

To provide the most reliable and user-friendly air movement & control and air conditioning service.



Due to continuing research, Shanghai Nautilus reserves the right to change specifications without notice.

SHANGHAI NAUTILUS GENERAL EQUIPMENT MANUFACTURING CO LTD

Add: No. 55 Qingneng Road, Waigang Town, Jiading District, Shanghai
P.C: 201806
Tel: 86 21 39185688
Toll free number: 400 821 3316
Fax: 86 21 69168759
Http: //www.infinair.com

Formula Series Principle Product

- Special wheel for whole Aluminum Roof Fans
- Efficiency has been greatly improved, energy saving
- Sound has been greatly improved, running quietly
- Patented positive cooling technology, longer life
- Whole aluminum alloy, light weight and save investment

G2.5



Company Profile

Shanghai Nautilus General Equipment Manufacturing Co., Ltd. is a middle and high-end solution provider of air supply and gas heating and air cleaning equipment that integrates R&D, production and sales. Established in September, 2003, it is located in the Jiading District of Shanghai. The company is the member of the US Green Building Council (USGBC) and International Air Movement and Control Association (AMCA), the high and new tech enterprise of Shanghai, **INFINAIR®** won the famous trademark in Shanghai.

Vision statement: To become the most trustworthy brand of professional air movement & control and air conditioning.
Mission statement: To provide the most reliable and user-friendly air movement & control and air conditioning service.



Shanghai Nautilus General Equipment Manufacturing Co Ltd certifies that the Model RTC shown herein is 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.

4G Wind-Surfer™ Wheel: Special for Aluminum Roof Fans

- ✓ Novel design overturning the tradition

 - The first centrifugal wheel in China for aluminum roof fans
 - With innovation based on advanced passage through constraint idea from abroad
 - Leading efficiency and noise advantage
 - Highly efficient area width, no overload
- ✓ Internationally advanced process is adopted for better conformity with characteristics of the flow field

 - Flow passage components are spin formed, in replacement of the traditional process
 - The blade is formed at one time by pressing, having ensured the processing quality
 - Special machine, mould and tooling design have ensured the molding and positioning precision
- ✓ Wind-Surfer™ wheel comes to its fourth generation (4G)

 - Continuous improvement, constant promotion
 - Higher energy efficiency, lower energy waste
 - Less noise, more quietness
- ✓ Whole aluminum alloy, light weight and inborn explosion-proof

 - Metal texture promotes the taste
 - Light weight accounting for only 1/3 of that of the traditional
 - Having reached the highest explosion-proof class SPACK A
- ✓ Carefully selected materials applicable to fire-fighting and coastal occasions

 - The strength is designed to be 200% of the highest rotating speed, and may fully satisfy the fire-fighting requirement
 - The material is resistant to neutral salt spray, and is widely used in the coastal regions
 - The rigorous experimental tests win trustworthiness



Product Feature

✓ Independent motor chamber: extra long lifetime

- Drive located in an independent chamber, contamination contact free
- Suitable for lubrication grease, kitchen grease, dust and VOC exhaust
- Stable performance and lifetime longer than 10 years

✓ Blade falling resistant, prevent condensation falling into room

- Even if blades break accidentally, blade pieces shall not fall into inside room without safety guard installation.
- Condensation will flow along blade to the outside instead of inside , available in coastal and humid area.

✓ Patented in design, practical & artistic

- Elegant profile design: balanced proportion and sophisticated craftwork.
- Silver white metallic lustre casing: harmonious with different building colors
- Modernize buildings with enhanced taste



✓ Light: suitable for steel structure roofdeck

- Housing and wheel: aluminum alloy material
- Effectively reduce roof load : investment on steel structure is saved

✓ Patented positive cooling technology

- Auxiliary blades suck in air: negative pressure in drive chamber
- Fresh cool air continuously pushing in to drive chamber: cool the motor bearing
- Motor and bearing life extended effectively

✓ Widely applied to needs

- Explosion prevention exhaust, all aluminum construction: Spark A
- Smoke removal application
- Coastal high-salt condensation

Experiment by Infinair Research Institute

Wind resistant test photo



● Strong wind resistant

The experiment certifies that RTC fan can keep stable performance and structural strength under 33.9 m/s wind speed (The meteorological industry standard QX/T 51-2007 is 12 level typhoon) .

rainstorm resistant photo



● Rainstorm resistant

The experiment certifies that even under extreme conditions that artificial rainfall is 156 mm/h (class: extraordinary rainfall) RTC fan performs excellently without water leakage or deformation whether the fan starts or shut downs.

