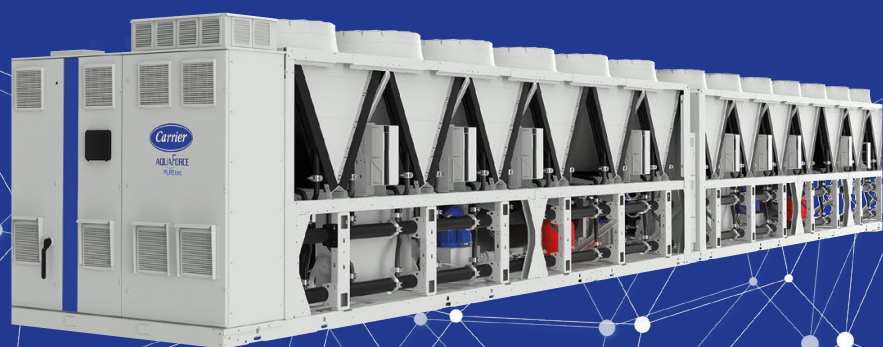


VARIABLE-SPEED SCREW LIQUID CHILLER WITH GREENSPEED INTELLIGENCE



Designed for Data Centers
& Process applications

Built-in free cooling

Outstanding performances

Reduction of energy
consumption

Service continuity &
redundancy

Environmental responsibility

30XF

AQUAForce greenspeed
PUREtec

Nominal cooling capacity: 390 - 2100 kW⁽¹⁾

The AquaForce® 30XF with Greenspeed® intelligence and PUREtec™ refrigerant is the premium solution dedicated for Data centers and Process applications. Designed with integrated free cooling and variable speed screw compressor with ultra-low GWP R-1234ze refrigerant, the 30XF is achieved through the optimised combination of proven best-in-class technologies that includes:

- Ultra-low GWP HFO R-1234ze
- Outstanding performances:
 - 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
 - Total Current Harmonic Filter/Suppression <5%
 - Carrier flooded shell-and-tube evaporator with new copper tubes for low pressure drops
- Reduction of energy consumption:
 - Free cooling with glycol or glycol free
 - Variable speed pumps on glycol free option to increase the performances during free cooling mode and mixed mode
- Service continuity & redundancy: Ultra-fast cooling capacity recovery <120s - optimization of the buffer tank size
- Built-in solution: Integrated free cooling and active harmonic filters. No external components to facilitate the transportation



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

(1) Unit size 400, 550, 600, 1100, 1250, 1400 & 1500 available in Q3 2024.

SUSTAINABILITY

PUREtec™: The environmental excellence solution

■ GWP<1*

Carrier has selected HFO R-1234ze as the best refrigerant to replace HFC R-134a on screw chillers and heat pumps.

HFO R-1234ze **offers a Global Warming Potential (GWP) index below 1**, similar to that of natural substances (CO₂ GWP=1).

* According to AR5 from the IPCC (International Panel on Climate change)

■ High efficiency

This excellent efficiency performance in turn means a **lower total carbon footprint**, with a reduction of 10% compared to HFC R-134a and HFC blends such as R-513A.

■ Regulation compliance

Carrier has made the strategic decision to choose a long-term solution for its new chiller and heat pump ranges using screw compressors: **HFO R-1234ze, with a GWP<1, is not impacted by the F-gas Regulation.**

AQUAFORCE® 30XF CUSTOMER BENEFITS



REDUCTION OF ENERGY CONSUMPTION

Free cooling Carrier system could reduce the energy consumption by 50%. When outside temperature is low enough, the compressors are switched off and only the fans are in operation. In free cooling operation, the unit can reach an energy efficiency ratio (EER) up to 90.



SERVICE CONTINUITY & REDUNDANCY

In case of a power outage, Carrier ultra fast capacity recovery option allows a 100% recovery in less than 120s.

This low period of time offers the possibility to reduce the size of the buffer tanks.



BUILT-IN SOLUTION

Hydraulic free cooling and active harmonic filters are built inside the Aquaforce 30XF unit to facilitate the transportation and the installation.



THANKS TO CARRIER FREE COOLING SOLUTION

■ Environmental responsibility

AquaForce® 30XF uses ultra-low global warming potential (GWP <1) HFO R-1234ze refrigerant. Combining reduced refrigerant charge and exceptional energy efficiency, it significantly lowers energy consumption while reducing CO₂ emissions throughout its life cycle.



OPTIMISATION OF THE BUFFER TANK SIZE

■ Intelligence and connectivity

The advanced SmartVu™ intelligent control displays the service parameters in real time, for an intuitive and particularly user-friendly use. The 30XF range is also characterised by an innovative intelligent energy monitoring function, which provides users with intelligent data such as real-time electrical energy consumption, cooling capacity, as well as instantaneous and average values of the real energy efficiency of the machine. To go further in terms of energy savings, the 30XF range can be monitored remotely by Carrier experts, in order to carry out a diagnosis and optimize electricity consumption.

No external component to facilitate the installation



■ Low sound levels

The new generation of Carrier 06Z variable-speed twin screw compressor with integrated resonance attenuator and the 6th generation of Flying Bird™ fans with new fan blade design inspired by nature help to significantly reduce compressor and fan noise. As an option, the 30XF chiller can be fitted with an acoustic cover for the screw compressor to achieve very low noise levels.



HFO R-1234ze refrigerant with direct CO₂ impact reduced by 99,9% compared to R-134a and 99,8% compared to R-513A



SMART ENERGY MONITORING



96 dB(A)

AQUAFORCE® 30XF CUSTOMER BENEFITS

AquaForce® liquid chillers with Greenspeed® Intelligence adapt effortlessly to a wide range of applications. An extended operating range covering ambient temperatures from -20 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, 30XF ranges meet 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. 30XF ranges also feature 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, AquaForce® can be monitored remotely by Carrier experts for energy consumption diagnosis and optimization.

Outstanding energy performance

- 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 AC 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)
- Hydraulic module with variable-speed pump
 - Variable-speed, single 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, 30XF ranges can be monitored remotely by Carrier experts for energy consumption diagnosis and optimization.

Built-in reliability and easy servicing

The AquaForce® offer enhanced performances as well as Carrier's acclaimed product quality and reliability. Major components were chosen, selected and tested to minimize 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%.
 - Synchronous motor 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
 - 30XF can be fitted with a Permanent Magnet (PM) motor to run the variable screw compressor (option 329)
 - Air-cooled compressor variable-speed drive (VSD) to ensure reliable operation and easy maintenance
 - 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:

30XF are 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.

- 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 4000 hours testing in constant neutral salt spray per ASTM B117.
 - Super Enviro-shield™ coating for MCHE used in highly corrosive environments (industry or marine applications) with superior durability confirmed through 6000 hours testing in constant neutral salt spray per ASTM B117.

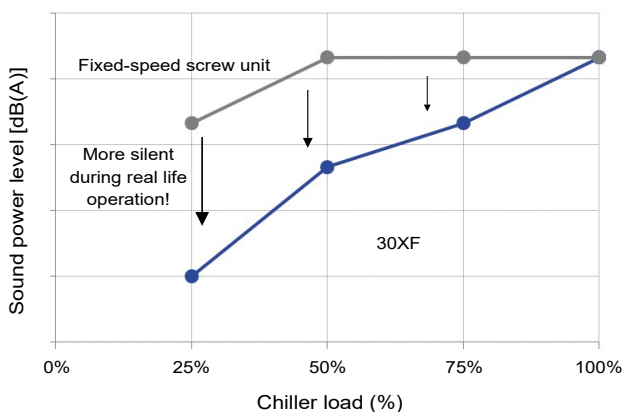
AQUAFORCE® 30XF CUSTOMER BENEFITS

- **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 281) improved resistance to mechanical and UV damage
- **Refrigerant circuits:**
 - Two independent refrigerant circuits for duplex units 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
- **Exceptional endurance tests:**
 - To design critical components and sub-assemblies to minimise the risk of failure on site, Carrier uses specialized 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 5000km by truck in a normal road
 - To ensure coils corrosion resistance, salt mist corrosion resistance test are performed in Carrier'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

- AquaForce® 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**
 - Full hydraulic module with pumps
 - Automatic nominal water flow adjustment through electronic control on the user display
- **No external component for easy transportation and installation.**
 - Built-in free cooling & active harmonic filters
- **Flexible electrical connections:**
 - Single or dual electrical point of connection
 - Single or dual disconnect switch
- **Simplified water connections:**
 - Victaulic connections on the evaporator
 - Clearly identified entering and practical reference marks for entering and leaving water connections
- **Fast commissioning:**
 - Systematic factory operating test before shipment
 - Functional test for main components, expansion valves, fans and compressors

Environmental care

- The AquaForce® with PUREtec™ refrigerant liquid chillers with Greenspeed® Intelligence is a boost for green cities and contributes to a sustainable future. Combining a reduced charge of R-1234ze 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).
- The AquaForce® with PUREtec™ refrigerant 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-1234ze: HFO 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.

AQUAFORCE® 30XF CUSTOMER BENEFITS

- 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 (option 92)
 - Refrigerant leak alert: The AquaForce® 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.
- The logo for AquaForce greenspeed PUREtec. It features the word "AQUAFORCE" in a bold, blue, sans-serif font. To its right, the word "greenspeed" is in a smaller, green, sans-serif font with a small green leaf icon. Below "AQUAFORCE", the word "PUREtec" is in a blue, sans-serif font with a stylized blue wave graphic above the "E".
- R-1234ze long-term refrigerant solution
 - HFO refrigerant with nearly zero global warming potential (GWP<1 following AR5) and zero ozone depletion potential (ODP = 0)
 - Not impacted by the HFC phase-down plan in Europe (79% HFC reduction in EU member states at 2030 horizon)
 - Compliant with refrigerant regulation in Switzerland that bans the use of HFC refrigerant in large capacity airconditioning equipment

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 AquaForce® 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 AquaForce® range helps customers involved in LEED® building certification.

The other benefit of using the AQUAFORCE PUREtec™ products is the eligibility for BUILDING labeling programs like BREEAM, HQE in France or Green Building Council labelling, that are recognizing the use of sustainable heating and air-conditioning equipment.

Let's take the example of BREEAM assessment method for the sustainability of buildings.

Two credits can be awarded where the refrigerants used in air-conditioning systems have a Global Warming Potential below 10.

And one additional credit can be awarded where the systems have a low Total Equivalent Warming Impact.

AQUAFORCE PUREtec™ is not only a solution that is reducing the energy bill and the CO₂ footprint.

It also helps the green certification of your buildings!

Energy saving certificate

AquaForce® with PUREtec™ refrigerant 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

30XF is equipped with variable speed asynchronous (standard) or synchronous (option 329) compressor motor

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

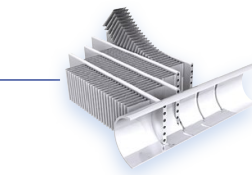
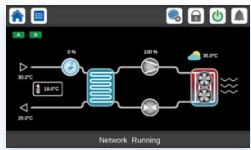
30XF TECHNICAL INSIGHTS

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

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



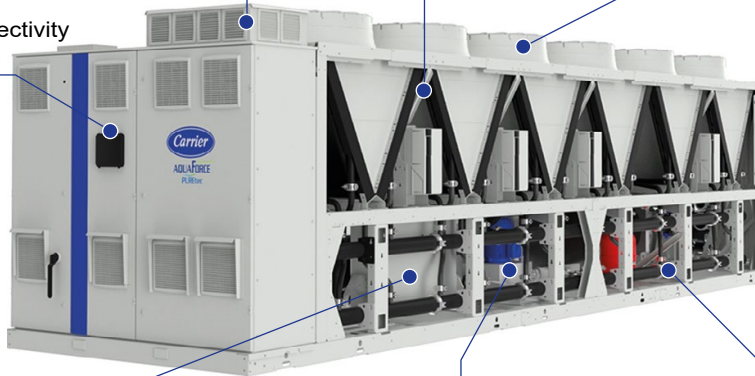
3RD GENERATION OF NOVATION® MICRO CHANNEL HEAT EXCHANGERS

- Exclusive Carrier design
- Increased reliability with new aluminum alloy
- Significantly reduces refrigerant charge (-40% vs cu/al coils)
- 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



6TH GENERATION OF VARIABLE-SPEED FLYING BIRD™ FANS WITH AC MOTOR

- Exclusive Carrier design
- Fan blade design inspired by nature
- AC motor technology



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
- High efficiency evaporator with higher ΔT design

LATEST GENERATION CARRIER VARIABLE-SPEED 06Z TWIN SCREW COMPRESSOR WITH AC MOTOR

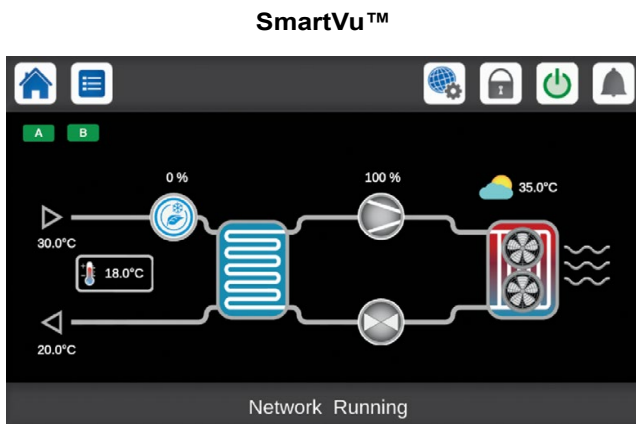
- Exclusive Carrier design
- Twin screw compressor designed for variable speed operation
- High efficiency AC motor
- Stepless variable-speed control (0%-100%)
- Integrated resonator array for compressor acoustic attenuation
- Integrated check valve for quiet shutdown
- Air-cooled inverter drive for increased reliability
- Bearing life exceeding 100,000 hours
- Twin screw compressor with permanent magnet motor as option

BUILT-IN FREE COOLING SYSTEM

- Integrated hydraulic free cooling
- Glycol free option with variable speed pump

TECHNICAL INSIGHTS

SmartVu™ Control (standard)



- 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)

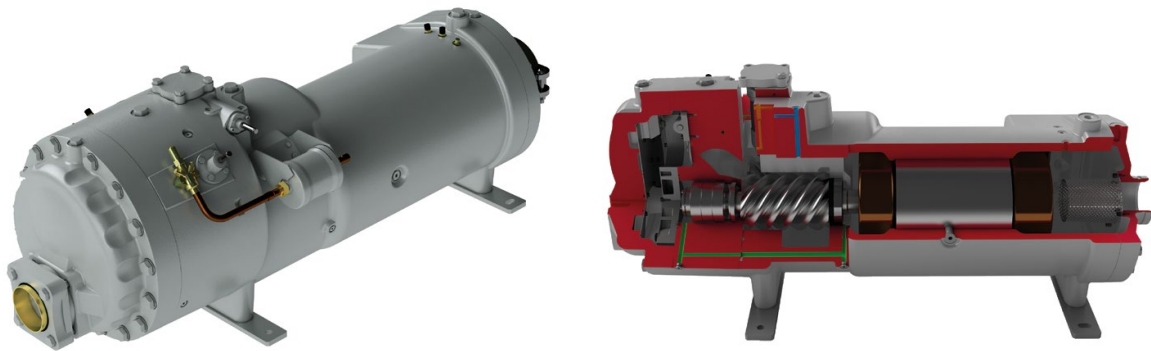
- Units with SmartVu™ control can be easily accessed from the internet, using a PC with an Ethernet connection. This makes remote control quick and easy and offers significant advantages for service operations.
- AquaForce with Greenspeed® Intelligence is equipped with an RS485 serial port that offers 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).
- Units 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

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 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

TECHNICAL INSIGHTS

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.

