



SINCE 1909
JAPAN

Energy Recovery Ventilator

YOUR HEALTHIER CHOICE

Specification

		E25DZUA + Filter Box(S)			E35DZUA + Filter Box(S)			E50DZUA + Filter Box(L)			
ERV Mode	Notch	SH	H	L	SH	H	L	SH	H	L	
	Air Volume (CMH)	250	250	150	350	350	255	500	500	350	
	Noise (dB)	33	33	26	37	36.5	30.5	38	37.5	32	
	Power Consumption	157	148	82	282	253	172	376	349	215	
	Temperature Exchange (%)	Cooling	60	60	65	53	53	53	53	53	58
		Heating	75	75	77	78	78	79	78	78	78
Enthalpy Exchange (%)	Cooling	61	61	70	66	66	67	66	66	66	
	Heating	67	67	74	71.5	71.5	73	70	70	72	
Main Body	Size (mm)	650 x 750 x 220			680 x 920 x 230			680 x 1090 x 240			
	Weight	30			39			45			
	OA Side Duct Diameter	ø200									
	Duct Diameter RA/SA/EA	ø150						ø200			
Up-Side Down Installation		Yes									
Filter Box	Duct Diameter	ø200									
	Size (mm)	600 x 385 x 240						600 x 385 x 350			

*Parameters are measured according to standard JIS B 8628



- **E25DZUA**
 - **E35DZUA**
 - **E50DZUA**
- By using the energy recovery ventilator, outdoor air will be filtered and ventilated indoors. It will also effectively filter the indoor polluted air to outdoors "Green" lifestyle is achieved and you and your family's health are taken care of.

KDK Company, Division of PES
4017, Takaki-cho, Kasugai, Aichi, Japan
<http://kdk.jp>



SINCE 1909
JAPAN

• Specifications are subject to change without prior notice.
• Actual colors may vary slightly from those shown.

CATALOG NO: K-ERV001A1
Printed in Hong Kong 10.16



With energy recovery ventilator,
nature is inside your home.



Outdoor Pollution

Asthma rate in Middle East, East Mediterranean

10.7% - 50 million

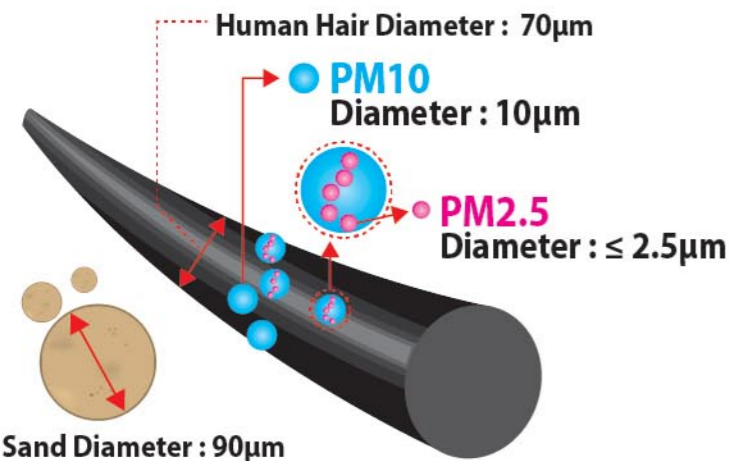
Asthma rate in worldwide 4%



Indoor Pollution

Invisible Killer PM2.5

PM2.5 refers to dangerous particles of pollutants that are less than 2.5 µm in diameter. These can be easily inhaled to lung and cause health issues.



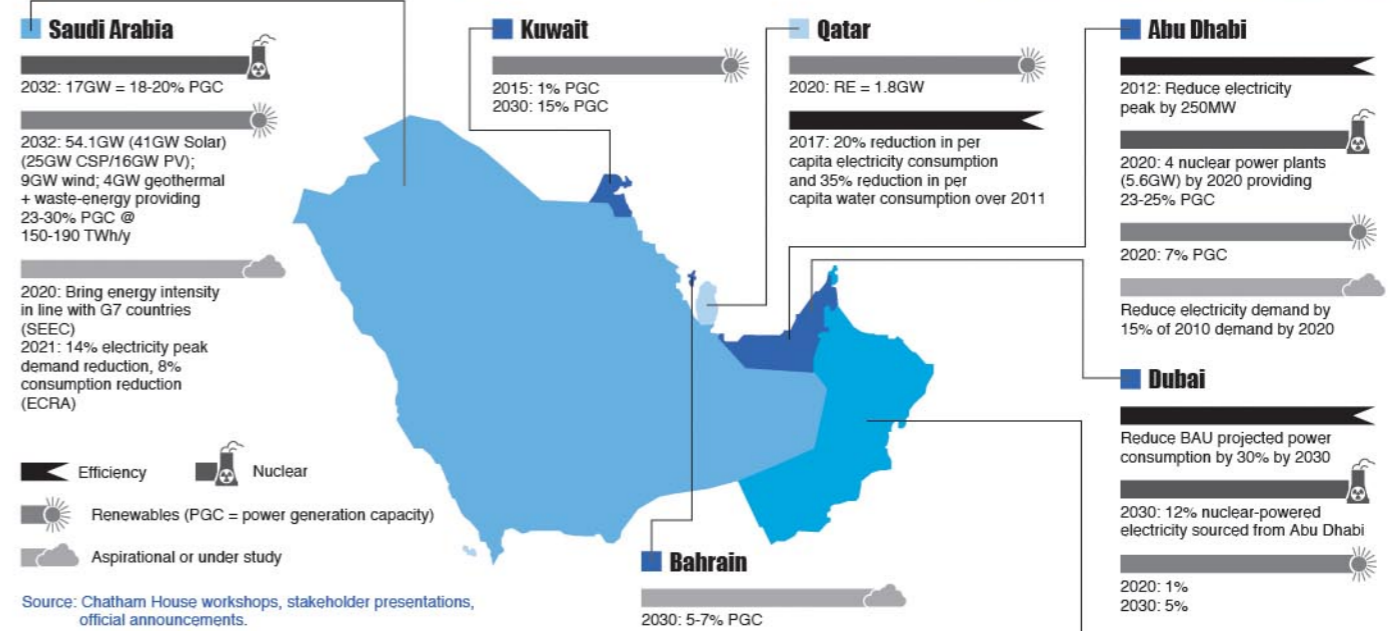
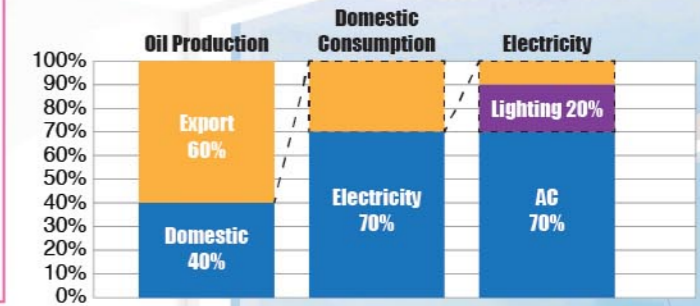
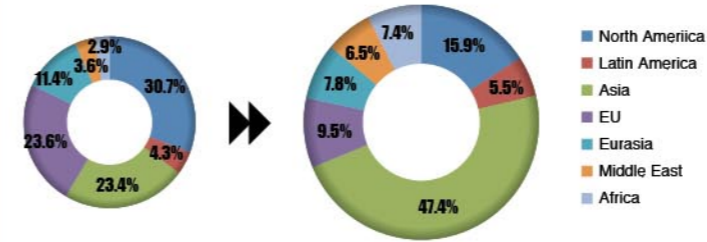
PM2.5 on health effects:

- easy to penetrate the thoracic cavity of the respiratory system
- respiratory and cardiovascular morbidity increases, such as aggravation of asthma, respiratory symptoms
- Increases the mortality caused by cardiovascular and respiratory diseases and lung cancer

There is a significant increase in the Energy consumption demand. The demand is expected to take up to 13.9% of global energy consumption in 2040 for Middle East and Africa region. Rapid rise of oil consumption will exceed the oil & NGL production in the future. If electricity demand is growing at a rate of 5-7 percent a year, it is expected to import oil in 2030. Air-conditioning has the highest proportion of domestic electricity consumption which over 70%.

