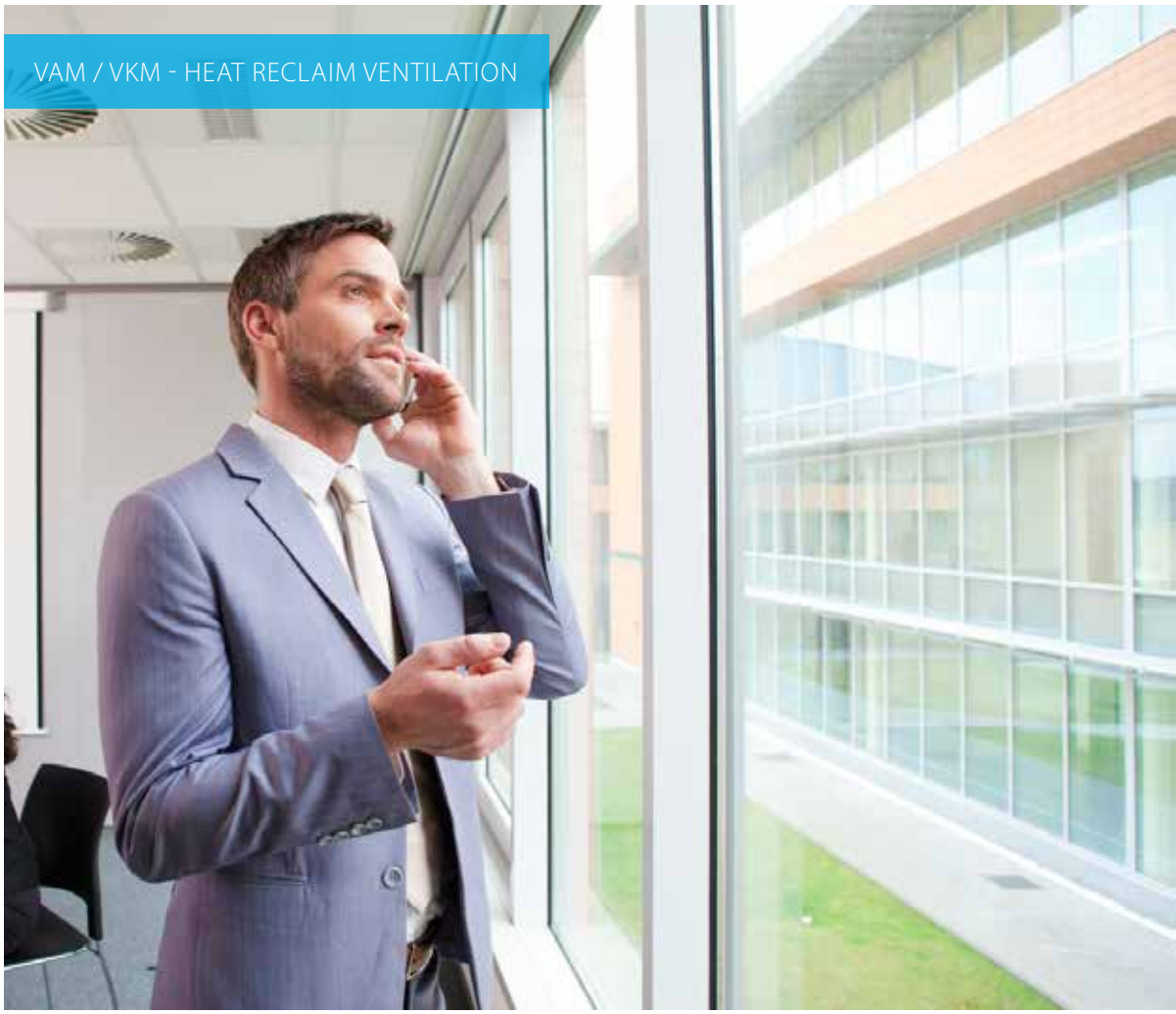
Ventilation

Product catalogue 2015 for installers

Fresh air for the residential and commercial sector
Heat reclaim ventilation and air handling applications

VAM / VKM - HEAT RECLAIM VENTILATION



DAIKIN AIR HANDLING UNIT AND ERQ/VRV PLUG & PLAY CONNECTION

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Why choose Daikin

Our promise is to ensure that **your customers can depend on Daikin for the ultimate in comfort**, so that they are free to **focus on their own working and home lives**.

We promise to dedicate ourselves to **technological excellence**, a **design focus** and the **highest quality standards** so that your customers can trust and rely on the comfort we deliver.

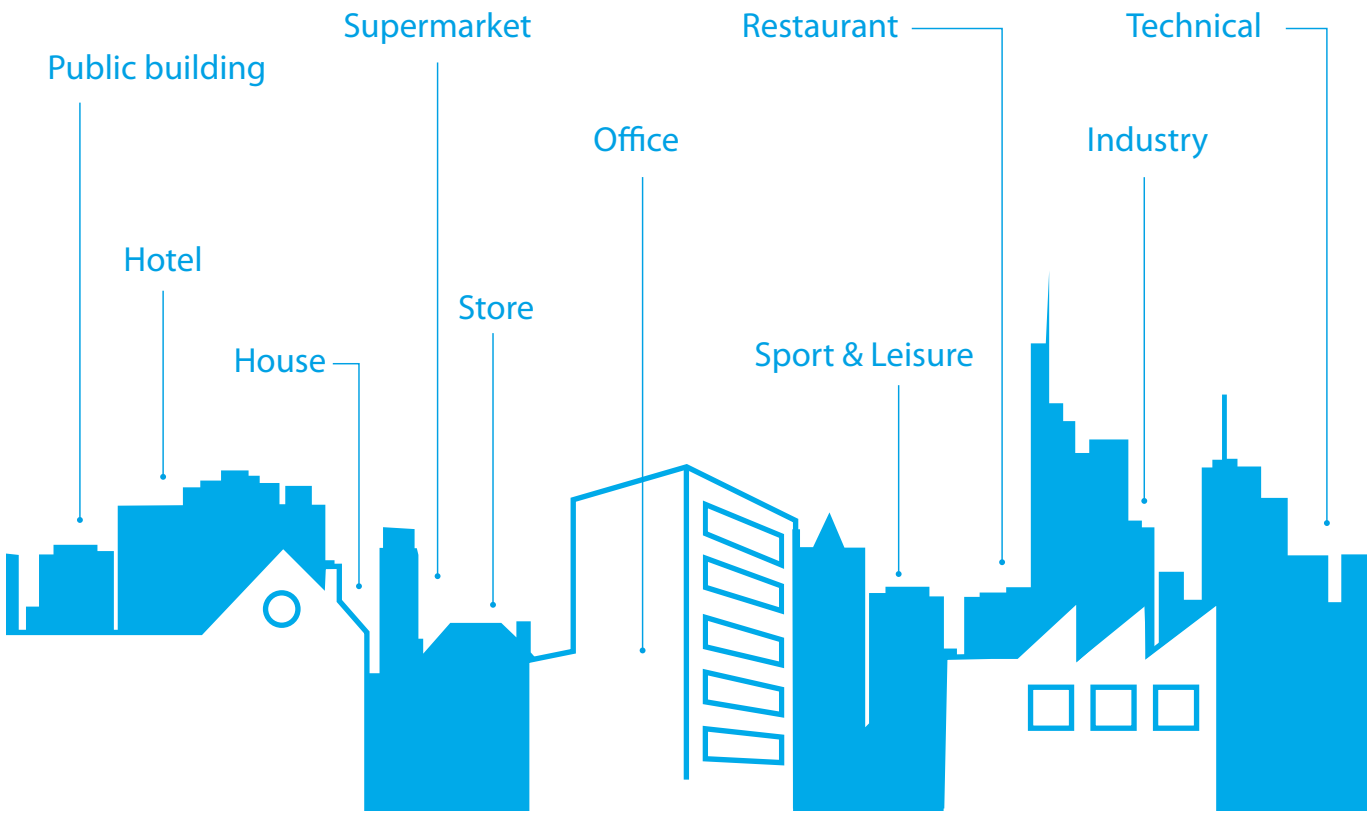
Our promise to the planet is absolute. Our products are at the forefront of **low energy consumption** and we continuously **innovate to reduce the environmental impact** of HVACR solutions further.

We lead where others follow. We will continue our global leadership in HVACR solutions as our specialist expertise in all market sectors combined with **90 years' experience** enable us to **deliver added value in long-lasting relationships based on trust, respect and credibility.**

Ventilation

Fresh air for the residential and commercial sector

Daikin commercial ventilation systems provide outdoor fresh air, remove stale air and balance the humidity within a building. This all helps to create a clean and comfortable environment that enhances the well-being of building users. Ventilation also provides free cooling, using fresh outside air, and has the option of heat recovery to provide the highest levels of energy efficiency and comfort.



Ventilation and air purification

Why Daikin ventilation and air purification?

Fresh air is vital to our quality of life and well being. But as buildings become more airtight, fresh air circulation is much reduced. Daikin offers a variety of ventilation, air purification and large scale air handling solutions to help provide a fresh, healthy and comfortable environment in offices, hotels, stores and other commercial environments.

Why we need fresh air in buildings

As building regulations raise standards in the energy efficient design of buildings, insulation levels become much higher, reducing the heating and cooling demand in buildings. However, stale air can remain trapped and cause:

› Need of oxygen
› Greater risk of allergies
› Odours lingering for longer
› Increased condensation causing mould

• Unique products that make the difference

in efficiency
› Recovery of up to 80% of heat lost through ventilation, reducing running costs
› Free night-time cooling using fresh outside air

in comfort
› Enhances the well-being of building users by introducing fresh air and balancing humidity
› Medium and fine dust filters (M6, F7, F8)
› Uses heat recovered from outgoing air to warm up incoming air to comfortable levels

in installation
› Plug & play connection of Daikin air handling units with ERQ and VRV
› Total fresh air solution with Daikin supplying both the VAM and the electrical heater
› Integrates seamlessly in the Daikin total solution, ensuring a single point of contact

in control
› Connect CO_2 sensors to prevent over-ventilation, while ensuring the correct amount of oxygen
› Intelligent Touch Manager: cost-effective mini BMS integrates HRV and Daikin air-handling units

• Top reliability

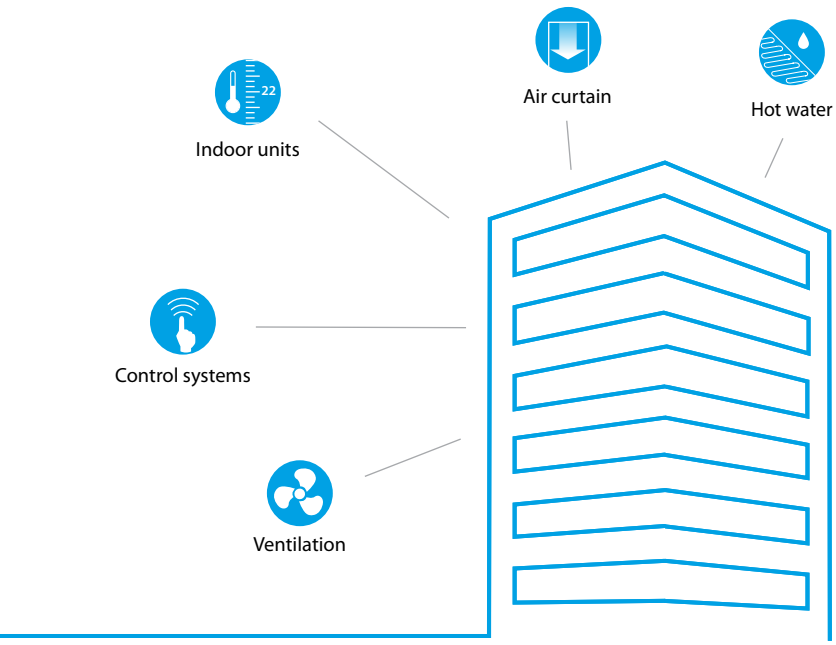
› Most extensive testing before new units leave the factory
› Widest support network and after sales service
› All spare parts available in Europe

Save energy with heat recovery

The beauty of Daikin commercial ventilation systems is that they can use heat reclaimed from the stale air being extracted from buildings to heat the incoming clean air to a comfortable temperature. This reduces the load on the air conditioning system, delivering 40% energy savings compared with introducing unheated fresh air into a building.

Integrated ventilation

Ventilation can be integrated with Daikin's cooling and heating systems, for simplified control of the entire system. By including ventilation as part of a complete climate control solution, it is possible to manage up to 50% of a building's energy use - delivering huge potential savings in running costs and carbon emissions.



Benefits for installers

Daikin's compact designs and modular assembly deliver shorter installation time

- All parts are manufactured by Daikin to work seamlessly together to ensure guaranteed compatibility
- Reduced configuration and installation time from pre-set and factory-installed components

Benefits for consultants

Daikin's wide range of systems provides a total solution concept allowing maximum flexibility

- From small ventilation systems for large air handling units, we have systems suitable for all applications
- Seamless integration of all Daikin components
- Easy integration with a Daikin or third-party BMS
- Tailor-made solutions to meet your client's needs

Benefits for owners

High air quality is essential for peak performance and optimal environment conditions

- Highly efficient heat recovery is combined with free cooling to ensure the lowest running costs
- Optional CO_2 sensors ensure the correct balance of oxygen and CO_2 while avoiding over-ventilation
- Fresh filtered air at the correct level of humidity is introduced to maximise the health benefits

Widest range of DX ventilation on the market

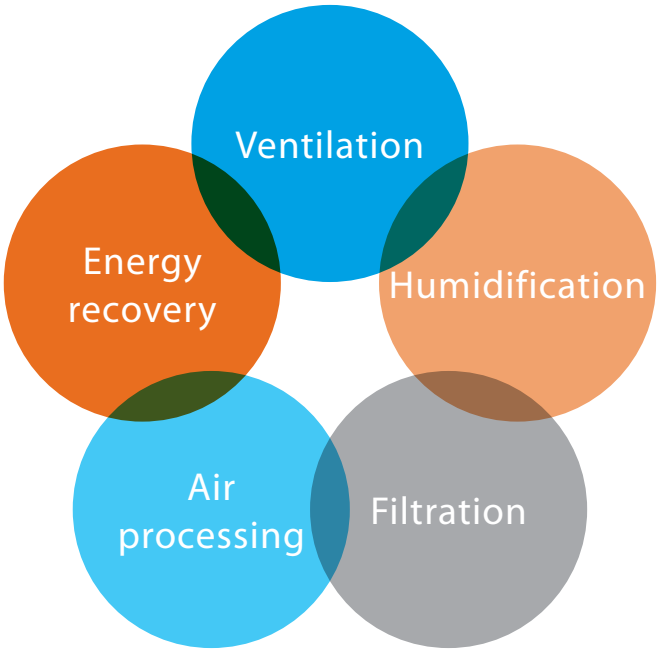
Daikin offers a variety of solutions from small heat recovery ventilation to large-scale air handling units for the provision of fresh air ventilation to homes, offices, hotels, stores and other commercial outlets.

Heat Reclaim Ventilation

Proper ventilation is a key component of climate control in buildings, offices and shops. In its basic function, it ensures a flow of incoming fresh air and outgoing stale air. Our HRV (heat reclaim ventilation) solution can do much more. It can **recover heat and optimise the balance between indoor and outdoor temperature and humidity**, thus reducing the load on the air conditioning system up to 40% and increasing efficiency.

Daikin air handling units combined with condensing units

From small to large commercial spaces, Daikin offers a range of R-410A inverter condensing units for use in conjunction with air handling units. In situations where Daikin's commercial range ventilation units cannot satisfy the ventilation requirement due to building constraints (large atriums, banqueting halls, etc.), air handling units represent the ideal solution. **Air handling units provide large fresh air volumes (>1,000 m/h) and high ESPs, enabling the use of extensive ductwork runs.**



Five components of indoor air quality

- **Ventilation:** ensures the provision of fresh air
- **Energy recovery:** recovers heat and moisture from the outgoing air to maximise comfort and efficiency
- **Air processing:** heats or cools incoming fresh air maximising comfort and minimising the load on the air conditioning installation
- **Humidification:** optimises the balance between indoor and outdoor humidity
- **Filtration:** removes dust, pollution and odours from the air

Air flow rate (m^3/h)*

Type	Product name	Model	0 200 400 600 800 1,000 2,000 4,000 6,000 8,000 140,000	Components of indoor air quality
Heat reclaim ventilation	VAM-FA/FB 	Ventilation with heat recovery as standard › Energy saving ventilation › Maximise floor space for furniture, decoration and fittings › Free cooling › Reduced energy consumption thanks to DC inverter fan motor › Optional CO_2 sensor saves energy while improving indoor air quality		› Ventilation › Energy recovery 
	VKM-GB 	Pre heating or cooling of fresh air for lower load on the air conditioning system › Energy saving ventilation › Creates a high quality indoor environment › Maximise floor space for furniture, decoration and fittings › Free cooling › Reduced energy consumption thanks to DC inverter fan motor		› Ventilation › Energy recovery › Air processing 
	VKM-GBM 	Pre heating, cooling and humidification for optimum comfort › Energy saving ventilation › Creates a high quality indoor environment › Balance your indoor humidity level › Maximise floor space for furniture, decoration and fittings › Free cooling		› Ventilation › Energy recovery › Air processing › Humidification 
Air handling units	DX total fresh air package 	Fully customised solution for ventilation and air handling › Inverter technology › Heat pump and heat recovery › Provides virtually free heating › Room temperature via Daikin control › Large range of expansion valve kits	 **	› Ventilation › Energy recovery › Air processing › Humidification › Filtration 

* Air flow rate is a calculated indication only, based on the following values: heating capacity EKEXV-kit * $200m^3/h$

** Daikin AHU connected to Daikin chiller solution

Create a high-quality indoor environment

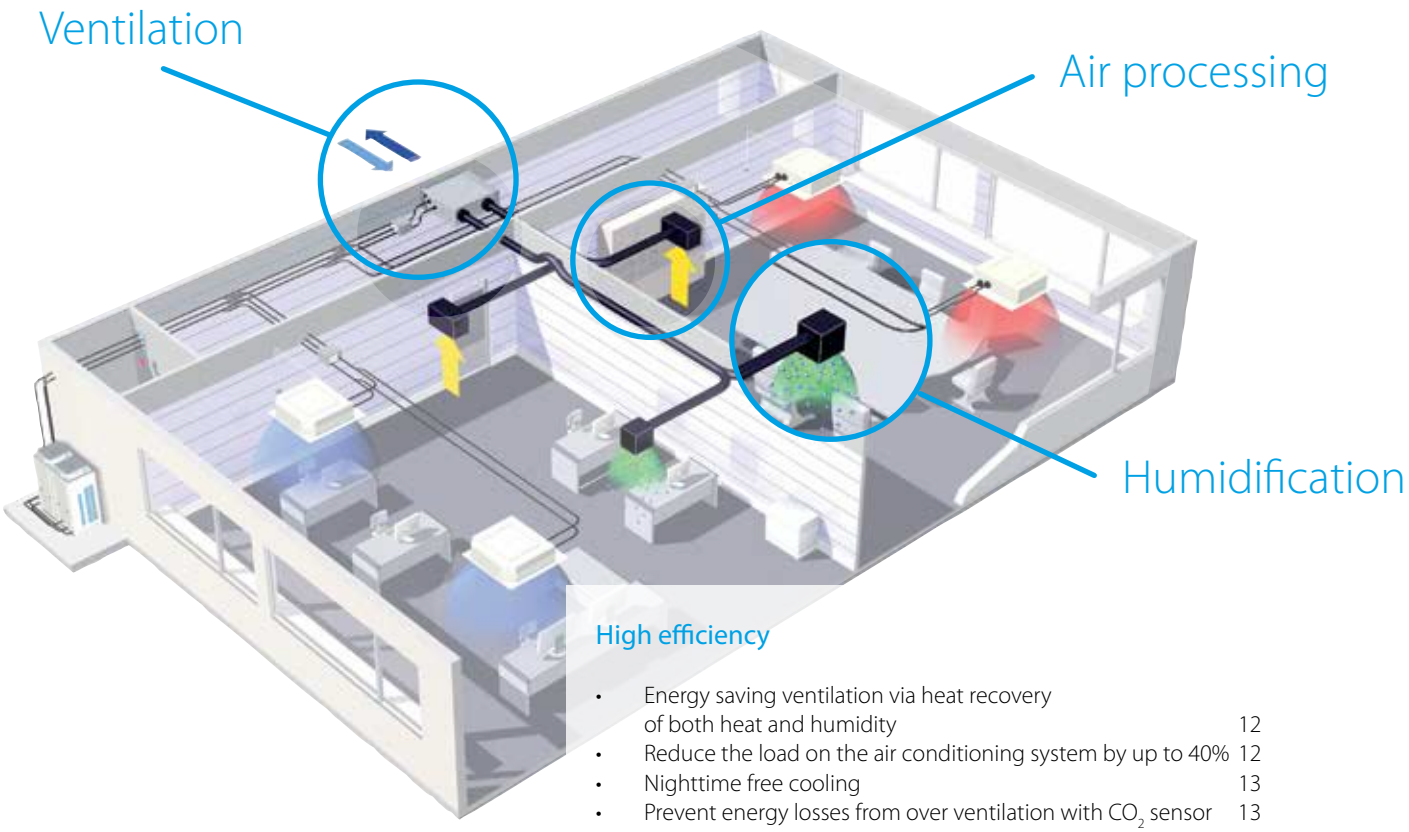
The Daikin HRV (heat reclaim ventilation) unit recovers up to 80% of heat energy lost through ventilation and maintains a comfortable and clean indoor environment without changing the room 's temperature.

Save up to 40% on running costs through integration

Integrating the HRV with Daikin's Sky Air and VRV air conditioning ensures that the system always operates in the most efficient and comfortable way. For example, the free cooling available via the ventilation unit will enable the air conditioning unit to be switched off and so saving running costs. Thanks to heat recovery and integration, up to 40% of the total running costs can be saved!

HRV

Heat reclaim ventilation



High efficiency

High indoor air quality & whisper quiet operation

Maximum flexibility

• High efficiency

Energy saving ventilation via heat recovery of both heat and humidity

Recovers up to **80%** of waste heat

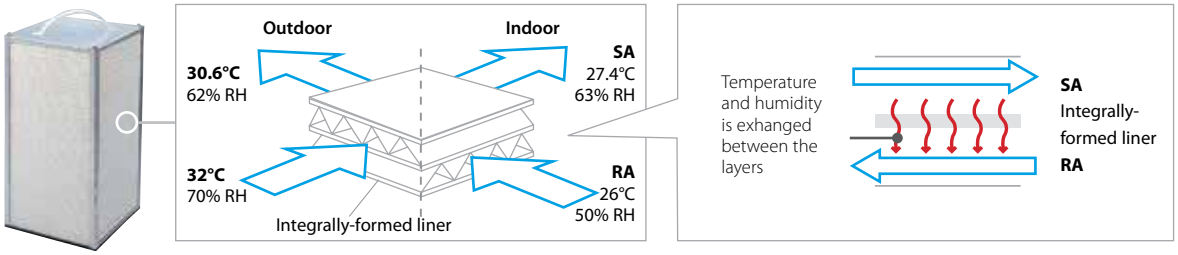
In traditional ventilation systems, conditioned air from the building is simply expelled, then new unheated air is brought into the building. So a large volume of air is heated up or cooled down unnecessarily, leading to a substantial waste of energy. Daikin's HRV solutions prevent energy being wasted by recovering up to 80% waste heat from the outgoing air, thus offering much greater levels of efficiency, while improving comfort levels too.

Specially developed heat exchange element

The heat exchange element uses a high efficiency paper (HEP) possessing superior moisture absorption and humidifying properties. The heat exchange unit rapidly recovers heat contained in latent heat (vapour). The element is made of a material with flame resistant properties and is treated with an anti-moulding agent.

Operation of the high effiency paper.

Cross flow of air to exchange heat and moisture.



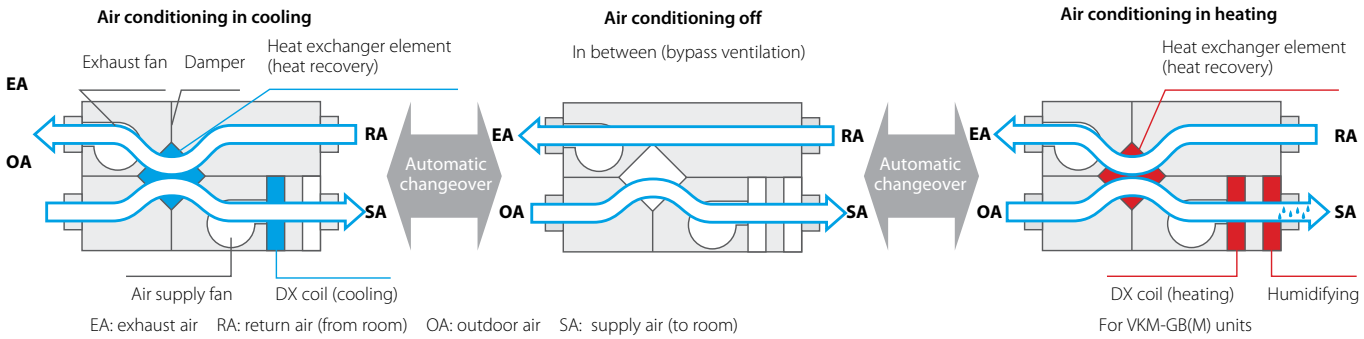
Thanks to the heat and moisture exchange the hot and humid outside air is brought to levels close to indoor conditions saving on the air conditioning runningcost and maintaining comfort.

RH: Relative Humidity
SA: Supply Air (to room)
RA: Return Air (from room)

Reduce the load on the air conditioning system by up to 40%

24%	by using heat recovery ventilation (in comparison with normal ventilation fans)
6%	by switching over to auto-ventilation mode
2%	by using the pre-cool, pre-heat control (reduces air conditioning load by running the HRV until after the air conditioning is switched on)
5%	by enabling the free cooling operation overnight
3%	by preventing over-ventilation with the optional CO_2 sensor

Advantages of integration of ventilation and air conditioning (automatic change over)



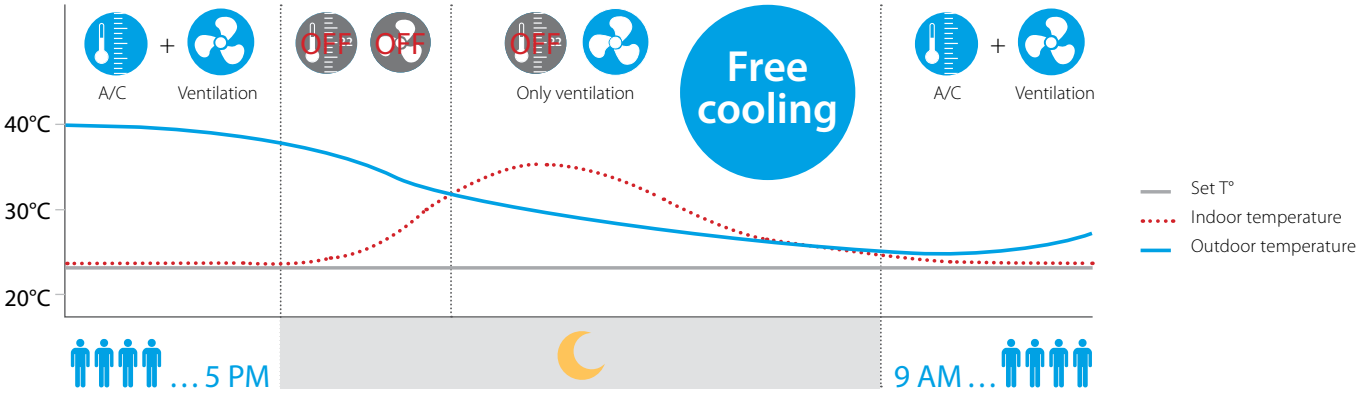
EA: exhaust air RA: return air (from room) OA: outdoor air SA: supply air (to room)

For VKM-GB(M) units

Night-time free cooling

Night-time free cooling operation is **an energy saving function operating at night** when the air conditioning is switched off. By ventilating rooms containing office equipment that increases room temperature, night purge reduces the cooling load when air conditioning is switched on in the morning, reducing the daily running costs.

