Carrier®

Ductable Air-Cooled Liquid Chillers/ Ductable Air-to-Water Heat Pumps

PRO-DIALOG

AQUASNAP™

EUROVENT CERTIFIED PERFORMANCE
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LLOYD'S REGISTER QUALITY ASSURANCE ISO9001

Quality Management Systems

30RBY/RQY 017-033

Nominal cooling capacity 15-32 kW
Nominal heating capacity 17-31 kW

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

It integrates the latest technological innovations:
- ozone-friendly refrigerant R410A
- scroll compressors
- low-noise fans
- auto-adaptive microprocessor control

The standard 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, of the water supply and return piping and of the air distribution ducting.

Features

Quiet operation

- Compressors
  - Low-noise scroll compressors with low vibration levels
  - The compressor assembly is installed on an independent chassis and supported by anti-vibration mountings
- Air heat exchanger section
  - Vertical air heat exchanger coils
  - Anti-vibration protection grilles protect the heat exchanger against possible shocks.
  - 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/accessory)
- 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).

Access panels, sizes 017-021

- Easy duct connection
  - Rectangular discharge air connection.
  - Fan with 80 Pa available pressure. Centrifugal fan for sizes 017 and 021, and axial fan for sizes 026 and 033.
  - Rectangular suction and filter connection option (sizes 017 and 021 only).

Inlet filters, sizes 017-021

- Simplified electrical connections
  - A single power supply point
  - 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 cooling mode and C in heating mode (in accordance with EN14511-3:2011).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

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

Hydronic module, sizes 026-033

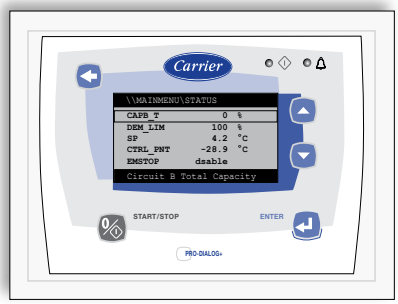
Superior reliability

- 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.

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)
- 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
- Compressor operation: this contact signals that the compressor is in operation

Remote interface (accessory)

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 016-033

Options and accessories

Options	Description	Advantages	Use
Hydronic module	The hydronic module is factory-installed. As it contains most of the required hydronic components, the unit is more compact and easier to install.	Simply plug in and the unit is ready, making installation quick and easy.	30RBY/RQY 017-033
Integrated water fill system	This option is offered for units with hydronic module. It allows the user to automatically fill water into the system.	Water is added automatically into the unit system circuit.	30RBY/RQY 017-033
Inlet duct frame	Inlet air duct conection frame	Easy connection of the inlet air duct	30RBY/RQY 017-021
Inlet filter frame	Inlet duct connection frame with washable G8 filters	Easy connection of the inlet air duct, protection of the coil against clogging	30RBY/RQY 017-021
Accessories	**Description**	**Advantages**	**Use**
Integrated water fill system	This option is offered for units with hydronic module. It allows the user to automatically fill water into the system.	Water is added automatically into the unit system circuit.	30RBY/RQY 017-033
JBus gateway	Two-directional communications board, complies with JBus protocol	Easy connection by communication bus to a building management system	30RBY/RQY 017-033
BacNet gateway	Two-directional communications board, complies with BacNet protocol	Easy connection by communication bus to a building management system	30RBY/RQY 017-033
LonTalk gateway	Two-directional communications board, complies with LonTalk protocol	Easy connection by communication bus to a building management system	30RBY/RQY 017-033
Remote interface	Remotely installed user interface (via communication bus)	Remote unit control up to 300 m	30RBY/RQY 017-033
Condensate drain pan	To be installed below the unit and connected to the water drain	Easy water drainage (maintenance and defrost)	30RBY/RQY 017-033

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°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.

Physical and electrical data

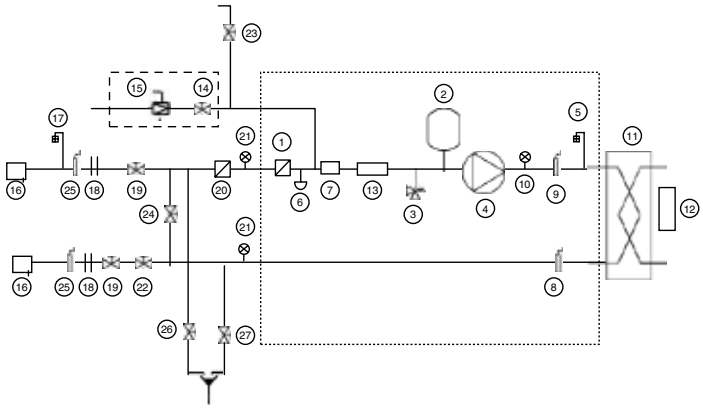
These are the same as for the standard unit except:

30RBY/RQY - units with hydronic module		017	021	026	033
Hydronic module					
Expansion tank volume	l	5	5	8	8
Maximum water-side operating pressure	kPa	400	400	400	400
Pumps					
Water pump		Pump, screen filter, expansion tank, flow switch, pressure gauge, automatic purge valve, safety valve			
Power input*	kW	0.54	0.59	0.99	1.10
Nominal operating current draw*	A	1.30	1.40	2.40	2.60

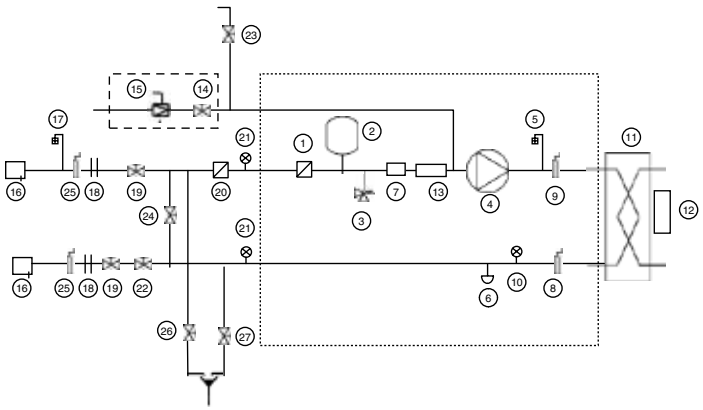
* Nominal conditions: evaporator entering/leaving water temperature 12°C/7°C, outside air temperature 35°C, evaporator fouling factor = 0 m^2 K/kW.
Gross performances, not in accordance with EN14511-3:2011. These performances do not take into account the correction for the proportional heating capacity and power input generated by the water pump to overcome the internal pressure drop in the heat exchanger.

Typical hydronic circuit diagram

Sizes 17-21 kW



Sizes 26-33 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 fiter (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

Physical data, 30RBY units

30RBY		017	021	026	033
Air conditioning application as per EN14511-3:2011*					
Condition 1					
Nominal cooling capacity	kW	15.7	20.3	27.0	32.3
EER	kW/kW	2.65	2.60	2.88	3.05
Eurovent class, cooling		B	B	A	A
ESEER	kW/kW	2.93	2.86	3.15	3.32
Condition 2					
Nominal cooling capacity	kW	19.9	24.8	36.1	42.3
EER	kW/kW	3.07	2.85	3.49	3.67
Air conditioning application**					
Condition 1					
Nominal cooling capacity	kW	15.8	20.5	27.3	32.7
EER	kW/kW	2.74	2.71	3.03	3.20
ESEER	kW/kW	2.80	2.81	2.98	3.17
Condition 2					
Nominal cooling capacity	kW	20.1	25.1	36.7	42.9
EER	kW/kW	3.21	2.99	3.76	3.94
Operating weight***					
Standard unit (with hydronic module)	kg	209	228	255	280
Standard unit (without hydronic module)	kg	193	213	237	262
Sound pressure level****	dB(A)	50	50	53	53
Sound power level radiated from the unit†	dB(A)	82	82	85	85
Sound power level at unit discharge†	dB(A)	80	80	91	91
Dimensions					
Length x depth x height	mm	1135 x 584 x 1608		1002 x 824 x 1829	
Compressor		One scroll compressor			
Refrigerant charge R-410A	kg	5.5	6.4	5.8	8.6
Control		Pro-Dialog+			
Fans		Two 2-speed centrifugal fans, 5 backward-curved blades		One 2-speed axial fan, 7 blades	
Diameter	mm	454	454	630	630
Number of blades		5	5	7	7
Available static pressure	Pa	80	80	80	80
Air flow	l/s	1640	1640	3472	3472
Speed	r/s	20.5	20.5	21.5	21.5
Air heat exchanger		Copper tubes and aluminium fins, pipe diamter 3/8", fin spacing 1.69 mm			
Number of rows		2	2	2	3
Number of pipes per row		60	60	60	60
Water heat exchanger		One plate heat exchanger			
Water volume	l	1.52	1.90	2.28	2.85
Maximum operating pressure	kPa	1000	1000	1000	1000
Standard unit					
Water connections (MPT gas)	in	1	1	1-1/4	1-1/4
Unit with hydronic module**		Safety valve, screen filter, expansion tank, automatic air purge valve, water circuit drain valve, pressure gauge, flow switch			
Pump		One single-speed pump			
Maximum water-side operating pressure	kPa	400	400	400	400
Entering water connection	in	1-1/4	1-1/4	1-1/4	1-1/4
Leaving water connection	in	1	1	1-1/4	1-1/4
Expansion tank capacity	l	5	5	8	8
Water fill system					
Inlet/outlet diameter	in	1/2	1/2	1/2	1/2
Chassis paint colour		Colour code: RAL 7035			

* Eurovent-certified performances in accordance with standard EN14511-3:2011.
Condition 1: 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
Condition 2: 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

** Gross performances, not in accordance with EN14511-3:2011. 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.
Condition 1: 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
Condition 2: 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

*** Weight shown is a guideline only.

**** For information, calculated from the sound power level Lw(A)

† In accordance with ISO 9614 (10^{-12} W)

