VRV IV
360° efficiency

VRV IV heat pump replacement
**Variable refrigerant temperature**

Customise your VRV for best seasonal efficiency and comfort

Thanks to its revolutionary variable refrigerant temperature technology (VRT), VRV IV continuously adjusts both the inverter compressor speed and the refrigerant temperature, providing the necessary capacity to meet the building load with the highest seasonal efficiency at all times!

- **Seasonal efficiency increased by 28%**
- **The first weather compensating control on the market**
- **Customer comfort is assured thanks to higher outblow temperatures (preventing cold draughts)**

**How does it work?**

**VRF standard**
Capacity is controlled only with the variance of the inverter compressor

**Daikin VRV IV**
Variable Refrigerant Temperature control for energy saving in partial load condition. The capacity is controlled by the inverter compressor AND variation of the evaporating (Te) and condensing (Tc) temperature of the refrigerant in order to achieve the highest seasonal efficiency.

Calculate the benefit of variable refrigerant temperature for your project in our seasonal solutions calculator:


**Success story**

**Live test: up to 46% less energy consumed**

A field trial was carried out at a fashion store chain in Germany and showed that the innovative Daikin VRV IV delivers dramatically better energy efficiency compared with previous models.

The trial results showed that the new VRV IV system consumed up to 60% less energy than the VRV III system, particularly during cooling. Overall energy savings during heating averaged 20%.

**How effective is the VRV IV heat pump technology?**

The trial demonstrated that by using air, an infinitely renewable and free energy source, the VRV IV system provides a complete and environmentally sustainable solution for heating, cooling and ventilation in commercial applications. The trial also showed that only by monitoring climate control systems carefully and intelligently businesses can identify and control energy waste. This is a service which Daikin also offers.
Different modes to maximise efficiency and comfort

For maximum energy efficiency and customer satisfaction, the outdoor unit needs to adapt the evaporating/condensing temperature at the optimum point for the application.

How to set the different modes?

<table>
<thead>
<tr>
<th>Set up the main operation mode of the system</th>
<th>Define how the system reacts to changing loads</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td><strong>Step 2</strong></td>
</tr>
<tr>
<td><strong>Automatic</strong>&lt;sup&gt;*&lt;/sup&gt;</td>
<td>Powerful</td>
</tr>
<tr>
<td>Quick reaction speed</td>
<td>Quick</td>
</tr>
<tr>
<td>Top efficiency</td>
<td>Mild</td>
</tr>
</tbody>
</table>
| The perfect balance: Achieves top efficiency throughout the year, reacts quickly on the hottest days | *
| **High sensible** (User selection) | Powerful |
| Quick reaction speed | Quick |
| Top efficiency | Mild |
| Year round top efficiency | Eco |
| **Basic** | No submodes |
| Current VRF standard | * Factory setting |

* Factory setting

**Measured data**

**Fashion store Unterhaching (Germany)**

- Floor space: 607m²
- Energy cost: 0,18 €/kWh
- System taken into account for consumption:
  - VRV IV heat pump with continuous heating
  - Round flow cassettes (without auto cleaning panel)
  - VAM for ventilation (2x VAM2000)
  - Biddle Air curtain.

<table>
<thead>
<tr>
<th>VRV III 20HP (2 modules)</th>
<th>VRV IV 18HP (1 module)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Period</strong></td>
<td>March 2012 - February 2013</td>
</tr>
<tr>
<td><strong>Avg (kWh/Month)</strong></td>
<td>2.797</td>
</tr>
<tr>
<td><strong>Total (kWh)</strong></td>
<td>33.562</td>
</tr>
<tr>
<td><strong>Total (€)</strong></td>
<td>6.041</td>
</tr>
<tr>
<td><strong>Yearly (operation cost/m²) (€/m²)</strong></td>
<td>9.9</td>
</tr>
</tbody>
</table>

46% savings = € 2.797
Continuous heating during defrost mode

**Pure comfort**

VRV IV continues to provide heating even when in defrost mode, providing an answer to any perceived disadvantages of specifying a heat pump as a monovalent heating system.

- Indoor comfort not affected either via the unique heat accumulating element or alternate defrost
- The best alternative to traditional heating systems

Heat pumps are known for their high energy efficiency in heating, but they accumulate ice during heating operation and this must be melted periodically using a defrost function that reverses the refrigeration cycle. This causes a temporary temperature drop and reduced comfort levels inside the building.

Defrosting can take over 10 minutes (depending on the size of the system) and occurs mostly between -7 and +7°C when there is most moisture in the air, which freezes to the coil, and this has a significant impact on the perceived indoor comfort levels and running costs.