Energy Consumption Demand

Worldwide Energy consumption demand

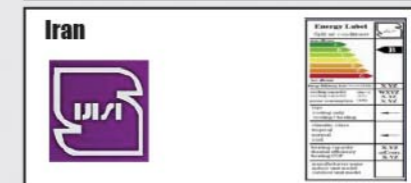


New Energy Saving Regulation "World Top Regulation (EER > 9.5 at T1 condition)"

- Y2013 Feb : DEWA Gov. Announced New Regulation (From 2015)
- Y2013 May : Oil Gov. Announced to Move up the Schedule (From 2014)
- (Phase-1)
- Y2013 Sep : Banned to Import / Manufacture Non-Conformity Products
- Y2014 Jan : Banned to Import / Manufacture Non-Conformity Products
- (Phase-2)
- Y2015 Jan : Regulation becomes more strict (Required for EER>11.5)

Energy Saving Label Regulation

Significant energy saving could be achieved by using more energy efficient appliances which helps reduce the emission of greenhouse gases and other air pollutants from power plants. To further facilitate the public in choosing energy efficient appliances and raise public awareness on energy saving, Energy Efficiency Labelling Scheme have been introduced.

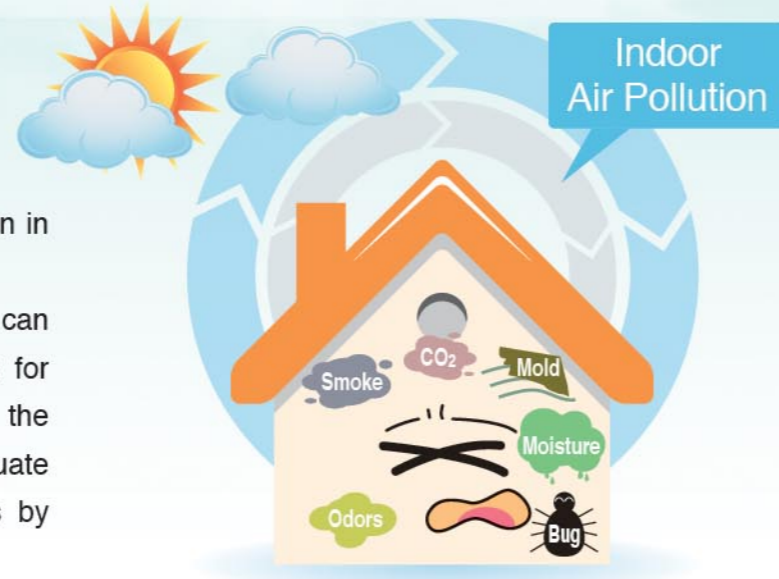




Importance of Indoor Air Quality

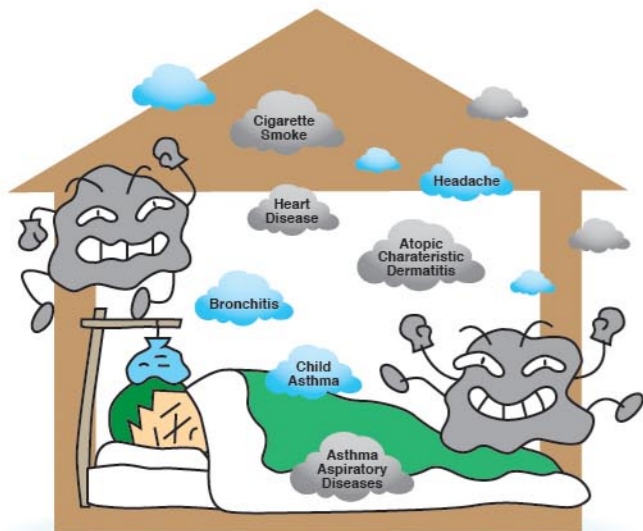
KDK Energy Recovery Ventilator (ERV) ensures proper indoor air circulation and conducts proper exchange between air indoors and outdoors.

In recent years, home are built more airtight than in the past. Highly airtight house restricts air leakage that can closely retain the expected indoor temperature for energy saving. However, it also brings out the problem of indoor air quality (IAQ). Inadequate ventilation can increase indoor pollutant levels by trapping air pollutant inside.



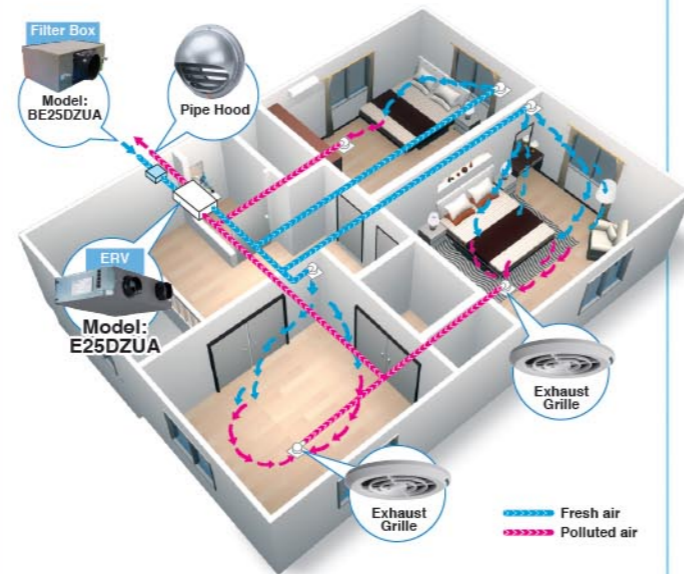
Influence of Insufficient Ventilation

Health effects from indoor air pollutants may be experienced soon after exposure or, possibly, years later. Some symptoms may show up shortly which include irritation of the eyes, nose, and throat, headaches, dizziness, and fatigue. Other long term health effects which include some respiratory diseases, heart disease and cancer, can be severely debilitating or fatal.



24-hours Whole House Ventilation

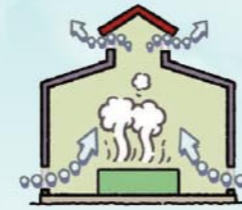
"24-hour ventilation" targets to the whole residence, focusing on general living area such as living room, dining room, bedroom, study room and guest room. It would run continuously with gentle extraction over 24-hour period. Sources, interval and amount of those unpleasant pollutants are often unclear, thus 24-hour ventilation is necessary, and 0.5 air change per hour is recommended.



