



## PRODUCT SELECTION DATA

AIR-COOLED LIQUID CHILLERS/  
AIR-TO-WATER HEAT PUMPS  
DUCTABLE AIR-COOLED LIQUID  
CHILLERS



Easy and fast installation  
Hydraulic module available  
Economical operation  
Superior reliability

30RB 026-040 A  
30RQ 026-040 A

**AQUASNAP**

Nominal cooling capacity 30RB: 27 - 41 kW  
Nominal cooling capacity 30RQ: 26 - 39 kW  
Nominal heating capacity 30RQ: 29 - 41 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:

- Non-ozone depleting refrigerant R-410A
- 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  
Check ongoing validity of certificate:  
[www.eurovent-certification.com](http://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  $-10^{\circ}\text{C}$ , 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 14825/2018 in average climate, the Seasonal Coefficient of performance (SCOP) reaches 3,27 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
  - R-410A refrigerant is easier to use than other refrigerant blends

### Environmental care

- Ozone-friendly R-410A refrigerant
  - Chlorine-free refrigerant of the HFC group with zero ozone depletion potential
  - Very efficient - gives an increased energy efficiency ratio (EER/SEER/COP/SCOP)
- Leak-tight refrigerant circuit
  - Brazed refrigerant connections for increased leak-tightness
  - Verification of pressure transducers and temperature sensors without transferring refrigerant charge

### Hydraulic module



### Superior reliability

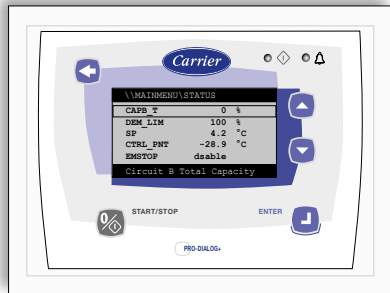
- State-of-the-art concept
  - Cooperation with specialist laboratories and use of limit simulation tools (finite element calculations) for the design of the critical components, e.g. motor supports, suction/discharge piping etc.
- Auto-adaptive control
  - Control algorithm prevents excessive compressor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

## 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



## HYDRAULIC MODULE

The hydraulic module reduces the installation time. The unit is factory-equipped with the main hydraulic components required for the installation: screen filter, variable speed circulator, expansion tank and relief valve.

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

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

### Physical and electrical data

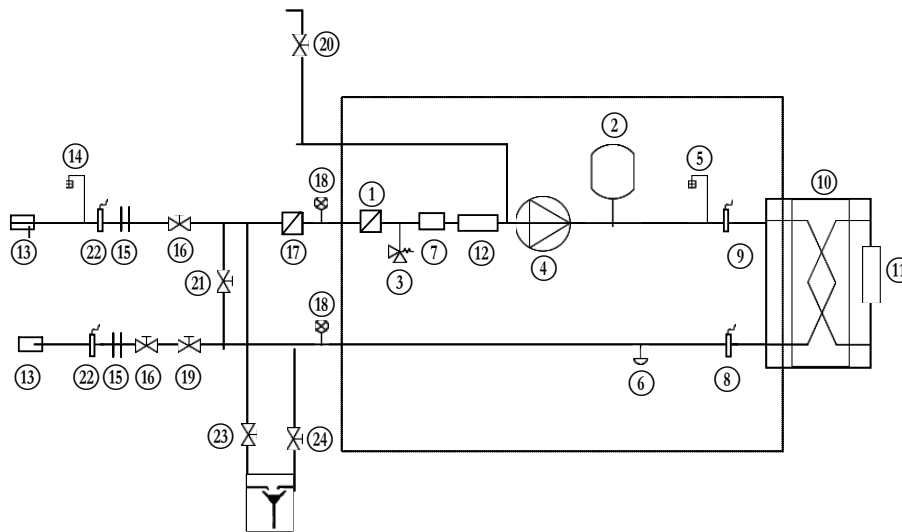
These are the same as for the standard unit except:

30RB/RQ		026	033	040
<b>Hydraulic module</b>				
Expansion tank volume	l	8	8	8
Maximum water-side operating pressure	kPa	400	400	400
<b>Pumps</b>				
Water pump		Pump, screen filter, expansion tank, flow switch, automatic purge valve, relief valve		
Power input <sup>(1)</sup>	kW	0,99	1,10	1,20
Nominal operating current draw <sup>(1)</sup>	A	2,40	2,60	2,80

(1) Nominal conditions: evaporator entering/leaving water temperature  $12^{\circ}\text{C}/7^{\circ}\text{C}$ , outside air temperature  $35^{\circ}\text{C}$ , evaporator fouling factor =  $0\text{ m}^2\text{ K/kW}$ .  
Gross performances, not in accordance with EN14511-3:2013. These performances do not take into account the correction for the proportional heating capacity and power input generated by the water pump to overcome the internal pressure drop in the heat exchanger.