The VRV IV has changed the heating paradigm by providing heat even during defrost operation thus eliminating the temperature drop inside and providing comfort at all times.

**Check on YouTube**

https://www.youtube.com/DaikinEurope
How does it work?

Heat accumulating element

For the VRV IV heat pump single models a unique heat-accumulating element is used. This element, based upon phase change materials, provides the energy to defrost the outdoor unit. The energy needed for defrosting is stored in the element during normal heating operation.

Alternate defrost

On all our multi model combinations only 1 outdoor coil is defrosted at a time, ensuring continuous comfort during the whole process.
Software for simplified commissioning, configuration and customisation
VRV configurator software

- Graphical interface
- Manage systems over multiple sites in exactly the same way
- Retrieve initial settings

Simplified commissioning

The VRV configurator is an advanced software solution that allows for easy system configuration and commissioning.
- Less time is required on the roof to configure the outdoor unit
- Multiple systems at different sites can be managed in exactly the same way, providing simplified commissioning for key accounts
- Initial settings on the outdoor unit can be easily retrieved

Simplified servicing

The user-friendly display for outdoor units simplifies basic servicing tasks.
- Easy-to-read error report
- Easy-to-understand menu indicates quick and easy on-site settings
- Easy-to-follow parameters for checking basic functions: high pressure, low pressure, frequency and operation time, compressor history, temperature of discharge/suction pipe.

3-digit 7-segment display

User-friendly interface instead of push buttons
Unique VRV IV core technologies

Newly developed compressor

Full inverter
› Enabling variable refrigerant temperature and low start-up currents
› Stepless capacity control

Reluctance brushless DC motor
› Increased efficiency compared to AC motors by simultaneously using normal and reluctance torque
› Powerful neodymium magnets efficiently generate high torque
› High-pressure oil reduces thrust losses

High efficiency J-type 6-pole motor
› 50% stronger magnetic field and higher rotation efficiency

Thixocasting process
› Compression volume is increased by 50% thanks to a new high-durability material cast in a semi-molten state

Refrigerant-cooled PCB
› Reliable cooling because it is not influenced by ambient air temperature
› Smaller switchbox for smoother air flow through the heat exchanger increasing heat exchange efficiency with 5%

4-sided, 3-row heat exchanger
› Heat exchange surface up to 50% larger (up to 235m²), leading to 30% more efficiency

37 patents
36 patents
10 patents
Predictive Control Function (PCF)
› Reaches the target capacity/refrigerant temperature faster
› Reaches the target without overshooting, so there is no waste, leading to improved efficiency
› Three capacity settings give more precise control for user comfort

The large number of Daikin systems already in operation and which are monitored by our i-Net software put us in the unique position of being able to analyse this data and develop the predictive compressor control function.

DC fan motor

Outer rotor DC motor for higher efficiency
› Larger rotor diameter results in greater force for the same magnetic field, leading to better efficiency
› Better control, resulting in more fan steps to match the actual capacity

Sine wave DC inverter
Optimizing the sine wave curve results in smoother motor rotation and improved motor efficiency.

DC fan motor
The use of a DC fan motor offers substantial improvements in operating efficiency compared to conventional AC motors, especially during low speed rotation.

E-Pass heat exchanger

Optimising the heat exchanger’s path layout prevents heat being transferred from the overheated gas section to the sub-cooled liquid section which is a more efficient way to use the heat exchanger.

I-demand function
Limit maximum power consumption.
The newly introduced current sensor minimizes the difference between the actual power consumption and the predefined power consumption.
Typically, many buildings today rely on several separate systems for heating, cooling, air curtain heating and hot water. As a result energy is wasted. To provide a much more efficient alternative, VRV technology has been developed into a total solution managing up to 70% of a buildings energy consumption giving large potential to cost saving.

- **Heating and cooling**
  for year round comfort
- **Hot water**
  for efficient production of hot water
- **Underfloor heating /cooling**
  for efficient space heating/cooling
- **Ventilation**
  for high quality environments
- **Air curtains**
  for optimum air separation
- **Controls**
  for maximum operating efficiency

**Combine up to 70% of your building’s energy consumption**

**Average hotel energy consumption**

- **Lighting**
- **Kitchen**
- **Office**
- **Other**

- **70%**
  - **Space heating** 31%
  - **Space cooling** 15%
  - **Refrigeration** 3%
  - **Ventilation** 4%
  - **Hot water** 17%