Types of Ventilation

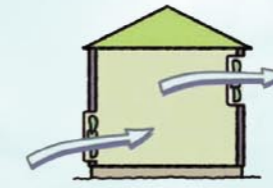
There are 2 methods of ventilation, Natural Ventilation and Mechanical Ventilation. Mechanical Ventilation is also divided into First Type, Second Type and Third Type Ventilation generally.

Natural Ventilation



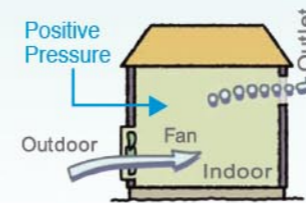
Exhaust → Natural
Intake → Natural

Mechanical Ventilation



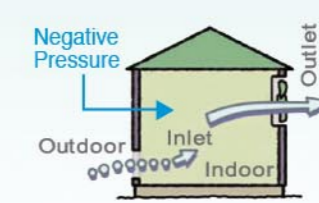
First Type
Exhaust → Mechanical
Intake → Mechanical
Provides most reliable ventilation and easy control airflow
Able to achieve stable ventilation in the house with low airtight

Mechanical Ventilation



Second Type
Exhaust → Natural
Intake → Mechanical
Suitable for apartment with steel and concrete structure in where only little condensation due to air leaking through the walls during winter

Mechanical Ventilation



Third Type
Exhaust → Mechanical
Intake → Natural
Ventilation plan may be at low cost. It should be aware that planned ventilation may not work effectively in low airtight houses

24-hour Ventilation Vs Spot Ventilation



"24-hour Ventilation" brings in fresh air and removes polluted air from the house constantly over 24-hour period.

- 24-hour Ventilation
- 24-Hour Operation
- Low Air Volume
- Slow

Air Change Per Hour = 0.5



Indoor air is polluted by cooking odors or cigarette smoke.

"Spot Ventilation" focuses on removal of concentrated pollutants directly from the sources, such as smoke and smell from cooking.

- Spot Ventilation
- Localized
- Powerful Air Volume
- Fast

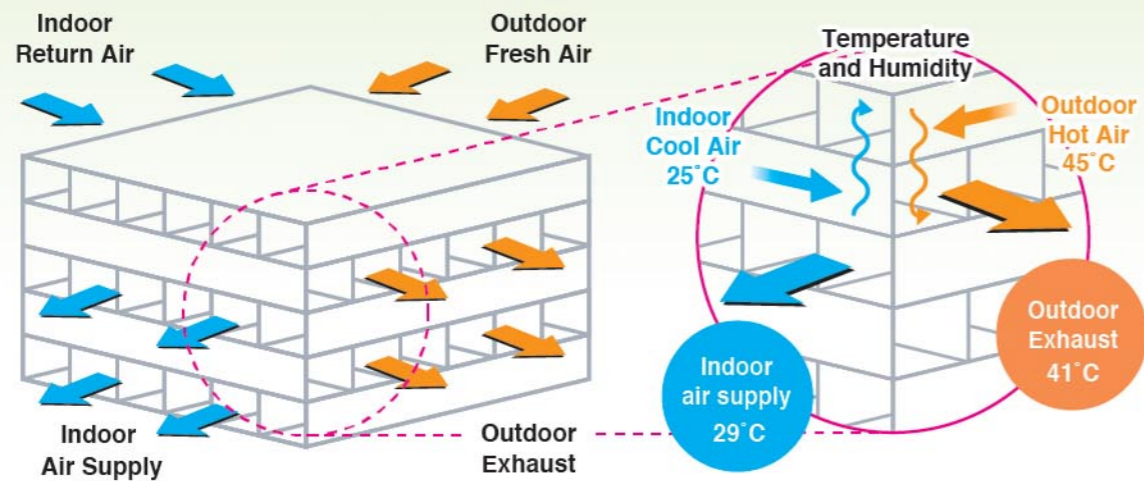
Air Change Per Hour depends on location e.g. bathroom = 5



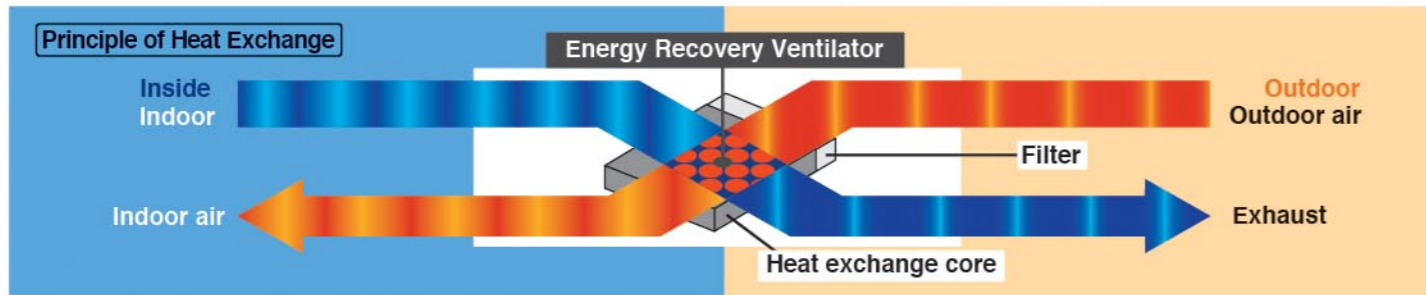
Reduce Energy Consumption

KDK Energy Recovery Ventilator is equipped with a heat-exchanging element. When outdoor fresh air and indoor foul air passes through the energy recovery element, the temperature is exchanged through air flow and heat conduction of different temperatures at both ends of the heat transfer sheets. Meanwhile, humidity exchange occurs from high humidity to low humidity as moisture is transferred through difference in pressure of water vapor.

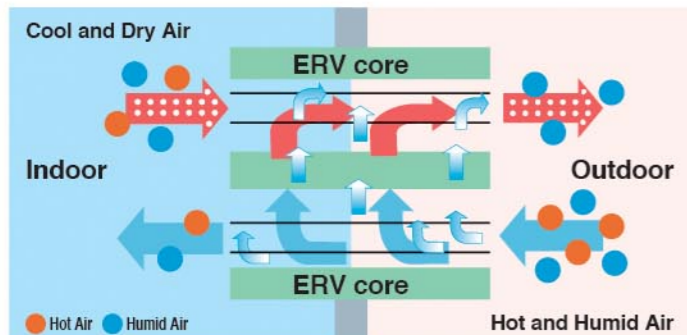
Inside of Heat Exchange Core (diagram)



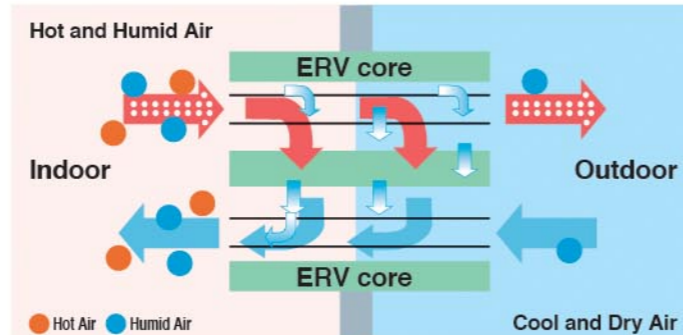
Principle of Heat Exchange



Summer
In summer, the indoor cool air discharged can be used to precool outdoor warm air before it gets delivered indoor and so reduces the loss of cool air.



