



INNOBIZ



ENERGY RECOVERY VENTILATION

Heat Recovery Ventilation Unit



SHINWOO

SHINWOO AIR CONDITIONING CO.,LTD.

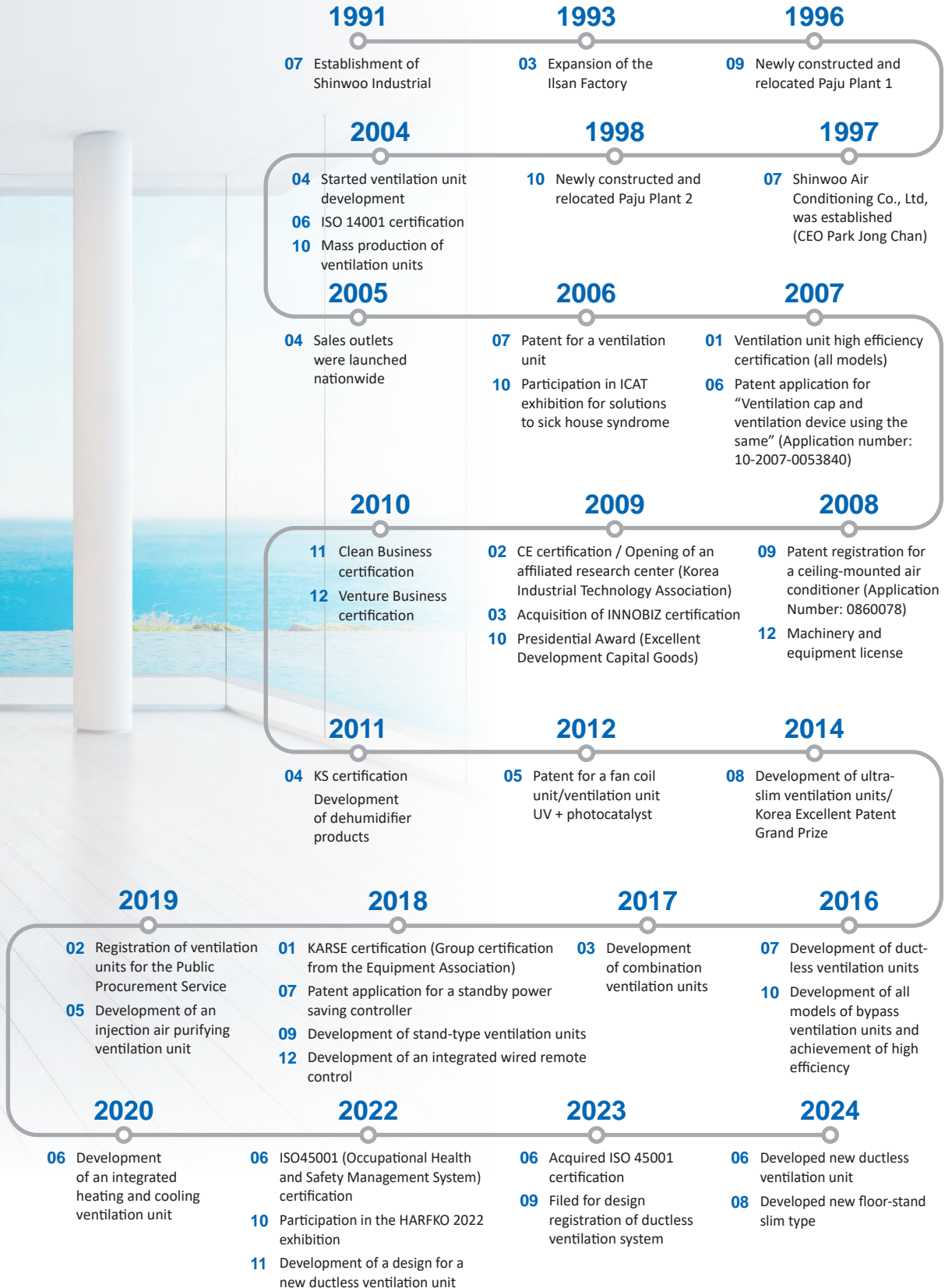
Shinwoo Air Conditioning will strive to create spaces as comfortable and healthy as nature to create a world where happiness is shared.



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SHINWOO AIR CONDITIONING CO., LTD. History



Necessity of Ventilation

The indoor air quality in South Korea is a growing concern due to high levels of bacterial contamination and the presence of heavy metal particles in fine dust. Furthermore, asbestos, a carcinogenic substance, has been detected at more than five times the recommended levels, indicating an urgent need to improve air quality through ventilation systems.

Indoor Air Pollution in Residential Environments

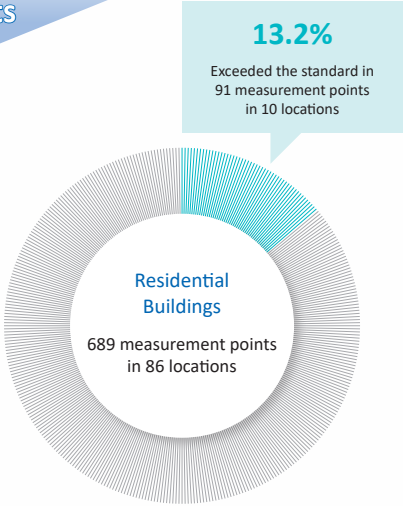
Indoor Air Quality Survey by the Ministry of Environment (2016)

- ▶ **Investigating Agencies** Ministry of Environment, National Institute of Environmental Research, Regional Environmental Offices
- ▶ **Survey Targets** Measurement at 689 points in 86 newly built apartment houses (as per local government inspection results)
- ▶ **Investigation Substances** Formaldehyde, benzene, toluene, ethylbenzene, xylene, styrene
- ▶ **Recommended Indoor Air Quality Standards for Newly Constructed Multi-Unit Residential Buildings**

Measurement Items	Recommended Standards (µg/m³)	Measurement Items	Recommended Standards (µg/m³)
Formaldehyde	210 or less	Ethylbenzene	360 or less
Benzene	30 or less	Xylene	700 or less
Toluene	1,000 or less	Styrene	300 or less

Investigation Results

The investigation has revealed that indoor air pollution is a significant issue, with locations exceeding the recommended standards in **10 locations and at 91 measurement points (13.2%)** for major pollutants such as formaldehyde, toluene, and styrene, which are the main causes of “new house syndrome.” Specifically, **toluene** was found to exceed the recommended standards in **52 locations, styrene in 27 locations, xylene in 14 locations, ethylbenzene in 13 locations, and formaldehyde in 9 locations.**



Air Pollution in Educational Facilities and Other Multi-Use Facilities

Indoor Air Quality Survey by the Ministry of Environment (2016)

- ▶ **Investigating Agencies** Ministry of Environment, National Institute of Environmental Research, Regional Environmental Offices
- ▶ **Survey Targets** Measurement of 2,136 out of 19,802 multi-use facilities nationwide
- ▶ **Investigation Substances** Formaldehyde, fine dust (PM10), carbon dioxide, carbon monoxide, total suspended bacteria
- ▶ **Indoor Air Quality Maintenance Standards (Annex 2:Article 3)**

Multi-Use Facilities	Airborne Pollutants	PM10 ($\mu\text{g}/\text{m}^3$)	CO ₂ (ppm)	HCHO ($\mu\text{g}/\text{m}^3$)	Total Suspended Bacteria (CFU/ m^3)*	CO (ppm)
Underground facilities, terminals, stations, airport facilities, port facilities, libraries, museums, funeral halls, bathhouses, large stores, etc.		150 or less	1,000 or less	100 or less	-	10 or less
Medical facilities, childcare centers (daycare facilities), elderly care/specialized hospitals, postpartum care centers, etc.		100 or less			800 or less	
Indoor parking lots		200 or less			-	25 or less
Indoor sports facilities, indoor performance halls, office facilities		200 or less	-	-	-	-

*For libraries, cinemas, academies, and PC rooms where natural ventilation is not possible, the carbon dioxide standard is set at 1,500 ppm or lower when using mechanical ventilation systems.

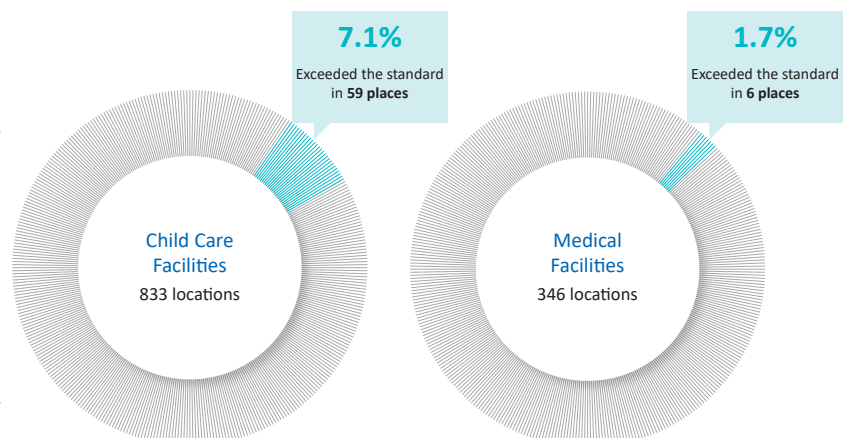
Investigation Results

Category	Total	Underground Subways	Underground Shopping Malls	Passenger Cars Terminal Waiting Rooms	Airport Facilities Passenger Terminals	Port Facilities Waiting Rooms	Libraries	Museums	Art Museums	Medical Facilities	Indoor Parking Lots
Target Facilities	14483	537	67	29	17	4	208	98	24	2051	3664
Facilities subject to Inspection	2576	145	17	3	5	-	26	17	5	566	131
Facilities Exceeding Standards	206	2	1	-	-	-	1	1	-	15	-
Exceedance Rate (%)	8	1.4	5.9	-	-	-	3.8	5.9	-	2.7	-

Category	Underground Subways Waiting Rooms	Large Retail Stores	Day Care Centers	Public Senior Centers Healthcare and Welfare Facilities	Funeral Halls	Bathhouses	Postpartum Care Centers	Movie Theaters	Educational Institutions (Academies)	Exhibition Halls	PC Rooms
Target Facilities	31	1,130	4,440	132	140	1,064	265	301	152	26	103
Facilities Under Inspection	7	109	1,321	24	15	67	36	60	11	2	9
Facilities Exceeding Standards	-	4	172	1	-	-	5	-	1	1	2
Exceedance Rate (%)	-	3.7	13	4.2	-	-	13.9	-	9.1	50	22.2

By facility type, it was found that among the **833** child care facilities, **59 of them (7.1%)** exceeded the maintenance standards in the pollution level tests, and among the **346** medical facilities, **6 of them (1.7%)** exceeded the maintenance standards.

When categorized by air pollutants, among the **11 cases of fine dust**, **6 of them were at child care facilities**, and among the **58 cases of total suspended particulates**, **55 of these were at child care facilities and the rest of 3 were at medical facilities**. It appears that **child care facilities have the highest level of contamination**, and there is an urgent need to improve indoor air quality through ventilation systems.



