Water-to-air heat pump using water as a heat source

Scale up your expectations
Maximising rental space
A Daikin VRV solution, tailored to your building’s requirements will take up nearly 30% less plant space than a typical chilled water system. The heat pumps are smaller, and also the refrigerant piping is taking up less space, the overall effect is maximised commercially lettable area.

Low operating costs
According to Franklin + Andrews running costs for a VRV heat recovery compare highly favourably with a 2 or 4 pipe fan coil system. Running costs per m² for a water-based system can be 40 to 72% higher compared to a VRV heat recovery system.
Building Managers - Putting you in control

Efficient building services, combined with intelligent building controls, promise smart use of energy that forward-thinking businesses expect and demand.

Precise zone control to suit building occupancy

The VRV’s intelligent control system can provide precise regulation of temperature and air flow for each room. Zone control delivers lower running costs, because it activates the system only in spaces that require heating or cooling, and it can shut down the system entirely where and when no air conditioning is required.

Smart energy management

Smart energy management tools maximise the system’s efficiency by reducing its running costs and preventing energy waste. Whether for an individual system or for the management of multiple buildings, Daikin has an intelligent control solution for every application.

Partial close down in multi-tenant environment

The modular and floor-by-floor approach adopted by Daikin ensures that, in a multi-tenancy environment, a partial close down for maintenance does not close down the entire VRV system. This avoids the need for expensive backup equipment and protocols.

Reliability you can depend on

High system reliability and efficiency over the entire lifetime of the system, coupled with low maintenance costs, is the only way of ensuring lower running costs and higher capital returns. This is why Daikin builds in reliability, after sales service and efficiency you can depend on.
Consultants - Freedom to design

With Daikin’s water-to-air heat pump you have the ultimate system to fit your design and legislation. Extremely compact they have the smallest footprint of comparable systems in the market and will fit any type of technical room.

Individually tailored solutions

The Daikin VRV provides great flexibility to help meet current and future client needs and regulations such as EN378. Because the system can be designed and assembled to meet any building’s requirements, it offers solutions for a wide range of spaces, from large open lobbies and reception areas, to individual rooms and offices.

The water cooled VRV systems can be connected to geothermal or hydrothermal sources, or use solar collectors, and have the option to add water heating and refrigeration into the system.

Our intelligent control solutions allow the climate regime to be tailored to meet the requirements of each room, floor or tenant as required, so as to maximise energy efficiency and prevent energy wastage.

Balancing heat loads

Our modular approach also provides great flexibility for balancing heat loads. By using our modelling tools, designers can balance heat loads in different parts of the building, allowing them to choose the right indoor unit style and capacity (over 120 different options) to meet their requirements.

Achieving a balanced mode of heat recovery within a VRV system can also deliver dramatically higher energy efficiencies helping to maximise BREEAM credits at the design stage. This involves designing the system so that it is capable of cooling areas of the building with the highest heat gains and transferring the reclaimed heat to other areas requiring heating or hot water. The 2-stage heat recovery (via the refrigerant and water circuit) maximises heat recovery potential.

Differentiating technologies

› Variable Refrigerant Temperature allow individual tailoring to the building need
› Stacked configuration: a 42HP system can be installed in less than 0.5m² of floor space
› Zero heat dissipation obviates the need for ventilation or cooling in the technical room

zero heat dissipation principle ensures a zero heat balance of the unit
Installers - designed with installation in mind

Daikin has designed its VRV system with ease of installation in mind. From lighter units with reduced footprint, over automatic charging and testing to better access to fault codes and components.

We have focussed on preventing errors in installation/commissioning, preventive maintenance and easy service access.

Reduced installation time by design

Daikin’s VRV are designed to be installed fast and accurate. Settings can be done via PC and uploaded, error read out is easy from a 7-segment display. Components in this compact unit are still easy to be reached thanks to a rotating switchbox. For heat recovery systems our wide range of extremely compact BS boxes reduce work as up to 16 units can be connected to one box. Connections and fittings are factory fitted with the option for horizontal or vertical connection making on-site assembly faster.

Easier integration of the water side

The VRV uses different output signals via a standard 0-10V allowing external control and variable water flow enabling you to control the circulation pump and configure the system to be the most energy efficient as possible.

Preventive maintenance

Monitoring the system’s performance via our intelligent controllers and i-Net cloud timely informs when maintenance should be done before a shut down occurs, thereby ensuring that the occupants of the building suffer no decline in environmental comfort. It also enables the building’s owner and manager to schedule longer term maintenance activities and refurbishments to suit demand.
How does a water-cooled VRV system work?
Stylish indoor units OR OR

Hot water hydrobox
Innovations
for maximum flexibility and ease of installation

Horizontal or vertical piping connection

Highly improved efficiency thanks to enlarged heat exchanger

Easy access to components

Easy front plate removal
Rotating switchbox

step 1
step 2
Zero heat dissipation principle

- No need for ventilation or cooling of the technical room
- Enhancing installation flexibility and reliability of parts

Heat dissipation coil cools down the unit to achieve a neutral heat balance in the technical room

PCB generates heat

Compressor generates heat

Minimal technical room space required.

VRV IV technology

- VRV configurator
- 7 segment display
A great and well-known example of a Daikin Total Solution leading to high energy-efficient HVAC consumption

› A combination of VRV, Sky Air and Applied systems ensuring all offices and common areas are fully air conditioned.

› Water-cooled VRV as the main contributor to total HVAC energy efficiency due to its two-stage heat recovery system.

› Flexibility: individual thermal control and comfort with VRV on each floor and space.

› Problem-free connection between Daikin units and the LonWorks BMS system ensures the building’s total energy consumption is properly monitored and controlled.