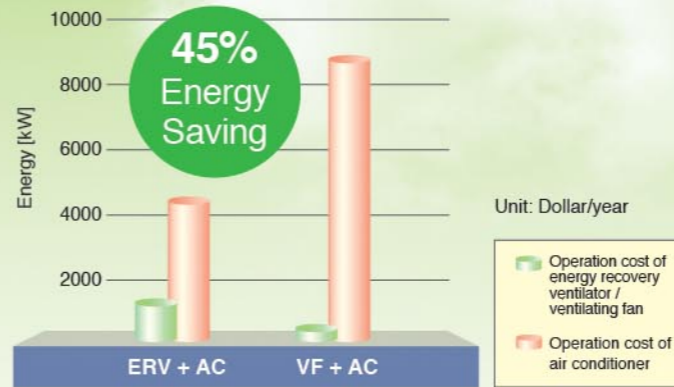
Winter
Whereas in winter, indoor warm air discharged can be used to preheat outdoor cool air before it is released indoor and so reduces the loss of warm air.



Highly efficient energy recovery reduces energy loss during ventilation, that achieve energy saving Example: FY-E15DZ1

Long Term Energy Comparison

Long term Energy comparison for KDK ventilation fan and energy recovery ventilator



Based on the following condition

Simulation place: Aug Riyadh Saudi Arabia
Room Area = 400 m²
Room Height = 3 m
Required Air Volume = 600CMH
A/C system running time : 2700h =15h/day*180day (May-Oct)
ERV : E35DUZA (2unit) 229W*2 = 458W
V-Fan : General (6unit) 26W*6 = 156W

Summer Utilizes energy of indoor return cool air to cool down outdoor air before intake to indoor, indoor cool loss is reduced

Energy Recovery Ventilation + Air Condition



Normal Ventilation + Air Condition



Energy saving while holding down the air-conditioning costs.



Saving of the air-conditioning cost

Because of less heat loss, indoor comfortable temperature won't be damaged, and the air-conditioning cost is largely saved.

Comfortable thanks to the almost unchanged room temperature.



Ventilation is performed while keeping warmth of the heated air.

In winter, because the cold outer air is supplied after being preheated and unpleasant cold air gush is prevented.



Ventilation is performed while keeping coolness of the conditioned air.

Outer air is supplied after being cooled close to the room temperature. A more comfortable environment is created.

Soundproof effect is high



Indoor sound is hard to leak

Ventilation is performed while preventing outflow of sound. Night music and video can be enjoyed without worry.



Outdoor noise is moderated as well.

Ventilation is performed while preventing entry of the noise from automobiles or constructions.

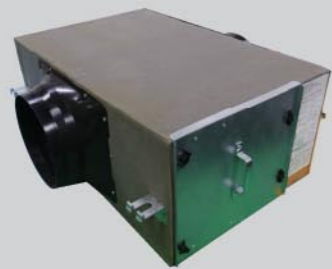


Filter Box designed for Middle East Bring clean air to your life

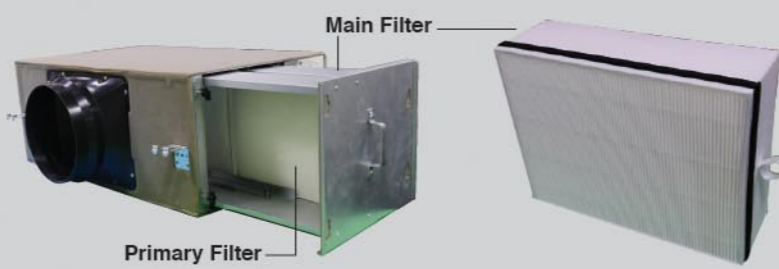
KDK filter box is part of the ERV which designed to make the indoor spaces insect free, dustproof and pollen free. Equipped with filter box, fresh air can circulate and refresh the household.

There are two filters - Primary and PM2.5 filter. First, primary filter will filter big particles such as sand, insect. The tiny and invisible particles can be trapped by PM2.5 filter. With two layers of filters, ERV can bring clean, fresh and comfortable air to your house.

Filter Box

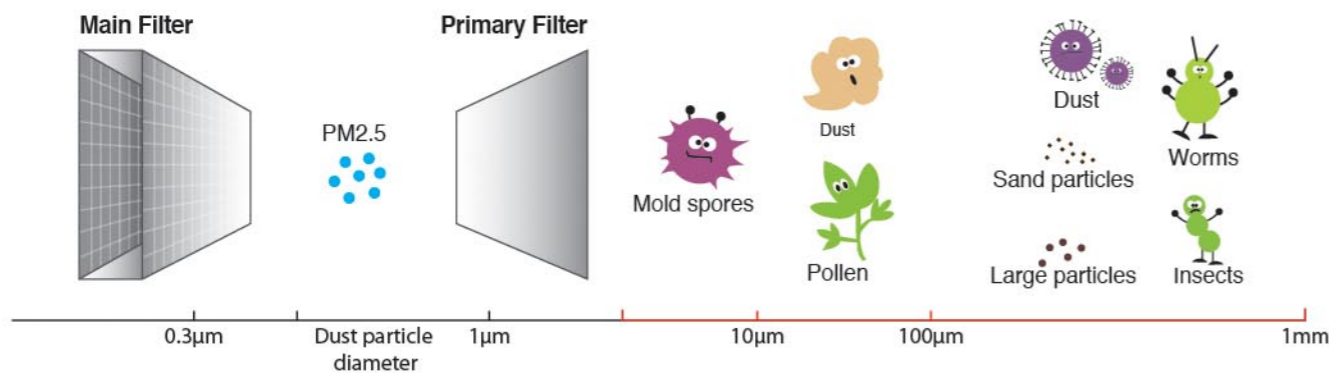


Filter Box Unit



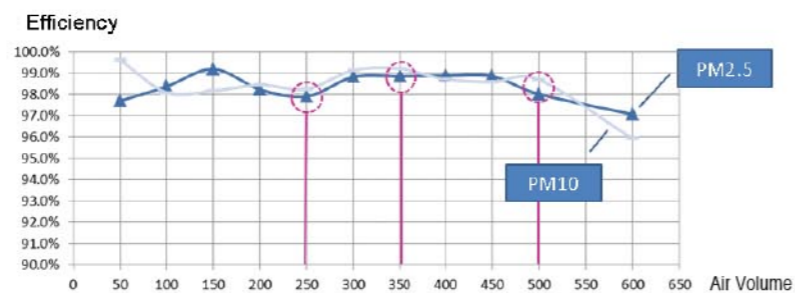
Outside Air Filter
Recommend to change every 2-4 month

