



# AQUASNAP™

LIQUID CHILLER  
HEAT PUMP  
250-750 kW

30RB/30RQ - R410A



## A Multi-Talented Performer



With more than 20,000 AQUASNAP units in operation on all continents this is not just a success story, it is the new reference standard! Today Carrier continues its innovative approach with a new more powerful AQUASNAP: up to 750 kW, and for the first time in the industry this is a project on a global scale.

The objective: to benefit from the synergy of global know-how, skills and resources in human and technology terms.

The result: an innovative product unique in its flexibility and capable of adapting to any need and any application.

The new AQUASNAP Puron is a combination of the technological innovation of direct-expansion free cooling, heat recovery and high-efficiency heat pumps to allow more intelligent buildings and save more electricity. A decisive factor in response to the European "Energy Performance of Buildings Directive" that will become effective in 2006. The AQUASNAP is a product designed for long life and to be the best in its class.

## A SOUND DEVELOPMENT STRATEGY



## OUR MISSION: TO PRESERVE THE ENVIRONMENT

Seven years ago, anticipating ecological market expectations, Carrier decided to use the non-ozone-depleting chlorine-free refrigerant Puron® for the first time in its new residential air conditioner range (Puron is Carrier's name for refrigerant R410A). Within a few years this refrigerant has become established as the benchmark for smaller installations.

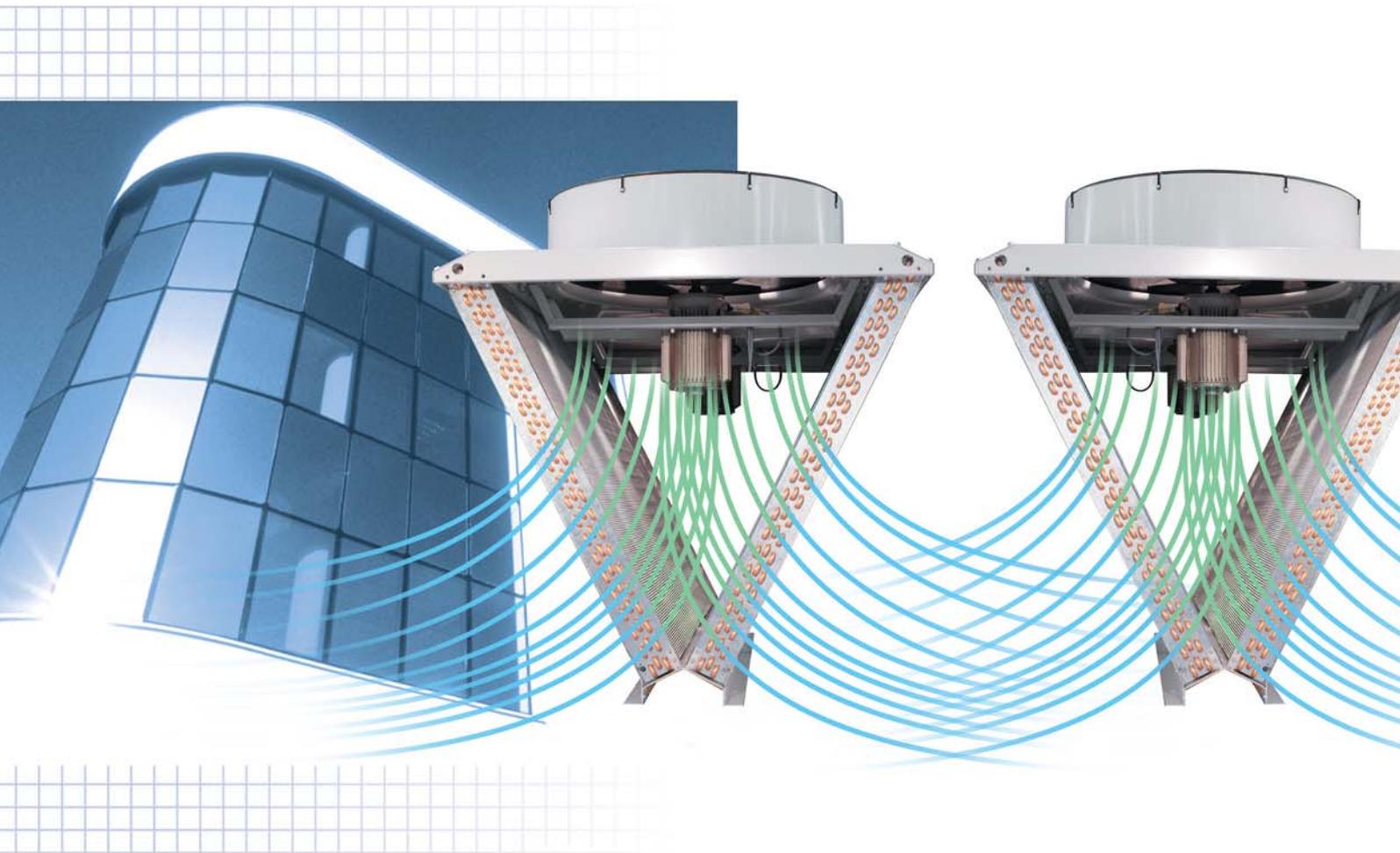
Always a pioneer, Carrier has extended the use of refrigerant R410A to large commercial and industrial air conditioning with the new AQUASNAP. R410A is a balanced blend of 50% R32 and 50% R125, a stable refrigerant with particularly efficient thermodynamic properties.

