Carrier

United Technologies

turn to the experts

THE BEST OF BOTH WORLDS

AQUAFLOW™

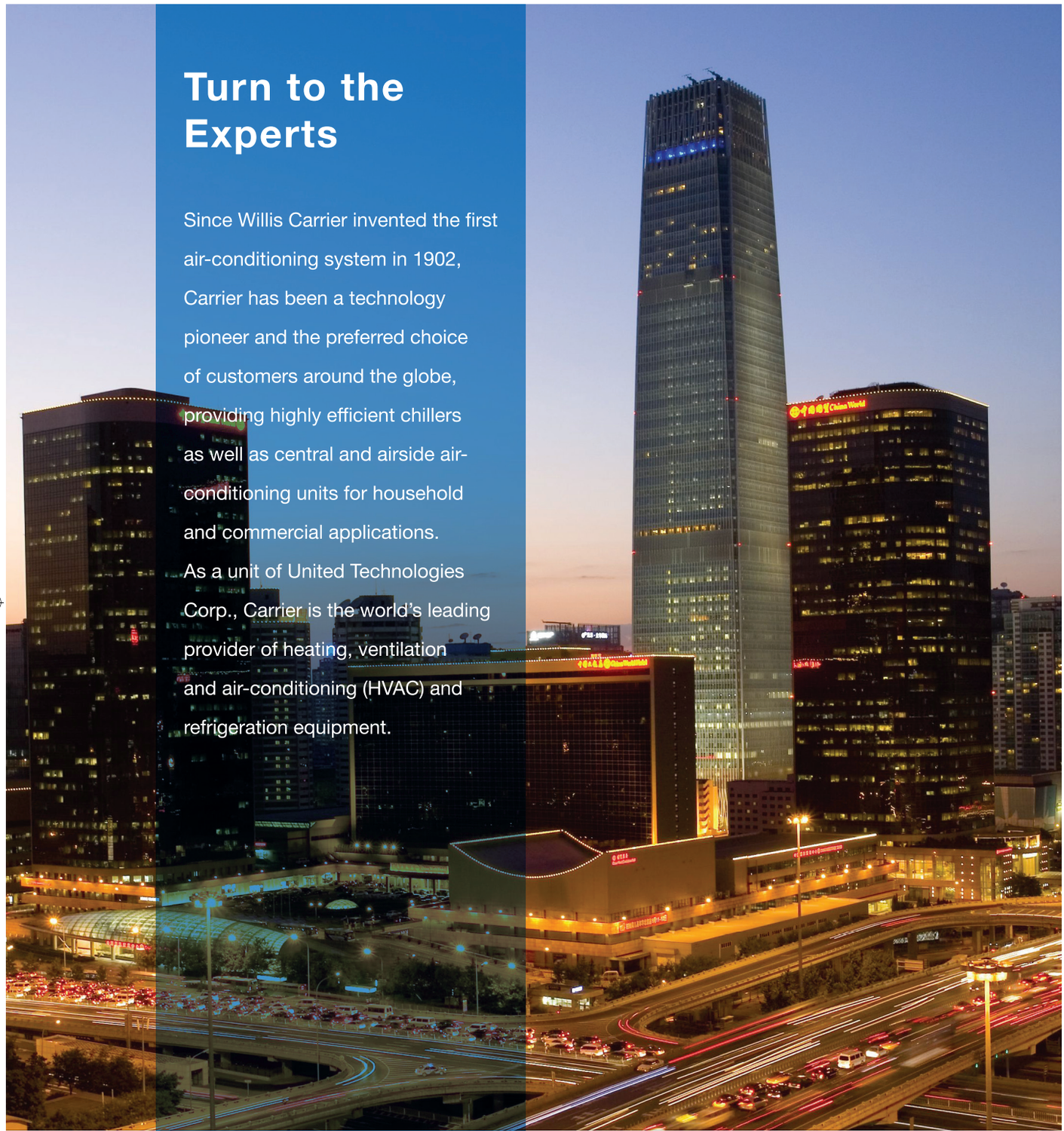
VWV system

Cooling capacity: 65~520 kW
Heating capacity: 68~544 kW

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.

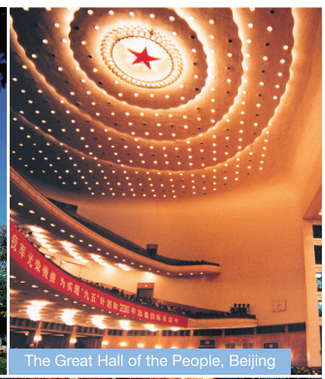
As a unit of United Technologies Corp., Carrier is the world's leading provider of heating, ventilation and air-conditioning (HVAC) and refrigeration equipment.



Contents


Shanghai Expo Boulevard

Beijing Wanda Plaza


The Great Hall of the People, Beijing

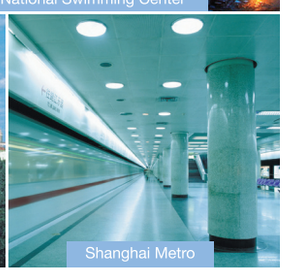

Hongkong International Airport


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: 65kW – 520kW

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

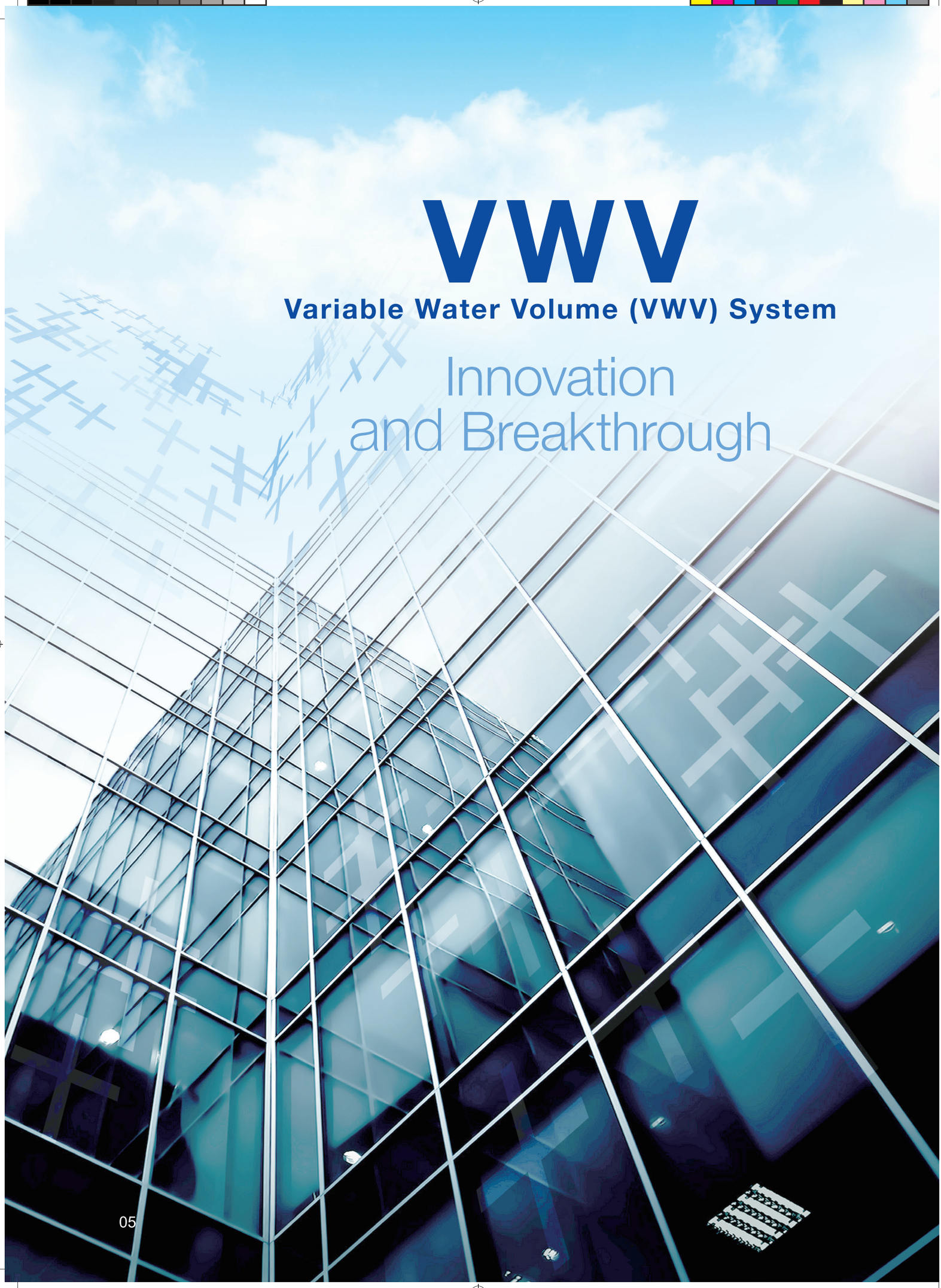
Versatile Applications


Villas


Shopping malls


Office buildings


Hotels


VWV
Variable Water Volume (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 Installa-tion and Mainte-nance	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% – 20% 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

Integrated intelligence

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	With 20% less cooling capacity, the system's indoor units are similar to those used in VRF systems and need no equipment layers or wall-mounted outdoor unit ventilation grilles.
	Initial investment	Better "first cost" than VRF (Outdoor unit sizing optimization).
Construction	Installation	Only water pipe and electrical connections are required, eliminating the risk of water leakage, with installation fees close to those for conventional variable flow systems.
	Commissioning	Optional auto-commissioning.
Service	Operation	Operating costs are reduced by 10% compared with conventional VRF and by 40% compared with conventional hydronic systems. The double compressors of the modular outdoor unit can be backed up interchangeably.
	Quality	The indoor temperature control accuracy is +/-0.5°C and humidity detection accuracy is +/-5%. Furthermore, the system is capable of continuous heating during winter. It provides non-stop heating during winter defrosting (multiple outdoor unit system) and maintains ideal indoor air quality while reducing the energy used by the fresh air unit by as much as 75%.
	Management	With zone control, time scheduling and energy metering functions built in, no extra hardware or software is needed.
After-sales service	Daily maintenance	The system is endowed with a centrally controlled auto-clean function and can also prevent freezing in winter.
	System modification	Outdoor units can be easily added, using existing piping, with significantly reduced labor costs and time requirements.

* The case study is based on a specific office project with an air-conditioning area of 1200m².

