



Domestic Hot Water Production Systems

VARIO

 **inventor**
Your-conditions

CATALOGUE 2012



YOUR CONDITIONS!

Since 1916, **Inventor** pioneers in the US market, by designing and manufacturing innovative air conditioning and heat pump units. The company's primary competitive advantage is the use of its know-how expertise gained in the past, to build air conditioning systems of the future.

The key to **Inventor** units' success is that they are specifically designed to enable the modern individual invent his own custom made living and working conditions. Regulating effectively the natural environment, **Inventor** units can create silently the perfect indoor conditions; your conditions!

All **Inventor** units carry a 2-year Warranty for the compressor and for all parts of the unit.

Inventor units can be found all across Europe in a continuously growing selected network of air conditioning professionals!

Their excellent quality and operational efficiency has been awarded by the European Union with the highest standard certificates.

Furthermore, the use of the environmental friendly refrigerants (freon) do not contribute to the increase of the global warming environment.



Your *natural* conditions



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WHAT IS VARIO?

These days, people are increasingly focusing on the cost of heating as well as the environmental issues. Traditional heating systems cost more money and are bad for sustainable development of the environment. Thus, people are searching for new heating technology with high efficiency, low running cost and eco-friendly features.

This is why we created Vario!

What is Vario?

Vario, is a DC inverter multifunctional air to water heat pump system. By adopting advanced heat pump technology, absorbs natural heat from the ambient air and uses it for room heating. It does not only satisfy room-heating requirements but also supplies domestic hot water.

Besides, Vario can also provide you cool air in hot summer. It is All in One!

Choose Vario, and enjoy a comfortable air all year round!

Eco-friendly---Create a Green World

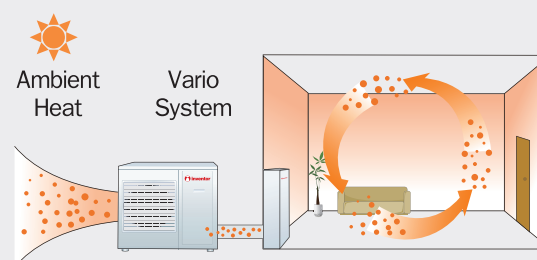
Vario adopts R410A, a new eco-friendly refrigerant which is harmless for the atmosphere. Moreover, with advanced heat pump and powerful hardware, the efficiency of Vario has been improved, resulting in much lower CO₂ discharge. It is an eco-friendly product, which mirrors your social commitment to protect environment.

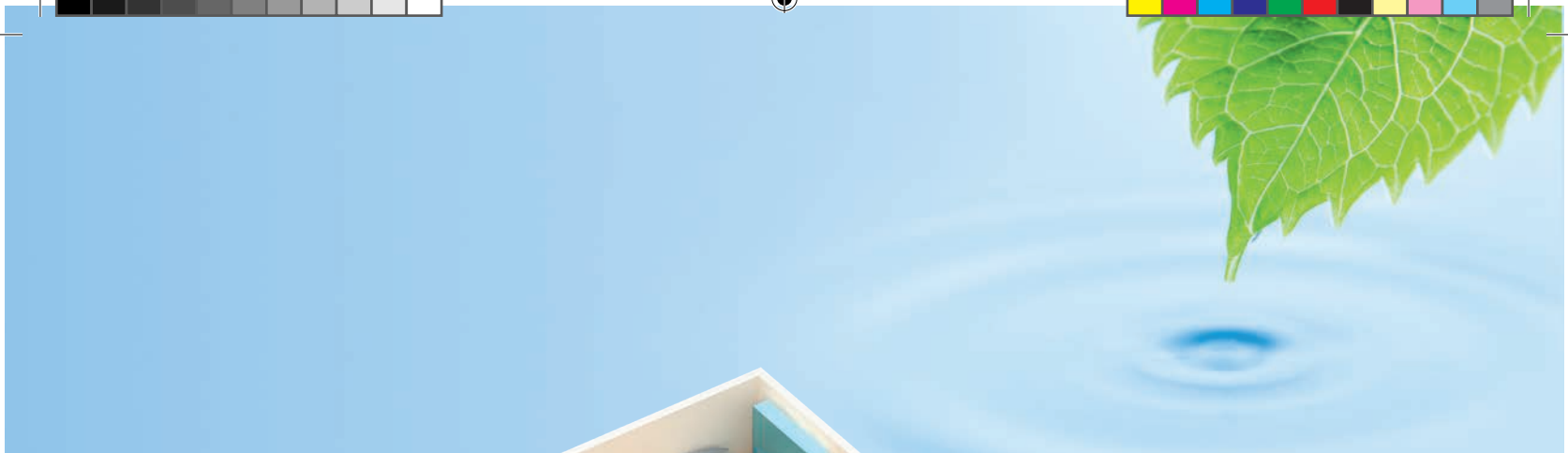
Outdoor Unit: Sustainable Energy Converter



The outdoor unit adopts DC inverter technology and the most efficient refrigerant R410A with zero ozone depletion. It can absorb environment's heat and heat it to a higher temperature.

Heat is transferred via the refrigerant pipe to the hydro unit. The compact outdoor unit enables easy installation.





Hydro Unit (incorporating the control system):

Heat is transferred through refrigerant pipes to the hydro unit. The Hydro unit transfers the heat to the circulating water in the under-floor heating, radiators or fan coil units and also to the domestic hot water tank.



