



United Technologies

## Variable-Speed Water-Cooled Liquid Chillers/ Variable-Speed-Water-to-Water Heating Units

greenspeed  
**AQUAFORCE**



www.eurovent-certification.com  
www.certiflash.com



## 30XW-V/30XWHV

**Nominal cooling capacity 587-1741 kW**

**Nominal heating capacity 648-1932 kW**

The 30XW-V/30XWHV water-sourced units are the premium solution for commercial and industrial applications where installers, consultants and building owners require maximum quality and optimal performances, especially at part load.

The 30XW-V/30XWHV units are designed to meet current and future requirements in terms of energy efficiency, versatility and compactness. They feature exclusive inverter-driven screw compressors - an evolution of the proven traditional Carrier twin-rotor screw compressor design.

Other features include:

- the new Touch Pilot control
- mechanically cleanable flooded heat exchangers
- refrigerant R-134a

The 30XW-V/30XWHV range is split into two versions:

- 30XW-V for air conditioning applications
- 30XWHV for heating applications

As standard, the unit can provide an evaporator leaving water temperature down to 3.3°C, and when operating as a heat pump, it can deliver up to 50°C on the condenser side.

### Features and advantages

- Low energy consumption
- Designed to support green building design
- High reliability
- Easy and fast installation
- Minimised operating sound levels
- Touch Pilot control
- New inverter-driven Thunderbolt screw compressor
- Environmental care
- Remote management

## Low energy consumption

- The 30XW-V/30XWHV was designed for high performance both at full load and at part load. Exceptional ESEER values set new benchmarks for low energy consumption.
  - Eurovent energy class A
  - Eurovent certified values per EN14511-3:2011: EER up to 5.5 and ESEER up to 8.0
  - EER up to 5.8 kW/kW and ESEER up to 9.5 kW/kW (gross adjusted performances, not taking into account the water pump and heat exchanger pressure drops, given as a reference for comparison).
- High energy efficiency
  - Inverter-driven twin-rotor screw compressors allow precise capacity matching of building load changes and significantly reduce unit power input, especially at part-load.
  - Flooded multi-pipe heat exchangers for increased heat exchange efficiency.
  - Electronic expansion device permits operation at a lower condensing pressure and improved utilisation of the evaporator heat exchange surface.
- Optimised electrical performance

All 30XW-V/30XWHV units comply with class 3 of standard EN61800-3. Category C3 refers to industrial environments. With option 282 category C2 compliance is possible.

  - Inverter-driven motors ensure negligible start-up current (value is lower than the maximum unit current draw)

## Designed to support green building design

- Design teams increasingly focus on designing “green buildings” to address today’s energy efficiency and environmental sustainability needs. The air conditioning system uses between 30% and 40% of the annual building energy consumption. Selection of the right air conditioning unit is one of the main aspects to consider when designing a green building. For buildings with a variable load throughout the year 30XW-V/30XWHV units offer the solution to this important challenge. For more details refer to page 4.

## High reliability

- Inverter-driven screw compressors
  - Industrial-type screw compressors with oversized bearings and motor cooled by suction gas.
  - The inverter is optimised for each compressor motor to ensure reliable operation and easy maintenance.
  - All compressor components are easily accessible on site minimising down-time.
- Refrigerant circuits
  - Two independent refrigerant circuits (from 1000 kW upwards); the second one automatically takes over, if the first one develops a fault, maintaining partial cooling under all circumstances.
- Evaporator
  - Electronic paddle-free flow switch. Auto-setting according to cooler size and fluid type.
- Auto-adaptive control
  - Control algorithm prevents excessive compressor cycling
  - Automatic compressor unloading in case of abnormally high condensing pressure or discharge temperature.
- Exceptional endurance tests
  - Partnerships with specialised laboratories and use of limit simulation tools (finite element calculation) for the design of critical components.
  - Transport simulation test in the laboratory on a vibrating table and then on an endurance circuit (based on a military standard).

## Easy and fast installation

- Compact design
  - The 30XW-V/30XWHV units are designed to offer compact dimensions for easy installation.
  - With a width of approximately 1.25 m up to 1000 kW the units can pass through standard door openings and only require minimum floor space in the plant room.
- Simplified electrical connections
  - Main disconnect switch with high trip capacity
  - Transformer supply to the integrated control circuit (400/24 V)
- Simplified water connections
  - Victaulic connections on the evaporator and condenser
  - Practical reference marks for entering and leaving water connections
  - Possibility to reverse the heat exchanger water inlet and outlet at the factory
  - Possibility to modify the number of heat exchanger passes
- Fast commissioning
  - Systematic factory operation test before shipment
  - Quick-test function for step-by-step verification of the instruments, expansion devices and compressors.

## Minimised operating sound levels

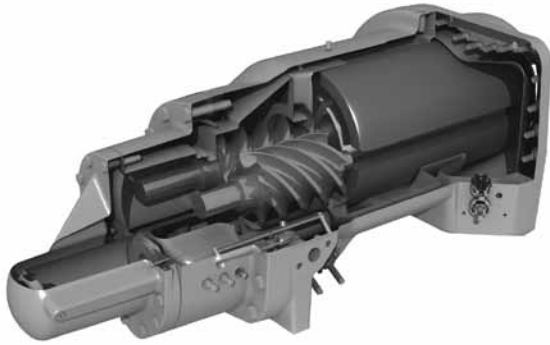
- The inverter technology used for the compressor motors minimises noise levels at part load operation. In two-compressor units at 25% of the maximum load the unit sound power level is reduced by 10 dB(A).
- Standard unit features include:
  - Silencers on the compressor discharge line.
  - Sound insulation on the components that are most subjected to radiated noise.
- Option 257 further reduces the global unit sound level.

## Touch Pilot control



- New innovative smart control for variable-drive screw-compressor chillers. With the ultimate touch screen interface the Touch Pilot includes:
  - An intuitive and user-friendly interface. Concise and clear information is available in local languages.
  - Complete menu, customised for different users (end user, service personnel or Carrier engineers).
  - Safe operation and unit setting: password protection ensures that unauthorised people cannot modify any advanced parameters.
  - General access without password to the most important operating parameters.
  - Touch Pilot combines intelligence with operating simplicity. For optimum energy efficiency the control constantly monitors all machine parameters and precisely manages the operation of compressors, electronic expansion devices and of the evaporator and condenser water pumps.
- Energy management
  - Internal time schedule clock: controls chiller on/off times and operation at a second set-point
  - Set-point reset based on the return water temperature
  - The DCT (Data Collection Tool) records the alarms history to simplify and facilitate service operations.

## New inverter-driven Thunderbolt screw compressor



- The new generation of Carrier inverter-driven screw compressors benefits from Carrier's long experience in the development of twin-rotor screw compressors. The design of the Thunderbolt compressors is based on the successful 06T screw compressors.
- Advanced control algorithms combine inverter frequency output with motor input logic to minimise mechanical part stress, resulting in best compression performance and high chiller reliability. The compressor is equipped with bearings with oversized rollers, oil pressure lubricated for reliable and durable operation, even at maximum load.
- Other advantages:
  - If a fault occurs e.g. if the condenser is fouled or at very high water temperature, the compressor does not switch off, but continues operation at reduced capacity (unloaded mode).
  - The silencer in the discharge line considerably reduces discharge gas pulsations for much quieter operation.
  - The condenser includes an oil separator that minimises the amount of oil in circulation in the refrigerant circuit and re-directs it to the compressor function.

### Environmental care

- R-134a refrigerant
  - HFC-refrigerant with zero ozone depletion potential
- Leak-tight refrigerant circuit
  - Reduction of leaks as no capillary tubes and flare connections are used
  - Verification of pressure transducers and temperature sensors without transferring refrigerant charge
  - Discharge line shut-off valve and liquid line service valve for simplified maintenance.

## Remote management (standard)

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

The 30XW-V/30XWHV is equipped with an RS485 serial port that offers multiple remote control, monitoring and diagnostic possibilities. Carrier offers a vast choice of control products, specially designed to control, manage and supervise the operation of an air conditioning system. Please consult your Carrier representative for more information.

The 30XW-V/30XWHV also communicates with other building management systems via optional communication gateways.

A connection terminal allows remote control of the 30XW-V/30XWHV by wired cable:

- A digital input allows verification of condenser water flow (the flow switch must be supplied by the installer). This function is required to control operation of the condenser pumps.
- Start/stop: opening of this contact will shut down the unit
- Dual set-point: closing of this contact activates a second set-point (example: unoccupied mode)
- Demand limit: closing of this contact limits the maximum chiller capacity to a predefined value
- Operation indication: this volt-free contact indicates that the chiller is operating (cooling load) or that it is ready to operate (no cooling load)
- Alarm indication: this volt-free contact indicates the presence of a major fault that has led to the shut-down of one or several refrigerant circuits.

## Remote management (EMM option)

The Energy Management Module offers extended remote control possibilities:

- 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 0-10 V signal
- Demand limit: permits limitation of the maximum chiller power or current based on a 0-10 V signal
- Demand limit 1 and 2: closing of these contacts limits the maximum chiller power or current to two predefined values
- User safety: this contact can be used for any customer safety loop; opening the contact generates a specific alarm
- Ice storage end: when ice storage has finished, this input permits return to the second set-point (unoccupied mode)
- Time schedule override: closing of this contact cancels the time schedule effects
- Out of service: this signal indicates that the chiller is completely out of service
- Chiller capacity: this analogue output (0-10 V) gives an immediate indication of the chiller capacity
- Alert indication: this volt-free contact indicates the necessity to carry out a maintenance operation or the presence of a minor fault.

## Carrier products and green building certification

### ■ Introduction

Energy usage and costs combined with increasing concerns to reduce CO<sub>2</sub> emissions are among the most important environmental challenges in today's world. New and existing buildings are one area where energy efficiency and the conservation of natural resources is a high priority.

### ■ Green building design

Design teams increasingly focus on designing "green buildings" to address today's energy efficiency and environmental sustainability needs. A green building is a building that is environmentally sustainable and has been designed, constructed and is operated to minimise the total impact of the environment.

The underlying principles of this approach: the resulting building will be economical to operate, offer increased comfort and create a healthier environment for the people who live and work there, increasing productivity.

The main strategies\* adopted to achieve a green building design include:

- Sustainable Sites (SS)
- Water Efficiency (WE)
- Energy & Atmosphere (EA)
- Materials & Resources (MR)
- Indoor Environmental Quality (IEQ)
- Innovation in Design (ID)

### ■ Green building certification

A number of green building certification programs exist in the market and offer third-party assessment of green building measures for a wide variety of building types. Some examples of existing programs include:

- LEED (Leadership in Energy & Environmental Design)
- BREEAM
- ESTIDAMA PEARL
- NABERS (National Australian Built Environment Rating System)

### ■ HVAC products and systems

Carrier HVAC products are built to high energy efficiency and indoor air quality standards. They assist building designers and owners by offering high-performance heating, ventilation, and air conditioning (HVAC) systems and products with reduced energy consumption and enhanced indoor air quality for the occupants, contributing to optimised green building performance.

Each certification program may address and prioritise different green building design strategies according to local and regional needs and legislation. The following example looks at how Carrier's new 30XW-V/30XWHV range helps customers involved in LEED building certification.

