



# VRV IV

sets the standard ...

# again



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**VRV IV**

HEAT PUMP AND  
HEAT RECOVERY

What is  
the new standard  
all about?

VRV IV =

# VRV +

# 3 revolutionary standards

- › Variable refrigerant temperature
- › Continuous heating via heat pump
- › VRV configurator

# What is the new standard all about?

VRV has always set the standard: in the past, in the present, and will continue to do so in the future. Today, the VRV IV is setting new standards for seasonal efficiency for building owners, indoor comfort for users, and installation simplicity for installers.



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## Variable refrigerant temperature

- Customize your VRV for best seasonal efficiency & comfort: Revolutionary variable refrigerant temperature control automatically adapts the system to individual building and climate requirements for greater efficiency and comfort.

p. 8

## Continuous heating

- The new standard in heating comfort: Unique continuous heating technology makes VRV IV the best alternative to traditional heating systems.

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## VRV configurator

software for simplified commissioning, configuration and customisation

- Simplified commissioning: graphical interface to configure, commission and upload system settings.
- Simplified servicing: additional 7-segment indicator for easy and quick access to basic functions and error read out.

## What else is new... ?

The **integrated** <sup>p. 12</sup>  
**climate control**  
just got better



- New round flow cassette creates optimal building conditions at the best efficiencies



- New Intelligent Touch Manager offers energy management tools, reducing running costs even further



- New low temperature hydrobox, high efficient space heating

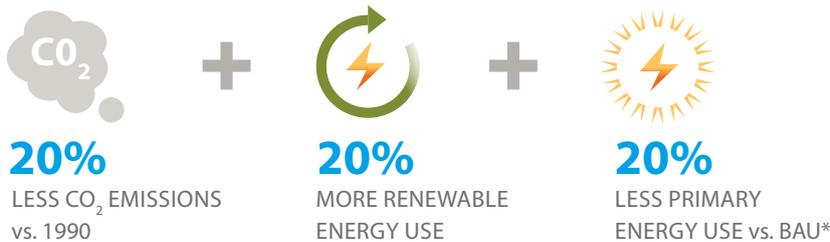
# Customize your VRV

## for best seasonal efficiency & comfort

### → DAIKIN LEADS THE WAY TO SEASONAL EFFICIENCY

Daikin again leads the industry by launching a new VRV range that is fully in line with the EU's 20/20/20 policy. VRV IV is up to 25% more efficient on a yearly basis while improving the comfort and flexibility features that make Daikin so unique.

European action plan



By the year  
**2020**

\*Business As Usual

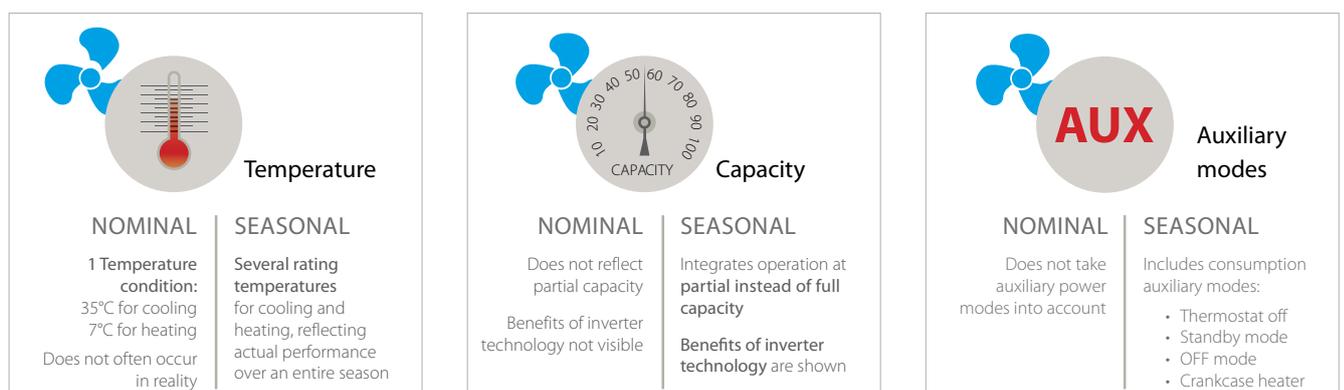
To help achieve the above targets, an Energy Related Products (ERP) Directive, has been introduced and this specifies minimum eco-design requirements, such as improved energy efficiency, that must be integrated into energy-using products. For climate control systems, the energy efficiency must be measured across the whole operating spectrum and this will be presented as the 'seasonal efficiency'.

