

AIR-COOLED SCROLL CHILLERS WITH GREENSPEED® INTELLIGENCE



Unit with low noise level option

High full-load and part-load efficiency

Compact and simple to install

Low sound level

Low refrigerant charge

Superior reliability

30RBM/30RBP 160-520



Nominal cooling capacity 164-528 kW

AquaSnap liquid chillers are the best solution for commercial and industrial applications where installers, engineering and design departments and building owners require reduced installation costs, optimal performance and the highest quality.

The new generation of AquaSnap liquid chillers feature two new versions:

- The AquaSnap (30RBM) version features a compact all-in-one package optimised for full-load applications where reduced investment cost (low CapEx) is required. For cold or hot climates, the AquaSnap can be equipped with specific options to operate from -20°C up to +52°C.
- The AquaSnap Greenspeed® (30RBP) version is a compact all-in-one package optimised for part-load applications where high ESEER, SEPR and IPLV are required. The AquaSnap Greenspeed®, equipped with a variable speed pump and fans, provides premium part-load efficiency to reduce maintenance costs over the lifespan of the chiller. Additionally, the low sounds levels achieved at part load conditions can be very beneficial for sensitive acoustic applications. Besides operating efficiently and quietly, the AquaSnap Greenspeed® operates from -20°C up to +48°C as standard.



CARRIER participates in the ECP programme for LCP/HP
Check ongoing validity of certificate:
www.eurovent-certification.com

FEATURES AND BENEFITS

AquaSnap liquid chillers are designed to meet current and future Ecodesign and F-Gas European regulation requirements in terms of energy efficiency and reduced CO₂ emissions. They use the best technologies available today:

- Reduced refrigerant charge of ozone-friendly refrigerant R-410A
- Scroll compressors
- Greenspeed® variable-speed fans (30RBP models)
- Novation® micro-channel heat exchangers with a new aluminium alloy
- Brazed-plate heat exchangers with reduced pressure drops
- Auto-adaptive microprocessor control with Greenspeed® intelligence
- Colour touch screen with web connectivity options
- Extra energy savings through multiple options: direct-expansion free-cooling system on one or two circuits, partial heat recovery.

Both Aquasnap versions can be equipped with a built-in hydraulic module, limiting the installation to conventional operations such as connection of the power supply and the supply and return piping (plug & play), according to the dimensions of the standard unit.

Recommended by Carrier, Aquasnap can be equipped with one or two Greenspeed® variable-speed pumps to significantly reduce energy costs linked to pumping (reduction of more than two-thirds), ensure optimum water flow rate control, and improve overall system reliability.

For use in the harshest environments combining high temperatures, dust and sand, the AquaSnap (30RBM) can be equipped with an optional IP54 electrical box and cabinet fan enabling it to operate at outdoor air temperatures of up to 52°C.



Very economical operation

- High unit full- and part-load energy efficiency and efficient design of the water side:
 - Eurovent energy efficiency class A or B
 - SEER_{12/7°C} of up to 4.52 (30RBP version) in line with the new Ecodesign 2016/2281 regulations
 - Multiple scroll compressors equipped with a high-efficiency motor which can exactly match the cooling capacity to the load required
 - Electronic expansion valve permitting operation at a lower condensing pressure and improved utilisation of the evaporator heat exchange surface (superheat control)

- Condenser with high-efficiency Novation® aluminium micro-channel heat exchangers and Greenspeed® variable-speed fans (30RBP version)
- Low pressure drop brazed plate heat exchangers (< 45 kPa under Eurovent conditions).

- Specific control functions to reduce unit cooling energy use during occupied and unoccupied periods:
 - Internal timer: switches the chiller on/off and controls operation at a second setpoint
 - Setpoint automatically offset based on the outside air temperature or room air temperature (via an option)
 - Floating high pressure management
 - Variable-speed fan control
 - Cooling demand limitation.

Refer to control chapter for more information.

- Greenspeed® variable-speed pump to reduce pumping energy consumption by up to two-thirds (option recommended by Carrier):
 - Eliminate energy losses through the water flow control valve by electronically setting the nominal water flow
 - Save energy during stand-by periods or part-load operation by automatically reducing the water pump speed. The energy consumption of the pump motor varies according to the cube of the speed, so that a reduction in speed of just 40% can reduce energy consumption by 80%
 - Improved unit part-load performance (Increased SEER value with variable water flow according to EN14825 standard).

Refer to the hydraulic option chapter for more information.



- Extra energy savings through multiple options:
 - Direct expansion free-cooling without glycol (Carrier patented) on one or two refrigerating circuits
 - Partial heat recovery.
- Reduced maintenance costs:
 - Fast diagnosis of possible incidents and their history via the control
 - R-410A refrigerant is easier to use than other refrigerant blends.

FEATURES AND BENEFITS

Low sound level

- Condenser with fixed-speed fans (30RBM models):
 - Optional low-speed fans (700 rpm) and compressor enclosure to reduce full-load noise level by 6 to 7 dB(A)
 - Condenser coils in V-shape with an open angle, allowing quieter air flow across the coil
 - Low-noise 4th generation Flying Bird fans, made of a composite material (Carrier patent)
 - Rigid fan installation for reduced noise (Carrier patent).
- Condenser with Greenspeed® variable-speed fans (30RBP models recommended by Carrier for even quieter operation):
 - Optional factory setting of the fan to low speed, with compressor enclosure to reduce full-load noise level by 6 to 7 dB(A)
 - Exceptional acoustic signature during part-load operation through smooth fan speed variation.
- Specific control functions or features to reduce noise level during the night or unoccupied periods:
 - Night-time sound control with cooling capacity and fan speed limitation
 - Low-noise scroll compressors with low vibration level
 - The compressor assembly is installed on an independent chassis and supported by flexible anti-vibration mounts
 - Dynamic suction and discharge piping support, minimising vibration transmission (Carrier patent)
 - Acoustic compressor enclosure, reducing noise emissions (optional).



Quick and easy installation

- Compact design:
 - AquaSnap units are designed with compact dimensions for easy installation.
 - With a length of approximately 4.8 m for 520 kW and a width of 2.25 m, the units require minimal floor space.
- Integrated hydronic module (optional):
 - Low or high-pressure water pump (as required)
 - Single or dual pump (as required) with operating time balancing and automatic changeover to the back-up pump if a fault develops

- Water filter protects the water pump against circulating debris
- Pressure transducers for direct numerical display of the water flow rate and water pressures
- Thermal insulation and frost protection down to -20°C, using a heater (optional)
- High-capacity membrane expansion tank (option).
- Built-in hydraulic module with Greenspeed® variable-speed pump (option recommended by Carrier):
 - Quick and easy electronic setting of the nominal water flow rate when the unit is commissioned, thus eliminating the need to adjust the water flow rate control valve
 - Automatic control of the pump speed based on constant speed, constant pressure difference or constant temperature difference.
- Simplified electrical connections
 - A single power supply point without neutral
 - Main disconnect switch with high trip capacity
 - 24 V control circuit using an integrated transformer.
- Fast unit commissioning
 - Systematic factory test before shipment
 - Quick-test function for step-by-step verification of the sensors, electrical components and motors.