Main Indoor Air Pollutants and Their Impact on Health

Most modern individuals spend more than 80% of their day in highly sealed indoor environments to save energy. However, these indoor spaces often lack effective air circulation with the outside, leading to indoor air quality that is more than three times more polluted than outdoor air. This can result in various issues, including increased levels of dust, bacteria, harmful gases, odors, and more.

Airborne Pollutants	Main Sources	Impact on Health
Airborne bacteria (mold, pollen, bacteria, viruses, etc.)	Humidifiers, air conditioners, refrigerators, pets, human activities, food waste, carpets	Infectious diseases, allergies, skin problems, respiratory diseases, lung diseases, bronchial diseases, lung cancer, itching, eczema, skin spots, ringworm, etc.
Formaldehyde	Various types of plywood, boards, furniture, insulation materials, cigarette smoke, cosmetics, clothing, adhesives, etc.	Eye, nose, and throat irritation, dizziness, coughing, emotional anxiety, memory impairment, diarrhea, skin conditions, sick building syndrome
Acetaldehyde	Synthetic resins, adhesives, fragrances	Unpleasant odors
Acetone	Chipboard, building materials, adhesives, lacquer, nail polish remover	Eye, nose, and throat irritation, headache, nausea, anesthesia, skin peeling and inflammation
Combustion gases (CO, NOx, SOx)	Stoves, fuel combustion, gas stoves	Headache, nausea, dizziness, loss of directional sensation, growth disorders, chronic respiratory diseases (pneumonia, bronchitis, asthma, chronic bronchitis)
Dust, heavy metals	Outdoor air inflow, daily activities, clothing, smoking, combustion devices, etc.	Asthma, lung cancer, etc.
Radon	Soil, building materials, groundwater	Class 1 carcinogen (causes lung cancer, etc.)
Volatile organic compounds, hydrocarbons, fine particulate matter, tar, nicotine	Cigarette smoke	Carcinogens
Benzene	Building materials, laundry detergent, paint, insecticides, petrochemical products, automotive exhaust, fuel combustion	Carcinogenic substances, anesthesia symptoms, respiratory difficulties, drowsiness, blood disorders, liver disorders, anemia, leukemia
Toluene	Cigarette smoke, building materials, paint, insecticides, fuel combustion	Skin, eye, throat irritation, headache, dizziness, fatigue, balance disorders, paralysis, loss of consciousness
Ethylbenzene	Automotive exhaust, cigarette smoke	Odor
Xylene	Adhesives, paint	Dizziness, vertigo, drowsiness, numbness, pulmonary edema, decreased appetite, nausea, abdominal pain
Styrene	Adhesives, kitchen wrap, plastic products, film	Respiratory irritation (skin, eyes, nose), drowsiness, unconsciousness, Effects on the nervous system, kidneys, lungs, and liver
Tetrachloroethylene, ethylene	Carpet cleaners, stain removers, dry cleaning solvents	Anesthesia, odor

► Recommended Indoor Air Quality Standards (Appendix 3: Article 4)

Pollutant Items	Nitrogen Dioxide (ppm)	Radon (Bq/m³)	Total Volatile Organic Compounds (µg/m³)	Until 2017		From 2018	
				Asbestos (product/cc)	Ozone (ppm)	Fine Particulate Matter (PM _{2.5}) (µg/m³)	Mold (CFU/m³)
Multi-Use Facilities							
1 Underground subways, underground shopping malls, railroad station waiting rooms, passenger car terminal waiting rooms, port facilities waiting rooms, passenger terminals in airports, libraries, museums and art galleries, large stores, funeral halls, movie theaters, academies, exhibition facilities, business facilities of the internet computer game service industry, business facilities of bathhouses	0.05 or less	148 or less	500 or less	0.01 or less	0.06 or less	-	-
2 Medical institutions, childcare centers, postpartum care centers, elderly care facilities			400 or less				
3 Indoor parking lots			1,000 or less				
	0.3 or less				0.08 or less	70 or less	500 or less

Calculation of Ventilation Rates Suitable for Objectives

Ventilation Calculation

The required ventilation rate varies depending on factors such as the type of living room, the use of heating appliances, the generation of heat and steam, and so on. In all cases, it is necessary to calculate the ventilation amount appropriate for the purpose of the location where the ventilation unit is installed.

Standards for Required Ventilation per Person Established by the Ministry of Land, Infrastructure and Transport

: Annex 1 of Article 2 of the Supplementary Provisions of the Building Act, revised on December 4, 2017.

Classification of Multi-Use Facilities		Required Ventilation Rate (m³/person·h)
Underground Facilities	Underground Subways	25 or more
	Underground Shopping Malls	36 or more
Cultural and Assembly Facilities		29 or more
Retail Facilities		29 or more
Transportation Facilities		29 or more
Funeral Halls		36 or more
Medical Facilities		36 or more
Educational and Research Facilities		36 or more
Facilities for the Elderly and Infants		36 or more
Business/Office Facilities		29 or more
Automotive Facilities		27 or more
Other Facilities		25 or more

- A) When calculating the floor area and total floor area, it is based on the floor area or total floor area occupied by the facilities installed in the indoor space.
 B) The required ventilation volume is calculated based on the time period when the expected number of users is highest.
 C) In the case of rooms used for special purposes such as operating rooms among medical facilities, the head of the relevant central administrative agency may establish or determine different standards.
 D) For facilities related to automobiles, the required ventilation volume is calculated as the ventilation rate per unit area (m³/m²·h).

Based on Occupancy

$$\text{Required Ventilation Volume (CMH)} = \text{Ventilation Rate per Person (m³/h)} \times \text{Number of People}$$

Based on Area Occupied per Person

: Based on the CO₂ emission rate (20 CMH) when an adult male is sitting quietly

$$\text{Required Ventilation Rate/Volume (CMH)} = 20 \text{ (CMH)} \times \text{Room Area (m²)} \div \text{Occupancy Area per Person (m²)}$$

Category	Occupancy Area per Person (m²)
Church assembly halls, gymnasiums	0.5–1
Theaters, cinemas, banquet halls	0.5–2
Inn, hotels, motels	10
Hospitals, clinics, offices	5
Department stores	2
Restaurants	2

Ventilation Frequency Standards

$$\text{Required Ventilation Rate/Volume (CMH)} = \text{Ventilation Frequency Per Hour (times/h)} \times \text{Interior Air Volume (m³)}$$

Installation Location	Frequency (times/h)
Restaurants	15
Bathrooms	10–12
Classrooms	6–8
Offices	6

Based on Room Area

$$\text{Required Ventilation Volume (CMH)} = \text{Ventilation Rate per Area (m³/m²·h)} \times \text{Room Area (m²)}$$

Classification of Room Types		Ventilation Rate by Room Area (m³/m²·h)
Office	Individual Offices	6.0
	General Offices	7.2
Shops, Stores		9.1
Restaurants		30–17.7
Banquet Halls		37.5
Hotels, Guest Rooms		3.0
Conference Rooms		30
Beauty Salons, Barber Shops		6.0
Residence, Apartments		9.0
Restaurants	Commercial	30.0
	Non-commercial	15.0
Lounges		15.0

Example of Apartment Ventilation Rate Calculation

$$\text{Required Ventilation Rate/Volume (CMH)} = \text{Room Area (m²)} \times \text{Room Height (m)} \times 0.5 \text{ times or more}$$

- Based on 115 m² (35 Py): 115 m² × 2.3 m × 0.5 = 132.25 CMH
 → 150 CMH product application
- Based on 165 m² (50 Py): 165 m² × 2.3 m × 0.5 = 189.75 CMH
 → 200 CMH product application

* Please note that actual areas like bathrooms and balconies are excluded when calculating ventilation rates, so the calculated values may be lower than the examples given

Features of Shinwoo Air Conditioning Heat Recovery Ventilation Units

A heat recovery ventilation unit refers to a ventilation device that can recover heat wasted during ventilation. Heat exchange is a heat recovery ventilation method, the most ideal for ventilation systems, that transfers the energy in the air released during ventilation to the introduced outdoor air to maintain indoor temperature and humidity.

01

The ventilation system creates a **comfortable indoor space** by **bringing outdoor air into the room** and **expelling harmful gases** that cause sick building syndromes.

02

The basic installed **heat exchanger component** helps **maintain indoor humidity** and **minimizes heat loss**, maximizing **energy savings**.

03

After a certain period of time, a **high-performance air purification filter** can be installed instead of the heat exchange component, depending on the consumer's choice. This filter **effectively filters out** various indoor pollutants such as **mold, dust mites, fine dust, and various odorous substances**, creating a **healthy indoor environment**.

04

Using **UV lamps and photocatalysts** provides a **sterilization, antibacterial, odor removal, deodorization, and sick house syndrome solution**.

- Korean Patent Registration (No. 10-1147406) (option)



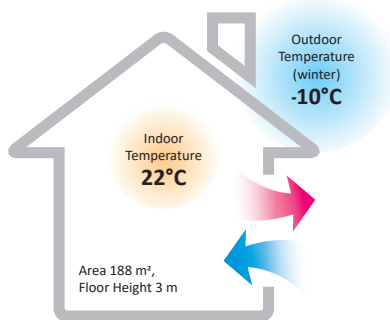
Advantages of Installing Shinwoo Air Conditioning Heat Recovery Ventilation Units

Energy Recovery and Energy Saving Effects

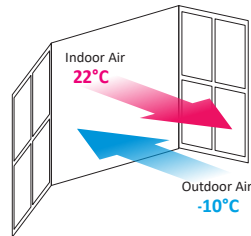
In conventional ventilation, when the contaminated indoor air is discharged, indoor heating and cooling energy are also discharged, resulting in the need to consume energy again during re-heating or re-cooling after ventilation.

The heat recovery ventilation unit is a ventilation system that provides comfortable ventilation and excellent energy savings by recovering indoor cooling and heating energy that is discarded during general ventilation and supplying it with fresh air to the indoor space.

General Natural Ventilation



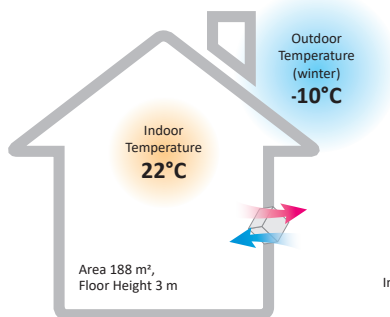
General natural ventilation involves opening windows or using an exhaust fan, which causes significant heat loss during ventilation.



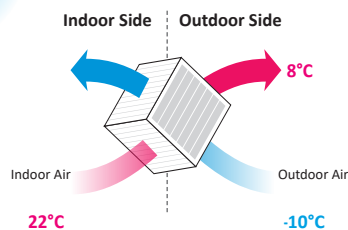
Required Heat Energy for General Natural Ventilation (Q)

$$0.29 (188 \text{ m}^2 \times 3 \text{ m} \times 0.5 \text{ times/hr}) \cdot \{22^\circ\text{C} - (-10^\circ\text{C})\} = \mathbf{2,616 \text{ kcal/hr}}$$

Heat Recovery Ventilation Unit Ventilation



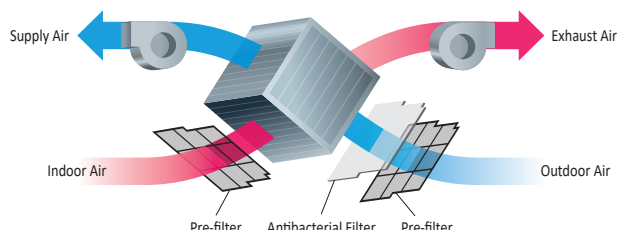
Using a heat recovery ventilation unit directly exchanges polluted air with fresh outdoor air while maintaining indoor temperature and humidity.



