



# AQUAFORCE™

AIR-COOLED LIQUID CHILLER

30XA



## THE FORCE IS WITHIN



## CARRIER STRENGTH: PROGRESSING ALL TECHNOLOGIES SIMULTANEOUSLY

The main Carrier objective is to achieve the optimal balance between technological progress - synonymous with performance - and environmental care - the guarantee for our future.

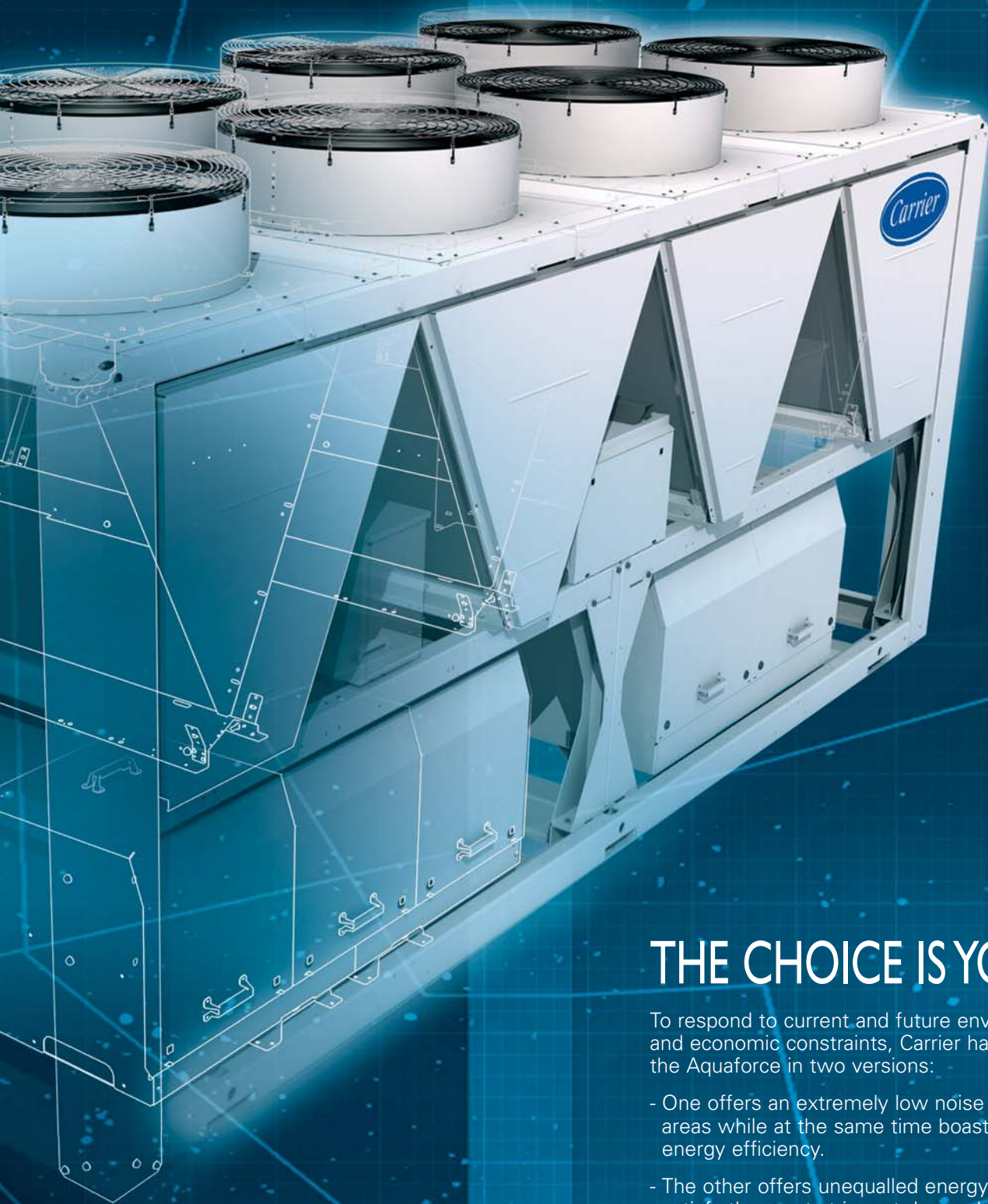
Carrier's strategy for the development of new products concentrates on three essential aspects:

- Minimising their impact on the environment
- Increasing their reliability and durability and raising the energy efficiency in response to European regulations.