Power Factor 0,98 is one benefit of Carrier technology choice using variable-speed compressor compared with power factor of 0,9 usually associated with fixed-speed compressor technology. High power factor close to 1 means that there is no energy lost in the distribution system thus, guaranteeing low power costs granted by electrical utilities, low energy costs and higher PUE of data centers.

- 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.
- 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.

TECHNICAL INSIGHTS

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 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 Carrier 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



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	Very good	No coil leak	Best
Enviro-shield® Novation™ MCHE	Very good	Good	No coil leak	Very good
Novation™ MCHE	Good	Very good	No coil leak	Good

Ultra-fast capacity recovery (Option 295+)

In mission-critical applications like data centers, process cooling & the food industry, a delay in chiller restart and capacity regain following the restoration of electrical power may increase the water temperatures thus potentially affecting the desired operation. Normally additional water volume loop/system is deployed to overcome this.

Ultra-Fast Capacity Recovery™ is an innovative feature that ensures immediate restart of chiller operation following a power restoration & allows 100% capacity recovery in less than 120s. This will eliminate or significantly reduce the need for additional water volume.

Carrier chillers have led the industry for decades in rapid capacity recovery, with the fastest restart and recovery time. Carrier Ultra-Fast Capacity Recovery™ feature will continue to lead in this regard, delivering even more accelerated capability. This new capability has been made possible thanks to specific software and hardware integration.

Harmonics filter (Option 336)

Harmonics Electronic Filter can be selected to eliminate harmonics at the source (THD < 5%). This option consists in active electronic filters to maintain a low and safe level of harmonics to ensure power reliability, no energy lost in the distribution system and higher PUE of data centers.

TECHNICAL INSIGHTS

New Generation of Flying Bird VI fans



The 30XF utilize Carrier's 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 30XF air management system configuration and heat exchanger technology. 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.

Variable Frequency Drives (VFD)

The compressors, AC fans and the pumps of AquaForce® are controlled by VFDs.

- Electrical box is capable of operating up to 55°C (with option 16 "High Ambient").
- Unit regulation is designed to withstand 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.

Actual Major product modification 30XF:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
3	0	X	F	-	Z	1	0	0	0	-	-	-	-	-	-	-	-

Product codification

- Digit 1-3 : Air cooled Screw Chiller
- Digit 4 : "F" = Free cooling capability (available as an option)
- Digit 5 : "-" = Standard Unit
- Digits 6 : Refrigerant ('Z' = R1234ze)
- Digits 7 to 10 : Number based on the cooling capacity in kW at water conditions +30/+20°C, outside air +35°C
- Digit 11 : Major product modification
- Digit 12 to 15 : Counter used to generate a one time product code
- Digit 16 : Used for TWO PIECES SHIPMENT '1' = module 1, '2' = module 2 and '-' for single piece

FREE COOLING SYSTEM WITH GLYCOL AND GLYCOL FREE (OPTION 305A - 305C)



Reducing operating costs and protecting the environment has become a major challenge for air conditioning applications, industrial processes and data centre cooling.

The free cooling option provides significant energy savings for all applications where there is a demand for cooling throughout the year, especially in cold climate regions. In these regions free cooling can meet a large part of the cooling requirements in a very economical and environmentally friendly way.

In free cooling mode, the compressors are switched off and only the fans are in operation. Switching from cooling mode to free cooling mode is managed automatically by the SmartVu™ control system according to the thermal load of the chiller and the temperature differential between the chilled water outlet and the ambient air.

Important: In order to optimise the performance of the chiller, it is advisable to use the water outlet temperature setpoint offset function.

How it works

The SmartVu™ control of the unit maximises the use of free cooling according to the needs of the application and the climatic conditions. As soon as the chilled water/room air temperature differential exceeds a threshold value of 1K, the SmartVu™ control activates the free cooling operation and adjusts the air flow rate to optimise the energy performance of the unit. If the operating conditions allow free cooling operation only to meet the requirements, the compressors are stopped. Two motorised valves direct the chilled water to the free cooling coils.

3 possible operating modes:

Summer, hot season: Mechanical cooling mode

The liquid chiller provides the traditional requirements with the help of the refrigeration circuit.

The fluid bypasses the free cooling coils and is cooled by the evaporator.

Mid-season: Mixed mode

Operation in mixed free cooling and Mechanical cooling mode is possible. This will help to optimise free cooling operations while ensuring that the cooling requirements of the system are met. The fluid pre-cooled by the free cooling coils positioned in series with the evaporator of the refrigeration circuit which completes its cooling.

Winter, cold season: Free cooling mode

Depending on the required power and the set point, the totality of the needs can be supplied by the free cooling.

In this operating mode, only the fans are running, ensuring optimum energy efficiency.

Adaptations to the needs

Depending on the user's needs. AquaForce free cooling is available in 2 performance levels:

- 305A Total hydraulic free cooling on both circuits, particularly suitable for installations with high cooling requirements all year round (industrial process, data centre...)
- 305C Total hydraulic free cooling Glycol Free allows the use of pure water in the cooling circuit.

UNIT PERFORMANCE TABLES IN FREE COOLING MODE

Free cooling Capacity as a percentage of Cooling Capacity depending on ambient air temperature, option 305A (Total Hydraulic Free Cooling)

OAT [°C]	0750	0900	1000	1700	1800	1900	2000	2100
45	0%	0%	0%	0%	0%	0%	0%	0%
35	0%	0%	0%	0%	0%	0%	0%	0%
25	18%	19%	19%	18%	18%	19%	19%	19%
20	37%	38%	39%	36%	37%	38%	39%	39%
15	55%	57%	58%	54%	55%	57%	58%	59%
10	70%	72%	74%	70%	71%	72%	73%	74%
5	71%	75%	77%	75%	79%	80%	81%	83%
0	100%	100%	100%	100%	100%	100%	100%	100%
-5	100%	100%	100%	100%	100%	100%	100%	100%

EER [kW/kW] depending on ambient air temperature, option 305A (Total Hydraulic Free Cooling)

OAT [°C]	0750	0900	1000	1700	1800	1900	2000	2100
45	3,15	3,16	3,16	3,11	3,13	3,14	3,11	3,13
35	3,76	3,75	3,66	3,59	3,65	3,69	3,68	3,66
25	6,02	6,05	6,07	5,85	5,95	6,04	6,09	6,14
20	8,49	8,63	8,81	8,23	8,46	8,65	8,80	8,95
15	13,71	14,19	14,80	12,24	13,21	14,18	14,68	15,05
10	22,21	22,73	23,53	21,18	22,28	23,22	23,96	24,74
5	25,88	29,06	31,17	23,87	26,95	28,15	29,07	32,28
0	58,19	58,01	58,94	57,57	60,69	63,06	65,14	67,01
-5	80,72	79,31	79,45	83,56	87,04	89,76	92,30	94,57

Free cooling Capacity as a percentage of Cooling Capacity depending on ambient air temperature, option 305C (Total Hydraulic Free Cooling, Glycol Free)

OAT [°C]	0750	0900	1000	1700	1800	1900	2000	2100
45	0%	0%	0%	0%	0%	0%	0%	0%
35	0%	0%	0%	0%	0%	0%	0%	0%
25	16%	16%	17%	15%	16%	16%	16%	17%
20	33%	33%	34%	33%	33%	34%	34%	34%
15	49%	49%	50%	47%	48%	49%	50%	51%
10	63%	64%	65%	62%	63%	64%	64%	65%
5	70%	71%	71%	71%	71%	71%	71%	71%
0	70%	73%	73%	79%	78%	73%	73%	73%
-5	100%	100%	100%	100%	100%	100%	100%	100%

EER [kW/kW] depending on ambient air temperature, option 305C (Total Hydraulic Free Cooling, Glycol Free)

OAT [°C]	0750	0900	1000	1700	1800	1900	2000	2100
45	3,22	3,23	3,24	3,29	3,31	3,32	3,31	3,32
35	3,81	3,81	3,71	3,73	3,73	3,78	3,77	3,75
25	5,90	5,88	5,86	5,85	5,93	6,00	6,01	6,03
20	8,02	8,07	8,15	8,07	8,07	8,07	8,07	8,07
15	11,59	12,64	12,83	10,76	11,73	12,67	12,91	13,13
10	18,82	18,84	19,16	17,92	18,49	19,02	19,35	19,73
5	25,80	26,21	26,13	26,21	26,45	26,78	26,86	27,09
0	29,10	31,88	31,64	30,32	33,31	32,79	32,85	33,00
-5	57,32	54,85	53,79	55,36	56,31	57,38	57,73	58,24

OPTIONS

Option	N°	Description	Advantage	Use 30XF-Z
High speed fans at 1140RPM	12B	Fans speed can be increased up to 1140RPM	Enhances the unit performances at high ambient temperature, Higher static pressure available (max 200Pa)	0400-2100
Low Noise	15	Aesthetic and sound absorbing compressor enclosure	Noise level reduction	0400-2100
Very Low Noise	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	0400-2100
Enclosure panels	23A	Side enclosure panels	Improves aesthetics and piping protection against impacts,	0400-2100
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,	Available in Q3 2024
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	0400-2100
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	0400-2100
Lead / Lag operation (sensor kit)	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 parallel operation with operating time equalisation	Available in Q3 2024
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	0400-2100
Dual Power Supply 400V/400V	85A	Power supply separated in two 400V feeds: Supply 1 (400V): Compressors & Fans / Supply 2 (400V): Control, Main pumps & Heaters	Chiller can be connected on 2 separated power supplies. Control, main pumps & heaters can be connected to external UPS 400V which allow ultra fast capacity recovery and maintain water flow in case of power supply 1 failure	0400-2100
Dual Power Supply 400V/230V	85B	Power supply separated in two feeds: Supply 1 (400V): Compressors, Fans, pumps & heaters / Supply 2 (230V): Control only	Chiller control can be connected to external UPS 230V which allow ultra-fast capacity with the chiller	0400-2100
Service set valve	92	Liquid line valve, evaporator suction line valve and compressor discharge line valve	Allow isolation of various refrigerant circuit components for simplified service and maintenance	0400-2100
HP VSD single-pump (variable speed)	116V	Single high-pressure water pump with variable speed drive (VSD), electronic water flow control, pressure transducers, Multiple possibilities of water flow control, (expansion tank not included)	Easy and fast installation (plug & play), significant pumping energy cost savings (up totwo-thirds), tighter water flow control, improved sytem reliability	0400-2100
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	0400-2100
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	0400-2100
Remote pump control	152P	Additional hardwired control outputs/inputs for internal pumps management	Pumps control can be directly managed by customer BMS via hardwired connections, Pumps control by Modbus is also possible	0400-2100
Energy Management Module Plus	156+	Extra control board card for additional control outputs/inputs, See Energy Management Module option chapter	Extended remote control capabilities (Set-point reset, freeze protection, demande limit, capacity limitation, input contact for refrigerant leak detection)	0400-2100
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	0400-2100
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	Available in Q3 2024

OPTIONS

Option	N°	Description	Advantage	Use 30XF-Z
Compliance with Australian regulations	200	Unit approved to Australian code	Conformance with Australian regulations	Available in Q3 2024
Capacity booster	232	Compression load increase	Cooling capacity increase	0400-2100
Insulation of the evap, in/out refrigerant 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	0400-2100
Anti-corrosion protection on total free cooling coils	262AC	Same anti-corrosion treatment as for condenser MCHE coils	Improved corrosion resistance, recommended for use in moderately corrosive environments	0400-2100
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	0400-2100
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	0400-2100
Super Enviro-Shield on Total free cooling coils	263AC	Same anti-corrosion treatment as for condenser MCHE coils	Improved corrosion resistance, recommended for use in extremely corrosive environments	0400-2100
Welded evaporator connection (kit)	266	Victaulic piping connections with welded joints	Easy installation	0400-2100
Evaporator with aluminum jacket	281	Evaporator covered with an aluminum sheet for thermal insulation protection	Improved resistance to aggressive climate conditions	Available in Q3 2024
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)	Available in Q3 2024
230V electrical plug	284	230V AC 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	0400-2100
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,	0400-2100
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)	0400-2100
Mexico screw compressor	297	Screw compressor made in Mexico	Mexico screw compressor	0400-2100
Total hydraulic free cooling	305A	Hydronic free cooling coils on both refrigerant circuits,	Energy savings for applications with cooling demand throughout the entire year (e.g, Industrial process, Data-center,...)	0400-2100

OPTIONS

Option	N°	Description	Advantage	Use 30XF-Z
Total hydraulic free cooling glycol free	305C	Hydronic free cooling coils on both refrigerant circuits and decoupling exchanger,	Energy savings for applications with cooling demand throughout the entire year (e.g, Industrial process, Data-center,...) Operation without glycol	0400-2100
Compliance with UAE regulation	318	Additional label on the unit with rated power input, rated current and EER following AHRI 550/590	Compliance with ESMA standard UAE,S 5010-5: 2019,	Available in Q3 2024
Compliance with Qatar regulation	319	Specific nameplate on the unit with power supply 415 V+/-6%	Compliance with KAHRAMAA regulation in Qatar,	Available in Q3 2024
Compliance with Morocco regulation	327	Specifics documents according Morocco regulation	Conformance with Morocco regulations	Available in Q3 2024
Compressor with permanent magnet	329	Screw compressor equipped with permanent magnet motor	Permanent magnet motor improves significantly compressor efficiency	Available in Q3 2024
Delivery with plastic tarp cover	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,	0400-2100
400-3-60Hz power supply	335	400-3-60Hz power supply	Permits unit connection to 400-3-60Hz power supply	0400-2100
Active Harmonic Filters	336	Use of active electronic filters placed into electrical cabinet (THDI 5% at full load)	No energy lost in the distribution system and higher Power Usage Effectiveness of data center to maintain low and safe level of harmonics to ensure reliability	0400-2100
Surge arrester	337	Surge arrester Class I/II according to IEC 61643-11	To protect electrical devices from high voltage spikes, Can be recommended in area with high flashes / km ² / year,	0400-2100
Hydraulic free cooling removal	338	Hydraulic free cooling features will not be included in the unit	Cost reduction when free cooling features can't be valorized	0400-2100

DUAL POWER SUPPLY (OPTIONS 85A & 85B)

This option allows power supply separation in two feeds:

Option 85A:

Power supply separated in two 400V feeds:

- Supply 1 (400V): Compressors & Fans
- Supply 2 (400V): Control, Main pumps & Heaters. They can be connected to an external UPS 400V which allow ultra fast capacity recovery and maintain water flow in case of power supply 1 failure