Reduced installation costs

- Optional Greenspeed® variable-speed pump with hydronic module (option recommended by Carrier)
 - Cut costs relating to the water flow control valve
 - The design of the water system with variable primary flow (VPF) can provide significant installation cost savings compared with traditional constant primary systems with variable secondary circuits; elimination of the secondary distribution pump, etc.
 - Water system design with fan coils fitted with 2-way valves instead of 3-way valves.
- No buffer tank required thanks to Carrier's advanced control algorithm
 - Minimum water loop volume reduced to 2.5 l/kW.

Environmentally responsible

- R-410A ozone-friendly refrigerant.
- Reduced direct warming potential (10% of total equivalent warming impact):
 - Low R410-A refrigerant charge, below 0.14 kg/kW, through the use of Novation® micro-channel heat exchangers
 - Leak-tight refrigerant circuit with minimum brazed connections
 - Qualified Carrier maintenance personnel carry out refrigerant servicing operations
 - ISO14001-certified site of manufacture.
- Reduced indirect warming potential (90% of total equivalent warming impact):
 - Reduced unit energy use (high full- and part-load efficiency)
 - Pumping energy consumption can be reduced by up to 2/3 using Greenspeed® variable-speed pumps.

FEATURES AND BENEFITS

Superior reliability

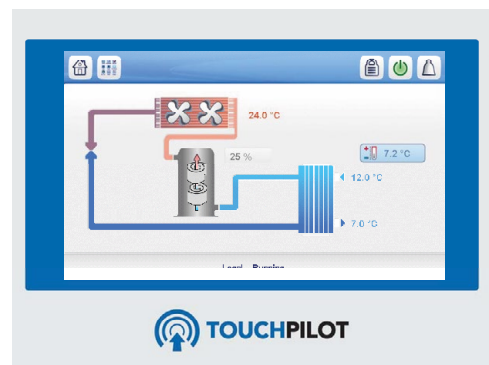
- State-of-the-art concept
 - Two independent refrigerant circuits; the second one automatically takes over, if the first one develops a fault, maintaining partial cooling under all circumstances
 - All compressor components are easily accessible on site minimising down-time
 - All-aluminum Novation® micro-channel heat exchanger (MCHE) with higher corrosion resistance than a conventional coil. The all-aluminum construction eliminates the formation of galvanic currents between aluminum and copper that are responsible for the coil corrosion in saline or corrosive atmospheres.
 - V-coil design to protect the coils against hail impact
 - Optional Enviro-shield anti-corrosion coil coating for use in moderately corrosive environments. Coating applied through conversion process which modifies the surface of the aluminum producing a coating that is integral to the coil. Complete immersion in a bath to ensure 100% coverage. No heat transfer variation, tested 4000 hours salt spray per ASTM B117.
 - Optional Super Enviro-shield anti-corrosion coil coating for use in extremely corrosive environments. Extremely durable and flexible epoxy polymer coating applied on micro channel heat exchangers by electro coating process with a final UV protective topcoat. Minimal heat transfer variation, tested 6000 hours constant neutral salt spray per ASTM B117, superior impact resistance per ASTM D2794.
 - Optional IP54 protection level of compressor control boxes and cabinet fan to guarantee safe operation in hot, dusty, sandy environments
 - Electronic flow switch. Auto-setting according to cooler size and fluid type.
- Auto-adaptive control
 - Control algorithm prevents excessive compressor cycling and permits reduction of the water quantity in the water loop (Carrier patent)
 - Automatic compressor unloading in case of abnormally high condensing pressure
 - Automatic fan speed adjustment in case of coil fouling (30RBP models)
 - Smooth fan start to increase unit lifetime (30RBP models).
- Exceptional endurance tests
 - Partnerships with specialised laboratories and use of limit simulation tools (finite element calculation) for the design of critical components
 - Transport simulation test on an endurance circuit based on a military standard.

Touch Pilot control

The Touch Pilot control 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 evaporator water pump for optimum energy efficiency.

The Touch Pilot control features advanced communication technology over Ethernet (IP), and a user-friendly and intuitive user interface with 5-inch colour touch screen.

- Energy management configuration
 - Internal timer: controls chiller on/off times and operation at a second setpoint
 - Setpoint offset based on the outside air temperature
 - Master/slave control of two chillers operating in parallel with runtime balancing and automatic changeover in case of a unit fault.
- Integrated features
 - Night mode: Capacity and fan speed limitation for reduced noise level
 - With hydronic module: Water pressure display and water flow rate calculation.
- Advanced communication features
 - Easy and high-speed communication technology over Ethernet (IP) to a centralised building management system
 - Access to multiple unit parameters.
- Maintenance functions
 - F-Gas regulation leak check reminder alert
 - Maintenance alert can be configured to days, months or hours of operation
- 5-inch Touch Pilot user interface



- Intuitive and user-friendly 5 inch touch screen interface
- Concise and clear information is available in local languages
- Complete menu, customised for different users (end user, service personnel or Carrier engineers).

FEATURES AND BENEFITS

Remote management (standard)

Units with Touch Pilot control can be easily accessed from the internet, using a PC with an Ethernet connection. This makes remote control quick and easy and offers significant advantages for service operations.

The Aquasnap is equipped with an RS485 serial port that 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.

The Aquasnap also communicates with other centralised building management systems via optional communication gateways.

A connection terminal allows remote control of the Aquasnap unit by wired cable:

- Start/stop: Opening of this contact will shut down the unit
- Dual setpoint: closing of this contact activates a second setpoint (e.g.: unoccupied mode).
- Demand limit: Closing of this contact limits the maximum chiller capacity to a predefined value.
- Operation indication: This volt-free contact indicates that the chiller is operating (cooling load).
- Alarm indication: this volt-free contact indicates the presence of a major fault that has led to the shut-down of one or several refrigerant circuits.