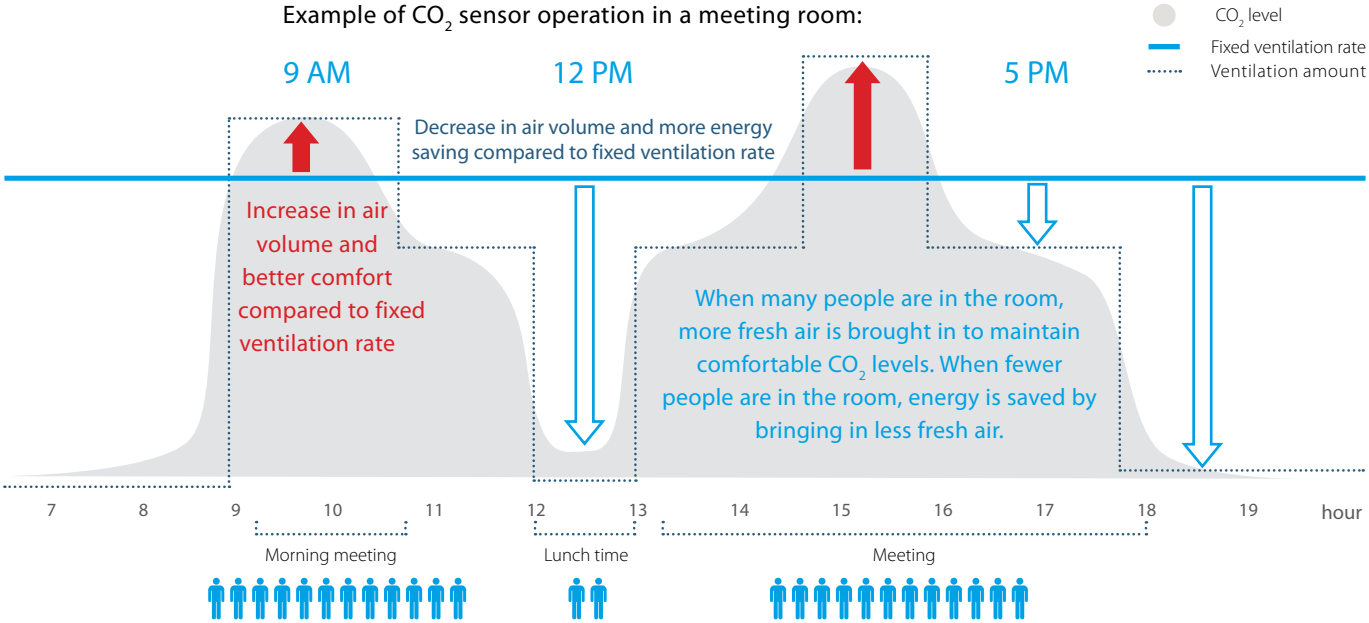
The new VAM-FB series can also perform nighttime free cooling in stand alone operation. The set temperature is a field setting at installation.



Prevent energy losses from over ventilation with CO_2 sensor

Enough fresh air is needed to create an enjoyable environment, but ventilating constantly is leading to energy waste. Therefore an optional CO_2 sensor can be installed which switches off the ventilation system when there is enough fresh air in the room, thus saving energy.

Example of CO_2 sensor operation in a meeting room:



Using CO_2 sensors has the most energy-saving potential in buildings where occupancy fluctuates during a 24-hour period, is unpredictable and peaks at a high level. For example office buildings, government facilities, retail stores and shopping malls, movie theaters, auditoriums, schools, entertainment clubs and nightclubs. The ventilation unit's reaction to fluctuations in CO_2 can be easily adjusted by the customer.

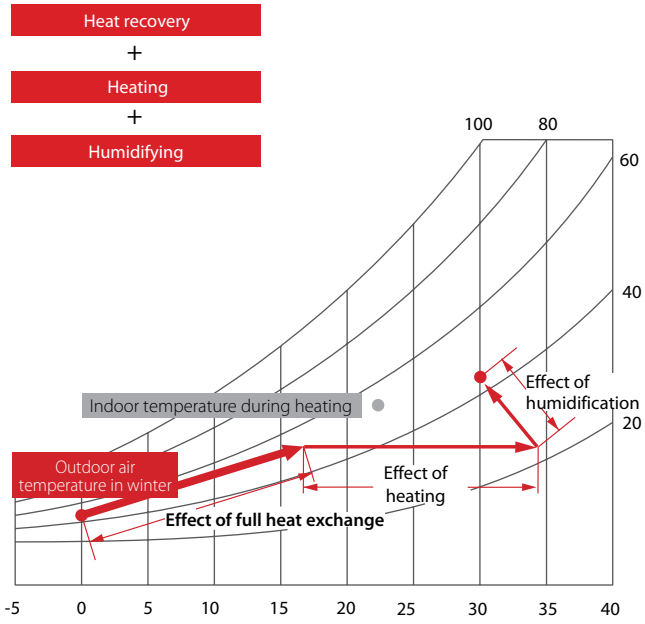
- High quality indoor air
- Whisper quiet

Creating a high quality environment

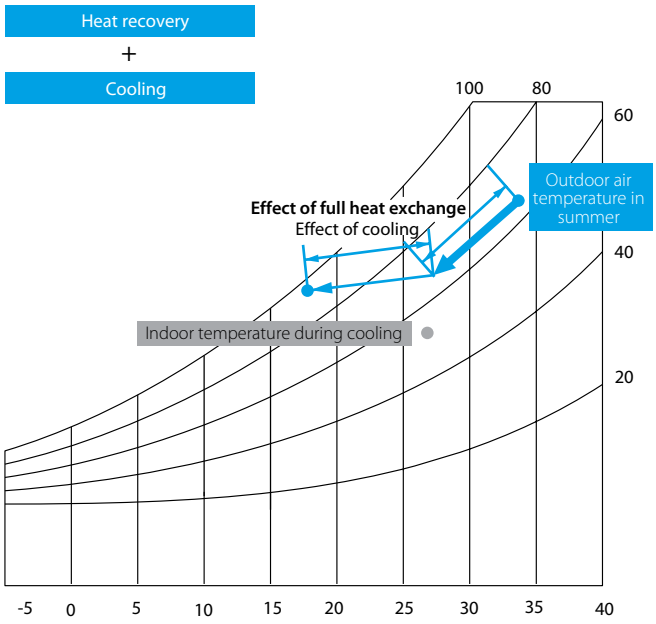
Maintain a comfortable indoor environment without fluctuations in room temperature.

How do the HRV units work?

In heating

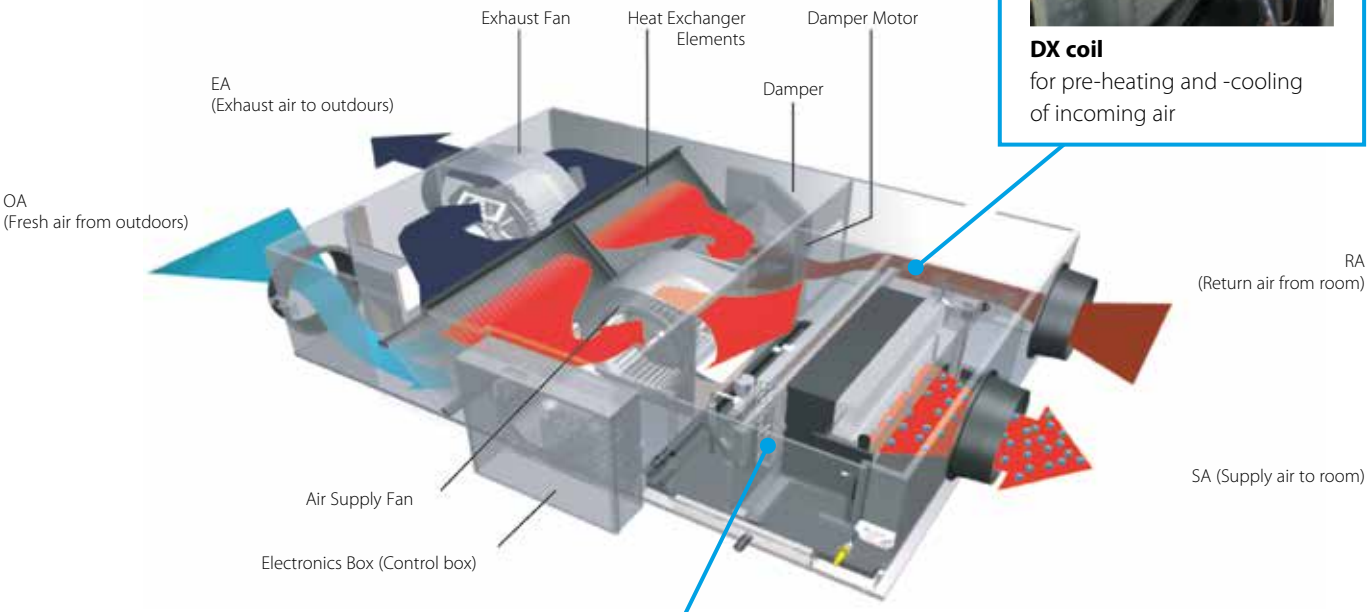


In cooling



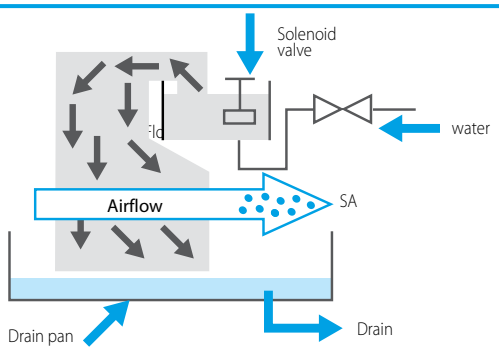
In heating we bring in cold outdoor fresh air and want to avoid cold draught and dry air.	In cooling we bring in hot outdoor fresh air and want to prevent additional load on the air conditioning system and too hot indoor temperatures.
1. Cold outside air is crossed with hot inside air. In the example the incoming air is heated up from 0 to 16°CDB while keeping the same relative humidity. This is the effect of the heat and moisture exchange.	**1.** Hot outside air is crossed with cold inside air. In the example the incoming air is cooled down from 34 to 27°CDB while keeping the same relative humidity. This is the effect of the heat and moisture exchange.
2. The DX coil further heats up the air to prevent cold draught. In the example the incoming air is further heated from 16 to 34°CDB. Because the air is heated up the relative humidity decreases.	**2.** The DX coil further cools down the air to prevent hot indoor temperatures and reduce the load on the air conditioning system. In the example the incoming air is further cooled down from 27 to 18°CDB.
3. To counter negative effects of dry air the air passes the humidifier which adds moisture in case needed. In the example the relative humidity rises from 22 to a comfortable 42%.	**3.** No humidification is needed in cooling as the air is not dried out
The result is incoming fresh air with the same humidity and slightly higher temperature for perfect comfort.	**The result is incoming fresh air with a slightly lower temperature for perfect comfort.**

Operation of humidification and air processing in heating mode (VKM-GBM)



DX coil
for pre-heating and -cooling of incoming air

Humidifier element:
Utilizing the principle of capillary action, water is permeated throughout the humidifier element. The heated air from the DX coil passes through the humidifier and absorbs the moisture.



Optional medium and fine dust filters available

M6, F7 and F8 filters are available on the VAM-FB models to meet your customer request or the local legislation.

As one has no control of the air quality in the building surroundings, you can rely on one of our dust filters to ensure the best indoor air quality possible.

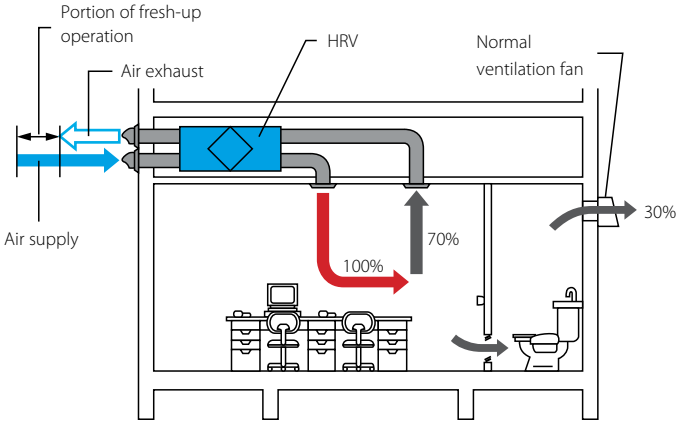
The optional filter comply with **EN779:2012**

Can operate in over and underpressure to prevent unpleasant odours

The user can select 2 fresh-up modes via the remote control for a more comfortable air environment.

1. Supply rich mode (overpressure):

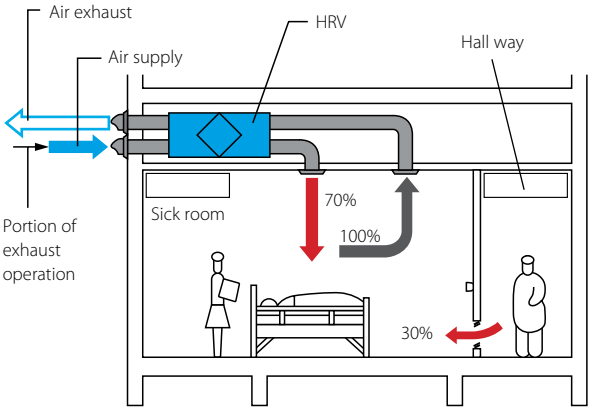
A higher air supply than air exhaust maintains proper room pressure to prevent back-flow of toilet/kitchen odours or moisture inflow.



eg. Office
Preventing that toilet odours flow to the office

2. Exhaust fresh-up (underpressure):

A higher exhaust air than air supply decreases room pressure to prevent the leaking of odours or floating bacteria into other rooms.



eg. Hospital
No bacteria can flow from the sick room to the hall way

Low operation sound level

Continuous research by Daikin into reducing operation sound levels has resulted in sound pressure levels down to 20.5dBA (VAM150FA).

Daikin indoor units

DBA	PERCEIVED LOUDNESS	SOUND
0	Treshold of hearing	-
20	Extremely soft	Rustling leaves
40	Very soft	Quiet room
60	Moderately loud	Normal conversation
80	Very loud	City traffic noise
100	Extremely loud	Symphonic orchestra
120	Threshold of feeling	Jet taking off

• Maximum flexibility

Total solution concept - integrated ventilation

The integration of ventilation into a total building climate system, such as the VRV system, offers numerous advantages. Daikin supplies all components of the entire system, simplifying its design and presenting an ideal solution for the building itself and a 'one-stop' solution for the client. As well as design benefits, it also simplifies project follow-up, installation and subsequent commissioning and maintenance since only one party is involved. Finally, the end user benefits from 'interlocking' ventilation with air conditioner operation by virtue of greatly simplified overall system control.

Note: more information on integrated control can be found in the control systems chapter.

Flexible installation

Horizontal or vertical installation

The VAM units can be installed horizontal in false ceilings for example. However if there are no false ceilings or the space is limited the unit can also be installed vertically in narrow service spaces or behind a wall. In this way the the consultant can focus fully on the design of the building.

Slim Design

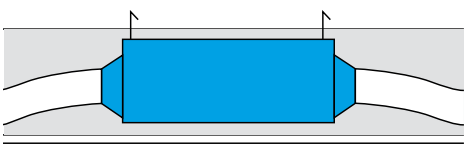
The slim design of the HRV unit enables it to be mounted in narrow ceiling voids and irregularly shaped spaces.

Ideal solution for shops, restaurants or offices requiring maximum floor space for furniture, decorations and fittings

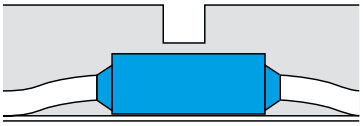
Our HRV range of units are not only energy efficient, they also blend in any interior and leave all the maximum of usable floor space. The units are invisible to see and can be installed in service spaces, making service possible while the building is in operation.

VAM250FA

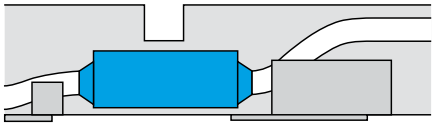
Installation under the floor of a small building



Installation under a beam



Installation in an irregular space



Wide range of units

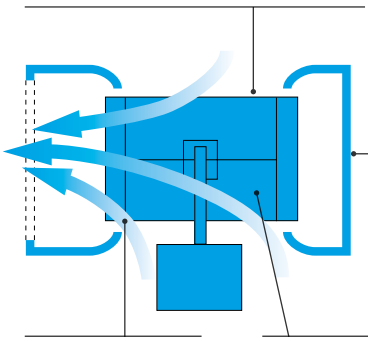
The wide Daikin range ensures correct equipment design and sizing.

High Static Pressure

External static pressure (ESP) up to 157 Pa facilitates the use with flexible ducts of varying lengths.

Higher static pressure and reduced noise

The use of multiple, overlapping arc shaped fan blades makes it possible to optimise the chord lenght and blade outlet angle.



Rotating currents for reduced loss

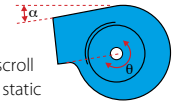
The use of a thinner scroll allows rectification of rotating currents within the scroll.

Higher static pressure

Thanks to wide fan diameter and optimised blade width

Higher static pressure and reduced pressure loss

In addition to increasing the scroll wrap angle and boosting the static pressure, the outflow angle has been optimised.



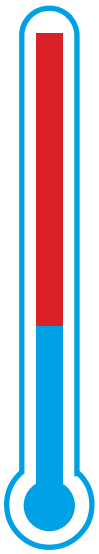
Wide operation range

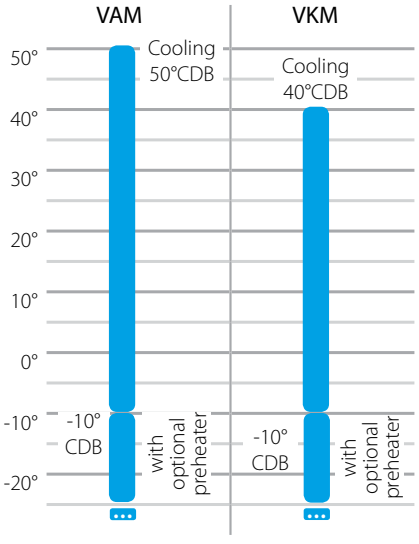
The HRV unit can be installed practically anywhere. The standard operation range (outdoor temperature) is from -10°C to 40°CDB (50°CDB for VAM units) and can be extended down if a Daikin pre-heater is installed.

[1] Contact your local dealer for more information and restrictions

Daikin's supplied electrical heater VH provides a total solution for fresh air and pre-heating.

- Integrated electrical heater concept (no additional accessories required)
- Standard dual flow and temperature sensor
- Flexible setting with adjustable setpoint
- Increased safety with 2 cut-outs: manual & automatic
- BMS integration thanks to:
  - volt free relay or error indication
  - 0-10V DC input for setpoint control

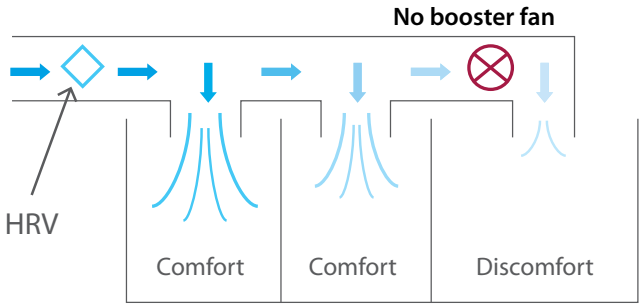


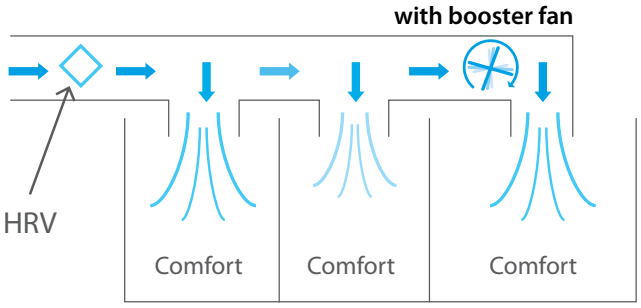


Connection to field-supplied booster fan increases flexibility even more

- Allows the installation to be adapted exactly to the installation space, filters, comfort, sound requirements and energy use
- Longer ducting or use of central duct possible
- Overcomes actual field situation when ducting is different from calculation
- Lower cost by using the booster fan instead of replacing with a larger unit when the ESP is not matched
- Can solve limited mounting space for larger VAM1500-2000 units

Example when HRV ESP is not high enough or field situation differs from calculation

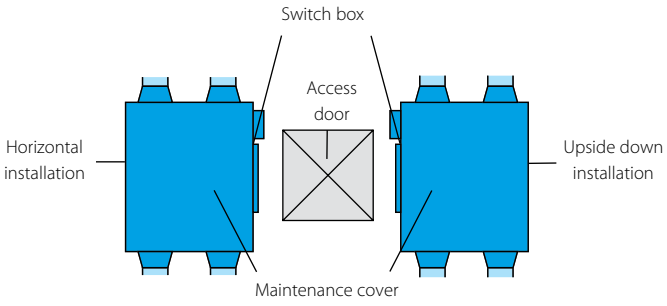




The furthest room is not well ventilated because the unit's ESP is too low for the actual field situation. This is overcome with the additional booster fan.

Simple Design and Construction

The unit can be installed either horizontally or upside down always allowing easy access for inspection and maintenance. A 450 mm square inspection hatch enables maintenance and heat exchange element replacement to be performed with ease.



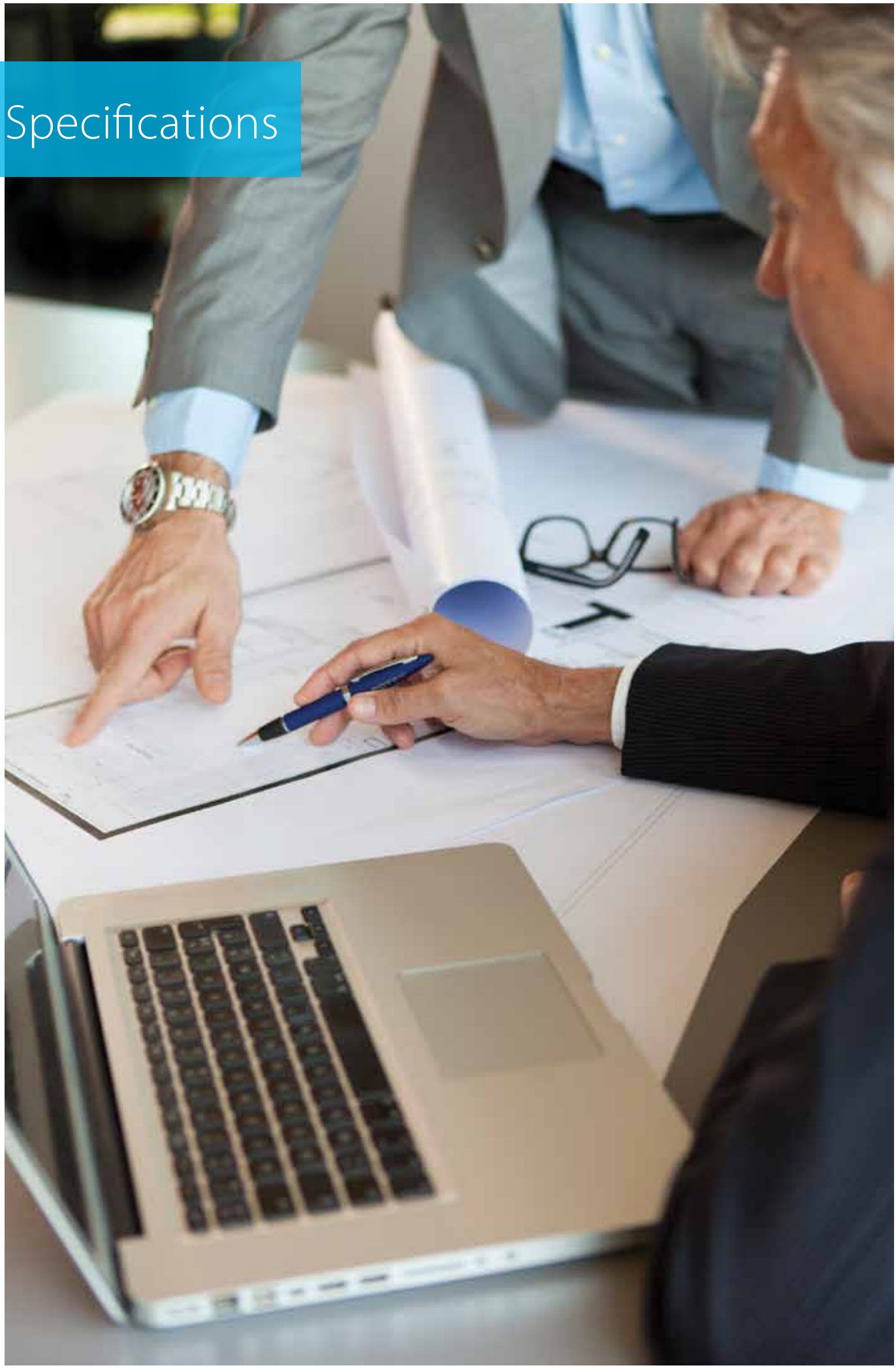
No drain needed

For the VAM-FA/FB models no drain piping is needed, meaning there additional flexibility for the installation of the units.

Ensure the most efficient selection via the selection software

The selection software Daikin supplies enables you to make the most optimum selection in the shortest possible time. The software proposes the best suited unit based upon the climate, building and applied ducting and proposes any needed accessories (electrical heater, …).