Following the success of the Aquasnap, the Aquaforce continues this three-way progress commitment. The result: an innovative product, in harmony with our planet, to meet all environmental requirements.

# AQUAForce™





## THE CHOICE IS YOURS

To respond to current and future environmental and economic constraints, Carrier has developed the Aquaforce in two versions:

- One offers an extremely low noise level for urban areas while at the same time boasting superior energy efficiency.
- The other offers unequalled energy efficiency to satisfy the most stringent demands of building owners wanting to reduce operating costs to the minimum.

The Aquaforce range is available in 20 models from 270 to 1700 kW and offers the best solution for any individual projects and site requirements.





# ALUMINIUM MICRO-CHANNEL HEAT EXCHANGER - MCHX

## A TRUE INNOVATION

Already utilised in the automobile and aeronautical industries, the new micro-channel heat exchanger MCHX used in the Aquaforce has proven its technology under the most difficult conditions. In the Aquaforce it is used for the first time in a liquid chiller, and it delivers unmatched performance.



## SECURE HEAT SEALING

The automated welding technology of the MCHX heat exchanger offers additional reliability. It is automatically heat-sealed in a controlled atmosphere in an oven to ensure perfect uniform welds on the manifold. The risk of leaks is minimised. The coils are all individually tested and pressurised with pure helium in a casing with a deep vacuum.

A vacuum pump and a helium detector connected to the casing find the smallest leaks.

These tests are more precise than traditional methods, and combined with a careful visual inspection to ensure total reliability. And as proof Carrier does not hesitate to guarantee this new heat exchanger for three years.



## OPTIMISED HEAT EXCHANGE

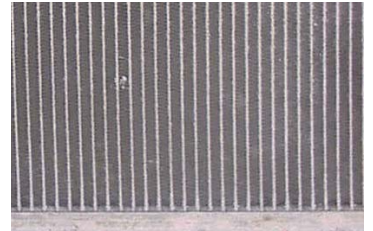
For an identical surface the MCHX heat exchanger is 10% more efficient than a conventional copper/aluminium coil. Its low thickness reduces air pressure losses by 50% and makes it less susceptible to fouling. This means that it can operate at full efficiency for longer than traditional coils.

# AQUAFORCE - DISCOVER ITS DURABILITY

AFTER 5000-HOUR SALT MIST/AMMONIUM SULPHATE TEST



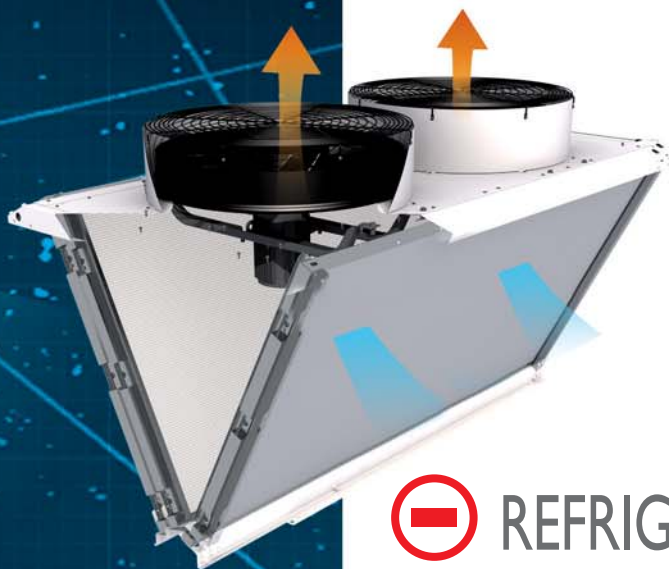
TRADITIONAL COIL



MCHX COIL

Unlike conventional coils, the MCHX heat exchanger is made entirely of aluminium: this one-metal concept eliminates galvanic currents that are generated when different metals touch in conventional coils. Many comparative tests, including the salt mist and ammonium sulphate test provide proof of the increased corrosion resistance of the MCHX.

