



NEW

REVERSIBLE AIR-TO-WATER HEAT PUMP



Simple, reliable,
high efficiency heat pump
Built-in hydraulic module
Equipped with NHC control

30AWH HO

Nominal heating capacity: 4 - 15 kW
Nominal cooling capacity : 4 - 17 kW

The 30AWH HO air-to-water heat pump is designed for heating and cooling applications in new and existing individual homes and small businesses.

When installed alone, the 30AWH HO is compatible with low to medium temperature emitters (underfloor heating, fan coil units, water cassettes, radiators, mixed installations, etc.).

The 30AWH HO is also compatible with medium to high temperature emitters for boiler back up operation.

The 30AWH HO heat pump is installed outside in an open area, ideally as close as possible to the boiler room.

Each device is tested in the factory and delivered ready for operation.



CARRIER participates in the ECP programme for LCP/HP
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RANGES

The 30AWH HO range of reversible heat pumps comprises 4 single-phase models and 2 three-phase models.

DESCRIPTION

Operation in cooling mode with an outdoor temperature of 0 °C to 46 °C.

Operation in heating mode with an outdoor temperature of -20 °C to 35 °C.

If the heat pump is the only source of heat:

Below the equilibrium temperature, heating must be provided by another heating source or using an additional electrical supply actuated by the 30AWH HO.

For a boiler backup heat pump installation: operates down to the equilibrium point (temperature below which the heat pump can no longer keep up with heating requirements); below this point, the heat pump and boiler run alternately.

CONFORMITY

EMC: Electromagnetic Compatibility directive 2014/30/EU

RoHS: Restriction of Hazardous Substances directive 2011/65/EU

Ecodesign 2009/125/EC

Machinery 2006/42/EC

DESCRIPTION OF THE MAIN COMPONENTS

The new 30AWH HO air-to-water reversible heat pumps, with Inverter technology, have been designed for residential applications and for small commercial installations.

They offer excellent energy efficiency and exceptionally quiet operation.

These units integrate the very latest technological innovations: R410A refrigerant fluid which does not contribute to ozone depletion, Twin Rotary DC Inverter compressors, a low-noise fan with an electronic control.



Ecodesign is the European ecodesign directive, aimed at improving the energy efficiency of energy-related products (ErP) through regulation. Carrier supports initiatives to reduce the environmental impact of its products.

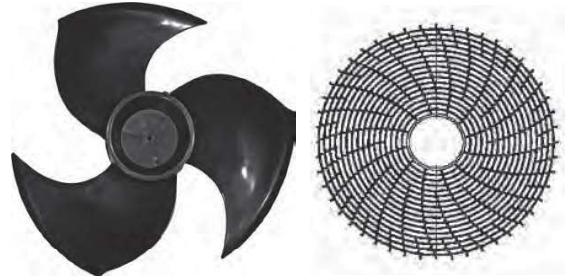
Specifications

- A vast operating range, both in cooling and heating mode, offering great performance across a broad range of temperatures.
- Twin Rotary DC Inverter compressors with pulse amplitude modulation (PAM) and pulse width modulation (PWM) for increased reliability, reduced energy consumption and operation without vibration, whatever the operating conditions.
- Variable speed fans with a patented innovative blade shape, ensuring better distribution of air at exceptionally low sound levels.
- Pre-configured or customisable water laws, for stable power levels which correspond to the losses.
- The option to connect and integrate the unit into existing heat sources or into an auxiliary heating source (using a single or dual energy source), which allows for increased savings and optimal comfort in any weather conditions.
- Inlet and outlet connections to the three-way valve, to enable connection to a domestic hot water tank, increase the flexibility of use, regardless of the application.
- A water outlet temperature of up to 60 °C for heating and domestic hot water in residential applications.
- Plug and play control for intrinsic maintenance and servicing safety.
- For enhanced safety, an incoming alarm signal can force the unit to shut down, and is compatible with external safety devices or control systems.
- Outgoing signal making it possible to control the operation of a customer's accelerator pump or additional pump to increase the versatility of the installation.