#### Measuring real-life performance

The EU requires objective performance metrics to establish the minimum requirements that must be met, and to provide customers with information on air conditioner performance on which to base their choice. The current methodology - nominal efficiency (EER) - results in a significant gap between projected and actual performance and so a more accurate method - seasonal efficiency (ESEER) - has been developed.

 Seasonal efficiency is a more accurate measurement of the real-life energy efficiency of systems and gives an indication on how efficient an air conditioner is when operating over an entire cooling or heating season.

#### Nominal versus Seasonal efficiency



Using its variable refrigerant temperature technology, the VRV IV continuously adjusts the refrigerant temperature to the actual temperature and capacity needed, thus providing optimal seasonal efficiency at all times.



- Annual cost savings up to 25%
- Optimise the match of building requirements with comfort and efficiency
- Automatic adjustment of refrigerant temperature guarantees customer satisfaction



## CUSTOMIZE YOUR VRV FOR OPTIMAL SEASONAL EFFICIENCY

Revolutionary variable refrigerant temperature (VRT) control automatically adapts your VRV to your individual building and climate requirements for comfort and efficiency, thus drastically reducing operational running costs.

The system can be easily customised via the VRT technology preset modes. With the modes you choose to optimise the system towards your required balance between comfort and efficiency.

With this new technology Daikin has invented the VRV system once again. By looking at the core of the system it enables us to improve seasonal efficiency up to 25%!

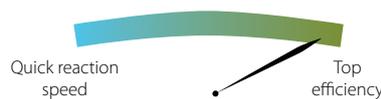
### One of the possible modes:

Automatic mode (Default setting on VRV IV)



The perfect balance :  
Top efficiency throughout most of the year. Quick reaction speed on the hottest days

High sensible mode



Year round top efficiency

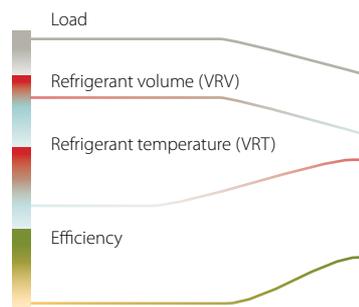
Basic mode (current VRF standard)



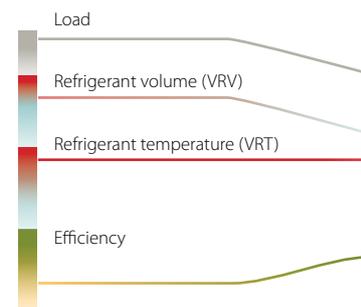
Quick reaction to peak load, to maintain set point

### Effect of preset modes on efficiency and reaction speed:

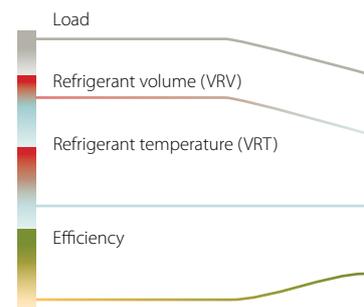
Automatic mode (Default setting on VRV IV)



High sensible mode



Basic mode (current VRF standard)

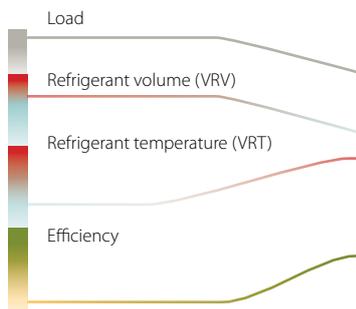




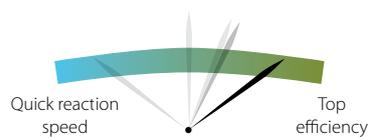
## UNIQUE VRT AUTOMATIC MODE LEADS TO 25% INCREASE IN SEASONAL EFFICIENCY

In automatic mode the system will go for maximum efficiency throughout most of the year and for quick reaction speed on the hottest days, ensuring comfort at all times while still resulting in an increased seasonal efficiency up to 25%.

