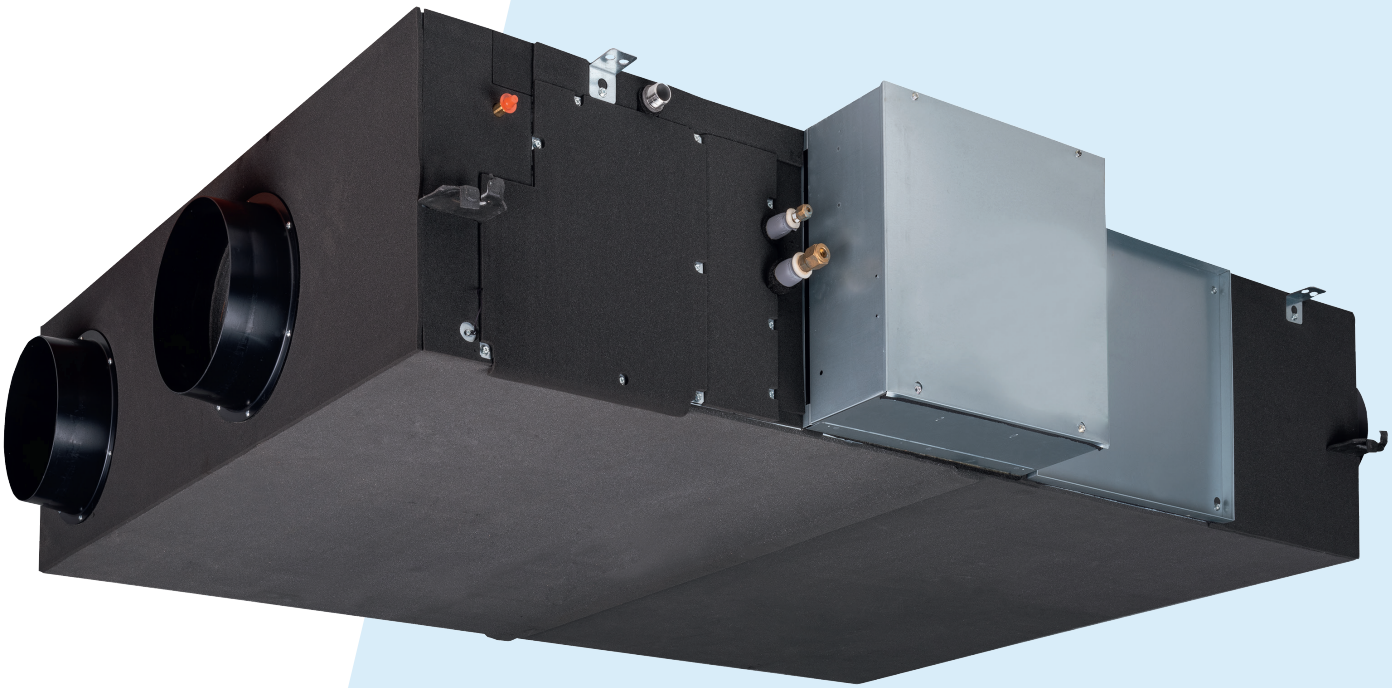
EEDEN26A

Decentralised energy recovery ventilation unit with integrated DX coil and humidifier
Technical Data
VKM-JM



VKM50JMV1
VKM80JMV1
VKM100JMV1

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VKM-JM

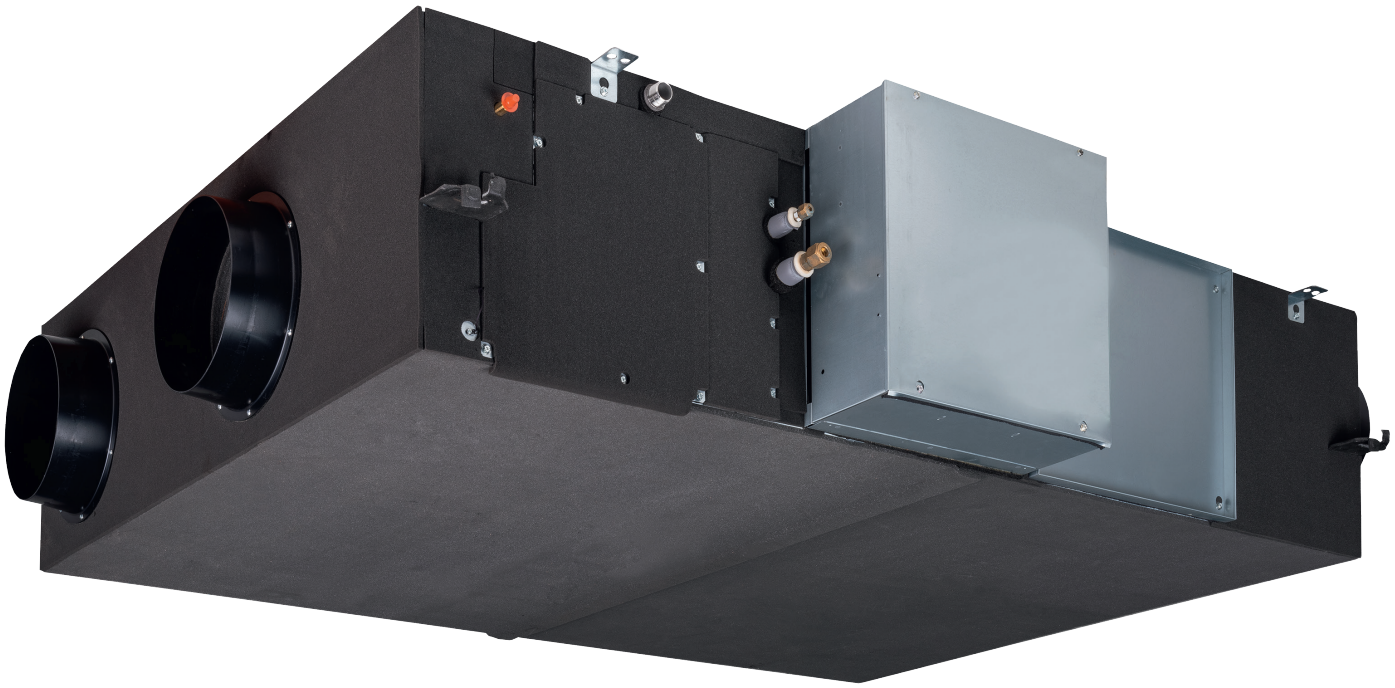
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1 Features

1 - 1 VKM-JM

Post heating or cooling of fresh air to lower the load on the air conditioning system

- Ventilation ensures a continuous supply of fresh air for healthier indoor environments, providing energy-saving operation as the primary function of the unit
- Enhanced energy efficiency: up to 74% enthalpic heat exchange, recovering both temperature and humidity to improve comfort and reduce the load on the A/C system
- Lower load on the VRV system thanks to the integrated R-32 / R-410A DX coil, which pre-conditions incoming fresh air and reduces the overall capacity demand on the connected VRV / A/C system
- Enhanced comfort, health and well-being with the integrated humidifier that maintains optimal indoor humidity levels for better comfort and productivity
- Easy integration in the VRV 5 R-32 total solution, including full compatibility with Daikin Cloud Plus for smart remote management and centralised control.
- Complete peace of mind thanks to Shîrudo Technology, ensuring full compliance with IEC60335-2-40
- Airflows rate from 500 to 950 m^3/h to support a range of ventilation applications and installation requirements.
- Prevents energy losses from over-ventilation while improving indoor air quality thanks to the optional CO_2 sensor.
- Free cooling possible when outdoor temperature is below indoor temperature (e.g., during nighttime), reducing the need for mechanical cooling.
- Can operate in under- or overpressure, either extracting unwanted air (moisture, pollutants, odors) or keeping clean rooms protected from incoming contaminants
- Automatic airflow adjustment measures and corrects airflow to the actual installation, simplifying commissioning and improving comfort
- Integrated ventilation functions such as fresh up air supply & fresh up air exhaust available throught Madoka and Madoka Plus



2 Specifications

2 - 1 Specifications

Technical specifications					VKM50JM	VKM80JM	VKM100JM
Fresh air conditioning load	Cooling			kW	4.74 (2) / 1.94 (17) / 2.8 (18)	7.46 (2) / 2.96 (17) / 4.5 (18)	9.12 (2) / 3.52 (17) / 5.6 (18)
	Heating			kW	5.67 (3) / 2.47 (17) / 3.2 (18)	8.84 (3) / 3.84 (17) / 5.0 (18)	10.80 (3) / 4.50 (17) / 6.3 (18)
Power input - 50Hz	Heat exchange mode	Nom.	Ultra high	kW	0.280 (8)	0.390 (8)	0.410 (8)
			High	kW	0.235 (8)	0.330 (8)	0.355 (8)
			Low	kW	0.175 (8)	0.215 (8)	0.235 (8)
Connection ratio	Outdoor units	with only ventilation units connected	Minimum	%	50		
			Maximum	%	130		
	Ventilation units	when combined with VRV® indoor units	Maximum	%	130		
Casing	Material				Galvanized steel plate		
Insulation material					Self-extinguishable urethane foam		
Dimensions	Unit	Height		mm	387		
		Width		mm	1,764		
		Depth		mm	832	1,214	
Weight	Unit			kg	100	126	128
Heat exchanger	Rows	Quantity			2		
	Stages	Quantity			12		
	Fin pitch			mm	1.6	2.2	
	Face area			m^2	0.078	0.165	
Fan	Type				Sirocco fan		
	Air flow rate - 50Hz	Heat exchange mode	Ultra high	m^3/h	500 (7)	750 (7)	950 (7)
			High	m^3/h	500 (7)	750 (7)	950 (7)
			Low	m^3/h	440 (7)	640 (7)	800 (7)
		Bypass mode	Ultra high	m^3/h	500 (7)	750 (7)	950 (7)
			High	m^3/h	500 (7)	750 (7)	950 (7)
			Low	m^3/h	440 (7)	640 (7)	800 (7)
	External static pressure - 50Hz	Ultra high		Pa	200	205	110
		High		Pa	150	155	70
		Low		Pa	120	105	55
Fan motor	Quantity				2		
	Output	50 Hz		W	249		
Temperature exchange efficiency - 50Hz	Ultra high			%	76	78	74
	High			%	76	78	74
	Low			%	77.5	79	76.5
Enthalpy exchange efficiency - 50Hz	Cooling	Ultra high		%	66		62
		High		%	66		62
Enthalpy exchange efficiency - 50Hz	Cooling	Low		%	69	68	66
	Heating	Ultra high		%	74	73.5	69.5
		High		%	74	73.5	69.5
		Low		%	76	75.5	72
Humidifier	System				Natural evaporating type		
	Amount			kg/h	2.7	4	5.4
	Feed water pressure			MPa	0.02 ~ 0.49		
	Elements	Quantity			1		2
Operation range	Around unit			°CDB	0°C~40°CDB, 80% RH or less		
	Supply air			°CDB	-15°C~40°CDB, 80% RH or less		
	Return air			°CDB	0°C~40°CDB, 80% RH or less		
	On coil temperature	Cooling	Max.	°CDB	43		
		Heating	Min.	°CDB	-15		
Sound pressure level - 50Hz	Heat exchange mode	Ultra high		dBA	41		
		High		dBA	38	40	39
		Low		dBA	35.5		
Piping connections	Liquid	Type			C1220T (Flare connection)		
		OD		mm	6.4		
	Gas	Type			C1220T (Flare connection)		
		OD		mm	12.7		
	Water supply			mm	6.4		
	Drain				R3/4 external thread		
Refrigerant	Control				Electronic expansion valve		
	Type				R-32 / R-410A		
	GWP				675 /2,087.5		
Heat exchange system					Air to air cross flow total heat (sensible + latent heat) exchange		
Heat exchange element					Specially processed non-flammable paper		
Air filter	Type				Multidirectional fibrous fleeces		
Connection duct diameter				mm	200	250	
Operation mode					Heat exchange mode, bypass mode, fresh-up mode		