Energy management module (optional)

The Energy Management Module offers extended remote control possibilities:

- Room temperature: enables the setpoint to be reset based on the indoor air temperature of the building (with Carrier thermostat).
- Setpoint reset: the cooling setpoint is reset based on a 4-20 mA signal.
- Demand limit: Enables the maximum chiller power to be limited based on a 4-20 mA signal.
- Demand limit 1 and 2: Closing of these contacts limits the maximum chiller power or current to two predefined values.
- User safety: This contact can be used for any customer safety loop; opening the contact generates a specific alarm.
- Ice storage end: when ice storage has finished, this input is used to return to the second setpoint (unoccupied mode).
- Timer override: closing of this contact cancels the effects of the timer.
- Out of service: This signal indicates that the chiller is completely out of service.
- Chiller capacity: This analogue output (0-10 V) gives an immediate indication of the chiller capacity.
- Alert indication: this volt-free contact indicates the necessity to carry out a maintenance operation or the presence of a minor fault.
- Boiler control: this on/off output controls an independent boiler to provide hot water.

Novation® Aluminium micro-channel heat exchanger



The Novation® is the latest generation of Carrier Micro-Channel Heat Exchanger (MCHE) with a new, extra-resistant aluminium alloy. Already used in the automotive and aeronautical industries for many years, the micro-channel heat exchanger (MCHE) on the AquaSnap is made entirely of aluminium. This one-piece concept significantly increases its corrosion resistance by eliminating the galvanic currents that are created when two different metals (copper and aluminium) come into contact in conventional heat exchangers. Unlike traditional heat exchangers, MCHEs can be used in moderate marine and urban environments.

In terms of energy efficiency, MCHEs are approximately 10% more efficient than a traditional coil and enable a 40% reduction in the amount of refrigerant used in the chiller. The slim design of the MCHE reduces air pressure losses by 50% and, compared to a traditional coil, makes it less susceptible to fouling (e.g. by sand). The MCHE can be cleaned very quickly using a high-pressure washer.

VARIABLE WATER FLOW SYSTEM (VWF) 30RBM/30RBP 160-520

Carrier Variable Water Flow

Recommended by Carrier, the Aquasnap can be equipped with one or two variable-speed pumps to save significant pumping energy costs (more than two-thirds), ensure tighter water flow rate control, and improve overall system reliability.



Carrier Variable Water Flow (VWF) is a hydraulic control function package that controls the water flow rate.

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

As Carrier 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 principle

■ Full-load setpoint:

The flow rate at full load is controlled by the interface, which reduces 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 energy consumption of the pump is reduced by the same proportion, compared to a traditional installation.



■ Operating mode at part load

Pro-Dialog+ includes three part-load operating modes:

- Fixed speed control
- Constant delta P control
- Constant delta T control.

1 - Fixed speed

The control continuously ensures a constant pump speed based on compressor capacity.

When the compressor capacity is equal to zero, the pump speed can be automatically reduced to a second setpoint (adjustable down to 60%) to save energy during low occupancy periods.

This solution is suitable for traditional installations with constant water flow and terminal units equipped with three-way valves. This solution reduces pumping energy costs especially when the flow can be reduced during night-time periods.

2 - Constant delta P control

The control continuously acts on the pump speed to ensure a constant delta P.

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 constant delta P 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.

3 - 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. It is suitable for the majority of comfort applications.

PHYSICAL DATA, SIZES 160 TO 520

30RBM		160	180	200	220	260	300	330	360	400	430	470	520	
Cooling														
Standard unit Full load performances*	CA1	Nominal capacity kW	168	181	198	216	261	300	331	365	397	430	464	523
		EER kW/kW	3,04	3,12	2,98	2,97	2,90	2,97	2,92	2,95	2,90	2,94	2,90	2,90
		Eurovent class	B	A	B	B	B	B	B	B	B	B	B	B
	CA2	Nominal capacity kW	216	247	263	297	336	393	428	475	510	556	593	676
		EER kW/kW	3,6	3,89	3,59	3,7	3,37	3,53	3,4	3,47	3,37	3,45	3,34	3,38
		Eurovent class	C	A	C	B	D	C	D	D	D	D	E	D
Standard unit Seasonal energy efficiency**	SEER_{12/7°C} Comfort low temp. kWh/kWh	4,15	4,18	4,10	4,09	4,10	4,15	4,19	4,21	4,16	4,15	4,12	4,10	
	η_{s cool}_{12/7°C} %	163	164	161	161	161	163	165	165	163	163	162	161	
	SEPR _{12/7°C} Process high temp. kWh/kWh	4,77	4,71	4,29	4,76	4,33	4,56	4,46	4,67	4,50	4,79	4,64	4,74	
Unit + option 6 Seasonal energy efficiency**	SEPR_{-2/-8°C} Process medium temp.*** kWh/kWh	2,81	3,08	3,14	2,99	3,13	3,05	3,04	2,76	3,23	NA	NA	NA	
Part Load integrated values	IPLV.SI kW/kW	4,566	4,570	4,538	4,508	4,500	4,610	4,612	4,690	4,579	4,618	4,555	4,579	
Sound levels														
Standard unit														
Sound power ⁽³⁾	dB(A)	91	92	92	92	92	93	93	93	93	94	94	94	
Sound pressure level at 10 m ⁽⁴⁾	dB(A)	59	60	60	60	60	60	60	61	61	62	62	62	
Standard unit + option 15⁽¹⁾														
Sound power ⁽³⁾	dB(A)	89	90	90	90	90	91	91	92	92	93	93	93	
Sound pressure at 10 m ⁽⁴⁾	dB(A)	57	58	58	58	58	59	59	60	60	61	61	61	
Standard unit + option 15LS⁽¹⁾														
Sound power ⁽³⁾	dB(A)	85	85	85	86	86	86	86	87	87	88	88	88	
Sound pressure at 10 m ⁽⁴⁾	dB(A)	53	53	53	54	54	54	54	55	55	55	55	56	
Dimensions - standard unit														
Length	mm	2410					3604			4797				
Width	mm	2253					2253			2253				
Height	mm	2297					2297			2297				
Operating weight⁽²⁾														
Standard unit	kg	1216	1257	1257	1387	1408	1865	1901	2069	2125	2545	2563	2761	
Standard unit + option 15 ⁽¹⁾	kg	1299	1339	1340	1495	1516	1991	2027	2212	2269	2707	2726	2941	
Standard unit + option 15 + option 116S ⁽¹⁾	kg	1438	1479	1479	1634	1670	2151	2231	2416	2472	2950	2967	3221	

