

# 30RQ

Nominal heating capacity 16-40 kW

Nominal Cooling capacity 16-40 kW



HEATING

**AQUASNAP**  
Reversible

**Easy and fast  
installation**

**Hydronic module  
available**

**Economical  
operation**

**Superior reliability**

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

This AquaSnap units integrate the latest technological innovations:

- Non-ozone depleting refrigerant R410A
- Scroll compressors
- Low-noise fans
- Auto-adaptive microprocessor control

The AquaSnap units are equipped with a hydronic 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.

# Physical data



30RQ		017	021	026	033	040
------	--	-----	-----	-----	-----	-----

## Cooling

<b>Full load performances*</b>	C1	Nominal capacity	kW	16.0	20.2	26.7	32.7	39.8
	C1	EER	kW/kW	3.17	3.11	3.01	3.21	2.92
	C1	Eurovent Energy Class		A	A	B	A	B
	C2	Nominal capacity	kW	22.2	27.4	34.3	43.6	55
	C2	EER	kW/kW	4.02	3.76	3.62	3.96	3.5
<b>Seasonal Efficiency*</b>	ESEER	kW/kW		3.61	3.44	3.36	3.58	3.25

## Heating

<b>Full load performances*</b>	H1	Nominal capacity	kW	17.6	22.2	31.0	34.7	38.9
	H1	COP	kW/kW	3.99	3.98	3.98	3.98	3.51
	H1	Eurovent Energy Class		B	B	B	B	E
	H2	Nominal capacity	kW	17	21.6	29.9	33.3	41
	H2	COP	kW/kW	3.18	3.28	3.2	3.19	3.16
	H2	Eurovent Energy Class		B	A	A	B	B
<b>Seasonal Efficiency**</b>	H1	Energy Class		A	A	A	A	A
	H1	SCOP	kW/kW	3.03	3.05	3.11	3.13	3.14
		I <sub>js</sub> heat	%	118	119	122	122	122
		Prated	KW	10	12	19	21	26
<b>Sound Power Level Standard Unit</b>			dB(A)	72	74	78	78	80
<b>Operating weight†</b>								
Standard unit with/without hydronic module			kg	206/191	223/208	280/262	295/277	304/287
<b>Refrigerant</b>				R-410A				
<b>Compressor</b>				One hermetic scroll compressor				
<b>Control</b>				Pro-Dialog+				
<b>Fans</b>				Two twin-speed axial fans, 3 blades			One twin-speed axial fan, 7 blades	
Air flow			l/s	2217	1978	3530	3530	3530
<b>Water heat exchanger</b>				Plate heat exchanger				
<b>Air heat exchanger</b>				Copper tubes and aluminium fins				
<b>Unit with hydronic module pump</b>				One single-speed pump, screen filter, expansion tank, flow switch, pressure gauge, automatic air purge valve, safety valve				
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	1.30	1.4	2.4	2.6	2.8
<b>Dimensions</b>								
Length			mm	1136	1136	1002	1002	1002
Depth			mm	584	584	824	824	824
Height			mm	1579	1579	1790	1790	1790

C1 Cooling mode conditions: Water heat exchanger, entering/leaving temperature 12°C/7°C, fouling factor 0 m² K/W. Outside air temperature 35°C

C2 Cooling mode conditions: Water heat exchanger, entering/leaving temperature 23°C/18°C, fouling factor 0 m² K/W. Outside air temperature 35°C

H1 Heating mode conditions: Water heat exchanger water entering/leaving temperature 30°C/35°C, fouling factor 0 m² K/W. Outside air temperature 7°C db/6°C wb,

H2 Heating mode conditions: Water heat exchanger water entering/leaving temperature 40°C/45°C, fouling factor 0 m² K/W. Outside air temperature 7°C db/6°C wb,

\* In accordance with standard EN14511-3:2013

\*\* In accordance with standard EN14825:2013, average climate

† Weight shown is a guideline only.