Standard accessories: Installation manual;Quantity: ;

Standard accessories: Duct connecting flange;Quantity: ;

Standard accessories: M4 tapping screw to connect duct;Quantity: ;

Standard accessories: Water supply piping with strainer;Quantity: ;

Standard accessories: Half union joint (copper piping);Quantity: ;

2 Specifications

2 - 1 Specifications

Standard accessories: Flare nut (copper piping joint);Quantity: ;

Standard accessories: Refrigerant piping insulation cover;Quantity: ;

Standard accessories: Water supply piping insulation cover;Quantity: ;

Standard accessories: Operation manual;Quantity: ;

Standard accessories: Clamps;Quantity: ;

Standard accessories: Sealing material;Quantity: ;

Electrical specifications			VKM50JM	VKM80JM	VKM100JM
Power supply	Phase			1~	
	Frequency	Hz		50	
	Voltage	V		220-240	
Current	Minimum circuit amps (MCA)	A	2.9	4.0	4.5
	Maximum fuse amps (MFA)	A		15	

(1)Cooling and heating capacities are based on the following conditions: Fan is based on High and Ultra High. The figures in parenthesis indicate the heat reclaimed from the heat recovery ventilator. When calculating the capacity as indoor units, use:3.5kW for VKM50JM,5.6kW for VKM80JM,7.0kW for VKM100JM |
(2)ndoor temperature: 27°C DB, 19°C WB, Outdoor temperature: 35°C DB. |
(3)ndoor temperature: 20°C DB, Outdoor temperature: 7°C DB, 6°C WB. |
(4)Humidifying capacity is based on the following condition: Indoor temperature: 20°C DB, 15°C WB, Outdoor temperature: 7°C DB, 6°C WB. |
(5)The operating sound measured at the point 1.5m below the center of the unit is converted to that measured at an anechoic chambar built in accordance with the JIS B 8628 condition. The actual operating sound varies depending on the surrounding conditions (near running unit's sound, reflected sound and so on) and is normally higher than this value. For operation in a quiet room, it is required to take measures to lower the sound. In details, refer to engineering data. |
(6)The noise level at the air discharge port is about 8-11 dB higher than the unit's operating sound. For operation in a quiet room, it is required to take measures to lower the sound for example install more than 2m soft duct near the air discharge grille. |
(7)Air flow rate can be changed to Low mode or High mode. |
(8)Normal input, efficiency depend on the above air flow rate value. |
(9)n case of holding full water in humidifier |
(10)OA: fresh air from outdoors, RA: return air from room. |
(11)The specifications, designs and information here are subject to change without notice. |
(12)Temperature Exchange Efficiency is a mean value in cooling and heating |
(13)Measured according to JIS B 8628 |
(14)Supplied water must be clean water that meets the requirements prescribed by the laws and regulations of each country, and also be purified water (municipal water / tap water or water equivalent in quality) that conforms to the following water quality standards. Acid consumption: 50 mg/L or less, Total hardness:70 mg/L or less, Ionic silica: 30 mg/L or lessIf the acid consumption, supply water hardness, or ionic silica content is high, it may result in valve blockage, deterioration of the humidifier, and deposition of scale components (white powder) on the surface of the humidifying element.(These values do not guarantee the service life of the humidifying element.)The service life of the humidifying element is approximately 3 years (4,000 hours) under water hardness conditions of 150 mg/L.(Under 400 mg/L hardness conditions, the service life is about 1 year (1,500 hours).)Annual operating time: 10 hours/day × 26 days/month × 5 months = 1,300 hours. |
(15)n heating operation, freezing of the outdoor unit's coil increases. Heating capability decreases and the system goes into defrost operation. During defrost operation, the fans of the unit continues driving (factory setting). The purpose of this is to maintain the amount of ventilation and humidifying. |
(16)When connecting with a VRV Heat Recovery type outdoor unit and bringing the RA (exhaust gas intake) of this unit directly in from the ceiling, connect to a BS unit identical to the VRV indoor unit (master unit). See the Engineering Data for details. |
(17)The heat reclaimed from the heat recovery ventilator |
(18)The rated cooling and heating capacities |

3 Electrical data

3 - 1 Electrical Data

VKM-JM

Units				Power supply		IFM		Input (W)
Model	Hz	Volts	Voltage range	MCA	MFA	kW	FLA	
VKM50JMV1	50Hz	220-240V	Max.264V Min.198V	2.8	15	0.249×2	1.1×2	280
VKM80JMV1				4.0	15	0.249×2	1.6×2	390
VKM100JMV1				4.5	15	0.249×2	1.8×2	410

SYMBOLS

MCA : Min. Circuit Amps. (A)
MFA : Max. Fuse Amps. (See note 5) (A)
kW : Fan Motor Rated Output (kW)
FLA : Full Load Amps. (A)
IFM : Indoor Fan Motor

NOTES

1. Voltage range
   Units are suitable for use on electrical systems where voltage supplied to unit terminals is not below or above listed range limits.
2. Maximum allowable voltage unbalance between phases is 2%.
3. MCA/MFA
   MCA = 1.25 x FLA
   MFA ≤ 4 x FLA
   (Next lower standard fuse rating. Min. 15A)
4. Select wiring size based on the MCA.
5. Instead of fuse, use circuit breaker.

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4 Options

4 - 1 Options

VKM-JM

Member		Applicable model	VKM50,80,100JMV1
Controlling device	Remote controller		BRC1H52W/S/K (note1)
	Centralized controlling device	Central remote controller	DCS302C51
		Unified ON/OFF controller	DCS301B51
		Intelligent Tablet Controller	DCC601A51
		Intelligent Touch Controller	DCS601C51
		Intelligent Touch Manager	DCM601B51
		Edge adapter for connection to DC+	DGE601A51/DGE602A51
		Modbus interface	EKMBDXB7V1
		BACnet interface	DMS502A51
		LonWorks interface	DMS504B51
	Adaptor PCB	For heater control kit	BRP4A50A

NOTES

1. VKM*JMV1 can only have one BRC1H52W/S/K.

Member	Applicable model	VKM50JMV1	VKM80JMV1	VKM100JMV1
Additional function	Air filter for replacement	KAF241J80M	KAF241J100M	
	High efficiency filter	KAF242J80M	KAF242J100M	
	CO_2 Sensor	BRYMA65	BRYMA100	

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5 Exchange efficiency

5 - 1 Exchange efficiency

VKM50JMV1

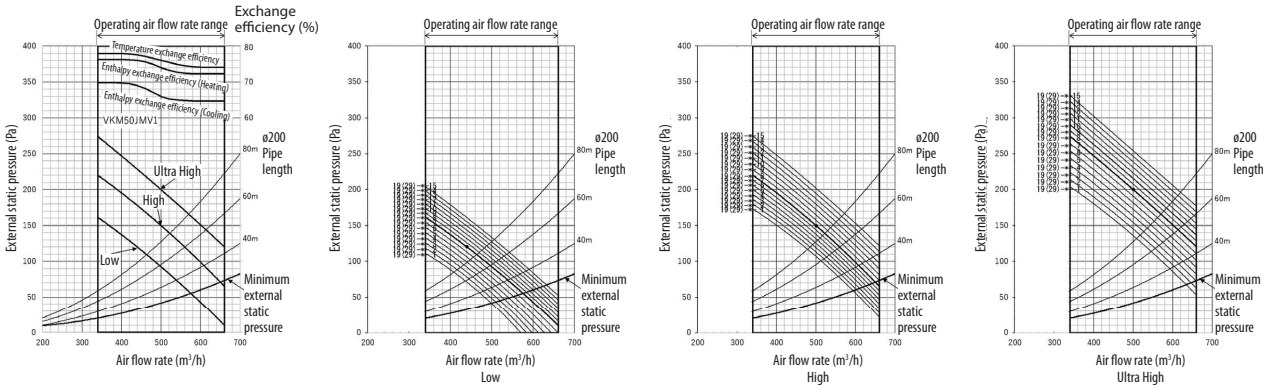
[Reading of Performance Characteristics]

1) For Example:19(29)-*-07
   MODE NO.:19(29)
   FIRST CODE:*(SUPPLY 「2」 EXHAUST 「3」)
   SECOND CODE NO.: 07

2) Rated point: ●

3) The characteristic of each tap becomes a setup of the characteristic of the same code number.

——— 50 Hz, 220V - 400V



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VKM80JMV1

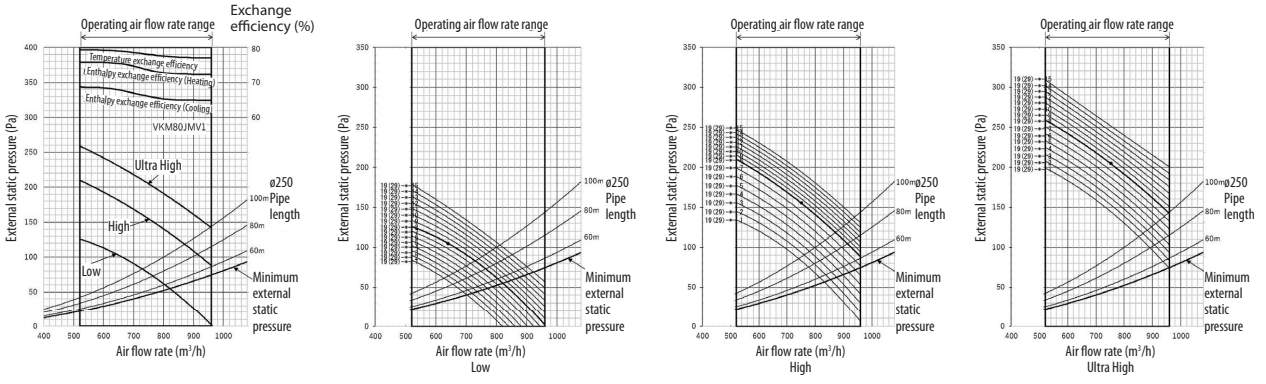
[Reading of Performance Characteristics]

1) For Example:19(29)-*-07
   MODE NO.:19(29)
   FIRST CODE:*(SUPPLY 「2」 EXHAUST 「3」)
   SECOND CODE NO.: 07

2) Rated point: ●

3) The characteristic of each tap becomes a setup of the characteristic of the same code number.