With R410A the AQUASNAP chillers and heat pumps offer higher capacity at reduced power consumption, contributing to a reduction in the global warming effect caused by CO<sub>2</sub> emission during electricity production. Moreover the use of recyclable materials and ISO 14001 certification (environment) at the Carrier manufacturing site allows us to work in harmony with the environment.

# AQUASNAP™ THE EXAMPLE TO FOLLOW

with PURON® refrigerant

# AQUASNAP STOPS INTRUSIVE NOISE



## THE CONDENSER: AN EFFICIENT DESIGN

The ideal condenser is one that offers maximum performance with minimum noise pollution and minimised coil surface. Carrier has evaluated all possible condenser coil configurations: U-shape, V-shape, W-shape, longitudinal or transverse. Following extensive thermal and acoustic studies we selected the transverse V-shape with an open angle of 50°. Only this angle allows even circulation over the complete coil surface at low velocity for maximum efficiency and minimal noise generation.

# FLYING BIRD FAN: THE SILENT GENERATION

The Flying Bird is an exclusive Carrier design, now in its 4th generation and more efficient and quieter than its predecessors. But how is it done? That's simple. Moulded from a composite recyclable material its more sophisticated and more aerodynamic impeller displaces air without turbulence and generates a linear sound spectrum without peaks at low frequencies. Its rotating shroud guarantees perfect leak tightness between the fan mouth and the blades, and with the new high-efficiency motor the Flying Bird fan achieves exceptional efficiency using on average 35% less energy than a conventional fan. For you this translates into more benefits: reduced power consumption, quiet operation and no intrusive low-frequency noise.