Automatic mode (Default setting on VRV IV)



Automatic mode (Default setting on VRV IV)



The perfect balance :  
Maximum efficiency throughout  
most of the year. Quick reaction speed  
on the hottest days

## How is this 25% increase of seasonal efficiency achieved?



In automatic mode, the system constantly adjusts the refrigerant temperature according to the total required capacity and weather conditions.

For example, in mid season when there is little cooling needed and the room temperature is close to the setpoint, the system will adjust its refrigerant temperature to a higher temperature so less energy is needed, leading to major savings in seasonal efficiency.



## → CONTROL EXACTLY HOW YOUR SYSTEM REACTS IN AUTOMATIC MODE

The submodes available allow the installer to easily finetune the way the system reacts to changes in indoor or outdoor temperature.

### Powerful

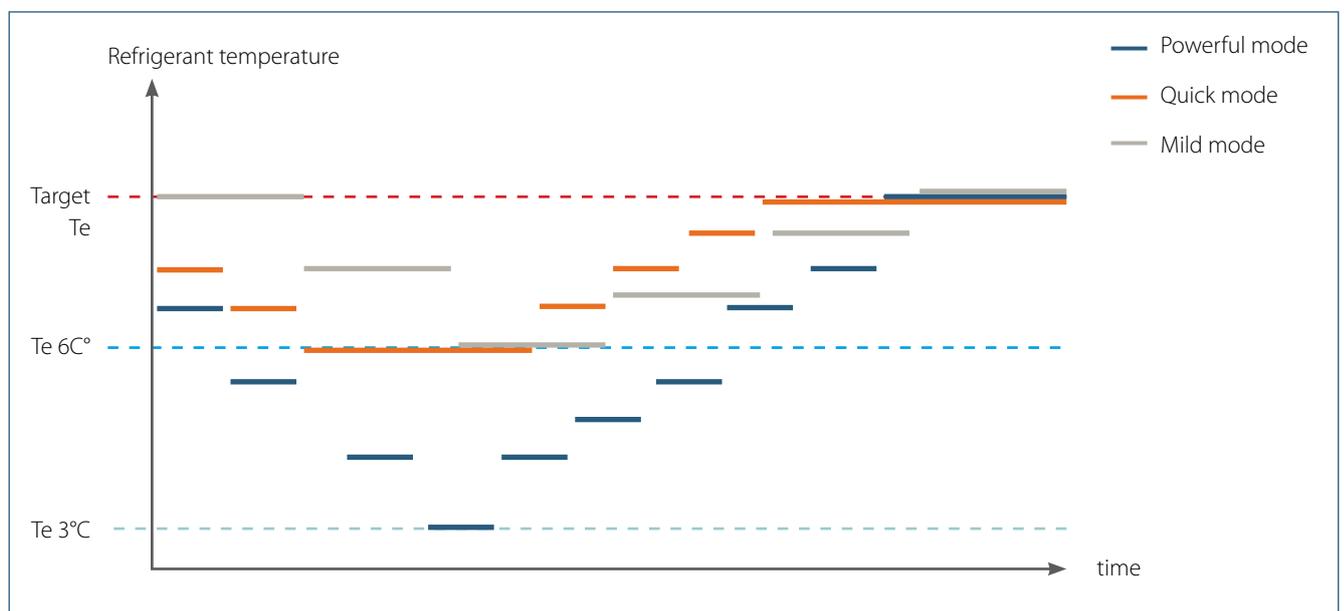
- Can boost capacity above 100% if needed.  
The refrigerant temperature can go lower in cooling (higher in heating) than the set minimum (maximum in heating).
- Gives priority to fast reaction speed  
The refrigerant temperature goes down (or up in heating) fast to keep the room setpoint stable

### Quick

- Gives priority to fast reaction speed  
The refrigerant temperature goes down (or up in heating) fast to keep the room setpoint stable

### Mild

- Gives priority to efficiency  
The refrigerant temperature goes down (or up in heating) gradually giving priority to the efficiency of the system instead of the reaction speed