——— 50 Hz, 220V - 400V



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5 Exchange efficiency

5 - 1 Exchange efficiency

VKM100JMV1

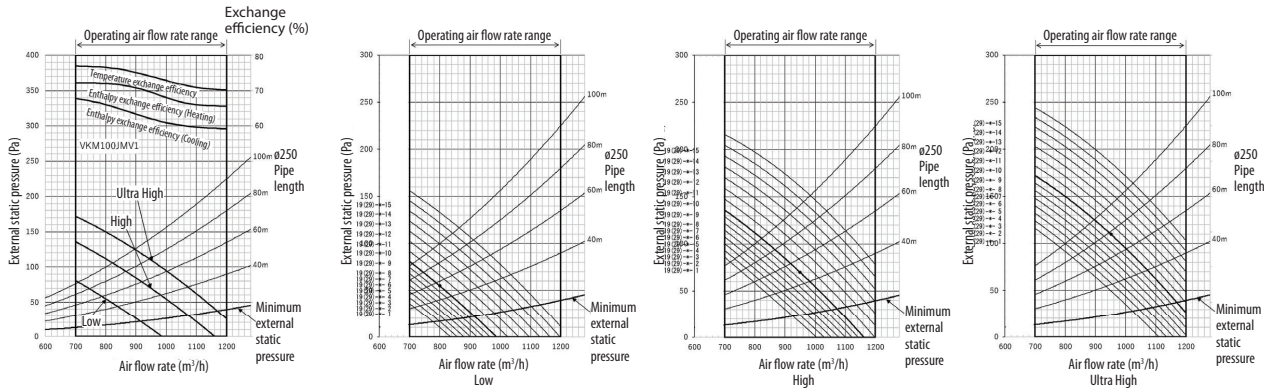
[Reading of Performance Characteristics]

1) For Example:19(29)-*-07
   MODE NO.:19(29)
   FIRST CODE:*(SUPPLY 「2」 EXHAUST 「3」)
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2) Rated point: ●

3) The characteristic of each tap becomes a setup of the characteristic of the same code number.

——— 50 Hz, 220V - 400V

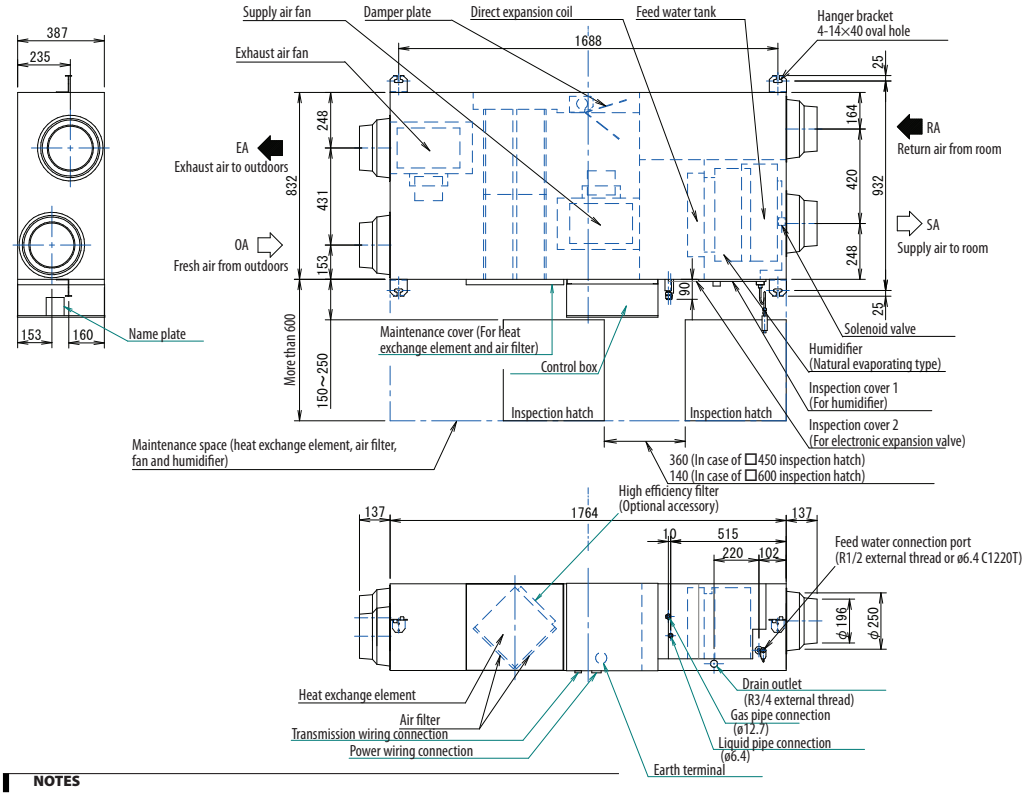


3D161520A

6 Dimensional drawings

6 - 1 Dimensional Drawings

VKM50JMV1

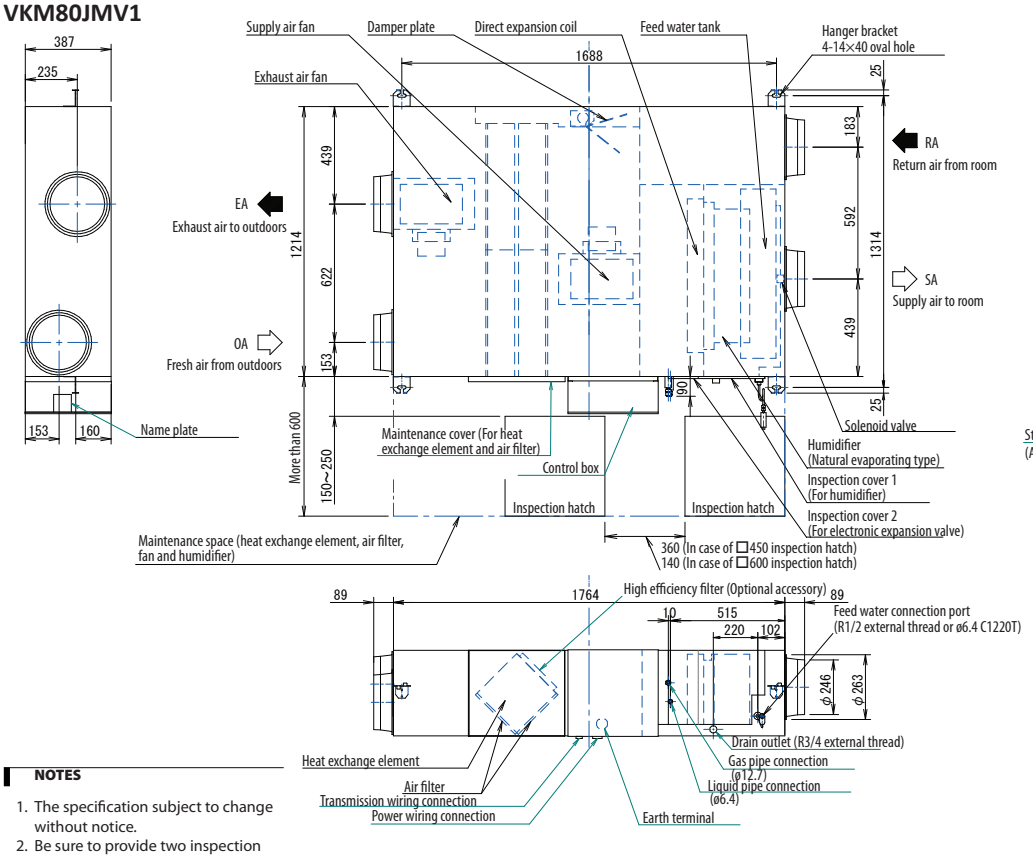


NOTES

1. The specification subject to change without notice.
2. Be sure to provide two inspection hatch.
   (☐450 or ☐600) at the service side of filter and element.

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VKM80JMV1



NOTES

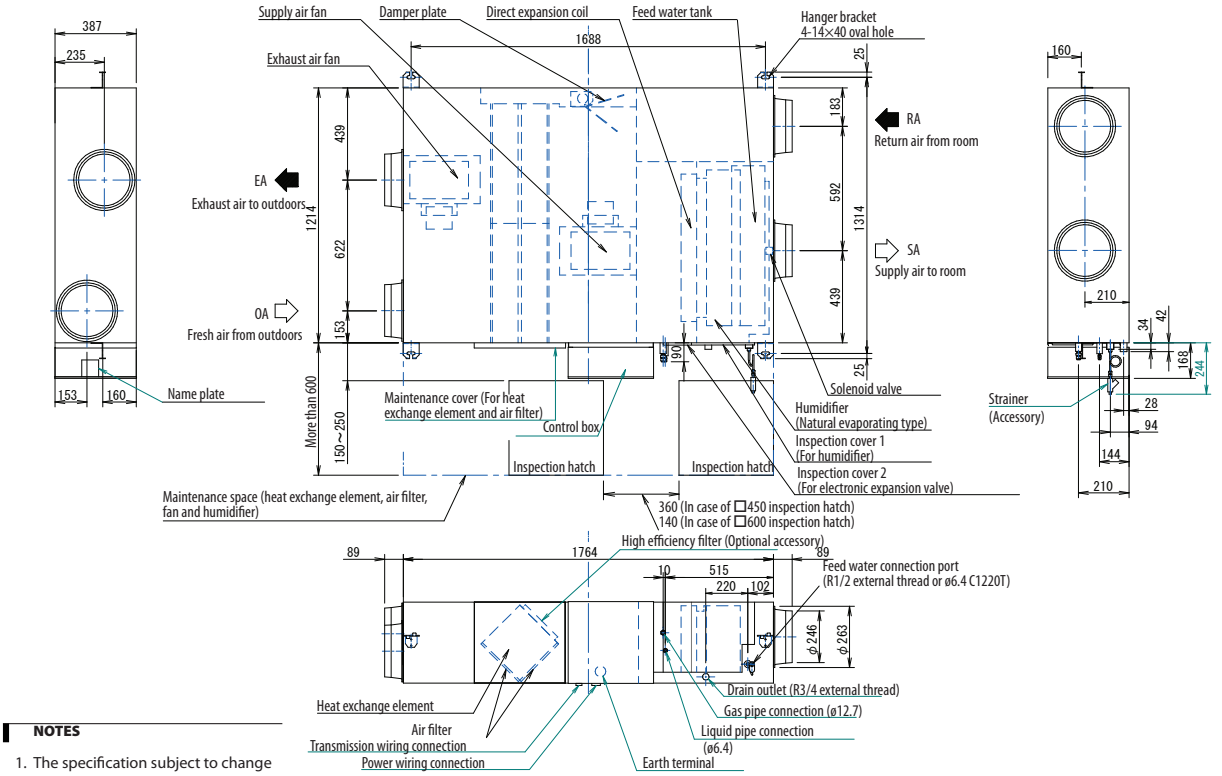
1. The specification subject to change without notice.
2. Be sure to provide two inspection hatch. (☐450 or ☐600) at the service side of filter and element.