Filter - It can filter PM2.5 and PM10



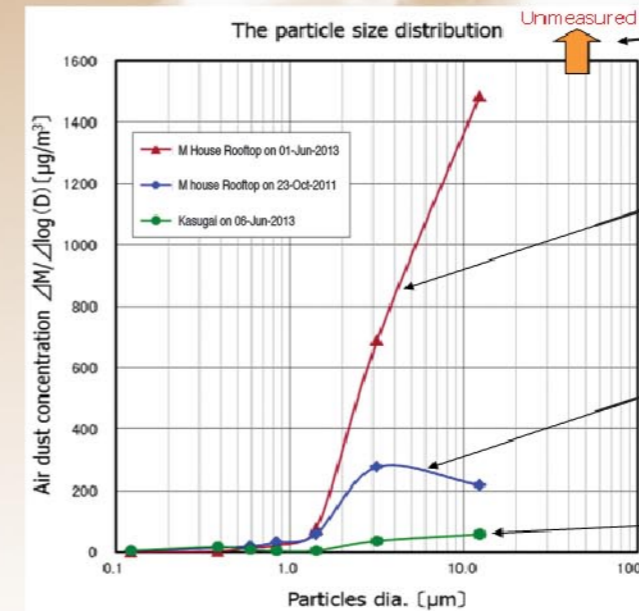
Filter Efficiency - Effectively capture PM2.5 and PM10 particles to deliver clean air to indoor

Model	Air Volume	PM 2.5	PM 10
E25DZUA	250	98%	98.2%
E35DZUA	350	99%	99.2%
E50DZUA	500	98%	98.8%



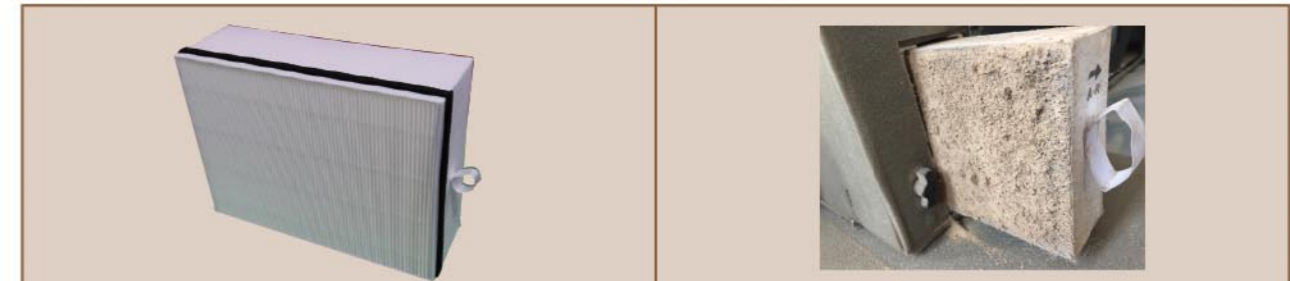
Dust Polluted Air in Riyadh

Comparison of the particle size distribution of air dust (At Mohammad House)



Field test result in KSA

When sand dust disperses, 2-10 micrometer particles are increased. KDK ERV can cooperate with filter box which is designed for Middle East environment.



New, Clean PM 2.5 Filter

Dirty PM 2.5 Filter after 1 month field test

KDK PM 2.5 Filter has high efficiency to capture PM 2.5 and PM 10.

Field Test Period: 4th Nov 2014 – 15th Dec 2014

Ignition Loss Test* result in KSA:

large particles can be effectively trapped by the filter, there are many pollutant can be obtained by filters.

Standard Pre-filter	Collection amount (g)	13.2	
	Moisture (%)	2.5	
	Inorganic matter (%)	60.7	

PM 2.5 Filter	Collection amount (g)	2.5	
	Moisture (%)	3.0	
	Inorganic matter (%)	61.7	

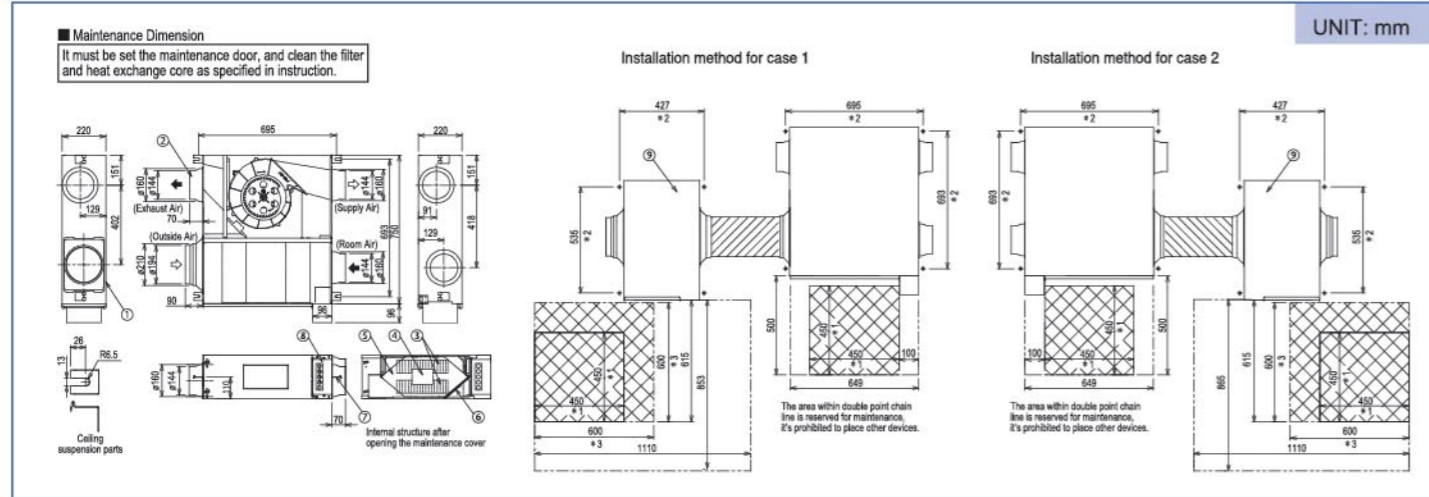
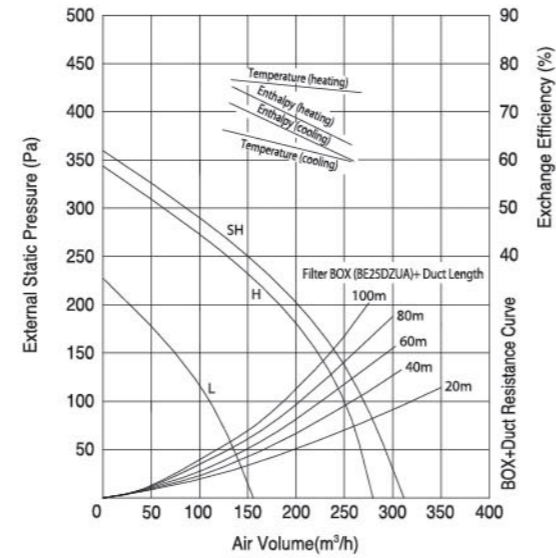
* Test Period: 2014/11/04~2014/12/15 Test Filter: FY-FBG25C

Product Specification



No.	Part name	Qty	Material
1	Frame	1	Galvanized Steel Sheet
2	Adapter	4	ABS
3	Impeller	2	PP
4	Fan Motor	1	/
5	Heat Exchange Core	1	Special Paper and Resin
6	Indoor Filter	1	/
7	Ceiling Suspension	4	Galvanized Steel Sheet
8	Switch Box	1	Galvanized Steel Sheet
9	Filter Box Unit	-	/

