

AQUAFORCE®



30KAV

Variable-Speed Screw
Liquid Chiller with
Greenspeed® Intelligence

HFC
R-134a

Nominal cooling capacity:
493-1099 kW



CARRIER participates in the ECP programme for
LCP-HP Check ongoing validity of certificate:
www.eurovent-certification.com



Outstanding performance
Low sound levels
Intelligence and connectivity
Wide range of applications
Simple installation and
maintenance

The AquaForce® Vision 30KAV liquid chillers with Greenspeed® Intelligence are the premium solution for commercial applications where installers, consultants and building owners require superior reliability and optimal performances, especially at part load.

The 30KAV units are designed to exceed European Ecodesign directive requirements in terms of energy efficiency, versatility and operating sound levels. This result is achieved through the optimised combination of proven best-in-class technologies that include:

- 2nd generation of high-efficiency variable-speed twin screw compressors with built in volume index control (Vi) valve for optimal full and part load performance and Integrated Resonator Array (IRA) for low sound operation.
- 6th generation of Carrier Flying Bird™ fans with AC or EC motor depending on options.
- Carrier flooded shell-and-tube evaporator with new copper tubes for low pressure drops.
- 3rd generation of "W" profile Carrier Novation™ microchannel heat exchangers with optional Enviro-Shield coatings.
- Carrier SmartVu™ control with color touch screen user interface that includes 10 languages and new smart energy monitoring function.



30KAV Customer benefits

Outstanding performance

Equipped with variable-speed screw compressors and variable-speed fans (AC as standard and EC as option) and optional variable-speed pumps, Carrier's AquaForce® Vision 30KAV chiller with Greenspeed® intelligence automatically adjusts the cooling capacity and the water flow to perfectly match the needs of the building or the process load variations. The result is optimum operation at both full load and part load (SEER up to 5.6). 30KAV offers energy efficiency up to 10% higher than the 30XAV range with the same footprint.

The range is already fully compliant with the 2021 Ecodesign regulations.



SEER up to 5.6



90 dB(A)



Smart energy monitoring

Intelligence and connectivity

The advanced SmartVu™ intelligent control system displays operating parameters in real time, making it intuitive and particularly user-friendly. 30KAV also features innovative smart energy monitoring, providing users with smart data such as real time electric energy consumption, cooling energy output and instantaneous and average seasonal energy efficiency ratios. For further energy savings, 30KAV can be monitored remotely by Carrier experts for energy consumption diagnosis and optimization.

Extensive scope of application

Carrier's AquaForce® Vision adapts effortlessly to a wide range of applications. Extended operating temperatures from -20 °C to 55 °C outdoor air temperatures and negative water temperatures make it ideal for various sectors of activity. From high-end office buildings and hotels to healthcare facilities, data centers and industrial projects, AquaForce® Vision 30KAV meets the most demanding expectations in terms of energy efficiency and savings, whatever the climate and wherever the location.



**From
-20°C
to 55°C**

Easy installation & maintenance

Built-in variable-speed pumps up to 800 kW, automatic nominal water flow adjustment through electronic control, automatic unit energy performance measurement under real conditions, in units that are 25% smaller than the previous 30XAV generation, all these new features provide peace of mind for installers and service companies alike.



**25%
Smaller**

Customer benefits

AquaForce® Vision 30KAV liquid chillers with Greenspeed® Intelligence adapt effortlessly to a wide range of applications. An extended operating range covering ambient temperatures from -20 °C to 55 °C makes it ideal for all areas of activity. From high-end office buildings and hotels to healthcare facilities, data centers and industrial projects, 30KAV meets the most demanding expectations in terms of energy efficiency and savings, whatever the climate and wherever the location.

Furthermore, the advanced SmartVu™ intelligent control system displays operating parameters in real time, making it intuitive and particularly user-friendly. 30KAV also features innovative smart energy monitoring, providing users with smart data such as real time electric energy consumption, cooling capacity, and instantaneous and average seasonal energy efficiency ratios as well as smart refrigerant leak alert that can indicate significant loss of refrigerant at any point of the system.

For further energy savings, 30KAV can be monitored remotely by Carrier experts for energy consumption diagnosis and optimization.

The 30KAV range is available in 4 efficiency levels.

■ 30KAV standard unit

The AquaForce™ 30KAV is equipped with variable-speed screw compressor and variable-speed fans with AC motors. The 30KAV is optimised to meet the most demanding technical and economic requirements while offering high seasonal energy efficiency levels.

(Average SEER of 5.17, average EER of 3.0).

■ 30KAV with EC fans (option 17)

The 30KAV with EC fans option enhances the seasonal energy efficiency and offers state of the art EC fan technology as standard.

(Average SEER of 5.23, average EER of 3.0).

■ 30KAV with High Energy Efficiency (option 119)

The 30KAV with High Energy Efficiency option is equipped with variable-speed fans with AC motor and additional heat exchange surface to deliver optimum performance at both full load and part load.

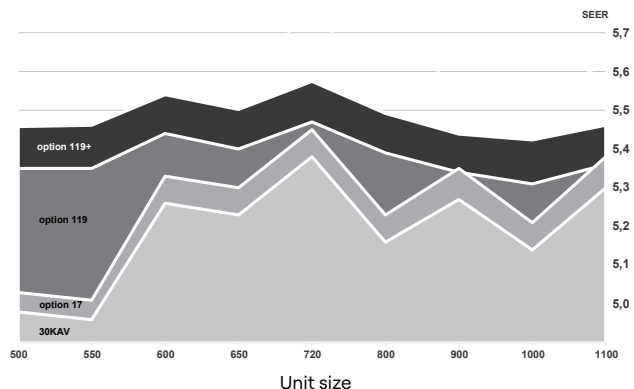
(Average SEER of 5.35, average EER of 3.4).

■ 30KAV with High Energy Efficiency+ (option 119+)

The 30KAV with High Energy Efficiency+ option is equipped with EC fans and additional heat exchange surface to provide the highest possible seasonal energy efficiency.

(Average SEER of 5.45, average EER of 3.4)

SEER of the 30KAV range



Outstanding energy performance

- The 30KAV with "High energy efficiency+" is designed for very high performance both at full and part load: average SEER 5.45, average EER 3.4 as per EN14825 & EN14511.
- The high energy efficiency is achieved through:
 - 2nd generation of Carrier high-efficiency variable-speed twin-screw compressors with built in volume index control (Vi) valve for both optimal full and part load performance.
 - Variable-speed Flying Bird™ fans with EC motor minimising power consumption while delivering optimum air flow.
 - Novation™ aluminum condenser with high-efficiency micro-channel coils technology.
 - New Carrier flooded shell-and-tube evaporator with new copper tubes for low pressure drops.
 - Electronic expansion device permitting operation at a lower condensing pressure and improved utilisation of the evaporator heat exchange surface (superheat control).
 - Economiser system with electronic expansion device for increased cooling capacity.
- Optimised electrical performance:
 - Negligible start-up current (value is lower than the maximum unit current draw).
 - High displacement power factor (above 0.98).
 - EMC compliance with Class 3 requirements of the EU standard EN61800-3 (Class 2 is possible as an option).

Customer benefits

- Hydraulic module with variable-speed dual pump :
 - Variable-speed, dual pumps which automatically adjust the water flow to match the needs of the building or process load variations.
 - 3 pump control modes available: constant water flow with possibility to reduce the pump speed when there is no cooling demand, variable water flow with constant delta T or constant delta P control.
- Smart energy monitoring :
 - Innovative smart energy monitoring providing users with smart data such as real time electric energy consumption, cooling capacity, and instantaneous and average seasonal energy efficiency ratios (Electricity metering accuracy: +/-5%. Cooling capacity metering accuracy: +/-5% at nominal rated conditions).
 - For further energy savings, 30KAV can be monitored remotely by Carrier experts for energy consumption diagnosis and optimization.

Built-in reliability and easy servicing

The 30KAV units offer enhanced performances as well as Carrier's acclaimed product quality and reliability. Major components were chosen, selected and tested to minimise the possibility of failure.

- 2nd generation of variable-speed twin-screw compressors:
 - The screw compressors are industrial-type with oversized bearings and motor cooled by suction gas, with a proven failure rate lower than 0.1%.
 - Motor is synchronous and spins at supplied frequency, without any slip and rotor losses to induce magnetic field. There is a benefit of +1% in full load efficiency and of +4% in part load efficiency compared to induction motors.
 - Air-cooled compressor variable-speed drive (VSD) to ensure reliable operation and easy maintenance. (Glycol-cooled variable-speed drive (VSD) types are subject to higher failure rates due to glycol pump issue. Refrigerant-cooled variable-speed drive (VSD) types are subject to higher compressor vibration levels causing possible failures in the long term).
 - Compressor bearing life exceeding 100 000 hours
 - All components related to the compressor assembly are easily accessible on site minimising down-time.
- Variable-speed fans:

30KAV is fitted with variable-speed asynchronous fan-motors as standard. One variable-speed drive (VSD) is sized to manage a group of fans per refrigerant circuit reducing first cost while ensuring high part-load efficiency.

30KAV with High Energy Efficiency+ option is fitted with variable-speed EC fan-motors. Each EC fan is controlled independently ensuring continuous chiller operation in case of motor or drive failure.
- Air-cooled condenser:
 - Novation™ aluminum micro-channel heat exchanger (MCHE) with high corrosion resistance. The all aluminum design eliminates the formation of galvanic currents between aluminum and copper that cause coil corrosion in saline or corrosive environments.
 - Enviro-shield™ coating for MCHE used in standard and mildly corrosive environments with superior durability confirmed through 5000 hours testing in constant neutral salt spray per ASTM B117 and superior heat transfer performances confirmed through 2000 hours testing per CM1 (Carrier proprietary testing).
 - Super Enviro-shield™ coating for MCHE used in highly corrosive environments (industry or marine applications) with superior durability confirmed through 5000 hours testing in constant neutral salt spray per ASTM B117 and superior heat transfer performances confirmed through 2 000 hours testing per CM1 (Carrier proprietary testing).
- Evaporator:
 - Carrier designed flooded evaporator with mechanically cleanable water tubes.
 - Electronic paddle-free flow switch to ensure prompt alarm in case of poor liquid flow rate.
 - Thermal insulation with aluminum sheet finish (option) improved resistance to mechanical and UV damage.
- Refrigerant circuits:
 - Two independent refrigerant circuits to secure partial cooling, if one of the two develops a fault.
- Auto-adaptive control:
 - Control algorithm prevents excessive compressor cycling (Carrier patent).
 - Automatic compressor unloading in case of abnormally high condensing pressure. If condenser coil fouling or fan failure occurs, the AquaForce continues to operate, but at reduced capacity.

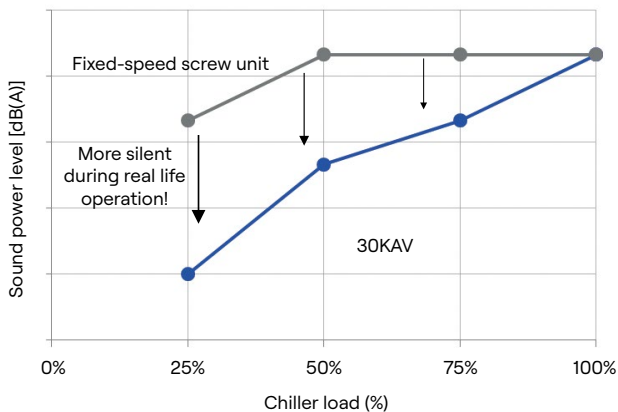
Customer benefits

- Exceptional endurance tests:
 - To design critical components and sub-assemblies to minimise the risk of failure on site, Carrier uses specialised laboratories and advanced dynamic simulation tools.
 - To ensure that the units reach customer sites in the same condition as they are when tested in the factory, Carrier tests the machine behavior while being moved along a 250 km trial. The test-route is based on a military standard and is the equivalent to 5000 km by truck in a normal road.
 - To ensure coils corrosion resistance, salt mist corrosion resistance test are performed in UTC's laboratory.

In addition, to maintain unit performance throughout its operating life, whilst minimising maintenance costs, end users can access the "Carrier Connect" remote monitoring service.

Minimised operating sound levels

- The Greenspeed® Intelligence, featuring variable-speed screw compressors and condenser fans, minimises noise levels at part load operation.