### Typical hydraulic circuit diagram

26-40 kW



Hydraulic module (unit with hydraulic module)  
Automatic water fill system option (option)

#### Legend

##### Components of the unit and hydraulic module

- ① Screen filter
- ② Expansion tank
- ③ Relief 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 Plate heat exchanger
- ⑪ Heat exchanger frost protection heater
- ⑫ Pipe frost protection heater

##### System components

- ⑬ Temperature sensor well
- ⑭ Air purge
- ⑮ Flexible connections
- ⑯ Shut-off valve
- ⑰ Screen filter (obligatory for a unit without hydraulic module)
- ⑱ Pressure gauge
- ⑲ Flow control valve (factory-supplied for field installation)
- ⑳ Charge valve
- ㉑ Frost protection bypass (when shut-off valves are closed in winter)
- ㉒ Pressure sensor
- ㉓ System drain valves
- ㉔ Plate heat exchanger drain valve

# PERFORMANCES DATA, 30RB / 30RQ UNITS

			30RB 26	30RB 33	30RB 40	30RQ 26	30RQ 33	30RQ 40	
<b>Heating</b>									
<b>Standard unit</b> Full load performances*	HA1	Nominal capacity	kW	-	-	-	30,4	34,0	38,4
		COP	kW/kW	-	-	-	3,99	3,99	3,53
	HA2	Nominal capacity	kW	-	-	-	29,4	32,8	40,6
		COP	kW/kW	-	-	-	3,22	3,20	3,17
<b>Standard unit</b> Seasonal energy efficiency**	HA1	<b>SCOP<sub>30/35°C</sub></b>	<b>kW/kW</b>	-	-	-	<b>3,34</b>	<b>3,34</b>	<b>3,30</b>
		<b>η<sub>s heat</sub><sub>30/35°C</sub></b>	<b>%</b>	-	-	-	<b>131</b>	<b>131</b>	<b>129</b>
		<b>P<sub>rated</sub></b>	<b>kW</b>	-	-	-	20	23	31
		Energy labelling		-	-	-	A++	A++	A++
<b>Cooling</b>									
<b>Standard unit</b> Full load performances*	CA1	Nominal capacity	kW	27,5	33,5	41,5	26,4	32,5	39,4
		EER	kW/kW	3,12	3,32	2,99	2,98	3,19	2,88
	CA2	Nominal capacity	kW	38,9	46,2	57,1	34,2	43,2	54,4
		EER	kW/kW	4,03	4,15	3,55	3,61	3,92	3,46
<b>Standard unit</b> Seasonal energy efficiency**		<b>SEPR<sub>-2/-8°C</sub> Process medium temp.***</b>	<b>kWh/kWh</b>	<b>3,17</b>	<b>3,02</b>	<b>3,07</b>	-	-	-
		SEPR <sub>12/7°C</sub> Process high temp.	kWh/kWh	5,25	5,28	5,18	5,06	5,20	3,98
		SEER <sub>12/7°C</sub> Comfort low temp.	kWh/kWh	3,44	3,63	3,53	3,39	3,57	3,41
		SEER <sub>23/18°C</sub> Comfort medium temp.	kWh/kWh	3,96	4,08	4,04	3,87	4,02	3,96
Integrated Part Load Value		IPLV.SI	kW/kW	4,340	4,540	4,030	4,068	4,352	3,846
<b>Operating weight<sup>(1)</sup></b>									
Standard unit, with hydraulic module			kg	255	280	291	280	295	305
Standard unit, without hydraulic module			kg	237	262	273	262	277	287
<b>Sound power level<sup>(2)</sup></b>			dB(A)	78	78	80	78	78	80
Sound pressure level at 10 m <sup>(3)</sup>			dB(A)	46	46	48	46	46	48