Performance P-Q Curve 1. When friction coefficient of pipe (duct) $\lambda=0.02$
2. PQ curve is for ERV in stand alone



Specification

Power Source	Notch	Heat Exchange Ventilation								Product Weight [kg]	
		Input [W]	Current [A]	Air Volume [m3/h]	External Static Pressure [Pa]	Temperature Exchange Efficiency [%]		Enthalpy Exchange Efficiency [%]			Noise [dB(A)]
						Cooling	Heating	Cooling	Heating		
220V 60Hz	SH	157	0.71	250	90	60	75	61	67	33	30
	H	148	0.67	250	40	60	75	61	67	33	
	L	82	0.37	150	0	65	77	70	74	26	

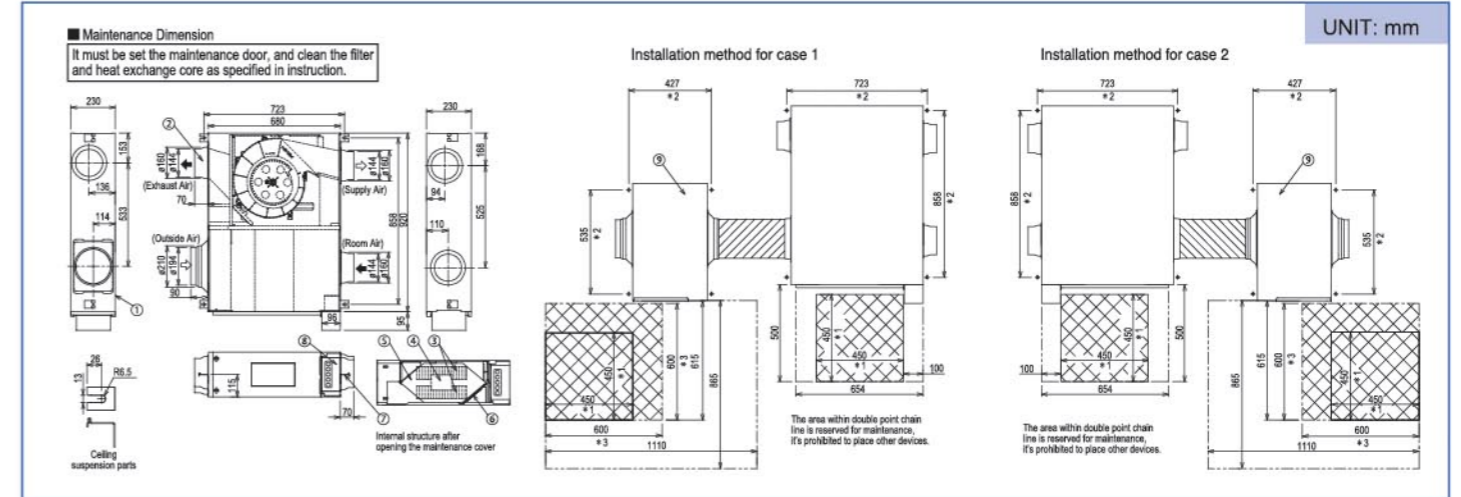
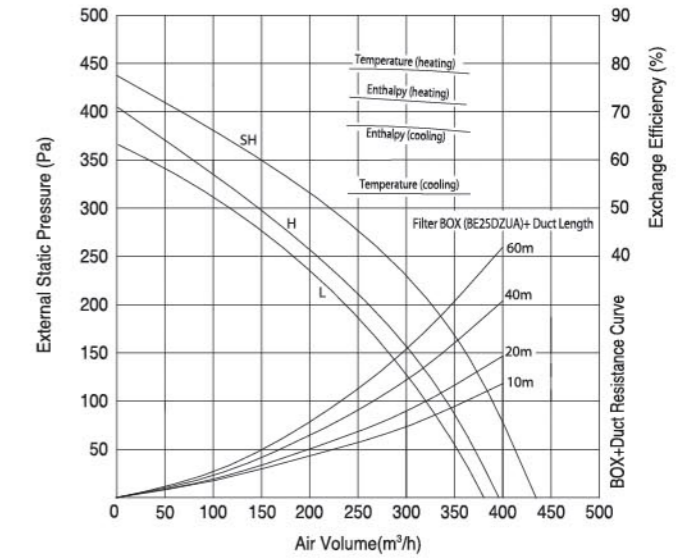
1.The above parameters are measured under the operation of assembly of ERV and Filter Box Unit.
2.The input power, the current and the exchange efficiency are measured at the standard air volume.
3.The input power indicated in name plate is the maximum value at the static pressure of 0 Pa.
4.The noise is measured 1.5m away from the bottom face of the unit. The noise value measured at the total acoustic room is more than the indicated value in actual operation.
5.The above parameters are measured according to standard JIS B 8628.

Product Specification



No.	Part name	Qty	Material
1	Frame	1	Galvanized Steel Sheet
2	Adapter	4	ABS
3	Impeller	2	PP
4	Fan Motor	1	/
5	Heat Exchange Core	1	Special Paper and Resin
6	Indoor Filter	1	/
7	Ceiling Suspension	4	Galvanized Steel Sheet
8	Switch Box	1	Galvanized Steel Sheet
9	Filter Box Unit	-	/

Performance P-Q Curve 1. When friction coefficient of pipe (duct) $\lambda=0.02$
2. PQ curve is for ERV in stand alone



Specification

Power Source	Notch	Heat Exchange Ventilation								Product Weight [kg]	
		Input [W]	Current [A]	Air Volume [m3/h]	External Static Pressure [Pa]	Temperature Exchange Efficiency [%]		Enthalpy Exchange Efficiency [%]			Noise [dB(A)]
						Cooling	Heating	Cooling	Heating		
220V 60Hz	SH	282	1.28	350	100	53	78	66	71.5	37	39
	H	253	1.15	350	18	53	78	66	71.5	36.5	
	L	172	0.78	255	0	53	79	67	73	30.5	