# The new standard in heating comfort



## VRV IV FOR CONTINUOUS COMFORT, ALSO DURING DEFROST

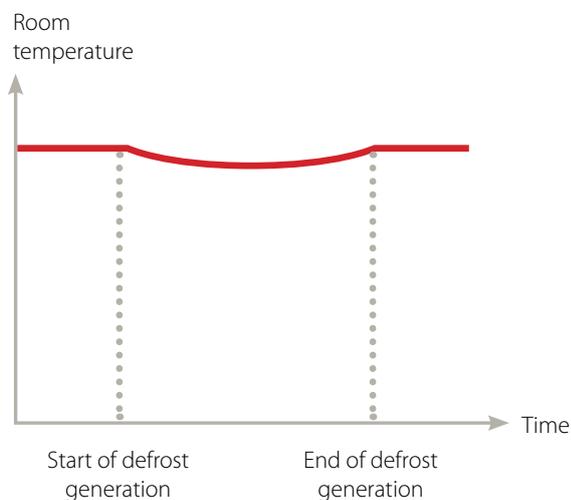
Because the VRV IV continues to provide heating even when in defrost mode, it provides the answer to any perceived disadvantages of specifying a heat pump for monovalent heating.

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.

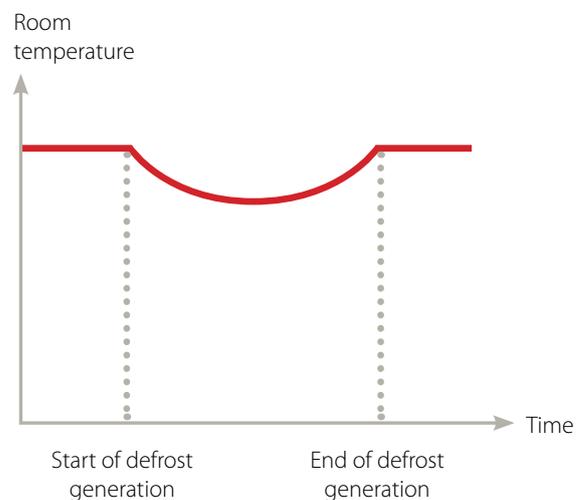
Defrosting can take over 10 minutes (depending on the size of the system) and occurs most frequently between  $-7$  and  $+7^{\circ}\text{C}$  when there is most humidity in the air, which freezes to the coil, and this has a significant impact on the perceived indoor comfort levels.

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.

**new** VRV IV heat pump  
with continuous heating



VRF heat pump benchmark

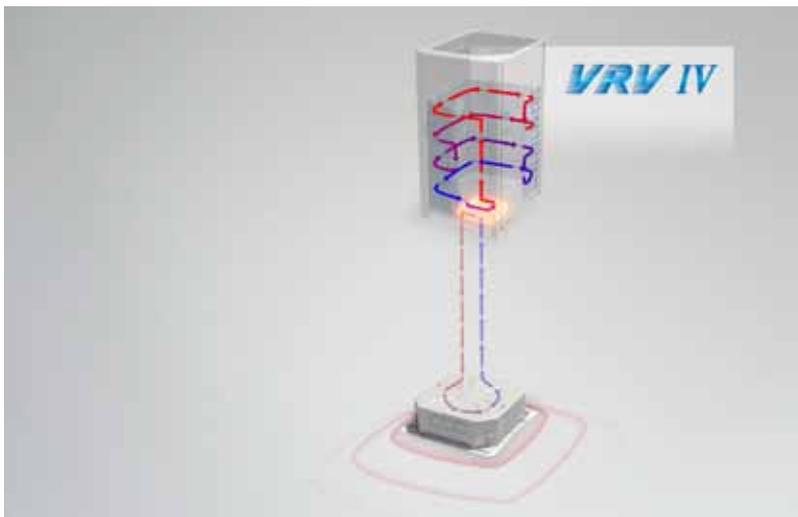




- Unique continuous heating technology
- The best alternative to traditional heating systems

## → HOW DOES IT WORK?

VRV IV features a unique heat-accumulating element, based upon phase change materials, which provides energy to defrost the outdoor unit while continuing to provide indoor heating to maintain a comfortable indoor climate. The energy needed for defrosting is stored in the element during normal heating operations.

