Carrier

United Technologies
turn to the experts

Carrier AquaFlow™
Variable Water Volume (VWV) System

THE BEST OF BOTH WORLDS

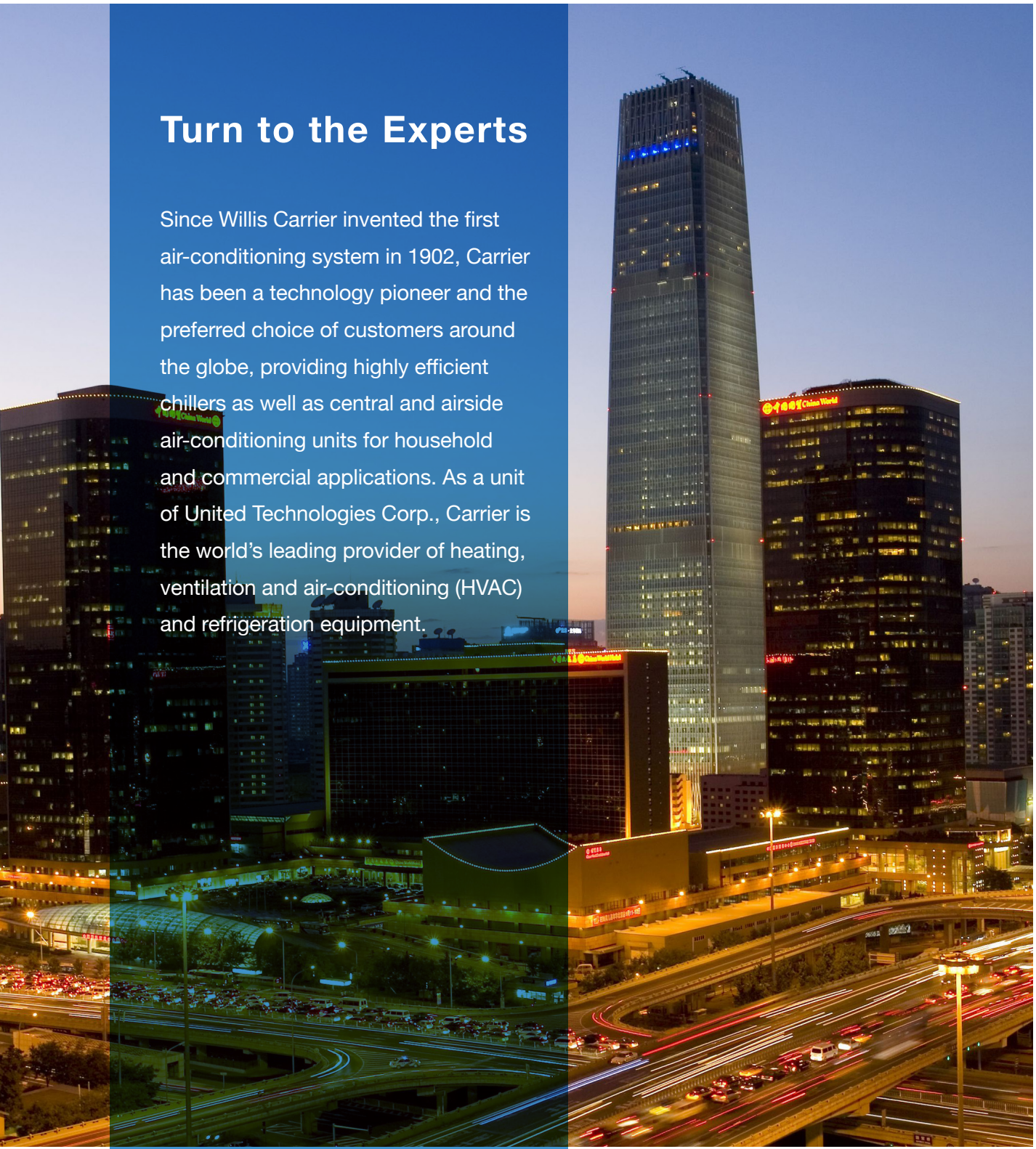
AQUAFLOW™

VWV system

Cooling capacity: 24.5~328kW
Heating capacity: 24.5~372kW

Turn to the Experts

Since Willis Carrier invented the first air-conditioning system in 1902, Carrier has been a technology pioneer and the preferred choice of customers around the globe, providing highly efficient chillers as well as central and airside air-conditioning units for household and commercial applications. As a unit of United Technologies Corp., Carrier is the world's leading provider of heating, ventilation and air-conditioning (HVAC) and refrigeration equipment.



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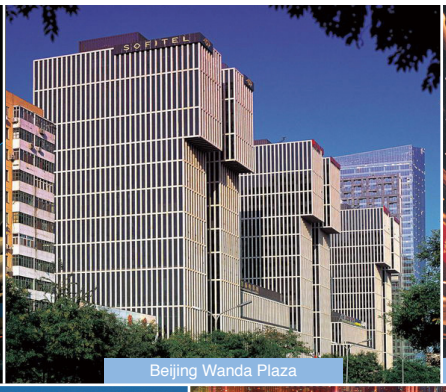
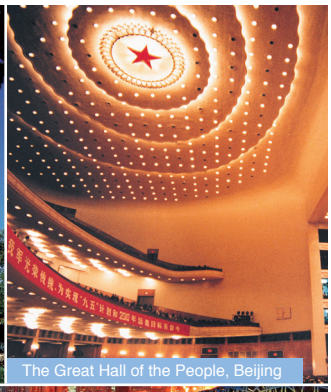
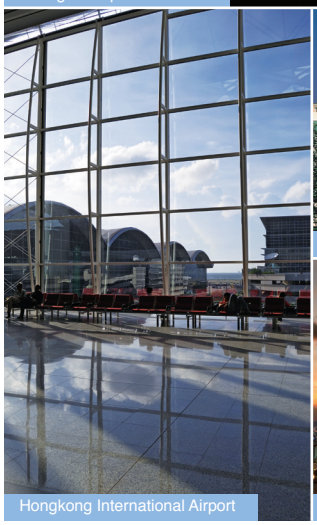
Shanghai Expo Boulevard



Beijing Wanda Plaza


The Great Hall of the People, Beijing


Hongkong International Airport


The Whitehouse, Washington


Beijing "Water Cube" National Swimming Center


Taipei 101


The Kremlin, Moscow


Shanghai Metro

Carrier AquaFlow™
Variable Water Volume (VWV) System

THE BEST OF BOTH WORLDS

Carrier's innovative AquaFlow™ VWV System combines the benefits of conventional hydronic and VRF systems, providing superior indoor comfort and energy efficiency.

The AquaFlow™ VWV System includes modular outdoor air-cooled chiller and heat pump unit with self adaptive technology to control the variable refrigerant evaporating temperature*, low-noise fan coil unit, heat recovery fresh air handling unit, VFD hydronic kit, networked indoor thermostat, and intelligent system manager.
Single system capacity: 24.5~328kW

*Self adaptive variable water temperature / Self adaptive variable refrigerant evaporating temperature

Versatile Applications


Villas


Shopping malls


Office buildings


Hotels

AQUAFLOW™

VWV system

Innovation and Breakthrough

		Carrier AquaFlow™ VWV System	Conventional Hydronic System	Conventional VRF
				
Expanding the benefits of conventional hydronic systems	Flexible Design	Max. indoor unit (IDU) / outdoor unit connectivity: 200%	Case by case design on job basis	Max. indoor unit/outdoor unit connectivity: 130%
		Max. pipe length: 400m Max. ODU / IDU height difference: 100m*	Case by case design on job basis	Max. pipe length: 150m Max. ODU / IDU height difference: 50m
	Indoor Comfort	Temp control +/-0.5°C, humidity detect +/-5%	No humidity control function	Air supplied too cold or too hot; no humidity control function
		Non-stop heating in winter defrosting (multiple outdoor unit system)	No heating during winter defrosting	No heating during winter defrosting
		No risk of indoor refrigerant leakage	No risk of indoor refrigerant leakage	Potential risk of indoor refrigerant leakage
Expanding the benefits of conventional VRF	Easy Installation and Maintenance	Lift transport, pipe connection only	Transported by crane; high installation cost	Lift transport and refrigerant pipe connect only
		System centralized control	No centralized control; no communication between IDU / ODU	System centralized control
		Energy metering and BA connection	Extra hardware & software needed and substantial investment	Extra hardware & software needed and substantial investment
	Cost Savings	40% higher system IPLV vs. conventional hydronic system, 10% higher system IPLV vs. VRF	IPLV is 40% lower than the VWV system	IPLV is 10% lower than the VWV system
		Self adaptive variable water temperature / Self adaptive variable refrigerant evaporating temperature Energy efficiency: grade 1(China GB)	No variable refrigerant flow / variable refrigerant evaporating temperature Energy efficiency: grade 2 or below (China GB)	Variable refrigerant flow Energy efficiency: grade 1(China GB)
		No cooling/heating capacity loss in long pipes, Outdoor unit optimized 10-20%**	No cooling/heating capacity loss in long pipes (subject to appropriate design)	Cooling capacity loss: 10% – 15% in long pipes
		Self adaptive variable water flow	Constant water flow speed	Not applicable
		100% fresh air effect, 25% fresh air operation cost	100% fresh air effect, 100% fresh air operation cost	100% fresh air effect, 100% fresh air operation cost

* Outdoor unit and hydronic kit sited above the indoor unit
** Within the recommended pipe length range

New Carrier AquaFlow™ VWV System

Besides its easy installation, auto-commissioning and integrated intelligent control, the Carrier Variable Flow System brings you unprecedented new control experience.

Project progress		Customer value
 Planning and business	Design	• Packaged selection by components and system • System level design validation • Flexible layout for any kinds of building
	Purchase	• Efficient investment based on optimized system capacity and roof installation • Phase- investment via flexible installation • Simple process via one contact, secured lead-time
 Construction	Installation	Only water pipe and electrical connections are required, eliminating the risk of water leakage, with installation fees close to conventional VRF system
	Commissioning	System automatically addressing, shorter commission cycle
 Service	Operation	• Lower system running cost based on variable flow rate, variable leaving temperature and fresh air heat recovery • Modularized outdoor unit w/ tandem compressor design can be backed up interchangeably.
	Indoor air quality	• Sufficient fresh air according to CO2 sensor • Continuous heating during defrosting (multi-outdoor units system) • Indoor no refrigerant leakage risk
	Management	• Integrated system with dedicated system controller (zone and schedule control) • Build-in individual billing function, only add one power meter for each system
 After-sales service	Daily maintenance	• Rigid quality control by system level • Quick response by one to one correspondence
	System modification	• Flexible for system retrofit in future • No impact with other users

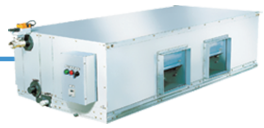
Single system capacity
24.5~328kW

Intelligent system manager

Controls up to 8 outdoor units, 128 indoor units (thermostat), 8 heat recovery fresh air handling units, and 1 hydronic kit

Heat recovery fresh air handling unit

9 models (1000CMH~8000CMH)



Fresh air handling unit

38 models (1000CMH~6000CMH)

Modular outdoor unit (Self adaptive variable refrigerant evaporating temperature*)

4 models
(25kW, 30kW, 35kW, 40kW)

Compact ducted fan coil unit

15 models (1.9~13.5kW)

Quiet ducted fan coil unit

15 models (1.9~13.5kW)

VFD hydronic kit

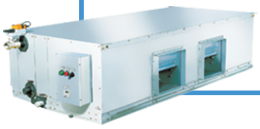
6 models

4-way cassette fan coil unit

8 models (3.2~12.6kW)

Hi-wall fan coil unit

4 models (1.98~5.1kW)



High ESP IDU

38 models (5~44kW)

*Self adaptive variable water temperature / Self adaptive variable refrigerant evaporating temperature


Six reasons to choose VWV
Design flexibility
Energy efficiency
Indoor comfort
Easy retrofitting
Powerful controls
Exceptional reliability

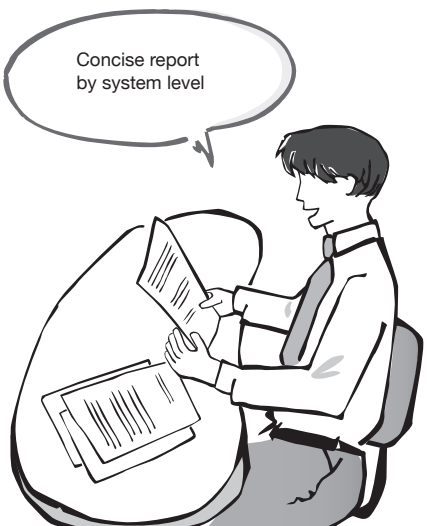
1. Design flexibility, free of concern

Offering one station system, less design workload

» Validated system selection report for business matters
» Components level report to review all facilities
» Packaged hydronic kits offering: test proven performance, smaller foot print, shorter install cycle and less labor burden

Professional and completed system level report

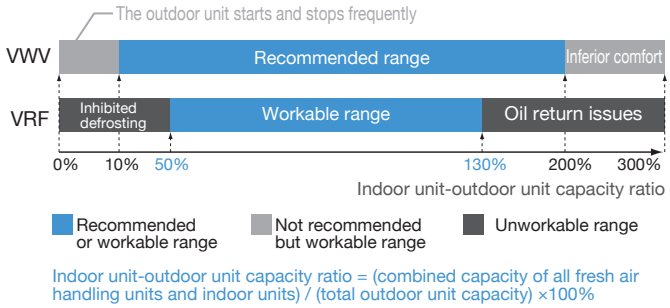
Other product report



VWV system report

Mutiple configuration options are offered with a wide range of IDUs and ODUs

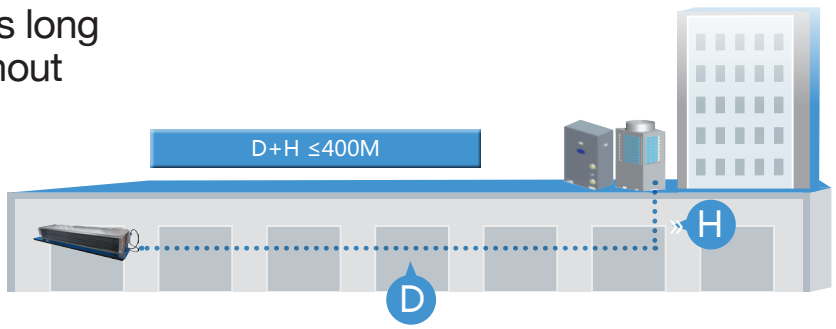
Wider workable load range for outdoor units (10% – 200%), lower initial cost and easier system upgrades.



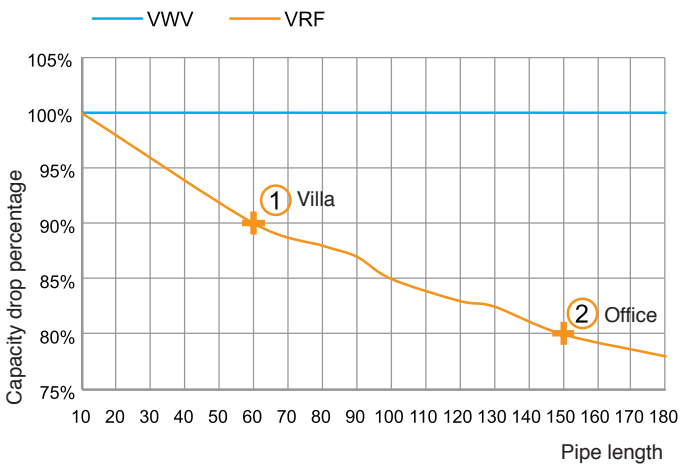
Indoor unit-outdoor unit capacity ratio = (combined capacity of all fresh air handling units and indoor units) / (total outdoor unit capacity) ×100%

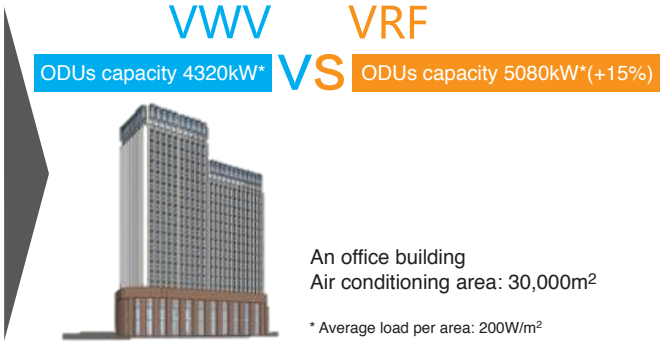
The extra-long pipe allows long distance applications without attenuation

The farthest piping length is 400 meters (from outdoor unit to the farthest indoor unit), which is suitable for shopping mall and other large space application.



Capacity drop benchmark





An office building
Air conditioning area: 30,000m²

* Average load per area: 200W/m²

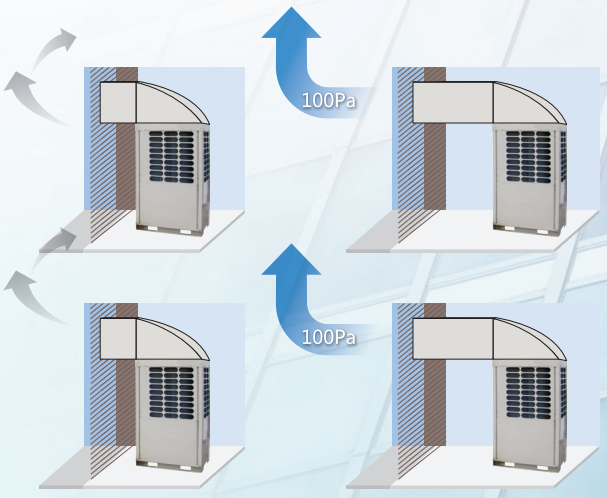
Flexible installation of outdoor unit, design freedom

Outdoor unit centralized installed on roof
With a greater maximum elevation difference between the indoor and outdoor units, the system allows design flexibility to help solve problems associated with limited space for outdoor unit installation.

Lower outdoor units | Upper outdoor units

Connecting pipe length of less than 400 m recommended.
(From the outdoor unit to the farthest indoor unit)

High external static pressure option for outdoor unit for install by floor or on refuge storey
Ultra-high external static pressure
It is possible to increase the external static pressure of the outdoor unit from 0 to 100 Pa
without disrupting heat transfer in either hierarchical or centralized configurations.

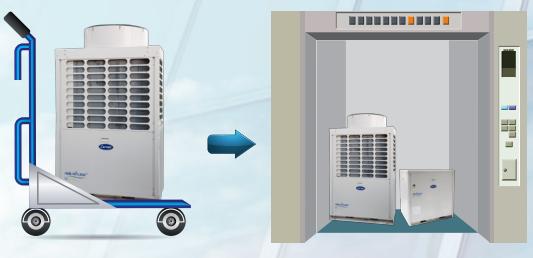


Low ESP, Air short circuit and interference

VWV high ESP, No interference for installation by floor

Compacted design, flexible layout

Compacted size suited for elevator transportation
leads to flexible location and shorter installation cycle



Elevator transportation

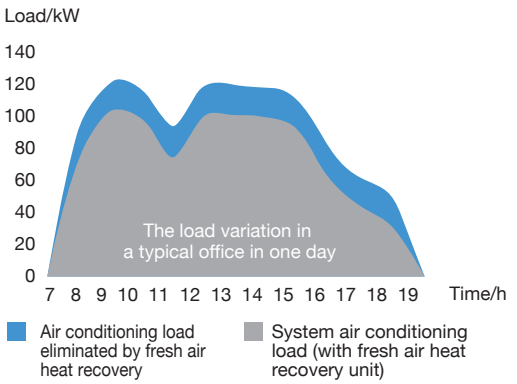
2. System efficiency

Tandem compressor, high efficiency at part loading

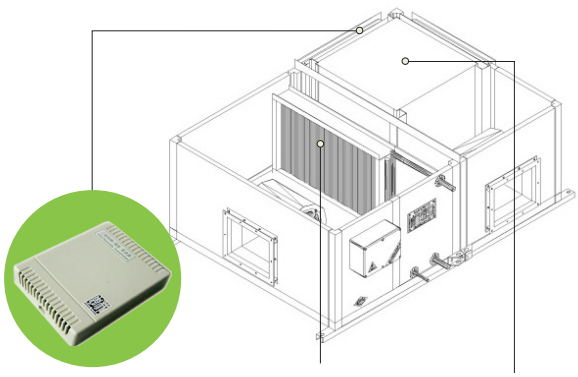
Dual compressor shared single-circuit leads to high IPLV (up to 5.2), gaining double heat exchange surface once only one compressor runs. On the contrast, the IPLV of modular chiller is low (over 3.7) derived from dual compressor w/ individual circuit.