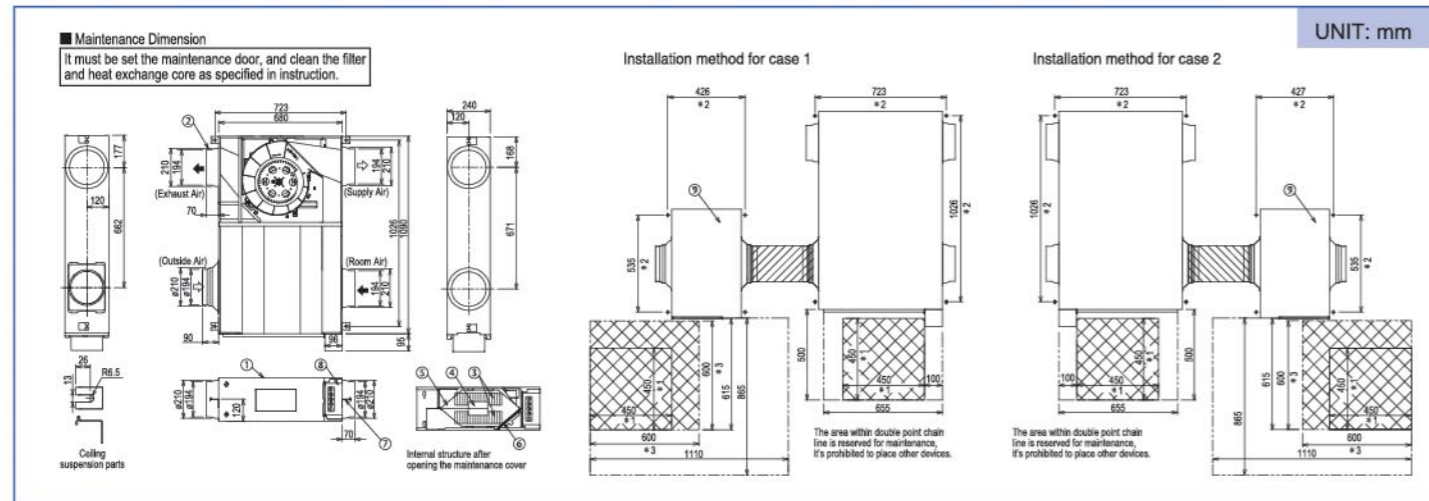
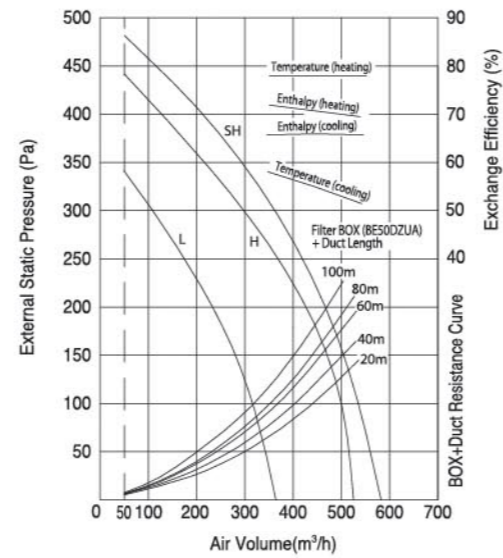
1.The above parameters are measured under the operation of assembly of ERV and Filter Box Unit.
2.The input power, the current and the exchange efficiency are measured at the standard air volume.
3.The input power indicated in name plate is the maximum value at the static pressure of 0 Pa.
4.The noise is measured 1.5m away from the bottom face of the unit. The noise value measured at the total acoustic room is more than the indicated value in actual operation.
5.The above parameters are measured according to standard JIS B 8628.

Product Specification



No.	Part name	Qty	Material
1	Frame	1	Galvanized Steel Sheet
2	Adapter	4	ABS
3	Impeller	2	PP
4	Fan Motor	1	/
5	Heat Exchange Core	2	Special Paper and Resin
6	Indoor Filter	1	/
7	Ceiling Suspension	4	Galvanized Steel Sheet
8	Switch Box	1	Galvanized Steel Sheet
9	Filter Box Unit	-	/

Performance P-Q Curve



Specification

Power Source	Notch	Heat Exchange Ventilation								Product Weight [kg]	
		Input [W]	Current [A]	Air Volume [m³/h]	External Static Pressure [Pa]	Temperature Exchange Efficiency [%]		Enthalpy Exchange Efficiency [%]			Noise [dB(A)]
						Cooling	Heating	Cooling	Heating		
220V 60Hz	SH	376	1.71	500	60	53	78	66	70	38	45
	H	349	1.59	500	0	53	78	66	70	37.5	
	L	215	0.98	350	0	58	78	66	72	32	

1.The above parameters are measured under the operation of assembly of ERV and Filter Box Unit.
2.The input power, the current and the exchange efficiency are measured at the standard air volume.
3.The input power indicated in name plate is the maximum value at the static pressure of 0 Pa.
4.The noise is measured 1.5m away from the bottom face of the unit. The noise value measured at the total acoustic room is more than the indicated value in actual operation.
5.The above parameters are measured according to standard JIS B 8628.

Accessory



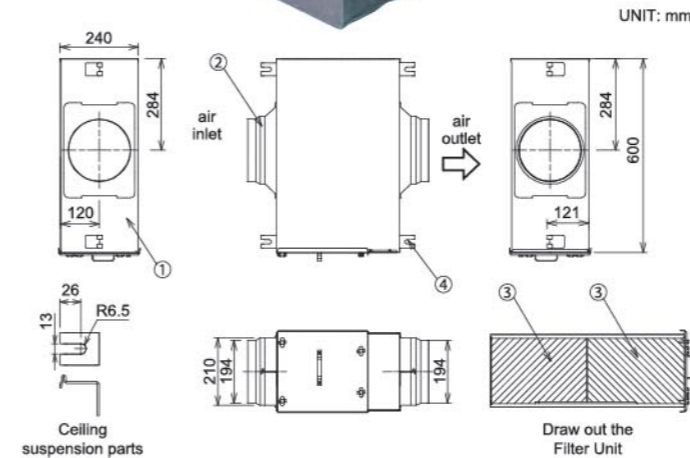
EB90SA (Applicable to series DZUA)

- Power : 220V / 60Hz
- Rate voltage : 3.6W
- Outer size : 86x86x40mm

Filter Box Unit



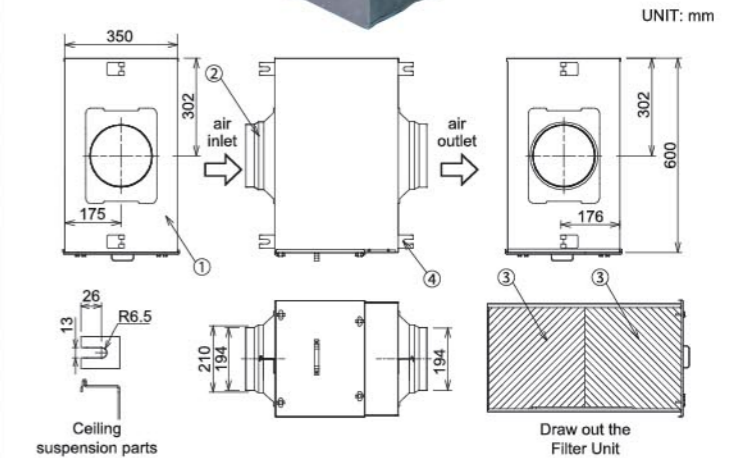
For E25DZUA, E35DZUA



No.	Part name	Qty	Material
1	Frame	1	Galvanized Steel Sheet
2	Adapter	2	ABS
3	Outdoor filter	2	Nonwoven Fabric
4	Ceiling Suspension	4	Galvanized Steel Sheet



For E50DZUA



No.	Part name	Qty	Material
1	Frame	1	Galvanized Steel Sheet
2	Adapter	2	ABS
3	Outdoor filter	2	Nonwoven Fabric
4	Ceiling Suspension	4	Galvanized Steel Sheet