Single system capacity
65kW – 520kW

Intelligent system manager
Controls up to 8 outdoor units, 128 indoor units (thermostat), 4 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)

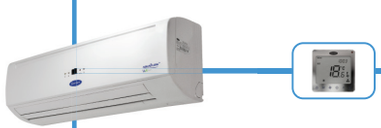
Modular outdoor unit (Self adaptive variable refrigerant evaporating temperature*)
65kW

VFD hydronic kit
5 models

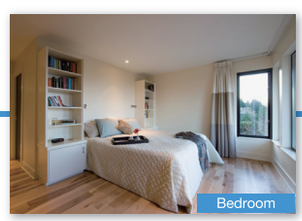
Compact ducted fan coil unit
15 models (1.9~13.5kW)

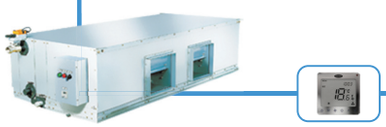
Quiet ducted fan coil unit
15 models (1.9~13.5kW)

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

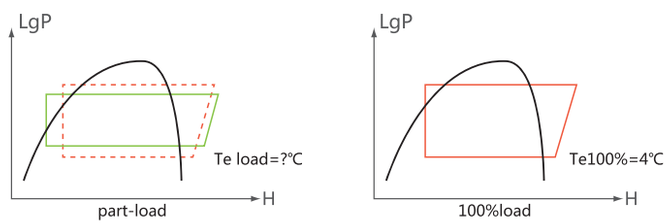

Exceptional reliability
Indoor comfort
Design flexibility
Seven Reasons to Choose VWV
Energy efficiency
Easy installation
Powerful controls
Investment flexibility

1. Leading Technologies and Energy Efficiency

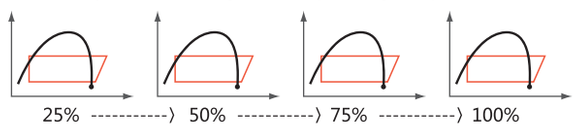
Energy saving: VWV VS VRF

Comparing part-load compressor operations

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

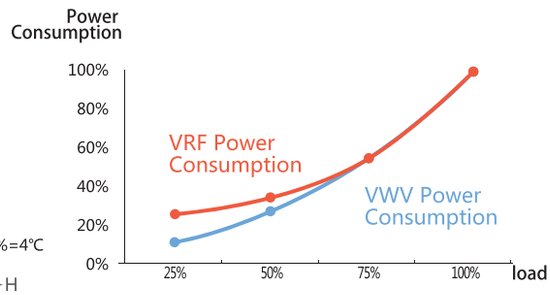


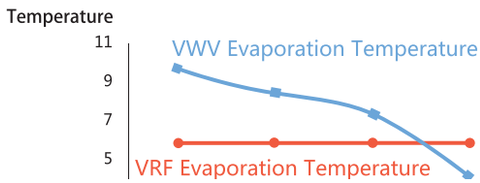
In a VRF system, the refrigerant evaporating temperature is set at 6℃



Under part load conditions, the VWV's unique technologies reduce

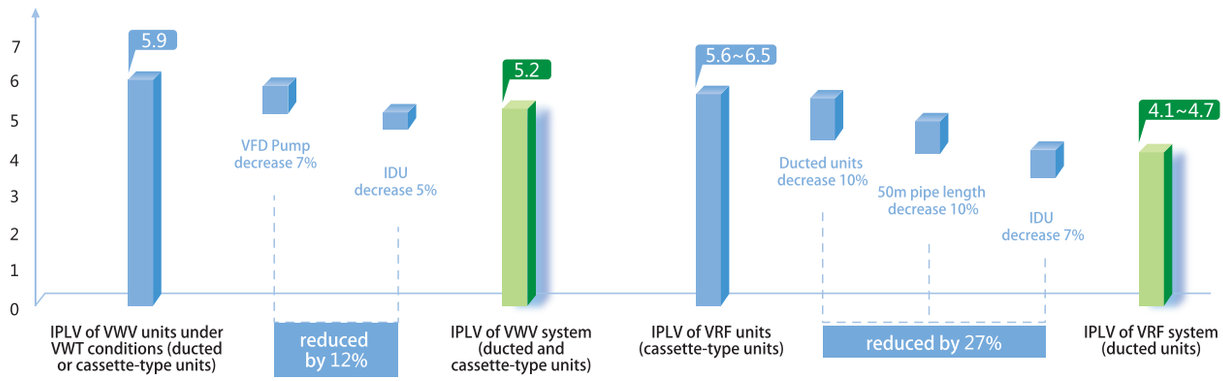
Power consumption drops rapidly under part-load conditions





Air-conditioning system efficiency

In practice, customers need to focus on the efficiency of air-conditioning system as a whole, rather than that of the outdoor unit (ODU) alone.

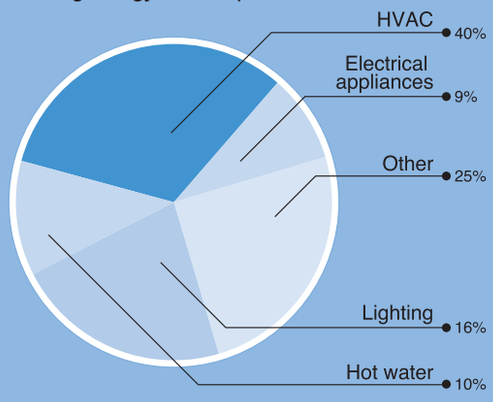


(AHRI Conditions) Compared to a variable refrigerant flow (VRF) system, the VWV system delivers 10~20% higher IPLV for greater energy saving.

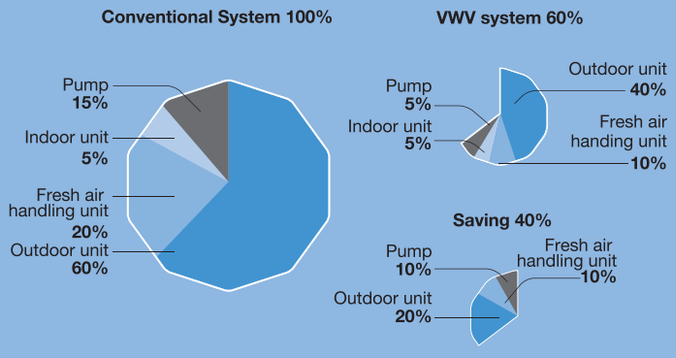
Energy saving: VWV VS conventional hydronic system

Air conditioning accounts for the largest proportion of energy consumed within a building

Building energy consumption



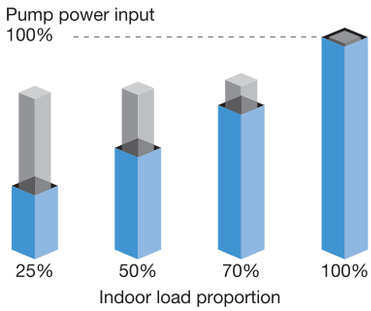
VWV VS conventional air cooled hydronic system



Key Energy-saving Measures

Variable frequency and flow control

VFD hydronic pump
System saving ~10%
Pump saving ~67%



At partial load, the system rapidly adjusts the frequency of the hydronic pump based on load variation and the number of outdoor units operating, thereby reducing energy consumption.

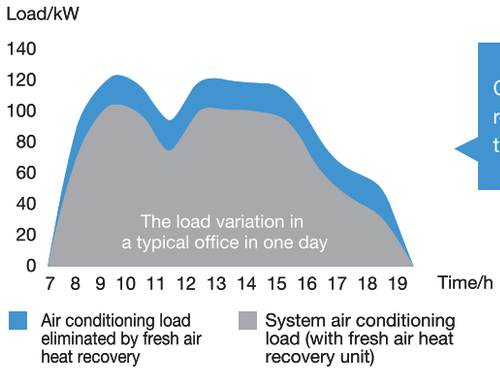
Water temperature auto-turning control

Dual compressor single-circuit
Self adaptive VWT / VRT
System saving ~20%
ODU saving ~25%

Uniquely, the VWV system self adaptive variable water temperature and refrigerant evaporation temperature. The leaving water temperature is set higher under part-load conditions to ensure indoor comfort (avoiding dryness caused by undercooling), while dual compressors are arranged in a single circuit to reduce power consumption.

Fresh air heat recovery

Fresh air heat recovery reduces
the outdoor unit load.
System saving ~7%
Fresh air unit saving ~50%

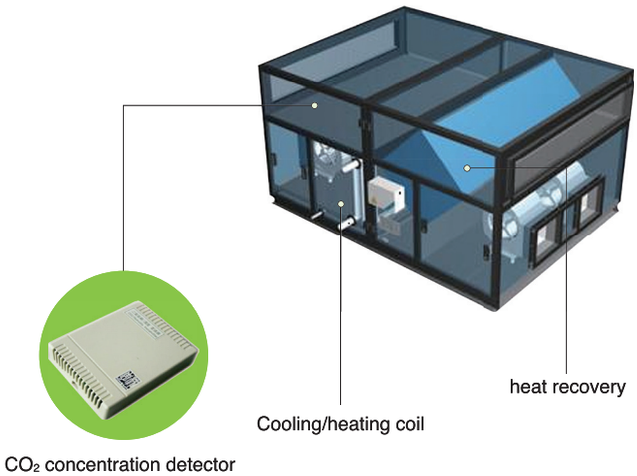


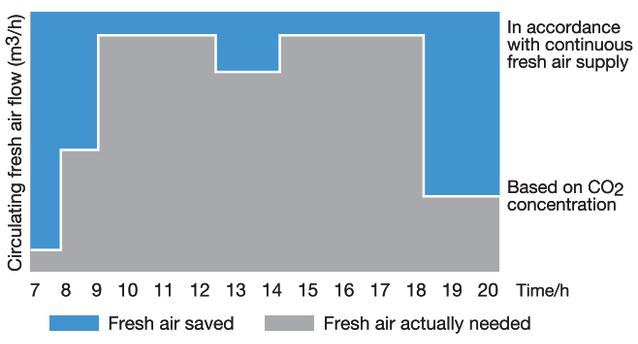
Carrier's new heat recovery fresh air handling unit (BFP) reduce ODU load 10%-15% (free cooling/heating for more than 50% of fresh air), saving initial investment.