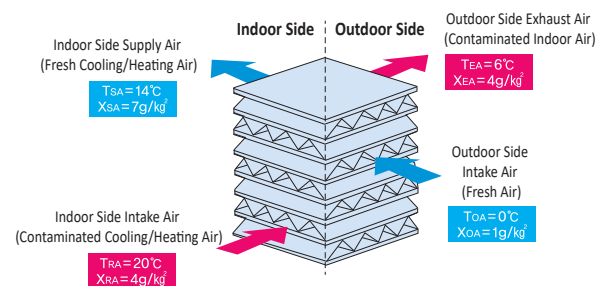
Heat Required for Heat Recovery Ventilation (Q)

$$0.29 (188 \text{ m}^2 \times 3 \text{ m} \times 0.5 \text{ times/hr}) \cdot \{22^\circ\text{C} - (-10^\circ\text{C})\} = \mathbf{1,027 \text{ kcal/hr}}$$

Energy Saving Effect of the Heat Recovery Ventilation Unit



Heat Exchanger

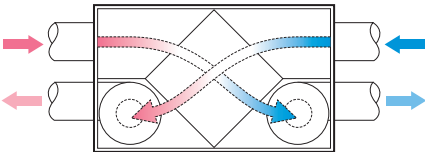
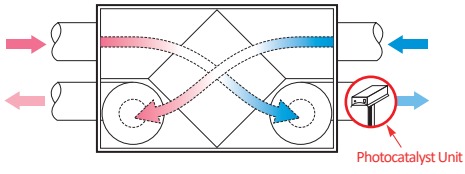


Energy Saving Effect of the Heat Exchanger System


Advantages of Installing Shinwoo Air Conditioning Heat Recovery Ventilation Units

Improvement of Indoor Air Quality

Improvement of Indoor Air Quality and Energy Saving Measures


Model Classification		Standard	Air Sterilization and Deodorization Device
Comparison Criteria			
Power Consumption	CO ₂ and Indoor Ventilation	100%	100%
	Hazardous Substance Removal	100%	50% Saving
Air Purification Function		<ol style="list-style-type: none"> 1 Dust: Removable 2 Odor: Partial removal when ventilated 3 Harmful Substances: Partial removal during ventilation 4 Bacteria: Not removable <p>➔ Additional air purifier installation indoors</p>	<ol style="list-style-type: none"> 1 Dust: Removable 2 Odor: Over 85% removal 3 Harmful Substances: Over 90% removal 4 Bacteria: Over 90% removal
Energy Recovery		None other than heat exchange efficiency	Heat exchange efficiency has the effect of reducing electric power energy by reducing product operation time.
Maintenance Costs		Due to contamination of the heat exchanger (bacteria, odor, etc.), it must be replaced at certain operating intervals.	Minimizes contamination of the heat exchanger (bacteria, odor, etc.), extending the replacement cycle of the heat exchanger and filter.

Expected Improvement Drawing on the Installation of a Photocatalyst Unit within the Duct



Photocatalyst Unit

Installation of a photocatalyst unit in the duct




Photocatalyst Unit

The OH[•], O₂, H₂O₂ and other substances generated by the photocatalyst unit are introduced into the indoor environment.




Hazardous Substances

Initial indoor pollution status (VOCs, HCHO, floating bacteria, odor)



After 6 hours of PHI operation

➔



After 12 hours of PHI operation

➔



After 1 day of PHI operation

Effects of Installing Air Sterilization and Deodorization (UV + Photocatalyst Option) Ventilation Units

➔ Sterilization, Deodorization, and Removal of Total Volatile Organic Compounds



Sterilization

Direct oxidation by UV radiation inhibits microbial growth (germs, viruses, and bacteria) by enclosing them and blocking nitrogen supply, resulting in a strong disinfection effect (KTL test 97.1%).

Deodorization

For gases such as hydrogen sulfide, mercaptans, amines, and other irritating substances, the molecular structure is broken to produce odorless molecules, with an effectiveness of approximately 90-96%.

Removal of Total Volatile Organic Compounds (TVOCs)

Excellent efficacy in removing organic compounds such as formaldehyde, which is a major cause of sick building syndrome.

Independent Test for the Photocatalyst Unit

Test Time 2 hours

Test Material	Unit	Results	Test Methods
Deodorization Efficiency (Acetaldehyde)	%	20	SPS-KACA002-132: 2006
Deodorization Efficiency (Benzene)		20	
Deodorization Efficiency (Toluene)		40	
Deodorization Efficiency (Formaldehyde)		85	
Deodorization Efficiency (Ammonia)		95	

Ventilation Unit Test with the Photocatalyst Unit Attached

Test Time 30 minutes

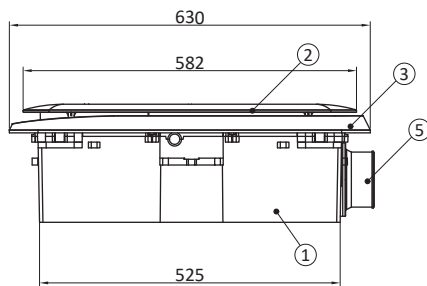
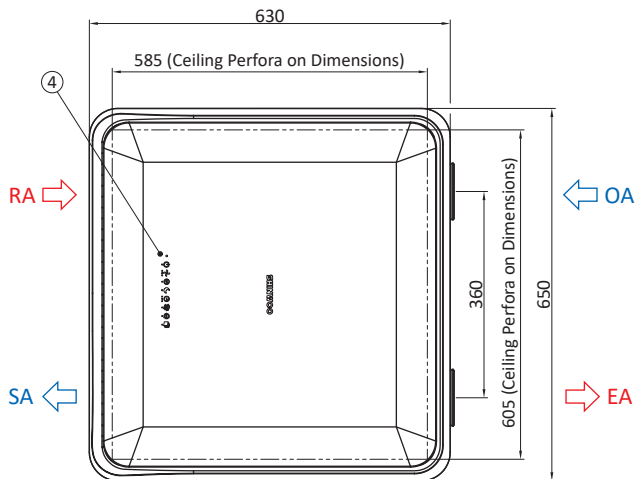
Test Material	Unit	Results	Test Methods
Deodorization Efficiency (Acetaldehyde)	%	20	SPS-KACA002-132: 2006
Deodorization Efficiency (Benzene)		20	
Deodorization Efficiency (Toluene)		40	
Deodorization Efficiency (Formaldehyde)		85	
Deodorization Efficiency (Ammonia)		95	

Ductless Ventilation Unit (New Model)

Ventilation unit suitable for
studio apartments and officetels

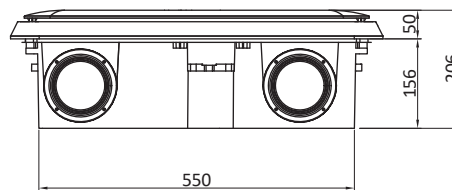


Ductless Ventilation Unit (New Model)



PART

NO.	PART NAME	MAT'L	Q'TY	DESCRIPTION
1	CASING	Composite pp	1	COLOR BLACK
2	ACCESS COVER	ABS	1	COLOR WHITE BEIGE
3	GRILLE PANEL	ABS	1	COLOR WHITE BEIGE
4	Remote Controller Receiver	-	1	
5	MD	ABS	2	Ø100



Standard Specifications

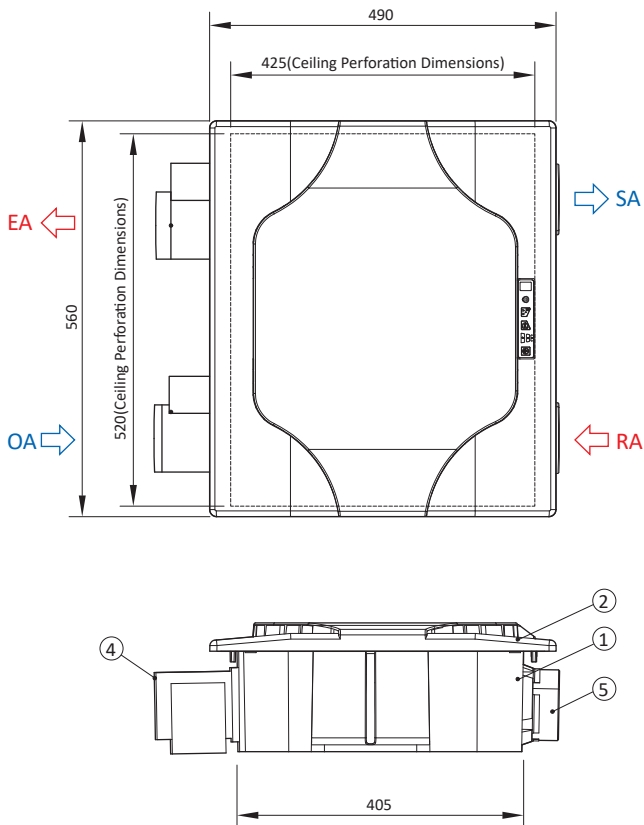
Classification	Unit	SW-100DB		
Airflow Volume	CMH	Strong	Medium	Weak
		100	100	80
Power Consumption	W	40	35	30
Duct Diameter	mm (Ø)	100		
Power Supply	-	Ø1 / 220 V / 60 Hz		
Heat Recovery Rate	%	Heating: 76 / Cooling: 65		
Heat Exchanger	-	Square Plate Heat Exchanger		
Air Volume Control Method	-	ON/OFF, 3-Stage Control		
Filter	-	PRE FILTER, HEPA FILTER (40 T)		
Casing	-	Composite PP		
Optional Specifications	-	Antibacterial, Deodorization, Wired Remote Control, etc.		
External Dimensions (W × L × H)	mm	650 X 630 X 206		

Ductless Ventilation Unit

Ventilation unit suitable for
studio apartments and officetels

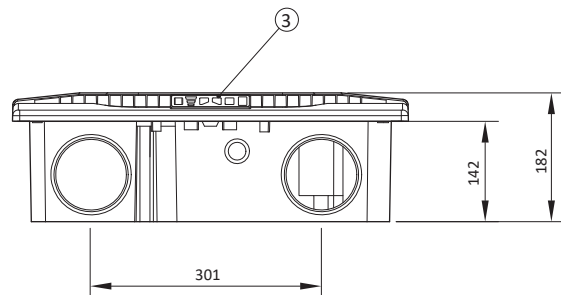


Ductless Ventilation Unit



PART

NO.	PART NAME	MAT'L	Q'TY	DESCRIPTION
1	CASING	Composite pp	1	COLOR BLACK
2	GRILLE PANEL	ABS	1	COLOR WHITE BEIGE
3	Remote Controller Receiver	Acryl	1	-
4	MD	ABS	2	Ø100
5	DUCT FLANGE	ABS	2	OPTION