3D160819

6 Dimensional drawings

6 - 1 Dimensional Drawings

VKM100JMV1



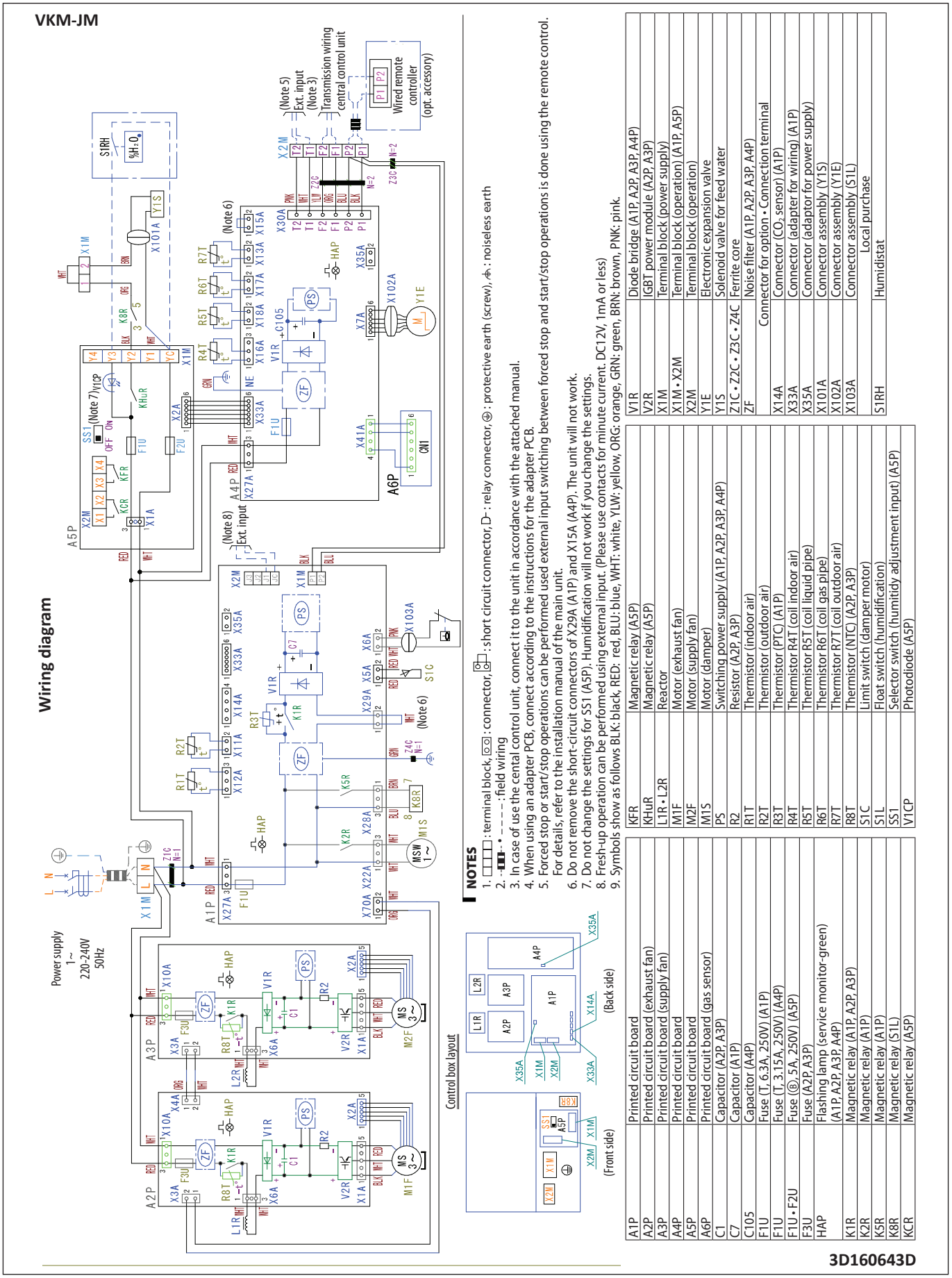
NOTES

1. The specification subject to change without notice.
2. Be sure to provide two inspection hatch. (□450 or □600) at the service side of filter and element.

3D160820

7 Wiring diagrams

7 - 1 Power Supply, Back-up Heater



NOTES

1. □□□ : terminal block, ⊙⊙ : connector, ⊙⊙ : short circuit connector, D- : relay connector, ⊕ : protective earth (screw), ⏚ : noiseless earth
2. - ■■ - • - - - - : field wiring
3. In case of use the cental control unit, connect it to the unit in accordance with the attached manual.
4. When using an adapter PCB, connect according to the instructions for the adapter PCB.
5. Forced stop or start/stop operations can be performed used external input switching between forced stop and start/stop operations is done using the remote control. For details, refer to the installation manual of the main unit.
6. Do not remove the short-circuit connectors of X29A (A1P) and X15A (A4P). The unit will not work.
7. Do not change the settings for SS1 (A5P). Humidification will not work if you change the settings.
8. Fresh-up operation can be performed using external input. (Please use contacts for minute current. DC12V, 1mA or less)
9. Symbols show as follows BLK: black, RED: red, BLU: blue, WHT: white, YLW: yellow, ORG: orange, GRN: green, BRN: brown, PNK: pink.

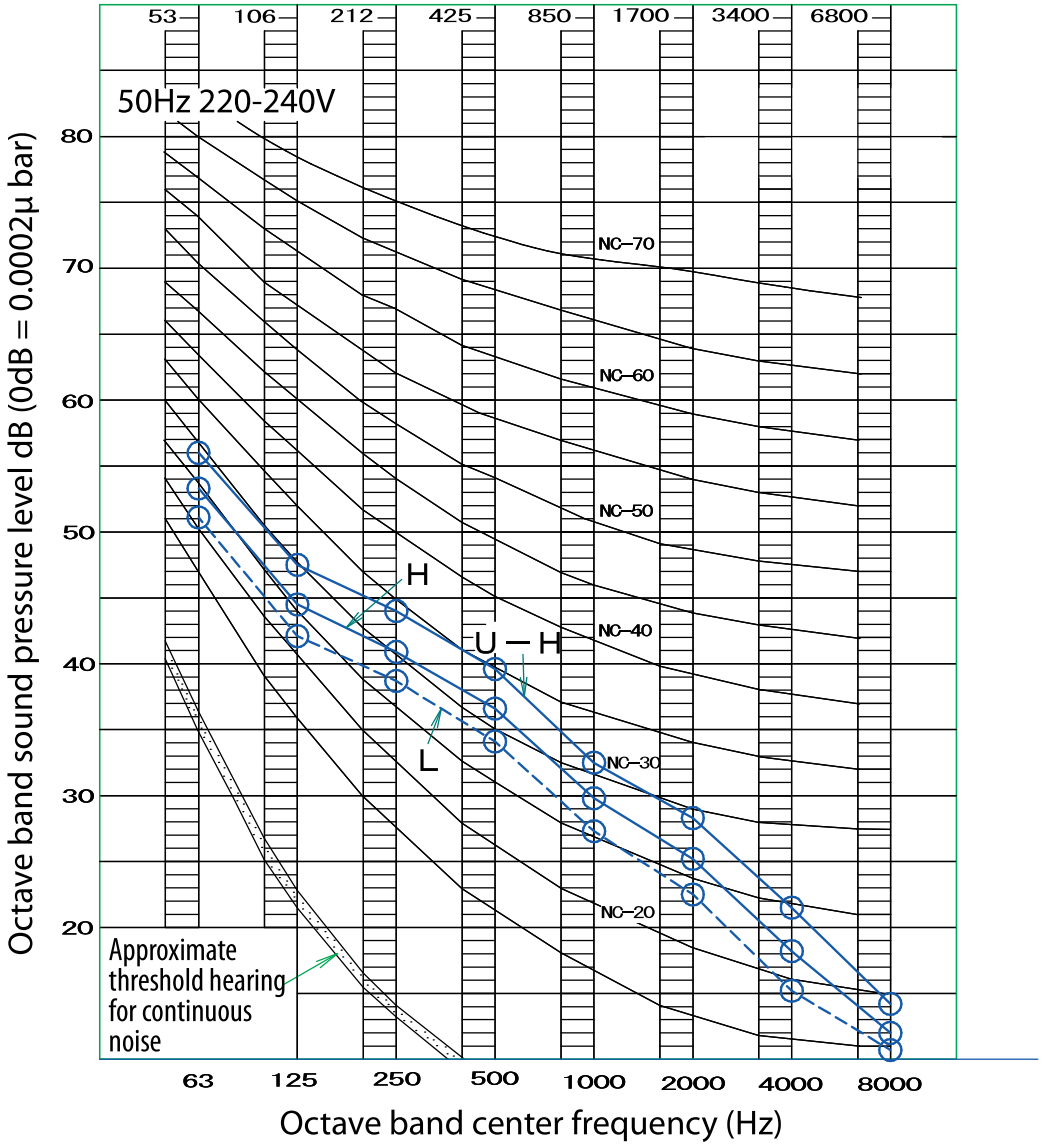
A1P	Printed circuit board	KFR	Magnetic relay (A5P)
A2P	Printed circuit board (exhaust fan)	KHuR	Magnetic relay (A5P)
A3P	Printed circuit board (supply fan)	L1R • L2R	Reactor
A4P	Printed circuit board	M1F	Motor (exhaust fan)
A5P	Printed circuit board	M2F	Motor (supply fan)
A6P	Printed circuit board (gas sensor)	M1S	Motor (damper)
C1	Capacitor (A2P, A3P)	PS	Switching power supply (A1P, A2P, A3P, A4P)
C7	Capacitor (A1P)	R2	Resistor (A2P, A3P)
C105	Capacitor (A4P)	R1T	Thermistor (indoor air)
F1U	Fuse (T, 6.3A, 250V) (A1P)	R2T	Thermistor (outdoor air)
F1U	Fuse (T, 3.15A, 250V) (A4P)	R3T	Thermistor (PTC) (A1P)
F1U • F2U	Fuse (Ⓑ, 5A, 250V) (A5P)	R4T	Thermistor R4T (coil indoor air)
F3U	Fuse (A2P, A3P)	R5T	Thermistor R5T (coil liquid pipe)
HAP	Flashing lamp (service monitor-green) (A1P, A2P, A3P, A4P)	R6T	Thermistor R6T (coil gas pipe)
		R7T	Thermistor R7T (coil outdoor air)
K1R	Magnetic relay (A1P, A2P, A3P)	R8T	Thermistor (NTC) (A2P, A3P)
K2R	Magnetic relay (A1P)	S1C	Limit switch (damper motor)
K5R	Magnetic relay (A1P)	S1L	Float switch (humidification)
K8R	Magnetic relay (S1L)	SS1	Selector switch (humitidy adjustment input) (A5P)
KCR	Magnetic relay (A5P)	V1CP	Photodiode (A5P)

V1R	Diode bridge (A1P, A2P, A3P, A4P)	X14A	Connector (CO, sensor) (A1P)
V2R	IGBT power module (A2P, A3P)	X33A	Connector (adapter for wiring) (A1P)
X1M	Terminal block (power supply)	X35A	Connector (adaptor for power supply)
X1M • X2M	Terminal block (operation) (A1P, A5P)	X101A	Connector assembly (Y1S)
X2M	Terminal block (operation)	X102A	Connector assembly (Y1E)
Y1E	Electronic expansion valve	X103A	Connector assembly (S1L)
Y1S	Solenoid valve for feed water		Local purchase
Z1C • Z2C • Z3C • Z4C	Ferrite core	S1RH	Humidistat
ZF	Noise filter (A1P, A2P, A3P, A4P)		
	Connector for option • Connection terminal		

