Carrier

Air-to-Water Heat Pumps with Integrated Hydronic Module

AQUASNAP™
with PURON® refrigerant

Quality Management System Approval

Puron
the environmentally sound refrigerant

Model shown is with low-noise option

30RQ 182-522

Nominal cooling capacity 174-465 kW
Nominal heating capacity 189-548 kW

The new generation of Aquasnap Puron heat pumps features the latest technological innovations: ozone-friendly refrigerant R410A, scroll compressors, low-noise fans made of a composite material, auto-adaptive microprocessor control. The Aquasnap can be equipped with an integrated hydronic module (option), limiting the installation to straightforward operations like connection of the power supply and the chilled water supply and return piping.

Features

Quiet operation

- Compressors
  - Low-noise scroll compressors with low vibration level
  - The compressor assembly is installed on an independent chassis and supported by flexible anti-vibration mountings
  - Dynamic suction and discharge piping support, minimising vibration transmission (Carrier patent)
  - Acoustic compressor enclosure, reducing radiated noise emissions (Euro Pack option)
- Air heat exchanger
  - Heat exchanger 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) are now even quieter and do not generate intrusive low-frequency noise
  - Rigid fan installation preventing start-up noise (Carrier patent)

Easy and fast installation

- Integrated hydronic module (option)
  - Centrifugal low or high-pressure water pump (as required), based on the pressure loss of the hydronic installation
  - Single or dual pump (as required) with operating time balancing and automatic changeover to the back-up pump if a fault develops
  - Water filter protecting the water pump against circulating debris
  - High-capacity membrane expansion tank ensures pressurisation of the water circuit
  - Thermal insulation and frost protection down to -20°C, using an electric resistance heater (see table of options)
  - Pressure gauge to check filter pollution and measure the system water flow rate
  - Water flow control valve
- Simplified electrical connections
  - A single power supply point without neutral
  - Main disconnect switch with high trip capacity (see table of options)
  - 24 V control circuit without risk from a transformer 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
  - The refrigerant circuit includes several compressors connected in parallel. At part load, around 99% of the operating time, only the compressors that are absolutely necessary operate. At these conditions the compressors operating are even more energy efficient, as they use the total air heat exchanger and water heat exchanger capacity.
  - The electronic expansion device (EXV) allows operation at a lower condensing pressure (EER and COP optimisation).
  - Dynamic superheat management for better utilisation of the heat exchange surface of the water heat exchanger and optimised compressor protection.
- Reduced maintenance costs
  - Maintenance-free scroll compressors
  - Fast diagnosis of possible incidents and their history via the Pro-Dialog Plus control
  - R410A refrigerant is easier to use than other refrigerant blends

Environmental care

- Refrigerant R410A
  - Chlorine-free refrigerant of the HFC group with zero ozone depletion potential
  - High-density refrigerant, therefore less refrigerant required
  - Very efficient – offers a very high coefficient of performance (EER/COP)
- Leak-tight refrigerant circuit
  - Brazed refrigerant connections for increased leak-tightness
  - Reduction of leaks as no capillary tubes and flare connections are used
  - Verification of pressure transducers and temperature sensors without transferring refrigerant charge
  - Discharge shut-off valve allows storage of the refrigerant charge in the air heat exchanger for simplified maintenance.

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
  - Compressor control box installed on the cold side of the compressor (Carrier patent)
- Refrigerant circuit
  - Two independent refrigerant circuits
  - Filter drier/refrigerant storage tank (Carrier patent) for optimised unit operation in both cooling and heating mode by controlling the refrigerant charge.
- Auto-adaptive control
  - Control algorithm prevents excessive compressor cycling and permits reduction of the water quantity in the hydronic circuit (Carrier patent)
  - Automatic compressor unloading in case of abnormally high condensing pressure. If an anomaly occurs (e.g. fouled air heat exchanger coil, fan failure) Aquasnap continues to operate, but at reduced capacity.
- Exceptional endurance tests
  - Corrosion resistance tests in salt mist in the laboratory
  - Accelerated aging test on components that are submitted to continuous operation: compressor piping, fan supports
  - Transport simulation test in the laboratory on a vibrating table. The test is based on a military standard and equivalent to 4000 km by truck.

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.

- Energy management
  - Internal time schedule clock: permits heat pump on/off control and operation at a second set-point
  - Automatic heating/cooling change-over based on the air temperature
  - Set-point reset based on the outside air temperature or the return water temperature
  - Master/slave control of two heat pumps operating in parallel with operating time equalisation and automatic change-over in case of a unit fault.
- Ease-of-use
  - User interface with synoptic diagram for intuitive display of the principal operating parameters: number of compressors operating, suction/discharge pressure, compressor operating hours, set-point, air temperature, entering/leaving water temperature
  - Ten menus for direct access to all machine commands, including fault history, allowing fast and complete heat pump diagnostics.

Pro-Dialog Plus operator interface

Pro-Dialog Plus operator interface

- RS 485 serial port
  Heat pump control by communication bus offers multiple remote control, monitoring and diagnostic possibilities. Carrier offers a vast choice of control products, specially designed to control, optimise and supervise the operation of an air conditioning system. Please consult your Carrier representative for more information on these products.
- Control terminal block
  - Start/stop: opening of this contact will shut down the unit
  - Operating mode control: heating or cooling
  - Dual set-point: closing of this contact activates a second set-point (example: unoccupied mode)
  - Demand limit: closing of this contact limits the maximum heat pump capacity to a predefined value
  - User safety: this contact is connected in series with the water flow switch and can be used for any customer safety loop
  - Water pump 1 and 2 control*: these outputs control the contactors of one or two water heat exchanger water pumps
  - Water pump on reversal*: these contacts are used to detect a water pump operation fault and automatically change over to the other pump
  - Operation indication: this volt-free contact indicates that the heat pump is operating (heating or cooling load) or that it is ready to start
  - Alert indication: this volt-free contact indicates the presence of a minor fault
  - Alarm indication: this volt-free contact indicates the presence of a major fault that has led to the shut-down of one or two refrigerant circuits

* contacts already supplied with the hydronic module option

Remote management (EMM option)

- Room temperature: permits set-point reset based on the building indoor air temperature (with Carrier thermostat)
- Set point reset: ensures reset of the cooling set-point based on a 4-20 mA or 0-5 V signal
- Demand limit: permits limitation of the maximum heat pump demand based on a 4-20 mA or 0-5 V signal
- Demand limit 1 and 2: closing of these contacts limits the maximum heat pump capacity to three predefined values
- User safety: this contact can be used for any customer safety loop, closing of the contact generates a specific alarm
- Time schedule override: closing of this contact cancels the time schedule effects
- Out of service: this signal indicates that the heat pump is completely out of service
- Heat pump capacity: this analogue output (0-10 V) gives an immediate indication of the heat pump capacity
- Compressor operation: this contact signals that one or several compressors are in operation

Part load performances in the cooling mode

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 liquid chiller at full load is rarely representative of the actual performance of the units, as on average a chiller 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 its occupation.

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

ESEER (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.

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%

Note: Constant leaving water temperature = 7°C

30RQ 182 - 802
Part load performances in accordance with Eurovent

30RQ	Load %	Cap kW	Unit kW	EER kW/kW	ESEER kW/kW
182	100	174.3	60.4	2.89	
	75	130.7	36.0	3.63	
	50	87.2	21.8	3.99	
	25	43.6	9.8	4.47	3.95
202	100	188.9	71.7	2.64	
	75	141.7	42.0	3.38	
	50	94.5	25.0	3.77	
	25	47.2	11.3	4.19	3.70
232	100	218.9	76.3	2.87	
	75	164.1	44.3	3.71	
	50	109.4	23.6	4.63	
	25	54.7	10.6	5.16	4.39
262	100	253.6	99.3	2.55	
	75	190.2	56.9	3.34	
	50	126.8	29.9	4.24	
	25	63.4	13.5	4.70	4.00
302	100	277.7	104.7	2.65	
	75	208.3	56.9	3.66	
	50	138.9	32.1	4.33	
	25	69.4	14.3	4.85	4.18
342	100	307.1	124.1	2.47	
	75	230.3	68.1	3.38	
	50	153.5	37.8	4.06	
	25	76.8	17.7	4.34	3.85
372	100	331.3	125.6	2.64	
	75	248.4	79.2	3.14	
	50	165.6	42.9	3.86	
	25	82.8	21.3	3.88	3.59
402	100	366.0	146.2	2.50	
	75	274.5	84.7	3.24	
	50	183.0	47.1	3.89	
	25	91.5	23.2	3.95	3.65
432	100	389.3	149.5	2.60	
	75	291.9	90.7	3.22	
	50	194.6	49.2	3.96	
	25	97.3	22.9	4.24	3.74
462	100	429.5	165.4	2.60	
	75	322.1	100.8	3.19	
	50	214.7	57.8	3.72	
	25	107.4	27.3	3.93	3.56
522	100	464.9	192.5	2.42	
	75	348.6	115.8	3.01	
	50	232.4	66.0	3.52	
	25	116.2	30.5	3.81	3.39

