

AIR-TO-WATER HEAT PUMPS



Easy and fast installation
Hydraulic module available
Economical operation
Superior reliability

30RQ 017-040 A



Nominal heating capacity 30RQ: 17-41 kW
Nominal cooling capacity 30RQ: 16-39 kW

The Aquasnap liquid chiller/heat pump range was designed for commercial applications such as the air conditioning of offices and hotels etc.

The new Aquasnap units integrate the latest technological innovations:

- Ozone-friendly refrigerant R410A
- Scroll compressors
- Low-noise fans
- Auto-adaptive microprocessor control

The Aquasnap units are equipped with a hydraulic module integrated into the unit chassis, limiting the installation to straightforward operations like connection of the power supply and the water supply and return piping.



CARRIER participates in the ECP programme for LCP/HP
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www.eurovent-certification.com

FEATURES

Quiet operation

- Compressors
 - Low-noise scroll compressors with low vibration levels
 - The compressor assembly is supported by anti-vibration mountings
- Air heat exchanger section
 - Vertical air heat exchanger coils
 - The latest-generation low-noise fans are now even quieter and do not generate intrusive low-frequency noise
 - Rigid fan installation for reduced start-up noise.

Easy and fast installation

- Integrated hydraulic module
 - Fixed speed circulator
 - Water filter protecting the water pump against circulating debris
 - High-capacity membrane expansion tank ensures pressurisation of the water circuit
 - Overpressure valve, set to 4 bar
 - Automatic purge valve positioned at the highest point of the hydraulic module to remove air from the system.
 - Thermal insulation and frost protection down to -10°C , using an electric resistance heater and pump cycling.
 - Integrated water fill system to ensure correct water pressure (option)
- Physical features
 - With its small footprint the unit blends in with any architectural styles.
 - The unit is enclosed by easily removable panels, covering all components (except air heat exchanger and fans).
- Simplified electrical connections
 - A single power supply point (power supply without neutral available as an option and in standard for units size 40kW)
 - Main disconnect switch with high trip capacity
 - Transformer for safe 24 V control circuit supply included
- Fast commissioning
 - Systematic factory operation test before shipment
 - Quick-test function for step-by-step verification of the instruments, electrical components and motors.

Economical operation

- Increased energy efficiency at part load
 - In accordance with standard EN 14825/2013 in average climate, the Seasonal Coefficient of performance (SCOP) reaches 3.01 for an energy label of A.
 - Specific Free Defrost algorithm is present to optimise performance and comfort even during defrost period.
- Reduced maintenance costs
 - Maintenance-free scroll compressors
 - Fast diagnosis of possible incidents and their history via the Pro-Dialog+ control
 - R410A refrigerant is easier to use than other refrigerant blends

Environmental care

- Ozone-friendly R410A refrigerant
 - Chlorine-free refrigerant of the HFC group with zero ozone depletion potential
 - Very efficient - gives an increased energy efficiency ratio (EER)
- Leak-tight refrigerant circuit
 - Brazed refrigerant connections for increased leak-tightness
 - Verification of pressure transducers and temperature sensors without transferring refrigerant charge

Hydraulic module, sizes 026-040



Superior reliability

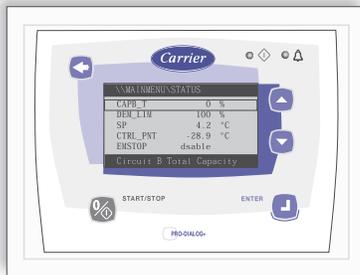
- State-of-the-art concept
 - Cooperation with specialist laboratories and use of limit simulation tools (finite element calculations) for the design of the critical components, e.g. motor supports, suction/discharge piping etc.
- Auto-adaptive control
 - Control algorithm prevents excessive compressor cycling and permits reduction of the water quantity in the hydraulic circuit (Carrier patent)
- Exceptional endurance tests
 - Corrosion resistance tests in salt mist in the laboratory
 - Accelerated ageing test on components that are submitted to continuous operation: compressor piping, fan supports
 - Transport simulation test in the laboratory on a vibrating table.