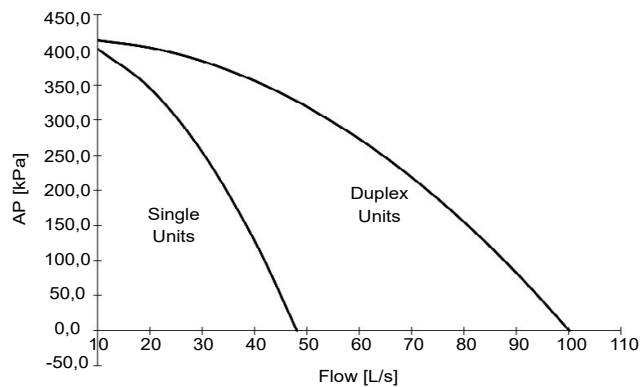
Option 85B:

Power supply separated in two feeds:

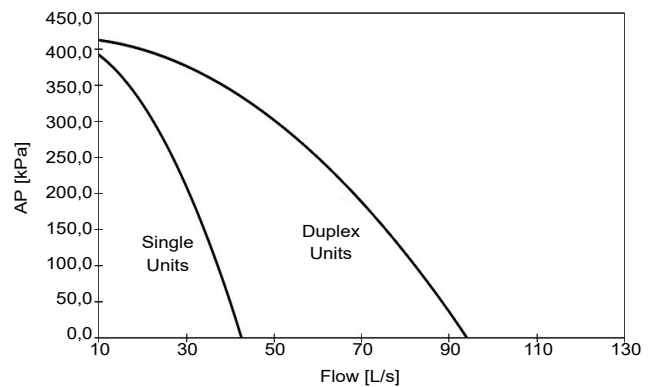
- Supply 1 (400V): Compressors, fans, pumps & heaters
- Supply 2 (230V): Control only. It can be connected to an external UPS 230V which allow ultra-fast capacity with the chiller

HP SINGLE PUMP VARIABLE SPEED (OPTION 116V)

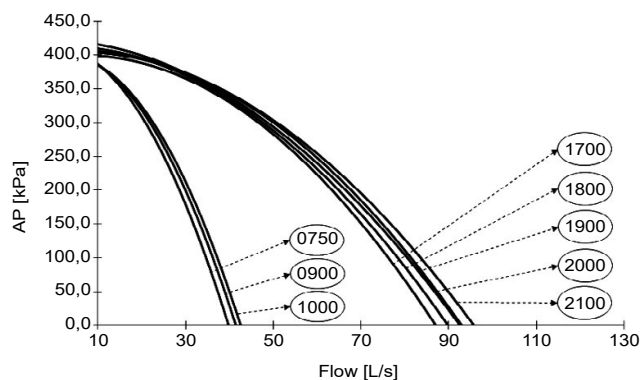
Units + Option 116V - Available Pressure



Units + Options 116V+305C - Available Pressure



Units + Options 116V+305A - Available Pressure



ULTRA FAST CAPACITY RECOVERY (OPTION 295+)

In mission-critical applications like data centers, process cooling & the food industry, a delay in chiller restart and capacity regain following the restoration of electrical power may increase the water temperatures thus potentially affecting the desired operation, Normally additional water volume loop/system is deployed to overcome this.

Ultra-Fast Capacity Recovery™ is an innovative feature that ensures immediate restart of chiller operation following a power restoration & allows 100% capacity recovery in less than 120s. This will eliminate or significantly reduce the need for additional water volume.

Carrier chillers have led the industry for decades in rapid capacity recovery, with the fastest restart and recovery time, Carrier Ultra-Fast Capacity Recovery™ feature will continue to lead in this regard, delivering even more accelerated capability, This new capability has been made possible thanks to specific software and hardware integration.

30XF-Z Units + Option 295+	0750	0900	1000	1700	1800	1900	2000	2100
Full load recovery time after power supply loss (sec.)	150	150	150	150	150	150	150	150

30XF-Z Units + Options 85A + 295+	0750	0900	1000	1700	1800	1900	2000	2100
Full load recovery time after Main power supply loss (sec.)	120	120	120	120	120	120	120	120
Full load recovery time after second power supply loss (sec.)	150	150	150	150	150	150	150	150

30XF-Z Units + Options 85B + 295+	0750	0900	1000	1700	1800	1900	2000	2100
Full load recovery time after Main power supply loss (sec.)	120	120	120	120	120	120	120	120
Full load recovery time after second power supply loss (sec.)	150	150	150	150	150	150	150	150

PERFORMANCES

Performance Data of Units without free cooling (Option 338)

30XF-Z Units			0750	0900	1000	1700	1800	1900	2000	2100
Cooling										
Full Load Performances*	Nominal Capacity	kW	811	953	1070	1787	1889	1991	2090	2190
	EER	kW/kW	4,14	4,10	3,99	4,03	4,06	4,09	4,07	4,03
Full Load Performances**	Nominal Capacity	kW	538	629	707	1161	1225	1289	1355	1420
	EER	kW/kW	3,19	3,16	3,10	3,12	3,14	3,16	3,14	3,12
Seasonal Energy Efficiency***	SEER _{12/7°C} Comfort low temp.	kWh/kWh	5,04	5,06	5,20	4,98	5,05	5,06	5,07	5,13
	ηs cool _{12/7°C}	%	199	199	205	196	199	200	200	202
	SEPR _{12/7°C} Process high temp.	kWh/kWh	6,17	6,17	6,10	6,14	6,17	6,19	6,19	6,19
Integrated Part Load Values	IPLV.SI	kW/kW	5,55	5,60	5,63	5,29	5,37	5,57	5,59	5,62
	IPLV.IP	Btu/Wh	19,08	19,20	19,29	18,25	18,41	19,10	19,18	19,18

* Cooling mode conditions: Entering/Leaving Temperature = 30°C/20°C. Outside Air Temperature = 35°C. Evaporator Fouling Factor = 0 m²/K/W. Heat Transfer Medium = Pure Water

** Cooling mode conditions: Entering/Leaving Temperature = 12°C/7°C. Outside Air Temperature = 35°C. Evaporator Fouling Factor = 0 m²/K/W. Heat Transfer Medium = Pure Water

*** In accordance with standard EN14825: 2022, average climate.

SEER_{12/7°C} & ηs cool_{12/7°C} In accordance with Ecodesign regulation (UE) N° 2016/2281 for Comfort Applications

SEPR_{12/7°C} In accordance with Ecodesign regulation (UE) N° 2016/2281 for Process Applications

IPLV.SI In accordance with AHRI standard (Air, Heating & Refrigeration Institute ; U.S.A) 550-591.

IPLV.IP In accordance with AHRI standard (Air, Heating & Refrigeration Institute ; U.S.A) 550-590.



Eurovent certified values



AHRI certified values
30XF-only

Performance Data of Units + Option 305A (Total Hydraulic Free Cooling)

30XF-Z Units + Option 305A			0750	0900	1000	1700	1800	1900	2000	2100
Cooling										
Full Load Performances*	Nominal Capacity	kW	777	911	1024	1649	1747	1846	1943	2039
	EER	kW/kW	3,76	3,75	3,66	3,59	3,65	3,69	3,68	3,66
Full Load Performances**	Nominal Capacity	kW	522	610	687	1096	1160	1223	1288	1353
	EER	kW/kW	2,93	2,91	2,84	2,83	2,85	2,87	2,86	2,84
Seasonal Energy Efficiency***	SEER _{12/7°C} Comfort low temp.	kWh/kWh	4,69	4,73	4,78	4,65	4,73	4,72	4,73	4,77
	ηs cool _{12/7°C}	%	185	186	188	183	186	186	186	188
	SEPR _{12/7°C} Process high temp.	kWh/kWh	7,03	7,02	7,00	6,94	7,01	7,08	7,12	7,15
Integrated Part Load Values	IPLV.SI	kW/kW	5,17	5,22	5,24	4,95	5,02	5,17	5,19	5,21
	IPLV.IP	Btu/Wh	17,76	17,90	17,97	16,99	17,21	17,73	17,88	17,88

* Cooling mode conditions: Entering/Leaving Temperature = 30°C/20°C. Outside Air Temperature = 35°C. Evaporator Fouling Factor = 0 m²/K/W. Heat Transfer Medium = Ethylene Glycol 30%

** Cooling mode conditions: Entering/Leaving Temperature = 12°C/7°C. Outside Air Temperature = 35°C. Evaporator Fouling Factor = 0 m²/K/W. Heat Transfer Medium = Ethylene Glycol 30%

*** In accordance with standard EN14825: 2022, average climate.

SEER_{12/7°C} & ηs cool_{12/7°C} In accordance with Ecodesign regulation (UE) N° 2016/2281 for Comfort Applications

SEPR_{12/7°C} In accordance with Ecodesign regulation (UE) N° 2016/2281 for Process Applications

IPLV.SI In accordance with AHRI standard (Air, Heating & Refrigeration Institute ; U.S.A) 550-591.

IPLV.IP In accordance with AHRI standard (Air, Heating & Refrigeration Institute ; U.S.A) 550-590.

PERFORMANCES

Performance Data of Units + Option 305C (Total Hydraulic Free Cooling, Glycol Free)

30XF-Z Units + Option 305C		0750	0900	1000	1700	1800	1900	2000	2100
Cooling									
Seasonal Energy Efficiency***	SEPR _{12/7°C} Process high temp. kWh/kWh	6,74	6,68	6,60	6,62	6,66	6,70	6,70	6,70

In accordance with standard EN14825: 2022, average climate.

SEPR_{12/7°C}

In accordance with Ecodesign regulation (UE) N° 2016/2281 for Process Applications

Performance Data of Units + Option 232 (Capacity booster, dedicated to Process Applications)

30XF-Z Units + Option 232		0750	0900	1000	1700	1800	1900	2000	2100
Cooling									
Full Load Performances*	Nominal Capacity kW	1030	1055	1070	2109	2134	2158	2173	2190
	EER kW/kW	3,42	3,74	3,99	3,46	3,62	3,78	3,90	4,03
Full Load Performances**	Nominal Capacity kW	694	702	707	1393	1403	1411	1415	1420
	EER kW/kW	2,75	2,96	3,10	2,78	2,88	2,98	3,05	3,12
Seasonal Energy Efficiency***	SEER _{12/7°C} Comfort low temp. kWh/kWh	4,81	4,96	5,20	4,76	4,89	4,96	5,01	5,13
	ηs cool _{12/7°C} %	189	196	205	187	193	195	198	202
	SEPR _{12/7°C} Process high temp. kWh/kWh	5,48	5,83	6,10	5,56	5,74	5,91	6,04	6,19
Integrated Part Load Values	IPLV.SI kW/kW	5,19	5,41	5,63	5,19	5,32	5,43	5,53	5,62
	IPLV.IP Btu/Wh	17,82	18,74	19,29	17,80	18,25	18,62	18,98	18,98

*

Cooling mode conditions: Entering/Leaving Temperature = 30°C/20°C. Outside Air Temperature = 35°C. Evaporator Fouling Factor = 0 m²/K/W. Heat Transfer Medium = Pure Water

**

Cooling mode conditions: Entering/Leaving Temperature = 12°C/7°C. Outside Air Temperature = 35°C. Evaporator Fouling Factor = 0 m²/K/W. Heat Transfer Medium = Pure Water

In accordance with standard EN14825: 2022, average climate.

SEER_{12/7°C} & ηs cool_{12/7°C}

In accordance with Ecodesign regulation (UE) N° 2016/2281 for Comfort Applications

SEPR_{12/7°C}

In accordance with Ecodesign regulation (UE) N° 2016/2281 for Process Applications

IPLV.SI

In accordance with AHRI standard (Air, Heating & Refrigeration Institute ; U.S.A) 550-591.

IPLV.IP

In accordance with AHRI standard (Air, Heating & Refrigeration Institute ; U.S.A) 550-590.



Eurovent certified values



AHRI certified values
30XF-only

PHYSICAL DATA

Physical Data of Units without free cooling (Option 338)

30XF-Z Single Units		0750	0900	1000
Dimensions				
Length	mm	6785	7979	9173
Width	mm	2258	2258	2258
Height	mm	2325	2325	2325
Weights				
Operating weight ⁽¹⁾	kg	6070	6370	6709
Sound levels				
Sound Power ⁽²⁾	dB(A)	102,5	101,0	102,5
Sound Pressure at 10 m ⁽³⁾	dB(A)	79,0	77,0	78,5
Chassis Paint Color		Color code RAL 7035		

30XF-Z Duplex Units		1700	1800	1900	2000	2100
Dimensions						
Length - Module A	mm	6785	7979	7979	7979	9173
Length - Module B	mm	6319	6319	7513	8707	8707
Length	mm	13135	14335	15529	16723	17919
Width	mm	2258	2258	2258	2258	2258
Height	mm	2325	2325	2325	2325	2325
Weights						
Operating weight ⁽¹⁾	kg	11863	12131	12459	12870	13325
Sound levels						
Sound Power ⁽²⁾	dB(A)	103,0	103,5	104,0	105,0	105,5
Sound Pressure at 10 m ⁽³⁾	dB(A)	78,0	78,5	78,5	79,5	80,0
Chassis Paint Color		Color code RAL 7035				

(1) Values are guidelines only. Refer to the unit name plate.

(2) In dB ref =10⁻¹² W, 'A' weighted. Declared noise emission value dissociated in accordance with ISO 4871 with an uncertainty of +/-3 dB(A). Measurement following ISO 9614-1 and certified by Eurovent.

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



Eurovent certified values

Physical Data of Units + Option 305A (Total Hydraulic Free Cooling)

30XF-Z Single Units + Option 305A		0750	0900	1000
Weights				
Operating weight ⁽¹⁾	kg	7489	7988	8513

30XF-Z Duplex Units + Options 305A		1700	1800	1900	2000	2100
Weights						
Operating weight ⁽¹⁾	kg	14704	15288	15833	16527	17198

(1) Values are guidelines only. Refer to the unit name plate.

PHYSICAL DATA

Physical Data of Units + Option 305C (Total Hydraulic Free Cooling, Glycol Free)

30XF-Z Single Units + Option 305C	0750		0900		1000	
Weights						
Operating weight ⁽¹⁾	kg	8064	8564	9092		

30XF-Z Duplex Units + Options 305C	1700		1800		1900		2000		2100	
Weights										
Operating weight ⁽¹⁾	kg	15859	16437	16980	17571	18236				

(1) Values are guidelines only. Refer to the unit name plate.

