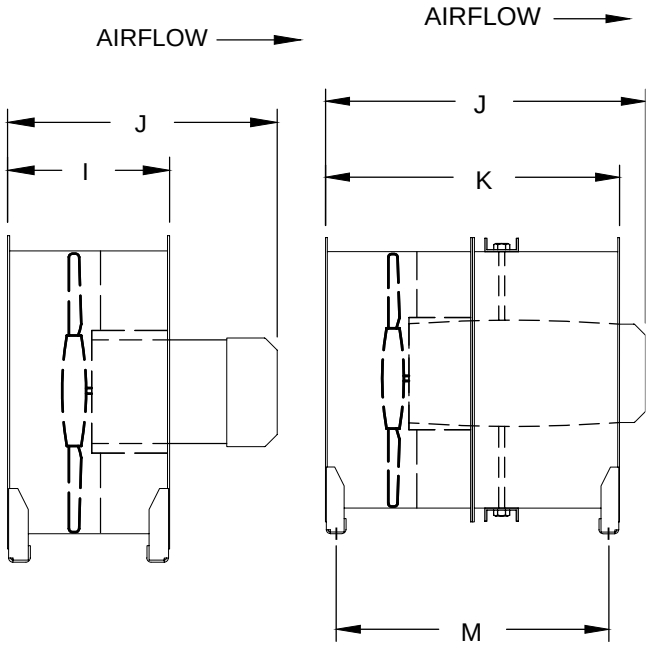
Size	A	B	C	D	E	F	G	H	I	J	K	M
RA-315-225	395	355	315	10	8	210	300	10	402	486	-	-
RA-355-225	435	395	355	10	8	228	330	10	402	486	-	-
RA-400-225	480	450	400	12	8	255	350	12	402	486	-	-
RA-450-225	530	500	450	12	8	278	440	12	402	486	-	-
RA-500-225	594	560	500	12	12	303	520	12	388	475	-	-
RA-500-325	594	560	500	12	12	303	520	12	390	598	-	-
RA-560-225	654	620	560	12	12	347	510	12	390	474	-	-
RA-560-325	654	620	560	12	12	347	510	12	390	598	-	-
RA-560-375	654	620	560	12	12	347	510	12	462	869	-	-
RA-630-225	724	690	630	12	12	388	625	12	392	474	-	-
RA-630-325	724	690	630	12	12	388	625	12	390	598	-	-
RA-630-375	724	690	630	12	12	388	625	12	462	869	-	-
RA-710-225	804	770	710	12	16	428	625	12	394	474	-	-
RA-710-325	804	770	710	12	16	428	625	12	394	598	-	-
RA-710-375	804	770	710	12	16	428	625	12	462	869	-	-
RA-800-225	894	860	800	12	16	468	770	12	394	474	-	-
RA-800-325	894	860	800	12	16	468	770	12	394	598	-	-
RA-800-375	894	860	800	12	16	468	770	12	462	869	-	-
RA-900-500	1006	970	900	15	16	526	770	15	520	1071	1040	993
RA-1000-500	1106	1070	1000	15	16	576	970	15	520	1071	1040	993
RA-1120-500	1258	1190	1120	15	20	660	985	15	488	1041	976	913
RA-1120-630	1258	1190	1120	15	20	660	985	15	488	1181	976	913
RA-1250-630	1388	1320	1250	15	20	738	1125	15	494	1181	988	913
RA-1400-630	1538	1470	1400	15	20	803	1230	15	494	1181	988	913
RA-1600-630	1760	1680	1600	20	24	907	1485	20	472	1159	944	870

NOTE: Dimensions in millimeters (mm)





Reference Projects

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Projects	Location
Al Shabab Power Plant	Ismallia, Egypt
Apollo Tyres	Chennai, India
Abdul Aziz Al Khatib Sports Hall	Kuwait
Apollo Hospital	Ahmedabad, India
Abu Dhabi Police Central Morgue	Abu Dhabi, UAE
Bangalore International Airport	Bangalore, India
Blue Ridge IT Park	Pune, India
BEA Hospital	Bangalore, India
Brigade - Signature Tower	Bangalore, India
Brigade North ridge	Bangalore, India
Cochin International Airport	Kochi, India
Clemenceau Medical Center	Riyadh, Saudi Arabia
Chennai Metropolitan Development Authority	Chennai, India
Cairo West Power Plant	Cairo, Egypt
Delhi Metro	Delhi, India
DLF Cyber Park	Gurugram, India
DLF The Camellias	Gurugram, India
Daikin Factory	Neemrana, India
Emerald Palace Kempinski Hotel	Dubai, UAE
Emaar Capital Tower	Gurugram, India
Formula1 Race Track	Noida, India
Ferrari & Massarati Car Showroom	Dubai, UAE
Indira Gandhi Paryavaran Bhawan	Delhi, India
Ireo-Grand Hyatt Mixed Use	Gurugram, India
Infosys	Hyderabad, India
Kolkata Metro	Kolkata, India
Lebanese University	Beirut, Lebanon
Lucknow Metro Rail Corporation	Lucknow, India
M3M Golf Estate Phase 1 & 2	Gurugram, India
New Assuit Super Critical Power Plant	Assiut, Egypt
One Horizon Center	Gurugram, India
Ram Manohar Lohia Academy	Lucknow, India
Sardar Patel Statue	Gujarat, India
Sohar City Centre	Sohar, Oman
SBIOA Unity Enclave	Chennai, India
TCS	Hyderabad, India

Design and Selection Support

Enjoy Greenheck's extraordinary service, before, during and after the sale.

Greenheck offers added value to our wide selection of top performing, energy-efficient products by providing unique Greenheck service programs.

- Greenheck's free Computer Aided Product Selection program (CAPS) is rated by many as the best in the industry. CAPS helps you conveniently and efficiently select the right products for the challenge at hand.
- Greenheck has been Green for a long time! Our energy-saving products and ongoing corporate commitment to sustainability can help you qualify for LEED credits.

Find out more about these special Greenheck services at greenheck.com or greenheck.co.in

Building Value in Air

Greenheck delivers value to mechanical engineers by helping them solve virtually any air quality challenges their clients face with a comprehensive selection of top quality, innovative air-related equipment. We offer extra value to contractors by providing easy-to-install, competitively priced, reliable products that arrive on time. And building owners and occupants value the energy efficiency, low maintenance and quiet dependable operation they experience long after the construction project ends.

Our Commitment

As a result of our commitment to continuous improvement, Greenheck reserves the right to change specifications without notice.

Product warranties can be found online at Greenheck.com, either on the specific product page or in the literature section of the website at Greenheck.com/Resources/Library/Literature.

U.S. GREEN BUILDING COUNCIL MEMBER

Prepared to Support Green Building Efforts

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Greenheck India Private Ltd has been independently audited and confirmed as being in conformity with ISO 9001:2015 and ISO 14001:2015.