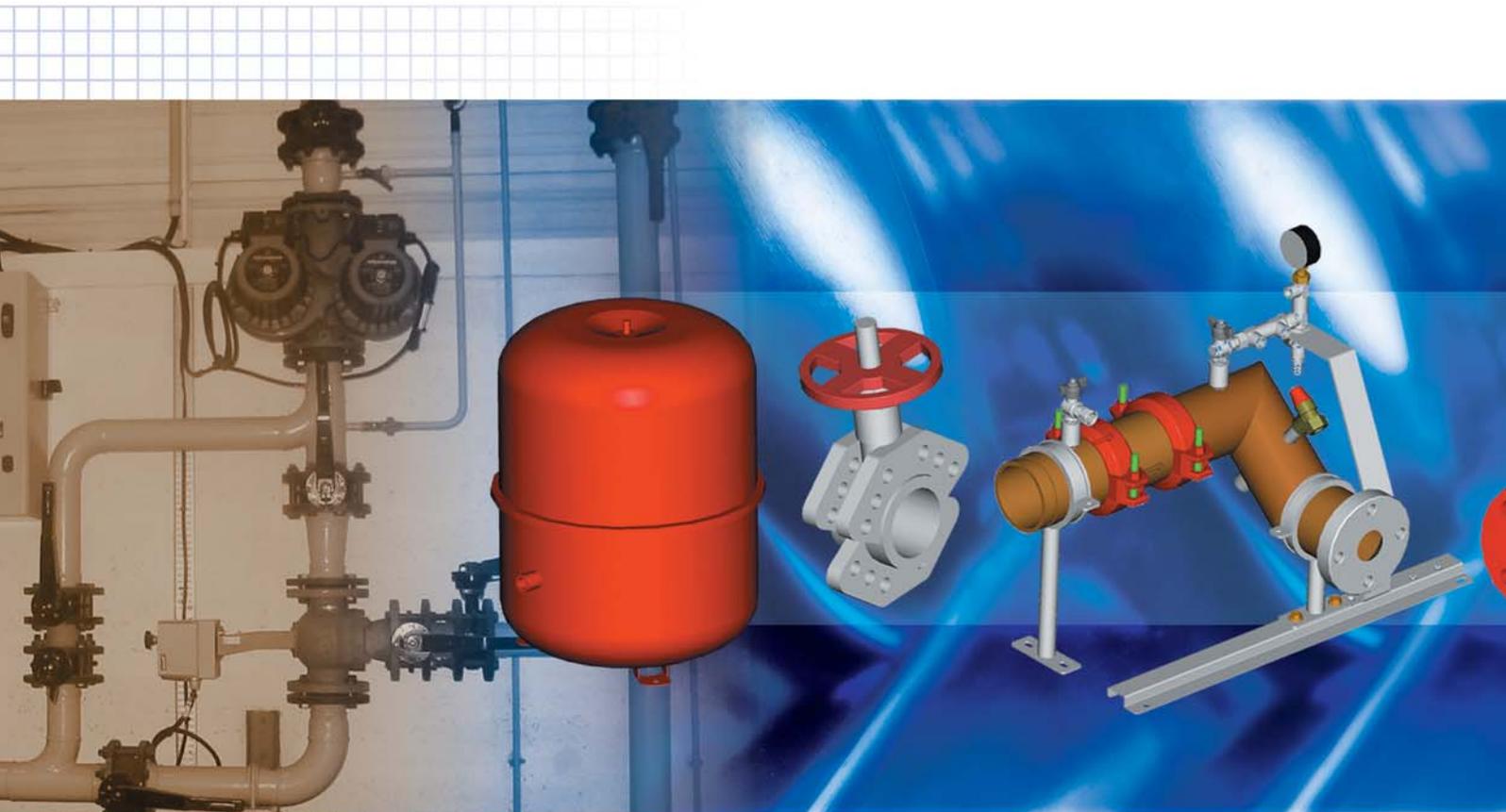


# THE COMPRESSORS: UNBEATABLE

By using rotary scroll compressors up to 750 kW capacity Carrier has become the pioneer in the anti-noise battle. The orbital movement of scroll compressors ensures a more balanced compression, generating fewer vibrations and thus less noise. High-quality technical solutions have resulted in increased performance: the compressor chassis is isolated from the unit by flexible anti-vibration mountings, the piping support is fixed to the compressor base to limit noise transmission (patented Carrier system), and the compressor is enclosed by a sound-absorbing acoustic casing (standard on the Euro Pack version). With only 56 dB(A) at 10 m distance for a capacity of 500 kW AQUASNAP (very low noise version) offers the best capacity/noise ratio.



# AQUASNAP INCLUDES EVERYTHING NOTHING LEFT TO CHANCE



MORE COMPACT,  
FREEING SPACE

Are you trying to reduce the size of your plant rooms in order to free more usable space?

Do you want to optimise the area in your new building for sale or to let? The new AQUASNAP is the solution. With the integrated hydronic module within the chiller AQUASNAP does not require any additional space for the installation of the water pump, valves and hydronic accessories. Its compactness makes it ideal for installation in existing buildings, freeing space for other activities: an important business and financial advantage.

## OPTIMISED FLOW

AQUASNAP is an example in modularity and can adapt to the hydronic characteristics of any building.

Its hydronic module is available in four versions: low and high pressure water pump, single or dual pump with automatic change-over for added security. A long-stroke control valve (18 turns) permits precise adjustment of the water flow rate at the commissioning of the machine.