\* Source USGBC: LEED

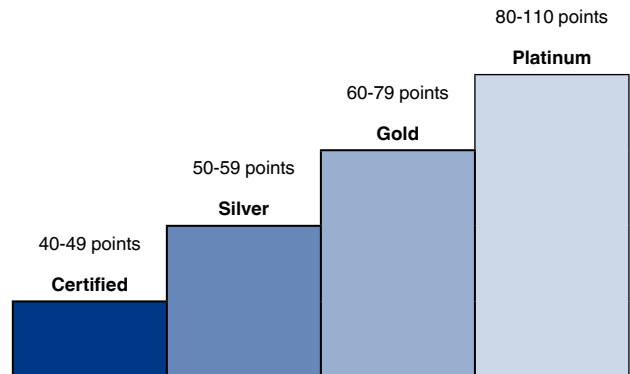
### Example: 30XW-V/30XWHV and LEED® certification

The LEED® (Leadership in Energy and Environmental Design) green building certification programme is a pre-eminent programme to rate the design, construction and operation of green buildings with points assigned in seven credit categories:

- Sustainable Sites (SS)
- Water Efficiency (WE)
- Energy & Atmosphere (EA)
- Materials & Resources (MR)
- Indoor Environmental Quality (IEQ)
- Innovation in Design (ID)
- Regional Priority (RP)

There are a number of different LEED® products. Whilst the strategies and categories assessed remain the same, the point distribution varies to address different building types and application needs, for example according to New Construction, Schools, Core & Shell, Retail and Healthcare. All programmes now use the same point scale.

### 110 possible LEED points

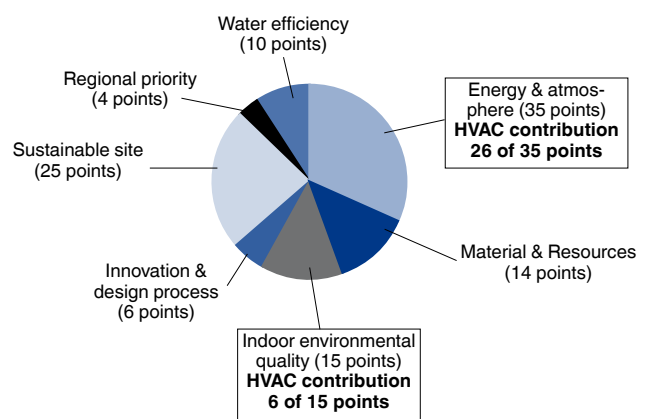


The majority of credits in LEED® rating systems are performance-based and achieving them is dependent on the impacts to the overall building. The contribution any product or system may make to the points achieved depends on how it impacts the entire building and its operations.

Whilst the LEED® green building certification programme does not certify products or services, the selection of products or service programmes is critical to obtaining LEED® certification for a registered project because the right products or service programmes can help meet the goals of green construction and ongoing operation and maintenance.

The choice of heating, ventilating and air conditioning (HVAC) products in particular can have a significant impact on LEED® certification, as the HVAC system directly impacts two categories that together influence 40% of the available points.

### Overview of LEED for new construction and major renovations



The new 30XW-V/30XWHV units from Carrier can assist building owners to earn LEED® points in the Energy & Atmosphere (EA) credit category and help address the following prerequisites and credit requirements:

- **EA prerequisite 2: Minimum Energy Performance**  
The 30XW-V exceeds the energy-efficiency requirements of ASHRAE 90.1-2007; therefore it complies with the prerequisite standard.
- **EA prerequisite 3: Fundamental Refrigerant Management**  
The 30XW-V/30XWHV does not use chlorofluorocarbon (CFC) refrigerants satisfying the prerequisite statement
- **EA credit 1: Optimise energy performance (1 to 19 points)**  
One component for this credit requires the energy cost reduction of the proposed building compared to ASHRAE 90.1-2007 minimum tables and beyond the performance level required to meet EA prerequisite 2.

The 30XW-V/30XWHV is designed for efficient part-load performance and therefore satisfies this LEED® credit. In addition, the Carrier HAP (Hourly Analysis Program) can be used in the energy analysis component of this credit. The HAP program can run analysis programs that comply with the modeling requirements for this credit and produce reports that are easily transferable to LEED® templates.

- **EA credit 4: Enhanced refrigerant management (2 points)**  
With this credit, LEED® awards systems that minimise the Ozone Depletion Potential (ODP) and Global Warming Potential (GWP) of the system.

The 30XW-V/30XWHV uses a reduced R134a charge and therefore contributes toward satisfying this credit under LEED®.

**NOTE:** This section describes the prerequisites and credit requirements in LEED® for New Construction and is directly related to the 30XW-V/30XWHV. Other prerequisites and credit requirements are not directly and purely related to the air-conditioning unit itself, but more to the control of the complete HVAC system. i-Vu®, Carrier's open control system, has features that can be valuable for:

- EA prerequisite 1: Fundamental commissioning of energy management systems
- EA credit 3: Enhanced commissioning (2 points)
- EA credit 5: Measurements and verification (3 points)

**NOTE:** Products are not reviewed or certified under LEED®. LEED® credit requirements cover the performance of materials in aggregate, not the performance of individual products or brands. For more information on LEED®, visit: [www.usgbc.org](http://www.usgbc.org).

# Options

Options	No.	Description	Advantages	Used for 30XW-V/ 30XWHV
Master/slave operation	58	Control of two units in master/slave configuration	The remote controls are applied to the master unit only.	580-1710
Single power connection point	81	Power connection of the unit via one main supply connection	Quick and easy installation	1150-1710
Evaporator pump electrical power/control circuit	84	Unit equipped with an electrical power/control circuit for single evaporator pumps	Quick and easy installation	580-1710
Dual evaporator pump electrical power/control circuit	84D	Unit equipped with an electrical power/control circuit for dual evaporator pumps	Quick and easy installation	580-1710
Condenser pump electrical power/control circuit	84R	Unit equipped with an electrical power/control circuit for single condenser pumps	Quick and easy installation	580-1710
Dual condenser pump electrical power/control circuit	84T	Unit equipped with an electrical power/control circuit for dual evaporator pumps. Does not control condenser pump operation (for this function add option 156 and flow switch).	Quick and easy installation	580-1710
Condenser insulation	86	Thermal condenser insulation	Allows configuration with special installation criteria (hot parts insulated).	580-1710
Service valve set	92	Valve set consisting of liquid line valve (evaporator inlet) and compressor suction line valve to isolate the various refrigerant circuit components.	Simplified service and maintenance	580-1710
Evaporator with one pass	100C	Evaporator with one pass on the water-side. Evaporator inlet and outlet on opposite sides.	Quick and easy installation. Reduced evaporator pressure losses.	580-1710
Condenser with one pass	102C	Condenser with one pass on the water-side. Condenser inlet and outlet on opposite sides.	Quick and easy installation. Reduced condenser pressure losses.	580-1710
21 bar evaporator	104	Reinforced evaporator for extension of the maximum water-side service pressure to 21 bar	Covers applications with a high water column (high buildings)	580-1710
21 bar condenser	104A	Reinforced condenser for extension of the maximum water-side service pressure to 21 bar	Covers applications with a high water column (high buildings)	580-1710
Reversed evaporator water connections	107	Evaporator with reversed water inlet/outlet	Simplification of the water piping	580-1710
Reversed condenser water connections	107A	Condenser with reversed water inlet/outlet	Simplification of the water piping	580-1710
JBus gateway	148B	Two-directional communications board, complies with JBus protocol	Easy connection by communication bus to a building management system	580-1710
BacNet gateway	148C	Two-directional communications board, complies with BacNet protocol	Easy connection by communication bus to a building management system	580-1710
LON gateway	148D	Two-directional communications board, complies with LON protocol	Easy connection by communication bus to a building management system	580-1710
BACnet IP	149	Additional module for communication according to BacNet via Ethernet (IP)	Connection facility via high-speed Ethernet (RJ45) to a BMS system. Access to a number of important unit parameters.	580-1710
Condensing temperature limitation	150B	Limitation of the maximum condenser leaving water temperature to 45°C. Modification on the unit name plate to reflect the reduced power input and current values.	Avoids oversizing of the protection elements and the power cables.	580-1710
Control for low condensing temperature systems	152	Output signal (0-10 V) to control the condenser water inlet valve.	Used for applications with cold water at condenser inlet (well water). In this case the valve controls the water entering temp. to maintain an acceptable condensing pressure.	580-1710
Energy Management Module EMM	156	Remote control module. Additional contacts for an extension of the unit control functions.	Easy connection by wired connection to a building management system	580-1710
Leak detection	159	0-10 V signal to report any refrigerant leakage in the unit directly on the controller (the leak detector itself must be supplied by the customer)	Immediate customer notification of refrigerant losses to the atmosphere, allowing timely correction	580-1710
Code compliance for Switzerland in addition to PED code	197	Additional tests on the water heat exchangers. Additional supply of PED documents, supplementary certificates and test certificates.	Conformance with Swiss regulations	580-1710
Code compliance for Australia	200	Heat exchanger approved in accordance with the Australian code.	Conformance with Australian regulations	580-1710
Low noise level (-3 dB(A) compared to standard unit)	257	Evaporator sound insulation	3 dB(A) quieter than a unit without this option	580-1710
Welded evaporator water connection kit	266	Victaulic piping connections with welded joints.	Easy installation	580-1710
Welded condenser water connection kit	267	Victaulic piping connections with welded joints.	Easy installation	580-1710
Flanged evaporator water connection kit	268	Victaulic piping connections with flanged joints.	Easy installation	580-1710
Flanged condenser water connection kit	269	Victaulic piping connections with flanged joints.	Easy installation	580-1710
Thermal compressor insulation	271	Thermal compressor insulation	Prevents condensation forming on the compressor (due to the ambient air)	580-1710
EMC classification according to IEC 61800-3 - class C2	282	Frequency variator with RFI filter class C2.	Reduces the risk of electromagnetic interference, if the unit is installed in a residential environment	580-1710

# Physical data, 30XW-V units

30XW-V		580	630	810	880	1150	1280	1470	1570	1710
<b>Air conditioning/cooling floor application - as per EN14511-3 : 2011*</b>										
<b>Condition 1</b>										
Cooling capacity	kW	587	652	812	858	1140	1305	1461	1604	1741
EER*	kW/kW	5.44	5.31	5.25	5.07	5.45	5.50	5.38	5.05	4.94
Eurovent class, cooling		A	A	A	A	A	A	A	A	B
ESEER*	kW/kW	7.80	7.60	8.04	7.76	7.79	7.59	7.30	7.15	6.85
<b>Condition 2</b>										
Cooling capacity	kW	791	846	1023	970	1528	1688	1703	2093	2273
EER	kW/kW	6.96	6.50	6.22	5.63	6.86	6.64	5.99	6.00	6.00
Eurovent class, cooling		A	A	A	A	A	A	A	A	A
<b>Air conditioning/cooling floor application**</b>										
<b>Condition 1</b>										
Cooling capacity	kW	588	655	814	861	1144	1311	1469	1614	1754
EER	kW/kW	5.67	5.56	5.46	5.29	5.68	5.80	5.74	5.41	5.34
ESEER	kW/kW	9.03	9.04	9.52	9.25	9.08	9.17	9.08	9.16	9.01
<b>Condition 2</b>										
Cooling capacity	kW	794	850	1026	973	1537	1700	1715	2113	2297
EER	kW/kW	7.50	7.03	6.62	5.93	7.42	7.29	6.53	6.76	6.88
Operating weight***	kg	3152	3190	4157	4161	7322	7398	7574	7770	7808
<b>Sound levels, standard units</b>										
Sound power level 10 <sup>-12</sup> W****	dB(A)	105	105	105	105	106	106	106	106	106
Sound pressure level at 1 m†	dB(A)	87	87	87	87	87	87	87	87	87
<b>Sound levels, units with option 257</b>										
Sound power level 10 <sup>-12</sup> W****	dB(A)	102	102	102	102	103	103	103	103	103
Sound pressure level at 1 m†	dB(A)	84	84	84	84	84	84	84	84	84
<b>Dimensions</b>										
Length x depth x height	mm	3059 x 1087 x 1743			3290 x 1237 x 1950		4730 x 1164 x 1997		4730 x 1255 x 2051	
<b>Compressors</b>										
Semi-hermetic 06T screw compressor, 60 r/s										
Circuit A		1	1	1	1	1	1	1	1	1
Circuit B		-	-	-	-	1	1	1	1	1
<b>Refrigerant charge***</b>										
R-134a										
Circuit A	kg	130	130	180	175	120	120	115	115	110
Circuit B	kg	-	-	-	-	120	120	120	115	110
<b>Capacity control</b>										
Touch Pilot, inverter-driven compressor, electronic expansion valve (EXV)										
Minimum capacity	%	20	20	20	20	10	10	10	10	10
<b>Evaporator</b>										
Multi-tube type flooded										
Net water volume	l	106	106	154	154	297	297	297	297	297
Water connections										
Victaulic										
Inlet/outlet††	inch	6	6	8	8	8	8	8	8	8
Drain and purge (NPT)	inch	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8
Maximum water-side operating pressure	kPa	1000	1000	1000	1000	1000	1000	1000	1000	1000
<b>Condenser</b>										
Multi-tube type flooded										
Net water volume	l	112	112	165	165	340	340	340	340	340
Water connections										
Victaulic										
Inlet/outlet††	inch	6	6	8	8	8	8	8	8	8
Drain and purge (NPT)	inch	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8
Maximum water-side operating pressure	kPa	1000	1000	1000	1000	1000	1000	1000	1000	1000
Chassis paint colour		Colour code: RAL7035								

