Technical Bulletin

BT15M017GB-08

SPINchiller³

High efficiency air-cooled water chiller
for outdoor installation

WSAT-XSC3 260.6-480.8 RANGE

Nominal cooling capacity from 695 kW to 1356 kW

- R-410A multiscroll technology
- Two or four independent refrigeration circuits
- Total/partial recovery of the condensing heat

EXCELLENCE version

- Eurovent Class A / Up to 52°C outdoor air temperature / Perfect for LEED

PREMIUM version

- Eurovent Class C / Compact version

Clivet is taking part in the EUROVENT certification programme.
The products concerned appear in the certified products list of the EUROVENT www.eurovent-certification.com site.

Clivet hydronic system

Designed to provide high energy efficiency and sustainability of the investment, the wide range of Clivet liquid chillers and heat pumps for high efficiency air conditioning of Residential and Commercial spaces and for Industrial applications it is available with air or water source.

HYDRONIC System - Air Source

Specialization

Every intended use has specific requirements which determine the overall efficiency. For this, the Clivet hydronic system always offers the best solution in every project.

- Modular range with over 8000 kW of overall capacity
- Capacity control with Screw and modular Scroll technology
- Multifunction versions
- Outdoor or indoor (ductable type) installation

Centrality of the Air Renewal

From the Air Renewal depends the comfort in the spaces. Since it often represents the main building energetic load, it also determines the running costs of the entire system.

ZEPHIR3
Packaged Primary Air supply system with thermodynamic energy recovery.

- Simplifies the system, reduces the heating and cooling generators
- Purifies the air with standard electronic filters
- Increases the energy efficiency and it also allows a savings of 40% on the running costs
- From –40°C to +50°C of outdoor air temperature

Terminal and AHU complete system

The hydronic terminal units are very diffused for their versatility and reliability. The Clivet range includes many versions that simplify the application in differents type of installation and building.

ELFOSpace
High energy efficiency hydronic terminal units

AQX
Air-conditioning unit

- Cased and uncased terminal units, from 1 to 90 kW
- Horizontal and vertical installation
- Energy-saving DC fans
- Modular air conditioning units up to 160.000 m³/h
- EUROVENT certification

SPINchiller³: modular scroll technology for every application

SPINchiller³ is the new generation of Clivet liquid chillers and heat pump with modular scroll technology. Thanks to its high seasonal efficiency and range versatility, it represents the ideal solution for different types of installation.

WSAT-XSC3

Air cooled water chiller

- EXCELLENCE high efficiency version and compact PREMIUM
- Operating with 52°C of outdoor air temperature
- Total / partial recovery of the condensing heat
- Eurovent certification

WSAT-XSC3 FREE-COOLING

Air cooled water chiller with FREE-COOLING

- Direct FREE-COOLING
- Indirect FREE-COOLING (No-Glycol)

Dedicated series separately documentated

WSAN-XSC3

Air coole heat pump

- EXCELLENCE high efficiency version
- Eurovent certification

Dedicated series separately documentated

WSAN-XSC3 Multifunction

Air cooled heat/cool heat pump with simultaneous operating

- EXCELLENCE high efficiency version
- 4-pipe system
- 2-pipe system and total condensing heat recovery

Dedicated series separately documentated

Cost or reliability?

The dilemma of modern system engineering applications

Air-conditioning systems in trade centres influence both the starting investment and monthly management costs, for the whole of their working lives. This theme is even more relevant in residential applications with centralised systems. Furthermore, maximum working flexibility requirements should be added to that, in serving different users while avoiding wasting energy and thus, money. Finally, there are several industrial applications which require hot or chilled water as service fluid, process fluid or vector fluid for operator comfort and for conserving goods and enabling cycles to function correctly. Furthermore, in all these cases, the working reliability of the system is decisive.



High efficiency hydronic systems

The high efficiency hydronic systems are extremely versatile, reliable and widespread

Despite their apparently low costs, split, multi-split and VRF direct expansion systems have a lot of limits in these applications. For example, they require a separate system for primary air treatment. The pipes that contain the refrigerant cross the served rooms and therefore they are subject to restrictions and use limitations. They cannot operate in the FREE-COOLING mode, the high efficiency and convenient mode that allows energy savings.

The hydronic systems are certainly more complete and versatile. They make it possible to adopt various types of terminals in the served environment, from fan coil units exposed or integrated in the furnishings, up to radiant or induction systems. They are also irreplaceable in the service and process industrial applications.

The main component performances, like air-cooled liquid chillers and hydronic heat pumps, are checked and certificated by appropriate certification programs, as Eurovent.

Clivet technological evolution

Clivet chillers reduce consumption and are compact and reliable

With over twenty years of technological evolution, Clivet liquid chillers and heat pumps represent the state of the art in air-conditioning of residential, trade and industrial environments.