## EVEN EASIER TO INSTALL

Low or high-pressure water pump, water filter, safety valve, membrane expansion tank, water flow switch, pressure gauge with valve manifold, frost protection down to  $-20^{\circ}\text{C}$  and flow control valve: with the AQUASNAP all hydronic elements are integrated in the unit. For you it changes everything: you do not waste time selecting the various components, ordering parts and chasing suppliers. Less administrative work, reduced installation complexity – and that means faster completion, more peace-of-mind, less time and money spent. Additionally everything is factory-tested before shipment, so installation and operation risks are also reduced!

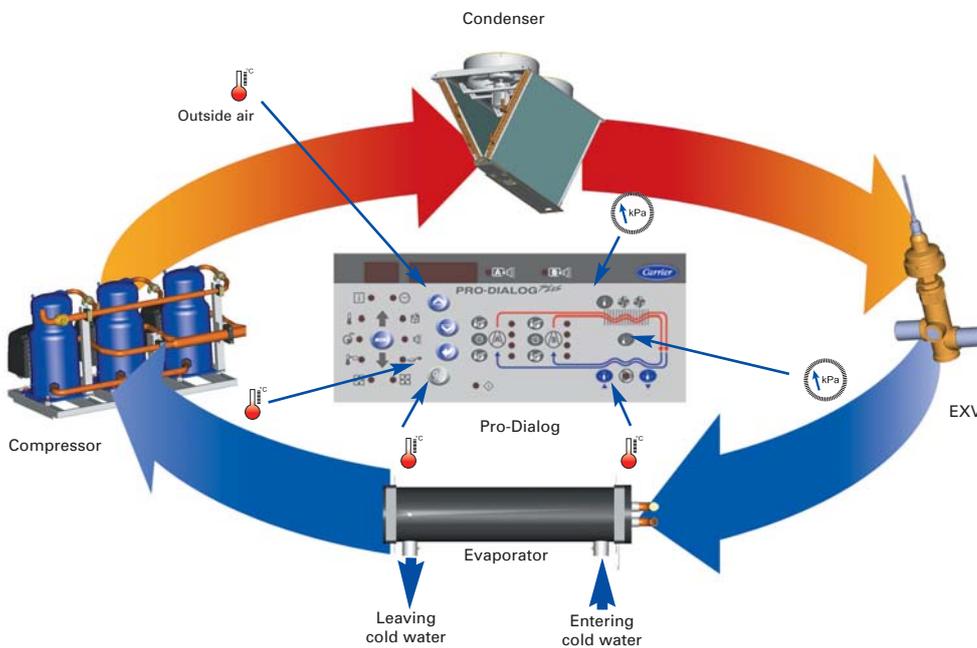


# AQUASNAP

## MORE ENERGY EFFICIENCY

## MORE SAVINGS

## AND MORE ECOLOGY



Taking the variations in climate conditions during the course of the year and the temperature differences during the course of the day into consideration, it is rare for an air conditioning system to operate at full load. The energy efficiency of a chiller depends on its adaptability to variations in thermal load. Here again the AQUASNAP excels: the Pro-Dialog control system, linked to the electronic expansion valve (EXV), permits operation of the refrigerant circuit at a much lower condensing pressure and improves utilisation of the evaporator heat exchange surface. The result: optimised energy consumption at part load.

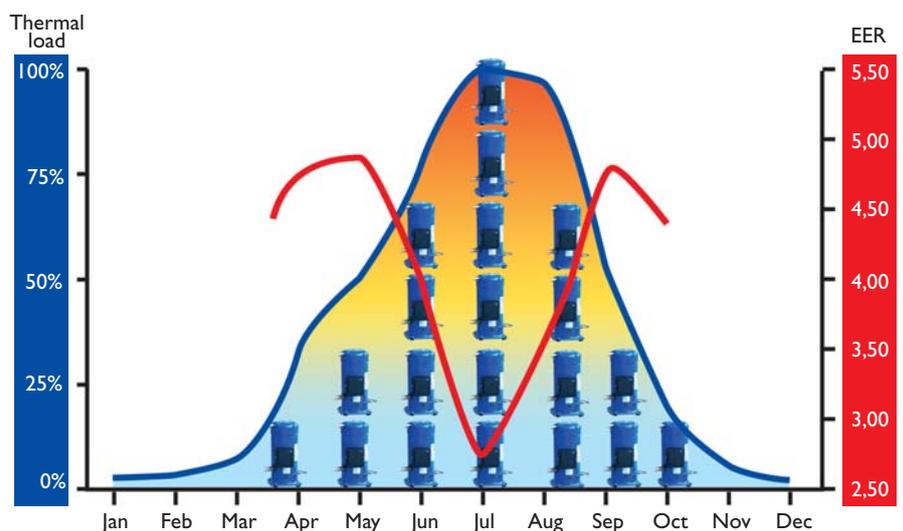
## ADAPTS THROUGHOUT THE YEAR

Multiple compressors make it easier and more efficient than ever to adapt the chiller capacity to the load: Pro-Dialog detects and anticipates load variations and only starts up the compressors that are absolutely necessary.