\* Eurovent-certified performances in accordance with standard EN14511-3:2011.

Condition 1: Conditions in cooling mode: evaporator water entering/leaving temperature 12°C/7°C, condenser water entering/leaving temperature 30°C/35°C, evaporator/condenser fouling factor = 0.

Condition 2: Conditions in cooling mode: evaporator water entering/leaving temperature 23°C/18°C, condenser water entering/leaving temperature 30°C/35°C, evaporator/condenser fouling factor = 0.

\*\* Gross performances, not in accordance with EN14511-3:2011. These performances do not take into account the correction for the proportional heating capacity and power input generated by the water pump to overcome the internal pressure drop in the heat exchanger.

Condition 1: Conditions in cooling mode: evaporator water entering/leaving temperature 12°C/7°C, condenser water entering/leaving temperature 30°C/35°C, evaporator/condenser fouling factor = 0.

Condition 2: Conditions in cooling mode: evaporator water entering/leaving temperature 23°C/18°C, condenser water entering/leaving temperature 30°C/35°C, evaporator/condenser fouling factor = 0.

\*\*\* Weights are guidelines only. The refrigerant charge is given on the unit nameplate.

\*\*\*\* In accordance with ISO 9614-1 and certified by Eurovent. Data is not contractually binding and data is for information only and rounded.

† For information, calculated from the sound power level Lw(A). In a free field at full load (ref. 2 x 10<sup>-3</sup> Pa).

†† For options 100C (single-pass evaporator) and 102C (single-pass condenser), please refer to chapter "Water connections" in the installation manual.

# Physical data, 30XWHV units

30XWHV		580	630	810	880	1150	1280	1470	1570	1710
<b>Heating application - as per EN14511-3 : 2011*</b>										
<b>Condition 1</b>										
Heating capacity	kW	648	719	890	974	1261	1428	1594	1761	1932
COP	kW/kW	4.64	4.53	4.56	4.43	4.62	4.61	4.55	4.33	4.16
Eurovent class, heating		A	A	A	B	A	A	A	B	B
<b>Condition 2</b>										
Heating capacity	kW	687	767	956	1021	1335	1524	1712	1898	2067
COP	kW/kW	6.15	5.98	5.96	5.81	6.05	6.00	5.82	5.49	5.34
Eurovent class, heating		A	A	A	A	A	A	A	A	A
<b>Heating application**</b>										
<b>Condition 1</b>										
Heating capacity	kW	646	716	887	970	1257	1423	1587	1753	1922
COP	kW/kW	4.84	4.75	4.75	4.63	4.87	4.93	4.92	4.70	4.56
<b>Condition 2</b>										
Heating capacity	kW	684	763	953	1017	1331	1519	1705	1889	2055
COP	kW/kW	6.59	6.49	6.39	6.25	6.61	6.72	6.66	6.33	6.27
Operating weight***	kg	3152	3190	4157	4161	7322	7398	7574	7770	7808
<b>Sound levels, standard units</b>										
Sound power level 10 <sup>-12</sup> W****	dB(A)	105	105	105	105	106	106	106	106	106
Sound pressure level at 1 m†	dB(A)	87	87	87	87	87	87	87	87	87
<b>Sound levels, units with option 257</b>										
Sound power level 10 <sup>-12</sup> W****	dB(A)	102	102	102	102	103	103	103	103	103
Sound pressure level at 1 m†	dB(A)	84	84	84	84	84	84	84	84	84
<b>Dimensions</b>										
Length x depth x height	mm	3059 x 1087 x 1743			3290 x 1237 x 1950		4730 x 1164 x 1997		4730 x 1255 x 2051	
<b>Compressors</b>										
Semi-hermetic 06T screw compressor, 60 r/s										
Circuit A		1	1	1	1	1	1	1	1	1
Circuit B		-	-	-	-	1	1	1	1	1
<b>Refrigerant charge***</b>										
R-134a										
Circuit A	kg	130	130	180	175	120	120	115	115	110
Circuit B	kg	-	-	-	-	120	120	120	115	110
<b>Capacity control</b>										
Touch Pilot, inverter-driven compressor, electronic expansion valve (EXV)										
Minimum capacity	%	20	20	20	20	10	10	10	10	10
<b>Evaporator</b>										
Multi-tube type flooded										
Net water volume	l	106	106	154	154	297	297	297	297	297
Water connections										
Victaulic										
Inlet/outlet††	inch	6	6	8	8	8	8	8	8	8
Drain and purge (NPT)	inch	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8
Maximum water-side operating pressure	kPa	1000	1000	1000	1000	1000	1000	1000	1000	1000
<b>Condenser</b>										
Multi-tube type flooded										
Net water volume	l	112	112	165	165	340	340	340	340	340
Water connections										
Victaulic										
Inlet/outlet††	inch	6	6	8	8	8	8	8	8	8
Drain and purge (NPT)	inch	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8
Maximum water-side operating pressure	kPa	1000	1000	1000	1000	1000	1000	1000	1000	1000
<b>Chassis paint colour</b>										
Colour code: RAL7035										

\* Eurovent-certified performances in accordance with standard EN14511-3:2011.

Condition 1: Conditions in heating mode: condenser water entering/leaving temperature 40°C/45°C, evaporator water entering/leaving temperature 10°C/7°C, evaporator/condenser fouling factor = 0.

Condition 2: Conditions in heating mode: condenser water entering/leaving temperature 30°C/35°C, evaporator water entering/leaving temperature 10°C/7°C, evaporator/condenser fouling factor = 0.

\*\* Gross performances, not in accordance with EN14511-3:2011. These performances do not take into account the correction for the proportional heating capacity and power input generated by the water pump to overcome the internal pressure drop in the heat exchanger.

Condition 1: Conditions in heating mode: condenser water entering/leaving temperature 40°C/45°C, evaporator water entering/leaving temperature 10°C/7°C, evaporator/condenser fouling factor = 0.

Condition 2: Conditions in heating mode: condenser water entering/leaving temperature 30°C/35°C, evaporator water entering/leaving temperature 10°C/7°C, evaporator/condenser fouling factor = 0.

\*\*\* Weights are guidelines only. The refrigerant charge is given on the unit nameplate.

\*\*\*\* In accordance with ISO 9614-1 and certified by Eurovent. Data is not contractually binding and data is for information only and rounded.

† For information, calculated from the sound power level L<sub>w</sub>(A). In a free field at full load (ref. 2 x 10<sup>-9</sup> Pa).

†† For options 100C (single-pass evaporator) and 102C (single-pass condenser), please refer to chapter "Water connections" in the installation manual.



# Electrical data

30XW-V/30XWHV		580	630	810	880	1150	1280	1470	1570	1710
<b>Power circuit</b>										
Nominal power supply	V-ph-Hz	400-3-50								
Voltage range	V	360-440								
<b>Control circuit</b>		24 V via the built-in transformer								
<b>Start-up current*</b>	A	Lower than the operating current								
<b>Maximum power factor**</b>		0.91-0.93	0.91-0.93	0.91-0.93	0.91-0.93	0.91-0.93	0.91-0.93	0.91-0.93	0.91-0.93	0.91-0.93
<b>Cosine phi</b>		>0.98	>0.98	>0.98	>0.98	>0.98	>0.98	>0.98	>0.98	>0.98
Total harmonic distortion***	%	35-45	35-45	35-45	35-45	35-45	35-45	35-45	35-45	35-45
<b>Maximum power input***</b>										
Circuit A	kW	155	193	222	246	155	193	222	222	246
Circuit B	kW	-	-	-	-	155	193	193	222	246
With option 81	kW	-	-	-	-	310	386	415	444	492
<b>Eurovent current draw****</b>										
Circuit A	A	175	200	240	265	175	200	240	240	265
Circuit B	A	-	-	-	-	175	200	200	240	265
With option 81	A	-	-	-	-	350	400	440	480	530
<b>Maximum current draw (Un)****</b>										
Circuit A	A	245	300	346	383	245	300	346	346	383
Circuit B	A	-	-	-	-	245	300	300	346	383
With option 81	A	-	-	-	-	490	600	646	692	766
<b>Maximum current draw (Un -10%)****</b>										
Circuit A	A	270	330	380	421	270	330	380	380	421
Circuit B	A	-	-	-	-	270	330	330	380	421
With option 81	A	-	-	-	-	540	660	710	760	842
<b>Maximum power input with option 150B****</b>										
Circuit A	kW	141	173	199	221	141	173	199	199	221
Circuit B	kW	-	-	-	-	141	173	173	199	221
With option 81	kW	-	-	-	-	282	346	372	398	442
<b>Maximum current draw (Un) with option 150B****</b>										
Circuit A	A	222	272	314	348	222	272	314	314	348
Circuit B	A	-	-	-	-	222	272	272	314	348
With option 81	A	-	-	-	-	444	544	586	628	696
<b>Dissipated power†</b>	W	3000	4200	4700	5300	6000	8400	8900	9400	10600

\* Instantaneous start-up current

\*\* This can vary as a function of the short-circuit current/maximum current ratio of the system transformer. Values obtained at operation with maximum unit power input.

\*\*\* Values obtained at operation with maximum unit power input. Values given on the unit name plate.

\*\*\*\* Eurovent unit operating conditions: evaporator entering/leaving water temperature = 12°C/7°C, condenser entering/leaving water temperature = 30°C/35°C.

Gross performances, not in accordance with EN14511-3:2011. These performances do not take into account the correction for the proportional heating capacity and power input generated by the water pump to overcome the internal pressure drop in the heat exchanger.

† Values obtained at operation with maximum unit power input.