Domestic Hot Water Tank:

A water tank is required for supplying domestic hot water. Two series of stainless steel water tanks are available (with 200L, 300L models). All of them are equipped with auxiliary heater, dual-sensor and all necessary controls. In addition, a built-in disinfection function can automatically raise the water temperature up to 70°C or higher to prevent the growth of bacteria.



OUTDOOR UNIT

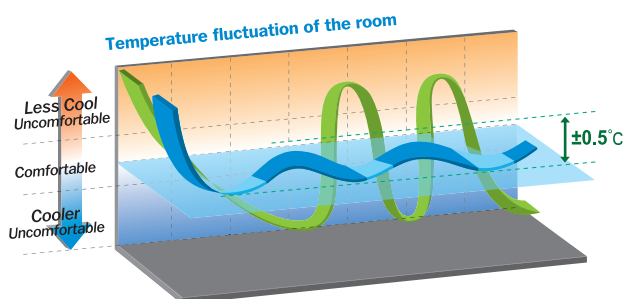
Vario outdoor units use twin rotary DC inverter compressor and optimized fan up to 4.5 COP, for more comfort and energy save.



High Efficiency

› Twin Rotary DC Inverter Compressor

Comparing with traditional compressors, DC inverter compressors have the advantage of high performance and high efficiency.



• DC inverter System

The DC inverter technology with high-power and high energy efficiency not only creates comfortable room air, but also saves energy.

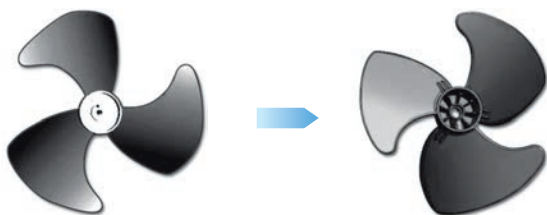
• Traditional System

ON and OFF frequently cause temperature fluctuation.

- By adopting DC Inverter technology, the compressor regulates its output according to the cooling/heating load in order to achieve higher energy efficiency.
- DC Inverter compressor optimizes its output, which ensures high efficient operation.
- With stepless power regulation technology, the DC Inverter compressor achieves stepless output regulation between 20Hz and 120Hz.
- The 180-degree sine wave current output results in small startup current, small torque pulse and free speed regulation between 900 and 6600r/min. It enables the system to meet the temperature requirements of various circumstances, to lower the power consumption greatly and to ensure comfortable use.

Fan

Efficient axial fan with streaming design and huge airflow volume, offers powerful cooling capacity and ensures the stability and reliability of the system.



DC Fan Motor

- › Stepless adjustment
- › Higher airflow volume and lower power consumption

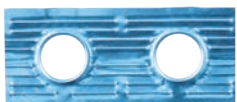


Heat exchanger

Compared with the common fin, the heat exchange efficiency of the louver fin is increased by 5%.

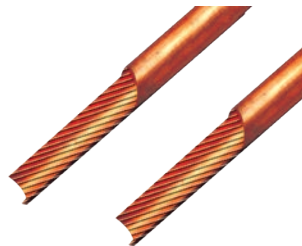


Former Models:
Normal Flat Fin

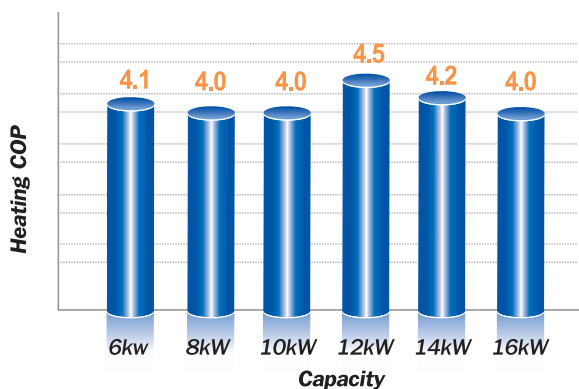


Vario:
Louver Fin with Blue Coated

Special thickened inside-thread copper pipe enhances the heat exchange performance by over 8%

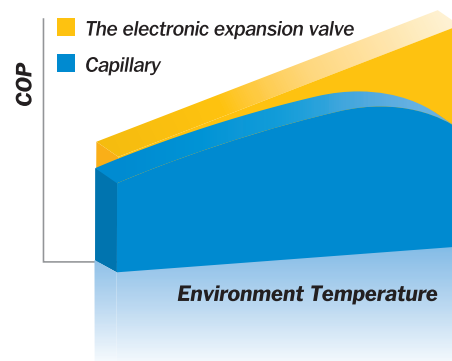


COP up to 4.5



Electronic Expansion Valve

The electronic expansion valve is highly flexible. It can automatically adjust the throttle according to the refrigerant demand based on the stability of the system. It is more energy saving and stable than capillary.



Comfort

Precise Temperature Regulation

The electronic expansion valve guarantees that the system made adjustments automatically, according to the changes of the circumstance and the water temperature.

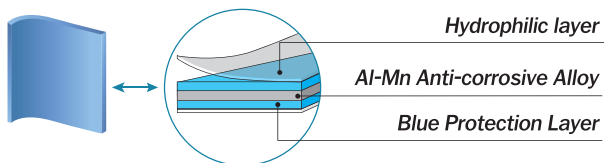
Quiet Mode

By adjusting the output of the compressor and fan, the operation noise of the unit can be decreased by more than 3dB(A). This way is meeting the quiet requirements at night or in special occasions.