Legend
Load % - Unit heat load
Cap kW - Cooling capacity
Unit kW - Unit power input
EER - Cooling capacity kW/unit power input kW

Options and accessories

Options	No.	Description	Advantages	Use
Corrosion protection, traditional coils	3A	Fins made of pre-treated aluminium (polyurethane or epoxy)	Improved corrosion resistance, recommended for marine, moderate or urban environments	30RQ 182-522
Unit for indoor installation with air discharge duct	12	Fans with available pressure	Ducted air heat exchanger air discharge, optimised condensing temperature control, based on the operating conditions and system characteristics	30RQ 182-522
Low noise level	15	Acoustic compressor enclosure	Noise emission reduction	30RQ 182-522
Grilles	23	Metallic grilles on all four unit faces (this option includes the supply of enclosure panels)	Improved aesthetics	30RQ 182-522
Enclosure panels	23A	Side panels on each end of the coils	Improved aesthetics	30RQ 182-522
Electronic starter	25	Electronic starter on each compressor	Reduced start-up current	30RQ 182-522
Winter operation down to -20°C	28	Fan speed control via frequency converter	Stable unit operation when the air temperature is between 0°C and -20°C	30RQ 182-522
Water heat exchanger frost protection	41	Electric heater on the water heat exchanger	Water heat exchanger frost protection down to -20°C outside temperature	30RQ 182-522
Water heat exchanger and hydronic module frost protection	42A	Electric heaters on the water heat exchanger and hydronic module	Water heat exchanger and hydronic module frost protection down to -20°C outside temperature	30RQ 182-522
Partial heat reclaim	49	Partial heat reclaim by desuperheating the compressor discharge gas	Free high-temperature hot-water production simultaneously with chilled water production	30RQ 182-522
Twinning	58	Unit equipped with an additional field-installed leaving water temperature sensor, allowing master/ slave operation of two heat pumps connected in parallel	Optimised operation of two units connected in parallel with operating time equalisation	30RQ 182-522
Main disconnect switch without fuse (standard for sizes 182-262)	70	Factory-installed main electric disconnect switch in the control box	Ease-of-installation and compliance with local electrical regulations	30RQ 302-522
Main disconnect switch with fuse	70D	Factory-installed main electric disconnect switch with fuse in the control box	Same advantage as main disconnect switch and reinforced anti-short circuit protection	30RQ 302-522
Water heat exchanger with aluminium jacket	88	Water heat exchanger thermal insulation protection by aluminium sheets	Improved resistance to climatic aggression	30RQ 182-522
Water heat exchanger and hydronic module with aluminium jacket	88A	Water heat exchanger and water piping thermal insulation protection by aluminium sheets	Improved resistance to climatic aggression	30RQ 302-522
Suction valve	92	Shut-off valves on the compressor suction piping (discharge valve as standard)	Simplified maintenance	30RQ 302-522
High-pressure single-pump hydronic module	116B	See hydronic module option	Easy and fast installation	30RQ 182-522
High-pressure dual-pump hydronic module	116C	See hydronic module option	Easy and fast installation, operating safety	30RQ 182-522
Low-pressure single-pump hydronic module	116F	See hydronic module option	Easy and fast installation	30RQ 182-522
Low-pressure dual-pump hydronic module	116G	See hydronic module option	Easy and fast installation, operating safety	30RQ 182-522
JBus gateway	148B	Two-directional communications board, complies with JBus protocol	Easy connection by communication bus to a building management system	30RQ 182-522
Bacnet gateway	148C	Two-directional communications board, complies with Bacnet protocol	Easy connection by communication bus to a building management system	30RQ 182-522
LonTalk gateway	148D	Two-directional communications board, complies with LonTalk protocol	Easy connection by communication bus to a building management system	30RQ 182-522
Energy Management module EMM	156	See controls manual	Easy connection by wired connection to a building management system	30RQ 182-522
Fitted safety valves with sealed ball valve	196	Valve with sealed ball upstream of the safety valves	Safety valve inspection and replacement facilitated without refrigerant loss	30RQ 182-522
Conformance with Australian regulations	200	Heat exchanger approved to Australian code	-	30RQ 182-522
Euro Pack	221	This option contains the options enclosure panels, water heat exchanger frost protection, main disconnect switch and low noise level	Aesthetics, ease-of-installation and low operating noise	30RQ 182-522
Storage unit above 48°C	241	Refrigerant charge stored in the air heat exchangers	Unit transport by container only possible with this option	30RQ 182-522
Coil defrost resistance heaters	252	Electric heaters under the coils and the condensate pans	Prevents frost formation on the coils; compulsory in the heating mode, if the outdoor temperature is below 0°C	30RQ 182-522
Accessories		**Description**	**Advantages**	**Use**
Connection sleeve		Piping to be welded with Victaulic connection	Ease-of-installation	30RQ 182-522
Energy Management Module EMM		See controls manual	Easy connection by wired connection to a building management system	30RQ 182-522
Scrolling Marquee Interface		Remotely installed user interface (communication bus)	Remote chiller control up to 300 m	30RQ 182-522
Power cable connection side extension		Side extension on the power control to allow a reduced cable bend radius	Use of thicker power cables	30RQ 302-522

Physical data

30RQ		182	202	232	262	302	342	372	402	432	462	522
Nominal cooling capacity*	kW	174	189	219	254	278	307	331	366	389	430	465
Total power input, cooling mode	kW	60	72	76	99	105	124	126	146	150	165	192
Nominal heating capacity**	kW	189	212	229	280	301	333	364	405	442	502	548
Total power input, heating mode	kW	63	74	77	96	110	119	128	148	159	180	201
Operating weight***												
Standard unit with Euro Pack option	kg	2340	2406	2432	2620	3276	3471	3578	3718	4318	4484	4694
Standard unit without option****	kg	2160	2236	2242	2429	3045	3241	3328	3458	4028	4194	4384
Refrigerant		R410A										
Circuit A	kg	24	24	27	27	41	41	53	54	54	53	54
Circuit B	kg	24	24	27	27	27	27	32	32	47	53	53
Compressors		Hermetic scroll, 48.3 r/s										
Circuit A		1	1	2	2	3	3	4	4	4	4	4
Circuit B		2	2	2	2	2	2	2	2	3	4	4
No. of control stages		3	3	4	4	5	5	6	6	7	8	8
Minimum capacity	%	28	33	25	25	18	20	15	17	13	11	13
Control		Pro-Dialog Plus										
Air heat exchangers		Grooved copper tubes and aluminium fins										
Fans		Axial FLYING BIRD 4 with rotating shroud										
Quantity		4	4	4	4	5	5	6	6	7	8	8
Total air flow	l/s	18056	18056	18056	18056	22569	22569	27083	27083	31597	36111	36111
Speed	r/s	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7
Water heat exchanger		Direct expansion, two-circuits, shell-and-tube										
Water volume	l	110	110	110	110	110	125	113	113	113	113	113
Max. water-side operating pressure without hydronic module	kPa	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Water connections without hydronic module		Victaulic										
Connections	in	3	3	3	3	4	4	6	6	6	6	6
Outside tube diameter	mm	88.9	88.9	88.9	88.9	114.3	114.3	168.3	168.3	168.3	168.3	168.3

* Standardised Eurovent conditions: water heat exchanger entering/leaving water temperature 12°C/7°C, outside air temperature 35°C, water heat exchanger fouling factor 0.18 x 10^{-4} (m^2 K)/W
** Standardised Eurovent conditions: water heat exchanger entering/leaving water temperature 40°C/45°C, outside air temperature 7°C, 87% rh, air heat exchanger fouling factor 0.18 x 10^{-4} (m^2 K)/W
*** Weights are for guidance only. To find out the unit refrigerant charge, please refer to the unit name plate.
**** Standard unit: Base unit without Euro Pack Option and hydronic module.