Fresh air supplied on demand

Typical office building fresh air demand

CO_2 demand control ventilation
System saving ~3%
Fresh air unit saving ~25%



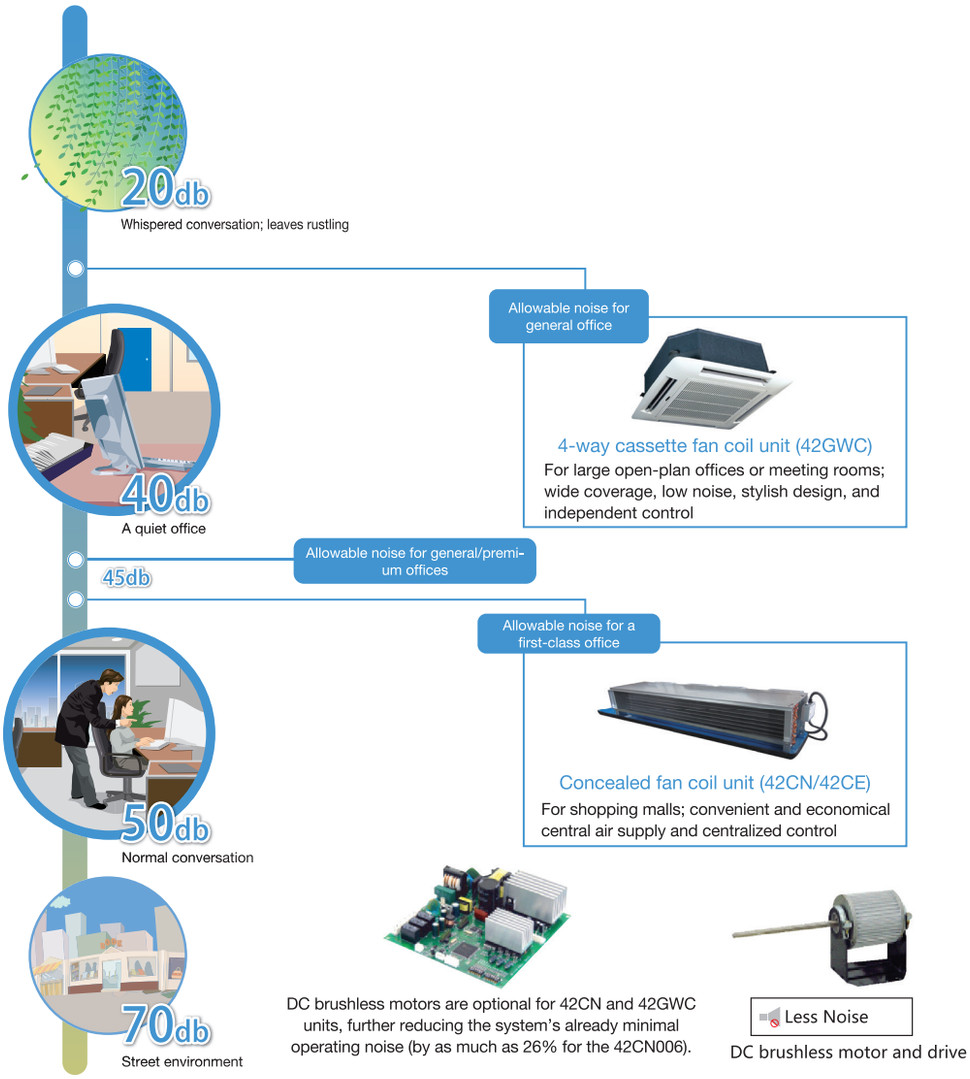


With an integrated CO_2 concentration detection device, the heat recovery fresh air handling unit (BFP) continuously monitors indoor CO_2 levels and intelligently starts or stops units on demand so as to reduce the energy needed for fresh air processing by the outdoor unit and fresh air discharge fan. 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).

2. Quiet Comfort and Pure Enjoyment

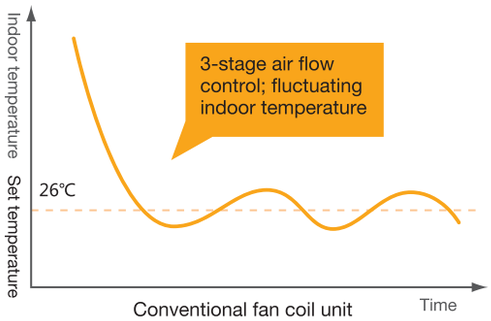
Low Indoor Noise



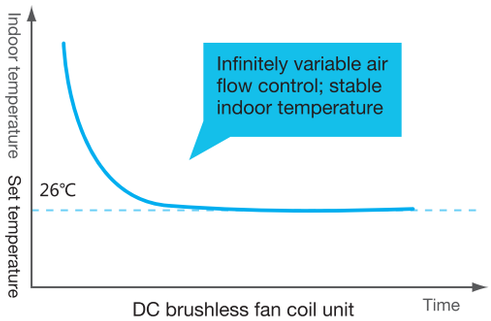
Maintaining Pleasant Indoor Temperature and Humidity

All too frequently, air-conditioning systems compromise indoor comfort by overcooling in summer and overheating in winter. With precise temperature and humidity control technologies, the Carrier AquaFlow™ variable water volume system ensures optimal indoor conditions for comfort, health, and productivity.

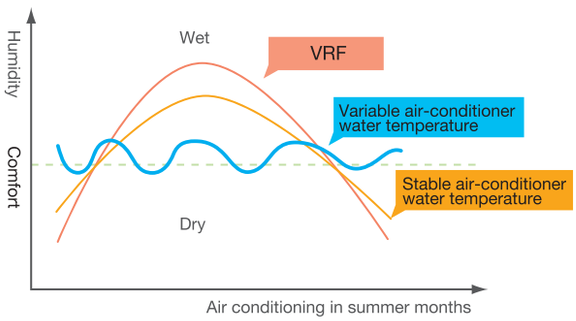
Precise indoor temperature and humidity detect control

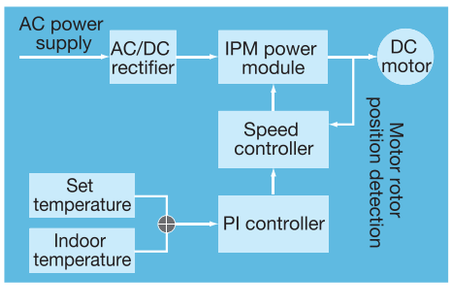


Conventional fan coil unit



DC brushless fan coil unit





Precise temperature control (+/-0.5°C)

Self adaptive variable water temperature control

Precise humidity sensing (+/-5%)

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/m³)*	700±50PPM(1260±90mg/m³)

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

Fresh air purifier (anti PM 2.5)

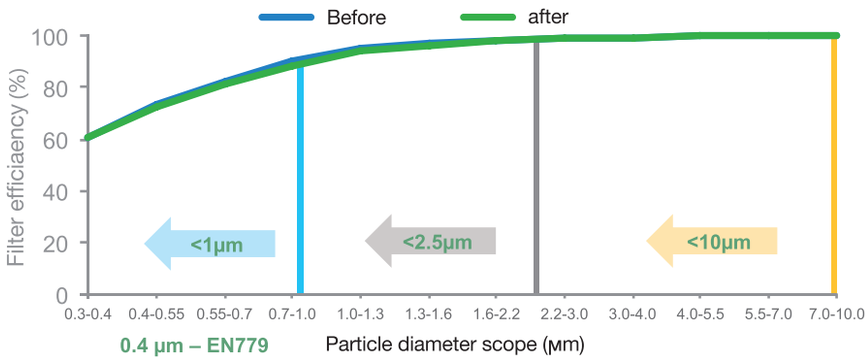
Optional fresh air purifier, including supply fan, primary filter and no charged medium filter

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

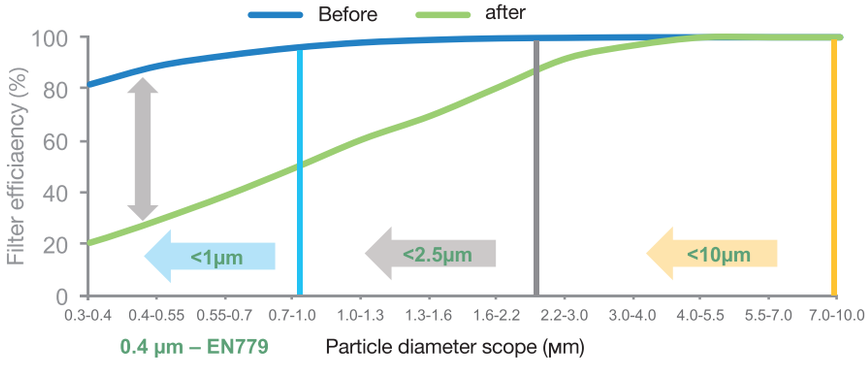
Filter efficiency high to **98.5%*** stably (anti PM 2.5)

*Efficiency value is for the particle of 0.1~2.5μm level

Benchmark of Carrier filter efficiency before and after discharge

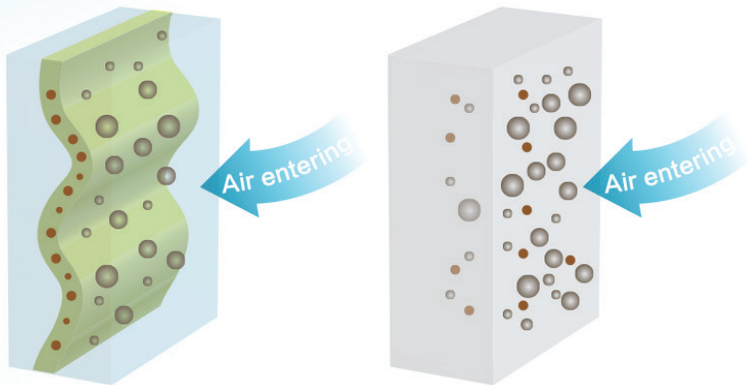


Benchmark of charged filter efficiency before and after discharge



Wave type design

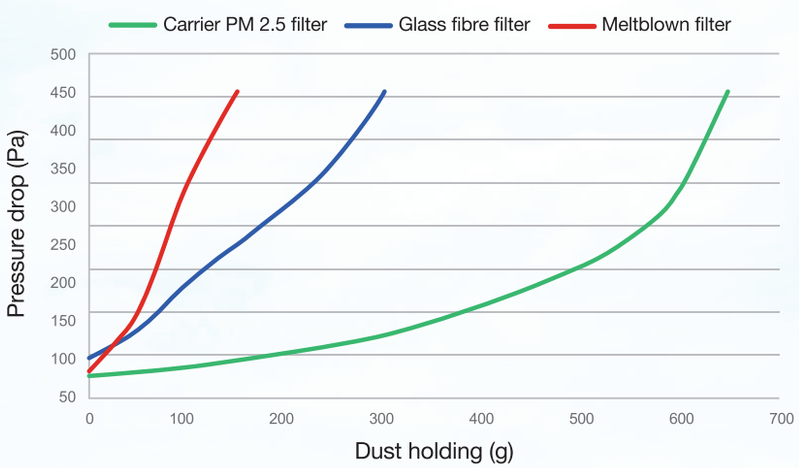
Longer life time due to
2–5 time of dust holding
compare to triditional filter