* In accordance with standard EN14511-3:2013.
 ** In accordance with standard EN14825:2016
 *** With EG 30%
 CA1 Cooling mode conditions: evaporator water inlet/outlet temperature 12 °C/7 °C, outdoor air temperature 35 °C, evaporator fouling factor 0 m². k/W
 CA2 Cooling mode conditions: evaporator water inlet/outlet temperature 23 °C/18 °C, outdoor air temperature 35 °C, evaporator fouling factor 0 m². k/W
η_{s cool}_{12/7°C} & SEER_{12/7°C} **Bold values compliant to Ecodesign regulation: (EU) No 2016/2281 for Comfort application**
 SEPR_{12/7°C} Values calculated in accordance with EN14825:2016
SEPR_{-2/-8°C} **Bold values compliant to Ecodesign regulation: (EU) No 2015/1095 for Process application**
 NA Not Authorised for the specific application for the CEE market
 IPLV.SI Calculations according to standard performances AHRI 551-591 (SI).
 (1) Options: 15 = Low noise level, 15LS = Very Low Noise level, 116S = High pressure dual-pump hydraulic module
 (2) Weights are guidelines only. Refer to the unit name plate.
 (3) In dB ref=10⁻¹² W, (A) weighting. Declared dual-number noise emission values in accordance with ISO 4871 (with an associated uncertainty of +/-3 dB(A)). Measured in accordance with ISO 9614-1 and certified by Eurovent
 (4) In dB ref 20μPa, (A) weighting. Declared dual-number noise emission values in accordance with ISO 4871 (with an associated uncertainty of +/-3 dB(A)). For information, calculated from the sound power Lw(A).



Valeurs certifiées Eurovent

PHYSICAL DATA, SIZES 160 TO 520

30RBM	160	180	200	220	260	300	330	360	400	430	470	520	
Compressors	Hermetic scroll 48,3 tr/s												
Circuit A	1	1	1	2	2	2	2	3	3	3	3	4	
Circuit B	2	2	2	2	2	3	3	3	3	4	4	4	
No. of control stages	3	3	3	4	4	5	5	6	6	7	7	8	
Refrigerant⁽²⁾ - Standard unit	R410A												
Circuit A	kg	8,40	10,90	10,90	12,60	13,10	14,70	15,40	20,30	21,10	23,50	23,50	26,75
	tCO ₂ e	17,5	22,8	22,8	26,3	27,4	30,7	32,2	42,4	44,1	49,1	49,1	55,9
Circuit B	kg	12,25	12,60	12,60	12,70	13,10	20,20	20,20	20,40	22,20	26,70	26,80	26,95
	tCO ₂ e	25,6	26,3	26,3	26,5	27,4	42,2	42,2	42,6	46,4	55,7	56,0	56,3
Capacity control	Pro-Dialog+ Control												
Minimum capacity	%	33	33	33	25	25	20	17	17	14	14	13	
Condensers	Aluminium micro-channel coils (MCHE)												
Fans - Standard unit	FLYING BIRD 4 axial fans with rotating impeller												
Quantity		3	4	4	4	4	5	5	6	6	7	7	8
Maximum total air flow	l/s	13542	18056	18056	18056	18056	22569	22569	27083	27083	31597	31597	36111
Maximum rotation speed	rps	16	16	16	16	16	16	16	16	16	16	16	16
Evaporator	Dual-circuit plate heat exchanger												
Water volume	l	15	15	15	15	19	27	35	33	42	44	47	53
Max. water-side operating pressure without hydronic module	kPa	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Hydraulic module (option)	Pump, Victaulic screen filter, relief valve, water and air drain valve, pressure sensors, expansion tank (option)												
Pump	Centrifugal pump, monocell, 48,3 rps, low or high pressure (as required), single or dual (as required)												
Expansion tank volume	l	50	50	50	50	50	80	80	80	80	80	80	80
Max. water-side operating pressure with hydraulic module	kPa	400	400	400	400	400	400	400	400	400	400	400	400
Water connections with or without hydraulic module	Victaulic type												
Diameter	inch	3	3	3	3	3	4	4	4	4	4	4	4
External diameter	mm	88,9	88,9	88,9	88,9	88,9	114,3	114,3	114,3	114,3	114,3	114,3	114,3
Casing paintwork	Colour code RAL 7035												

(2) Weights are guidelines only. Refer to the unit name plate.

ELECTRICAL SPECIFICATIONS

30RBM		160	180	200	220	260	300	330	360	400	430	470	520
Power circuit													
Nominal voltage	V-ph-Hz	400 - 3 - 50											
Voltage range	V	360 - 440											
Control circuit supply													
24 V via internal transformer													
Nominal unit current draw⁽¹⁾													
Circuit A&B	A	100	110	124	133	161	180	201	221	242	261	282	322
Max. operating input power⁽²⁾													
Circuit A&B	kW	80	88	99	107	129	145	161	177	194	210	226	258
Cosine Phi unit at maximum power⁽²⁾													
		0,88	0,87	0,87	0,88	0,88	0,88	0,88	0,88	0,88	0,88	0,88	0,88
Maximum unit current draw (Un-10%)⁽³⁾													
Circuit A&B	A	144	158	176	192	230	259	288	317	345	374	403	460
Maximum unit current draw (Un)⁽⁴⁾													
Circuit A&B - Standard Unit	A	133	146	163	177	212	239	266	292	319	345	372	425
Circuit A&B - Unit with option 231	A	100	110	125	133	163	181	204	222	244	262	285	326
Maximum start-up current, standard unit (Un)†													
Circuit A&B	A	307	356	374	352	423	450	476	503	529	556	583	636
Max. start-up current, unit with soft starter (Un)†													
Circuit A&B	A	261	283	300	305	349	376	403	429	456	482	509	562

- (1) Conditions equivalent to the standardised Eurovent conditions (evaporator water input-output temperature = 12 °C/7 °C, outside air temperature = 35 °C)
- (2) Power input, compressors and fans, at the unit operating limits (saturated suction temperature 15°C, saturated condensing temperature 68.3°C) and nominal voltage of 400 V (data given on the unit nameplate).
- (3) Maximum unit operating current at maximum unit input power and 360 V.
- (4) Maximum unit operating current at maximum unit input power and 400 V (values given on the unit's nameplate).
- † Maximum instantaneous start-up current at operating limits (maximum operating current of the smallest compressor(s) + current of the fan(s) + locked rotor current of the largest compressor).
- Fan motor electrical data reported upstream the variable speed drive at Eurovent equivalent conditions and motor ambient air temperature of 50°C at 400 V: Current 3.8 A; In-rush current 20 A; Power input: 1.75 kW.