Advanced technology

- Electronic system management: several sensors placed in key positions within the refrigerant circuit detect the operating status of the system. Two micro-controls receive the signals sent by the sensors; they manage them using advanced control algorithms and optimise the refrigerant fluid flow rate and the operation of all the main components – the compressor, the fan motors and the electronic expansion valve.

- The electronic expansion valve is a dual flow electronic device that optimises the volume of refrigerant in the circuit and overheats it, preventing fluid from returning to the compressor. This device further improves system performance and reliability.
- The air management system, which comprises the axial flow fan, the orifice and the air discharge grille, guarantees minimised sound levels.



New patented fan blade shape and low pressure drop grille

- The new coil has a blue hydrophilic coating which allows water to migrate more easily to the bottom of the exchanger using gravity.

In particular, this innovation enables:

- the frosting time to be increased by reducing the accumulation of frost on the coil
- better defrosting by improving the flow of water over the fins

Operation in heating mode is thereby improved.

Advanced performances

- The 30AWH HO offers extremely high energy efficiency, both in heating mode and in cooling mode, thereby guaranteeing significant energy savings. Large coils with high efficiency and optimised circuits ensure that all the combinations meet the European objectives concerning tax deductions relating to energy savings. The part load efficiency (seasonal energy efficiency) reaches the highest level in this industrial sector.
- Year-round comfort – the advanced technology used in the 30AWH HO provides users with optimised levels of comfort, in terms of water temperature regulation and the low sound level.

The required temperature is obtained rapidly, and kept constant, without any fluctuations. The 30AWH HO offers optimised levels of comfort in both winter and summer.
- The 30AWH HO can operate at low ambient temperatures in cooling mode (from outdoor temperatures of 0 °C to 46 °C). To guarantee user comfort, the units operate down to an outdoor temperature of -20 °C in heating mode, while in summer, they can produce hot water up to 60 °C, at an outdoor temperature of up to 35 °C for domestic hot water applications.
- The 30AWH HO also has new Energy Soft technology. This advanced control logic allows energy to be extracted from the outside air to guarantee energy-optimised defrosting without the use of the compressor.

Unlike traditional defrosting technology, Energy Soft has virtually no thermal impact on the water loop.

FEATURES AND BENEFITS

Environmental care

- Non-ozone depleting R-410A refrigerant.
- Fluid from the HFC family, a chlorine-free product which does not deplete the ozone layer.
- Very dense, so a smaller amount is required than other fluids.
- Highly efficient, it enables a high energy efficiency ratio (EER) to be obtained.
- The packaging offers increased protection during transport and handling, and is 100% recyclable.

Quick and simple to install and maintain

- Easy access to all internal components: simply undo three screws to remove the entire front panel, in order to access all of the components.
- The advanced circuit design and choice of components has enabled a compact unit to be created, with an exceptionally small footprint that is easy to transport even through narrow doors.
- The reduced weight of the unit, and the presence of a handle on the panels, ensure it is easy to transport.
- 3 bar safety valve fitted as standard.
- Two- or three-litre internal expansion tank.
- Protection against high refrigerant temperatures.
- Water flow controller to ensure that the circuits contain enough water to operate correctly.
- Several options for the power cable outlets: prepunched holes in the casing panels enable the cable to be fed via the side, front, or rear.
- The 30AWH HO has gas type male couplings.
- The built-in hydraulic module reduces the space required and simplifies installation. Simply connect up all the connections: electrical, water supply, and return pipes.
- The coupling between the condensate drain pipe and the unit has an airtight rubber gasket.
- The mounting brackets have a specially designed shape to ensure that the unit is safely and securely attached to its base.