Conclusion: The MCHX heat exchanger offers three and a half times higher corrosion resistance than copper/ aluminium coils.



## ⊖ REFRIGERANT: GREATEST CARE FOR THE ENVIRONMENT

Thanks to its micro-channels the MCHX heat exchanger ensures improved refrigerant circulation. It permits a 30% reduction in the refrigerant charge for the chiller and increased performance. R134a is an HFC refrigerant with zero ozone depletion potential.



# A COMPELLING FACTOR: AN EER OF 3.15 EER\*

\* average value for high-efficiency version

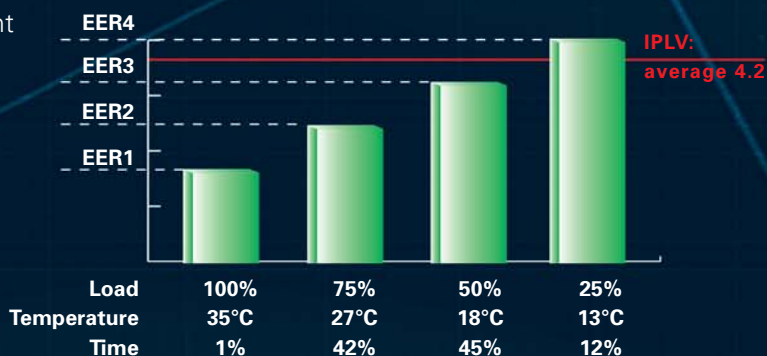


## ⊕ ENERGY EFFICIENCY

With an average EER of 3.15 the Aquaforce reaches new heights in energy efficiency: for each kW of consumed electricity the system produces 3.15 kW cooling. This performance places the Aquaforce at the top of the Eurovent energy efficiency classification - class A. Full load operation is only required 1% of the machine operating time.

A unique value: The IPLV (Integrated Part Load Value) permits evaluation of the weighted energy performance based on load, outside temperature, energy efficiency at various loads and corresponding temperatures and operating time. It gives the weighted average EER at different operating conditions.

The Aquaforce economiser with its electronic expansion device permits a considerable increase in cooling capacity and contributes to optimised energy efficiency of the chiller installation.

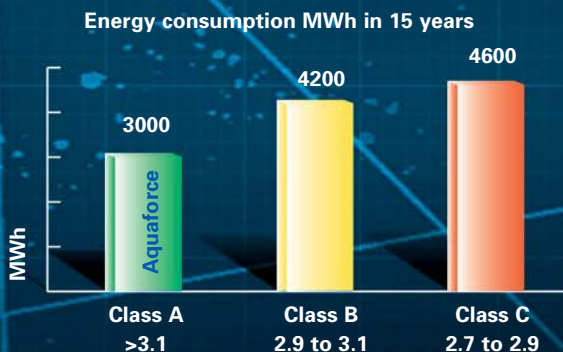


This is illustrated by the following formula:

$$\text{IPLV} = 1\% \times \text{EER1} + 42\% \times \text{EER2} + 45\% \times \text{EER3} + 12\% \times \text{EER4}$$

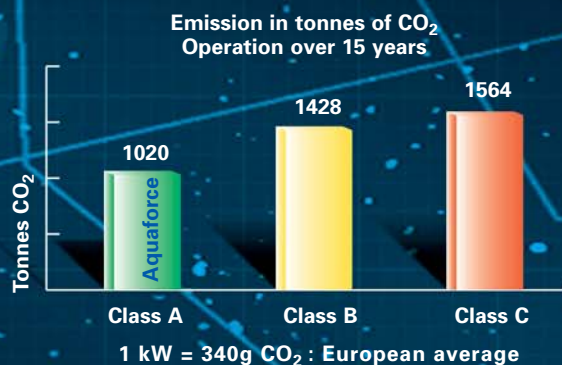
## ENERGY SAVINGS

The example of the energy consumption in an office building in London. The heat load is 850 kW. The study compares the energy consumption of products in energy class A, B and C, as well as the CO<sub>2</sub> emissions over 15 years.