Physical data, 30RQY units

30RQY		017	021	026	033
Air conditioning application as per EN14511-3:2011*					
Condition 1					
Nominal cooling capacity	kW	14.9	19.0	27.1	32.3
EER	kW/kW	2.63	2.63	2.90	3.05
Eurovent class, cooling		B	B	A	A
ESEER	kW/kW	2.91	2.88	3.15	3.30
Condition 2					
Nominal cooling capacity	kW	18.4	23.9	35.6	41.3
EER	kW/kW	2.93	3.01	3.54	3.63
Air conditioning application**					
Condition 1					
Nominal cooling capacity	kW	15.0	19.2	27.3	32.6
EER	kW/kW	2.72	2.72	3.03	3.19
ESEER	kW/kW	2.78	2.78	2.97	3.16
Condition 2					
Nominal cooling capacity	kW	18.6	24.1	36.1	41.9
EER	kW/kW	3.06	3.15	3.77	3.87
Heating application as per EN14511-3:2011*					
Condition 1					
Nominal heating capacity	kW	17.0	20.5	28.8	31.4
COP	kW/kW	2.77	2.77	2.76	2.76
Eurovent class, heating		C	C	C	C
Condition 2					
Nominal heating capacity	kW	17.5	20.8	29.9	32.3
COP	kW/kW	3.38	3.29	3.36	3.34
Heating application**					
Condition 1					
Nominal heating capacity	kW	16.9	20.3	28.5	31.1
COP	kW/kW	2.81	2.81	2.81	2.81
Condition 2					
Nominal heating capacity	kW	17.3	20.6	29.6	32.0
COP	kW/kW	3.45	3.36	3.44	3.42
Operating weight***					
Standard unit (with hydronic module)	kg	226	243	280	295
Standard unit (without hydronic module)	kg	211	228	262	277
Sound pressure level****	dB(A)	50	50	53	53
Sound power level radiated from the unit†	dB(A)	82	82	85	85
Sound power level at unit discharge†	dB(A)	80	80	91	91
Dimensions					
Length x depth x height	mm	1135 x 584 x 1608		1002 x 824 x 1829	
Compressor		One scroll compressor			
Refrigerant charge R-410A	kg	6.4	7.7	7.6	9.5
Control		Pro-Dialog+			
Fans		Two 2-speed centrifugal fans, 5 backward-curved blades		One 2-speed axial fan, 7 blades	
Diameter	mm	454	454	630	630
Available static pressure	Pa	80	80	80	80
Air flow	l/s	1640	1640	3472	3472
Speed	r/s	20.5	20.5	21.5	21.5
Air heat exchanger		Copper tubes and aluminium fins, pipe diameter 3/8", fin spacing 1.69 mm			
Number of rows		2	2	2	3
Number of pipes per row		60	60	60	60
Water heat exchanger		One plate heat exchanger			
Water volume	l	1.52	1.90	2.28	2.85
Maximum operating pressure	kPa	1000	1000	1000	1000
Standard unit					
Water connections (MPT gas)	in	1	1	1-1/4	1-1/4
Unit with hydronic module**		Safety valve, screen filter, expansion tank, automatic air purge valve, water circuit drain valve, pressure gauge, flow switch			
Pump		One single-speed pump			
Maximum water-side operating pressure	kPa	400	400	400	400
Entering (leaving) water connection	in	1-1/4 (1)	1-1/4 (1)	1-1/4 (1-1/4)	1-1/4 (1-1/4)
Expansion tank capacity	l	5	5	8	8
Water fill system					
Inlet/outlet diameter	in	1/2	1/2	1/2	1/2
Chassis paint colour		Colour code: RAL 7035			

* Eurovent-certified performances in accordance with standard EN14511-3:2011.
Condition 1: Cooling mode conditions: evaporator water entering/leaving temperature 12°C/7°C, outside air temperature 35°C, evaporator fouling factor 0 m² K/W
Condition 2: Cooling mode conditions: evaporator water entering/leaving temperature 23°C/18°C, outside air temperature 35°C, evaporator fouling factor 0 m² K/W
Condition 1: Heating mode conditions: water heat exchanger water entering/leaving temperature 40°C/45°C, outside air temperature 7°C db/6°C wb, evaporator fouling factor 0 m² K/W.
Condition 2: Heating mode conditions: water heat exchanger water entering/leaving temperature 30°C/35°C, outside air temperature 7°C db/6°C wb, evaporator fouling factor 0 m² K/W.

** Gross performances, not in accordance with EN14511-3:2011. 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.
Condition 1: Cooling mode conditions: evaporator water entering/leaving temperature 12°C/7°C, outside air temperature 35°C, evaporator fouling factor 0 m² K/W
Condition 2: Cooling mode conditions: evaporator water entering/leaving temperature 23°C/18°C, outside air temperature 35°C, evaporator fouling factor 0 m² K/W
Condition 1: Heating mode conditions: water heat exchanger water entering/leaving temperature 40°C/45°C, outside air temperature 7°C db/6°C wb, evaporator fouling factor 0 m² K/W.
Condition 2: Heating mode conditions: water heat exchanger water entering/leaving temperature 30°C/35°C, outside air temperature 7°C db/6°C wb, evaporator fouling factor 0 m² K/W.

*** Weight shown is a guideline only.

**** For information, calculated from the sound power level Lw(A)

† In accordance with ISO 9614 (10^{-12} W)

Electrical data, 30RBY/RQY units

30RBY/RQY		017	021	026	033
Power circuit					
Nominal power supply	V-ph-Hz	400-3-50			
Voltage range	V	340-440			
Control circuit supply		24 V via internal transformer			
Maximum start-up current (Un)*	A	75	95	118	118
Unit power factor at nominal capacity**		0.84	0.79	0.77	0.81
Maximum operating power input**	kW	8.0	9.3	11.2	14.0
Nominal unit operating current draw***	A	8	12	20	21
Maximum operating current draw (Un)****	A	13	16	20	24
Maximum operating current draw (Un-15%)†	A	15	18	23	27

* 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 340-460 V.

Part load performances

With the rapid increase in energy costs and the care about environmental impacts of electricity production, the power consumption of air conditioning equipment has become an important topic. The energy efficiency of a unit at full load is rarely representative of the actual performance of the units, as on average a unit works less than 5% of the time at full load.

The heat load of a building depends on many factors, such as the outside air temperature, the exposure to the sun and the building occupancy.

Consequently it is preferable to use the average energy efficiency, calculated at several operating points that are representative for the unit utilisation.

IPLV (in accordance with AHRI 550/590)

The IPLV (integrated part load value) allows evaluation of the average energy efficiency based on four operating conditions defined by the AHRI (Air Conditioning, Heating and Refrigeration Institute). The IPLV is the average weighted value of the energy efficiency ratios (EER) at different operating conditions, weighted by the operating time.

ESEER (in accordance with EUROVENT)

The ESEER (European seasonal energy efficiency ratio) permits evaluation of the average energy efficiency at part load, based on four operating conditions defined by Eurovent. The ESEER is the average value of energy efficiency ratios (EER) at different operating conditions, weighted by the operating time.

IPLV (integrated part load value)

Load %	Air temperature °C	Energy efficiency	Operating time %
100	35	EER_1	1
75	26.7	EER_2	42
50	18.3	EER_3	45
25	12.8	EER_4	12
ESEER =	EER_1 x 1% + EER_2 x 42% + EER_3 x 45% + EER_4 x 12%		

ESEER (European seasonal energy efficiency ratio)

Load %	Air temperature °C	Energy efficiency	Operating time %
100	35	EER_1	3
75	30	EER_2	33
50	25	EER_3	41
25	20	EER_4	23
ESEER =	EER_1 x 3% + EER_2 x 33% + EER_3 x 41% + EER_4 x 23%		

Part load performances

30RBY 017-033

30RBY		017	021	026	033
IPLV	kW/kW	3.34	3.30	3.49	3.69
ESEER	kW/kW	2.93	2.86	3.15	3.32

30RQY 017-033

30RQY		017	021	026	033
IPLV	kW/kW	3.29	3.29	3.48	3.68
ESEER	kW/kW	2.91	2.88	3.15	3.30

ESEER Calculations according to standard performances (in accordance with EN14511-3:2011) and certified by Eurovent.
IPLV Calculations according to standard performances (in accordance with AHRI 550-590)

Sound spectrum, 30RBY/RQY units

30RBY/RQY			Octave bands, Hz							Sound power levels	
			125	250	500	1000	2000	4000	8000		
017	Radiated	dB	95	80	78	73	71	69	65	dB(A)	82
021		dB	95	80	78	73	71	69	65	dB(A)	82
026		dB	95	84	80	79	78	72	68	dB(A)	85
033		dB	95	84	80	79	78	72	68	dB(A)	85
017	Fan outlet	dB	88	79	77	74	71	68	65	dB(A)	80
021		dB	88	79	77	74	71	68	65	dB(A)	80
026		dB	91	85	84	87	86	78	71	dB(A)	91
033		dB	91	85	84	87	86	78	71	dB(A)	91

Operating limits

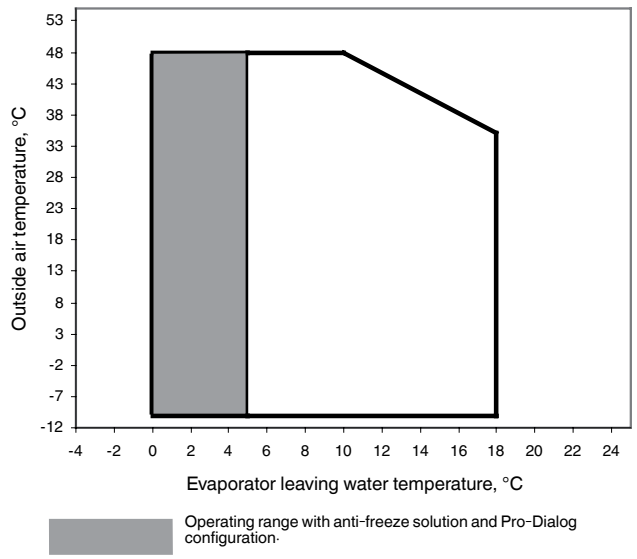
Water heat exchanger water flow rate

30RBY	Flow rate, l/s		
	Minimum	Maximum*	Maximum**
017	0.45	1.39	1.26
021	0.57	1.52	1.42
026	0.67	1.96	1.43
033	0.87	2.18	1.72

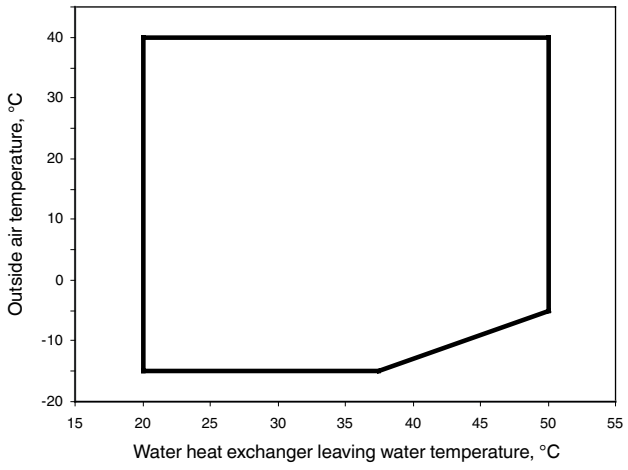
30RQY	Flow rate, l/s		
	Minimum	Maximum*	Maximum**
017	0.45	1.39	1.26
021	0.57	1.52	1.42
026	0.67	2.18	1.72
033	0.87	2.29	1.85

* 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).