Eurovent certified data

Eurovent certified data

# Electrical data

30RQ		017	021	026	033	040
<b>Power circuit</b>						
Nominal power supply	V-ph-Hz	400-3-50 ± 10%				
<b>Control circuit supply</b>		24 V via internal transformer				
<b>Maximum start-up current (Un)*</b>	A	75	95	118	118	176
<b>Maximum operating power input**</b>	kW	7.8	9.1	11	13.8	17.5
<b>Nominal unit operating current draw***</b>	A	8	12	16	17	25

\* 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.

## Type key

<b>30R</b>	<b>Q</b>	<b>-</b>	<b>0 2 1</b>	<b>C</b>	<b>H</b>	<b>E</b>	<b>-</b>	<b>B</b>	<b>-</b>	<b>-</b>	<b>-</b>	
Product Range												Revision status
												New option (not used)
Q - Heat pump AquaSnap												
Standard version												- - Standard
Nominal capacity												A - Remote User Interface HMI
C - Power supply with neutral cable (not available for size 40)												- - Without gateway
D - Power supply without neutral cable												B - CCN Jbus gateway
												C - CCN Bacnet gateway
												D - CCN LONtalk gateway
												Standard
												- - Without coil protection
												E - Epoxy coil-protection (Gold-fin)
0 - Without hydronic module												
H - With hydronic module with expansion tank												
F - With hydronic module with expansion tank and water filling system												
R - With hydronic module, without expansion tank												
Z - With hydronic module, w/o exp. tank, with water filling system												

# Features and advantages

## 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 hydronic module
  - High-pressure centrifugal water pump
  - 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
  - Pressure gauge to measure the system pressure.
  - Automatic purge valve positioned at the highest point of the hydronic 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
  - Eurovent energy efficiency class A and B (in accordance with EN14511-3:2013) in cooling and heating mode. The exceptionally high energy efficiency of the AquaSnap unit is the result of a long qualification and optimisation process.
- 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

## Environmentally balanced

- Non-ozone depleting 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

## Superior reliability

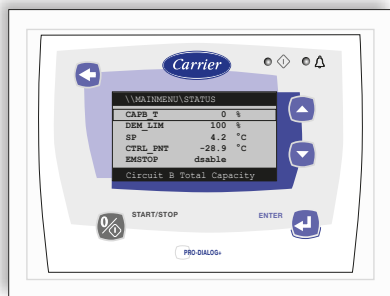
- State-of-the-art concept
  - Cooperation with specialist laboratories and use of limit simulation tools (finite element calculations) for the design of the critical components, e.g. motor supports, suction/discharge piping etc.
- Auto-adaptive control
  - Control algorithm prevents excessive compressor cycling and permits reduction of the water quantity in the hydronic 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.

# Controls

## 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.

# Operating limits

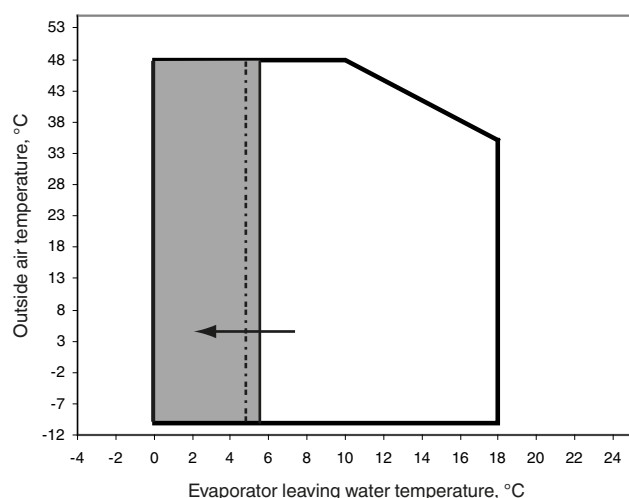
## Water heat exchanger water flow rate

30RQ	Flow rate, l/s		Maximum*	Maximum**
	Minimum			
017	0.45		1.39	1.26
021	0.57		1.52	1.42
026	0.67		2.18	1.72
033	0.87		2.29	1.85
040	1.05		2.60	2.70