Sound levels

30RQ		182	202	232	262	302	342	372	402	432	462	522
Unit with low noise option												
Sound power level* 10^{-12} W	dB(A)	89	89	89	89	90	90	91	91	92	92	92
Sound pressure level** at 10 m	dB(A)	57	57	57	57	58	58	59	59	60	60	60
Standard unit												
Sound power level* 10^{-12} W	dB(A)	91	91	91	91	92	92	93	93	94	94	94
Sound pressure level** at 10 m	dB(A)	59	59	59	59	60	60	61	61	62	62	62

* In accordance with ISO 9614-1 and certified by Eurovent
** Average sound pressure level, unit in a free field on a reflective surface

Electrical data

30RQ (without hydronic module)		182	202	232	262	302	342	372	402	432	462	522
Power circuit												
Nominal power supply	V-ph-Hz	400-3-50										
Voltage range	V	360-440										
Max. connectable power cable section												
Circuits A + B	mm^2	1 x 240 or 2 x 150	1 x 240 or 2 x 150	1 x 240 or 2 x 150	1 x 240 or 2 x 150	2 x 240	2 x 240	2 x 240	2 x 240	3 x 240	3 x 240	3 x 240
Control circuit supply		24 V, via internal transformer										
Maximum unit power input**												
Circuits A + B	kW	85	98	102	127	140	159	166	191	204	229	255
Nominal unit current draw*												
Circuits A + B	A	113	129	135	167	185	209	226	251	269	293	334
Maximum unit current draw***												
Circuits A + B	A	146	168	175	219	241	274	285	329	351	394	438
Max. start-up current, standard unit†												
Circuits A + B	A	353	375	348	426	448	481	492	536	558	601	645
Cosine phi, unit at nom. capacity		0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Max. start-up current, unit with soft starter (Un)†												
Circuits A + B	A	283	305	277	356	378	411	433	466	489	521	575
Stability for three-phase short circuits (TN system)												
Unit with main disconnect without fuse††												
Short-time current (1 s) - rms/peak value												
Circuits A + B	kA/kA	13/26	13/26	13/26	13/26	13/26	13/26	13/26	13/26	15/30	15/30	15/30
Unit with main disconnect with fuse‡												
Current value, rms												
Circuits A + B	kA	N/A	N/A	N/A	N/A	50	50	50	50	50	50	50

* Power input of the compressor(s) + fan(s) at maximum unit operating conditions. Values given on the unit name plate.
** Nominal unit current draw at nominal conditions: water heat exchanger entering/leaving water temperature 12°C/7°C, outdoor air temperature 35°C. The current values are given at 400 V nominal voltage.
*** Maximum unit operating current at maximum unit power input and 400 V.
† Maximum instantaneous starting current at 400 V nominal voltage and operating limit values with compressor in across-the-line start (maximum operating current of the smallest compressor(s) + fan current + locked rotor current of the largest compressor).
†† Standard for 30RQ 182 to 262 and option for 30RQ 302 to 522
‡ Not available for 30RQ 182 to 262 and option for 30RQ 302 to 522

Electrical data notes

- 30RQ 182-522 units have a single power connection point.
- The control box includes:
  A main disconnect switch (option), starter and motor protection devices for each compressor, the fan(s) and the pump, control devices
- Field connections:
  All connections to the system and the electrical installations must be in full accordance with all applicable local codes.
- The Carrier 30RQ units are designed and built to ensure conformance with these codes. The recommendations of European standard EN 60 204-1 (corresponds to IEC 60204-1) (machine safety - electrical machine components - part 1: general regulations) are specifically taken into account, when designing the electrical equipment.

IMPORTANT:
- Generally the recommendations of IEC 60364 are accepted as compliance with the requirements of the installation directives. Conformance with EN 60204 is the best means of ensuring compliance with the Machines Directive § 1.5.1.
- Annex B of EN 60204-1 describes the electrical characteristics used for the operation of the machines.

1. The operating environment for the 30RQ units is specified below:
   - Environment* - Environment as classified in EN 60721 (corresponds to IEC 60721) :
     - outdoor installation*
     - ambient temperature range: -20°C to +48°C ± 1 K, class 4K3*
     - altitude: ≤ 2000 m
     - presence of hard solids, class 4S2 (no significant dust present)
     - presence of corrosive and polluting substances, class 4C2 (negligible)
2. Power supply frequency variation: ± 2 Hz.
3. The neutral (N) line must not be connected directly to the unit (if necessary use a transformer).
4. Overcurrent protection of the power supply conductors is not provided with the unit.
5. The factory-installed disconnect switch/circuit breaker is of a type suitable for power interruption in accordance with EN 60947-3 (corresponds to IEC 60947-3).
6. The units are designed for simplified connection on TN(s) networks (IEC 60364). For IT networks derived currents may interfere with network monitoring elements, and it is recommended to create an IT type divider for the system units that require this and/or a TN type divider for Carrier units. Please consult the appropriate local organisations to define the monitoring and protection elements and carry out the electrical installation.
7. 30RQ units comply with the requirements of general standard EN 61000-6-3 (residential, commercial and light industrial applications.

NOTE: If particular aspects of an actual installation do not conform to the conditions described above, or if there are other conditions which should be considered, always contact your local Carrier representative.

* The required protection level for this class is IP43BW (according to reference document IEC 60529). All 30RQ units are protected to IP44CW and fulfil this protection condition.

Operating limits

Water heat exchanger water flow rate

30RQ	Min. water flow, l/s	Max. water flow*, l/s
182	2.8	26.7
202	2.8	26.7
232	3.0	26.7
262	3.5	26.7
302	3.9	26.7
342	4.4	29.4
372	4.9	29.4
402	5.2	29.4
432	5.8	31.1
462	6.1	31.1
522	6.9	31.1

* Maximum flow rate for a heat exchanger pressure drop of 100 kPa

Minimum and maximum temperatures Cooling mode

Water heat exchanger (evaporator)		Minimum	Maximum
Entering water temperature at start-up	°C	6.8*	30
Leaving water temperature during operation	°C	5	15
Entering water temperature at shut-down	°C	-	60
Air heat exchanger (condenser)**			
Air entering temperature	°C	0	46
Available static pressure	Pa	0	0

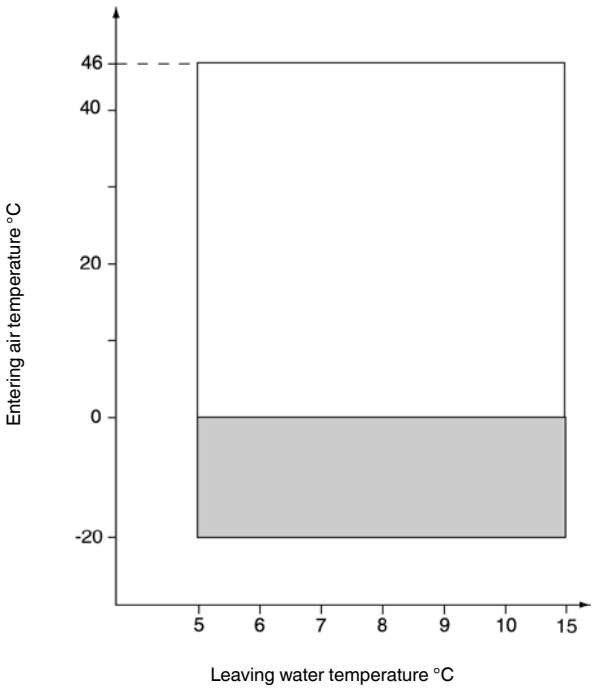
Heating mode

Water heat exchanger (condenser)		Minimum	Maximum
Entering water temperature at start-up	°C	8	45
Leaving water temperature during operation		20	50
Entering water temperature at shut-down	°C	3	60
Air heat exchanger (evaporator)			
Air entering temperature**	°C	-10	35

* For an application that requires operation below a minimum of 6.8°C, please contact Carrier.
** For operation down to -20°C the unit must be equipped with option 28 (winter operation). In addition the unit must either be equipped with the water heat exchanger defrost option, or the installer must use an antifreeze solution to ensure that the water circuit is protected against frost.

Note: Do not exceed the maximum operating temperature.

Operating range – cooling mode

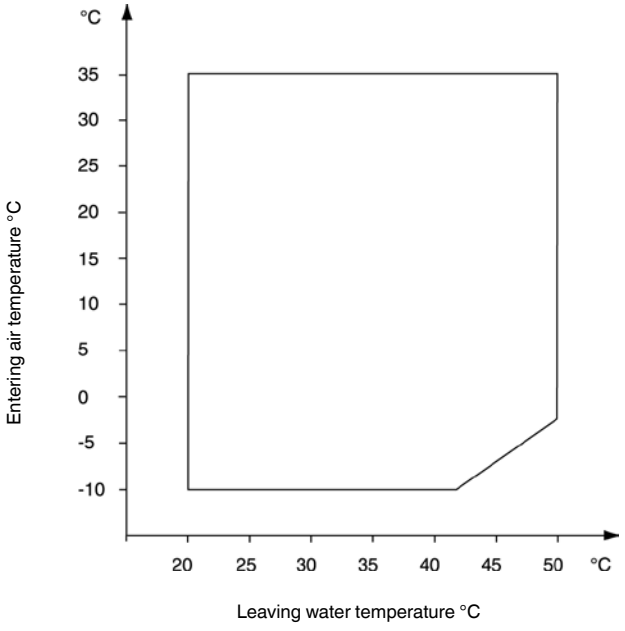


Note: Water heat exchanger and air heat exchanger Δt = 5 K

Operating range, standard unit

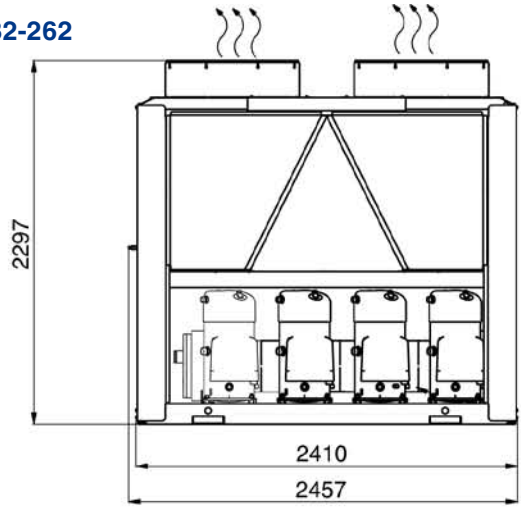
Operating range, unit equipped with option 28 (winter operation). In addition the unit must either be equipped with the frost protection option for the water heat exchanger and the hydronic module (if used), or the water loop must be protected against frost by the installer, using an anti-freeze solution..