FEATURES

Pro-Dialog+ control

Pro-Dialog+ combines intelligence with operating simplicity. The control constantly monitors all machine parameters and precisely manages the operation of compressors, expansion devices, fans and of the water heat exchanger water pump for optimum energy efficiency.

Pro-Dialog+ interface



- Energy management
 - Seven-day internal time schedule clock: Permits unit on/off control and operation at a second set point
 - Set point reset based on the outside air temperature or the return water temperature or on the water heat exchanger delta T
 - Master/slave control of two units operating in parallel with operating time equalisation and automatic change-over in case of a unit fault.
 - Change-over based on the outside air temperature
- Integrated features
 - Night mode: Capacity and fan speed limitation for reduced noise level
- Ease-of-use
 - The new backlit LCD interface includes a manual control potentiometer to ensure legibility under any lighting conditions.
 - The information is displayed clearly in English, French, German, Italian and Spanish (for other languages please consult Carrier)
 - The Pro-Dialog+ navigation uses intuitive tree-structure menus, similar to the Internet navigators. They are user-friendly and permit quick access to the principal operating parameters: number of compressors operating, suction/discharge pressure, compressor operating hours, set point, air temperature, entering/leaving water temperature.

Remote operating mode with volt-free contacts (standard)

A simple two-wire communication bus between the RS485 port of the Aquasnap and the Carrier Comfort Network offers multiple remote control, monitoring and diagnostic possibilities. Carrier offers a vast choice of control products, specially designed to control, manage and supervise the operation of an air conditioning system. Please consult your Carrier representative for more information on these products.

- Start/stop: Opening of this contact will shut down the unit
- Dual set point: Closing of this contact activates a second set point (example: Unoccupied mode)
- Alert indication: This volt-free contact indicates the presence of a minor fault
- Alarm indication: This volt-free contact indicates the presence of a major fault that has led to the shut-down of the unit
- User safety: This contact can be used for any customer safety loop, closing of the contact generates a specific alarm
- Out of service: This signal indicates that the unit is completely out of service
- Unit capacity: This analogue output (0-10 V) gives an immediate indication of the unit capacity
- Compressor operation: This contact signals that the compressor is in operation



FEATURES

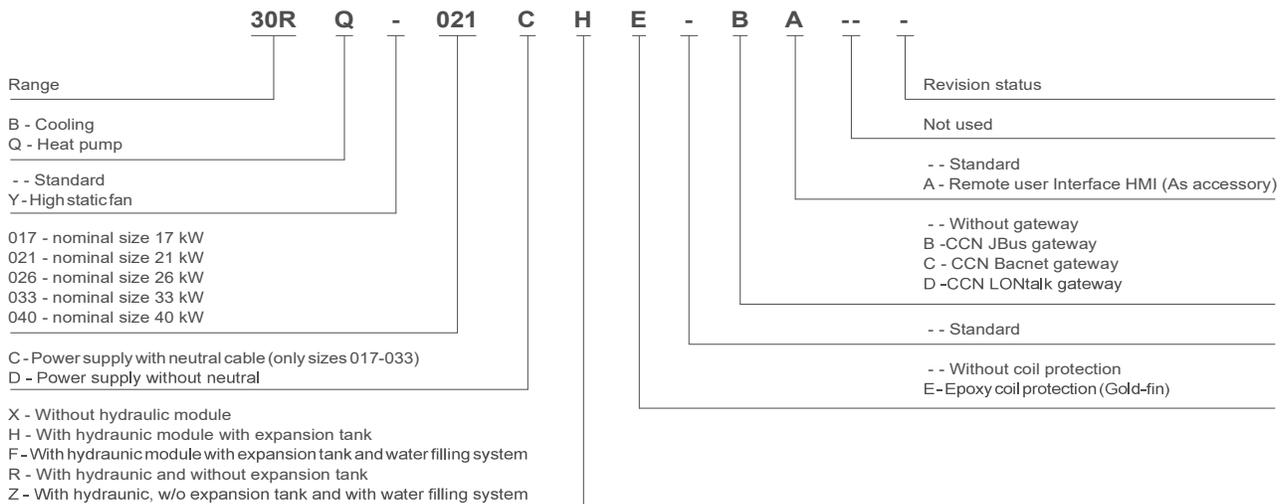
Remote interface (option)

This interface allows access to the same menus as the unit interface and can be installed up to 300 m away. It includes a box that can be mounted inside the building. The power supply is provided via a 220 V/24V transformer supplied.