Physical Data of Units + Option 15&15LS (Low Noise & Very Low Noise)

30XF-Z Single Units + Option 15		0750		0900		1000	
Sound levels							
Sound Power ⁽¹⁾	dB(A)	98,0		97,5		99,5	
Sound Pressure at 10 m ⁽²⁾	dB(A)	75,0		73,5		75,5	

30XF-Z Duplex Units + Option 15		1700		1800		1900		2000		2100	
Sound levels											
Sound Power ⁽¹⁾	dB(A)	100,0		100,5		100,5		101,5		102,5	
Sound Pressure at 10 m ⁽²⁾	dB(A)	75,0		75,5		75,0		75,5		76,5	

30XF-Z Single Units + Option 15LS		0750		0900		1000	
Sound levels							
Sound Power ⁽¹⁾	dB(A)	96,5		96,0		97,0	
Sound Pressure at 10 m ⁽²⁾	dB(A)	73,5		72,5		73,0	

30XF-Z Duplex Units + Option 15LS		1700		1800		1900		2000		2100	
Sound levels											
Sound Power ⁽¹⁾	dB(A)	99,0		99,0		99,5		100,0		100,0	
Sound Pressure at 10 m ⁽²⁾	dB(A)	74,0		74,0		74,0		74,5		74,0	

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

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



Eurovent certified values

PHYSICAL DATA

Physical Data of Units + Option 116V (HP single pump, variable speed)

30XF-Z Single Units + Option 116V		0750	0900	1000
Dimensions				
Length	mm	6935	7979	9173
Weights				
Operating weight ⁽¹⁾	kg	6262	6562	6901

30XF-Z Duplex Units + Option 116V		1700	1800	1900	2000	2100
Dimensions						
Length - Module A	mm	6785	7979	7979	7979	9173
Length - Module B	mm	6427	6427	7513	8707	8707
Length	mm	13251	14443	15529	16723	17919
Weights						
Operating weight ⁽¹⁾	kg	12247	12515	12843	13254	13709

(1) Values are guidelines only. Refer to the unit name plate.

Physical Data of Units + Option 335 (400-3-60Hz power supply)

30XF-Z Single Units		0750	0900	1000
Dimensions				
Length	in	267	314	361
Width	in	89	89	89
Height	in	91	91	91
Weights				
Operating weight ⁽¹⁾	lb	13382	14044	14792

30XF-Z Duplex Units		1700	1800	1900	2000	2100
Dimensions						
Length - Module A	in	267	314	314	314	361
Length - Module B	in	249	249	296	343	343
Length	in	516	563	610	657	704
Width	in	89	89	89	89	89
Height	in	91	91	91	91	91
Weights						
Operating weight ⁽¹⁾	lb	26154	26745	27467	28374	29378

(1) Values are guidelines only. Refer to the unit name plate.

Physical Data of Units + Options 335 (400-3-60Hz power supply) + 116V (HP single-pump, variable speed)

30XF-Z Single Units + Option 335 + 116V		0750	0900	1000
Weights				
Operating weight ⁽¹⁾	lb	13806	14467	15215

30XF-Z Duplex Units + Option 335 + 116V		1700	1800	1900	2000	2100
Weights						
Operating weight ⁽¹⁾	lb	27000	27592	28314	29221	30224

(1) Values are guidelines only. Refer to the unit name plate.

ELECTRICAL DATA

Electrical Data of Units without free cooling (Option 338)

30XF-Z Units		0750	0900	1000	1700	1800	1900	2000	2100
Power circuit supply									
Nominal voltage	V-ph-Hz	400-3-50							
Voltage range	V	360-440							
Input power⁽¹⁾									
Maximum operating input power ⁽²⁾	kW	229	271	311	482	512	571	604	609
Operating current draw⁽¹⁾									
Maximum Current (Un) ⁽²⁾	A	355	421	482	748	795	887	938	945
Maximum Current (Un-10%)	A	387	459	513	816	867	954	997	1004
Power factor at maximum input power⁽¹⁾		0,91-0,93							
Displacement Power Factor (Cos. Phi) ⁽³⁾		>0,98							
Total current harmonic distortion rate (THDi) ⁽⁴⁾	%	35-45%							
Start-up current⁽¹⁾									
Maximum Current (Un) ⁽⁵⁾	A	80	80	80	455	502	547	554	554

(1) Values obtained at operation with maximum operating input power.

(2) Values given on the unit nameplate.

(3) Values decrease when load lowers.

(4) May vary according to the installation's short circuit THDi ratio increase when load lowers. It's necessary to consider a degradation of the values when the input power drops.

The exact values depend on the short-circuit ratio (Rsce). 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.

(5) Starting current of the smallest compressor + Operating current of the biggest compressor + Fan current.

Note :

- Control circuit is supplied with 24V via internal transformer.

Electrical Data of Units + Option 85A (Dual Power Supply 400V/400V)

30XF-Z Units + Option 85A - Supply 400V_2		0750	0900	1000	1700	1800	1900	2000	2100
Power circuit supply									
Nominal voltage	V-ph-Hz	400-3-50							
Voltage range	V	360-440							
Operating current draw									
Maximum Current (Un) ⁽²⁾	A	0,3	0,3	0,3	0,5	0,5	0,5	0,5	0,5

(2) Values given on the unit nameplate.

Notes :

- Control circuit is supplied with 24V via internal transformer from 400V second power supply.
- Electrical data concerning 400V Main power supply is the same as electrical data concerning single power connection point for standard units (Option 338).

ELECTRICAL DATA

Electrical Data of Units + Options 85A + 116V

30XF-Z Units + Options 85A + 116V - Supply 400V_2		0750	0900	1000	1700	1800	1900	2000	2100
Power circuit supply									
Nominal voltage	V-ph-Hz	400-3-50							
Voltage range	V	360-440							
Input power⁽¹⁾									
Maximum operating input power ⁽²⁾	kW	10,1	10,1	10,1	19,2	19,2	19,2	19,2	19,2
Operating current draw⁽¹⁾									
Maximum Current (Un) ⁽²⁾	A	25	25	25	49	49	49	49	49
Maximum Current (Un-10%) ⁽²⁾	A	28	28	28	55	55	55	55	55

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

(2) Values given on the unit nameplate.

Notes :

- Control circuit is supplied with 24V via internal transformer from 400V second power supply.
- Electrical data concerning 400V Main power supply is the same as electrical data concerning single power connection point for standard units (Option 338).

Electrical Data of Units + Option 85B (Dual Power Supply 400V/230V)

30XF-Z Units + Option 85B - Supply 230V		0750	0900	1000	1700	1800	1900	2000	2100
Power circuit supply									
Nominal voltage	V-ph-Hz	400-3-50							
Voltage range	V	360-440							
Operating current draw									
Maximum Current (Un) ⁽²⁾	A	1,1	1,1	1,1	2,1	2,1	2,1	2,1	2,1

(2) Values given on the unit nameplate.

Notes :

- Control circuit is supplied with 24V via internal transformer from 230V power supply.
- Electrical data concerning 400V power supply is the same as electrical data concerning single power connection point for standard units (Option 338).

Electrical Data of Units + Option 232

30XF-Z Units + Option 232		0750	0900	1000	1700	1800	1900	2000	2100
Input power⁽¹⁾									
Maximum operating input power ⁽²⁾	kW	330	335	339	647	651	655	659	663
Operating current draw⁽¹⁾									
Maximum Current (Un) ⁽²⁾	A	526	533	540	1031	1038	1045	1051	1058
Maximum Current (Un-10%)	A	526	533	540	1031	1038	1045	1051	1058
Start-up current⁽¹⁾									
Maximum Current (Un) ⁽⁵⁾	A	80	80	80	597	604	604	611	611

(1) Values obtained at operation with maximum operating input power.

(2) Values given on the unit nameplate.

(5) Starting current of the smallest compressor + Operating current of the biggest compressor + Fan current.

ELECTRICAL DATA

Electrical Data of Units + Option 336 (Active Harmonic Filters)

30XF-Z Units + Option 336	0750	0900	1000	1700	1800	1900	2000	2100
Power factor at maximum input power ⁽⁶⁾	>0,98							
Displacement Power Factor (Cos. Phi) ⁽³⁾	>0,98							
Total current harmonic distortion rate (THDi) ⁽⁶⁾ %	5%							

(3) Values decrease when load lowers.

(6) Values obtained when the anti-harmonic filter is operating normally. However:

- Filter efficiency decreases when unit current is under 60A.
 - The impedance of the installation can modify this value: a tolerance of +/-2% may be considered on the announced value.
 - The filtering capacity decreases when the temperature increases.
- When the ambient temperature exceeds 42 °C, Power Factor and THDi will get close to the values of the unit without harmonic filter.
- The machine can be configured to allow operation when the filter is inactive, in case of failure or when the ambient temperature exceeds 42 °C.

Compressor motors electrical data of Units without free cooling (Option 338)

Compressor	Max. Current [A] ⁽¹⁾	Max. Frequency [Hz] ⁽²⁾	VFD Type ⁽³⁾
06ZJG3T3AA06013	503	95	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) VFD mechanical type: Defines VFD weight and dimensions.

Distribution of compressors per circuit

Compressor (Single units)	Module	0750	0900	1000
06ZJGCT3AA06013	A	1	1	1

Compressor (Duplex units)	Module	1700	1800	1900	2000	2100
06ZJGCT3AA06013	A	1	1	1	1	1
	B	1	1	1	1	1

ELECTRICAL DATA

Compliance of electrical installation

Electrical installation and all the connections to the network must be carried out in compliance with all standards applicable to the installation location. Generally, the recommendations of the International Electrotechnical Commission document (IEC60364) are accepted as compliance with the requirements of the installation guidelines.

The units are designed and built to ensure compliance with these guidelines. The European standard EN 60204-1 (corresponds to IEC 60204-1 - Machine safety - Electrical equipment of machines - part 1: General requirements) was specifically taken into account when the electrical equipment was designed.

Note : The standard EN60204-1 also enables to meet the requirements of the Machinery Directive.

Annex B of EN 60204-1 is intended to define the electrical characteristics used for the operation of the units.

Those described below apply alongside the other information provided in this document.

Note: If aspects of an installation require different specifications from those listed below (or which are not listed), always contact your Carrier representative.

Overcurrent Protections

Overcurrent protection of the power supply conductors is not provided with the unit.

WARNING: A part of the short circuit protection must be carried out on the customer installation, in compliance with the instructions given in this document.

Leakage Currents Protections

If protection by monitoring the leakage currents is necessary to ensure the safety of the installation, the presence of DC voltage component as well as additional derived currents introduced using variable frequency drives in the unit must be considered.

It is especially recommended that the differential protection devices are:

- Suitable for protection of DC and AC circuitry
- Of reinforced immunity protection types and/or set at a threshold value not lower than 150 mA.

Unit's Power Connection Point

The units with one or two modules are equipped with:

- One electrical power connection point as standard.
- Two electrical power connection points if option 85A (dual power supply 400V/400V) or 85B (dual power supply 400V/230V) is present.

The power connection point(s) is/are located immediately upstream of their dedicated main disconnect switch:

- 400Vac 3~ for first/single power supply.
- 400Vac 3~ for second power supply with option 85A.
- 230Vac 2~ for second power supply with option 85B.

Neutral Regime

The units are designed for connection to TN networks (IEC 60364).

The neutral wire (N) must not be connected directly to the unit.

Notes :

In IT networks, the use of filters integrated into the variable frequency drives is not suitable.

In addition, the equipment's short circuit holding current characteristics are modified.

Unit's Disconnect Switch

It is of a type suitable for power interruption in compliance with EN 60947-3 (equivalent to IEC 60947-3)."

Environment classification following IEC60364

Environment Criteria	Environment Class
Ambient atmosphere	Outdoor ⁽¹⁾
Altitude	Up to 1000 m (2000 m) ⁽²⁾
Ambient temperature range	From -20°C to +48°C (55°C) ⁽³⁾
Presence of solid foreign bodies	Class AE3 (no significant dust present) ⁽¹⁾
Presence of water	Class AD4 (projection in all directions without pressure) ⁽¹⁾
Presence of corrosive and polluting substances:	Class AF1 (negligible)
Competence of personnel:	BA4 (trained personnel),

(1) The required protection level for this class is IP43BW minimum (according to the reference standard IEC 60529). All units are classified as IP44CW and fulfil this protection condition.

(2) Above 1000m, the maximum temperature must be reduced by 0,5K for every additional 100m up to 2000m.

(3) The value in brackets corresponds to operation with degraded thermal performances.

ELECTRICAL DATA

Electromagnetic (High frequency) conducted disturbances

Compatibility levels for electromagnetic (high frequency) conducted disturbances following EN 61800-3:

Disturbance Criteria	Disturbance Level
Immunity to external interference	Defined by the second environment ⁽¹⁾
Interference emissions	defined in category C3 ⁽²⁾

(1) Examples of installations included in the first / second electromagnetic environments:

First Environment	Second Environment
Commercial buildings	Industrial zones
Residential buildings	Technical premises powered from a dedicated transformer,

(2) 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 or commercial locations. As an option, conformity with category C2 permits this type of installation.

Warning: *In a residential or commercial environment, this product may cause radio interference in which case additional mitigation measures could be required.*

Note: EN 61800-3 is equivalent to IEC 61800-3.

Low frequency conducted disturbances

Compatibility levels for low frequency conducted disturbances as per the class 2 levels from IEC61000-2-4:

Disturbance Criteria	Disturbance Level
Power supply frequency variation	±1Hz
Voltage Phase imbalance	2%
Current Phase imbalance	10%
Voltage Total Harmonic Distortion (THDu)	8%
Rated impulse voltage Uw (IEC60664-1)	2,5 kV

The units integrate variable frequency drives which have harmonic currents which are a source of interference.

An analysis may be required to verify if this interference exceeds the compatibility limits of the other devices connected to the same power supply network.

Note : 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 IEC 61000-2-4.

WARNING: *If the phase imbalance exceeds 2% for voltage, or 10% for current, contact your local electricity supplier and ensure that the chiller is not switched on until corrective measures have been taken.*

HYDRAULIC DATA

Connection Piping Diameters for Units without free cooling (Option 338)

30XF-Z Single Units		0750	0900	1000
Inlet Connection Diameter	mm	168,3	168,3	168,3
Outlet Connection Diameter	mm	168,3	168,3	168,3

30XF-Z Duplex Units		1700	1800	1900	2000	2100
Inlet Connection Diameter	mm	168,3	168,3	168,3	168,3	168,3
Connection Diameter for the flow from A to B - Leaving A	mm	219,1	168,3	168,3	168,3	168,3
Connection Diameter for the flow from A to B - Entering B	mm	168,3	168,3	168,3	168,3	168,3
Outlet Connection Diameter	mm	219,1	219,1	168,3	168,3	168,3

Connection Piping Diameters for Units + Option 116V (HP single-pump, variable speed) / 305A (Total Hydraulic Free Cooling) / 305C (Total Hydraulic Free Cooling, Glycol Free)

30XF-Z Single Units + Option 116V		0750	0900	1000
Inlet Connection Diameter	mm	114,3	114,3	114,3
Outlet Connection Diameter	mm	168,3	168,3	168,3

30XF-Z Duplex Units + Option 116V		1700	1800	1900	2000	2100
Inlet Connection Diameter - Module A	mm	114,3	114,3	114,3	114,3	114,3
Inlet Connection Diameter - Module B	mm	114,3	114,3	114,3	114,3	114,3
Connection Diameter for the flow from B to A - Leaving B	mm	114,3	114,3	114,3	114,3	114,3
Connection Diameter for the flow from B to A - Entering A	mm	114,3	114,3	114,3	114,3	114,3
Connection Diameter for the flow from A to B - Leaving A	mm	168,3 ⁽¹⁾	168,3	168,3	168,3	168,3
Connection Diameter for the flow from A to B - Entering B	mm	168,3	168,3	168,3	168,3	168,3
Outlet Connection Diameter	mm	219,1	219,1	168,3	168,3	168,3

(1) From A to B - Leaving A: Evaporator water box outlet diameter is 219,1mm (8"). Then a reduction pipe from 219,1mm (8") to 168,3mm (6") is delivered with the unit but not factory fitted.