- Standard unit features include:
 - The new generation of Carrier 06Z variable-speed twin screw compressor with integrated resonator array to reduce the noise level by 6 dB(A) compared with 06T twin screw compressor previous generation.
 - The 6th generation of silent Flying Bird™ fans with new fan blade design inspired by nature, help reduce airflow noise.

- 30KAV is available with 3 sound levels to match the most sensitive environments:
 - Standard: standard unit configuration with new generation of low sound screw compressor and fans.
 - Low noise option: addition of high-performance compressor sound enclosure.
 - Very low noise option: addition of high-performance compressor sound enclosure and fan operation at lower rotational speed.

Easy and fast installation

- Built-in variable speed pumps up to 800 kW :
 - Full hydraulic module with dual pumps (low or high pressure as required) and optional expansion tank.
 - Automatic nominal water flow adjustment through electronic control on the user display.
- Compact units for easy transportation and installation :
 - Dimensions 25% smaller than the previous 30XAV generation.
 - Similar dimensions as the old 30GX chillers for easy replacement of the installed base.
- Simplified electrical connections:
 - Main disconnect switch.
 - Transformer supply to the integrated control circuit (400/24V).
 - Single electrical point of connection.
- Simplified water connections:
 - Victaulic connections on the evaporator.
 - Clearly identified entering and practical reference marks for entering and leaving water connections.
 - Possibility to choose different evaporator configurations, 1 or 2 passes.
- Fast commissioning:
 - Systematic factory operating test before shipment.
 - Functional test for main components, expansion devices, fans and compressors.

Environmental responsibility

- The AquaForce® Vision 30KAV liquid chillers with Greenspeed® Intelligence is a boost for green cities and contributes to a sustainable future. Combining a reduced charge of R134a refrigerant and exceptional energy efficiency it significantly lowers energy consumption while reducing carbon dioxide emissions by 25% throughout its life cycle (compared to previous fixed-speed screw liquid chiller generation).

Customer benefits

- The AquaForce® Vision 30KAV liquid chiller is equipped with an automatic energy meter that provides estimated instantaneous and cumulative cooling energy output, instantaneous and cumulative electric energy consumption, instantaneous and average seasonal energy efficiency ratios (Accuracy: +/- 5% at nominal condition, +/-10% elsewhere) for unit performance monitoring and verification.
- R-134a: HFC refrigerant with zero ozone depletion potential.
- 40% less refrigerant charge: The micro-channel technology used for condenser coils optimises heat transfer while minimising the refrigerant volume.
- Leak tight refrigerant circuits:
 - 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.
- Refrigerant leak alert: The AquaForce® Vision 30KAV liquid chiller is equipped with an automatic refrigerant leak detection algorithm that can detect serious refrigerant loss at any point on the system (Sensitivity: 25% refrigerant charge loss per circuit, depending on the conditions). The automatic refrigerant leak detection system can help to achieve recognition within pollution prevention assessment programs, ideal for assisting in the design of sustainable buildings.
- Refrigerant leak detection: Available as an option, this additional dry-contact allows reporting of possible leaks. The leak detector (by others) should be mounted in the most likely leak location.

Designed to support Green Building Design

A green building is a building that is environmentally sustainable and has been designed, constructed and is operated to minimise the total impact on the environment. 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 air conditioning system can use between 30 and 40% of the annual building energy consumption. Selection of the right air conditioning system is one of the main aspects to consider when designing a green building. For buildings with a variable load throughout the year 30KAV units offer a solution to this important challenge.

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.

The following example looks at how Carrier's new 30KAV range helps customers involved in LEED® building certification.

Energy saving certificate

30KAV is eligible to Energy savings certificates in France (CEE) in comfort, industrial and agriculture applications:

- Floating High pressure control (by modulating the air flow through fan activation and its speed).
- Floating Low pressure control.
- Variable speed on asynchronous compressor motor.
- Variable speed on asynchronous fan motor.
- Variable speed on asynchronous pump motor.

For more details about financial incentives in France, please refer to "Fiche produit CEE".

30KAV and LEED® certification

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

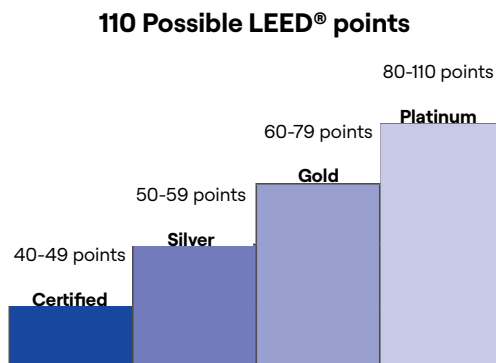
- Sustainable Sites (SS).
- Water Efficiency (WE).
- Energy & Atmosphere (EA).
- Materials & Resources (MR).
- Indoor Environmental Quality (IEQ).
- Innovation in Design (ID).
- Regional Priority (RP).

There are a number of different LEED® products.

While the strategies and categories assessed remain 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.

Customer benefits

All programmes now use the same point scale:

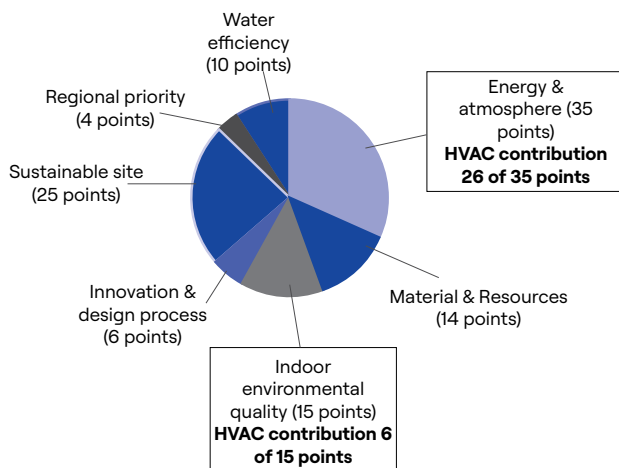


The majority of credits in LEED® rating systems are performance-based and achieving them is dependent on the impacts of each component or sub-system to the overall building.

While the LEED® green building certification programs do not certify products or services, the selection of the right products, systems or service programs is critical to obtain 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 30KAV units from Carrier can assist building owners to earn LEED® points in particular in the Energy & Atmosphere (EA) credit category and help address the following prerequisites and credit requirements:

- EA prerequisite 2: Minimum energy Performance.
The 30KAV exceeds the energy efficiency requirements of ASHRAE 90.1-2007; therefore it complies with the prerequisite standard.
- EA prerequisite 3: Fundamental Refrigerant Management
The 30KAV does not use chlorofluorocarbon (CFC) refrigerants thus satisfying the prerequisite statement.
- EA credit 1: Optimise energy performance (1 to 19 points):
Points for this credit are assigned depending on the energy cost reduction virtually achievable by the new building, compared to ASHRAE 90.1-2007 reference. The 30KAV, which is designed for high performance especially during part load operation, contributes to reducing the energy consumption of the building and therefore helps in gaining points within this credit. In addition, the Carrier HAP (Hourly Analyses Program) can be used as an energy analyses program complying 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 30KAV uses a reduced R134a charge and therefore contributes toward satisfying this credit under LEED®.

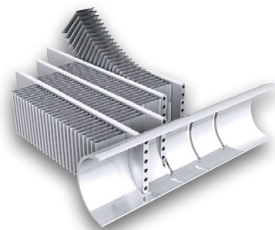
NOTE: This section describes the prerequisites and credit requirements in LEED® for New Construction and is directly related to the 30KAV. Other prerequisites and credit requirements are not directly and purely related to the air-conditioning unit itself, but more to the control of the complete HVAC system.

i-Vu®, Carrier's open control system, has features that can be valuable for:

- EA prerequisite 1: Fundamental commissioning of energy management system.
- 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.

30KAV Technical insights



3rd generation of "w" shape novation® micro channel heat exchangers

- Exclusive Carrier design.
- Increased reliability with new aluminum alloy.
- Significantly reduces refrigerant charge (~40% vs cu/al coils).
- More compact units (~25% vs previous 30XAV generation).
- Enviro-shield™ coating for mildly corrosive environments.
- Super Enviro-shield™ coating for highly corrosive environments (industry or marine applications).
- Easy cleaning with high pressure air or water washer.

Advanced smartvu™ with 7 inch color touch screen interface

- Exclusive Carrier design.
- 10 languages available: DE, EN, ES, FR, IT, NL, PT, TR, TU + one additional customer choice.
- Touch screen user interface.
- BACnet, J-Bus or LON communication interfaces.
- Optional wireless connectivity.



Powerful smart energy monitoring function

- Provides smart data based on intelligent algorithms.
- Real time energy consumption measurement (kWh).
- Cooling energy output measurement (kWh).
- Instantaneous and average Energy Efficiency Ratio under real operating conditions.
- Remote monitoring with Carrier Connect.

Flooded shell and tube evaporator

- Exclusive Carrier design.
- Flooded technology for high energy efficiency.
- New generation of copper tubes with specific profile to reduce pressure drops when operating with glycol.
- Exclusive Carrier design.
- Twin screw compressor designed for variable speed operation.
- High efficiency AC motor.
- Stepless variable-speed control (0%-100%).
- Integrated resonator array for compressor acoustic attenuation.
- Integrated check valve for quiet shutdown.
- Air-cooled inverter drive for increased reliability.
- Bearing life exceeding 100.000 hours.
- Twin screw compressor with permanent magnet motor as option.



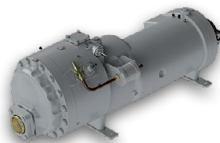
6th generation of variable-speed flying bird™ fans with ac or ec motor

- Exclusive Carrier design.
- Fan blade design inspired by nature.
- High efficiency version with AC motor technology.
- EC motor technology (option).



Variable-speed dual pumps with ac motor

- Dual pumps designed for variable speed operation.
- High efficiency AC motor.
- Low static pressure (~100 kPa) or high static pressure (~180 Kpa) available.
- 3 pump control modes available: constant water flow with 2 speeds, variable water flow based on constant delta T or constant delta P.
- Compatibility of chillers for variable primary flow operation.



Latest generation carrier variable-speed 06z twin screw compressor with ac motor

- Exclusive Carrier design.
- Twin screw compressor designed for variable speed operation.
- High efficiency AC motor.
- Stepless variable-speed control (0%-100%).
- Integrated resonator array for compressor acoustic attenuation.
- Integrated check valve for quiet shutdown.
- Air-cooled inverter drive for increased reliability.
- Bearing life exceeding 100.000 hours.
- Twin screw compressor with permanent magnet motor as option.

Technical insights



- New innovative smart control features:
 - An intuitive and user-friendly, coloured, 7" interface.
 - 10 languages available on choice: DE, EN, ES, FR, IT, NL, PT, TR, TU + one additional customer choice.
 - Screen-shots with concise and clear information in local languages.
 - Complete menu, customised for different users (end user, service personnel and Carrier-factory technicians).
 - Setpoint offset based on the outside air temperature.
 - Safe operation and unit setting: Password protection ensures that unauthorised people cannot modify any advanced parameters.
 - Simple and "smart" intelligence uses data collection from the constant monitoring of all machine parameters to optimise unit operation.
 - Night-mode: Cooling capacity management for reduced noise level.
 - With hydraulic module: Water pressure display and water flow rate calculation.
- Energy management:
 - Innovative smart energy monitoring, providing users with smart data such as real time electric energy consumption, cooling capacity, and instantaneous and average seasonal energy efficiency ratios.
 - Internal time schedule clock controls chiller on/off times and operation at a second set-point.
 - The DCT (Data Collection Tool) records the alarms history to simplify and facilitate service operations.
- Maintenance functions:
 - F-Gas regulation leak check reminder alert.
 - Maintenance alert can be configured to days, months or hours of operation.

- Advanced communication features:
 - Easy and high-speed communication technology over Ethernet (IP) to a centralised building management system.
 - Access to multiple unit parameters.

