DX-AHU WITH VRF SYSTEMS
JOINING TWO FORCES

Panasonic, the global leading air conditioning company, and SAIVER, manufacturer of high quality air handling units for more than half a century, now join forces to bring DX-AHU with VRF Systems, a new and comprehensive air conditioning solution to the market through cutting edge technologies and superior reliability.

SAIVER Air Handling Units incorporate the finely tuned, value engineered cost effective design aided by computer coupled with human ingenuity. SAIVER team comprises of highly experienced engineers and technicians totally committed to produce one of the finest Double Skinned Air Handling Units range in the World to meet the requirements of most demanding cost and quality conscious customer.

Panasonic’s air conditioner business delivers leading-quality air conditioning solutions throughout the world. Its reliable and widely-trusted Japanese craftsmanship, with performance that has been refined for over 60 years since the start of the air conditioner business, is acknowledged as a global brand of the highest quality.

Case studies - DX-AHU with VRF Systems

Global Switch Data Center / Hong Kong - Installed in 2018
Sukho Gallery / Thailand - Installed in 2016
Paramount Utropolis / Malaysia - Installed in 2017
Queen Mary Hospital / Hong Kong - Installed in 2015
Tesco Lotus / Thailand - Installed in 2015
Sukmo Gallery / Thailand - Installed in 2018
Cheung Ching Community Centre / Hong Kong - Installed in 2017

Installation reference

Cheung Ching Community Centre / Hong Kong - Installed in 2017

by SAIVER

by Panasonic

VRF Systems

DX-AHU

Marina Bay Sands

Xiamen University
Introduction

In any indoor environment, air quality and efficient air conditioning plays a vital role in maintaining our health, comfort and productivity. Whether it’s a hotel, hospital or museum, every building matters. That’s why Panasonic together with SAIVER has developed large scale DX-AHU with VRF Systems to suit a variety of business applications.

Panasonic’s FSV-EX is a game-changing VRF systems delivering high energy-saving performance, powerful operation, reliability and comfort surpassing anything previously possible. It represents a true paradigm shift in air conditioning solutions. Taking quality to the extreme - that’s the Panasonic challenge.

SAIVER’s AHU/OHU is HVAC system used to regulate and circulate air as part of heating, cooling and ventilation with large air flow rate and high static pressure. Its configuration is also expandable with various add-ons such as heat recovery, heat pipe, filter, etc., providing a tailor-made solution according to modular size fitting for a variety of large sized applications.

DX-AHU with VRF Systems applications

Panasonic VRF Systems

SAIVER AHU

System overview

Panasonic VRF Systems

SAIVER AHU

Panasonic AHU Kit

SAIVER DX-AHU

Benefits by applications

Easy air conditioning installation for both guest rooms (VRF) and large spaces (DX-AHU) like ballroom.
Effortless management of air conditioning for large spaces displaying items that require temperature and humidity control.
Effective air conditioning for classrooms and large spaces and rooms.
Customized air conditioning for processes requiring control of temperature and humidity.
 Easily customized air conditioning for operating rooms, general wards and lobbies.
Comparison of DX-AHU with VRF Systems to Chiller & AHU Systems

The combined system of VRF for buildings and AHU allows control of room air temperature and humidity, delivering many benefits. The installation of DX-AHU with VRF Systems requires minimal effort as there's no need to add cooling towers, chillers, and long piping on the premises. It also allows installation in spaces with limited construction flexibility. Even the maintenance cost of the total solution can be drastically reduced, eliminating the need for cooling tower and water piping.

**DX-AHU with VRF Systems**
- Easy maintenance (Same as common VRF Systems)
- Minimal maintenance cost
- Small installation space (Only for AHU & VRF)
- Simple system (HVAC ducting)
- Simple control (Intelligent control)

**Chiller & AHU Systems**
- Maintenance
- Maintenance Cost
- Space
- System
- Control

**Comparison of DX-AHU with VRF Systems to Chiller & AHU Systems**
- **Easy maintenance**: Same as common VRF Systems
- **Minimal maintenance cost**: Higher cost due to frequent maintenance
- **Small installation space**: Require larger installation space (AHU, FCU, chiller, cooling tower)
- **Simple system**: HVAC ducting
- **Simple control**: Intelligent control

**Increased piping length for greater design flexibility**
Adaptable to various building types and sizes.
Actual piping length: 100m / Equivalent 120m

*Please consult with Panasonic sales engineers in case piping elevation of 50m or over is required.
*Connection of other types of indoor units is not available in case of DX-AHU with VRF in the same system.