Standard Specifications

Classification	Unit	SW-50D		
Airflow Volume	CMH	Strong	Medium	Weak
		50	50	40
Power Consumption	W	24	19	17
Duct Diameter	mm (Ø)	100		
Noise*	dB	45dB (A) or less		
Power Supply	-	Ø1 / 220 V / 60 Hz		
Heat Recovery Rate	%	Heating: 74 / Cooling: 65		
Heat Exchanger	-	Square Plate Heat Exchanger		
Air Volume Control Method	-	ON/OFF, 3-Stage Control		
Filter	-	PRE FILTER, MEDIUM FILTER		
Casing	-	Composite PP		
Optional Specifications	-	Antibacterial, Deodorization, Wired Remote Control, etc.		
External Dimensions (W × L × H)	mm	560 × 490 × 182		

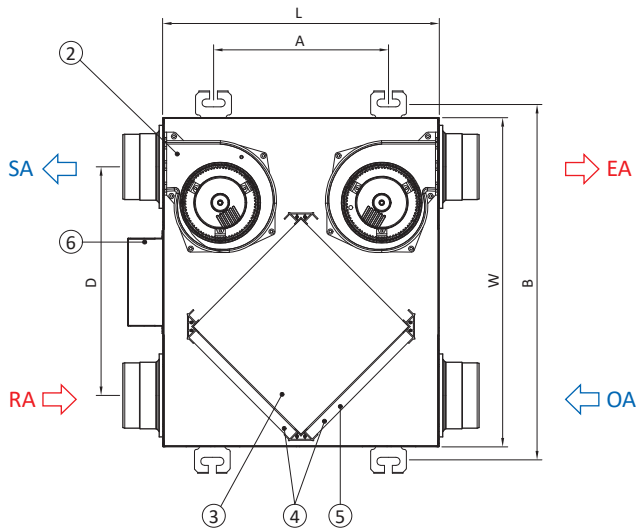
* The noise level indication is based on the installation and completion of finishing work on-site.

Ventilation Unit | Slim

Ventilation unit suitable for
officetels and urban-style residential homes
due to the appropriate height



Heat Recovery Ventilation Unit | Slim

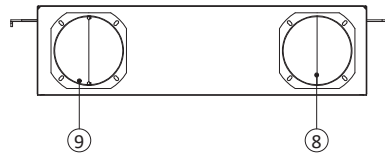
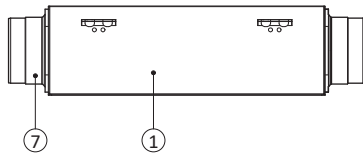


PART

NO.	PART NAME	MAT'L	Q'TY	DESCRIPTION
1	CASING	SGCC	1	-
2	FAN & MOTOR	-	2	BLDC MOTOR
3	HEAT EXCHANGER	PULP	1	Special Processed Pulp for Heat Exchange
4	PRE-FILTER	-	2	Nonwoven Fabric
5	MEDIUM FILTER	-	1	Synthetic Fiber
6	CONTROL BOX	SGCC	1	PCB Included
7	DUCT FLANGE	ABS	2	F (SA, RA)
8	MD	ABS	1	F (EA)
9	BDD	ABS	1	F (OA)

DIMENSIONS

MODEL	W	L	H	A	B	D	F
SW-50DHJ	497	418	135	266	541	346	Ø100
SW-100DHJ	547	517	140	364	591	382	Ø100

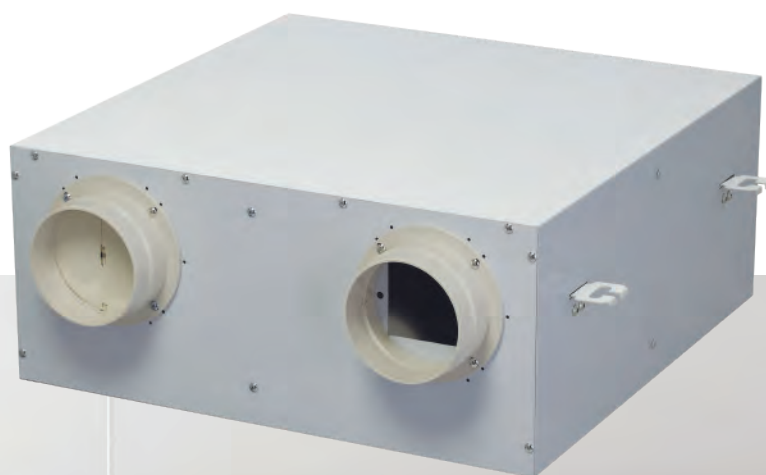


Standard Specifications

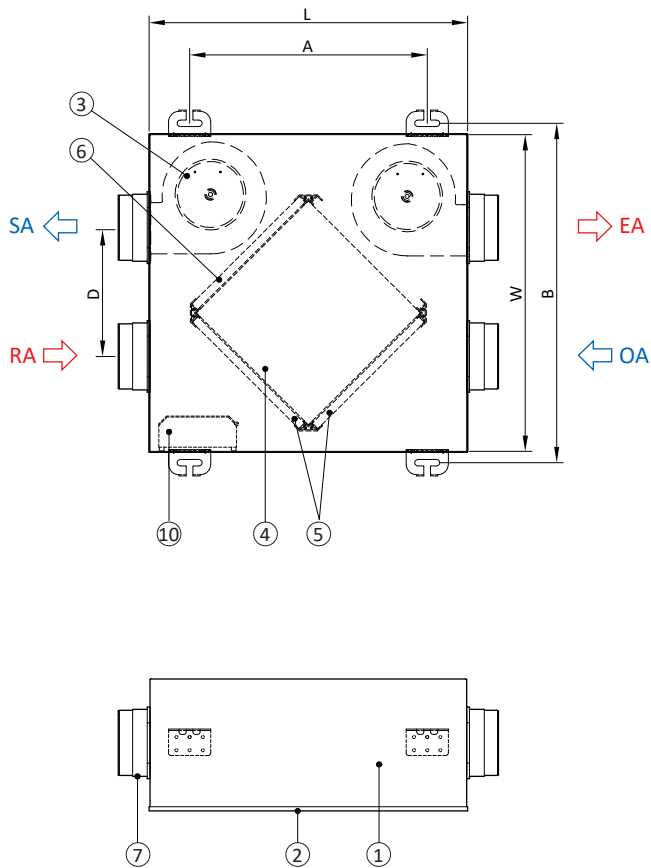
Classification	Unit	SW-50DHJ			SW-100DHJ		
Airflow Volume	CMH	Strong	Medium	Weak	Strong	Medium	Weak
		50	50	40	100	100	80
Power Consumption	W	30	24	20	50	41	35
Static Pressure	mmAq	10	7		10	7	
Product Size (W × L × H)	mm	497 × 418 × 135			547 × 517 × 140		
Duct Diameter	mm (∅)	100			100		
Noise*	dB	45dB (A) or less					
Power Supply	-	Ø1 / 220 V / 60 Hz					
Heat Recovery Rate	%	Heating: 70 / Cooling: 45			Heating: 70 / Cooling: 45		
Heat Exchanger	-	Square Plate Heat Exchanger					
Air Volume Control Method	-	ON/OFF, 3-Stage Control					
Filter	-	PRE FILTER, MEDIUM FILTER					
Casing	-	Galvanized Steel Sheet, Color-Coated Steel Sheet (optional)					
Optional Specifications	-	Antibacterial, Deodorizing, HEPA Filter, Photocatalyst Unit, etc.					

* The noise level indication is based on the installation and completion of finishing work on-site.

Ventilation Unit | Small



Heat Recovery Ventilation Unit | Small



PART

NO.	PART NAME	MAT'L	Q'TY	DESCRIPTION
1	CASING	SGCC	1	-
2	ACCESS DOOR	SGCC	1	-
3	FAN & MOTOR	-	2	BLDC MOTOR
4	HEAT EXCHANGER	PULP	1	Special Processed Pulp for Heat Exchange
5	PRE-FILTER	-	2	Nonwoven Fabric
6	MEDIUM FILTER	-	1	Synthetic Fiber
7	DUCT FLANGE	ABS	2	F (SA, RA)
8	MD	ABS	1	F (EA)
9	BDD	ABS	1	F (OA)
10	CONTROL BOX	ABS	1	PCB Included

DIMENSIONS

MODEL	W	L	H	A	B	D	F
SW-150LHJ	580	580	250	390	630	350	Ø125
SW-250LHJ	650	650	230	500	690	427	Ø150
SW-350LHJ	730	700	250	500	771	339	Ø150

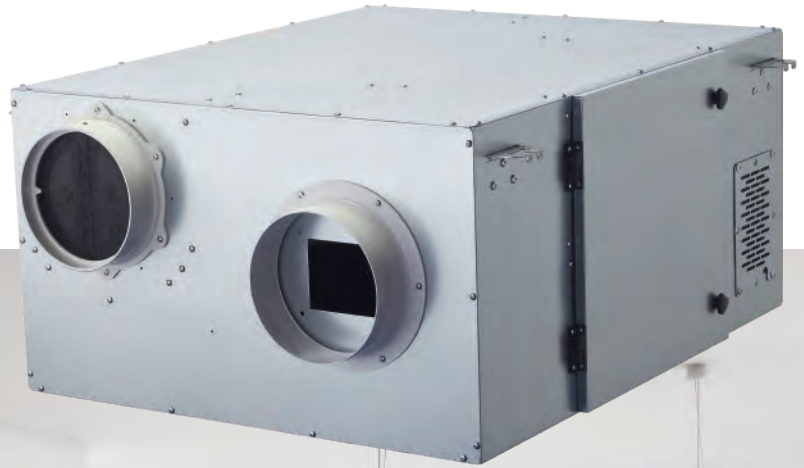
Standard Specifications

Classification	Unit	SW-150LHJ			SW-250LHJ			SW-350LHJ		
Airflow Volume	CMH	Strong	Medium	Weak	Strong	Medium	Weak	Strong	Medium	Weak
		150	150	120	250	250	200	350	350	250
Power Consumption	W	57	44	35	105	93	76	175	164	145
Static Pressure	mmAq	10	7		10	7		12	10	
Product Size (W × L × H)	mm	580 × 580 × 250			650 × 650 × 230			730 × 700 × 250		
Duct Diameter	mm (∅)	125			150					
Noise★	dB	45dB (A) or less								
Power Supply	-	∅1 / 220 V / 60 Hz								
Heat Recovery Rate	%	Heating: 77 / Cooling: 69			Heating: 75 / Cooling: 65			Heating: 76 / Cooling: 68		
Heat Exchanger	-	Square Plate Heat Exchanger								
Air Volume Control Method	-	ON/OFF, 3-Stage Control								
Filter	-	PRE FILTER, MEDIUM FILTER								
Casing	-	Galvanized Steel Sheet, Color-Coated Steel Sheet (optional)								
Optional Specifications	-	Deodorizing, HEPA Filter, etc.								