Aluminum wheel test comparison photo

before



after



● Salt spray corrosion resistant

The experiment in accordance with GB/T10125-1997 standards (salt spray test method) certifies that RTC fan doesn't rust after neutral salt spray corrosion tests and RTC fan can bear salt spray corrosion and be used under certain environments such as marine and island. Test result is as shown below:

smoke removal test photo



● Smoke removal test

The company certifies that it has passed the certification by National Fire Control and Supervision Center. RTC fan can completely meet requirements of smoke removal fan, which can continuously work under temperature of 280°C for 30 minutes

Optional Accessories

• Gravity back-draft damper

The damper whose aluminum blades are mutually coordinated can stop the back flow of external air .



• Curb Adapter

The curb adapter is ordered when roof curb is already made or the size is fixed to match RTC fan. The adapter can be converted from big to small or small to big. However, existing roof curb size must be required in the order.



• Fire resistant damper (for smoke removal)

The regulator is normally open. Once the temperature reaches 280°C, the valve could automatically close and the signal will be sent out to the control system at the same time. Except for fire resisting, it has the function of adjusting air volume.



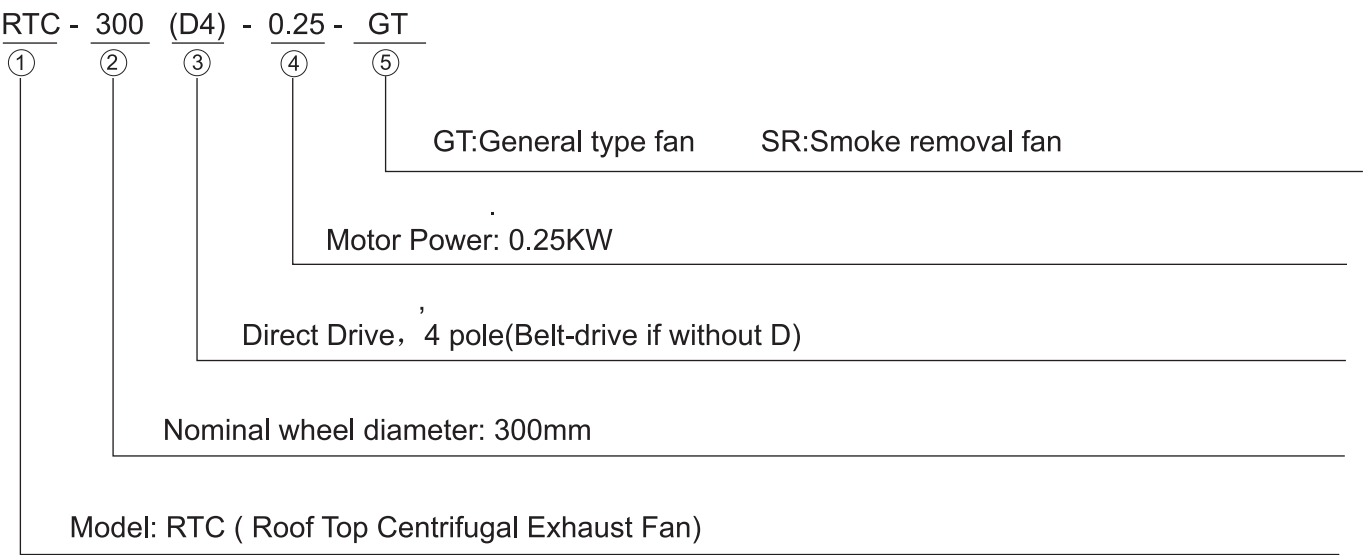
• Rubber isolation pad (not for smoke removal)

The rubber isolation pad is located between curb and curb cap, which is waterproof and sealed and can effectively reduce vibration, lower noise and extend performance life of fan.