\* Maximum flow rate at an available pressure of 50 kPa (unit with hydronic module)

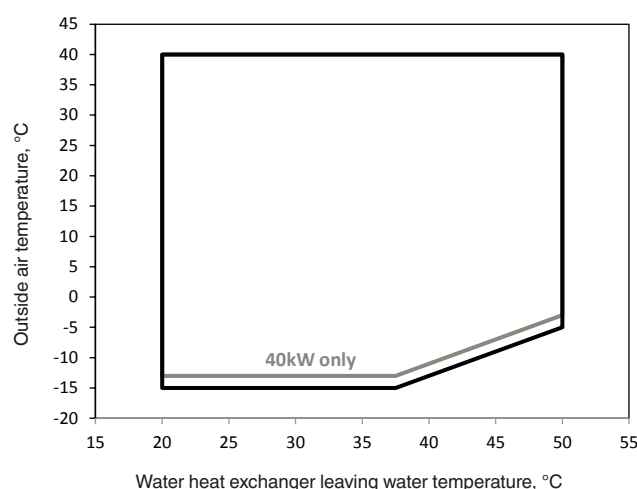
\*\* Maximum flow rate at pressure drop of 100 kPa in the plate heat exchanger (unit without hydronic module).

30RQ (cooling mode)



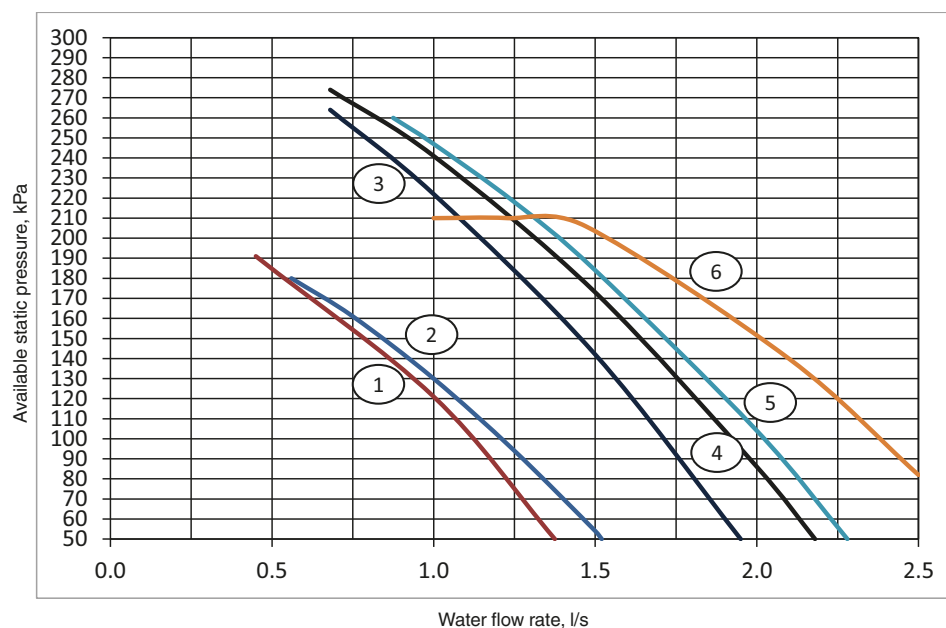
Operating range with anti-freeze solution and Pro-Dialog configuration.