30RBY/RQY (cooling mode)

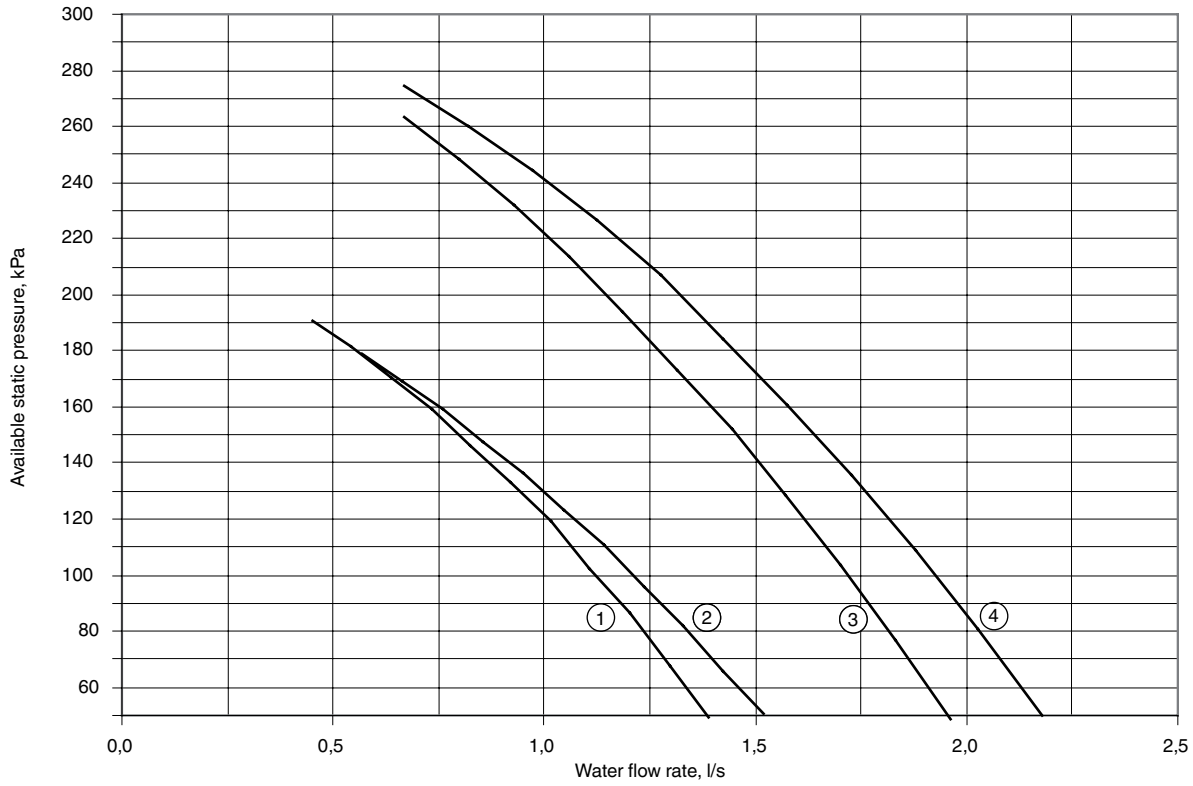


30RQY (heating mode)



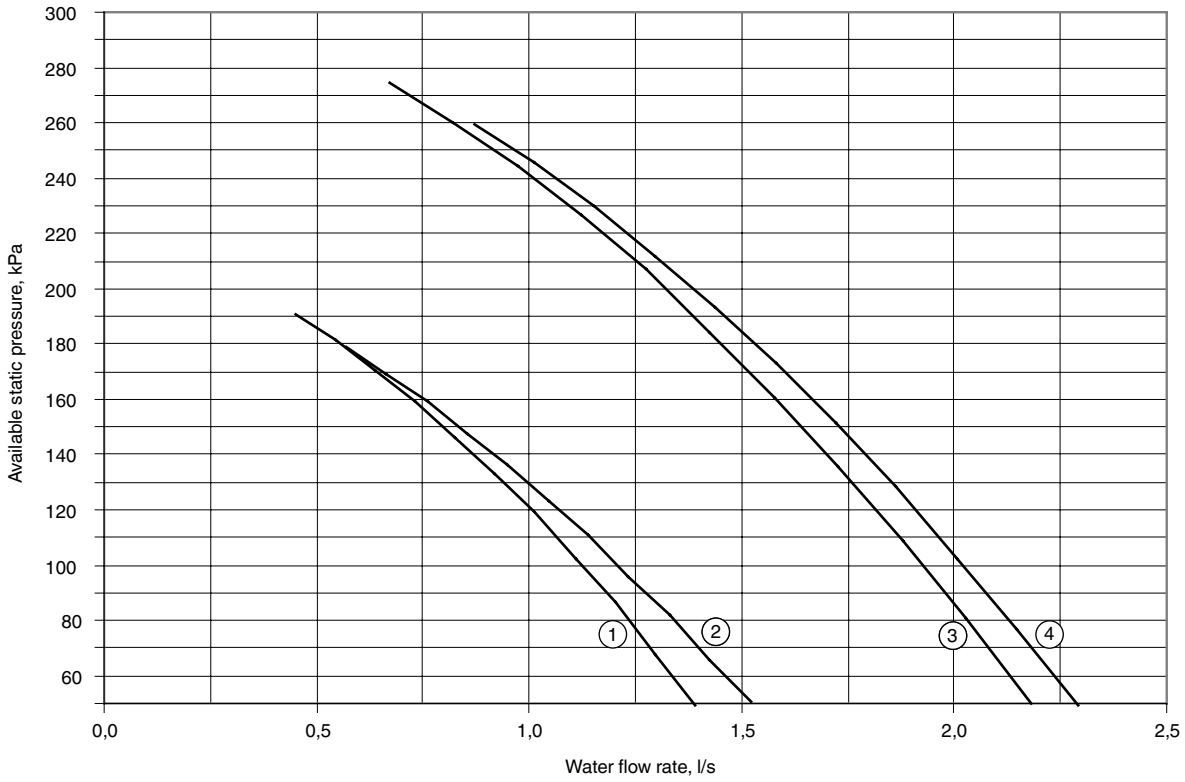
Available static system pressure

30RBY 017-033



Legend
1. 30RBY 017
2. 30RBY 021
3. 30RBY 026
4. 30RBY 033

30RQY 017-033



Legend
1. 30RQY 017
2. 30RQY 021
3. 30RQY 026
4. 30RQY 033

Air pressure drop

Ducted unit selection

The selection is based on the pressure drop:
The cooling and heating capacities are given for an available pressure of 80 Pa and for a unit without filter.

To calculate the performances at lower pressure drops please use the correction factors below.

Example 30RQY 021 without filter:

Duct pressure drop: 40 Pa
Performance at Eurovent conditions:
Cooling capacity: 20.3 x 1.034 = 21.0 kW
Power input: 7.06 x 0.979 = 6.91 kW
Air flow = 1640 x 1.064 = 1745 l/s

Cooling mode

Air duct conditions, 30RBY/RQY 017-021				
Duct pressure drop, Pa	**Air flow factor**	**Cooling capacity factor**	**EER factor**	**Power input factor**
0	1.129	1.053	1.087	0.962
20	1.097	1.047	1.076	0.966
40	1.064	1.034	1.050	0.979
60	1.032	1.021	1.022	0.990
80	1.000	1.000	1.000	1.000

Air duct conditions, 30RBY/RQY 026-033				
Duct pressure drop, Pa	**Air flow factor**	**Cooling capacity factor**	**EER factor**	**Power input factor**
0	1.200	1.042	1.075	0.971
20	1.150	1.033	1.065	0.974
40	1.100	1.021	1.043	0.981
60	1.049	1.010	1.022	0.990
80	1.000	1.000	1.000	1.000

Heating mode

Air duct conditions, 30RQY 017-021				
Duct pressure drop, Pa	**Air flow factor**	**Heating capacity factor**	**COP factor**	**Power input factor**
0	1.129	1.020	1.020	1.000
20	1.097	1.018	1.018	1.000
40	1.064	1.015	1.015	1.000
60	1.032	1.008	1.008	1.000
80	1.000	1.000	1.000	1.000

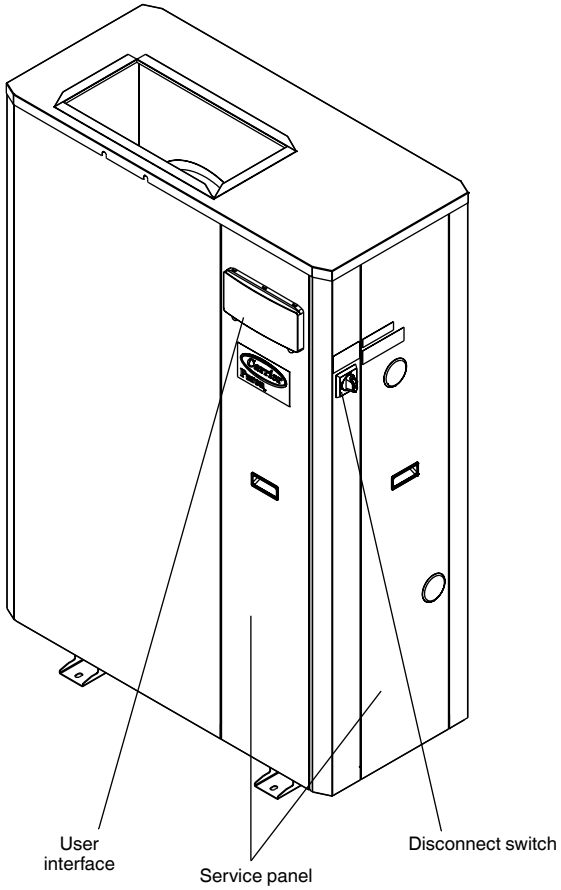
Air duct conditions, 30RQY 026-033				
Duct pressure drop, Pa	**Air flow factor**	**Heating capacity factor**	**COP factor**	**Power input factor**
0	1.200	1.015	1.015	1.000
20	1.150	1.012	1.012	1.000
40	1.100	1.009	1.009	1.000
60	1.049	1.005	1.005	1.000
80	1.000	1.000	1.000	1.000