• Temperature control auto switch

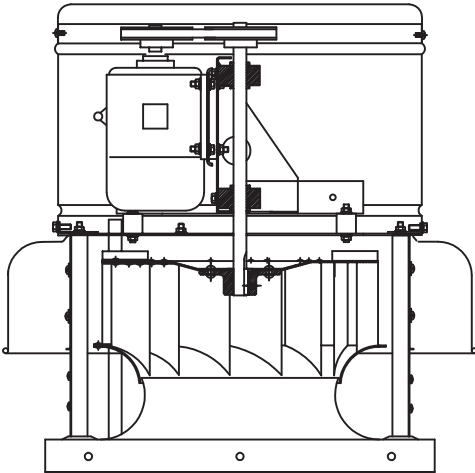
The switch could be automatically controlled to save energy when the ambient temperature reaches the setting value.

Naming convention

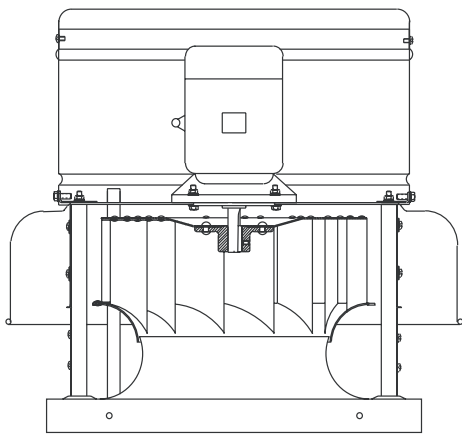


Note: General type and smoke removal type have the same volume and pressure.

RTC Outline Drawing



RTC (Belt - drive)



RTC-D (Direct - drive)

RTC (Belt)	
smoke removal	Optional
explosion proof	No the function
wheel epoxy coated	Optional
fan epoxy coated	Optional

RTC (Direct -drive)	
smoke removal	Optional
explosion proof	Optional
wheel epoxy coated	Optional
fan epoxy coated	Optional

Laboratory Introduction

Laboratory Introduction

Following methods are used to increase Infinair aerodynamic laboratory’s test accuracy:

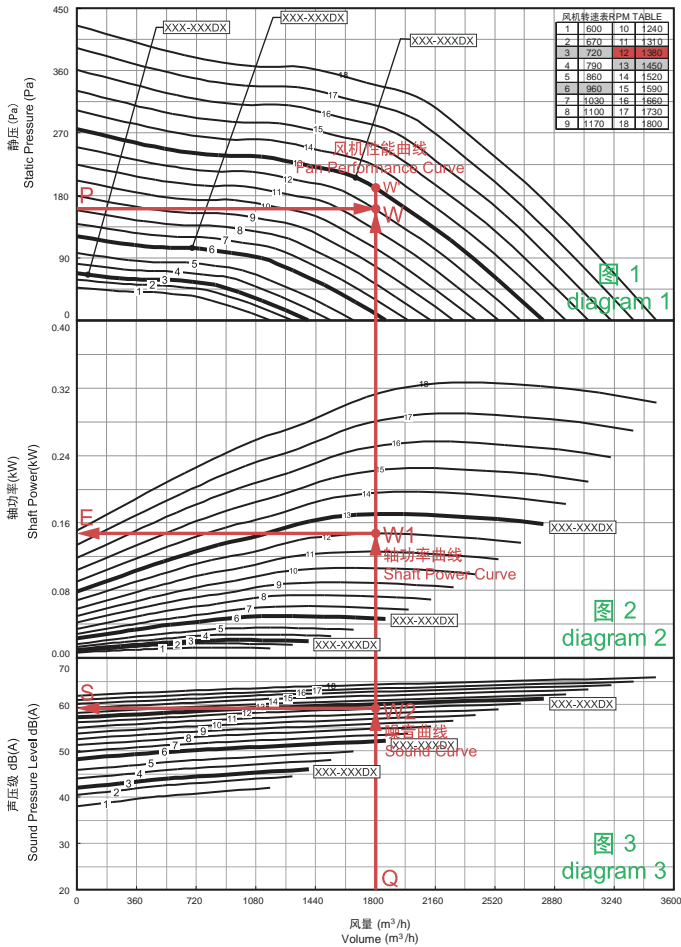
- (1) Strictly following AMCA-210 standards to design and fabricate
- (2) Traditional Pitot tube method is replaced by high precision nozzle matrix to increase accuracy.
- (3) State of the art instruments and equipments are widely used in the lab.
- (4) Test instruments are strictly calibrated, the calibration is repeated in time.