\* In accordance with standard EN14511-3:2018  
 \*\* In accordance with standard EN14825:2018, 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 frosting factor 0 m².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 frosting factor 0 m².K/W  
 CA1 Cooling mode conditions: evaporator water entering/leaving temperature 12°C/7°C, outside air temperature 35°C, evaporator frosting factor 0 m².K/W  
 CA2 Cooling mode conditions: evaporator water entering/leaving temperature 23°C/18°C, outside air temperature 35°C, evaporator frosting factor 0 m².K/W  
**η<sub>s heat</sub><sub>30/35°C</sub> & SCOP<sub>30/35°C</sub>** **Bold values compliant to Ecodesign regulation: (EU) No 813/2013 for Heat Pump application**  
**SEPR<sub>-2/-8°C</sub>** **Bold values compliant to Ecodesign regulation: (EU) No 2015/1095 for Process application**  
 SEER<sub>12/7°C</sub> & SEPR<sub>12/7°C</sub> Values calculated in accordance with EN14825:2018  
 SEER<sub>23/18°C</sub> Values calculated in accordance with EN14825:2018  
 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<sup>-12</sup> 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, 30RB / 30RQ UNITS

		30RB 26	30RB 33	30RB 40	30RQ 26	30RQ 33	30RQ 40
<b>Dimensions</b>							
Length	mm	1002					
Depth	mm	824					
Height	mm	1790					
<b>Compressor</b>		One hermetic scroll compressor					
<b>Refrigerant charge R-410A</b>	kg	5,8	8,6	8,8	7,6	9,5	9,8
	teqCO <sub>2</sub>	12,1	18,0	18,4	15,9	19,8	20,5
<b>Control</b>		Pro-Dialog+					
<b>Fans</b>		One twin-speed axial fan, 7 blades					
Diameter	mm	710					
Air flow	l/s	3530					
Speed	r/s	15					
<b>Water heat exchanger</b>		Plate heat exchanger, maximum operating pressure 1000 kPa					
<b>Water volume</b>	l	2,28	2,85	3,8	2,28	2,85	3,8
<b>Air heat exchanger</b>		Copper tubes and aluminum fins					
Pipe diameter	in	3/8	3/8	3/8	3/8	3/8	3/8
Number of rows		2	3	3	2,5	3	3
Number of pipes per row		60	60	60	60	60	60
Fin spacing	mm	1,69	1,69	1,69	1,69	1,69	1,69
<b>Standard unit</b>							
Water connections (MPT gas)	in	1-1/4					
<b>Unit with hydraulic module</b>		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	8					
Entering water connection	in	1-1/4					
Leaving water connection	in	1-1/4					
Nominal operating current	A	2,4	2,6	2,8	2,4	2,6	2,8
<b>Chassis paint colour</b>		RAL 7035					

## ELECTRICAL DATA, 30RB/RQ UNITS

30RB/RQ		026	033	040
<b>Power circuit</b>				
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
<b>Control circuit supply</b>				
24 V via internal transformer				
<b>Maximum start-up current (Un)<sup>(1)</sup></b>	A	118	118	176
<b>Unit power factor at nominal capacity<sup>(2)</sup></b>		0,77	0,81	0,9
<b>Maximum operating power input<sup>(2)</sup></b>	kW	11	13,8	17,5
<b>Nominal current drawn<sup>(3)</sup></b>	A	16	17	25
<b>Maximum operating current draw (Un)<sup>(4)</sup></b>	A	20	24	30
<b>Maximum operating current draw (Un-15%)<sup>(5)</sup></b>	A	23	27	36

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

(2) 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).

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

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

(5) Maximum unit operating current at maximum unit power input and 340-460V for sizes 026 to 033 or 360-440V for size 040.

## PART LOAD PERFORMANCES

### SEER for comfort chillers (in accordance with EU ECODESIGN)

The **SEER (Seasonal Energy Efficiency Ratio)** measures the seasonal energy efficiency of comfort **chillers** by calculating the ratio between annual cooling demand of the building and annual energy demand of the chiller. It takes into account the energy efficiency achieved for each outdoor temperature weighted by the number of hours observed for each of these temperatures, using actual climate data.

**SEER** is a new way of measuring the true energy efficiency of chillers for **comfort cooling** over an entire year. This new indicator gives a more realistic indication of the real energy efficiency and environmental impact of a cooling system (Ecodesign Regulation 2016/2281).

### SCOP (In accordance with standard N14825:2018, average climate)

The **SCOP (Seasonal Coefficient of Performance)** permit evaluation of the average energy efficiency at part load, based on multipoint conditions (16°C to -10°C for average climate) and number of hours occurring at each air temperature (Bin hours).

To be able to compare the energy efficiency of boilers using a primary energy source (gas or fuel) with heat pumps using a final energy source (electricity), the seasonal efficiency criteria used by the Ecodesign regulations is known as it is based on the use of primary energy sources and expressed in %.