Reliability

Heat Exchange Anti-corrosion

Highly anti-corrosion blue hydrophilic-coated aluminum fin has longer life than common fin



Wide Voltage Range Operation

The unit can safely operate within 185V~264V.



Self-diagnosis of the Outdoor Unit

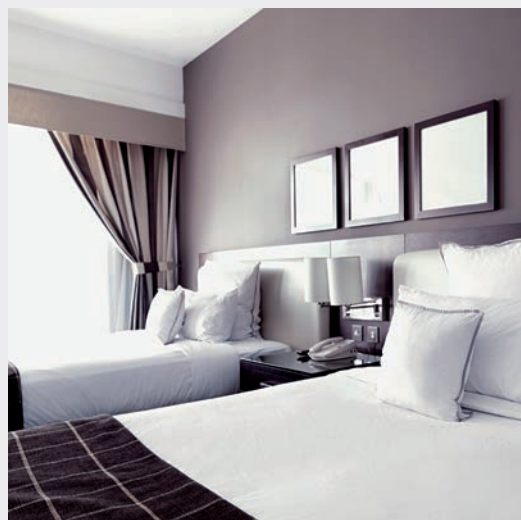
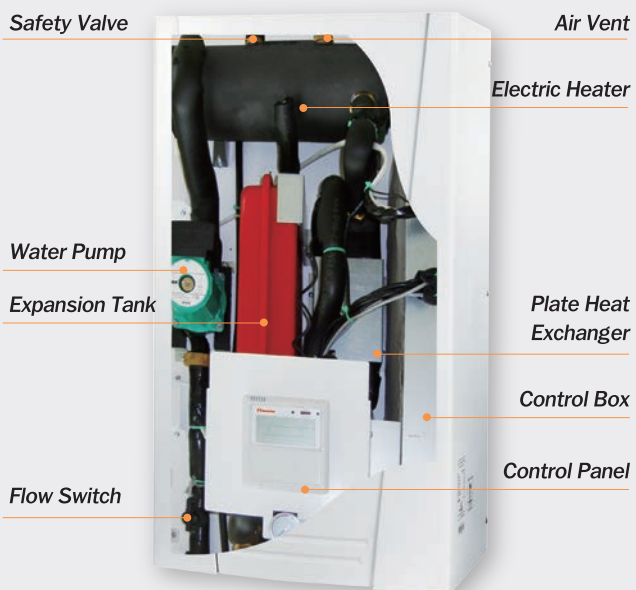
With the self-diagnosis function, the outdoor unit will start auto-protection if the power voltage of the current is out of the normal range. Protection will be cancelled automatically when the power condition resumes to normal.

Compact Design



HYDRO UNIT

Vario's hydro unit equipped with high COP plate heat exchanger and high efficiency pump. The innovative compact design gives you more flexibility.



High Efficiency

> High COP plate heat exchanger



> High efficient pump



Flexible and Compact Design



Compact design, easy for installation
Dimension (WxDxH) (mm)

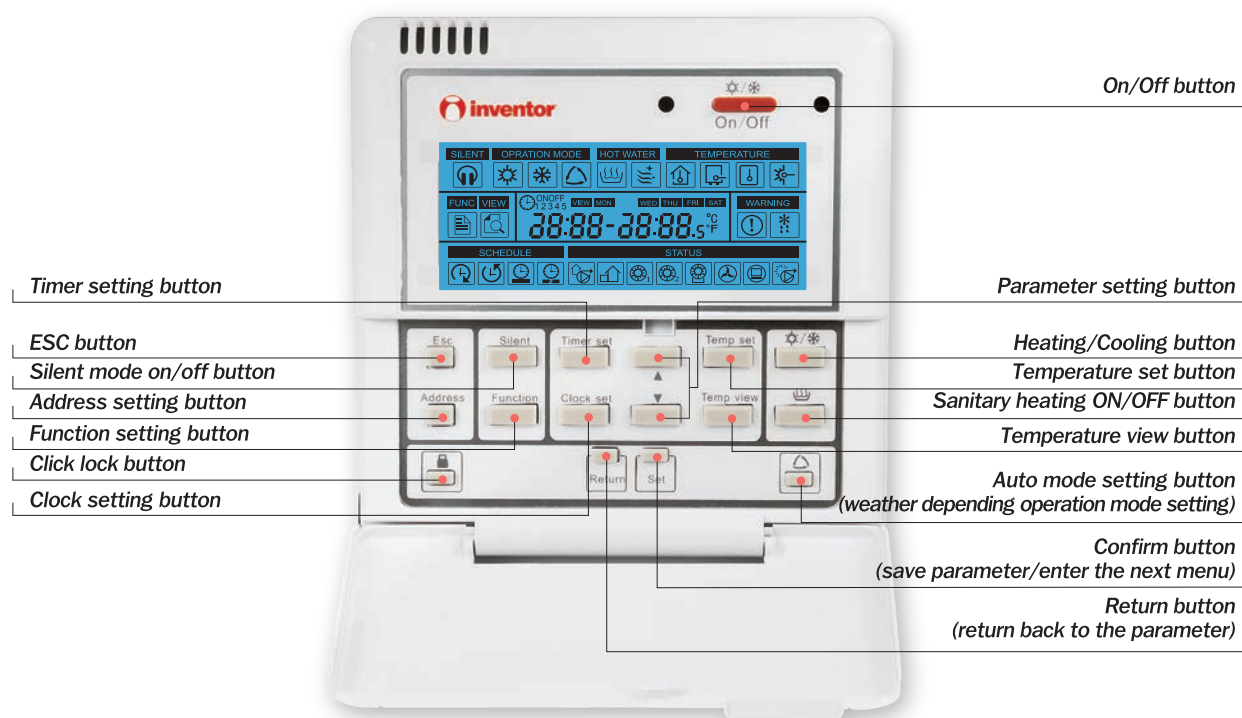
500x324x900mm.

