Rotary Heat Exchanger (Wheel)

Product Description

Rotary heat exchanger (wheel) is mainly used in building ventilation or in the air supply/discharge system of air conditioning equipment. The wheel transfers the energy (cold or heat) contained in exhaust air to the fresh air supplied to indoor. It's one important equipment and key technology in the field of construction energy-saving.

Rotary heat exchanger is composed of heat wheel, case, drive system and sealing parts. The heat wheel rotates powered by the drive system. When outdoor air passes through half of the wheel, return air passes through reversely the rest half of the wheel. In this process, about 70% to 90% heat contained in the return air can be recovered to supply air to indoor

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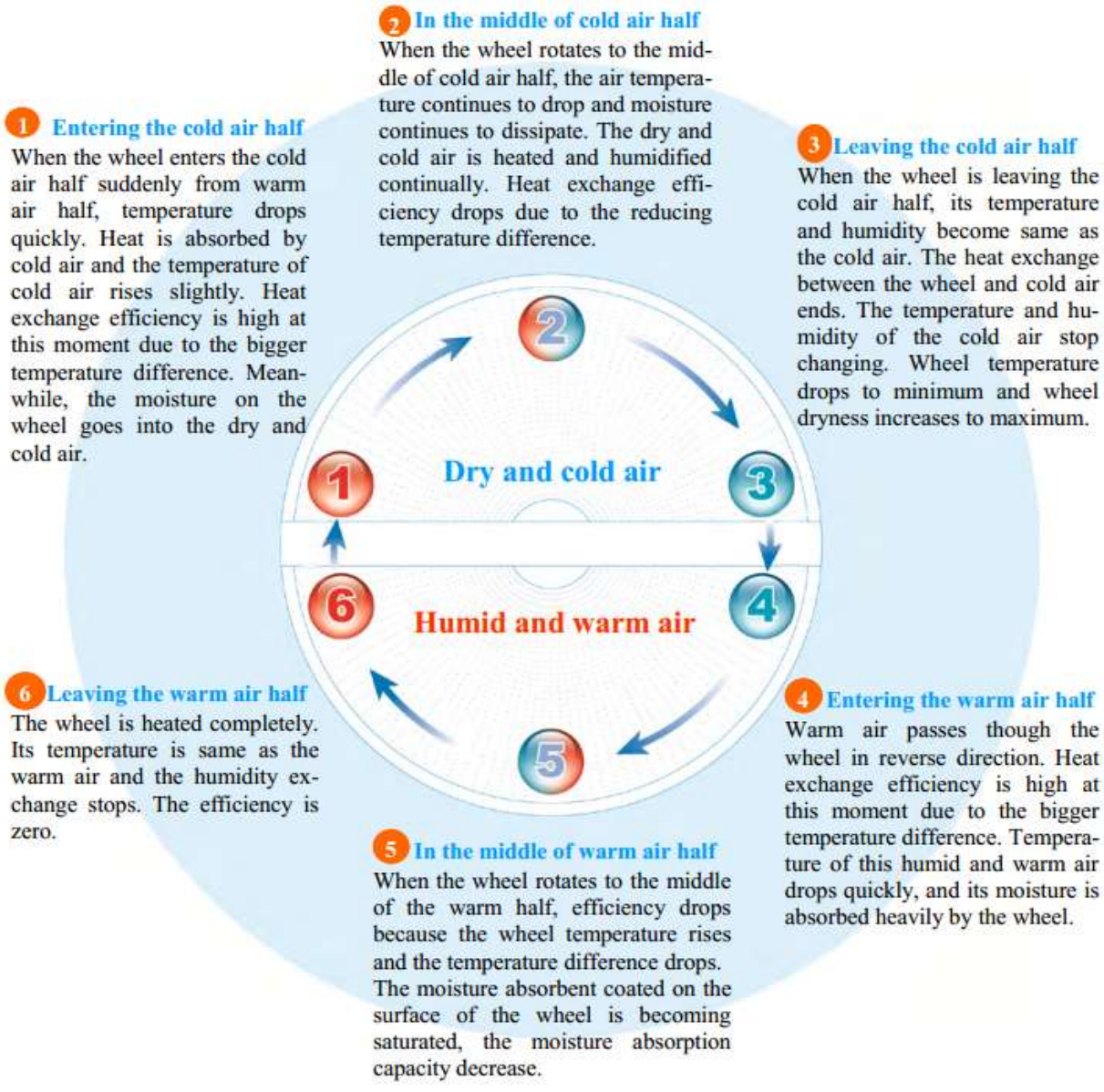
Working Principle

Rotary heat exchanger is composed of alveolate heat wheel, case, drive system and sealing parts. The exhaust and outdoor air pass through half of the wheel separately, when the wheel rotates, the heat and moisture are exchanged between the exhaust and outdoor
air. The energy recovery efficiency is up to 70% to 90%.