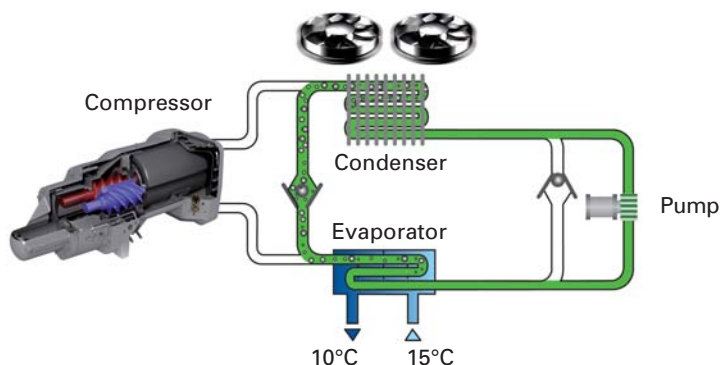
## EMISSIONS INTO THE ATMOSPHERE

The CO<sub>2</sub> reduction in kWh and kg for a class A 30XA 902 unit, compared to a class B machine is 28%, and 36% for a class C machine.



# TRUE ECOLOGICAL AND ECONOMIC PROGRESS

## UTILISE AVAILABLE NATURAL COLD AIR!



For buildings that require year-round cooling, even in the coldest regions, Carrier has developed the DX Free Cooling system that offers significant energy savings.

When the outside temperature falls below a threshold value the DX Free Cooling system offers savings.

The system utilises the principle of natural migration of a gas from the evaporator to the condenser.

A cooling-mode micro-pump ensures the continuity of the cycle and allows the compressors to switch off. Only the fans and the micro-pump operate.

This innovative principle offers increased energy efficiency and significant energy savings (EER ~15 to 30).

This approach also offers the following advantages:

- No need to use glycol/water solution to protect the water circuit against frost.
- No need for an additional heat exchanger.
- No three-way valve and no additional control.

The pressure loss and the energy consumption of the water pump are much lower.

TRUE ECOLOGICAL AND ECONOMIC PROGRESS



# THE LOW-NOISE FACTOR 94 dB(A)\*

\* Sound power level of 1000 kW low-noise unit

## EVERYTHING OPTIMISED FOR LOW NOISE LEVELS

To achieve such low values, Carrier has reduced the noise levels of all Aquaforce elements: fan, compressor and condenser. Aquaforce is equipped with the 4th generation Flying Bird fan, made of composite materials. Its sophisticated, aerodynamic shroud displaces the air without turbulence and generates a sound spectrum without irritating low-frequency peaks.

## INHERENT SOUND ABSORPTION

The Aquaforce screw compressor includes a discharge damper located inside the oil separator to absorb refrigerant pulsations. It is also equipped with flexible connections on the suction piping to prevent noise transmission. The compressors are enclosed by noise absorbing casings to limit sound transmission and contribute to the exceptionally low Aquaforce sound levels.

Discharge  
sound  
damper

Compressor

Suction  
pipe

Silent Bloc

Economiser  
sound  
damper





# EASY AND USER-FRIENDLY

## ⊖ MAINTENANCE TIME

## ⊖ DOWN-TIME

Thanks to its ingenious concept the Aquaforce maintenance is fast and easy. The MCHX coils are cleaned with a high-pressure water.



The compressors are mounted on slide rails to facilitate on-site technical intervention, limiting the machine down-time.

## ⊕ EASE-OF-USE

The Aquaforce operator interface is very user-friendly. A large-format touch screen gives easy access to the information: clear texts in the language of your choice to access all operating parameters.

Up to eight screens can be personalised.