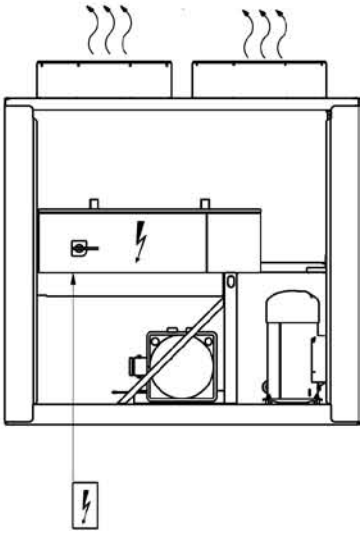
Operating range – heating mode



Dimensions/clearances

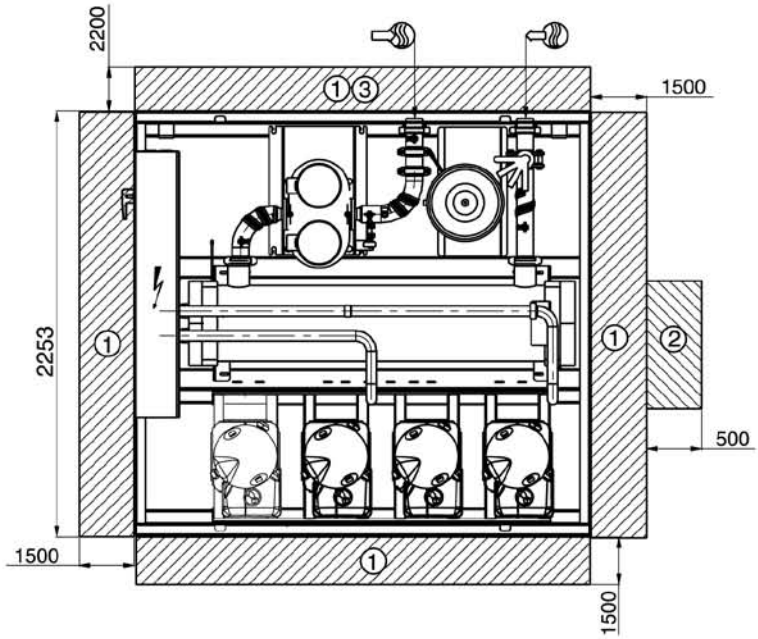
30RQ 182-262



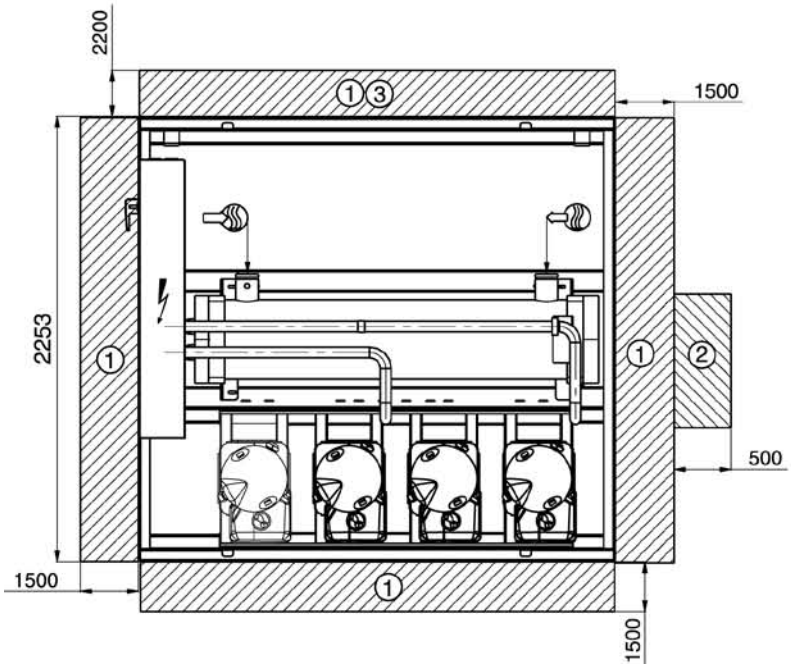


Power supply connection

Unit with hydronic module



Unit without hydronic module



Legend:
All dimensions are given in mm.

1 Required clearances for maintenance and air flow

2 Recommended space for water heat exchanger tube removal

3 Recommended space for heat exchanger removal

Water inlet

Water outlet

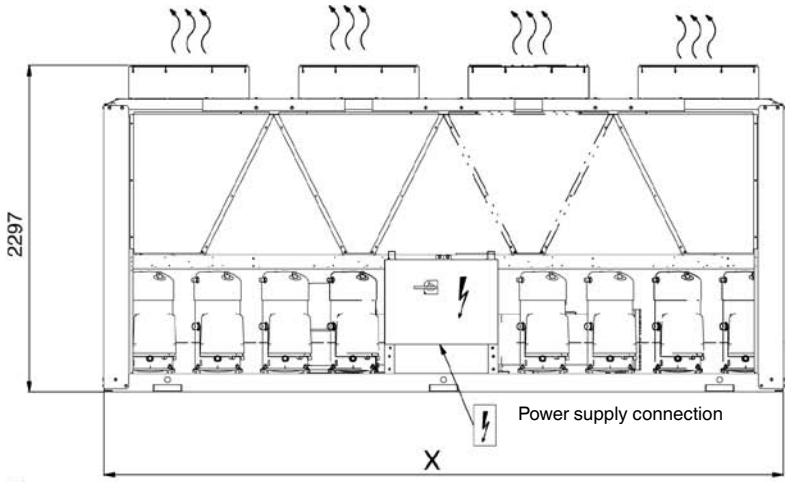
Air outlet, do not obstruct

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

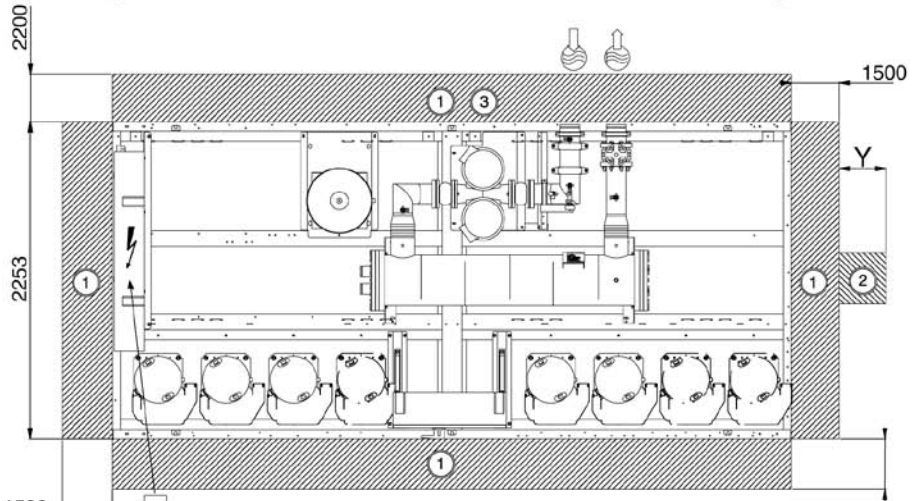
Dimensions/clearances

30RQ 302-522

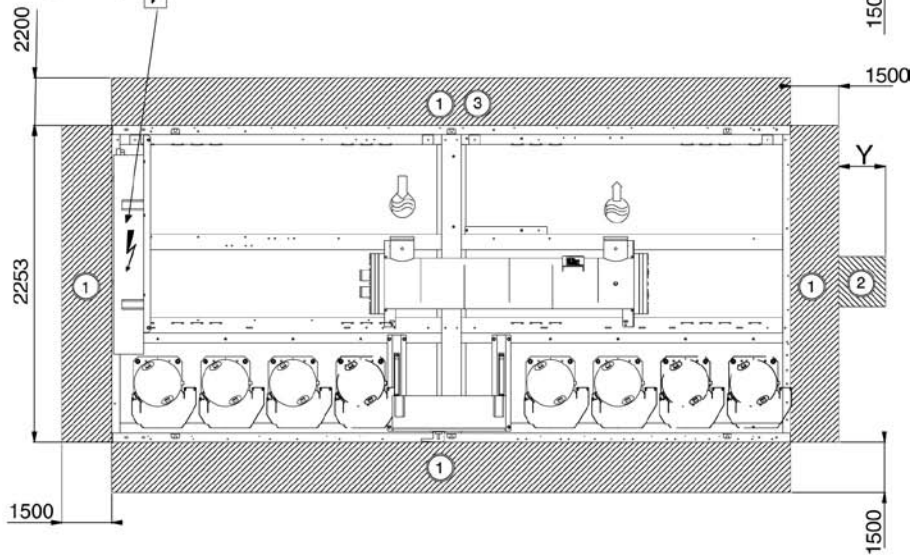
30RQ	X	Y
302-402	3604	200
432-522	4798	0



Unit with hydronic module



Unit without hydronic module



Legend:
All dimensions are given in mm.