Carrier PM 2.5 filter

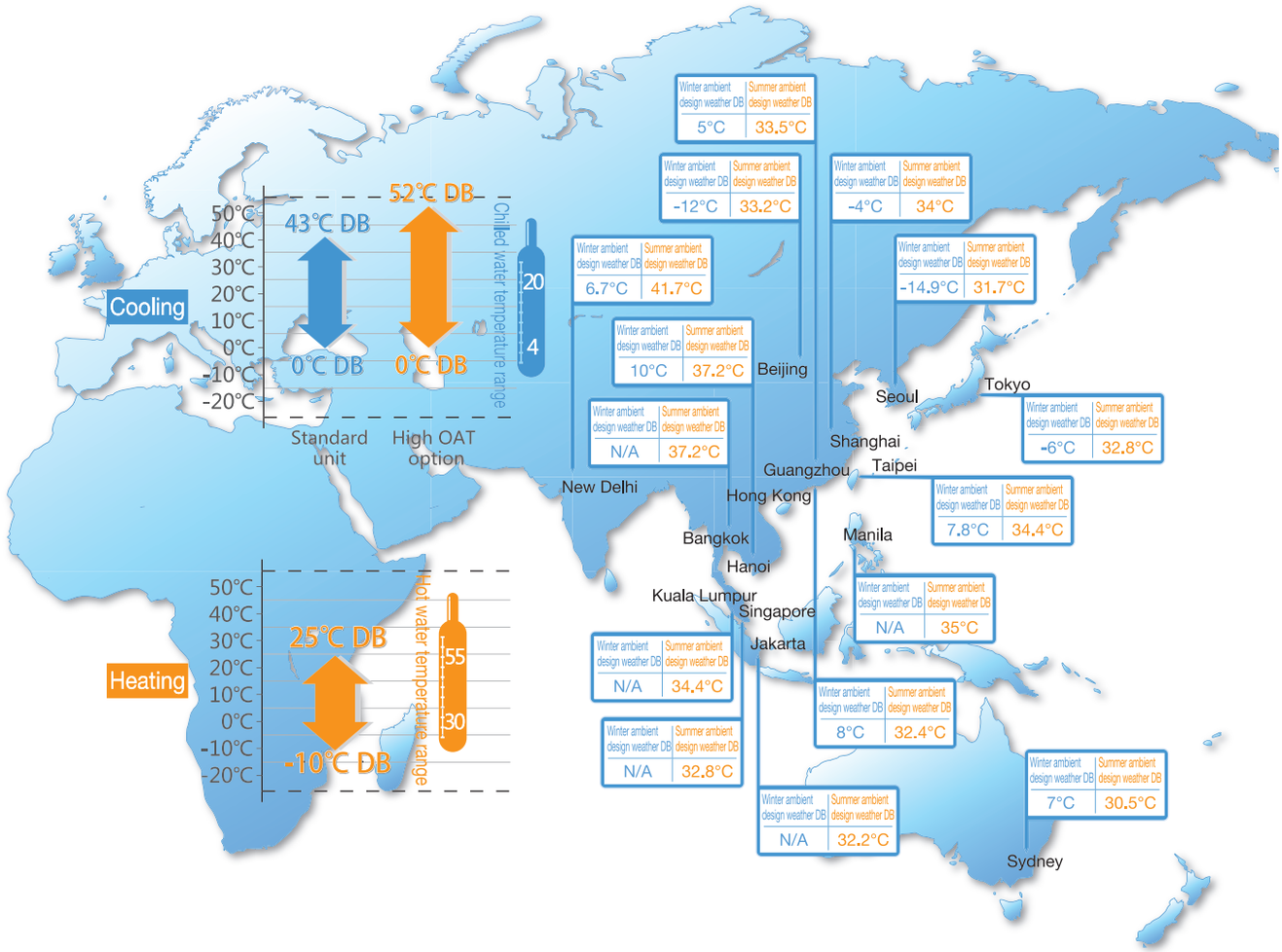
Traditional filter

Benchmark of pressure drop and dust holding



3. Exceptional Reliability and Stability

Wide Operating Range and High OAT option for in Extreme Weather



Intelligent Defrosting Control

The Carrier AquaFlow™ VWV system can provide continuous indoor heating even while defrosting the outdoor unit in winter.

1) Single unit defrosting control

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

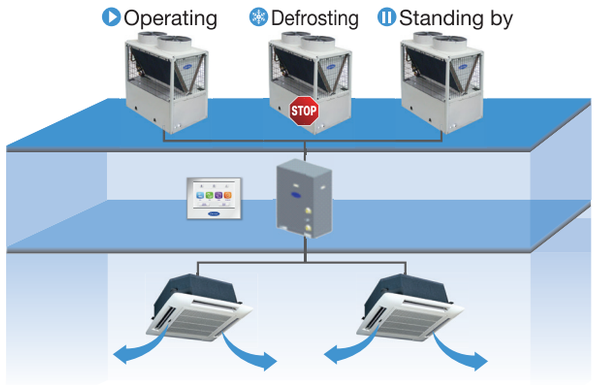
» The system dynamically analyzes frost buildup on the heat pump coil by measuring the difference between entering air temperature and air suction saturation temperature. When this “frost factor” reaches a predetermined value, automatic defrosting is triggered to avoid any loss of heat or water temperature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

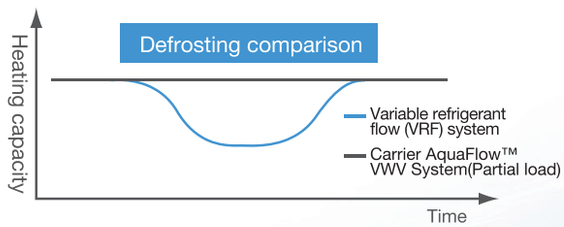
» Prior to shut-down, the unit will automatically determine the “frost factor” and decide whether residual frost needs to be cleaned from the coil to facilitate the next startup.

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.





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 high efficient outdoor unit Energy saving product (China GB)

» All products in the series achieve grade 2 energy efficiency (30RQH065).

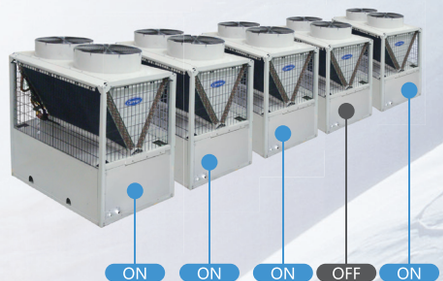
» Compressors in the modular outdoor unit can be backed up interchangeably and in combination to simplify servicing.

» 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 8 specifications, catering to different needs.

» Side-by-side installation.

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.

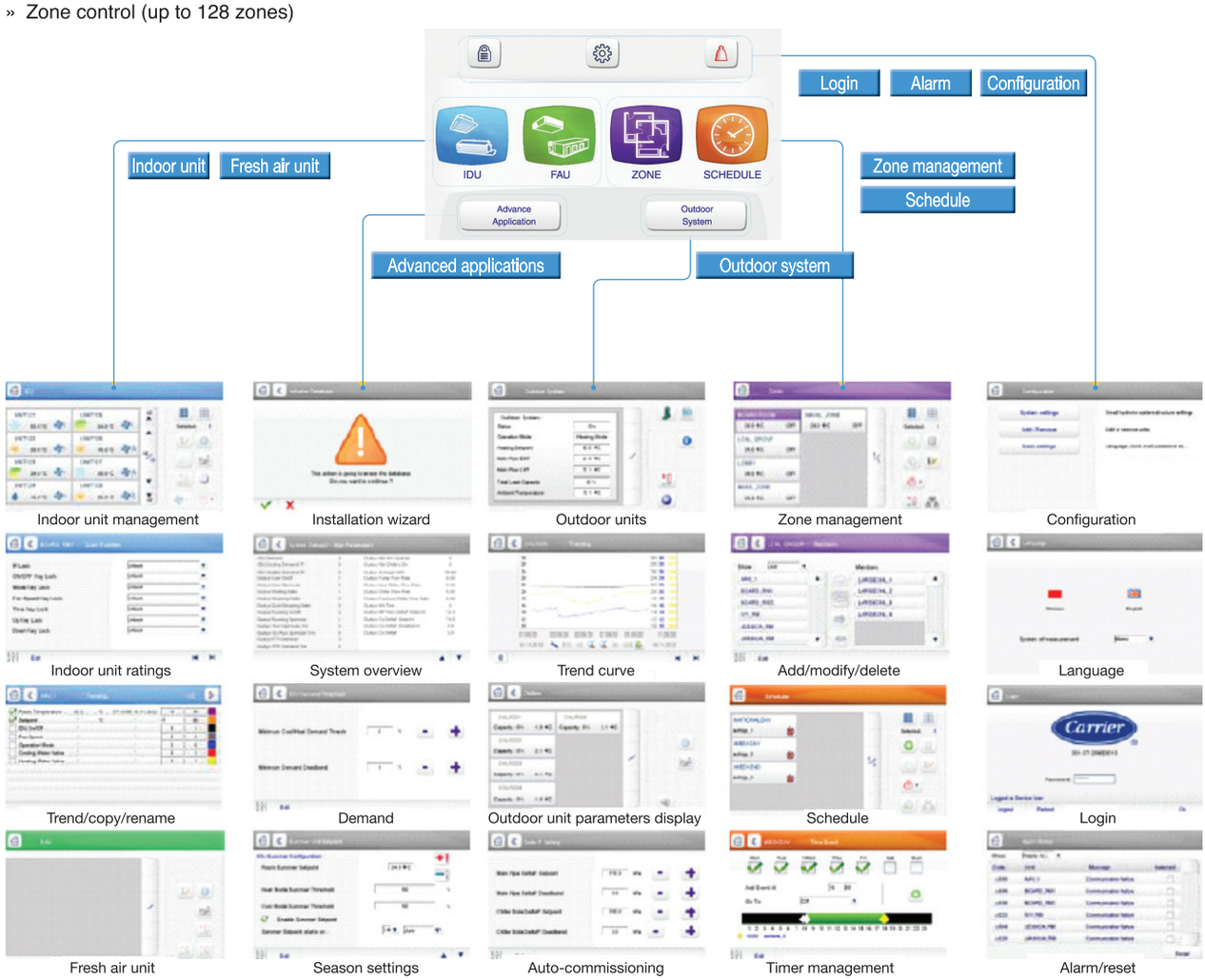
4. Intelligent Control and Powerful Functionality