Pressure safety, plate heat exchanger, expansion tank, water pump and control box all in one.



CONTROLLER

User Friendly Control System



Timer setting button

Parameter setting button

ESC button

Heating/Cooling button

Silent mode on/off button

Temperature set button

Address setting button

Sanitary heating ON/OFF button

Function setting button

Temperature view button

Click lock button

Auto mode setting button

Clock setting button

(weather depending operation mode setting)

Confirm button
(save parameter/enter the next menu)

Return button
(return back to the parameter)

- | | | | |
|------------------------|---------------------------------|--|---|
| Silent mode | Water -Leaving temperature | 24 hours timer | The second stage internal electric heater |
| Heating mode | Sanitary water tank temperature | 24 hours decrease timer | Sanitary water tank heater |
| Cooling mode | Solar leaving temperature | Weekly timer | Thermostat |
| Weather depending mode | Function setting | Holiay reservation | Central controller |
| Sanitary heating mode | Temperature view | Water pump | Auxiliary solar thermal pump |
| Disinfections mode | Trouble | Outdoor unit | |
| Room air temperature | Defrosting | The first stage internal electric heater | |

WATER TANK

Comfort

> Smart Dual-temperature Detection Control Technology

ON and OFF control of the unit is realized by upper and lower temperature sensors, which renews water temperature in real time, thus ensuring the perfect timing of startup:

- Avoid premature startup. Improved hot water yielding rate by accurate timing of hot / cold water mixture.
- Avoid overdue startup. Improved hot water use rate and shorten the waiting time of reheating.

> Water is charged from the bottom and the water inlet pipe has equispaced water inlets. This can reduce cold-water shock and enhance the service life of the tank.



Upper temperature sensor

Lower temperature sensor



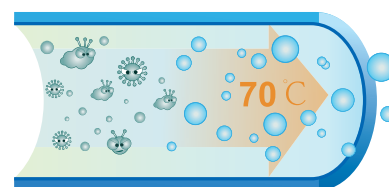
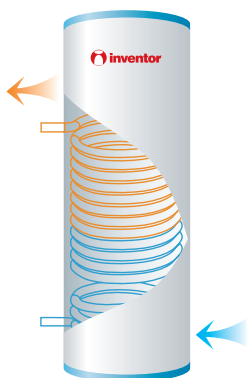
Cold-water inlet pipe with decentralized water inlets

Health

> Domestic water is sanitary and can be used directly.

> The stainless steel tank and coil will not affect the water quality

> The disinfection function at a high temperature up to 70°C can prevent the growth of bacteria and ensure sanitary water; creating a wholesome life experience for the user.



Reliability

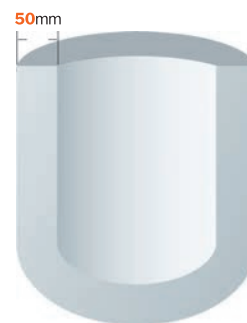
› When water is used, due to the existence of bearing tank, the unit is refilled with water. This ensures rapid storage and continuous delivery.



› The magnesium stick protecting container contributes to lifespan.



› Thermal insulating layer of 50mm thickness.



› Water and electricity isolation ensures safe operation.

Water and electricity are completely separated so that electrical leakage is absolutely avoided.

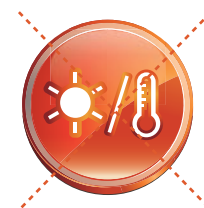
Advanced microcomputer control and complete protection functions are preventing any electricity leakage, dry heating, over-high temperature, etc.



Dry heating



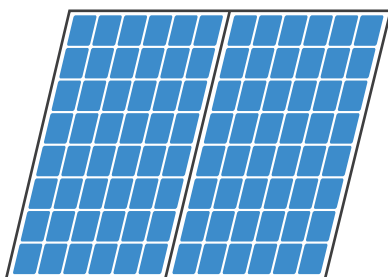
Electricity leakage



Over-high temperature

Flexibility

› Dual-coil design makes convenient to join solar panel or boiler.