The result: the compressors work more efficiently and over shorter periods, further reducing energy consumption.

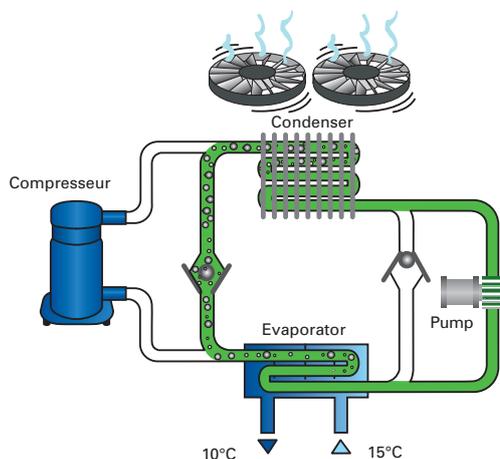
Here too the AQUASNAP is the champion in maximising cost savings.

Energy efficiency ratio (EER) versus thermal load



# OPTIMISING THE EXPLOITATION OF RENEWABLE ENERGY

## COOLING MODE: DX FREE COOLING, AN ECONOMICAL AND ECOLOGICAL REVOLUTION



Modern architecture and the extensive use of office and information equipment means that certain buildings require cooling all year round, even at the coldest latitudes. Why not use free cold air from the outside? Because traditional free-cooling water systems are expensive and it can take a long time to recover the investment. They use a glycol water solution, so power consumption outside the free-cooling periods is increased. We need a more cost-effective system. Now Carrier has the answer: the revolutionary DX free-cooling system (Carrier patent) guarantees exceptionally economical chilled-water production, as soon as the outside temperature falls below 5°C. How? The direct-expansion (DX) free-cooling system from Carrier utilises the thermosyphon principle. Gas from a relatively warm region (the evaporator) migrates to a relatively cool region (the condenser), transferring heat in the process. Only the condenser fans and a small refrigerant circulating pump operate to sustain this process. This explains the significant reduction in energy consumption. Moreover the hydronic circuit uses pure water without glycol. Decreased energy consumption, less generated noise, less pollution: with DX free cooling you gain savings and the environment is not harmed.

## HEATING MODE: NOTHING IS LOST, EVERYTHING IS RECOVERED



Why reject heat into the atmosphere when it can be used to produce free domestic hot water? Or for an industrial process? Once again AQUASNAP has the solution: with partial or total heat recovery options (20% or 100% depending on the requirements) you have another opportunity to save money.

## COOLING OR HEATING: SAVINGS ALL YEAR ROUND AND PEACE-OF-MIND



With the AQUASNAP heat pump the same machine heats and cools your buildings. All year round, from -10°C to +48°C, anywhere in the world, at any time AQUASNAP guarantees safe and reliable operation. Through the use of R410A refrigerant, AQUASNAP provides an exceptionally high coefficient of performance (COP) in heating mode. Now Carrier offers a heating system that is both economical and environmentally sound.

# AQUASNAP IMPROVED QUALITY, ANTICIPATING THE UNEXPECTED



## TOTAL PRECISION FROM DESIGN TO COMPLETION

AQUASNAP is the result of exceptional research and development, essentially based on the modularity of the design, optimising product quality. By using finite element modelling techniques Carrier has the resources to evaluate the stress properties of each component, before even building the prototypes. At each step of the design AQUASNAP undergoes a whole series of validations. Prevention is better than cure: this is Carrier's philosophy to maximise peace-of-mind and cost savings.