8 Sound data

8 - 1 Sound Pressure Spectrum

VKM50JMV1



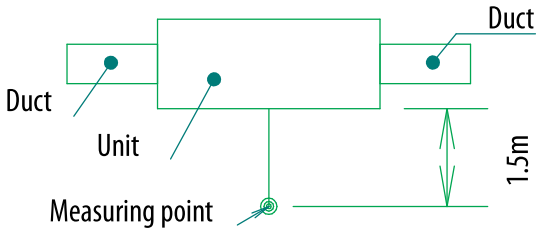
NOTES

1. Over All (dB):

Scale	Air flow rate		
	U-H	H	L
A	41.0	38.0	35.5

(B,G,N is already rectified)

2. Measuring place: Anechoic chamber
3. Operating conditions:
   Power source:
   - Single phase 50Hz 220-240V
4. Ventilation mode: total heat exchange
5. Measured according to JIS B8628



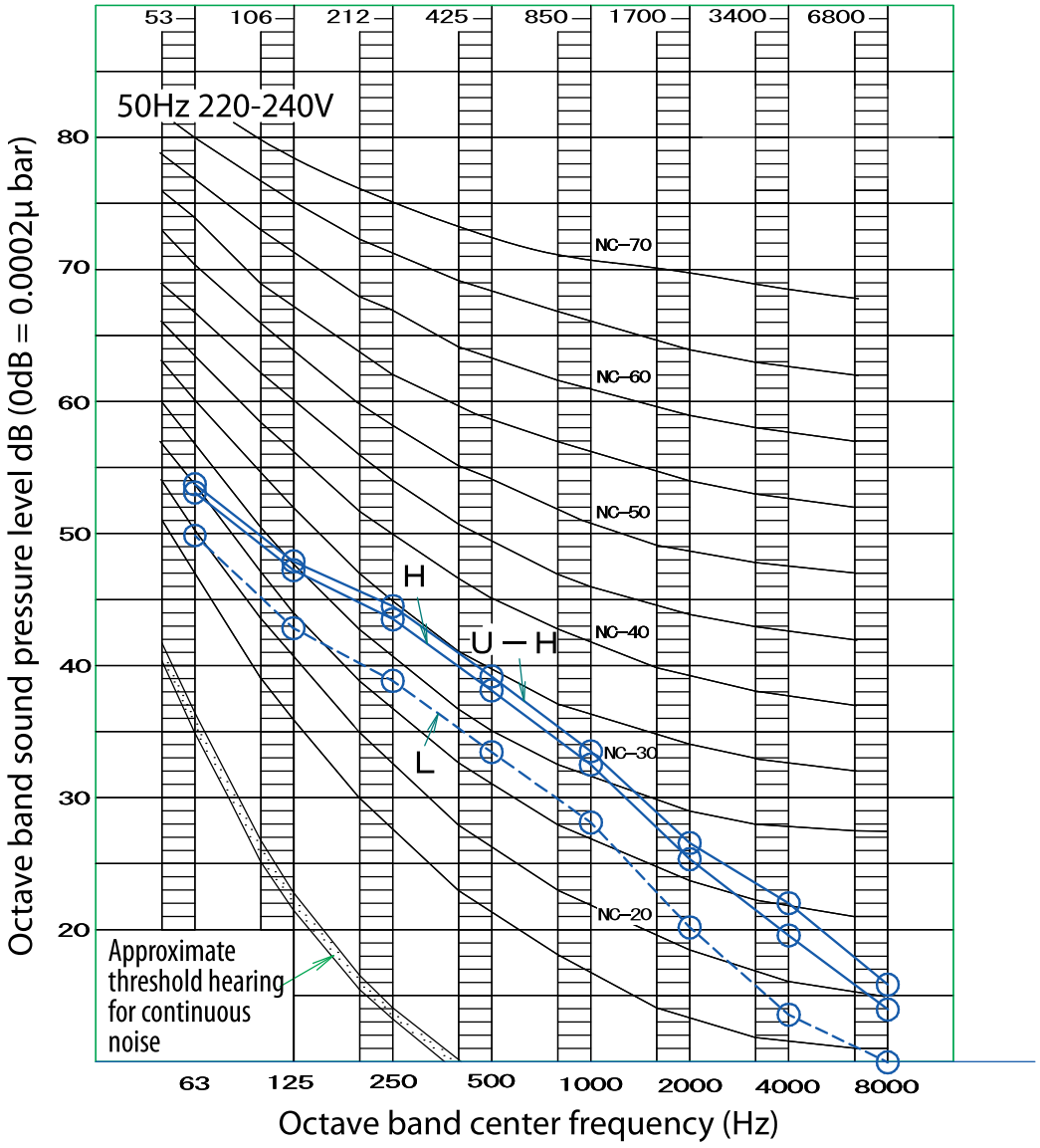
6. Operation noise differs with operation and ambient conditions.

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8 Sound data

8 - 1 Sound Pressure Spectrum

VKM80JMV1



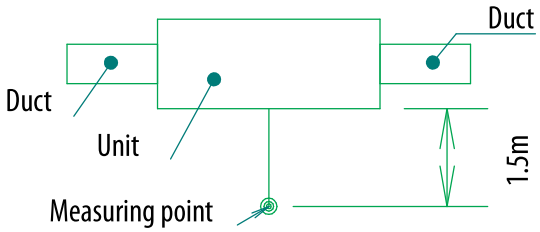
NOTES

1. Over All (dB):

Scale	Air flow rate		
	U-H	H	L
A	41.0	40.0	35.5

(B,G,N is already rectified)

2. Measuring place: Anechoic chamber
3. Operating conditions:
   Power source:
   • Single phase 50Hz 220-240V
4. Ventilation mode: total heat exchange
5. Measured according to JIS B8628



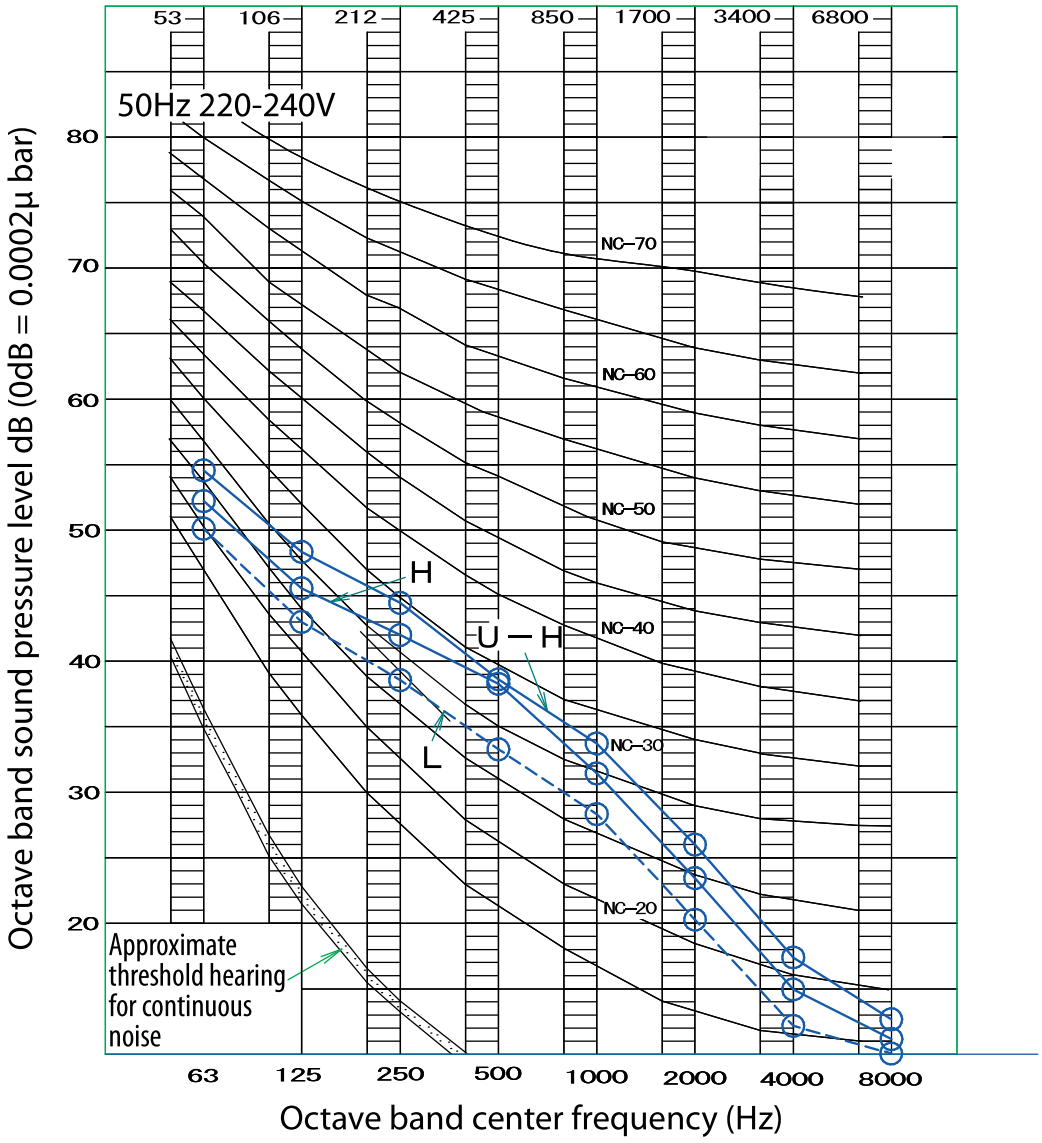
6. Operation noise differs with operation and ambient conditions.

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8 Sound data

8 - 1 Sound Pressure Spectrum

VKM100JMV1



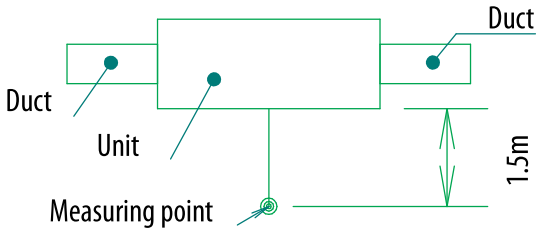
NOTES

1. Over All (dB):

Scale	Air flow rate		
	U-H	H	L
A	41.0	39.0	35.5

(B,G,N is already rectified)

2. Measuring place: Anechoic chamber
3. Operating conditions:
   Power source:
   - Single phase 50Hz 220-240V
4. Ventilation mode: tota0l heat exchange
5. Measured according to JIS B8628