30RBP		160	180	200	220	260	300	330	360	400	430	470	520
Power circuit													
Nominal voltage	V-ph-Hz	400 - 3 - 50											
Voltage range	V	360 - 440											
Control circuit supply													
24 V via internal transformer													
Nominal unit current draw⁽¹⁾													
Circuit A&B	A	97	107	121	130	158	176	197	216	237	255	276	316
Cosine Phi unit at maximum power⁽²⁾													
Circuit A&B	kW	81	88	99	108	129	145	162	178	194	210	226	259
Cosine Phi unit at maximum power⁽²⁾													
		0,88	0,88	0,88	0,88	0,88	0,88	0,88	0,88	0,88	0,88	0,88	0,88
Maximum unit current draw (Un-10%)⁽³⁾													
Circuit A&B	A	142	154	173	189	227	255	284	312	340	369	397	454
Maximum unit current draw (Un)⁽⁴⁾													
Circuit A&B - Standard Unit	A	131	142	160	174	209	235	262	287	314	340	366	419
Circuit A&B - Unit with option 231	A	98	108	123	131	161	178	201	219	241	259	281	321
Maximum start-up current, standard unit (Un)†													
Circuit A&B	A	305	353	371	349	420	446	472	498	525	550	577	629
Max. start-up current, unit with soft starter (Un)†													
Circuit A&B	A	259	279	297	302	346	372	399	424	451	477	503	556

- (1) Conditions equivalent to the standardised Eurovent conditions (evaporator water input-output temperature = 12 °C/7 °C, outside air temperature = 35 °C)
- (2) Input power, compressors + fans, at the unit operating limits (saturated suction temperature: 15°C, saturated condensing temperature: 68.3°C) and nominal voltage of 400 V (data given on the unit nameplate).
- (3) Maximum unit operating current at maximum unit input power and 360 V.
- (4) Maximum unit operating current at maximum unit input power and 400 V (values given on the unit's nameplate).
- † Maximum instantaneous start-up current at operating limits (maximum operating current of the smallest compressor(s) + current of the fan(s) + locked rotor current of the largest compressor).
- Fan motor electrical data reported upstream of the variable drive at Eurovent equivalent conditions and motor ambient air temperature of 50°C at 400 V: Current 3.0 A; Start-up current 20 A; Power input: 1.75 kW.

SOUND SPECTRUM

30RBM/30RBP - Standard unit

		Octave bands, Hz ⁽¹⁾						Sound power ⁽²⁾	
		125	250	500	1k	2k	4k		
160	dB	92	89	90	86	81	77	dB(A)	91
180	dB	93	90	91	87	81	78	dB(A)	92
200	dB	93	90	91	87	81	78	dB(A)	92
220	dB	93	91	91	87	82	78	dB(A)	92
260	dB	93	91	91	87	82	78	dB(A)	92
300	dB	93	91	92	88	82	79	dB(A)	93
330	dB	93	91	92	88	82	79	dB(A)	93
360	dB	94	92	92	89	83	79	dB(A)	93
400	dB	94	92	92	89	83	79	dB(A)	93
430	dB	95	92	93	89	84	80	dB(A)	94
470	dB	95	92	93	89	84	80	dB(A)	94
520	dB	95	92	93	89	84	80	dB(A)	94

(1) in dB ref=10⁻¹² W, as a guideline. Measured in accordance with ISO 9614-1.

(2) in dB ref=10⁻¹² W, weighting (A), with uncertainty +/-3 dB. Measured in accordance with ISO 9614-1 and certified by Eurovent.

30RBM/30RBP - Standard unit + option 15LS⁽³⁾

		Octave bands, Hz ⁽¹⁾						Sound power ⁽²⁾	
		125	250	500	1k	2k	4k		
160	dB	83	86	83	80	76	69	dB(A)	85
180	dB	84	85	83	80	76	69	dB(A)	85
200	dB	84	85	83	80	76	69	dB(A)	85
220	dB	85	87	84	81	77	70	dB(A)	86
260	dB	85	87	84	81	77	70	dB(A)	86
300	dB	84	87	84	81	77	70	dB(A)	86
330	dB	84	87	84	81	77	70	dB(A)	86
360	dB	85	88	85	82	78	71	dB(A)	87
400	dB	85	88	85	82	78	71	dB(A)	87
430	dB	86	88	86	82	79	72	dB(A)	88
470	dB	86	88	86	82	79	72	dB(A)	88
520	dB	87	89	86	83	79	72	dB(A)	88

(1) in dB ref=10⁻¹² W, as a guideline. Measured in accordance with ISO 9614-1.

(2) in dB ref=10⁻¹² W, weighting (A), with uncertainty +/-3 dB. Measured in accordance with ISO 9614-1 and certified by Eurovent.

(3) Options: 15 = low noise level, 15LS = very low noise level.

30RBM/30RBP - Standard unit + option 15⁽³⁾

		Octave bands, Hz ⁽¹⁾						Sound power ⁽²⁾	
		125	250	500	1k	2k	4k		
160	dB	91	88	87	85	79	76	dB(A)	89
180	dB	92	89	88	86	80	77	dB(A)	90
200	dB	92	89	88	86	80	77	dB(A)	90
220	dB	92	89	88	86	80	77	dB(A)	90
260	dB	92	89	88	86	80	77	dB(A)	90
300	dB	93	90	89	87	81	78	dB(A)	91
330	dB	93	90	89	87	81	78	dB(A)	91
360	dB	94	91	90	88	82	79	dB(A)	92
400	dB	94	91	90	88	82	79	dB(A)	92
430	dB	95	92	91	88	83	80	dB(A)	93
470	dB	95	92	91	88	83	80	dB(A)	93
520	dB	95	92	91	88	83	80	dB(A)	93

(1) in dB ref=10⁻¹² W, as a guideline. Measured in accordance with ISO 9614-1.

(2) in dB ref=10⁻¹² W, weighting (A), with uncertainty +/-3 dB. Measured in accordance with ISO 9614-1 and certified by Eurovent.

(3) Options: 15 = low noise level, 15LS = very low noise level.