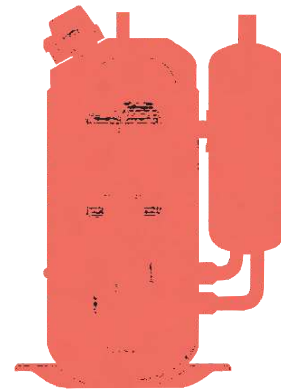
Twin Rotary DC Inverter compressors

- Advanced technology, which offers maximum energy efficiency, with high capacity available under peak conditions, and optimised efficiency at low and moderate compressor speeds. The 30AWH HO heat pump uses IPDU (intelligent power drive unit) hybrid inverter technology, which combines two electronic control logics: pulse amplitude modulation (PAM) and pulse width modulation (PWM) to ensure the compressor provides optimised operation under all conditions, to minimise temperature fluctuations, and ensure perfect control of individual comfort, whilst significantly reducing energy consumption.

- PAM: the pulse amplitude modulation of the direct current controls the compressor under maximum load conditions (start-up and peak load), which increases the voltage at a fixed frequency. The compressor runs at a high speed to quickly reach the desired temperature,
- PWM: the pulse width modulation of the direct current controls the compressor at partial load conditions, adjusting the frequency at fixed voltage.

The compressor speed is precisely adjusted, and the system offers an enhanced level of comfort (no fluctuations in temperature) in operating conditions with exceptional efficiency.

- The compressor frequency is increased continuously up to the maximum level. This ensures there are no current peaks during the start-up phase, and provides a secure connection to a single-phase current supply, even for large capacity systems. The maximum operating current of the 30AWH HO is less than 8.9 A (for systems up to 5 kW) and less than 25.6 A for larger systems (15 kW). The inverter warm-up speed makes soft starts unnecessary by ensuring maximum capacity immediately.
- The two rotating compression cylinders, offset from one another by 180°, and the brushless DC motor with a perfectly balanced shaft, ensure that vibrations and noise are reduced to a minimum, even at very low operating speeds. This gives a very wide operating range between the minimum capacity and the maximum capacity in continuous operation, which guarantees that the system is always optimised and provides maximum comfort at exceptionally high levels of energy efficiency.
- The two rotating compression cylinders, the low vibrations and the low load imposed on the shaft ensure the compressor offers the best possible reliability and a long and trouble-free operational life.
- All two-cylinder rotary compressors with a brushless DC inverter motor are equipped with crankcase heaters as standard.
- A double protective screen soundproofs the compressor, further reducing the sound levels.



FEATURES AND BENEFITS

Absolute reliability

- Exceptional endurance tests:
 - All the units undergo tests at various stages of their manufacture to ensure tightness of the circuits, electrical conformity, and to check the water and refrigerant pressure.
 - At the end of production, all the unit's operating parameters are thoroughly tested.
 - Corrosion durability test.
 - Accelerated ageing test on the critical components and on the fully-assembled units, simulating thousands of hours of continuous operation.
 - Impact testing on the packaging, to ensure that the units are suitably protected against accidental impacts.
 - Numerous, comprehensive tests on-site.

Economical operation

- High energy efficiency:
 - The exceptionally high energy efficiency of 30AWH HO heat pumps is the result of a long selection and optimisation process.
 - The use of ambient air as the main energy source in residential heating applications considerably reduces energy consumption and CO₂ emissions.
 - Sleep mode, with reduced compressor speed at night, provides a low operating sound level, and significant reductions in energy consumption.
 - An easily adjustable and economical silent mode reduces the compressor speed.
 - R-410A refrigerant is easier to use than other fluids.

NHC Control

NHC control associate with compressor and fan variable frequency driver combines intelligence with operating simplicity. The control constantly monitors all machine parameters and precisely manages the operation of compressor, expansion devices, fans and of the water heat exchanger water pump for optimum energy efficiency.