## Notes, electrical data and operating conditions - 30XW-V/30XWHV units

- The control box includes the following standard features:
    - One main disconnect switch per circuit
    - Anti-short cycle protection devices
    - Control devices
  - **Field connections:**  
All connections to the system and the electrical installations must be in full accordance with all applicable codes.
  - The Carrier 30XW-V/30XWHV units are designed and built to ensure conformance with local codes. The recommendations of European standard EN 60204-1 (corresponds to IEC 60204-1) (machine safety - electrical machine components - part 1: general regulations) are specifically taken into account, when designing the electrical equipment\*.
  - Annex B of EN 60204 1 describes the electrical characteristics used for the operation of the machines. The ones described below apply to 30XW-V/30XWHV units and complement other information in this document:
1. Physical environment\*\*: Environment as classified in EN 60721 (corresponds to IEC 60721):
    - indoor installation
    - ambient temperature range: minimum temperature +5°C to +42°C, class AA4
    - altitude: lower than or equal to 2000 m
    - presence of water: class AD2 (possibility of water droplets)
    - 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(es)/circuit breaker(s) is (are) of a type suitable for power interruption in accordance with EN 60947-3 (corresponds to IEC 60947-3).
  6. The units are designed for connection to TN networks (IEC 60364). In IT networks the use of noise filters integrated into the frequency variator(s) make machine use unsuitable. In addition, the short-circuit holding current characteristics have been modified. Provide a local earth, consult competent local organisations to complete the electrical installation.
  7. Electromagnetic environment: classification of the electromagnetic environment is described in standard EN 61800-3 (corresponds to IEC 61800-3):
    - Immunity to external interference defined by the second environment\*\*\*
    - Interference emission as defined in category C3†
  - Due to the harmonic currents the integrated frequency variator in the 30XW-V/30XWHV units is a source of interference. An analysis may be required to verify if these interferences exceed the compatibility limits of the other devices connected to the same power supply network. The compatibility levels inside an electrical installation, that must be met at the in-plant coupling point (IPC) to which other loads are connected are described in standard 61000-2-4.  
Two characteristics are required for this analysis:
    - The short-circuit ratio (Rsce) of the installation calculated at the in-plant coupling point (IPC).
    - The total harmonic current distortion rate (THDI), calculated for the machine at maximum capacity.
  - Derived currents: If protection by monitoring the leakage currents is necessary to ensure the safety of the installation, the presence of derived currents introduced by the use of frequency variators in the unit must be considered. In particular the reinforced immunity protection types and a control value not lower than 150 mA are recommended to control differential protection devices.

**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.**

\* Generally the recommendations of IEC 60364 are accepted as compliance with the requirements of the installation directives. Conformance with EN 60204-1 is the best means of ensuring compliance with the Machinery Directive.

\*\* The required protection level for this class is IP21B or IPX1B (according to reference document IEC 60529). All 30XW-V/30XWHV have IP23 units fulfil this protection condition.

\*\*\* Example of installations of the second environment: industrial zones, technical locations supplied from a dedicated transformer.

† Category C3 is suitable for use in an industrial environment and is not designed for use in a public low-voltage system that supplies residential locations. As an option, conformity with category C2 permits this type of installation.

# Part load performances

With the rapid increase in energy costs and the care about environmental impacts of electricity production, power consumption of air conditioning equipment has become an important topic. The energy efficiency of a unit at full load is rarely representative of the actual performance of the units, as on average a unit works less than 5% of the time at full load.

## IPLV (in accordance with AHRI 550/590)

The IPLV (integrated part load value) allows evaluation of the average energy efficiency based on four operating conditions defined by the AHRI (Air Conditioning, Heating and Refrigeration Institute). The IPLV is the average weighted value of the energy efficiency ratios (EER) at different operating conditions, weighted by the operating time.

### IPLV (integrated part load value)

Load %	Condenser entering water temperature, °C	Energy efficiency	Operating time, %
100	29.4	EER <sub>1</sub>	1
75	23.9	EER <sub>2</sub>	42
50	18.3	EER <sub>3</sub>	45
25	18.3	EER <sub>4</sub>	12

$$\text{IPLV} = \text{EER}_1 \times 1\% + \text{EER}_2 \times 42\% + \text{EER}_3 \times 45\% + \text{EER}_4 \times 12\%$$

Note: Constant leaving water temperature: 6.67°C

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 average energy efficiency, calculated at several operating points that are representative for the unit utilisation.

## ESEER (in accordance with 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 %	Condenser entering water temperature, °C	Energy efficiency	Operating time, %
100	30	EER <sub>1</sub>	3
75	26	EER <sub>2</sub>	33
50	22	EER <sub>3</sub>	41
25	18	EER <sub>4</sub>	23

$$\text{ESEER} = \text{EER}_1 \times 3\% + \text{EER}_2 \times 33\% + \text{EER}_3 \times 41\% + \text{EER}_4 \times 23\%$$

Note: Constant leaving water temperature: 7°C

## Part load performances

30XW-V 580 to 1710										
30XW-V		580	630	810	880	1150	1280	1470	1570	1710
IPLV	kW/kW	9.06	9.12	9.45	8.95	9.24	9.30	9.17	9.30	8.98
ESEER	kW/kW	7.80	7.60	8.04	7.76	7.79	7.59	7.30	7.15	6.85

30XWHV 580 to 1710										
30XWHV		580	630	810	880	1150	1280	1470	1570	1710
IPLV	kW/kW	9.06	9.12	9.45	8.95	9.24	9.30	9.17	9.30	8.98
ESEER	kW/kW	7.80	7.60	8.04	7.76	7.79	7.59	7.30	7.15	6.85

ESEER Calculations according to standard performances (in accordance with EN14511-3:2011) and certified by Eurovent.

IPLV Calculations according to standard performances (in accordance with AHRI 550-590)

# Sound spectrum

**30XW-V/30XWHV 580-880 standard units**

%	Octave bands, Hz							Sound power levels
	125	250	500	1k	2k	4k		
100	dB	88	102	105	100	94	84	dB(A) 105
75*	dB	88	97	101	100	95	84	dB(A) 103
50*	dB	91	95	94	94	87	86	dB(A) 97
25*	dB	91	95	94	94	87	86	dB(A) 97

**30XW-V/30XWHV 580-880 - units with option 257\*\***

%	Octave bands, Hz							Sound power levels
	125	250	500	1k	2k	4k		
100	dB	85	99	102	97	91	81	dB(A) 102
75*	dB	85	94	98	97	92	81	dB(A) 100
50*	dB	88	92	91	91	84	83	dB(A) 94
25*	dB	88	92	91	91	84	83	dB(A) 94

**30XW-V/30XWHV 1150-1710 standard units**

%	Octave bands, Hz							Sound power levels
	125	250	500	1k	2k	4k		
100	dB	91	102	104	103	97	84	dB(A) 106
75*	dB	81	96	105	102	93	80	dB(A) 105
50*	dB	97	91	98	93	81	80	dB(A) 97
25*	dB	100	90	96	91	79	80	dB(A) 96

**30XW-V/30XWHV 1150-1710 - units with option 257\*\***

%	Octave bands, Hz							Sound power levels
	125	250	500	1k	2k	4k		
100	dB	88	99	101	100	94	81	dB(A) 103
75*	dB	78	93	102	99	90	77	dB(A) 102
50*	dB	94	88	95	90	78	77	dB(A) 94
25*	dB	97	87	93	88	76	77	dB(A) 93

\* Values for information only and not contractually binding.  
 \*\* Evaporator equipped with acoustic insulation.

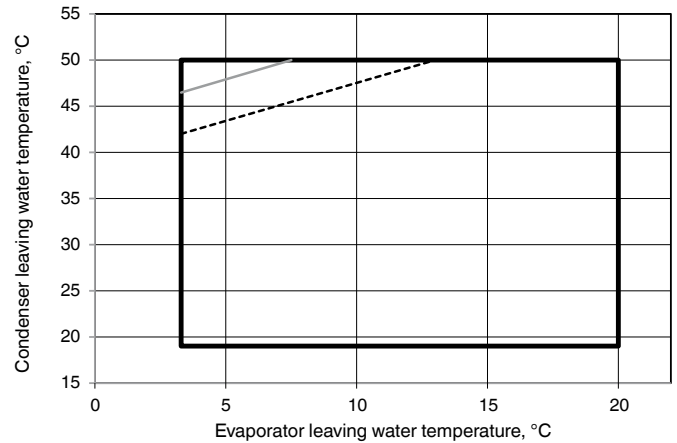
# Operating limits and operating range

30XW-V/30XWHV	Minimum	Maximum
<b>Evaporator</b>		
Entering temperature at start-up	-	35.0°C
Leaving temperature during operation	3.3°C*	20.0°C
Entering/leaving temperature difference at full load	2.8 K	11.1 K
<b>Condenser</b>		
Entering temperature at start-up	13.0°C**	-
Leaving temperature during operation	19.0°C**	50.0°C
Entering/leaving temperature difference at full load	2.8 K	11.1 K

\* Options 5/6 not available  
 \*\* For lower condenser temperatures, a water flow control valve must be installed at the condenser (two-way or three-way). Please refer to option 152 to ensure the correct condensing temperature.

**Notes:**  
 Ambient temperatures: During storage and transport of the units (including by container) the minimum and maximum permissible temperatures are -20°C and 72°C (and 65°C for option 200).

For more precise details refer to the unit selection program.

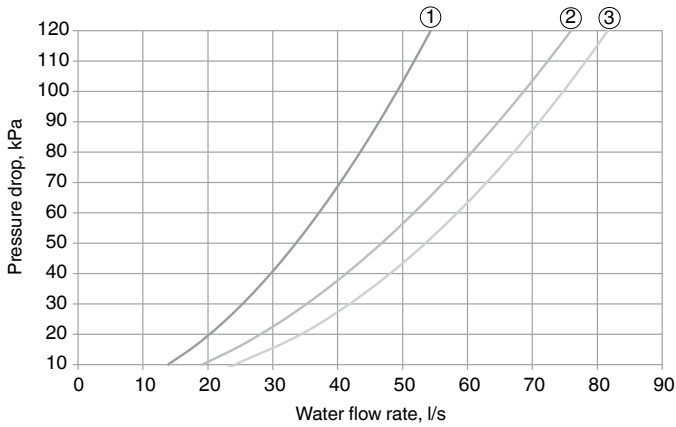


— From approx. 50% to full load  
 - - - Part load limit approx. 50%  
 . . . Minimum load limit

For more precise details please refer to the unit selection program.