**Better air treatment**
Comparison of custom-made DX-AHU with VRF Systems to conventional VRF Systems for fresh air.

**DX-AHU with VRF Systems**
- Up to 13,000 CMH
- Large cooling capacity (up to 80HP)
- Large external static pressure provided (up to 500Pa)
- Lots of IAQ options (e.g., dehumidifier, UV light, PCO, heat pipe or heat wheel)

**Conventional VRF Systems for Fresh Air**
- Up to 2,100 CMH
- Small cooling capacity (Max. 10HP)
- Limited external static pressure (Max. 200Pa)
- No space to install IAQ components

**Comfort temperature control**
Comparing inverter condensing unit to non-inverter condensing unit.
- Prevention of temperature hunting

With inverter condensing unit:
- Supply air temperature is closer to setpoint
- Zone temperature maintains a tight zone around setpoint at all times by continuous load-matching operation

With non-inverter condensing unit:
- Supply air temperature will be colder than needed due to excess capacity
- Zone setpoint is maintained by on-off cycling
Panasonic AHU Kit connects VRF systems to SAEVER Air Handling Unit systems using same refrigerant circuit as the VRF systems. With flexible connectivity, Panasonic AHU Kit can be easily integrated to air conditioning system for a high efficiency operation.

**AHU Connection Kit**

- PCB, Power trans., Terminal block
  - CZ-280MAH1
  - CZ-560MAH1
  - Heat load: 40kW to 450kW (in case of 1 unit/unit)
- Timer remote controller, CZ-RTC4
  - (must be purchased)
  - Up to 500m wiring
- CZ-RTC4
  - Timer remote controller.
  - HxWxD: 404x425x78 (mm)
- CZ-560MAH1
- CZ-280MAH1
- Terminal block
  - PCB, Power trans., Expansion valve
- Thermistor x2
  - Refrigerant: E1, E2
- Thermistor x2
  - Air: T1, T2

**Optional connector**

- T10 connector
  - Input signal: Operation On/Off
  - Output signal: Operating-ON status
  - Alarm output (by DC12 V)
- OPTION connector, DC12V outlet
  - Output signal: Cool / Heat/Fan status
  - Defrost
  - Thermostat:ON

**Optional parts**

- Seri-Para I/O unit for DDC connection (CZ-CAPBC2)
  - Control and status monitoring is possible for individual indoor unit (1 group).
  - In addition to operation and stop, there is a digital input function for air speed and operation mode.
  - Temperature setting and measuring of the indoor suction temperature can be performed from central monitoring.
  - The analog input for temperature setting is 0 to 10 V, or 0 to 140 Ohm.
  - Power is supplied from the T10 terminal of the indoor units.
  - Separate power supply also is possible (in case of suction temperature measuring).

**AHU Kit usage example**

- **Standard usage**
  - (Used without DDC)
  - CZ-AHU with VRF supplies large air volume to large spaces. AHU Kit can be used with CZ-AHU without DDC or other external devices under certain conditions. (Please consult with Panasonic sales engineers).

- **DDC…Digital Direct Controller**

**Control by room temperature**

**Room temperature control by DDC**

**Digital/Analog output to external devices**

- **Seri-Para DDC**
  - As OHU
  - As AHU

**AHU Kit can be connected to Panasonic remote sensor/controller to control the discharged air by room temperature.**

- When DDC controls external equipment (e.g. Dampers), AHU Kit supplies On/Off status to DDC with dry contact. (Dampers are controlled by DDC.)

**Send the On/Off status to DDC for damper control**

- AHU Kit gives On/Off status to DDC with dry contact. (Dampers are controlled by DDC.)