Specifications



Heat reclaim ventilation

Ventilation with heat recovery as standard

- Energy saving ventilation using indoor heating, cooling and moisture recovery
- Ideal solution for shops, restaurants or offices requiring maximum floor space for furniture, decorations and fittings
- Free cooling possible when outdoor temperature is below indoor temperature (eg. during nighttime)
- Reduced energy consumption thanks to specially developed DC fan motor
- Prevent energy losses from over-ventilation while maintaining indoor air quality with optional CO_2 sensor
- Can be used as stand alone unit or integrated in the VRV system
- Wide range of units: air flow rate from 150 up to 2,000 m^3/h
- High efficiency filters available in F6 ,F7, F8 grades
- Shorter installation time thanks to easy adjustment of nominal air flow rate, so less need for dampers compared with traditional installation.
- Specially developed heat exchange element with High Efficiency Paper (HEP)
- No drain piping needed
- Can operate in over- and under pressure
- Total solution for fresh air with Daikin supply of both VAM and electrical heaters

VAM-FA-FB

Fine dust filter

Ventilation				VAM	150FA	250FA	350FB	500FB	650FB	800FB	1000FB	1500FB	2000FB
Power input - 50Hz	Heat exchange mode	Nom.	Ultra high	kW	0.116	0.141	0.132	0.178	0.196	0.373	0.375	0.828	0.852
	Bypass mode	Nom.	Ultra high	kW	0.116	0.141	0.132	0.178	0.196	0.373	0.375	0.828	0.852
Temperature exchange efficiency - 50Hz	Ultra high/High/Low			%	74/74/79	72/72/77	75/75/80	74/74/77		74/74/76	75/75/76.5	75/75/78	
Enthalpy exchange efficiency - 50Hz	Cooling	Ultra high/High/Low		%	58/58/64	58/58/62	61/61/67	58/58/63		60/60/62	61/61/63	61/61/64	61/61/66
	Heating	Ultra high/High/Low		%	64/64/69	64/64/68	65/65/70	62/62/67	63/63/66	65/65/67	66/66/68		66/66/70
Operation mode					Heat exchange mode / Bypass mode / Fresh-up mode								
Heat exchange system					Air to air cross flow total heat (sensible + latent heat) exchange								
Heat exchange element					Specially processed non-flammable paper								
Dimensions	Unit	HeightxWidthxDepth		mm	285x776x525		301x828x816		364x1,004x868		364x1,004x1,156	726x1,512x868	726x1,512x1,156
Weight	Unit			kg	24		33		52	55	64	131	152
Casing	Material				Galvanised steel plate								
Fan-Air flow rate - 50Hz	Heat exchange mode	Ultra high		m^3/h	150	250	350	500	650	800	1,000	1,500	2,000
	Bypass mode	Ultra high		m^3/h	150	250	350	500	650	800	1,000	1,500	2,000
Fan-External static pressure - 50Hz	Ultra high			Pa	69	64	98		93	137	157	137	
	High			Pa	39		-						
	Low			Pa	20		-						
Air filter	Type				Multidirectional fibrous fleeces								
Sound pressure level - 50Hz	Heat exchange mode	Ultra high		dBA	27 / 28.5	28 / 29	32	33	34.5	36		39.5	40
	Bypass mode	Ultra high		dBA	27 / 28.5	28 / 29	32	33.5	34.5	36		40.5	40
Operation range	Min.			°CDB	-15								
	Max.			°CDB	50								
	Relative humidity			%	80% or less								
Refrigerant	Type / GWP				- / -								
Connection duct diameter				mm	100	150		200		250		350	
Power supply	Phase/Frequency/Voltage			Hz/V	1~/50/60/220-240/220								
Current	Maximum fuse amps (MFA)			A	15		16						

VH

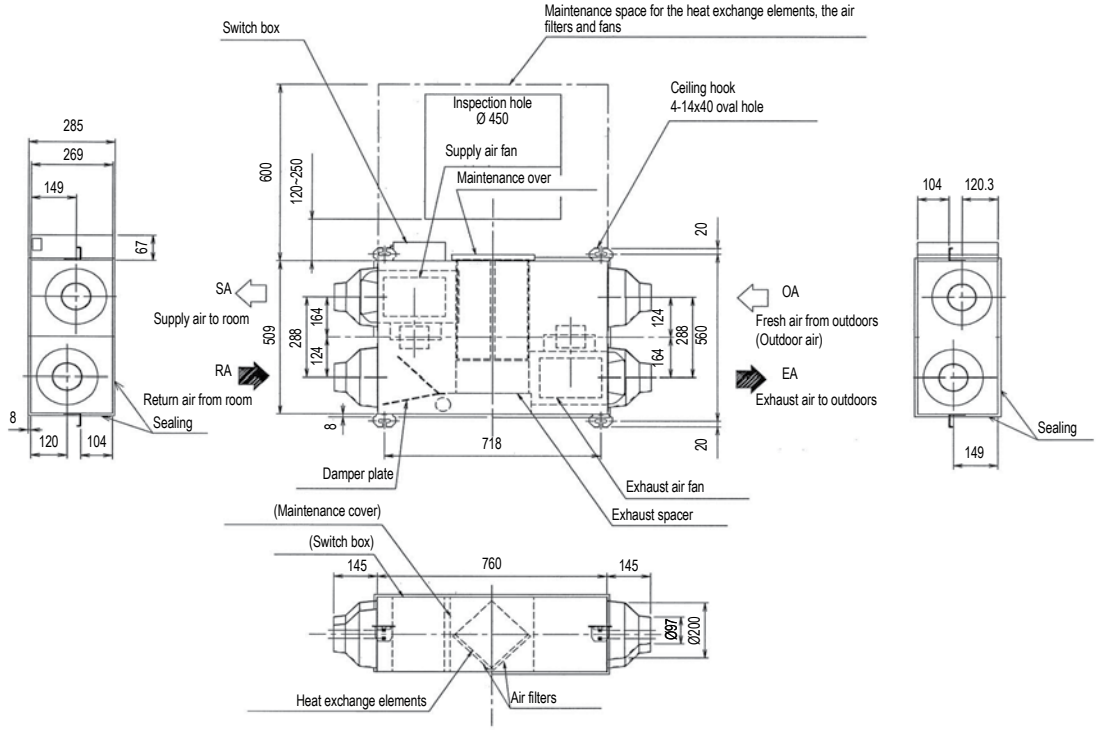
- Total solution for fresh air with Daikin supply of both VAM and electrical heaters
- Increased comfort in low outdoor temperature thanks to the heated outdoor air
- Integrated electrical heater concept (no additional accessories required)
- Standard dual flow and temperature sensor
- Flexible setting with adjustable setpoint
- Increased safety with 2 cut-outs: manual & automatic
- BMS integration thanks to:
  - Volt free relay for error indication
  - 0-10VDC input for setpoint control

ELECTRICAL HEATER FOR VAM VH	(VH)
Supply voltage	220/250V ac 50/60 Hz. +/-10%
Output current (maximum)	19A at 40°C (ambient)
Temperature sensor	5k ohms at 25°C (table 502 1T)
Temperature control range	0 to 40°C / (0-10V 0-100%)
Control fuse	20 x 5mm 250mA
LED indicators	Power ON - Yellow Heater ON - Red (solid or flashing, indicating pulsed control) Airflow fault - Red
Mounting holes	98mm x 181mm centres 5 mm ø holes
Maximum ambient adjacent to terminal box	35°C (during operation)
Auto high temp. cutout	100°C Pre-set
Man. reset high temp. cutout	125°C Pre-set
Run relay	1A 120V AC or 1A 24V DC
BMS setpoint input	0-10VDC

VH		1B	2B	3B	4B	4/AB	5B
Capacity	kW	1	1	1	1.5	2.5	2.5
Duct diameter	mm	100	150	200	250	250	300
Connectable VAM		VAM150FA	VAM250FA	VAM500FB	VAM800FB	VAM800FB	VAM1500FB
		-	VAM350FB	VAM650FB	VAM1000FB	VAM1000FB	VAM2000FB

For the selection of the appropriate capacity, please refer to the VAM selection software.