The lab assures INFINAIR is capable to test different product design, increase the accuracy and liability of products, and become a good reason why you trust INFINAIR.



Catalogue introduction

- Each fan performance is symbolized by a group of curves for different RPM.
 - The bolded curves indicate the fan is direct drive which means the wheel is installed on the motor shaft directly.
 - All direct drive models shall have a suffix letter D followed by motor pole number (which is already marked on the drawing). The attached table shows motor RPM at different number of poles.
 - The not-bolded curves means the fan is belt drive. The belt drive models establish different RPM by choosing different diameter of the 2 pulleys, while the motor is 2/4/6 pole.
 - Shaft Power Curve displays the fan actual power consumption.
- The sound pressure level curve indicated the noise level at 1.5 meter distance.



Example: 1800M³/h , 160Pa Static Pressure

Step 1: From given volume (Point Q: 1800M³/H) draw a vertical line upwards, from given static pressure (Point P: 160Pa) draw a horizontal line to the right, the intersection point W is the working point. Find a fan curve close to the point, which would be curve No. 12. As highlighted in the RPM table, it is 1380 RPM.

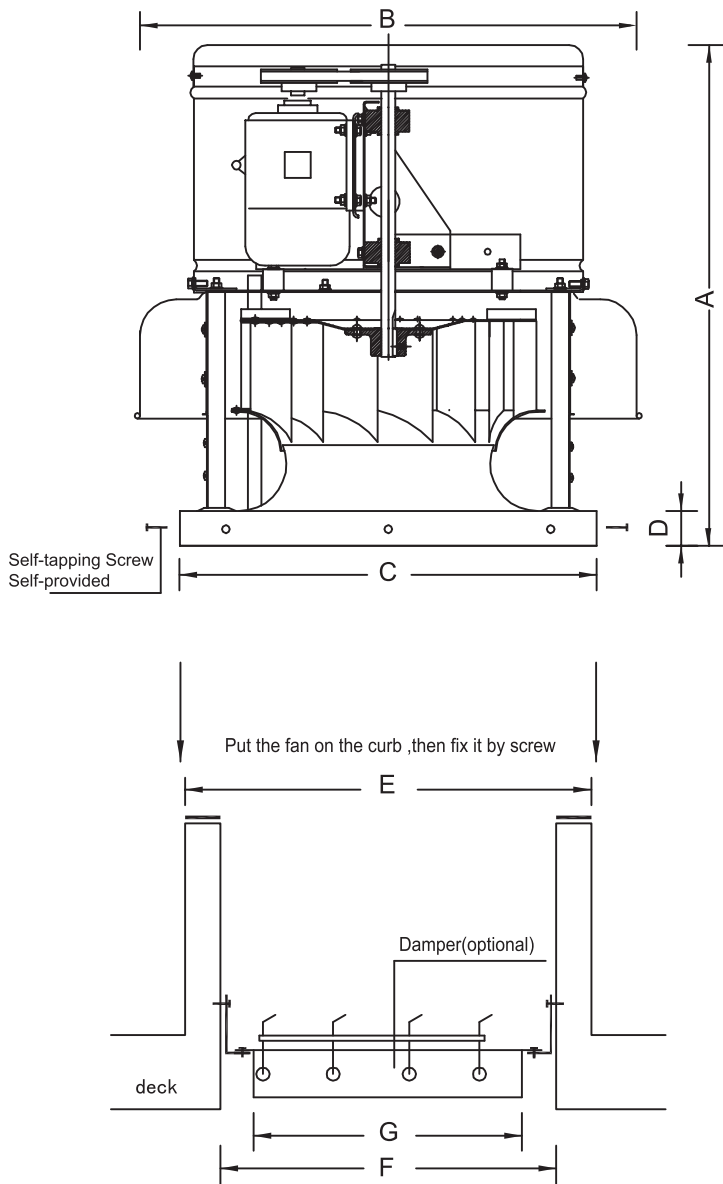
Step 2: The intersection point between the vertical line and the curve No. 12 in diagram 2 is marked as point W1. Draw a horizontal line from point W1 to the left coordinate, which makes point E. The point E (about 0.15kW) is the shaft power. According to the shaft power, a 0.25kW motor shall be equipped.