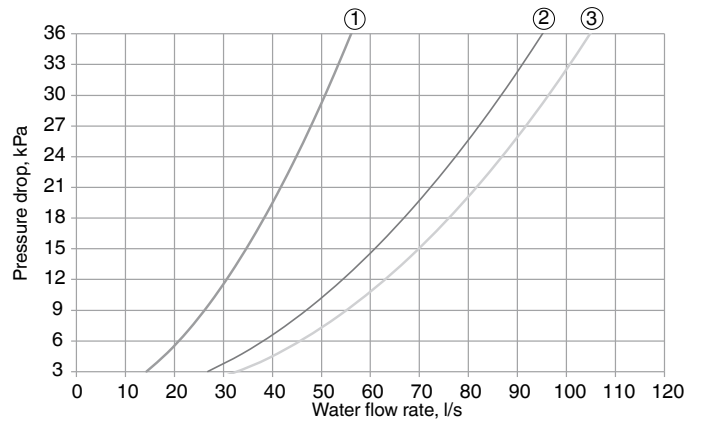
# Pressure drop curves, 30XW-V/30XWHV units

## Units with two evaporator passes (standard)



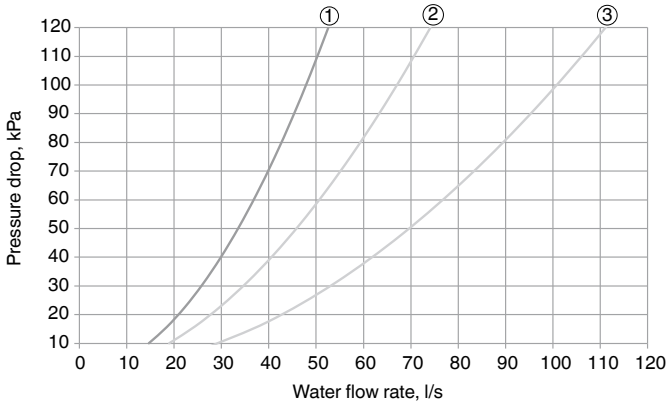
- 1 Sizes 580, 630
- 2 Sizes 810, 880
- 3 Sizes 1150, 1280, 1470, 1570, 1710

## Units with one evaporator pass (option 100C)



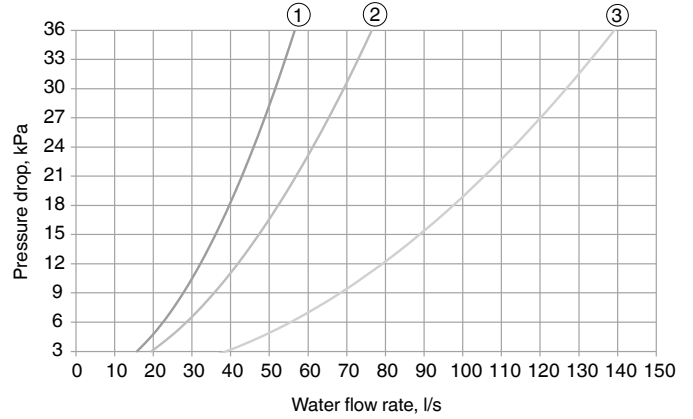
- 1 Sizes 580, 630
- 2 Sizes 810, 880
- 3 Sizes 1150, 1280, 1470, 1570, 1710

## Units with two condenser passes (standard)



- 1 Sizes 580, 630
- 2 Sizes 810, 880
- 3 Sizes 1150, 1280, 1470, 1570, 1710

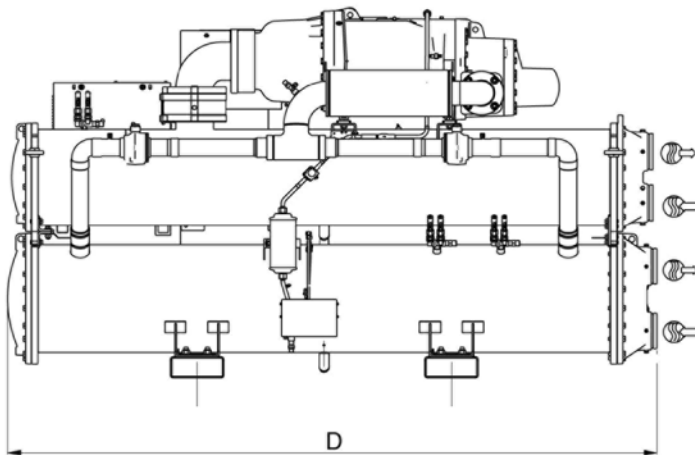
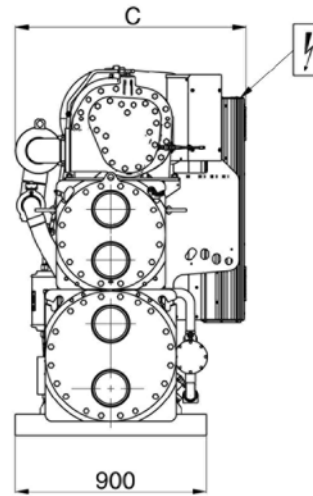
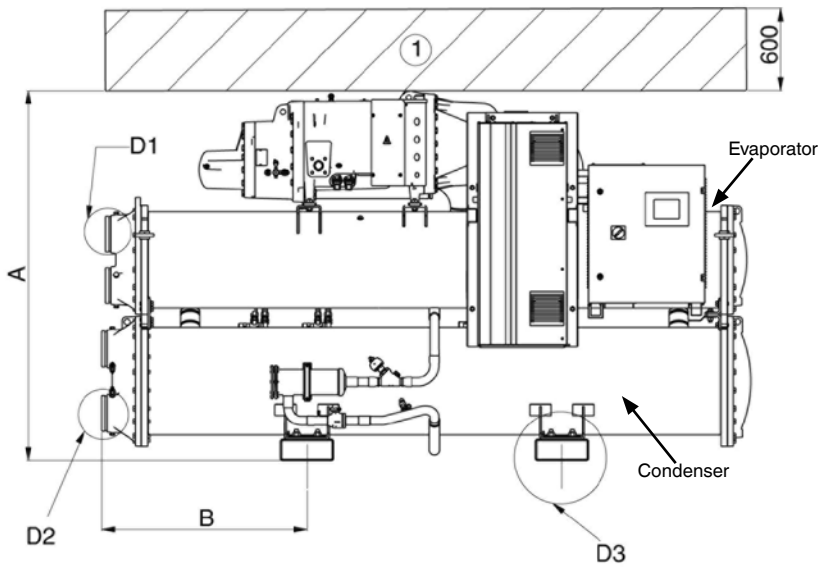
## Units with one condenser pass (option 102C)



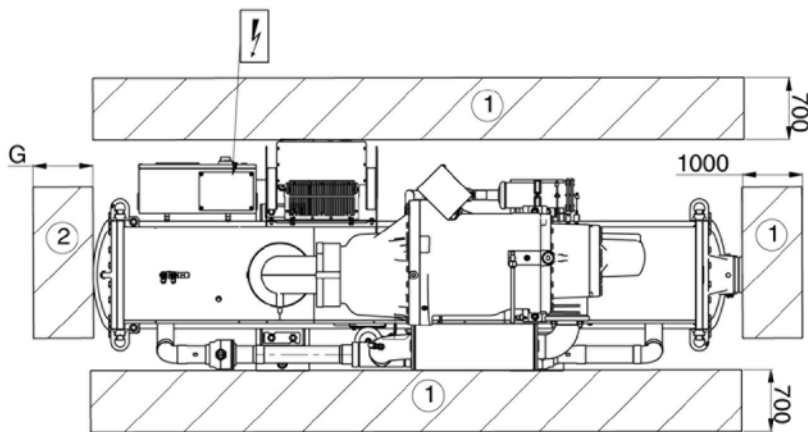
- 1 Sizes 580, 630
- 2 Sizes 810, 880
- 3 Sizes 1150, 1280, 1470, 1570, 1710

# Dimensions/clearances

30XW-V/30XWHV 580-880



Dimensions in mm							
	A	B	C	D	E	F	G
<b>30XW-V/30XWHV</b>							
<b>580</b>	1743	968	1087	3059	168.3	168.3	2900
<b>630</b>	1743	968	1087	3059	168.3	168.3	2900
<b>810</b>	1950	1083	1237	3290	219.1	219.1	3100
<b>880</b>	1950	1083	1237	3290	219.1	219.1	3100



**Legend:**

All dimensions are in mm.

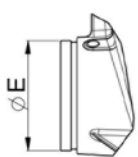
① Required clearance for maintenance

② Recommended clearance for tube removal

Water inlet

Water outlet

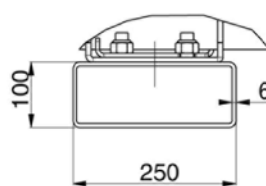
Power supply connection



D1



D2

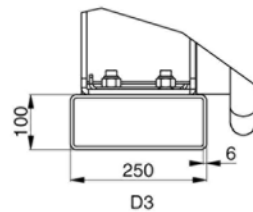
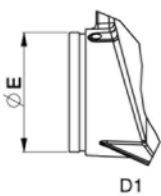
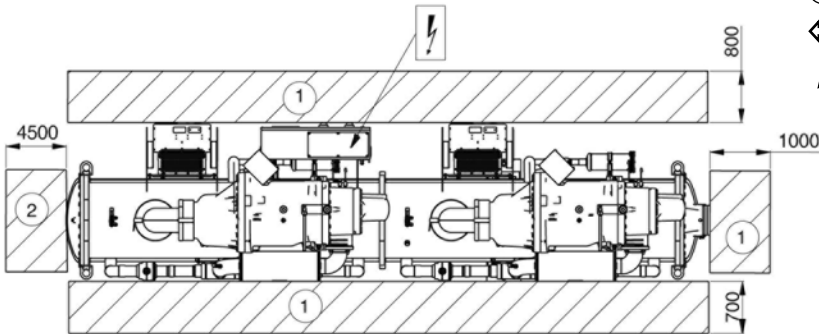
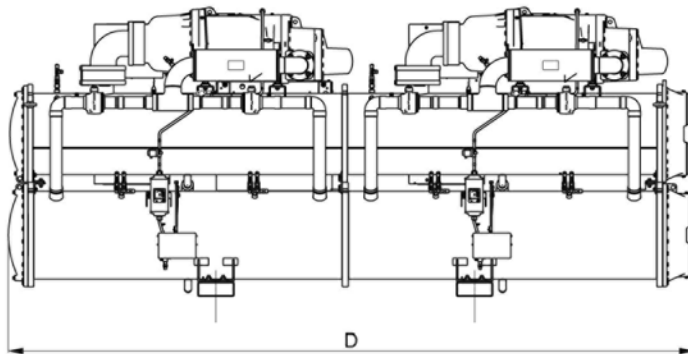
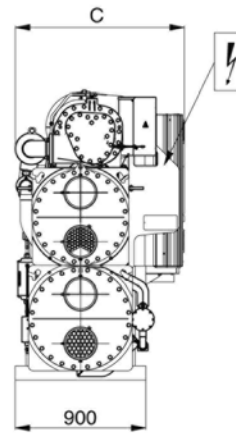
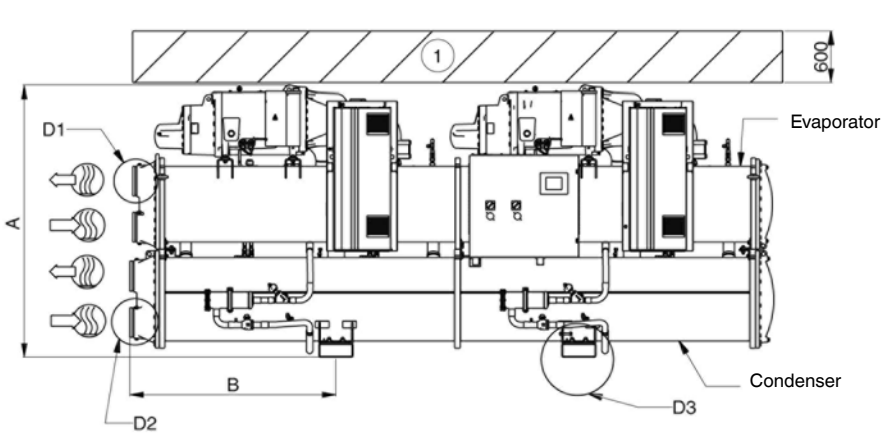


D3

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

# Dimensions/clearances

30XW-V/30XWHV 1150-1710



Dimensions in mm

	A	B	C	D	E	F
<b>30XW-V/30XWHV</b>						
<b>1150</b>	1997	1514	1164	4730	219.1	219.1
<b>1280</b>	1997	1514	1164	4730	219.1	219.1
<b>1470</b>	2051	1514	1255	4730	219.1	219.1
<b>1570</b>	2051	1514	1255	4730	219.1	219.1
<b>1710</b>	2051	1514	1255	4730	219.1	219.1

**Legend:**

All dimensions are in mm.