Ease of use

- The NHC controller can be associated with a new user interface (WUI) which allows easy access to the configuration parameters (compressor frequency, refrigerant temperature, setpoints, air temp., water inlet temp., alarm report, etc.).
- This user interface is also very intuitive in its use. It allows the operating mode to be easily read and selected. The functions are represented by icons on the LCD backlit screen.

To facilitate the use of this interface, 3 access levels are available: end user, installer and factory.

Key features

- Predefined climatic curves (12) or customized climatic curve (water temperature setpoint control)
- Air temperature setpoint control
- Scheduling mode
- Low noise level or night mode
- Antifreeze protection by triggering the internal accelerator pump
- Slab curing mode
- Backup electric heater controlled in 1/2/3 heat stage(s)
- Backup by oil or gas boiler
- Hydraulic module with control of the flow rate
- Manages an additional pump

- Management of swimming pool heating during autumn and winter
- Manages domestic hot water with or without
 - anti-legionella mode
 - DHW backup
 - DHW backup + boosted by 1, 2 or 3 electric heating stage(s)
- Master-slave control of 4 units operating in parallel with runtime balancing and automatic changeover in case of a unit fault (sensor available as an accessory).
- ModBus protocol

Choice of control product

Two options are available to actuate the 30AWH HO heat pump:

- User interface (WUI)
- ModBus protocol

User interface (WUI)



This interface can be installed up to 50 m away. It is connected to the NHC control using 4 H07RN-F 0.75 mm² cables.

The WUI has an internal sensor to measure the room temperature.

Regulation can be based on the room air temperature

ModBus

Direct access with ModBus connection to set, configure and monitor the 30AWH HO unit.

FEATURES AND BENEFITS

Large choice of input contacts:

- Remote on/off contact
- Remote heating/cooling contact: this contact is used to select cooling mode (contact open) or heating mode (contact closed).
- Remote economy contact: this contact is used to select the presence mode when the contact is open or the economy absence mode when the contact is closed.
- Safety input contact: this contact is normally closed and, depending on the configuration, is used to stop the unit, disable heating mode or disable cooling mode when open.

Several functions can be configured by the installer.

They can be used to adapt to the machine environment:

- Night mode/power limitation: this contact reduces the compressor maximum frequency to prevent noise.
- Off-peak times: if the general purpose contact, configured to "off-peak times", is closed, then the electric heating stages are not allowed.
- Offloading request: if the general purpose contact, configured to "Offloading request", is closed, then the unit must be stopped as soon as possible.
- Solar input: If the general purpose contact, configured to "Solar Input", is closed, then the unit is not allowed to run in heating or DHW mode because hot water is produced from a solar source.
- DHW priority: when this input is closed, the unit switches to domestic hot water production regardless of the space heating demand and the current DHW schedule (requires DHW temperature sensor supplied as an accessory).
- Anti-legionella cycle request: when this input is closed, domestic hot water production is requested with the anti-legionella setpoint.
- Summer contact: this contact is used to select winter (contact open) or summer mode (contact closed).
- Electric energy meter input: this input is used to count the number of pulses received from an external electric energy meter (not supplied).
- External alarm indication input: when this input is open, the alarm is tripped. This alarm is for information only, it does not affect unit operation.

Remote output contact available

Two output contacts can be chosen on the NHC control, based on the desired configuration:

State: alert (unit still operates), Alarm, Standby, Cooling or Heating or DHW or Defrosting operation),

Cooling operation, Heating operation, DHW operation, Defrosting operation, indoor air temperature reached, electric stage 2 activated, electric stage 3 activated.