Location
48 Lancu de Hunedoara Boulevard
Bucharest Romania

Building details
Built-up area: 24,728 m²
Total usable area: 20,020 m²
Floors: 4 basements, 15 floors, technical floor
Building height: 72 m
Office space per level: approx. 1,000 m²

Daikin systems installed
› 67 x VRV water-cooled units
› 2 x VRV outdoor heat pump units
› 289 VRV indoor units (265 ducts, 24 x cassettes)
› 5 x Sky Air with Roundflow Cassettes
› 4 x air-cooled water chillers
› 11 x DMSS04B5I (LonWorks gateway)

Awards
› Green Building of the Year 2012 (ROGBC)
› Environmental Social & Sustainability award (ESSA)
Application
example

Closed evaporative cooling tower used for cooling, Chiller used for heating

Benefits of this setup
› Chiller is only used when cooling tower capacity is not enough and/or when cooling and heating load of VRV is unbalanced \(\rightarrow\) very energy efficient installation
› In case the chiller is operating, a renewable heat source (air) is used, contributing to BREEAM score.
› It is possible to downsize the cooling tower, making the installation more compact

When to use?
› When there is anyway a chiller used for other purposes in the building
› When space for outdoor installation is limited
› Efficiency / green building certification schemes oriented projects
Hotel Van der Valk chose:
Comfort for guests and staff

› Concealed ceiling units create comfort zones within the lobby, meeting the different needs of guests and staff
› Daikin Variable Refrigerant Temperature technology ensures the optimal comfort levels by avoiding cold draughts

Centralised control & management

› Central control of the entire HVAC-R solution
› Easy to set schedules
› Easy integration in front-desk controls with remote access
› BMS functions integrated such as alarm inputs, control of lights, ...

Complete Daikin solution

› Cooling and heating supplied by a combination of VRV air-cooled and water-cooled systems connected to a Geothermal loop for maximum efficiency
› Hot water production via Daikin gas boilers connected to Daikin hot water storage tanks
› Ventilation with Daikin heat recovery air handling units
› Kitchen refrigeration with Daikin ZEAS units

Location

Avenue Mélina Mercouri 7, 7000 Mons
Belgium

Daikin systems installed

› 11 Water cooled VRV outdoor units
› 10 Air cooled VRV outdoor units (heat recovery and heat pump)
› 1 ZEAS refrigeration outdoor unit
› 177 concealed ceiling indoor units
› 2 Daikin condensing gas boilers connected to Daikin hot water tanks
› 2 Daikin DX air handling units
› 1 intelligent Touch Manager central control with WAGO interface
Application example

Geothermal operation

Benefits of this setup

- Very energy efficient
- Ground loop can be in service for a very long time, so future equipment upgrades/replacements are easy
- Vertical boreholes provide more stable water temperature (constant high efficiency) and do not occupy a lot of ground space.

When to use?

- When the soil is suitable for geothermal loops and there is availability of geothermal installation expertise locally
- For the projects with high requirements to energy efficiency, green building certification oriented
Hilton Istanbul
Success case study
Location

Doubletree by Hilton Hotel
Istanbul - Turkey

Daikin systems installed

› Indoor Amount : 420 pcs
  FXSQ - FXDQ - FXMQ - FXFQ - FXCQ - FXAQ - FXKQ
› Outdoor Amount : 135 pcs
  RWEYQ 8 – 10 – 20 hp
› Heat Reclaim Ventilation : 23 pcs
› Individual Control (BRCID52) : 391 pcs
› Centralized Control (I-Manager) : 2 pcs
› AHU DX condensing Unit application : VRW

Efficient use of space

The first steel construction hotel in Turkey, efficiently equipped with Daikin. The construction consists of 2,500 ton of steel. With its 110 m height, 25 floors and 230 rooms project area is 29,000 m². The total capacity goes up to 3,500 kW.

The DoubleTree by Hilton hotel in Istanbul chose to install the water cooled VRV units floor by floor, a choice for efficient use of space and efficient climate control.

The technical specifications speak for themselves:
› The VRV outdoor installation area is 50% smaller than the Applied System installation area
› The noise is lowered from 96 dBa to 54 dBa with the VRV outdoor system
› The VRV system power supply capacity is reduced by 30%
› The VRV system has a low start up current
› An energy saving up to 50% and a high COP value
› The VRV system is 40% lighter
› The used boiler capacity has been reduced by 20%

Lower maintenance costs

All the improvements also reduced the service needed to keep the system’s performance up to speed. And by not using any water based fan coils there is no corrosion in the floors.

A total solution

Daikin equipped this hotel with a complete solution. The ventilation is a mix of Daikin air handling units and heat reclaim ventilation units. The full solution is monitored and controlled centrally via the intelligent Touch Manager.
Application example

Dry cooler used for cooling, boiler used for heating

Benefits of this setup

- Simple, cost efficient. Good option to use VRV technology in high-rise building
- Does not make any special demand to the building/project/installation location
- Provides high efficiency as for hotel application it is usual to have simultaneous cooling and heating load.
- Heat recovery process in the water loop often allows the water temperature to stay within acceptable range even without using drycooler and boiler.

When to use?

- For high-rise buildings or other places where VRV Water Cooled is preferable because of installation conditions
Detailed floor design

BS box installed in hallway, outside guest rooms. One box can address 1 up to 16 rooms.

FXSQ
Concealed ceiling unit for guestroom temperature control.

HRV
Ventilation located on every floor, close to shaft.

RWEYQ
Watercooled VRV on every floor close to shaft. Condensers are silent and compact allowing installation small technical room.
Faster project completion turned a chiller solution into a Water cooled VRV solution

This building was originally designed with chiller and boiler system. Daikin Water cooled VRVIII heat pump connected to an open source is installed for refurbishment. Air handling unit is used for ventilation. Installation of water cooled VRV units are realised faster than planning. Each room is controlled by Intelligent Manager system.

Location
Ordina Groningen
Groningen - Netherlands

Daikin systems installed
1. Indoor units: 130 FXSQ concealed ceiling
2. VRV outdoor units: 15 RWEYQ10 units
3. Control systems: Intelligent Manager central control
Application setup

Benefits of this setup
› Open type geothermal loop can be as efficient as vertical boreholes, and are more cost efficient to install
› It provides stable water loop temperature (=constant high efficiency)

When to use?
› Open type geothermal loops can be considered when there is a suitable source of water at installation location (underground water, river, lake, sea...)
### Water-to-air

#### Outdoor units

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<td>Reduced CO2 emissions thanks to the use of geothermal energy as a renewable energy source</td>
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<td>No need for an external heating or cooling source when used in geothermal mode</td>
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<td>Variable Water Flow control option increases flexibility and control</td>
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<td>Mixed connection of HT hydroboxes and VRV indoor units</td>
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<td>2 analogue input signals allowing external control</td>
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<td>Fully integrated solution with heat recovery for maximum efficiency</td>
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<td>Covers all thermal needs of a building via a single point of contact: accurate temperature control, ventilation, hot water, air handling units and Biddle air curtains</td>
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<td>“Free” heating and hot water through heat recovery</td>
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<td>The perfect personal comfort for guests/tenants via simultaneous cooling and heating</td>
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<td>Compact and lightweight single fan design saves space and is easy to install</td>
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<td>Either connect VRV of stylish indoor units (Daikin Emura, Nexura)</td>
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#### Water-cooled