HYDRAULIC DATA

Hydraulic data for Units without free cooling (Option 338)

30XF-Z Single Units		0750	0900	1000
Volume in the unit	L	206	206	206
Max. operating pressure - hydraulic side	kPa	1000	1000	1000
Min. hydraulic flow rate	m³/h	7	9	10
Max. hydraulic flow rate	m³/h	49	57	63

30XF-Z Duplex Units		1700	1800	1900	2000	2100
Volume in the unit	L	506	526	549	549	562
Max. operating pressure - hydraulic side	kPa	1000	1000	1000	1000	1000
Min. hydraulic flow rate	m³/h	15	16	17	18	20
Max. hydraulic flow rate	m³/h	106	111	117	122	127

Hydraulic data for Units + Option 116V (HP single-pump, variable speed)

30XF-Z Single Units + Option 116V		0750	0900	1000
Volume in the unit	L	270	270	270

30XF-Z Duplex Units + Option 116V		1700	1800	1900	2000	2100
Volume in the unit	L	615	640	657	657	676

Hydraulic data for Units + Option 305A (Total Hydraulic Free Cooling)

30XF-Z Single Units + Option 305A		0750	0900	1000
Volume in the unit	L	556	603	649
Free cooling Coils Quantity		10	12	14

30XF-Z Duplex Units + Option 305A		1700	1800	1900	2000	2100
Volume in the unit	L	1199	1271	1335	1381	1447
Free cooling Coils Quantity		20	22	24	26	28

HYDRAULIC DATA

Hydraulic data for Units + Option 305C (Total Hydraulic Free Cooling, Glycol Free)

30XF-Z Single Units + Option 305C		0750	0900	1000
Volume in the unit - water side	L	375	375	375
Volume in the unit - glycol side	L	342	389	435
Max. operating pressure - glycol side	kPa	1000	1000	1000
Free cooling Coils Quantity		10	12	14

30XF-Z Duplex Units + Option 305C		1700	1800	1900	2000	2100
Volume in the unit - water side	L	837	862	880	880	899
Volume in the unit - glycol side - Module A	L	342	389	389	389	435
Volume in the unit - glycol side - Module B	L	342	342	389	435	435
Max. operating pressure - glycol side - Module A	kPa	1000	1000	1000	1000	1000
Max. operating pressure - glycol side - Module B	kPa	1000	1000	1000	1000	1000
Free cooling Coils Quantity - Module A	kPa	10	12	12	12	14
Free cooling Coils Quantity - Module B	m³/h	10	10	12	14	14

Hydraulic data for Units + Option 335 (400-3-60Hz power supply)

30XF-Z Single Units + Option 335		0750	0900	1000
Volume in the unit	gal	54	54	54
Max. operating pressure - hydraulic side	psi	145	145	145
Min. hydraulic flow rate	gpm	115	136	155
Max. hydraulic flow rate	gpm	781	901	1004

30XF-Z Duplex Units + Option 335		1700	1800	1900	2000	2100
Volume in the unit	gal	134	139	145	145	148
Max. operating pressure - hydraulic side	psi	145	145	145	145	145
Min. hydraulic flow rate	gpm	231	252	272	290	310
Max. hydraulic flow rate	gpm	1678	1765	1848	1933	2017

Hydraulic data for Units + Options 335 (400-3-60Hz power supply) + 116V (HP single-pump, variable speed)

30XF-Z Single Units + Option 335+116V		0750	0900	1000
Volume in the unit	gal	71	71	71

30XF-Z Duplex Units + Option 335+116V		1700	1800	1900	2000	2100
Volume in the unit	gal	162	169	174	174	179

THERMODYNAMIC DATA

Thermodynamic Data for Units without free cooling (Option 338)

30XF-Z Single Units		0750	0900	1000
Refrigerant Charge⁽¹⁾		R1234ze A2L (GWP = 1 following AR 5 ; ODP=0)		
Module A	kg	130,00	132,00	134,00
	teqCO ₂	0,91	0,92	0,94
Oil Charge⁽¹⁾		POE oil for R1234ze, Contact Carrier ERCD for supplying,		
Module A	L	26,0	26,0	26,0
Unit Minimum Part Load⁽²⁾		24	20	18
PED Category		IV	IV	IV

30XF-Z Duplex Units		1700	1800	1900	2000	2100
Refrigerant Charge⁽¹⁾		R1234ze A2L (GWP = 1 following AR 5 ; ODP=0)				
Module A	kg	128	130	130	130	132
	teqCO ₂	0,90	0,91	0,91	0,91	0,92
Module B	kg	130	130	132	134	134
	teqCO ₂	0,91	0,91	0,92	0,94	0,94
Oil Charge⁽¹⁾		POE oil for R1234ze, Contact Carrier ERCD for supplying,				
Module A	L	26,0	26,0	26,0	26,0	26,0
Module B	L	26,0	26,0	26,0	26,0	26,0
Unit Minimum Part Load⁽²⁾		11	11	10	9	9
PED Category		IV	IV	IV	IV	IV

(1) Values are guidelines only. Refer to the unit name plate.

(2) For standard conditions. Depending on operating conditions, units might have a different minimum part load or cycle.

Thermodynamic Data of Units + Option 232 (Capacity booster, dedicated to Process applications)

30XF-Z Single Units		0750	0900	1000
Unit Minimum Part Load⁽²⁾		18	18	18

30XF-Z Duplex Units		1700	1800	1900	2000	2100
Unit Minimum Part Load⁽²⁾		9	9	9	9	9

(2) For standard conditions. Depending on operating conditions, units might have a different minimum part load or cycle.

PART-LOAD PERFORMANCES

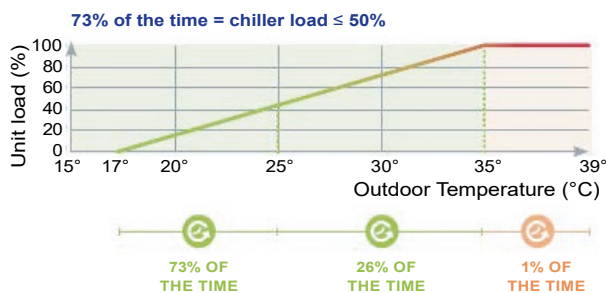
SEER for comfort chillers (in accordance with EU ECODESIGN)

The **SEER** (Seasonal Energy Efficiency Ratio) permits the evaluation of the average energy efficiency of comfort chillers, based on multiple operating conditions (load variation from 0% to 100%). From 1st January 2018, Tier 1 and from 1st January 2021, Tier 2, European member states will impose minimum SEER values to meet the requirements of Eco-design directive for ENER Lot 21 comfort cooling chillers. The Ecodesign Directive aims at minimizing the environmental impact of energy-related products under consideration of their full lifecycle.

EU ECODESIGN MEPS ⁽¹⁾ for air-cooled chillers		Tier 1 (from 01/01/2018)	Tier 2 (from 01/01/2021)
SEER for comfort Chillers < 400 kW	kWh/kWh	3,80	4,09
SEER for comfort Chillers > 400 kW	kWh/kWh	4,09	4,55



SEER is: The new metric for chillers in **comfort cooling applications**,

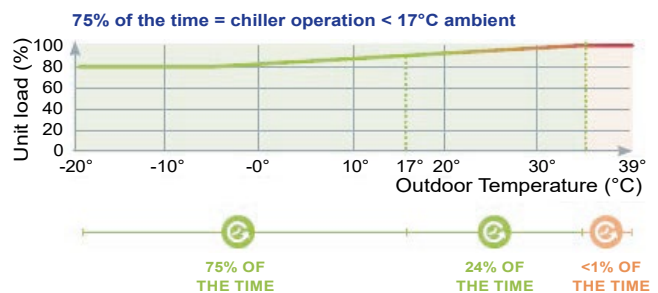


SEPR for process chillers (in accordance with EU ECODESIGN)

The **SEPR** (Seasonal Energy Performance Ratio) permits the evaluation of the average energy efficiency of process chillers, based on multiple operating conditions (load variation from 80% to 100%). From 1st January 2018, Tier 1 and from 1st January 2021, Tier 2, European member states will impose minimum SEPR values for process chillers to meet the requirements of Eco-design directive for ENER Lot 21 for high temperature process chillers (7°C to 12°C) and from 1st July 2018, for ENER Lot 1 for low temperature process chillers (-25°C to -8°C) and medium temperature process chillers (-8°C to 7°C). The Ecodesign Directive aims at minimizing the environmental impact of energy-related products under consideration of their full lifecycle. All process chillers marked with a CE label must meet the determined SEPR (Seasonal Energy Performance Ratio) value stipulated in EU Directive.



SEPR is the new metric for chillers in **industrial process cooling applications**,



EU ECODESIGN MEPS ⁽¹⁾ for air-cooled chillers		Tier 1 (from 01/07/2016)	Tier 2 (from 01/07/2018)
SEPR for medium temperature chillers < 300 kW	kWh/kWh	2,24	2,58
SEPR for medium temperature chillers > 300 kW	kWh/kWh	2,80	3,22

EU ECODESIGN MEPS ⁽¹⁾ for air-cooled chillers		Tier 1 (from 01/01/2018)	Tier 2 (from 01/01/2021)
SEPR for high temperature Process Chillers < 400 kW	kWh/kWh	4,50	5,00
SEPR for high temperature Process Chillers > 400 kW	kWh/kWh	5,00	5,50

(1) Minimum Efficiency Performance Standards set by EU member states to comply with EU Ecodesign directive.

OPERATING RANGE

Unit operating range

Heat Transfer Medium Heat Exchanger		Minimum	Maximum
Heat Transfer Medium Inlet Temperature at start-up	°C	-	45 ⁽¹⁾
Heat Transfer Medium Inlet Temperature during operation	°C	6,8	36
Heat Transfer Medium Outlet Temperature during operation	°C	3,3 ⁽²⁾	26
Air Heat Exchanger		Minimum	Maximum
Ambient Air Temperature during storage	°C	-20	68
Ambient Air Temperature during operation	°C	-20 ⁽³⁾	55

(1) Operating at partial load.

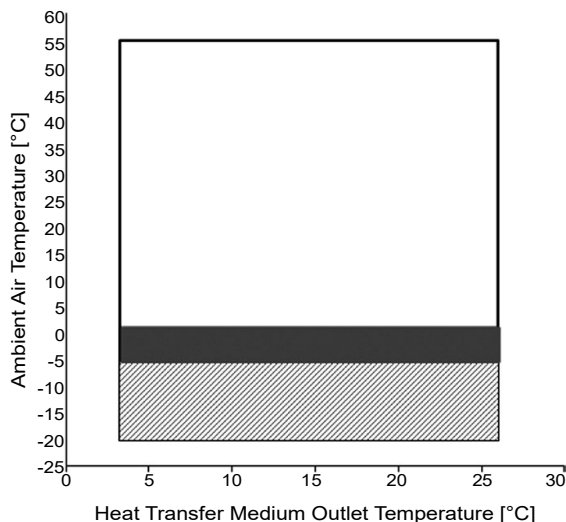
(2) According to the type of installation and air temperature.

(3) Options 41A/41B mandatory for start-ups below -5°C.

Note:

- The use of brine or antifreeze protection option is required if pure water is to be used and to be cooled below 4°C.
- If the air temperature is to fall below 0°C, a glycol/water solution or the freeze protection option must be used.

Units Operating Range



Note:

- These ranges are given for indicative purpose. Check the operating range from Carrier electronic catalogue.

Legend:

- Operating range, standard units.
- Below 0°C air temperature the unit must either be equipped with the evaporator frost protection option 41A/41B, or the water loop must be protected against frost by using a frost protection solution (by the installer).
- ▨ For start-ups with air temperature below -5°C, the machine must be equipped with options 41A/41B.

Free cooling operation

The unit SmartVu™ control maximises the use of the free cooling based on the needs of the application and the climate conditions. Once the chilled water/ambient air temperature differential exceeds the threshold value by 1K, the SmartVu™ control activates free cooling and adjusts the air flow rate to optimize the unit's energy performance. If the operating conditions enables the free cooling to operate on its own to meet the requirements, the compressors are stopped, Two motorized valves direct the chilled water to the free cooling coils.

There are three operating modes:

Warm weather season: Mechanical cooling mode

The liquid chiller meets the needs traditionally using the refrigerant circuit. The fluid bypasses the free cooling coils and is cooled by the evaporator.

Mid-season: Combination mode

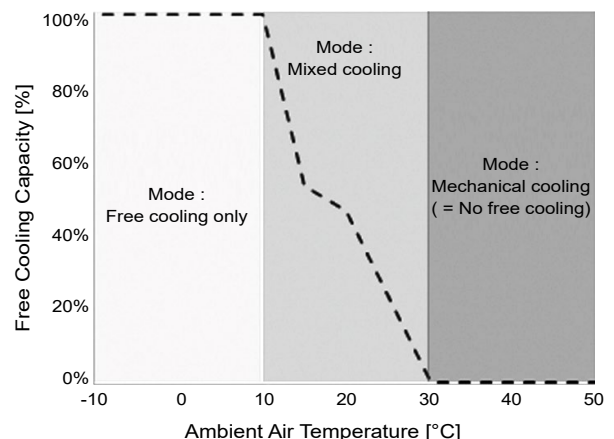
It is possible to operate in combination free cooling and mechanical cooling mode. This helps optimize free cooling operations while covering the system's cooling requirements. The fluid is pre-cooled by the free cooling coils positioned in series with the refrigerant circuit evaporator which finalizes cooling the fluid.

Cold weather season: Free cooling mode

Depending on the capacity requested and the setpoint, all of the requirements may be fulfilled by the free cooling in this operating mode without the fans running, thereby ensuring optimum energy efficiency.