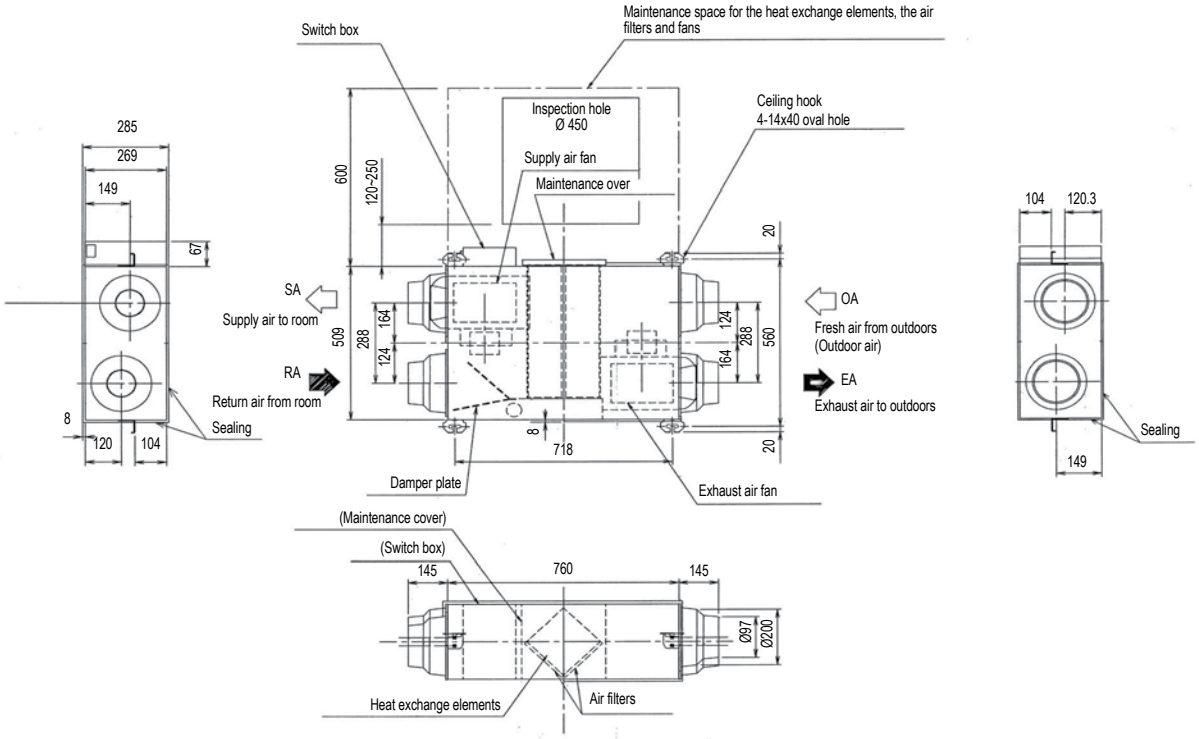
VAM150FA



NOTE

1 Be sure to provide the inspection hole (450x450 mm) to inspect the air filters, the exchange elements and fans.

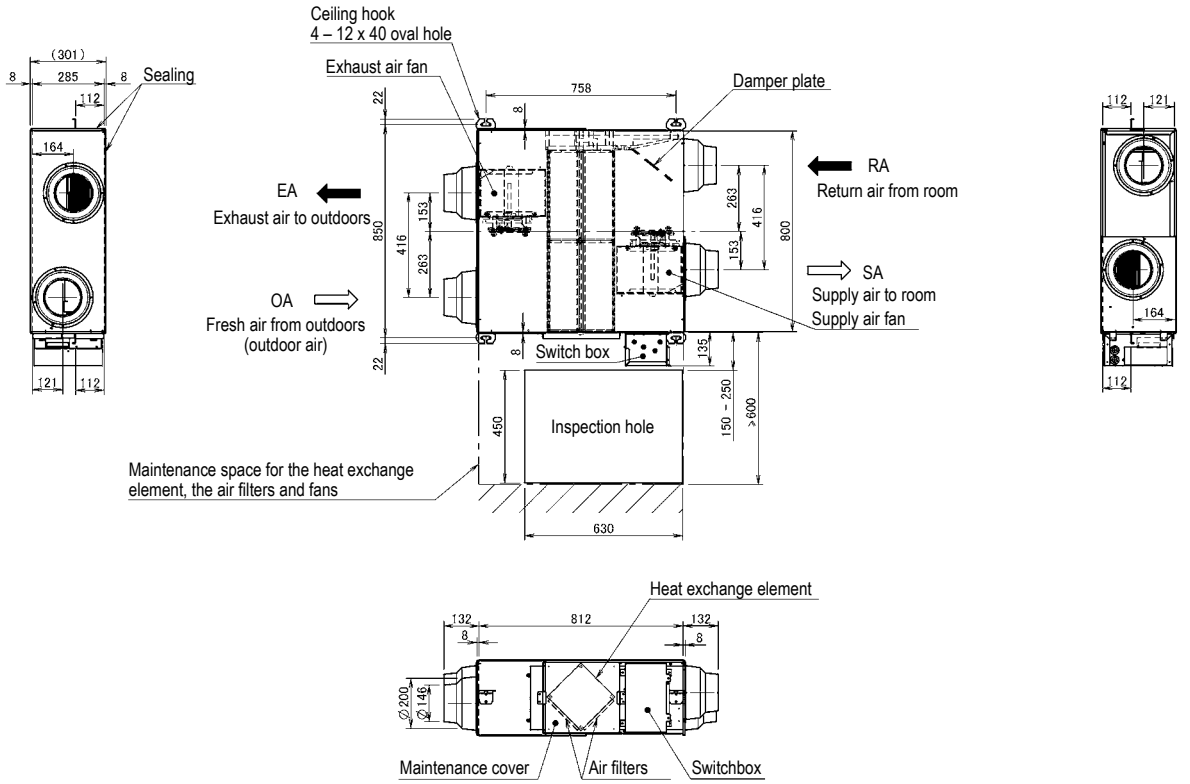
VAM250FA



NOTE

1 Be sure to provide the inspection hole (450x450 mm) to inspect the air filters, the exchange elements and fans.

VAM350FB

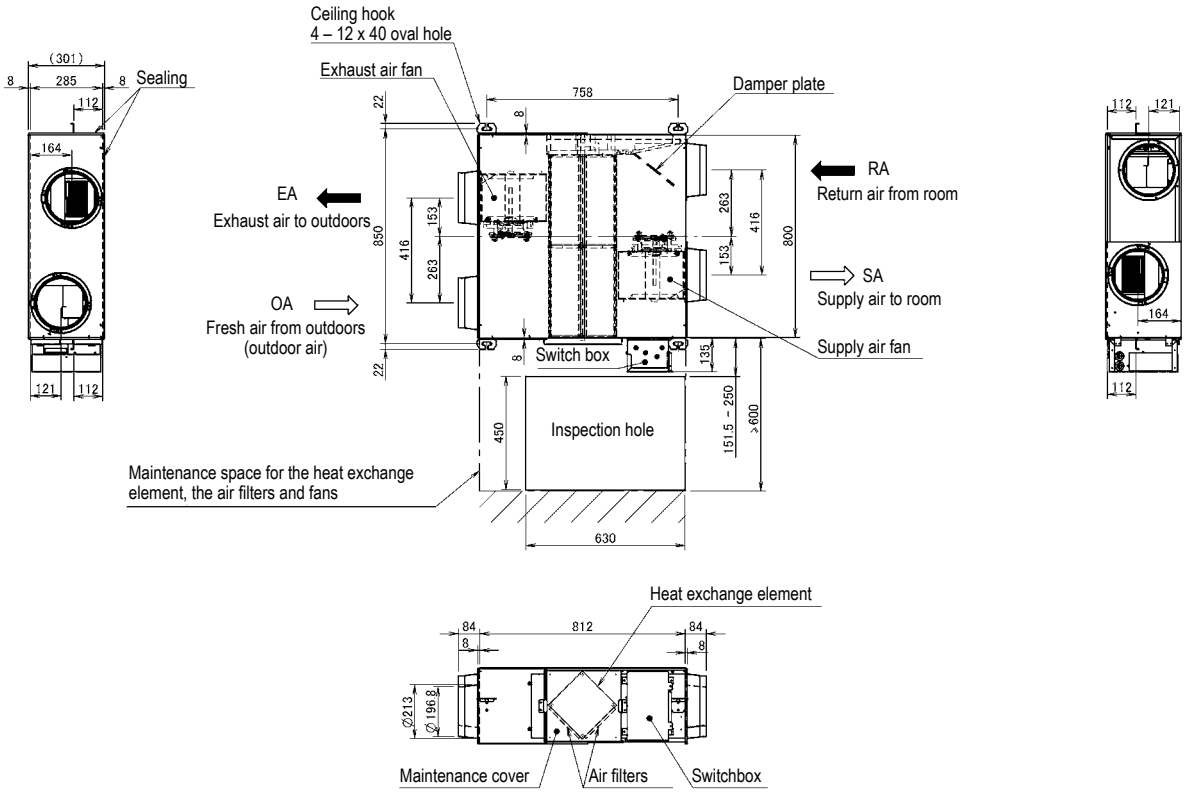


NOTES

1. Be sure to provide the inspection hole to inspect the air filters, the exchange elements and fans.

3D081162

VAM500FB

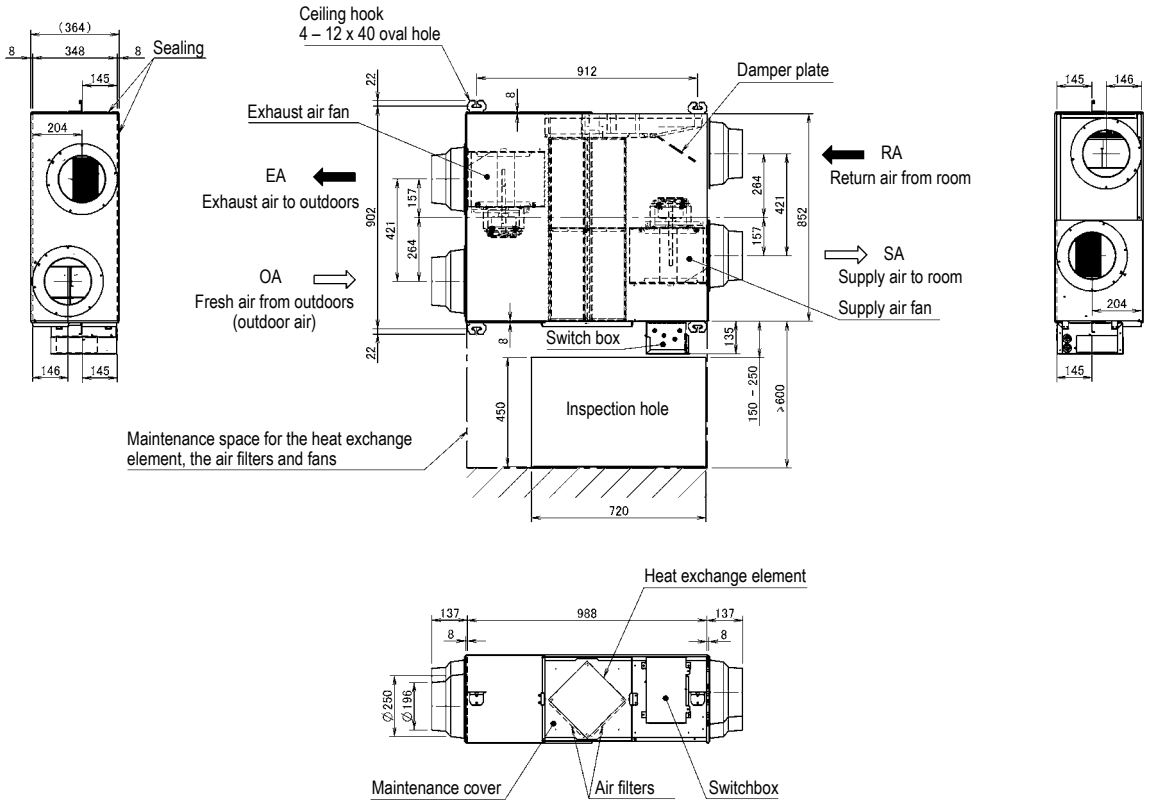


NOTES

1. Be sure to provide the inspection hole to inspectthe air filters, the exchange elements and fans.

3D081163

VAM650FB

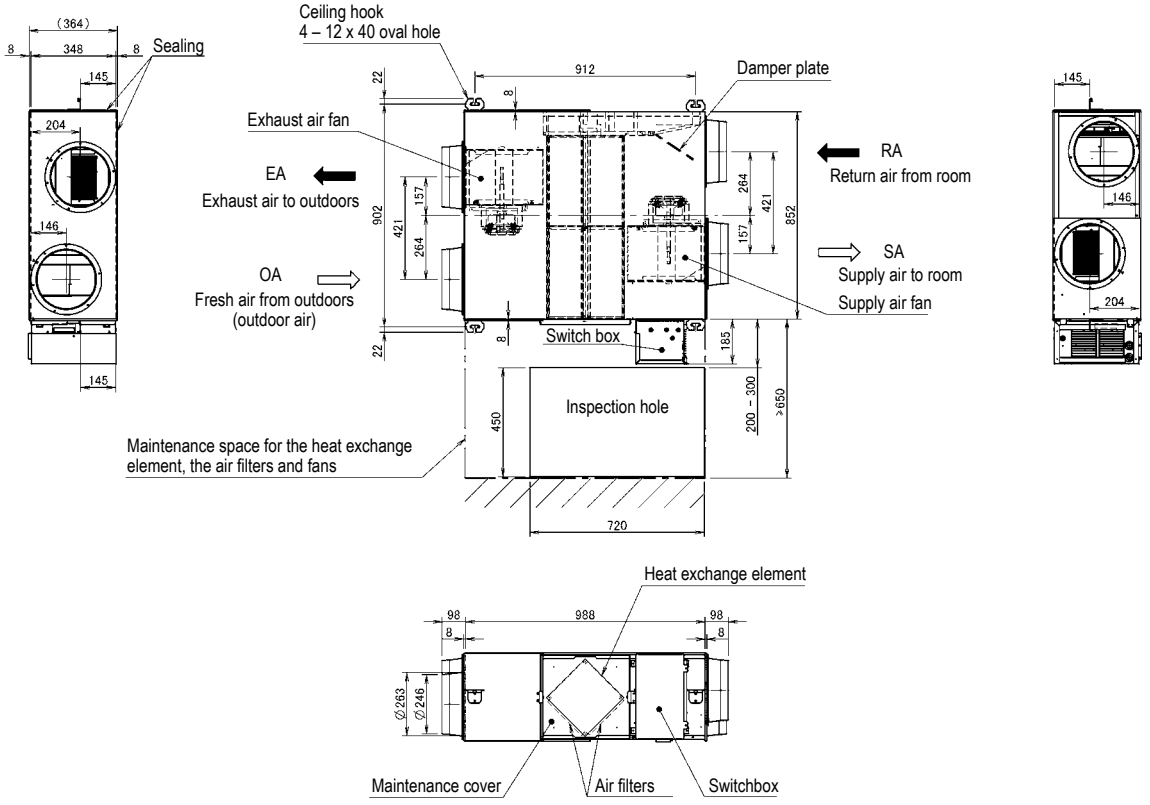


NOTES

1. Be sure to provide the inspection hole to inspect the air filters, the exchange elements and fans.

3D081164

VAM800FB

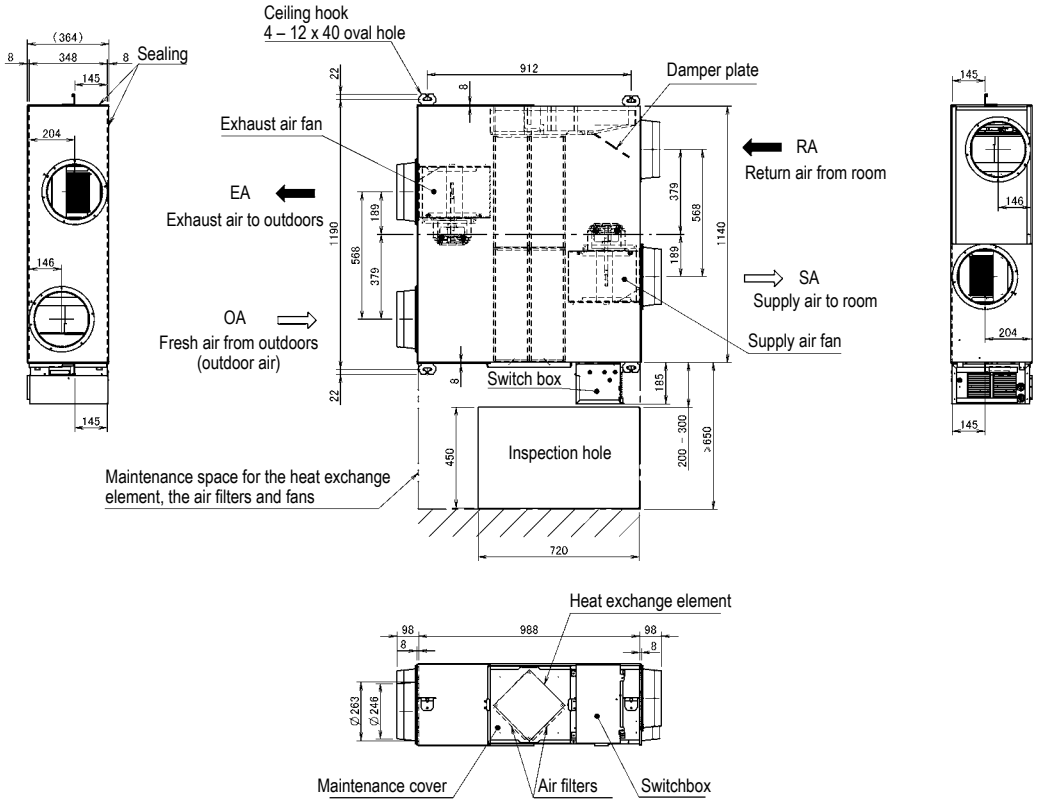


NOTES

1. Be sure to provide the inspection hole to inspect the air filters, the exchange elements and fans.

3D081165

VAM1000FB

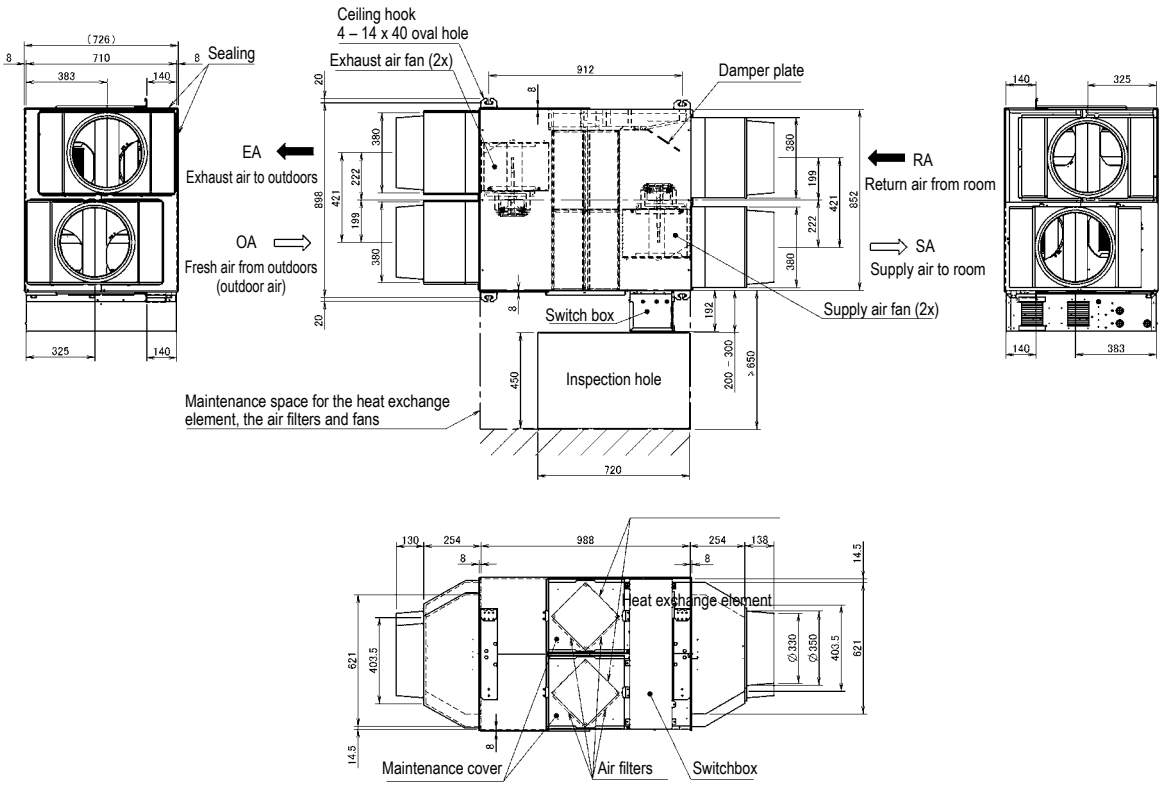


NOTES

1. Be sure to provide the inspection hole to inspect the air filters, the exchange elements and fans.

3D081166

VAM1500FB

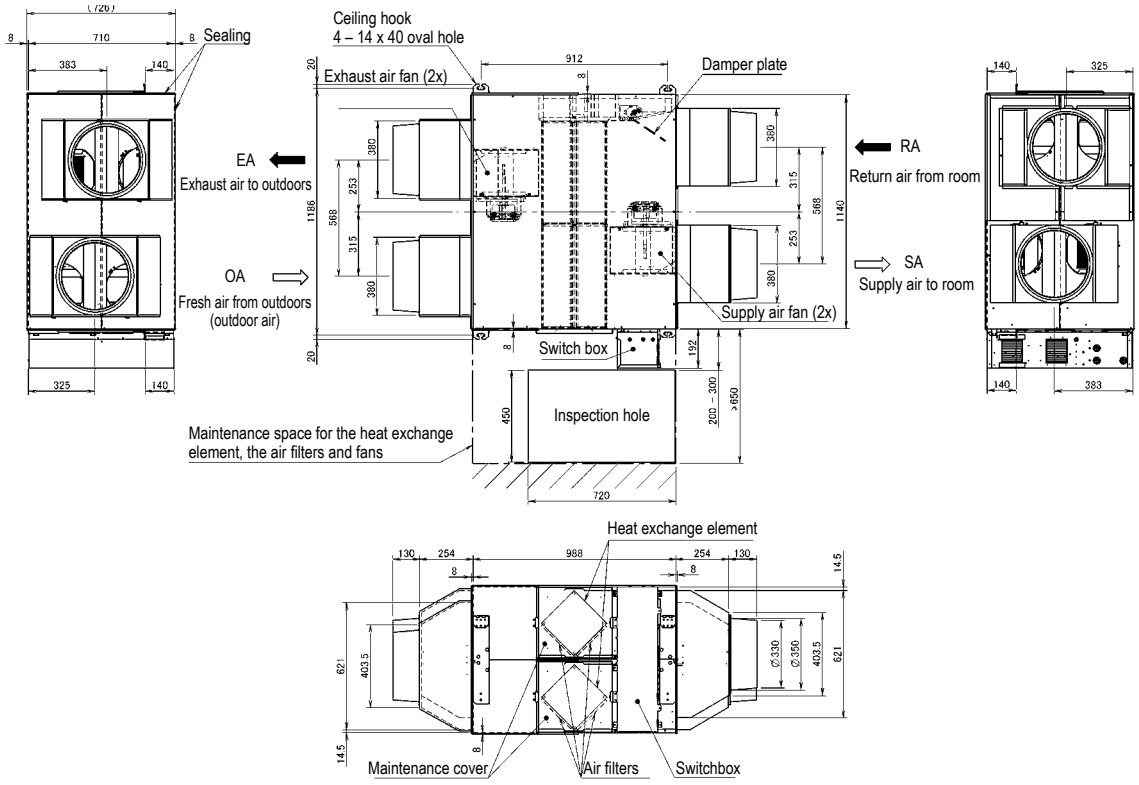


NOTES

1. Be sure to provide the inspection hole to inspect the air filters, the exchange elements and fans.

3D081167

VAM2000FB

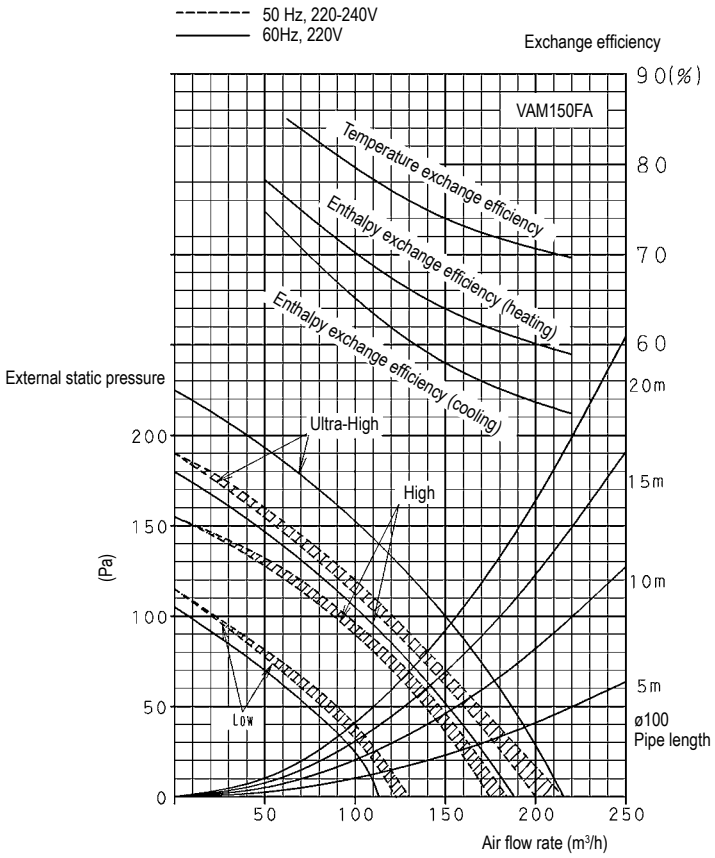


NOTES

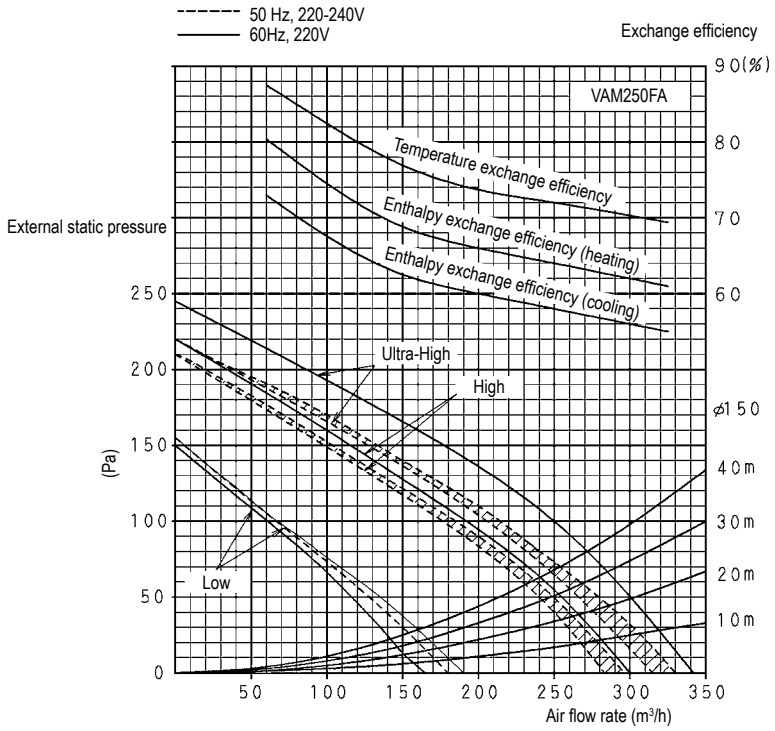
1. Be sure to provide the inspection hole to inspect the air filters, the exchange elements and fans.

3D081168

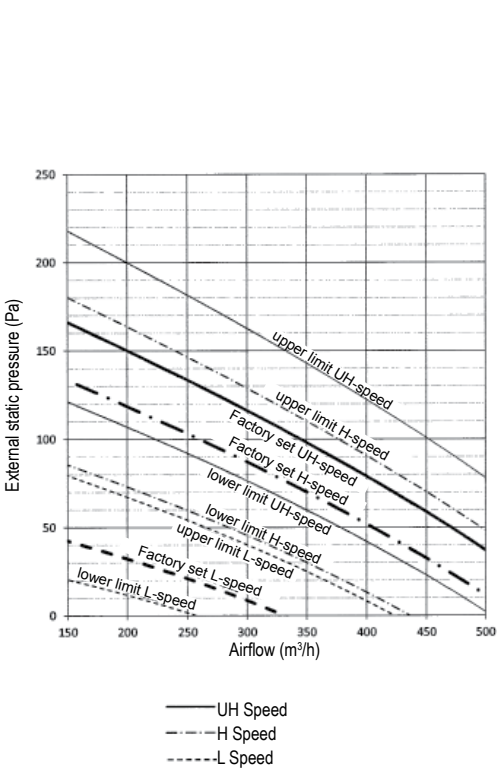
VAM150FA

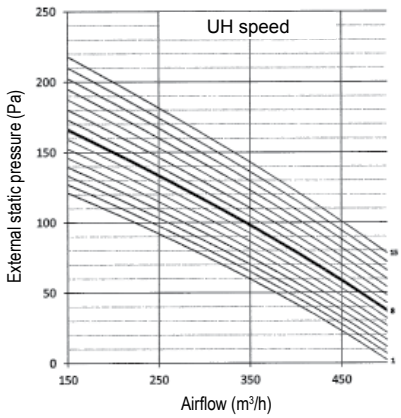


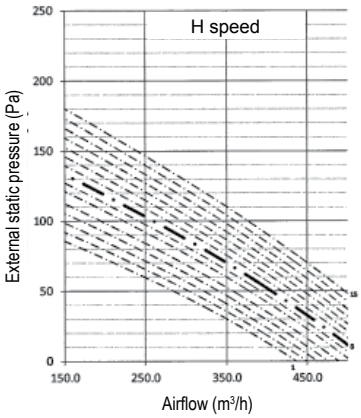
VAM250FA

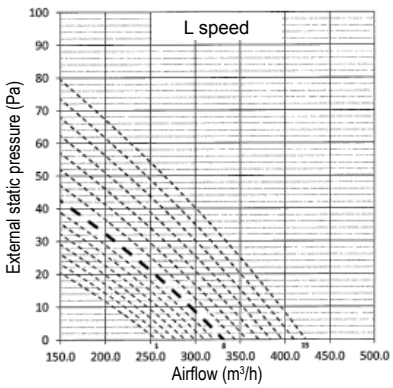


VAM350FA



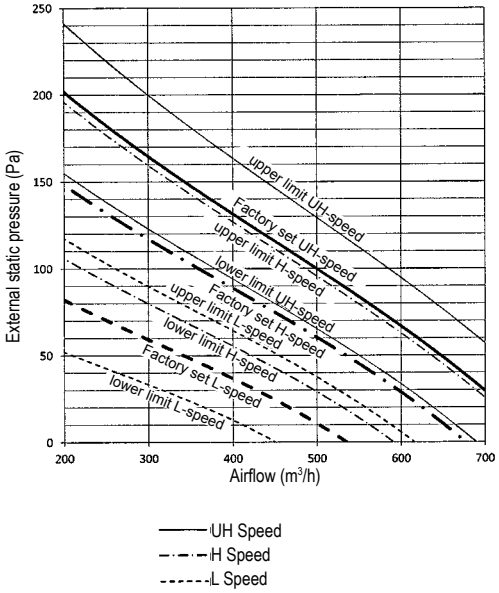


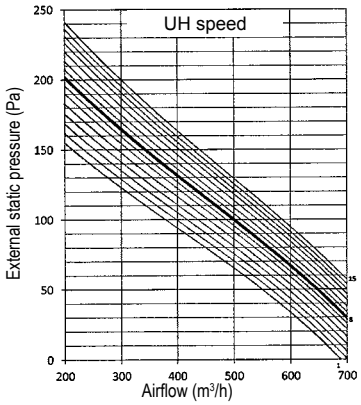


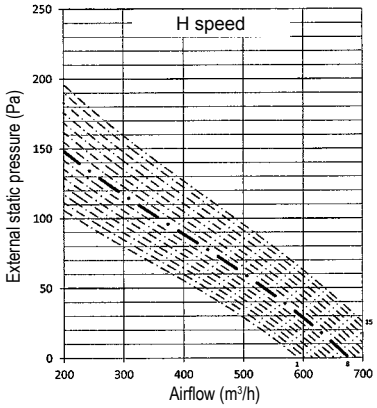


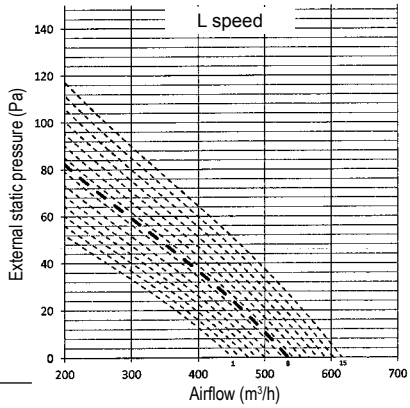
NOTES

VAM500FA



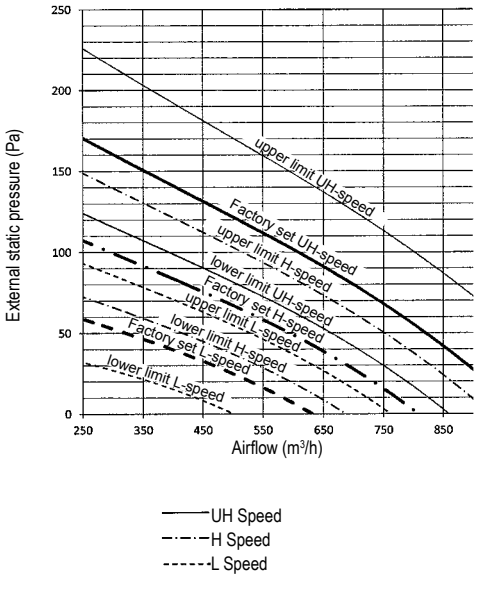


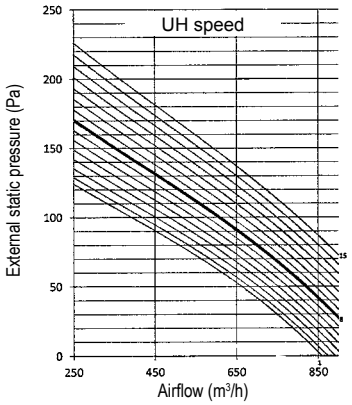


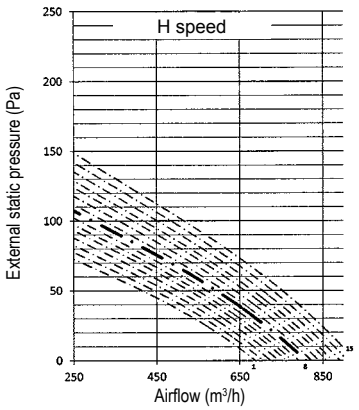


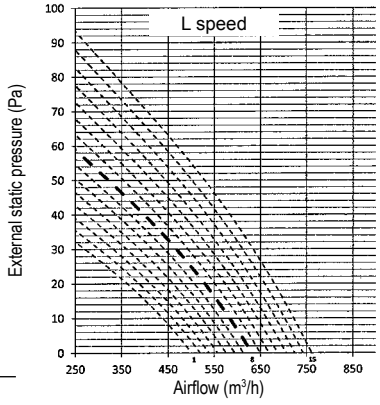
NOTES

VAM650FA



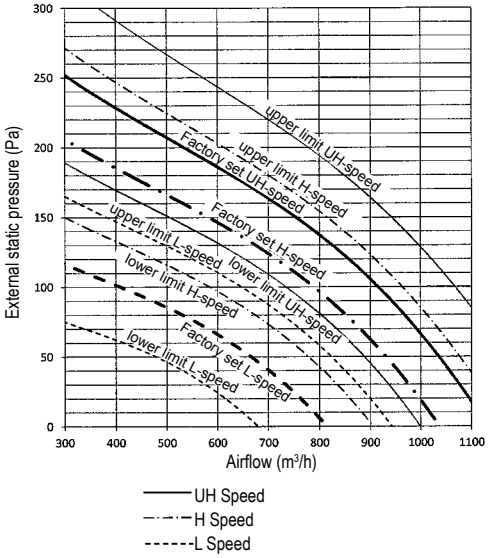


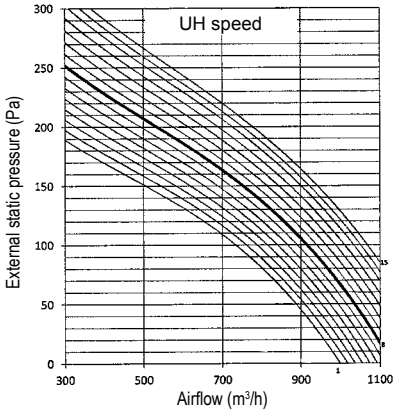


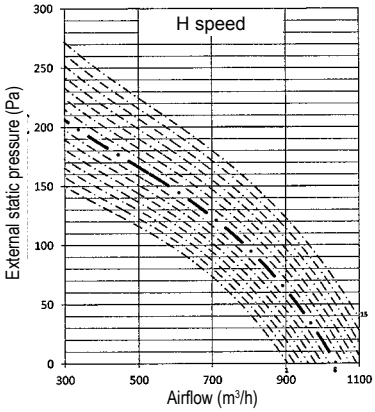


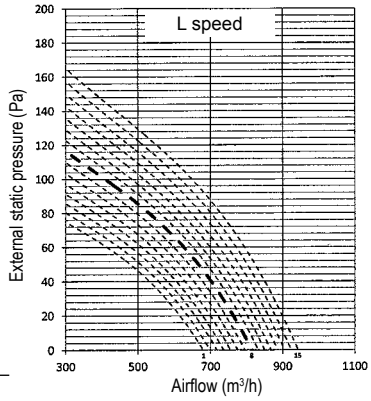
NOTES

VAM800FB







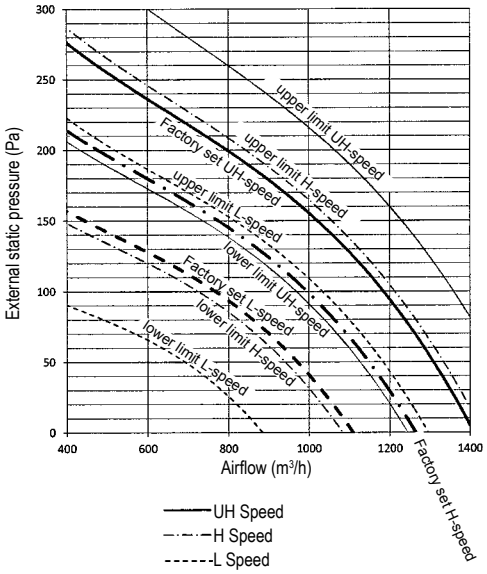


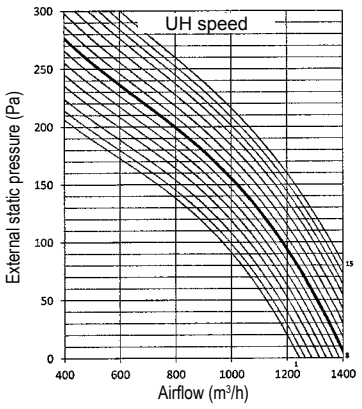
NOTES

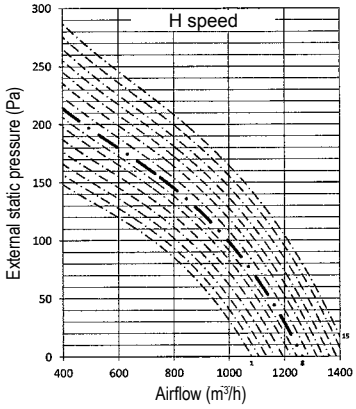
1. The fan speeds are valid for 230V 50Hz power supply

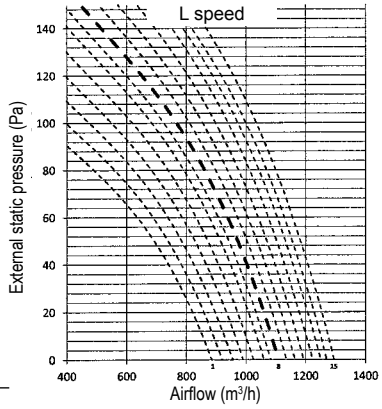
3D082180

VAM1000FB







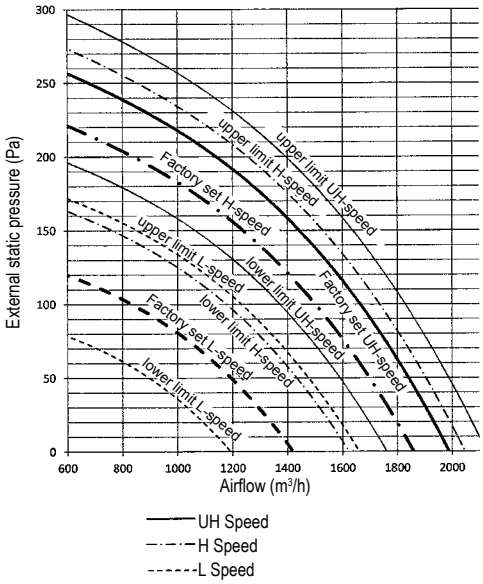


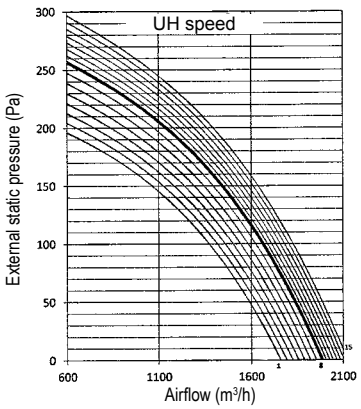
NOTES

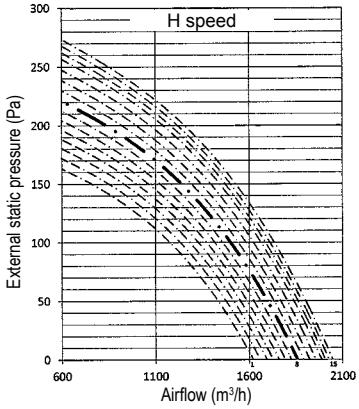
1. The fan speeds are valid for 230V 50Hz power supply

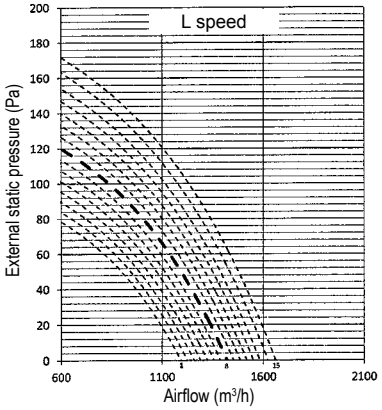
3D082181

VAM1500FB







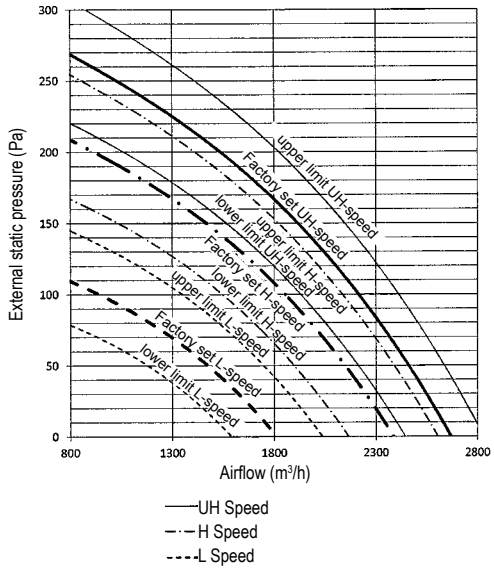


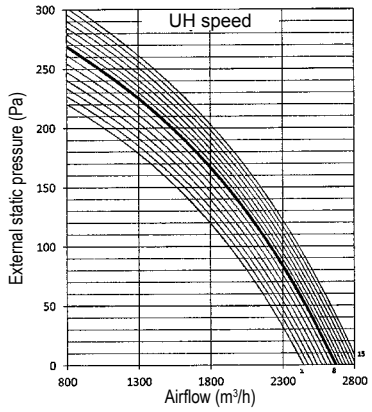
NOTES

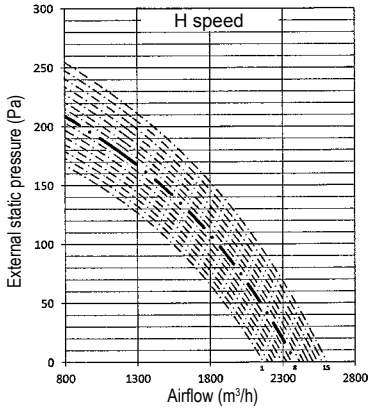
1. The fan speeds are valid for 230V 50Hz power supply

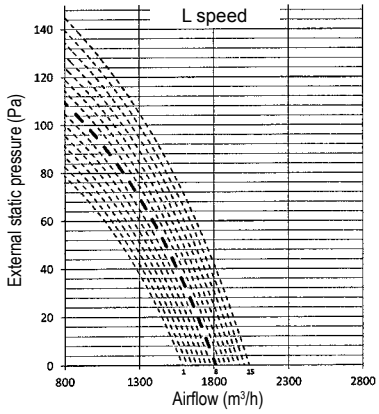
3D082182

VAM2000FB









NOTES

1. The fan speeds are valid for 230V 50Hz power supply

3D082183

Heat reclaim ventilation and air processing

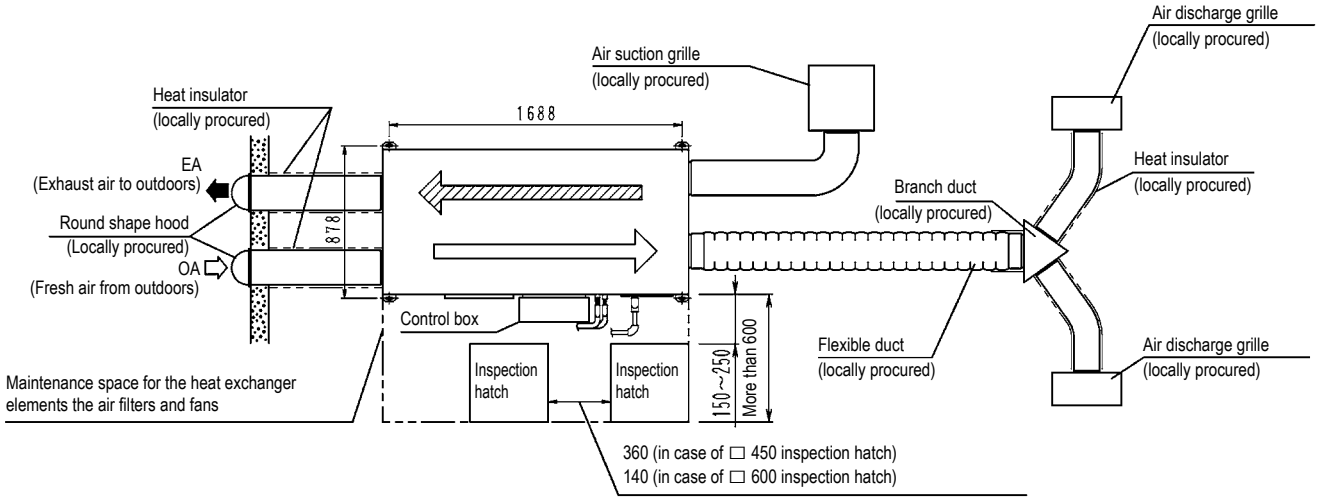
Pre heating or cooling of fresh air for lower load on the air conditioning system