Efficient fresh air unit

Fresh air heat recovery
Reduce system load

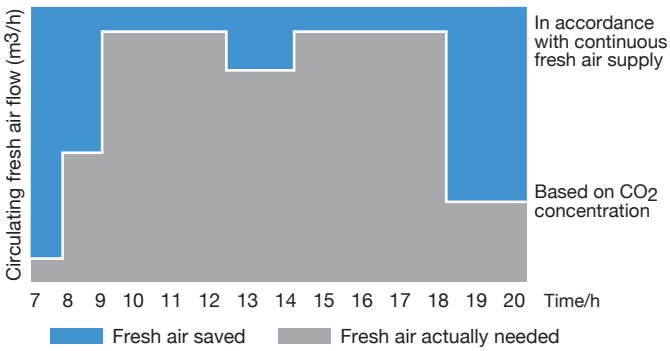


Carrier's new heat recovery fresh air handling unit (BFP) reduce ODU load 10%-15% (free cooling/heating for more than 50% of fresh air), saving initial investment.



Fresh air supplied on demand

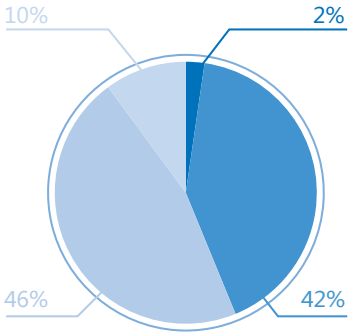
CO_2 demand control



With an integrated CO_2 concentration detection device, the heat recovery fresh air handling unit (BFP) continuously monitors indoor CO_2 levels and intelligently starts or stops units on demand so as to reduce the energy needed for fresh air processing by the outdoor unit and fresh air discharge fan. When a building has large variations in personnel density, a great deal of cooling or heating capacity will be wasted if fresh air is supplied everywhere and at all times at a preset level suitable to meet the peak demand of the highest-density area.

* CO_2 can be used as an indicator of indoor air quality.
* The calculation references GB 50189-2005 〈China's national design standards for energy efficiency of public buildings〉, table B.0.6-2 (hour-by-hour personnel presence ratios).

Efficient system- water temperature self-adjust



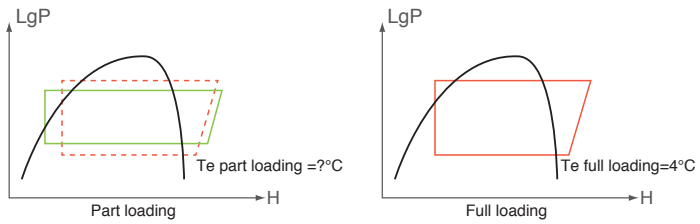
- 100% loading
- 50~75% loading
- 25~50% loading
- 0~25% loading

The load of outdoor unit in 90% operation time is over 50~75%

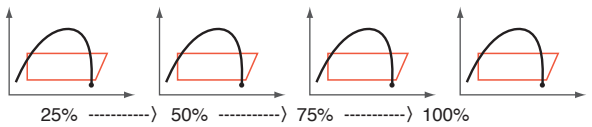
Data source: GBT 18430.2-2008 (water chiller (heat pump) packages using the vapor compression cycle-part 2: water chiller (heat pump) packages for household and similar application)

Comparing part-load compressor operations

VWV = Self adaptive variable leaving water temperature /Self adaptive variable refrigerant evaporation temperature

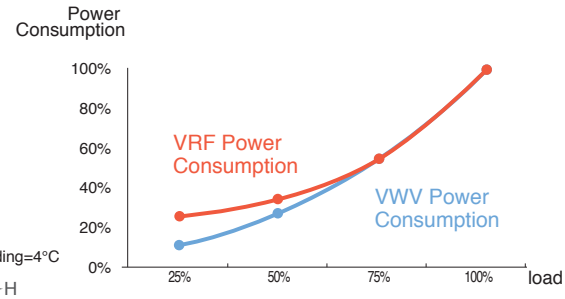


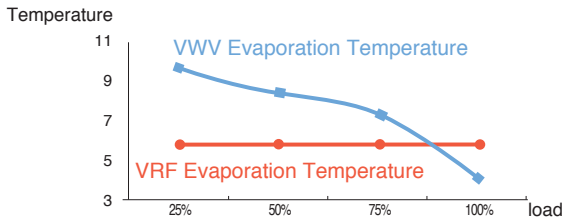
In a VRF system, the refrigerant evaporating temperature is set at 6°C



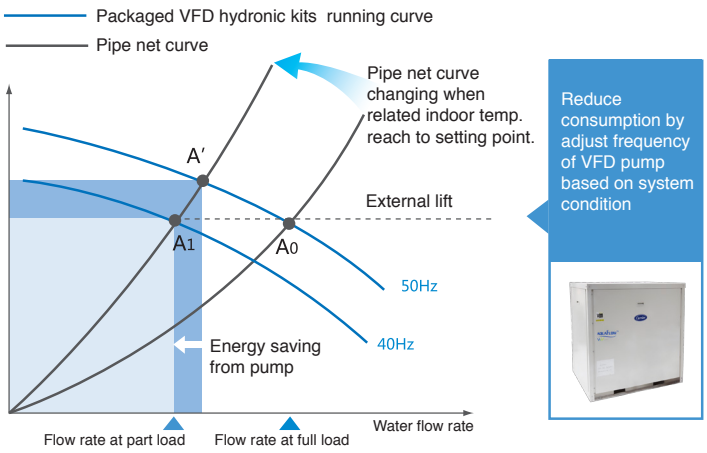
Under part load conditions, the VWV's unique technologies reduce power consumption and increase operating efficiency by varying the leaving water temperature and refrigerant evaporation temperature.

Power consumption drops rapidly under part-load conditions





Efficient system- variable water flow



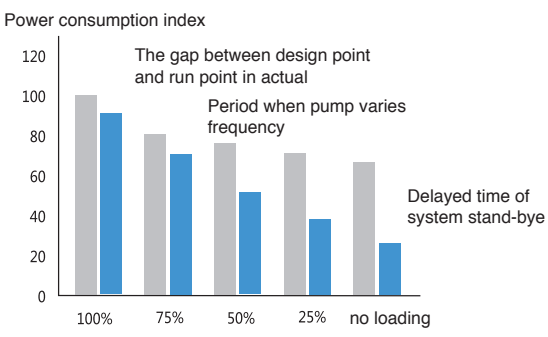
Reduce consumption by adjust frequency of VFD pump based on system condition

A_0 : Pump working point at full load

A' : Pump working point w/ constant frequency when partial outdoor and indoor units isolated at part-load

A_1 : Pump working point w/ smaller frequency when partial outdoor and indoor units isolated at part-load

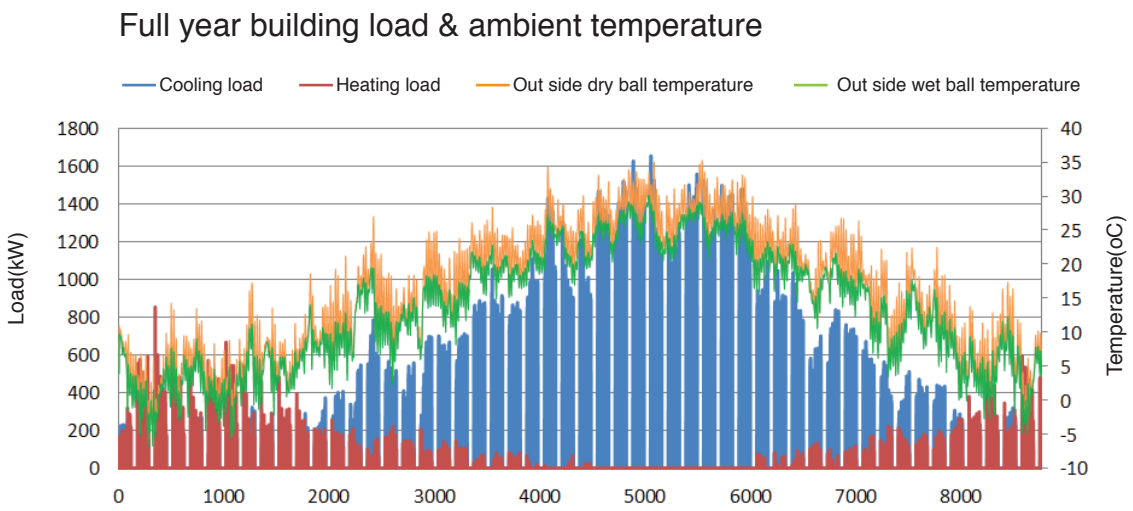
Variable flow rate control, leads to -67% energy saving of water pump



Fixed pump Variable pump

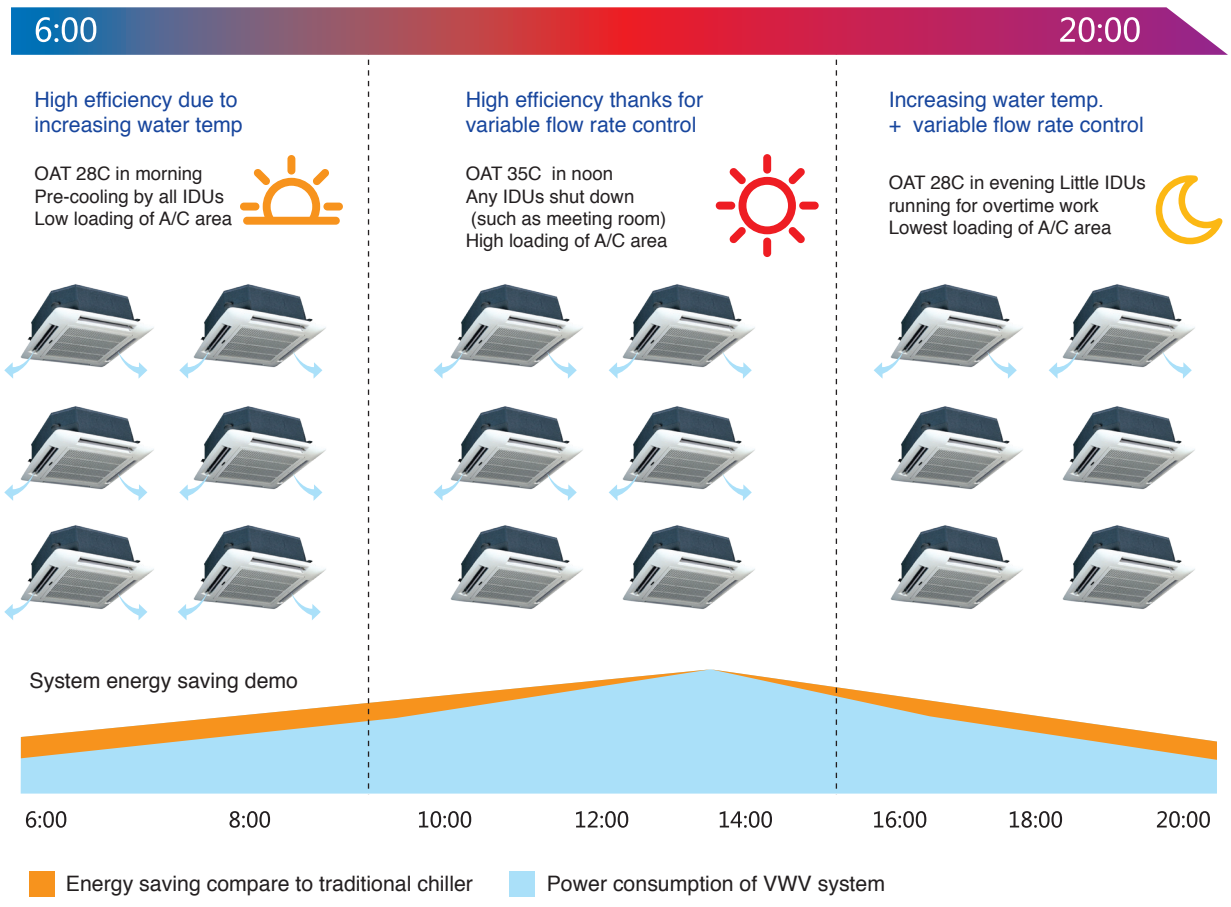
Case study

An office building in Shanghai, construction area 14000 m2, indoor peak loading 1150kW, fresh air loading 550kW.
System configuration: outdoor unit 30RQM040*4sets, Packaged hydronic kits HK320*5 sets, cassette type indoor unit 42GWC006*100sets, fresh air unit DBFPZ4I*10 sets



Both of energy saving technique

Compare to traditional air cooled chiller, VWV system can save over 40% system consumption (249,274 Kw*h), including 27% saving upon water temperature self-adjust and available water flow



Note: data source from carrier internal case study

3. Indoor comfort

Smart defrosting, secure heating effect

1) Single unit defrosting control

» The outdoor unit incorporates intelligent defrosting control, based on the patented frost factor method.

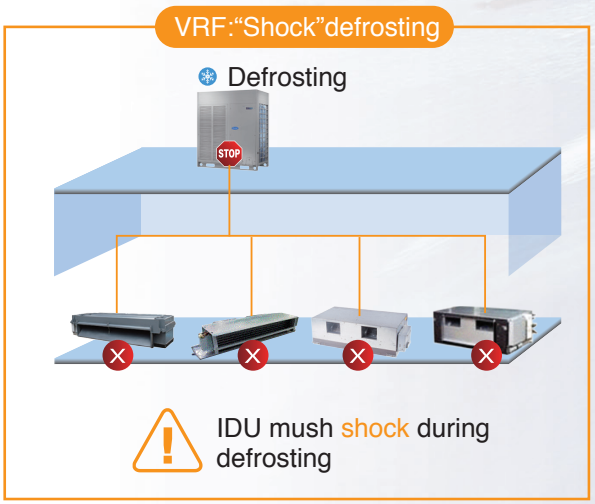
» The system dynamically analyzes frost buildup on the heat pump coil by measuring the difference between entering air temperature and air suction saturation temperature. When this “frost factor” reaches a predetermined value, automatic defrosting is triggered to avoid any loss of heat or water temperature fluctuation.

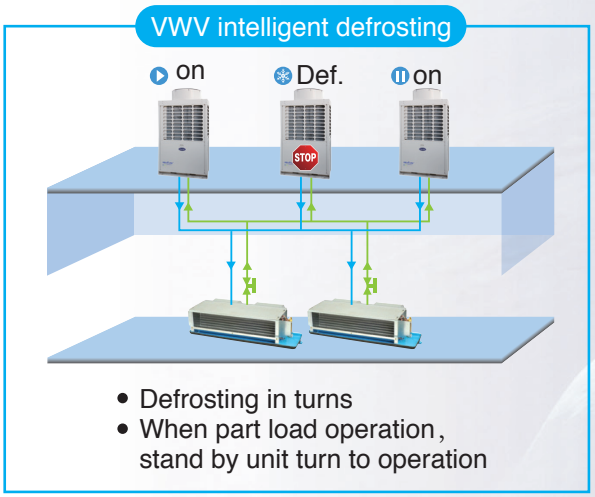
» Prior to shut-down, the unit will automatically determine the “frost factor” and decide whether residual frost needs to be cleaned from the coil to facilitate the next startup.

2) System defrosting control

» The Carrier system’s centralized management system collects information about which units are defrosting and awakens other outdoor units in standby mode as necessary to ensure that indoor heating can be maintained without interruption.

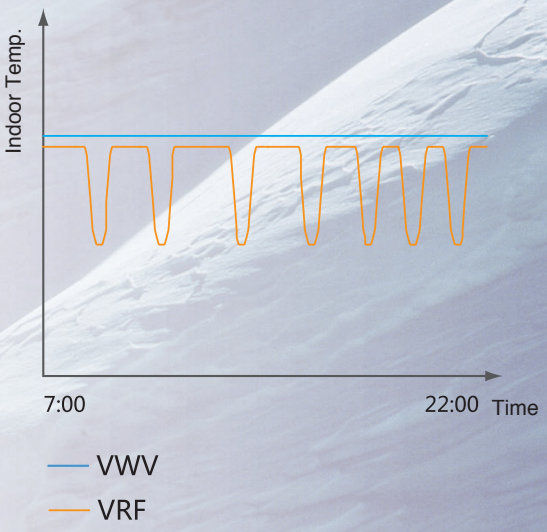
» Note: This function applies to systems with two or more ODUs.





VWV system

✓IDU keeping ON when defrosting
✓When part load operation, the heating output keeps stable



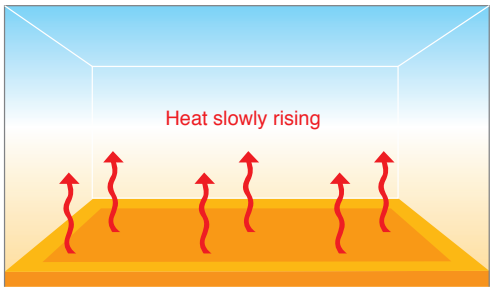
2 in 1 control -air conditioning + floor heating

Conventional air conditioning

Blow directly to head, unequable temperature
Unhealthy if head is hotter than foot

Floor heating

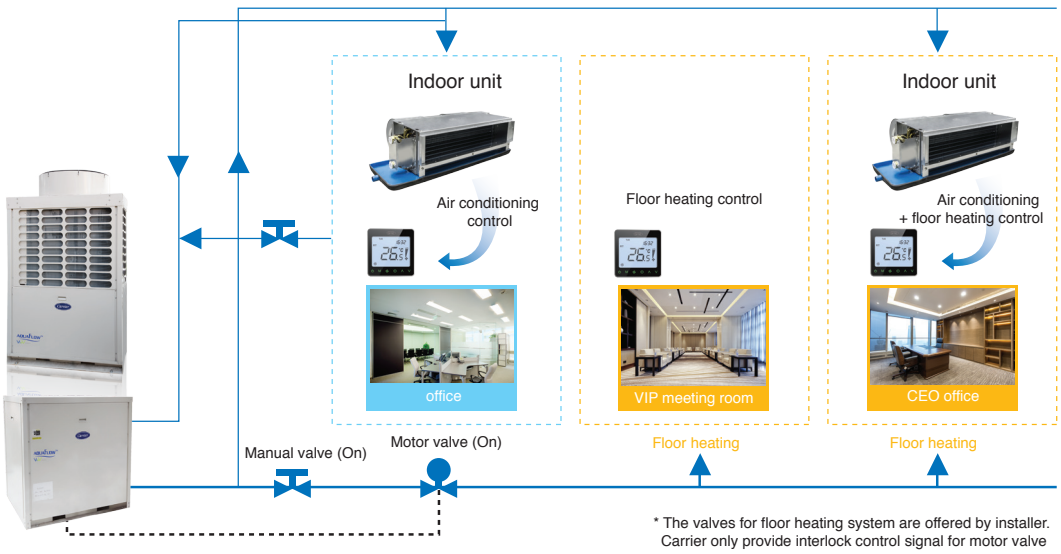
Floor radiation, heating equably
More comfort if warming from foot



▲ Big space (hall of hotel) Secured heating effect at low spot

▲ High tier room (CEO office) Comfort and healthy

Outdoor unit: air conditioning + floor heating
Thermostat: 2 in 1 control, install and operate easily



* The valves for floor heating system are offered by installer.
Carrier only provide interlock control signal for motor valve

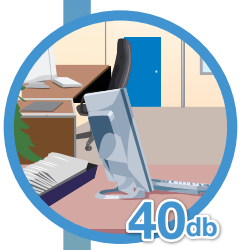
Low Indoor Noise

Whispered conversation; leaves rustling

Hi-wall fan coil unit (42CM)

For separate small offices; flexible layout and low noise

Allowable noise for general office



A quiet office

4-way cassette fan coil unit (42GWC)

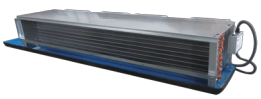
For large open-plan offices or meeting rooms; wide coverage, low noise, stylish design, and independent control

45db

Allowable noise for general/premium offices

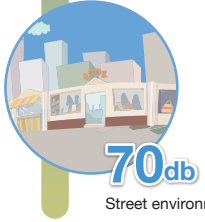
Allowable noise for a first-class office

Normal conversation

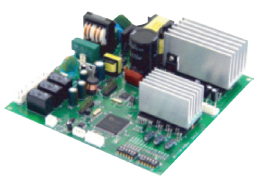


Concealed fan coil unit (42CN/42CE)

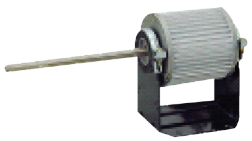
For shopping malls; convenient and economical central air supply and centralized control



Street environment



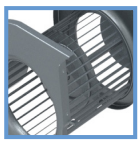
DC brushless motors are optional for 42CN and 42GWC units, further reducing the system's already minimal operating noise (by as much as 26% for the 42CN006).



