Caution on product corrosion

1. The representative should not be allowed to work on an electric panel, which is not one of the following: a) The electrical panel should be removed from the building. b) The electrical panel should be disconnected from the building. c) The electrical panel should be disconnected from the building.

2. If the equipment is to be installed in a high voltage area, it is recommended to use a high voltage circuit breaker. If the equipment is to be installed in a high voltage area, it is recommended to use a high voltage circuit breaker.

If you have any questions, please contact our local importer, distributor, or retailer.

IE3 MOTOR VERSION
VRV AHU Introduction

Daikin released 2 series of VRV AHU, standard series model AHUR-DBV/CBV and outdoor air series model AHUR-DBL/CBL. It is a DX AHU that is specially designed to operate with VRV IV outdoor unit. This enabled the users to reduce maintenance costs and enjoy more space savings.

Daikin VRV AHU improves the indoor air quality caused by haze, pollutants, etc. with options of pre-filters and primary filters.

This is the only total AHU solutions provided and manufactured completely by Daikin.

What is VRV?

Daikin VRV system is a multi-split type air conditioner for commercial buildings that uses variable refrigerant flow control invented by Daikin.

It enables long piping length up to 165m and maximum level difference (between outdoor and indoor units) of 90m to provide more design flexibility which can match even large-sized buildings.

VRV AHU Application

From small to large commercial spaces, Daikin offers a wide range of R-410A inverter condensing units for use in conjunction with Air Handling Units (AHU) from 6 HP to 120 HP.

AHU provides large air volumes and high ESP (External Static Pressure) enabling the use of extensive ductworks. The refrigerant flows through the copper pipes using R-410A and operates like a large VRV fan coil unit.

Daikin AHU represents the ideal solution for large storage places, atrium, lobby, banquet halls, showrooms, exhibition halls, shopping malls, etc.

It also has the options to customize the specifications such as the filtration type, direction of air intake and discharge, service access door and blower type (backward or forward curves and plug fan).
**Features of VRV AHU**
- Harnessing VRV IV VRT technology
- Inverter controlled system
- Can be easily controlled via standard wired remote control (BRC1/E2)
- Comes in double skin panel model (Single skin option available)
- Easily managed using intelligent Touch Manager central control system.
  - Communication protocol using DIB-Net to communicate with all existing Daikin communication devices. (option to connect directly to BACnet® BMS)
- Can be placed indoor or outdoor*1

**Benefits of using VRV AHU**
- Quality and warranty assured
  - VRV AHU are manufactured by Daikin factory.
- Ease of installation
  - No additional system such as cooling tower, chiller, and long water piping system are required. This also reduces the total system maintenance costs.
  - Flexible design of the ducting system.
- Cover large area with different ducting configuration.
  - VRV AHU can provide ESP up to 500Pa*2 (Standard Model)
- Total solution concept
  - Integrating an AHU into the total building climate system enables both design and installation procedures to be based on a single common technology. This simplifies project follow-up, Installation, commissioning and maintenance since only one party is involved.
  - VRV AHU system can be combined with other types of indoor units to operate concurrently.

**Options**
- Wide range of options to meet design requirements:
  - Please contact Daikin’s Sales Office on options below:
    - Fan Type
      - Backward Curve Aerofoil
      - Plug Fan
      - Brushless DC Fan
    - Fan Motor control
      - VSD
      - Fixed Speed
    - AHU Cell Material Type
      - Copper Fin
      - Blue Fin
      - Epoxy Coated Fin and Cell
    - AHU Drain Pan Type
      - Acrylic Enamel with Steel Coating
      - Galvanized Steel
    - AHU Air Filter Type
      - Medium Filter
      - Extra Filter
      - Synthetic
      - Bag
      - HEPA
      - Aluminum
      - Cartridge
      - UL®-PA
    - Special Option
      - Electric Heater
      - Mixing Box
      - Outdoor Roof
      - Heat Pipes
      - Motor Starter Box
- Customisation
  - Airflow
  - Capacity
  - ESP
  - Discharge Direction
  - Heat Recovery Wheel
  - Piping Outlet
- Controller for Outdoor Air Series
  - MicroTech III® (DDC)

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**Notes:**
*1 Optional items required
*2 For ESP more than 500Pa, please contact Daikin’s Sales Office

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**Comparison Table and Diagram for Conventional AHU System and VRV AHU System**