(1) Required clearances for maintenance and air flow

(2) Recommended space for water heat exchanger tube removal

(3) Recommended space for heat exchanger removal

Water inlet

Water outlet

Air outlet, do not obstruct

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

30RQ 182-522

Entering air temperature at the air heat exchanger, °C

	LWT	25					30					35					40					45				
		CAP	COMP	UNIT	COOL	COOL	CAP	COMP	UNIT	COOL	COOL	CAP	COMP	UNIT	COOL	COOL	CAP	COMP	UNIT	COOL	COOL	CAP	COMP	UNIT	COOL	COOL
	°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
182	5	182	43	50	9	19	172	48	54	8	17	163	53	59	8	15	151	58	65	7	13	139	65	71	7	11
202	5	197	53	59	9	25	187	58	65	9	23	176	64	71	8	21	164	71	77	8	19	151	78	84	7	17
232	5	231	56	63	11	30	219	62	69	10	28	206	68	75	10	26	192	75	82	9	23	177	83	89	8	21
262	5	267	75	82	13	37	253	83	89	12	34	237	91	97	11	31	221	99	106	11	28	204	109	115	10	25
302	5	293	78	86	14	43	279	86	94	13	40	263	94	102	13	37	245	104	112	12	33	226	114	122	11	30
342	5	326	94	103	16	36	309	104	112	15	33	290	114	122	14	29	269	125	133	13	26	248	137	145	12	22
372	5	346	93	103	16	32	329	103	113	16	29	311	114	123	15	26	290	126	135	14	23	268	139	149	13	20
402	5	390	111	121	19	40	370	122	132	18	37	349	134	143	17	33	326	147	156	16	29	303	161	170	14	25
432	5	415	112	124	20	45	395	124	135	19	41	371	136	147	18	37	345	149	160	16	32	317	164	175	15	28
462	5	464	124	137	22	56	439	137	149	21	50	411	150	163	20	44	380	166	178	18	38	347	183	195	17	32
522	5	499	146	159	24	64	472	161	173	22	58	442	176	188	21	51	410	193	205	20	45	377	212	224	18	38
182	6	188	44	50	9	20	179	48	55	9	18	168	53	60	8	16	157	59	65	7	14	145	65	71	7	12
202	6	204	54	60	10	26	194	59	65	9	24	182	65	71	9	22	170	71	78	8	20	156	78	85	7	18
232	6	238	57	63	11	31	225	63	69	11	29	212	69	75	10	27	197	76	82	9	24	181	84	90	9	21
262	6	275	76	83	13	38	262	84	90	12	36	245	92	98	12	33	228	100	107	11	29	211	110	117	10	26
302	6	301	79	87	14	44	286	87	95	14	41	270	95	103	13	38	253	105	113	12	35	233	115	123	11	31
342	6	336	95	104	16	37	318	105	113	15	34	299	115	123	14	31	277	126	134	13	27	255	138	146	12	23
372	6	357	94	104	17	34	340	104	114	16	31	321	115	125	15	28	300	127	136	14	24	228	105	114	11	15
402	6	397	112	122	19	42	378	123	133	18	38	356	135	145	17	34	333	148	157	16	30	310	163	172	15	26
432	6	422	113	124	20	47	402	125	136	19	43	379	137	148	18	38	353	150	161	17	33	325	165	176	16	29
462	6	468	124	137	22	56	443	137	150	21	51	417	151	164	20	45	388	167	179	18	40	358	184	197	17	34
522	6	504	147	160	24	65	479	162	174	23	59	452	177	190	22	53	422	195	207	20	47	392	214	227	19	41
182	7	195	44	51	9	21	185	49	55	9	19	174	54	60	8	17	163	60	66	8	15	150	66	72	7	13
202	7	211	54	61	10	27	200	60	66	10	25	189	65	72	9	23	176	72	78	8	21	162	79	85	8	18
232	7	246	58	64	12	33	233	63	70	11	30	219	70	76	10	28	203	77	83	10	25	186	85	91	9	22
262	7	283	78	84	14	40	269	85	92	13	37	254	93	99	12	34	236	102	108	11	31	218	112	118	10	27
302	7	310	80	89	15	46	294	88	96	14	43	278	97	105	13	39	260	106	114	12	36	241	117	124	11	32
342	7	345	96	105	16	39	327	106	114	16	35	307	116	124	15	32	285	127	135	14	28	263	140	148	13	24
372	7	369	95	105	18	36	351	105	115	17	33	331	116	126	16	29	309	128	138	15	26	235	105	115	11	16
402	7	408	113	123	19	44	388	125	134	18	40	366	137	146	17	36	342	150	159	16	31	318	164	174	15	27
432	7	431	114	125	21	48	411	126	137	20	44	389	138	150	19	40	365	152	163	17	35	338	168	179	16	31
462	7	476	125	138	23	58	454	138	151	22	53	430	153	165	20	48	402	168	181	19	42	372	186	198	18	37
522	7	516	148	161	25	67	492	164	177	23	62	465	180	192	22	55	436	197	210	21	49	405	217	230	19	43

Legend:

LWT	Leaving water temperature
CAP kW	Cooling capacity
COMP kW	Compressor power input
UNIT kW	Unit power input (compressors, fans and control circuit)
COOL l/s	Water heat exchanger water flow rate
COOL kPa	Water heat exchanger pressure drop

Application data:

Standard units, refrigerant: R410A
Water heat exchanger temperature rise: 5 K
Water heat exchanger fluid: chilled water
Fouling factor: 0.18 x 10^{-4} (m^2 K)/W

Performances in accordance with EN 14511.

30RQ 182-522

		Entering air temperature at the air heat exchanger, °C																									
	LWT	25					30					35					40					45				
		CAP	COMP	UNIT	COOL	COOL	CAP	COMP	UNIT	COOL	COOL	CAP	COMP	UNIT	COOL	COOL	CAP	COMP	UNIT	COOL	COOL	CAP	COMP	UNIT	COOL	COOL
	°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
182	8	202	45	51	10	22	192	49	56	9	20	181	55	61	9	18	168	60	66	8	16	155	66	73	7	14
202	8	219	55	62	10	28	207	60	67	10	26	195	66	73	9	24	182	72	79	9	22	168	80	86	8	19
232	8	254	58	65	12	34	241	64	71	11	32	226	71	77	11	29	210	78	84	10	26	193	86	92	9	23
262	8	291	79	85	14	41	276	86	93	13	38	260	94	100	12	35	243	103	109	12	32	225	113	119	11	28
302	8	320	83	91	15	48	303	90	98	14	44	285	98	106	14	41	266	107	115	13	37	247	118	126	12	33
342	8	355	98	106	17	40	337	107	115	16	37	316	117	125	15	33	294	129	136	14	29	270	141	149	13	26
372	8	380	96	106	18	38	362	106	116	17	34	342	117	127	16	31	319	129	139	15	27	243	106	116	12	16
402	8	419	115	125	20	46	400	126	136	19	42	376	138	148	18	37	351	152	161	17	33	327	166	176	16	29
432	8	442	115	126	21	50	422	127	138	20	46	400	140	151	19	42	374	154	165	18	37	347	169	180	17	32
462	8	491	126	139	23	61	469	140	153	22	56	444	155	167	21	50	415	170	183	20	45	385	188	200	18	39
522	8	530	150	163	25	70	506	166	178	24	64	477	182	195	23	58	447	200	212	21	51	416	220	232	20	45
182	10	216	46	52	10	25	205	50	57	10	23	193	56	62	9	20	180	61	68	9	18	165	67	74	8	15
202	10	234	56	63	11	30	222	62	68	11	28	209	68	74	10	26	194	74	81	9	23	179	81	88	9	21
232	10	271	60	66	13	37	257	66	72	12	34	241	72	79	12	31	224	80	86	11	28	206	88	94	10	25
262	10	309	81	88	15	44	293	89	95	14	41	275	97	103	13	37	256	105	112	12	34	238	115	122	11	30
302	10	339	85	93	16	51	321	93	101	15	48	302	102	110	14	44	280	110	118	13	39	260	121	129	12	35
342	10	376	102	110	18	44	357	111	119	17	40	335	121	129	16	36	312	131	139	15	32	287	144	152	14	28
372	10	404	98	108	19	42	385	109	118	18	38	364	120	129	17	34	340	132	141	16	30	259	108	117	12	18
402	10	441	118	128	21	50	421	130	139	20	45	397	142	151	19	41	372	155	165	18	36	344	170	180	16	31
432	10	469	118	129	22	55	448	130	141	21	51	423	143	154	20	46	396	157	168	19	40	367	173	184	18	35
462	10	524	129	142	25	68	501	143	156	24	63	474	158	170	23	56	443	174	186	21	50	410	192	204	20	43
522	10	563	153	166	27	78	536	169	182	26	71	505	186	199	24	64	472	204	217	23	56	438	225	237	21	49

Legend:

LWT	Leaving water temperature
CAP kW	Cooling capacity
COMP kW	Compressor power input
UNIT kW	Unit power input (compressors, fans and control circuit)
COOL l/s	Water heat exchanger water flow rate
COOL kPa	Water heat exchanger pressure drop

Application data:

Standard units, refrigerant: R410A
Water heat exchanger temperature rise: 5 K
Water heat exchanger fluid: chilled water
Fouling factor: 0.18 x 10^{-4} (m^2 K)/W

Performances in accordance with EN 14511.