TECHNICAL CHARACTERISTICS

30AWH HO			5H	7H	11H	15H	11 HT	15 HT	
Heating									
Unit with hydraulic module Full load performance*	HA1	Nominal capacity	kW	5,10	7,15	11,25	15,10	11,20	15,00
		COP	kW/kW	4,40	4,10	4,70	4,25	4,60	4,35
	HA2	Nominal capacity	kW	4,85	6,80	11,30	13,40	10,40	13,50
		COP	kW/kW	3,40	3,20	3,60	3,40	3,60	3,50
	HA3	Nominal capacity	kW	4,45	6,75	11,20	11,65	10,25	11,80
		COP	kW/kW	2,80	2,70	2,95	2,90	3,00	3,00
Unit with hydraulic module Seasonal energy efficiency**	HA1	SCOP _{30/35°C}	kWh/kWh	4,73	4,68	4,39	4,41	4,26	4,35
		η _{s heat 30/35°C}	%	186	184	173	173	167	171
	HA3	SCOP_{47/55°C}	kWh/kWh	3,32	3,36	3,35	3,45	3,34	3,40
		η_{s heat 47/55°C}	%	130	131	131	135	131	133
		P _{rated}	kW	3	4	9	10	9	11
		Energy labelling		A++	A++	A++	A++	A++	A++
Cooling									
Unit with hydraulic module Full load performance*	CA1	Nominal capacity	kW	4,00	5,55	11,20	12,80	10,65	13,00
		EER	kW/kW	3,10	3,10	3,40	3,10	3,40	3,20
		Eurovent class		A	A	A	A	A	A
	CA2	Nominal capacity	kW	4,85	8,00	13,70	16,00	13,75	17,00
		EER	kW/kW	4,35	4,00	4,60	4,10	4,65	4,15
		Eurovent class		A	A	A	A	A	A
Unit with hydraulic module Seasonal energy efficiency**		SEER _{12/7°C} Comfort low temp.	kWh/kWh	4,85	5,75	5,15	5,00	5,40	5,25
		η _{s cool 12/7°C}	kW/kW	191	227	203	197	212	208
Sound levels									
Standard unit									
Sound power level ⁽²⁾									
			dB(A)	64	65	68	69	69	69
Sound pressure level at 10 m ⁽³⁾									
			dB(A)	33	34	37	38	38	38
Dimensions									
Length									
		mm		908	908	908	908	908	908
Width									
		mm		350	350	350	350	350	350
Height									
		mm		821	821	1363	1363	1363	1363
Operating weight⁽¹⁾									
Standard unit									
		kg		57	69	115	115	121	121
Compressors									
		Rotary compressor		1	1	1	1	1	1
Refrigerant									
Charge ⁽¹⁾									
		R410A		1,10	1,60	2,80	2,80	3	3
Capacity control									
Minimum capacity ⁽⁴⁾									
		%		23 %	20 %	20 %	17 %	20 %	17 %

- * In accordance with standard EN14511-3:2013. In accordance with standard EN14511-3:2013.
- ** In accordance with standard EN14825:2016, average climate conditions
- HA1 Heating mode conditions: Water type heat exchanger water inlet/outlet temperature 30°C/35°C, outside air temperature tdb/twb = 7°C db/6°C wb, evaporator fouling factor 0 m². k/W
- HA2 Heating mode conditions: Water type heat exchanger water inlet/outlet temperature 40°C/45°C, outside air temperature tdb/twb = 7°C db/6°C wb, evaporator fouling factor 0 m². k/W
- HA3 Heating mode conditions: Water type heat exchanger water inlet/outlet temperature 47°C/55°C, outside air temperature tdb/twb = 7°C db/6°C wb, evaporator fouling factor 0 m². k/W
- CA1 Cooling mode conditions: evaporator water inlet/outlet temperature 12 °C/7 °C, outdoor air temperature 35 °C, evaporator fouling factor 0 m². k/W
- CA2 Cooling mode conditions: evaporator water inlet/outlet temperature 23 °C/18 °C, outdoor air temperature 35 °C, evaporator fouling factor 0 m². k/W
- η_{s heat 30/35°C} & SCOP_{30/35°C} Values calculated in accordance with standard EN 14825:2016
- η_{s heat 47/55°C} & SCOP_{47/55°C} **Values in bold comply with Ecodesign Regulation (EU) No. 813/2013 for Heating applications**
- η_{s cool 12/7°C} & SEER_{12/7°C} Values calculated in accordance with standard EN 14825:2016
- (1) Values are guidelines only. Refer to the unit nameplate.
- (2) In dB ref=10⁻¹² W, (A) weighting. Declared dual number noise emission value in accordance with ISO 4871 (with an associated uncertainty of +/-2dB(A)). Measured in accordance with ISO 9614-1 and certified by Eurovent.
- (3) In dB ref 20 μPa, (A) weighting. Declared dual number noise emission value in accordance with ISO 4871 (with an associated uncertainty of +/-2dB(A)). For information, calculated from the sound power level Lw(A).
- (4) Min. water-side operating pressure with variable speed hydraulic module is 40 kPa.