Their success is based on high energy efficiency, compactness and management maintenance simplicity, with wide versatility in the choice of the most suitable model for the specific use.

SPINchiller³

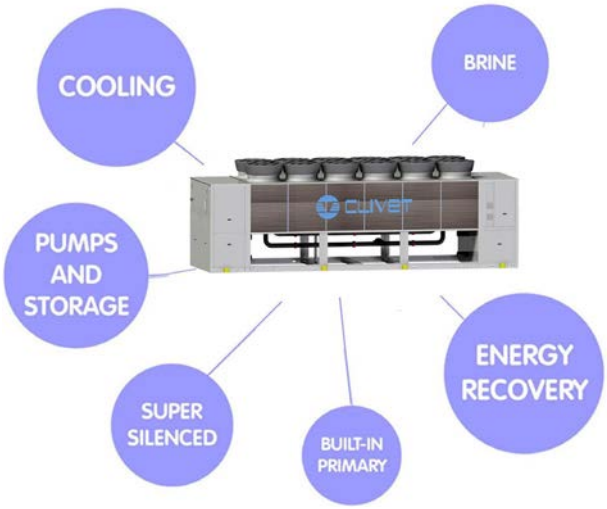
Provides all Clivet technological developments for their medium capacity hydronic systems

High efficiency Scroll compressors, high performance heat exchangers, electronic control fans, fully automatic operation: these are only some of the technologies available with SPINchiller³, in a range of models that are ideal for high capacity air conditioning systems in commercial, residential and industrial buildings.

The two available versions allow to choose the best combination between the initial investment and the costs throughout the entire life cycle of the system:

- the EXCELLENCE SC version stands out for its extremely high energy efficiency under both part and full load conditions. (A- class Eurovent certification);
- the distinctive feature of the PREMIUM version is its compactness and high part-load efficiency.

SPINchiller³ can also be supplied in many configurations equipped with the main components installed built-in.



Advantages

High efficiency all year round

SPINchiller³ reduces yearly energy consumption thanks to its high part-load efficiency i.e., by far the most frequent condition throughout the system's life-cycle. This way, even the value of the served building increases. The main components are manufactured on an industrial scale, with maximum manufacturing reliability and can be easily found as spare parts.

To further increase energy efficiency in a system with several SPINchiller³ units operating on the same equipment, there is the innovative ECOSHARE feature, which automatically distributes the load and activates the necessary pumps.

System simplification

All of the features are provided by Clivet already assembled and tested built-in, differently then other manufacturers who make numerous additional components available to be installed on site.

Compact and versatile

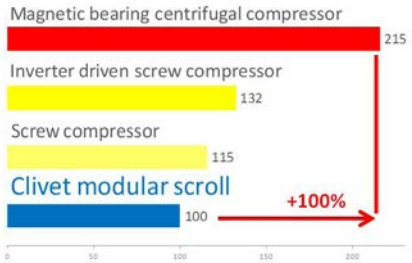
Suitable for any type of terminals, from fan coils to radiant systems and chilled beams, SPINchiller³ is also available in Super-silenced configuration. Energy recovery for producing hot water free of charge, FREE-COOLING. Seasonal energy efficiency is further increased with the DST operating logic, which maintains a constant return temperature.

Borderless multiscroll technology

With SPINchiller³ the modular scroll compressor technology reaches the best levels of performance and versatility ever, guaranteeing competitiveness in more and more demanding applications. The top class seasonal efficiency rewards SPINchiller³ in comparison to any other air cooled chiller technology. A comparison with three SPINchiller³ competitors such as:

- air cooled liquid chillers with magnetic bearing centrifugal compressors,
- air cooled liquid chillers with modulating capacity screw compressors,
- air cooled liquid chillers with inverter screw compressors,

shows that SPINchiller³ is the best solution, considering its seasonal efficiency similar to the inverter screw chillers and a capital cost lower than that of centrifugal compressor chillers, even considering the capital investment pay back, that for analized technologies are always above acceptable values normally considered for system investment equal to 3 years.

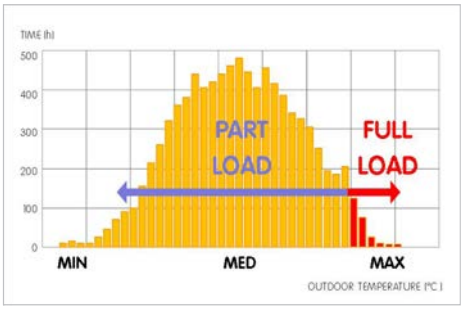


Average capital investment for 500 kW installation proportional with scroll technology

Comfort and energy saving in one solution

Maximum efficiency is necessary with a part load

The system is required to generate maximum capacity only for a short amount of time. Therefore, it is essential to have the maximum efficiency under part-load conditions. This is the only way to actually reduce overall yearly consumptions.