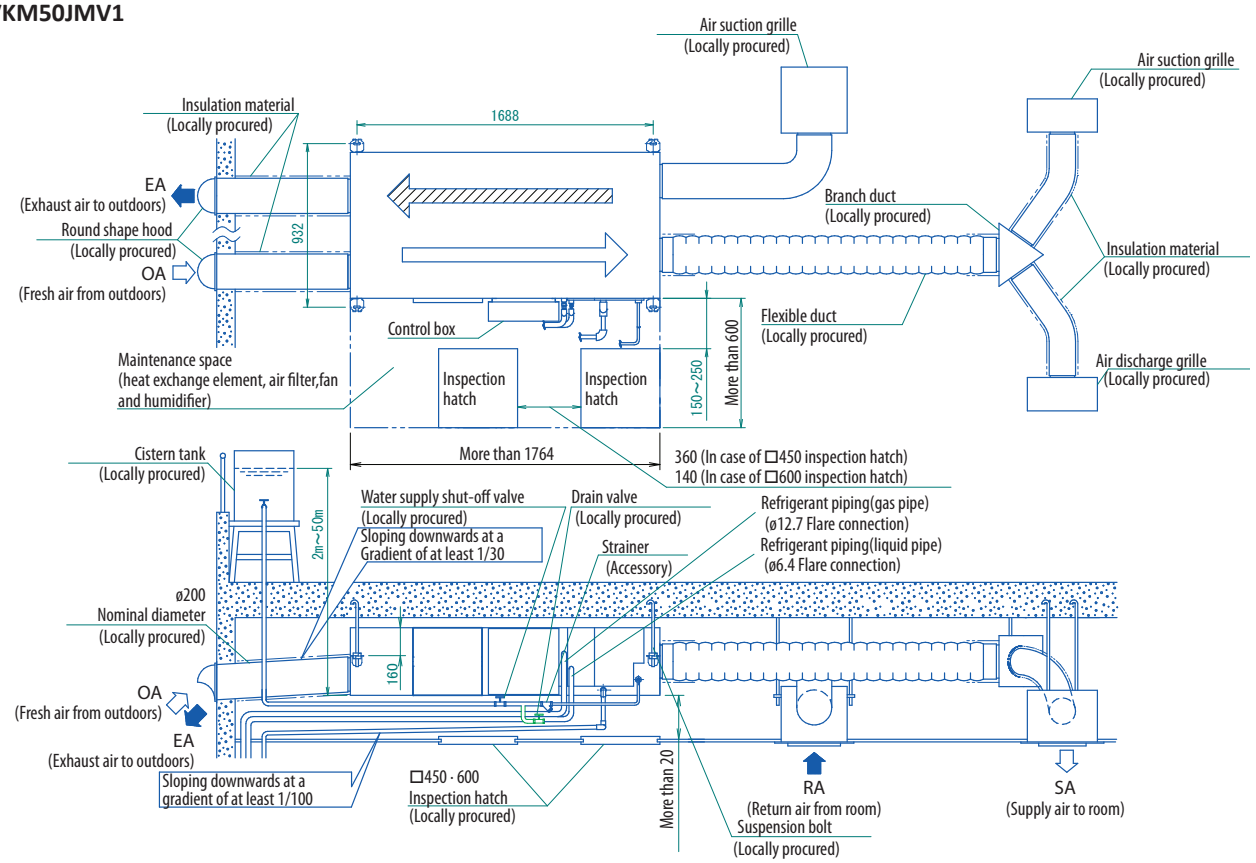
6. Operation noise differs with operation and ambient conditions.

4D161366

9 Installation

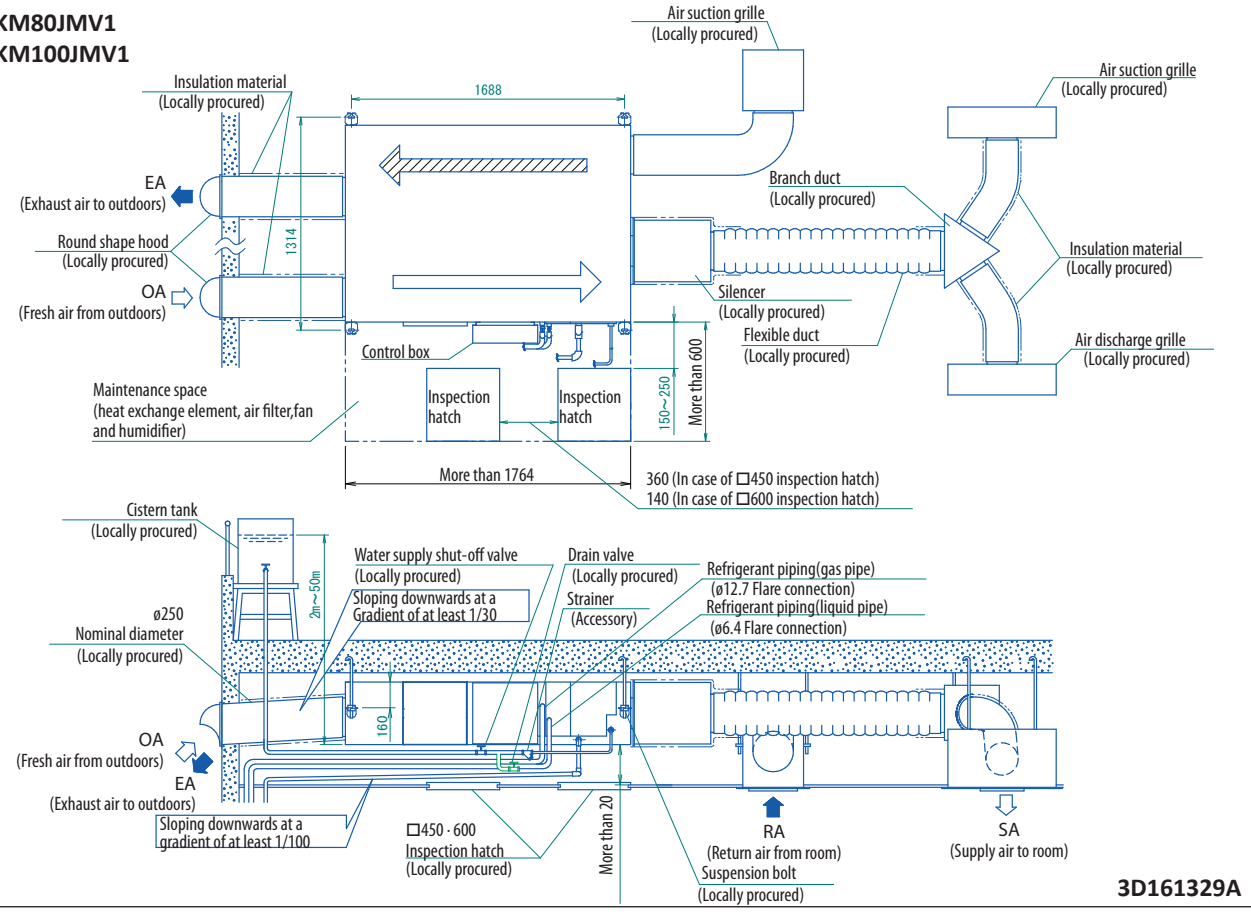
9 - 1 Installation Method

VKM50JMV1



3D161328

VKM80JMV1
VKM100JMV1



3D161329A

10 Precautions

10 - 1 Precautions

VKM-JM

[Precautions for Selecting a Model]

- Before use, please ensure you check the "Unit Ambient Conditions" stated in the "Specifications." Note that this applies to general occupied rooms under air-conditioned temperature and humidity conditions. Therefore, it cannot be used in conditions with significant temperature differences, such as industrial refrigerators or extreme cooling conditions, even if they fall within the specified conditions. Additionally, depending on air conditions, dew condensation prevention might be necessary, even within operating conditions. Please review each precaution and ensure use in an environment that meets the requirements.
- Do not install in areas with frequent fog, high temperature, or where direct flame exposure is possible.
- Avoid use in high humidity conditions like heated pools, bathrooms, mushroom cultivation rooms, and heated stone spa facilities, as electrical components may fail.
- Do not use in places where harmful gases, corrosive components, or gases containing acids, alkalis, organic solvents, oil mist, paint, or insecticide are present, such as mechanical and chemical factories.
- Refrain from installing in areas with heavy oil mist, such as kitchens, or where oil dispersion and steam are prevalent, like barbershops, beauty salons, or smoking areas where heavy smoke is typical.
- Do not install in locations with salt damage, hot spring damage, where electromagnetic machinery is present, where flammable gas might leak, or where carbon fiber or flammable dust is airborne, as well as where volatile flammable materials like thinner or gasoline are handled. Avoid areas like factories with frequent voltage fluctuations, vehicles, and ships.
- Avoid using any system that recovers air containing odors and supplies it to other areas.
- Ensure that the outside air intake does not directly take in air from exhaust outlets or air-conditioned outlets.
- Install the outdoor air intake in a location that does not draw in odorous air or air that could lead to indoor oxygen deficiency, such as exhaust gases or factory smoke.
- In suburban buildings with windows or outdoor lights near fresh air from outdoors (OA) , insects attracted to light may enter through fresh air from outdoors (OA) , pass through air filters, and penetrate indoors. Small insects entering throughfresh air from outdoors (OA) might also exit through exhaust air to outdoors(EA) . Consider insect entry prevention measures during the design stage.
- In cold regions, indoor negative pressure areas, and places with strong external winds, there may be penetration of external winds through ducts when the operation is stopped. To prevent this, install electric shutters on both fresh air from outdoors (OA) and exhaust air to outdoors(EA) . Additionally, if water accumulates inside the unit, please clean by wiping away any droplets before use.
- In cold regions or places where the operating conditions are outside the acceptable range, either temporarily or throughout the day, operation should not be conducted. If conditions fall outside the acceptable range, please stop the operation.
- Inhaling fog, mist, or highly humid air may cause water droplets to drip from the air filter and heat exchange element, leading to water leakage and potential failure of electrical components like damper motors. In such cases, stop the operation. If water has accumulated inside the unit, clean it by wiping away the droplets before use.
- When using in cold regions, condensation or freezing may occur in winter; ensure to check the usage conditions and precautions. Conduct additional insulation work if necessary. Stop the operation if the outside air is below -15°C.
- If the ambient temperature around the Heat Reclaim Ventilator exceeds the operational range (e.g., when an air supply heater is installed nearby), damage or malfunction may occur. Ensure the ambient temperature, fresh air from outdoors (OA) , and return air from room (RA) do not exceed the operational range.
- Long-term operation outside the usage condition range due to 24-hour ventilation may cause water leakage from condensation. Avoid 24-hour ventilation if operating outside the condition range is anticipated.
- When heating indoors during winter, do not operate in "Bypass Mode" as it may cause condensation.
- Avoid installing in locations exposed to ultraviolet rays as it can deteriorate the insulation material.
- In areas affected by volcanic ash, install filter units or similar at the outdoor air intake and indoor exhaust outlet.
- If installing Heat Reclaim Ventilator near the coast where salt damage prevention is necessary, connect a filter for collecting sea salt particles (a locally sourced salt damage prevention filter) to fresh air from outdoors (OA) side of the duct.
- In areas where the outdoor or exhaust intake air exceeds 40°C, consider the potential deformation of plastic parts like the air filter and the reduced lifespan of electrical components due to insulation degradation in motors.
- In situations with indoor negative pressure or strong external winds, even when operation is stopped, outdoor air may be drawn in, leading to water accumulation inside or condensation on the product exterior. As a preventive measure, install electric shutters on both fresh air from outdoors (OA) and exhaust air to outdoors(EA) .