Less Noise

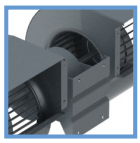
DC brushless motor and drive

18



Low noise fan

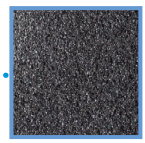
Bigger impeller and low entering speed fan structure equipped with NSK bearing leads to reduce the mechanical noise



DC brushless motor

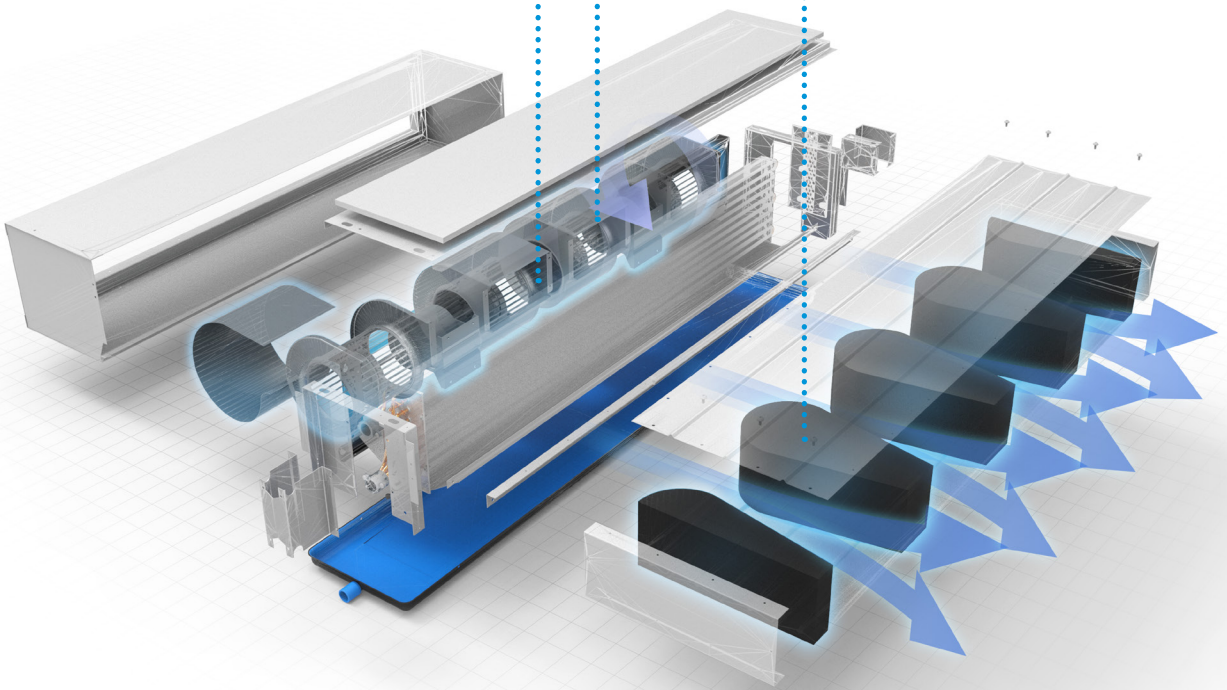
DC brushless motor can avoid low frequency noise and furtherly reduce running noise. Considering indoor unit ope-rating at mid or low speed mostly, the effect of running noise is better than AC motor

The running noise of indoor unit can be decreased down to 22 dB(A) because of low noise fan and DC brushless motor



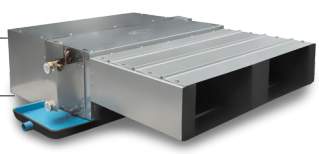
Carrier patent design Silencer

the noise generated by the dynamic pressure of the outlet of the wind turbine is absorbed by built-in wing type foam spacer, which involved with the advanced computational fluid dynamics to simulate the optimization, and the performance of the unit is not affected. At the same time, greatly reduce the unit noise at high speed (over -3 dB(A))



The air flow rate and static pressure of the unit is not affected by silencer, the performance of some models is also slightly improved, the following is measured contrast by unit

Ducted indoor unit	Silencer	ESP (Pa)	Test flow rate (CMH)	Test noise(dBA)	Noise drop
Unit 1 (2 fans)	No	30	1005.0	45.6	3.4 dBA
	Yes	30	1011.6	42.2	
Unit 2 (4 fans)	No	30	1333.1	46.0	3.5 dBA
	Yes	30	1351.4	42.5	
Unit 3 (4 fans)	No	12	1973.0	46.7	3.0 dBA
	Yes	12	1954.0	43.7	



Maintaining Pleasant Indoor Temperture and Humidity

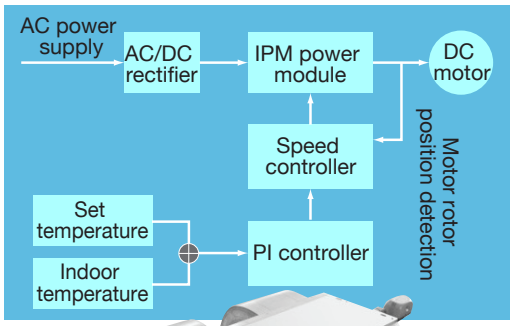
Powerful air conditioning doesn't mean better comfort, too cold in summer or too hot in winter leads to catch cold or serious water loss of the human body. Carrier VWV can offer better indoor comfort based on strong temperature and humidity control technology.

Precise humidity sensing(+/-5%)

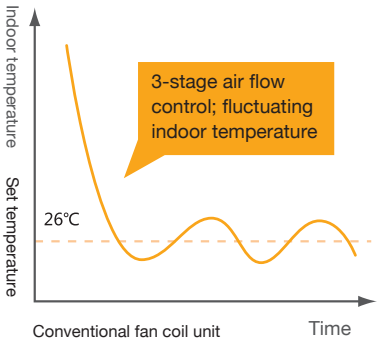
Build-in temperature and humidity sensor for return air side

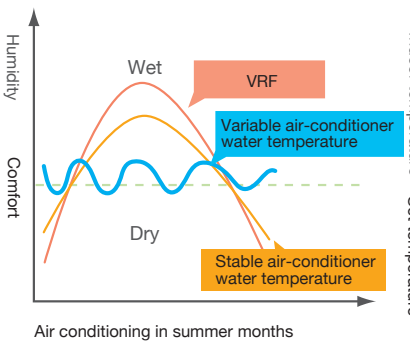
Optional wet film humidifier in winter

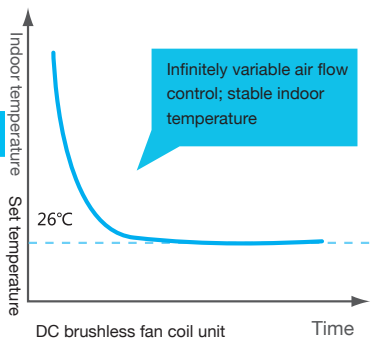
Precise temperature control(+/-5%)



Strong ability for indoor temperature and humidity control







Guaranteeing Indoor Air Quality

The heat recovery fresh air handling unit (BFP) intelligently monitors indoor CO_2 concentration and supplies fresh air on demand, giving due consideration to both energy efficiency and comfort while also controlling the fan units to avoid negative indoor air pressure.

National CO_2 density standard	VWV CO_2 Status
⩽0.1%(2000mg/m^3)*	700±50PPM(1260±90mg/m^3)

*From GB/T 18883-2002 Indoor Air Quality Standard

Fresh air purifier (anti PM 2.5)

Optional fresh air purifier, including supply fan, primary filter and no charged medium filter

Nanoscale mechanical filter, uncharged. Anti particle smaller than PM 2.5 especially: sandwich structure and ripple type design of filter contribute to filtering area.

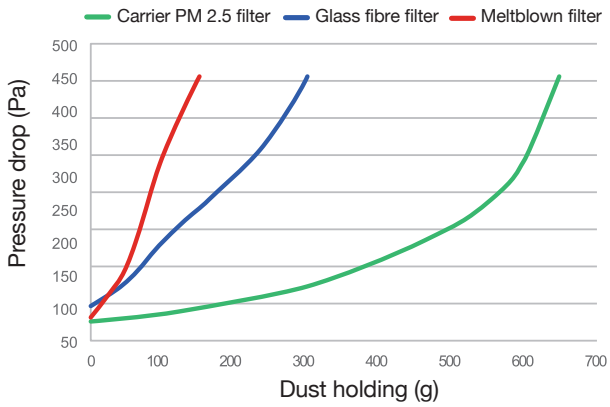
Filter efficiency high to **98.5%*** stably (anti PM 2.5)

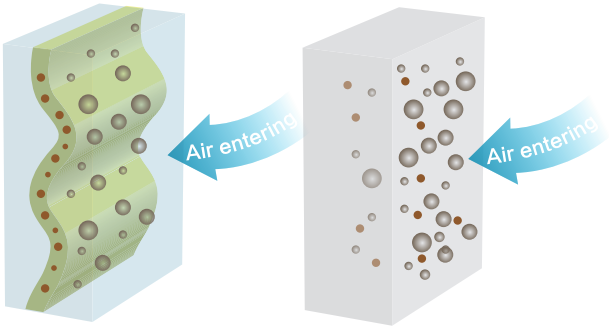
Wave type design

Longer life time due to **2–5 time** of dust hol–ding compare to triditional filter

*效率指对0.1~2.5um的所有颗粒物

Benchmark of pressure drop and dust holding



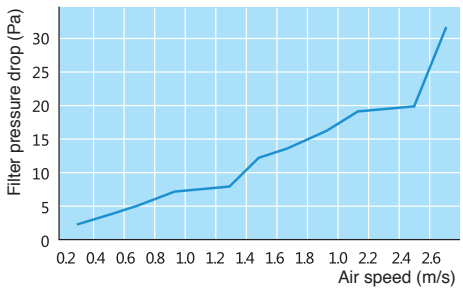


Indoor air purifier (anti- PM 2.5)

Optional HAF electrostatically charged media filter for ducted indoor unit (42CE/CN)

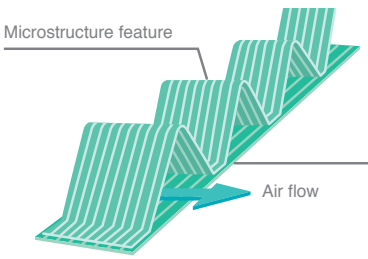
Efficient removal of PM2.5 particles

The unique electrostatic technology and microstruc-ture technology, and to ensure stable effect of electrostatic filter, the filter can increase the effective area, more efficient capture and bearing micro particles. Test loop filter efficiency of PM2.5 is up to 98%.)



Low air flow pressure drop

The filter adopts the open channel structure, which ensures the high efficiency and low resistance, especially suitable for small ducted indoor unit w/ low static pressure



Resistance to mildew and moisture

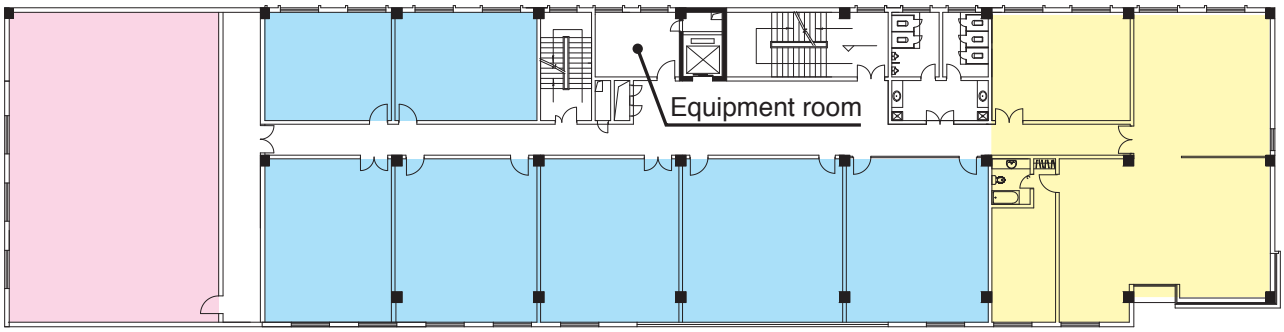
The filter made of pure synthetic fiber material, which is non-toxic, non-detach-ment, resistance to mildew and moisture, can not lead to secondary pollution indoor.

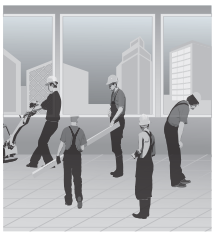
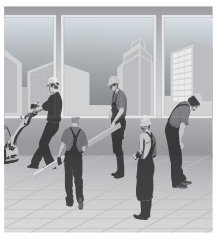
* Please select suitable model according to air speed and related pressure drop

4. System expand and retrofit easily

Multi-stage Installation to Spread Out Capital Investment

All indoor units can be installed first, followed by the outdoor units in batches, or the process can be reversed, with outdoor units deployed first and indoor units following in batches.
As shown in below case: developer can install outdoor unit for property management office firstly, then add related outdoor unit for trading company and customer service center step by step depending on leasing status.

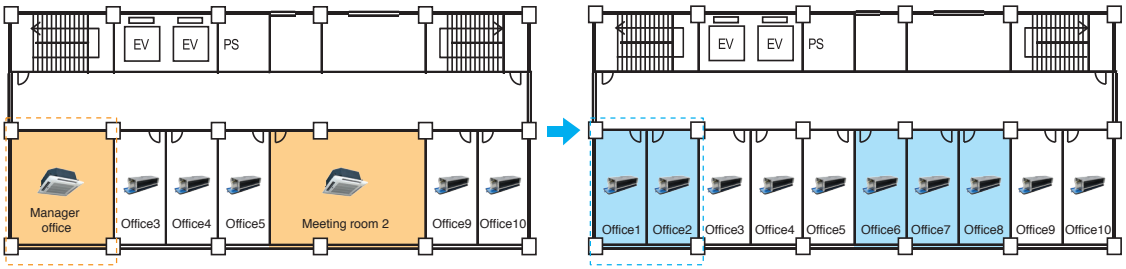


Zone	Status
1st stage Property management office	 Interior design with air duct layout  Typical office conditions
2nd stage Trading company	 Rental or sales period  Interior design with air duct layout  Typical office conditions
3rd stage Customer service center	 Typical office conditions  Interior design with air duct layout  Typical office conditions

More flexibility for changing pipe and products in future

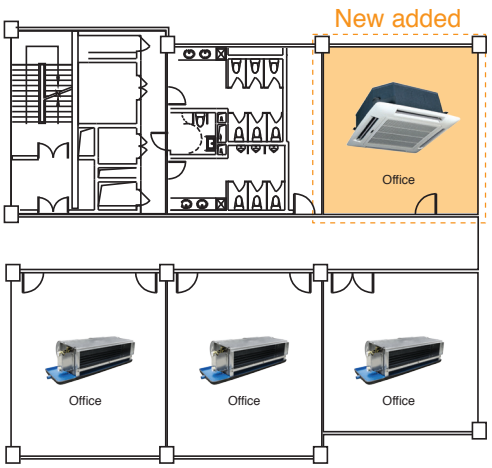
For rental office building, we often face tenants changing, which will impact on re-decoration indoor, transforming of structure layout and system expansion