Wheel Materials

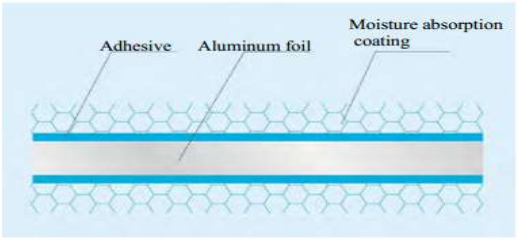
1)HRS-500~HRS-5000 series: Sensible heat wheel is made by aluminum foils of 0.05mm thickness.

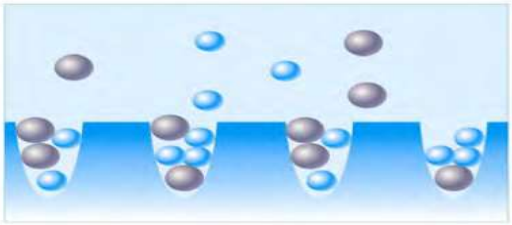
2)HRT-500~HRT-5000 series:

Total heat wheel is made by aluminum foils coated with 3A molecular sieve of 0.04mm thickness.

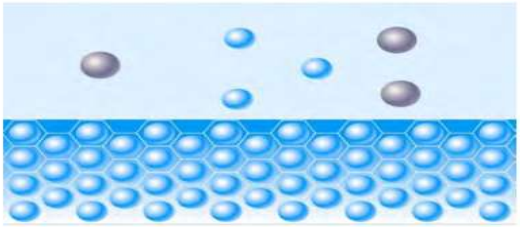
Wheel Materials

The sensible heat wheel is made by aluminum foils of 0.05mm thickness.
And the total heat wheel is made by aluminum foils coated with 3A molecular sieve of 0.04mm thickness.





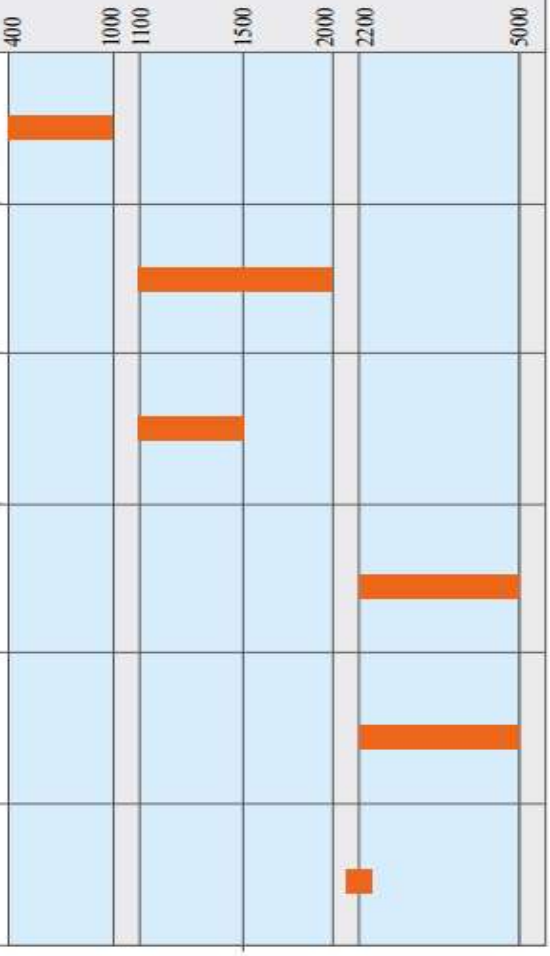
Silicon gel absorbs both moisture and odor by capillarity.



Molecular sieve selectively absorbs moisture and expels odor by molecular lattice.

