



WATER-COOLED 400 TO 1800kW  
**AQUAFORCE**<sup>®</sup>

WATER-COOLED LIQUID CHILLER

30XW



THE PRODUCT OF EXPERIENCE



# THE PRODU

## CARRIER'S FULL EXPERIENCE...

Carrier, a world leader in heating, ventilation, air conditioning and refrigeration, is proud to present the Aquaforce 30XW – a screw compressor liquid chiller.

In developing a new generation of water-cooled liquid chillers, Carrier design teams conducted research on the characteristics of cooling and heating systems, from manufacturing to maintenance, to ensure that the requirements exceeded the expectations of the customers. The result is the Aquaforce 30XW chiller.

The Aquaforce chiller is a leader in energy efficiency, adaptability and reliability.



WATER-COOLED

400

# AQUA FORCE

# CT OF EXPERIENCE



## ...IN THE PURSUIT OF EXCELLENCE

The Carrier-designed Aquaforce 30XW chiller exceeds customer requirements.

- **Flexibility:** One product family that can satisfy the different requirements of every market segment - heating, air conditioning and industrial.
- **Efficiency:** The Aquaforce chiller is more affordable to operate and environmentally responsible, contributing to the reduction of building energy consumption and CO<sub>2</sub> emissions.
- **Adaptability:** To anticipate the realities of on-site installation, the Aquaforce chiller provides factory-installed options.

TO 1800 kW

# FORCE<sup>®</sup>

# APPLICATION



## HEATING

The principles of thermodynamics and heat transfer in a liquid chiller are well-known and widely used in cooling applications. Offering higher efficiencies than traditional boiler equipment, these principles are increasingly applied in heating applications as a strategy to meet the new challenges of energy usage. Heat transferred from the source application can be used for space heating or to pre-heat domestic hot water, reducing building energy consumption and minimizing environmental impacts through reduced emissions.



## AIR CONDITIONING

Air conditioning plays an important part in all our lives and can significantly contribute to our well-being. In many applications - such as in hotels, shopping centres or leisure facilities - it is essential for the comfort of customers. Air conditioning also enhances the quality of life for office employees, hospital patients and medical staff alike. The multitude of application requirements results in many diverse system installations, and liquid chiller design has to adapt to these.



## INDUSTRIAL

Cooling is essential for many manufacturing processes and for the conservation of food products throughout the production and distribution chain. Whether in the chemical and plastics industries or in the field of agriculture or food processing, reliability and precision are essential customer requirements for water chilling systems.



# EXPERTISE

## HEATING APPLICATION

Aquaforce water-cooled liquid chillers used as thermodynamics boilers have an efficiency above 6.5 COP for floor heating applications. The units can also produce hot water up to 63°C, significantly expanding the range of possible system applications. Aquaforce offers the ability to control the machine based on the heating system requirement making it an ideal product range for heating applications.

## AIR CONDITIONING APPLICATION

To meet the needs of various water-cooled system applications, the Aquaforce chillers function under an expanded range of water temperatures. Where ground source water is available as low as 8°C, the Aquaforce 30XW chiller can control and manage the entering condenser water temperature to ensure satisfactory operation. The chiller is also capable of offering leaving condenser water temperatures as high as 63°C. This makes the 30XW compatible with a wide range of heat rejection configurations including ground source systems, cooling towers and dry coolers.

## INDUSTRIAL APPLICATION

Where industrial applications require sub-zero cooling water temperatures, Aquaforce chillers can be configured for cooling at sub-zero temperatures as low as -12°C, meeting the majority of process cooling needs.



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*The Carrier-designed Aquaforce chillers are flexible to cover several application types and offer the possibility to meet different requirements within one product family.*

# ALL IN ONE



## THE POWER OF THE RANGE

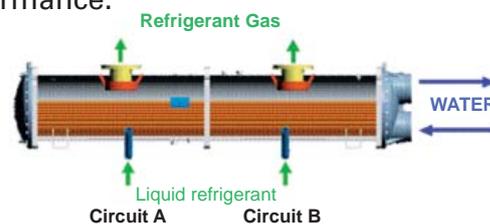
Aquaforce offers 27 models with capacity ranges from 400 to 1800 kW, providing one of the widest ranges of screw-compression liquid chillers on the market. Aquaforce chillers are available in two energy efficiency classes:

The Aquaforce 30XW unit provides great operating performance in a cost-effective energy efficient solution.