Solar panel



Boiler

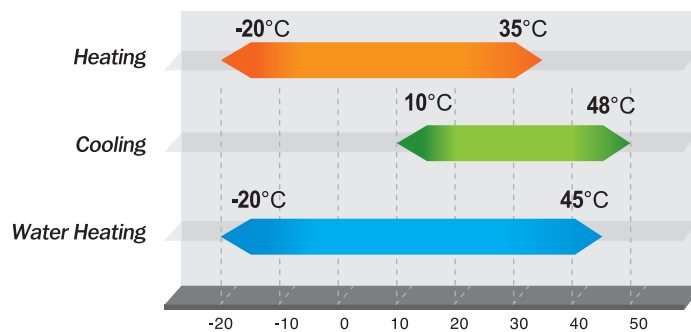
FLEXIBLE APPLICATIONS

Five-Mode Operation

- > Heating
- > Cooling
- > Water Heating
- > Heating + Water resistance
- > Cooling + Water resistance

> Wide Range of Operation Temperature

Heating	-20°C ~ 35°C
Cooling	10°C ~ 48°C
Water Heating	-20°C ~ 45°C



> Hot Water Temperature Range

Domestic water: 40°C to 80°C

Heating

Fan coil/Radiator: 25°C ~ 55°C

Floor: 25°C ~ 45°C

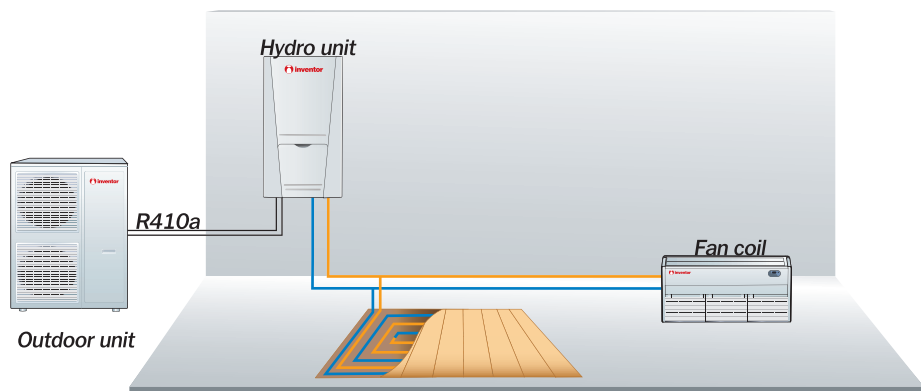
Cooling

Fan coil/Radiator: 7°C ~ 25°C

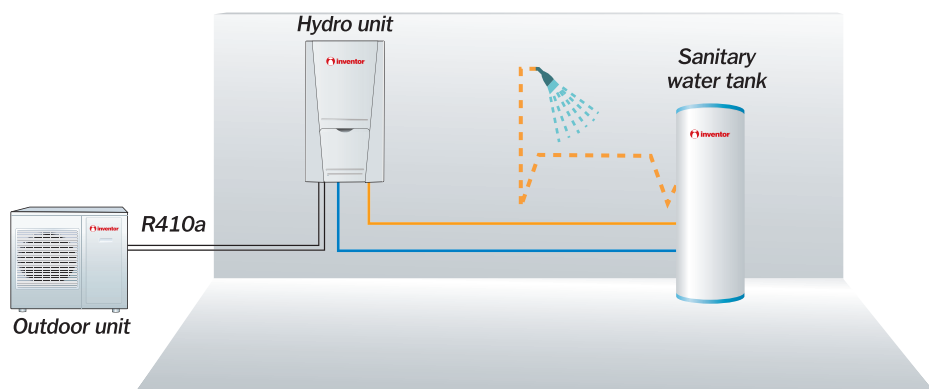
Floor: 18°C ~ 25°C

Combination Examples

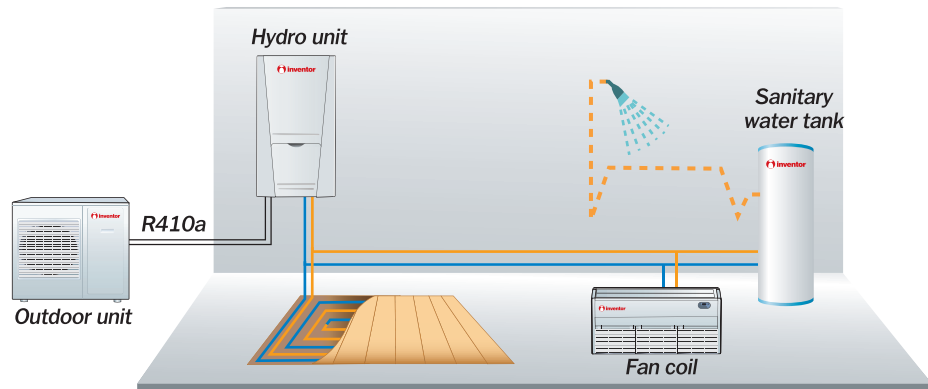
> Heating / Cooling



> Water Heating



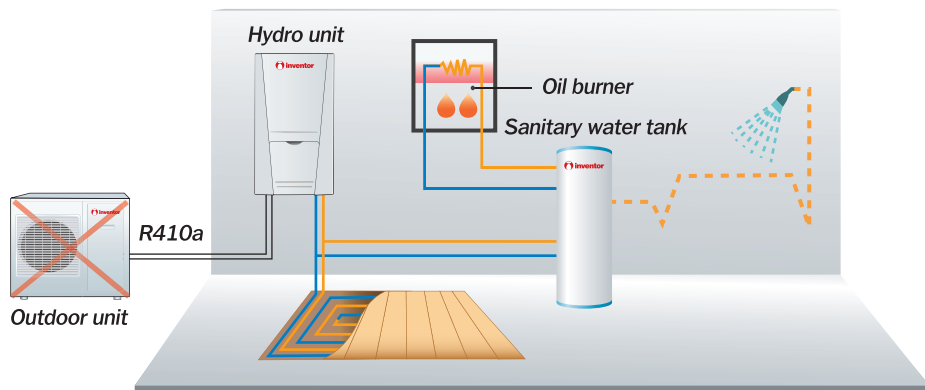
› Heating / Cooling with Water Heating



Multiple Additional functions and Humanized Function

› Urgent Water Heating

Electric heater is used as backup in any case that a fault occurs.