Interface access, sizes 026-040



TYPE KEY



PHYSICAL DATA, 30RQ UNITS

30RQ			017	021	026	033	040	
Heating								
Standard unit		Nominal capacity	kW	17,6	22,0	30,8	34,3	38,6
Full load performances*	HA1	COP	kW/kW	4,03	3,98	3,98	3,98	3,52
		Nominal capacity	kW	17,0	21,5	29,6	33,0	40,7
	HA2	COP	kW/kW	3,21	3,28	3,21	3,19	3,16
		Standard unit		SCOP _{30/35°C}	kW/kW	3,23	3,20	3,26
Seasonal energy efficiency**	HA1	η_s heat _{30/35°C}	%	126	125	127	128	127
		P_{rated}	kW	13	13	21	23	31
		Energy labelling		A+	A+	A+	A+	A+
Cooling								
Standard unit		Nominal capacity	kW	15,8	19,9	26,3	32,3	39,2
Full load performances*	CA1	EER	kW/kW	3,10	3,03	2,94	3,14	2,85
		Eurovent class		A	B	B	A	C
		Nominal capacity	kW	21,9	26,9	34,0	42,9	54,2
	CA2	EER	kW/kW	3,93	3,68	3,56	3,88	3,44
		Eurovent class		A	B	C	A	D
		Standard unit		SEER _{12/7°C} Comfort low temp.	kWh/kWh	3,42	3,28	3,25
Seasonal energy efficiency**		SEER _{23/18°C} Comfort medium temp.	kWh/kWh	4,08	3,78	3,74	3,96	3,85
		SEPR _{12/7°C} Process high temp.	kWh/kWh	5,43	5,20	4,95	5,10	3,94
Integrated Part Load Value		IPLV,SI	kW/kW	4,400	4,172	4,068	4,352	3,846
Operating weight⁽¹⁾								
Standard unit, with hydraulic module		kg	206	223	280	295	305	
Standard unit, without hydraulic module		kg	191	208	262	277	287	
Sound power level⁽²⁾		dB(A)	72	74	78	78	80	
Sound pressure level at 10 m ⁽³⁾		dB(A)	40	42	46	46	48	
Dimensions								
Length		mm	1136		1002			
Depth		mm	584		824			
Height		mm	1579		1790			
Compressor		One hermetic scroll compressor						
Refrigerant charge R-410A		kg	6,4	7,7	7,6	9,5	9,8	
		teqCO ₂	13,4	16,1	15,9	19,8	20,5	
Control		Pro-Dialog+						

*	In accordance with standard EN14511-3:2013
**	In accordance with standard EN14825:2016, average climate
HA1	Heating mode conditions: Water heat exchanger water entering/leaving temperature 30°C/35°C, outside air temperature tdb/twb = 7°C db/6°C wb, evaporator fouling factor 0 m ² .K/W
HA2	Heating mode conditions: Water heat exchanger water entering/leaving temperature 40°C/45°C, outside air temperature tdb/twb = 7°C db/6°C wb, evaporator fouling factor 0 m ² .K/W
CA1	Cooling mode conditions: evaporator water entering/leaving temperature 12°C/7°C, outside air temperature 35°C, evaporator fouling factor 0 m ² .K/W
CA2	Cooling mode conditions: evaporator water entering/leaving temperature 23°C/18°C, outside air temperature 35°C, evaporator fouling factor 0 m ² .K/W
η_s heat _{30/35°C} & SCOP _{30/35°C}	Bold values compliant to Ecodesign regulation: (EU) No 813/2013 for Heat Pump application
SEER _{12/7°C} & SEPR _{12/7°C}	Values calculated in accordance with EN14825:2016
SEER _{23/18°C}	Values calculated in accordance with EN14825:2016
IPLV,SI	Calculations according to standard performances AHRI 551-591 (SI)
(1)	Weight shown is a guideline only. Please refer to the unit nameplate
(2)	In dB ref=10 ⁻¹² W, (A) weighting. Declared dualnumber noise emission values in accordance with ISO 4871 (with an associated uncertainty of +/-3dB(A)). Measured in accordance with ISO 9614-1 and certified by Eurovent.
(3)	In dB ref 20µPa, (A) weighting. Declared dualnumber noise emission values in accordance with ISO 4871 (with an associated uncertainty of +/-3dB(A)). For information, calculated from the sound power level Lw(A).