OPERATING LIMITS

Evaporator water flow rate

30RBM/30RBP 160-520 without hydronic module

	Minimum flow rate (l/s) ⁽¹⁾	Maximum flow rate (l/s) ⁽²⁾
160	2.9	17.5
180	3.2	17.5
200	3.6	17.5
220	3.8	17.5
260	4.6	21.8
300	5.2	29.8
330	5.9	35.2
360	6.3	33.8
400	7.1	38.9
430	7.6	40.4
470	8.2	41.6
520	9.4	43.4

- (1) Minimum flow rate for the maximum permitted water temperature difference conditions (10 K) at the minimum water outlet temperature value (5°C)
 (2) Maximum flow rate for a pressure drop of 100 kPa in the plate heat exchanger

30RBM/30RBP 160-520 with low pressure hydronic module

	Minimum flow rate (l/s) ⁽¹⁾		Maximum flow rate (l/s)	
	Single	Dual	Single	Dual
160	2.8	3.2	12.2	10.3
180	2.8	3.2	12.2	10.3
200	2.8	2.5	12.2	12.2
220	2.8	2.5	12.2	12.2
260	4	2.7	14.3	15
300	3.1	3.7	20.2	20.2
330	3.4	3.7	20.2	20.2
360	3.7	3.8	20.2	20.2
400	9.5	4.1	25	22.9
430	9.5	8	25	25
470	9.5	8	25	25
520	5.4	5.4	26.6	26.5

- (1) Minimum water flow rate, factory-set according to pump type

30RBM/30RBP 160-520 with high pressure hydronic module

	Minimum flow rate (l/s) ⁽¹⁾		Maximum flow rate (l/s)	
	Single	Dual	Single	Dual
160	2.5	2.6	11.7	11.7
180	2.5	2.6	11.7	11.7
200	2.5	2.6	11.7	11.7
220	2.5	2.6	11.7	11.7
260	5.2	2.9	16.1	15.5
300	6.4	3.5	16.1	15.5
330	3.6	3.4	26.5	26.5
360	3.7	3.7	26.5	26.5
400	4.1	4.1	26.5	26.5
430	4.4	4.4	26.7	29.2
470	4.8	4.8	26.7	29.2
520	5.4	5.4	26.7	35

- (1) Minimum water flow rate, factory-set according to pump type

Unit operating limits

30RBM 160-520 units

Water-cooled heat exchanger	Minimum	Maximum
Entering water temperature at start-up °C	8 ⁽¹⁾	40
Leaving water temperature during operation option 5B °C	0 ⁽²⁾	20 ⁽³⁾
Leaving water temperature during operation option 6B °C	-15 ⁽⁶⁾	20 ⁽³⁾
Air-cooled exchanger	Minimum	Maximum
Outdoor ambient operating temperature		
Standard units °C	0 ⁽⁴⁾ /10	48 ⁽⁵⁾
Units with options 28B-28C (winter operation) °C	-10	48 ⁽⁵⁾
Units with option 28 (winter operation) °C	-20	48 ⁽⁵⁾
Units with option 16 (high ambient operation) °C	0/10	52
Available static pressure		
Standard units (outdoor installation) Pa	0	0

30RBP 160-520 units

Water-cooled heat exchanger	Minimum	Maximum
Entering water temperature at start-up °C	8 ⁽¹⁾	40
Leaving water temperature during operation option 5B °C	0 ⁽²⁾	20 ⁽³⁾
Leaving water temperature during operation option 6B °C	-15 ⁽⁶⁾	20 ⁽³⁾
Condenser	Minimum	Maximum
Outdoor ambient operating temperature		
Standard unit °C	-20	48
Available static pressure		
Standard unit (outdoor installation) Pa	0	0

- (1) For applications requiring operation at less than 8°C, contact Carrier to select a unit using the Carrier electronic catalogue.
 (2) Use of antifreeze is obligatory if the water outlet temperature is below 5°C.
 (3) For applications requiring operation at a water outlet temperature exceeding 20°C, contact Carrier to select a unit using the Carrier electronic catalogue.
 (4) "For applications requiring operation from 0°C to -10°C, the unit must be equipped with options 28B-28C "Winter operation"". For operation from 0°C to -20°C, the unit must be equipped with option 28 "Winter operation".
 For both options, the unit must either be equipped with the evaporator frost protection option (for units without hydraulic module option), or the evaporator and hydraulic module frost protection option (for units with hydraulic module option), or the water loop must be protected against frost by the installer, using an antifreeze solution.
 (5) The maximum ambient temperature allowed for machines equipped with option 231 is +40°C.
 Maximum ambient temperature: if storing and transporting 30RBM/30RBP units, the minimum and maximum ambient temperatures to be respected are -20°C and +52°C. These temperature limits shall be considered in case of container shipment and temperatures over 52°C.
 (6) If using ethylene glycol and for RBM 160-400 or RBP 160-400.

AVAILABLE STATIC SYSTEM PRESSURE

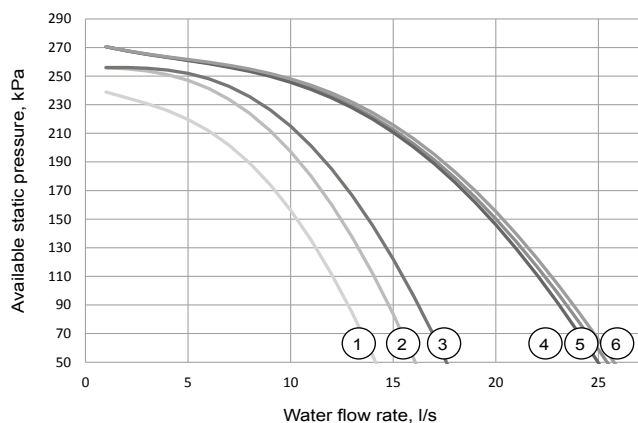
Data applicable for:

- Pure water at 20°C.
- Refer to the chapter “Evaporator flow rate” for the maximum water flow values.
- If glycol is used, the maximum water flow is reduced.

High-pressure pumps (fixed speed or variable speed at 50 Hz) on 30RBM/30RBP units

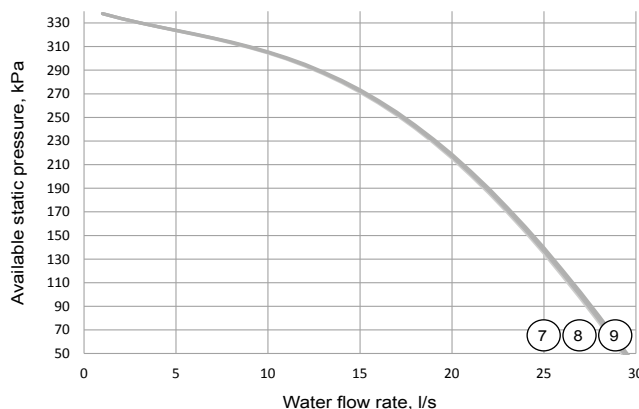
Single pumps

Sizes 160-400



- | | |
|---------------------------|--------------------|
| 1. 30RBM-30RBP 160 to 220 | 4. 30RBM-30RBP 360 |
| 2. 30RBM-30RBP 260 | 5. 30RBM-30RBP 330 |
| 3. 30RBM-30RBP 300 | 6. 30RBM-30RBP 400 |