› Quick Water Heating

The heat pump and the water tank's electric heater operate at the same time to realize rapid heating.

› Disinfections

The water will be heated to 70°C at set time to kill the bacteria in the water. The disinfect ion is usually carried out at night.

› Holiday Mode

In heating mode, when the user is on a trip, the unit can be set to operate automatically so as to keep the room temperature between 10°C and 15°C.

› Weather - dependent operation

The unit can automatically adjust the operation state according to the temperature range set by the user.

› Floor Protection

Under floor heating

As for under floor heating, the default highest water temperature is 45°C so that it will not damage the floor or reduce its lifespan due to superheat. (The highest temperature of outlet water during operation is 55°C)

Under floor cooling

As for under floor cooling, the default lowest outlet temperature is 18°C so that it will not produce condensate, which will damage the floor or reduce the lifespan of the floor. (The lowest temperature of outlet water during cooling operation is 7°C)

SPECIFICATIONS

1 Phase system



6kW, 8kW, 10kW



12kW, 14kW, 16kW

Outdoor Unit

Model			DHW-CQ6.0Pd/ Na-K(O)	DHW-CQ8.0Pd/ Na-K(O)	DHW-CQ10Pd/ Na-K(O)	DHW-CQ12Pd/ Na-K(O)	DHW-CQ14Pd/ Na-K(O)	DHW-CQ16Pd/ Na-K(O)	
Capacity ¹	Heating (floor heating)	kW	6.2	8.5	10.0	12.0	13.5	16.0	
	Cooling (floor cooling)	kW	5.5	9.0	10.5	14.0	15.0	15.5	
Power input ¹	Heating (floor heating)	kW	1.50	2.10	2.50	2.79	3.21	3.95	
	Cooling (floor cooling)	kW	1.60	2.50	3.14	3.68	4.29	4.63	
EER ¹	Cooling (floor cooling)		3.40	3.60	3.35	3.80	3.50	3.35	
COP ¹	Heating (floor heating)		4.10	4.00	4.00	4.30	4.20	4.05	
Capacity ²	Heating (fan coil or radiator)	kW	5.5	8.0	9.0	11.5	12.5	14.0	
	Cooling (for fan coil)	kW	4.0	6.5	8.0	10.0	11.0	11.5	
Power input ²	Heating (fan coil or radiator)	kW	1.83	2.65	2.90	3.38	3.73	4.59	
	Cooling (for fan coil)	kW	1.54	2.50	3.08	3.45	3.93	4.60	
EER ²	Cooling (for fan coil)		2.60	2.60	2.60	2.90	2.80	2.50	
COP ²	Heating (fan coil or radiator)		3.00	3.00	3.10	3.40	3.35	3.05	
Power Supply			1-Phase, 220~240V, 50Hz						
Compressor	Type		Hermetically sealed swing compressor						
Refrigerant charge	R410A	g	1700	2000	2000	3300	3300	3300	
Sanitary water Temperature		°C	40~80						
Sound pressure level	Cooling	dB(A)	57	57	57	57	57	60	
	Heating	dB(A)	59	59	59	59	59	62	
Dimensions	WxDxH	mm	921x427x791				950x412x1253		
Weight		Kg	66	69	69	99	99	99	
Connecting pipe (refrigerant)	Gas	mm	12.7	15.9	15.9	15.9	15.9	15.9	
		inch	1/2	5/8	5/8	5/8	5/8	5/8	
	Liquid	mm	6.35	9.52	9.52	9.52	9.52	9.52	
		inch	1/4	3/8	3/8	3/8	3/8	3/8	

Note:

1. Capacities and power inputs are based on the following conditions:

- (1) Cooling conditions
Indoor water temperature 23 °C / 18 °C
Outdoor air temperature 35 °CDB / 24 °CWB
- (2) Heating conditions
Indoor water temperature 30 °C / 35 °C
Outdoor air temperature 7 °CDB / 6 °CWB
- (3) Standard piping length 7.5m

2. Capacities and power inputs are based on the following conditions:

- (1) Cooling conditions
Indoor water temperature 12 °C / 7 °C
Outdoor air temperature 35 °CDB / 24 °CWB
- (2) Heating conditions
Indoor water temperature 40 °C / 45 °C
Outdoor air temperature 7 °CDB / 6 °CWB
- (3) Standard piping length 7.5m