▼ Space rearrangement



▼ Newly decorated

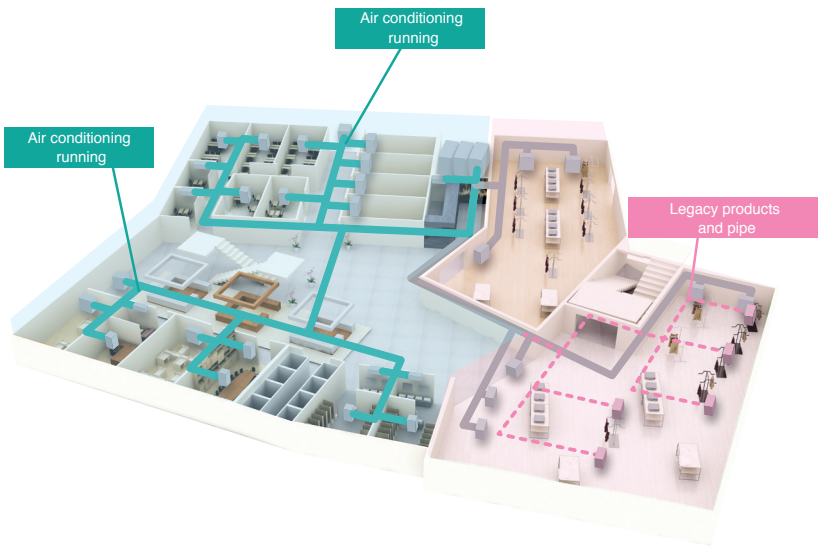
▼ Air conditioning area change



Easy operation
Shut off 2-way valve only

Less cost
Cheaper water piping and no refrigerant waste

No impacts to other users
System continue operation



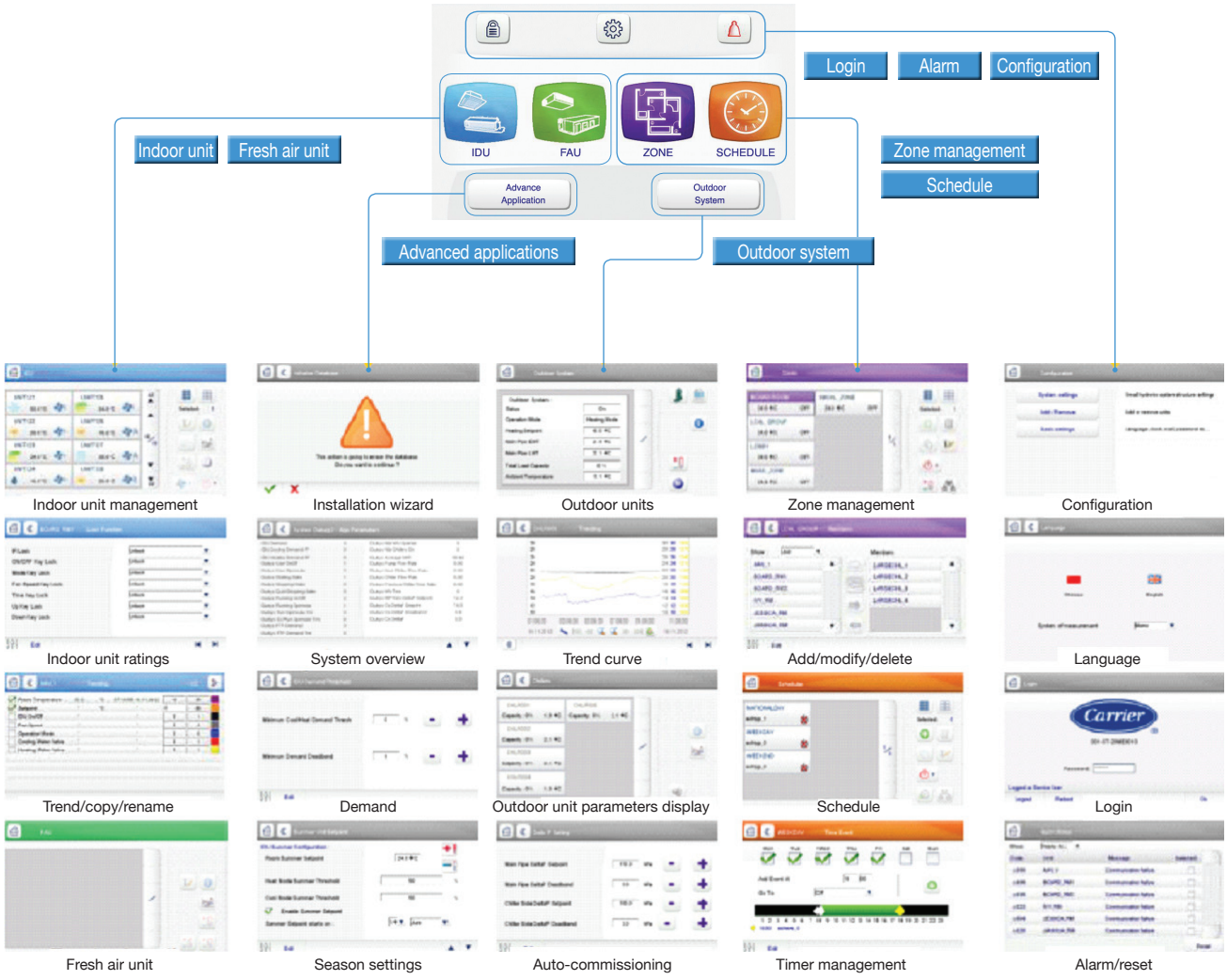
5. Efficient and easy management

New Networked Thermostat

- » Easy operation with backlit LCD display and touch buttons
- » Multi-modes: cooling , heating, ventilation, dehumidifying, E-heating, floor heating
- » Option fan speed: high/mid/low/auto
- » Indoor temperature display and setting
- » Multiple colors available to complement interior design
- » Optional remote control for easy operation of multiple indoor units
- » support to allocate address of products manually or automatically
- » System keep running if one thermostat power off or damaged

Intelligent System Manager

- » 5” color LCD touch screen (optional 7” available)
- » Graphical touch-screen interface
- » Chinese and English languages
- » Zone control (up to 128 zones)
- » display and storage running data based on SD card
- » support to web access
- » Schedule control (week/month/year)
- » Energy metering
- » Remote control and indoor unit locking functions
- » remote diagnosis and reset for products
- » several levels accouter for logo in

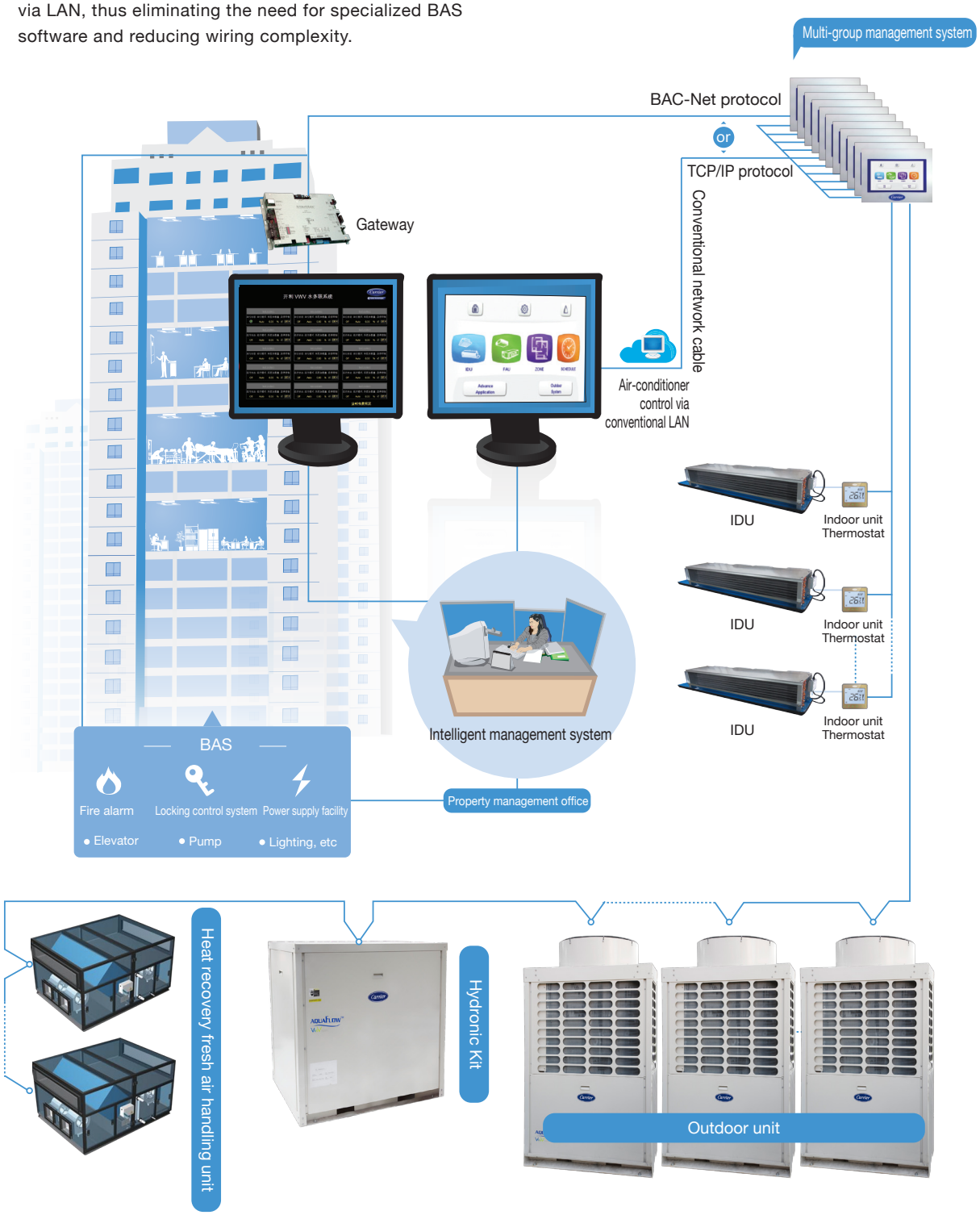


Network Connection

The centralized management system supports TCP/IP and is connected to the building services control room via a conventional local area network (LAN), allowing the entire Variable Flow Air-conditioning System to be monitored and managed via a web browser. Multiple systems can form a simple group-controlled system via LAN, thus eliminating the need for specialized BAS software and reducing wiring complexity.

The management system can also be connected to the building automation system (BAS) via the build-in BAC-Net protocol.

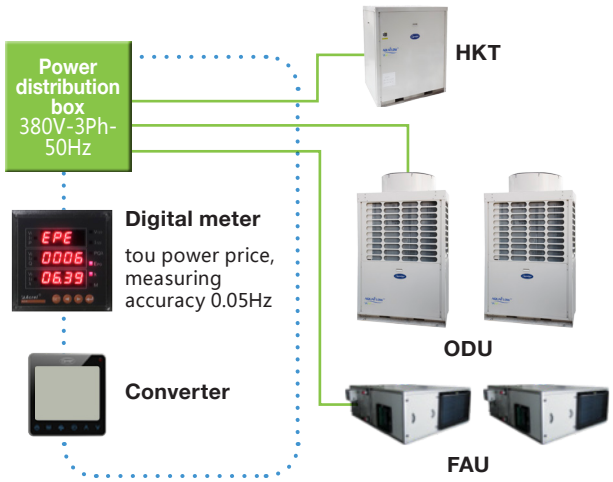
Carrier also can provide PC level : VWV intelligent management for over 30 systems



Precise energy metering

Shared power consumption accurate collection (Per 2s)

Shared power = HKT power + ODU power + FAU power



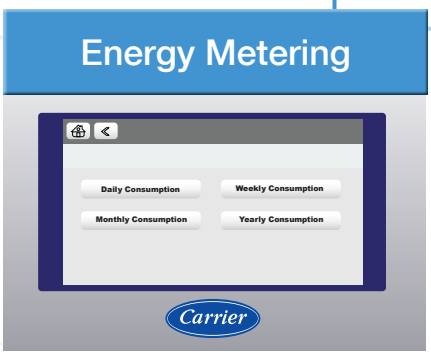
IDU capacity consumption accurate calculation (Per 10s)

Tenant Cap. Consumption Rate = Tenant IDU Cap. Consumption / All IDU Cap. Consumption

Precision Temp Sensor
Accuracy ± 0.1 ℃

2 Accurately calculates each tenant's actual consumption of cooling and heating from power consumption data and air-conditioning unit parameters

1



3

4

Tenant power consumption transform to Tenant bill

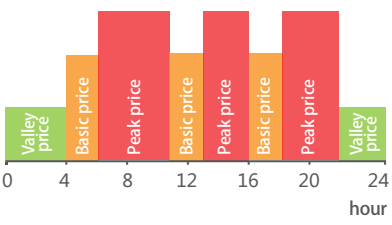
Tenant Bill = Discount x (Peak price bill + Basic price bill + Valley price bill)

AAA billing history | Electricity bills

Period	Peak	Low	Total
2013-6	120	30	150
2013-5	120	30	150
2013-4	120	30	150
2013-3	120	30	150
2013-2	120	30	150
2013-1	120	30	150
2012-12	120	30	150
2012-11	120	30	150

2012 total: 2500RMB,
2013 until now: 1400RMB

Power consumption indicators of a typical summer air-conditioning system



Tenant cap. consumption transform to tenant power consumption (Per 10s)

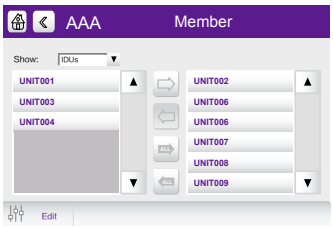
Tenant power consumption /10s = Tenant power consumption x Tenant Cap. consumption rate

Tenant power consumption /30m = Σ 10-second tenant power consumption

Time	A Tenant	B Tenant	C Tenant	....
...	0.27	0.9	1.11	0
14:00~14:30(2013/8/9)	0.46	0	1.58	0
14:30~15:00(2013/8/9)	0.39	0	1.77	0
15:00~15:30(2013/8/9)	0	0	1.09	0.44
15:30~16:00(2013/8/9)	0.41	0.29	0	0.27
...	0	0.44	0	0.53

User-friendly Operation

» 1. Multiple units per tenant
User groups are defined according to indoor units (IDUs)

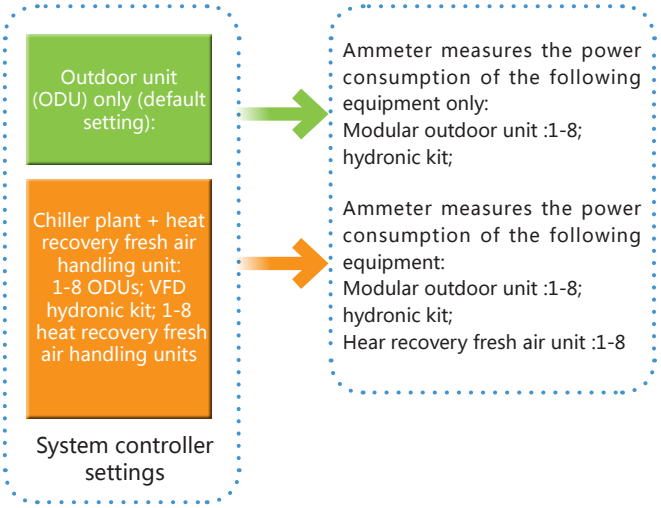


» 3. Electricity bills are issued automatically each month as plain text CSV files that can be viewed and edited in Microsoft Excel®

Bill for August 2013 (from 1st to 31st)					
Billing description	Peak-time power consumption (kWh)	Peak-time electricity cost (RMB)	Valley time power consumption (kWh)	Valley time electricity cost (RMB)	Total electricity cost (RMB)
Total power consumption	193	231.6	123	36.9	268.5
Shanghai A Industrial Company	54	64.8	8	2.4	67.2
--Unit001	15	18	3	0.9	18.9
--Unit002	7	8.4	2	0.6	9
--Unit003	11	13.2	2	0.6	13.8
--Unit004	5	6	1	0.3	6.3
--Unit005	16	19.2	0	0	19.2

Notes: Please to adopt VWV intelligent management if daily report required.

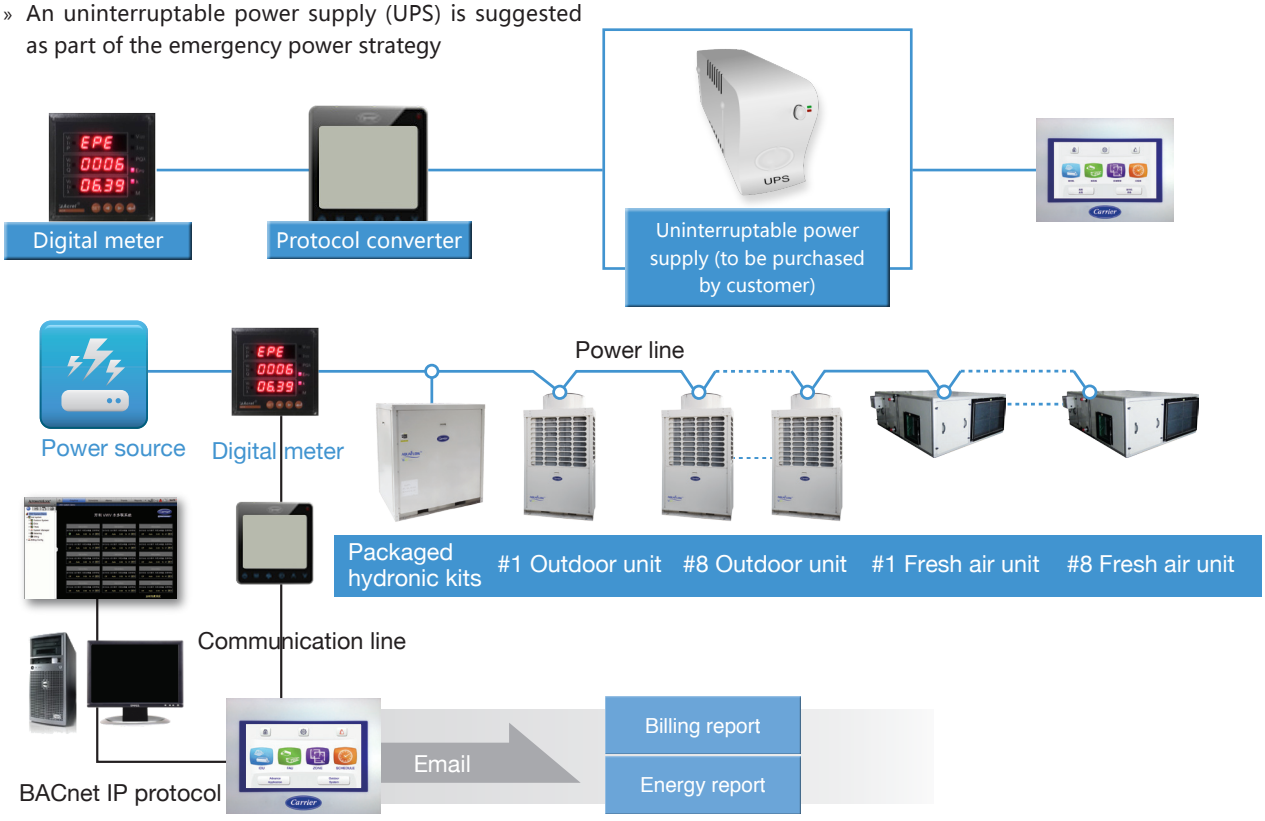
» 2. Multiple metering modes



Shanghai B Industrial Company	28	33.6	30	9	42.6
--Unit006	6	7.2	8	2.4	9.6
--Unit007	12	14.4	12	3.6	18
--Unit008	3	3.6	6	1.8	5.4
--Unit009	7	8.4	4	1.2	9.6
Shanghai C Commercial Company	9	10.8	8	2.4	13.2
--Unit010	4	4.8	7	2.1	6.9
--Unit011	5	6	1	0.3	6.3
.....	.....	.....	.....	.....	.....