New Networked Thermostat

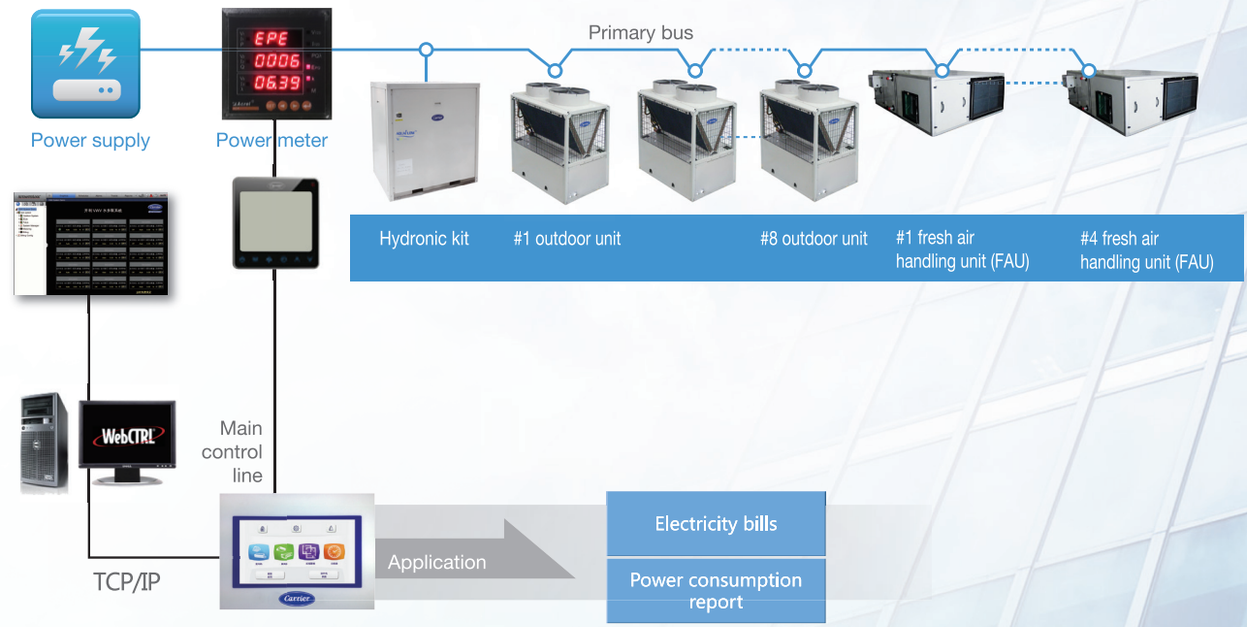
- » Easy operation with backlit LCD display and touch buttons
- » 4 operating modes: Cool, Heat, Ventilation, Dehumidify
- » Fan control; water valve control
- » Local weekly schedule control
- » Indoor temperature display and setting
- » Multiple colors available to complement interior design
- » Optional remote control for easy operation of multiple indoor units

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)
- » Schedule control (week/month/year)
- » Energy metering
- » Remote control and indoor unit locking functions



Energy metering structure of the Carrier AquaFlow™ VWV System



Power consumption statistics
» The system's overall electrical power consumption is tracked for analysis

Power consumption allocation
» Electrical power is allocated according to actual usage at each terminal

Generating bills
» Electricity bills are issued automatically for each tenant

Bill application
» Electricity bills can be itemized according to zones or terminals
» View billing history

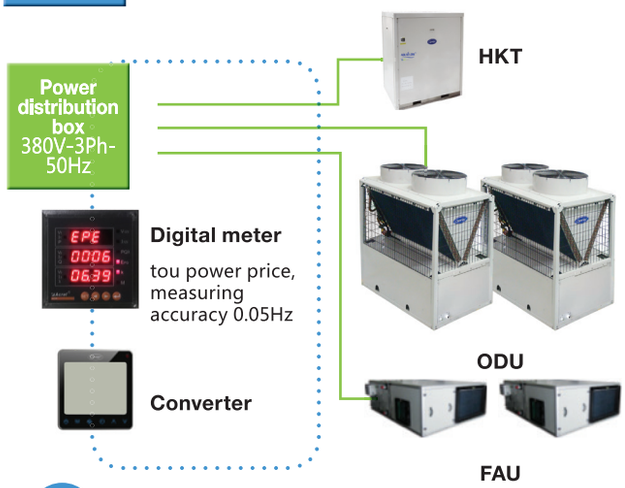
Applications

Office building | Shopping mall | Other projects where energy metering is required

Precise energy metering

Shared power consumption accurate collection (Per 2s)

Shared power = HKT power + ODU power + FAU power

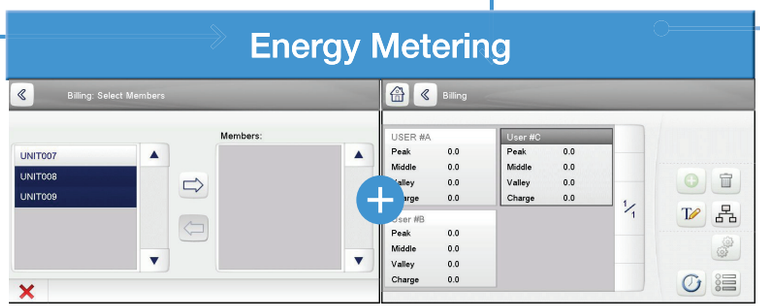


IDU capacity consumption accurate calculation (Per 10s)

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

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

1



3

4

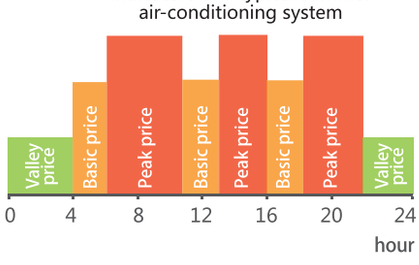
Tenant power consumption transform to Tenant bill

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

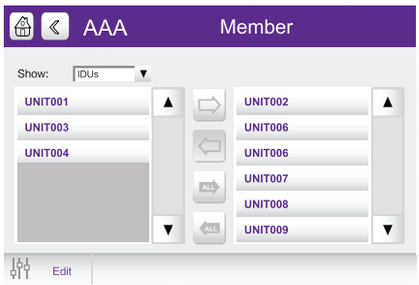
Tenant power consumption /30m = ∑ 10-second tenant power consumption

time \ Power (kWh)	A Tenant	B Tenant	C Tenant
14:00~14:30(2013/8/9)	0.46	0	1.58
14:00~14:30(2013/8/9)	0.39	0	1.77
14:00~14:30(2013/8/9)	0	0	1.09
14:00~14:30(2013/8/9)	0.41	0.29	0

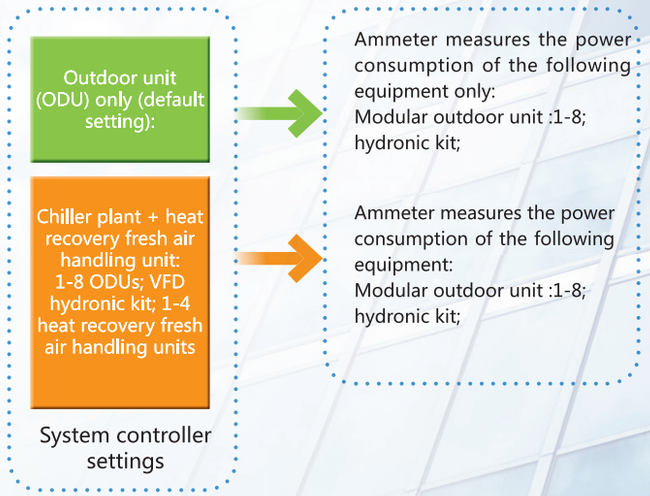
User-friendly Operation

» 1. Multiple units per tenant

User groups are defined according to indoor units (IDUs)



» 2. Multiple metering modes

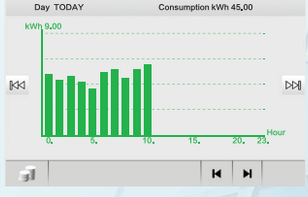


» 3. Electricity bills are issued automatically each month as plain text CSV files that can be viewed and edited in Microsoft Excel®

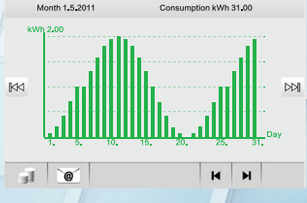
Bill for August 2013 (from 1st to 31st)					
Billing description	Peak-time power consumption (kWh)	Peak-time electricity cost (RMB)	Valley time power consumption (kWh)	Valley time electricity cost (RMB)	Total electricity cost (RMB)
Total power consumption	193	231.6	123	36.9	268.5
Shanghai A Industrial 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
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
.....	.....	.....	.....	.....	.....

» 4. Convenient historical data reports

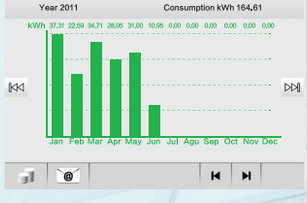
searched by date



searched by year



searched by month



Data Storage and Protection

» 1GB data storage capacity

» An uninterruptable power supply (UPS) is suggested as part of the emergency power strategy

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.

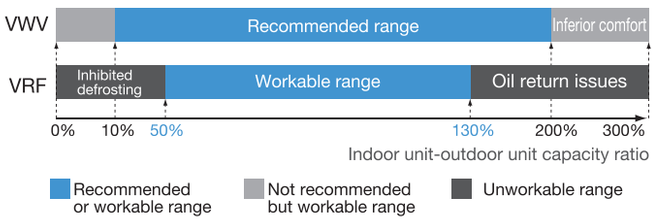
The management system can also be connected to the building automation system (BAS) via the build-in BAC-Net protocol.

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

5. Flexible Design and Unlimited Possibilities

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

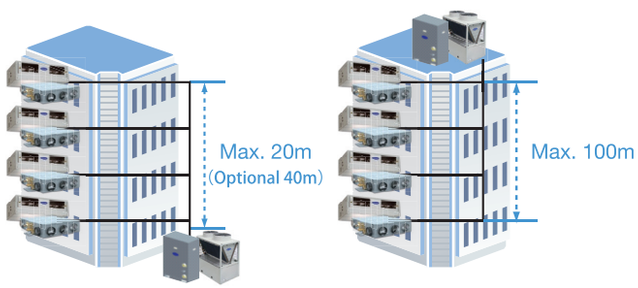
Wider workable load range for outdoor units (10% – 200%), lower initial cost and easier system upgrades.