The following example shows the three operating modes depending on the ambient air temperature for a heat transfer medium inlet temperature at 30°C:

Free cooling Operation Modes



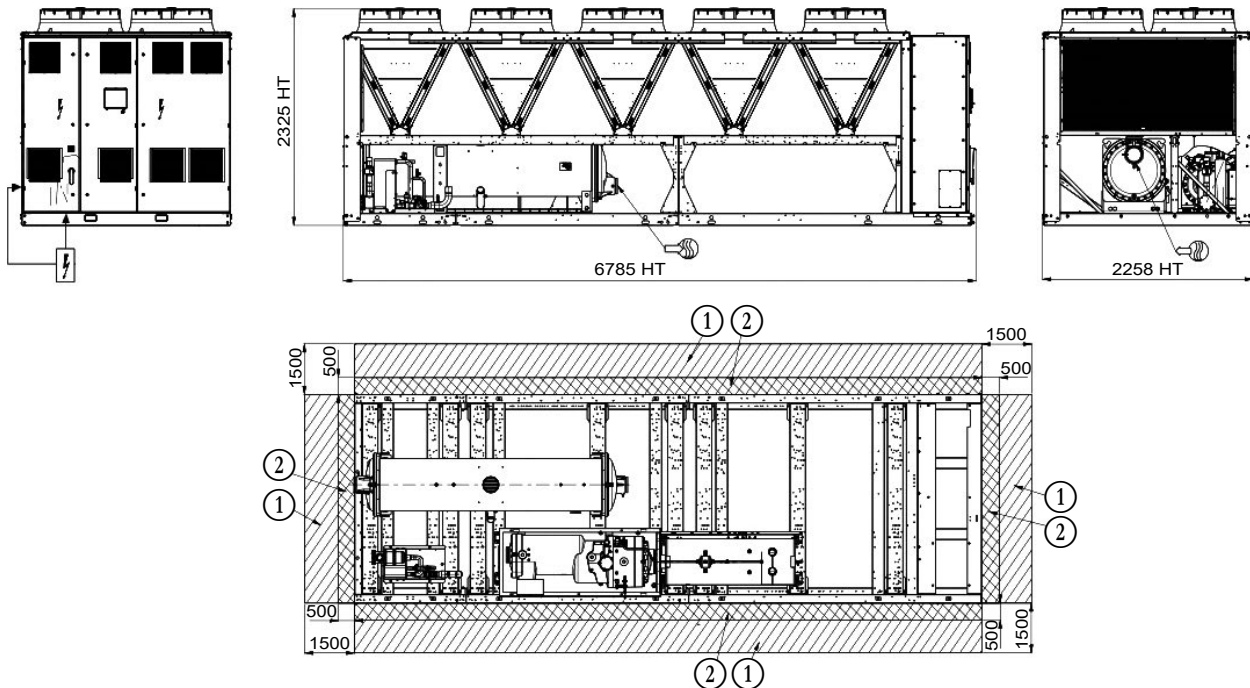
Corrosion protection

With the hydraulic free cooling options, a glycol-based solution (EG or PG) is used to exchange heat with the air through MCHE coils. Those solutions contain corrosion inhibitors, in order to protect the aluminum exchangers.

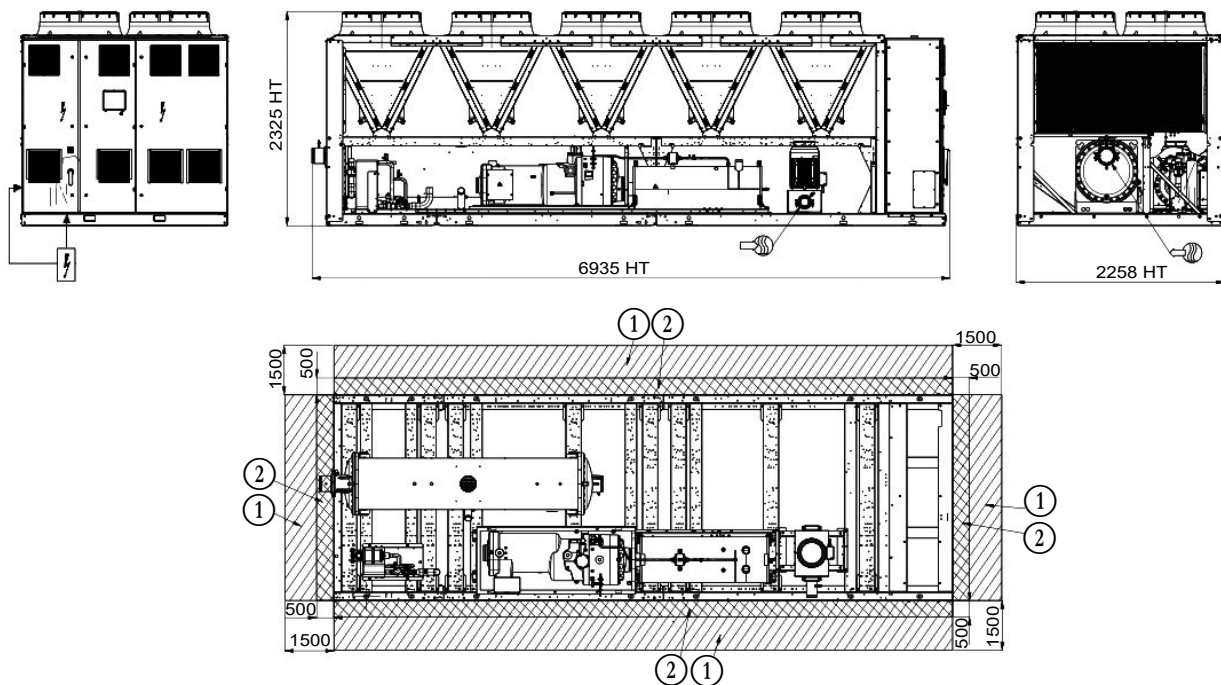
It is strongly recommended that the loop is analyzed each year to ensure that these inhibitors are present.

DIMENSIONS/CLEARANCES

30XF-Z_0750 - Units without free cooling (Option 338)



30XF-Z_0750 - Option 116V (HP VSD single-pump, variable speed) / 305A (Total Hydraulic Free Cooling) / 305C (Total Hydraulic Free Cooling, Glycol Free)



Legend

All dimensions are given in mm.

- ① Required clearances for maintenance (see note)
- ② Potentially flammable zone around the machine
-  Water inlet for standard unit
-  Water outlet for standard unit
-  Air outlet – do not obstruct
-  Power electrical connection

NOTES:

Drawings are not contractually binding.

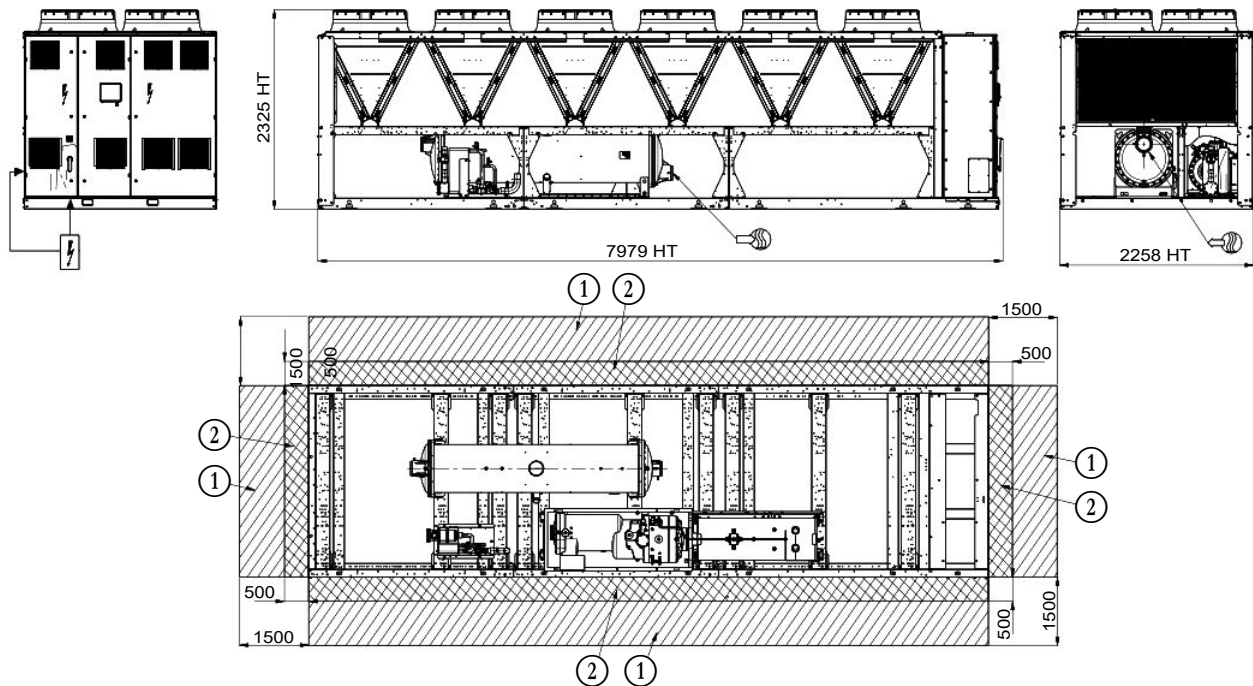
Before designing an installation, consult the certified dimensional drawings, available on request.

For the positioning of the fixing points, weight distribution and centre of gravity coordinates please refer to the dimensional drawings.

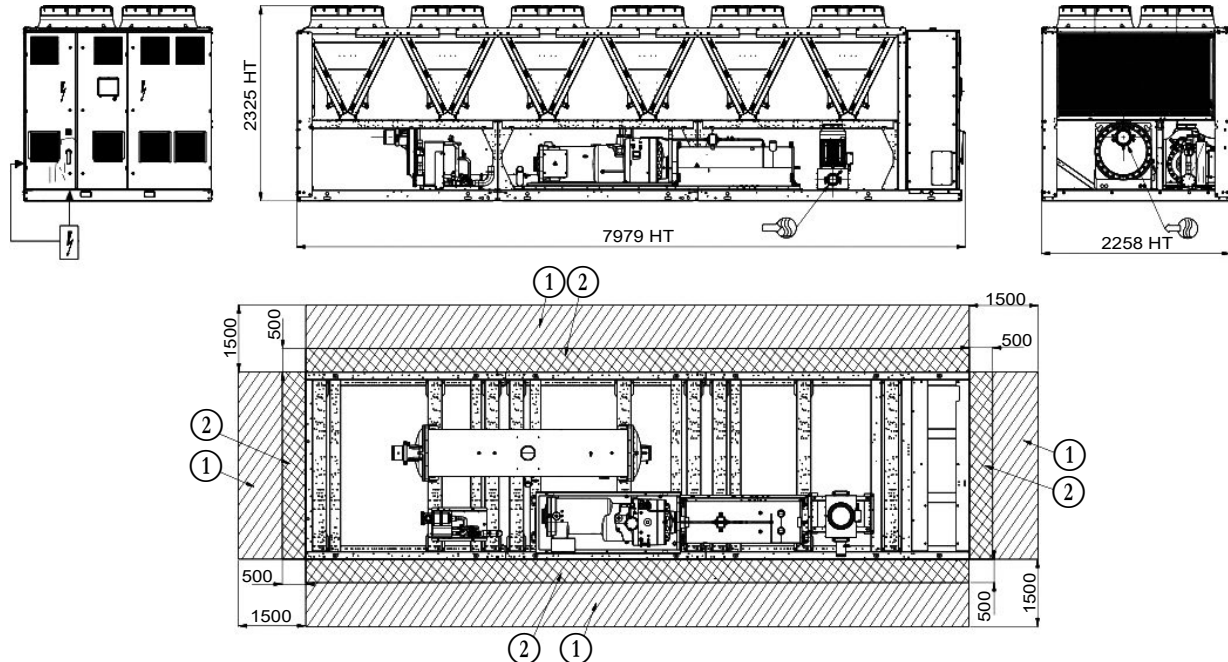
If any unit(s) are close to walls, please refer to chapter “Distance to the wall” of this document to determine the space required.

DIMENSIONS/CLEARANCES

30XF-Z_0900 - Units without free cooling (Option 338)



30XF-Z_0900 - Option 116V (HP VSD single-pump, variable speed) / 305A (Total Hydraulic Free Cooling) / 305C (Total Hydraulic Free Cooling, Glycol Free)



Legend

All dimensions are given in mm.

① Required clearances for maintenance (see note)

② Potentially flammable zone around the machine



Water inlet for standard unit



Water outlet for standard unit



Air outlet – do not obstruct



Power electrical connection

NOTES:

Drawings are not contractually binding.

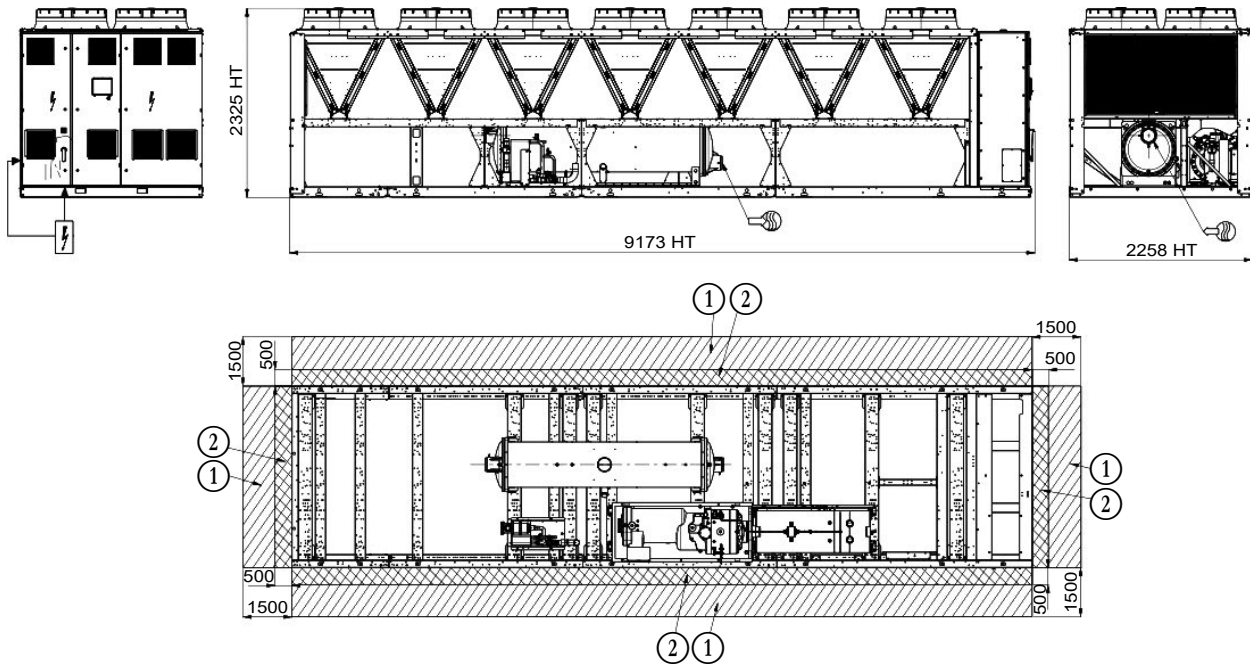
Before designing an installation, consult the certified dimensional drawings, available on request.

For the positioning of the fixing points, weight distribution and centre of gravity coordinates please refer to the dimensional drawings.