Casing Construction

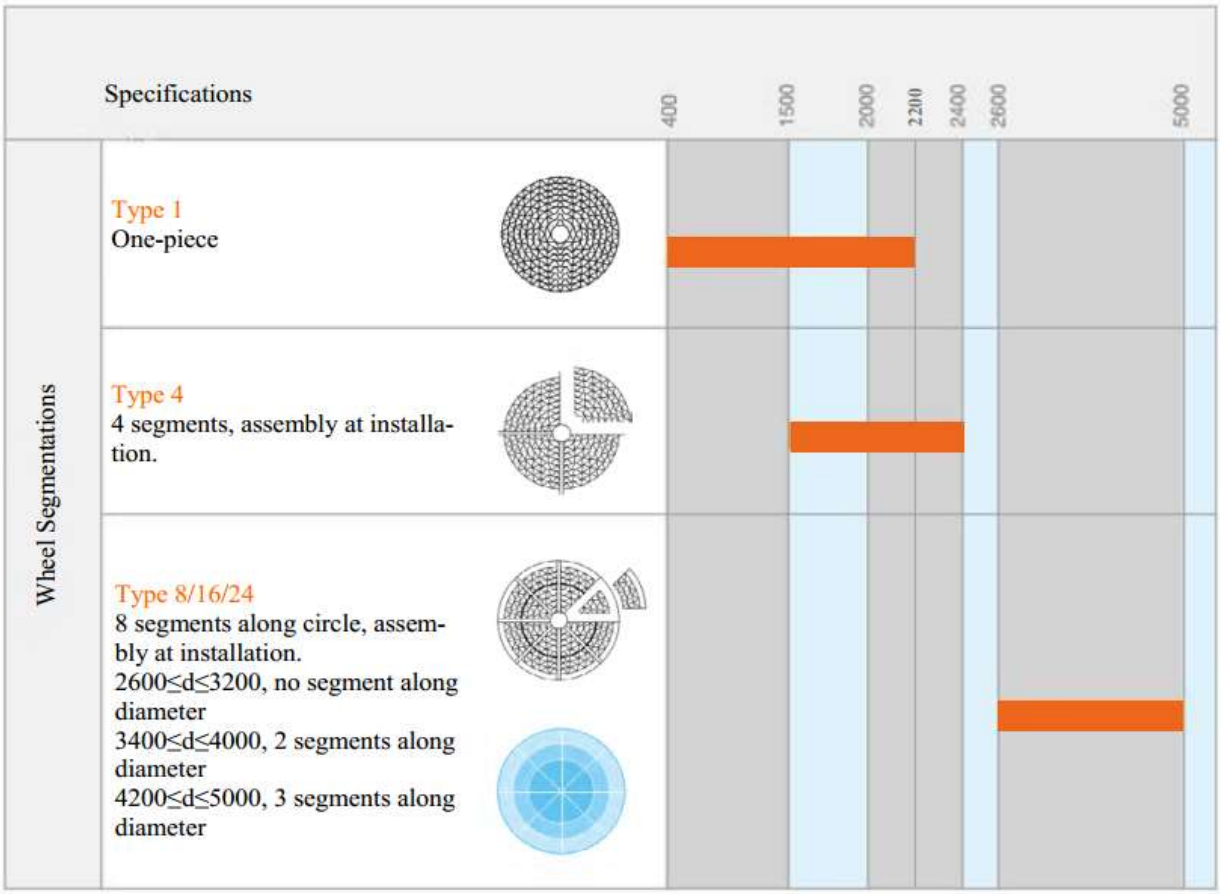
	Specifications	
Casing Type	Casing A Plate structure, made of aluzinc, one-piece.	
	Casing B Plate structure, made of aluzinc, one-piece. For right and left ducted, the upper side should add a vertical beam.	
	Casing C Plate structure, made of aluzinc, in two sections. For right and left ducted, the upper side should add a vertical beam.	
	Casing D Frame structure, made of aluminum profiles with aluzinc plates, in two sections, assembly at installation.	
	Casing E Frame structure, made of aluminum profiles with aluzinc plates, casing delivered in parts and assembled at installation.	
	Casing F Frame structure, made of aluminum profiles with aluzinc plates, casing delivered in one-piece.	



⚠ The ways of casing should be selected according to the application spaces as well as transportation capability and conditions at installation. Over segmentation will increase the assembly work, and overlarge size will cause difficulties in transportation.

Wheel Construction

The wheel of the rotary heat exchanger is made of alternating layers of flat and corrugated aluminum foil to form the alveolate shape. Various height of corrugation is available. Flat surface ensures minimum leakage.
Interior spokes are used to mechanically bond the rotor's laminations. These are threaded at the hub and welded at the periphery.



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Laminar Flow Channels

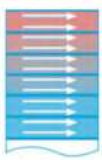
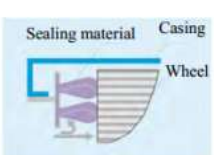
The wave type structure of the wheel forms narrow channels in the direction of air flow. The air flow forms a laminar flow inside the wheel when passing through it. When the wheel rotates, dust won't accumulate on the channel since outdoor air and exhaust air respectively flow through the channels from two directions. This is called self-cleaning.

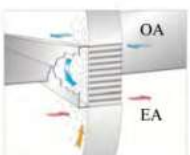
Double Sealing System

Unique double-sealing system is installed around the rotor periphery and along the central beam. The sealing materials are soft and dense of small friction and longer service life.

Purge Sector

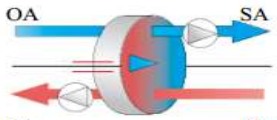
Because of the structure of rotary heat exchanger, the outdoor air and exhaust air will mix. According to the air velocity, wheel rotating speed and direction, purge sector is installed to prevent the exhaust air from entering the outdoor air. The purge sector enables a small fraction of outdoor air to blow back the exhaust air in the alveolate holes to its side. A minimum pressure difference of 200Pa between the outdoor air side and the exhaust air side is required to ensure the cleaning effectiveness. With all conditions provided, the sector can ensure a leakage below 0.3% from exhaust air to outdoor air.