**AHU Connection Kit / System Combination**

<table>
<thead>
<tr>
<th>Capacity (HP)</th>
<th>Outdoor unit combination</th>
<th>AHU Kit combination</th>
</tr>
</thead>
<tbody>
<tr>
<td>28 kW (100 HP)</td>
<td>U-15ME2H7</td>
<td>CZ-280MAH1</td>
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<tr>
<td>35 kW (125 HP)</td>
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<td>44 kW (150 HP)</td>
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<td>576 kW (2200 HP)</td>
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<td>640 kW (2400 HP)</td>
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<td>920 kW (3500 HP)</td>
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<tr>
<td>1000 kW (4000 HP)</td>
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*These are combination examples for space saving combination. These combinations are also compatible for high efficiency models on page 16-17.*
### DX-AHU Standard Series (30mm Panel)

#### AHU Performance

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<td>Air Flow</td>
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<td>174</td>
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</tr>
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<td>1.78</td>
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<tr>
<td>Effective Area</td>
<td>0.222</td>
<td>0.394</td>
<td>0.603</td>
<td>0.748</td>
</tr>
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<td>85.0</td>
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<tr>
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<td>Motor kW</td>
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#### Specifications

- **Casing/Insulation**: Galvanized steel with polyester powder coating.
- **Frame**: Galvanized steel.
- **Wheel**: Mild steel.
- **Motor**: Type Double width double inlet backward/Forward curved centrifugal belt drive fan.
- **Fan**: Brand = Nicotra/Comefri.
- **Working Pressure**: 1600kPa.
- **Headers**: Copper tube.
- **Tubes**: Copper tube.
- **Coil**: DX coil.
- **Air filter**: Glass fibre / Synthetic.”

### DX-AHU Standard Series (60mm Panel with EC Fan)

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</tr>
<tr>
<td>Cooling Coil No. of row</td>
<td>6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cooling Coil</td>
<td>60mm Thickness double skinned panel</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Class = G3 (AFI=80-85%) Synthetic washable</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protection = IP54 Insulation class=F</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>External rotor motor</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Brand = ebm)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Specifications

- **Casing/Insulation**: Galvanized steel with polyester powder coating.
- **Frame**: Galvanized steel.
- **Wheel**: Mild steel.
- **Motor**: Type Double width double inlet backward/Forward curved centrifugal belt drive fan.
- **Fan**: Brand = Nicotra/Comefri.
- **Working Pressure**: 1600kPa.
- **Headers**: Copper tube.
- **Tubes**: Copper tube.
- **Coil**: DX coil.
- **Air filter**: Glass fibre / Synthetic.”

### Drawings

[Diagram of DX-AHU Standard Series (30mm Panel)]

[Diagram of DX-AHU Standard Series (60mm Panel with EC Fan)]
SAIVER DX-AHU Options

Wide range options to fit any use-case

1. Fan types
   - Backward curve aerofoil
   - Plug fan
   - Standard In 60mm EC fan series

2. Fan motor controls
   - VSD
   - Fixed speed
   - Class H motor
   - Soc. Exe explosion motor
   - PM motor

3. DX coil material types
   - Copper fin
   - Blue fin
   - Epoxy coated fin and coil
   - Tinmed copper fin
   - Hindled coated fin
   - Blygold coated fin

4. Drain pan types
   - Galvanized steel
   - Stainless steel (SS304/ SS316/ SS316L)
   - Epoxy polyester powder coated GI

5. Air filter types
   - Medium filter
   - Extra filter
   - Synthetic
   - Bag
   - HEPA
   - Aluminium
   - Cartridge
   - LUPA
   - Auto-roll filter
   - Chemical filter
   - Carbon filter

Customization
- Airflow
- Capacity
- ESP
- Discharge direction
- Piping outlet

6. Special options
   - Electric heater
   - Mixing box
   - Outdoor roof
   - 80mm panel thickness
   - Heat pipes
   - Heat wheel
   - Acoustic panel
   - Dessicant wheel
   - UV lamp
   - Humidifier

DX-AHU work flow / Certification

1. Selection software by SAIVER
   - Sophisticated computer selection software.
   - Flexible AHU dimension.
   - Accurate quotation, technical data, detailed drawing.

2. Selection sheet
   - Data sheet, sound data
   - Energy class calculation
   - Psychrometric chart
   - Fan operating point
   - Dimensioning
   - Eurovent

3. Real Use case
   - Customized system design
   - E.G.: Outdoor installation
     - Outdoor canopy with slope
     - Rain hood, wire mesh
     - Anti-corrosion

Certification for SAIVER DX-AHU

- EUROVENT - EN1886
- VDI 6022 Hygienic standard
- AMCA Fan standard
VRF Systems Features

FSV-EX advantages

The most efficient, powerful and quiet systems in Panasonic’s history. There has never been a VRF systems like it. It’s the story of a true game changer.