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<td>Space saving trunk design for flexible installation</td>
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#### Special models

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<td>Unique VRV heat pump for indoor installation</td>
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<td>Total flexibility for any shop location and building type as the outdoor unit is invisible and split up in 2 parts</td>
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#### Replacement

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<td>Dramatically improve your comfort, efficiency and reliability</td>
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<td>No interruption of daily business while replacing your system</td>
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Ranges marked with "*" are not Eurovent certified. Multi combinations are not in scope of the Eurovent certification programme.
## Outdoor units

<table>
<thead>
<tr>
<th>Capacity (HP)</th>
<th>Description / Combination</th>
<th>VRV indoor units</th>
<th>LT/HT Hydrobox</th>
<th>HRV Hydrobox</th>
<th>AHU connection</th>
<th>Remarks</th>
</tr>
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<tbody>
<tr>
<td>32 34 36 38 40 42 44 46 48 50 52 54</td>
<td>VRV IV-W Water-cooled VRV RWEYQ-T9</td>
<td>O O O O O O O O</td>
<td>X X X X X X</td>
<td>X X X X X X</td>
<td>X X X X X X</td>
<td>Standard total system connection ratio limit: 50 ~ 130%</td>
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<tr>
<td></td>
<td>with VRV indoor units</td>
<td>✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓</td>
<td>✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓</td>
<td>✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓</td>
<td>✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓</td>
<td>Only single-module systems</td>
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<tr>
<td></td>
<td>with residential indoor units</td>
<td>✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓</td>
<td>✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓</td>
<td>✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓</td>
<td>✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓</td>
<td>Connection ratio: 80 ~ 130%</td>
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<td></td>
<td>with LT hydrobox</td>
<td>✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓</td>
<td>✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓</td>
<td>✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓</td>
<td>✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓</td>
<td>Total system connection ratio with AHU only is 90 ~ 110%</td>
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<td>with HT hydrobox</td>
<td>✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓</td>
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<td>✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓</td>
<td>Total system connection ratio with AHU only is 90 ~ 110%</td>
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<td></td>
<td>AHU connection</td>
<td>✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓</td>
<td>✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓</td>
<td>✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓</td>
<td>✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓</td>
<td>Total system connection ratio with AHU only is 90 ~ 110%</td>
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| 32 34 36 38 40 42 44 46 48 50 52 54 | VRV IV Heat Recovery REYQ-T | O X O O O X O O | X X X X X X | X X X X X X | X X X X X X | Standard total system connection ratio limit: 50 ~ 130% |
|                | with only VRV indoor units | ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ | ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ | ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ | ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ | 200% system connection ratio possible under special circumstances |
|                | with LT/HT Hydroboxes | ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ | ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ | ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ | ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ | Only single-module systems (RYQ 8~20 T / RXYQ 8~20 T) |
|                | HRV units VAM-, VKM- | ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ | ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ | ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ | ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ | Max 32 indoor units, even on 16HP and larger systems |
|                | AHU connection EKEXV + EKEQMCBA | ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ | ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ | ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ | ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ | Contact Daikin in case of multi-module systems (>20HP) |
|                | Biddle air curtain CYV-DK | ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ | ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ | ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ | ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ | |

| 32 34 36 38 40 42 44 46 48 50 52 54 | VRV IV Heat Pump RYYQ-T(8) / RXYQ-T(9) | O O O O O O O O | X X X X X X | X X X X X X | X X X X X X | Standard total system connection ratio limit: 50 ~ 130% |
|                | with only VRV indoor units | ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ | ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ | ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ | ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ | Only single-module systems (RYQ 8~20 T / RXYQ 8~20 T) |
|                | with residential indoor units | ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ | ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ | ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ | ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ | Max 32 indoor units, even on 16HP and larger systems |
|                | with LT Hydroboxes | ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ | ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ | ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ | ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ | Contact Daikin in case of multi-module systems (>20HP) |
|                | HRV units VAM-, VKM- | ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ | ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ | ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ | ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ | |
|                | AHU connection EKEXV + EKEQMCBA | ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ | ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ | ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ | ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ | |
|                | AHU connection EKEXV + EKEQFCBA | ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ | ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ | ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ | ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ | Biddle air curtain CYV-DK |

| 32 34 36 38 40 42 44 46 48 50 52 54 | VRV IV-S RXYSQ-/RXYSQJ- | O O X O O O O O O | X X X X X X | X X X X X X | X X X X X X | Standard total system connection ratio limit: 50 ~ 130% |
|                | with VRV indoor units only | ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ | ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ | ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ | ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ | With residential indoor unit: connection ratio limit: 80 ~ 130% |
|                | with residential indoor units only | ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ | ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ | ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ | ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ | |

| 32 34 36 38 40 42 44 46 48 50 52 54 | VRV IV i series SB.RXYYQ-T(8) | ✓ X X X ✓ X | ✓ X X X ✓ X | ✓ X X X ✓ X | ✓ X X X ✓ X | Standard total system connection ratio limit: 50 ~ 130% |

| 32 34 36 38 40 42 44 46 48 50 52 54 | VRV III-Q Replacement H/R RQCEQ-P3 | ✓ X X X ✓ X | ✓ X X X ✓ X | ✓ X X X ✓ X | ✓ X X X ✓ X | Standard total system connection ratio limit: 50 ~ 130% |

| 32 34 36 38 40 42 44 46 48 50 52 54 | VRV IV-Q Replacement H/P RXYQQ-T | ✓ X X X ✓ X | ✓ X X X ✓ X | ✓ X X X ✓ X | ✓ X X X ✓ X | Standard total system connection ratio limit: 50 ~ 130% |

- O: Connection of indoor unit possible, but not necessarily simultaneously with other allowed indoor units
- ✓: Connection of indoor unit possible even simultaneously with other checked units in the same row
- X: Connection of indoor unit not possible on this outdoor unit system
### Indoor units

#### Products overview

**Capacity class (kW)**

<table>
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<td>FXFQ-A</td>
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<td>2-way blow ceiling mounted cassette</td>
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<td>Small concealed ceiling unit</td>
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<td>Concealed ceiling unit with medium ESP</td>
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<td>Concealed ceiling unit with high ESP</td>
<td>FXMLQ-P7</td>
<td></td>
<td></td>
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<tr>
<td>Concealed ceiling unit with high ESP</td>
<td>FXMLQ-MB</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Wall mounted unit</td>
<td>FXAQ-A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Ceiling suspended unit</td>
<td>FXHQ-A</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>4-way blow ceiling suspended unit</td>
<td>FXUQ-A</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Floor standing unit</td>
<td>FXLQ-P</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Concealed floor standing unit</td>
<td>FXNQ-A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(1) Nominal cooling capacities are based on: indoor temperature: 27°CDB, 19°CWB, outdoor temperature: 35°CDB, equivalent refrigerant piping: 5m, level difference: 0m
(2) Nominal heating capacities are based on: indoor temperature: 20°CDB, outdoor temperature: 7°CDB, 6°CWB, equivalent refrigerant piping: 5m, level difference: 0m
Stylish indoor units overview

If you want to connect DX cassette, ceiling suspended or concealed ceiling, use VRV models.