Hydro Unit



Model	DHW-CQ6.0Pd/ Na-K(l)	DHW-CQ8.0Pd/ Na-K(l)	DHW-CQ10Pd/ Na-K(l)	DHW-CQ12Pd/ Na-K(l)	DHW-CQ14Pd/ Na-K(l)	DHW-CQ16Pd/ Na-K(l)	
Nominal Input (W)	3200	6200	6200	6200	6200	6200	
Power Supply (Ph/V/Hz)	1-Phase, 220-240V, 50Hz						
Leaving water temp.	Cooling (Fan coil unit) °C	7-25	7-25	7-25	7-25	7-25	
	Cooling (Floor cooling) °C	18-25	18-25	18-25	18-25	18-25	
	Heating (Fan coil unit) °C	25~55 (High Temperature Cycle)					
	Heating (Floor heating) °C	25~45 (Low Temperature Cycle)					
Pump	Type	Water Cooled	Water Cooled	Water Cooled	Water Cooled	Water Cooled	
	Nr. of speed	3	3	3	3	3	
	Power input (W)	200	200	200	200	200	
	Water flow limit (LPM)	12	12	12	12	12	
Electric Heater	Operation	Automatic	Automatic	Automatic	Automatic	Automatic	
	Steps	2	2	2	2	2	
	Capacity (kW)	3	6	6	6	6	
	Combination (kW)	1.5+1.5	3+3	3+3	3+3	3+3	
Sound pressure level (dB(A))	31	31	31	31	31	31	
Dimensions (WxDxH) (mm)	900x500x324	900x500x324	900x500x324	900x500x324	900x500x324	900x500x324	
Weight (Kg)	52	52	52	53	53	53	

Water Tank



Model	AT200LCJ/A-K	AT300LCJ/A-K	AT200LCJ2/A-K	AT300LCJ2/A-K
Volume (L)	200	300	200	300
Power Supply	1-Phase, 220-240V, 50Hz			
Electric Heater Power (W)	3000	3000	3000	3000
Cool water inlet pipe	Outlet diameter mm	DN15	DN15	DN15
	Outlet diameter inch	1/2	1/2	1/2
	Screw Thread spec	1/2" Female BSP	1/2" Female BSP	1/2" Female BSP
Circulation Water Inlet/Outlet Pipe	Outlet diameter mm	/	/	DN20
	Outlet diameter inch	/	/	3/4
	Screw thread spec	/	/	3/4" Female BSP
Water inlet/outlet (heat pump) pipe	Outlet diameter mm	DN20	DN20	DN20
	Outlet diameter inch	3/4	3/4	3/4
	Screw thread spec	3/4" Female BSP	3/4" Female BSP	3/4" Female BSP
Dimensions	Φ630X1620	Φ630X1620	Φ710X1645	Φ710X1645
Net weight (Kg)	68	82	71	87

SPECIFICATIONS

3 Phase system



12kW, 14kW, 16kW

Outdoor Unit

Model			DHW-CQ12Pd/Na-M(O)	DHW-CQ14Pd/Na-M(O)	DHW-CQ16Pd/Na-M(O)
Capacity ¹	Heating (floor heating)	kW	12.0	14.0	15.5
	Cooling (floor cooling)	kW	14.0	15.0	15.5
Power input ¹	Heating (floor heating)	kW	2.67	3.33	3.70
	Cooling (floor cooling)	kW	3.68	4.29	4.43
EER ¹	Cooling (floor cooling)		3.80	3.50	3.50
COP ¹	Heating (floor heating)		4.50	4.20	4.00
Capacity ²	Heating (fan coil or radiator)	kW	11.0	12.0	14.0
	Cooling (fan coil)	kW	10.0	10.5	11.0
Power input ²	Heating (fan coil or radiator)	kW	3.24	3.58	4.38
	Cooling (fan coil)	kW	3.45	3.75	4.07
EER ²	Cooling (fan coil)		2.90	2.80	2.70
COP ²	Heating (fan coil or radiator)		3.40	3.35	3.20
Power Supply (Ph/V/Hz)			3-Phase, 380-415V, 50Hz		
Compressor	Type		Hermetically sealed swing compressor		
Refrigerant charge	R410A	g	3.500	3.500	3.500
Sanitary water Temperature		°C	40~80	40~80	40~80
Sound pressure level	Cooling	dB(A)	57	57	60
	Heating	dB(A)	59	59	62
Dimensions	WxDxH	mm	950x412x1253	950x412x1253	950x412x1253
Weight		Kg	99	99	99
Connecting pipe (refrigerant)	Gas	mm	15.9	15.9	15.9
		inch	5/8	5/8	5/8
	Liquid	mm	9.52	9.52	9.52
		inch	3/8	3/8	3/8

Note:

1. Capacities and power inputs are based on the following conditions:

- (1) Cooling conditions
Indoor water temperature 23 °C / 18 °C
Outdoor air temperature 35 °CDB / 24 °CWB
- (2) Heating conditions
Indoor water temperature 30 °C / 35 °C
Outdoor air temperature 7 °CDB / 6 °CWB
- (3) Standard piping length 7.5m

2. Capacities and power inputs are based on the following conditions:

- (1) Cooling conditions
Indoor water temperature 12 °C / 7 °C
Outdoor air temperature 35 °CDB / 24 °CWB
- (2) Heating conditions
Indoor water temperature 40 °C / 45 °C
Outdoor air temperature 7 °CDB / 6 °CWB
- (3) Standard piping length 7.5m