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

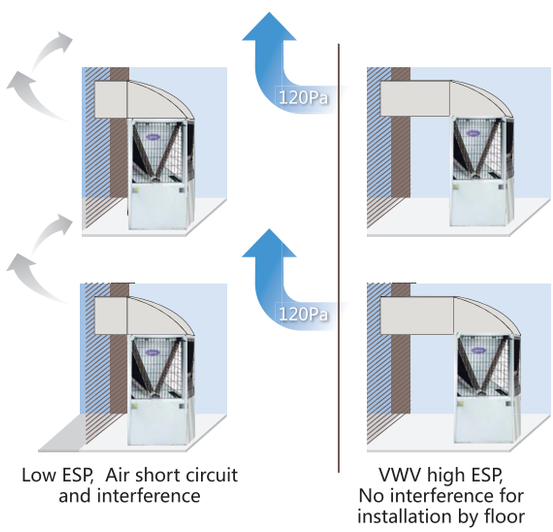
IDU and ODU height difference options enable flexible installation to suit different needs

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.



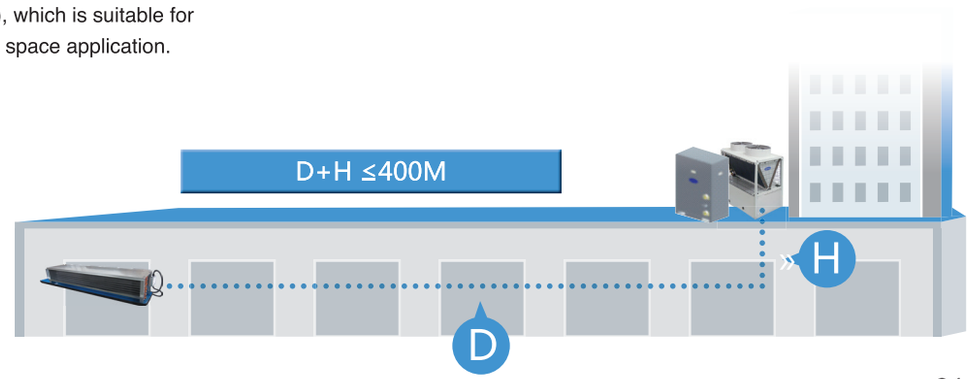
High external static pressure option for outdoor unit

Ultra-high external static pressure
It is possible to increase the external static pressure of the outdoor unit up to 120 Pa without disrupting heat transfer in either hierarchical or centralized configurations.



The extra-long pipe allows long distance applications without attenuation

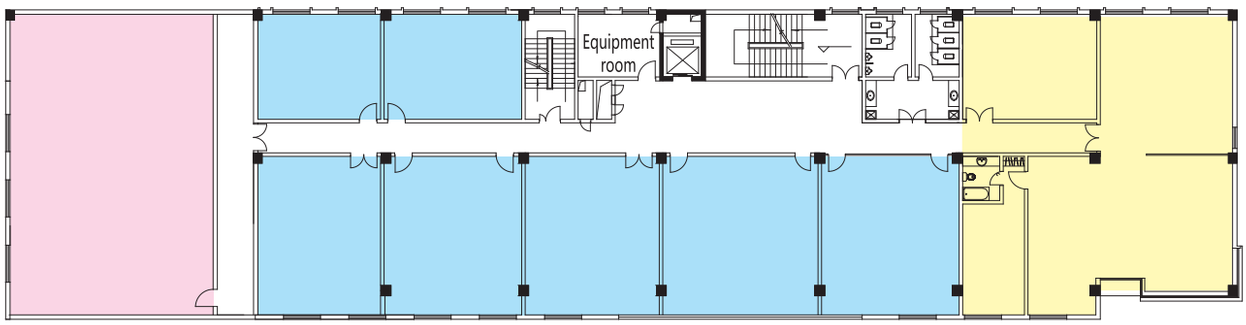
The farthest piping length is 400 meters (from outdoor unit to the farthest indoor unit), which is suitable for shopping mall and other large space application.



6. Multiple Applications Tailored to Local Conditions

Multi-stage Installation to Spread Out Capital Investment

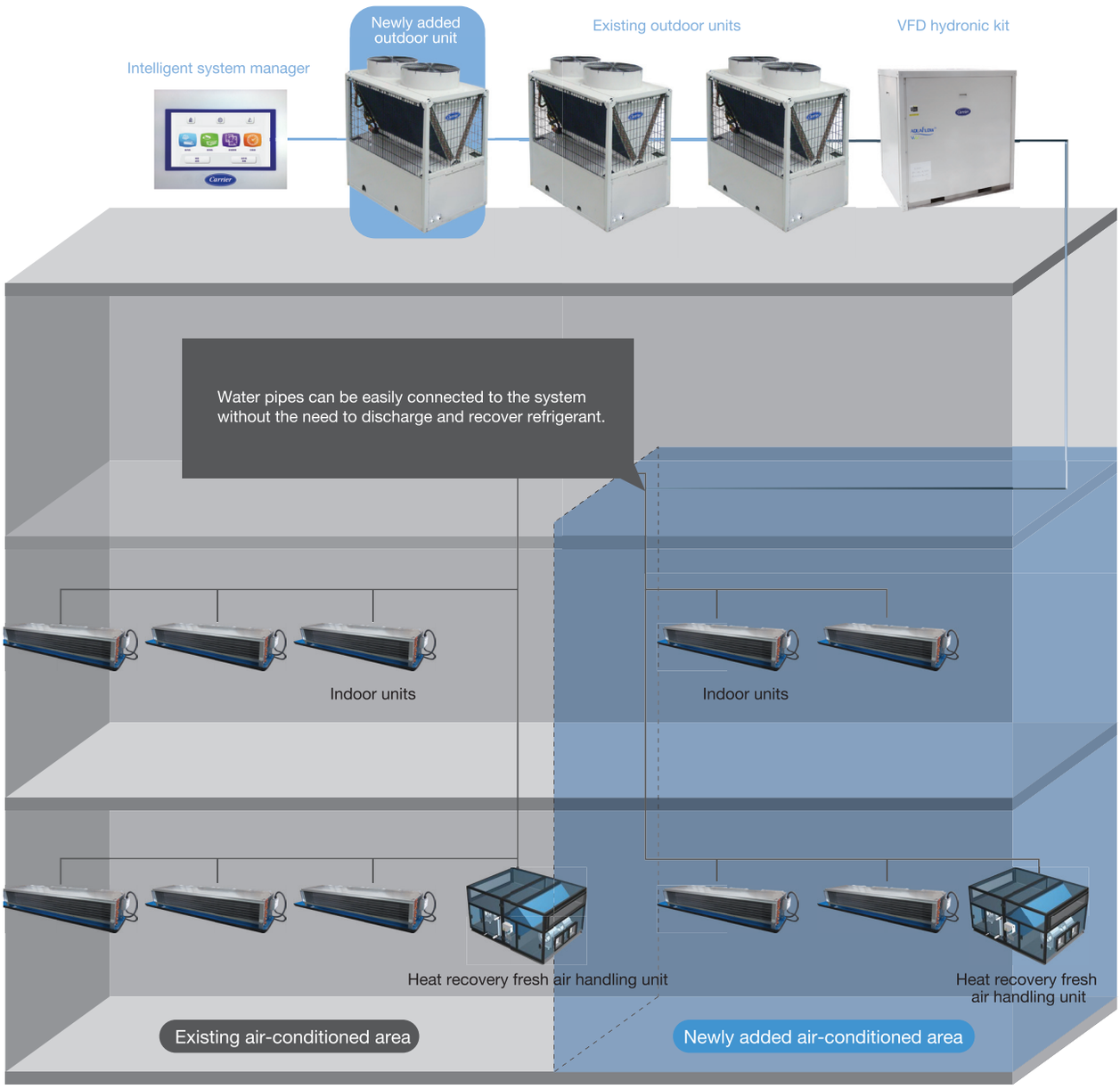
All indoor units can be installed first, followed by the outdoor units in batches, or the process can be reversed, with outdoor units deployed first and indoor units following in batches.
(Note: The initial round of outdoor unit installations should account for 50% of the total units in the system)



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

It is easy to expand the system and to make interior design changes without affecting air-conditioning operations

Rezoning indoor units requires only a resetting of the partition control table.
(Note: A single system is able to control up to 8 outdoor units of the same model as well as 128 indoor units and 4 heat recovery fresh air handling units)

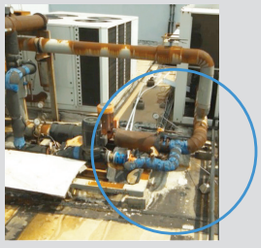


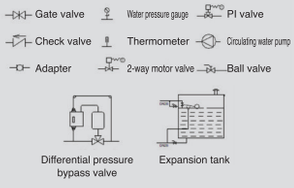
7. Easy Installation and Auto-commissioning