Step 3: The intersection point between the vertical line and the curve No. 12 in diagram 3 is marked as point W2. Draw a horizontal line from point W2 to the left coordinate, which makes point S (about 59dB(A)). It is the fan sound pressure level.

Step 4: According to above steps, the primary model selection would be RTC-300-0.25, belt drive, and factory set to 1380RPM. If lower shaft power or noise is expected, you may compare with another larger fan. However a larger fan would increase primary investment.

Step 5: Furthermore, if customer needs 1800M³/H at 180Pa static pressure, you would find point W' is close to curve No.13(bolded, indicates 1450 RPM 4 pole direct drive). Then a direct drive fan (RTC-300D4-0.25) can be selected which would be more economic.

Fan size and weight



- Installation instruction
1. The roof curb height shall be defined by design engineer. We suggest the height shall be 300mm-500mm according to local rainfall.
 2. Isolation pads, steel angels and screws for roof fans in this drawing are not included in the material lists of standard products by "INFINAIR."
 3. The rubber isolation pads should be chosen according to the maximum weight of the fan they can bear without any deformation. Typically, the thickness of pad is 5-8mm.

The below dimensions apply to all RTC types.

Model	A(mm)	B(mm)	C(mm)	D(mm)	weight (kg)
RTC-300	600 _(max)	540	500	50	21
RTC-425	749 _(max)	726	600	50	30
RTC-500	862 _(max)	830	750	70	39
RTC-575	890 _(max)	940	750	70	46
RTC-675	995 _(max)	1100	900	53	67
RTC-750	1064 _(max)	1200	900	53	71
RTC-900	1215 _(max)	1438	1100	70	118
RTC-1000	1338 _(max)	1588	1200	70	141