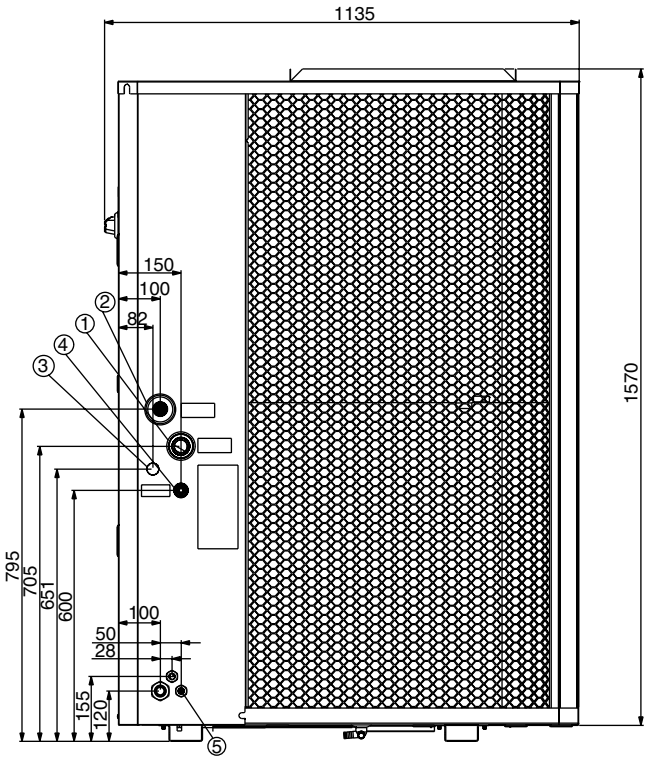
Filter option

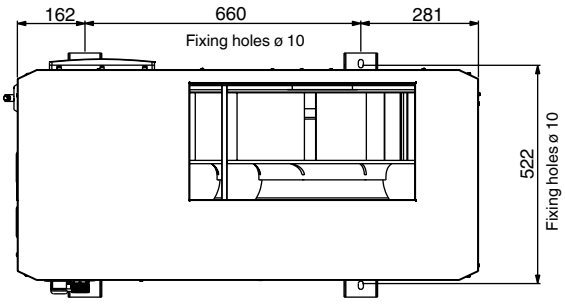
30RBY/RQY		017	021
Filter pressure drop			
Clean filter	Pa	10	10
Clogged filter	Pa	20	20

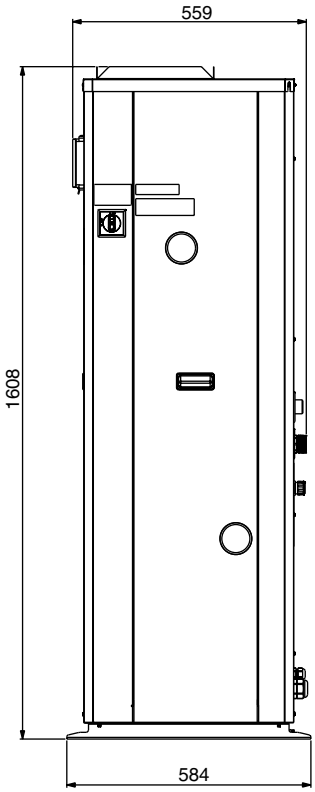
Dimensions/clearances

30RBY/RQY 017-021 - standard units





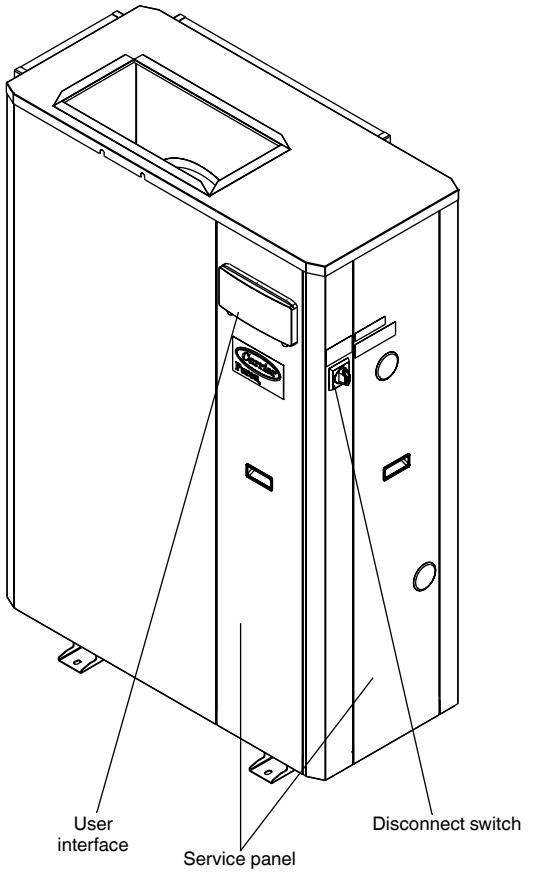


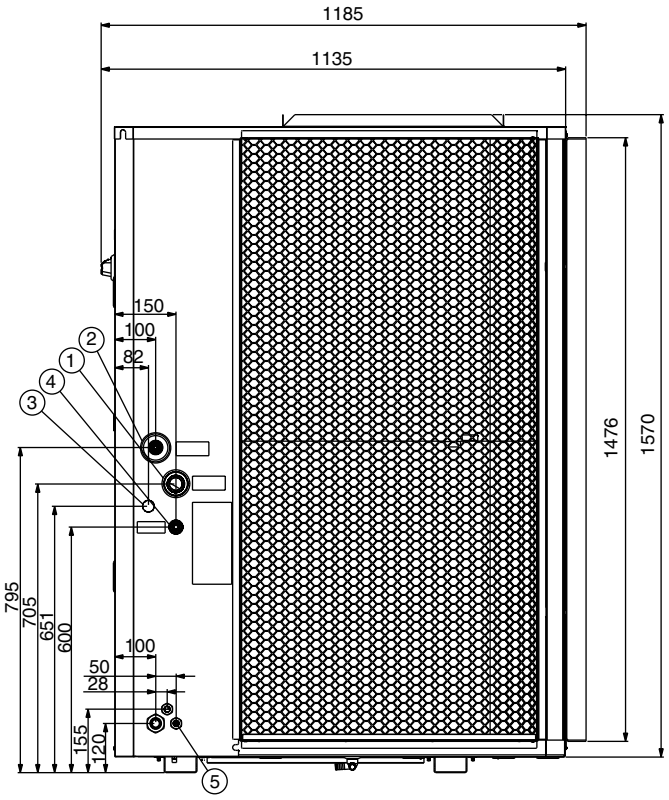


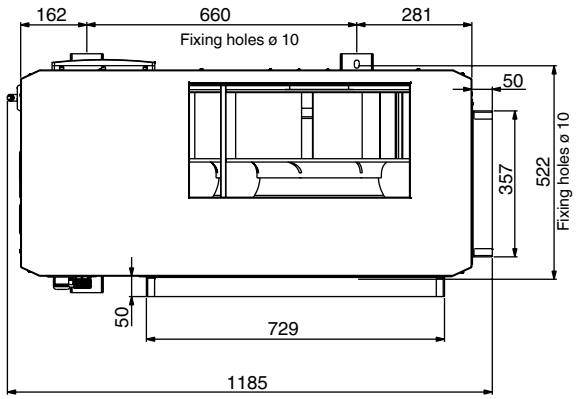
Legend
All dimensions are in mm
1 Water inlet
2 Water outlet
3 Water fill kit connection (option)
4. Safety valve
5 Power connections