Remote management (standard)

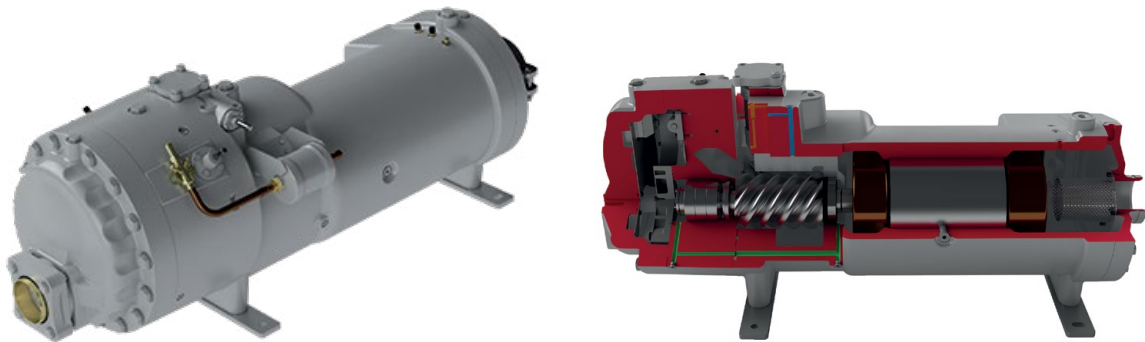
- Units with SmartVu™ control can be easily accessed from the internet, using a PC with an Ethernet connection. This makes remote control quick and easy and offers significant advantages for service operations.
- AquaForce with Greenspeed® Intelligence is equipped with an RS485 serial port that offers multiple remote control, monitoring and diagnostic possibilities. When networked with other Carrier equipment through the CCN (Carrier Comfort Network - proprietary protocol), all components form a HVAC system fully-integrated and balanced through one of the Carrier's network system products, like the Chiller System Manager or the Plant System Manager (optional).
- The 30KAV also communicates with other building management systems via optional communication gateways (BACnet, LON or JBus).
- The following commands/visualisations are possible from remote connection:
 - Start/Stop of the machine.
 - Dual set-point management: Through a dedicated contact is possible to activate a second set-point (example, unoccupied mode).
 - Demand limit setting: To limit the maximum chiller capacity to a predefined value.
 - Water pump control: These outputs control the contactors of one/two evaporator water pumps.
 - Water pumps changeover (only with hydraulic module options): These contacts are used to detect a water pump operation fault and automatically change over to the other pump.
 - Operation visualisation: Indication if the unit is operating or if it is in stand-by (no cooling load)
 - Alarm visualisation.

Technical insights

Remote management (EMM option)

- The Energy Management Module (EMM) offers extended remote control possibilities:
 - Room temperature: Permits set-point reset based on the building indoor air temperature (if Carrier thermostats are installed).
 - Set-point reset: Allows reset of the cooling set-point based on a 4-20 mA.
 - Demand limit: Permits limitation of the maximum chiller capacity.
 - Demand limit 1 and 2: Closing of these contacts limits the maximum chiller capacity 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 programmed time schedule.
 - 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.
 - Compressors running status: Set of outputs (as many as the compressors number) indicating which compressors are running.

New generation of Carrier 06Z variable-speed twin screw compressor



The new generation of 06Z variable-speed twin screw compressors benefits from Carrier's long experience in the development of twin-rotor screw compressors. The 06Z compressor design is based on the successful 06T screw compressor, core of the well-known AquaForce series with a number of modifications to reduce noise level and improve the energy efficiency especially during part load operation.

- New 06Z twin screw compressor optimized for variable speed operation: elimination of the slide valve, built-in volume index control (Vi) valve for both optimal full and part load performance, high efficiency AC motor with stepless inverter control from 20% to 100%.
- Separate air-cooled inverter drive for increased reliability.
- New 06Z twin screw compressor design with Integrated Resonator Array (IRA) to reduce the sound level by up to 6 dB(A) when compared with previous 06T generation.
- Integrated Check Valve for quiet shutdown.
- Bearing life exceeding 100 000 hours.

Technical insights

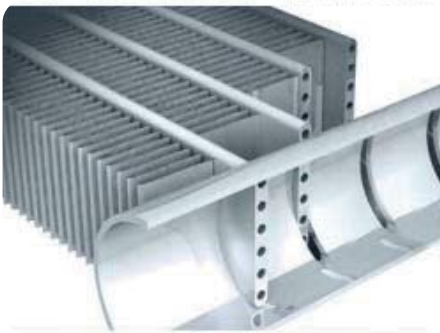
- A dedicated oil separator is installed at the discharge of each compressor to ensure maximum oil return: Oil separates from refrigerant by gravity and returns to the low pressure side of the compressor without use of additional pumps.
- Volume index control (Vi) valve provides a reliable method of adjusting the compression ratio to better match system demand. It provides optimal performance regardless of operating condition.
- Screw compressors work on the positive displacement principle to compress gas to a higher pressure. As a result, if there is an unusually high pressure in the condenser (due for example to coil fouling or operation in harsh climate) the compressor does not switch off, but continues operation at reduced capacity (unloaded mode).
- The silencer in the oil separator line (at the compressor outlet) considerably reduces discharge gas pulsations for much quieter operation.

Novation® Heat Exchangers with Microchannel Coil Technology

Already utilised in the automobile and aeronautical industries for many years, the Novation™ Micro-Channel Heat Exchanger (MCHE) used in the AquaForce is entirely made of aluminum. This one-piece concept significantly increases its corrosion resistance by eliminating the galvanic currents that are created when two different metals (copper and aluminum) come into contact in traditional heat exchangers.

- From the energy efficiency point-of-view the Novation® heat exchangers are approximately 10% more efficient than traditional coils and micro-channel coil technology allows a 40% reduction in the amount of refrigerant used in the chiller.
- The reduced depth of the Novation™ MCHE reduces air pressure losses by 50% and makes it much less susceptible to fouling (e.g. by sand). Cleaning of the Novation™ MCHE heat exchanger is very fast using a high pressure washer.
- To further enhance long-term performance, and protect coils from early deterioration, Carrier offers (as options) dedicated treatments for installations in corrosive environments.
 - The Novation™ MCHE with Enviro-Shield protection (option 262) is recommended for installations in moderately corrosive environments. The Enviro-Shield protection utilises corrosion inhibitors which actively arrest oxidation in case of mechanical damage.
 - The Novation™ MCHE with exclusive Super Enviro-Shield protection (option 263) is recommended for installations in corrosive environments. The Super Enviro-Shield protection consist of an extremely durable and flexible epoxy coating uniformly applied over all coil surfaces for complete isolation from the contaminated environment.
- After a total of more than 7 000 hours of testing following various test standards in UTC laboratories, the Carrier Novation® MCHE with Super Enviro-shield® coating appears to be the best-suited customer choice to minimize the harmful effects of corrosive atmospheres and ensure long equipment life.
 - Best corrosion resistance per ASTM B117/D610 test.
 - Best heat transfer performance per Carrier Marine 1 test.
 - Proven reliability per ASTM B117 test.

Technical insights



Coil Types (ranked by performance)	Visual Corrosion Evaluation	Heat Transfer Performance Degradation	Time to Failure	Test Campaign Conclusions
Super Enviro-shield® Novation™ MCHE	Very good	Good	No coil leak	Best
Super Enviro-shield® Cu/Al coil	Very good	Very good	No coil leak	Very good
Enviro-shield® Novation™ MCHE	Very good	Good	No coil leak	Very good
Al/Al coil	Very good	Good	No coil leak	Very good
Novation™ MCHE	Good	Very good	No coil leak	Good
Cu/Cu coil	Good	Good	Leak	Acceptable
Blygold® Cu/Al coil	Good	Good	No coil leak	Acceptable
Precoat Cu/Al coil	Bad	Bad	No coil leak	Bad
Cu/Al coil	Bad	Bad	No coil leak	Bad

Technical insights

New generation of Flying Bird VI fans with EC motors



The 30KAV utilizes Carrier's the 6th generation Flying Bird™ fan technology, engineered for maximum efficiency, super low noise, and wide operating range. The fan includes Carrier patented rotating shroud technology and back-swept blades with a unique wave-serration trailing edge inspired from nature.

It was designed and optimized for the 30KAV air management system configuration and heat exchanger technology. On 30KAV with option 17 and option 119+, fans are propelled by an EC motor, also known as brushless DC, with a unique electronics to manage commutation. This provides a great accuracy for fans that require higher efficiencies and variable speed. The fan meets the latest European eco-design requirements for fan efficiency. The fan uses Carrier's robust and proven injection molded composite-thermoplastic construction.

EC Motor



Technical insights

Variable Frequency Drives (VFD)

The compressors, the fans and the pumps of 30KAV are controlled by VFDs.

- VFDs electrical box has an IP44 rating as standard and IP54 as an option.
- Electrical box is capable of operating up to 55 °C (with option 16 "High Ambient").
- Unit controls is capable of withstanding storage temperatures in the control compartment from -20 °C to 68 °C.
- All VFDs on the chiller (compressors, fans and pumps motors) are fully air cooled and shall not require an additional glycol cooling system, thus avoiding the maintenance associated with such cooling systems.



Fan drives + Pump drives +
electronic boards



Compressor drives + main
power connection

Actual Major product modification : A

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
3	0	K	A	V	-	1	0	0	0	A	-	-	-	-	-	-	-

Product codification

- Digit 5: Model series 30KAV.
- Digits 7 to 10: Number based on the cooling capacity in kW.
- Digit 11: Major product modification.
- Digit 12 to 14: Counter used to generate a one time product code.
- Digit 15: Used for TWO PIECES SHIPMENT '1' = module 1, '2' = module 2 and '-' for single piece.
- Digit 16: Country code / P with Montluel 30KAV (European PED pressure vessel approval).
- Digit 17 & 18, always EE (Montluel production).

Options

Option	N°	Description	Advantage	Use 30KAV
Medium Brine down to -6 °C	5	Redesigned evaporator to allow chilled brine solution production down to -6 °C (including different number of tubes in the evaporator, extra insulation, specific sensors and algorithms).	Covers specific applications such as ice storage and industrial processes	0500-1100
Low Brine with turbulators down to -15 °C	6	Redesigned evaporator including turbulators to allow chilled brine solution production with low pressure drops on the entire negative application range, down to -15 °C (including turbulators, extra insulation and algorithms).	Covers specific applications such as ice storage and industrial processes	0500-1100
Light-brine solution, down to -4 °C	8	Implementation of new control algorithms and thermal insulation to allow chilled brine solution production down to -4 °C when ethylene glycol is used (-2°C with propylène glycol)	Matches with most application requirements for ground-sourced heat pumps and fits with many industrial processes requirements	0500-1100
Low noise level	15	Sound absorbing & aesthetic compressor enclosure	Noise level reduction	0500-1100
Very low noise level	15LS	Sound absorbing & aesthetic compressor enclosure and oil separator, evaporator and suction line acoustic treatment, combined with low-speed fans	Noise level reduction in sensitive environments	0500-1100
High ambient temperature	16	Electrical components sized for part load operation up to 55 °C air ambient	Extended unit part-load operation up to 55 °C ambient temperature	0500-1100
EC fans	17	Unit equipped with EC fans	Enhances the unit energy efficiency	0500-1100
IP54 control box	20A	Increased leak tightness of the unit	Protects the inside of the electrical box from dust, water and sand. In general this option is recommended for installations in polluted environments	0500-1100
Grilles and enclosure panels	23	Metallic protection grilles and side enclosure panels	Improves aesthetics, protection against intrusion to the unit interior, coil and piping protection against impacts.	0500-1100
Enclosure panels	23A	Side enclosure panels	Improves aesthetics and piping protection against impacts.	0500-1100
Water exchanger frost protection	41A	Electric resistance heater on the water exchanger and discharge valve	Water exchanger frost protection down to -20 °C outside temperature	0500-1100
Evaporator & hydraulic module frost protection	41B	Electric resistance heater on water exchanger, discharge valve and hydraulic module	Water exchanger and hydraulic module frost protection down to -20 °C outside temperature	0500-0800
Evaporator & recovery condenser frost protection	41C	Electric resistance heater on evaporator exchanger, discharge valve and add heaters and insulation on hydraulic connection (option 325)	Water exchanger module frost protection between 0 °C and -20 °C outside air temperature	0500-1100
Partial heat recovery	49	Unit equipped with one desuperheater on each refrigerant circuit	Production of free high-temperature hot-water simultaneously with chilled water production (or hot water for Heat pump)	0500-1100