Eurovent certified values

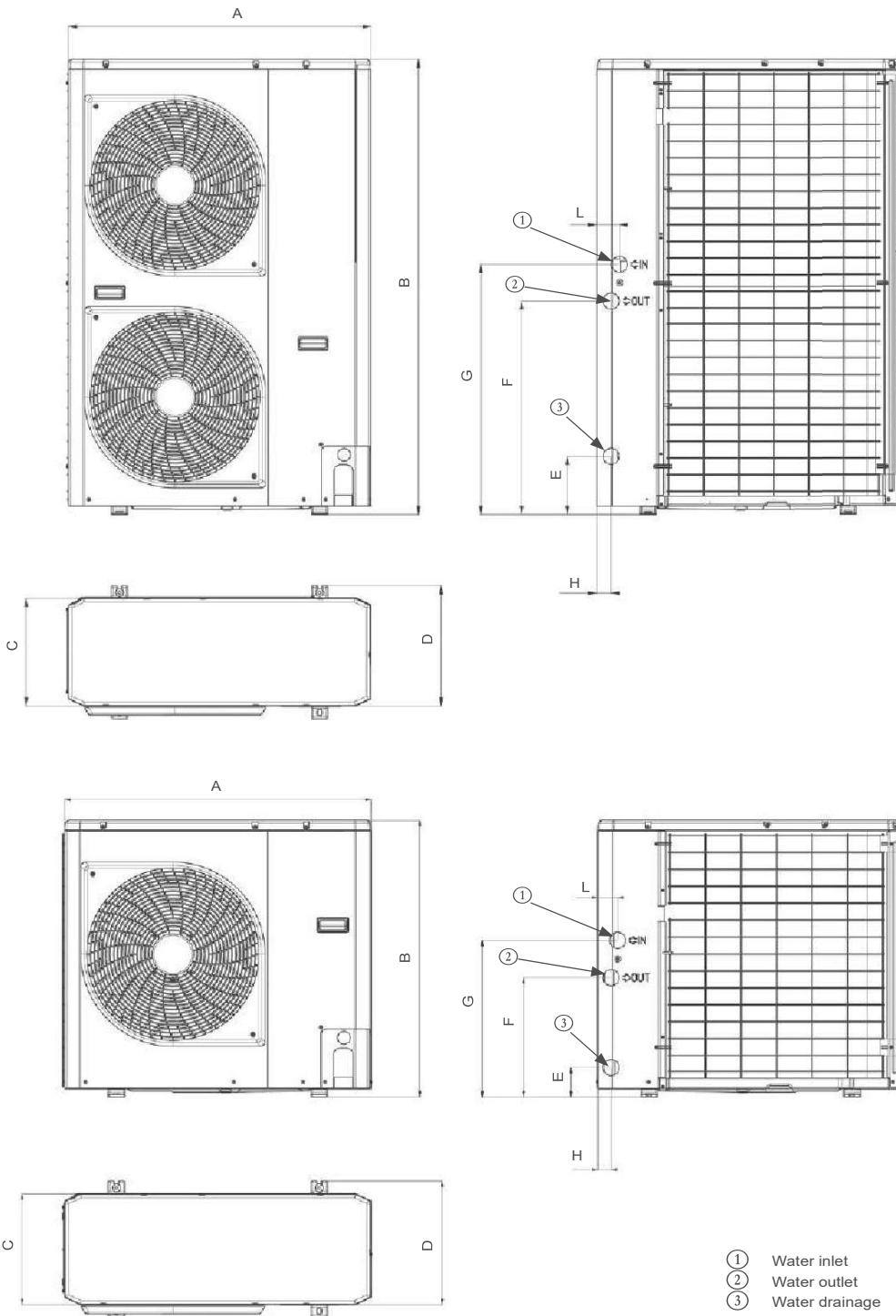
TECHNICAL CHARACTERISTICS

30AWH HO		5H	7H	11H	15H	11 HT	15 HT
Condenser		Grooved copper tubes, aluminium fins					
Fans		Axial type					
Quantity		1	1	2	2	2	2
Maximum total air flow	l/s	800	800	1800	1800	1800	1800
Maximum rotation speed	rpm	560	660	820	820	820	820
Evaporator		Brazen plate heat exchanger					
Water volume	l	1,7	2,3	4,4	4,4	4,4	4,4
Hydraulic module		Circulator, relief valve, paddle flow switch, expansion tank					
Circulator		Centrifugal pump (variable speed)					
Expansion tank volume	l	2	2	3	3	3	3
Max. water-side operating pressure with hydraulic module ⁽⁵⁾	kPa	300	300	300	300	300	300
Water connections							
Inlet diameter (BSP GAS)	inch	1	1	1	1	1	1
Outlet diameter (BSP GAS)	inch	1	1	1	1	1	1
Casing paint colour		Colour code: RAL 7035					