30RQ 182-522

Entering air temperature at the air heat exchanger, °C

	LWT	-10					-5					0					7					10				
		CAP	COMP	UNIT	COOL	COOL	CAP	COMP	UNIT	COOL	COOL	CAP	COMP	UNIT	COOL	COOL	CAP	COMP	UNIT	COOL	COOL	CAP	COMP	UNIT	COOL	COOL
	°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
182	30	126	40	48	6	12	144	40	48	7	14	163	39	47	8	17	194	40	48	9	22	210	41	48	10	24
202	30	140	48	56	7	14	160	48	56	8	17	182	47	55	9	20	215	49	56	10	25	233	49	57	11	28
232	30	154	47	55	7	16	175	48	56	8	19	199	49	57	10	23	238	50	58	11	29	258	51	58	12	33
262	30	184	60	68	9	20	210	61	69	10	24	237	63	71	11	29	287	65	72	14	37	311	65	73	15	41
302	30	199	66	76	10	23	229	68	78	11	27	259	70	80	12	33	306	73	82	15	41	331	72	81	16	46
342	30	221	75	85	11	17	253	78	88	12	21	285	79	89	14	26	337	81	90	16	34	364	81	91	17	39
372	30	241	78	90	12	15	274	80	92	13	19	311	82	94	15	24	370	85	96	18	33	400	86	97	19	39
402	30	268	91	103	13	18	306	94	106	15	24	345	96	108	17	29	407	100	112	20	40	441	100	111	21	46
432	30	295	97	111	14	22	336	100	113	16	28	376	102	116	18	35	444	106	119	21	47	480	106	119	23	54
462	30	336	110	126	16	28	382	113	129	18	36	430	116	131	21	44	508	120	135	24	60	549	120	135	26	70
522	30	365	124	140	18	33	416	127	143	20	42	467	131	147	22	52	548	137	152	26	70	594	135	150	29	81
182	35	125	45	53	6	12	143	45	53	7	14	163	44	52	8	17	192	45	52	9	21	207	45	52	10	23
202	35	141	54	62	7	14	160	54	61	8	16	182	53	61	9	19	214	54	62	10	24	230	55	62	11	27
232	35	153	53	61	7	15	174	54	62	8	18	197	55	62	9	22	234	56	64	11	28	254	57	64	12	31
262	35	184	66	74	9	19	209	68	76	10	23	237	70	78	11	28	285	72	80	14	36	306	72	80	15	40
302	35	199	73	83	10	22	229	76	86	11	27	259	78	88	12	32	304	81	91	15	40	327	80	89	16	44
342	35	222	84	94	11	17	253	88	97	12	21	286	88	98	14	25	335	89	99	16	33	360	90	99	17	37
372	35	241	87	99	12	15	275	89	101	13	19	312	91	103	15	24	365	94	106	18	32	394	96	107	19	37
402	35	269	101	113	13	18	307	104	116	15	23	348	107	119	17	29	404	111	123	19	39	435	111	122	21	44
432	35	295	108	122	14	22	338	111	125	16	28	380	114	127	18	34	439	118	131	21	45	474	117	130	23	52
462	35	337	123	139	16	28	385	126	142	19	35	433	129	144	21	44	502	133	148	24	58	542	133	148	26	66
522	35	365	137	153	18	32	418	142	158	20	41	472	146	161	23	52	543	152	167	26	67	586	149	164	28	77
182	40	125	51	59	6	11	142	51	58	7	13	161	50	58	8	16	190	50	57	9	20	204	50	57	10	22
202	40	141	60	68	7	13	159	60	68	8	16	181	60	67	9	19	214	60	68	10	24	228	61	68	11	26
232	40	153	59	67	7	15	172	60	68	8	18	195	61	69	9	21	232	62	70	11	27	249	63	71	12	30
262	40	183	74	82	9	19	208	76	83	10	23	235	78	85	11	27	280	80	87	13	35	303	80	88	15	38
302	40	199	82	92	10	22	227	84	94	11	26	258	87	97	12	31	302	91	100	15	39	323	89	98	16	43
342	40	222	93	103	11	16	253	98	108	12	20	286	98	108	14	25	334	99	108	16	32	357	100	109	17	36
372	40	240	97	109	12	14	273	99	111	13	18	312	102	113	15	23	365	105	116	18	31	388	106	117	19	35
402	40	269	112	124	13	18	306	115	127	15	23	348	119	130	17	29	404	123	135	19	38	430	122	134	21	42
432	40	295	120	134	14	21	336	124	137	16	27	383	127	140	18	34	439	131	144	21	44	467	130	143	22	49
462	40	336	136	152	16	27	383	140	156	18	34	436	144	159	21	44	501	148	163	24	56	534	148	163	26	63
522	40	366	152	168	18	32	417	157	173	20	40	474	162	177	23	51	545	168	183	26	66	579	165	180	28	74

Legend:

LWT	Leaving water temperature
CAP kW	Heating capacity
COMP kW	Compressor power input
UNIT kW	Unit power input (compressors, fans and control circuit)
COOL l/s	Water heat exchanger water flow rate
COOL kPa	Water heat exchanger pressure drop

Application data:

Standard units, refrigerant: R410A
Water heat exchanger temperature rise: 5 K
Water heat exchanger fluid: water
Fouling factor: 0.18 x 10^{-4} (m^2 K)/W

Performances in accordance with EN 14511.

30RQ 182-522

Entering air temperature at the air heat exchanger, °C

	LWT	-10					-5					0					7					10				
		CAP	COMP	UNIT	COOL	COOL	CAP	COMP	UNIT	COOL	COOL	CAP	COMP	UNIT	COOL	COOL	CAP	COMP	UNIT	COOL	COOL	CAP	COMP	UNIT	COOL	COOL
	°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
182	45	-	-	-	-	-	141	57	65	7	13	159	56	64	8	15	189	56	63	9	20	202	56	63	10	22
202	45	-	-	-	-	-	159	67	74	8	15	179	67	74	9	18	212	67	74	10	23	227	67	75	11	26
232	45	-	-	-	-	-	171	67	75	8	17	192	68	76	9	20	229	70	77	11	26	246	70	78	12	29
262	45	-	-	-	-	-	206	84	91	10	22	232	86	93	11	26	280	88	96	14	34	300	89	96	14	37
302	45	-	-	-	-	-	226	94	104	11	25	256	97	107	12	30	301	101	110	15	38	320	99	109	15	41
342	45	-	-	-	-	-	202	82	92	PL	-	284	110	119	14	24	333	110	119	16	32	355	110	120	17	35
372	45	-	-	-	-	-	271	111	122	13	18	308	113	125	15	22	364	117	128	18	31	387	118	129	19	34
402	45	-	-	-	-	-	305	128	139	15	22	345	131	143	17	28	405	137	148	20	37	428	136	147	21	41
432	45	-	-	-	-	-	335	137	151	16	26	380	141	154	18	33	442	145	159	21	44	466	144	157	22	48
462	45	-	-	-	-	-	382	156	172	18	33	433	160	175	21	42	502	165	180	24	56	530	164	179	26	61
522	45	-	-	-	-	-	416	175	190	20	39	471	180	195	23	50	548	186	201	26	65	578	184	199	28	72
182	50	-	-	-	-	-	-	-	-	-	-	157	63	71	8	15	185	63	70	9	19	199	62	70	10	21
202	50	-	-	-	-	-	-	-	-	-	-	178	74	82	9	18	209	74	82	10	22	224	74	82	11	25
232	50	-	-	-	-	-	-	-	-	-	-	189	76	84	9	19	224	78	85	11	25	242	78	86	12	27
262	50	-	-	-	-	-	-	-	-	-	-	229	95	103	11	25	276	98	105	13	32	296	98	106	14	36
302	50	-	-	-	-	-	-	-	-	-	-	207	84	94	10	22	298	112	122	14	37	318	111	121	15	40
342	50	-	-	-	-	-	-	-	-	-	-	229	94	104	11	17	330	123	133	16	31	353	123	132	17	34
372	50	-	-	-	-	-	-	-	-	-	-	306	127	138	15	22	362	132	143	17	30	386	133	144	19	33
402	50	-	-	-	-	-	-	-	-	-	-	344	146	157	17	27	401	151	163	19	36	428	152	163	21	41
432	50	-	-	-	-	-	-	-	-	-	-	378	157	171	18	32	442	162	175	21	43	470	162	175	23	48
462	50	-	-	-	-	-	-	-	-	-	-	431	179	194	21	41	502	183	198	24	55	531	183	198	26	61
522	50	-	-	-	-	-	-	-	-	-	-	471	200	215	23	49	546	206	221	26	64	581	205	220	28	72

Legend:

LWT	Leaving water temperature
CAP kW	Heating capacity
COMP kW	Compressor power input
UNIT kW	Unit power input (compressors, fans and control circuit)
COOL l/s	Water heat exchanger water flow rate
COOL kPa	Water heat exchanger pressure drop

Application data:

Standard units, refrigerant: R410A
Water heat exchanger temperature rise: 5 K
Water heat exchanger fluid: water
Fouling factor: 0.18 x 10^{-4} (m^2 K)/W

Performances in accordance with EN 14511.