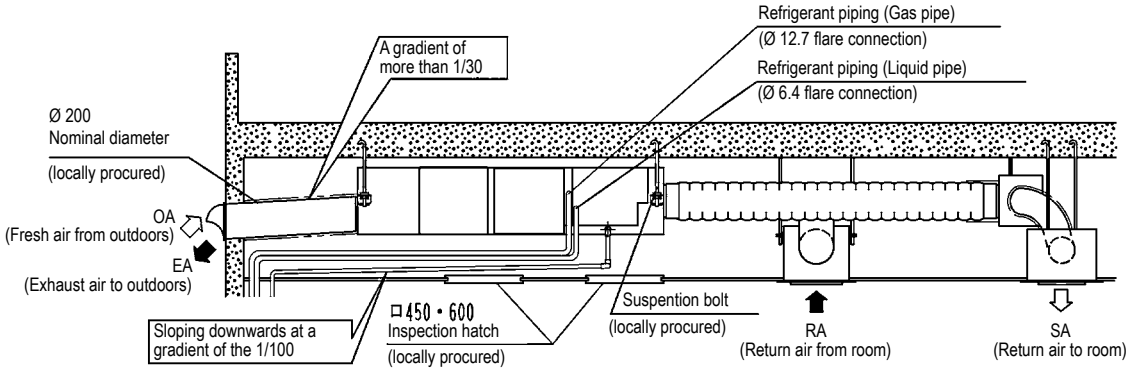
- Energy saving ventilation using indoor heating, cooling and moisture recovery
- Creates a high quality indoor environment by pre conditioning incoming fresh air
- Humidification of the incoming air results in comfortable indoor humidity level, even during heating
- Ideal solution for shops, restaurants or offices requiring maximum floor space for furniture, decorations and fittings
- Free cooling possible when outdoor temperature is below indoor temperature (eg. during nighttime)
- Low energy consumption thanks to DC fan motor
- Prevent energy losses from over-ventilation while maintaining indoor air quality with optional CO_2 sensor
- Shorter installation time thanks to easy adjustment of nominal air flow rate, so less need for dampers compared with traditional installation.
- Specially developed heat exchange element with High Efficiency Paper (HEP)
- Can operate in over- and under pressure

VKM80-100GB(M)

						Heat reclaim ventilation and air processing			Heat reclaim ventilation, air processing and humidification		
Ventilation					**VKM**	**50GB**	**80GB**	**100GB**	**50GBM**	**80GBM**	**100GBM**
Power input - 50Hz	Heat exchange mode	Nom.	Ultra high		kW	0.270	0.330	0.410	0.270	0.330	0.410
	Bypass mode	Nom.	Ultra high		kW	0.270	0.330	0.410	0.270	0.330	0.410
Fresh air conditioning load	Cooling				kW	4.71 / 1.91 / 3.5	7.46 / 2.96 / 5.6	9.12 / 3.52 / 7.0	4.71 / 1.91 / 3.5	7.46 / 2.96 / 5.6	9.12 / 3.52 / 7.0
	Heating				kW	5.58 / 2.38 / 3.5	8.79 / 3.79 / 5.6	10.69 / 4.39 / 7.0	5.58 / 2.38 / 3.5	8.79 / 3.79 / 5.6	10.69 / 4.39 / 7.0
Temperature exchange efficiency - 50Hz	Ultra high/High/Low				%	76/76/77.5	78/78/79	74/74/76.5	76/76/77.5	78/78/79	74/74/76.5
Enthalpy exchange efficiency - 50Hz	Cooling	Ultra high/High/Low			%	64/64/67	66/66/68	62/62/66	64/64/67	66/66/68	62/62/66
	Heating	Ultra high/High/Low			%	67/67/69	71/71/73	65/65/69	67/67/69	71/71/73	65/65/69
Operation mode						Heat exchange mode / Bypass mode / Fresh-up mode					
Heat exchange system						Air to air cross flow total heat (sensible + latent heat) exchange					
Heat exchange element						Specially processed non-flammable paper					
Humidifier	System					-			Natural evaporating type		
Dimensions	Unit	HeightxWidthxDepth			mm	387x1,764x832	387x1,764x1,214		387x1,764x832	387x1,764x1,214	
Weight	Unit				kg	94	110	112	100	119	123
Casing	Material					Galvanised steel plate					
Fan-Air flow rate - 50Hz	Heat exchange mode	Ultra high			m^3/h	500	750	950	500	750	950
	Bypass mode	Ultra high			m^3/h	500	750	950	500	750	950
Fan-External static pressure - 50Hz	Ultra high				Pa	210		150	200	205	110
	High				Pa	170	160	100	150	155	70
	Low				Pa	140	110	70	120	105	60
Air filter	Type					Multidirectional fibrous fleeces					
Sound pressure level - 50Hz	Heat exchange mode	Ultra high			dBA	39	41.5	41	38	40	
	Bypass mode	Ultra high			dBA	40	41.5	41	39	41	
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	-15					
		Heating	Min.		°CDB	43					
Refrigerant	Type / GWP					R-410A / 2.087,5					
Connection duct diameter					mm	200	250		200	250	
Piping connections	Liquid	OD			mm	6.35					
	Gas	OD			mm	12.7					
	Water supply				mm	-			6.4		
	Drain					PT3/4 external thread					
Power supply	Phase/Frequency/Voltage				Hz/V	1~/50/220-240					
Current	Maximum fuse amps (MFA)				A	15					

VKM50GB

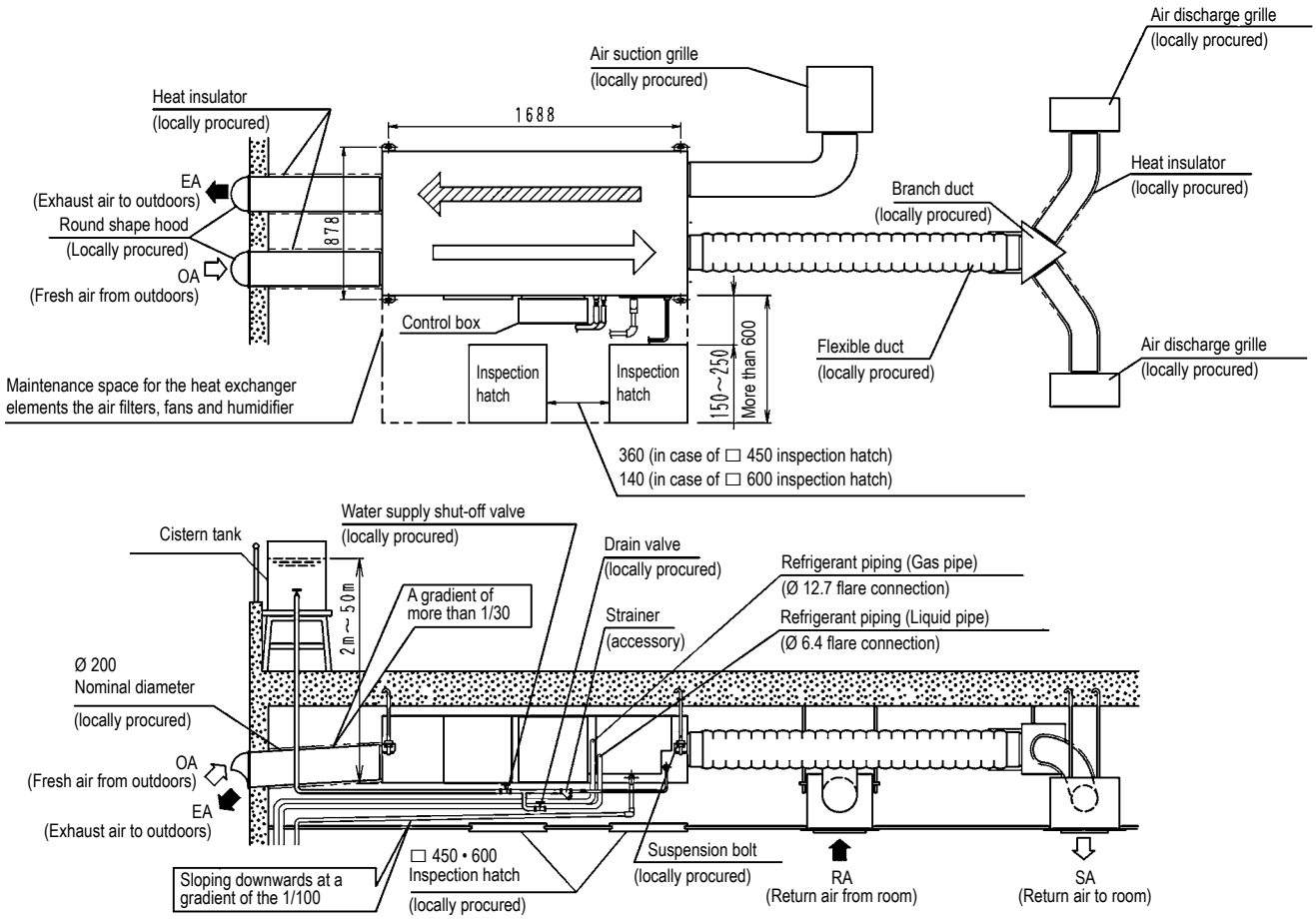




NOTES

1. Leave space for servicing the unit and include inspection hatch. (Always open a hole on the side of the control box so that the air filters, heat exchange elements, and fans can easily be inspected and serviced.)
2. Install the two outdoor ducts with down slope (slope of 1/30 or more) to prevent entry of rain water, also, provide insulation for three ducts (outdoor ducts and indoor supply air duct) to prevent dew condensation. (Material: glass wool of 25mm thick)
3. Do not turn the unit upside down.
4. Make sure to install drain piping, and insulate drain piping to prevent dew condensation.
5. Keep the drain pipe short and sloping downwards at a gradient of at least 1/100 to prevent air from forming.
6. Do not use a bent cap or a round hood as the outdoor hood if they might get rained on directly (we recommend using a deep hood) (optional accessory).
7. In areas where freezing may occur, always take steps to prevent the pipes from freezing.
8. Do not place something which shouldn't get wet at the below of this unit. The dew would fall at following case, where humidity is 80% more, or the exit of drain socket is choked up, or the air filter is very dirty.

VKM50GBM



NOTES

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4. Use city water or clean water.
   Include water supply piping with straner, a water supply shut-off valve, and a drain valve (both locally procured) somewhere along the water supply piping that can be reached from the inspection.
5. It is impossible to connect the water supply piping directly to public piping. Use a cistern tank (of the approved type), if you need to get your water supply from public piping.
6. Make sure the supply water 0.02MPa to 0.49MPa (0.2 kg/cm^2 to 5 kg/cm^2).
7. Make sure the supply water is between 5 °C and 40 °C in temperature.
8. Insulate the water supply piping to prevent condensation from forming.
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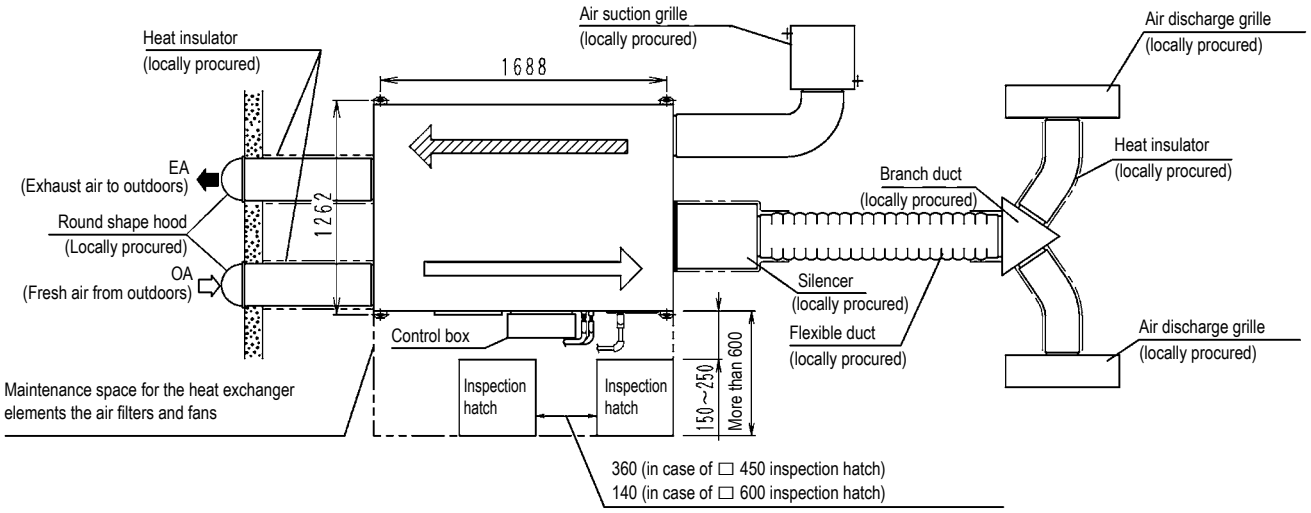
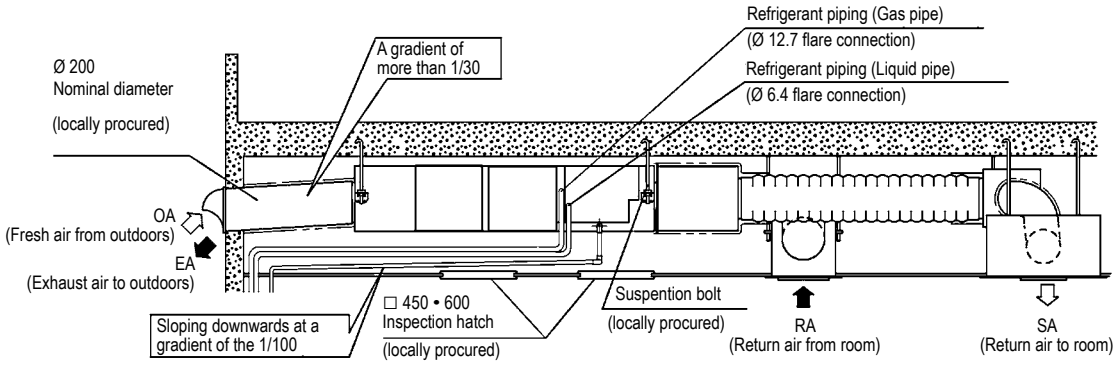
15. Feed clean water. If the supply water is hard water, use a water softener because of short life.
    Life of humidifying element is about 3 years (4,000 hours), under the supply water conditions of hardness: 150 mg/L. (Life of humidifying element is about 1 years (1500 hours), under the supply water conditions of hardness: 400 mg/L.)

3D083011

VKM80GB





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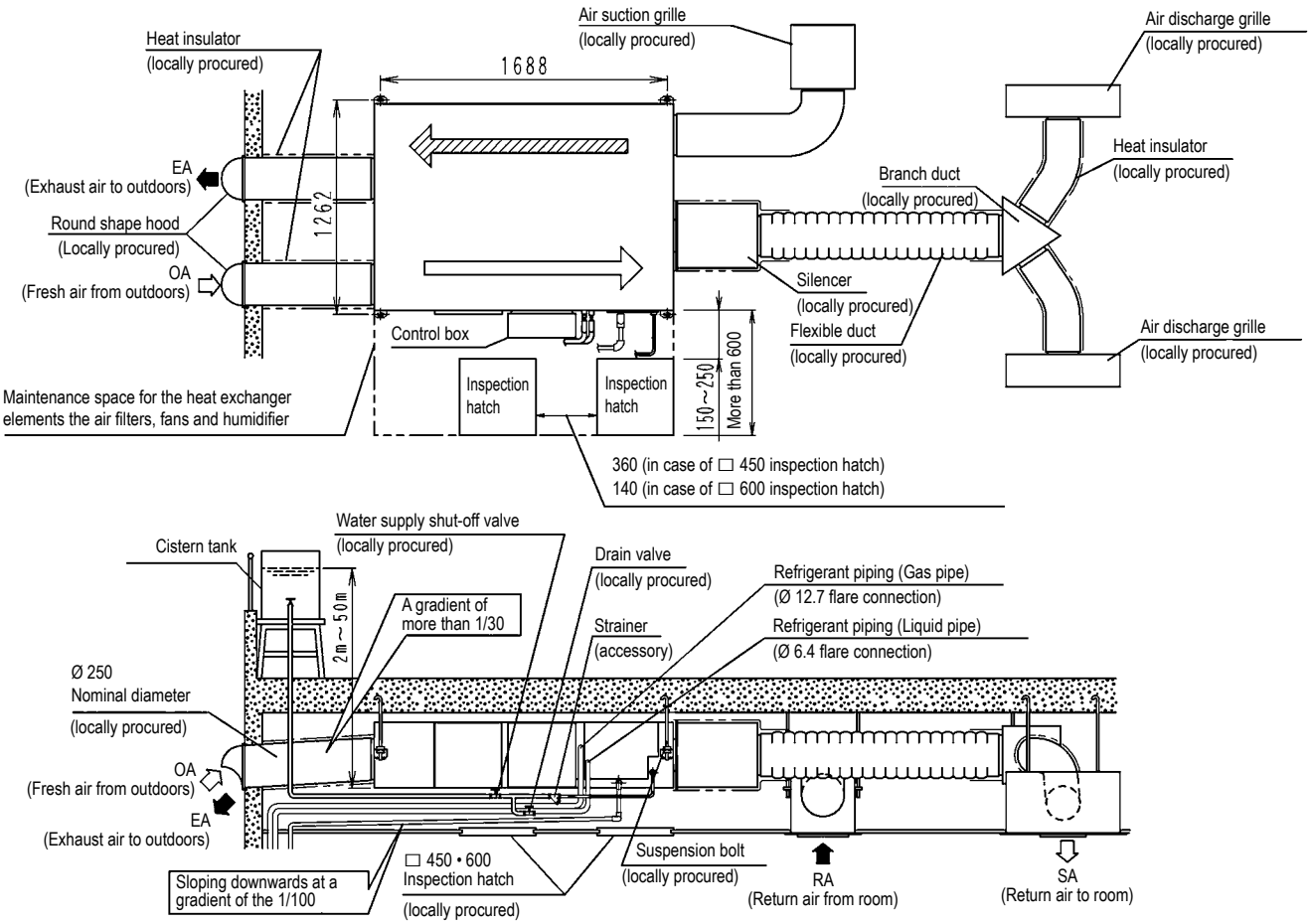
3D083015

VKM80GBM



NOTES

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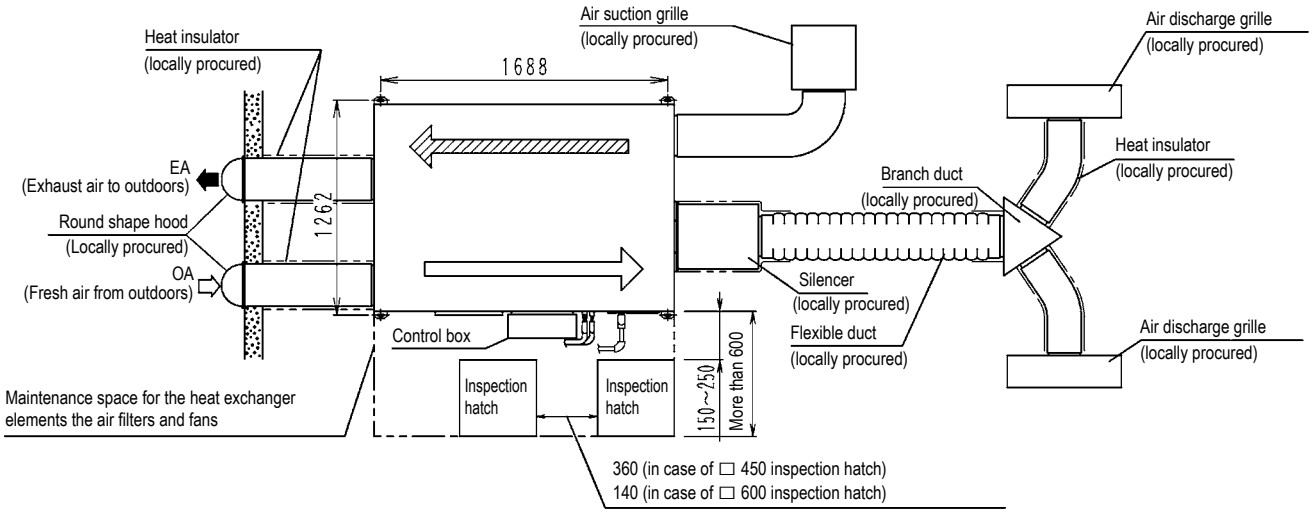
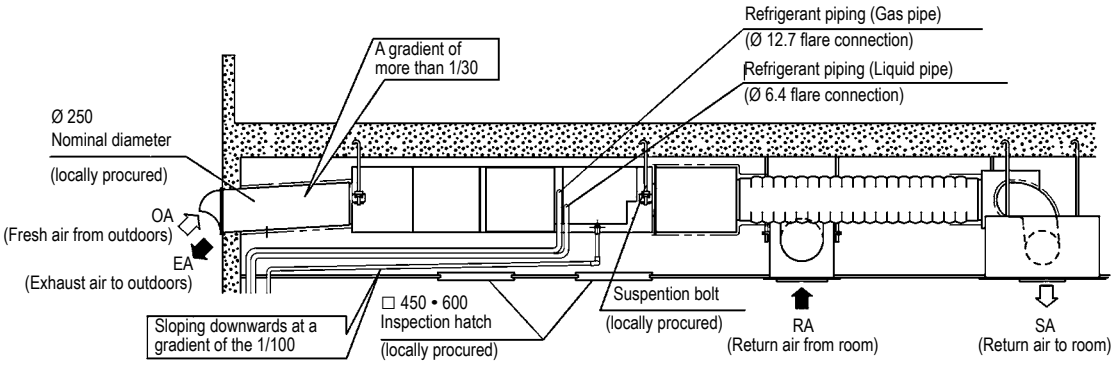
3D083012

VKM100GB





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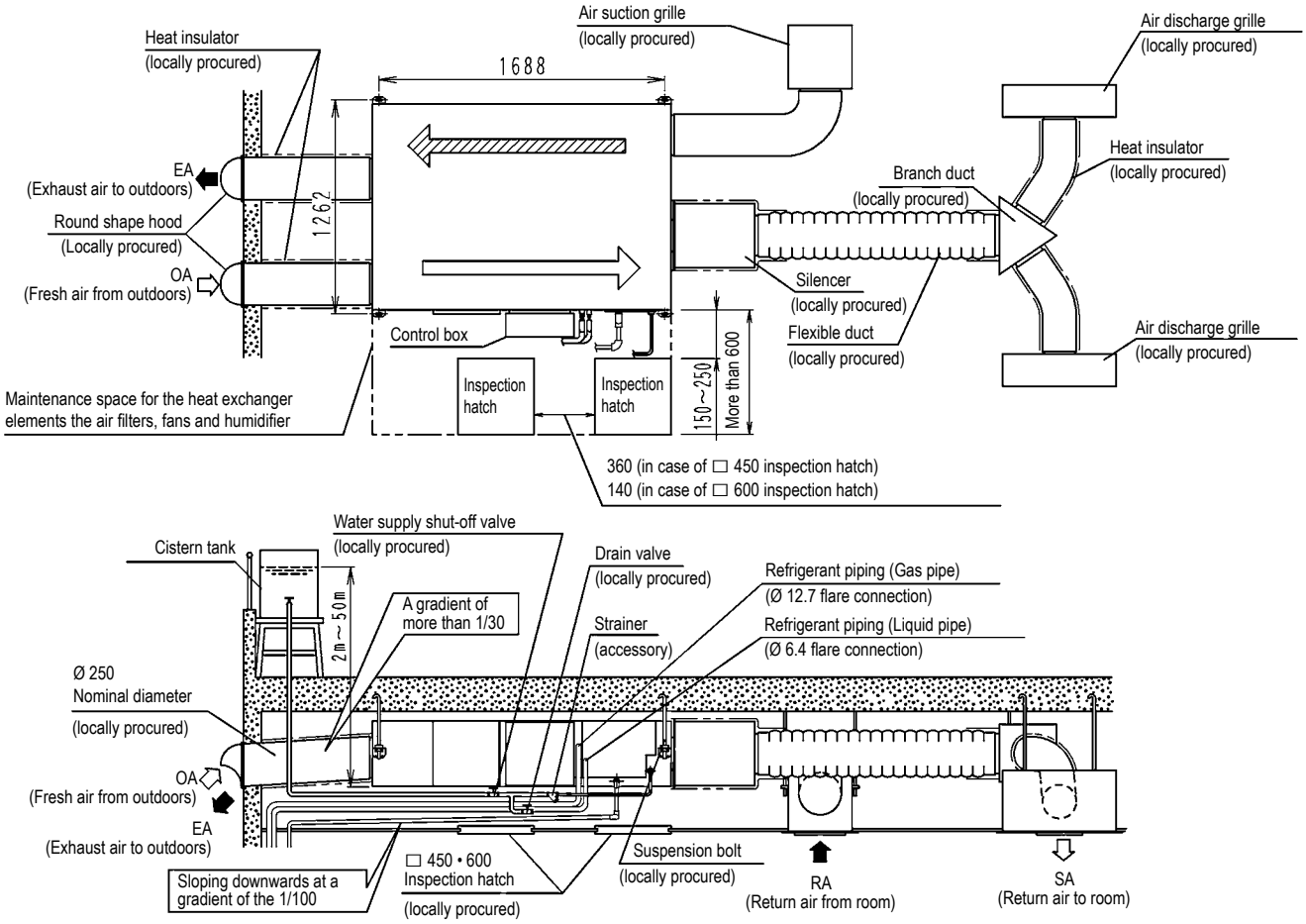
3D083016

VKM100GBM



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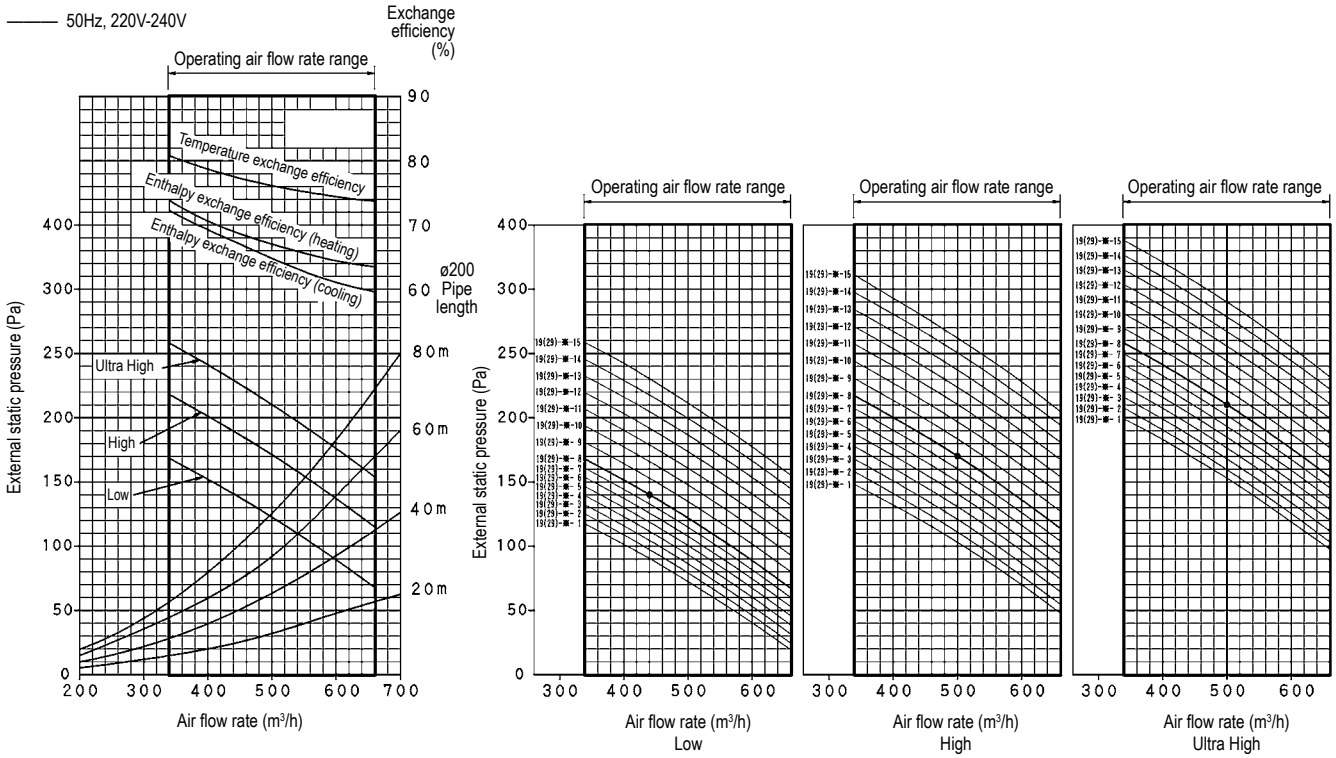
3D083013