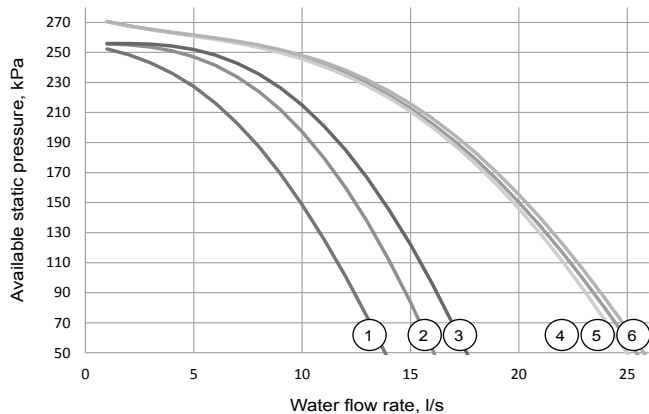
Sizes 430-520



- | |
|--------------------|
| 7. 30RBM-30RBP 430 |
| 8. 30RBM-30RBP 470 |
| 9. 30RBM-30RBP 520 |

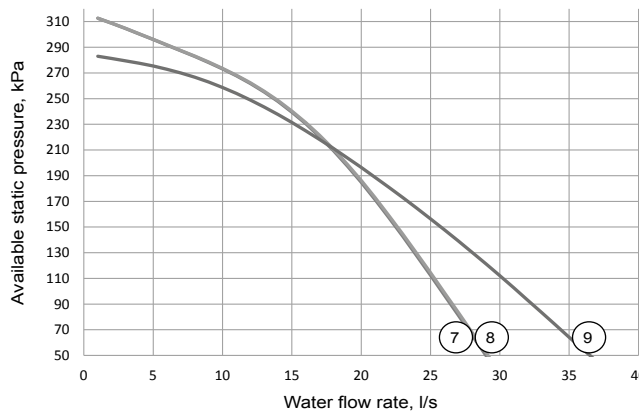
Dual pumps

Sizes 160-400



- | | |
|---------------------------|--------------------|
| 1. 30RBM-30RBP 160 to 220 | 4. 30RBM-30RBP 360 |
| 2. 30RBM-30RBP 260 | 5. 30RBM-30RBP 330 |
| 3. 30RBM-30RBP 300 | 6. 30RBM-30RBP 400 |

Sizes 430-520



- | |
|--------------------|
| 7. 30RBM-30RBP 430 |
| 8. 30RBM-30RBP 470 |
| 9. 30RBM-30RBP 520 |

AVAILABLE STATIC SYSTEM PRESSURE

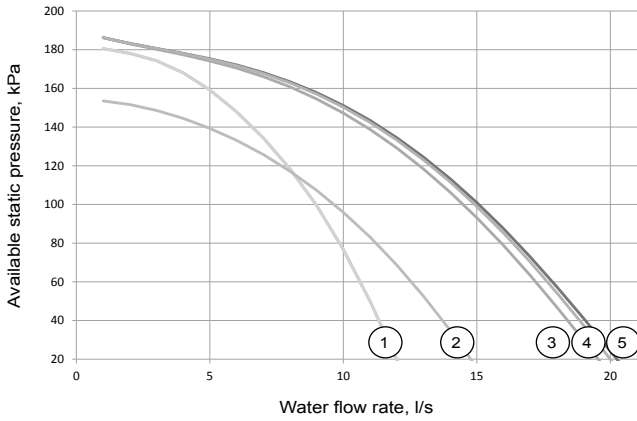
Data applicable for:

- Pure water at 20°C.
- Refer to the chapter “Evaporator flow rate” for the maximum water flow values.
- If glycol is used, the maximum water flow is reduced.

Low-pressure pumps (fixed speed) on 30RBM/30RBP units

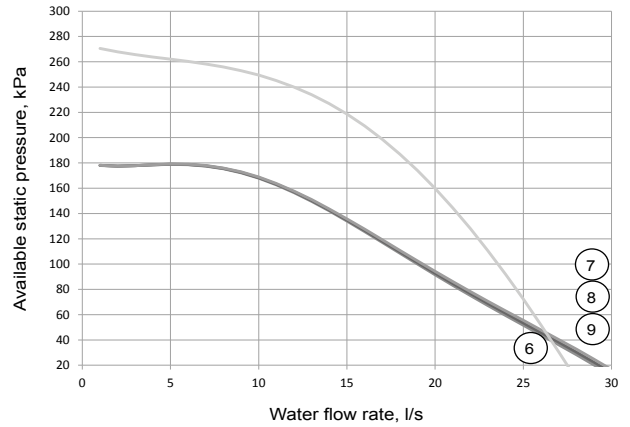
Single pumps

Sizes 160-360



- | | |
|---------------------------|--------------------|
| 1. 30RBM-30RBP 160 to 220 | 4. 30RBM-30RBP 360 |
| 2. 30RBM-30RBP 260 | 5. 30RBM-30RBP 330 |
| 3. 30RBM-30RBP 300 | |

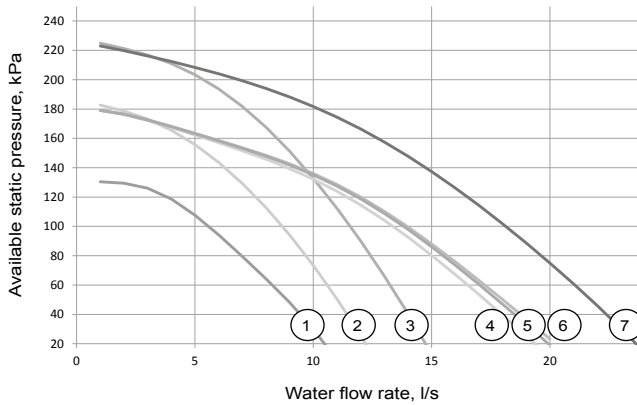
Sizes 400-520



- | | |
|--------------------|--------------------|
| 6. 30RBM-30RBP 520 | 8. 30RBM-30RBP 430 |
| 7. 30RBM-30RBP 400 | 9. 30RBM-30RBP 470 |