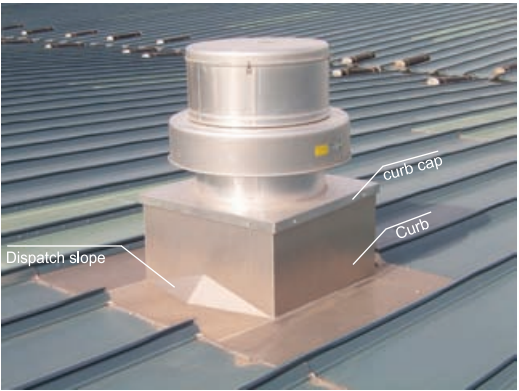
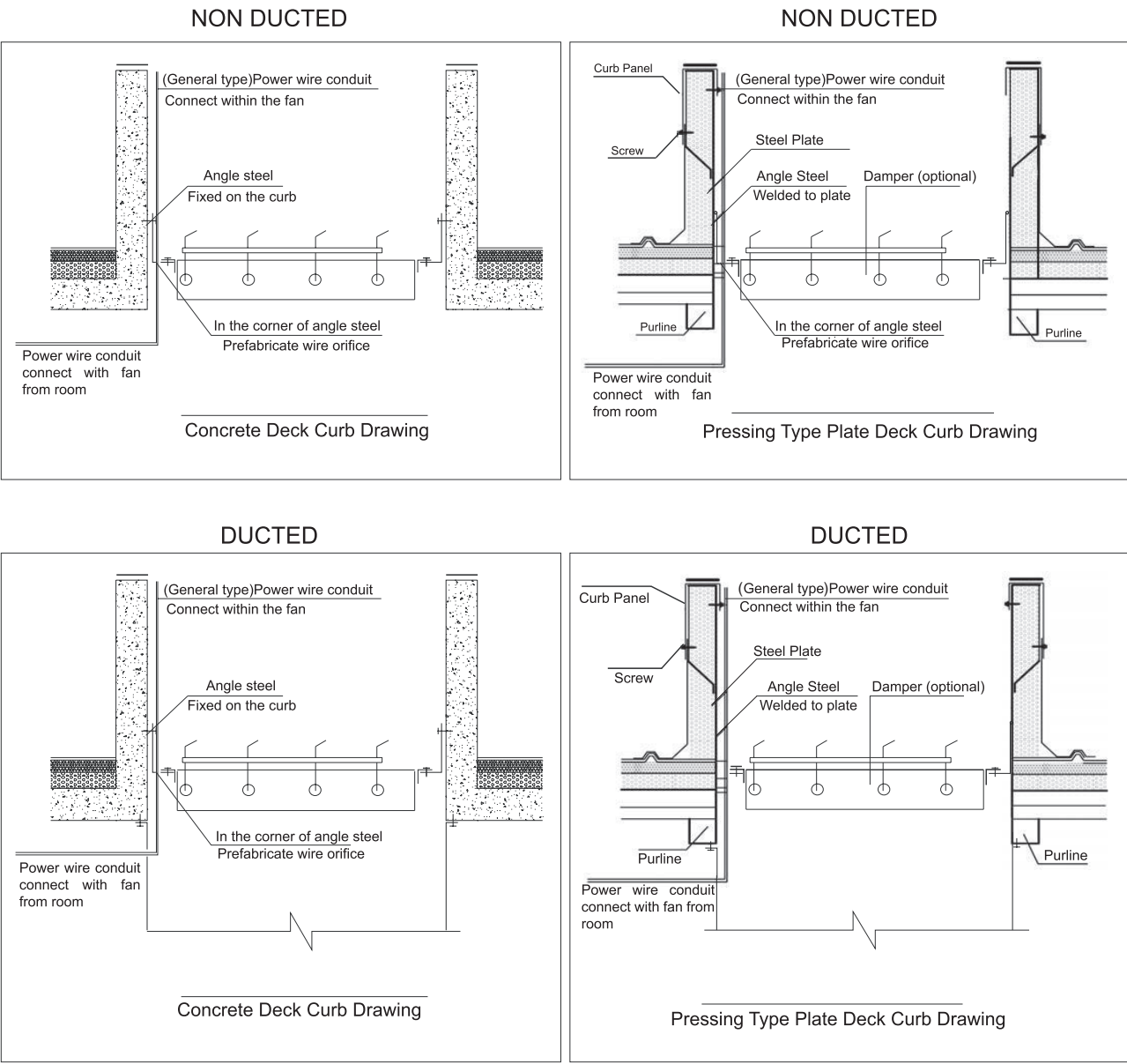
* The weight in the above table does not include that of motor. Refer motor weight to the table below.

(kW) (poles)	Motor Weigh (kg)							
	2P	4P	6P	8P	10P	12P	14P	16P
0.09	5.5	5		10				
0.12	5.5	6		10	11	13	15	18
0.18	14	13.5	14	16	10	15	17	21
0.25	14.5	14	14.5	17	14	16	20	23
0.37	15	14.5	16	24	17	18	21	30
0.55	15.5	17	17	28	20	21	30	37
0.75	16	18	23	33	23	24	36	41
1.1	17	22	25	38	30	30	42	48
1.5	22	27	33	45	38	42	35	58
2.2	25	34	45	63	39	45	52	62
3	33	38	63	79	40	50	62	67
4	45	43	73	110	56	60	68	70
5.5	64	68	84	121				
7.5	70	81	121	147				
11	118	124	146	182				

The below dimensions apply to all RTC types.

Model	Curb Edge Size	Roof Opening Size	Damper Size	Fire Resistant Damper Size
RTC-300	490	370	300x300	420x420
RTC-425	590	470	400x400	520x520
RTC-500	740	620	550x550	670x670
RTC-575	740	620	550x550	670x670
RTC-675	890	730	650x650	780x780
RTC-750	890	730	650x650	780x780
RTC-900	1090	930	800x800	980x980
RTC-1000	1190	1030	900x900	1080x1080

Roof Curb Fabrication Detail



Used on the slope for water diversion, protect curb from direct rain damage.