<table>
<thead>
<tr>
<th>Conventional AHU System</th>
<th>VRV AHU System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Require Frequent Maintenance</td>
<td>Easy Maintenance (same as common A/C System)</td>
</tr>
<tr>
<td>Higher Cost Due to Frequent Maintenance</td>
<td>No Additional Maintenance Cost</td>
</tr>
<tr>
<td>Require Larger Installation Space (AHU, Chiller, Cooling Tower)</td>
<td>Require Small Installation Space (AHU, VRV)</td>
</tr>
<tr>
<td>Complex System (HVAC Ducting, Chiller and Water Piping)</td>
<td>Simple System (HVAC Ducting)</td>
</tr>
<tr>
<td>Complex Control (Variable Frequency Device, Variable Air Volume Control)</td>
<td>Simple Control (Remote Control / intelligent Touch Manager / MicroTech III Controller)</td>
</tr>
</tbody>
</table>

**Diagram:**
- Conventional AHU System
- VRV AHU System
  - Cooling Tower
  - Office
  - Lobby
  - Underground
  - Basement Carpark
**VRV AHU Standard Series**

The VRV AHU standard series are available from the capacity range of 6 HP to 120 HP, also with airflow ranging from 3,340 CMH ~ 59,760 CMH.

<table>
<thead>
<tr>
<th>HP</th>
<th>Capacity (kW)</th>
<th>CMH</th>
</tr>
</thead>
<tbody>
<tr>
<td>120</td>
<td>336</td>
<td>19,740</td>
</tr>
<tr>
<td>100</td>
<td>280</td>
<td>19,740</td>
</tr>
<tr>
<td>80</td>
<td>224</td>
<td>19,740</td>
</tr>
<tr>
<td>60</td>
<td>168</td>
<td>19,740</td>
</tr>
<tr>
<td>48</td>
<td>135</td>
<td>19,740</td>
</tr>
<tr>
<td>40</td>
<td>114</td>
<td>19,740</td>
</tr>
<tr>
<td>32</td>
<td>90.0</td>
<td>19,740</td>
</tr>
<tr>
<td>20</td>
<td>55.9</td>
<td>19,740</td>
</tr>
<tr>
<td>16</td>
<td>45.0</td>
<td>19,740</td>
</tr>
<tr>
<td>10</td>
<td>28.0</td>
<td>19,740</td>
</tr>
<tr>
<td>8</td>
<td>22.4</td>
<td>19,740</td>
</tr>
<tr>
<td>6</td>
<td>16.0</td>
<td>19,740</td>
</tr>
</tbody>
</table>

**Expanded Line Up for Daikin VRV Indoor Series**

Comparison for External Static Pressure and Capacity between VRV AHU and Duct Typed Unit.

<table>
<thead>
<tr>
<th>External Static Pressure (Pa)</th>
<th>FXMO</th>
<th>VRV AHU</th>
</tr>
</thead>
<tbody>
<tr>
<td>500</td>
<td>600</td>
<td>800</td>
</tr>
</tbody>
</table>

VRV AHU offers higher ESP and Capacity as compared to duct type fan coil unit.

**VRV AHU Operation Range**

VRV AHU AHUR-DBV/CBV operation is similar as other VRV Indoor unit. Following table is the list of operation range for AHU unit.

<table>
<thead>
<tr>
<th>Condition</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entering Air Temperature</td>
<td></td>
<td></td>
</tr>
<tr>
<td>to VRV AHU</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outdoor Unit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>VRV IV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expansion Valve</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standard Series PCB</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**VRV AHU Expansion Valve**

- **Casing**: Mellow white, white, gray
- **Dimensions**: 116 x 88 x 35 mm, 132 x 409 x 220 mm
- **Weight**: 3 kg
- **Operation Range**: Cooling: -8°C ~ 64°C
- **Power Supply**: 1 phase

**VRV AHU Standard series PCB**

- **Application**: Multi, Wall, Fan coil
- **Outdoor Unit**: VRV IV
- **Casing**: Mellow white, gray, material: Metal
- **Dimensions**: 116 x 88 x 35 mm, 132 x 409 x 220 mm
- **Weight**: 3 kg
- **Operation Range**: Cooling: -8°C ~ 64°C
- **Power Supply**: 1 phase, frequency: 50/60 Hz, voltage: 220/230 V
VRV Connection to AHU Configuration

Single VRV System Configuration

Each coil up to 20 HP
(Max combination of 6) = 120 HP

Combined VRV System Configuration

Up to 120 HP Max.6 circuits

Multiple Indoor Units with AHU Configuration

*In case of more than 60 HP system, connection is Multiple VRV system.

Multiple VRV Systems Configuration

*In case of more than 60 HP system, connection is Multiple VRV system.

---

Control Wiring  Remote Control Wiring (R/P)  Liquid  Gas
MT III controller is recommended for Outdoor air series AHU controlling, switching and monitoring functions. This controller is programmed to optimize the performance and efficiency of VRV AHU automatically. It can also communicate with Daikin’s intelligent Touch Manager via BACnet protocol easily.