- ① Required clearance for maintenance
- ② Recommended clearance for tube removal
- Water inlet
- Water outlet
- Power supply connection

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

# Cooling capacities in accordance with EN14511-3 : 2011

## Standard-efficiency 30XW-V units

		30XW-V																			
		Condenser entering water temperature, °C																			
LWT °C		25				30				35				40				45			
		Qc kW	EER kW/ kW	q l/s	Δp kPa	Qc kW	EER kW/ kW	q l/s	Δp kPa	Qc kW	EER kW/ kW	q l/s	Δp kPa	Qc kW	EER kW/ kW	q l/s	Δp kPa	Qc kW	EER kW/ kW	q l/s	Δp kPa
580	5	570	5.95	27	33	540	5.03	26	30	509	4.22	24	27	478	3.51	23	24	447	2.88	21	21
630		634	5.80	30	41	601	4.88	29	37	565	4.09	27	33	527	3.39	25	29	486	2.76	23	25
810		791	5.72	38	37	749	4.86	36	33	703	4.09	34	30	654	3.41	31	26	603	2.81	29	22
880		810	5.50	39	38	812	4.82	39	38	762	4.03	36	34	711	3.32	34	30	658	2.69	31	26
1150		1110	5.99	53	52	1052	5.07	50	47	993	4.26	47	42	932	3.54	45	37	870	2.90	42	33
1280		1271	6.02	61	70	1206	5.09	58	63	1135	4.28	54	56	1060	3.56	51	49	979	2.91	47	42
1470		1425	5.87	68	87	1348	4.99	65	78	1266	4.22	61	69	1179	3.53	56	60	1089	2.90	52	52
1570		1567	5.50	75	103	1478	4.68	71	92	1385	3.97	66	81	1288	3.34	62	70	1186	2.75	57	60
1710		1702	5.46	82	121	1605	4.62	77	108	1505	3.87	72	95	1400	3.20	67	83	1293	2.59	62	71
580	7	613	6.33	29	37	581	5.35	28	34	549	4.50	26	30	516	3.75	25	27	482	3.09	23	24
630		680	6.18	33	46	645	5.21	31	42	608	4.37	29	37	568	3.64	27	33	525	2.98	25	29
810		829	5.95	40	39	805	5.18	39	37	756	4.37	36	33	704	3.66	34	29	651	3.04	31	25
880		835	5.63	40	39	854	5.01	41	41	819	4.27	39	38	765	3.54	37	33	709	2.89	34	29
1150		1193	6.35	57	60	1132	5.38	54	54	1070	4.54	51	48	1006	3.78	48	43	940	3.12	45	38
1280		1358	6.39	65	79	1294	5.42	62	72	1220	4.57	58	64	1142	3.81	55	56	1057	3.13	51	48
1470		1515	6.16	73	97	1447	5.30	69	89	1361	4.49	65	79	1270	3.78	61	69	1175	3.13	56	59
1570		1681	5.78	81	116	1587	4.96	76	104	1488	4.22	71	92	1385	3.55	66	80	1279	2.96	61	69
1710		1823	5.72	88	136	1721	4.85	83	122	1615	4.09	78	108	1505	3.39	72	94	1391	2.77	67	81
580	10	674	6.85	32	43	648	5.86	31	40	613	4.94	29	36	577	4.13	28	33	540	3.42	26	29
630		745	6.66	36	53	716	5.66	34	49	676	4.77	32	44	633	3.98	30	39	584	3.27	28	34
810		879	6.22	42	43	860	5.45	41	41	840	4.75	40	40	784	4.01	38	35	726	3.34	35	30
880		874	5.82	42	42	892	5.19	43	43	899	4.62	43	44	850	3.90	41	40	789	3.21	38	35
1150		1307	6.83	63	70	1260	5.87	60	65	1193	4.96	57	59	1124	4.16	54	52	1053	3.45	50	46
1280		1438	6.69	69	86	1435	5.87	69	86	1355	4.96	65	77	1270	4.16	61	68	1179	3.45	55	56
1470		1642	6.51	79	112	1591	5.67	76	105	1511	4.86	73	95	1413	4.11	68	83	1309	3.43	63	72
1570		1861	6.19	90	140	1759	5.33	85	125	1652	4.56	79	111	1540	3.86	74	97	1424	3.23	68	83
1710		2018	6.13	97	164	1906	5.25	92	146	1790	4.44	86	130	1670	3.71	80	113	1503	3.01	72	94
580	15	738	7.39	35	50	740	6.53	36	50	731	5.70	35	49	690	4.80	33	44	645	4.00	31	39
630		825	7.20	40	62	826	6.31	40	63	790	5.36	38	58	690	4.26	33	45	585	3.28	28	33
810		965	6.66	46	50	949	5.84	46	48	938	5.13	45	47	919	4.48	44	45	851	3.77	41	40
880		910	5.99	44	44	945	5.45	45	47	957	4.90	46	48	940	4.28	45	47	798	3.24	38	35
1150		1441	7.38	69	82	1421	6.44	68	80	1421	5.68	68	80	1341	4.80	64	72	1257	4.04	60	64
1280		1593	7.20	77	103	1588	6.31	76	102	1587	5.55	76	102	1400	4.58	72	102	1191	3.52	67	72
1470		1711	6.69	82	118	1707	5.93	82	117	1659	5.17	80	111	1655	4.58	80	111	1506	3.89	72	91
1570		2187	6.83	106	186	2055	5.80	99	165	1942	5.06	94	148	1809	4.32	87	129	1606	3.70	77	102
1710		2206	6.49	107	190	2182	5.79	106	186	2077	5.14	93	148	1788	4.06	85	125	1511	3.03	72	91
580	18	772	7.67	37	53	776	6.78	37	54	780	5.99	38	54	728	5.01	35	48	645	4.00	31	38
630		866	7.48	42	67	841	6.39	40	64	794	5.38	38	57	693	4.28	33	45	587	3.29	28	33
810		1009	6.88	49	53	1003	6.08	48	53	993	5.34	48	52	926	4.51	45	46	858	3.80	41	40
880		932	6.10	45	45	961	5.53	46	48	982	5.01	47	50	929	4.18	45	45	802	3.26	39	34
1150		1523	7.69	73	90	1512	6.75	73	89	1508	5.93	73	89	1421	5.12	68	80	1259	4.08	60	63
1280		1699	7.54	82	115	1674	6.54	81	111	1597	5.57	77	102	1406	4.57	67	78	1197	3.53	57	57
1470		1725	6.73	83	118	1706	5.93	82	115	1685	5.22	81	113	1654	4.58	80	109	1510	3.90	72	89
1570		2200	6.85	107	186	2078	5.91	101	166	1952	5.08	94	147	1820	4.33	88	128	1583	3.74	76	98
1710		2356	6.73	114	212	2255	5.91	109	195	2083	5.08	100	168	1788	4.03	86	125	1511	3.02	72	89

### Legend

LWT Leaving water temperature, °C  
 Qc Cooling capacity, kW  
 EER Energy efficiency ratio, kW/kW  
 q Evaporator water flow rate, l/s  
 Δp Evaporator pressure drop, kPa

### Application data

Standard units, refrigerant: R-134a  
 Evaporator entering/leaving water temperature difference: 5 K  
 Condenser entering/leaving water temperature difference: 5 K  
 Evaporator and condenser fluid: chilled water  
 Fouling factor:  $0.18 \times 10^{-4} \text{ (m}^2 \text{ K)/W}$

Performances in accordance with EN14511-3:2011.

# Cooling capacities

## Standard-efficiency 30XW-V units

30XW-V		Condenser entering water temperature, °C																			
		25				30				35				40				45			
		Qc kW	EER kW/kW	q l/s	Δp kPa	Qc kW	EER kW/kW	q l/s	Δp kPa	Qc kW	EER kW/kW	q l/s	Δp kPa	Qc kW	EER kW/kW	q l/s	Δp kPa	Qc kW	EER kW/kW	q l/s	Δp kPa
580	5	571	6.21	27	33	541	5.21	26	30	510	4.34	24	27	479	3.59	23	24	447	2.93	21	21
630		636	6.09	30	41	603	5.08	29	37	567	4.22	27	33	528	3.48	25	29	488	2.82	23	25
810		793	5.96	38	37	751	5.03	36	33	704	4.20	34	30	655	3.49	31	26	604	2.86	29	22
880		813	5.73	39	38	814	5.00	39	38	764	4.15	36	34	713	3.40	34	30	659	2.74	31	26
1150		1114	6.26	53	52	1056	5.26	50	47	996	4.38	47	42	934	3.62	45	37	872	2.95	42	33
1280		1277	6.38	61	70	1211	5.33	58	63	1140	4.44	54	56	1063	3.66	51	49	982	2.97	47	42
1470		1433	6.27	68	87	1355	5.27	65	78	1272	4.40	61	69	1184	3.65	56	60	1092	2.98	52	52
1570		1576	5.91	75	103	1486	4.96	71	92	1392	4.16	66	81	1294	3.46	62	70	1191	2.83	57	60
1710		1714	5.92	82	121	1616	4.93	77	108	1513	4.07	72	95	1408	3.33	67	83	1299	2.67	62	71
580	7	615	6.65	29	37	583	5.57	28	34	550	4.65	26	30	517	3.85	25	27	483	3.15	23	24
630		682	6.55	33	46	648	5.45	31	42	610	4.54	29	37	569	3.75	27	33	527	3.05	25	29
810		831	6.23	40	39	808	5.38	39	37	758	4.51	36	33	706	3.76	34	29	652	3.10	31	25
880		838	5.87	40	39	856	5.22	41	41	822	4.42	39	38	767	3.64	37	33	711	2.95	34	29
1150		1198	6.69	57	60	1137	5.61	54	54	1074	4.69	51	48	1009	3.88	48	43	943	3.18	45	38
1280		1365	6.83	65	79	1300	5.72	62	72	1226	4.76	58	64	1146	3.94	55	56	1061	3.22	51	48
1470		1524	6.65	73	97	1455	5.64	69	89	1368	4.72	65	79	1276	3.93	61	69	1179	3.22	56	59
1570		1692	6.29	81	116	1597	5.31	76	104	1497	4.45	71	92	1392	3.71	66	80	1284	3.06	61	69
1710		1838	6.29	88	136	1733	5.23	83	122	1625	4.34	78	108	1514	3.55	72	94	1398	2.87	67	81
580	10	676	7.27	32	43	650	6.15	31	40	614	5.14	29	36	578	4.27	28	33	542	3.51	26	29
630		748	7.13	36	53	719	5.99	34	49	678	4.99	32	44	635	4.13	30	39	585	3.37	28	34
810		882	6.55	42	43	862	5.70	41	41	842	4.94	40	40	786	4.13	38	35	728	3.43	35	30
880		877	6.09	42	42	895	5.43	43	43	902	4.81	43	44	852	4.03	41	40	791	3.29	38	35
1150		1313	7.27	63	70	1266	6.18	60	65	1198	5.17	57	59	1128	4.30	54	52	1057	3.54	50	46
1280		1446	7.21	69	86	1442	6.27	69	86	1362	5.23	65	77	1276	4.34	61	68	1184	3.56	55	56
1470		1653	7.13	79	112	1601	6.12	76	105	1520	5.17	73	95	1420	4.31	68	83	1316	3.56	63	72
1570		1876	6.87	90	140	1772	5.80	85	125	1663	4.87	79	111	1549	4.07	74	97	1431	3.37	68	83
1710		2037	6.90	97	164	1922	5.76	92	146	1804	4.78	86	130	1681	3.93	80	113	1505	3.09	72	94
580	15	740	7.94	35	50	743	6.97	36	50	733	6.03	35	49	692	5.03	33	44	647	4.14	31	39
630		828	7.82	40	62	830	6.80	40	63	794	5.70	38	58	692	4.45	33	45	586	3.37	28	33
810		969	7.08	46	50	952	6.16	46	48	941	5.37	45	47	922	4.67	44	45	854	3.90	41	40
880		913	6.30	44	44	949	5.73	45	47	961	5.13	46	48	943	4.46	45	47	800	3.33	38	35
1150		1448	7.97	69	82	1428	6.89	68	80	1428	6.04	68	80	1347	5.03	64	72	1260	4.16	60	64
1280		1603	7.90	77	103	1598	6.84	76	102	1597	5.97	76	102	1401	4.69	67	80	1191	3.58	57	58
1470		1723	7.38	82	118	1719	6.47	82	117	1670	5.57	80	111	1666	4.90	80	111	1507	3.99	72	91
1570		2209	7.89	106	186	2074	6.49	99	165	1958	5.54	94	148	1823	4.64	87	129	1616	3.90	77	102
1710		2229	7.48	107	190	2204	6.57	106	186	2086	5.51	100	171	1789	4.19	85	125	1512	3.10	72	91
580	18	775	8.29	37	53	779	7.27	37	54	783	6.39	38	54	730	5.27	35	48	647	4.14	31	38
630		870	8.20	42	67	844	6.90	40	64	797	5.72	38	57	695	4.47	33	45	589	3.38	28	33
810		1012	7.36	49	53	1007	6.45	48	53	996	5.63	48	52	929	4.70	45	46	861	3.92	41	40
880		935	6.43	45	45	964	5.82	46	48	985	5.26	47	50	932	4.35	45	45	804	3.34	39	34
1150		1531	8.39	73	90	1521	7.28	73	89	1516	6.35	73	89	1422	5.27	68	80	1259	4.15	60	63
1280		1711	8.38	82	115	1685	7.16	81	111	1607	6.00	77	102	1408	4.71	67	78	1198	3.60	57	57
1470		1738	7.43	83	118	1717	6.46	82	115	1696	5.63	81	113	1665	4.89	80	109	1511	4.00	72	89
1570		2223	7.93	107	186	2098	6.63	101	166	1969	5.57	94	147	1833	4.66	88	128	1593	3.94	76	98
1710		2383	7.92	114	212	2279	6.76	109	195	2097	5.54	100	168	1791	4.18	86	125	1512	3.08	72	89