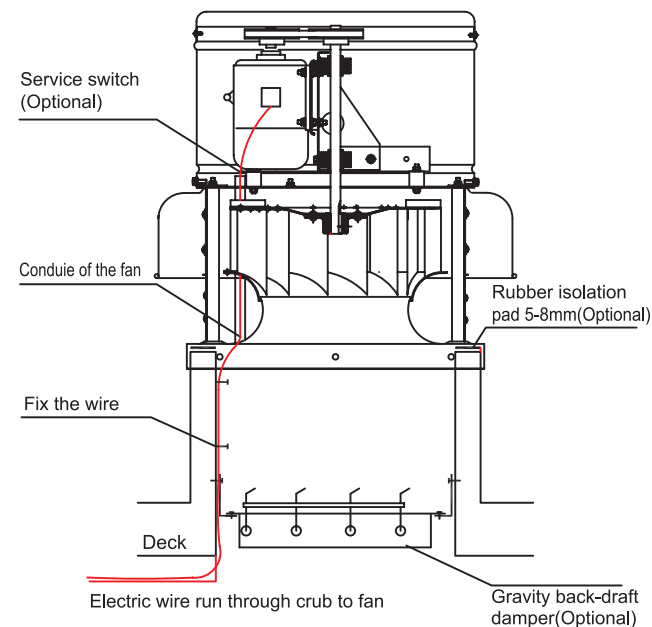


Figure 1: RTC-GT non smoke removal fan installation drawing

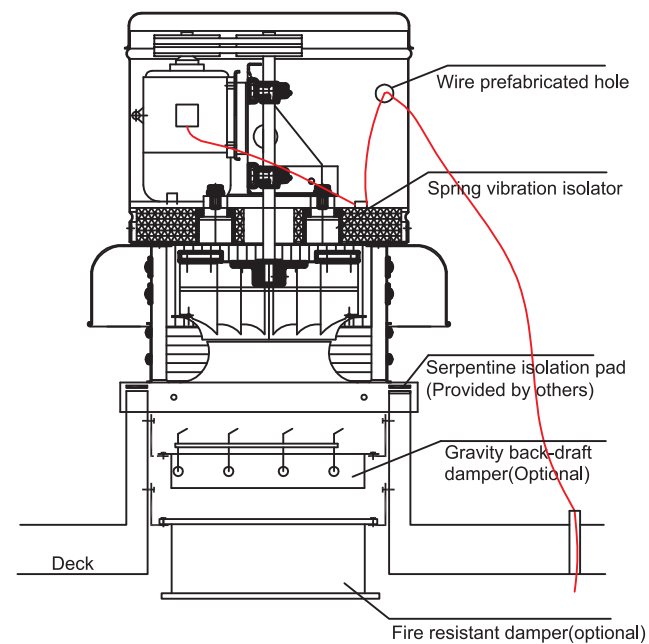


Figure 2: RTC-SR smoke removal fan installation drawing

Installation

Fan & roof installation structure dimension

Please see page 17 for fan size and opening hole size on the roof. The opening hole size on the roof shall be provided to the contractor at early stage when the roof is under construction.

Roof curb fabrication

Roof curb is a kind of structure on the roof, that is, The contractor is the only party who is responsible for the fabrication and procedure of the roof curb, figure 1 and figure 2 are for reference only. The thickness of curb wall shall be different according to the model. The thickness shall be between 60-80mm.

As to the metal where the fan contacts the curb in the top, a linear rubber vibration isolation pad (smoke removal type needs serpentine isolation pad) shall be applied and also acts as seal. The thickness of the pad shall be decided according to the thickness if it still maintains proper elasticity after fan is seated. The pad could be cut by typical carpet type isolation pads from market and shall be provided by contractors.

How to mount the fan

Put the fan curb cap on the curb, and fix it at all four sides by self-tapping screw as shown by figure 1 and figure 2. The fan must be repte level.

Power supply wiring

As general and explosion proof exhaust fan, wiring starts inside the curb and is connected with motor through the tube provided by fan as thown by figure 1. As smoke removal fan, wiring starts on the roof and is connected with motor through provided hole in motor chamber as shown by figure 2.