VRV AHU Outdoor Air Series

The VRV AHU Outdoor air series are available from the capacity range of 8 HP to 60 HP, also with airflow ranging from 2,040 CMH to 16,380 CMH.

Comparison for ESP and Capacity between VRV AHU, Ceiling Mounted Duct Type and Floor Standing Duct Type.

VRV AHU offers higher ESP and airflow rate as compared to duct type units.

**VRV AHU Operation Range**

VRV AHU AHUR-DBL/CBL operation is similar as other VRV indoor unit. Following table is the list of operation range for AHU unit.

<table>
<thead>
<tr>
<th>VRV AHU</th>
<th>VRV IV</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outdoor Unit</td>
<td>-5°C DB</td>
<td>49°C DB</td>
</tr>
<tr>
<td>Expansion Valve</td>
<td>-5°C DB</td>
<td>44°C DB</td>
</tr>
<tr>
<td>Outdoor air series PCB</td>
<td>-10°C DB</td>
<td>40°C DB</td>
</tr>
</tbody>
</table>

**Possibility X (Td/TR control):**

Precise air temperature control via MicroTech III MT III controller (option).

Room temperature is controlled as a function of the air handling unit suction or discharge air (customer selection). The MT III controller translates 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 Outdoor air series PCB (EKEQFCBA).

This reference voltage will be used as the main input value for the compressor frequency control.

**VRV AHU Outdoor Air Series Evaporator Coil, Expansion Valve and Outdoor Air Series PCB AHUR-DBL/CBL**

Outdoor air series use DX coil. Each DX coil will be connected to one external expansion valve (EKEEXV) and controlled by one Outdoor air series PCB (EKEQFCBA).

- **4 capacities of Evaporator Coil**
  - 8HP used on 8HP AHU unit
  - 10HP used on 10HP AHU unit
  - 16HP used on 16HP, 32HP, 48HP AHU unit
  - 20HP used on 20HP, 40HP, 60HP AHU unit

- **VRV AHU Expansion Valve (EKEEXV)**
  - 4 capacities of AHU Expansion Valve
    - EKEEXV200 for 8HP Coil
    - EKEEXV2S0 for 10HP Coil
    - EKEEXV400 for 16HP coil
    - EKEEXV500 for 20HP coil

**VRV AHU Outdoor air series PCB**

- **Application**
  - Multi OutDoor Unit
- **Coating**
  - Color: White, Gray
- **Dimensions**
  - Unit: 122 x 490 x 200
- **Weight**
  - Unit: 30 kg
- **Power Supply**
  - Voltage: 220V

Installation of AHU Outdoor air series PCB should be positioned under a shaded area. Alternatively, a panel should be provided at the Outdoor air series PCB to block off direct sunlight.

Direct sunlight will increase the temperature inside the Outdoor air series PCB and may reduce its lifetime and influence its operation.

Operating temperature of the Outdoor air series PCB is between -10°C and 40°C.
VRV AHU Configuration

AHU SPECIFICATION (AHUR-DBL/CBL)

1. CASING / INSULATION (DBL SERIES)
   - 50mm Thickness Double Skinned Panel (Thermal Break)
   - 0.5mm Thickness White Colourbond Steel Sheet
   - 50mm Thickness Polyurethane Foam 40Kg/m² Density
   - SUS 304

2. CASING / INSULATION (CBL SERIES)
   - 25mm Thickness Double Skinned Panel
   - 0.5mm Thickness White Colourbond Steel Sheet
   - 0.5mm Thickness Galvanized Steel Sheet
   - 25mm Thickness Polyurethane Foam 40Kg/m² Density

3. CASING-FRAME (DBL SERIES)
   - Steel With Black Epoxy Paint

4. CASING-FRAME (CBL SERIES)
   - Extruded Aluminium Profile
   - DX Coil
   - Copper Tube
   - Copper Tube-Connect
   - Galvanized Steel

5. WORKING PRESSURE
   - 10Kg/cm²

6. FAN
   - (Brand = Kruger)

7. TYPE
   - Double Width Double Inlet Forward Curved Centrifugal Belt Drive Fan
   - Wheel: Galvanized Steel Sheet
   - Housing: Galvanized Steel Sheet
   - FRAME: Steel With Polyester Powder Coating
   - (Brand = Teco)
   - Three-Phase Induction Motor Totally Enclosed Fan-Cooled Type
   - Protection: IP55 Insulation Class = F, IE3