<table>
<thead>
<tr>
<th>Type</th>
<th>Model</th>
<th>Product name</th>
<th>15</th>
<th>20</th>
<th>25</th>
<th>35</th>
<th>42</th>
<th>50</th>
<th>60</th>
<th>71</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wall mounted</td>
<td>Daikin Emura</td>
<td>FTXJ-MW/MS</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Wall mounted unit</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Nexura floor standing</td>
<td>FVXG-K</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Floor standing</td>
<td>Nexura floor standing</td>
<td>FVXG-K</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Floor standing unit</td>
<td>FVXM-F</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Flexi type unit</td>
<td>FLXS-B(9)</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. Decoration panel BYCQ140DG or BYCQ140DGF + BRC1E3A/B/C needed.
2. To connect stylish indoor units a BPMKS unit is needed.
3. A mix of RA indoor units and VRV indoor units is not allowed.
Hydrobox overview
for efficient hot water production

Hydrobox range

<table>
<thead>
<tr>
<th>Type</th>
<th>Product name</th>
<th>Model</th>
<th>Capacity class (kW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low temperature</td>
<td>HXY-A8</td>
<td>For high efficiency space heating and cooling</td>
<td>80, 125, 200</td>
</tr>
<tr>
<td>hydrobox</td>
<td></td>
<td>Ideal for hot or cold water in underfloor, air handling units, low temperature radiators...</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hot/cold water from 5°C to 45°C</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Large operation range (down to -20°C and up to 43°C)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fully integrated water-side components save time on system design</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Space saving contemporary wall hung design</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Leaving water temperature range</td>
<td>5°C - 45°C</td>
</tr>
<tr>
<td>High temperature</td>
<td>HXHD-A8</td>
<td>For efficient hot water production and space heating</td>
<td>80, 125, 200</td>
</tr>
<tr>
<td>hydrobox</td>
<td></td>
<td>Ideal for hot water in bathrooms, sinks and for underfloor heating, radiators, air handling units...</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hot water from 25°C to 80°C</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>“Free” heating and hot water through heat recovery</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Uses heat pump technology to produce hot water efficiently, providing up to 17% savings compared to a gas boiler</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Possibility to connect thermal solar collectors</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>25°C - 80°C</td>
<td></td>
</tr>
</tbody>
</table>
Biddle air curtains
overview

‘Open Door’ Trading

Although the customer friendly aspects of open door trading are widely appreciated by retail and commercial outlet managers, open doors can also give rise to massive losses in conditioned warm or cold air and hence, energy. Biddle air curtains however, not only preserve indoor temperatures and generate significant economies, they also represent an invitation for customers, to enter a pleasant trading and working environment.

High efficiency and low CO₂ emission

An efficient outdoor/indoor climate separation limits heat loss through the door opening and enhances the efficiency of the air conditioning system. Combining Biddle air curtains with Daikin heat pumps can lead to savings up to 72% compared to electric air curtains and a payback period of less than 1.5 years!

Air curtain size selector

<table>
<thead>
<tr>
<th>Door height (m)</th>
<th>Favourable</th>
<th>Normal</th>
<th>Unfavourable</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Covered shopping mall or revolving door entrance</td>
<td>No opposite open doors, little direct wind, building with ground floor only</td>
<td>Location at a corner or square, multiple floors and/or open stairwell</td>
</tr>
<tr>
<td>S</td>
<td>2.3</td>
<td>2.15</td>
<td>2.0</td>
</tr>
<tr>
<td>M</td>
<td>2.5</td>
<td>2.4</td>
<td>2.3</td>
</tr>
<tr>
<td>L</td>
<td>3.0</td>
<td>2.75</td>
<td>2.5</td>
</tr>
</tbody>
</table>

Portfolio

<table>
<thead>
<tr>
<th>Type</th>
<th>Product name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biddle air curtain free hanging</td>
<td>CYV S/M/L-DK-F</td>
</tr>
<tr>
<td>Biddle air curtain cassette</td>
<td>CYV S/M/L-DK-C</td>
</tr>
<tr>
<td>Biddle air curtain recessed</td>
<td>CYV S/M/L-DK-R</td>
</tr>
</tbody>
</table>

› A payback time of less than 1.5 years compared to electrical air curtains
› Easy and quick installation
› Maximum energy efficiency thanks to rectifier technology
› 85% air separation efficiency
› Cassette model (C): mounted into a false ceiling enhancing aesthetics
› Free-hanging model (F): easy wall mounted installation
› Recessed model (R): neatly concealed in the ceiling
Ventilation unit overview

from small heat recovery ventilation to large-scale air handling units for the provision of fresh air ventilation to homes, or commercial outlets such as offices, hotels, stores and others.

Ventilation solutions

Daikin offers state-of-the-art ventilation solutions that can easily be integrated into any project.

› Unique portfolio within DX manufacturers
› High-quality solutions complying with the highest Daikin quality standards
› Seamless integration of all products to provide the best indoor climate
› All Daikin products connected to a single control total control of the HVAC system.

Heat Reclaim Ventilation - Ventilation with heat recovery as standard

Proper ventilation is a key component of climate control in buildings, offices and shops and part of the EU requirements. Our heat recovery units can recover both sensible and latent heat thus substantially reducing the air conditioning load of up to 40%. The range starts from as low as 150 m³/h to 2500 m³/h (VAM) and go up to 25000 m³/h (Modular AHU).

Ventilation with DX connection - Control over fresh air temperature

Daikin offers a range of R-410A inverter condensing units to be used in combination with Daikin AHUs for ultimate control over the fresh air. There are 4 control possibilities when combining AHU and Daikin outdoor units hence offering all the required flexibility for any installation. Indoor units can be combined to the same outdoor unit to reduce the installation costs. For false-ceiling installations where space is a constraint, the VKM can fit perfectly to deliver fresh air at a comfortable temperature and it has an optional humidification element.