(5) Min. water-side operating pressure with variable speed hydraulic module is 40 kPa.

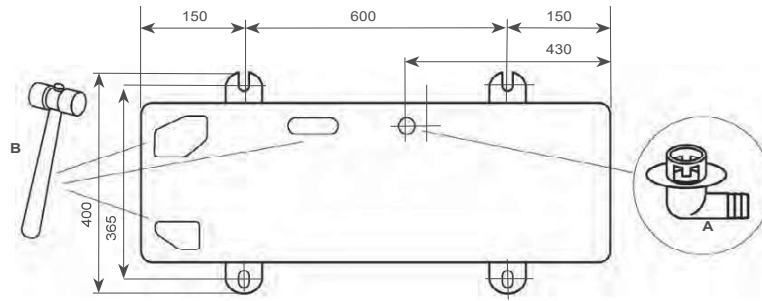
ELECTRICAL DATA

30AWH HO		5H	7H	11H	15H	11 HT	15 HT
Nominal voltage	V-ph-Hz	230-1-50	230-1-50	230-1-50	230-1-50	400-3N-50	400-3N-50
Voltage range	V	220-240	220-240	220-240	220-240	380-415	380-415
Current at full load	A	8,9	16,7	23,3	25,6	16,8	16,8
Fuse capacity	A	16	20	32	32	20	20
Electrical power cable section (H07 RN-F)	mm ²	2,5	2,5	4	4	2,5	2,5
WUI (user interface) cable section	mm ²	H07RN-F 4 x 0.75					
Circuit breaker	Am	10	16	25	25	16	16

DIMENSIONS


30AWH HO	A	B	C	D	E	F	G	H	L	weight (kg)
5H	908	821	326	350	87	356	466	40	60	57
7H	908	821	326	350	87	356	466	40	60	69
11H	908	1363	326	350	169	645	744	43	73	115
15H	908	1363	326	350	169	645	744	43	73	115
11HT	908	1363	326	350	169	645	744	43	73	121
15HT	908	1363	326	350	169	645	744	43	73	121