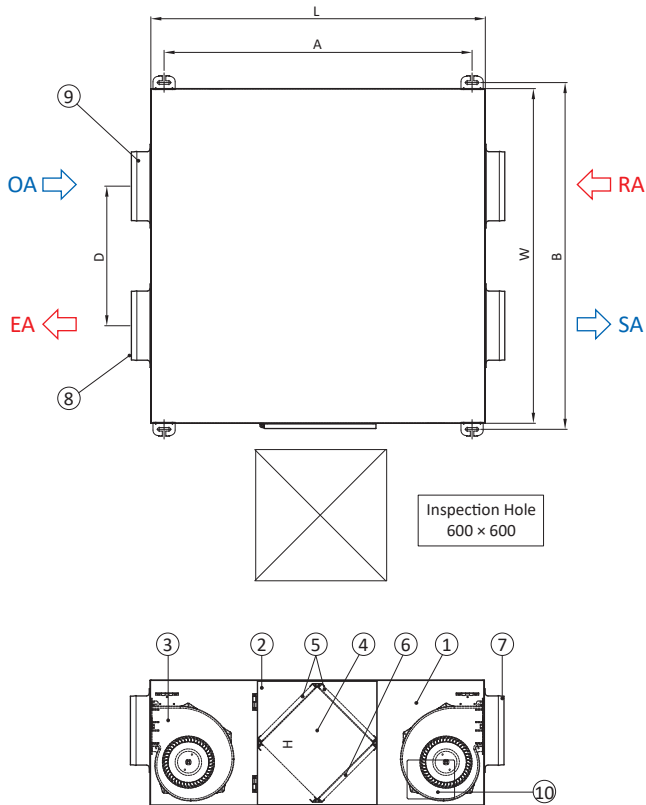
* The noise level indication is based on the installation and completion of finishing work on-site.

Ventilation Unit | Standard

Representative Standard Model
of the Ventilation Unit



Heat Recovery Ventilation Unit | Standard

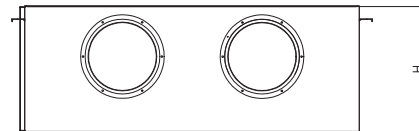


PART

NO.	PART NAME	MAT'L	Q'TY	DESCRIPTION
1	CASING	SGCC	1	-
2	ACCESS DOOR	SGCC	1	-
3	FAN & MOTOR	-	2	BLDC MOTOR
4	HEAT EXCHANGER	PULP	1 SET	Special Processed Pulp for Heat Exchange
5	PRE-FILTER	-	2 SETS	Nonwoven Fabric
6	MEDIUM FILTER	-	1 SET	Synthetic Fiber
7	DUCT FLANGE	ABS	2	F (SA, RA)
8	MD	-	1	F (EA)
9	BDD	-	1	F (OA)
10	CONTROL BOX	SGCC	1	PCB Included

DIMENSIONS

MODEL	W	L	H	A	B	D	F
SW-500SHJ	745	900	430	758	787	387	Ø200
SW-800SHJ	1,200	1,200	450	1,078	1,242	500	Ø250
SW-1000SHJ	1,200	1,200	450	1,078	1,242	500	Ø250



Standard Specifications

Classification	Unit	SW-500SHJ			SW-800SHJ			SW-1000SHJ		
Airflow Volume	CMH	Strong	Medium	Weak	Strong	Medium	Weak	Strong	Medium	Weak
		500	500	400	800	800	700	1,000	1,000	800
Power Consumption	W	240	191	180	420	248	214	500	413	375
Static Pressure	mmAq	12	10		12	10		12	10	
Product Size (W × L × H)	mm	745 × 900 × 430			1,200 × 1,200 × 450			1,200 × 1,200 × 450		
Duct Diameter	mm (∅)	200			250			250		
Noise*	dB	45dB (A) or less			50dB (A) or less			50dB (A) or less		
Power Supply	-	∅1 / 220 V / 60 Hz								
Heat Recovery Rate	%	Heating: 78 / Cooling: 69			Heating: 75 / Cooling: 65			Heating: 75 / Cooling: 62		
Heat Exchanger	-	Square Plate Heat Exchanger								
Air Volume Control Method	-	ON/OFF, 3-Stage Control								
Filter	-	PRE FILTER, MEDIUM FILTER								
Casing	-	Galvanized Steel Sheet, Color-Coated Steel Sheet (optional)								
Optional Specifications	-	Antibacterial, Deodorizing, HEPA Filter, Photocatalyst Unit, etc.								

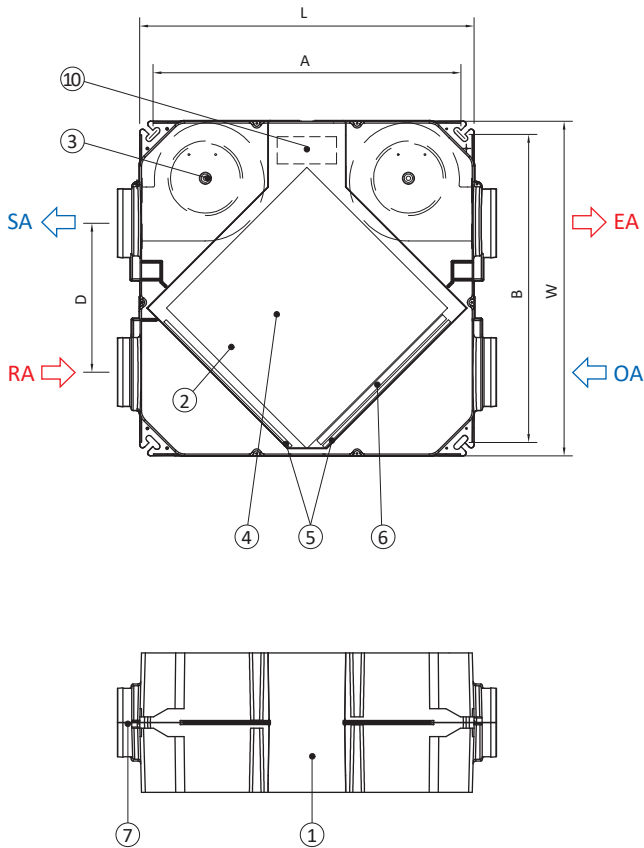
* The noise level indication is based on the installation and completion of finishing work on-site.

Ventilation Unit | High-Efficiency ABS

A lightweight and high-performance ventilation unit made of ABS material.



Heat Recovery Ventilation Unit | High-Efficiency ABS

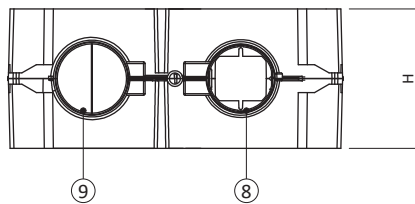


PART

NO.	PART NAME	MAT'L	Q'TY	DESCRIPTION
1	CASING	ABS	1	-
2	ACCESS DOOR	ABS	1	-
3	FAN & MOTOR	-	2	BLDC MOTOR
4	HEAT EXCHANGER	PULP	1	Special Processed Pulp for Heat Exchange
5	PRE-FILTER	-	2	Nonwoven Fabric
6	MEDIUM FILTER	-	1	Synthetic Fiber
7	DUCT FLANGE	ABS	2	F (SA, RA)
8	MD	ABS	1	F (EA)
9	BDD	ABS	1	F (OA)
10	CONTROL BOX	ABS	1	PCB Included

DIMENSIONS

MODEL	W	L	H	A	B	D	F
SW-150SCJ	529	493	220	449	485	220	Ø125
SW-200SCJ	602	630	250	582	552	254	Ø150



Standard Specifications

Classification	Unit	SW-150SCJ			SW-200SCJ		
Airflow Volume	CMH	Strong	Medium	Weak	Strong	Medium	Weak
		150	150	120	200	200	160
Power Consumption	W	65	52	48	90	80	65
Static Pressure	mmAq	10	7		10	7	
Product Size (W × L × H)	mm	529 × 493 × 220			602 × 630 × 250		
Duct Diameter	mm (∅)	125			150		
Noise*	dB	45dB (A) or less					
Power Supply	-	∅1 / 220 V / 60 Hz					
Heat Recovery Rate	%	Heating: 70 / Cooling: 45			Heating: 70 / Cooling: 45		
Heat Exchanger	-	Square Plate Heat Exchanger					
Air Volume Control Method	-	ON/OFF, Three-Stage Control					
Filter	-	PRE FILTER, MEDIUM FILTER					
Casing	-	ABS					
Optional Specifications	-	Antibacterial, Deodorizing, HEPA Filter, etc.					

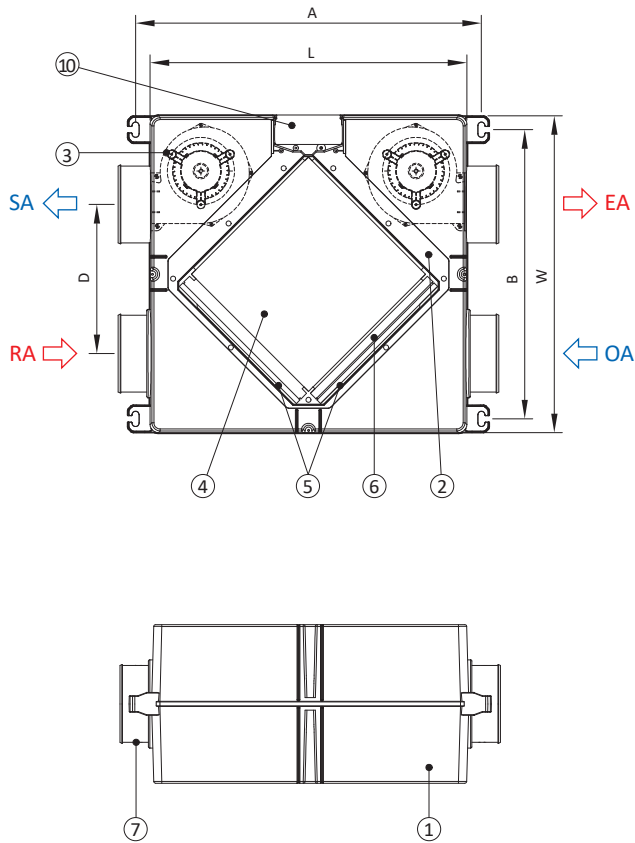
* The noise level indication is based on the installation and completion of finishing work on-site.

Ventilation Unit | ABS Internal Bypass

An internal bypass ventilation unit designed to reduce energy consumption during the change of seasons.