Data Storage and Protection

» 1GB data storage capacity
» An uninterruptable power supply (UPS) is suggested as part of the emergency power strategy



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6. Overall safety and reliability

Integrated system, reliable performance and secured quality

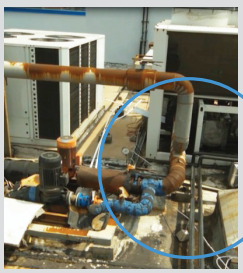
Fragmental system

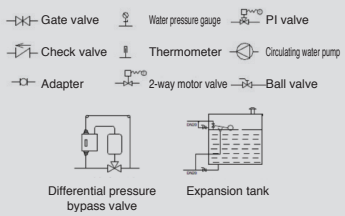
- Components combined on site, compatibility concern and uncertain performance
- Lots of hydronic kits installed on site, more leakage points
- Failure shoot product by product, fussy and long cycle

Integrated system

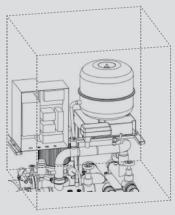
- Design and test by system, no compatibility issue and reliable performance
- Packaged hydronic kits preinstalled, secured quality and less leakage points
- All alarm in one screen, quick and precise failure shoot

Conventional hydronic system

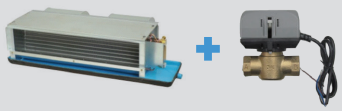




Carrier VWV system packaged hydronic kits



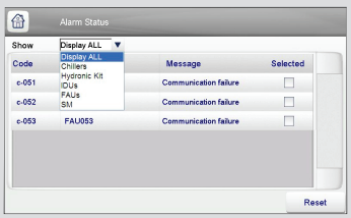
Conventional indoor unit



Carrier VWV system indoor unit

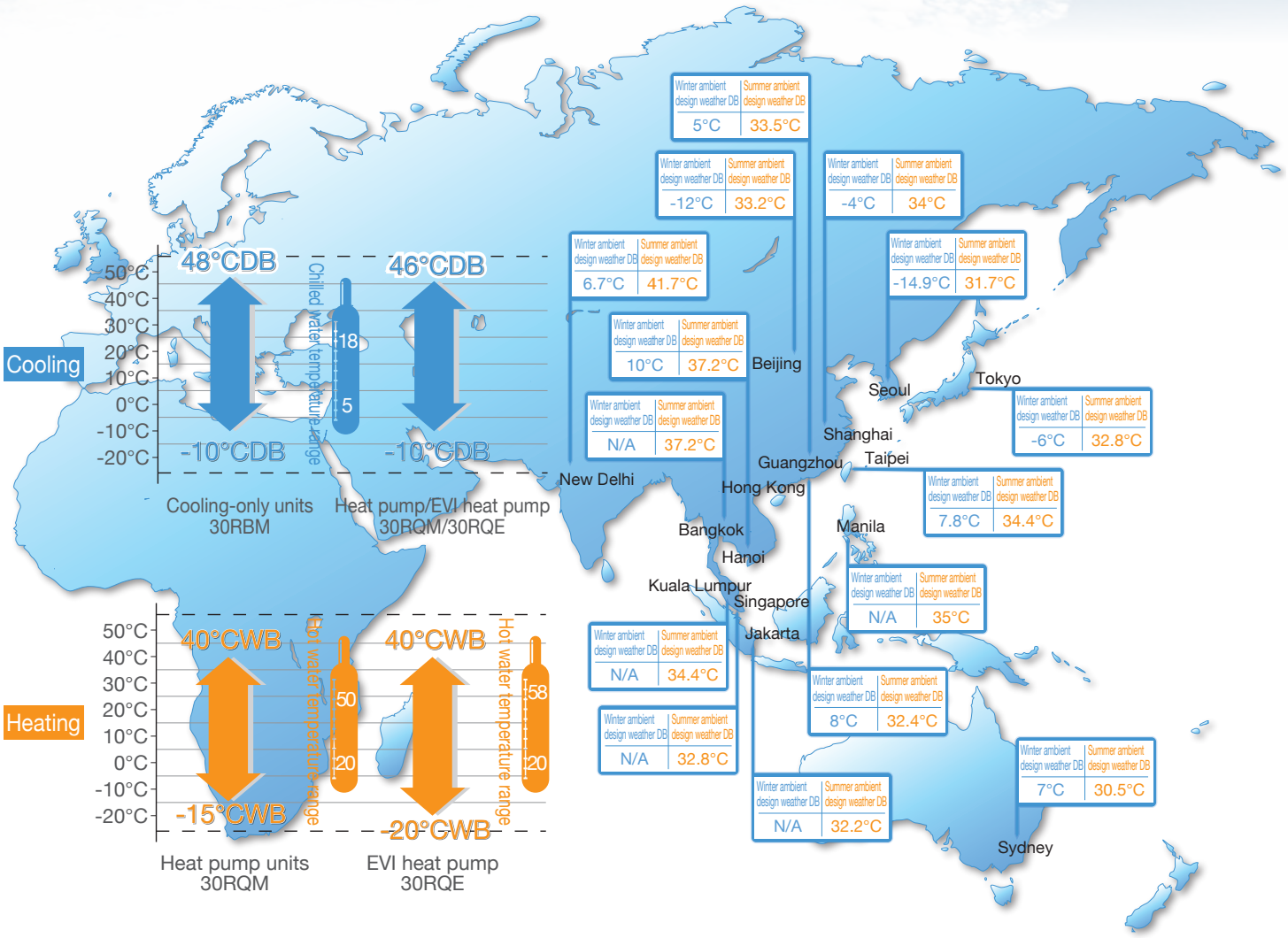
System failure shoot

Carrier VWV system manager



Wide Operating Range and Enhanced Heating in Extreme Weather

When equipped with the optional EVI heat pump, the Carrier variable flow air-conditioning system is able to operate in heating mode at ambient temperatures as low as -20°C, making it particularly suited to northern regions.



Freeze Protection

Double freeze protection

When the air-conditioning system is in stand-by mode in winter (such as at a retail outlet that is closed for the night or an office closed for a public holiday), customers can be assured that the system will automatically begin freeze protection measures to eliminate any risk of freezing.

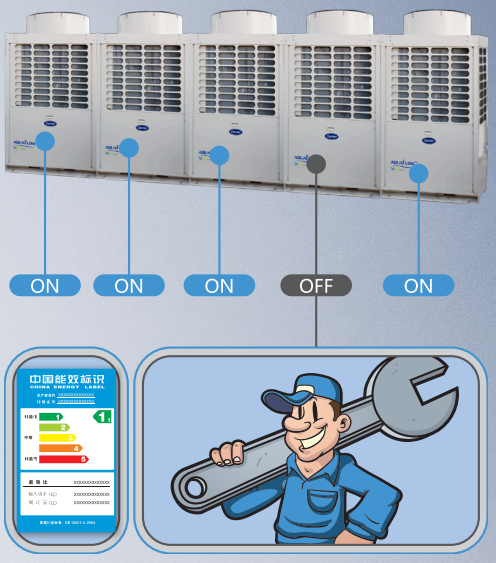
» Freeze protection at equipment level: in cold conditions, the fresh air handling unit's fresh air damp and exhaust damp automatically close and the electronic water heater in the outdoor unit heat exchanger automatically runs.

» Freeze protection at system level: when the water temperature is low, all water valves automatically open and the pump operates; when the water temperature is even lower, the outdoor unit will enter heating mode.

Modular Outdoor Unit with Grade 1 Energy Efficiency (China GB)

- All products in the series achieve grade 1 energy efficiency (China GB).
- Compressors in the modular outdoor unit can be backed up interchangeably and in combination to simplify servicing.
- Staggered equipment start-up to minimize the impact on the power grid.
- Small cooling capacity gap and a combination of up to 8 units in 4 specifications, catering to different needs.
- Side-by-side installation with a gap as small as 20mm.

Backup operation, modular units →



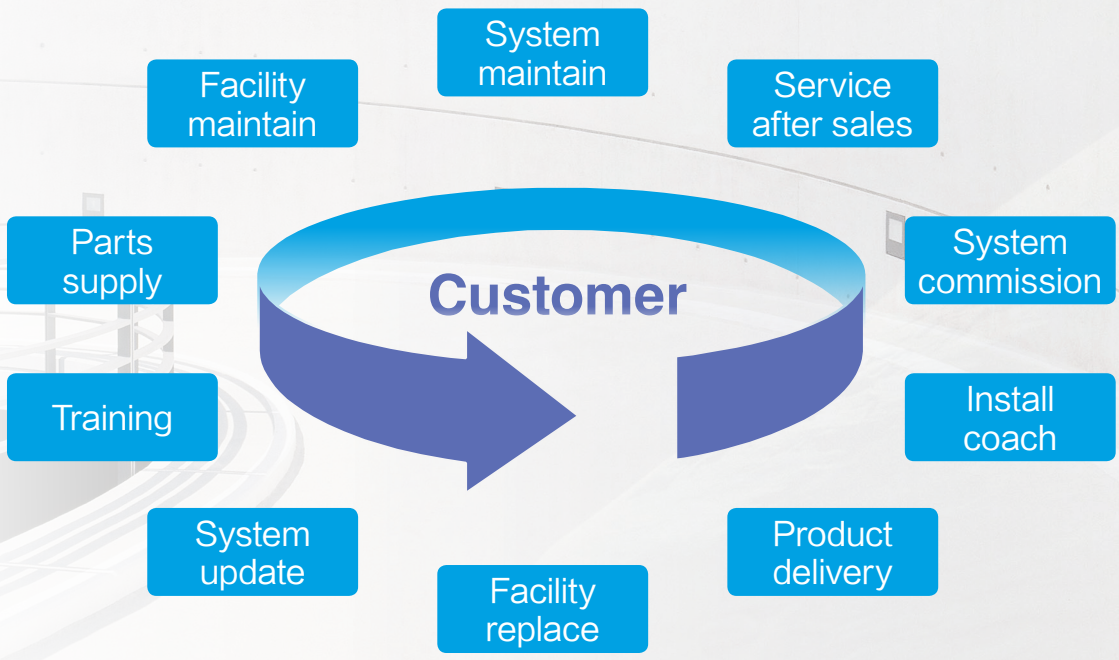
Backup operation, double compressors →

Eliminating Oil-return Issues

Conventional variable refrigerant flow (VRF) unit: refrigerant is sent from the outdoor unit to the indoor unit, so oil return may be inhibited through long pipes.
Carrier AquaFlow™ VWV System : water flows between the outdoor and indoor units, eliminating the potential for compressor damage due to insufficient oil return.

Professional service, quick response

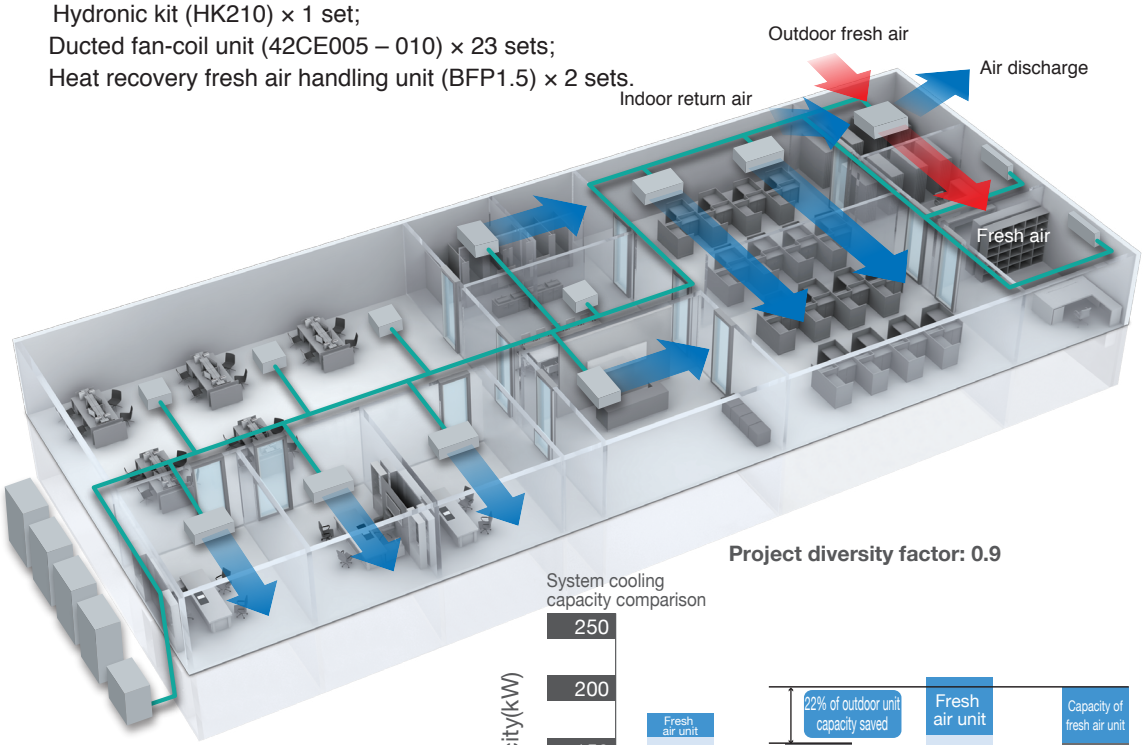
- More professional analysis for failure and faster repairing due to well known for system and components
- Carrier global service network, quick response



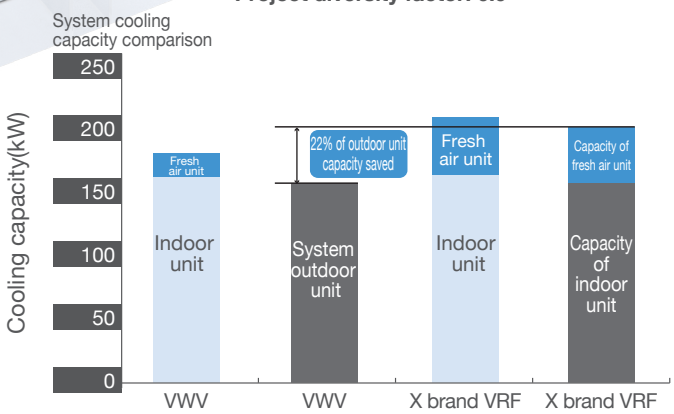
Office Project

Situation: Office building floor area of up to 1,200m^2, indoor peak load of approximately 141kW, and fresh air load of 39kW.

Solution: Carrier AquaFlow™ VWV System SHSRQ160 (system cooling capacity: 158kW);
Outdoor unit (30RQM040) × 4 sets;
Hydronic kit (HK210) × 1 set;
Ducted fan-coil unit (42CE005 – 010) × 23 sets;
Heat recovery fresh air handling unit (BFP1.5) × 2 sets.



Project diversity factor: 0.9



Note: For standards and regulations related to office noise, refer to GB J118-88
(China's national design standards for sound insulation in civic buildings)

Demand of office building	Solution of VWV system		
Low running cost		Fresh air supply depending on smart control Variable water flow control, variable leaving temperature control	
Easy operation		Centralized control, zone and schedule control, metering and billing	
Flexible system retrofit		Shut off related valve to isolate from system only, easy to fulfill room re-layout, indoor unit type changing and system expansion	
Indoor quiet		42CE005~008 (< 45 dB(A))	Optional silencer (additional -3 dB(A))
High indoor air quality		BFP (CO_2 control)	Optional fresh air purifier Eliminate PM 2.5 particle from out side Optional HAF electrostatically charged media filter Eliminate PM 2.5 particle indoor
Low investment		Fresh air heat recovery , No capacity drop of outdoor unit by piping length,	

Allows for premium and general office environments
22%* cooling capacity optimization than VRF
Caters to different rental and sales programs
Fresh air on demand

Creating a Quiet Office Environment

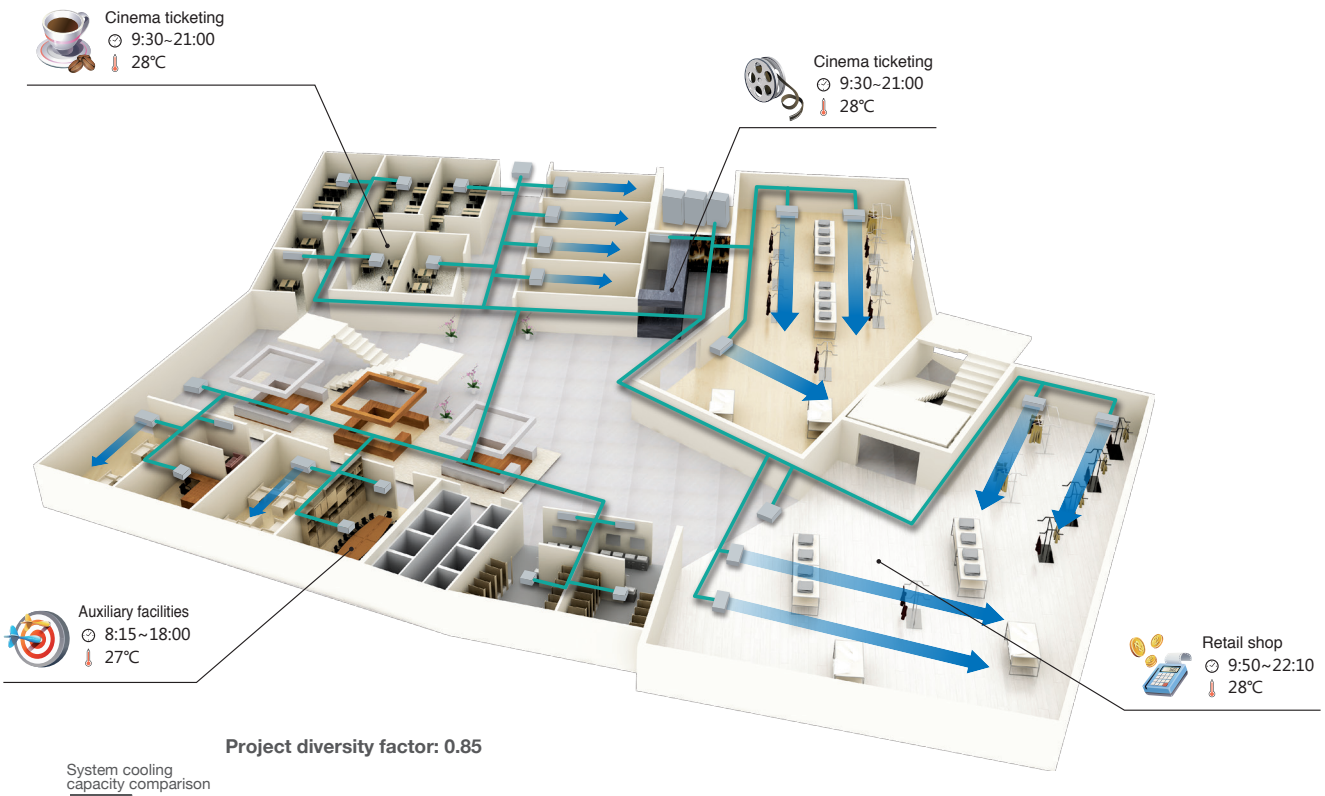
*Based on Carrier studies

Shopping Mall

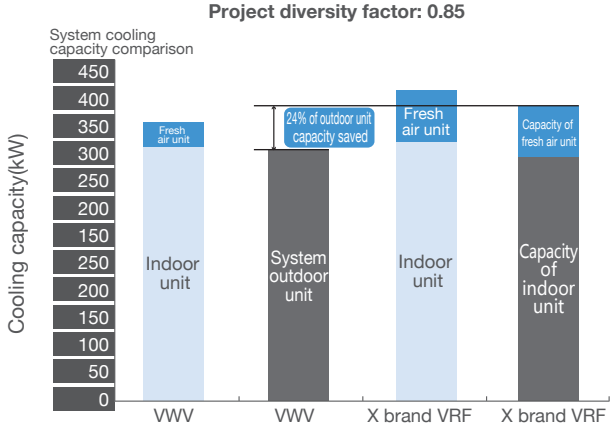
Situation: Commercial building floor area of up to 1,840m^2,
indoor peak load of approximately 313 kW, and fresh air load of 104 kW.

Solution: Carrier AquaFlow™ VWV System SHSRQ320 (system cooling capacity: 316 kW);
Outdoor unit (30RQM040) × 8 sets;
Hydronic kit (HK320) × 1 set;
Ducted fan-coil unit (42CE006 - 010) × 43 sets;
Heat recovery fresh air handling unit (BFP4) × 2 sets.

Requirements for store	Solutions	
Low initial investment		Fresh air heat recovery, no capacity loss in pipes
Low operating cost		Fresh air supplied on demand with intelligent controls
Evidence-based tenant billing		Energy metering



Project diversity factor: 0.85



Mall property management office

Mall retail store

Evidence-based tenant billing with energy metering and the ability to suspend air-conditioning service in the event of a deliberate default

Provides energy metering and independent control for each store, facilitating individual billing

24%* cooling capacity optimization than VRF

Creating a Pleasant Shopping Experience

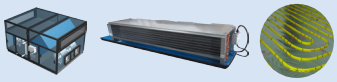
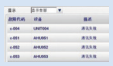
* Based on Carrier studies

Luxury Villa Project

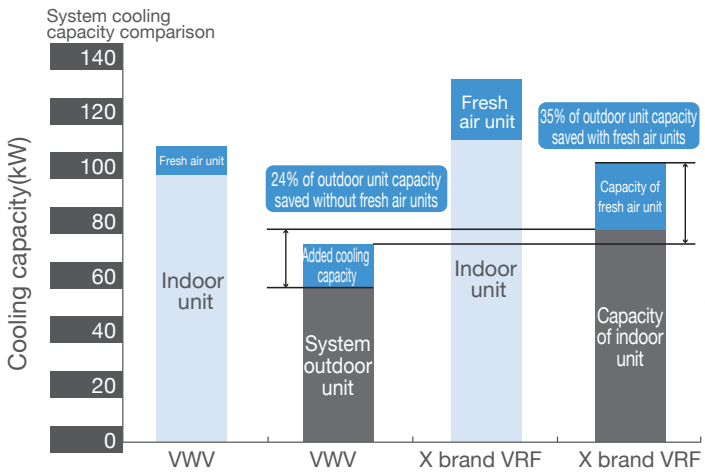
Situation: A three-storey villa with 21 independently controlled rooms, total floor area of up to 660m^2, and indoor peak load around 94kW.