Extended operation range up to 52°C

The FSV-EX can provide cooling even when the outside temperature reaches a maximum of about 52°C. And amazingly, it can still operate at 100% capacity when the outside temperature is as high as 43°C.

Low-noise operation

Numerous technological innovations, including an improved compressor and a newly designed bell mouth and larger fan, have dramatically reduced the outdoor noise level.

Remarkable improvement on key components

- Extraordinary energy-saving performance
- Redesigned for smooth and better air discharge
- Newly designed curved air discharge bell mouth for better aerodynamics
- Multiple large-capacity all inverter compressors (more than 14HP)
- Enlarged heat exchanger surface area with triple surface*  
  *For 8 & 10HP unit, the heat exchanger is 2 row design.
- Large air discharge area with new flush surface top panel
- Multiple large-capacity inverter compressor (More than 14HP)
- Flat fan guard
- New curved bell mouth
- Combined triple-surface heat exchanger

High external static pressure on condensers

With a newly designed fan, fan guard, motor, and casing, new models can be custom-installed on-site to provide up to 80 Pa of external static pressure. An air discharge duct prevents shortages of air circulation, allowing outdoor units to be installed on every floor of a building.

Extended compressor life by uniform compressor operation time

The total run-time of compressors are monitored by a built-in microcomputer, which ensures that operation times of all compressors within the same refrigerant circuit are balanced.

Compressors with histories showing shorter run times are selected first, ensuring equal wear and tear across all units and extended the working life of the system.

Automatic backup operation

Automatic backup operation in the case of compressor failure or outdoor unit malfunction.

*Except for 10 HP single unit installation.
*Backup operation allows uninterrupted cooling or heating to continue whilst waiting for service. Users should contact their authorised service centre as soon as fault occurs.

Hi-durability outdoor unit (option)

Corrosion-resistance treated for high resistance to rust and salty air to assure long-lasting performance.

Note: Selecting this unit does not completely eliminate the possibility of rust developing. For details concerning installation and maintenance, please consult an authorised dealer.
### VRF Specifications

#### VRF Outdoor Unit Performance

<table>
<thead>
<tr>
<th>HP*</th>
<th>10</th>
<th>20</th>
<th>30</th>
<th>40</th>
<th>50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model Name</td>
<td>U-10ME2H7</td>
<td>U-20ME2H7</td>
<td>U-10ME2H7</td>
<td>U-16ME2H7</td>
<td>U-20ME2H7</td>
</tr>
<tr>
<td>Power Supply</td>
<td>380 / 400 / 415V-3-phase / 50Hz</td>
<td>380 / 400 / 3-phase / 60Hz</td>
<td>380 / 400 / 415V-3-phase / 50Hz</td>
<td>380 / 400 / 3-phase / 60Hz</td>
<td>380 / 400 / 415V-3-phase / 50Hz</td>
</tr>
<tr>
<td>Cooling Capacity kW</td>
<td>28</td>
<td>56</td>
<td>56</td>
<td>85</td>
<td>113</td>
</tr>
<tr>
<td>Power Input kW</td>
<td>5.57</td>
<td>14.90</td>
<td>11.10</td>
<td>19.70</td>
<td>30.50</td>
</tr>
<tr>
<td>Net Weight kg</td>
<td>210</td>
<td>375</td>
<td>420</td>
<td>630</td>
<td>855</td>
</tr>
<tr>
<td>Depth mm</td>
<td>1,000</td>
<td>1,000</td>
<td>1,000</td>
<td>1,000</td>
<td>1,000</td>
</tr>
<tr>
<td>Height mm</td>
<td>1,842</td>
<td>1,842</td>
<td>1,842</td>
<td>1,842</td>
<td>1,842</td>
</tr>
<tr>
<td>Width mm</td>
<td>770</td>
<td>1,540</td>
<td>1,600</td>
<td>2,420</td>
<td>3,140</td>
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<tr>
<td>Sound Pressure Level Normal mode dB</td>
<td>56.0</td>
<td>59.0</td>
<td>59.0</td>
<td>63.0</td>
<td>62.0</td>
</tr>
<tr>
<td>Sound Power Level Normal mode dB</td>
<td>77.0</td>
<td>80.0</td>
<td>80.0</td>
<td>84.0</td>
<td>83.0</td>
</tr>
</tbody>
</table>