Heat Recovery Ventilation Unit | ABS Internal Bypass

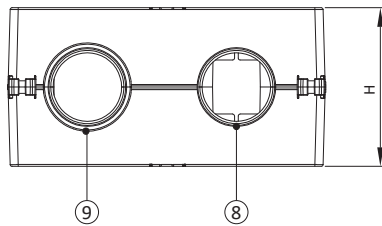


PART

NO.	PART NAME	MAT'L	Q'TY	DESCRIPTION
1	CASING	ABS	1	-
2	ACCESS DOOR	ABS	1	-
3	FAN & MOTOR	-	2	BLDC MOTOR
4	HEAT EXCHANGER	PULP	1	Special Processed Pulp for Heat Exchange
5	PRE-FILTER	-	2	Nonwoven Fabric
6	MEDIUM FILTER	-	1	Synthetic Fiber
7	DUCT FLANGE	ABS	2	F (SA, RA)
8	MD	ABS	1	F (EA)
9	BDD	ABS	1	F (OA)
10	CONTROL BOX	ABS	1	PCB Included

DIMENSIONS

MODEL	W	L	H	A	B	D	F
SW-100SCNBP	502	502	250	545	455	235	ø125
SW-150SCNBP							



Standard Specifications

Classification	Unit	SW-100SCNBP			SW-150SCNBP		
Airflow Volume	CMH	Strong	Medium	Weak	Strong	Medium	Weak
		100	100	80	150	150	120
Power Consumption	W	44	34	29	65	52	48
Static Pressure	mmAq	10	7		10	7	
Product Size (W × L × H)	mm	502 × 502 × 250					
Duct Diameter	mm (∅)	125					
Noise*	dB	45dB (A) or less					
Power Supply	-	∅1 / 220 V / 60 Hz					
Heat Recovery Rate	%	Heating: 76 / Cooling: 56			Heating: 76 / Cooling: 54		
Heat Exchanger	-	Square Plate Heat Exchanger					
Air Volume Control Method	-	ON/OFF, 3-Stage Control					
Filter	-	PRE FILTER, MEDIUM FILTER					
Casing	-	ABS					
Optional Specifications	-	Antibacterial, Deodorizing, HEPA Filter, etc.					

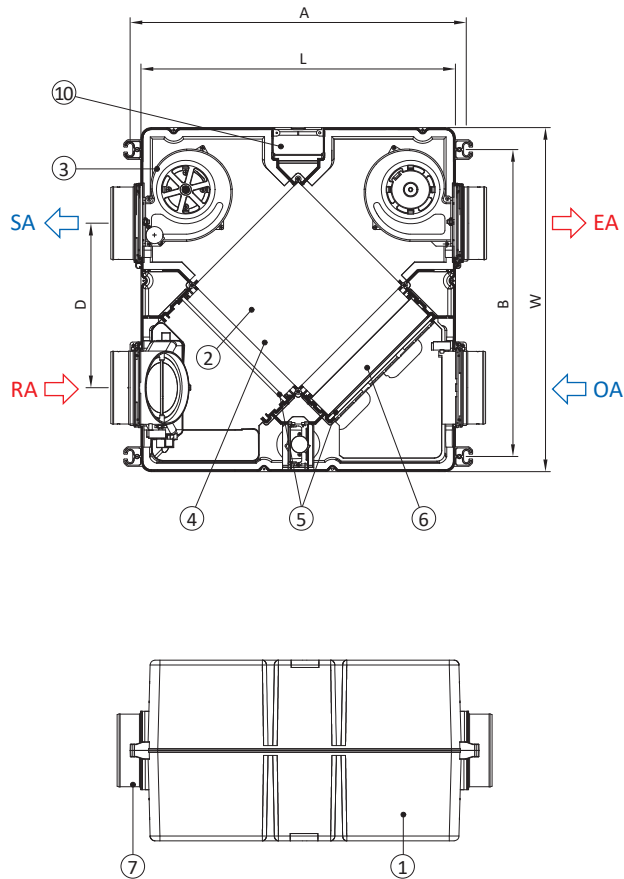
* The noise level indication is based on the installation and completion of finishing work on-site.

Ventilation Unit | ABS Air Purification Bypass

Representative Standard Model
of the Ventilation Unit



Heat Recovery Ventilation Unit | ABS Air Purification Bypass



PART

NO.	PART NAME	MAT'L	Q'TY	DESCRIPTION
1	CASING	ABS	1	-
2	ACCESS DOOR	ABS	1	-
3	FAN & MOTOR	-	2	BLDC MOTOR
4	HEAT EXCHANGER	PULP	1	Special Processed Pulp for Heat Exchange
5	PRE-FILTER	-	2	Nonwoven Fabric
6	HEPA FILTER	-	1	H13 Grade
7	DUCT FLANGE	ABS	2	F (SA, RA)
8	MD	ABS	1	F (EA)
9	BDD	ABS	1	F (OA)
10	CONTROL BOX	ABS	1	PCB Included

DIMENSIONS

MODEL	W	L	H	A	B	D	F
SW-100GNBP	599	610	330	655	505	277	Ø125
SW-150GNBP	599	610	330	655	505	277	Ø125
SW-200GNBP	705	644	370	689	629	337	Ø125 or 150
SW-250GNBP	705	644	370	689	629	337	Ø125 or 150

Standard Specifications

Classification	Unit	SW-100GNBP			SW-150GNBP			SW-200GNBP			SW-250GNBP		
Airflow Volume	CMH	Strong	Medium	Weak	Strong	Medium	Weak	Strong	Medium	Weak	Strong	Medium	Weak
		100	100	80	150	150	120	200	200	160	250	250	200
Power Consumption	W	39	30	29	65	47	45	70	55	48	105	81	70
Static Pressure	mmAq	10	7		10	7		10	7		10	7	
Product Size (W × L × H)	mm	599 × 610 × 330						644 × 705 × 370					
Duct Diameter	mm (∅)	125						125 or 150					
Noise★	dB	45dB (A) or less											
Power Supply	-	∅1 / 220 V / 60 Hz											
Heat Recovery Rate	%	Heating: 78 / Cooling: 59			Heating: 77 / Cooling: 62			Heating: 78 / Cooling: 62			Heating: 76 / Cooling: 58		
Heat Exchanger	-	Square Plate Heat Exchanger											
Air Volume Control Method	-	ON/OFF, 3-Stage Control											
Filter	-	PRE FILTER, HEPA FILTER (50 T)											
Casing	-	ABS											
Optional Specifications	-	Deodorizing, Sterilizing Filters, etc.											

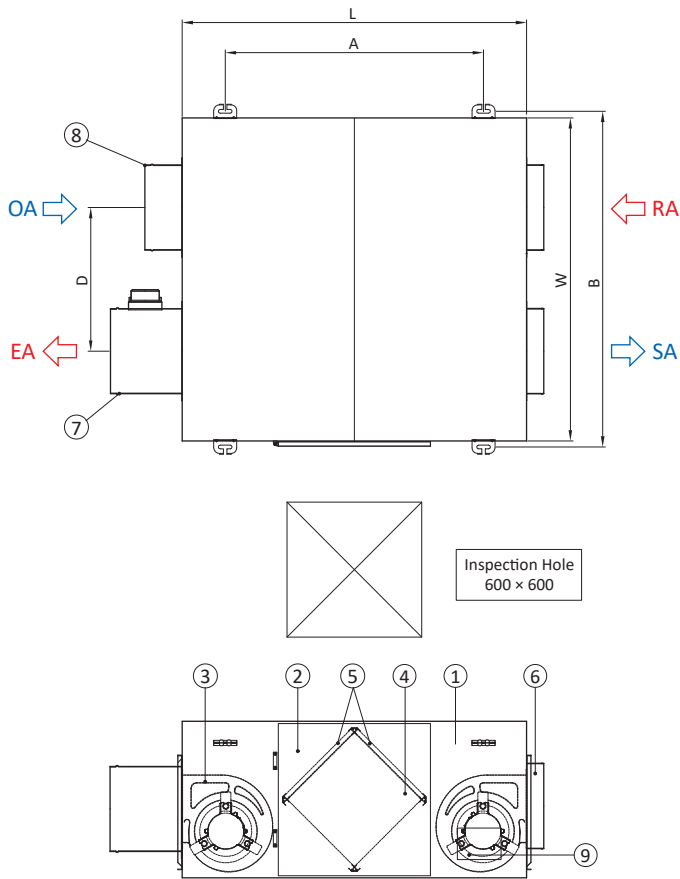
* The noise level indication is based on the installation and completion of finishing work on-site.

Ventilation Unit | Large-Capacity

Powerful large-capacity ventilation unit



Heat Recovery Ventilation Unit | Large-Capacity

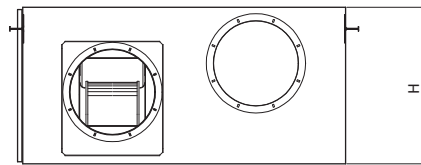


PART

NO.	PART NAME	MAT'L	Q'TY	DESCRIPTION
1	CASING	SGCC	1	-
2	ACCESS DOOR	SGCC	1	-
3	FAN & MOTOR	-	2	BLDC MOTOR
4	HEAT EXCHANGER	PULP	1 SET	Special Processed Pulp for Heat Exchange
5	PRE-FILTER	-	2 SETS	Nonwoven Fabric
6	DUCT FLANGE	-	2	F (SA,RA)
7	MD	-	1	F (EA)
8	BDD	-	1	F (OA)
9	CONTROL BOX	SGCC	1	PCB Included

DIMENSIONS

MODEL	W	L	H	A	B	D	F
SW-1500SBa	1,125	1,200	545	900	1,167	500	Ø300
SW-2000SBa	1,500	1,400	545	900	1,542	700	Ø350

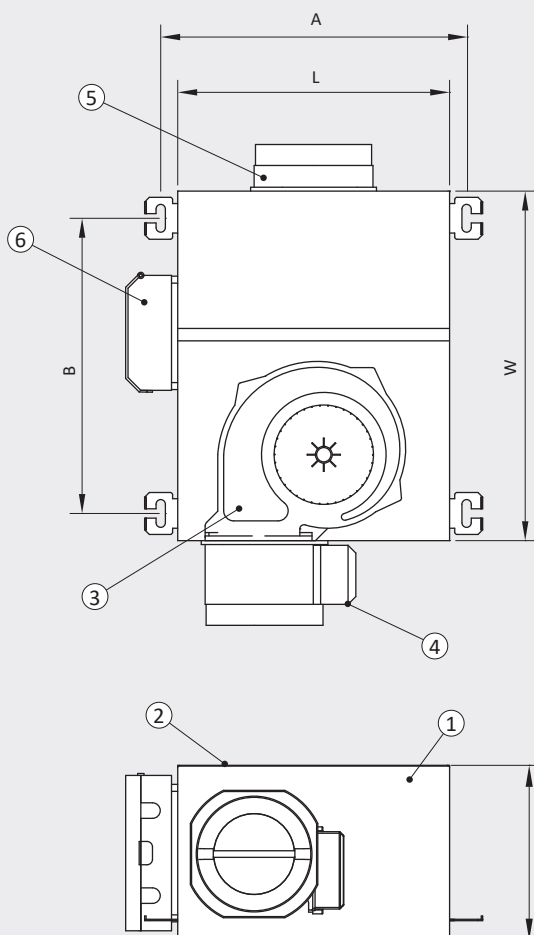


Standard Specifications

Classification	Unit	SW-1500SBa			SW-2000SBa		
Airflow Volume	CMH	Strong	Medium	Weak	Strong	Medium	Weak
		1,500	1,500	1,125	2,000	2,000	1,750
Power Consumption	W	1,050	696	530	1,150	927	910
Static Pressure	mmAq	15	12		15	12	
Product Size (W × L × H)	mm	1,125 × 1,200 × 545			1,500 × 1,400 × 545		
Duct Diameter	mm (∅)	300			350		
Noise*	dB	60dB (A) or less					
Power Supply	-	∅1 / 220 V / 60 Hz					
Heat Recovery Rate	%	More than 70% when heating					
Heat Exchanger	-	Square Plate Heat Exchanger					
Air Volume Control Method	-	ON/OFF, 3-Stage Control					
Filter	-	PRE FILTER					
Casing	-	Galvanized Steel Sheet, Color-Coated Steel Sheet (optional)					
Optional Specifications	-	MEDIUM FILTER, Antibacterial, Deodorization, Copper Sulfate, HEPA Filter, Photocatalyst Unit					

* The noise level indication is based on the installation and completion of finishing work on-site.