Solution 1 (without fresh air configuration):
Carrier VWV System SHSRQ060
(system cooling capacity: 57.8kW);
Outdoor unit (30RQM030) × 2;
Hydronic kit (HK080) × 1;
Low-noise ducted fan coil unit
(42CN002 – 008) × 17;
Cassette fan coil unit (42GWC005) × 2;
Hi-wall fan coil unit (42CM002) × 2.

Solution 2 (with fresh air configuration):
Carrier VWV System SHSRQ070
(system cooling capacity: 67.8kW);
Outdoor unit (30RQM035) × 2;
Heat recovery fresh air handling unit (BFP2) × 1;
Hydronic kit (HK080) × 1;
Low-noise ducted fan coil unit
(42CN002 – 008) × 17;
Cassette fan coil unit (42GWC005) × 2;
Hi-wall fan coil unit (42CM002) × 2.

Requirements for a high-quality villa	Solutions	
Low initial investment		Optimized solutions; outdoor unit high connectivity
Indoor comfort		The 42CN002 fan-coil unit is as quiet as 24dB(A) BFP (CO_2 concentration control) Floor heating, equally heating distribution
Reliability		30RQM030 (035) × 2; Intelligent defrosting control
Easy operation		Chinese and English display; System manager with touch buttons and optional remote control 2 in 1 control, air conditioning and floor heating
Easy maintenance		Auto-cleaning of pipes; Automatic anti-freeze protection in winter
Timely service		Automatic malfunction diagnostics with detail description

Project diversity factor: 0.6



Independent temperature and humidity control meets the each room load needs

35%* outdoor unit cooling capacity optimize compared with VRF

Easy operation, optimal comfort

Enjoy an extra 10% fresh air!

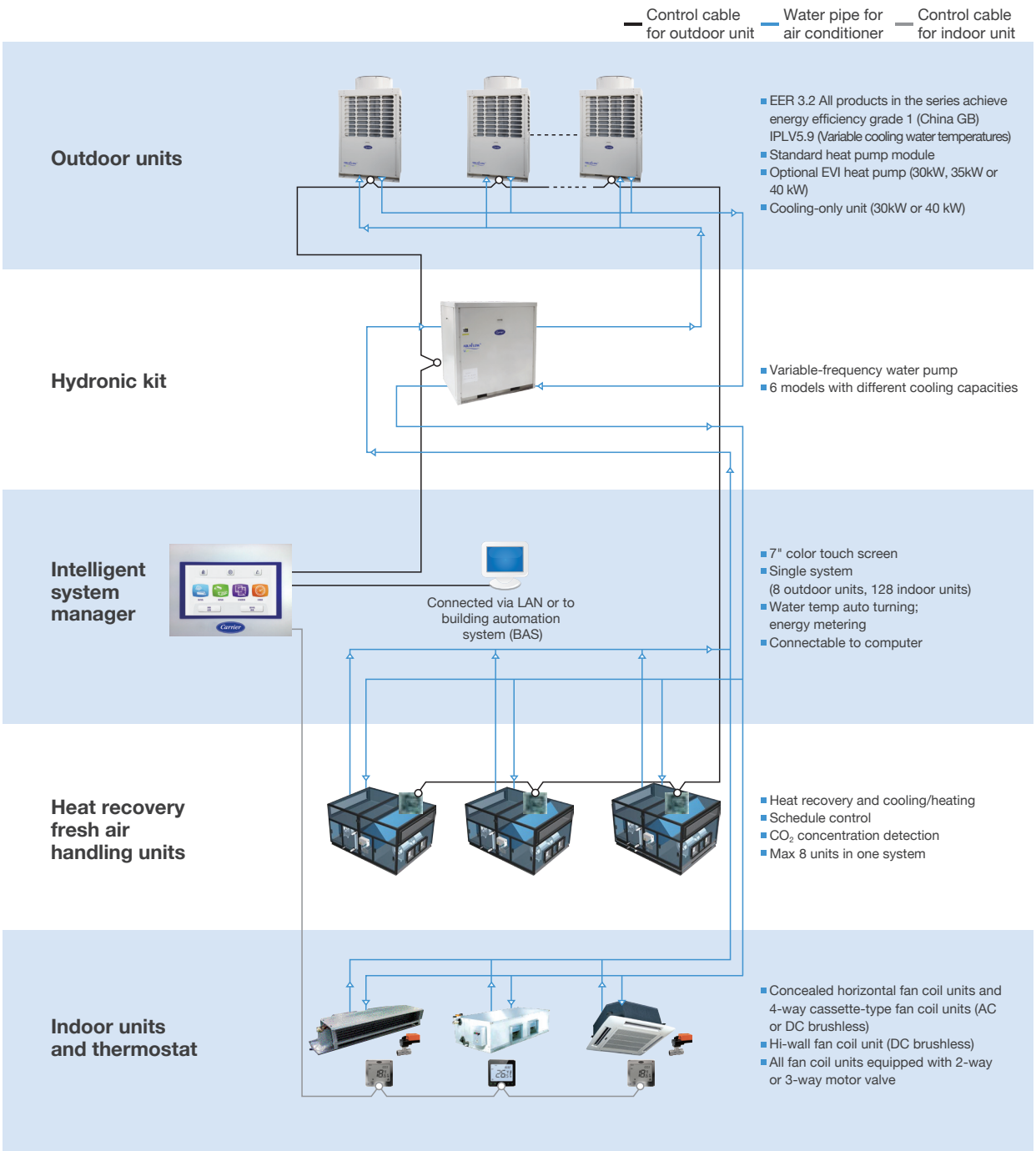
Creating a Comfortable Living Environment

* Based on Carrier studies

Technical Specifications

Carrier AquaFlow™ VWV System

System structure



* To include these optional functions, contact your local sales team.

Outdoor unit

Cooling-only type

Unit model	System cooling capacity	Number of outdoor units	Combined model		Hydronic kit	Sets	System external water pressure	Intelligent system manager
	kW		30RBM030	30RBM040			kPa	
SHSRBM030	29.2	1	1		HK030	1	188	HSM*1
SHSRBM040	39.5	1		1	HK040		218	
SHSRBM060	58.4	2	2		HK080		218	
SHSRBM070	68.7	2	1	1			195	
SHSRBM080	79	2		2			178	
SHSRBM090	87.6	3	3		HK150S/ HK150T		215	
SHSRBM100	97.9	3	2	1			211	
SHSRBM110	108.2	3	1	2			209	
SHSRBM120	118.5	3		3			209	
SHSRBM130	127.1	4	3	1			202	
SHSRBM140	137.4	4	2	2			199	
SHSRBM150	147.7	4	1	3			195	
SHSRBM160	158	4		4	HK210S/ HK210T		246	
SHSRBM170	166.6	5	3	2			241	
SHSRBM180	176.9	5	2	3			239	
SHSRBM190	187.2	5	1	4			235	
SHSRBM200	197.5	5		5			234	
SHSRBM210	206.1	6	3	3	HK325S/ HK325T		225	
SHSRBM220	216.4	6	2	4			250	
SHSRBM230	226.7	6	1	5			248	
SHSRBM240	237	6		6			248	
SHSRBM250	245.6	7	3	4			243	
SHSRBM260	255.9	7	2	5			242	
SHSRBM270	266.2	7	1	6			240	
SHSRBM280	276.5	7		7			239	
SHSRBM290	285.1	8	3	5			236	
SHSRBM300	295.4	8	2	6			235	
SHSRBM310	305.7	8	1	7			227	
SHSRBM320	316	8		8			223	

VWV power options

Product name	Type	380V/400V-3Ph-50Hz	230V-3Ph-60Hz	415V-3Ph-50Hz	220V-1Ph-50Hz	230V-1Ph-50Hz	240V-1Ph-50Hz	230V-1Ph-60Hz
ODU	Heat pump	√		√				
	Cooling only	√	√	√				
	EVI heat pump	√		√				
	High ESP option	√		√				
HK	Single pump	√	√	√				
	Dual pump	√		√				
	High pressure endure	Non-standard order		Non-standard order				
FAU(BFP)	Standard unit	√		√				
	Purifier option	√		√				
42CE	Standard unit				√	√	√	√
42CN	Standard unit				√	√	√	√
42GWC	Standard unit				√	√	√	√
DBFP/DFP	Standard unit				√	√		

Note: Please refer to *Design, Installation and Commissioning Manual for Aqua-flow™ VWV System* for nomenclature and detailed specifications

Outdoor unit

Heat pump type

Unit model	System cooling capacity	Number of outdoor units	Combined model				Hydronic kit	Sets	System external water pressure	Intelligent system manager
	kW		30RQM025	30RQM030	30RQM035	30RQM040	Model		kPa	
SHSRQM025	24.5	1	1				HK030	1	236	HSM*1
SHSRQM030	28.9	1		1					188	
SHSRQM035	33.9	1			1		HK040	1	235	
SHSRQM040	39.2	1				1			218	
SHSRQM050	49.0	2	2				HK080	1	247	
SHSRQM055	53.4	2	1	1					230	
SHSRQM060	57.8	2		2					218	
SHSRQM065	62.8	2		1	1				210	
SHSRQM070	67.8	2			2				205	
SHSRQM075	73.1	2			1	1			190	
SHSRQM080	78.4	2				2			178	
SHSRQM085	82.3	3	1	2			HK150S/ HK150T	1	217	
SHSRQM090	86.7	3		3					215	
SHSRQM095	91.7	3		2	1				214	
SHSRQM100	96.7	3		1	2				213	
SHSRQM105	101.7	3			3				220	
SHSRQM110	107.0	3			2	1			213	
SHSRQM115	112.3	3			1	2			211	
SHSRQM120	117.6	3				3			209	
SHSRQM125	120.6	4		3	1				205	
SHSRQM130	125.6	4		2	2				204	
SHSRQM135	130.6	4		1	3				200	
SHSRQM140	135.6	4			4				207	
SHSRQM145	140.9	4			3	1			200	
SHSRQM150	146.2	4			2	2			199	
SHSRQM155	151.5	4			1	3	HK210S/ HK210T	1	247	
SHSRQM160	156.8	4				4			246	
SHSRQM165	159.5	5		2	3				243	
SHSRQM170	164.5	5		1	4				242	
SHSRQM175	169.5	5			5				248	
SHSRQM180	175.4	5		2		3			239	
SHSRQM185	180.1	5			3	2			239	
SHSRQM190	185.4	5			2	3			237	
SHSRQM195	190.7	5			1	4			235	
SHSRQM200	196.0	5				5			234	
SHSRQM205	198.4	6		1	5				232	
SHSRQM210	203.4	6			6				238	
SHSRQM215	208.7	6			5	1			227	
SHSRQM220	214.0	6			4	2	HK325S/ HK325T	1	252	
SHSRQM225	219.3	6			3	3			251	
SHSRQM230	224.6	6			2	4			250	
SHSRQM235	229.9	6			1	5			249	
SHSRQM240	235.2	6				6			248	
SHSRQM245	237.3	7			7				253	
SHSRQM250	242.6	7			6	1			246	
SHSRQM255	247.9	7			5	2			245	
SHSRQM260	253.2	7			4	3			244	
SHSRQM265	258.5	7			3	4			243	
SHSRQM270	263.8	7			2	5			242	
SHSRQM275	269.1	7			1	6			241	
SHSRQM280	274.4	7				7			239	
SHSRQM285	276.5	8			7	1			238	
SHSRQM290	281.8	8			6	2			238	
SHSRQM295	287.1	8			5	3			237	
SHSRQM300	292.4	8			4	4			237	
SHSRQM305	297.7	8			3	5			233	
SHSRQM310	303.0	8			2	6			229	
SHSRQM315	308.3	8			1	7			225	
SHSRQM320	313.6	8				8			223	

Outdoor unit

EVI heat pump

Unit model	System cooling capacity	Number of outdoor units	Combined model		Hydronic kit	Sets	System external water pressure	Intelligent system manager
	kW		30RQE035	30RQE040	Model		kPa	
SHSRQE035	35.5	1	1		HK040	1	233	
SHSRQE040	41.0	1		1			215	
SHSRQE070	71.0	2	2		HK080	1	195	
SHSRQE075	76.5	2	1	1			180	
SHSRQE080	82.0	2		2			170	
SHSRQE105	106.5	3	3		HK150S/ HK150T	1	220	
SHSRQE110	112.0	3	2	1			210	
SHSRQE115	117.5	3	1	2			207	
SHSRQE120	123.0	3		3			205	
SHSRQE140	142.0	4	4				205	
SHSRQE145	147.5	4	3	1			197	
SHSRQE150	153.0	4	2	2			192	
SHSRQE155	158.5	4	1	3	HK210S/ HK210T	1	240	
SHSRQE160	164.0	4		4			238	
SHSRQE175	177.5	5	5				242	
SHSRQE180	183.0	5	4	1			235	
SHSRQE185	188.5	5	3	2			233	
SHSRQE190	194.0	5	2	3			230	
SHSRQE195	199.5	5	1	4			228	
SHSRQE200	205.0	5		5			226	
SHSRQE205	213.0	6	6				230	
SHSRQE210	218.5	6	5	1			222	HSM*1
SHSRQE215	224.0	6	4	2	HK325S/ HK325T	1	252	
SHSRQE220	229.5	6	3	3			250	
SHSRQE225	235.0	6	2	4			248	
SHSRQE230	240.5	6	1	5			245	
SHSRQE240	246.0	6		6			244	
SHSRQE245	248.5	7	7				249	
SHSRQE250	254.0	7	6	1			243	
SHSRQE255	259.5	7	5	2			242	
SHSRQE260	265.0	7	4	3			241	
SHSRQE265	270.5	7	3	4			240	
SHSRQE270	276.0	7	2	5			239	
SHSRQE275	281.5	7	1	6			237	
SHSRQE280	287.0	7		7			236	
SHSRQE285	289.5	8	7	1			234	
SHSRQE290	295.0	8	6	2			233	
SHSRQE295	300.5	8	5	3			231	
SHSRQE300	306.0	8	4	4			228	
SHSRQE305	311.5	8	3	5			225	
SHSRQE310	317.0	8	2	6			223	
SHSRQE315	322.5	8	1	7			221	
SHSRQE320	328.0	8		8			219	

Indoor equipment

Other important components	Indoor unit	Concealed horizontal fan coil units (42CE, 42CN); 4-way cassette fan coil unit (42GWC); hi-wall fan coil unit (42CM), up to 128 units for each system
	Fresh air handling unit	Heat recovery fresh air handling unit (BFP) and fresh air handling unit (DBFP/DFP) , up to 8 units for each system
	Thermostat	Thermostat with networking function (CTC), 1 for each indoor unit
Options		1. HMI (00PSY143780200); 2. Remote control (CTCIR01); 3. Manual stop value (00PPY141440200)

Selection restrictions:
All outdoor units must be models of the same type.
(For example, cooling-only models cannot be combined with the heat pump unit.) The total number of outdoor units must not exceed 8.

Main Equipment Parameters

Technical parameters for outdoor unit

Heat pump unit

Model	Unit	30RQM025	30RQM030	30RQM035	30RQM040	30RQE035	30RQE040
Nominal cooling capacity	kW	24.5	28.9	33.9	39.2	35.5	41
Nominal heating capacity	kW	24.5	30	34.8	39.5	41.0	46.5
Power input for cooling	kW	7.3	8.8	10.1	12.2	11.6	13.3
Power input for heating	kW	7.8	9.4	10.9	12.2	12.4	13.8
Cooling EER	kW/kW	3.36	3.28	3.36	3.21	3.06	3.08
Heating COP (Coefficient of Performance)	kW/kW	3.14	3.19	3.19	3.24	3.31	3.37
*ARI Integrated Part-Load Value (IPLV)	kW/kW	5.93	5.86	5.96	5.84	5.29	5.49
Refrigerant		HFC-410A					
Charge amount	kg	9	11	10.9	12.8	12.8	13.4
Compressor		Hermetic scroll compressor					
Quantity		2	2	2	2	2	2
Control system		Pro-dialog Plus microcomputer control system					
Condenser		Copper and aluminum/finned coil with hydrophilic coating					
Fan quantity		1	1	1	1	1	1
Maximum fan speed	rpm	720	720	720	720	720	720
Air flow rate	L/S	2820	2820	3750	3750	3750	3750
Evaporator		Brazed plate heat exchanger					
Nominal water flow rate (cooling)	m^3/h	4.2	5	5.8	6.8	6.1	7.1
Nominal water flow rate (heating)	m^3/h	4.2	5.2	6.0	6.8	7.1	8.0
Outdoor unit water pressure drop (including optional joints, cooling)	kPa	54	65	57	63	60	65
Outdoor unit water pressure drop (including optional joints, heating)	kPa	54	70	60	63	65	80
Maximum water pressure	kPa	1000	1000	1000	1000	1000	1000
Outdoor unit water-related components		Filter, pressure gauge, flow switch, automatic air vent valve, 2-way solenoid valve					
Inlet/outlet port (male thread)	MPT	1-1/4"	1-1/4"	1-1/2"	1-1/2"	1-1/2"	1-1/2"
Nominal diameter of water joint		DN32	DN32	DN40	DN40	DN40	DN40
Electrical parameters							
Mains power supply		380V/400V-3Ph-50Hz; 415V-3Ph-50Hz					
Control power supply							
Nominal operating current (cooling)	A	13.9	16	18	23.2	21.2	24.3
Nominal operating current (heating)	A	14.9	16.8	18.6	23.5	22.7	25.3
MCA at 46 d.b OAT	A	17.1	20.6	22	27	26.5	29.5
Dimensions (L×W×H)	mm	990×755×1800		1240×860×1820		1240×860×1820	
Net weight	kg	315	335	360	380	375	390
Noise level	dB(A)	62	62	64	64	64	64

Note: Cooling data is measured at an ambient temperature of 35°C DBT / 24°C WBT and inlet and outlet water temperatures of 12°C and 7°C respectively.
Heating data is measured at an ambient temperature of 7°C DBT / 6°C WBT and inlet and outlet water temperatures of 40°C and 45°C respectively.
*Please refer to AHRI condtions with Self adaptive variable water temperature technology (6.7 ~ 13°C)

Note: Please refer to *Design, Installation and Commissioning Manual for Aqua-flow™ VWV System* for nomenclature and detailed specifications

Technical parameters for outdoor unit

Cooling-only unit

Model	Unit	30RBM030	30RBM040
Nominal cooling capacity	kW	29.2	39.5
Power input power for cooling	kW	8.8	12.0
Cooling EER (energy efficiency ratio)	kW/kW	3.32	3.29
*ARI Integrated Part-Load Value (IPLV)	kW/kW	5.86	5.84
Refrigerant		HFC-410A	
Charge amount	kg	10.0	12.0
Compressor		Hermetic scroll compressor	
Quantity		2	2
Control system		Pro-Dialog Plus microcomputer control system	
Condenser		Copper and aluminum fin coils with hydrophilic coating	
Fan quantity		1	1
Maximum fan speed	rpm	720	720
Evaporator		Brazed plate heat exchanger	
Nominal water flow rate (cooling)	m^3/h	5.0	6.8
Outdoor unit water pressure drop (including optional joints, cooling)	kPa	65	63
Maximum water pressure	kPa	1000	1000
Outdoor unit water-related components		Filter, pressure gauge, flow switch, automatic air vent valve, 2-way solenoid valve	
Inlet/outlet port (male thread)	MPT	1-1/4"	1-1/2"
Nominal diameter of water joint		DN32	DN40
Electrical parameters			
Mains power supply		380V/400V-3Ph-50Hz; 415V-3Ph-50Hz; 230V-3Ph-60Hz	
Control power supply		The built-in transformer connects to the mains power supply	
Nominal operating current (cooling)	A	30.0	36.5
MCA at 48°C d.b OAT	A	38.5	52.9
Starting current	A	133	174
Dimensions (L×W×H)	mm	990×755×1800	1240×860×1820
Net weight	kg	310	360
Noise level	dB(A)	62	64