30RQ (heating mode)



# Available static system pressure

30RQ 017-040



### Legend

- 30RQ 017
- 30RQ 021
- 30RB 026
- 30RQ 026
- 30RQ 033
- 30RQ 040

# Hydronic module

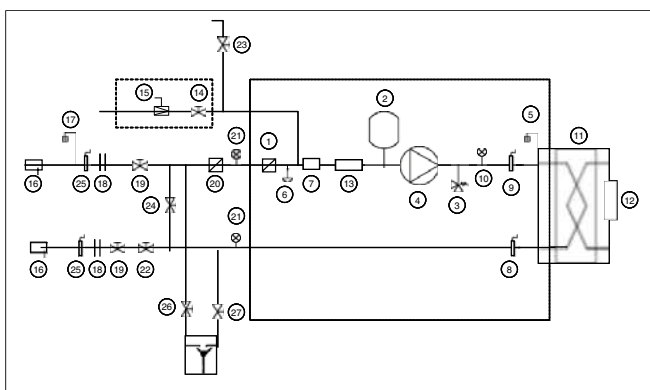
The hydronic module reduces the installation time. The unit is factory-equipped with the main hydronic components required for the installation: screen filter, water pump, expansion tank, safety valve and pressure gauge.

The water heat exchanger and the hydronic module are protected against frost down to  $-10^{\circ}\text{C}$ , using an electric resistance heater (standard) and pump cycling.

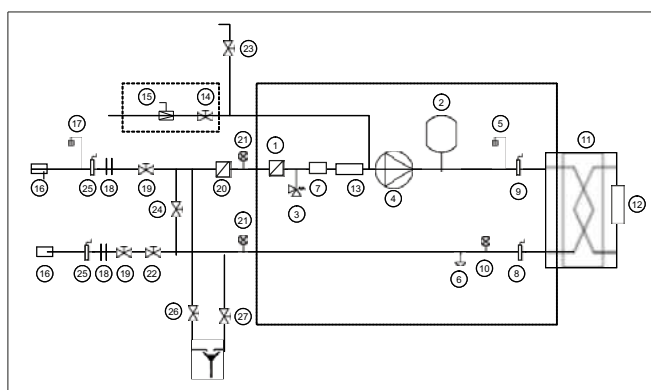
The hydronic module is integrated into the unit without increasing its dimensions and saves the space normally used for the water pump.

## Typical hydronic circuit diagram

### 17-21 kW



### 26-40 kW



— Hydronic module (unit with hydronic module)  
 - - - Automatic water fill system option

## Legend

### Components of the unit and hydronic module

1. Screen filter
2. Expansion tank
3. Safety valve
4. High-pressure pump
5. Air purge
6. Water drain valve
7. Flow sensor
8. Plate heat exchanger leaving temperature sensor
9. Plate heat exchanger entering temperature sensor
10. Pressure gauge
11. Plate heat exchanger
12. Heat exchanger frost protection heater
13. Pipe frost protection heater
14. Shut-off valve (automatic water fill option)
15. Pressure reducer (automatic water fill option)

### System components

16. Temperature sensor well
17. Air purge
18. Flexible connections
19. Shut-off valve
20. Screen filter (obligatory for a unit without hydronic module)
21. Pressure gauge
22. Flow control valve (factory-supplied for field installation)
23. Charge valve
24. Frost protection bypass (when shut-off valves are closed in winter)
25. Pressure sensor
26. System drain valves
27. Plate heat exchanger drain valve