Air Supply (Exhaust) Unit

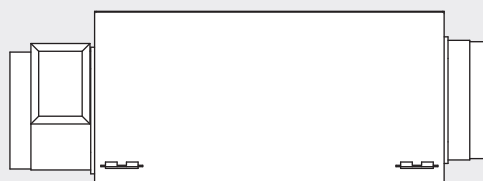


PART

NO.	PART NAME	MAT'L	Q'TY	DESCRIPTION
1	CASING	SGCC	1	-
2	ACCESS DOOR	SGCC	1	-
3	FAN & MOTOR	-	1	BLDC MOTOR
4	MD	ABS	1	E
5	BDD	ABS	1	E
6	CONTROL BOX	ABS	1	PCB Included
7	PRE FILTER	-	1	Nonwoven Fabric
8	MEDIUM FILTER	-	1	OPTION

DIMENSIONS

MODEL	W	L	H	A	B	E
SW-150SA/EA	450	350	225	395	380	Ø125
SW-250SA/EA	450	350	225	395	380	Ø150
SW-350SA/EA	450	350	225	395	380	Ø150

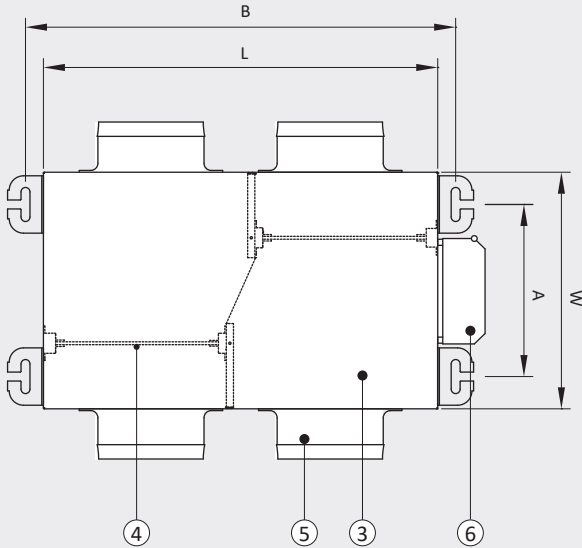


Standard Specifications

Classification	Unit	SW-150SA/EA			SW-250SA/EA			SW-350SA/EA		
Airflow Volume	CMH	Strong	Medium	Weak	Strong	Medium	Weak	Strong	Medium	Weak
		150	150	120	250	250	200	350	350	280
Power Consumption	W	50	45	40	60	55	50	75	70	65
Static Pressure	mmAq	12	10		12	10		12	10	
Product Size (W × L × H)	mm	450 × 350 × 225								
Duct Diameter	mm (∅)	125			150			150		
Noise*	dB	55dB (A) or less								
Power Supply	-	∅1 / 220 V / 60 Hz								
Air Volume Control Method	-	ON/OFF, 3-Stage Control								
Filter	-	PRE FILTER								
Casing	-	Galvanized Steel Sheet, Color-Coated Steel Sheet (optional)								

* The noise level indication is based on the installation and completion of finishing work on-site.

Supply and Exhaust Unit

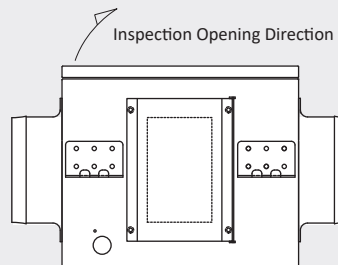
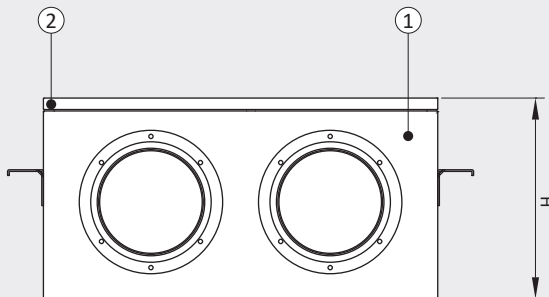


PART

NO.	PART NAME	MAT'L	Q'TY	DESCRIPTION
1	CASING	SGCC	1	-
2	ACCESS DOOR	SGCC	1	-
3	FAN & MOTOR	-	2	BLDC MOTOR
4	PRE FILTER	-	2	Chloride Mesh
5	DUCT FLANGE	ABS	4	E
6	CONTROL BOX	ABS	1	PCB Included

DIMENSIONS

MODEL	W	L	H	A	B	E
SW-150SE	330	550	280	250	600	Ø125
SW-250SE	330	550	280	250	600	Ø150
SW-350SE	330	550	280	250	600	Ø150



Standard Specifications

Classification	Unit	SW-150SE			SW-250SE			SW-350SE		
Airflow Volume	CMH	Strong	Medium	Weak	Strong	Medium	Weak	Strong	Medium	Weak
		150	150	120	250	250	200	350	350	280
Power Consumption	W	90	80	70	110	100	90	150	140	130
Static Pressure	mmAq	12	10		12	10		12	10	
Product Size (W × L × H)	mm	330 × 550 × 280								
Duct Diameter	mm (∅)	125			150			150		
Noise*	dB	55dB (A) or less								
Power Supply	-	∅1 / 220 V / 60 Hz								
Air Volume Control Method	-	ON/OFF, 3-Stage Control								
Filter	-	PRE FILTER								
Casing	-	Galvanized Steel Sheet, Color-Coated Steel Sheet (optional)								

* The noise level indication is based on the installation and completion of finishing work on-site.

Heat Recovery Ventilation Unit

Components

Heat Exchanger Component

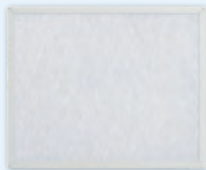


Air Blower



- Uses a high-pressure, /low-noise blower to ensure durability

Filter



Pre-Filter (Default)



HEPA Filter (Default)



Medium Filter

Damper



Backdraft Damper



Motorized Damper

Wired/Wireless Remote Controller



Ductless Wireless Remote Controller



STR-D1



STR-T3



SW-E1

Heat Recovery Ventilation Unit

Fine Dust, CO₂ Sensor Room ControllerFine Dust, CO₂ Sensor Room Controller (SHR-L1)Bypass
FunctionsFine Dust
Sensor Built-inCO₂ Sensor
Built-inPre-heater
ControlAutomatic operation
controlled by a sensor

Heat Recovery Ventilation Unit

Central Controller

Full Touch Central Controller



Features of Full Touch Central Controller



Display of current status,
such as operation status,
air volume, etc.



Overall and
individual control,
scheduled operation



Bypass Setting Function
(Individual, All)



Alarm Display
Functions



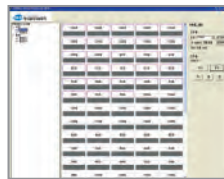
BMS
(Building Management
System) Control