INSTALLATION RECOMMENDATION

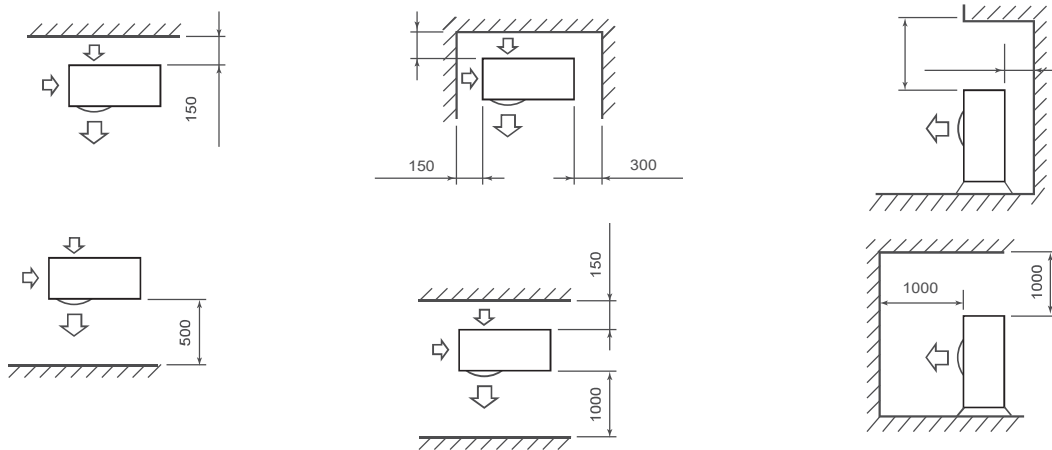


If drainage is provided by the drain pipe, connect the nipple (A) and use the drain pipe (internal diameter: 16 mm) available commercially. If the installation is to be located in a very cold area or area with high snowfall levels, where the condensate drain pipe could freeze, the drainage capacity of the pipe must be checked, or a electric heat trace cable must be added.

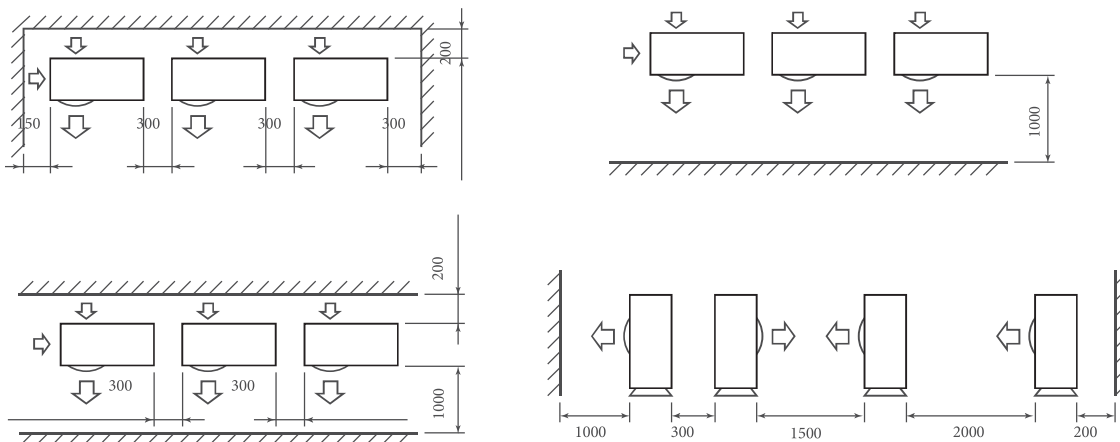
The drainage capacity increases if the prepunched holes in the condensate pan are open (open the prepunched holes outwards using a hammer (B), etc.).

FREE SPACE (MM)

Installation of a single unit



Installation of multiple units



Note: The height of obstacles at the front and rear should be less than the height of the outdoor unit,