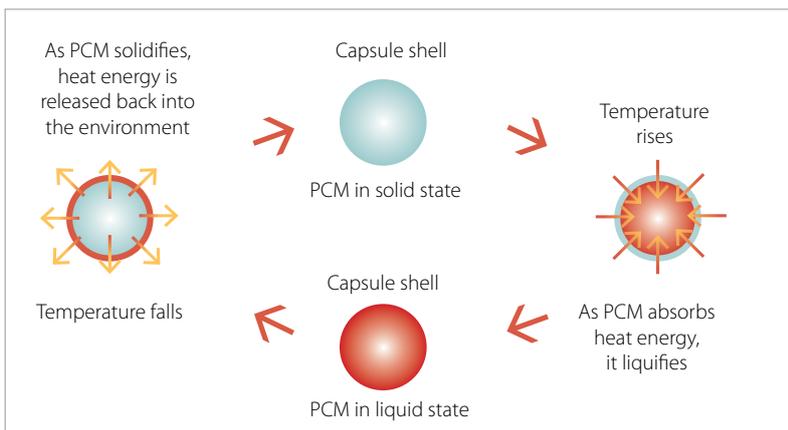


- ← The outdoor unit coil is defrosted ...
- ← ... with the energy stored in the heat accumulating element ...
- ← ... while indoors a comfortable temperature is maintained.



### How phase change material works?

A phase change material (PCM) will store or release energy when it changes phase from solid to liquid or liquid to solid.



# VRV configurator software

Simplified commissioning: graphical interface to configure, commission and upload system settings.

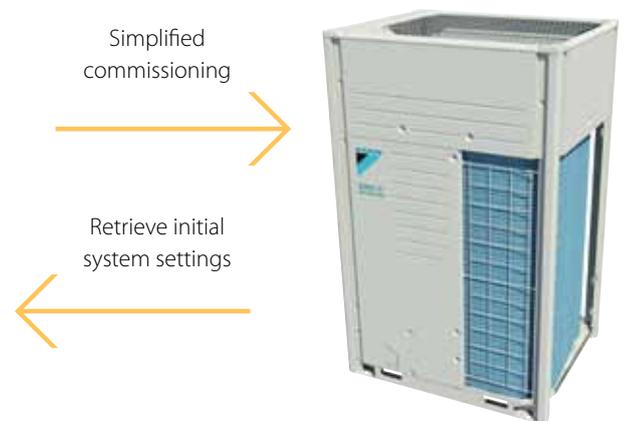
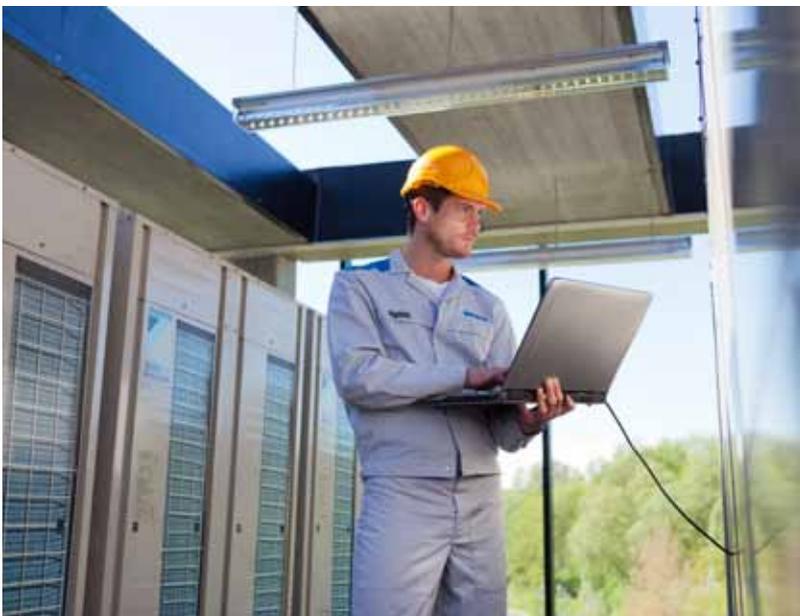
Simplified servicing: additional 7-segment indicator for a quick and easy check of basic functions and error read-out.



## 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 configuring the outdoor unit.
- multiple systems at different sites can be managed in exactly the same way, thus offering simplified commissioning for key accounts.
- Initial settings on the outdoor unit can be easily retrieved.