*Please refer to AHRI condtions with Self adaptive variable water temperature technology (6.7 ~ 13°C)

Parameter modification table for high-external static pressure (ESP) unit

Model	Unit	30RQM025	30RQM030	30RQM035	30RQM040	30RBM030	30RBM040
Cooling power input @ maximum ESP	kW	7.8	9.3	10.76	12.86	9.3	12.7
Heating power input @ maximum ESP	kW	8.3	9.9	11.56	12.86	-	-
Nominal operating current (cooling) @ maximum ESP	A	14.8	17.7	19.2	24.5	17.6	24.2
Nominal operating current (heating) @ maximum ESP	A	15.9	18.2	19.6	24.6	-	-
Maximum ESP	Pa	85	85	100	100	85	100
High fan speed @ maximum ESP	rpm	960	960	960	960	960	960

Technical parameters for hydronic kit

Hydronic kit

Model	Single pump						Twin pump (100% standby)		
	HK030004000THC HK030006000THC	HK040004000THC HK040006000THC	HK080004000THC HK080006000THC	HK150S11 00001THC	HK210S11 00001THC	HK325S11 00001THC	HK150T01 00001THC	HK210T01 00001THC	HK325T01 00001THC
Application	Single unit system		Dual unit parallel system	Multi-unit parallel system					
System cooling capacity range (heat pump unit)	25~30kW	25~40kW	25~80kW	25~150kW	25~210kW	25~320kW	25~150kW	25~210kW	25~320kW
Nominal flow and hydraulic module external lift	$5m^3/h$ 250kPa	$6.8m^3/h$ 270kPa	$13.6m^3/h$ 250kPa	$25m^3/h$ 250kPa	$35m^3/h$ 270kPa	$56m^3/h$ 270kPa	$25m^3/h$ 250kPa	$35m^3/h$ 270kPa	$56m^3/h$ 270kPa
Major components	VFD pump, differential pressure bypass valve, water replenishing valve, expansion tank, automatic relief valve, filter, etc.			VFD pump, differential pressure bypass valve, water replenishing valve, expansion tank (excluded if system endure pressure >20m) , automatic relief valve, filter, etc.			VFD pump, differential pressure bypass valve, water replenishing valve, expansion tank (excluded if system endure pressure >20m) , automatic relief valve, filter, etc.		
Dimensions (L×W×H)	785×425×1075			1312x608x1186			1404x798x1186	1462x878x1186	
Nominal diamater of joint	DN32	DN40	DN50	DN65	DN80	DN100	DN65	DN80	DN100
Bypass pipe connector				DN50	DN50	DN65	DN50	DN50	DN65
Joint connection type	Male thread			Clamp			Clamp		
Expansion tank capacity	8L		12L	35L	50L	80L	35L	50L	80L
Main Power supply	380/400V-3Ph-50Hz								
Water pump quantity	1						2 (100% standby)		
Rated power	0.75	1.1	1.85	4	5.5	7.5	4	5.5	7.5
Maximum operating current	1.9 A	2.4 A	5 A	8.2 A	10.9 A	14.5 A	7.7A	10.2A	13.7A
Net weight	100kg	110kg	130kg	229kg	262kg	288kg	270kg	348kg	411kg

Note: 1. Please refer to Design, Installation and Commissioning Manual for Aqua-flow™ VWV System for nomenclature and detailed specifications.

2. The standard pressure endurance of packaged VFD hydronic kits (HK 025-520) is 20 meter ; for HK 025-080, Carrier can offer 40 meter option; for HK150-520, Carrier can offer 60 meter option without expansion tank, which should be installed on the top of system lop and is purchased by customer or is supplied by Carrier.

Technical parameters for heat recovery fresh air handing unit

Heat recovery fresh air handling unit (BFP)

2-Row										
Unit model			BFP1	BFP1.5	BFP2	BFP2.5	BFP3	BFP4	BFP5	BFP6	BFP8
Airflow	CMH		1000	1500	2000	2500	3000	4000	5000	6000	8000
Type			Ceiling-mounted								Horizontal
Total pressure at outlet	Fresh air side	L (Pa)	135	189	161	116	160	248	321	362	240
		H (Pa)	266	233	251	265	253	425	365	449	417
	Air discharge side	L (Pa)	128	84	90	107	103	244	205	284	141
		H (Pa)	174	234	244	168	217	312	386	428	317
Heat exchange rate	Sensible heat	Summer/winter (%)	67.2/70.9	66.9/70.6	67.1/71.6	65.7/69.4	64.3/67.8	66.2/69.8	67.9/71.7	68.9/72.7	63.0/66.5
	Total heat	Summer/winter (%)	53.3/62.8	53.3/62.4	53.7/63.4	52.2/61.4	51.3/60.2	52.6/61.8	53.8/63.5	54.5/64.3	50.5/59.1
Motor input power	Fresh air side	L (kW)	0.29	0.42	0.57	0.66	0.79	1.66	1.83	2.96	3.32
		H (kW)	0.41	0.42	0.63	0.82	1.11	1.83	1.99	3.14	3.66
	Air discharge side	L (kW)	0.16	0.31	0.39	0.57	0.66	1.54	1.75	2.08	2.5
		H (kW)	0.29	0.42	0.63	0.66	0.79	1.66	1.83	2.96	3.1
Total capacity	Cooling capacity	kW	10.3	15.9	21.9	26.5	31.2	42.4	55.3	68.2	92.7
	Heating capacity	kW	12.2	18.1	24.2	29.7	35	46.5	59.5	72.5	97.4
Recovery capacity	Cooling capacity	kW	6	9.1	12.2	14.8	17.5	23.9	30.5	37.1	45.8
	Heating capacity	kW	5	7.4	10	12.2	14.3	19.6	25.2	30.6	37.5
Coil cooling/ heating capacity	Cooling capacity	kW	4.3	6.8	9.7	11.7	13.7	18.5	24.8	31.1	46.9
	Water flow rate	T/h	0.73	1.17	1.66	2.01	2.36	3.18	4.26	5.34	8.06
	Heating capacity	kW	7.2	10.7	14.2	17.5	20.7	26.9	34.3	41.9	59.9
	Water flow rate	T/h	0.63	0.93	1.25	1.53	1.81	2.35	3	3.66	5.24
Net weight		LL (kg)	160	200	230	240	260	325	375	470	595
		LH (kg)	160	200	230	240	265	325	375	475	610
		HH (kg)	160	200	230	245	265	330	390	475	615
		HL (kg)	160	200	230	240	265	325	390	470	600

4-Row										
Unit model			BFP1	BFP1.5	BFP2	BFP2.5	BFP3	BFP4	BFP5	BFP6	BFP8
Airflow	CMH		1000	1500	2000	2500	3000	4000	5000	6000	8000
Type			Ceiling-mounted								Horizontal
Total pressure at outlet	Fresh air side	L (Pa)	111	161	131	82	122	203	275	316	196
		H (Pa)	243	205	221	231	215	380	320	403	373
	Air discharge side	L (Pa)	128	84	90	107	103	244	205	284	141
		H (Pa)	174	234	244	168	217	312	386	428	317
Heat exchange rate	Sensible heat	Summer/winter (%)	67.2/70.9	66.9/70.6	67.1/71.6	65.7/69.4	64.3/67.8	66.2/69.8	67.9/71.7	68.9/72.7	63.0/66.5
	Total heat	Summer/winter (%)	53.3/62.8	53.3/62.4	53.7/63.4	52.2/61.4	51.3/60.2	52.6/61.8	53.8/63.5	54.5/64.3	50.5/59.1
Motor input power	Fresh air side	L (kW)	0.29	0.42	0.57	0.66	0.79	1.66	1.83	2.96	3.32
		H (kW)	0.41	0.42	0.57	0.82	1.11	1.83	1.99	3.14	3.66
	Air discharge side	L (kW)	0.16	0.31	0.39	0.57	0.66	1.54	1.75	2.08	2.5
		H (kW)	0.29	0.42	0.63	0.66	0.79	1.66	1.83	2.96	3.1
Total capacity	Cooling capacity	kW	15.5	23.3	31.3	38.2	45.2	60.2	70.3	86.8	119.7
	Heating capacity	kW	16.4	24.2	32.3	39.9	47.4	62.7	76.3	92.8	125.8
Recovery capacity	Cooling capacity	kW	6	9.1	12.2	14.8	17.5	23.9	30.5	37.1	45.8
	Heating capacity	kW	5	7.4	10	12.2	14.3	19.6	25.2	30.6	37.5
Coil cooling/ heating capacity	Cooling capacity	kW	9.5	14.2	19.1	23.4	27.7	36.3	39.8	49.7	73.9
	Water flow rate	T/h	1.64	2.43	3.28	4.01	4.76	6.24	6.84	8.53	12.7
	Heating capacity	kW	11.4	16.8	22.3	27.7	33.1	43.1	51.1	62.2	88.3
	Water flow rate	T/h	0.99	1.47	1.95	2.42	2.89	3.77	4.47	5.44	7.72
Net weight		LL (kg)	165	205	235	245	270	335	385	485	615
		LH (kg)	165	205	235	250	270	335	390	490	630
		HH (kg)	165	205	235	250	275	340	400	485	635
		HL (kg)	165	205	235	250	270	335	400	485	620

Unit model			BFP1	BFP1.5	BFP2	BFP2.5	BFP3	BFP4	BFP5	BFP6	BFP8
Outline dimensions	L	mm	1450	1520	1610	1660	1750	1970	2130	2300	2430
	W	mm	960	1120	1220	1180	1180	1370	1520	1710	1800
	H	mm	520	580	640	700	770	770	770	770	1220

wet film humidifier option of BFP

Unit model			BFP1R	BFP1.5R	BFP2R	BFP2.5R	BFP3R	BFP4R	BFP5R	BFP6R	BFP8R
Air flow rate (CMH)			1000	1500	2000	2500	3000	4000	5000	6000	8000
Velocity of coil (m/s)			1.68	1.89	1.95	2.14	2.28	2.56	2.59	2.6	2.54
100mm Wet film	Stature efficiency (%)		71	67	66	62	59	54	53	53	54
	2 rows	capacity (kg/h)	9.9	14	18.7	21.8	24.9	31.1	39.9	48.8	62.1
	4 rows	capacity (kg/h)	12.4	17.6	23.4	27.7	32	39.9	50.5	57.8	80.1
Air drop (Pa)			15	20	20	24	28	35	36	36	35
Weight adder (kg)			6	8	11	12	14	16	20	24	33

build-out purifier option of BFP

Unit model	BFP1	BFP1.5	BFP2	BFP2.5	BFP3	BFP4	BFP5	BFP6	BFP8
Air flow rate	1000	1500	2000	2500	3000	4000	5000	6000	8000
Power source (V)	380V/3P/50Hz								
Rated power (kW)	0.2	0.32	0.37	0.55	0.75	1.0	1.5	2.2	3.8
Input power (kW)	0.38	0.65	0.64	0.84	1.1	1.6	2.0	3.1	62.1
Current (A)	0.8	1.3	1.21	1.6	2.3	3.0	3.9	5.9	7.8
Primary filter level	G3	G3	G3	G3	G3	G3	G3	G3	G3
Medium filter level	F7	F7	F7	F7	F7	F7	F7	F7	F7
Weight (kg)	45	60	65	85	95	110	135	145	165
Width (mm)	431	635	635	822	1026	1230	1128	1230	1230
Length (mm)	1130	1200	1240	1280	1320	1360	1360	1480	1480
Height (mm)	480	480	582	582	582	582	684	684	871

Summertime calculations based on: outdoor conditions of 35°C DBT and 59.1% RH, indoor conditions of 27°C DBT and 50% RH, and inlet/outlet water temperature of 7°C/12°C.
Wintertime calculations based on: outdoor conditions of 5°C DBT and 60% RH, indoor conditions of 21°C DBT and 40% RH, and inlet/outlet water temperature of 60°C/50°C.

Note: Please refer to *Design, Installation and Commissioning Manual for Aqua-flow™ VWV System* for nomenclature and detailed specifications

Technical parameters for Fresh air handing unit

Fresh air handling unit (suspending AHU)

Model	Air flow rate (m^3/h)	Width (unit + control box) ×length×height	Motor kW-pole	Input power (kW)	Fan /motor sets	ESP (Pa)	TP (Pa)	Cooling capacity (kW)	Chilled water flow rare(l/s)	Cooling WDP (Kpa)	Heating capacity (kW)	Hot water flow rate(l/s)	Heating WPD (Kpa)	Unit weight (kg)	Noise level (dB(A))
DBFPY1	1000	(680+154)×986×380	0.175-4	0.34	1/1	130	234	12.6	0.6	53.4	13.2	0.3	14.2	46	52
DBFPY1I			0.275-4	0.44		220	321							47	55
DBFPY1.5	1500	(875+154)×986×380	0.275-4	0.44	1/1	115	227	19	0.9	50.4	19.8	0.5	13.3	53	55
DBFPY1.5I			0.425-4	0.79		215	320							55	58
DBFPY2	2000	(872+150)×986×500	0.35-4	0.63	1/1	195	300	25.3	1.2	53.7	26.4	0.6	14.2	63	56.5
DBFPY2I			0.55-4	0.84		280	381							64	59.5
DBFPY2.5	2500	(1018+150)×986×500	0.45-4	0.83	1/1	165	265	31	1.5	53.2	32.7	0.8	14.3	67	60
DBFPY2.5I			0.55-4	0.84		250	356							70	61
DBFPY3	3000	(1166+150)×986×500	0.65-4	1.09	1/1	120	250	38.7	1.9	87.9	39.7	1	22.5	75	62
DBFPY3I			0.65-4	1.09		200	330							75	62
DBFPY4	4000	(1458+150)×986×500	0.35-4X2	0.63X2	2/2	185	300	53.4	2.6	86.8	53.5	1.3	21.1	108	58
DBFPY4I			0.55-4X2	0.84X2		250	381							112	61
DBFPY5	5000	(1752+150)×986×500	0.45-4X2	0.83X2	2/2	160	265	64.1	3.1	81.7	65.7	1.6	20.8	123	60.5
DBFPY5I			0.55-4X2	0.84X2		250	356							127	61.5
DBFPY6	6000	(2044+150)×986×500	0.65-4X2	1.09X2	2/2	150	250	78.1	3.7	104	79.3	1.9	25.9	134	62.5
DBFPY6I			0.65-4X2	1.09X2		220	330							138	63.5
DBFPZ1	1000	(680+150)×986×380	0.175-4	0.34	1/1	90	234	15.8	0.8	44	15	0.4	9.8	49	52
DBFPZ1I			0.275-4	0.44		175	321							50	55
DBFPZ1.5	1500	(875+150)×986×380	0.275-4	0.44	1/1	70	227	24	1.2	57.7	22.6	0.5	12.6	56	55
DBFPZ1.5I			0.425-4	0.79		170	320							58	58
DBFPZ2	2000	(872+150)×986×500	0.35-4	0.63	1/1	160	300	31.4	1.5	46.8	30	0.7	10.6	67	56.5
DBFPZ2I			0.55-4	0.84		230	381							68	59.5
DBFPZ2.5	2500	(1018+150)×986×500	0.45-4	0.83	1/1	140	265	39.7	1.9	58.9	37.5	0.9	13.1	75	60
DBFPZ2.5I			0.55-4	0.84		210	356							75	61
DBFPZ3	3000	(1166+150)×986×500	0.65-4	1.09	1/1	85	250	49.5	2.4	101.1	45.5	1.1	21.1	81	62
DBFPZ3I			0.65-4	1.09		150	330							81	62
DBFPZ4	4000	(1458+150)×986×500	0.35-4X2	0.63X2	2/2	150	300	65.5	3.1	81.6	60.5	1.5	17.2	115	58
DBFPZ4I			0.55-4X2	0.84X2		215	381							119	61
DBFPZ5	5000	(1752+150)×986×500	0.45-4X2	0.83X2	2/2	120	265	80.4	3.8	76.5	74.8	1.8	16.4	129	60.5
DBFPZ5I			0.55-4X2	0.84X2		210	356							133	61.5
DBFPZ6	6000	(2044+150)×986×500	0.65-4X2	1.09X2	2/2	115	250	98.7	4.7	109.9	90.5	2.2	22.8	142	62.5
DBFPZ6I			0.65-4X2	1.09X2		185	330							146	63.5

Rated condition: Cooling- entering air temperature of 35°C DBT and 28°C WBT; entering water temperature of 7°C.
Heating- entering air temperature of 7°C DBT; entering water temperature of 60°C. leaving temperature difference of 50°C.

Note: 1. Connect position- left connect, when it comes to face inlet vent and the coil connector is on the left of AHU; opposition is right connect
2. Related model with Y means rated capacity unit, model with Z means high capacity unit, model with I means high ESP unit.
3. Input power means total input power by unit level.

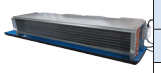
Model	Width (unit + control box) *length*height	Air flow rate (m^3/h)	ESP (Pa)	TP (Pa)	Input power (kW)	Unit weight (kg)	Noise level (dB(A))
DFPY2	(1018+154) ×986×380	2000	95	297	0.79×1	65	58.2
DFPZ2		2000	65	297	0.79×1	67	58.2
DFPY3	(1458+154) ×986×380	3000	130	320	0.79×2	92	58.5
DFPZ3		3000	100	320	0.79×2	95	58.5
DFPY4	(1752+154) ×986×380	4000	85	297	0.79×2	105	60
DFPZ4		4000	55	297	0.79×2	109	60

Note: 1. Unit capacity refer to DBFP(X) w/ same air flow rate.
2. Related model with Y means rated capacity unit, model with Z means high capacity unit.
3. Input power means total input power by unit level.