Fresh air portfolio

<table>
<thead>
<tr>
<th>150</th>
<th>500</th>
<th>1,000</th>
<th>2,000</th>
<th>2,500</th>
<th>15,000</th>
<th>25,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>VAM-FC / VAM-J</td>
<td>D-AHU MODULAR R/P</td>
<td>D-AHU MODULAR L</td>
<td>VKM-GB(M)</td>
<td>D-AHU Modular R with DX connection</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

› High efficiency heat exchange
› Eurovent energy class A+
› Extensive airflow
› R = heat recovery wheel; P = plate heat exchanger

› Compact size
› High energy efficient paper
› EC fan motors

› High efficiency counterflow heat exchanger
› Free-cooling operation
› EC centrifugal fan
› Wide range of options

› With DX coil
› Increased comfort
› Humidifier option

› Plug&play
› Fully customizable
› 4 types of control
New pre-sized fresh air solution

Easy selection
› 16 pre-selected combinations – to cover all fresh air needs in Europe
› The right outdoor unit and the necessary connection kits to the coil of the AHU are factory mounted and configured.
› Total solution – Daikin provides the complete solution

Easy ordering
› AHU and outdoor unit are automatically selected in VRV xpress

Easy installation
› Same pipe diameter from AHU to outdoor unit
› Direct integration in Intelligent Manager

Fast quotation
› Select as any other unit in Xpress selection software and show the solution in the report

Download Xpress now with the new pre-sized combination from my.daikin.eu

More details in the dedicated brochure
Daikin offers various control solution adapted to the requirements of even the most demanding commercial application.

- Basic control solutions for those customers with few requirements and limited budget
- Integrating control solutions for those customers that would like to integrate Daikin units into their existing BMS system
- Advanced control solutions for those customers that expect Daikin to deliver a mini BMS solution, including advance energy management

### Shop

<table>
<thead>
<tr>
<th>Unit control</th>
<th>Integrating control</th>
<th>Advanced control</th>
</tr>
</thead>
<tbody>
<tr>
<td>RC19W/S/K</td>
<td>RTD-20</td>
<td>RTD-Net</td>
</tr>
<tr>
<td></td>
<td>KLIC-DI</td>
<td>EKMBDXA</td>
</tr>
<tr>
<td></td>
<td>DCC601A51</td>
<td>DCM601A51</td>
</tr>
</tbody>
</table>

- 1 remote controller for 1 indoor unit (group)
- 1 gateway for 1 indoor unit (group)
- 1 gateway for 1 indoor unit (group)
- 1 gateway for max. 64 indoor unit(s) (groups) & 10 outdoors
- 1 unit for 32 indoor unit(s) & 1 outdoor unit(s) (groups)
- 1 iTM for 64 indoor unit(s) (groups)

<table>
<thead>
<tr>
<th>Feature</th>
<th>Shop</th>
<th>Hotel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automatic control of A/C</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Limit control possibilities for shop staff</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Create zones within the shop</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Interlock with eg. Alarm, PIR sensor</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Integrate Daikin units into existing BMS via Modbus</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Integrate Daikin units into existing BMS via KNX</td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>Integrate Daikin units into existing BMS via HTTP</td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>Monitor energy consumption</td>
<td>(4)</td>
<td>(2)</td>
</tr>
<tr>
<td>Advanced energy management</td>
<td>(2)</td>
<td>●</td>
</tr>
<tr>
<td>Allows free cooling</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Integrate Daikin products cross pillars into Daikin BMS</td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>Integrate third party products into Daikin BMS</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Online control</td>
<td>(2)</td>
<td>●</td>
</tr>
<tr>
<td>Manage multiple sites</td>
<td>(2)</td>
<td>(3)</td>
</tr>
</tbody>
</table>

### Hotel

<table>
<thead>
<tr>
<th>Unit control</th>
<th>Integrating control</th>
<th>Advanced control</th>
</tr>
</thead>
<tbody>
<tr>
<td>BRC19W/S/K</td>
<td>RTD-HO</td>
<td>KLIC-DI</td>
</tr>
<tr>
<td></td>
<td></td>
<td>DCM601A51</td>
</tr>
</tbody>
</table>

- 1 remote controller for 1 indoor unit (group)
- 1 gateway for 1 indoor unit (group)
- 1 gateway for 1 indoor unit (group)
- 1 iTM for 64 indoor unit(s) (groups)

<table>
<thead>
<tr>
<th>Feature</th>
<th>Shop</th>
<th>Hotel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hotel guest can control &amp; monitor basic functionalities from his room</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Limit control possibilities for hotel guests</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Interlock with window contact</td>
<td>(2)</td>
<td>●</td>
</tr>
<tr>
<td>Interlock with key-card</td>
<td>(2)</td>
<td>●</td>
</tr>
<tr>
<td>Integrate Daikin units into existing BMS via Modbus</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Integrate Daikin units into existing BMS via KNX</td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>Integrate Daikin units into existing BMS via HTTP</td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>Monitor energy consumption</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Advanced energy management</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Integrate Daikin products cross pillars into Daikin BMS</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Integrate third party products into Daikin BMS</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Online control</td>
<td>●</td>
<td>●</td>
</tr>
</tbody>
</table>

(1) 7 iTM plus adapters (DCM601A52) can be added to have 512 indoor groups and 80 outdoor systems. (2) Via Daikin cloud service. (3) Through own IT set-up (not Daikin cloud server) (4) Not available on all indoors
### Office

#### Unit control
- BRC1E3S3A/B/C
- EKMBDXA
- DMSS04BS1
- DMS502A51 / DAM412BS1
- DCC601A51
- DCM601A51

#### Integrating control
- 1 remote controller for 1 indoor unit (group)
- 1 gateway for max. 64 indoor unit(s) (groups) & 10 outdoors
- 1 gateway for 64 indoor unit(s) (groups)
- 1 gateway for 128 indoor unit(s) (groups), 20 outdoors (2)
- 1 unit for 32 indoor unit(s) (groups)
- 1 iTM for 64 indoor unit(s) (groups) (1)

#### Advanced control
- Automatic control of A/C
- Centralised control for management
- Local control for office workers
- Limit control possibilities for office workers
- Integrate Daikin units into existing BMS via Modbus
- Integrate Daikin units into existing BMS via HTTP
- Integrate Daikin units into existing BMS via LonTalk
- Integrate Daikin units into existing BMS via BACnet
- Energy consumption read out
- Monitor energy consumption
- Advanced energy management
- Integrate Daikin cross pillar products into Daikin BMS
- Integrate third party products into Daikin BMS
- Online control
- Manage multiple sites