### SEPR for process chillers (in accordance with EU ECODESIGN)

The **SEPR (Seasonal Energy Performance Ratio)** measures the seasonal energy efficiency of **process chillers** by calculating the ratio between annual cooling demand of the process and annual energy demand of the chiller. It takes into account the energy efficiency achieved at each outdoor temperature of an average climate weighted by the number of hours observed for each of these temperatures.

**SEPR** is a new way of measuring the true energy efficiency of chillers for **process cooling** over an entire year. This new indicator gives a more realistic indication of the real energy efficiency and environmental impact of the cooling system (Ecodesign Regulation 2015/1095).

# OPERATING LIMITS

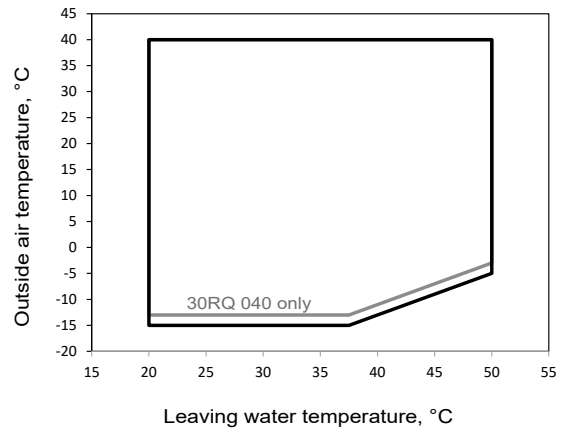
## Water heat exchanger water flow rate

30RB	Minimum flow rate	Maximum flow rate <sup>(1)</sup>	Maximum flow rate <sup>(2)</sup>
	l/s	l/s	l/s
26	0,63	1,96	1,43
33	0,82	2,18	1,72
40	0,99	2,6	2,7

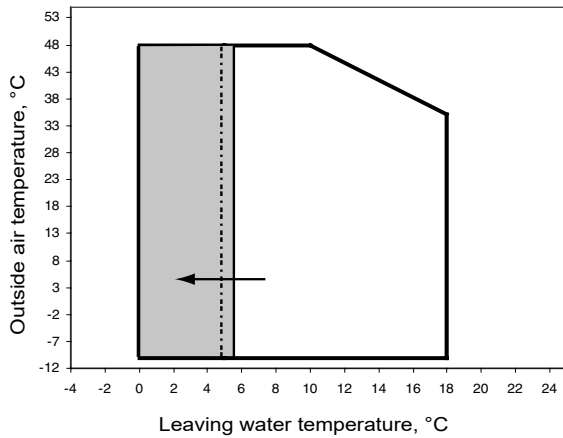
30RQ	Minimum flow rate	Maximum flow rate <sup>(1)</sup>	Maximum flow rate <sup>(2)</sup>
	l/s	l/s	l/s
26	0,67	2,18	1,72
33	0,87	2,29	1,85
40	1,05	2,6	2,7

- (1) Maximum flow rate at an available pressure of 50 kPa (unit with hydraulic module)
- (2) Maximum flow rate at pressure drop of 100 kPa in the plate heat exchanger (unit without hydraulic module).