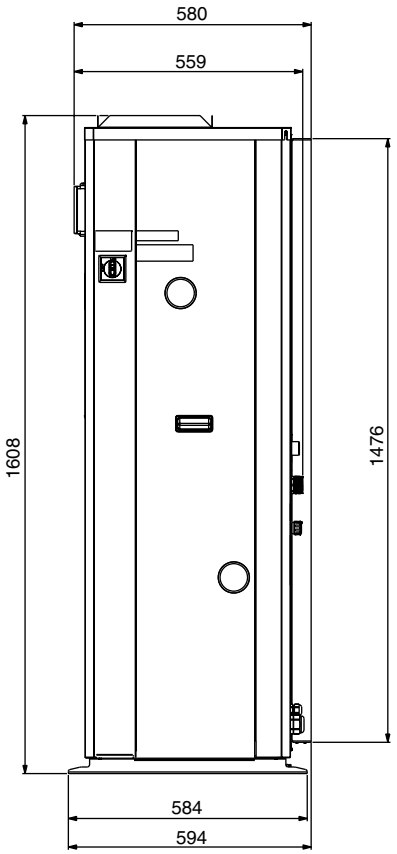
Dimensions/clearances

30RBY/RQY 017-021 - units with return air ducts





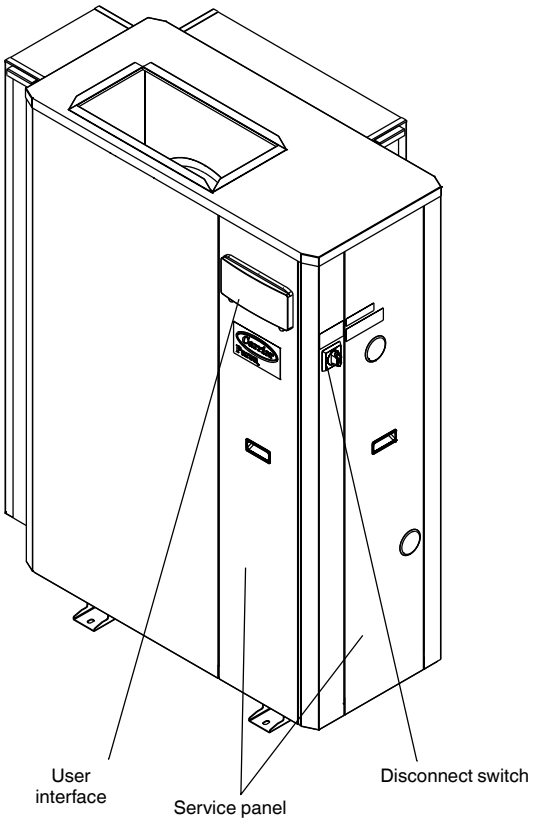


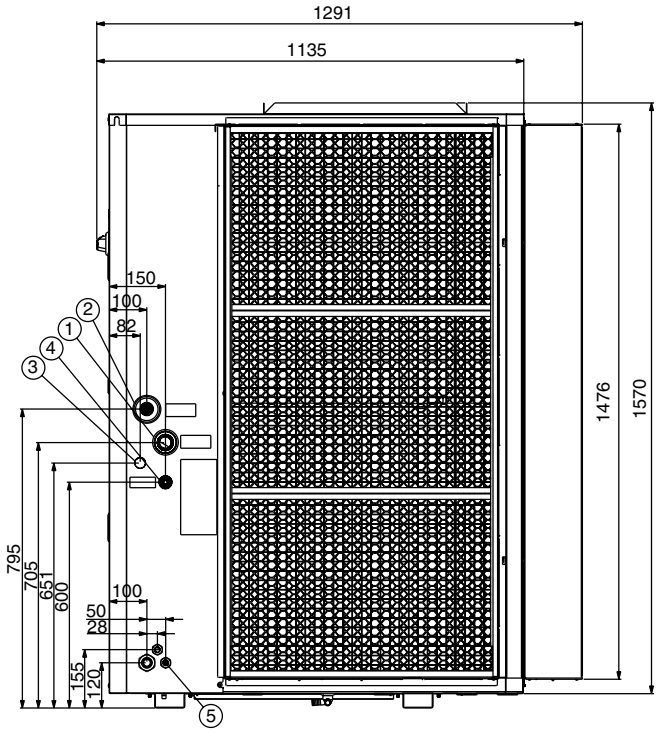


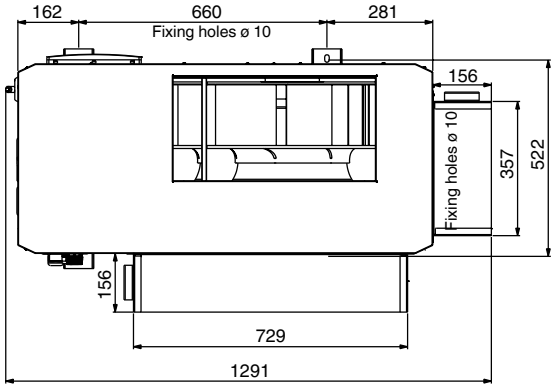
Legend
All dimensions are in mm
1 Water inlet
2 Water outlet
3 Water fill kit connection (option)
4. Safety valve
5 Power connections

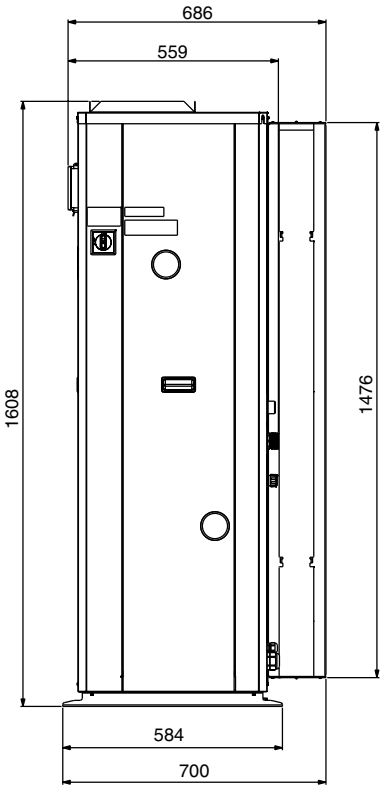
Dimensions/clearances

30RBY/RQY 017-021 - units with filter frame on the return air side





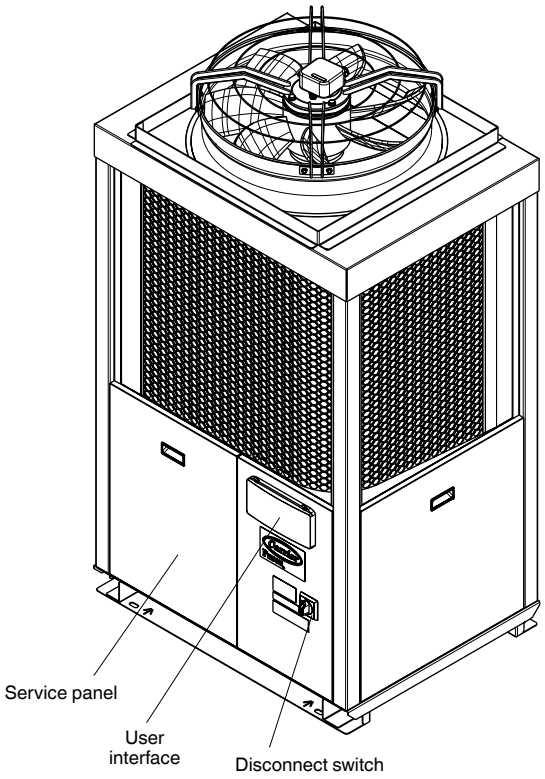


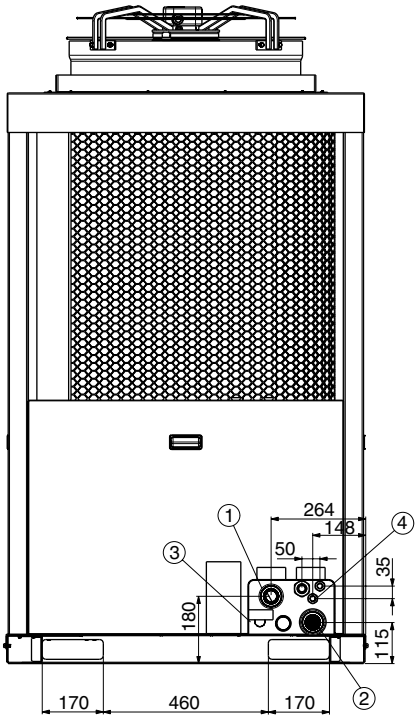


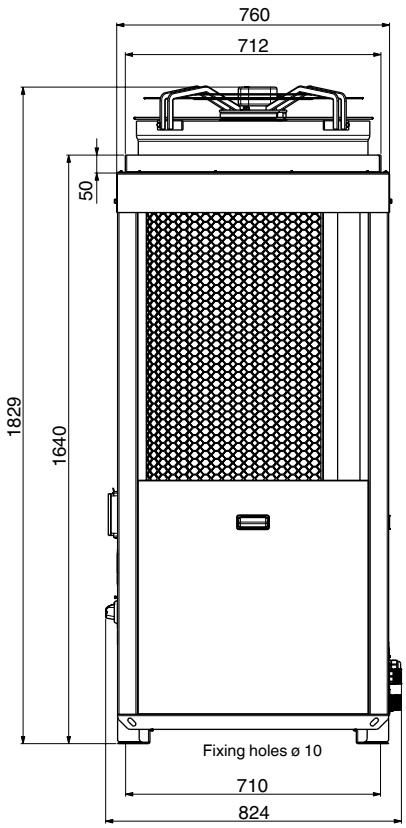
Legend
All dimensions are in mm
1 Water inlet
2 Water outlet
3 Water fill kit connection (option)
4. Safety valve
5 Power connections