### Infrastructure Cooling

#### Unit
- BRC1H519W/S/K
- RTD-10
- DTA113BS1
- DCM601A51

#### Integrating
- 1 remote controller for 1 indoor unit (group) (2)
- 1 gateway for 1 indoor unit (group)
- Up to 8 gateways can be linked together
- 1 adapter for up to 4 units
- 1 iTM for 64 indoor unit(s) (groups) (1)

#### Advanced
- Automatic control of A/C
- Back-up operation
- Duty rotation
- Limit control possibilities in the technical cooling room
- If room temperature above max., then show alarm & start standby unit.
- If an error occurs, an alarm will be shown.
- If an error occurs, activate an alarm output

(1) 7 iTM plus adapters (DCM601A52) can be added to have 512 indoor groups and 80 outdoor (systems) (2) extension needed to go to 256 indoor unit(s) (groups), 40 outdoors (3) ON/OFF only (4) Via Daikin cloud service (5) Through own IT set-up (not Daikin cloud server)
Specifications

RWEYQ-T9

VRV IV water cooled+ series

Ideal for high rise buildings, using water as heat source

› Environmental conscious solution: reduced CO2 emissions thanks to the use of geothermal energy as a renewable energy source and typical lower refrigerant levels making it ideal to comply with EN378
› Covers all thermal needs of a building via a single point of contact: accurate temperature control, ventilation, air handling units, Biddle air curtains and hot water
NEW› Unique zero heat dissipation principle obviates the need for ventilation or cooling in the technical room, maximising installation flexibility
NEW› Wide range of indoor units: combine VRV with stylish indoor units such as Daikin Emura, Nexura ...
› Incorporates VRV IV standards & technologies: Variable Refrigerant Temperature, VRV configurator, 7-segment display and full inverter compressors
› Customize your VRV for best seasonal efficiency & comfort with the weather dependant Variable Refrigerant Temperature function. Increased seasonal efficiency and no more cold draft by supply of high outblow temperatures
NEW› Developed for easy installation and servicing: choice between top or front connection for refrigerant piping and rotating switch box for easy access to serviceable parts
NEW› Compact & lightweight design can be stacked for maximum space saving: 42HP can be installed in less than 0,5m² floorspace
› 2-stage heat recovery: first stage between indoor units, second stage between outdoor units thanks to the storage of energy in the water circuit

Outdoor unit

<table>
<thead>
<tr>
<th>RWEYQ</th>
<th>8T9</th>
<th>10T9</th>
<th>12T9</th>
<th>14T9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capacity range HP</td>
<td>8</td>
<td>10</td>
<td>12</td>
<td>14</td>
</tr>
<tr>
<td>Cooling capacity Nom. 30°C inlet water temperature kV</td>
<td>22.4</td>
<td>28.0</td>
<td>33.5</td>
<td>40.0</td>
</tr>
<tr>
<td>Heating capacity Nom. 20°C inlet water temperature kV</td>
<td>25.0</td>
<td>31.5</td>
<td>37.5</td>
<td>45.0</td>
</tr>
<tr>
<td>Power input - 50Hz Cooling kV</td>
<td>3.5</td>
<td>4.9</td>
<td>6.0</td>
<td>7.9</td>
</tr>
<tr>
<td>Power input - 50Hz Heating kV</td>
<td>3.9</td>
<td>4.9</td>
<td>6.2</td>
<td>8.4</td>
</tr>
<tr>
<td>EER at nom. capacity 30°C inlet water temperature kW/kW</td>
<td>6.40</td>
<td>5.75</td>
<td>5.55</td>
<td>5.04</td>
</tr>
<tr>
<td>COP at nom. capacity 20°C inlet water temperature kW/kW</td>
<td>6.50</td>
<td>6.40</td>
<td>6.10</td>
<td>5.37</td>
</tr>
</tbody>
</table>

Maximum number of connectable indoor units 64(1)

Indoor index connection

| Min. | 100 | 125 | 150 | 175 |
| Nom. | 200 | 250 | 300 | 350 |
| Max. | 300 | 375 | 450 | 525 |

Dimensions Unit HeightxWidthxDepth mm 980x767x560

Weight Unit kg 185

Sound power level Cooling Nom. dBA | 65 | 71 | 72 | 74 |

Sound pressure level Cooling Nom. dBA | 48 | 50 | 56 | 58 |

Operation range

| Inlet water temperature °CDB Min.—Max. | 10—45 |
| Heating temperature °CWB Min.—Max. | 10—45 |
| Temperature around casing °CDB Max. | 40 |
| Humidity around casing % | 80—80 |

Refrigerant Type/GWP R-410A/2,087.5

Charge kg/TCO2Eq 7.90/16.5 9.60/20.0

Piping connections Liquid OD mm 9,52 12,7

Gas OD mm 19.1 (2) 22.2 (2) 28.6 (2)

HP/LP gas OD mm 15.90 (3) / 19.10 (4) 19.10 (3) / 22.20 (4) 19.10 (3) / 28.60 (4) 22.20 (4) / 28.60 (3)

Drain Size mm 14mm OD/10mm ID

Water Inlet/Outlet ISO 228-G1 1/4 B ISO 228-G1 1/4 B

Total piping length m 300

Power supply Phase/Frequency/Voltage Hz/V 3N~/50/380-415

Current - 50Hz Maximum fuse amps (MFA) A 25

NEW Extended piping length between indoor and outdoor units up to 165m (actual)

(1) Actual number of connectable indoor units depends on the indoor unit type (VRV indoor, Hydrobox, RA indoor, etc.) and the connection ratio restriction for the system (50% <= CR <= 130%)

(2) In case of heat pump system gas pipe is not used. (3) In case of heat recovery system. (4) In case of heat pump system.
### System Overview

- **Fill Flash:**
  - 50Hz
  - 3N~/50/380-415

- **Power supply:**
  - 3N~/50/380-415

- **Current - 50Hz:**
  - 25 A

### Outdoor Unit Modules

<table>
<thead>
<tr>
<th>System</th>
<th>Outdoor unit module 1</th>
<th>Outdoor unit module 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>RWEYQ-&lt;T9&gt;</td>
<td>RWEYQ-&lt;T9&gt;</td>
<td>RWEYQ-&lt;T9&gt;</td>
</tr>
<tr>
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</tr>
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</tr>
<tr>
<td>RWEYQ-&lt;T9&gt;</td>
<td>RWEYQ-&lt;T9&gt;</td>
<td>RWEYQ-&lt;T9&gt;</td>
</tr>
</tbody>
</table>