Hydronic module (option 116)

The hydronic module option saves a lot of installation time. The heat pump is factory-equipped with the main components for the hydronic system: screen filter, water pump, expansion tank, safety valve and water flow control valve.

Several water pump types are available to suit any application: primary single or dual low-pressure pump or single or dual high-pressure pump (30RQ 182-522).

An automatic pump start-up algorithm protects the heat exchanger and the hydronic module piping against frost down to -10°C outside temperature, if the evaporator frost protection option is installed. If necessary increased frost protection down to -20°C is possible by adding the heater option to the hydronic module piping (see options 41 and 42A).

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

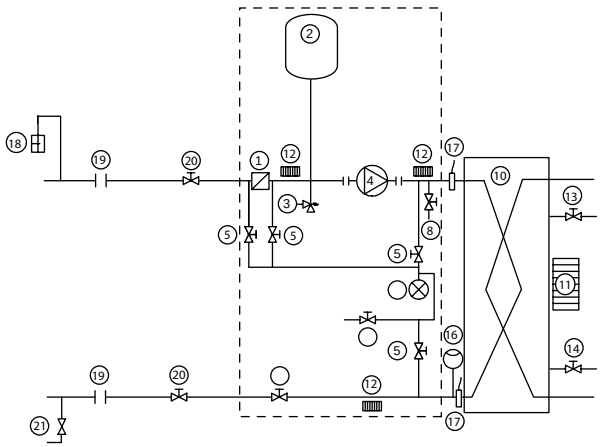
Hydronic module

Physical and electrical data

These are the same as for the standard unit except:

30RQ		182	202	232	262	302	342	372	402	432	462	522
Operating weight*												
Unit with Euro Pack and high-pressure dual-pump hydronic module options	kg	2600	2646	2672	2680	3586	3781	3928	4058	4668	4884	5114
Hydronic module												
Expansion tank volume	l	50	50	50	50	80	80	80	80	80	80	80
Maximum operating pressure	kPa	400	400	400	400	400	400	400	400	400	400	400
Water filter		Screen filter (Victaulic)										
Low-pressure pump												
Water pump		Single or dual monocell centrifugal pump										
Pump capacity	kW	2.2	2.2	2.2	2.2	3	3	4	4	4	6	6
Pump power input	kW	2.7	2.7	2.7	2.7	3.6	3.6	4.6	4.6	4.6	6.3	6.3
Maximum pump current drawn	A	4.7	4.7	4.7	4.7	6.4	6.4	8.2	8.2	8.2	11.2	11.2
High-pressure pump												
Water pump		Single or dual monocell centrifugal pump										
Pump capacity	kW	4	4	4	4	6	6	8	8	8	11	11
Pump power input	kW	4.7	4.7	4.7	4.7	6.4	6.4	8.5	8.5	8.5	12.2	12.2
Maximum pump current drawn	A	8.2	8.2	8.2	8.2	11.2	11.2	15.4	15.4	15.4	21.2	21.2
Water connections (with hydronic module)		Victaulic type										
Diameter	in	3	3	3	3	4	4	4	4	5	5	5
Outside pipe diameter	mm	88.9	88.9	88.9	88.9	114.3	114.3	114.3	114.3	139.7	139.7	139.7

* Weights are for guidance only



Typical hydronic circuit diagram

Legend

Components of unit and hydronic module

1 Victaulic screen filter
2 Expansion tank
3 Safety valve
4 Available pressure pump
5 Pressure tap valve (see Installation Manual)
6 Pressure gauge to measure the component pressure loss (see Installation Manual)
7 System vent valve, pressure gauge
8 Drain valve
9 Water flow control valve
10 Heat exchanger
11 Water heat exchanger heater (option)
12 Hydronic module heater (option)
13 Air vent (water heat exchanger)
14 Water purge (water heat exchanger)
16 Flow switch
17 Water temperature sensor

System components

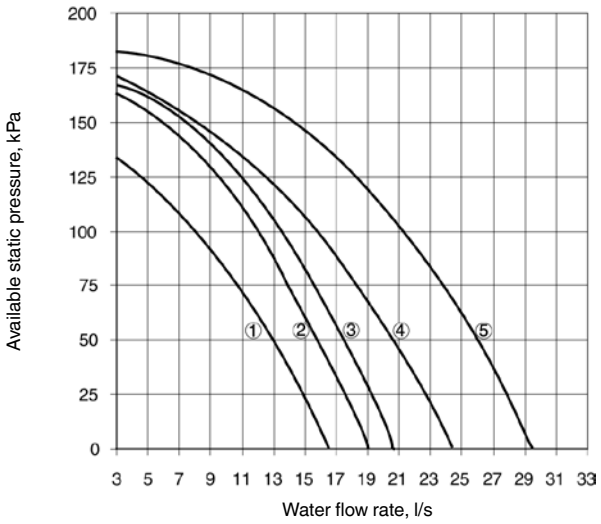
18 Air vent
19 Flexible connection
20 Shut-down valves
21 Charge valve
---- Hydronic module (units with hydronic module)

Notes:

With option 42A the unit hydronic module is protected against frost by electric heaters.
The unit water heat exchanger must be protected against frost (anti-freeze solution or optional electric heater).

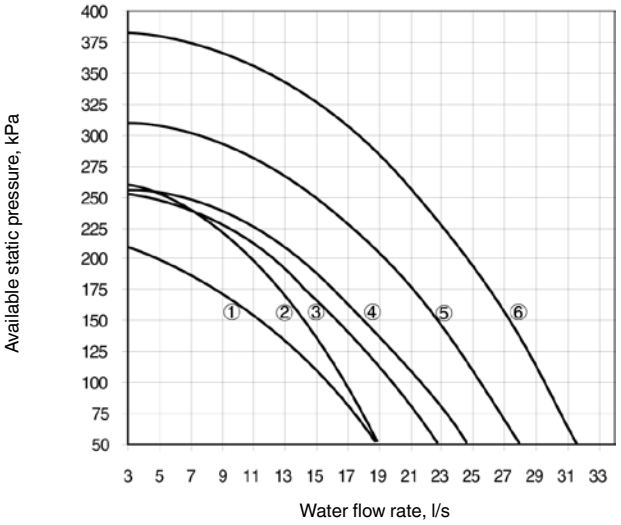
Available static system pressure

Low-pressure pump (hydronic module option)



Legend
1 30RQ 182-262
2 30RQ 302
3 30RQ 342
4 30RQ 372-432
5 30RQ 462-522

High-pressure pump (hydronic module option)



Legend
1 30RQ 182-202
2 30RQ 232-262
3 30RQ 302
4 30RQ 342
5 30RQ 372-432
6 30RQ 462-522

Partial heat reclaim using desuperheaters (option 49)

This option permits the production of free hot water using heat reclaim by desuperheating the compressor discharge gases. The option is available for the whole 30RQ range.

A plate heat exchanger is installed in series with the air heat exchanger coils on the compressor discharge line of each circuit.