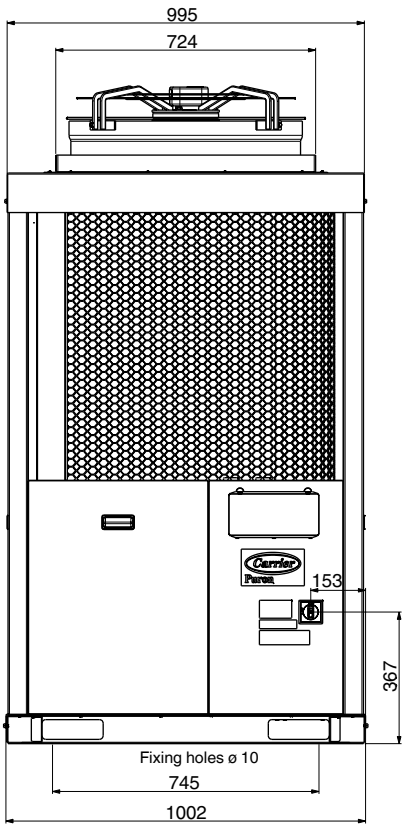
Dimensions/clearances

30RBY/RQY 026-033









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

Cooling capacities in accordance with EN14511-3 : 2011

30RBY units

		Condenser entering air temperature, °C																							
		20				25				30				35				40				46			
	LWT	Qc	EER	q	Δp	Qc	EER	q	Δp	Qc	EER	q	Δp	Qc	EER	q	Δp	Qc	EER	q	Δp	Qc	EER	q	Δp
	°C	kW	kW/kW	l/s	kPa	kW	kW/kW	l/s	kPa	kW	kW/kW	l/s	kPa	kW	kW/kW	l/s	kPa	kW	kW/kW	l/s	kPa	kW	kW/kW	l/s	kPa
017	5	17.3	3.71	0.85	48	16.6	3.34	0.81	44	15.8	2.98	0.78	41	15.1	2.64	0.74	37	14.2	2.34	0.70	33	13.2	2.00	0.65	29
021		22.0	3.55	1.10	66	21.2	3.22	1.06	62	20.4	2.88	1.02	58	19.3	2.54	0.97	53	18.1	2.18	0.90	48	16.3	1.77	0.81	40
026		28.6	3.85	1.41	100	27.7	3.45	1.37	95	26.6	3.09	1.31	88	25.4	2.75	1.25	81	24.0	2.40	1.18	74	21.9	2.00	1.08	63
033		34.0	4.04	1.63	92	33.0	3.64	1.59	87	31.8	3.28	1.53	82	30.5	2.91	1.46	75	28.7	2.53	1.38	67	26.0	2.09	1.25	56
017	7	18.2	3.83	0.89	52	17.4	3.40	0.85	48	16.5	2.98	0.81	43	15.7	2.65	0.77	39	14.8	2.35	0.73	35	13.7	2.00	0.67	30
021		23.2	3.65	1.16	72	22.3	3.30	1.12	67	21.4	2.96	1.07	63	20.3	2.60	1.02	57	19.0	2.25	0.95	51	17.2	1.83	0.86	43
026		30.2	4.00	1.49	109	29.3	3.60	1.45	103	28.2	3.23	1.40	97	26.9	2.87	1.33	89	25.5	2.52	1.26	81	23.3	2.10	1.15	69
033		35.9	4.19	1.73	101	35.0	3.79	1.68	96	33.7	3.42	1.62	90	32.3	3.05	1.55	83	30.4	2.66	1.46	74	27.7	2.20	1.33	62
017	10	19.7	4.04	0.97	60	18.9	3.59	0.93	55	17.9	3.16	0.88	50	16.9	2.76	0.83	45	15.8	2.39	0.78	39	14.4	2.00	0.71	33
021		25.0	3.77	1.26	80	24.1	3.42	1.21	75	23.1	3.07	1.16	70	21.8	2.70	1.10	64	20.5	2.34	1.03	57	18.5	1.92	0.93	48
026		32.7	4.20	1.62	123	31.8	3.80	1.58	117	30.7	3.43	1.52	110	29.3	3.06	1.45	101	27.8	2.70	1.37	92	25.4	2.26	1.26	79
033		38.9	4.42	1.88	116	37.9	4.01	1.83	110	36.6	3.62	1.77	103	35.1	3.24	1.69	95	33.2	2.84	1.60	86	30.3	2.36	1.46	72
017	15	22.3	4.26	1.10	74	21.4	3.84	1.06	68	20.5	3.44	1.01	63	19.4	3.03	0.96	56	18.1	2.63	0.89	50	16.3	2.16	0.80	41
021		28.4	3.96	1.43	97	27.3	3.60	1.38	91	26.1	3.23	1.32	84	24.7	2.85	1.24	76	23.0	2.47	1.16	68	-	-	-	-
026		37.4	4.51	1.86	150	36.4	4.10	1.81	143	35.1	3.72	1.75	135	33.6	3.35	1.67	125	31.9	2.97	1.59	115	29.4	2.52	1.46	99
033		44.8	4.80	2.17	148	43.6	4.38	2.11	140	42.1	3.97	2.04	131	40.4	3.57	1.96	122	38.3	3.14	1.86	110	35.1	2.64	1.70	93
017	18	23.0	4.28	1.14	76	22.0	3.85	1.09	70	20.9	3.44	1.04	64	19.9	3.07	0.98	58	-	-	-	-	-	-	-	-
021		28.8	3.97	1.46	97	27.6	3.61	1.40	91	26.3	3.24	1.33	84	24.8	2.85	1.25	76	23.1	2.47	1.16	67	-	-	-	-
026		40.4	4.67	2.01	169	39.3	4.26	1.96	161	37.9	3.87	1.89	152	36.1	3.49	1.80	139	34.1	3.10	1.69	126	31.1	2.61	1.54	108
033		47.2	4.92	2.29	161	45.9	4.51	2.23	152	44.2	4.09	2.15	142	42.3	3.67	2.05	130	39.9	3.23	1.93	117	36.2	2.70	1.75	97

Legend
LWT Leaving water temperature, °C
Qc Cooling capacity, kW
EER Energy efficiency ratio, kW/kW
q Evaporator water flow rate, l/s
Δp Evaporator pressure drop, kPa

Application data
Standard units, refrigerant: R-410A
Evaporator entering/leaving water temperature difference: 5 K
Evaporator fluid: chilled water
Fouling factor: 0.18 x 10^{-4} (m^2 K)/W

Performances in accordance with EN14511-3:2011.

Cooling capacities

30RBY units

		Condenser entering air temperature, °C																							
		20				25				30				35				40				46			
	LWT	Qc	EER	q	Δp	Qc	EER	q	Δp	Qc	EER	q	Δp	Qc	EER	q	Δp	Qc	EER	q	Δp	Qc	EER	q	Δp
	°C	kW	kW/kW	l/s	kPa	kW	kW/kW	l/s	kPa	kW	kW/kW	l/s	kPa	kW	kW/kW	l/s	kPa	kW	kW/kW	l/s	kPa	kW	kW/kW	l/s	kPa
017	5	17.4	3.89	0.85	48	16.7	3.48	0.81	44	16.0	3.09	0.78	41	15.2	2.73	0.74	37	14.4	2.40	0.70	33	13.3	2.04	0.65	29
021		22.3	3.75	1.10	66	21.5	3.38	1.06	62	20.6	3.01	1.02	58	19.5	2.63	0.97	53	18.2	2.25	0.90	48	16.4	1.82	0.81	40
026		29.0	4.12	1.41	100	28.1	3.68	1.37	95	27.0	3.27	1.31	88	25.7	2.88	1.25	81	24.3	2.51	1.18	74	22.2	2.07	1.08	63
033		34.4	4.30	1.63	92	33.4	3.85	1.59	87	32.2	3.45	1.53	82	30.8	3.04	1.46	75	29.0	2.63	1.38	67	26.3	2.15	1.25	56
017	7	18.4	4.04	0.89	52	17.5	3.55	0.85	48	16.6	3.10	0.81	43	15.8	2.74	0.77	39	14.9	2.41	0.73	35	13.8	2.05	0.67	30
021		23.5	3.86	1.16	72	22.6	3.48	1.12	67	21.7	3.09	1.07	63	20.5	2.71	1.02	57	19.2	2.32	0.95	51	17.3	1.88	0.86	43
026		30.6	4.31	1.49	109	29.7	3.85	1.45	103	28.6	3.43	1.40	97	27.3	3.03	1.33	89	25.8	2.64	1.26	81	23.6	2.18	1.15	69
033		36.4	4.50	1.73	101	35.4	4.03	1.68	96	34.1	3.62	1.62	90	32.7	3.20	1.55	83	30.8	2.77	1.46	74	27.9	2.27	1.33	62
017	10	20.0	4.28	0.97	60	19.1	3.78	0.93	55	18.1	3.30	0.88	50	17.1	2.86	0.83	45	15.9	2.46	0.78	39	14.5	2.05	0.71	33
021		25.3	4.02	1.26	80	24.4	3.62	1.21	75	23.4	3.22	1.16	70	22.1	2.82	1.10	64	20.7	2.42	1.03	57	18.7	1.97	0.93	48
026		33.2	4.57	1.62	123	32.3	4.10	1.58	117	31.1	3.67	1.52	110	29.7	3.25	1.45	101	28.1	2.84	1.37	92	25.7	2.35	1.26	79
033		39.5	4.78	1.88	116	38.4	4.30	1.83	110	37.1	3.86	1.77	103	35.5	3.42	1.69	95	33.6	2.97	1.60	86	30.6	2.45	1.46	72
017	15	22.6	4.56	1.10	74	21.7	4.07	1.06	68	20.7	3.62	1.01	63	19.6	3.16	0.96	56	18.3	2.73	0.89	50	16.5	2.22	0.80	41
021		28.8	4.25	1.43	97	27.7	3.83	1.38	91	26.5	3.42	1.32	84	25.0	2.99	1.24	76	23.3	2.58	1.16	68	-	-	-	-
026		38.0	4.97	1.86	150	37.0	4.48	1.81	143	35.7	4.02	1.75	135	34.2	3.59	1.67	125	32.4	3.16	1.59	115	29.9	2.65	1.46	99
033		45.5	5.28	2.17	148	44.2	4.76	2.11	140	42.7	4.28	2.04	131	41.0	3.81	1.96	122	38.8	3.33	1.86	110	35.5	2.76	1.70	93
017	18	23.2	4.58	1.14	76	22.2	4.09	1.09	70	21.2	3.63	1.04	64	20.1	3.21	0.98	58	-	-	-	-	-	-	-	-
021		29.2	4.27	1.46	97	28.0	3.85	1.40	91	26.7	3.42	1.33	84	25.1	2.99	1.25	76	23.3	2.58	1.16	67	-	-	-	-
026		41.1	5.20	2.01	169	40.0	4.70	1.96	161	38.5	4.22	1.89	152	36.7	3.76	1.80	139	34.6	3.31	1.69	126	31.5	2.76	1.54	108
033		48.0	5.45	2.29	161	46.6	4.94	2.23	152	44.9	4.43	2.15	142	42.9	3.94	2.05	130	40.5	3.43	1.93	117	36.6	2.83	1.75	97

Legend
LWT Leaving water temperature, °C
Qc Cooling capacity, kW
EER Energy efficiency ratio, kW/kW
q Evaporator water flow rate, l/s
Δp Evaporator pressure drop, kPa

Application data
Standard units, refrigerant: R-410A
Evaporator entering/leaving water temperature difference: 5 K
Evaporator fluid: chilled water
Fouling factor: 0.18 x 10^{-4} (m^2 K)/W

Gross performances, not in accordance with EN14511-3:2011. 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.