### Capacity Range

- **HP:**
  - 16, 18, 20, 22, 24, 26, 28

- **Cooling Capacity:**
  - Nom. 30°C inlet water temperature: 44.8 kW, 50.4 kW, 56.0 kW, 61.5 kW, 67.0 kW, 73.5 kW, 80.0 kW

- **Heating Capacity:**
  - Nom. 20°C inlet water temperature: 50.0 kW, 56.5 kW, 63.0 kW, 69.0 kW, 75.0 kW, 82.5 kW, 90.0 kW

### EER at Nom. Capacity

- **30°C inlet water temperature:**
  - Nom. Waterflow kW/kW: 6.40, 6.02, 5.75, 5.65, 5.56, 5.33, 5.04

### COP at Nom. Capacity

- **20°C inlet water temperature:**
  - Nom. Waterflow kW/kW: 6.50, 6.44, 6.40, 6.23, 6.10, 5.74, 5.37

### Maximum Number of Connectable Indoor Units

- 64

### Piping Connections

- **Liquid OD mm:**
  - 12.7

- **Gas OD mm:**
  - 28.6 (2)

### Power Supply

- 3N~/50/380-415

### Current - 50Hz

- 25 A

### Permissible Fuse Amps (MFA)

- 50 A

### Energy Efficiency

- **EER:**
  - Nom. 30°C inlet water temperature: 6.40, 6.02, 5.75, 5.65, 5.56, 5.33, 5.04

- **COP:**
  - Nom. 20°C inlet water temperature: 6.50, 6.44, 6.40, 6.23, 6.10, 5.74, 5.37

### Maximum Number of Connectable Indoor Units

- 64

### Indoor Index

- **Min.**
  - 200

- **Nom.**
  - 400

- **Max.**
  - 600

### Piping Connections

- **Liquid OD mm:**
  - 12.7

- **Gas OD mm:**
  - 28.6 (2)

### Domestic Hot Water

- **Discharge gas pipe OD mm:**
  - 28.6 (3)

### Liquid Pipe

- **Liquid pipe OD mm:**
  - 12.7

### Gas Pipe

- **Discharge gas pipe OD mm:**
  - 28.6 (2)

### Reversible Low Temperature Hydrobox

- **HP/LP gas OD mm:**
  - 28.6 (3) / 19.1 (4)

- **34.9 (3) / 19.1 (4)**

### Total Piping Length

- **System Actual m:**
  - 300

(1) Actual number of connectable indoor units depends on the indoor unit type (VRV indoor, Hydrobox, RA indoor, etc.) and the connection ratio restriction for the system (50% <= CR <= 130%)

(2) In case of heat pump system gas pipe is not used. (3) In case of heat recovery system. (4) In case of heat pump system
Typical Installation in cold district with cooling tower, glycol and intermediary heat exchanger

Use a hermetic cooling tower in terms of water quality control.

In order to use brine for the freezing protection, install the heat exchanger to break off the line concerned.

In order to use the open type cooling tower, install the heat exchanger to break off the line concerned.

On each floor, if multiple units are installed or the units are installed far away from each other, use horizontal reverse return piping or a constant flow control valve to prevent air drift.

It is recommended to provide a port used for the cleaning of horizontal drain pipes.

For RWEY models, provide interlock with the flow switch. (Through the pump operation signal, an operative flow switch is recommended.)

Considering the maintenance of the boiler, it is recommended to break off the line concerned using the heat exchanger.

Hydrothermal source/recirculation pump (used for the maintenance of pumps)
Note:
Pleased be noted that this Schematic Diagram is absolutely for reference only. Practically, construction methods may vary with projects. Therefore, consult with the architect office for the design and construction of the system.

The following section shows precautions for the design of systems, which should be thoroughly observed.

1. Temperature

The operating range of hydrothermal cooling/heating free VRV (RWEY) is 10°C to 45°C. Keep the water temperature in the system within the said range through the ON/OFF operation of 2-way control valve, three-way control valve, cooling tower, or boiler.

2. Water quality

The hydrothermal cooling/heating free VRV (RWEY) requires quality stability of water to be used. Be sure to install the hermetic cooling water or, in order to install the open type cooling water, install the heat exchanger to break off the line concerned.

3. Freezing

Freezing protection should be provided for the cooling tower water during wintertime.

Take some sort of measures shown below so that water on the primary and secondary side of the cooling water will not freeze up during wintertime.

Typical measure:
- If the water temperature drops, start the pump to recirculate water.
- Provide freezing protection using freezing protection heater.
- Provide water temperature drop protection through the forced startup of the boiler. Drain water from the cooling tower.

Particularly, if the unit should stop for an extended period of time, it may freeze up. Consequently, attention should be paid for this point.

4. Air drift

Provide constant amount of feed water through the installation of reverse return piping system and constant flow control valve.

Typical modification to Part A (Three-way valve  Two-way valve)

Typical modification to Part B (Three-way valve  Two-way valve)

Typical set values (reference values)

<table>
<thead>
<tr>
<th>Operation mode</th>
<th>Cooling (mainly for cooling)</th>
<th>Heating (mainly for cooling)</th>
<th>In-between seasons (cooling/heating combination)</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1 set value</td>
<td>35°C</td>
<td>40°C</td>
<td>25°C</td>
</tr>
<tr>
<td>T2 set value</td>
<td>31°C, 30°C</td>
<td>40°C, 31°C</td>
<td>25°C, 20°C</td>
</tr>
<tr>
<td>T3 set value</td>
<td>31°C, 30°C</td>
<td>40°C, 31°C</td>
<td>25°C, 20°C</td>
</tr>
<tr>
<td>Open/Close of valve</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T1</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>T2</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>T3</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>
Typical installation with chiller instead of cooling tower

- In order to use the chiller for cooling operation, install the heat exchanger to break off the line concerned.
- In order to conduct vertical piping through three floors or more, use vertical reverse turn piping or the like to prevent air drift.
- On each floor, if multiple units are installed or the units are installed far away from each other, use horizontal reverse return piping or a constant flow control valve to prevent air drift.
- For RWEY models, provide interlock with the flow switch. (Through the pump operation signal, an operative flow switch is recommended.)
- Considering the maintenance of the boiler, it is recommended to break off the line concerned using the heat exchanger.
Pleased be noted that this Schematic Diagram is absolutely for reference only. Practically, construction methods may vary with projects. Therefore, consult with the architect office for the design and construction of the system.