Options

Option	N°	Description	Advantage	Use 30KAV
Total heat recovery	50	Unit equipped with additional heat exchanger in series with the condenser coils. (Each exchanger is equipped with heaters and insulation)	Production of free hot-water with variable heat reclaim	0500-1100
Lead /Lag operation	58	Unit equipped with supplementary water outlet temperature sensor kit (to be field installed) allowing Lead /Lag operation of two units connected in parallel	Optimised operation of two units connected in parrallel operation with operating time equalisation	0500-1100
Main disconnect switch with short-circuit protection	70D	Disconnecter circuit breaker equipped with an external disconnect switch handle	Ensure protection of main disconnect switch and associated cables against short-circuits when building devices are not compliant	0500-1100
Evap. and pumps with aluminum jacket	88A	Evaporator and pumps covered with an aluminum sheet for thermal insulation protection	Improved resistance to aggressive climate conditions	0500-0800
Service valve set	92	Liquid line valve (evaporator inlet) and compressor suction line valve	Allow isolation of various refrigerant circuit components for simplified service and maintenance	0500-1100
Compressor discharge valves	93A	Shut-off valve on the compressor discharge piping	Simplified maintenance	0500-1100
21 bar evaporator	104	Reinforced evaporator for extension of the maximum water-side service pressure to 21 bar (standard 10 bar)	Covers applications with a high water column evaporator side (typically high buildings)	0500-1100
LP VSD dual-pump hydraulic mod.	116A	Dual low-pressure water pump with variable speed drive (VSD), pressure transducers. Multiple possibilities of water flow control. For more details, refer to the dedicated chapter.	Easy and fast installation (plug & play), significant pumping energy cost savings (more than two-thirds), tighter water flow control, improved sytem reliability	0500-0800
HP VSD dual-pump hydraulic module	116W	Dual high-pressure water pump with variable speed drive (VSD), pressure transducers. Multiple possibilities of water flow control (expansion tank with built-in safety hydraulic components available in option)	Easy and fast installation (plug & play), significant pumping energy cost savings (up to two-thirds), tighter water flow control, improved sytem reliability	0500-0800
High Energy Efficiency	119	Additional condenser coil to improve unit energy efficiency	Enhances the unit energy efficiency performance	0500-1100
High Energy Efficiency+	119+	Additional condenser coil plus EC fans to improve unit energy efficiency	Enhances the unit energy efficiency performance	0500-1100
Lon gateway	148D	Bi-directional communication board complying with Lon Talk protocol	Connects the unit by communication bus to a building management system	0500-1100
Bacnet over IP	149	Bi-directional high-speed communication using BACnet protocol over Ethernet network (IP)	Easy and high-speed connection by ethernet line to a building management system. Allows access to multiple unit parameters	0500-1100
Modbus over IP and RS485	149B	Bi-directional high-speed communication using Modbus protocol over Ethernet network (IP)	Easy and high-speed connection by ethernet line to a building management system. Allows access to multiple unit parameters	0500-1100

Options

Option	N°	Description	Advantage	Use 30KAV
Energy Management Module	156	EMM Control board with additional inputs/outputs. See Energy Management Module option chapter	Extended remote control capabilities (Set-point reset, ice storage end, demand limits, boiler on/off command...)	0500-1100
Input contact for Refrigerant 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 corrective actions	0500-1100
Dual relief valves on 3-way valve	194	Three-way valve upstream of dual relief valves on the shell and tubes evaporator	Valve replacement and inspection facilitated without refrigerant loss. Comforms to European standard EN378/BGVD4	0500-1100
Compliance with Swiss regulations	197	Additional tests on the water heat exchangers: supply (additional of PED documents) supplementary certificates and test certifications	Conformance with Swiss regulations	0500-1100
Compliance with Russian regulations	199	EAC certification	Conformance with Russian regulations	0500-1100
Compliance with Australian regulations	200	Unit approved to Australian code	Conformance with Australian regulations	0500-1100
Insulation of the evap. in/ out ref.lines	256	Thermal insulation of the evaporator entering/leaving refrigerant lines with flexible, UV resistant insulation	Prevents condensation on the evaporator entering/leaving refrigerant lines	0500-1100
Enviro-Shield anti-corrosion protection	262	Coating by conversion process which modifies the surface of the aluminum producing a coating that is integral to the coil. Complete immersion in a bath to ensure 100% coverage. Minimal heat transfer variation, tested 4000 hours salt spray per ASTM B117	Improved corrosion resistance, recommended for use in moderately corrosive environments	0500-1100
Super Enviro-Shield anti-corrosion protection	263	Extremely durable and flexible epoxy polymer coating applied on micro channel heat exchangers by electro coating process, final UV protective topcoat. Minimal heat transfer variation, tested 6000 hours constant neutral salt spray per ASTM B117, superior impact resistance per ASTM D2794	Improved corrosion resistance, recommended for use in extremely corrosive environments	0500-1100
Welded evaporator connection (kit)	266	Victaulic piping connections with welded joints	Easy installation	0500-1100
Welded heat recovery condenser connection (kit)	267	Victaulic piping connection with welded joints	Easy installation	0500-1100
Evaporator with aluminum jacket	281	Evaporator covered with an aluminum sheet for thermal insulation protection	Improved resistance to aggressive climate conditions	0500-1100
EMC class. C2, as per EN 61800-3	282	Additional RFI filters on the unit power line	Reduces electromagnetic interferences for compliance with emission level category C2 in order to allow the units to operate in the first environment (so called, residential environment)	0500-1100

Options

Option	N°	Description	Advantage	Use 30KAV
230 V electrical plug	284	230 VAC power supply source provided with plug socket and transformer (180 VA, 0,8 Amps)	Permits connection of a laptop or an electrical device during unit commissioning or servicing	0500-1100
Expansion tank	293	6 bar expansion tank integrated in the hydraulic module (requires hydraulic module option)	Easy and fast installation (plug & play), & Protection of closed water systems from excessive pressure	0500-0800
Electric energy meter	294	Electricity meter . Display of energy consumption, instantaneous (U, V, I) and cumulated (kWh) on the unit user interface datas available on communication bus	Permits the acquisition, (remote) monitoring of energy used.	0500-1100
Fast Capacity Recovery	295	New software algorithms to allow quick restart and fast loading while preserving unit-reliability	Full capacity recovery in less than 5 minutes after power failure. Matches requirements of typical critical missions applications	0500-1100
Ultra Fast Capacity Recovery	295+	Electrical capacity module to enable quick restart and fast loading preserving unit reliability	Ultra Fast full capacity recovery after power failure. Matches requirements of typical critical missions applications. (process, data centers)	0500-1100
Mexico screw compressor	297	Screw compressor made in Mexico	Mexico screw compressor	0500-1100
Connected Services	298A	Transmit the machine's operating data in real time via a 4G LTEM network.	Monitor and control machine status remotely.	0500-1100
Variable Water Flow control	299	Hydraulic control function package that permits control of the water flow rate based on different possible logics (at customer choice): constant delta T, constant outlet pressure and "fixed-speed" control	When variable-speed pumps on the primary circuit, the VWF control modulates flow rate through the evaporator, minimising pump consumption while ensuring safe/ optimised chiller operation	0500-1100
Free-cooling Dry cooler control	313	Control & connections to a Free Cooling Dry cooler 09PE or 09VE fitted with option FC control box	Easy system management, Extended control capabilities to a Dry cooler used in Free Cooling mode	0500-1100
Compliance with UAE regulation	318	Additional label on the unit with rated power input, rated current and EER following AHRI 550/590 (I-P)	Compliance with ESMA standard UAE.S 5010-5:2019.	0500-1100
Compliance with Qatar regulation	319	Specific nameplate on the unit with power supply 415 V+/-6%	Compliance with KAHRAMAA regulation in Qatar.	0500-1100
Hydraulic connection kit	325	Water piping on condenser and evaporator side	Easy installation	0500-1100
Compliance with Morocco regulation	327	Specifics documents according Morocco regulation	Conformance with Morocco regulations	0500-1100
Compressor with permanent magnet	329	Screw compressor equipped with permanent magnet motor	Permanent magnet motor improves significantly compressor efficiency	0500-1100
Delivery with plastic tarp	331	Plastic sheeting covering the units, with strapping securing it on the wooden pallet.	Allow unit to avoid dust and dirt from the outside environment during stocking and shipping	0500-1100
400-3-60Hz power supply	335	400V - 3PH - 60Hz power supply	Permits unit connection to 400-3-60Hz power supply	0500-1100

Physical data

Standard units

30KAV			500A	550A	600A	650A	720A	800A	900A	1000A	1100A	
Cooling												
Standard unit Full load performances*	CA1	Nominal capacity	kW	493	537	600	636	723	791	892	975	1079
		EER	kW/kW	2,85	2,80	3,08	2,92	3,12	2,91	3,01	2,84	2,96
Standard unit Seasonal energy efficiency **		SEER ^{12/7°C} Comfort low temp.	kWh/kWh	4,96	4,90	5,20	5,16	5,31	5,09	5,25	5,09	5,24
		η _s cool ^{12/7°C}	%	195	193	205	203	209	200	207	200	207
		SEPR ^{12/7°C} Process high temp.	kWh/kWh	6,16	5,96	6,48	6,32	6,48	6,24	6,34	6,13	6,22
Unit + option 17 [®] Seasonal energy efficiency **		SEER ^{12/7°C} Comfort low temp.	kWh/kWh	5,07	5,01	5,32	5,28	5,43	5,20	5,36	5,20	5,36
		η _s cool ^{12/7°C}	%	200	197	210	208	214	205	212	205	211
		SEPR ^{12/7°C} Process high temp.	kWh/kWh	6,29	6,08	6,63	6,46	6,62	6,37	6,48	6,25	6,35
Unit + option 329 [®] Seasonal energy efficiency **		SEER ^{12/7°C} Comfort low temp.	kWh/kWh	5,24	5,16	5,44	5,39	5,51	5,34	5,49	5,34	5,48
		η _s cool ^{12/7°C}	%	206	203	215	213	218	211	216	211	216
		SEPR ^{12/7°C} Process high temp.	kWh/kWh	6,38	6,14	6,65	6,47	6,60	6,40	6,49	6,30	6,37
Unit + option 17 + option 329 [®] Seasonal energy efficiency **		SEER ^{12/7°C} Comfort low temp.	kWh/kWh	5,36	5,28	5,58	5,52	5,64	5,47	5,62	5,47	5,61
		η _s cool ^{12/7°C}	%	211	208	220	218	223	216	222	216	221
		SEPR ^{12/7°C} Process high temp.	kWh/kWh	6,51	6,27	6,80	6,62	6,76	6,54	6,63	6,43	6,50
Sound levels												
Standard unit												
Sound power ^①			dB(A)	95	95	96	98	99	98	99	98	100
Sound pressure at 10 m ^②			dB(A)	63	63	64	65	66	65	67	65	67
Dimensions												
Standard unit												
Length			mm	4387	4387	5578	5578	6772	6772	7962	7962	9155
Width			mm	2261	2261	2261	2261	2261	2261	2261	2261	2261
Height			mm	2324	2324	2324	2324	2324	2324	2324	2324	2324
Operating weight ^④												
Standard unit			kg	4782	4796	5170	5184	5647	6088	6529	6993	7402

* In accordance with standard EN14511-3:2022.

** In accordance with standard EN14825:2022.

CA1 Cooling mode conditions: Evaporator water entering/leaving temperature 12 °C / 7 °C, outside air temperature 35 °C, evaporator fouling factor 0 m².K/W.η_s cool_{12/7°C} & SEER_{12/7°C} Bold values compliant to Ecodesign regulation: (EU) No 2016/2281 for Comfort application.SEPR_{12/7°C} Bold values compliant to Ecodesign regulation: (EU) No 2016/2281 for Process application High Temperature.① In dB ref=10¹² W, 'A' weighted. Declared dual-number noise emission values in accordance with ISO 4871 with an associated uncertainty of +/-3dB(A). Measured in accordance with ISO 9614-1 and certified by Eurovent.

② In dB ref 20μPa, 'A' weighted. Declared dual-number noise emission values in accordance with ISO 4871 with an associated uncertainty of +/-3dB(A). For information, calculated from the sound power Lw(A).

③ Options: 17=Fans motors EC type.

④ Values are guidelines only. Refer to the unit name plate.