## COMPLETE PEACE-OF-MIND

The Carrier AQUASNAP manufacturing site is certified to ISO 9001 (quality) and ISO 14001 (environment) by an independent organisation. Moreover the AQUASNAP has an exclusively dedicated production line to ensure reliable and fast production times. All AQUASNAP units are systematically and fully run-tested at the end of assembly.



## PRE-TESTS ON SITE AT OUR CUSTOMERS

The best guarantee of reliability is one confirmed by our customers. We therefore tested the new AQUASNAP on site in real installations before production began. Over a period of 8 months and encompassing a wide range of locations, seasons and climatic conditions the new AQUASNAP was proven by selected customers to demonstrate that we have achieved our reliability objectives.



## ENDURANCE TESTS IN EXTREME CONDITIONS

In order to verify the design objectives Carrier utilised the know-how of specialist test laboratories for endurance tests in extreme conditions.

The new compressor control box was subjected to thousands of hours of rigorous testing: vibrations, climatic chamber, exposure to bad weather etc.

To evaluate the damage caused by transport over thousands of kilometres the AQUASNAP was placed on a vibrating table unique in Europe. A test based on American military standards and corresponding to over 4000 km on a truck.

Objective: to diagnose the weak points and find solutions to ensure that the product arrives on site in the same perfect condition it was when leaving the factory.

*From design to delivery, the AQUASNAP can offer the best guarantees for highest performance. In order to preserve these qualities over time and to optimise your energy cost management, Carrier offers you various maintenance contract solutions suited for your particular applications.*

TECHNICAL DATA 30RB/30RQ		262	302	342	372	402	432	462	522	602	672	732	802
Cooling capacity 30RB*	kW	256	291	325	357	388	415	444	503	593	648	700	753
Cooling capacity 30RQ*	kW	249	275	307	326	366	389	430	465	-	-	-	-
Heating capacity 30RQ**	kW	276	303	335	366	407	450	505	552	-	-	-	-
Length	mm	2410	3604	3604	3604	3604	4798	4798	4798	5992	5992	7186	7186
Width	mm	2253	2253	2253	2253	2253	2253	2253	2253	2253	2253	2253	2253
Height	mm	2297	2297	2297	2297	2297	2297	2297	2297	2297	2297	2297	2297
Operating weight 30RB (Euro Pack)	kg	2510	3160	3360	3440	3570	4160	4300	4510	5810	6020	6740	6950
Sound power 30RB (Euro Pack)	dB(A)	89	90	90	91	91	92	92	92	93	93	94	94
Sound power 30RB (very low noise dB(A))	dB(A)	85	86	86	87	87	87	87	88	89	89	89	90

\* Nominal conditions: Evaporator entering/leaving water 12°C/7°C, outdoor air temperature 35°C.

\*\* Nominal conditions: Water heat exchanger entering/leaving water 40°C/45°C, outdoor air temperature 7°C.



THE HYDRONIC SOLUTION  
**Aquasmart**

A MEMBER OF THE AQUASMART FAMILY

OPTIONS AND ACCESSORIES	30RB	30RQ
Euro Pack*	X	X
DX free cooling	X	
Low-pressure hydronic module (single or dual pump)	X	X
High-pressure hydronic module (single or dual pump)	X	X
Total heat recovery	X	
Low noise level	X	X
Very low noise level	X	X
Condenser with anti-corrosion treatment	X	X
Suction valve	X	X
Enclosure panels	X	X
Grilles	X	X
Aluminium clad evaporator insulation	X	X
Evaporator frost protection	X	X
Winter operation	X	X
Main disconnect switch	X	X
Compressor electronic soft start	X	X
Low leaving water temperature	X	
Duplex operation of two units	X	X
JBus, BacNet or LonTalk communications gateway	X	X
Energy Management Module (EMM)	X	X

\* Includes low-noise option, main disconnect switch, enclosure panels and evaporator frost protection



Carrier actively participates in the Eurovent certification programmes. Eurovent is an independent organisation that tests products and verifies the conformance between test results and data published by the manufacturer. Eurovent certification is an important guarantee for consultants and installers. They can be sure that a product with Eurovent certification will operate in conformance with the specifications and satisfy customer requirements. Carrier chillers and heat pumps come with Eurovent certification.



A member of the United Technologies Corporation family

Order No.: 13437-20-11/2005  
Supersedes order No.: 13437-20-10/2004  
Manufacturer reserves the right to change any product specifications without notice.