Positioning of Fan and Wheel

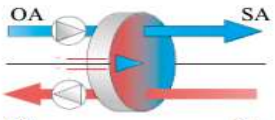
The cleaning effect of the purge sector is bound up with the fan position and static pressure difference between outdoor air side and exhaust air side. When the pressure difference is less than 200pa, the cleaning effect is not guaranteed.



Model 1

Mode 1: both fans suck out. (Top-priority)

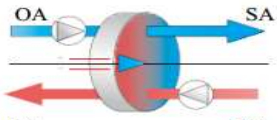
The pressure of supply fan should be more than that of exhaust fan 200-500Pa, standard 2x5 degree of purge sector should be used.



Model 2

Mode 2: supply fan drives in, and exhaust fan sucks out.

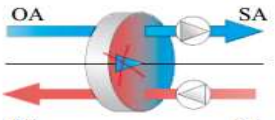
By this way, the pressure difference is 500-800pa, The outdoor air through the purge sector is increased, so 2x2.5 degree of purge sector should be used.



Model 3

Mode 3: both fans drive in.

The pressure of supply fan should be more than that of exhaust fan 200-500Pa, standard 2x5 degree of purge sector should be used.

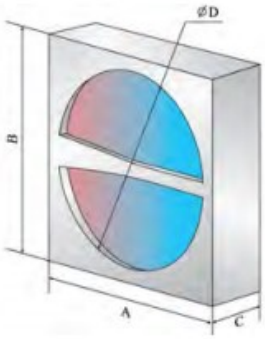


Model 4

Mode 4: supply fan sucks out, and exhaust fan drives in.

In this case, the exhaust air enters the supply air inevitably, so the purge sector is prohibited.

Specifications

Model HRT(S)-	Width A(mm)	Height B(mm)	Depth C(mm)	Diameter D(mm)	Motor Power (kw)	Weight (kg) Up-down type /Right-left type	Rotor cut	Casing construction	Diagram
500	600	600	340	530	0.09	42	 One piece	 Casing A, plate structure, made of aluzinc, one-piece	
600	700	700	340	630	0.09	59			
700	800	800	340	730	0.09	71			
800	900	900	340	830	0.09	82			
900	1030	1030	340	930	0.09	102			
1000	1130	1130	340	1030	0.09	130			
1100	1230	1230	340	1130	0.09	151			
1200	1330	1330	340	1230	0.18	169			
1300	1430	1430	340	1330	0.18	190			
1400	1530	1530	340	1430	0.18	205			
1500	1630	1630	340	1530	0.18	212/220			
1600	1730	1730	340	1630	0.18	230/239			
1700	1830	1830	340	1730	0.25	256/266			
1800	1930	1930	340	1830	0.25	283/293			
1900	2030	2030	340	1930	0.25	301/320			
2000	2130	2130	340	2030	0.25	358/370		 Casing C, plate structure, made of aluzinc, one-piece	
2200	2400	2400	400	2230	0.37	420	 4 segments, Site assembly	Casing D Frame structure, made of aluminum profiles with aluzinc plates, in two sections, site assembly	
2400	2600	2600	400	2430	0.37	500			
2600	2800	2800	400	2630	0.37	570	  8/16/24 segments, Site assembly	 Casing E / F Frame structure, made of aluminum profiles with aluzinc plates, Caseing E is parts delivery and site assembly; Caseing F is complete delivery	
2800	3000	3000	400	2830	0.37	860			
3000	3200	3200	430	3030	0.55	950			
3200	3400	3400	430	3230	0.55	1039			
3400	3600	3600	430	3430	0.55	1110			
3600	3800	3800	430	3630	0.55	1220			
3800	4000	4000	430	3830	0.55	1360			
4000	4200	4200	430	4030	0.75	1500			
4200	4400	4400	430	4230	0.75	1645			
4400	4600	4600	430	4430	0.75	1750			
4600	4800	4800	430	4630	1.1	1830			
4800	5000	5000	430	4830	1.1	1980			
5000	5200	5200	430	5030	1.1	2100			

* Model HRT-xxx stands for hygroscopic wheel, model HRS-xxx standds for sensible heat wheel.

Application:

Rotary heat exchanger can built in air handling unit(AHU) as a main part of the heat recovery section. Usually side panel of the exchanger casing is unnecessary, except that bypass has been set in AHU.
It can also be installed in the ducts of ventilation system as a main part of the heat recovery section, connected by flange. In this case, side panel of the exchanger is necessary to prevent leakage.