» Simplified work and reduced installation time

Conventional hydronic system

More leakage points due to on-site installation of components

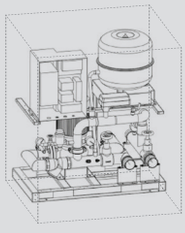




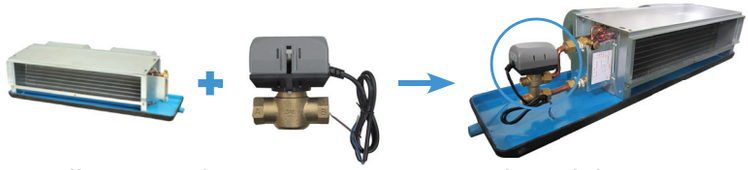
Conventional indoor unit

Carrier AquaFlow™ VWV hydronic kit

Pre-installation at factory effectively avoids leakage points



Carrier AquaFlow™ VWV System indoor unit



» System manager's installation and commissioning wizard ensures easy set up

Installation and commissioning wizard guidelines

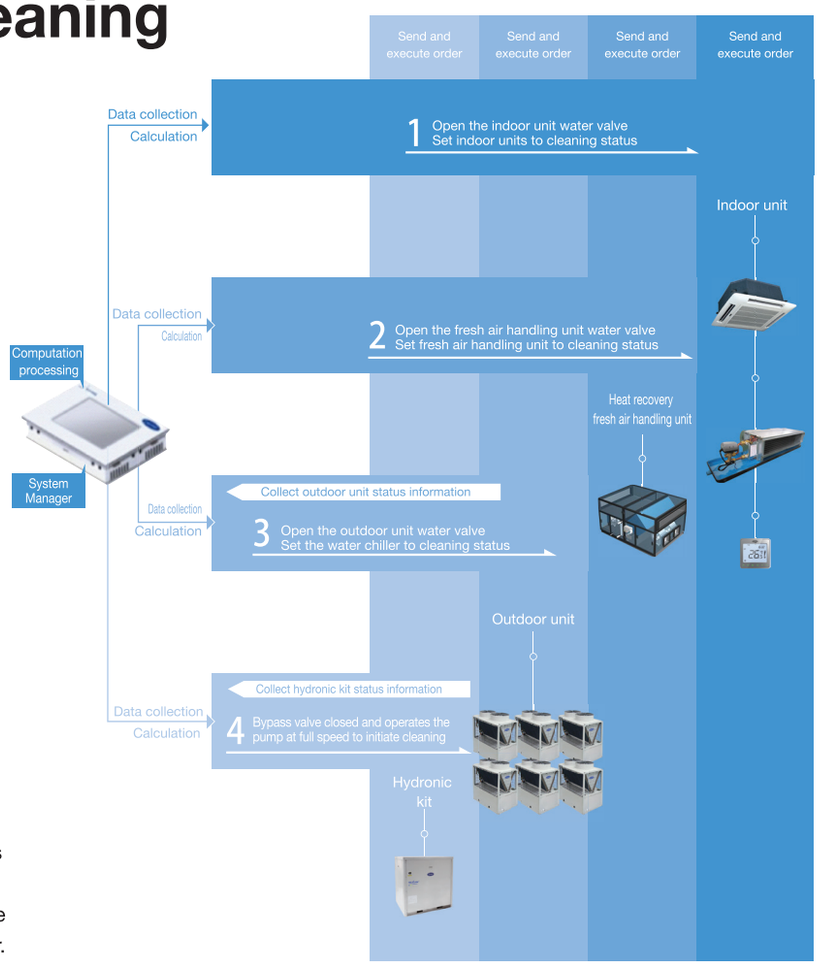
Startup settings → Language → Project information → Outdoor unit setting → Indoor unit address → Fresh air handling unit address → Control wire connection → Installation complete

System auto cleaning

» Auto-cleaning: The Carrier hydronic kit has an auto-cleaning function that is used to clean water pipes during commissioning and also at regular intervals to prevent fouling and rusting.

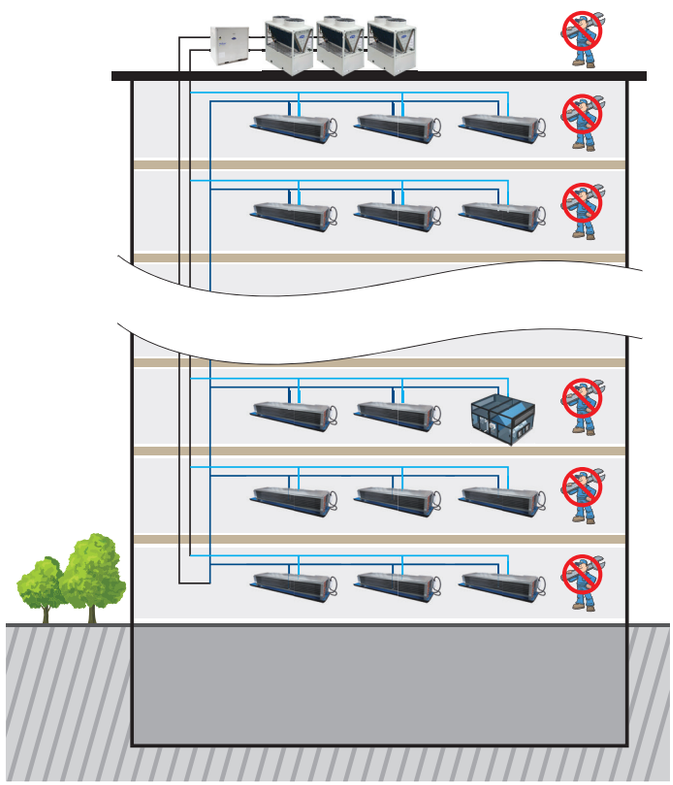
» Automated pressure control: The system automatically calculates and sets optimal flow and lift without the need for operator intervention.

» Auto-addressing: The central management system automatically assigns indoor unit addresses, eliminating the need to set each address locally.



The system manager automatically opens all valves throughout the system and forces the water pump into operation. The operator simply needs to replace the filter.

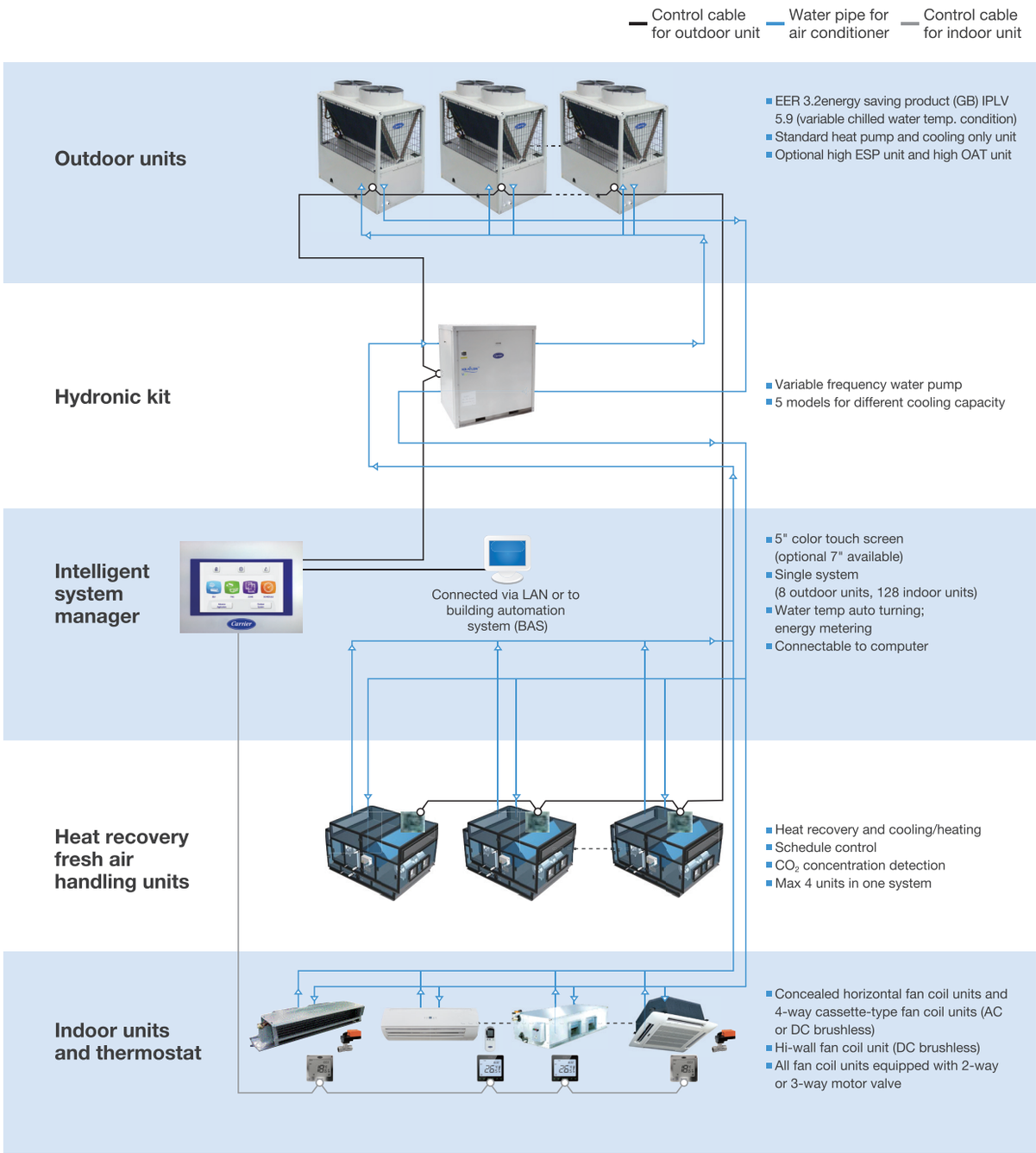
* Auto-cleaning is used during the initial installation and commissioning of the system and also before re-starting the air conditioner after a long period of shutdown to ensure efficiency.



Technical Specifications

Carrier AquaFlow™ VWV System

System structure



Standard System Configuration

Outdoor unit

Heat pump type

Unit model	System cooling capacity	Combined model	Number of outdoor units	Hydronic kit		System flow rate (m^3/h)	System external water pressure (kPa)	Intelligent system manager
				Model	Sets			
SHSRQA065	65	30RQH065	1	HK080	1	11.2	193	HSM*1
SHSRQA130	130		2	HK150 (Optional dual pump)	1	22.4	188	
SHSRQA195	195		3	HK210 (Optional dual pump)	1	33.6	220	
SHSRQA260	260		4	HK320 (Optional dual pump)	1	44.8	228	
SHSRQA325	325		5			56	218	
SHSRQA390	390		6	HK520 (Optional dual pump)	1	67.2	217	
SHSRQA455	455		7			78.4	198	
SHSRQA520	520		8			89.6	168	

Cooling only type

Unit model	System cooling capacity	Combined model	Number of outdoor units	Hydronic kit		System flow rate (m^3/h)	System external water pressure (kPa)	Intelligent system manager
				Model	Sets			
SHSRBA065	65	30RBH065	1	HK080	1	11.2	193	HSM*1
SHSRBA130	130		2	HK150 (Optional dual pump)	1	22.4	188	
SHSRBA195	195		3	HK210 (Optional dual pump)	1	33.6	220	
SHSRBA260	260		4	HK320 (Optional dual pump)	1	44.8	228	
SHSRBA325	325		5			56	218	
SHSRBA390	390		6	HK520 (Optional dual pump)	1	67.2	217	
SHSRBA455	455		7			78.4	198	
SHSRBA520	520		8			89.6	168	

The total number of outdoor units must not exceed 8.