VKM50GB

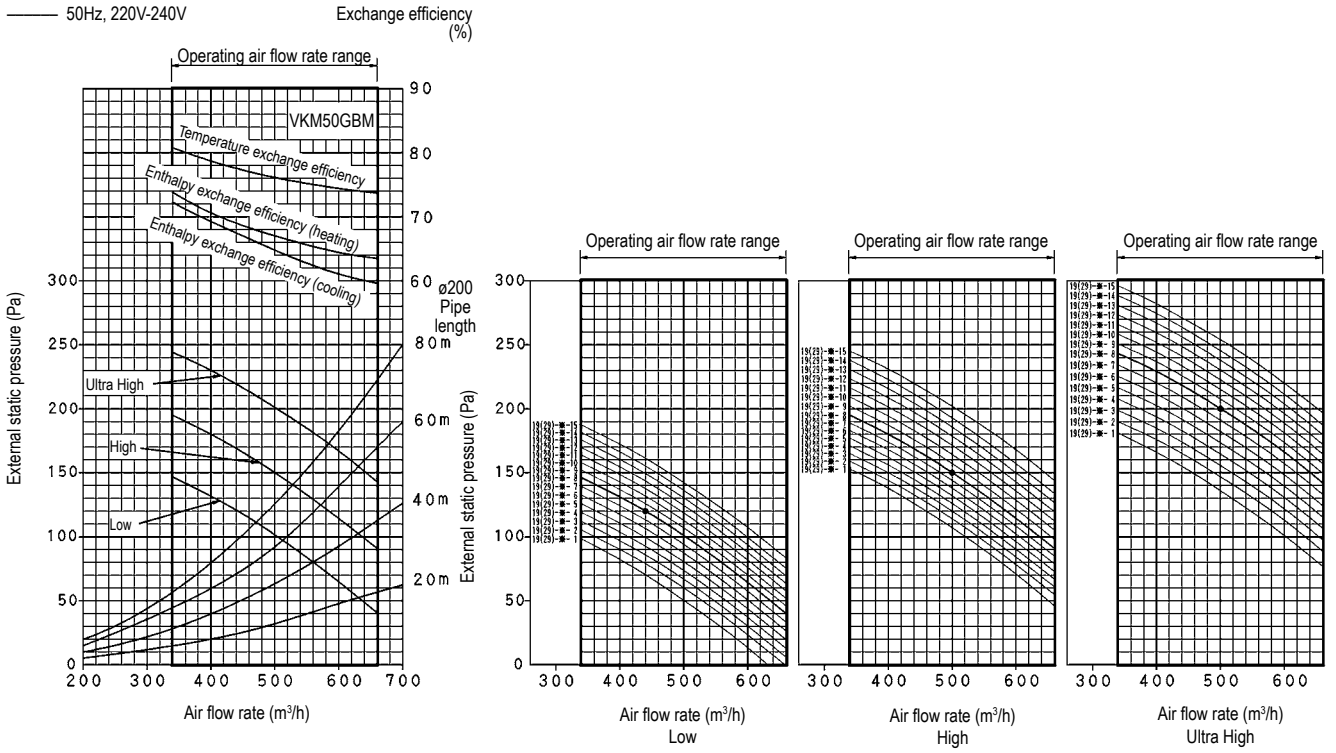


[Reading of Performance Characteristics]

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.

3D082904

VKM50GBM



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   Mode no. : 19(29)
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   Second code no. : 07
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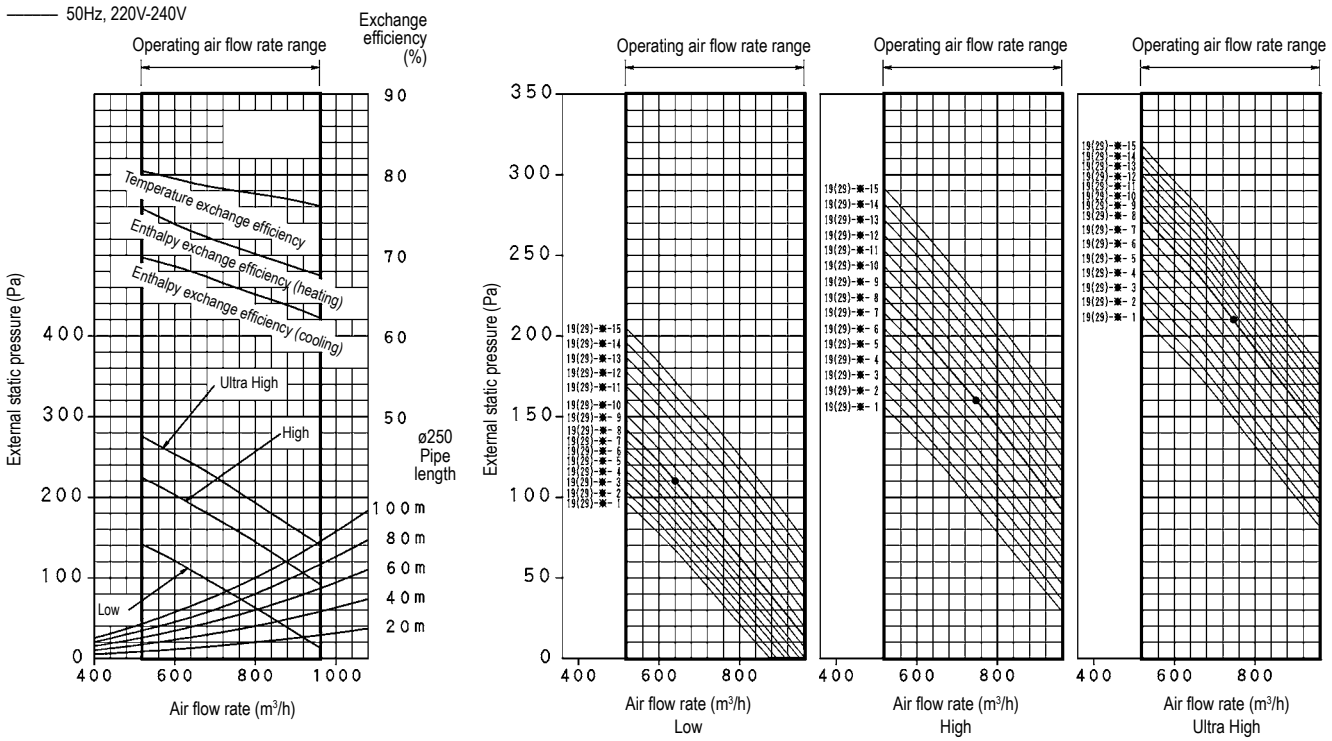
3D082901

VKM80GB



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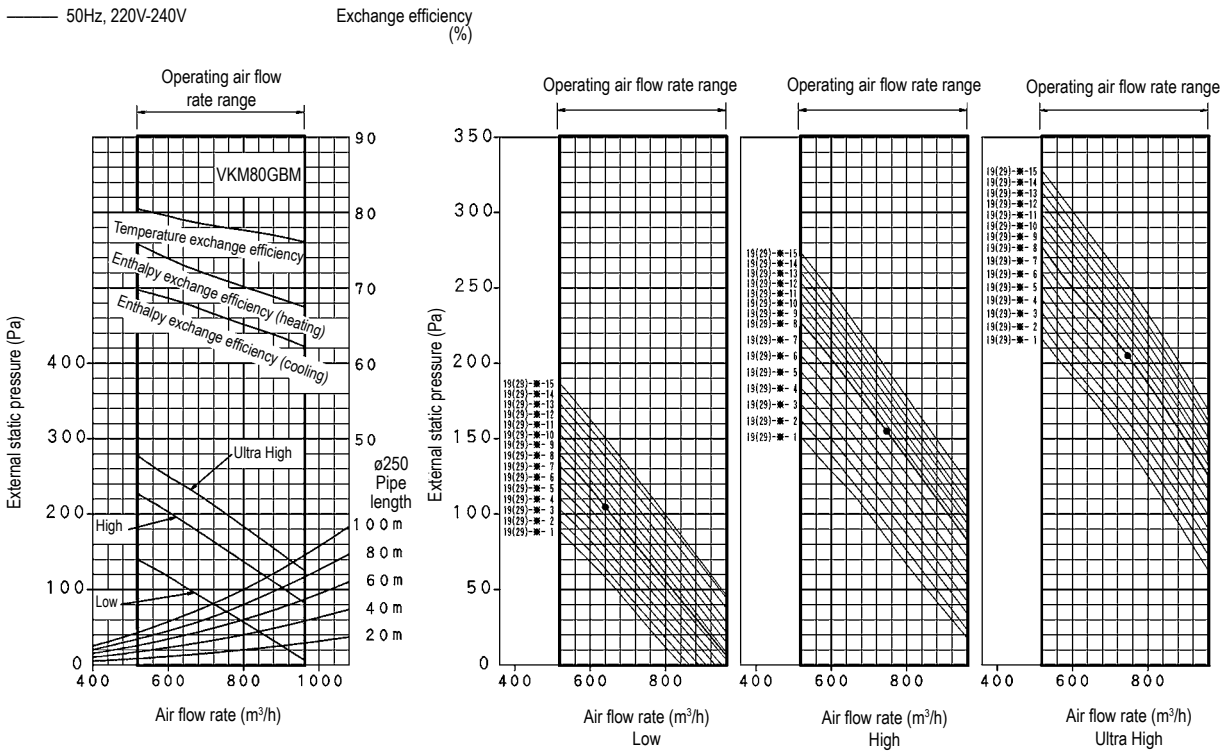
3D082905

VKM80GBM



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   Second code no. : 07

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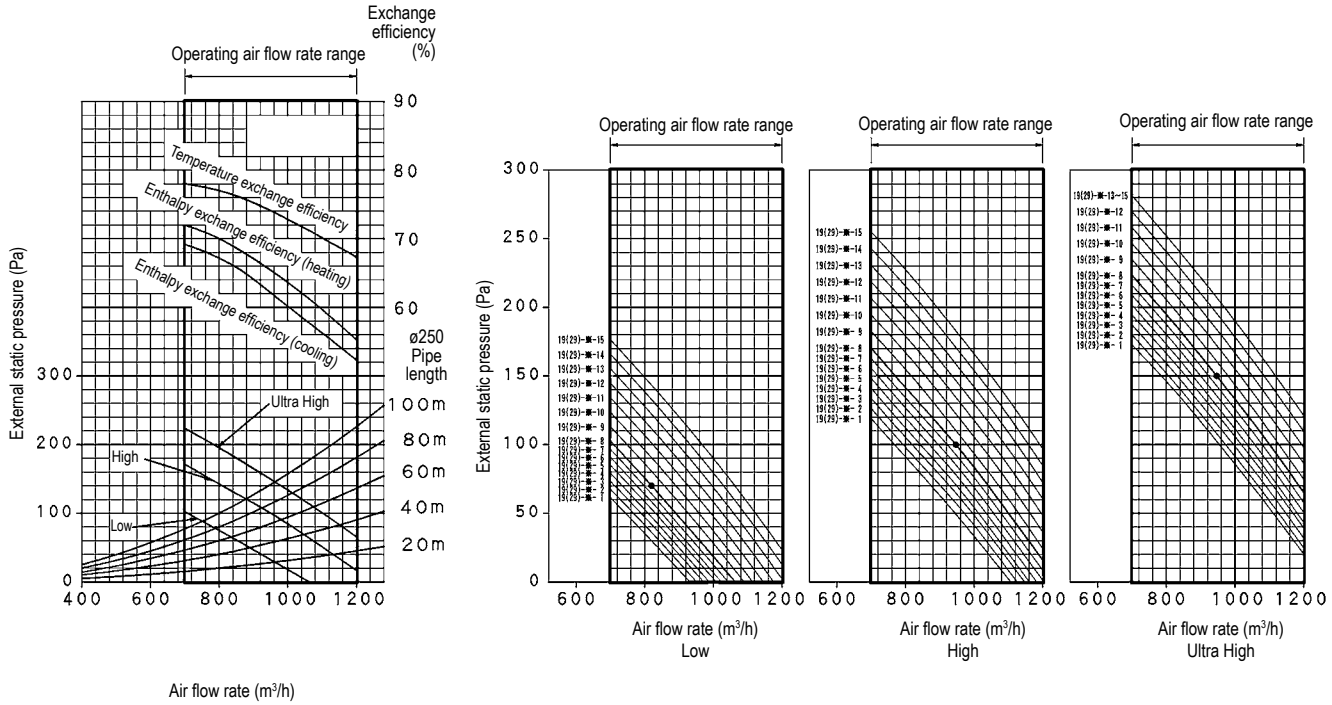
3) The characteristic of each tap becomes a setup of the characteristic of the same code number.

3D082902

VKM100GB

——— 50Hz, 220V-240V



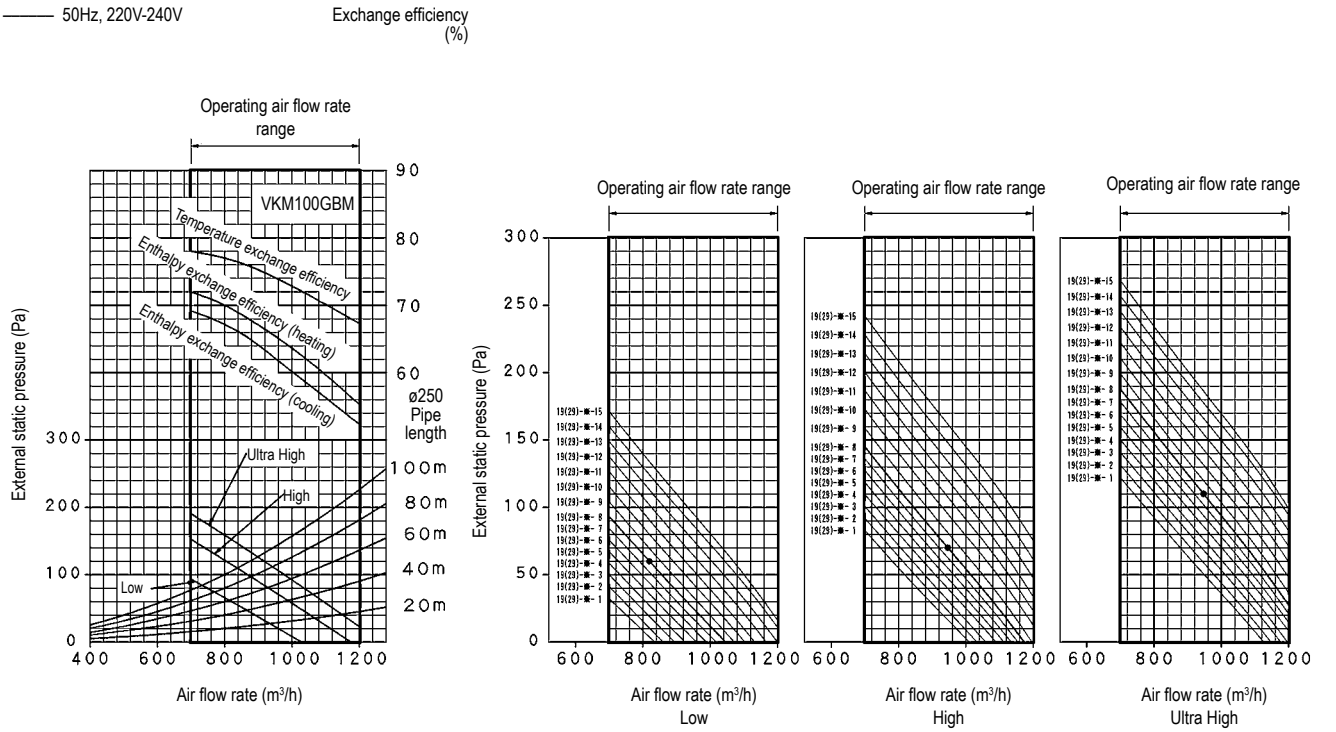
[Reading of Performance Characteristics]

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.

3D082906

VKM100GBM

——— 50Hz, 220V-240V



[Reading of Performance Characteristics]

1) For example: 19(29)-✱-07
   Mode no. : 19(29)
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   Second code no. : 07
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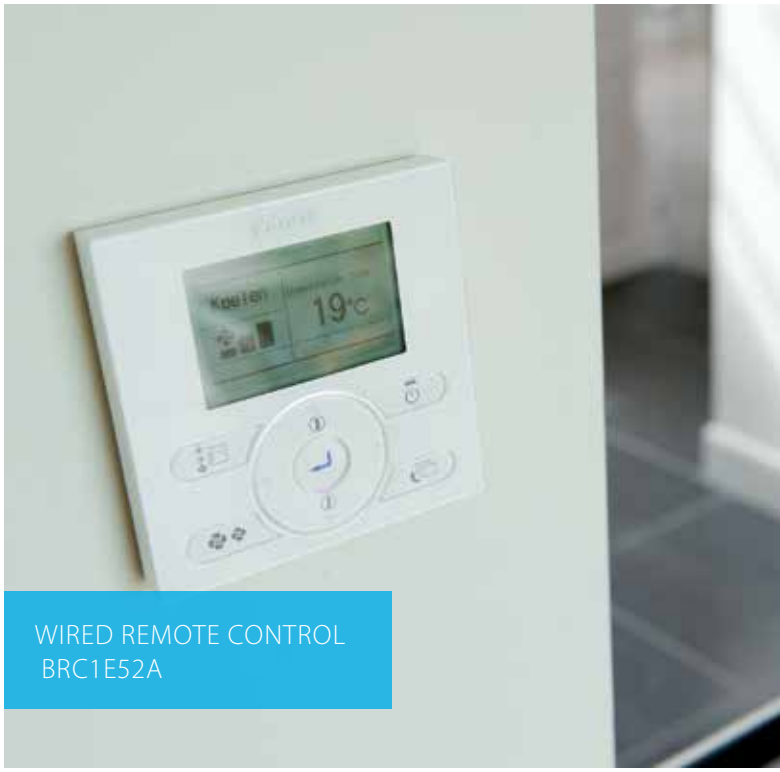
3D082903



WIRED REMOTE CONTROL
BRC1E52A

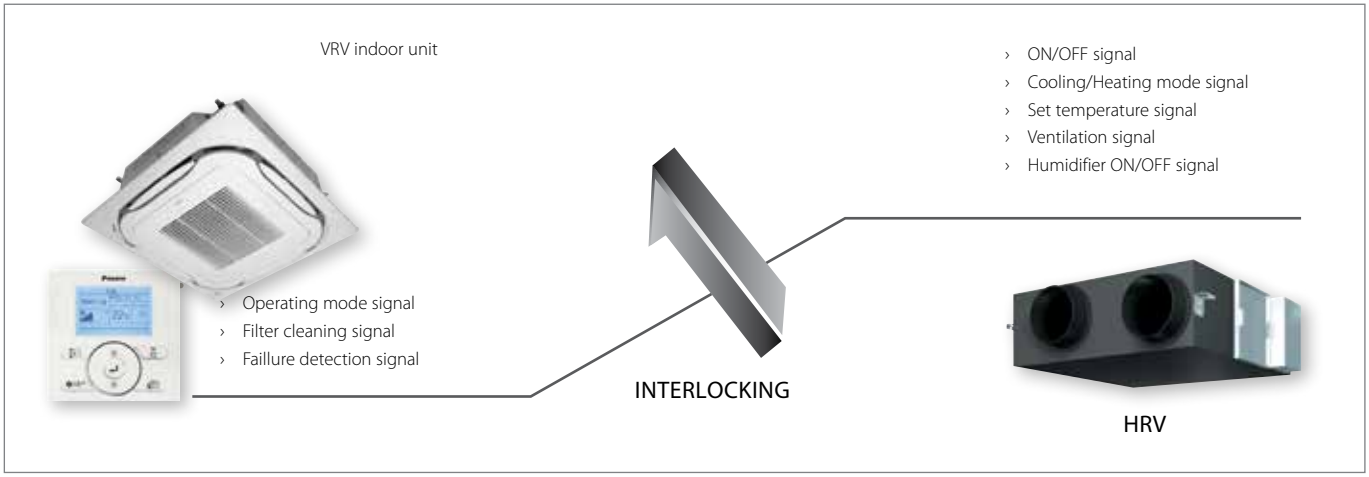
INTELLIGENT
TOUCH MANAGER
DCM601A51

Control systems

User friendly control systems

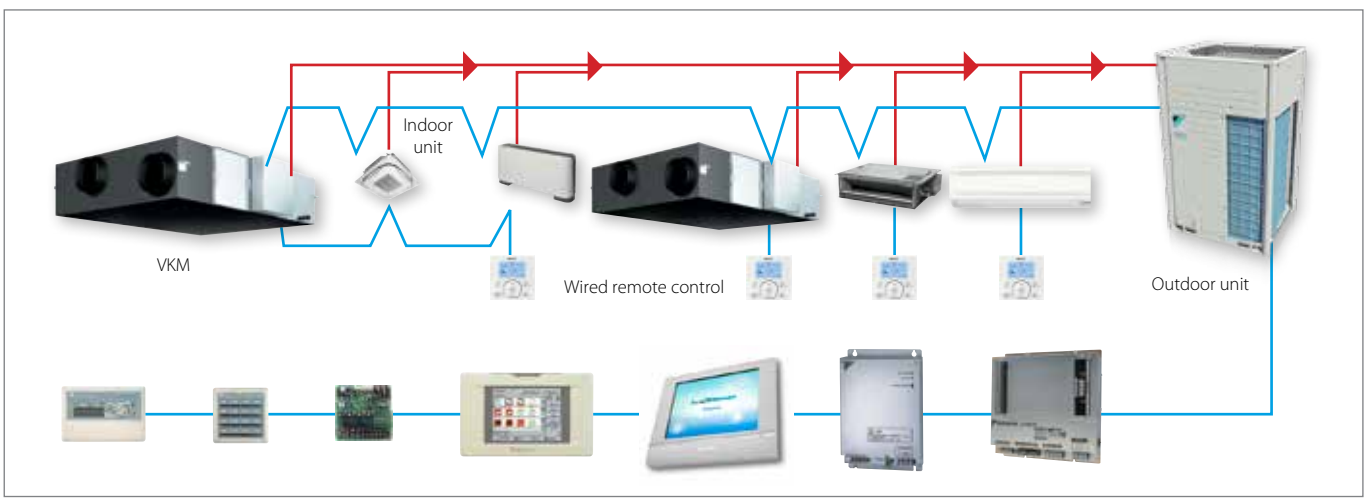
Interlock of the ventilation operation with the air conditioner operation

Interlock of the ventilation operation with the air conditioner operation greatly simplifies overall system control. The same remote control centralizes air conditioning and ventilation. Using a centralized remote control also frees the user to choose from a wide range of control systems that integrate air conditioning and ventilation. By incorporating a variety of centralized control equipment, the user can build a large, high grade centralized control system.



"Super Wiring" System

A Super Wiring system is used to enable the shared use of wiring between indoor units, outdoor units and the centralised remote control. This system makes it easy for the user to retrofit the existing system with a centralised remote control, simply by connecting it to the outdoor units. Thanks to a non polarity wiring system, incorrect connections become impossible and installation time is reduced.



Overview

Individual control systems

5 individual control systems give the user control over the VRV system and the combined ventilation.

› BRC1D52 and BRC1E52A/B are wired remote controllers, giving access to room temperature settings, schedule timer, … Next to that they also have user friendly HRV functions.
› BRC301B61 is a wired controller especially designed for VAM units.
› BRC2E52 and BRC3E52 are compact, easy to use remote controllers, ideal for use in hotel bedrooms.

Centralised control systems

By combining the (optional) centralised control equipment listed below, the user can achieve a wide range of comprehensive centralised control systems for air conditioning and ventilation.

Network solutions

HRV units are connectable to all current Daikin network solutions:

intelligent Touch Controller — **DCS601C51**
Allows detailed and easy monitoring and operation of VRV systems (maximum 2 x 64 control groups).

intelligent Touch Manager — **DCM601A51**
The ideal solution for full control and management of maximum 1,024 VRV indoor units.

LonWorks Interface — **DMS504B5**
Open network integration of VRV monitoring and control functions into LonWorks networks.

BACnet Interface — **DMS502A51**
Integrated control system for seamless connection between VRV and BMS systems.

Other integration devices

KRP2A*
Wiring adapter for electrical appendices

Daikin's adapter PCB's provide simple solutions for unique requirements. They are a low-cost option to satisfy simple control requirements and can be used on single or multiple units.