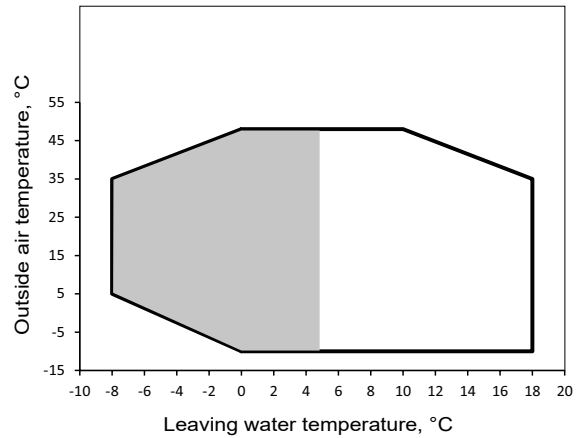
**30RQ (heating mode)**



**30RQ (cooling mode)**



**30RB (cooling mode)**



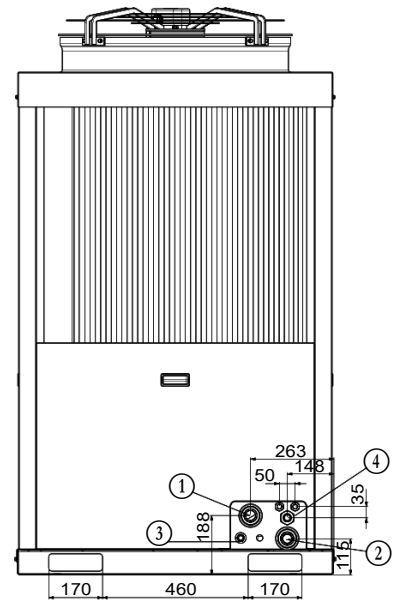
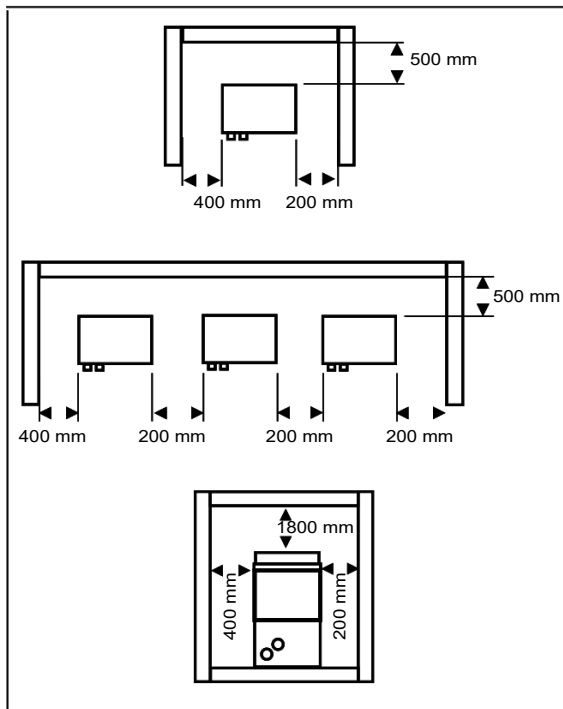
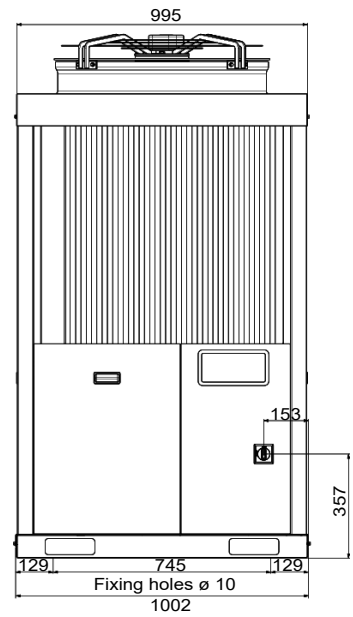
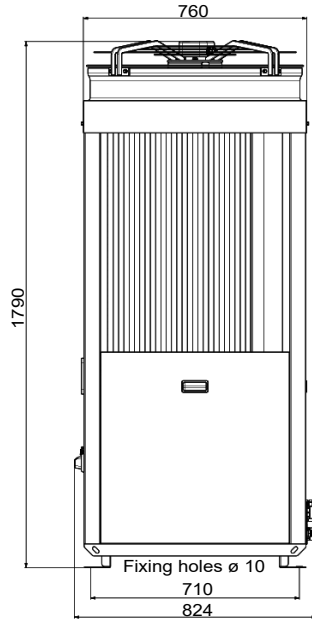
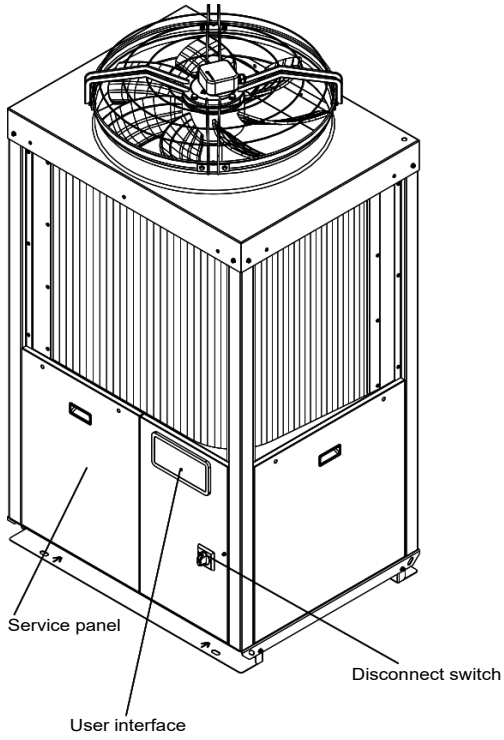
■ Operating range with anti-freeze solution and Pro-Dialog configuration.

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



# DIMENSIONS/CLEARANCES

30RB/RQ 026-040



**Legend**

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