Hydro Unit

Model	DHW-CQ12Pd/Na-M(I)	DHW-CQ14Pd/Na-M(I)	DHW-CQ16Pd/Na-M(I)	
Nominal Input (W)	6200	6200	6200	
Power Supply (Ph/V/Hz)	3-Phase, 380-415V, 50Hz			
Leaving water temp.	Cooling (Fan coil unit) °C	7-25	7-25	7-25
	Cooling (Floor cooling) °C	18-25	18-25	18-25
	Heating (Fan coil unit) °C	25~55 (High Temperature Cycle)		
	Heating (Floor heating) °C	25~45 (Low Temperature Cycle)		
Pump	Type	Water Cooled	Water Cooled	Water Cooled
	Nr. of. speed	3	3	3
	Power input (W)	200	200	200
	Water flow limit (LPM)	12	12	12
Electric Heater	Operation	Automatic	Automatic	Automatic
	Steps	1	1	1
	Capacity (kW)	6.0	6.0	6.0
	Combination (kW)	6.0	6.0	6.0
Sound pressure level (dB(A))	31	31	31	
Dimensions (WxDxH) (mm)	900x500x324	900x500x324	900x500x324	
Weight (Kg)	53	53	53	



Water Tank

Model	AT200LCJ/A-M	AT300LCJ/A-M	AT200LCJ2/A-M	AT300LCJ2/A-M
Volume (L)	200	300	200	300
Power Supply (Ph/V/Hz)	3-Phase, 380-415V, 50Hz			
Electric Heater Power (W)	3.000	3.000	3.000	3.000
Cool water inlet pipe	Outlet diameter mm	DN15	DN15	DN15
	Outlet diameter inch	1/2	1/2	1/2
	Screw Thread spec	1/2" Female BSP	1/2" Female BSP	1/2" Female BSP
Circulation Water Inlet/Outlet Pipe	Outlet diameter mm	/	/	DN20
	Outlet diameter inch	/	/	3/4
	Screw thread spec	/	/	3/4" Female BSP
Water inlet/outlet (heat pump) pipe	Outlet diameter mm	DN20	DN20	DN20
	Outlet diameter inch	3/4	3/4	3/4
	Screw thread spec	3/4" Female BSP	3/4" Female BSP	3/4" Female BSP
Dimensions ØDxH (mm)	Ø540X1595	Ø620X1620	Ø540X1595	Ø620X1620
Net weight (Kg)	68	82	71	87

AIR SOURCE HEAT PUMP WATER HEATER

R134a

Circulating Heat Pump



3.8kW, 5.0kW



150L - 300L

> The air is the main energy source and the electric heat is the auxiliary energy. This way the unit produces high temperature hot water which is stored in the water tank and used for family bathing, heating and daily life. It is the most energy saving and environment friendly water heater used in families.

- High efficiency and energy saving
- Easy Installation and Maintenance
- Comfortable
- Auto cleaning, healthy on every day
- Multipoint water supply and simultaneous water using
- Intelligent water supply and energy saving
- Safe and Reliable



Model	Water-tank
DHW-C3.8/NbA-K	WT150LC-K
	WT200LC-K
	WT250LC-K
DHW-C5.0/NbA-K	WT250LC-K
	WT300LC-K

Item	Nominal Testing Condition			
	Outdoor Condition		Water Side Condition	
	DB Temperature(°C)	WB Temperature(°C)	Initial Water Temperature(°C)	Final Water Temperature(°C)
Water Heating	20	15	15	55

Operation Range	Item	Outdoor Condition(DB °C)
	Water Heating	-15~43

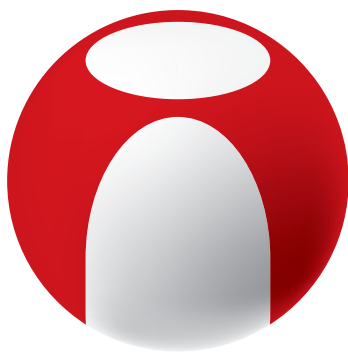


Outdoor Unit

Model		DHW-C3.8/NbA-K	DHW-C5.0/NbA-K
Rated water heating capacity	kW	3.8	5.0
Rated water supply	L/h	82	108
Water temperature	°C	35-70	35-70
Noise	dB(A)	50	52
R134a charged volume	kg	0.70	0.95
Power supply	V/Ph/Hz	220-240V/1Ph/50Hz	
Power input/ Water heating	(kW)	1.02	1.35
COP (Heating)*	W/W	3.72	3.70
Outline dimension (WxDxH)	mm	762x256x750	762x256x750
Package dimension (WxDxH)	mm	881x363x815	881x363x815
Connecting pipes diameter (to water tank)	(Inch)	3/4	3/4
N.W / G.W	Kg	55/61	60/66

Water Tank with Electric Heater

Water tank model		WT150LC-K	WT200LC-K	WT250LC-K	WT300LC-K
Tank volume (L)		150	200	250	300
Power supply (V/Ph/Hz)		220-240V/1Ph/50Hz			
Auxiliary electrical heater power input (kW)		1.5	1.5	1.5	1.5
Dimension	Outline (Diameter x H) (mm)	520X1.350	540X1.595	540X1.945	620X1.620
	Package (WxDxH) (mm)	1.378X608X625	1.623X628X645	1.973X628X645	1.648X708X725
Water pipes diameter	Tap water inlet (Inch)	1/2	1/2	1/2	1/2
	Hot water outlet (Inch)	1/2	1/2	1/2	1/2
N.W./G.W (Kg)		45/52	57/66	68/77	71/81



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