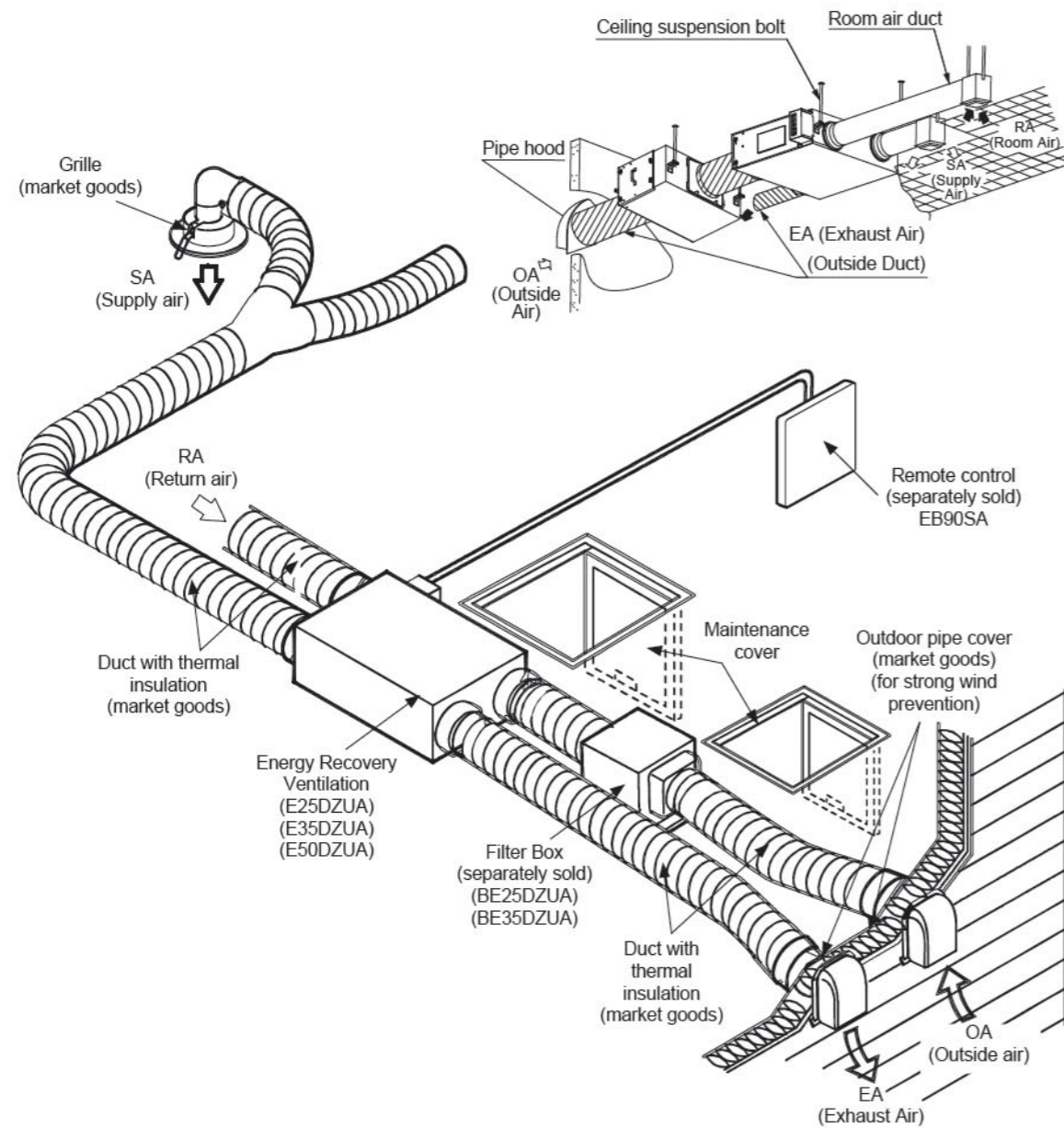
Replacement Filter

Product name	Filter Model	Filter(s) Included	Applicable Model	Service life of the filter	Remarks
Replacement filter for Filter Box Unit	FP25DZUA	2	BE25DZUA	2-4 months	Clean monthly
	FP50DZUA	2	BE50DZUA		
Replacement filter for ERV	FB25DZUA	1	E25DZUA	6 months	
	FB35DZUA	1	E35DZUA		
	FB50DZUA	1	E50DZUA		

• The service life of the filters varies with service environment, and the filters should be replaced with the new one.
• The air volume and filter efficiency will drop to different levels because of different service environments and service time. If the whole area indicated by the arrow turns black, please replace the filter.

General Information

Installation Diagram



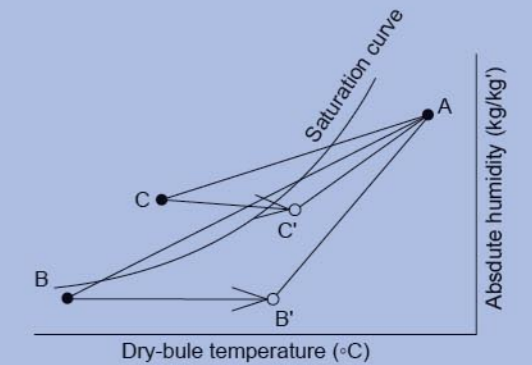
Cautions

- It's recommended to install the pipe cover for strong wind prevention form outside. Please stop the unit during the strong wind and sandstorm as they may enter into the room along the air duct.
- Please carefully read the instruction for parts which are sold separately during the construction.
- Handle the thermal insulation to duct.
 1. The Outside air is cold in winter, but the dry air comes into the duct, dew will occur in the external duct.
 2. The Exhaust air is warm in the room, but the damp air goes out of the room, dew will occur in the internal duct.
 In the conclusion, the outdoor duct should be conducted with thermal insulation.
- The air duct which connects the filter box unit to ERV is suggested to install horizontally.

General Information

Using Condition

- Outdoor air condition
Temperature range -10°C~+50°C, relative humidity 85% or less.
- Indoor air condition
Refer to the indoor air condition of living room.
- Installation requirements:
Same as the indoor air conditions.
Indoor air here means air in air-conditioned living rooms. The appliance usage in refrigerators or other places where temperature can fluctuate greatly. It is prohibited even if a temperature range is acceptable.



Be careful of frost and dew

- As shown in the right figure, it's supposed that a high temperature absorbing air condition A and a low temperature absorbing air condition B are plotted on the air line figure. In this case, it will cause the dew or frost inside the unit. To avoid this, you are required to heat a low temperature air B up to B' so as to get C' below the saturation curve before using the unit.
- The Energy Recovery Ventilator manufactured by our company is conducted the condensation without the water dropping test in the following conditions based on JIS B 8628:2003, if using condition is tougher than the following sheet, it may cause the frost or dew.

JIS B8628:2003 Energy Recovery Ventilator Appendix 5 (Specification) condensation test method

Classification	Indoor condition			Outdoor condition			Operation status	Measured time
	dry-bulb temperature	wet-bulb temperature	* relative Humidity (reference) %	dry-bulb temperature	wet-bulb temperature	* relative Humidity (reference) %		
Cooling in summer	22°C	17°C	60	35°C	29°C	65	operate	6 hours
Heating in winter	20°C	14°C	50	-5°C	-	-	operate	6 hours
Heating in winter	20°C	14°C	50	-15°C	-	-	Stop	6 hours

※ Relative humidity is calculated according to JIS B 8628:2003.