**Average office energy consumption**

- **Lighting**
- **Office equipment**
- **Other**

- **48%**
  - **Space heating** 25%
  - **Space cooling** 9%
  - **Hot water** 9%
  - **Ventilation** 5%
  - **Other**
VRV IV outdoor unit
products overview

**VRV IV heat recovery**
- Fully integrated solution with heat recovery for maximum efficiency with COPs of up to 8!
- Covers all thermal needs of a building via single point of contact: accurate temperature control, ventilation, hot water, air handling units and Biddle air curtains
- 'Free' heating and hot water through heat recovery
- Perfect personal comfort for guests/tenants via simultaneous cooling and heating
- Incorporates VRV IV standards and technologies such as variable refrigerant temperature and continuous heating
- Unique range of single- and multi BS boxes

**VRV IV heat pump**
- 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
- Can be connected to stylish indoor units (Daikin Emura, Nexura)
- Incorporates VRV IV standards and technologies such as variable refrigerant temperature and continuous heating

**Replacement VRV IV**
- Cost-effective and fast replacement through re-use of existing piping
- Up to 40% more efficient than R-22 systems
- No interruption of daily business while replacing your system
- Replace Daikin and other manufacturers’ systems safely
- Incorporates VRV IV standards and technologies such as variable refrigerant temperature

**Water cooled VRV IV**
- Reduces CO₂ emissions by using geothermal energy as an energy source
- Geothermal mode eliminates need for an external heating or cooling source
- 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
- Compact and lightweight design can be stacked for maximum space saving
- Incorporates VRV IV standards and technologies such as variable refrigerant temperature
- Variable water flow control option increases flexibility and control
### Replacement VRV IV heat pump