The following section shows precautions for the design of systems, which should be thoroughly observed.

1. **Temperature**

   The operating range of hydrothermal cooling/heating free VRV (RWEY) is 10°C to 45°C. Keep the water temperature in the system within the said range through the ON/OFF operation of 2-way control valve, three-way control valve, cooling tower, or boiler.

2. **Water quality**

   The hydrothermal cooling/heating free VRV (RWEY) requires quality stability of water to be used. Be sure to install the hermetic cooling water or, in order to install the open type cooling water, install the heat exchanger to break off the line concerned.

3. **Freezing**

   Freezing protection should be provided for the cooling tower water during wintertime. Take some sort of measures shown below so that water on the primary and secondary side of the cooling water will not freeze up during wintertime.

   - **Typical measure:** If the water temperature drops,
     - Start the pump to recirculate water.
     - Provide freezing protection using freezing protection heater.
     - Provide water temperature drop protection through the forced startup of the boiler. Drain water from the cooling tower.
   - Particularly, if the unit should stop for an extended period of time, it may freeze up. Consequently, attention should be paid for this point.

4. **Air drift**

   Provide constant amount of feed water through the installation of reverse return piping system and constant flow control valve.

---

### Typical set values (reference values)

<table>
<thead>
<tr>
<th>Operation mode</th>
<th>Cooling (mainly for cooling)</th>
<th>Heating (mainly for cooling)</th>
<th>In-between seasons (cooling/heating combination)</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1 set value</td>
<td>15°C</td>
<td>31°C, 33°C</td>
<td>20°C</td>
</tr>
<tr>
<td>T2 set value</td>
<td>31°C, 33°C</td>
<td>40°C</td>
<td>25°C</td>
</tr>
<tr>
<td>T3 set value</td>
<td>31°C, 33°C</td>
<td>40°C</td>
<td>25°C</td>
</tr>
<tr>
<td>Open/Closed of valve</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>V1</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>V2</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>V3</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>V4</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>V5</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
</tbody>
</table>

---

### Typical modification to Part A (Three-way valve → Two-way valve)

- Temperature indicating controller
- Temperature controller
- Pump
- Y-strainer
- Flexible joint
- Pressure gauge
- Thermometer
- Flow switch

### Typical modification to Part B (Three-way valve → Two-way valve)

- Temperature indicating controller
- Temperature控制器
- Pump
- Y-strainer
- Flexible joint
- Pressure gauge
- Thermometer
- Flow switch

---

### Notes

- If the water temperature drops, start the pump to recirculate water.
- Provide freezing protection using freezing protection heater.
- Provide water temperature drop protection through the forced startup of the boiler.
- Drain water from the cooling tower.
- Especially, if the unit should stop for an extended period of time, it may freeze up. Consequently, attention should be paid for this point.
Typical Installation with heat recovery from multiple systems through water circuit

* Use a hermetic cooling tower in terms of water quality control

* In order to use bromine for the freezing protection, install the heat exchanger to break off the line concerned.

* In order to provide two or more hydrothermal systems (e.g., mainly heating for the north side system and mainly cooling on the south side), integrate the multiple systems into a single system, thus allowing for heat recovery even between the water vs. water systems.

* It is recommended to provide a port used for the cleaning of horizontal drain pipes.

* For RWEY models, provide interlock with the flow switch (Through the pump operation signal, an operative flow switch is recommended.)

---

<table>
<thead>
<tr>
<th>Valve</th>
<th>Open/Closed of valve</th>
<th>Ti set value</th>
<th>To set value</th>
<th>T3 set value</th>
</tr>
</thead>
<tbody>
<tr>
<td>V1</td>
<td>O</td>
<td>32°C</td>
<td>31°C, 31°C</td>
<td>25°C, 20°C</td>
</tr>
<tr>
<td>V2</td>
<td>O</td>
<td>32°C</td>
<td>31°C, 31°C</td>
<td>25°C, 20°C</td>
</tr>
<tr>
<td>V3</td>
<td>O</td>
<td>32°C</td>
<td>31°C, 31°C</td>
<td>25°C, 20°C</td>
</tr>
<tr>
<td>V4</td>
<td>O</td>
<td>32°C</td>
<td>31°C, 31°C</td>
<td>25°C, 20°C</td>
</tr>
<tr>
<td>V5</td>
<td>O</td>
<td>32°C</td>
<td>31°C, 31°C</td>
<td>25°C, 20°C</td>
</tr>
<tr>
<td>V6</td>
<td>O</td>
<td>32°C</td>
<td>31°C, 31°C</td>
<td>25°C, 20°C</td>
</tr>
</tbody>
</table>

---

- **To BS unit**
- **Cooling (mainly for cooling)**
- **Heating (mainly for heating)**
- **In-between seasons (cooling/heating combination)**

---

- **Pump**
- **Temperature controller**
- **Three-way valve (mixed type)**
- **Y union**
- **Flexible joint**
- **Pressure gauge**
- **Thermometer**
- **Flow switch**
Expansion tank

Hydrothermal source recirculation pump
(used for the maintenance of pumps)

To BS unit

Note:

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The following section shows precautions for the design of systems, which should be thoroughly observed.

1. Temperature

   The operating range of hydrothermal cooling/heating free VRV (RWEY) is 10°C to 45°C.
   Keep the water temperature in the system within the said range through the ON/OFF operation of 2-way control valve, three-way control valve, cooling tower, or boiler.

2. Water quality

   The hydrothermal cooling/heating free VRV (RWEY) requires quality stability of water to be used. Be sure to install the hermetic cooling water or, in order to install the open type cooling water, install the heat exchanger to break off the line concerned.

3. Freezing

   Freezing protection should be provided for the cooling tower water during wintertime.
   Take some sort of measures shown below so that water on the primary and secondary side of the cooling water will not freeze up during wintertime.
   Typical measure: If the water temperature drops,
   - Start the pump to recirculate water.
   - Provide freezing protection using freezing protection heater.
   - Provide water temperature drop protection through the forced startup of the boiler. Drain water from the cooling tower.
   Particularly, if the unit should stop for an extended period of time, it may freeze up. Consequently, attention should be paid for this point.

4. Air drift

   Provide constant amount of feed water through the installation of reverse return piping system and constant flow control valve.

* If freezing is expected to occur, install the freezing protection heater or drain water from the water sprinkling side.
  (If water is drained from the water sprinkling side, pay attention so that loads will never be applied to cooling mainly.)
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