Eurovent certified values

PHYSICAL DATA, 30RQ UNITS

30RQ		017	021	026	033	040
Fans		Two twin-speed axial fans, 3 blades		One twin-speed axial fan, 7 blades		
Diameter	mm	495	495	710	710	710
Air flow	l/s	2217	1978	3530	3530	3530
Speed	r/s	14,5	14,5	15	15	15
Water heat exchanger		Plate heat exchanger, maximum operating pressure 1000 kPa				
Water volume	l	1,52	1,9	2,28	2,85	3,8
Air heat exchanger		Copper tubes and aluminum fins				
Pipe diameter	in	3/8	3/8	3/8	3/8	3/8
Number of rows		2,5	3	2,5	3	3
Number of pipes per row		60	60	60	60	60
Fin spacing	mm	1,69	1,69	1,69	1,69	1,69
Standard unit						
Water connections (MPT gas)	in	1	1	1-1/4	1-1/4	1-1/4
Unit with hydraulic module		Pump, screen filter, expansion tank, flow switch, pressure gauge, automatic air purge valve, relief valve				
Pump		One single-speed pump, maximum water-side operating pressure 400 kPa				
Expansion tank capacity	l	5	5	8	8	8
Entering water connection	in	1-1/4	1-1/4	1-1/4	1-1/4	1-1/4
Leaving water connection	in	1	1	1-1/4	1-1/4	1-1/4
Nominal operating current	A	1,3	1,4	2,4	2,6	2,8
Chassis paint colour		Beige				

ELECTRICAL DATA, 30RQ UNITS

30RQ		017	021	026	033	040
Power circuit						
Nominal power supply	V-ph-Hz	400-3+N-50 (power supply option C) or 400-3-50 (power supply option D)				400-3-50 (STD - no option)
Voltage range	V	340-460				360-440
Control circuit supply						
24 V via internal transformer						
Maximum start-up current (Un)*	A	75	95	118	118	176
Unit power factor at nominal capacity**		0.84	0.79	0.77	0.81	0.9
Maximum operating power input**	kW	7.8	9.1	11	13.8	17.5
Nominal current drawn***	A	8	12	16	17	25
Maximum operating current draw (Un)****	A	13	16	20	24	30
Maximum operating current draw (Un-15%)†	A	15	18	23	27	36

* Maximum instantaneous start-up current (locked rotor current of the compressor).

** Power input, compressors and fans, at the unit operating limits (saturated suction temperature 10°C, saturated condensing temperature 65°C) and nominal voltage of 400 V (data given on the unit nameplate).