<table>
<thead>
<tr>
<th>Outdoor unit</th>
<th>RXYQQ-T</th>
<th>8T</th>
<th>10T</th>
<th>12T</th>
<th>14T</th>
<th>16T</th>
<th>18T</th>
<th>20T</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capacity range</td>
<td>HP</td>
<td>8</td>
<td>10</td>
<td>12</td>
<td>14</td>
<td>16</td>
<td>18</td>
<td>20</td>
</tr>
<tr>
<td>Cooling capacity Nom.</td>
<td>kW</td>
<td>22.4</td>
<td>28.0</td>
<td>33.5</td>
<td>40.0</td>
<td>45.0</td>
<td>50.0</td>
<td>56.0</td>
</tr>
<tr>
<td>Heating capacity Nom./Max.</td>
<td>kW</td>
<td>22.4/25.0</td>
<td>28.0/31.5</td>
<td>33.5/37.5</td>
<td>40.0/45.0</td>
<td>45.0/50.0</td>
<td>50.0/55.0</td>
<td>56.0/60.0</td>
</tr>
<tr>
<td>Power input - 50Hz</td>
<td>Cooling Nom.</td>
<td>kW</td>
<td>5.21</td>
<td>7.29</td>
<td>9.89</td>
<td>11.0</td>
<td>13.0</td>
<td>14.7</td>
</tr>
<tr>
<td>Heating Nom./Max.</td>
<td>kW</td>
<td>4.75/5.51</td>
<td>6.29/7.38</td>
<td>7.77/9.10</td>
<td>9.52/11.2</td>
<td>11.12/12.8</td>
<td>12.4/14.4</td>
<td>14.5/17.0</td>
</tr>
<tr>
<td>EER</td>
<td>4.30</td>
<td>3.84</td>
<td>3.73</td>
<td>3.64</td>
<td>3.64</td>
<td>3.46</td>
<td>3.40</td>
<td>3.03</td>
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<tr>
<td>ESEER</td>
<td>6.37/5.73(2)</td>
<td>5.67/5.20(2)</td>
<td>5.10/4.96(2)</td>
<td>5.31/4.83(2)</td>
<td>5.03/4.60(2)</td>
<td>4.97/4.68(2)</td>
<td>4.42/4.57(2)</td>
<td></td>
</tr>
<tr>
<td>COP</td>
<td>4.75/4.54</td>
<td>4.45/4.42</td>
<td>4.31/4.12</td>
<td>4.24/4.02</td>
<td>4.05/3.91</td>
<td>4.03/3.89</td>
<td>3.87/3.71</td>
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<tr>
<td>Maximum number of connectable indoor units</td>
<td>64(3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dimensions</td>
<td>Unit</td>
<td>HeightxWidthxDepth</td>
<td>mm</td>
<td>1,685x930x765</td>
<td>1,685x1,240x765</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Weight</td>
<td>Unit</td>
<td>kg</td>
<td>261</td>
<td>268</td>
<td>364</td>
<td>398</td>
<td></td>
<td></td>
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<tr>
<td>Fan</td>
<td>Air flow rate</td>
<td>m³/min</td>
<td>162</td>
<td>175</td>
<td>185</td>
<td>223</td>
<td>260</td>
<td>251</td>
</tr>
<tr>
<td>Sound pressure level</td>
<td>Nom. dBA</td>
<td>78</td>
<td>79</td>
<td>81</td>
<td>86</td>
<td>88</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operation range</td>
<td>Nom./Max. °CDB</td>
<td>22.4/25.0</td>
<td>28.0/31.5</td>
<td>33.5/37.5</td>
<td>40.0/45.0</td>
<td>45.0/50.0</td>
<td>50.0/55.0</td>
<td>56.0/60.0</td>
</tr>
<tr>
<td>Refrigerant</td>
<td>Type / GWP</td>
<td>R-410A / 2,087.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Piping connections</td>
<td>Charge</td>
<td>kg / TCO2Eq</td>
<td>9.52</td>
<td>12.7</td>
<td>19.1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power supply</td>
<td>Phase/Frequency/Voltage</td>
<td>Hz/V</td>
<td>3N~/50/380-415</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outdoor system</td>
<td>RXYQQ-T</td>
<td>38T</td>
<td>40T</td>
<td>42T</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Capacity range</td>
<td>HP</td>
<td>8</td>
<td>10</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cooling capacity Nom.</td>
<td>kW</td>
<td>106.0</td>
<td>111.5</td>
<td>118.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heating capacity Nom./Max.</td>
<td>kW</td>
<td>106.4/119.5</td>
<td>111.5/131.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power input - 50Hz</td>
<td>Cooling Nom.</td>
<td>kW</td>
<td>16.27</td>
<td>18.2</td>
<td>20.0</td>
<td>22.0</td>
<td>23.7</td>
<td>26.0</td>
</tr>
<tr>
<td>Heating Nom./Max.</td>
<td>kW</td>
<td>14.06/16.48</td>
<td>16.27/18.2</td>
<td>18.2/20.0</td>
<td>20.0/22.0</td>
<td>22.0/23.7</td>
<td>26.0/26.7</td>
<td></td>
</tr>
<tr>
<td>EER</td>
<td>3.77</td>
<td>3.70</td>
<td>3.67</td>
<td>3.57</td>
<td>3.52</td>
<td>3.46</td>
<td>3.43</td>
<td>3.21</td>
</tr>
<tr>
<td>ESEER</td>
<td>5.58(1)/7.07(2)</td>
<td>5.42(1)/6.82(2)</td>
<td>5.39(1)/6.89(2)</td>
<td>5.23(1)/6.69(2)</td>
<td>5.17(1)/6.60(2)</td>
<td>5.05(1)/6.50(2)</td>
<td>5.00(1)/6.44(2)</td>
<td></td>
</tr>
<tr>
<td>COP</td>
<td>4.37/4.99</td>
<td>4.25/4.50</td>
<td>4.25/4.06</td>
<td>4.16/4.00</td>
<td>4.14/3.98</td>
<td>4.05/3.91</td>
<td>4.04/3.90</td>
<td>3.95/3.79</td>
</tr>
<tr>
<td>Maximum number of connectable indoor units</td>
<td>64(3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indoor index connection</td>
<td>Min.</td>
<td>275</td>
<td>300</td>
<td>325</td>
<td>350</td>
<td>375</td>
<td>400</td>
<td>425</td>
</tr>
<tr>
<td>Nom.</td>
<td>550</td>
<td>600</td>
<td>650</td>
<td>700</td>
<td>750</td>
<td>800</td>
<td>850</td>
<td></td>
</tr>
<tr>
<td>Max.</td>
<td>715</td>
<td>780</td>
<td>845</td>
<td>910</td>
<td>975</td>
<td>1,040</td>
<td>1,105</td>
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<tr>
<td>Piping connections</td>
<td>Liquid OD mm</td>
<td>15.9</td>
<td>19.1</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Gas OD mm</td>
<td>28.6</td>
<td>34.9</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Total piping/length System Actual m</td>
<td>1,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(1) The STANDARD ESEER value corresponds with normal VRV IV heat pump operation, not taking into account advanced energy saving operation functionality.
(2) The AUTOMATIC ESEER corresponds with normal VRV IV heat pump operation, taking into account the advanced energy saving functionality (variable refrigerant temperature).
(3) Actual number of 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%).
(4) Not Eurovent certified.

Contains fluorinated greenhouse gases.
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