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Physical data

Standard units

30KAV		500A	550A	600A	650A	720A	800A	900A	1000A	1100A
Compressors										
Standard unit		06Z twin screw variable speed with AC induction motor and variable frequency drive								
Unit + option 329^③		06Z twin screw variable speed with AC permanent magnet motor and variable frequency drive								
Circuit A	Quantity	1	1	1	1	1	1	1	1	1
Circuit B	Quantity	1	1	1	1	1	1	1	1	1
Unit minimum part load ^④	%	13	13	13	13	13	13	13	12	12
Unit PED Category		III	III	III	III	III	IV	IV	IV	IV
Refrigerant^⑤ - Standard unit		R134a (GWP=1430 following AR 4)								
Circuit A	kg	49	50	56	59	68	81	91	86	89
	teqCO ₂	70	72	80	84	97	116	130	123	127
Circuit B	kg	50	51	57	60	69	61	72	87	90
	teqCO ₂	72	73	82	86	99	87	103	124	129
Oil		Oil for R134a. Contact Carrier ERCD for supplying.								
Circuit A	l	27	26	25	23	20	23	20	23	20
Circuit B	l	27	26	25	23	20	23	20	23	20
Unit control		SmartVu™ with 7 inch coloured touch screen interface								
Languages		10 languages (DE, EN, ES, FR, IT, NL, PT, TR, TU + one on customer choice)								
Smart energy metering		Standard feature								
Wireless connectivity		Option								
Expansion valve		Electronic expansion valve								
Air heat exchanger		Novation™ Micro Channel Heat Exchanger								
Fans										
Standard unit		Flying Bird™ VI impeller variable speed with AC motor and variable frequency drive								
Unit + option 17^⑤		Flying Bird™ VI impeller variable speed with EC motor								
Quantity		6	6	8	8	10	10	12	12	14
Maximum total air flow	l/s	35580	35580	47440	47440	59300	59300	71160	71160	83020
Maximum rotation speed	r/s	16,0	16,0	16,0	16,0	16,0	16,0	16,0	16,0	16,0
Water heat exchanger		Flooded shell and tube heat exchanger								
Water volume	l	83	88	96	100	115	126	144	165	183
Max. water-side operating pressure without hydraulic module	kPa	1000	1000	1000	1000	1000	1000	1000	1000	1000
Water connections		Victaulic® type								
Standard unit										
Connections	pouces	5	5	6	6	6	6	8	8	8
Outside tube diameter	mm	141,3	141,3	168,3	168,3	168,3	168,3	219,1	219,1	219,1
Casing paint		Colour code RAL 7035								

③ Options: 17=Fans motors EC type.

④ Values are guidelines only. Refer to the unit name plate.

⑤ For standard conditions. Depending on operating conditions, unit might have a different minimum part load or cycle.

Physical data

Standard units - option 15&15LS

30KAV		500A	550A	600A	650A	720A	800A	900A	1000A	1100A
Sound levels										
Unit + option 15										
Sound power ^①	dB(A)	94	94	94	96	97	96	97	97	98
Sound pressure at 10 m ^②	dB(A)	62	62	61	64	64	63	65	64	65
Unit + option 15LS										
Sound power ^①	dB(A)	90	90	90	92	94	92	94	93	65
Sound pressure at 10 m ^②	dB(A)	57	58	58	59	61	60	62	60	61
Fans										
Quantity		6	6	8	8	10	10	12	12	14
Maximum total air flow + option 15LS	l/s	28920	26100	41600	43200	56000	50000	67200	57840	72800
Maximum rotation speed + option 15LS	r/s	13,2	12,0	14,2	14,7	15,2	13,7	15,2	13,2	14,2

- ① In dB ref=10⁻¹² W, 'A' weighted. Declared dual-number noise emission values in accordance with ISO 4871 with an associated uncertainty of +/-3dB(A). Measured in accordance with ISO 9614-1 and certified by Eurovent.
- ② In dB ref 20μPa, 'A' weighted. Declared dual-number noise emission values in accordance with ISO 4871 with an associated uncertainty of +/-3dB(A). For information, calculated from the sound power Lw(A).



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Physical data

Units with High energy Efficiency option (119 & 119+)

30KAV option 119/119+			500A	550A	600A	650A	720A	800A	900A	1000A	1100A	
Cooling												
Unit + option 119 + option 17 Full load performances*	CA1	Nominal capacity	kW	514	577	614	663	733	820	909	1012	1099
		EER	kW/kW	3,49	3,41	3,40	3,29	3,38	3,35	3,26	3,28	3,19
Unit + option 119 Seasonal energy efficiency**		SEER _{12/7°C} Comfort low temp.	kWh/kWh	5,24	5,21	5,30	5,28	5,37	5,23	5,27	5,18	5,25
		η _{s cool} _{12/7°C}	%	207	205	209	208	212	206	208	204	207
		SEPR _{12/7°C} Process high temp.	kWh/kWh	7,16	6,87	6,86	6,67	6,76	6,78	6,58	6,62	6,45
Unit + option 119 + Seasonal energy efficiency**		SEER _{12/7°C} Comfort low temp.	kWh/kWh	5,37	5,34	5,43	5,41	5,50	5,36	5,39	5,30	5,37
		η _{s cool} _{12/7°C}	%	212	211	214	213	217	211	213	209	212
		SEPR _{12/7°C} Process high temp.	kWh/kWh	7,32	7,03	7,02	6,82	6,91	6,92	6,72	6,76	6,58
30KAV option 119			500A	550A	600A	650A	720A	800A	900A	1000A	1100A	
Sound levels												
30KAV_option_119+												
Sound power ^①			dB(A)	96	96	97	98	99	98	100	98	100
Sound pressure at 10 m ^②			dB(A)	63	63	64	66	66	65	67	65	67
Dimensions												
30KAV option 119												
Length			mm	6772	6772	6772	6772	7962	9155	9120	10346	10346
Width			mm	2261	2261	2261	2261	2261	2261	2261	2261	2261
Height			mm	2324	2324	2324	2324	2324	2324	2324	2324	2324
Operating weight ^③												
30KAV option 119+			kg	5530	5543	5563	5570	6020	6836	6962	7743	7790

- * In accordance with standard EN14511-3:2022.
- ** In accordance with standard EN14825:2022.
- CA1 Cooling mode conditions: Evaporator water entering/leaving temperature 12 °C / 7 °C, outside air temperature 35 °C, evaporator fouling factor 0 m².K/W.
- η_{s cool}_{12/7°C} & SEER_{12/7°C} **Bold values compliant to Ecodesign regulation: (EU) No 2016/2281 for Comfort application.**
- SEPR_{12/7°C} **Bold values compliant to Ecodesign regulation: (EU) No 2016/2281 for Process application High Temperature.**
- ① In dB ref=10¹² W, 'A' weighted. Declared dual-number noise emission values in accordance with ISO 4871 with an associated uncertainty of +/-3dB(A). Measured in accordance with ISO 9614-1 and certified by Eurovent.
- ② In dB ref 20μPa, 'A' weighted. Declared dual-number noise emission values in accordance with ISO 4871 with an associated uncertainty of +/-3dB(A). For information, calculated from the sound power Lw(A).
- ③ Values are guidelines only. Refer to the unit name plate.



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Physical data

Units with High energy Efficiency option (119 & 119+)

30KAV option 119		500A	550A	600A	650A	720A	800A	900A	1000A	1100A
Compressors										
30KAV option 119		06Z twin screw variable speed with AC induction motor and variable frequency drive								
30KAV option 119 + option 329^③		06Z twin screw variable speed with AC permanent magnet motor and variable frequency drive								
Circuit A	Quantity	1	1	1	1	1	1	1	1	1
Circuit B	Quantity	1	1	1	1	1	1	1	1	1
Unit minimum part load ^④	%	13	13	13	13	13	13	13	12	12
Unit PED Category		III	III	III	III	III	IV	IV	IV	IV
Refrigerant^⑤ - 30KAV option 119		R134a (GWP=1430 following AR 4)								
Circuit A	kg	66	66	63	64	72	93	97	97	98
	teqCO ₂	94	94	90	92	103	133	139	139	140
Circuit B	kg	67	67	63	65	73	73	78	98	99
	teqCO ₂	96	96	90	93	104	104	112	140	142
Oil		Oil for R134a. Contact Carrier ERCD for supplying.								
Circuit A	l	27	26	25	23	20	23	20	23	20
Circuit B	l	27	26	25	23	20	23	20	23	20
Unit control		SmartVu™ with 7 inch colored touch screen interface								
Languages		10 languages (DE, EN, ES, FR, IT, NL, PT, TR, TU + one on customer choice)								
Smart energy metering		Standard feature								
Wireless connectivity		Option								
Expansion valve		Electronic expansion valve								
Air heat exchanger		Novation™ Micro Channel Heat Exchanger								
Fans										
30KAV option 119		Flying Bird™ VI impeller variable speed with AC motor and variable frequency drive								
30KAV option 119 + option 17^③		Flying Bird™ VI impeller variable speed with EC motor								
Quantity		10	10	10	10	12	14	14	16	16
Maximum total air flow	l/s	59300	59300	59300	59300	71160	83020	83020	94880	94880
Maximum rotation speed	r/s	16,0	16,0	16,0	16,0	16,0	16,0	16,0	16,0	16,0
Water heat exchanger		Flooded shell and tube heat exchanger								
Water volume	l	83	88	96	100	115	126	144	165	183
Max. water-side operating pressure without hydraulic module	kPa	1000	1000	1000	1000	1000	1000	1000	1000	1000
Water connections		Victaulic® type								
Standard unit										
Connections	inch	5	5	6	6	6	6	8	8	8
Outside tube diameter	mm	141,3	141,3	168,3	168,3	168,3	168,3	219,1	219,1	219,1
Casing paint		Colour code RAL 7035								

③ Options: 17=Fans motors EC type ; 329=Compressors motors PM type.

④ Values are guidelines only. Refer to the unit name plate.

⑤ For standard conditions. Depending on operating conditions, unit might have a different minimum part load or cycle.

Physical data

Standard units - option 15&15LS

30KAV option 119		500A	550A	600A	650A	720A	800A	900A	1000A	1100A
Sound levels										
30KAV_option_119+ : option 15										
Sound power ^①	dB(A)	95	95	94	96	97	96	98	98	98
Sound pressure at 10 m ^②	dB(A)	62	62	62	64	64	64	65	65	65
30KAV_option_119+ : option 15LS										
Sound power ^①	dB(A)	90	91	91	92	94	92	94	93	65
Sound pressure at 10 m ^②	dB(A)	57	58	58	59	61	60	61	60	61
Fans										
Quantity		10	10	10	10	12	14	14	16	16
Maximum total air flow + option 15LS	l/s	44700	43500	52000	52000	64800	67480	75600	74080	83200
Maximum rotation speed + option 15LS	r/s	12,3	12,0	14,2	14,2	14,7	13,2	14,7	12,7	14,2

① In dB ref=10⁻¹² W, 'A' weighted. Declared dual-number noise emission values in accordance with ISO 4871 with an associated uncertainty of +/-3dB(A). Measured in accordance with ISO 9614-1 and certified by Eurovent.

② In dB ref 20μPa, 'A' weighted. Declared dual-number noise emission values in accordance with ISO 4871 with an associated uncertainty of +/-3dB(A). For information, calculated from the sound power L_w(A).



CARRIER participates in the LCP programme for
LCP-HP Check ongoing validity of certificate:
www.eurovent-certification.com

Eurovent certified values

Electrical data

Electrical data - Standard units

30KAV		500A	550A	600A	650A	720A	800A	900A	1000A	1100A
Power circuit supply										
Nominal voltage	V-ph-Hz	400-3-50								
Voltage range	V	360-440								
Control circuit supply		24 V via internal transformer								
Maximum operating input power^①										
Standard unit	kW	225	246	272	296	320	367	402	451	484
Power factor at maximum power^②		0,91-0,93								
Displacement Power Factor (Cos Phi)		>0,98								
Total harmonic distortion (THDi) ^{① ③}	%	35-45%								
Maximum operating current draw (Un)^④										
Standard unit	A	350	382	423	460	498	570	625	701	752
Maximum operating current draw (Un-10%)^④										
Standard unit	A	383	416	463	490	530	618	666	747	801
Start-up current^④										
Standard unit	A	212	228	245	262	286	378	412	399	425

① Values obtained at operation with maximum operating power input (data given on the unit nameplate).

② Value decreases when load lowers.

③ May vary according to the installation's short circuit ratio.