4D161682B

10 Precautions

10 - 1 Precautions

VKM-JM

[Precautions During Installation]

- Do not perform any on-site modifications as they may cause malfunctions.
- Have installation carried out by the dealer or a professional service, following the installation manual to ensure accuracy. Incorrect installation can lead to water leakage, electric shock, or fire.
- Be sure to use the included installation parts and those specified in the requirements. Using unspecified parts can result in product drop, water leakage, electric shock, or fire.
- Install the unit on a surface strong enough to bear its weight. Inadequate strength may lead to product drop and injury.
- Prepare for strong winds and earthquakes, such as a typhoon, by conducting the specified installation work. Incomplete installation work can cause accidents due to falling.
- Ensure the outdoor air intake does not directly channel air from the exhaust outlet, as this can contaminate indoor air and cause health issues.
- Position the outdoor air intake where it will not inhale exhaust gases like combustion gases. Inadequate placement may lead to indoor oxygen deficiency and serious accidents.
- Choose an installation location meeting the following conditions with client approval:
  - Suitable strength and stability (e.g., beams, ceilings capable of bearing the product weight). Use suspension bolts for installation, ensuring the location can support the product weight. If necessary, reinforce with girders before installing suspension bolts. Inadequate strength can lead to product drop and injury, as well as cause vibration and abnormal noise.
  - Free of obstructions in airflow paths.
  - Not in contact with ceilings or walls. Contact can cause vibrations.
  - Sufficient space for installation, maintenance workspace, and duct connections. Provide maintenance space and inspection ports for air filter and heat exchange element maintenance (cleaning).
  - Verify with external dimensions to ensure necessary maintenance space and inspection ports.
  - Free from flammable gas leaks.
  - Ceiling materials installed (installation location should be restricted to above ceilings). Without ceiling materials, operational noise might be noticeable in quiet environments.
- Do not install the unit upside down or at an angle.
- During and after unpacking, transport the product by holding the hanging brackets (four locations). Applying force to parts other than the hanging brackets (especially the electrical component box, supply, exhaust outlets, and duct joints) may cause deformation.
- If the unit is installed from the ceiling with short suspension bolts, resonating with the ceiling may cause abnormal noise. Implement anti-vibration measures on the suspension bolts. If the noise seems to originate from the spiral duct connection, switch to a flexible duct.
- Do not place electrical or electronic equipment, or objects that should not get wet, under the Heat Reclaim Ventilator.
- Condensation from the Heat Reclaim Ventilator may lead to damage or soiling if the outdoor air or site conditions involve high temperature and humidity, if the unit operates for long periods with humidity over 80%, if the drain outlet is clogged, or if the air filter is dirty.
- When using cool tubes or pits to fresh air from outdoors (OA) , avoid installations that overcool and exceed fresh air from outdoors (OA) relative humidity conditions at the Heat Reclaim Ventilator's outdoor air intake. This may cause water leakage or product malfunctions.
- Do not insert materials between the hanging brackets and washers. If the properly specified washers are not correctly
- installed as instructed in the installation manual, the suspension bolts may detach from the hanging brackets.
- If not installed horizontally, there is an increased risk of water leakage due to the conditions of the outdoor air and site environment. Ensure installation within a 1° incline.
- If the temperature and humidity in the installation location exceed 30°C and 80% RH, additional insulation should be applied to the product.
- Use insulation material, such as glass wool or polyethylene foam, with a thickness of 10mm or more, while ensuring it fits within the ceiling opening.

4D161683

10 Precautions

10 - 1 Precautions

VKM-JM

[Precautions During Installation]

- Do not perform ductwork as shown in the diagram of prohibited ductwork examples.

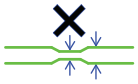
(a) Extreme bend (Do not bend the duct over 90°.)



(b) Multi bend

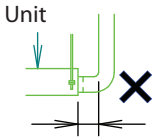


(c) Reduce the diameter of the duct to be connected.



(Do not reduce the duct diameter halfway.)

(d) A bend right next to the outlet



- Seal the connection between the duct joint and duct with aluminum tape or similar to prevent air leaks.
- Use the applicable duct for the model in use (refer to the catalog).
- If there are temperature and humidity conditions in the ceiling causing potential condensation, insulate the indoor supply and exhaust ducts.
- In cold regions, even when used within operating conditions, outdoor air and ceiling space conditions might cause condensation or freezing on the unit's surface and duct connections. In such cases, apply additional insulation.
- If using metal ducts to penetrate wooden structures with wire lathe or metal sheeting, electrically insulate the duct from the wall.
- Do not use when the duct is nearly fully closed, as it may cause abnormal noise.
- Position supply air to room(SA) and return air from room (RA) openings to prevent short circuits.
- Ensure supply air to room(SA) and return air from room (RA) openings are in the same occupied space. Placing them across different spaces can cause noise through door gaps and transfer odors, and may cause doors to open or close unexpectedly.
- For outdoor side ducts (intake and discharge), ensure they slope downward toward the outside to prevent rainwater entry (slope of 1/30 or more). Insulate ducts and duct joints to prevent condensation (material: glass wool, thickness: 25mm).
- In cold regions where outdoor temperatures fall below -10°C, insulate supply air to room(SA) duct against potential condensation.
- If the ceiling space is hot and humid, install ventilation within the ceiling space.
- When using vent caps or round hoods on outdoor hoods, do not install them where they will be directly exposed to rain. In such cases, a deep hood (sold separately) is recommended.
- Ensure a duct length of at least 1m from the deep hood (external wall) to the product.
- Maintain a pitch of at least three times the duct diameter between the outdoor wall's exhaust air to outdoors(EA) and fresh air from outdoors (OA) .
- For ceiling-embedded duct types, consider anti-draft measures and airflow distribution, such as providing at least two supply air outlets(SA). Avoid positioning where airflow directly strikes people.
- Flexible ducts, soundproof boxes, and soundproof supply and exhaust grilles are effective for reducing noise when used in supply air to room(SA) ducts. Consider airflow and discharge sound appropriate to the application when selecting materials and conducting installation work.
- Avoid installation that results in excessive supply or exhaust, as it can cause noise through door gaps or affect door operation.
- Position return air from room (RA) openings to avoid directly inhaling air from sources like air conditioners.
- If the interior finish work is not completed after the commissioning, advise the customer not to operate the unit until completion to prevent contamination from paint and adhesives used during interior construction.
- If external force is applied to the damper plate in the Heat Reclaim Ventilator, it may hinder proper damper operation when switching between total heat exchange and regular ventilation. Since Heat Reclaim Ventilator stops the fan motor during damper operation, ensure that booster fans are interlocked using external output signals to prevent force on the damper plate. Moreover, installing the system to prevent reverse airflow in the airstream when the fan motor is stopped is essential to ensure that the fan motor and damper operate correctly upon startup.
- Implement measures like installing electric shutters to prevent backflow.

4D161684B

10 Precautions

10 - 1 Precautions

VKM-JM

[Precautions for Electrical Work]

- All wiring must be performed by an authorized electrician.
- Electrical work should be performed following the installation instructions, using a dedicated circuit without extending the wiring. Inadequate circuit capacity or improper installation can lead to electric shock or fire.
- Use the specified wiring and ensure secure connections so that external force does not affect terminal connections. Incomplete connections or fixtures may cause overheating or fire.
- Electrical, remote control, and communication wiring should be organized and the cover securely attached to prevent any structural components like the electric component box cover from being lifted. An improperly attached cover may lead to electric shock or fire at the terminal.
- Perform grounding work and do not connect the grounding wire to gas pipes, water pipes, lightning rods, or phone grounding wires. An incomplete ground may cause electric shock or fire.
- Install the specified leak circuit breaker. Without it, there is a risk of electric shock or fire.
- Always disconnect power before touching electrical components. Contact with live parts can lead to electric shock.
- Install the main unit, its power wiring, communication wiring, and remote control wiring at least 1 meter away from televisions and radios to prevent interference or noise. However, depending on radio wave conditions, noise may still occur even beyond 1 meter.
- Electrical wiring should be done based on the electrical wiring diagram label affixed to the product and as described in this section.
- Always disconnect the power before conducting any electrical wiring work.- Make sure the ground resistance is no greater than 100Ω .This value can be as high as 500Ω when using a ground fault circuit interrupter since the protective ground resistance can be applied.
- If the leak circuit breaker is solely for grounding fault protection, always use it in combination with a fused load switch or a circuit breaker for wiring. In such cases, use a fuse capacity or breaker with a capacity equal to or greater than the rated current.
- When opening the electric component box cover for wiring or other tasks, discharge any static electricity from your body by touching the product's outer panel before proceeding to prevent damage to electrical components.
- When installing multiple units, label each as Unit A, Unit B, etc., and ensure the terminal symbols match exactly during wiring and connection with indoor units.
- Do not power the unit until all work is complete.
- To prevent small animals from entering, seal gaps between wiring and wiring penetration holes with putty or insulation material (may be sourced locally or included as accessories depending on the model).
- Avoid touching electrical components other than terminal blocks and connectors, as this may cause damage.
- Follow the "Installation Instructions" included with the remote controller for its mounting and wiring.
- Be cautious of residual voltage:
  1. Do not open the electrical component box cover for 10 minutes after cutting the power.
  2. Use a tester to ensure power is cut off at the power terminal block.
  3. Measure residual voltage with a tester to confirm it is below DC 50V. Avoid contact with live parts until this is verified. Refer to the warnings provided with each product for specific measurement locations.

4D161685

10 Precautions

10 - 1 Precautions

VKM-JM

[Precautions for Units with Humidifier]

- Supplied water must be clean water that meets the requirements prescribed by the laws and regulations of each country, and also be purified water (municipal water / tap water or water equivalent in quality) that conforms to the following water quality standards.
- Acid consumption: 50 mg/L or less, Total hardness:70 mg/L or less, Ionic silica: 30 mg/L or less
- *If the humidifying element becomes contaminated with impurities (silicone, machining oil, etc.), humidification performance may decrease.
- Immerse in a solution of 25 g of citric acid per 1 L of water for about 3 hours, then rinse thoroughly with water.
- Perform cleaning and rinsing at room temperature. Depending on the installation location, cleaning may be required about once a month. Frequent cleaning may shorten the replacement interval.
- Dirty water may cause valves to clog, dirt to accumulate in water tanks, and resulting in poor humidifier performance. (Never use water from a cooling tower or warm water for heating.)
- Always install service and drain valves in the water supply piping system.
- Make sure the supply water is between 5 °C and 40 °C in temperature and 0.02 MPa to 0.49 MPa (0.2 kg/cm2 to 5 kg/cm^2) in pressure. Include a pressure release valve between the humidifier and the strainer if the water pressure will be higher than this range.
- Connect the water supply pipe to the product's water inlet with flexible pipes or equivalent to absorb vibrations and ensure anti-condensation work is done.
- Perform drain piping and anti-condensation work without fail.
- In regions with a risk of freezing, implement antifreeze measures.
- Do not connect drain pipes directly to sewage systems with an ammonia smell, as ammonia can corrode the product internally through the drain pipe.
- Install a shut-off valve for water supply and drainage (sourced locally) within reach of the inspection port.
- During water supply piping work, ensure cleanliness by washing away debris with tap water before piping, or by thoroughly draining murky water through a shut-off valve. Avoid contamination by cutting oil or cleaning solutions used in piping work.
- Maintain a slope of at least 1/100 in the drain piping to prevent water accumulation.
- For collective drain piping, other connected products may increase internal pipe pressure, hindering drainage. Ensure the pressure does not rise.
- Always attach the included drain hose to the drain outlet.
- Keep the product's installation location and humidification air conditions above 0°C.
- Install the product horizontally or slightly inclined towards the drain outlet (within 1°) to avoid water accumulation in the drain pan.
- Avoid placing items that should not get wet under the product. Condensation may drip if humidity exceeds 80% or if the drain outlet is clogged.
- The lifespan (replacement cycle) of the humidification element is approximately three years, though it may shorten based on water quality and operation conditions.
  - Conditions:
    - Evaporation residue: 150ppm
    - Total hardness: 53mg/L
    - Ionic silica: 20mg/L
  - Annual operating time: 10 hours/day × 26 days/month × 5 months = 1,300 hours.
  - Replacement cycle: When initial humidifying capacity falls to about 70%. This is a guideline for safe long-term use, not a warranty period.
- Install a locally sourced humidity control device to prevent over-humidification.
- For 24-hour operation, regular maintenance (e.g., part replacement) is necessary.