#### Dimensions

**10 HP**
- According to the installation site, you may choose the setting position in the depth direction of the anchor bolt from A, B or C.
- A: (Installation hole pitch) For removing tube forward
- B: (Installation hole pitch) For removing tube downward
- C: (Installation hole pitch)

**12 / 14 / 16 HP**
- According to the installation site, you may choose the setting position in the depth direction of the anchor bolt from A, B or C.
- A: (Installation hole pitch) For removing tube forward
- B: (Installation hole pitch) For removing tube downward
- C: (Installation hole pitch)

**18 / 20 HP**
- According to the installation site, you may choose the setting position in the depth direction of the anchor bolt from A, B or C.
- A: (Installation hole pitch) For removing tube forward
- B: (Installation hole pitch) For removing tube downward
- C: (Installation hole pitch)
AHU Smart Connectivity+ brings unrivaled benefits for connectivity and control at the same time.

SE8000 controller advantages and benefits
- DDC/BMS connectivity by BACnet/Modbus minimizes the cost of BMS interface
- Wireless sensing by Zigbee reduce hard wiring installation
- CO2 wireless sensor improves IAQ with ventilation

Panasonic together with SAIVER has a diverse network of sales, production and R&D facilities, deliver innovative products incorporating cutting-edge technologies that set the standard for air conditioners worldwide.

Usage example

DDC(BMS) connectivity

Compact AHU with CO2 control

AHU Smart Connectivity+ brings unrivaled benefits for connectivity and control at the same time.

SAIVER Head office in Asia
Welcome Air-Tech. Ltd
11th Floor, Trend Centre,
29 Cheung Lee Street, Chai Wan, Hong Kong

SAIVER China Factory
Zhongshan SAIVER WELAIR Conditioning Equipment Company Ltd.
Block 1, Meiping Street, Maling Village, South District, Zhongshan City, Guangdong Province, 528455, China

SAIVER Malaysia Factory
Welcome Air-Tech (Malaysia) Sdn. Bhd.
46, Jalan Anggerik Mokara 31/47,
Kota Kemuning, Seksyen 31,
40460 Shah Alam, Selangor D.E., Malaysia

Schneider Electric SE8000 controller can be easily integrated with DX-AHU with VRF Systems maximizing the air quality management of each products. Various types of devices such as sensor, relay pack can be connected to control and improve IAQ.

System diagram

In case of combination with DDC/BMS, SE8000 does not require any interface for a BACnet/Modbus native controller. BMS can have quite large amount of data from SE8000 through open protocol.

BMS can have quite large amount of data from SE8000 through open protocol.

In case of combination with DDC, SE8000 and TE2 can provide wireless CO2 control based on the feedback from indoor CO2 sensor without DDC or BMS system. (e.g. CO2: 1000ppm, Fan: High-50Hz, Setpoint: -1°C)

Please consult with Panasonic sales engineers where SE8000 can be installed.

*Please consult with Panasonic sales engineers where SE8000 can be installed.

*need to check installation conditions

*need to check installation conditions

In case of combination with DDC/BMS, SE8000 does not require any interface for a BACnet/Modbus native controller. BMS can have quite large amount of data from SE8000 through open protocol.

In case of combination with DDC/BMS, SE8000 does not require any interface for a BACnet/Modbus native controller. BMS can have quite large amount of data from SE8000 through open protocol.

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In case of combination with DDC/BMS, SE8000 does not require any interface for a BACnet/Modbus native controller. BMS can have quite large amount of data from SE8000 through open protocol.
Please read the Installation Instructions carefully before installing the unit, and the Operating Instructions before using it.

- Specifications are subject to change without prior notice.
- The contents of this catalogue are accurate as of April 2019.
- Due to printing considerations, the actual colours may vary slightly from those shown.
- All graphics are provided merely for the purpose of illustrating a point.

Do not add or replace refrigerant other than the specified type. Manufacturer is not responsible for the damage and deterioration in safety due to usage of other refrigerant.

We face a time in which “quality air” differentiates business. It’s a time for Panasonic to fully display its strengths. Our ability to assemble and build superior systems isn’t just due to the rich resources we have as a comprehensive electronics manufacturer, but also to Panasonic’s 100 years of tradition, where each person thinks and acts on their own initiative while working in a team to reach further heights. We do not compromise. Each of our independent selves is a one stop solution. We face our customers’ challenges together with our customers and do all that we can to build effective systems. As a true partner for our customers, we strive to always be at the forefront of business.