Physical data, 30RQ units with partial heat reclaim

30RQ - partial heat reclaim mode		182	202	232	262	302	342	372	402	432	462	522
Cooling capacity*	kW	174	189	219	254	278	307	331	366	389	430	465
Heating capacity*	kW	54	66	68	102	104	123	155	150	134	144	166
Unit power input*	kW	60	72	76	99	105	124	126	146	150	165	192
Energy efficiency ratio*	kW/kW	2.89	2.64	2.87	2.55	2.65	2.47	2.64	2.50	2.60	2.60	2.42
Operating weight**												
Standard unit***	kg	2170	2320	2340	2530	3160	3350	3400	3580	4180	4360	4550
Unit with options****	kg	2350	2490	2530	2720	3400	3600	3710	3840	4480	4590	4860
Unit with options†	kg	2590	2740	2770	2970	3710	3900	4060	4190	4820	4990	45280
Desuperheater in circuits A/B		Plate heat exchanger										
Water volume circuit A	l	1.75	1.75	3.75	3.75	5.5	5.5	7.5	7.5	7.5	7.5	7.5
Water volume circuit B	l	3.5	3.5	3.75	3.75	3.75	3.75	3.5	3.5	5.5	5.5	7.5
Max. water-side operating pressure	kPa	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Water connections		Cylindrical male gas thread										
Connection	in	2	2	2	2	2	2	2	2	2	2	2
Outside diameter	mm	60.3	60.3	60.3	60.3	60.3	60.3	60.3	60.3	60.3	60.3	60.3

* Nominal conditions:
Water heat exchanger entering and leaving water temperature = 12°C/7°C
Desuperheater entering and leaving water temperature = 50°C/60°C
Outside air temperature = 35°C
** Weights shown are a guideline only
*** Standard unit and desuperheater option
**** Unit with Euro Pack option and desuperheater
† Unit with Euro Pack option and desuperheater and hydronic module with high-pressure dual pump

Water loop water volume

Minimum volume

The minimum water loop volume for air conditioning applications can be determined using the following formula: Volume (l) = CAP (kW) x 2.5.

Volume = Water loop volume with closed water control valves
CAP = Cooling capacity at the selection conditions

Maximum volume

Units with hydronic option are equipped with an expansion tank. The expansion tank is sized for the maximum water volume below.

Max. water loop volume l

30RQ	182-262			302 - 522		
Static pressure (bar)	1	2	2.5	1	2	2.5
Pure water	2400	1600	1200	3960	2640	1980
10% ethylene glycol	1800	1200	900	2940	1960	1470
20% ethylene glycol	1320	880	660	2100	1400	1050
30% ethylene glycol	1080	720	540	1740	1160	870
40% ethylene glycol	900	600	450	1500	1000	750

Instantaneous heating capacity

Heating capacity at low outdoor temperature

The published heating capacities are instantaneous capacities. They do not take account of the decrease of the heating capacity, resulting from the formation of frost on the coil and the effect of the defrost cycles.
The integrated heating capacity takes these effects into account. They depend on the temperature and the relative humidity (rh) of the outdoor air.

Correction factor to obtain integrated heating capacities

LWT	Air temperature °C (90% rh)				
°C	-10	-5	0	5	7
25	0.86	0.88	0.9	0.92	1
35	0.84	0.86	0.88	0.90	1
40	0.82	0.84	0.86	0.88	1
45	0.80	0.82	0.84	0.86	1
50	0.78	0.80	0.82	0.84	1

LWT - Leaving water temperature

Note:
The Carrier electronic selection program permits calculating the integrated heating capacity as a function of the actual humidity conditions at the installation site. Contact Carrier for your personalised heat pump selection.

Units with fans with available pressure for indoor installation (option 12)

This option applies to 30RQ units installed inside the building in a plant room. For this type of installation the cold or hot air leaving the air-cooled air heat exchangers is discharged by the fans to the outside of the building, using a duct system.

30RQ units equipped with fans with available pressure are designed to operate with air discharge ducts with maximum pressure drops of 200 Pa.

To compensate for these pressure drops 30RQ units with option 12 are equipped with variable-speed fans with a maximum speed of 19 r/s, instead of 15.8 r/s and fixed-speed fans as for the standard units.

All fans in the same refrigerant circuit are controlled by a single speed variator and therefore all run at the same speed.

In the cooling mode, the full-load or part-load speed is controlled by a patented algorithm that permanently optimises the condensing temperature to ensure the best unit energy efficiency (EER) whatever the operating conditions and pressure drops of the system ductwork.

In the heating mode, the full-load or part-load speed of each circuit is fixed and at the configured maximum (range configurable from 13.3 r/s to 19 r/s) based on the constraints and characteristics of the installation site. The maximum configured speed applies to both the heating and cooling mode.

Each refrigerant circuit (A and B) must have a separate ducting system to prevent any air recycling between the air heat exchangers of the different refrigerant circuits.

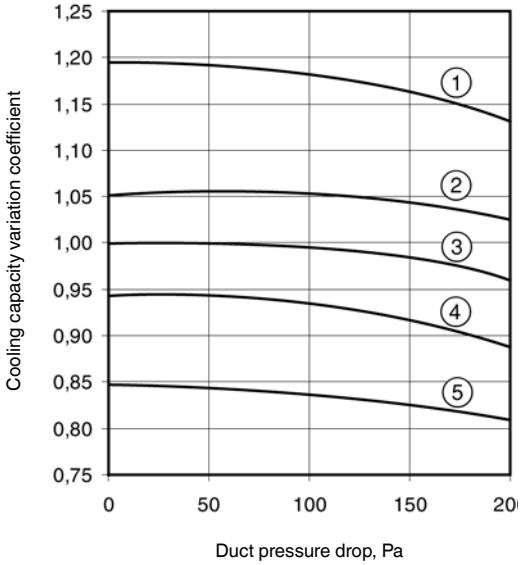
In 30RQ units with option 12 each fan is equipped with a factory-installed connection interface, allowing the connection to the ducting system for the specific circuit (A and B) for each fan. Please refer to the unit dimensional drawings for the exact dimensions of the connection interface.

Important:
To collect the defrost water from the coils in the heating mode, the 30RQ units must be installed on an appropriate surface to permit efficient condensate drainage and evacuation and to prevent any risk of flooding at the site.

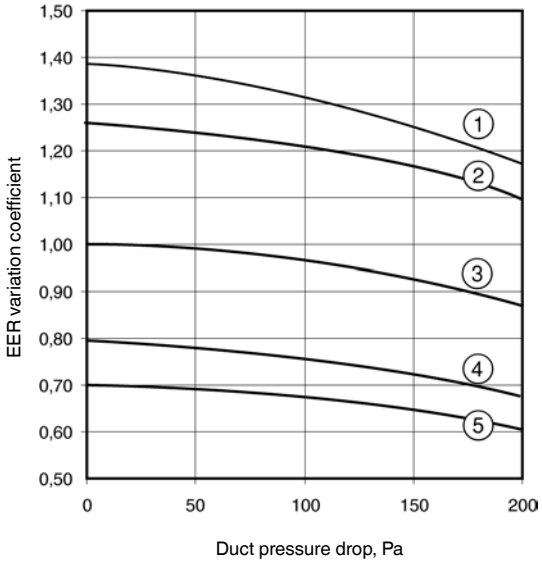
The unit cooling capacity and energy efficiency ratio (EER) in the cooling mode varies depending on the duct pressure drops:
- between 0 and 100 Pa the unit cooling capacity is only slightly affected,
- between 100 and 200 Pa the unit cooling capacity falls considerably depending on the operating conditions (outdoor air temperature and water conditions).

Please refer to the curves below to evaluate the impact of the estimated duct system pressure drop for the installation and the impact of different full load operating conditions on the 30RQ unit cooling capacity and EER.

Cooling capacity variations for operating conditions that differ from Eurovent conditions



EER variations for operating conditions that differ from Eurovent conditions



Operating conditions

Curve No.	Outside temperature, °C	Entering water temperature, °C	Leaving water temperature, °C	Load %
1	25	15	10	100
2	25	10	5	100
3 Eurovent	**35**	**12**	**7**	**100**
4	45	15	10	100
5	45	10	5	100

The unit heating capacity and energy efficiency ratio (COP) in the heating mode vary depending on the duct pressure drops:
- there is no reduction in the unit heating capacity and the COP compared to a standard unit,
- in the heating mode the fan speed is fixed and 19 r/s maximum, and allows maintaining or even increasing the performances and the COP.

Nominal and maximum air flows per circuit

30RQ	Nominal/maximum air flow, l/s	
	Circuit A	Circuit B
182-262	9030/11110	9030/11110
302-342	13540/16670	9030/11110
372-402	18060/22220	9030/11110
432	18060/22220	13540/16670
462-522	18060/22220	18060/22220

Sound power level at the discharge duct outlet for circuits A and B of the 30RQ units

30RQ		182	202	232	262	302	342	372	402	432	462	522
Sound power level 10^{-12} W	dB(A)	93	93	93	93	94	94	95	95	95,5	96	96

Carrier is participating in the Eurovent Certification Programme for liquid chilling packages. Products are as listed in the Eurovent Directory of Certified Products or on the Internet site www.eurovent-certification.com.

This programme covers air-cooled chillers up to 600 kW and water-cooled chillers up to 1500 kW.

EUROVENT CERTIFIED PERFORMANCE

LLOYD'S REGISTER QUALITY ASSURANCE ISO 14001

UKAS ENVIRONMENTAL MANAGEMENT 001

Environmental Management System Approval

Carrier

Order No. 13445-20, 12.2008. Supersedes order No.: 13445-20.05.2008.
The cover photo is solely for illustration purposes, and is not contractually binding.

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