› Start and stop up to 16 indoor units remotely (1 group) (KRP2A* via P1 P2)
› Alarm indication / fire shut-down
› Remote temperature set-point adjustment

For more information consult the Daikin controls systems brochure or contact your local dealer

Individual control systems

- Control up to 16 indoor units or 8 HRV units (1group)
- Easy to use: all main functions directly accessible
- Easy setup: improved graphical user interface for advanced menu settings
- Simultaneous ON/OFF of HRV and air conditioner (BRC1D52/BRC1E52A/B)
- Airflow rate switching (initial setting)
- Ventilation mode switching (initial setting)
- Self diagnostic functions
- Filter sign display and reset
- Timer settings, simultaneous control with air conditioner (BRC1D52/BRC1E52A/B)
- ON/OFF of VAM (BRC301B61)
- Independent operation of HRV
- Timer settings (BRC301B61)
- Fresh-up mode switching (HRV only)

  (Selectable: supply rich mode, exhaust rich mode; initial setting)

BRC1E52A/B

BRC1D52

BRC301B61

Simplfied remote control for hotel applications

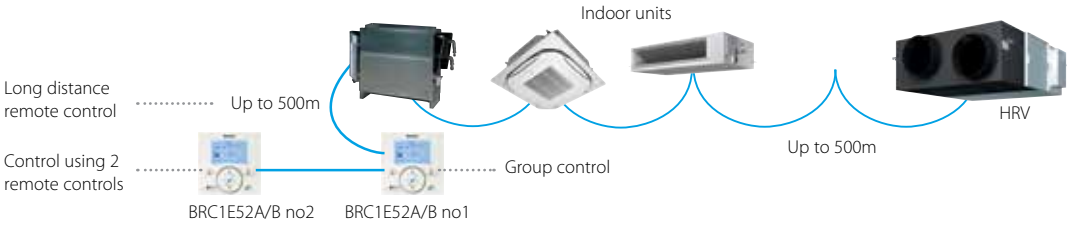
BRC2/3E52

A variety of units can be controlled using only the BRC1D52 or the BRC1E51A (HRV only)

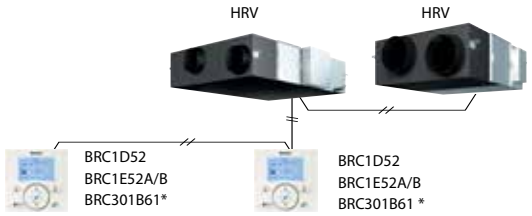
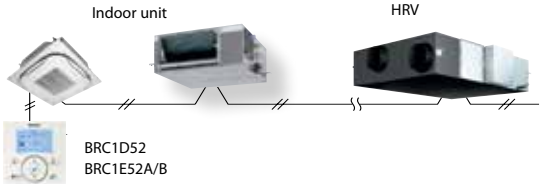
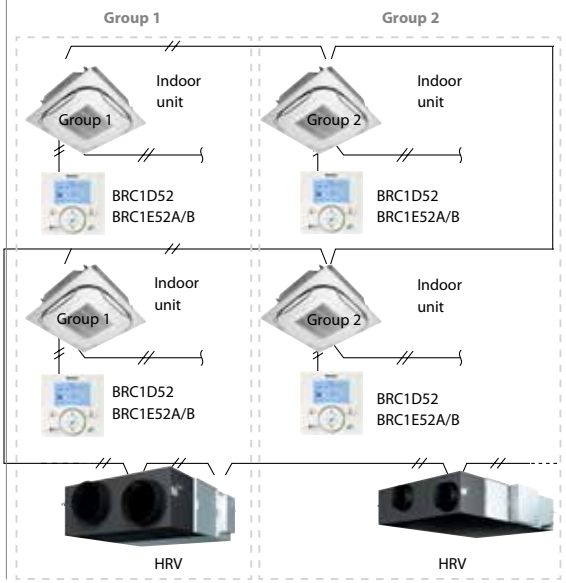
› **Group Control**
One air conditioner remote control simultaneously controls up to 16 air conditioning and HRV units.

› **Control using 2 remote controls**
Allows control of air conditioning and HRV units from two locations by connecting two air conditioner remote controls. (group control is possible)

› **Long-distance Remote Control**
Remote operation control - from a distant control room for example - is possible thanks to wiring of up to 500 m. (2 remote controllers possible)



*1: Count VKM unit as two air conditioner indoor units. For details, see below.

System construction (HRV only)		System Characteristics	Necessary Accessories
Independent Operation system		› Independent operation of HRV is possible › Operation is possible using 2 remote controls › Multiple HRV units can be simultaneously controlled in batch. (Up to 8 HRV units can be connected) › Air conditioner remote control can be used	BRC1D52 or BRC1E52A/B BRC301B61 *
Air conditioning interlocked control (VRV, Sky Air) system — Standard system	 During group control operation, the VKM unit has a capacity equivalent to 2 standard indoor units. Up to 16 standard indoor units can be connected at the same time. Connectable indoor units: VKM 0 1 2 3 4 5 6 7 8 Max. no. of VRV 16 14 12 10 8 6 4 2 0 Note: The VKM uses 2 remote controller addresses per unit. The number of units that can be group controlled is shown above.	› Multiple VRV indoor units or HRV units can be connected and controlled in batches, with interlocked operation of HRV and air conditioners by using the air conditioner remote control. › The HRV unit can also be operated independently using the remote control for the indoor unit, even if the indoor unit is not in operation	BRC1D52 or BRC1E52A/B
Multiple groups interlocked Operation system		› Can control interlocked operation of multiple groups of VRV or Sky Air indoor units › When one of the multiple groups operates, HRV units are interlocked and operate simultaneously	BRC1D52 or BRC1E52A/B

* BRC301B61 only available for VAM-FA/FB

Centralised control systems

By combining the (optional) centralised control equipment listed below, the user can achieve a wide range of comprehensive centralised control systems for air conditioning and ventilation.

DCS302C51

Centralised remote control - DCS302C51

› A maximum of 64 groups (128 indoor units, max. 10 outdoor units) can be controlled
› A maximum of 128 groups (128 indoor units, max. 10 outdoor units) can be controlled via 2 centralised remote controls in separate locations
› Group control (up and down buttons are added for group selection)
› Zone control
› Malfunction code display
› Max. wiring length 1,000 m (total : 2,000 m)
› Combination with unified ON/OFF control, schedule timer and BMS system
› Airflow volume and direction can be controlled individually for indoor units in each group operation.
› Ventilation volume and mode can be controlled for Heat Reclaim Ventilation (VKM).
› Up to 4 'operation/stop' pairs can be set per day by connecting a schedule timer.

DCS301B51

Unified on/off control - DCS301B51

Providing simultaneous and individual control on 16 groups of indoor units

› A maximum of 16 groups (128 air conditioning indoor and HRV units) can be controlled
› 2 remote controls in separate locations can be used
› Centralised control indication
› Maximum wiring length of 1,000m (total: 2,000m)

DST301B51

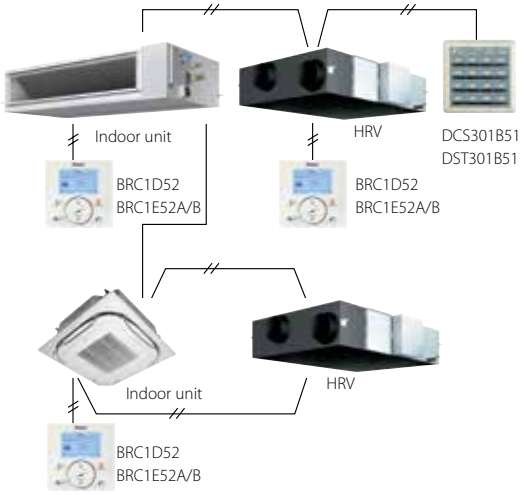
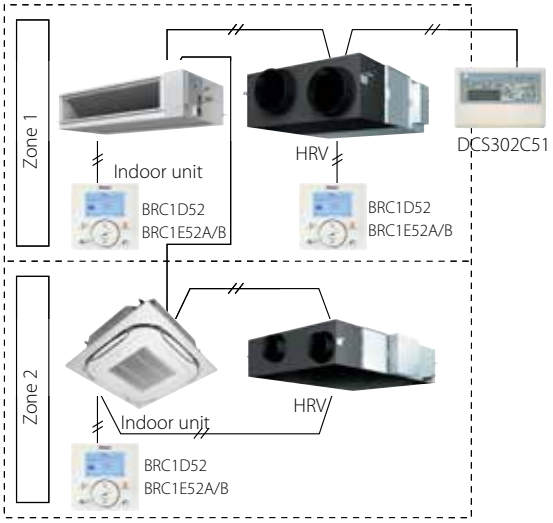
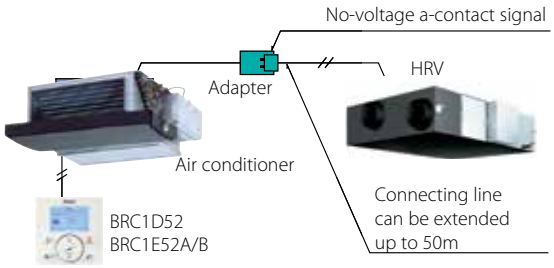
Schedule timer - DST301B51

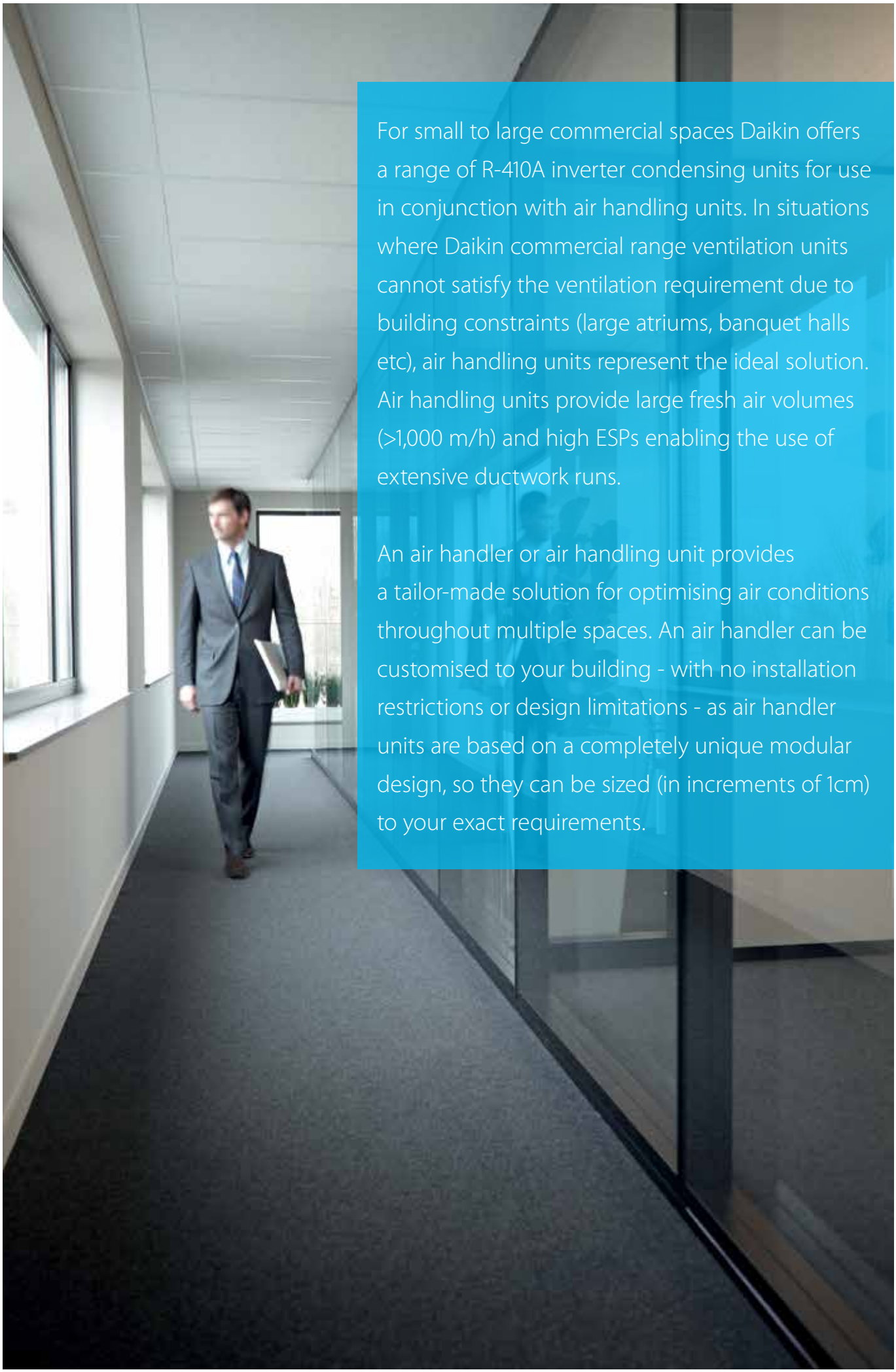
Enabling 64 groups to be programmed

› A maximum of 128 air conditioning indoor and HRV units can be controlled
› 8 types of weekly schedule
› A maximum of 48 hours back-up power supply
› Maximum wiring length of 1,000m (total: 2,000m)

Number of HRV units that can be connected per system

Centralised remote control	2 units
Unified on/off control	8 units
Schedule timer	1 unit

System construction (hrv only)			System Characteristics	Necessary Accessories
Air Conditioning Interlocked Centralised Control System	Batch / Individual Control System		**Unified ON/OFF control - DCS301B51** › One controller can control the on/ off operation of 16 groups of units collectively or individually › Up to 8 controllers can be installed in one centralised transmission line (in one system), which enables control of up to 128 groups. (16 groups x 8 = 128 groups) **Schedule timer - DST301B51** › One schedule timer can control the weekly sche-dule of up to 128 units › HRV remote control can set the individual operation of each HRV unit › Control system can be expanded depending on its purposes by combining a variety of centralised control equipment	DCS301B51 or DST301B51, BRC1D52 or BRC1E52A/B If necessary: DCS302C51
	Zone Control System		**Centralised remote control - DCS302C51** › The centralised remote control provides settings and monitoring functions and can control up to 128 VRV and HRV units. A special adapter is required to connect Sky Air to the centralised line. › Control is possible in 3 different patterns: individual, batch or zone › Multiple groups can be controlled within the same zone › Multiple HRV units can be operated independently › System without air condi-tioning or HRV remote controls can be constructed › Control system can be expanded depending on requirements by combining a variety of centralised control systems	DCS302C51, BRC1D52 or BRC1E52A/B If necessary: DSC301B51 or DST301B51
Combination with other types of air conditioners			› Simultaneous operation of HRVs and air conditioners is possible via BRC1D52/ BRC1E52A/B › Use of the HRV remote control enables to change settings or operate HRVs independently	Connection adapter (no-voltage-a-contact-signal)



For small to large commercial spaces Daikin offers a range of R-410A inverter condensing units for use in conjunction with air handling units. In situations where Daikin commercial range ventilation units cannot satisfy the ventilation requirement due to building constraints (large atriums, banquet halls etc), air handling units represent the ideal solution. Air handling units provide large fresh air volumes (>1,000 m/h) and high ESPs enabling the use of extensive ductwork runs.

An air handler or air handling unit provides a tailor-made solution for optimising air conditions throughout multiple spaces. An air handler can be customised to your building - with no installation restrictions or design limitations - as air handler units are based on a completely unique modular design, so they can be sized (in increments of 1cm) to your exact requirements.

Daikin

air handling units

Air handling unit applications

Software

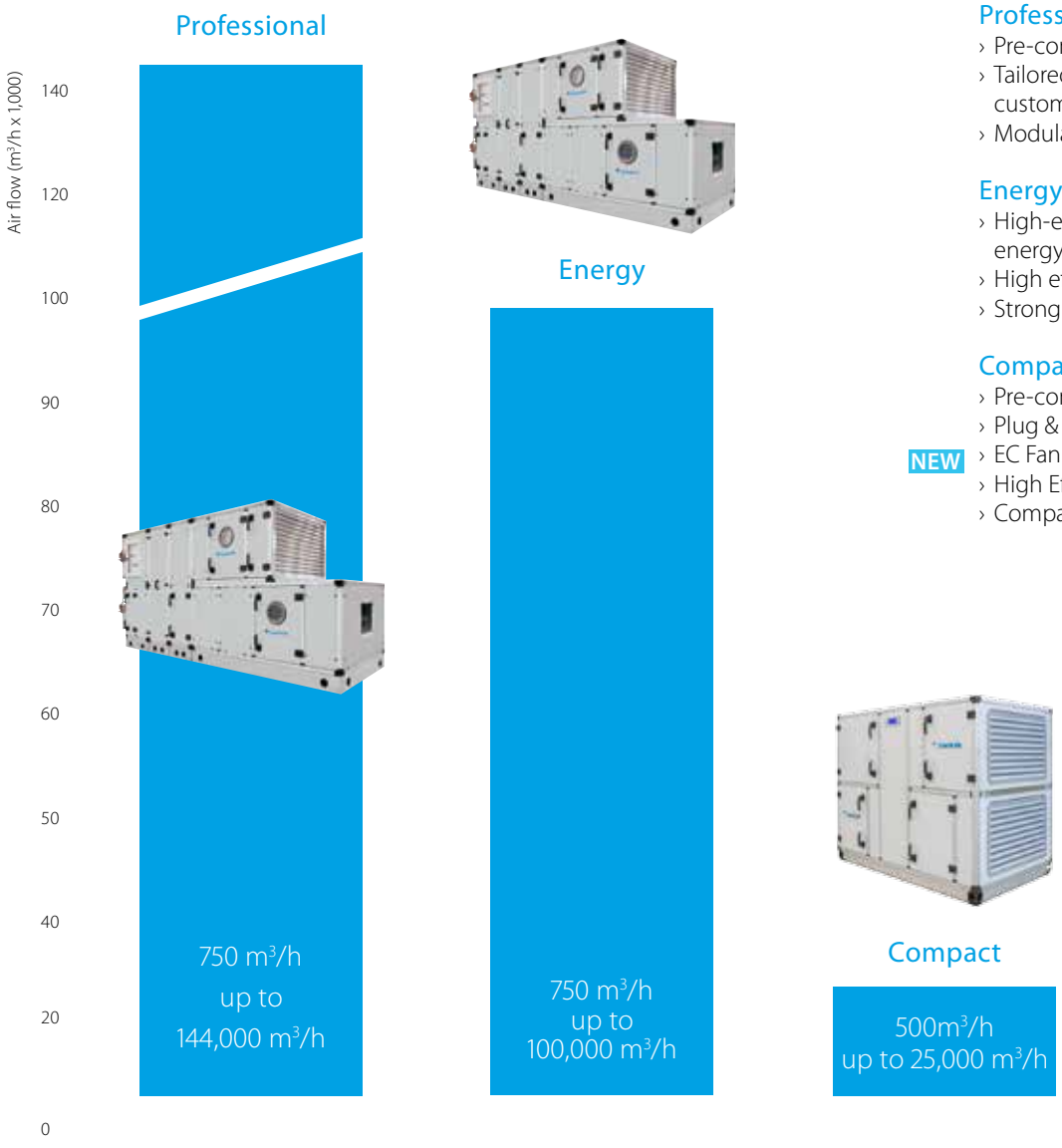
ASTRA is the powerful software that Daikin has developed to offer a quick and comprehensive service for the customer in order to make the technical choice and the economic valorization of each AHU. It is a complete tool that can configure any type of product and respond exactly to the strictest design needs. The result is a comprehensive economic offer including all the technical data and drawings, the psychrometric diagram with the relative air treatment and the fans' performance curves.

Air handling unit applications

Wide range of air flows

For applications that require big volumes of treated fresh air (large atriums, banquet halls, etc) air handling units represent the ideal solution. Daikin's wide range of air handling units treat air volumes from 500 m^3/h up to 140,000 m^3/h.

The air handling unit can be designed to deliver whatever air flow you require, via the specific dimensions of flow section available at the installation.



Professional
- Pre-configured sizes
- Tailored to the individual customer
- Modular construction

Energy
- High-end solution for optimised energy consumption
- High efficiency components
- Strong Return on Investment

Compact
NEW
- Pre-configured sizes
- Plug & Play concept
- EC Fan Technology
- High Efficiency Heat Wheel
- Compact Design

Selection software

ASTRA is the powerful software that Daikin has developed to offer a quick and comprehensive service for the customer in order to make the technical choice and the economic valorization of each AHU. It is a complete tool that can configure any type of product and respond exactly to the strictest design needs.
The result is a comprehensive economic offer including all the technical data and drawings, the psychrometric diagram with the relative air treatment and the fans' performance curves.
The ASTRA software features a specific DX heat pump coil section able to calculate cooling and heating performances with the automatic selection of the appropriate Daikin expansion valve.
The complementary Xpress software allows the correct ERQ or VRV outdoor unit to be selected.

Dainkin fresh air package - plug & play

The D-AHU Professional and Energy series provide a complete solution including unit control (EKEXV, EKEQ, DDC controller) factory mounted and configured, plug & play with our ERQ and VRV condensing units.
The easiest solution as you save time and only have one point of contact!

Pre-defined sizes

27 fixed sizes are available, optimised to reach the optimum combination between value for money and manufacturing standardisation. Daikin's section by section design means that units can be sized by 1cm increments and assembled on site, without welding, to suit the space constraints of the installation.

Return on investment

The air handling unit (AHU) is critical to an effective climate control system and the savings generated by our advanced designs and operating efficiencies guarantee a rapid return on the investment made. Our AHU Energy series has been designed to deliver exceptional performance thus driving down the energy consumed and so lowering energy bills. Taken over the expected 15-year life-span of the equipment, this will result in a substantial saving, especially in a time of ever increasing energy prices.

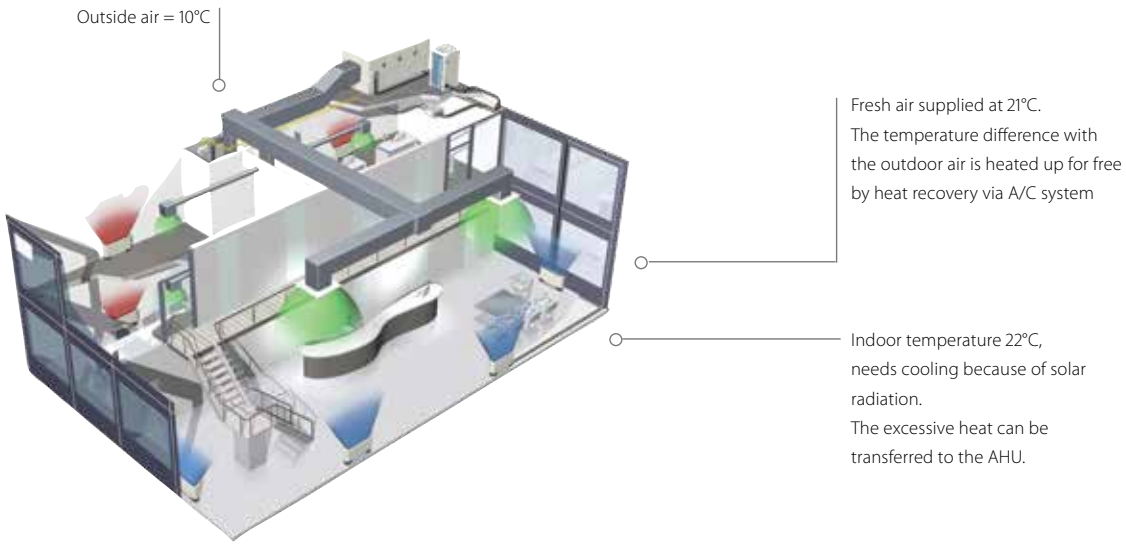
High efficiency components

All Daikin air handling units have been designed for optimum energy efficiency.
Polyurethane or Mineral wool panels guarantee excellent thermal insulation performance.
And the widest range of filters are provided to meet even the most strict demands.

Why use ERQ and VRV condensing units for connection to air handling units?

High Efficiency

Daikin heat pumps are renowned for their high energy efficiency. Integrating the AHU with a heat recovery system is even more effective since an office system can frequently be in cooling mode while the outdoor air is too cold to be brought inside in an unconditioned state. In this case heat from the offices is merely transferred to heat up the cold incoming fresh air.



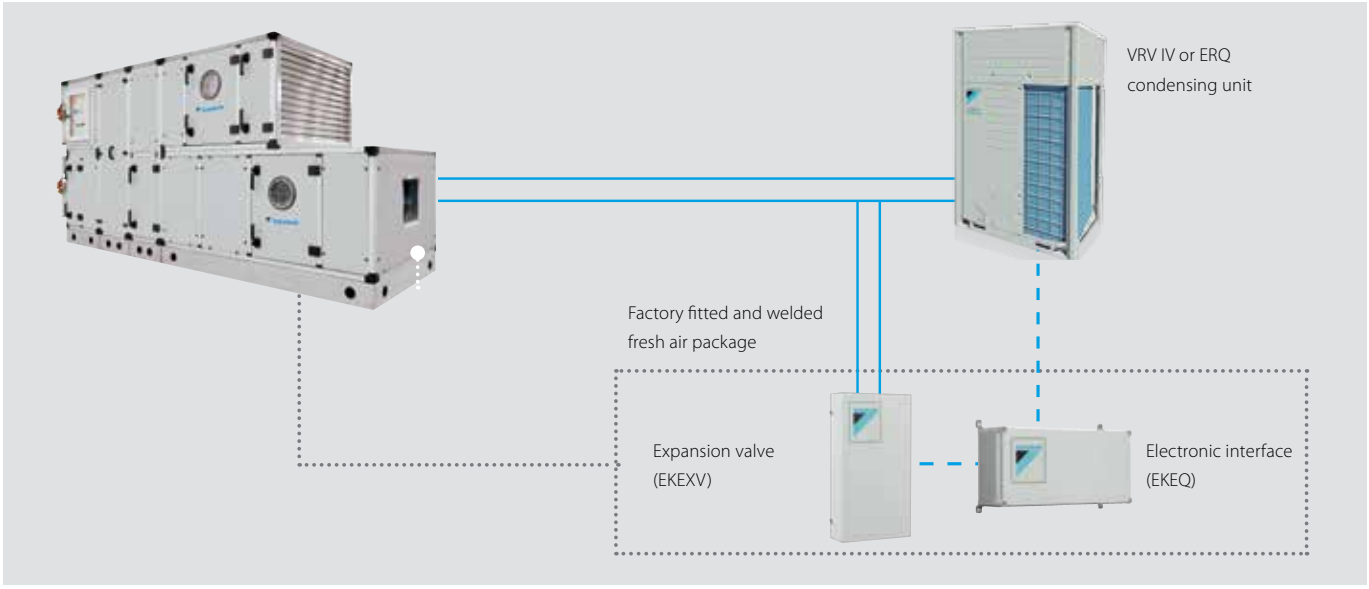
Fast response to changing loads resulting in high comfort levels

Daikin ERQ and VRV units respond rapidly to fluctuations in supply air temperature, resulting in a steady indoor temperature and resultant high comfort levels for the end user. The ultimate is the VRV range which improves comfort even more by offering continuous heating, also during defrost.

Easy Design and Installation

The system is easy to design and install since no additional water systems such as boilers, tanks and gas connections etc. are required. This also reduces both the total system investment and running cost.

Daikin Fresh air package



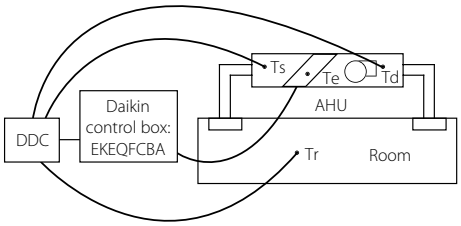
In order to maximise installation flexibility, 4 types of control systems are offered

Control w: Off the shelf control of air temperature (discharge temperature, suction temperature, room temperature) via any DDC controller
Control x: Precise control of air temperature (discharge temperature, suction temperature, room temperature) requiring a preprogrammed DDC controller (for special applications)

Control y: Control of refrigerant (Te/Tc) temperature via Daikin control (no DDC controller needed)
Control z: Control of air temperature (suction temperature, room temperature) via Daikin control (no DDC controller needed)

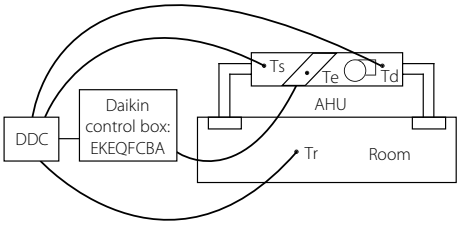
Possibility W (Td/Tr control):

Air temperature control via DDC controller
Room temperature is controlled as a function of the air handling unit suction or discharge air (customer selection). The DDC controller is translating the temperature difference between set point and air suction temperature (or air discharge temperature or room temperature) into a proportional 0-10V signal which is transferred to the Daikin control box (EKEQFCBA). This voltage controls the compressor frequency.