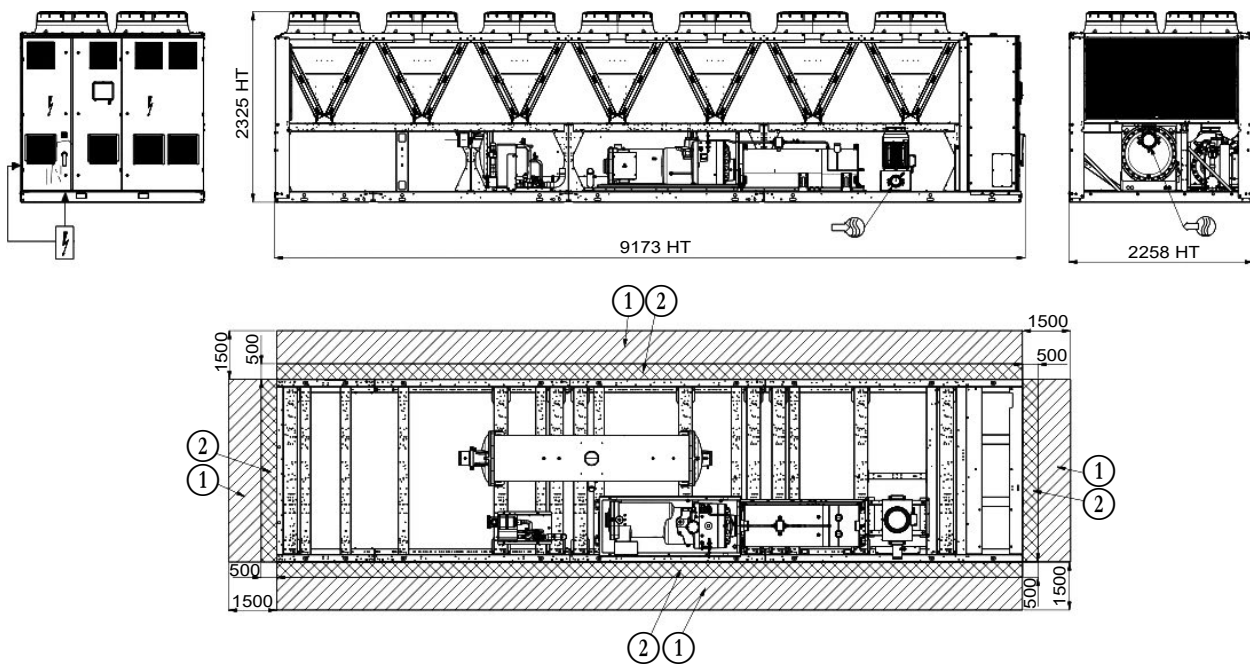
If any unit(s) are close to walls, please refer to chapter “Distance to the wall” of this document to determine the space required.

DIMENSIONS/CLEARANCES

30XF-Z_1000 - Units without free cooling (Option 338)



30XF-Z_1000 - Option 116V (HP VSD single-pump, variable speed) / 305A (Total Hydraulic Free Cooling) / 305C (Total Hydraulic Free Cooling, Glycol Free)



Legend

All dimensions are given in mm.

- ① Required clearances for maintenance (see note)
- ② Potentially flammable zone around the machine
-  Water inlet for standard unit
-  Water outlet for standard unit
-  Air outlet – do not obstruct
-  Power electrical connection

NOTES:

Drawings are not contractually binding.

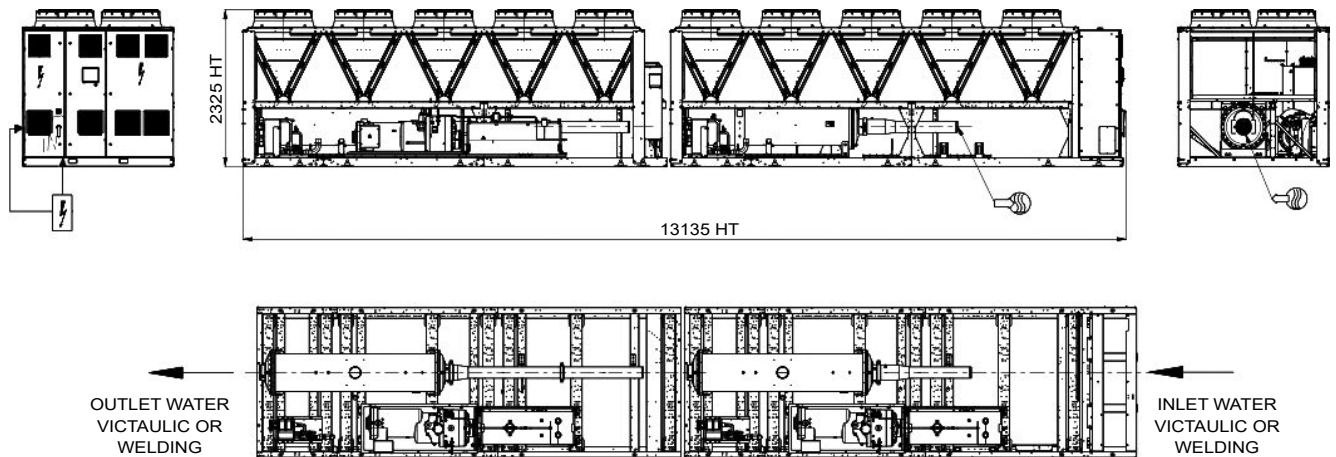
Before designing an installation, consult the certified dimensional drawings, available on request.

For the positioning of the fixing points, weight distribution and centre of gravity coordinates please refer to the dimensional drawings.

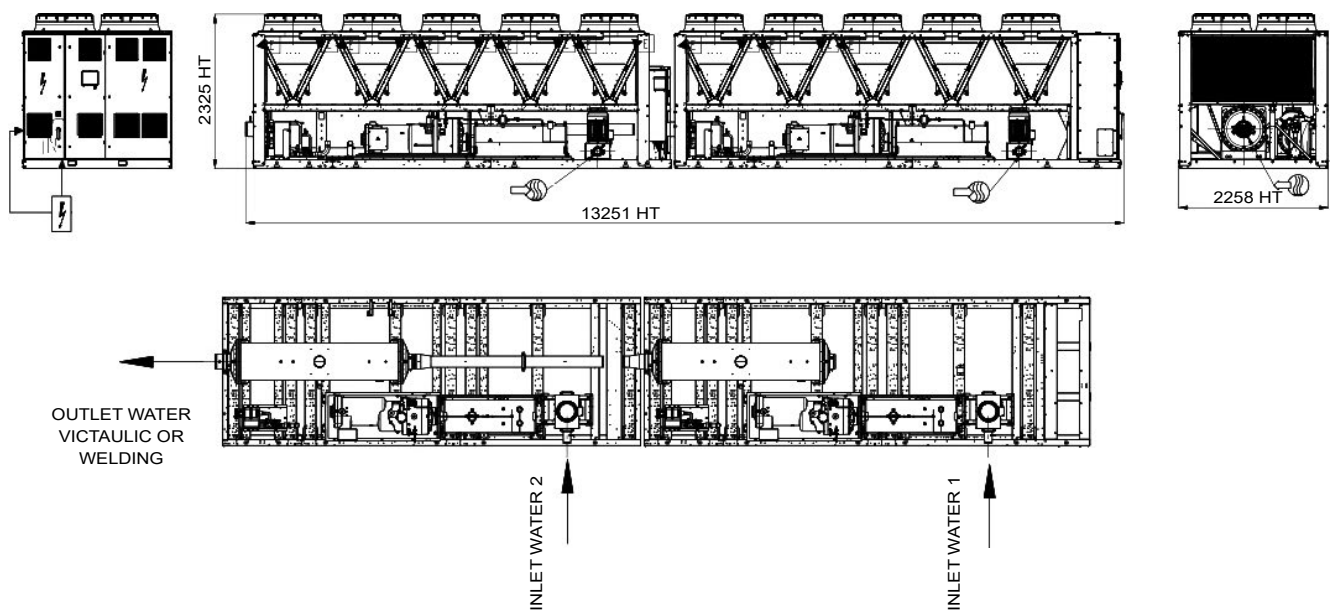
If any unit(s) are close to walls, please refer to chapter "Distance to the wall" of this document to determine the space required.

DIMENSIONS/CLEARANCES

30XF-Z_1700 - Units without free cooling (Option 338)



30XF-Z_1700 - Option 116V (HP VSD single-pump, variable speed) / 305A (Total Hydraulic Free Cooling) / 305C (Total Hydraulic Free Cooling, Glycol Free)



Legend

All dimensions are given in mm.

- ① Required clearances for maintenance (see note)
- ② Potentially flammable zone around the machine
-  Water inlet for standard unit
-  Water outlet for standard unit
-  Air outlet – do not obstruct
-  Power electrical connection

NOTES:

Drawings are not contractually binding.

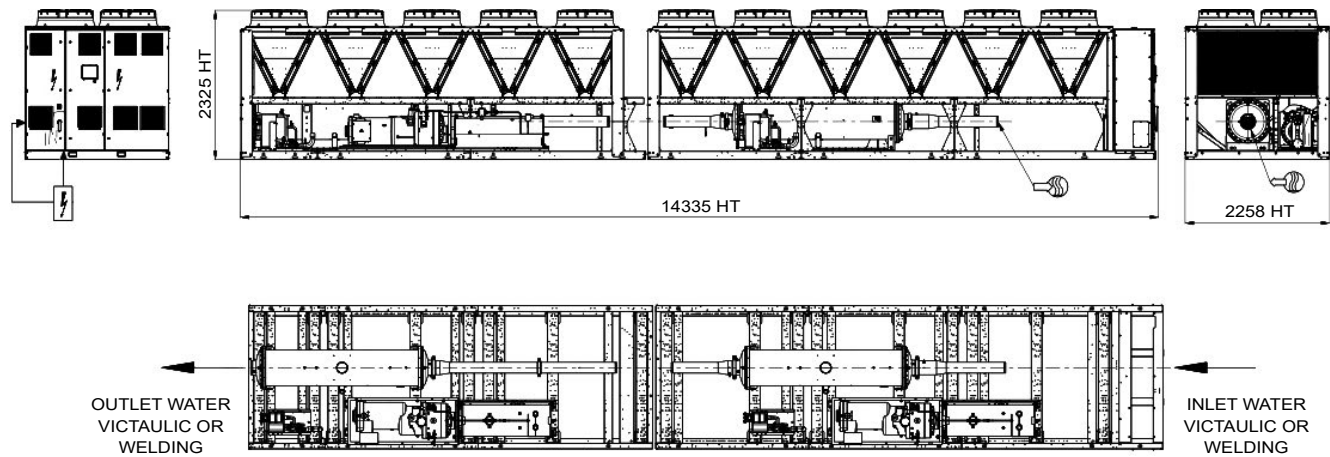
Before designing an installation, consult the certified dimensional drawings, available on request.

For the positioning of the fixing points, weight distribution and centre of gravity coordinates please refer to the dimensional drawings.

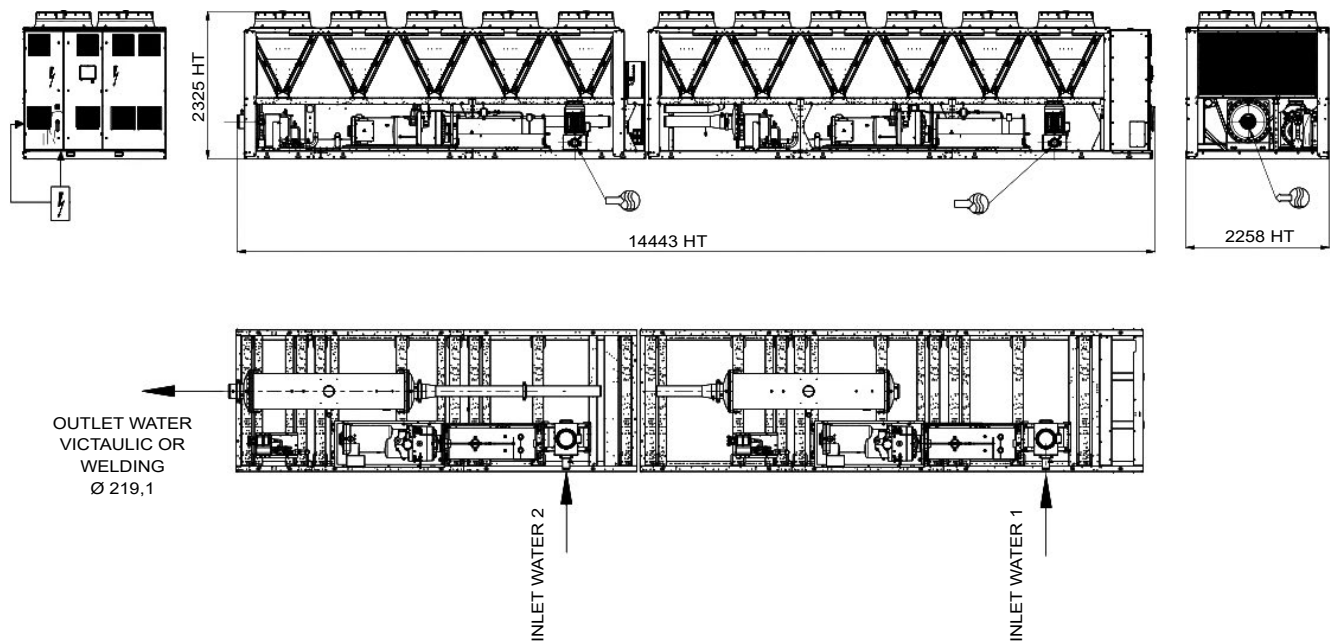
If any unit(s) are close to walls, please refer to chapter "Distance to the wall" of this document to determine the space required.

DIMENSIONS/CLEARANCES

30XF-Z_1800 - Units without free cooling (Option 338)



30XF-Z_1800 - Option 116V (HP VSD single-pump, variable speed) / 305A (Total Hydraulic Free Cooling) / 305C (Total Hydraulic Free Cooling, Glycol Free)



Legend

All dimensions are given in mm.

- ① Required clearances for maintenance (see note)
- ② Potentially flammable zone around the machine
- Water inlet for standard unit
- Water outlet for standard unit
- Air outlet – do not obstruct
- Power electrical connection

NOTES:

Drawings are not contractually binding.

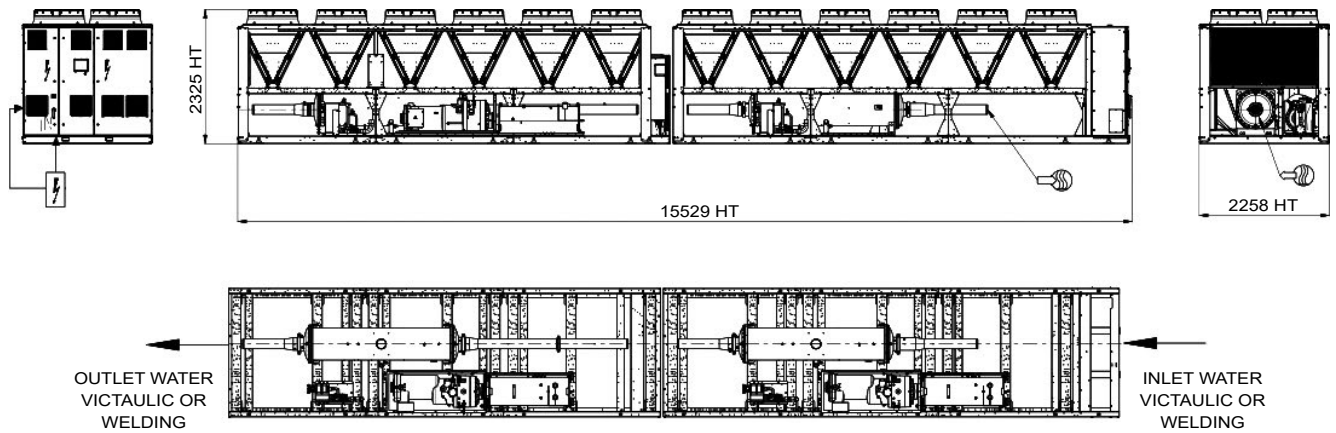
Before designing an installation, consult the certified dimensional drawings, available on request.

For the positioning of the fixing points, weight distribution and centre of gravity coordinates please refer to the dimensional drawings.