### Legend

LWT Leaving water temperature, °C  
 Qc Cooling capacity, kW  
 EER Energy efficiency ratio, kW/kW  
 q Evaporator water flow rate, l/s  
 Δp Evaporator pressure drop, kPa

### Application data

Standard units, refrigerant: R-134a  
 Evaporator entering/leaving water temperature difference: 5 K  
 Condenser entering/leaving water temperature difference: 5 K  
 Evaporator and condenser fluid: chilled water  
 Fouling factor:  $0.18 \times 10^{-4}$  (m<sup>2</sup> K)/W

Gross performances, not in accordance with EN14511-3:2011. These performances do not take into account the correction for the proportional heating capacity and power input generated by the water pump to overcome the internal pressure drop in the heat exchanger.



# Heating capacities in accordance with EN14511-3 : 2011

## Standard-efficiency 30XWHV units

30XWHV		Evaporator entering water temperature, °C															
LWT °C		8				10				15				18			
		Qh kW	COP kW/kW	q l/s	Δp kPa	Qh kW	COP kW/kW	q l/s	Δp kPa	Qh kW	COP kW/kW	q l/s	Δp kPa	Qh kW	COP kW/kW	q l/s	Δp kPa
580	30	657	6.62	31	45	701	6.93	34	50	795	7.57	38	61	836	7.83	40	67
630		735	6.42	35	55	781	6.74	37	60	886	7.31	42	75	932	7.53	45	81
810		921	6.40	44	45	959	6.60	46	48	1055	6.99	50	57	1109	7.20	53	63
880		949	6.20	45	47	980	6.33	47	49	1041	6.57	50	55	1060	6.65	51	57
1150		1281	6.54	61	37	1366	6.81	65	42	1534	7.29	73	52	1630	7.54	78	58
1280		1465	6.46	70	49	1556	6.73	74	55	1708	7.06	82	65	1810	7.24	87	73
1470		1648	6.24	79	61	1741	6.43	83	68	1929	6.71	92	82	1969	6.76	94	85
1570		1829	5.87	87	73	1946	6.04	93	82	2268	6.36	108	109	2480	6.48	118	128
1710		1987	5.77	95	85	2115	5.90	101	95	2407	6.17	115	121	2531	6.24	121	133
580	35	639	5.79	31	42	681	6.06	33	46	796	6.77	38	60	846	7.04	40	67
630		715	5.61	34	51	760	5.89	36	56	883	6.49	42	73	950	6.77	45	82
810		892	5.61	43	41	949	5.89	45	46	1048	6.28	50	55	1110	6.48	53	62
880		968	5.57	46	47	1014	5.74	49	51	1086	6.01	52	58	1112	6.13	53	61
1150		1244	5.75	60	35	1327	5.99	64	39	1549	6.59	74	52	1635	6.79	78	57
1280		1424	5.68	68	46	1514	5.93	73	51	1733	6.38	83	66	1829	6.54	88	73
1470		1597	5.54	77	56	1698	5.76	81	63	1944	6.11	93	81	1970	6.15	94	83
1570		1769	5.23	85	67	1881	5.42	90	75	2190	5.77	105	100	2394	5.91	114	117
1710		1925	5.13	92	79	2047	5.27	98	88	2372	5.64	113	116	2532	5.76	121	130
580	40	621	5.04	30	39	662	5.28	32	43	773	5.92	37	56	848	6.30	41	66
630		693	4.88	33	47	737	5.14	35	53	855	5.69	41	67	930	5.97	45	77
810		862	4.91	41	38	916	5.16	44	43	1054	5.65	51	55	1112	5.82	53	60
880		938	4.84	45	44	997	5.05	48	49	1109	5.47	53	59	1146	5.62	55	63
1150		1210	5.02	58	32	1289	5.25	62	36	1505	5.81	72	48	1650	6.13	79	57
1280		1381	4.99	66	42	1467	5.22	70	47	1704	5.69	82	62	1854	5.92	89	73
1470		1544	4.89	74	52	1641	5.10	79	58	1907	5.51	91	77	1967	5.58	94	81
1570		1708	4.64	82	62	1814	4.83	87	69	2109	5.19	101	91	2302	5.35	110	107
1710		1865	4.52	89	73	1980	4.67	95	81	2288	5.07	110	106	2457	5.61	118	121
580	45	605	4.37	29	37	644	4.59	31	41	750	5.17	36	52	822	5.51	39	61
630		672	4.23	32	44	713	4.46	34	49	827	4.96	40	62	842	5.03	40	64
810		832	4.27	40	35	883	4.50	42	39	1024	4.99	49	51	1113	5.23	53	59
880		911	4.17	44	41	966	4.38	46	45	1113	4.92	53	59	1141	5.00	55	61
1150		1178	4.36	57	30	1254	4.58	60	34	1461	5.10	70	45	1598	5.40	77	53
1280		1337	4.34	64	39	1419	4.56	68	44	1646	5.02	79	57	1682	5.46	81	60
1470		1490	4.29	72	48	1582	4.50	76	53	1835	4.90	88	70	1989	5.08	95	81
1570		1648	4.10	79	57	1747	4.27	84	63	2025	4.64	97	83	2206	4.82	106	97
1710		1808	3.95	87	67	1917	4.10	92	75	2198	4.37	105	97	2203	4.98	106	97
580	50	591	3.76	28	35	628	3.96	30	38	729	4.48	35	49	796	4.79	38	57
630		651	3.64	31	41	690	3.84	33	45	751	4.12	36	52	753	4.13	36	52
810		803	3.70	39	32	851	3.91	41	36	983	4.37	47	47	1065	4.59	51	54
880		886	3.58	43	38	938	3.76	45	42	1028	4.09	50	50	1030	4.10	50	50
1150		1152	3.77	56	28	1224	3.96	59	32	1420	4.45	68	42	1551	4.73	75	49
1280		1295	3.75	62	36	1372	3.95	66	40	1506	4.44	73	48	1509	4.46	73	48
1470		1438	3.73	69	44	1524	3.93	73	49	1763	4.33	85	64	1869	4.81	90	71
1570		1589	3.58	77	52	1682	3.75	81	58	1941	4.12	93	75	2017	4.36	97	81
1710		1759	3.41	85	63	1859	3.56	89	70	1976	3.96	95	78	1981	3.98	95	78

### Legend

LWT Leaving water temperature, °C  
 Qh Heating capacity, kW  
 COP Coefficient of performance, kW/kW  
 q Condenser water flow rate, l/s  
 Δp Condenser pressure drop, kPa

### Application data

Standard units, refrigerant: R-134a  
 Evaporator entering/leaving water temperature difference: 3 K  
 Condenser entering/leaving water temperature difference: 5 K  
 Evaporator and condenser fluid: water  
 Fouling factor: 0.18 x 10<sup>-4</sup> (m<sup>2</sup> K)/W

Performances in accordance with EN14511-3:2011.