The rotation must be checked by connecting the electric power strictly according to the direction mark on the machine after the wiring is done. If reverse, inter-change any 2 of the 3 phase lines. Fan reverse rotation is forbidden.

Product Specifications

Section 1: Quality Standards

Centrifugal roof exhaust fans shall be tested and certified in accordance with AMCA Standard 210 &300. Each fan shall bear AMCA Sound & Air Performance Seal.

Section 2: Fan Type

Fan shall be rooftop centrifugal exhaust type with aluminum backward inclined centrifugal wheel. The inlet Venturi shall have round curved section to smoothly transit the air to the wheel cone. The wheel shall be statically and dynamically balanced to Level G2.5 in accordance with ISO Standard No.1940.

Section 3: Fan material

The fan housing, wheel and curb shall be produced by aluminum alloy. And the exterior color of the fan shall be silver white to be harmony with the building.

Section 4: Drive (Apply to belt drive model only)

Shaft: fan shaft shall be heat treated through soaking furnace to reach the hardness level of HB250, and the surface shall be hard film corrosion treated. The fan shaft shall be balanced together with the wheel. And the shaft design speed shall at least exceed 25% of the maximum fan operation speed.

Pulleys: Fan pulleys shall be sized for a minimum of 150% of driven power. Pulleys shall be of cast iron type. Motor pulleys shall be adjustable for final system balancing. Conical (QD) type bushings shall be equipped for easy removal of the pulleys.

Bearings: Bearings shall be chosen of metallic to avoid direct vibration on motor. High quality motor bearings shall be selected for a minimum (L-10) life in excess of 80,000 hours at maximum cataloged operating speed. Bearing type shall be lubricable pillow block metal ball bearings, permanently sealed.

Drive support: Drive assemblies shall be supported by heavy gauge powder coated steel and mounted on vibration isolators. The belt tension shall be adjusted through motor support plate, ensuring the fan shaft and motor shaft are always keeping parallel.

Section 5: Motor

Motor shall be carefully matched to the fan load with IP 54 and insulation class F. The motor bearings shall be lubrication-free ball bearing type. Motor and drives shall be mounted on vibration isolators, and out of the air stream to avoid grease or dirt accumulation. Motor chamber shall be fixed through stainless steel clips for easy access.

Section 6: Structure

The hood shall be rigid enough to bear heavy load and protect the fan from leaking of heavy rain or snow melting.

Motor, drive support panel shall use an anti-corrosion treated steel panel. Using the same material as that of the housing is prohibited. The column shall be aluminum stick to make sure the support is stable.

Internal wiring conduit: Fan shall be furnished with a conduit to lead the power supply wiring through the curb to the motor chamber. (Limited to non smoke removal type)

Roof curb caps with mounting holes: the roof curb cap shall have pre-drilled holes at its side by which the fan could be fixed.

Galvanized bird screen: Galvanized bird screen shall be furnished to protect the fan’s discharge from birds when the fan is not running.

Section7: Smoke removal fan with certificate(apply to smoke remov

The centrifugal fan must be tested OK in accordance with the “General Usage of Centrifugal Fan Technical Specification”(China National Standard JB/T10563-2006) on terms of general performance. A test report issued by licensed authorities shall be provided. The fan must be tested according to “Fire Fighting Smoke Removal Fan High Temperature Testing Method”(China National Standard GA211-2009) by qualified fire safety testing organizations. The high temperature resistance performance-running continuously for over 30 minutes when the main duct air temperature is 280°C-must be identified by presenting an official certificate.

Section 8: Fresh air cooling motor

Fresh air shall be drawn into the motor compartment from an area free of discharge contaminants to cool the motor and drive. The fresh air shall be guided into the motor chamber through auxiliary wheel blades to the gap below the motor cover

Section 9: Nameplate

Each fan shall bear a permanently fixed aluminum nameplate clearly containing fan number, product model and serial number. The serial number shall be a unique ID for each fan, so that customers have an easy access to finding out the records of used parts.

Section 10: Acceptable manufacturers

INFINAIR® products or equivalents which are based on **INFINAIR®** RTC Fan are acceptable.