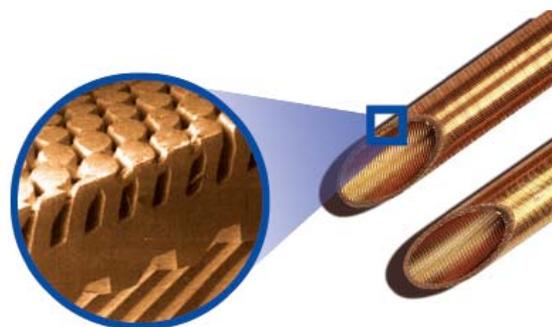
The Aquaforce 30XW-P unit offers higher efficiencies to satisfy the demand for the lowest operating costs.

## OPTIMISED HEAT EXCHANGER DESIGN

Aquaforce 30XW chillers utilize flooded heat exchangers to maximize energy transfer between fluid and refrigerant. The refrigerant distribution system and the tube and baffle arrangement result in optimized water-side and refrigerant-side performance.



The external and internal tube surfaces are micro-grooved, resulting in an increased surface area and enhanced heat transfer.



# EER THE EFFICIENCY EXPERT

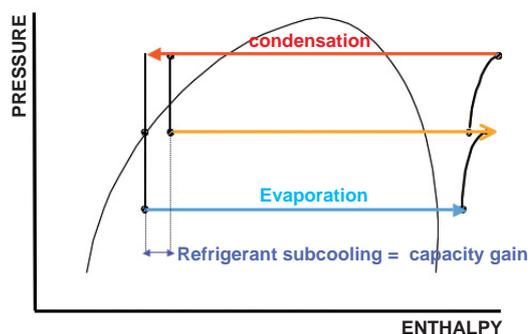
*Designed to exceed current energy standards, the Aquaforce chillers are more affordable to operate. The Eurovent Energy Efficiency classification for water-cooled liquid chillers, Class A requires a full-load EER of 5.1 which Aquaforce chillers exceed with EERs up to 6.2.*

*highly efficient on a part load performance basis when facilities are in limited use. Using the weighted value known as the Eurovent Season Energy Efficiency Ratio (ESEER), Aquaforce chillers have part load ratings as high as 8.1.*

*The Aquaforce liquid chillers are also*

## ECONOMIZED CYCLE FOR ENHANCED PERFORMANCE

The Aquaforce 30XW chiller includes an economizer with an electronic expansion device resulting in an improvement in both unit cooling capacity and operating efficiency.



## FLEXIBLE AND RELIABLE COMPRESSION

To achieve the required energy efficiency levels, Aquaforce chillers are equipped with Carrier's new-generation 06T screw compressors – the results of Carrier's long experience in twin-screw compressor development.



The compressor is driven by a high-efficiency motor optimized for water-cooled chiller operation. The rotors feature the latest lobe design for R134a operation, running in oversized roller bearings and with variable slide valve capacity control.

# INSTALLATION EXP

*Carrier focuses its efforts on the design of simplified products, to continuously reduce installation time and offer installers turnkey solutions.*

*Through the availability of standard options and accessories, Carrier strives to offer products that are easily adaptable to meet individual installation challenges.*

## COMPACTNESS

An important aspect when choosing a liquid chiller is the unit size. Since plant rooms are not a source of revenue, architects minimize non-profitable areas. Aquaforce chillers meet this design criteria with their compact size.

When determining the units' component layout the main objectives were to reduce the size, offer more handling and installation flexibility, and facilitate maintenance by allowing fast and easy access to critical components.

**1m WIDE** ||||| A MORE COMPACT PRODUCT THAT FITS THROUGH

For refurbishing projects it is important to be able to replace equipment without added cost and work. With a width of less than 1 meter, even for a unit with a cooling capacity of greater than 1MW, Aquaforce 30XW chillers can fit through a standard plant room door.



# ERIENCE



## ADAPTABILITY

Aquaforce chillers can further meet the needs of specific application constraints with a wide choice of factory-installed options:

- **Reversal of the water connections:**

configuration at the factory allows for fewer modifications to the existing pipe work on-site saving valuable time and reducing unnecessary material cost.

- **Single or dual power connection:**

units can be specified to match the electrical supply arrangement on site for faster and easier installation.

- **Disassembled delivery:**

units may be delivered in several sections to facilitate installation in plant rooms with limited access.

With the next generation of Aquaforce screw compression liquid chillers, Carrier can meet all your installation requirements. Our commitment to high performance and high quality of service makes Carrier a partner you can rely on.



# RELIABILITY BASED ON EXPERIENCE

In 1922, Willis Carrier invented centrifugal chillers and Carrier continued to lead the industry in 2005 with the first integrated variable speed, water-cooled, chlorine free screw chiller. Today, the introduction for the Aquaforce 30XW chiller builds on this experience.