- Less time needed for commissioning
- Manage multiple systems in exactly the same way
- Retrieve initial system settings



## SIMPLIFIED SERVICING

The 7-segment indicator saves time through:

- easy-to-read error report.
- indication of basic service parameters to quickly check basic functions.
- clear menu indicating quick and easy on-site settings..



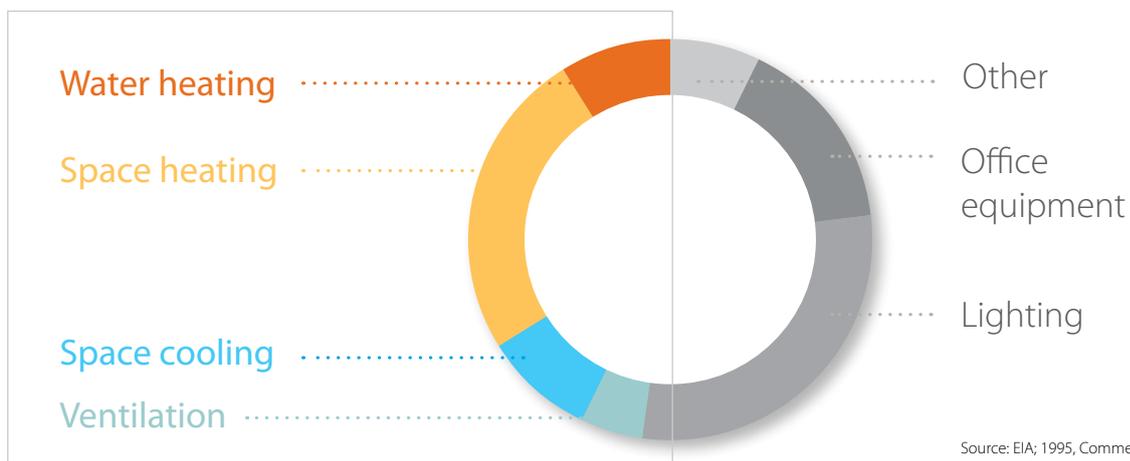
# A new integrated climate control

## → INTRODUCTION

The Daikin VRV total solution provides a single point of contact for the design and maintenance of your integrated climate control system. Our solution can be used to manage up to 50% of a building's energy consumption, giving you a huge potential cost saving. Therefore we have not only worked to make our outdoor units more efficient and easier to install, but also worked to increase the efficiency, comfort and installation friendliness of all other components, focusing on:

- creating optimal building climate conditions at the best efficiencies using the new round flow cassette sensors
- reducing running costs even further with the energy management tools on the new Intelligent Touch Manager
- highly efficiency space heating with the new low temperature hydrobox

## Manage up to 50% of your building's energy consumption



Source: EIA; 1995, Commercial buildings Energy consumption survey

# One system, multiple applications



## Heating & cooling



- Combine VRV indoor units with stylish indoor units in one system.
- New round flow cassette sets the standard for efficiency and comfort.

## Intelligent Touch Manager



- Integration with intelligent control solutions with energy management tools to reduce running costs