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
	Heat recovery fresh air handling unit	Heat recovery fresh air handling unit (BFP), up to 4 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)

VWV power option

Product name	Type	380~415V-3Ph-50Hz	380V/400V-3Ph-50Hz	415V-3Ph-50Hz	220V-1Ph-50Hz	230V-1Ph-50Hz	240V-1Ph-50Hz
ODU	Heat pump		√				
	Cooling only		√				
	High ESP option		√				
HK	Single pump	HK520	HK080-320	HK080-320			
	Dual pump	HK520	HK080-320	HK080-320			
	High pressure endure	HK520 non-standard order	HK080-320 No standard order	HK080-320 No standard order			
FAU(BFP)	Standard unit		√	√			
	Purifier option		√	√			
42CE	Standard unit				√	√	√
42CN	Standard unit				√	√	√
42GWC	Standard unit				√	√	√
DBFP/DFP	Standard unit				√	√	

Main Equipment Parameters

Technical parameters for outdoor unit

Heat pump / cooling only

Model	Unit	30RQH065	30RBH065
Nominal cooling capacity	kW	65	65
Nominal heating capacity	kW	68	
Power input power for cooling	kW	20.2	20.2
Power input power for heating	kW	21.1	
Cooling Efficiency	kW/kW	3.22	3.22
Heating Efficiency	kW/kW	3.22	
ARI Integrated Part-Load Value (IPLV)	kW/kW	5.2	5.2
*ARI+VWT (IPLV)	kW/kW	5.9	5.9
Mains power supply		380/400V-3Ph-50Hz	380/400V-3Ph-50Hz
Nominal operating current (cooling)	A	35.9	35.9
Nominal operating current (heating)	A	37.6	
Net weight	kg	748	699
Noise level	dB(A)	66	66
Refrigerant		HFC-410A	HFC-410A
Compressor		Hermetic scroll compressor	Hermetic scroll compressor
Quantity		2	2
Condenser		Copper and aluminum fin coils with hydrophilic coating	Copper and aluminum fin coils with hydrophilic coating
Fan quantity		2	2
Maximum fan speed	rpm	720	720
Evaporator		Brazed plate heat exchanger	Brazed plate heat exchanger
Nominal water flow rate (cooling)	m3/h	11.2	11.2
Nominal water flow rate (heating)	m3/h	11.8	
Outdoor unit water pressure drop (cooling)	kpa	77	77
Outdoor unit water pressure drop (heating)	kpa	86	
Maximum water pressure	kpa	1000	1000
Outdoor unit water-related components		Inlet Pipe(Y type Strainer)	Inlet Pipe(Y type Strainer)
		Outlet Pipe (Flow switch、Drain Plug)	Outlet Pipe (Flow switch、Drain Plug)
		Conector(Victaulic to Screw)	Conector(Victaulic to Screw)
Nominal diameter of water joint		DN40	DN40
Dimensions (L×W×H)	mm	2236*1100*1898	2236*1100*1898

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)

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

Model	Unit	30RQH65A	30RBH65A
Cooling capacity @ maximum ESP	kW	64.8	64.8
Heating capacity @ maximum ESP	kW	68.3	
Cooling power input @ maximum ESP	kW	22.5	22.5
Heating power input @ maximum ESP	kW	23.9	
Maximum ESP	Pa	120	120
Nominal operating current (cooling) @ maximum ESP	A	40	40
Nominal operating current (heating) @ maximum ESP	A	42.6	

Technical parameters for hydronic kit

Hydronic kit

Single pump

Model	HK08004000THC HK08006000THC	HK15004000THC HK15006000THC	HK21004000THC HK21006000THC	HK32004000THC HK32006000THC	HK52001010YLC
System cooling capacity range (heat pump unit)	65kW	65-130kW	65-195kW	65-325kW	65-520kW
Nominal flow and hydraulic module external lift	11.2m³/h 270kPa	22.4m³/h 265kPa	33.6m³/h 297kPa	56m³/h 295kPa	89.6m³/h 245kPa
Major components	Variable frequency water pump, differential pressure bypass valve, water replenishing valve, expansion tank, drain valve, safety valve and temperature sensor, etc.				
Dimensions (L×W×H)	785×425×1075	985×545×1105	1305×725×1085		1466×910×1186
Water pump quantity	1				
Nominal diamater of joint	DN 50	DN 65	DN 80	DN 100	DN 100
Joint connection type	Male thread				Clamp
Expansion tank capacity	12 L	35 L	50 L	80 L	80 L
Main Power supply	380/400V-3Ph-50Hz; 415V-3Ph-50Hz				380~415V-3Ph-50Hz
Rated power	1.85kW	4kW	5.5kW	7.5kW	11kW
Maximum operating current	5 A	7.7 A	10.2 A	13.7 A	20.6 A
Net weight(kg)	130	140	250	340	494

Dual pump

Model	HK15004200THC HK15006200THC	HK21004200THC HK21006200THC	HK32004200THC HK32006200THC	HK52001210YLC
System cooling capacity range (heat pump unit)	65-130kW	65-195kW	65-325kW	65-520kW
Nominal flow and hydraulic module external lift	22.4m³/h 265kPa	33.6m³/h 297kPa	56m³/h 295kPa	89.6m³/h 245kPa
Major components	Variable frequency water pump, differential pressure bypass valve, water replenishing valve, expansion tank, drain valve, safety valve and temperature sensor, etc.			
Dimensions (L×W×H)	1208×936×1105	1566×1014×1085		1612×1314×1186
Water pump quantity	2 (100% standby)			
Nominal diamater of joint	DN 65	DN 80	DN 100	DN 100
Joint connection type	Male thread			Clamp
Expansion tank capacity	35 L	50 L	80 L	80 L
Main Power supply	380/400V-3Ph-50Hz; 415V-3Ph-50Hz			380~415V-3Ph-50Hz
Rated power	4kW	5.5kW	7.5kW	11kW
Maximum operating current	7.7 A	10.2 A	13.7 A	20.6 A
Net weight (kg)	280	510	550	779

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 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

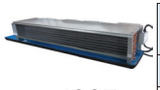
Summertime calculations based on: outdoor conditions of 35°C DBT and 59.1% RH, indoor conditions of 27°C DBT and 50% RH, and inlet/outlet water temperature of 7°C/12°C.

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

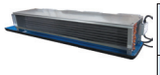
Technical parameters for air conditioner terminals

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 (m^3/h)	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 (m^3/h)	ESP (Pa)	TP (Pa)	Input power (kW)	Unit weight (kg)	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)

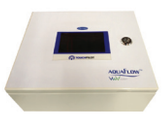
Performance	Model	003	004	005	006	008	010	012	014
Rated air flow rate m^3/h	High	540	680	850	1020	1360	1700	2040	2380
	Mid	430	540	680	810	1080	1300	1570	1830
	Low	350	440	550	660	880	1010	1210	1410
Cooling capacity	W	3200	3700	5800	6600	8700	9100	10900	12600
Heating capacity	W	4900	5800	9000	10200	13500	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

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.

Technical parameters for controller



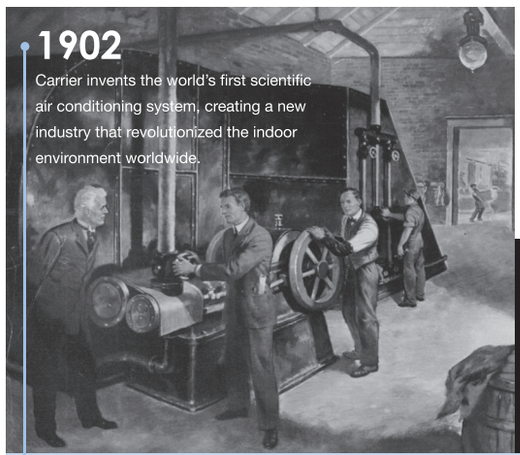
Model	Integrated installation: HSM5IPRTA/HSM7IPRTA	Flush mounted installation: HSM5RPKTA/HSM7RPKTA
Name	Intelligent system manager	
Dimensions (W×H×D)	300×250×120 mm	215×175×60 mm
Rated power supply	220~240V ± 10%/1ph/50-60Hz	
Appearance	5' or 7' color LCD touch screen with graphical display in Chinese 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		

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

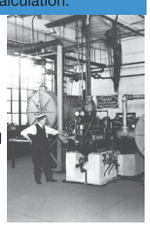
Carrier air-conditioner milestones

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

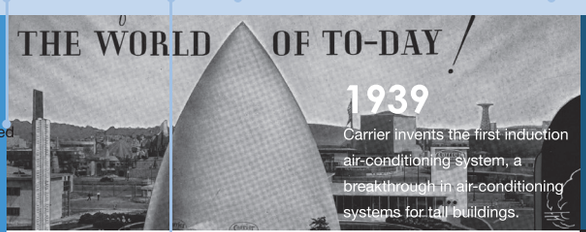


1911
Dr. Carrier publishes his basic principles of temperature and humidity control, which later evolved into his "Rational Psychrometric Formulae" paper and laid the foundation for modern air conditioning calculation.

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.

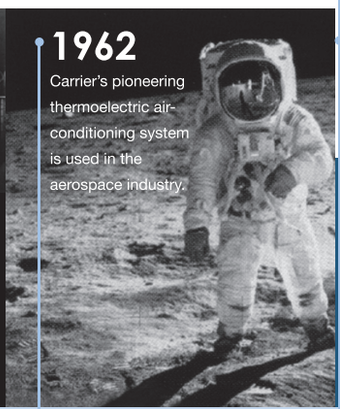


1945
Carrier produces the world's first lithium bromide absorption chiller.

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.

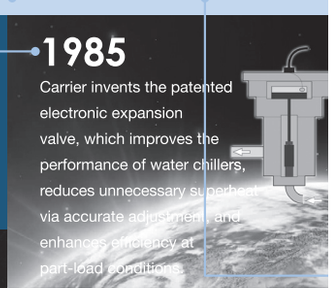
1962
Carrier's pioneering thermoelectric air-conditioning system is used in the aerospace industry.



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 standardby combining a 3-rotor screw compressor with leading inverter technologies.

2013

Innovative Carrier AquaFlow™ VWV System

2015

Carrier AquaFlow™ VWV system new members release

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.

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.

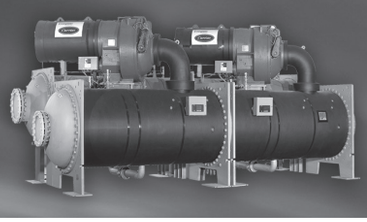
It also launches a compact new centrifugal chiller with the latest centrifugal compression technology and HFC-134a refrigerant to achieve improved COP.

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

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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