Cooling capacities in accordance with EN14511-3 : 2011

30RQY units

		Condenser entering air temperature, °C																					
		20				25				30				35				40				46			
	LWT	Qc	EER	q	Δp	Qc	EER	q	Δp	Qc	EER	q	Δp	Qc	EER	q	Δp	Qc	EER	q	Δp	Qc	EER	q	Δp
	°C	kW	kW/kW	l/s	kPa	kW	kW/kW	l/s	kPa	kW	kW/kW	l/s	kPa	kW	kW/kW	l/s	kPa	kW	kW/kW	l/s	kPa	kW	kW/kW	l/s	kPa
017	5	16.4	3.66	0.81	44	15.7	3.30	0.77	40	15.0	2.91	0.74	37	14.2	2.55	0.70	33	13.3	2.22	0.65	30	12.1	1.84	0.60	25
021		20.5	3.54	0.98	55	19.8	3.17	0.95	51	18.9	2.85	0.91	48	18.0	2.53	0.86	44	16.9	2.19	0.81	40	15.3	1.79	0.73	33
026		28.6	3.88	1.42	70	27.7	3.49	1.37	66	26.7	3.12	1.32	62	25.5	2.77	1.26	57	24.0	2.42	1.19	51	22.0	2.01	1.09	43
033		34.1	4.1	1.7	82.2	33.1	3.65	1.62	78	31.9	3.29	1.56	72	30.5	2.92	1.48	66	28.6	2.53	1.39	58	25.8	2.08	1.26	48
017	7	17.2	3.77	0.85	47	16.5	3.40	0.81	44	15.7	3.00	0.78	40	14.9	2.63	0.73	36	14.0	2.29	0.69	32	12.8	1.91	0.63	27
021		21.6	3.67	1.04	59	20.9	3.29	1.00	56	20.0	2.96	0.96	52	19.0	2.63	0.91	48	17.8	2.28	0.85	43	16.1	1.87	0.77	36
026		30.3	4.04	1.50	78	29.4	3.64	1.46	73	28.3	3.26	1.40	68	27.0	2.90	1.34	63	25.5	2.54	1.27	56	23.4	2.12	1.16	48
033		36.1	4.21	1.76	90	35.0	3.80	1.71	86	33.7	3.43	1.65	79	32.3	3.05	1.58	73	30.3	2.66	1.48	65	27.4	2.19	1.34	53
017	10	18.6	3.93	0.92	54	17.8	3.55	0.88	50	17.0	3.15	0.84	46	16.1	2.76	0.80	41	15.1	2.41	0.75	37	13.8	2.02	0.68	31
021		23.4	3.86	1.13	66	22.6	3.47	1.09	63	21.7	3.13	1.04	58	20.7	2.8	1.0	54	19.4	2.43	0.93	48	17.5	1.99	0.84	41
026		32.8	4.26	1.63	89	31.9	3.85	1.59	84	30.7	3.47	1.53	79	29.4	3.10	1.46	72	27.9	2.73	1.38	65	25.6	2.28	1.27	55
033		39.2	4.44	1.92	105	38.1	4.02	1.87	99	36.7	3.64	1.80	92	35.1	3.25	1.72	84	33.1	2.84	1.62	75	30.1	2.36	1.47	62
017	15	20.9	4.07	1.04	66	20.0	3.69	1.00	61	19.1	3.30	0.95	56	18.2	2.93	0.90	50	17.1	2.58	0.85	45	15.6	2.18	0.78	38
021		26.6	3.99	1.28	80	25.7	3.64	1.24	76	24.7	3.32	1.19	71	23.6	3.00	1.14	66	22.3	2.68	1.07	60	20.2	2.21	0.97	50
026		37.7	4.63	1.88	113	36.7	4.22	1.83	107	35.5	3.8	1.8	101	34.0	3.43	1.70	93	32.3	3.04	1.61	84	29.8	2.57	1.48	72
033		45.0	4.82	2.21	133	43.7	4.39	2.15	126	42.1	3.97	2.07	117	40.3	3.57	1.98	108	38.1	3.14	1.87	97	34.7	2.63	1.70	80
017	18	21.3	4.1	1.1	66.8	20.4	3.71	1.01	62	19.4	3.31	0.97	56	18.4	2.93	0.91	51	-	-	-	-	-	-	-	-
021		27.1	4.0	1.3	81.5	26.1	3.65	1.26	76	25.0	3.33	1.21	71	23.9	3.01	1.15	66	22.5	2.69	1.08	59	20.2	2.21	0.97	50
026		39.9	4.8	2.0	123.7	38.7	4.35	1.94	117	37.3	3.94	1.87	109	35.6	3.54	1.78	100	33.7	3.13	1.68	90	30.8	2.63	1.53	76
033		46.4	4.9	2.3	139.9	45.0	4.47	2.22	132	43.3	4.04	2.13	122	41.3	3.63	2.03	111	39.0	3.19	1.92	99	35.2	2.65	1.73	81

Legend
LWT Leaving water temperature, °C
Qc Cooling capacity, kW
EER Energy efficiency ratio, kW/kW
q Evaporator water flow rate, l/s
Δp Evaporator pressure drop, kPa

Application data

Standard units, refrigerant: R-410A
Evaporator entering/leaving water temperature difference: 5 K
Evaporator fluid: chilled water
Fouling factor: 0.18 x 10^{-4} (m^2 K)/W

Performances in accordance with EN14511-3:2011.

Cooling capacities

30RQY units

		Condenser entering air temperature, °C																					
		20				25				30				35				40				46			
	LWT	Qc	EER	q	Δp	Qc	EER	q	Δp	Qc	EER	q	Δp	Qc	EER	q	Δp	Qc	EER	q	Δp	Qc	EER	q	Δp
	°C	kW	kW/kW	l/s	kPa	kW	kW/kW	l/s	kPa	kW	kW/kW	l/s	kPa	kW	kW/kW	l/s	kPa	kW	kW/kW	l/s	kPa	kW	kW/kW	l/s	kPa
017	5	16.5	3.83	0.81	44	15.8	3.43	0.77	40	15.1	3.02	0.74	37	14.3	2.63	0.70	33	13.4	2.27	0.65	30	12.2	1.88	0.60	25
021		20.7	3.71	0.98	55	20.0	3.31	0.95	51	19.1	2.96	0.91	48	18.2	2.61	0.86	44	17.0	2.25	0.81	40	15.4	1.83	0.73	33
026		28.9	4.11	1.42	70	28.0	3.66	1.37	66	27.0	3.26	1.32	62	25.7	2.88	1.26	57	24.3	2.50	1.19	51	22.2	2.06	1.09	43
033		34.5	4.3	1.7	82.2	33.5	3.85	1.62	78	32.2	3.45	1.56	72	30.8	3.04	1.48	66	28.9	2.62	1.39	58	26.1	2.14	1.26	48
017	7	17.4	3.96	0.85	47	16.7	3.55	0.81	44	15.9	3.12	0.78	40	15.0	2.72	0.73	36	14.1	2.36	0.69	32	12.9	1.96	0.63	27
021		21.8	3.85	1.04	59	21.1	3.44	1.00	56	20.2	3.08	0.96	52	19.2	2.72	0.91	48	18.0	2.35	0.85	43	16.3	1.91	0.77	36
026		30.6	4.29	1.50	78	29.7	3.84	1.46	73	28.6	3.42	1.40	68	27.3	3.02	1.34	63	25.8	2.64	1.27	56	23.6	2.18	1.16	48
033		36.5	4.49	1.76	90	35.5	4.03	1.71	86	34.1	3.61	1.65	79	32.6	3.19	1.58	73	30.6	2.76	1.48	65	27.7	2.26	1.34	53
017	10	18.8	4.15	0.92	54	18.0	3.72	0.88	50	17.2	3.28	0.84	46	16.2	2.86	0.80	41	15.2	2.48	0.75	37	13.9	2.07	0.68	31
021		23.7	4.08	1.13	66	22.9	3.64	1.09	63	21.9	3.27	1.04	58	20.9	2.9	1.0	54	19.6	2.51	0.93	48	17.7	2.05	0.84	41
026		33.2	4.56	1.63	89	32.3	4.09	1.59	84	31.1	3.66	1.53	79	29.8	3.24	1.46	72	28.2	2.84	1.38	65	25.8	2.35	1.27	55
033		39.7	4.78	1.92	105	38.6	4.30	1.87	99	37.1	3.85	1.80	92	35.5	3.41	1.72	84	33.5	2.96	1.62	75	30.4	2.44	1.47	62
017	15	21.1	4.32	1.04	66	20.3	3.90	1.00	61	19.3	3.46	0.95	56	18.3	3.05	0.90	50	17.3	2.67	0.85	45	15.8	2.24	0.78	38
021		26.9	4.25	1.28	80	26.0	3.85	1.24	76	25.0	3.50	1.19	71	23.9	3.14	1.14	66	22.5	2.79	1.07	60	20.4	2.28	0.97	50
026		38.2	5.03	1.88	113	37.2	4.54	1.83	107	36.0	4.1	1.8	101	34.5	3.64	1.70	93	32.7	3.20	1.61	84	30.1	2.67	1.48	72
033		45.6	5.27	2.21	133	44.3	4.75	2.15	126	42.7	4.27	2.07	117	40.8	3.80	1.98	108	38.6	3.31	1.87	97	35.1	2.74	1.70	80
017	18	21.5	4.3	1.1	66.8	20.6	3.92	1.01	62	19.7	3.47	0.97	56	18.6	3.06	0.91	51	-	-	-	-	-	-	-	-
021		27.4	4.3	1.3	81.5	26.4	3.86	1.26	76	25.3	3.50	1.21	71	24.1	3.15	1.15	66	22.7	2.80	1.08	59	20.4	2.28	0.97	50
026		40.4	5.2	2.0	123.7	39.3	4.71	1.94	117	37.9	4.23	1.87	109	36.1	3.77	1.78	100	34.1	3.30	1.68	90	31.1	2.75	1.53	76
033		47.1	5.4	2.3	139.9	45.7	4.85	2.22	132	43.9	4.35	2.13	122	41.9	3.87	2.03	111	39.4	3.36	1.92	99	35.6	2.77	1.73	81

Legend
LWT Leaving water temperature, °C
Qc Cooling capacity, kW
EER Energy efficiency ratio, kW/kW
q Evaporator water flow rate, l/s
Δp Evaporator pressure drop, kPa

Application data
Standard units, refrigerant: R-410A
Evaporator entering/leaving water temperature difference: 5 K
Evaporator fluid: chilled water
Fouling factor: 0.18 x 10^{-4} (m^2 K)/W

Gross performances, not in accordance with EN14511-3:2011. 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.