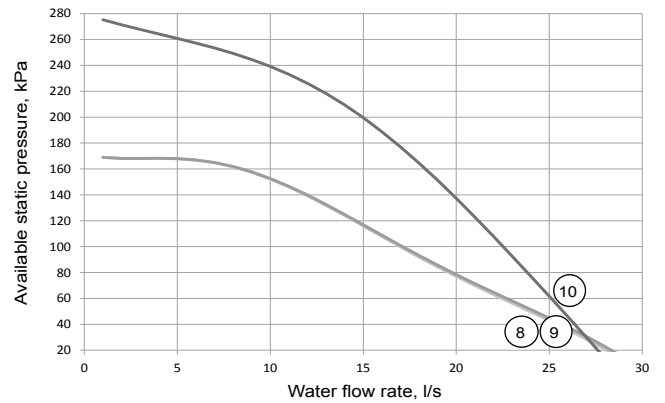
Dual pumps

Sizes 160-400



- | | |
|---------------------------|--------------------|
| 1. 30RBM-30RBP 160 to 180 | 5. 30RBM-30RBP 330 |
| 2. 30RBM-30RBP 200 to 220 | 6. 30RBM-30RBP 360 |
| 3. 30RBM-30RBP 260 | 7. 30RBM-30RBP 400 |
| 4. 30RBM-30RBP 300 | |

Sizes 430-520

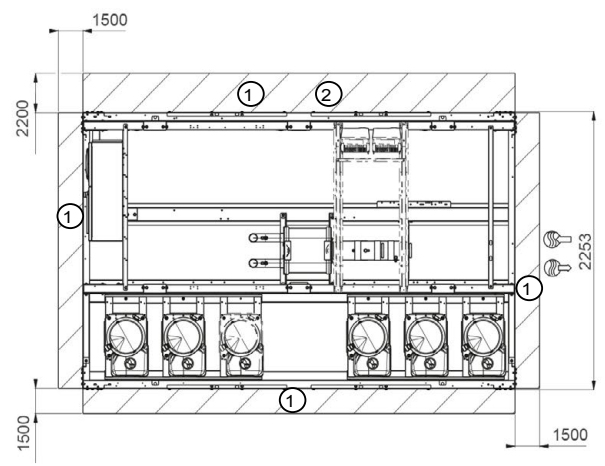
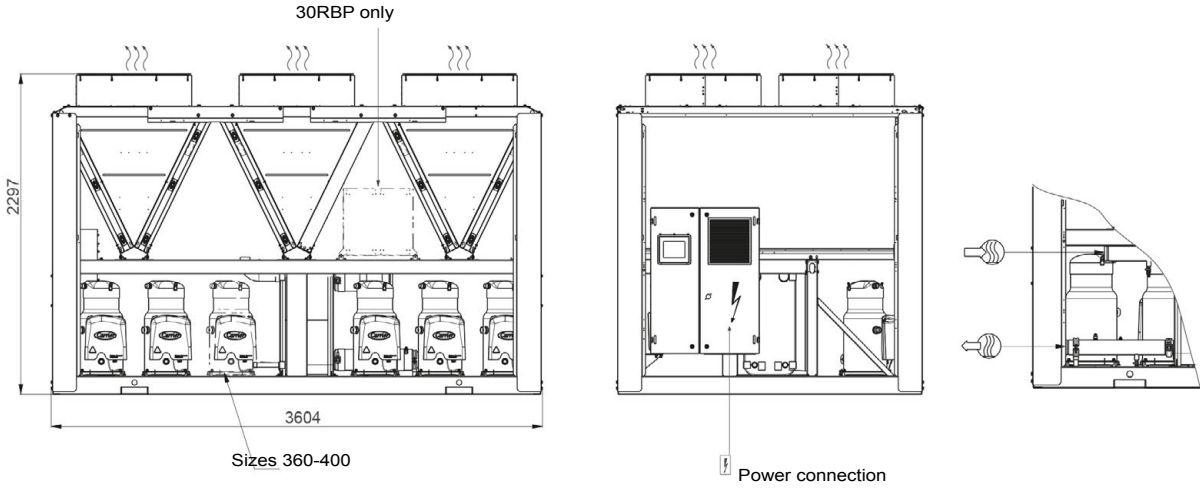


- | |
|---------------------|
| 8. 30RBM-30RBP 520 |
| 9. 30RBM-30RBP 430 |
| 10. 30RBM-30RBP 470 |

DIMENSIONS/CLEARANCES

30RBM/30RBP 300-400 (with and without hydraulic module)

Without hydraulic module

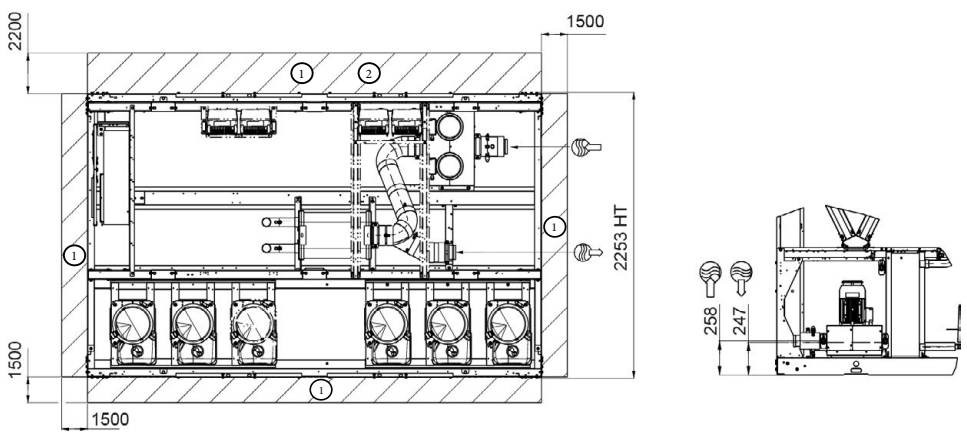


- Key:**
All dimensions are in mm.
- ① Clearances required for maintenance and air flow
 - ② Clearance recommended for coil removal
 - ☞ Water inlet
 - ☚ Water outlet
 - ☞ Air outlet, do not obstruct
 - ⚡ Electrical cabinet

Note: Drawings are not contractually binding. Before designing an installation, consult the certified dimensional drawings, available on request.

For the location of fixing points, weight distribution and coordinates of the centre of gravity, refer to the certified dimensional drawings.

With hydraulic module





Order No.: 13538, 09.2018. Supersedes order No.: 13538, 02.2018.
Manufacturer reserves the right to change any product specifications without notice.

Manufactured by: Carrier SCS, Montluel, France.
Printed in the European Union.



Quality and Environment
Management Systems
Approval