THDi increases when load lowers. But the highest impact on the installation occurs when the current is maximum. Therefore compliance of the installation regarding voltage harmonic distortion at PCC (per IEC61000-2-4 or other standard) shall be usually checked at max load in order to cover all load conditions.»

④ Operating current of the biggest compressor + fan current + starting current of the smallest compressor.

Starting current values used for the compressor are : 06ZCE1-H3AA06013 = 40A ; 06ZFC2-3AA06013 = 50A ; 06ZIG3-3AA06013 = 80A.

Electrical data - Units + option 16

30KAV		500A	550A	600A	650A	720A	800A	900A	1000A	1100A
Maximum operating input power^①										
Unit + option 16	kW	239	260	288	313	340	390	430	481	519
Maximum operating current draw (Un)^①										
Unit + option 16	A	371	404	448	487	529	606	668	747	807
Maximum operating current draw (Un-10%)^①										
Unit + option 16	A	406	441	490	519	563	658	711	796	859

① Values obtained at operation with maximum operating power input (data given on the unit nameplate).

Electrical data

Electrical data - Units with combination of options High energy efficiency (119), PM motor (329), EC motor (17)

30KAV options 119 & 329		500A	550A	600A	650A	720A	800A	900A	1000A	1100A
Power circuit supply										
Nominal voltage	V-ph-Hz	400-3-50								
Voltage range	V	360-440								
Control circuit supply		24 V via internal transformer								
Maximum operating input power^①										
Unit + option 119	kW	224	249	264	286	310	359	388	439	467
Unit + option 119 + option 17	kW	222	247	261	283	307	356	384	435	462
Unit + option 329	kW	220	241	256	279	314	350	395	436	476
Unit + option 329 + option 119	kW	219	244	248	269	304	342	381	424	459
Power factor at maximum power^②		0,91-0,93								
Displacement Power Factor (Cos Phi)		>0,98								
Total harmonic distortion (THDi) ^③	%	35-45%								
Maximum operating current draw (Un)^④										
Unit + option 119	A	348	386	411	445	482	558	603	683	725
Unit + option 119 + option 17	A	345	383	407	441	477	553	597	677	718
Unit + option 329	A	343	375	398	433	488	544	614	678	739
Unit + option 329 + option 119	A	341	379	386	418	472	532	592	660	712
Maximum operating current draw (Un-10%)										
Unit + option 119	A	379	411	448	474	512	603	642	726	772
Unit + option 119+	A	376	408	444	470	507	598	636	720	765
Unit + option 329	A	376	409	438	463	520	592	655	724	788
Unit + option 329 + option 119	A	372	404	423	447	502	577	631	703	759
Start-up current^④										
Unit + option 119	A	211	230	239	255	278	371	401	390	411
Unit + option 119 + option 17	A	209	229	237	253	275	369	398	387	408
Unit + option 329	A	204	219	220	240	271	353	391	376	400

① Values obtained at operation with maximum operating power input (data given on the unit nameplate).

② Value decreases when load lowers.

③ May vary according to the installation's short circuit ratio.

THDi increases when load lowers. But the highest impact on the installation occurs when the current is maximum. Therefore compliance of the installation regarding voltage harmonic distortion at PCC (per IEC61000-2-4 or other standard) shall be usually checked at max load in order to cover all load conditions.

④ Operating current of the biggest compressor + fan current + starting current of the smallest compressor.

Starting current values used for the compressor are : 06ZCE1-H3AA06013 = 40A ; 06ZFC2-3AA06013 = 50A ; 06ZJG3-3AA06013 = 80A.

Electrical data

Electrical data - Units with combination of options High energy efficiency (119), compressor with PM motor (329), fans with EC motor (17) + option 16

30KAV options 119 & 329		500A	550A	600A	650A	720A	800A	900A	1000A	1100A
Maximum operating input power^①										
Unit + option 119 + option 16	kW	238	263	280	303	330	382	416	469	502
Unit + option 119 + option 17 + option 16	kW	236	261	277	300	327	379	412	465	497
Unit + option 329 + option 16	kW	234	255	272	296	334	373	423	466	511
Unit + option 329 + option 119 + option 16	kW	233	258	264	286	324	365	409	454	494
Maximum operating current draw (Un)^①										
Unit + option 119 + option 16	A	369	408	436	472	513	594	646	729	780
Unit + option 119 + option 17 + option 16	A	366	405	432	468	508	589	640	723	773
Unit + option 329 + option 16	A	364	397	423	460	519	580	657	724	794
Unit + option 329 + option 119 + option 16	A	362	401	411	445	503	568	635	706	767
Maximum operating current draw (Un-10%)^①										
Unit + option 119 + option 16	A	402	436	475	503	545	643	687	775	830
Unit + option 119+ + option 16	A	399	433	471	499	540	638	681	769	823
Unit + option 329 + option 16	A	399	434	465	492	553	632	700	773	846
Unit + option 329 + option 119 + option 16	A	395	429	450	476	535	617	676	752	817

① Values obtained at operation with maximum operating power input (data given on the unit nameplate).

Compressor electrical data

Compressor	I Max (A) ^① Standard	I Max (A) ^① Option 16	F max (Hz) ^②	Inverter type ^③
06ZCE1H3AA06013	190	202	82	D3h
06ZCE1T3AA06013	239	254	105	D3h
06ZFC2T3AA06013	364	389	95	D4h
06ZCEAT3AA06013	220	233	103	D3h
06ZFCBT3AA06013	335	357	93	D4h

① Maximum compressor operating current draw over the entire range when powered at rated voltage. May be lower depending on the unit size.

② Maximum compressor frequency over the entire range. This frequency can be limited to a lower value depending on the unit size.

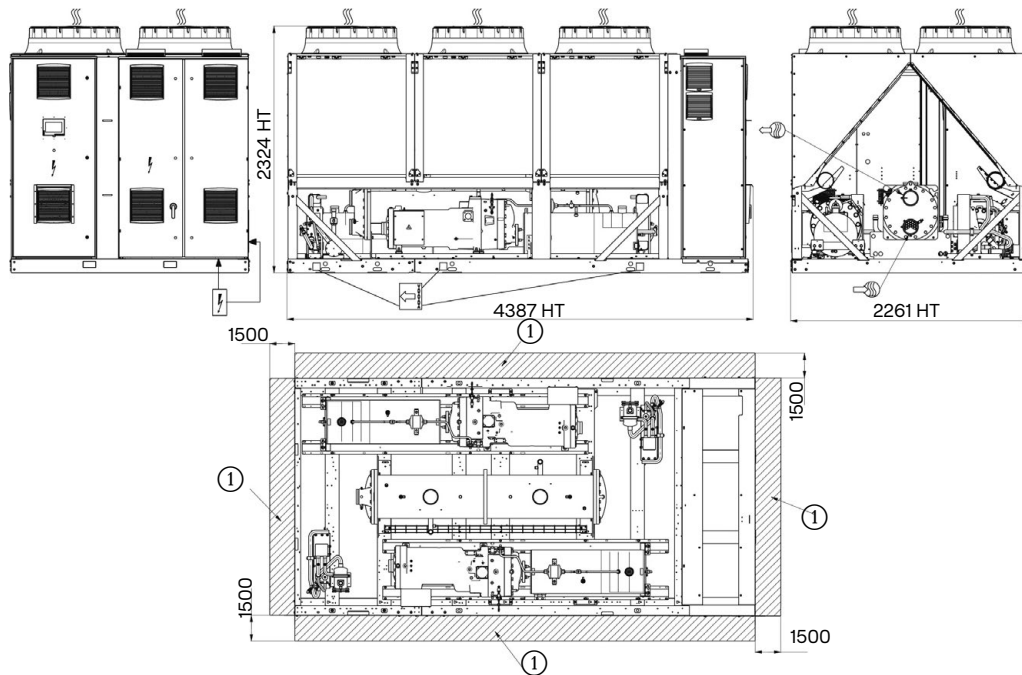
③ Mechanical inverter type : defines inverter weight and dimensions.

Distribution of compressors per circuit

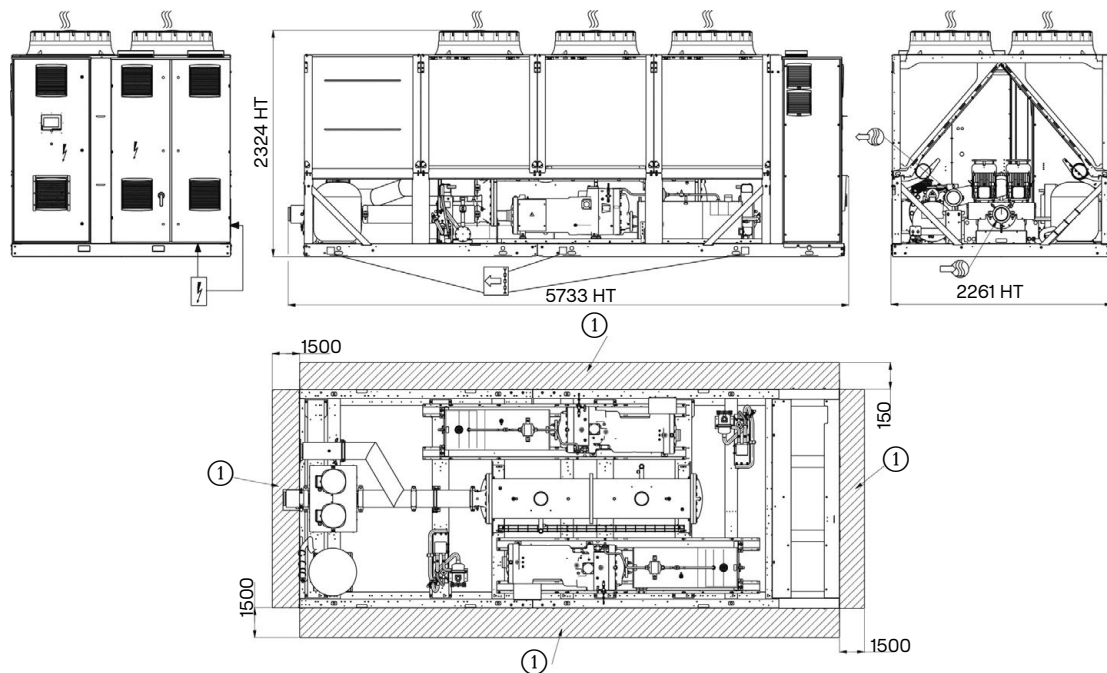
30KAV	Circuit	500A	550A	600A	650A	720A	800A	900A	1000A	1100A
06ZCE1H3AA06013	A	1	1	-	-	-	-	-	-	-
	B	1	1	-	-	-	-	-	-	-
06ZCE1T3AA06013	A	-	-	1	1	1	-	-	-	-
	B	-	-	1	1	1	1	1	-	-
06ZFC2T3AA06013	A	-	-	-	-	-	1	1	1	1
	B	-	-	-	-	-	-	-	1	1

Dimensions/clearances

30KAV 500A & 550A without Hydraulic module



30KAV 500A & 550A with Hydraulic module



Legend

All dimensions are given in mm.