Heating capacities in accordance with EN14511-3 : 2011

30RQY units

		Outside air dry-bulb (wet-bulb) temperature. °C																							
		-15 (-16)				-10 (-11)				-7 (-8)				2 (1)				7 (6)				12 (11)			
	LWT	Qh	COP	q	Δp	Qh	COP	q	Δp	Qh	COP	q	Δp	Qh	COP	q	Δp	Qh	COP	q	Δp	Qh	COP	q	Δp
	°C	kW	kW/kW	l/s	kPa	kW	kW/kW	l/s	kPa	kW	kW/kW	l/s	kPa	kW	kW/kW	l/s	kPa	kW	kW/kW	l/s	kPa	kW	kW/kW	l/s	kPa
017	30	8.8	1.78	0.47	14	9.6	1.93	0.54	18	10.1	2.04	0.58	21	12.8	2.72	0.74	33	17.7	3.67	0.84	41	20.2	4.08	0.96	53
021		10.8	1.79	0.58	20	11.6	1.92	0.65	24	12.2	2.02	0.70	27	15.2	2.61	0.88	40	21.0	3.54	1.00	49	23.9	3.91	1.13	60
026		14.8	1.73	0.79	22	16.3	1.90	0.91	28	17.2	2.01	0.99	33	21.8	2.69	1.26	53	30.2	3.64	1.44	67	34.5	4.08	1.64	86
033		-	-	-	-	17.7	1.92	0.99	28	18.7	2.02	1.07	33	23.6	2.68	1.36	52	32.5	3.58	1.55	66	37.0	4.00	1.76	85
017	35	8.8	1.64	0.47	14	9.5	1.77	0.54	18	10.0	1.86	0.58	20	12.5	2.45	0.73	31	17.5	3.35	0.83	40	19.9	3.74	0.95	50
021		10.8	1.66	0.58	19	11.5	1.77	0.65	23	12.1	1.86	0.70	26	15.0	2.40	0.88	38	20.8	3.28	0.99	47	23.7	3.62	1.13	58
026		14.6	1.58	0.79	21	16.0	1.73	0.90	27	16.9	1.83	0.98	32	21.3	2.43	1.25	50	29.8	3.33	1.42	64	34.1	3.75	1.62	82
033		16.0	1.62	0.86	21	17.4	1.76	0.99	27	18.4	1.86	1.07	32	23.1	2.44	1.35	50	32.3	3.31	1.54	64	36.7	3.70	1.75	82
017	40	8.6	1.49	0.48	14	9.3	1.59	0.54	17	9.7	1.67	0.58	20	-	-	-	-	17.2	3.04	0.82	38	19.6	3.40	0.94	48
021		10.6	1.51	0.59	19	11.3	1.60	0.65	23	11.8	1.68	0.70	26	14.5	2.2	0.9	37	20.7	3.02	0.99	46	23.4	3.34	1.12	56
026		14.1	1.42	0.78	20	15.4	1.55	0.90	26	16.3	1.63	0.97	30	20.5	2.15	1.23	48	29.3	3.03	1.40	61	33.5	3.43	1.60	78
033		15.5	1.45	0.85	20	-	-	-	-	-	-	-	-	22.4	2.18	1.34	48	31.9	3.02	1.52	61	36.2	3.41	1.73	78
017	45	8.5	1.35	0.48	14	9.1	1.44	0.54	17	9.5	1.50	0.58	19	11.7	1.92	0.72	29	17.0	2.75	0.81	36	19.3	3.06	0.92	46
021		-	-	-	-	11.1	1.43	0.66	23	11.5	1.50	0.70	26	14.1	1.92	0.87	36	20.5	2.75	0.98	44	23.1	3.05	1.11	54
026		13.7	1.26	0.78	20	14.9	1.37	0.89	25	15.7	1.4	1.0	29.1	19.6	1.89	1.21	45	28.7	2.73	1.37	57	32.8	3.10	1.56	73
033		14.8	1.28	0.84	19	-	-	-	-	-	-	-	-	21.4	1.92	1.32	46	31.3	2.73	1.50	58	35.7	3.10	1.70	74
017	50	-	-	-	-	9.0	1.31	0.54	17	9.3	1.36	0.58	19	11.4	1.72	0.71	28	16.7	2.48	0.80	35	18.9	2.76	0.90	43
021		-	-	-	-	-	-	-	-	11.5	1.34	0.71	25	13.9	1.70	0.87	35	20.2	2.47	0.97	42	22.7	2.75	1.09	51
026		-	-	-	-	14.6	1.23	0.88	24	-	-	-	-	19.0	1.67	1.19	43	28.0	2.44	1.34	54	31.8	2.77	1.52	68
033		-	-	-	-	-	-	-	-	-	-	-	-	20.7	1.70	1.30	43	30.5	2.44	1.46	54	34.6	2.76	1.65	69

Legend
LWT Leaving water temperature, °C
Qh Heating capacity, kW
COP Coefficient of performance, kW/kW
q Condenser water flow rate, l/s
Δp Condenser pressure drop, kPa

Application data
Standard units, refrigerant: R-410A
Condenser entering/leaving water temperature difference: 5 K for LWT values <50°C
Condenser fluid: water
Fouling factor: 0.18 x 10^{-4} (m^2 K)/W

Performances in accordance with EN14511-3:2011.

Heating capacities

30RQY units

		Outside air dry-bulb (wet-bulb) temperature. °C																							
		-15 (-16)				-10 (-11)				-7 (-8)				2 (1)				7 (6)				12 (11)			
		Qh	COP	q	Δp	Qh	COP	q	Δp	Qh	COP	q	Δp	Qh	COP	q	Δp	Qh	COP	q	Δp	Qh	COP	q	Δp
	°C	kW	kW/kW	l/s	kPa	kW	kW/kW	l/s	kPa	kW	kW/kW	l/s	kPa	kW	kW/kW	l/s	kPa	kW	kW/kW	l/s	kPa	kW	kW/kW	l/s	kPa
017	30	9.8	2.00	0.47	14	11.2	2.28	0.54	18	12.1	2.47	0.58	21	15.4	3.36	0.74	33	17.5	3.76	0.84	41	20.0	4.21	0.96	53
021		12.0	2.01	0.58	20	13.5	2.27	0.65	24	14.5	2.45	0.70	27	18.3	3.23	0.88	40	20.8	3.63	1.00	49	23.6	4.04	1.13	60
026		16.5	1.95	0.79	22	19.0	2.25	0.91	28	20.5	2.44	0.99	33	26.3	3.34	1.26	53	29.9	3.74	1.44	67	34.1	4.23	1.64	86
033		-	-	-	-	20.6	2.27	0.99	28	22.3	2.46	1.07	33	28.4	3.32	1.36	52	32.2	3.68	1.55	66	36.6	4.15	1.76	85
017	35	9.9	1.85	0.47	14	11.2	2.11	0.54	18	12.1	2.27	0.58	20	15.2	3.05	0.73	31	17.3	3.42	0.83	40	19.7	3.85	0.95	50
021		12.1	1.88	0.58	19	13.5	2.11	0.65	23	14.5	2.28	0.70	26	18.2	2.99	0.88	38	20.6	3.35	0.99	47	23.4	3.72	1.13	58
026		16.3	1.79	0.79	21	18.8	2.06	0.90	27	20.3	2.24	0.98	32	25.9	3.04	1.25	50	29.5	3.42	1.42	64	33.7	3.87	1.62	82
033		17.9	1.83	0.86	21	20.5	2.10	0.99	27	22.2	2.27	1.07	32	28.2	3.05	1.35	50	31.9	3.39	1.54	64	36.3	3.82	1.75	82
017	40	9.9	1.72	0.48	14	11.2	1.94	0.54	17	12.0	2.09	0.58	20	-	-	-	-	17.1	3.09	0.82	38	19.4	3.48	0.94	48
021		12.2	1.74	0.59	19	13.6	1.95	0.65	23	14.6	2.11	0.70	26	18.2	2.8	0.9	37	20.5	3.07	0.99	46	23.2	3.42	1.12	56
026		16.2	1.64	0.78	20	18.6	1.88	0.90	26	20.1	2.04	0.97	30	25.6	2.75	1.23	48	29.1	3.09	1.40	61	33.1	3.53	1.60	78
033		17.7	1.67	0.85	20	-	-	-	-	-	-	-	-	27.9	2.78	1.34	48	31.6	3.08	1.52	61	35.8	3.51	1.73	78
017	45	10.0	1.60	0.48	14	11.2	1.79	0.54	17	12.0	1.92	0.58	19	15.0	2.51	0.72	29	16.9	2.79	0.81	36	19.1	3.12	0.92	46
021		-	-	-	-	13.6	1.79	0.66	23	14.6	1.92	0.70	26	18.0	2.50	0.87	36	20.3	2.79	0.98	44	22.9	3.12	1.11	54
026		16.1	1.49	0.78	20	18.4	1.71	0.89	25	19.9	1.9	1.0	29.1	25.1	2.47	1.21	45	28.4	2.78	1.37	57	32.4	3.18	1.56	73
033		17.4	1.52	0.84	19	-	-	-	-	-	-	-	-	27.4	2.51	1.32	46	31.0	2.77	1.50	58	35.3	3.17	1.70	74
017	50	-	-	-	-	11.2	1.65	0.54	17	12.0	1.76	0.58	19	14.8	2.27	0.71	28	16.6	2.51	0.80	35	18.7	2.80	0.90	43
021		-	-	-	-	-	-	-	-	14.7	1.74	0.71	25	17.9	2.24	0.87	35	20.1	2.50	0.97	42	22.5	2.79	1.09	51
026		-	-	-	-	18.2	1.55	0.88	24	-	-	-	-	24.5	2.20	1.19	43	27.7	2.47	1.34	54	31.5	2.82	1.52	68
033		-	-	-	-	-	-	-	-	-	-	-	-	26.8	2.24	1.30	43	30.2	2.47	1.46	54	34.2	2.81	1.65	69

Legend
LWT Leaving water temperature, °C
Qh Heating capacity, kW
COP Coefficient of performance, kW/kW
q Condenser water flow rate, l/s
Δp Condenser pressure drop, kPa

Application data
Standard units, refrigerant: R-410A
Condenser entering/leaving water temperature difference: 5 K for LWT values <50°C
Condenser fluid: water
Fouling factor: 0.18 x 10^{-4} (m^2 K)/W

Gross performances, not in accordance with EN14511-3:2011. 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.

Variable water flow system (VWF)

Variable water flow is a hydronic control function package that permits control of the water flow rate.

The VWF not only ensures control at full load, a specific Carrier algorithm linked to an electronic frequency converter also continuously modulates the flow rate to minimise pump consumption at full load as well as part load.

The hydronic module includes pressure transducers that permit intelligent measurement of the water flow rate and real-time display on the Pro-Dialog+ interface. All adjustments can be made directly on the interface, speeding up start-up and maintenance.

As VWF acts directly on the pump, the system no longer requires the control valve at the unit outlet. However, for applications with two-way valves a bypass system must be kept to guarantee the minimum flow rate.

Operating logic

- **Full-load set point**
  The flow rate control at full load uses the Pro-Dialog+ interface, reducing the pump speed. This first control saves energy that would normally be dissipated in the control valve. For example, if the pressure supplied by the pump is reduced by 20% the power consumption of the pump is reduced by the same ratio, compared to a traditional installation.

- **Operating mode at part load**
  Pro-Dialog+ includes two part-load operating modes:
  - Constant outlet pressure control
  - Constant delta T control.

  1 – Constant unit outlet pressure control
  The control continuously acts on the pump speed to ensure a constant outlet pressure.

  This solution is suitable for installations with two-way valves. When these close, the water speed will accelerate in the system branches that are still open. For a fixed-speed pump this results in an unnecessary increase of the pressure at the pump outlet.

  The outlet pressure control mode ensures that each circuit branch always has a uniform supply, without unnecessary energy waste.

  In industrial processes such as plastic injection moulding, this solution ensures that each terminal unit has the correct pressure supply.

  2 – Constant delta T control
  The VWF algorithm maintains a constant delta T no matter what the unit load, reducing the flow rate to the minimum.

  This solution can be used for systems with two-way or three-way valves and achieves higher energy savings than the “Constant unit outlet pressure control” mode. It is suitable for the majority of comfort applications.

Environmental
Management
Systems

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Manufacturer reserves the right to change any product specifications without notice.

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