## A TOUCH-SCREEN TO NAVIGATE WITH FINGERS AND EYES



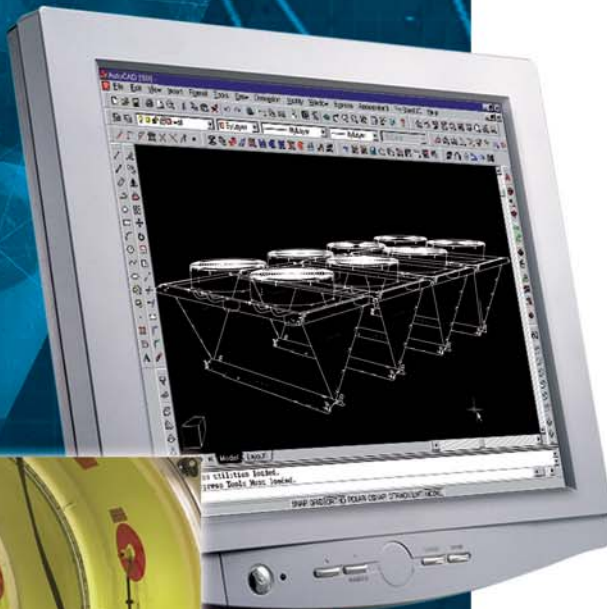
## ⊖ INSTALLATION TIME WITH THE ALL-IN-ONE CONCEPT\*

With the integrated hydronic module the Aquaforce is installed easily and quickly. No time is lost to select the various components and order parts, and no complicated installation: the complete system is pre-tested at the factory and immediately operational. Gaining time and money!

\*models from 270 to 500 kW



# THE FORCE TO FORESEE THE UNFORESEEN ...

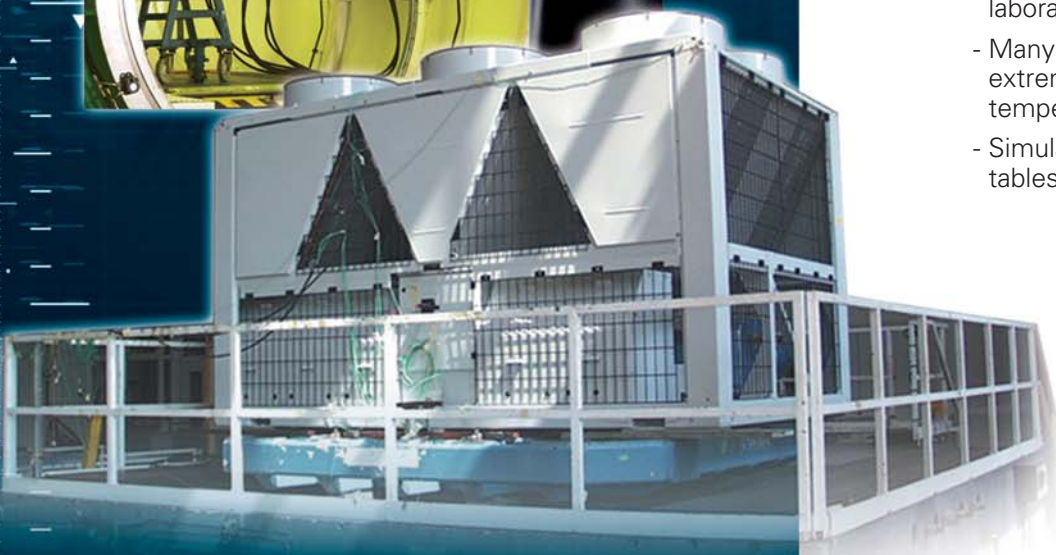


The Aquaforce range is the result of several years of research in the Carrier Research and Development Center and offers an unequalled level of energy efficiency and ecological performance.

Carrier is committed to deliver perfect operational products to every client, and therefore:

- Each system element is tested in numerous validations in specialist laboratories.
- Many field tests are carried out in extreme conditions (sand storms, extreme temperatures and corrosive environments).
- Simulated transport tests on vibrating tables.

The reliability of the Aquaforce is the result of exceptional research, combined with the highest quality standards. From design to delivery at your site, the Aquaforce delivers guaranteed long-term optimised performance.





# AND TO ANTICIPATE EVERYTHING FOR IMPROVED CONTROL

## CONTRACTS DESIGNED TO OPTIMISE YOUR INSTALLATION

Carrier has a maintenance solution that perfectly matches your expectations and gives you access to several contract levels:

- Fast intervention in accordance with your needs, during the manufacturer's warranty period and afterwards. The checks carried out by expert technicians reduce break-downs, control the costs and maintain the system at a high efficiency level.
- Full maintenance plan: parts and labour, tracking the history of your equipment, basic and extended service, replacement of defective parts etc. Maximum peace-of-mind, and maintenance costs without surprises.