Note: Please refer to *Design, Installation and Commissioning Manual for Aqua-flow™ VWV System* for nomenclature and detailed specifications

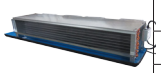
Technical parameters for air conditioner terminals

Compact ducted fan coil unit (42CE)/Quiet ducted fan coil unit (42CN)



42CE

Performance	Model	2-row unit parameters						3-row unit parameters								
		002	003	004	005	006	008	002	003	004	005	006	008	010	012	014
Rated airflow rate m^3/h	High	340	530	700	880	1020	1430	340	510	680	850	1020	1360	1700	2040	2380
	Mid	270	420	560	700	810	1140	265	405	535	680	790	1060	1360	1595	1904
	Low	200	310	420	520	610	850	195	305	405	510	585	790	1020	1180	1428
Cooling capacity W		1900	2820	3640	4500	5400	7200	2300	3200	4150	5000	6200	8100	9800	11500	13500
Heating capacity W		3100	4400	5820	6900	8400	11160	3600	5100	6450	7870	9300	12500	15200	17200	20500
Input power W	12 Pa	32	46	56	75	94	134	32	46	56	75	94	134	150	180	225
	30 Pa	40	54	72	87	102	155	40	52	72	87	102	155	172	210	240
	50 Pa	46	65	84	98	112	174	46	63	84	98	112	174	195	236	290
Noise level dB(A)	12 Pa	36	38	41	43	45	46	36	38	41	43	45	46	47	50	51
	30 Pa	40	41	44	46	47	48	40	41	44	46	47	48	49	51	53
	50 Pa	42	44	46	47	49	50	42	44	46	47	49	50	51	53	54
Electric heater	Quantity	1					2	1					2		2	
	Power W	1000	1200	1500	1800	2200	1200	1000	1200	1500	1800	2200	1200	1500	1800	2200
Net weight kg		12.7	14.2	16.1	17.4	18.5	25.8	13.4	14.9	16.9	18.2	19.5	26.9	29.5	33.6	39.5
Outline dimensions mm	L	890	970	1090	1170	1410	1650	890	970	1090	1170	1410	1650	1770	2010	2250
	W	466						466								
	H	230						230								
Options		Return air plenum						Return air plenum								



42CN

Performance	Model	2-row unit parameters						3-row unit parameters								
		002	003	004	005	006	008	002	003	004	005	006	008	010	012	014
Rated airflow rate m^3/h	High	340	530	700	880	1020	1430	340	510	680	850	1020	1360	1700	2040	2380
	Mid	270	420	560	700	810	1140	265	405	535	680	790	1060	1360	1595	1904
	Low	200	310	420	520	610	850	195	305	405	510	585	790	1020	1180	1428
Cooling capacity W		1900	2820	3640	4500	5400	7200	2300	3200	4150	5000	6200	8100	9800	11500	13500
Heating capacity W		3100	4400	5820	6900	8400	11160	3600	5100	6450	7870	9300	12500	15200	17200	20500
Input power (AC) W	12Pa	32	46	56	75	94	134	32	46	56	75	94	134	150	180	225
	30Pa	42	54	72	87	106	155	42	52	72	87	106	155	172	210	240
	50Pa	46	65	84	98	116	174	46	63	84	98	116	174	195	236	290
Input power (DC) W	12Pa	18	23	33	45	54	64	18	23	33	45	54	64	88	116	/
	30Pa	22	32	45	57	66	75	22	32	45	57	66	75	111	146	/
	50Pa	30	45	63	72	88	115	30	45	63	72	88	115	121	/	/
Noise level dB(A)	12Pa	34	36	38	42	44	43	34	36	38	42	44	43	46.5	48.5	48.5
	30Pa	37.5	39.5	41.5	43.5	44.5	46	37.5	39.5	41.5	43.5	44.5	46	48.5	49.5	51
	50Pa	41	43	44.5	45.5	46.5	47.5	41	43	44.5	45.5	46.5	47.5	50	50.5	52
Electric heater	Quantity	1					2	1					2		2	
	Power W	1000	1200	1500	1800	2200	1200	1000	1200	1500	1800	2200	1200	1500	1800	2200
Net weight kg		12.7	14.2	16.1	17.4	18.5	25.8	13.4	14.9	16.9	18.2	19.5	26.9	29.5	33.6	39.5
Outline dimensions mm	L	890	970	1090	1170	1410	1650	890	970	1090	1170	1410	1650	1770	2010	2250
	W	466						466								
	H	230						230								
Options		Return air plenum						Return air plenum								

Note: The performance data in the table is measured at a high airflow rate with corresponding residual pressure.
Cooling capacity is measured at an inlet cold water temperature of 7°C, inlet air temperature of 27°C DBT/19.5°C WBT, and inlet-outlet temperature difference of 5°C.
Heating capacity is measured at an inlet hot water temperature of 60°C, inlet air temperature of 21°C DBT, and the same water flow as for cooling.
Noise level is measured at a location 1m from both the front and bottom of the unit in a semi-anechoic room.
The electric heater applies only to the units with this option.

Note: Please refer to *Design, Installation and Commissioning Manual for Aqua-flow™ VWV System* for nomenclature and detailed specifications

High ESP IDU (suspending AHU)

Model	Air flow rate (CMH)	Width (unit + control box) *length*height	Input power (KW)	ESP (Pa)	TP (Pa)	Cooling capacity (kw)	Cooling WDP (Kpa)	Heating capacity (kw)	Heating WPD (Kpa)	Unit weight (kg)	Noise level (dB(A))
DBFP1	1000	(680+154)×986×380	0.34	130	234	5.0	10.1	11.2	11.3	46	52
DBFP1I			0.44	220	321					47	55
DBFP1.5	1500	(875+154)×986×380	0.44	115	227	7.8	14.5	17.0	17.3	53	55
DBFP1.5I			0.79	215	320					55	58
DBFP2	2000	(872+150)×986×500	0.63	195	300	11.1	22.0	23.0	24.1	63	56.5
DBFP2I			0.84	280	381					64	59.5
DBFP2.5	2500	(1018+150)×986×500	0.83	165	265	13.9	25.8	28.7	28.1	67	60
DBFP2.5I			0.84	250	356					70	61
DBFP3	3000	(1166+150)×986×500	1.09	120	250	16.9	30.0	34.8	32.4	75	62
DBFP3I			1.09	200	330					75	62
DBFP4	4000	(1458+150)×986×500	0.63X2	185	300	22.1	28.3	45.7	30.9	108	58
DBFP4I			0.84X2	250	381					112	61
DBFP5	5000	(1752+150)×986×500	0.83X2	160	265	28.9	43.8	58.2	45.6	123	60.5
DBFP5I			0.84X2	250	356					127	61.5
DBFP6	6000	(2044+150)×986×500	1.09X2	150	250	34.5	57.2	69.5	59.5	134	62.5
DBFP6I			1.09X2	220	330					138	63.5
DBFPX1	1000	(680+150)×986×380	0.34	90	234	6.4	8.3	13.0	8.2	49	52
DBFPX1I			0.44	175	321					50	55
DBFPX1.5	1500	(875+150)×986×380	0.44	70	227	10.0	10.9	19.6	10.7	56	55
DBFPX1.5I			0.79	170	320					58	58
DBFPX2	2000	(872+150)×986×500	0.63	160	300	12.7	8.6	26.0	8.2	67	56.5
DBFPX2I			0.84	230	381					68	59.5
DBFPX2.5	2500	(1018+150)×986×500	0.83	140	265	16.1	18.8	32.6	10.9	75	60
DBFPX2.5I			0.84	210	356					75	61
DBFPX3	3000	(1166+150)×986×500	1.09	85	250	20.2	28.3	39.2	15.0	81	62
DBFPX3I			1.09	150	330					81	62
DBFPX4	4000	(1458+150)×986×500	0.63X2	150	300	27.2	31.3	52.6	23.6	115	58
DBFPX4I			0.84X2	215	381					119	61
DBFPX5	5000	(1752+150)×986×500	0.83X2	120	265	37.0	61.5	67.0	52.8	129	60.5
DBFPX5I			0.84X2	210	356					133	61.5
DBFPX6	6000	(2044+150)×986×500	1.09X2	115	250	44.0	66.0	80.2	57.0	142	62.5
DBFPX6I			1.09X2	185	330					146	63.5

Rated condition: Cooling- entering air temperature of 27°C DBT and 19.5°C WBT; entering water temperature of 7°C, entering and leaving temperature difference of 5°C.
Heating- entering air temperature of 15°C DBT; entering water temperature of 60°C. entering and leaving temperature difference of 10°C.

Note: 1. Connect position- left connect, when it comes to face inlet vent and the coil connector is on the left of AHU; opposition is right connect
2. Related model with X means high capacity unit, model with I means high ESP unit..
3. Input power means total input power by unit level.

Model	Width (unit + control box) *length*height	Air flow rate (CMH)	ESP (Pa)	TP (Pa)	Input power (KW)	Input power (KW)	Noise level (dB(A))
DFP2	(1018+154)×986×380	2000	95	297	0.79×1	65	58.2
DFPX2		2000	65	297	0.79×1	67	58.2
DFP3	(1458+154)×986×380	3000	130	320	0.79×2	92	58.5
DFPX3		3000	100	320	0.79×2	95	58.5
DFP4	(1752+154)×986×380	4000	85	297	0.79×2	105	60
DFPX4		4000	55	297	0.79×2	109	60

Note: 1. Unit capacity refer to DBFP(X) w/ same air flow rate.
2. Related model with X means high capacity unit, model with I means high ESP unit..
3. Input power means total input power by unit level.

Note: Please refer to *Design, Installation and Commissioning Manual for Aqua-flow™ VWV System* for nomenclature and detailed specifications

Casette type fan coil unit(42GWC)

Performance	Model	003	004	005	006	008	010	012	014
Rated air flow rate m^3/h	High	540	680	850	1020	1360	1700	2040	2380
	Mid	430	540	680	810	1080	1300	1570	1830
	Low	350	440	550	660	880	1010	1210	1410
Cooling capacity	W	3200	3700	5800	6600	8700	9100	10900	12600
Heating capacity	W	4900	5800	9000	10200	13500	13700	16300	18900
Input power	(AC)W	35	48	50	60	102	150	160	190
Input power	(DC)W	14	25	22	28	50	/	/	/
Noise level	dB(A)	35/ 32/ 29	40/ 35/ 31	35/ 31/ 27	37/ 33/ 29	45/ 40/ 35	48 /45 /41	50 /47 /44	52 /49 /46
Panel dimensions mm		720*720		960*960			1050*1050		
Unit dimensions mm		575*575 *298		825*825 *298			930*930*290		
Panel weight kg		2.5	2.5	5.0	5.0	5.0	6.5	6.5	6.5
Unit weight kg		16.5	16.5	37.0	37.0	39.6	43.5	43.5	43.5

Note: 1. The performance data in the table is measured at a high airflow rate.
2. Cooling capacity is measured with an inlet cold water temperature of 7°C, inlet air temperature of 27°C DBT and 19.5°C WBT, and inlet-outlet temperature difference of 5°C. Heating capacity is measured at an inlet hot water temperature of 60°C, inlet air temperature of 21°C DBT, and inlet-outlet temperature difference of 10°C.
3. Noise level is measured at a location 1m from both the front and bottom of the unit in a semi-anechoic room.

Hi-wall fan coil unit (42CM)

Performance	Model	002	003	004	005
Rated air flow rate m^3/h	High	360	510	700	850
	Mid	300	370	450	740
	Low	230	290	375	570
Cooling capacity	W	1980	2950	3700	5100
Heating capacity	W	3000	4450	5550	7650
Input power	(DC)W	15	20	25	32
Noise level	dB(A)	36/ 33/ 30	39/ 35/ 31	41/ 36/ 32	43/ 39/ 35
Outline dimensions mm		876*228*300		1063*240*310	
Unit weight kg		12	13	16	16

Note: 1. The performance data in the table is measured at a high airflow rate.
2. Cooling capacity is measured with an inlet cold water temperature of 7°C, inlet air temperature of 27°C DBT and 19.5°C WBT, and inlet-outlet temperature difference of 5°C. Heating capacity is measured at an inlet hot water temperature of 60°C, inlet air temperature of 21°C DBT, and inlet-outlet temperature difference of 10°C.
3. Noise level is measured at a location 1m from both the front and bottom of the unit in a semi-anechoic room.

Note: Please refer to *Design, Installation and Commissioning Manual for Aqua-flow™ VWV System* for nomenclature and detailed specifications

Technical parameters for controller

Model	Integrated installation: HSM7IPRTA	Flush mounted installation: HSM7RPKTA
Name	Intelligent system manager	
Dimensions (W×H×D)	300×250×120 mm	215×175×60 mm
Rated power supply	220~240V ± 10%/1ph/50-60Hz	
Appearance	7' color LCD touch screen with graphical display in Chinese and English	
Basic functions	Controllable components: up to 8 outdoor units, 4 heat recovery fresh air handling units, 128 indoor units and 1 hydronic kit	
Advanced functions	Zone control, schedule control, pump VFD control, self adaptive variable water temperature control, fresh air unit CO_2 concentration control, energy metering function	
Network connection	TCP/IP (connected to LAN and controlled via a web browser) and BAC-Net (connected to building automation control system)	

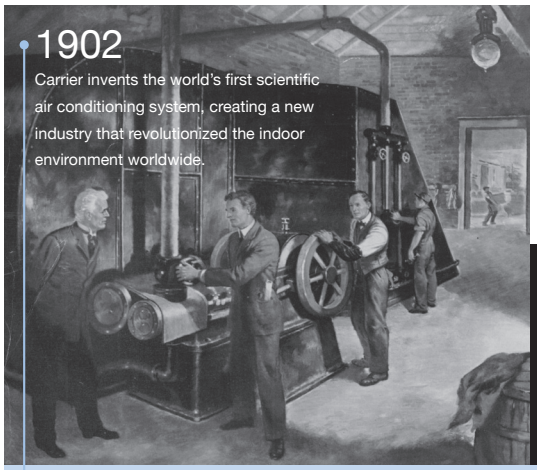
Model	CTC100/200BR	CTC100/200GR	CTC100/200SR
Color	Black	Gold	Silver
Name	Indoor thermostat		
Dimensions (W×H×D)	86×86×40 mm		
Rated power supply	CTC100: AC 220 ~ 242V, 50/60Hz CTC200: DC 12V (DC brushless fan-coil unit only)		
Appearance	LED back light, soft key, graphical display in English		
Basic functions	On/Off; Operating mode selection; Cool, heat, Ventilation, Dehumidify; Sleep mode setting; Wind speed setting; Temperature setting CTC100 applied for 2 pipes, 2 pipes + E-heater, floor heating, and floor heating + 2 pipes CTC200 applied for 2 pipe, and 2 pipe + E-heater		
Advanced functions	Real-time clock setting; Weekly timer setting; User parameter setting		
Network connection	CCN port		
Options	Wireless remote control: CTCIR01		

Model	30RBM90E003
Name	Repeater
Dimensions (WxHxD)	70x120x25mm
Rated power supply	Build-in power adapter,220V-240V+/-10%1P,50-60Hz
Shell material	ABS plastic
Basic function	Enhance the signal between thermostats and system manager Suggestion: add one repeater per 400 meter control line or per 40 thermostats

Note: Please refer to *Design, Installation and Commissioning Manual for Aqua-flow™ VWV System* for nomenclature and detailed specifications

Carrier air-conditioner milestones

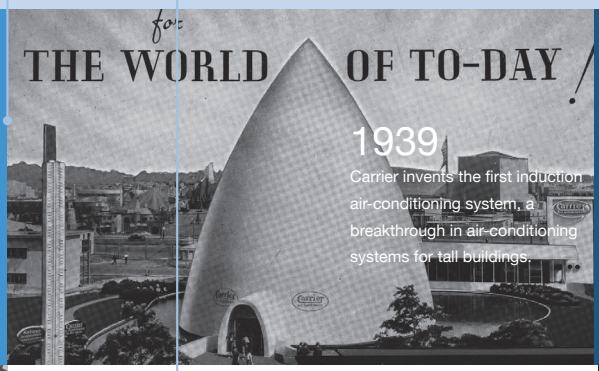
1902
Carrier invents the world's first scientific air conditioning system, creating a new industry that revolutionized the indoor environment worldwide.



1911
Dr. Carrier publishes his basic principles of temperature and humidity control, which later evolved into his "Rational Psychrometric Formulae" paper and laid the foundation for modern air conditioning calculation.

1922
Carrier develops the first centrifugal water chiller, now displayed at the Washington State Museum.

1939
Carrier invents the first induction air-conditioning system, a breakthrough in air-conditioning systems for tall buildings.

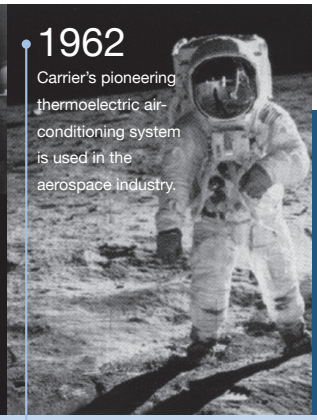


1945
Carrier produces the world's first lithium bromide absorption chiller.

1952
Carrier develops the first residential central air conditioning system.

1955
Carrier, an early first champion of energy conservation, develops the first automatic variable airflow supply fan, controlled by system pressure.

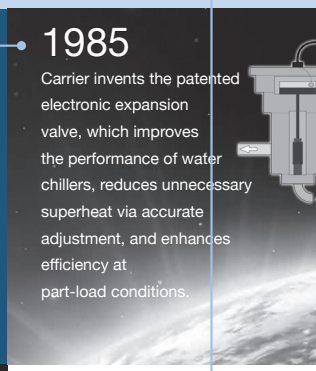
1962
Carrier's pioneering thermoelectric air-conditioning system is used in the aerospace industry.



1972
Carrier manufactures the first centrifugal water chiller with single unit cooling capacity of 10,000 RTH.

1982
Carrier introduces the first centrifugal water chiller with a titanium heat exchange pipe, completely overcoming pipe corrosion issues.

1985
Carrier invents the patented electronic expansion valve, which improves the performance of water chillers, reduces unnecessary superheat via accurate adjustment, and enhances efficiency at part-load conditions.



1992
Carrier develops the cone diffuser for eco-friendly refrigerant. Used in a positive-pressure environment, it improves the efficiency of the centrifugal compressor by reducing loss in the diffusion section.

1994
Carrier adopts the patented expansion turbine technology in its centrifugal water chillers to replace conventional throttle technology used by the rest of the industry. Carrier receives the Energy Saver Award from the US Department of Energy.

2009

Carrier brings the 30XQ air-cooled screw heat pump to market.Carrier introduces the NGA air-cooled scroll water chiller/heat pump. Carrier launches the 30XW water-cooled screw chiller, with models ranging from 133 RTH o 500 RTH, all of which achieve China's national energy efficiency grade 1 or 2.

One hundred years of innovation.

2002

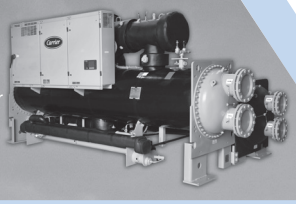
Carrier and its industry peers jointly celebrate the 100 anniversary of Wills H. Carrier's invention of air conditioning.

2005

Carrier globally launches Starfire, the 30RB/RQ large air-cooled scroll chiller/heat pump that is the first to use the eco-friendly refrigerant HFC-410A .

2010

Carrier launches 23XRV, the world's first variable-frequency water-cooled screw chiller, achieving 40% higher energy efficiency than the industry standard by combining a 3-rotor screw compressor with leading inverter technologies.



2013
Innovative Carrier AquaFlow™ VWV System

AQUAFLOW™ VWV system

1999

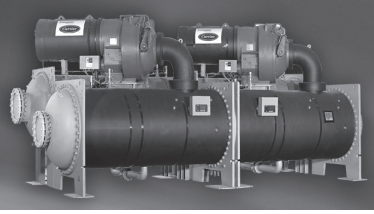
Carrier establishes a global strategic alliance with Toshiba Corporation to engage in technology research and develop new residential and commercial air-conditioning products.

2006

Carrier globally launches the AquaForce water chiller, using HFC energy efficiency. It is also honored with the Chinese construction industry's Gold Energy-saving Air Conditioning Product Award

2008

Carrier launches the 19XRD twin-compressor centrifugal chiller with HFC-134a, raising the cooling capacity of a single unit to 3000 RTH and enhancing part-load energy efficiency by 7%



2011

The AdvanTE^{3}C Solutions Center is established in Shanghai, gathering experts in energy efficiency and environment protection from across the globe to engage in research and development of sustainable building solutions.

AdvanTE^{3}C
United Technologies
Building Experts in Efficiency and Environment

1996

Carrier launches the 30HXC water-cooled screw chiller and the 30GX air-cooled screw chiller, fully adopting the eco-friendly chlorine-free refrigerant HFC-134a.

It also launches a compact new centrifugal chiller with the latest centrifugal compression technology and HFC-134a refrigerant to achieve improved COP.

improve buildings™

We make the world a better place to live. We create comfortable, efficient, healthy, safe and secure environments, and ensure the global food supply is transported and preserved for safe consumption.

Carrier

United Technologies

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