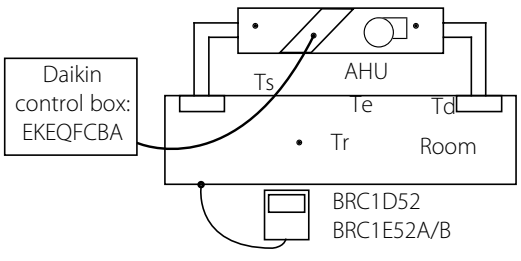
Possibility X (Td/Tr control):

Precise air temperature control via DDC controller
Room temperature is controlled as a function of the air handling unit suction or discharge air (customer selection). The DDC controller is translating the temperature difference between set point and air suction temperature (or air discharge temperature or room temperature) into a reference voltage (0-10V) which is transferred to the Daikin control box (EKEQFCBA). This reference voltage will be used as the main input value for the compressor frequency control.



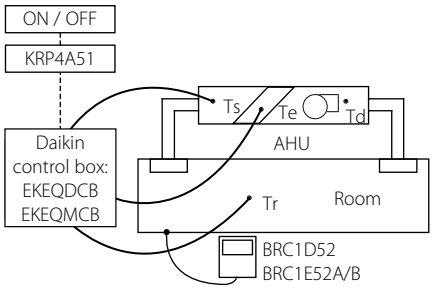
Possibility Y (Te/Tc control):

By fixed evaporating /condensing temperature
A fixed target evaporating temperature of between 3°C and 12°C can be set by the customer. In this case, room temperature is only indirectly controlled. The cooling load is determined from the actual evaporating temperature (i.e. load to the heat exchanger). A Daikin infrared remote control (BRC1D52 or BRC1E52A/B - optional) can be connected for error indication.



Possibility Z (Ts/Tr control):

Control your AHU just like a VRV indoor unit with 100% fresh air
(BRC1D52 or BRC1E52A/B - optional)
Set point can be fixed via standard Daikin infrared remote control. Remote ON/OFF can be achieved by an optional adapter KRP4A51.
No external DDC controller should be connected. The cooling load is determined from the air suction temperature and set point on the Daikin controller.



Ts = Air suction temperature	Tr = Room temperature	AHU = Air Handling Unit
Td = Air discharge temperature	Te = Evaporating temperature	DDC = Digital Display Controller

	Option kit	Features
Possibility w	EKEQFCBA	DDC controller is required temperature control using air suction or air discharge temperature
Possibility x		DDC and Microtech controller is required Precise Temperature control using air suction or air discharge temperature
Possibility y		Using fixed evaporating temperature, no set point can be set using remote control
Possibility z	EKEQDCB EKFQMCBA*	Using Daikin infrared remote control BRC1D52 or BRC1E52A/B Temperature control using air suction temperature

* EKEQMCB (for 'multi' application)

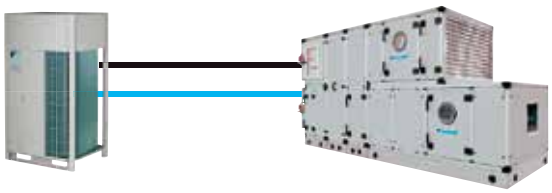
VRV - for larger capacities (from 8 to 54HP)

An advanced solution for both pair and multi application

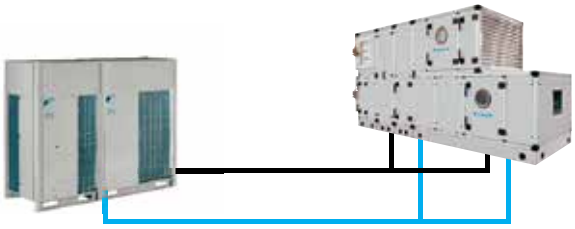
› Inverter controlled units
› Heat recovery, heat pump
› R-410A
› Control of room temperature via Daikin control
› Large range of expansion valve kits available
› BRC1E52A/B is used to set the set point temperature (connected to the EKEQMCBA).
› Connectable to all VRV heat recovery and heat pump systems

W, X, Y control for VRV IV heat pump

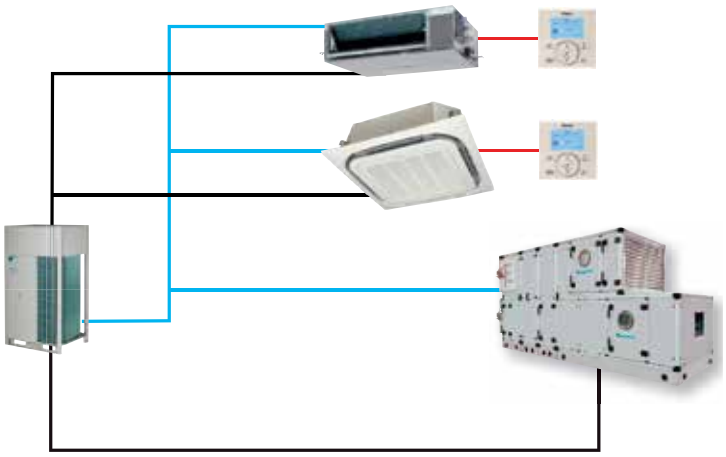
R*YQ8-20T



R*YQ12-54T



Z control for all VRV outdoor units



Refrigerant piping
F1-F2
other communication

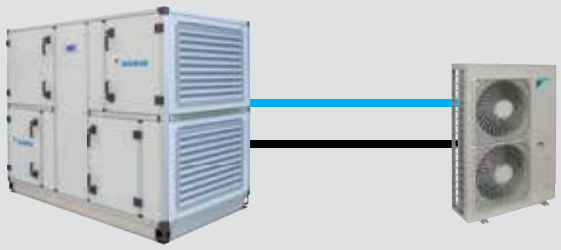
ERQ - for smaller capacities (from 100 to 250 class)

An basic fresh air solution for both pair application

› Inverter controlled units
› Heat pump
› R-410A
› Wide range of expansion valve kits available

The "Daikin Fresh Air Package" provides a complete Plug & Play Solution including AHU, ERQ or VRV Condensing Unit and all unit control (EKEQ, EKEX, DDC controller) factory mounted and configured. The easiest solution with only one point of contact.

Daikin air handling unit



F1 - F2
Refrigerant piping

Ventilation			ERQ	100AV1	125AV1	140AV1
Capacity range			HP	4	5	6
Cooling capacity	Nom.		kW	11.2	14.0	15.5
Heating capacity	Nom.		kW	12.5	16.0	18.0
Power input	Cooling	Nom.	kW	2.81	3.51	4.53
	Heating	Nom.	kW	2.74	3.86	4.57
EER				3.99		3.42
COP				4.56	4.15	3.94
Dimensions	Unit		mm	1,345x900x320		
Weight	Unit		kg	120		
Fan-Air flow rate	Cooling	Nom.	m^3/min	106		
	Heating	Nom.	m^3/min	102	105	
Sound power level	Cooling	Nom.	dBA	66	67	69
Sound pressure	Cooling	Nom.	dBA	50	51	53
level	Heating	Nom.	dBA	52	53	55
Operation range	Cooling	Min./Max.	°CDB	-5/46		
	Heating	Min./Max.	°CWB	-20/15.5		
	On coil	Heating Min.	°CDB	10		
	temperature	Cooling Max.	°CDB	35		
Refrigerant	Type / GWP			R-410A / 2.087,5		
	Charge		kg/ TCO_2Eq	4.0/8.4		
Piping	Liquid	OD	mm	9.52		
connections	Gas	OD	mm	15.9		19.1
	Drain	OD	mm	26x3		
Power supply	Phase/Frequency/Voltage		Hz/V	1N~/50/220-240		
Current	Maximum fuse amps (MFA)		A	32.0		

Ventilation			ERQ	125AW1	200AW1	250AW1
Capacity range			HP	5	8	10
Cooling capacity	Nom.		kW	14.0	22.4	28.0
Heating capacity	Nom.		kW	16.0	25.0	31.5
Power input	Cooling	Nom.	kW	3.52	5.22	7.42
	Heating	Nom.	kW	4.00	5.56	7.70
EER				3.98	4.29	3.77
COP				4.00	4.50	4.09
Dimensions	Unit		mm	1,680x635x765	1,680x930x765	
Weight	Unit		kg	159	187	240
Fan-Air flow rate	Cooling	Nom.	m^3/min	95	171	185
	Heating	Nom.	m^3/min	95	171	185
Sound power level	Nom.		dBA	72	78	
Sound pressure level	Nom.		dBA	54	57	58
Operation range	Cooling	Min./Max.	°CDB	-5/43		
	Heating	Min./Max.	°CWB	-20/15		
	On coil	Heating Min.	°CDB	10		
	temperature	Cooling Max.	°CDB	35		
Refrigerant	Type / GWP			R-410A / 2.087,5		
	Charge		kg/ TCO_2Eq	6.2/12.9	7.7/16.1	8.4/17.5
Piping	Liquid	OD	mm	9.52		
connections	Gas	OD	mm	15.9	19.1	22.2
Power supply	Phase/Frequency/Voltage		Hz/V	3N~/50/400		
Current	Maximum fuse amps (MFA)		A	16	25	

Integration of ERQ and VRV in third party air handling units

a wide range of expension valve kits and control boxes

Combination table

			Control box			Expansion valve kit									
			EKEQDCBV3	EKEQFCBAV3	EKEQMCBAV3	EKEXV50	EKEXV63	EKEXV80	EKEXV100	EKEXV125	EKEXV140	EKEXV200	EKEXV250	EKEXV400	EKEXV500
			Z control	W,X,Y control	Z control										
System A	1-phase	ERQ100	P	P		-	P	P	P	P	-	-	-	-	-
		ERQ125	P	P		-	P	P	P	P	P	-	-	-	-
		ERQ140	P	P		-	-	P	P	P	P	-	-	-	-
	3-phase	ERQ125	P	P		-	P	P	P	P	P	-	-	-	-
		ERQ200	P	P		-	-	-	P	P	P	P	P	-	-
		ERQ250	P	P		-	-	-	-	P	P	P	P	-	-
System B	VRV III				n1	n1	n1	n1	n1	n1	n1	n1	n1	n1	n1
System B	VRV IV			1 -> 3	n2	n2	n2	n2	n2	n2	n2	n2	n2	n2	n2

- P (pair application): combination depends on the capacity of the air handling unit
- n1 (multi application: combination of air handling units and VRV DX indoor units): to determine the quantity, refer to the engineering data book
- n2 (multi application: multiple air handling units, or the combination of air handling units and VRV DX indoor units): to determine the quantity, refer to the engineering data book
- Control box EKEQFA can be connected to some types of VRV IV outdoor units (with a maximum of 3 boxes per unit). Do not combine EKEQFA control boxes with VRV DX indoor units, RA indoor units or hydroboxes

Capacity table

Cooling

EKEXV Class	Allowed heat exchanger capacity (kW)	
	Minimum	Maximum
50	5,0	6,2
63	6,3	7,8
80	7,9	9,9
100	10,0	12,3
125	12,4	15,4
140	15,5	17,6
200	17,7	24,6
250	24,7	30,8
400	35,4	49,5
500	49,6	61,6

Saturated evaporating temperature: 6°C
Air temperature: 27°C DB / 19°C WB

Heating

EKEXV Class	Allowed heat exchanger capacity (kW)	
	Minimum	Maximum
50	5,6	7,0
63	7,1	8,8
80	8,9	11,1
100	11,2	13,8
125	13,9	17,3
140	17,4	19,8
200	19,9	27,7
250	27,8	34,7
400	39,8	55,0
500	55,1	69,3

Saturated condensing temperature: 46°C
Air temperature: 20°C DB

EKEXV - Expansion valve kit for air handling applications

Ventilation			EKEXV	50	63	80	100	125	140	200	250	400	500
Dimensions	Unit		mm	401x215x78									
Weight	Unit		kg	2.9									
Sound pressure level	Nom.		dBA	45									
Operation range	On coil temperature	Heating Min.	°CDB	10 (1)									
		Cooling Max.	°CDB	35 (2)									
Refrigerant	Type / GWP			R-410A / 2.087,5									
Piping connections	Liquid	OD	mm	6.35	9.52							12.7	15.9

(1) The temperature of the air entering the coil in heating mode can be reduced to -5°CDB. Contact your local dealer for more information. (2) 45% Relative humidity.

EKEQ - Control box for air handling applications

Ventilation		EKEQ	FCBA	DCB	MCBA
Application			See note	Pair	Multi
Outdoor unit			ERQ / VRV	ERQ	VRV
Dimensions	Unit	mm	132x400x200		
Weight	Unit	kg	3.9	3.6	
Power supply	Phase/Frequency/Voltage	Hz/V	1~/50/230		

The combination of EKEQFCBA and ERQ is in pair application. The EKEQFCBA can be connected to some type of VRV IV outdoor units with a maximum of 3 control boxes. The combination with DX indoor units, hydroboxes, RA outdoor units, ... is not allowed. Refer to the combination table drawing of the outdoor unit for details.

Pair application

Step 1: Select required capacity of AHU

Based on the required capacity of the AHU please select the expansion valve

Step 1

	Allowed heat exchanger volume (dm³)		Allowed heat exchanger capacity in coolong (kW)			Allowed heat exchanger capacity in heating (kW)		
EKEXV class	Minimum	Maximum	Minimum	Standard	Maximum	Minimum	Standard	Maximum
63	1.66	2.08	6.3	7.1	7.8	7.1	8.0	8.8
80	2.09	2.64	7.9	9.0	9.9	8.9	10.0	11.1
100	2.65	3.3	10	11.2	12.3	11.2	12.5	13.8
125	3.31	4.12	12.4	14.0	15.4	13.9	16.0	17.3
140	4.13	4.62	15.5	16.0	17.6	17.4	18.0	19.8
200	4.63	6.6	17.7	22.4	24.6	19.9	25.0	27.7
250	6.61	8.25	24.7	28.0	30.8	27.8	31.5	34.7

Heat exchanger capacity is defined under following conditions:
Saturated suction temperature (SST) = 6°C, Superheat (SH) = 5K
Subcool condensor (SC) = 3K
Air temperature = 27°CDB/19°CWB

Eg: If you need 14kW in cooling, you will require an expansion valve of 125class (EKEXV125). The heat exchanger capacity has priority over the volume of the heat exchanger and is therefore the determining factor for the selection of the expansion valve. More information on the volume can be found in the data book and service manual.

Step 2: Select outdoor unit

Pair combinations with ERQ outdoor units are possible based on the same principle as standard DX units. The capacity of the AHU unit is indicated by the capacity of the expansion valve and can be connected as indicated in below table.

Step 2

OUTDOOR UNIT			CONTROL BOX		EXPANSION VALVE KIT						
			Control z	Control x or y	Class 63	Class 80	Class 100	Class 125	Class 140	Class 200	Class 250
			EKEQDCB	EKEQFCB	EKEXV63	EKEXV80	EKEXV100	EKEXV125	EKEXV140	EKEXV200	EKEXV250
ERQ	1~	ERQ100AV1	P	P	P	P	P	P	-	-	-
		ERQ125AV1	P	P	P	P	P	P	P	-	-
		ERQ140AV1	P	P	-	P	P	P	P	-	-
	3~	ERQ125AW1	P	P	P	P	P	P	P	-	-
		ERQ200AW1	P	P	-	-	P	P	P	P	P
		ERQ250AW1	P	P	-	-	-	P	P	P	P

P: Pair, combination depending on AHU coil volume and capacity

Eg: Based on above selected expansion valve, the EKEXV125 has a capacity of class 125. Therefore we can choose to connect it in pair with all outdoor units indicated in the table above with P.

Step 3: Control box selection

Please make your selection of the control box based on your requirements. All the different control possibilities are mentioned on page 59. More information on the selection is available in the service manual.

Multi application

Step 1: Select required capacity of AHU

Based on the required capacity of the AHU please select the expansion valve

Step 1

EKEXV class	Allowed heat exchanger volume (dm³)		Allowed heat exchanger capacity in cooling (kW)			Allowed heat exchanger capacity in heating (kW)		
	Minimum	Maximum	Minimum	Standard	Maximum	Minimum	Standard	Maximum
50	0.76	1.65	5.0	5.6	6.2	5.6	6.3	7.0
63	~~1.66~~	~~2.08~~	~~6.3~~	6.9	7.1	7.8	7.1	8.0	8.8
80	2.09	2.64	7.9	9.0	9.9	8.9	10.0	11.1
100	2.65	3.3	10	11.2	12.3	11.2	12.5	13.8
125	3.31	4.12	12.4	14.0	15.4	13.9	16.0	17.3
140	4.13	4.62	15.5	16.0	17.6	17.4	18.0	19.8
200	4.63	6.6	17.7	22.4	24.6	19.9	25.0	27.7
250	6.61	8.25	24.7	28.0	30.8	27.8	31.5	34.7

Eg: If the required capacity of the AHU is 6.9kW in cooling, which lies between 6.3 and 7.8, the EKEXV63 can be selected.
The heat exchanger capacity has priority over the volume of the heat exchanger and is therefore the determining factor for the selection of the expansion valve. More information on the volume can be found in the data book and service manual.

Step 2: Select outdoor unit

Multiple AHU can be connected to a VRV system and the connection principle is similar as for ERQ. Connection of the full system can be up till 110% including at least 1 Daikin indoor unit (cassette, duct, …) The capacity index of the AHU needs to be calculated based on the indicated capacity of the selected expansion valve and the actual capacity. The AHU capacity index = capacity class (expansion valve) * ratio (actual capacity AHU / standard capacity expansion valve)

Eg: AHU has a capacity requirement of 6.9kW and the selected expansion valvue is the EKEXV63 with a standard capacity of 7.1kW. So the AHU capacity = 63 * (6.9kW / 7.1kW) = 61 class
In case that in the system 2 FXSQ50 class are connected, the total sum of capacity would be 61 + 2*50 = 161 class
Based on the 161 class a 10 HP VRV is required as outdoor unit.

Step 3: Control box selection

EKEQMCB is the control box which is required to control the communication between the AHU and the VRV system beside the standard communication of the Daikin DX indoor units (cassette, duct, wall…). More information on the selection is available in the service manual.

[1] For detailed specifications of VRV outdoor units, refer to the VRV catalogue or databooks

Options & accessories

VH ELECTRICAL HEATER FOR VAM

HIGH EFFICIENCY FILTERS

FILTERS

		VAM150FA	VAM250FA	VAM350FB	VAM500FB	VAM650FB	VAM800FB	VAM1000FB	VAM1500FB	VAM2000FB	VKM50GB(M)	VKM80GB(M)	VKM100GB(M)
Dust filters	EN779 Medium M6	-	-	EKAFV50F6	EKAFV50F6	EKAFV80F6	EKAFV80F6	EKAFV100F6	EKAFV100F6 x2	EKAFV100F6 x2	-	-	-
	EN779 Fine F7	-	-	EKAFV50F7	EKAFV50F7	EKAFV80F7	EKAFV80F7	EKAFV100F7	EKAFV100F7 x2	EKAFV100F7 x2	-	-	-
	EN779 Fine F8	-	-	EKAFV50F8	EKAFV50F8	EKAFV80F8	EKAFV80F8	EKAFV100F8	EKAFV100F8 x2	EKAFV100F8 x2	-	-	-
Silencer	Model name	-	-	-	KDDM24B50	KDDM24B100	KDDM24B100	KDDM24B100	KDDM24B100 x2	KDDM24B100 x2	-	KDDM24B100	KDDM24B100
	Nominal pipe Diameter (mm)	-	-	-	200	200	250	250	250	250	-	250	250
CO_2 sensor		-	-	BRYMA65	BRYMA65	BRYMA65	BRYMA100	BRYMA100	BRYMA200	BRYMA200	BRYMA65	BRYMA100	BRYMA200
VH electrical heater for VAM		VH1B	VH2B	VH2B	VH3B	VH3B	VH4B / VH4/AB	VH4B / VH4/AB	VH5B	VH5B	-	-	-

Individual control systems	VAM-FA/FB	VKM-GB(M)	EKEQFCB [2]	EKEQDCB [2]	EKEQMCB [2]
Wired remote control	BRC1E52A/B / BRC1D52	BRC1E52A/B / BRC1D52	BRC1E52A/B / BRC1D52	BRC1E52A/B / BRC1D52 [1]	BRC1E52A/B / BRC1D52 [1]
VAM wired remote control	BRC301B61	-	-	-	-

Centralised control systems	VAM-FA/FB	VKM-GB(M)	EKEQFCB [2]	EKEQDCB [2]	EKEQMCB [2]
Centralised remote control	DCS302C51	DCS302C51	-	-	-
Unified ON/OFF control	DCS301B51	DCS301B51	-	-	-
Schedule timer	DST301B51	DST301B51	-	-	-

Others	VAM150-250FA	VAM350-2000FB	VKM-GB(M)	EKEQFCB [2]	EKEQDCB [2]	EKEQMCB [2]
Wiring adapter for electrical appendices (note 6)	KRP2A51	KRP2A51 (note 3)	BRP4A50A (note 4/5)	-	-	-
Adapter PCB for humidifier	KRP50-2	BRP4A50A (note 4/5)	BRP4A50A (note 4/5)	-	-	-
Adapter PCB for 3rd party heater	BRP4A50	BRP4A50A (note 4/5)	BRP4A50A (note 4/5)	-	-	-
Remote sensor	-	-	-		KRCS01-1	

Notes

(1) Cool/heat selector required for operation

(2) Do not connect the system to DIII-net devices (Intelligent controller, Intelligent Manager, LonWorks interface, BACnet interface…).

(3) Installation box KRP1BA101 needed.

(4) Fixing plate EKMPVAM additionally needed for VAM1500-2000FB.

(5) 3rd party heater and 3rd party humidifier cannot be combined

(6) For external control and monitoring (ON/OFF control, operation signal, error indication)

	VH electrical heater for VAM
Supply voltage	220/250V ac 50/60 Hz. +/-10%
Output current (maximum)	19A at 40°C (ambient)
Temperature sensor	5k ohms at 25°C (table 502 1T)
Temperature control range	0 to 40°C / (0-10V 0-100%)
Run on timer	Adjustable from 1 to 2 minutes (factory set at 1.5 minutes)
Control fuse	20 X5 mm 250 m A
LED indicators	Power ON - Yellow Heater ON - Red (solid or flashing, indicating pulsed control) Airflow fault - Red
Mounting holes	98mm X 181mm centres 5 mm ø holes
Maximum ambient adjacent to terminal box	35°C (during operation)
Auto high temp. cutout	100°C Pre-set
Man. reset high temp. cutout	125°C Pre-set
Run relay	1A 120V AC or 1A 24V DC
BMS setpoint input	0-10VDC

Vh electrical heater for vam		vH1B	VH2B	VH3B	VH4B	VH4/AB	VH5B
Capacity	kW	1	1	1	1.5	2.5	2.5
Duct diameter	mm	100	150	200	250	250	350
Connectable VAM		VAM150FA	VAM250FA	VAM500FB	VAM800FB	VAM800FB	VAM1500FB
		-	VAM350FB	VAM650FB	VAM1000FB	VAM1000FB	VAM2000FB

Literature overview

Daikin has a wide portfolio of commercial catalogues in order to supply you with information or help you to sell our products to your customers.

Commercial market - literature overview

for professional network

Solution guides:

Hotel Solutions
Clear installer benefits why to choose Daikin for a hotel

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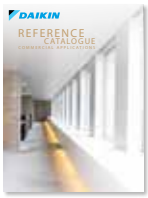
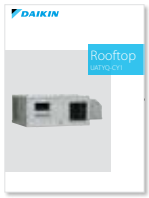
Reference books:



Product profiles:

VRV IV range
Detailed VRV IV standards and technologies benefits. Main features and specs of VRV IV product range

15-206



Rooftop UATYQ-CY1
Detailed rooftop benefits incl. UAYTQ-CY1, ECONO-AY1

15-120

D-AHU Modular
Details on compact AHU range.

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Focus topics:

Replacement Technology
Clear installer benefits of VRV replacement technology

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Technical cooling
Clear installer benefits why to choose Daikin for technical cooling

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Product flyers:

Wired Remote Control
Detailed info on BRC1E-52A/B remote control

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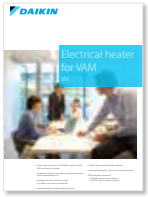
KNX Interface
Detailed info on KLIC-DI and KLIC-DD interfaces

15-310

DIII-net modbus gateway
Detailed info on EKMBDXA modbus interface

15-312



VAM electrical heater
Detailed info on electrical heater for VAM

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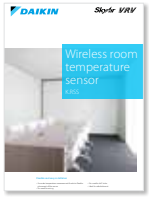
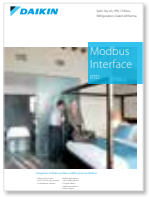


Wireless temperature sensor
Detailed info on wireless sensor K.RSS

15-309



RTD modbus interface
Detailed info on RTD controls and applications

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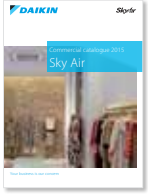
Product catalogues:



Sky Air Catalogue
Detailed technical information & benefits on Sky Air/ Ventilation/Biddle Air Curtain/Control systems/AHU

15-114

VRV Catalogue
Detailed technical information & benefits of the VRV total solution

15-200

Ventilation Catalogue
Detailed info on Ventilation products

15-203

Air handling units catalogue
Detailed info on AHU's.

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Product portfolios:

Sky Air product portfolio
Overview of Sky air product range

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VRV product portfolio
Overview of VRV total solution product range

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Controls systems portfolio
Overview of all Daikin control systems

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for your customers

Commercial Solutions
Daikin offers solutions for commercial applications

15-100

Reference catalogue
Daikin commercial and industrial references

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Green Buiding Solutions
Clear building owner/investor benefits why to choose Daikin for a green building, with emphasis on BREEAM

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Hotel Solutions
Clear building owner/investor benefits why to choose Daikin for a hotel

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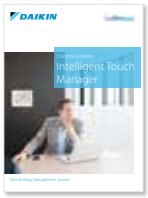

Intelligent Touch Manager
Detailed benefits of Intelligent Touch Manager

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VRV IV i-series
Details on VRV IV heat pump for indoor installation.

15-207

VRV IV S-series
Details on mini VRV IV heat pump
Cover van webshop halen

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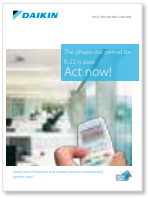

Replacement technology
Clear building owner/investor benefits of replacement technology

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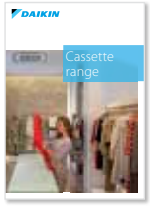
Sky Air product leaflets
Single page leaflet with the main benefits and technical specifications of each individual Sky Air unit. Ideal for quotations

VRV product leaflets
Single page leaflet with the main benefits and technical specifications of each individual VRV unit. Ideal for quotations



Cassette mini catalogue
Giving overview of our cassette unit product solutions
(incl. Round flow cassette FCQ(H)G-F/FXFQ-A, Fully flat cassette FFQ-C/FXZQ-A, FUQ-C/ FXUQ-A, ACQ-C)

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Concealed ceiling unit mini catalogue
Catalogue giving overview of our concealed ceiling unit product solutions
(incl. FDXS-F(9), FBQ-D, FDQ-C, FDQ-B, FXDQ-M9, FXDQ-A, FXSQ-A, FXMQ-P7, FXMQ-MA)

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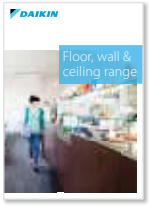

Ceiling suspended, wall mounted, floor standing units mini catalogue
Catalogue giving overview of our Ceiling suspended, wall mounted and floor standing product solutions.
(incl. FXHQ-A,FHQ-C, FXAQ-A, FAQ-C, FXNQ-A, FNQ-A, FXLQ-P, FVQ-C)

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Technical documentation:

Download all technical documentation such as engineering databooks, selection software, installation and operation manuals and service manuals directly from our extranet: extranet.daikineurope.com

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