8. VIBRATION ISOLATOR
   - Spring Isolator

9. DRAIN PAN (DBL SERIES)
   - 1.2mm (SUS 304)
   - The Drain Pan is Covered With PU Insulation 40Kg/m² Density

10. DRAIN PAN (CBL SERIES)
    - 1.6mm (Steel Sheet With Epoxy Coated)
    - Beneath The Drain Pan is Covered With PU Insulation 40Kg/m² Density
    - (Brand = AAF)
    - Type = R29 Class = G3 (AF1 = 80-85%) Synthetic Washable
    - Size = Full (34" x 24" x 2") Half (12" x 24" x 2")

Drawings and Dimension of AHU

<table>
<thead>
<tr>
<th>Model</th>
<th>Dimension W x D x H (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AHUR120BN</td>
<td>1,300 x 1,500 x 1,200</td>
</tr>
<tr>
<td>AHUR150BN</td>
<td>1,500 x 1,800 x 1,200</td>
</tr>
<tr>
<td>AHUR160BN</td>
<td>1,800 x 1,500 x 1,200</td>
</tr>
<tr>
<td>AHUR200BN</td>
<td>2,000 x 1,600 x 1,200</td>
</tr>
<tr>
<td>AHUR230BN</td>
<td>2,500 x 1,800 x 1,600</td>
</tr>
<tr>
<td>AHUR400BN</td>
<td>2,000 x 1,800 x 1,600</td>
</tr>
<tr>
<td>AHUR600BN</td>
<td>2,000 x 1,950 x 2,200</td>
</tr>
</tbody>
</table>

* Dimension does not include Outdoor air series PCB, Expansion Valve and Pre-filter
Features of MicroTech III

1. BACnet IP Module for integration of MicroTech III AHU Controller in networks featuring the BACnet Protocol. Compatible with Daikin intelligent Touch Manager (iTM) or 3rd party BMS.

2. Principal Module POL 638 and Extension Module POL 955 have selected analog and digital I/O contacts programmed for control and monitoring of sensors and other related devices in a VRV Outdoor Air Series AHU.

3. HMI screen on the Principal Module POL 638 allows easy testing and commissioning and even without a centralised controller or 3rd party BMS.

Functions of MicroTech III

1. Supply air control using the supply air sensor
   • Used for temperature control.

2. Air quality control – CO2 Levels
   • The controls of the mixing damper can be dependent on the CO2 set point.
   • User can define the CO2 set point.
   • The fresh air damper will be difference between 100% and the percentage opening of the mixing damper.

3. Fan airflow control
   • The fan speed control can be done through
     i. Direct (w/o inverters).
     ii. DirectVar (with inverters).
     iii. Analog controlled variable speed drive with digital release.
     iv. Pressure control to meet the pressure set points in the duct.

4. Monitoring points for other features
   i. Room humidity
   ii. Electric heating coil
   iii. Outside, room and return temperature
   iv. VRV alarm

MicroTech III can connect to intelligent Touch Manager.

Monitor and control devices related to AHU such as fan, sensors, and damper

- On/Off
- Operation mode
- Setpoint
- Error monitoring
- CO2 ppm
- Discharged air temp
- Humidity
- Damper control etc...

Available object list
- BACnet Bi/Bo/Bv
- BACnet Ai/Ao/Av

MicroTech III consists of 4 components in a fixed configuration.
Case Study of Customization

Flexible customization of AHU
Dalkein's AHU can be customized to meet your requirements

Case 1

<table>
<thead>
<tr>
<th>Specification</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Flow</td>
<td>15,000 CFM</td>
<td>Pre-cool Capacity</td>
<td>15,000 Kcal/hr</td>
</tr>
<tr>
<td>Water Flow</td>
<td>-</td>
<td>Mass Cool Capacity</td>
<td>-</td>
</tr>
<tr>
<td>Air Flow</td>
<td>15,000 CFM</td>
<td>Air-handling Capacity</td>
<td>15,000 Kcal/hr</td>
</tr>
<tr>
<td>Water Flow</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Air Flow</td>
<td>15,000 CFM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water Flow</td>
<td>-</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Drawing**

Top View

Front View

Side View

Case 2

<table>
<thead>
<tr>
<th>Specification</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Flow</td>
<td>15,000 CFM</td>
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<td>-</td>
<td>Mass Cool Capacity</td>
<td>-</td>
</tr>
<tr>
<td>Air Flow</td>
<td>15,000 CFM</td>
<td>Air-handling Capacity</td>
<td>15,000 Kcal/hr</td>
</tr>
<tr>
<td>Water Flow</td>
<td>-</td>
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</tr>
<tr>
<td>Air Flow</td>
<td>15,000 CFM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water Flow</td>
<td>-</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Drawing**

Top View

Front View

Side View

*Please contact Dalkein sales office for more information.*