The Aquaforce 30XW line underwent extensive testing in our laboratories. Long-term reliability was proven under actual operating conditions at a series of pilot installations. And, the rigors of transportation were simulated on computer-controlled vibrating tables to ensure that quality levels would be maintained upon delivery to installation sites. All production units systematically undergo an extensive run test at the end of the assembly line.



As environmental stewards, Carrier is also committed to the preservation of energy and resources both in the manufacturing process as well as the product life cycle. All products that Carrier delivers to the market are extensively tested to deliver innovative technology, reliability and performance while meeting environmental standards.



From the drawing board through the commissioning of the unit on site, Carrier works to ensure customer satisfaction in our products and services.

# TRUST BASED ON COMMITMENT

## CARRIER COMMITMENT

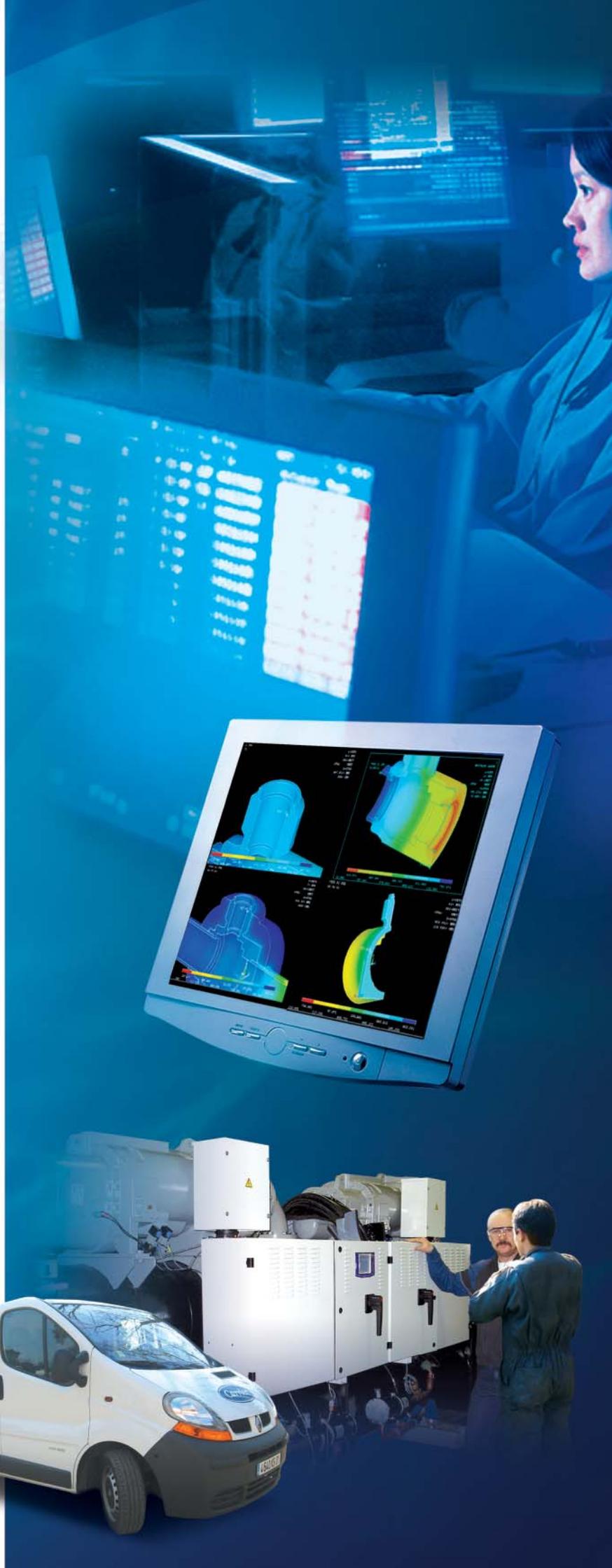
Our commitment to our product extends far beyond the factory gate. Carrier can continue to support you by offering a variety of maintenance and control solution packages.



## ALWAYS BY YOUR SIDE

In order to ensure that your chiller delivers its optimum performance and provides a long operating life, the Carrier Service team will become your partner and take responsibility for integration, optimization and supervision of the plant within its operating environment.

Post-installation services are aimed at delivering energy savings by ensuring that the equipment always operates at peak efficiency. Of course they offer the added advantage of allowing faster diagnosis of faults, thus minimizing the risk of an operational loss or interruption of service.