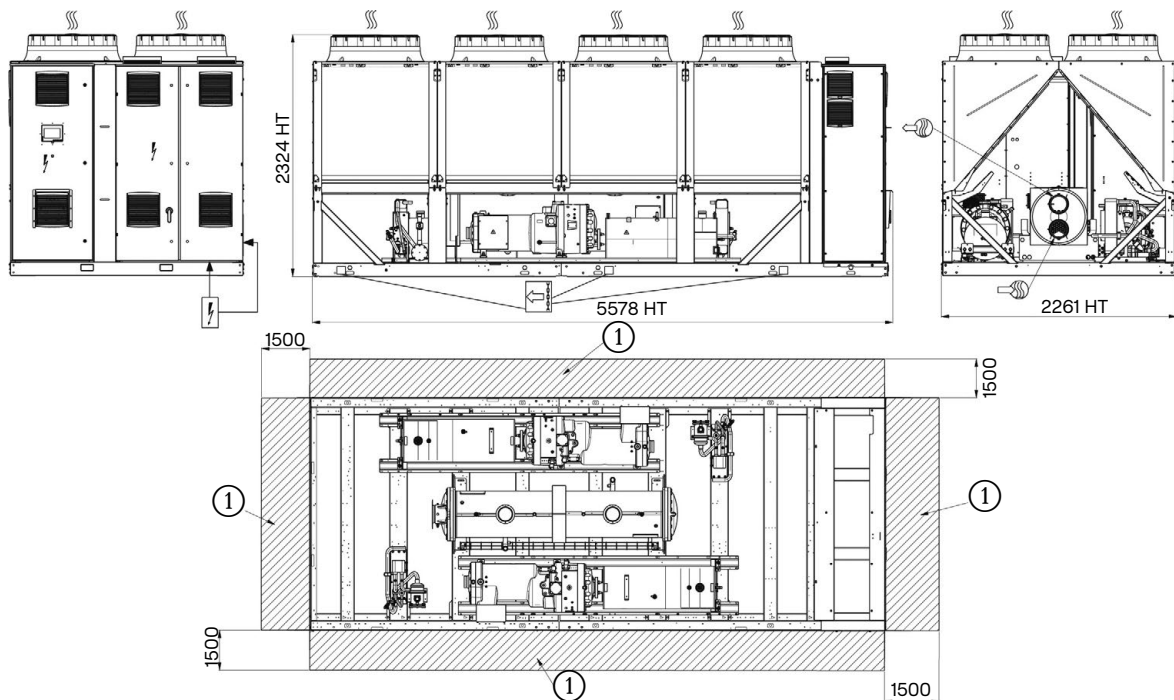
- ① Required clearances for maintenance (see note).
- Water inlet for standard unit.
- Water outlet for standard unit.
- Air outlet – do not obstruct.
- Power supply connection.
- Sling points.

NOTES:

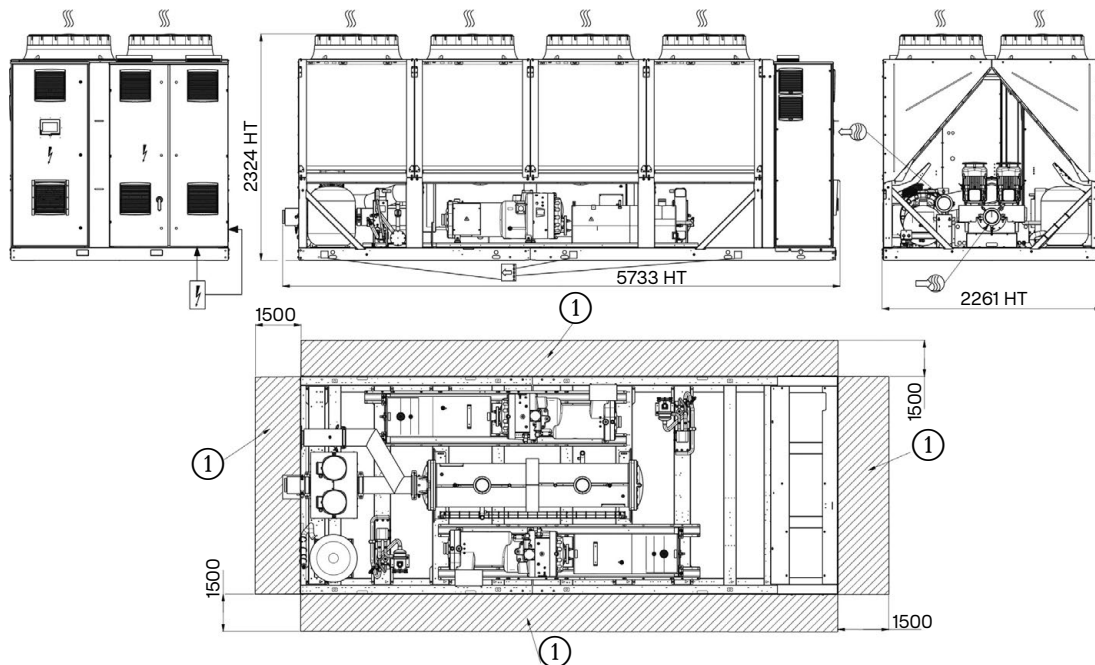
Non-contractual drawings.

Dimensions/clearances

30KAV 600A & 650A without Hydraulic module



30KAV 600A & 650A with Hydraulic module



Legend

All dimensions are given in mm.

① Required clearances for maintenance (see note).

Water inlet for standard unit.

Water outlet for standard unit.

Air outlet – do not obstruct.

Power supply connection.

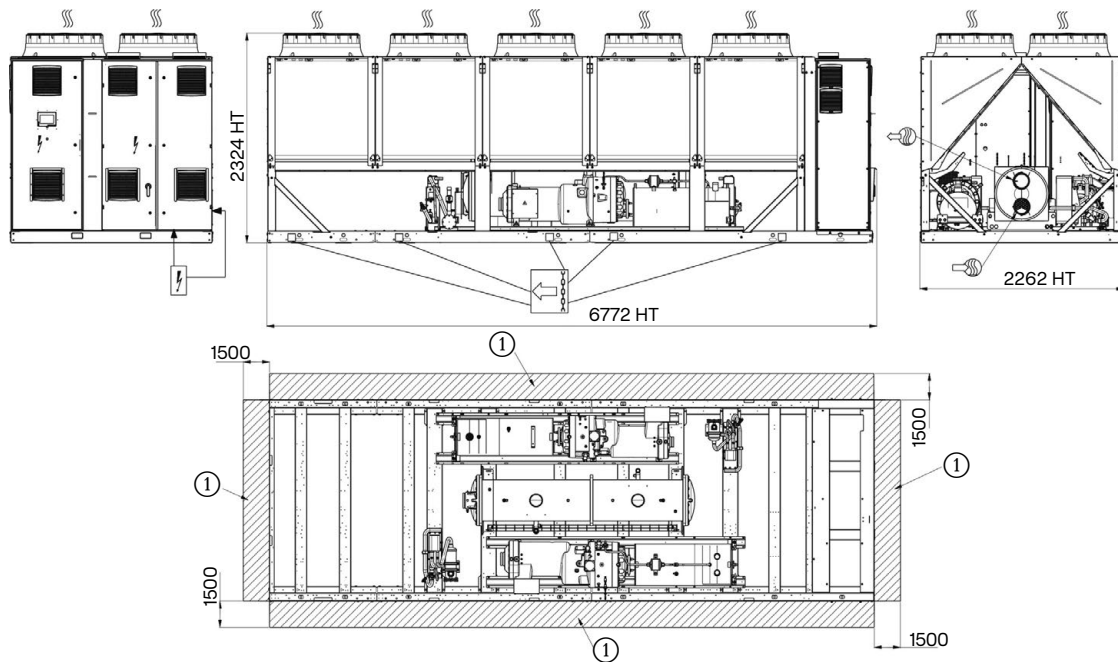
Sling points.

NOTES:

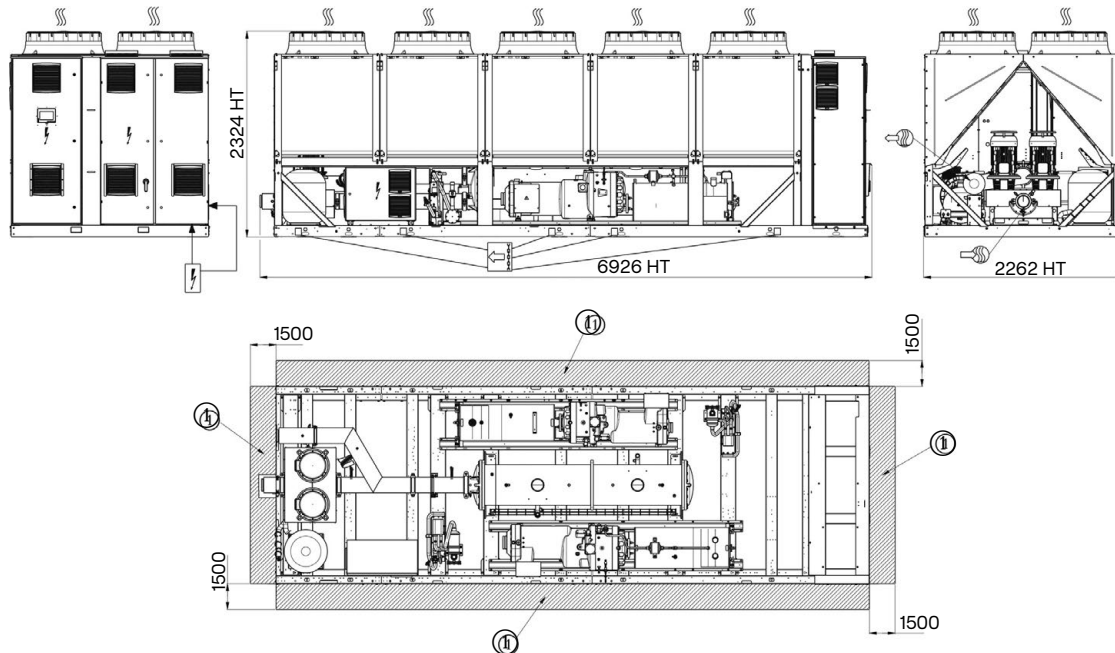
Non-contractual drawings.

Dimensions/clearances

30KAV 720A & 800A ; 30KAV 500A, 550A, 600A, 650A - opt 119 ; without hydraulic module



30KAV 720A & 800A ; 30KAV 500A, 550A, 600A, 650A - opt 119 ; with hydraulic module



Legend

All dimensions are given in mm.

① Required clearances for maintenance (see note).

Water inlet for standard unit.

Water outlet for standard unit.

Air outlet – do not obstruct.

Power supply connection.

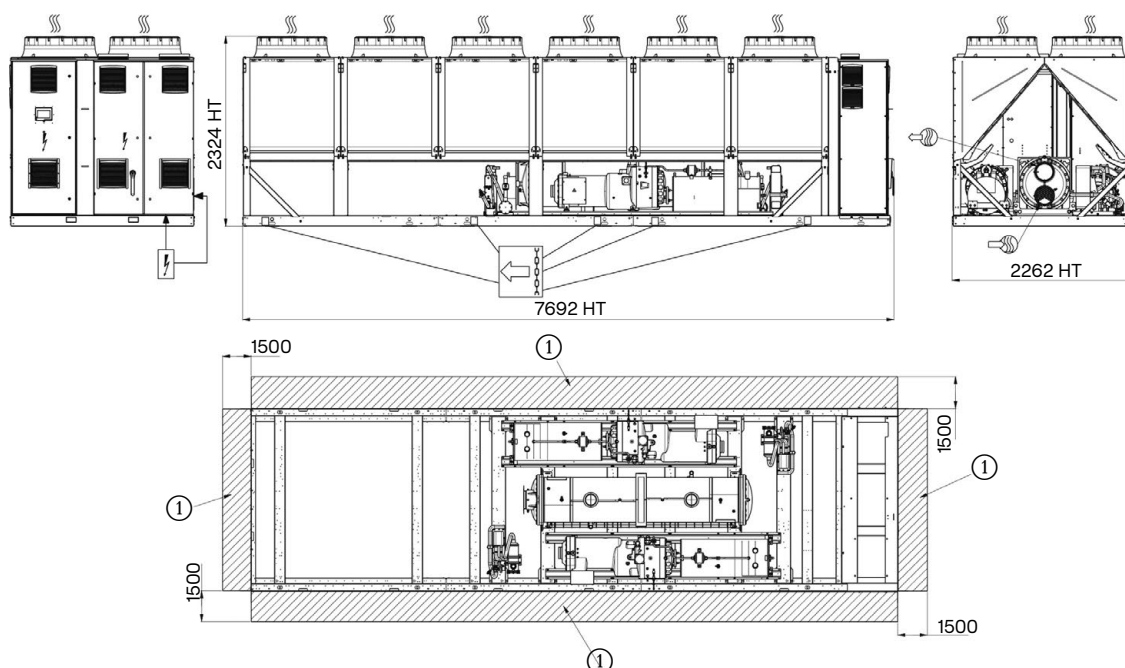
Sling points.