**30RQ 017-021**

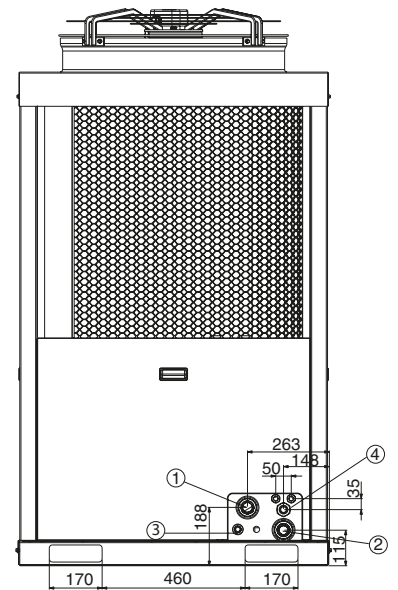
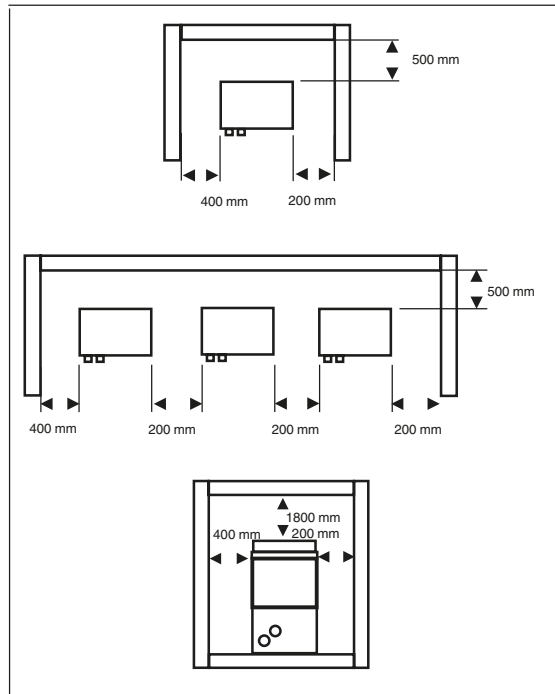
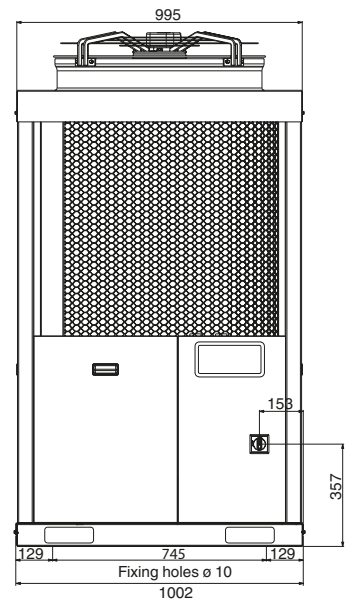
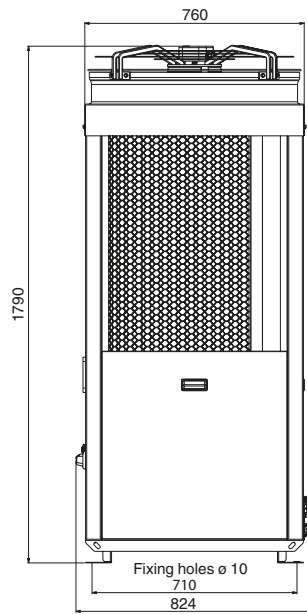
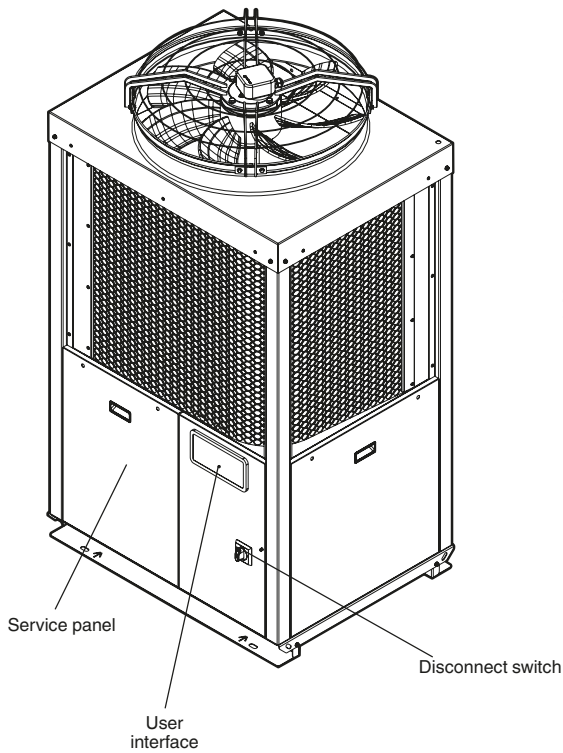


All dimensions are in mm

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



## 30RQ 026-040



### Legend

All dimensions are in mm

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