## REMOTE MONITORING AND CONTINUOUS SUPERVISION

The Carrier remote monitoring centre has real-time and simultaneous information on the operation of your systems. The transmission of all parameters permits quick diagnosis, localising of the defect and organising efficient intervention. By eliminating time losses remote monitoring ensures optimised profitability.



## MAINTAIN MAXIMUM PERFORMANCE

Beyond the maintenance and break-down procedures Carrier offers genuine monitoring of your systems. A technician will regularly carry out a thorough system check. Keeping a complete history log of your individual installation, Carrier can now propose solutions to maintain the highest efficiency level and anticipate break-downs.

TECHNICAL DATA 30XA		252	302	352	402	452	502	602	702	752	802
Refrigerant		R134a									
No. of compressors		2	2	2	2	2	2	2	2	2	2
Length	mm	3604	3604	3604	4798	4798	5992	7186	7186	7186	7186
Width	mm	2253	2253	2253	2253	2253	2253	2253	2253	2253	2253
Height	mm	2297	2297	2297	2297	2297	2297	2297	2297	2297	2297
Operating weight	kg	3551	3597	3632	4454	4524	4992	5868	6022	6304	6601
<b>High-efficiency version</b>											
Cooling capacity*	kW	274	300	326	393	451	508	616	677	726	792
Energy efficiency (EER)*	kW/kW	3,13	3,12	3,11	3,24	3,21	3,29	3,26	3,33	3,16	3,18
Energy class		A									
Sound power level	dB(A)	94	94	94	95	95	95	96	96	98	98
Sound pressure level**	dB(A)	62	62	62	63	63	63	64	63	65	65
<b>Low-noise version</b>											
Cooling capacity*	kW	271	295	322	387	438	493	600	659	708	766
Energy efficiency (EER)*	kW/kW	3,11	3,00	3,01	3,15	3,04	3,12	3,09	3,16	3,00	2,95
Energy class		A	B	B	A	B	A	B	A	B	B
Sound power level	dB(A)	90	90	90	91	92	92	93	92	95	95
Sound pressure level**	dB(A)	58	58	58	59	60	60	60	59	62	62

TECHNICAL DATA 30XA		852	902	1002	1102	1202	1302	1352	1402	1502	1702
Refrigerant		R134a									
No. of compressors		2	2	2	3	3	3	3	3	3	4
Length	mm	8380	8380	9574	11962	11962	11962	11962	14372	14353	16760
Width	mm	2253	2253	2253	2253	2253	2253	2253	2253	2253	2253
Height	mm	2297	2297	2297	2297	2297	2297	2297	2297	2297	2297
Operating weight	kg	7137	7419	8022	9847	10282	10665	10996	12011	12155	14279
<b>High-efficiency version</b>											
Cooling capacity*	kW	837	899	999	1146	1245	1352	1440	1466	1521	1673
Energy efficiency (EER)*	kW/kW	3,26	3,14	3,22	3,29	3,21	3,17	3,11	3,25	3,27	3,26
Energy class		A									
Sound power level	dB(A)	98	99	98	99	100	99	100	101	100	101
Sound pressure level**	dB(A)	65	66	65	66	67	66	67	68	67	67
<b>Low-noise version</b>											
Cooling capacity*	kW	809	870	967	1119	1218	1299	1399	1433	1484	1619
Energy efficiency (EER)*	kW/kW	3,05	2,94	2,98	3,07	2,97	2,91	2,72	3,02	2,99	3,05
Energy class		B	B	B	B	B	B	C	B	B	B
Sound power level	dB(A)	94	96	95	96	96	96	97	97	97	97
Sound pressure level**	dB(A)	61	63	62	63	63	63	64	64	64	63

\* Standardised conditions: air 35°C, water 12/7°C

\*\* Sound pressure levels at 10 m distance in a free field

Models 1402, 1502 and 702 are supplied as two separate modules.



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 Supersedes order No.: New  
 Manufacturer reserves the right to change  
 any product specifications without notice

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