NOTES:

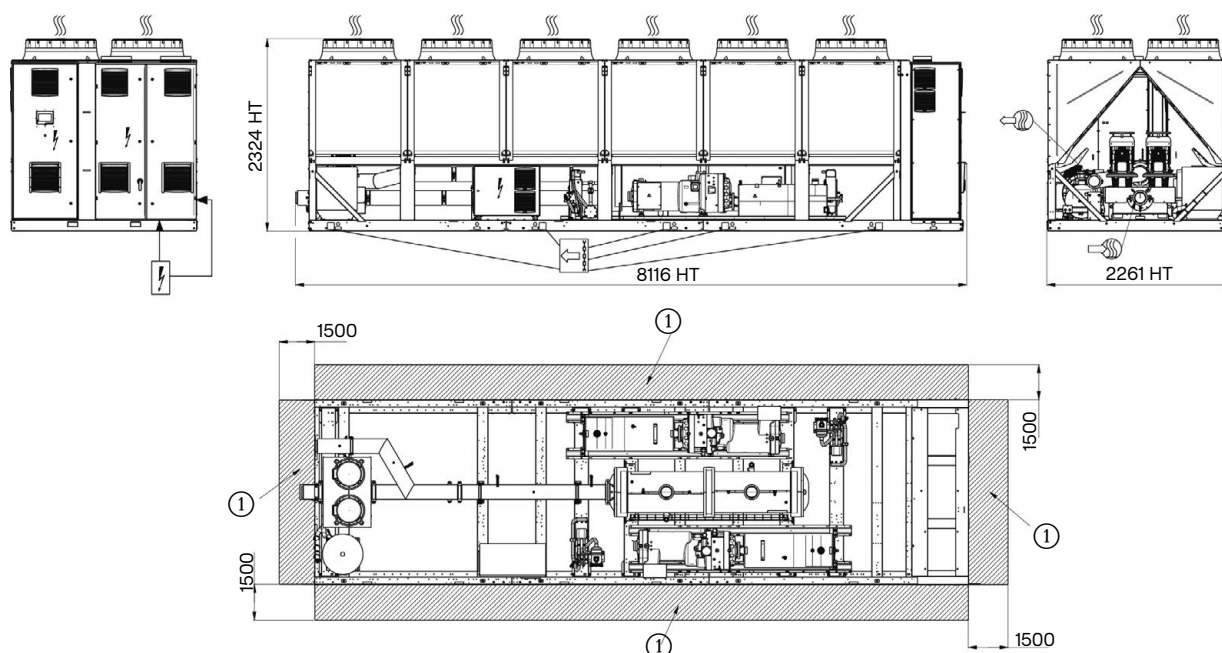
Non-contractual drawings.

Dimensions/clearances

30KAV 900A & 1000A ; 30KAV 720A - opt 119 ; without hydraulic module



30KAV 720A - opt 119 ; with hydraulic module



Legend

All dimensions are given in mm.

① Required clearances for maintenance (see note).

Water inlet for standard unit.

Water outlet for standard unit.

Air outlet – do not obstruct.

Power supply connection.

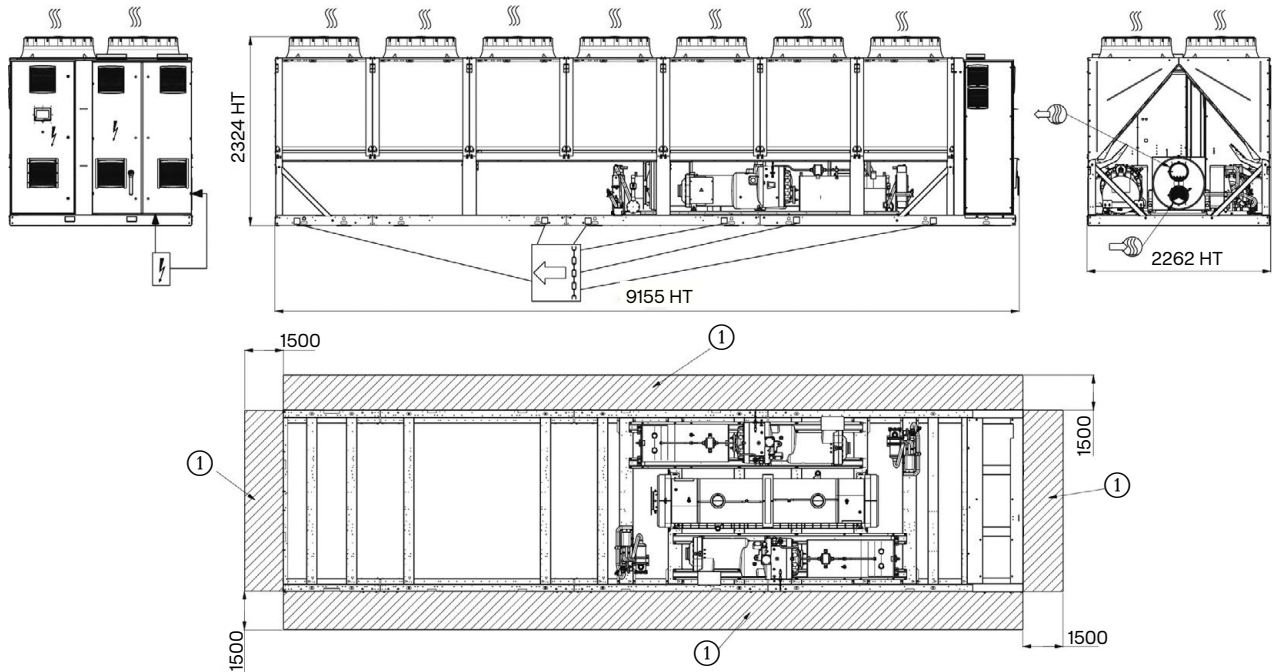
Sling points.

NOTES:

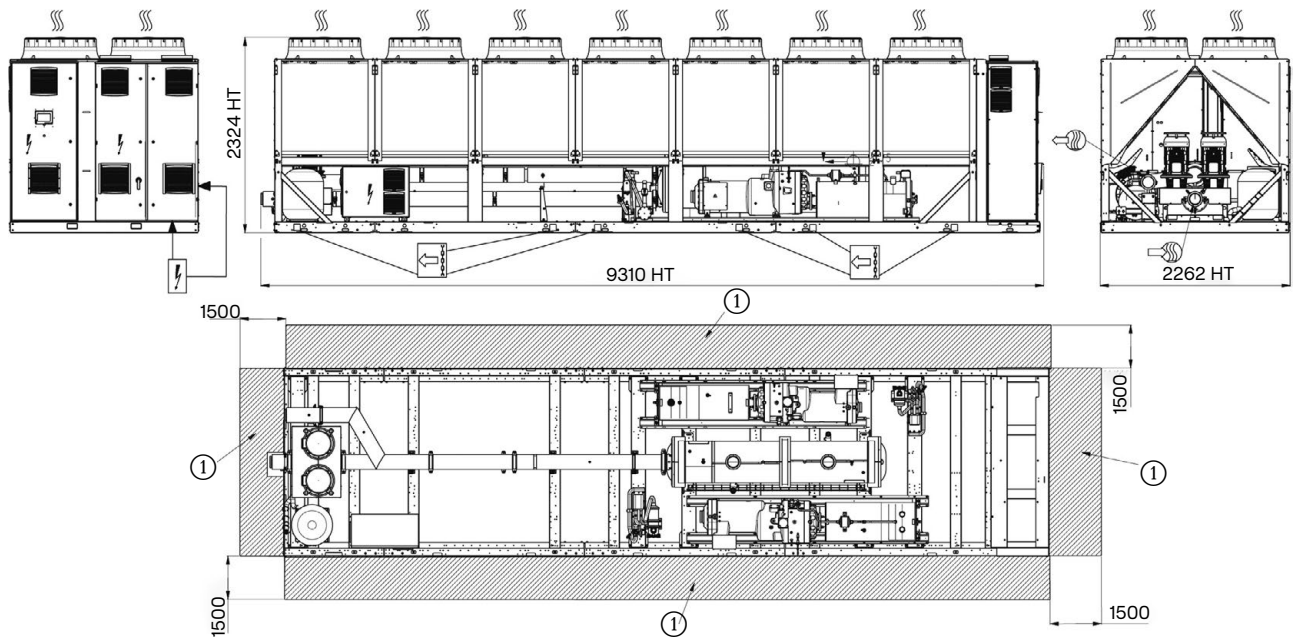
Non-contractual drawings.

Dimensions/clearances

30KAV 1100A ; 30KAV 800A & 900A - opt 119 ; without hydraulic module



30KAV 800A - opt 119 ; with hydraulic module



Legend

All dimensions are given in mm.

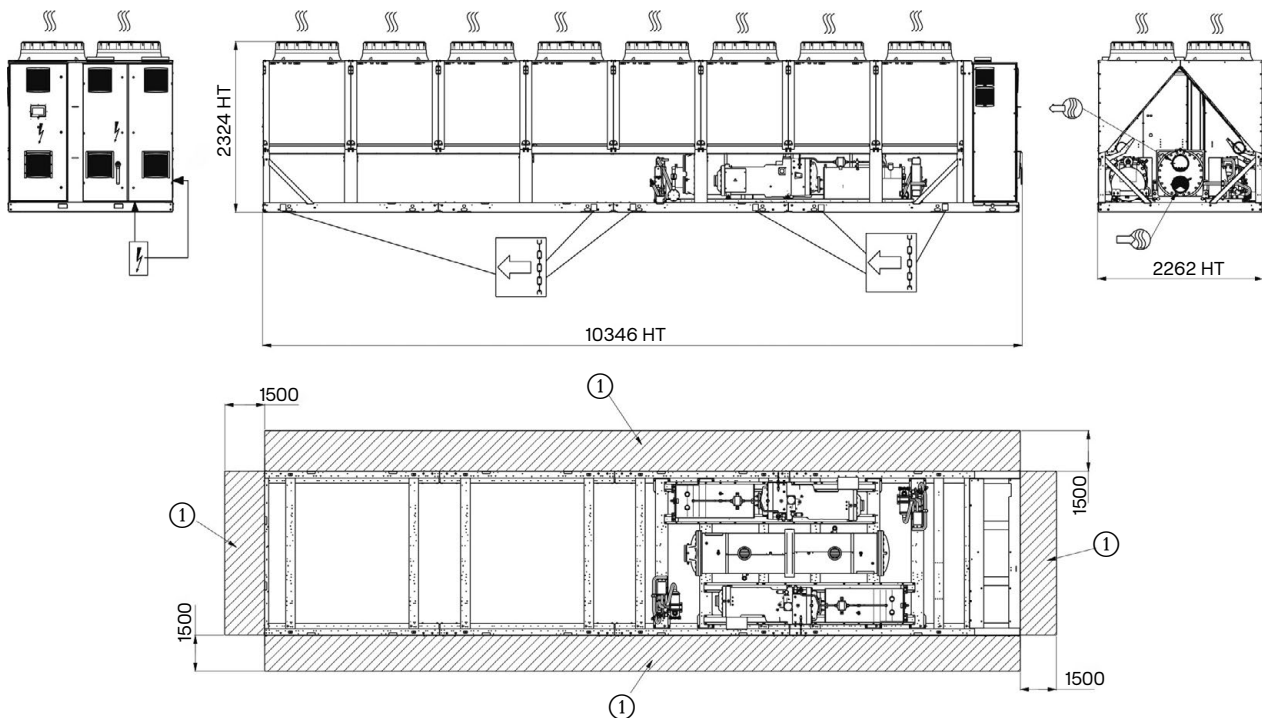
- ① Required clearances for maintenance (see note).
- Water inlet for standard unit.
- Water outlet for standard unit.
- Air outlet – do not obstruct.
- Power supply connection.
- Sling points.

NOTES:

Non-contractual drawings.

Dimensions/clearances

30KAV 1000A & 1100A - opt 119



Legend

All dimensions are given in mm.

- ① Required clearances for maintenance (see note).
- Water inlet for standard unit.
- Water outlet for standard unit.
- Air outlet – do not obstruct.
- Power supply connection.
- Sling points.

NOTES:

Non-contractual drawings.

Installation of multiple chillers

It is recommended to install multiple chillers in a single row, arranged as shown in the example below, to avoid recycling of warm air from one unit to another.



If the floor space does not allow this arrangement, contact your Carrier distributor to assess the various installation options.

Proximity to walls

To guarantee correct operation for most cases:

- If $h < H$ (2,3 m), S minimum = 3 m.
- If $h > H$ or $S < 3$ m, contact your Carrier distributor to assess the various installation options. An accessory (available for sale as a spare part) can be added to the unit in certain situations.