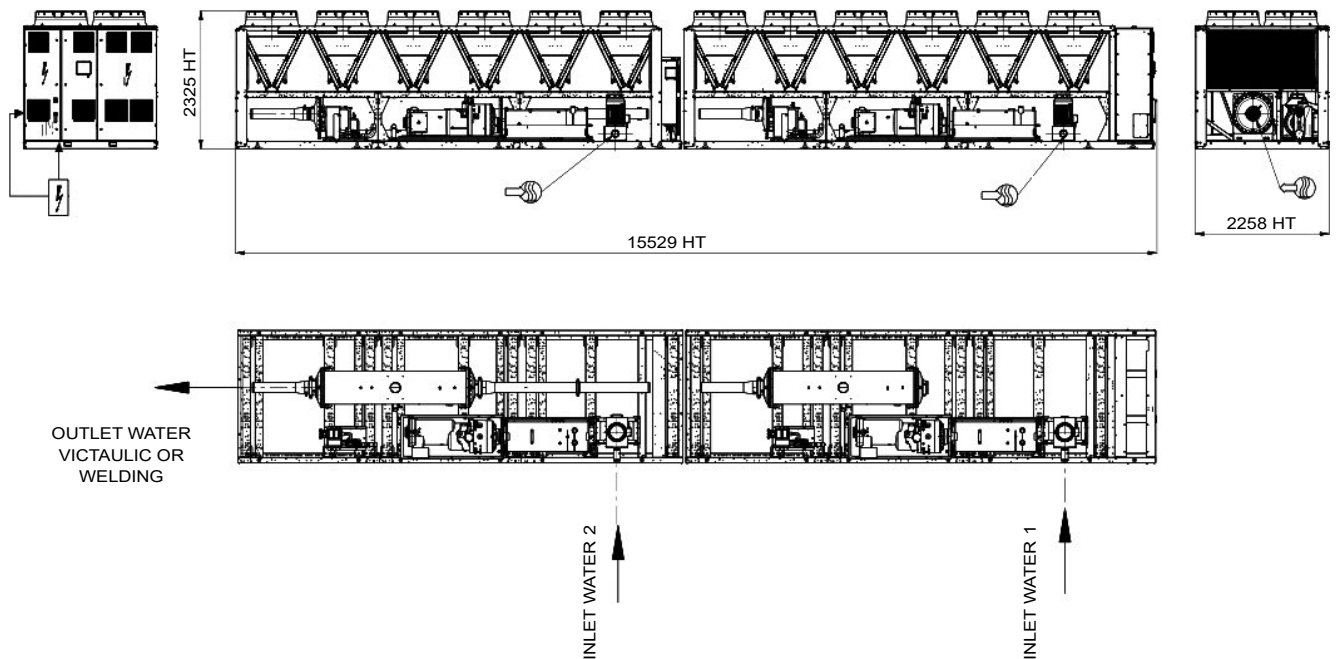
If any unit(s) are close to walls, please refer to chapter “Distance to the wall” of this document to determine the space required.

DIMENSIONS/CLEARANCES

30XF-Z_1900 - Units without free cooling (Option 338)



30XF-Z_1900 - Option 116V (HP VSD single-pump, variable speed) / 305A (Total Hydraulic Free Cooling) / 305C (Total Hydraulic Free Cooling, Glycol Free)



Legend

All dimensions are given in mm.

- ① Required clearances for maintenance (see note)
- ② Potentially flammable zone around the machine
-  Water inlet for standard unit
-  Water outlet for standard unit
-  Air outlet – do not obstruct
-  Power electrical connection

NOTES:

Drawings are not contractually binding.

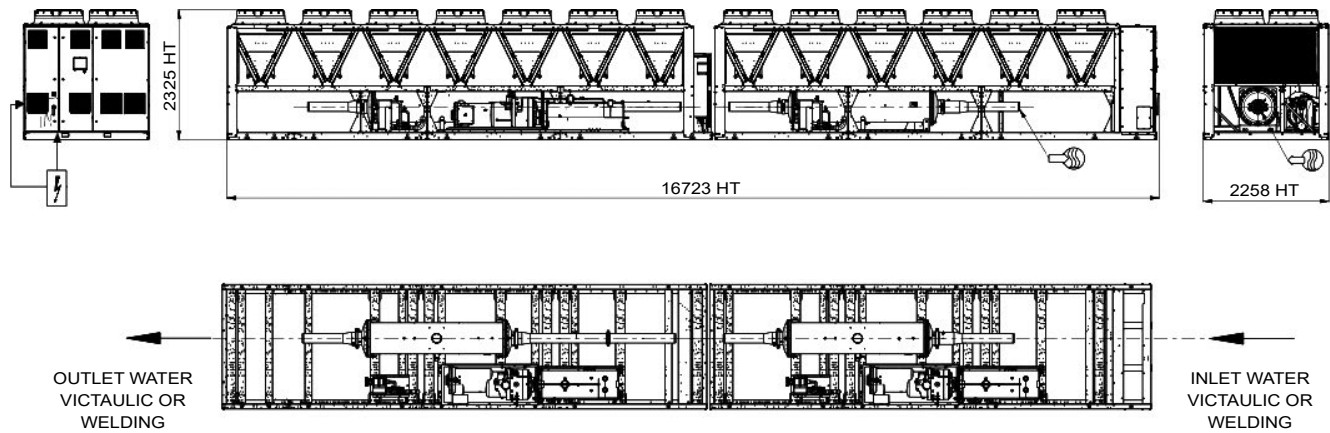
Before designing an installation, consult the certified dimensional drawings, available on request.

For the positioning of the fixing points, weight distribution and centre of gravity coordinates please refer to the dimensional drawings.

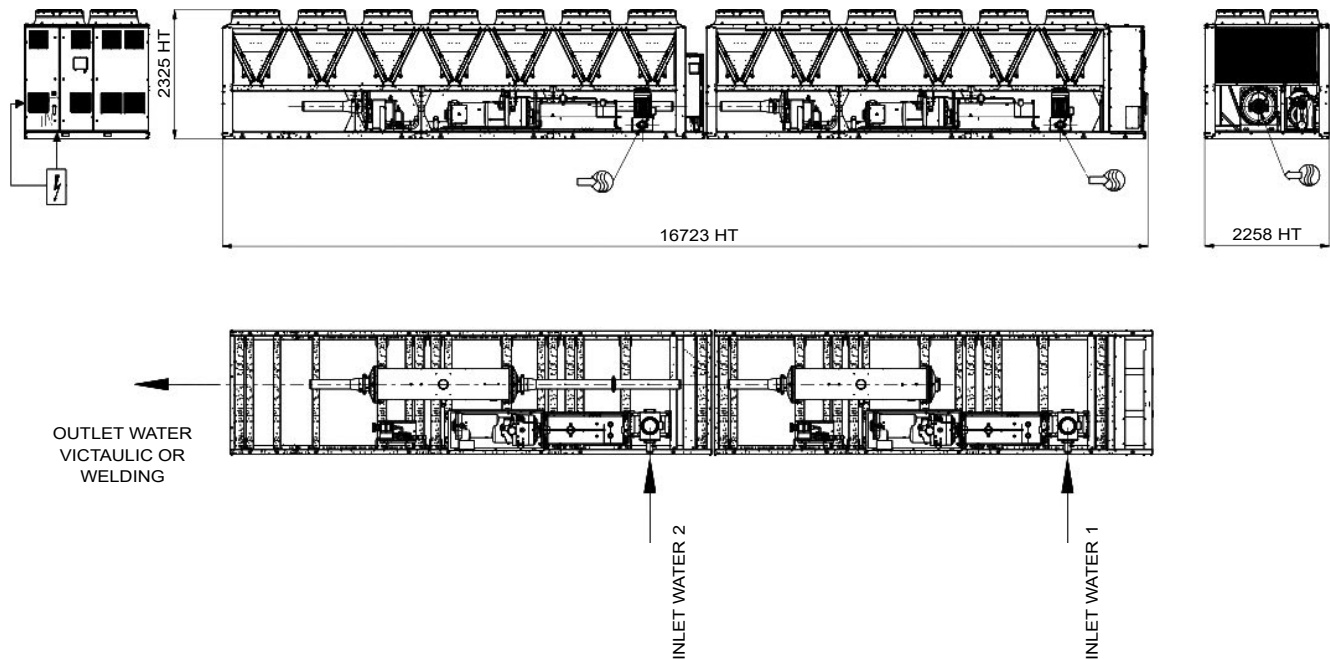
If any unit(s) are close to walls, please refer to chapter “Distance to the wall” of this document to determine the space required.

DIMENSIONS/CLEARANCES

30XF-Z_2000 - Units without free cooling (Option 338)



30XF-Z_2000 - Option 116V (HP VSD single-pump, variable speed) / 305A (Total Hydraulic Free Cooling) / 305C (Total Hydraulic Free Cooling, Glycol Free)



Legend

All dimensions are given in mm.

- ① Required clearances for maintenance (see note)
- ② Potentially flammable zone around the machine
- Water inlet for standard unit
- Water outlet for standard unit
- Air outlet – do not obstruct
- Power electrical connection

NOTES:

Drawings are not contractually binding.

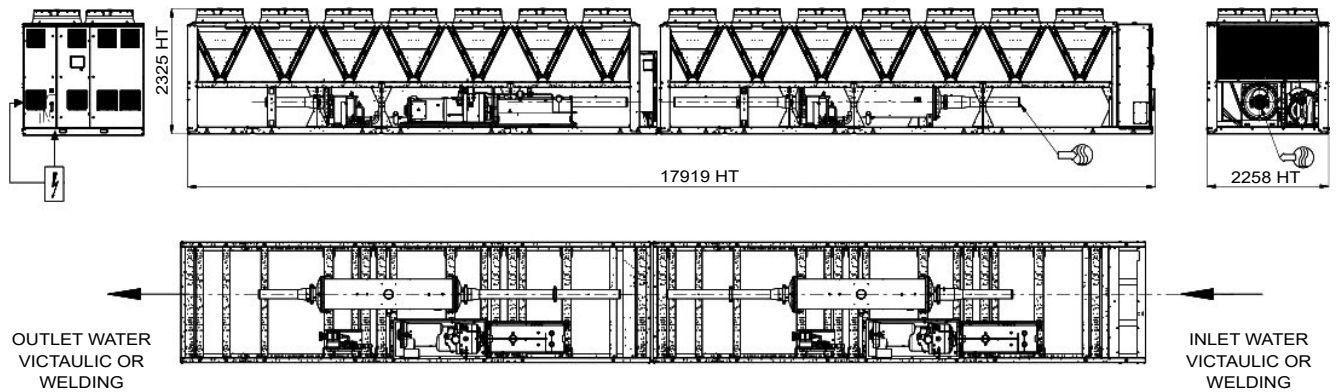
Before designing an installation, consult the certified dimensional drawings, available on request.

For the positioning of the fixing points, weight distribution and centre of gravity coordinates please refer to the dimensional drawings.

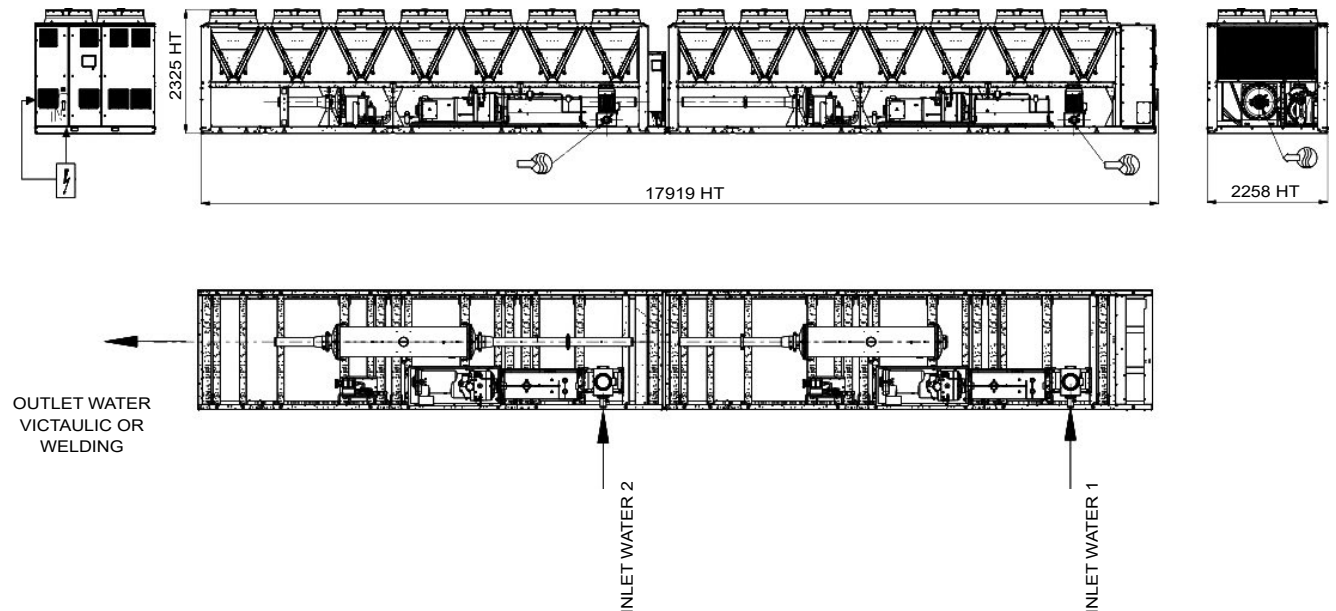
If any unit(s) are close to walls, please refer to chapter “Distance to the wall” of this document to determine the space required.

DIMENSIONS/CLEARANCES

30XF-Z_2100 - Units without free cooling (Option 338)



30XF-Z_2100 - Option 116V (HP VSD single-pump, variable speed) / 305A (Total Hydraulic Free Cooling) / 305C (Total Hydraulic Free Cooling, Glycol Free)



Legend

All dimensions are given in mm.

- ① Required clearances for maintenance (see note)
- ② Potentially flammable zone around the machine
- Water inlet for standard unit
- Water outlet for standard unit
- Air outlet – do not obstruct
- Power electrical connection

NOTES:

Drawings are not contractually binding.

Before designing an installation, consult the certified dimensional drawings, available on request.

For the positioning of the fixing points, weight distribution and centre of gravity coordinates please refer to the dimensional drawings.

If any unit(s) are close to walls, please refer to chapter "Distance to the wall" of this document to determine the space required.

The quality management system of this product's assembly site has been certified in accordance with the requirements of the ISO 9001 standard (latest current version) after an assessment conducted by an authorized independent third party.

The environmental management system of this product's assembly site has been certified in accordance with the requirements of the ISO 14001 standard (latest current version) after an assessment conducted by an authorized independent third party.

The occupational health and safety management system of this product's assembly site has been certified in accordance with the requirements of the ISO 45001 standard (latest current version) after an assessment conducted by an authorized independent third party.

Please contact your sales representative for more information

Order No.: 10749, 01.2024. Supersedes order No.: 10749, 09.2023.

Carrier, Route de Thil - BP49 01120 Montluel Cedex, France.

Manufacturer reserves the right to change any product specifications without notice.

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