**TECHNICAL DATA 30XW / 30XWH**

<b>Standard range</b>		<b>452</b>	<b>552</b>	<b>602</b>	<b>652</b>	<b>702</b>	<b>802</b>	<b>852</b>	<b>1002</b>	<b>1052</b>	<b>1152</b>	<b>1252</b>	<b>1352</b>	<b>1452</b>	<b>1552</b>	<b>1652</b>	<b>1702</b>
Nominal cooling capacity*	kW	476	535	548	658	721	780	839	1016	1060	1155	1232	1345	1475	1566	1638	1704
Energy efficiency ratio (EER)	kW/kW	5.6	5.6	5.5	5.6	5.6	5.6	5.6	5.6	5.4	5.8	5.9	5.8	5.8	5.4	5.6	5.7
EUROVENT class, cooling		A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
European Seasonal Energy Efficiency Ratio (ESEER)		6.6	6.4	6.7	6.4	6.3	6.3	6.2	6.7	7.4	7.5	7.2	7.1	7.0	6.6	6.8	6.8
Heating capacity*	kW	506	580	616	-	-	-	-	1 081	1 127	1 284	-	-	-	-	-	-
Coefficient of performance (COP)	kW/kW	4.6	4.7	4.8	-	-	-	-	4.6	4.5	4.9	-	-	-	-	-	-
EUROVENT class, heating		A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Refrigerant		← R134a →															
Nb refrigerant circuit/Compressor		1/1	1/1	1/1	1/1	1/1	1/1	1/1	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2
Length	mm	2742	2742	2742	3048	3048	3048	2768	4085	4085	4093	4796	4796	4796	4809	4872	4872
Width	mm	936	936	936	1038	1038	1038	1050	1036	1036	1036	1153	1153	1153	1153	1683	1683
Height	mm	1693	1693	1693	1900	1900	1900	1950	1870	1870	1926	2109	2100	2100	2100	1798	1798
Operating weight	kg	2810	2850	2890	-	-	-	-	5550	5590	6100	-	-	-	-	-	-
Sound power level Lw	dB(A)	99	99	99	-	-	-	-	102	102	102	-	-	-	-	-	-

**TECHNICAL DATA 30XWP / 30XWHP**

<b>Premium range</b>		<b>512</b>	<b>562</b>	<b>712</b>	<b>812</b>	<b>862</b>	<b>1012</b>	<b>1162</b>	<b>1312</b>	<b>1462</b>	<b>1612</b>	<b>1762</b>
Nominal cooling capacity*	kW	509	582	721	792	860	1030	1178	1 309	1456	1610	1748
Energy efficiency ratio (EER)	kW/kW	5.9	6.0	5.9	5.8	5.9	6.0	6.2	6.1	6.0	6.1	6.2
EUROVENT class, cooling		A	A	A	A	A	A	A	A	A	A	A
European Seasonal Energy Efficiency Ratio (ESEER)		6.7	6.7	6.5	6.5	6.5	7.6	8.1	7.3	7.2	7.3	7.4
Heating capacity*	kW	554	661	-	-	-	1119	1276	-	-	-	-
Coefficient of performance (COP)	kW/kW	4.8	5.2	-	-	-	4.9	5.1	-	-	-	-
EUROVENT class, heating		A	A	A	A	A	A	A	A	A	A	A
Refrigerant		← R134a →										
Nb refrigerant circuit/Compressor		1/1	1/1	1/1	1/1	1/1	2/2	2/2	2/2	2/2	2/2	2/2
Length	mm	3059	3059	3278	3278	3278	4795	4795	4832	4832	4872	4872
Width	mm	936	936	1064	1064	1064	1039	1039	1740	1740	1924	1924
Height	mm	1743	1743	2000	2000	2000	1997	1997	1855	1855	1919	1919
Operating weight	kg	3180	3220	-	-	-	7160	7260	-	-	-	-
Sound power level Lw	dB(A)	99	99	-	-	-	102	102	-	-	-	-

30XWH and 30XWHP are versions of Aquaforce chillers dedicated to heating applications.

\*Eurovent conditions :

Cooling mode : Evaporator inlet/outlet temperatures = 12/7°C, Condensator inlet/outlet temperatures = 30/35°C

Heating mode : Condensator inlet/outlet temperatures = 40/45°C, Evaporator inlet/outlet temperatures = 10°C with the same flow rate as for the Eurovent cooling mode conditions.

Evaporator & condensator coefficient = 0,000018 m²K/W

Available 2009 / Preliminary data



CARRIER participates in the Eurovent certification programme for liquid chilling packages; the certified data for the certified models is listed in the Eurovent directory available from [www.eurovent-certification.com](http://www.eurovent-certification.com)



Quality Management System Approval



Environmental Management System Approval



Order number: 13459-20, 03.2009

Supersedes order No.: New

Manufacturer reserves the right to discontinue, or change at any time specifications or designs without notice and without incurring obligations.

Carrier Corporation is a unit of United Technologies Corporation (NYSE:UTX.)