## Low temperature hydrobox for highly efficient space heating through



- Underfloor heating
- Low temperature radiators
- Heat pump convector

## Biddle air curtain



- A highly efficient solution for doorway climate separation

## High temperature hydrobox for efficient hot water production for (hot water from 25 to 35°C)



- Showers
- Sinks
- Tapwater for cleaning

## Ventilation



- Combined fresh air treatment and air conditioning

# Next-generation round flow cassette

Setting the standard for efficiency and comfort



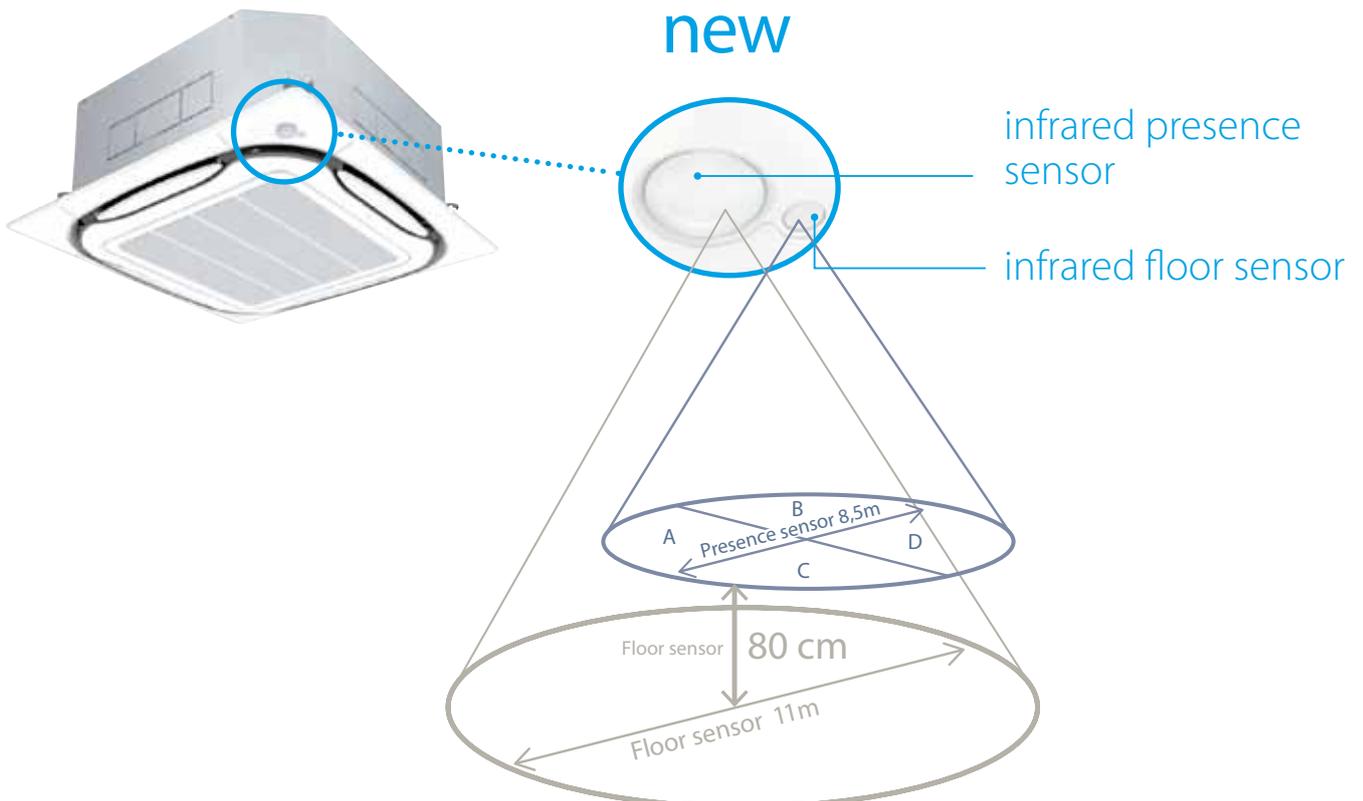
## IMPROVED COMFORT

- The unique 360° air flow discharge pattern ensures a uniform temperature distribution across the room without dead corners.



The comfort can be further enhanced thanks to the optional sensors:

- The presence sensor allows the air flow control to direct air away from any person it detects in the room.
- With the floor sensor having cold feet becomes history. This sensor detects the average floor temperature and ensures an even temperature distribution between ceiling and floor.