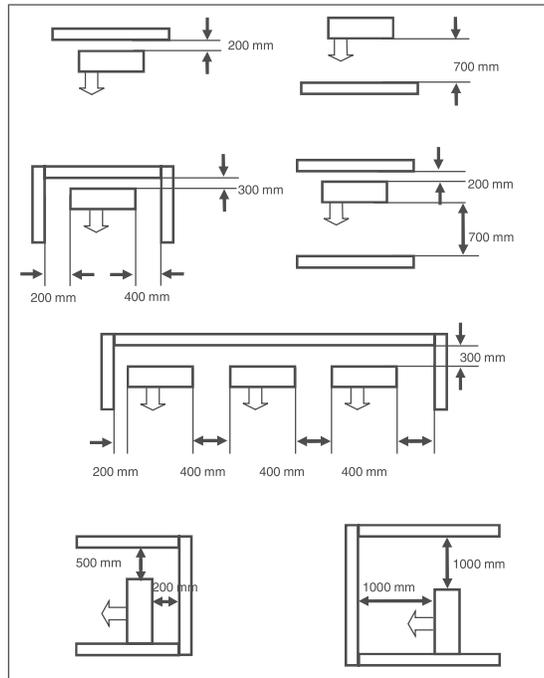
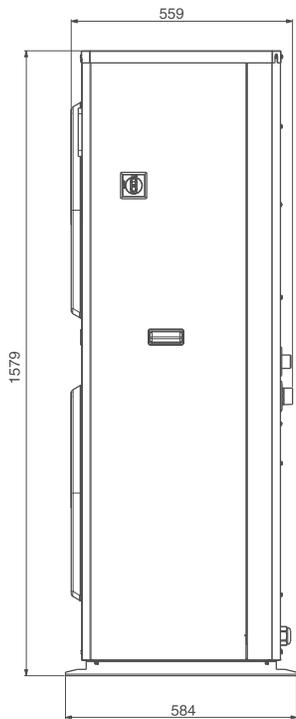
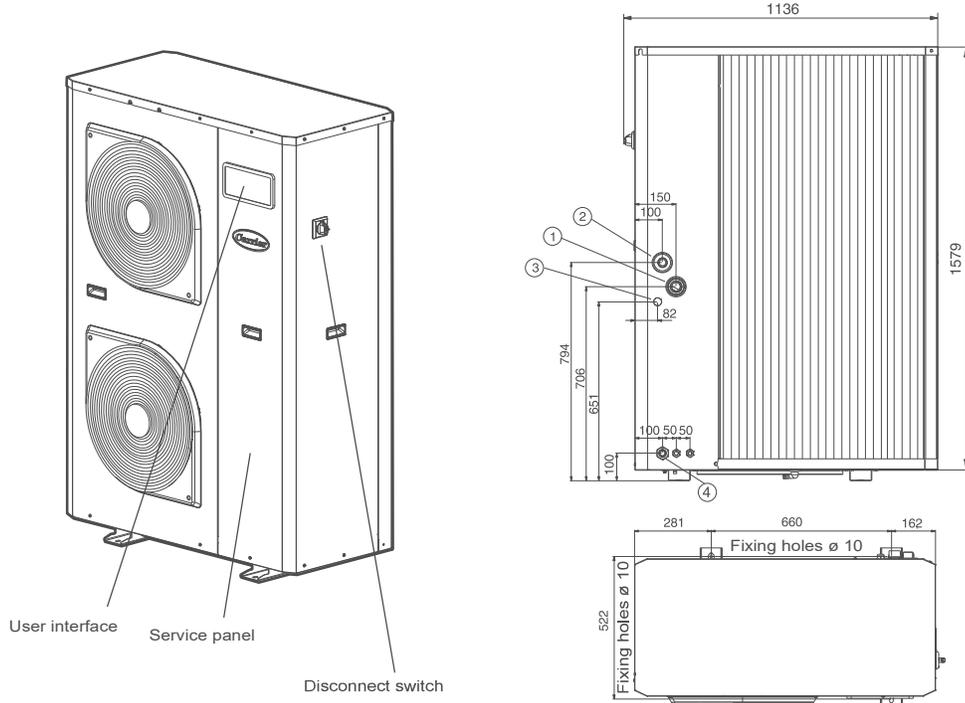
*** Standardised Eurovent conditions: Water heat exchanger entering/leaving water temperature 12°C/7°C, outside air temperature 35°C.

**** Maximum unit operating current at maximum unit power input and 400 V (values given on the unit nameplate).

† Maximum unit operating current at maximum unit power input and 340-460V for sizes 017 to 033 or 360-440V for size 040.