Heat Recovery Ventilation Unit

Central Controller-Unit Group Configuration

PC Integrated Operation System Diagram

Integrated Operation Program

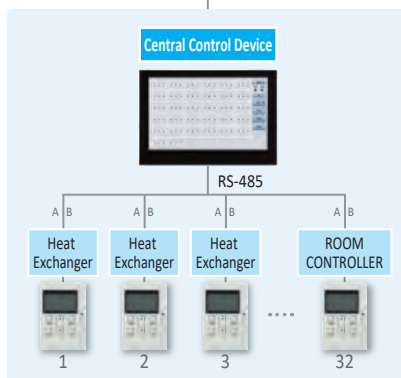


RS-485

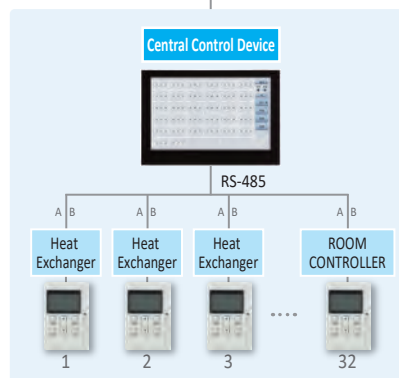
A B

A B

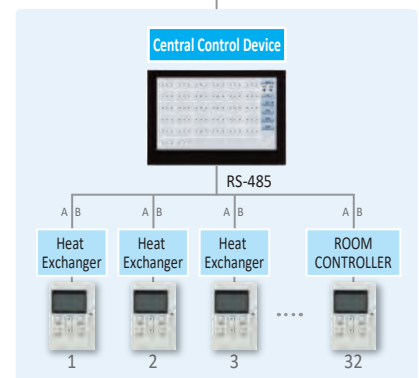
A B



GROUP 1



GROUP 2



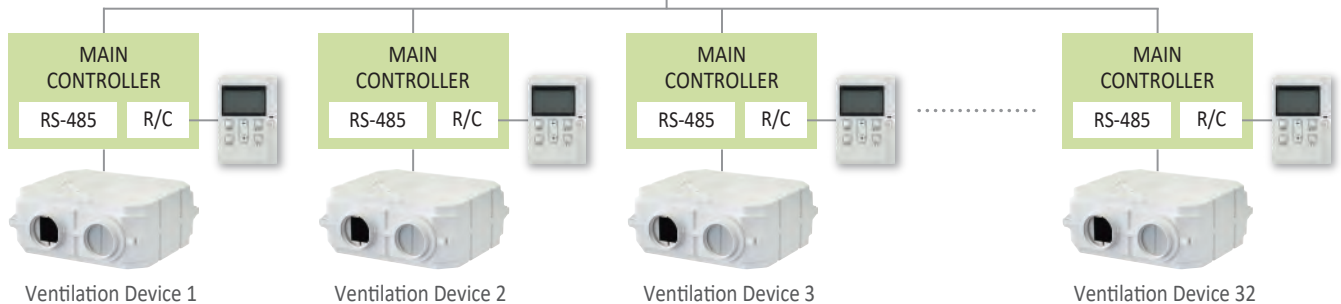
GROUP 3

Central Control Linked Operation and Individual Operation

Central Control Device



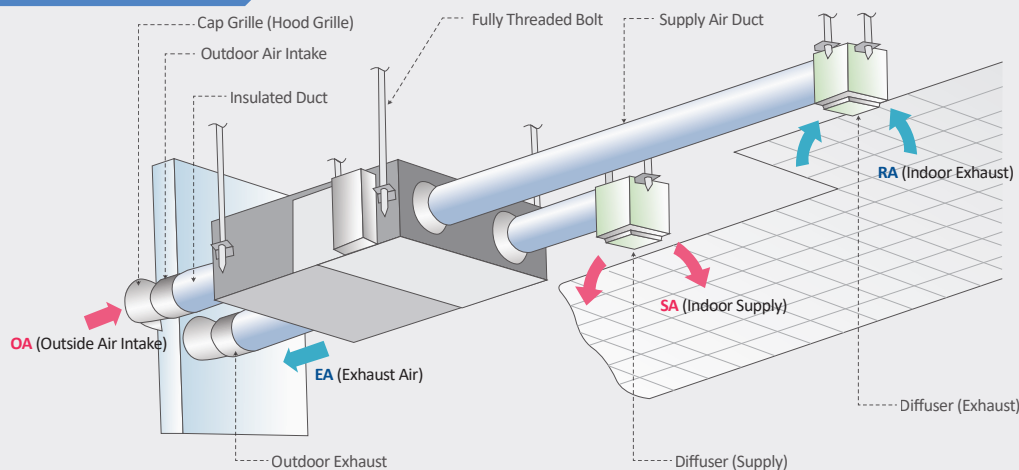
RS-485



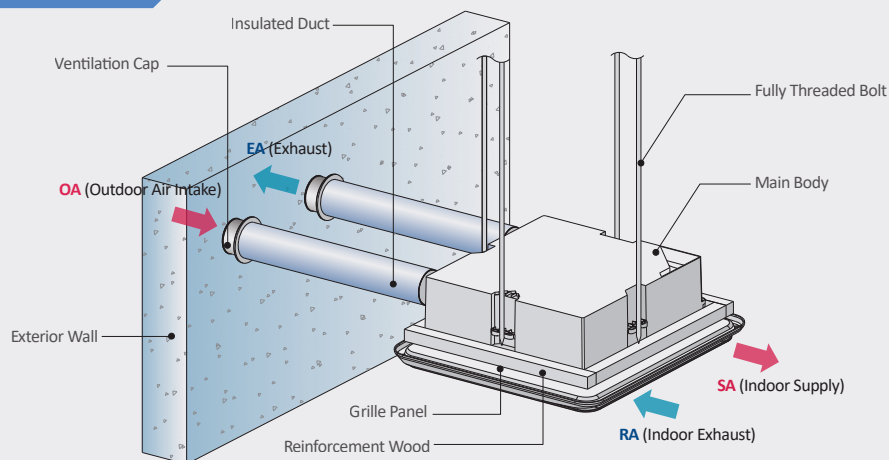
Heat Recovery Ventilation Unit

Installation Example

Installation Example (Ceiling-Mounted)



Installation Example (Ductless Ventilation)



Transportation/Delivery

- Please be careful as the device in the package may be damaged if dropped or impacted during transportation.
- In particular, when placing the product down after transportation, be cautious of any potential impact that could affect the balance of the fan.



After Unpacking

- When installing and operating the equipment after unpacking, make sure to prevent dust or debris from entering the internal components of the device at the construction site, as this can cause a decrease in performance. Proper equipment protection is essential.
- If the exterior case of the equipment is damaged or scratched, recoating is not possible as color steel plates are used, so please handle with care.



Electrical Wiring

- Additional switches are provided separately, so please wire them at the site.
- When controlling multiple units with one switch, please consult with the distributor.



Storage/Load

- When stacking the products at the site, do not unwrap the packaging and avoid stacking more than five layers.
- When storing the products outdoors, make sure to protect them from rain or snow by wrapping them in plastic or similar materials.



Installation Instructions

- Due to the heavy weight of the product, it is recommended that you use machinery or have at least two people assist with the installation. Use leveling bolts to ensure that the unit is level during installation.
- When connecting the equipment to the duct, it is advisable that you use materials that do not transmit vibrations at the connection points to reduce noise.



Other Matters

- Please secure inspection ports and repair spaces for inspections and repairs.
- Please clean the heat exchanger and filters regularly.

Indoor Air Quality Certification System and Related Regulations



Enforcement Regulation of the Indoor Air Quality Management Act [Presidential Decree No. 33479, revised in 2023. 5. 23.]

Article 1 (Purpose) This law aims to protect the health of citizens using multi-use facilities, newly built apartment complexes, and public transportation vehicles and to prevent environmental harm by properly maintaining and managing the indoor air quality of these facilities.

Article 2 (Applicability) ① In the parts other than each subparagraph of Article 3, Paragraph 1 of the Indoor Air Quality Management Act (hereinafter referred to as the "Act"), "those of a scale prescribed by Presidential Decree" refers to facilities that fall under any of the following subparagraphs. In this case, the total floor area of a facility consisting of two or more buildings shall be the sum of the total floor areas of the individual buildings.

1. All underground stations (including entrances, waiting rooms, platforms, and transfer passageways, along with their associated facilities)
2. Underground shopping areas with a total floor area of 2,000 square meters or more (including facilities located in the basements of above-ground buildings). This includes cases where the combined total floor area of two or more connected underground shopping areas is 2,000 square meters or more.
3. Waiting rooms in railway stations with a total floor area of 2,000 square meters or more
4. Waiting rooms in passenger bus/car terminals with a total floor area of 2,000 square meters or more
5. Waiting rooms in port facilities with a total floor area of 5,000 square meters or more
6. Passenger terminals in airports with a total floor area of 15,000 square meters or more
7. Libraries with a total floor area of 3,000 square meters or more
8. Museums and art galleries with a total floor area of 3,000 square meters or more
9. Medical institutions with a total floor area of 2,000 square meters or more with 100 or more beds
10. Postnatal care centers with a total floor area of 500 square meters or more
11. Elderly care facilities with a total floor area of 1,000 square meters or more
12. Childcare centers with a total floor area of 430 square meters or more
- 12-2. Indoor children's play facilities with a total floor area of 430 square meters or more
13. All large-scale retail stores
14. Funeral halls with a total floor area of 1,000 square meters or more (limited to facilities located underground)
15. All movie theaters (limited to indoor movie theaters)
16. Academies with a total floor area of 1,000 square meters or more
17. Exhibition facilities with a total floor area of 2,000 square meters or more (limited to indoor facilities)
18. Business facilities for the operation of Internet computer game facilities with a total floor area of 300 square meters or more
19. Indoor parking lots with a total floor area of 2,000 square meters or more (excluding mechanical parking lots)
20. Office buildings and business facilities with a total floor area of 3,000 square meters or more
21. Buildings used for two or more purposes (as defined under Article 2(2) of the Building Act) with a total floor area of 2,000 square meters or more
22. Indoor performance venues with seating for 1,000 or more
23. Indoor sports facilities with seating for 1,000 or more
24. Bathhouse business facilities with a total floor area of 1,000 square meters or more
- ③ In the parts other than each subparagraph of Article 3, Paragraph 2 of the act, "scale prescribed by Presidential Decree" refers to 100 households.
- ④ In Article 3, Paragraph 3, Item 3 of the Act, "vehicles prescribed by Presidential Decree" refers to high-speed intercity buses and direct intercity buses among the cars used in the intercity bus transportation business under Article 3, Item 1 (d) of the Enforcement Decree of the Passenger Transport Business Act.



Regulations on Facility Standards for Buildings [Ministry of Land, Infrastructure and Transport Decree No.882, 2021. 8. 27.]

Article 11 ① Houses or buildings falling under any of the following items that are newly built or remodeled in accordance with the provisions of Article 87, Paragraph 2 (hereinafter referred to as "newly constructed apartment houses, etc.") must install natural ventilation facilities or mechanical ventilation facilities to ensure ventilation occurs at a rate of at least 0.5 times per hour

1. Multi-unit housing with 30 or more units
2. A building in which housing is constructed as part of the same building with other facilities, and the housing portion has 30 or more units.
- ② When installing natural ventilation facilities in newly constructed residential buildings or similar, the adequacy of the natural ventilation facilities to meet the ventilation frequency under paragraph (1) must be reviewed by the Local Building Committee pursuant to Article 4 of the Act. However, in the case of newly constructed residential buildings or similar, natural ventilation facilities that have undergone performance testing according to the ventilation performance testing method specified in the Korean Industrial Standards (hereinafter referred to as "Korean Industrial Standards") for natural ventilation facilities (KSF 2921) and are installed with a length exceeding that specified in Annex 1-3 shall be exempted.
- ③ When installing natural ventilation facilities or mechanical ventilation facilities in newly constructed residential buildings or similar, they must comply with the standards specified in Annex 1-4 or Annex 1-5.
- ④ The mayor of a special city, metropolitan city, special autonomous city, or special autonomous province, or the mayor, county executive, or district office head (referring to the head of a district office in a local government designated as an autonomous district, hereinafter referred to as the "permitting authority") may recommend the installation of natural ventilation facilities or mechanical ventilation facilities to ensure that ventilation occurs at a rate of at least 0.5 times per hour for buildings that have fewer than 30 housing units and for buildings that are constructed as buildings other than housing units but have fewer than 30 housing units.
- ⑤ When constructing multi-use facilities, the required ventilation amount for multi-use facilities and each facility is as specified in Annex 1-6. The structure and installation of the mechanical ventilation facilities to be installed must comply with the following criteria.
 1. The capacity standard for mechanical ventilation equipment in multi-use facilities shall be calculated based on the ventilation volume/rate per person using the facility.
 2. Mechanical ventilation equipment shall ensure the distribution of air supplied to multi-use facilities is as even as possible to minimize variation in indoor airflow.
 3. Blowers installed in an air supply system, air discharge system, air intake/exhaust ports, etc., shall not have a structure that reduces fan performance due to external air currents.
 4. The air supply system or air intake openings that supply outdoor air shall be equipped with equipment that can effectively block the entry of particulate and gaseous pollutants from the outside, such as removal and filtration devices. This equipment shall also have a design that allows easy cleaning, maintenance, and replacement of removal and filtration devices.
 5. The air exhaust system and exhaust openings shall be installed at locations where the discharged air does not directly enter the air supply system and air intake openings.
 6. When determining the efficiency and performance of equipment, devices, and products that make up the mechanical ventilation system, matters not specified in these regulations shall comply with the Korean Industrial Standards for the relevant items.



School Health Act Enforcement Regulations [Ministry of Education Decree No. 270, Revised on 2022 6. 29. (Partial Amendment)]

A. Ventilation Control Standards

Ensure that ventilation windows or mechanical ventilation systems are operated regularly to achieve an air exchange rate of at least 21.6 cubic meters per hour per person.

B. Ventilation System Structure and Installation Standards (limited to cases where structure and installation standards for ventilation equipment are established)

- 1) Ventilation equipment must be installed with a capacity that can bring in sufficient outside air and exhaust sufficient inside air to meet the air quality standards of the school building.
- 2) The capacity of ventilation systems in classrooms shall meet standards suitable for the ventilation control standards.
- 3) Equalize the distribution of air entering the school to ensure even circulation of indoor air.
- 4) When planning centrally managed ventilation facilities, ventilation ducts shall be made of materials that do not pollute the air.

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