4D161686

10 Precautions

10 - 1 Precautions

VKM-JM

[Usage Precautions]

- Maintenance
  - To use the product correctly, please read the attached instruction manual before use.
  - Cleaning the air filter, heat exchange element, and integrating or replacing high-performance filters (sold separately)
  - involves high places and can be dangerous. Please contact your dealer. If you do it yourself, follow the safety precautions and the instruction manual closely.
  - Ensure you stop operation and turn the power switch to "off" before maintaining the product to prevent injury.
  - Disconnect all power sources, including remote displays, booster fans, and electric damper interlock power. Refer to the catalog and installation instructions for optional adapters for confirmation of connected power sources.
  - When opening the maintenance cover, protect against water leakage by placing a plastic sheet beneath the product.
  - Water may spill due to movement during maintenance if it has accumulated inside. Wipe off any water droplets or clean as necessary if water is noted inside.

- Air Filter Maintenance
  - Clean the air filter at least once a year.
  - Use a vacuum cleaner to remove dirt or wash with water. If heavily soiled, wash with a soft brush and neutral detergent.
  - After washing, ensure thorough draining and air-dry in the shade for 20-30 minutes before securely reinstalling.

- **Note:**
  1. Do not wash the air filter with water hotter than 50°C.
  2. Do not expose the air filter to an open flame.
  3. Avoid direct sunlight on the air filter.
  4. Do not use gasoline, thinner, or similar organic solvents.
  5. Ensure the air filter is installed correctly to prevent clogging of the heat exchange element with debris. Replacement air filters are available as optional accessories.
  6. Avoid scrubbing the air filter when washing with water.

- Heat Exchange Element Maintenance
  - Follow the instruction manual of each model for maintenance at least once every two years.
  - Use a vacuum cleaner with a brush attachment to remove dust and debris from the heat exchange element's surface.
  - Gently run a brush over the surface of the heat exchange element for cleaning without damaging its structure.

- **Note:**
  - Do not wash the heat exchange elements of standard type models with water. If heavily soiled, immerse in lukewarm water with dissolved neutral detergent, and lightly scrub with a brush before ensuring thorough drainage after washing.

4D161687

10 Precautions

10 - 1 Precautions

VKM-JM

[Usage Precautions]

Maintenance

- Before the first operation after installation and at the beginning of each season, perform flushing of the water supply piping.
- Perform the following checks once a year (at season start) as a guideline:
  - Inspect and clean the strainer (mesh).
  - Inspect and clean the water supply tank and the float switch for the water supply tank.
  - Inspect and clean the humidification element.
  - Inspect the solenoid valve.
  - Inspect and clean the drain pan and its float switch.

- To keep the humidifier clean, if the humidification function will not be used for a prolonged period (2 to 3 weeks or more), stop the water supply and operate in fan mode to perform a drying operation of the humidifier.
- The lifespan (replacement cycle) of the humidification element is approximately three years, though it may shorten based on water quality and operation conditions.
  - Conditions:
    - Evaporation residue: 150ppm
    - Total hardness: 53mg/L
    - Ionic silica: 20mg/L
  - Annual operating time: 10 hours/day × 26 days/month × 5 months = 1,300 hours.
  - Replacement cycle: When initial humidifying capacity falls to about 70%. This is a guideline for safe long-term use, not a warranty period.

*If the humidifying element becomes contaminated with impurities (silicone, machining oil, etc.), humidification performance may decrease.

Immerse in a solution of 25 g of citric acid per 1 L of water for about 3 hours, then rinse thoroughly with water.
Perform cleaning and rinsing at room temperature. Depending on the installation location, cleaning may be required about once a month. Frequent cleaning may shorten the replacement interval.

Other Usage Precautions

- Do not operate the unit without the air filter, as debris and dust can clog the heat exchange element, reducing performance and potentially causing a malfunction.
- If the handle of the heat exchange element is damaged or deteriorated during cleaning, it may pose a risk of detachment or falling. Replace it if necessary.
- Do not attach anything other than the designated air filter (such as kitchen paper) to the intake. This can reduce performance and cause freezing or water leakage.
- Inhaling fog, mist, or humid air may lead to water droplets dripping from the air filter and heat exchange element, causing external water leakage and possibly damaging electrical components like damper motors. Stop operation if this occurs and wipe up any accumulated water inside the unit before resuming use.
- If fresh air from outdoors (OA) is highly humid and the air conditioner is not operating, continuous operation of the product may cause return air from room (RA) to fall outside the humidity operational range, leading to potential water leakage from the heat exchange element. In such cases, either operate the air conditioner to adjust indoor humidity within the operational range or stop the product operation.
- During severe weather conditions, such as heavy snow or strong winds (e.g., snowstorms or typhoons), water may enter the unit. Stop operation to prevent this.
- Avoid placing items below the product that could be damaged by moisture. Condensation may drip if humidity exceeds 80% or if the drain outlet is clogged.

4D161688

10 Precautions

10 - 1 Precautions

VKM-JM

[Precautions for Options and CO_2 Sensor]

- For optional items, refer to the latest option list.
- The optional kit is exclusively for use with the total heat exchanger unit (Heat Reclaim Ventilator). Ensure the correct model application and proper installation to prevent part detachment or injury.
- For moving, reinstallation, disassembly, or repair of the product, consult your dealer or the manufacturer's customer service center. Improper handling can result in electric shock, fire, or injury from product drop.
- When performing installation on pre-installed products, ensure the power is off and existing wiring does not interfere with the installation work to avoid electric shock.
- The product's sensors are not measuring instruments based on the Measurement Act and should not be used as safety devices for detecting or preventing toxic or flammable gases like oxygen deficiency or carbon monoxide poisoning. CO_2 detection is performed in return air from room (RA) airflow path of the unit, which may cause discrepancies with the room's actual CO_2 concentration.
- The target CO_2 concentration is a reference value. The detected CO_2 concentration can vary based on the usage environment and installation conditions, sometimes exceeding the target in certain environments.
- Avoid use in rooms with cigarette smoke as the environment cannot be maintained.
- Do not use in environments with high sulfur dioxide content, such as hot spring areas, as it may degrade the CO_2 sensor.
- CO_2 sensors can also detect gases such as Freon, city gas, LP gas, thinners, gasoline, alcohol, hair spray, carbon monoxide, spray-type insecticides, combustion gases from oil stoves, and car exhaust.
- Sudden temperature changes or humidity fluctuations from rainfall can affect sensor detection. In such cases, switch ventilation control from "Auto" to "Strong" or "Extra-strong".
- For fan control via CO_2 sensor:
  - Set the remote control ventilation toggle to "Auto" to adjust airflow to the room's CO_2 concentration.
  - After setting "Auto", force operation in "Strong" mode for 20 minutes to reduce indoor CO_2 levels.
  - Automatic airflow adjustment is not performed during normal ventilation mode.
- If you want to remove odors or dust regardless of CO_2 levels, operate in "Strong" or "Extra-strong" instead of "Auto".
- In areas where CO_2 is constantly high, detection accuracy decreases, so use "Strong" or "Extra-strong" ventilation. Automatic increase in airflow during auto operation may lead to increased noise.
- If ventilation is designed to include miscellaneous exhausts such as toilets, air balance may be disrupted, allowing unwanted exhaust into living areas. Use "Fresh-up Operation" in such cases.

4D161689

10 Precautions

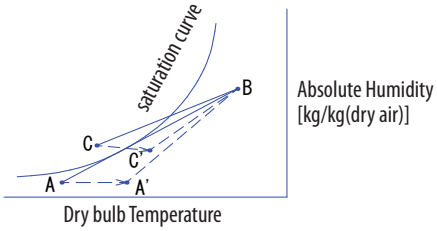
10 - 1 Precautions

VKM-JM

[Outdoor Air Intake Conditions Requiring Condensation Prevention]

As shown in the figure below, when the air conditions at the intake side, Points A and B, are plotted on a psychrometric chart, condensation or frost may occur on the heat exchange element if the high-temperature side air B, after heat exchange, reaches an air condition such as Point C that exceeds the saturation curve.In such cases, the low-temperature side air condition A shall be increased to Point A' so that the resulting air condition after heat exchange shifts from Point C to Point C', which remains below the saturation curve, before operating the unit.Based on the Winter Condensation

Limit Chart, appropriate measures such as preheating shall be applied to ensure that the outdoor air intake temperature does not fall below the limit defined by return air from room (RA) temperature and relative humidity.



If the heat exchange element becomes wet due to condensation, the element may deteriorate, resulting in a reduction of enthalpy exchange efficiency.In the case of frosting, heat exchange will not be performed.

As a countermeasure, preheating of the low-temperature side air is recommended.

[Ambient Temperature and Humidity Conditions Requiring Condensation Prevention]

Depending on the ambient temperature and humidity conditions surrounding the unit, condensation may occur on the unit casing and ductwork, which may result in water leakage outside the unit. Therefore, the following precautions shall be observed.

- The unit shall not be used in high-humidity environments such as indoor swimming pools with warm water, bathrooms, mushroom cultivation rooms, or heated stone spa facilities.
- The figure below assumes indoor installation of the unit; therefore, the term "Return air from room(RA) or ambient conditions" is used.
- The unit and all connected ductwork shall be installed within the insulated envelope of the building.

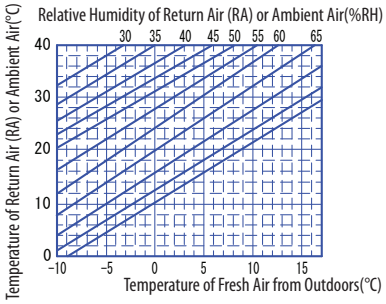
Winter Condensation Limit Chart

- Refer to the Winter Condensation Limit Chart, and operate the unit under conditions where, based on the fresh air from outdoors (OA) temperature, the ambient temperature surrounding the unit and the relative humidity of the return air from room (RA) do not exceed the specified limit lines.
- When the unit is operated for extended periods exceeding 10 hours per day, condensation may occur even within the range shown in the condensation limit chart.If the temperature of fresh air from outdoors (OA) falls below 0°C, operate the unit under conditions where the dew point temperature of the ambient air surrounding the unit does not exceed 10°C.

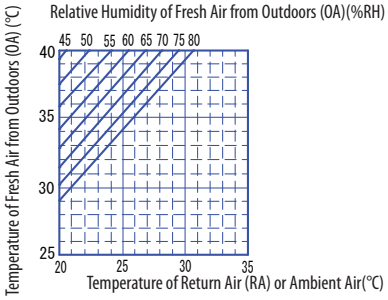
Summer Condensation Limit Chart

- Refer to the Summer Condensation Limit Chart, and operate the unit under conditions where the ambient temperature surrounding the unit does not exceed the limit lines defined by the temperature and relative humidity of fresh air from outdoors (OA).
- When the unit is operated for extended periods exceeding 10 hours per day, condensation may occur even within the range shown in the condensation limit chart.

Winter Condensation Limit Chart



Summer Condensation Limit Chart



4D161690B

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