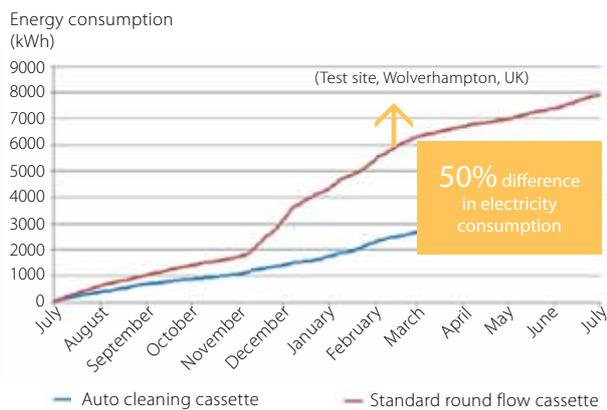




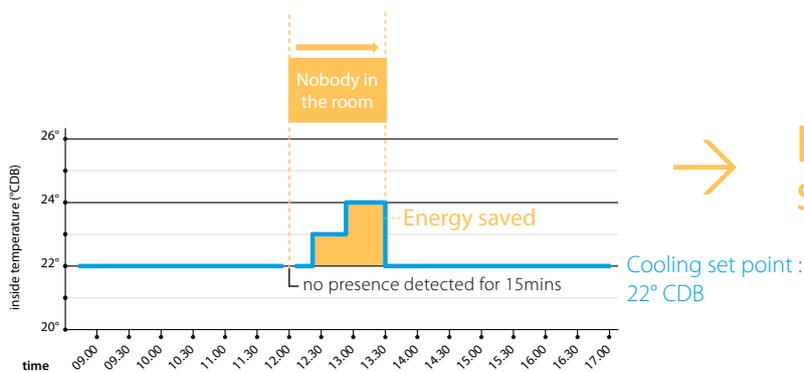
## → EVEN MORE ENERGY EFFICIENT...

Automatic filter cleaning saves up to 50% in electricity costs compared to the industry standard and reduces on-site time for maintenance. The presence sensor saves another 27% by adjusting the set point or switching off the unit when nobody is in the room.

Cumulative energy comparison between standard and auto cleaning round flow cassette over 12 months



→ Auto-cleaning panel saves up to **50%**



→ Presence sensor saves up to **27%**

## → FLEXIBLE INSTALLATION

When rearranging or refurbishing the interior, there is no more need to change the location of the indoor unit thanks to being able to close one or more flaps via the wired remote control.

# Integration with intelligent control solutions



A heat pump system will only work as intelligent as its control system allows. Therefore Daikin launches easy-to-use, intelligent control systems with energy management tools to reduce running costs.

## NEW INTELLIGENT TOUCH MANAGER:



### USER FRIENDLINESS

- Intuitive user interface
- Visual lay out view and direct access to indoor unit main functions
- All functions direct accessible via touch screen or via web interface



### SMART ENERGY MANAGEMENT

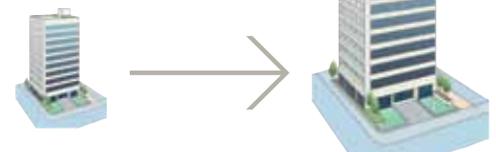
Smart energy management tools enable monitoring if energy use is according to plan and help detect origins of energy waste, thus maximizing efficiency.



### FLEXIBILITY

- in size: modular design for use in small to large applications
- in integration: from simple A/C control to small BMS with integration of control of lighting, pumps, ... via WAGO I/O

Flexibility in size  
64 up to 2560 groups



### EASY SERVICING AND COMMISSIONING

Perform the refrigerant containment check remotely and when it is most convenient for you and so prevent an on-site visit. At the same time, increase your customer satisfaction because there is no disruption to the air conditioning during business hours.

# VRV IV Heat recovery and heat pump portfolio



**VRV III**

**VRV IV**

## HEAT PUMP

(Available October 2012)

Single and multi **5** | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 → **52** | 54



Single **8** | 10 | 12 | 14 | 16 | 18 | 20  
Multi **8** | 10 | 12 | 14 | 16 | 18 | 20 | 22 → **54**

RXYRQ **8** | 10 | 12 | 14 | 16 | 18

RXYRQ functionality is integrated in the standard range

(VRV heat pump for connection to stylish indoor units)

## HEAT RECOVERY

(Available Spring 2013)

Single REYQ **8** | 10 | 12 | 14 | 16  
Multi REYQ **8** | 10 | 12 | 14 | 16 | 18 | 20 → **48**



Single REYQ **8** | 10 | 12 | 14 | 16 | 18  
Multi REYQ **8** | 10 | 12 | 14 | 16 | 18 | 20 | 22 → **54**

PRELIMINARY

REYAQ **10** | 12 | 14 | 16

REYAQ functionality is integrated in the standard range

(VRV heat recovery for connection to heating only hydrobox)

# GREAT NEWS

VRV IV SETS THE STANDARD ... AGAIN



Daikin's unique position as a manufacturer of air conditioning equipment, compressors and refrigerants has led to its close involvement in environmental issues. For several years Daikin has had the intention to become a leader in the provision of products that have limited impact on the environment. This challenge demands the eco design and development of a wide range of products and an energy management system, resulting in energy conservation and a reduction of waste.

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