# Heating capacities

## Standard-efficiency 30XWHV units

		30XWHV															
		Evaporator entering water temperature, °C															
LWT °C		8				10				15				18			
		Qh kW	COP kW/kW	q l/s	Δp kPa	Qh kW	COP kW/kW	q l/s	Δp kPa	Qh kW	COP kW/kW	q l/s	Δp kPa	Qh kW	COP kW/kW	q l/s	Δp kPa
580	30	655	7.13	31	45	699	7.56	34	50	792	8.50	38	61	832	8.92	40	67
630		732	7.00	35	55	777	7.46	37	60	881	8.36	42	75	927	8.75	45	81
810		918	6.89	44	45	956	7.16	46	48	1051	7.74	50	57	1105	8.06	53	63
880		945	6.67	45	47	977	6.84	47	49	1037	7.17	50	55	1056	7.28	51	57
1150		1277	7.18	61	37	1362	7.60	65	42	1528	8.45	73	52	1624	8.93	78	58
1280		1460	7.28	70	49	1550	7.75	74	55	1701	8.43	82	65	1802	8.87	87	73
1470		1641	7.18	79	61	1733	7.56	83	68	1919	8.24	92	82	1959	8.37	94	85
1570		1820	6.82	87	73	1936	7.20	93	82	2253	8.17	108	109	2461	8.80	118	128
1710		1977	6.84	95	85	2102	7.20	101	95	2390	8.08	115	121	2512	8.43	121	133
580	35	637	6.13	31	42	679	6.49	33	46	793	7.47	38	60	841	7.89	40	67
630		712	5.99	34	51	756	6.37	36	56	878	7.27	42	73	945	7.74	45	82
810		889	5.95	43	41	946	6.30	45	46	1044	6.84	50	55	1105	7.14	53	62
880		964	5.93	46	47	1010	6.16	49	51	1081	6.53	52	58	1107	6.68	53	61
1150		1241	6.19	60	35	1323	6.54	64	39	1543	7.49	74	52	1629	7.86	78	57
1280		1420	6.24	68	46	1508	6.63	73	51	1725	7.45	83	66	1820	7.79	88	73
1470		1591	6.18	77	56	1691	6.56	81	63	1934	7.31	93	81	1959	7.38	94	83
1570		1761	5.88	85	67	1872	6.23	90	75	2176	7.04	105	100	2378	7.54	114	117
1710		1916	5.85	92	79	2036	6.15	98	88	2356	7.05	113	116	2513	7.49	121	130
580	40	619	5.27	30	39	660	5.57	32	43	770	6.40	37	56	843	6.94	41	66
630		691	5.14	33	47	734	5.46	35	53	851	6.21	41	67	925	6.64	45	77
810		860	5.13	41	38	913	5.44	44	43	1050	6.08	51	55	1107	6.32	53	60
880		935	5.08	45	44	994	5.35	48	49	1104	5.89	53	59	1141	6.09	55	63
1150		1207	5.31	58	32	1286	5.62	62	36	1500	6.43	72	48	1643	6.95	79	57
1280		1377	5.36	66	42	1462	5.69	70	47	1697	6.45	82	62	1845	6.90	89	73
1470		1538	5.32	74	52	1634	5.64	79	58	1897	6.37	91	77	1957	6.52	94	81
1570		1701	5.08	82	62	1806	5.37	87	69	2097	6.06	101	91	2287	6.48	110	107
1710		1856	5.00	89	73	1970	5.26	95	81	2273	6.02	110	106	2440	6.45	118	121
580	45	603	4.52	29	37	642	4.78	31	41	747	5.49	36	52	818	5.94	39	61
630		669	4.40	32	44	710	4.67	34	49	823	5.31	40	62	838	5.39	40	64
810		830	4.42	40	35	881	4.69	42	39	1020	5.29	49	51	1108	5.62	53	59
880		908	4.33	44	41	963	4.57	46	45	1108	5.23	53	59	1136	5.34	55	61
1150		1176	4.56	57	30	1251	4.82	60	34	1456	5.52	70	45	1592	5.95	77	53
1280		1333	4.59	64	39	1415	4.87	68	44	1640	5.52	79	57	1675	5.59	81	60
1470		1485	4.57	72	48	1576	4.85	76	53	1827	5.48	88	70	1979	5.82	95	81
1570		1641	4.38	79	57	1739	4.63	84	63	2014	5.22	97	83	2193	5.58	106	97
1710		1799	4.26	87	67	1907	4.48	92	75	2185	5.12	105	97	2190	5.13	106	97
580	50	590	3.86	28	35	626	4.08	30	38	726	4.69	35	49	793	5.08	38	57
630		649	3.75	31	41	687	3.98	33	45	748	4.31	36	52	750	4.31	36	52
810		801	3.79	39	32	848	4.03	41	36	980	4.56	47	47	1061	4.84	51	54
880		884	3.68	43	38	935	3.88	45	42	1024	4.26	50	50	1026	4.27	50	50
1150		1149	3.89	56	28	1220	4.12	59	32	1415	4.72	68	42	1545	5.10	75	49
1280		1291	3.90	62	36	1368	4.15	66	40	1501	4.51	73	48	1503	4.52	73	48
1470		1434	3.91	69	44	1519	4.15	73	49	1755	4.71	85	64	1860	4.93	90	71
1570		1583	3.76	77	52	1675	3.98	81	58	1932	4.50	93	75	2007	4.84	97	81
1710		1751	3.60	85	63	1850	3.79	89	70	1966	4.03	95	78	1971	4.04	95	78

### Legend

LWT Leaving water temperature, °C  
 Qh Heating capacity, kW  
 COP Coefficient of performance, kW/kW  
 q Condenser water flow rate, l/s  
 Δp Condenser pressure drop, kPa

### Application data

Standard units, refrigerant: R-134a  
 Evaporator entering/leaving water temperature difference: 3 K  
 Condenser entering/leaving water temperature difference: 5 K  
 Evaporator and condenser fluid: water  
 Fouling factor:  $0.18 \times 10^{-4}$  (m<sup>2</sup> K)/W

Gross performances, not in accordance with EN14511-3:2011. These performances do not take into account the correction for the proportional heating capacity and power input generated by the water pump to overcome the internal pressure drop in the heat exchanger.

# Guide specification

- 30XW-V Water-cooled liquid chillers with inverter-driven screw compressor
- 30XWHV Water-sourced heating units with inverter-driven screw compressor  
Cooling capacity range: 587-1741 kW  
Heating capacity range: 648-1932 kW

■ General description  
Factory-assembled single-piece water-sourced units, shall include all factory wiring, piping, controls, refrigerant charge (HFC-134a), refrigerant circuits, inverter-driven screw compressors, electronic expansion valves and equipment required prior to field start-up.

- Performances
  - Cooling capacity: ..... kW
  - Unit power input: ..... kW
  - Full load energy efficiency (EER kW/kW): .....
  - Part load energy efficiency (ESEER kW/kW): .....
  - Evaporator entering/leaving water temperature: .../...°C  
Fluid.....
  - Condenser entering/leaving water temperature: .../...°C  
Fluid.....
  - Sound power level: .....dB(A)

Unit shall be rated Eurovent class A (class B for 30XW-V 1710 and 30XWHV 880, 1570 and 1710) in accordance with EN14511-3:2011 and certified by Eurovent.

- Quality assurance  
Unit construction shall comply with European directives:
  - Pressure equipment directive (PED) 97/23/EC
  - Machinery directive 2006/42/EC, modified
  - Low voltage directive 2006/95/EC, modified
  - Electromagnetic compatibility directive 2004/108/EC, modified, and the applicable recommendations of European standards
  - Machine safety: electrical equipment in machines, general requirements, EN 60204-1
  - Electromagnetic emission and immunity EN 61800-3 'C3' ('C2' as option)

Unit shall be designed, manufactured and tested in a facility with a quality management system certified ISO 9001 and environmental management system ISO 14001. Unit shall be run tested at the factory.

## Product features

- Compressors
  - Unit shall have semi-hermetic inverter-driven twin-screw compressors with internal relief valve and check valve to avoid reverse rotation on shut down.
  - Each compressor shall be equipped with a discharge shut-off valve.
  - The discharge shall also be equipped with a muffler to reduce discharge gas pulsations.
  - Capacity control shall be provided by an inverter motor capable of reducing compressor capacity down to 20% of maximum capacity.
  - Compressor shall start in unloaded condition.
  - Motor shall be cooled by suction gas and protected by internal winding temperature sensors. Compressor bearings shall be designed for a minimum 73000 hours at maximum operating conditions.
  - Lubrication oil system shall include pre-filter and external filter capable of filtration to 5 µm.

- Evaporator
  - Unit shall be equipped with a single evaporator.
  - Evaporator shall be manufactured, tested and stamped in accordance with the European directive for pressurised equipment 97/23/EC.
  - The maximum refrigerant-side operating pressure will be 2100 kPa, and the maximum water-side pressure will be 1000 kPa (2100 kPa as an option).
  - The evaporator shall be a mechanically cleanable, shell-and-tube type with removable heads. Tubes shall be internally and externally grooved, seamless-copper, and shall be rolled into tube sheets. Shell shall be insulated with 19 mm closed-cell foam with a maximum K factor of 0.28. Evaporator thermal insulation shall be factory fitted.
  - The evaporator shall have a drain and vent in each head.
  - The evaporator shall incorporate an active refrigerant level control system to ensure optimum heat transfer performance under all load conditions.
  - Design shall incorporate either one or two independent refrigerant circuits
  - Chiller shall have only one water inlet and outlet connection with Victaulic couplings to avoid vibration transmission and accept a small misalignment (water connection kit on demand).
  - Evaporator shall be fitted with an electronic self-setting water flow switch. Paddle switches or differential pressure switches shall not be acceptable.

- Condenser  
Unit shall be equipped with a single condenser.
  - Condenser shall be manufactured, tested and stamped in accordance with the European directive for pressurised equipment 97/23/EC.
  - The maximum refrigerant-side operating pressure will be 2100 kPa, and the maximum water-side pressure will be 1000 kPa (2100 kPa as an option).
  - The condenser shall be a mechanically cleanable shell-and-tube type with removable heads.
  - Tubes shall be internally and externally grooved, seamless copper, and shall be rolled into tube sheets.
  - Design shall incorporate either one or two independent refrigerant circuits and the oil separator.
  - The condenser shall have a drain and vent in each head.
  - The unit shall have only one water inlet and outlet connection with Victaulic couplings to avoid vibration transmission and accept a small misalignment (water connection kit on demand).

- Refrigerant circuit
  - Refrigerant circuit components shall include compressor, oil separator, high and low- side pressure relief devices, compressor discharge shut-off valves, filter driers, moisture indicating sight glasses, long-stroke electronic expansion device, and a complete operating charge of refrigerant HFC-134a and compressor oil.
  - To facilitate service and maintenance and avoid refrigerant charge transfers, it must be possible to isolate the following components and systems independently: filter driers, oil filters, expansion devices and compressor (with service valve option).

- Controls:
  - Unit controls shall include as a minimum: microprocessor with non-volatile memory, picture-guided unit/operator interface, the Local/Off/Remote/CCN selector and a coloured touch-screen display with multiple-language capability.
  - Pressure sensors shall be installed to measure suction, discharge, and oil pressure.
  - Temperature probes shall be installed to measure cooler entering and leaving temperatures (cooler and condenser side).

Unit shall be capable of performing the following functions:

- EXV control, based on pinch control, shall optimise evaporator charging
- Capacity control based on leaving chilled fluid temperature with return fluid temperature sensing
- Limitation of the chilled-fluid temperature pull-down rate at start-up to an adjustable range of 0.1 K to 1.1 K per minute to prevent excessive demand spikes at start-up.
- Reset enable of leaving chilled-water temperature based on the return water temperature or via a 0-10 V signal.
- Provision of a dual set point for the leaving chilled water temperature activated by a remote contact closure signal or by the built in time clock
- Enabling a 2-level demand limit control (between 0 and 100%) activated by remote contact closure or by the built-in time clock
- Water pump control, safety pumps (if installed), on both condenser and cooler side
- Allowing two time scheduling programs to enable unit start-up control, demand limit and set-point changes.

■ **Diagnostics**

- Display module shall be capable of displaying set points, system status including temperatures, pressures, current for each compressor, run time and percent loading.
- The control system shall allow a quick test of all machine elements to verify the correct operation of every switch, circuit breaker, contactor etc. before the chiller is started.

■ **Safety devices**

Unit shall be equipped with all necessary components, and in conjunction with the control system shall provide the unit with protection against the following:

- Reverse rotation
- Low chilled water temperature
- Low oil pressure (per compressor)
- Current imbalance
- Compressor thermal overload
- Automatic compressor unloading in case of excessive condensing temperature
- High pressure
- Electrical overload
- Loss of phase.

Control shall provide a separate general alert (minor incident) and alarm (circuit shut-down) remote indication.

■ **Operating characteristics**

- Unit shall be capable of starting with 19°C entering water temperature to the condenser, down to 13°C with condenser head pressure control option.
- Unit shall be capable of starting with 35°C entering water temperature to the evaporator.

■ **Electrical characteristics**

- Unit shall operate on three-phase power supply without neutral.
- Control voltage shall be supplied by a factory-installed transformer.
- Unit shall be supplied with factory-installed main circuit breaker, also acting as electrical disconnect/isolator.
- The inverter-driven motor shall provide a unit soft charge, with negligible start-up current. Unit power factor correction at full load should be higher than 0.92.
- The unit shall be certified for limited electromagnetic distortion, in accordance with EN61800-3, category C3.



Quality and Environment  
Management Systems  
Approval



Order No.13473-20, 04.2013. Supersedes order No. 13473-20, 01.2013.  
Manufacturer reserves the right to change any product specifications without notice.  
The cover photo is solely for illustration purposes and not contractually binding.

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