DIMENSIONS/CLEARANCES

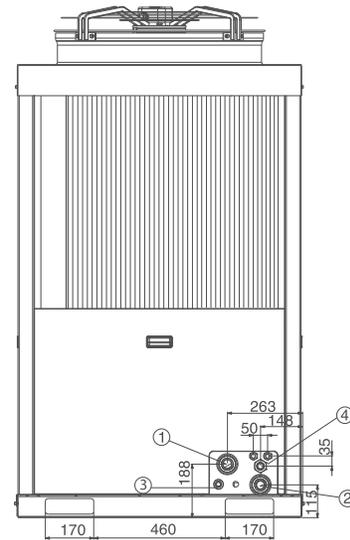
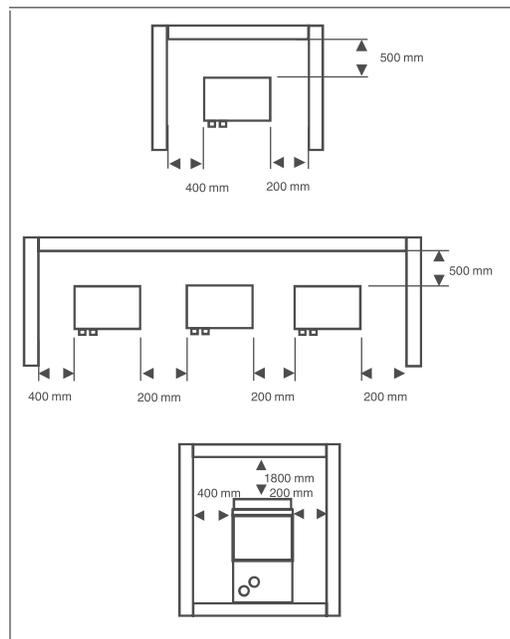
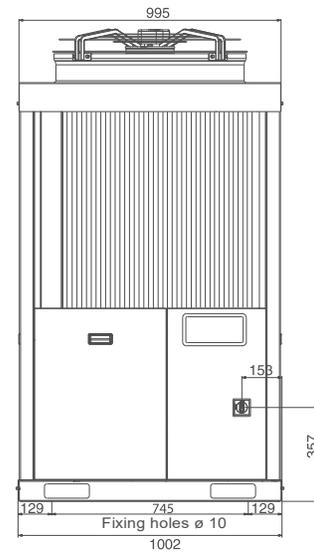
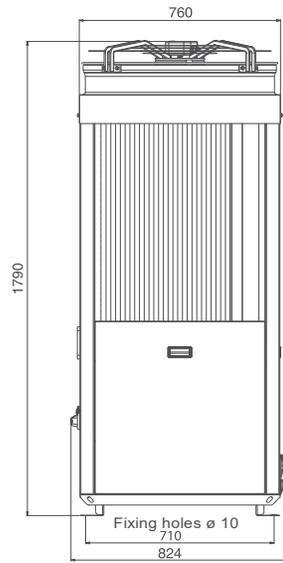
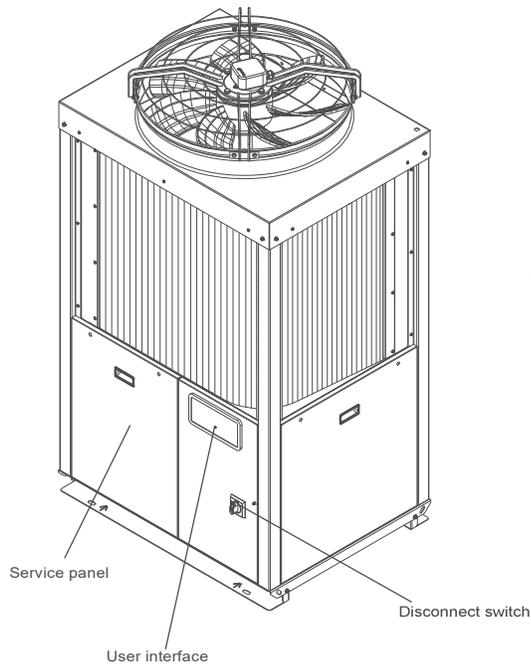
30RQ 017-021



- Legend**
 All dimensions are in mm
 1. Water inlet
 2. Water outlet
 3. Water fill kit connection (option)
 4. Power connections

DIMENSIONS/CLEARANCES

30RQ 026-040



Legend

All dimensions are in mm

1. Water inlet
2. Water outlet
3. Water fill kit connection (option)
4. Power connections