Part load efficiency determines the seasonal efficiency

Seasonal efficiency is conventionally represented by ESEER parameters according to Eurovent and IPLV parameters according to ARI. Both give great importance to part load operation, since it is the predominant condition.

SYSTEM LOAD	WEIGHT (ESEER) *	WEIGHT (IPLV) *
100%	3%	1%
75%	33%	42%
50%	41%	45%
25%	23%	12%

* EUROVENT (ESEER) supply times reference and ARI (IPLV) reference for seasonal efficiency calculations.

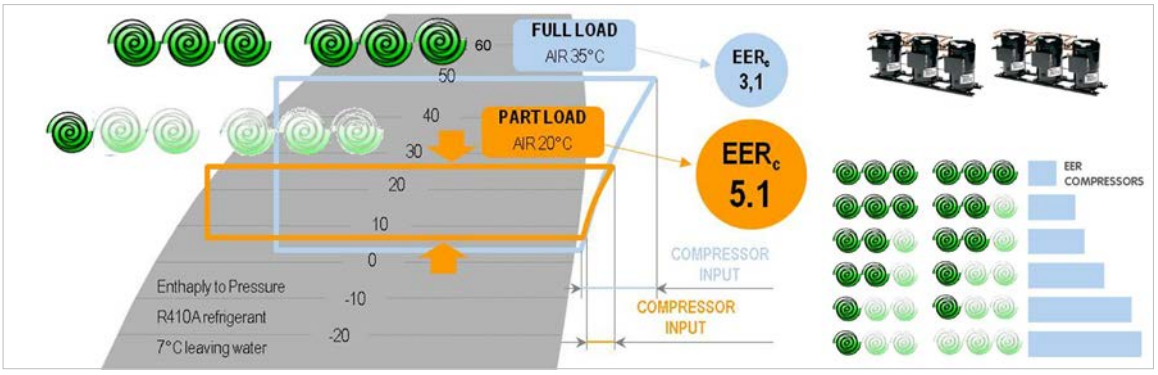
SPINchiller technology enhances part-load efficiency

SPINchiller[3] uses high efficiency Scroll compressors. The advantages are:

- compressors manufactured in large ranges on an industrial scale with strict quality control inspections and maximum manufacturing reliability thanks to the high production volumes;
- every refrigeration circuit uses two Scroll compressors, depending on the different sizes of the unit. When two compressors are used, their sizes are different in order to obtain more control steps. This way, only the necessary energy is supplied.

Doubled efficiency

The heat exchange surface is sized for full capacity operation. Under part load condition, some compressors are automatically deactivated. Under this condition, in fact, the compressors in operation make use of a much larger surface. This entails a reduced condensation temperature and an increased evaporation temperature. This way, the compressor capacity consumption is reduced with respect to the yield thereby increasing the overall efficiency of the unit.

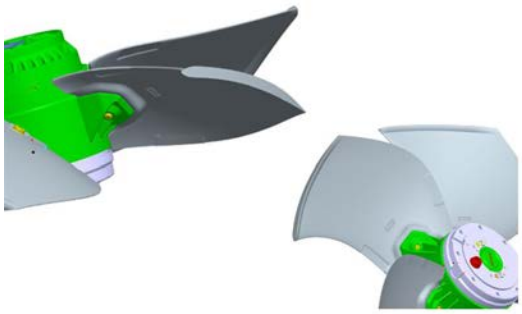


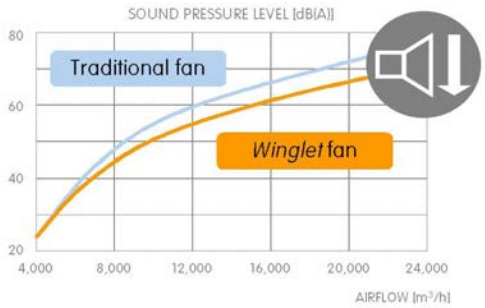
EERc =Energy efficiency referred to compressors

Efficient and silent ventilation technology

Advanced aerofoil fans

The external axial fans are equipped with the innovative Winglet airfoil-vane with integrated baffle, able to increase the aerodynamic efficiency. It results in a consumption reduction of the 10% and a medium sound emission lower of 6 dB than the traditional fans.



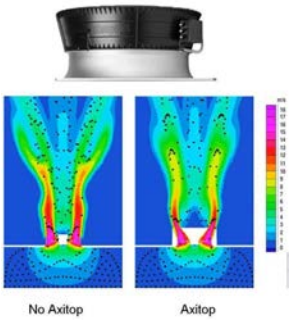


Diffusers for fans

Also the innovative air handling system on the external exchangers is the result of the Clivet design evolution.

The new AxiTop diffuser creates an ideal air distribution: it aerodynamically decelerates the flow and transforms a big part of its dynamic energy in static pressure, obtaining:

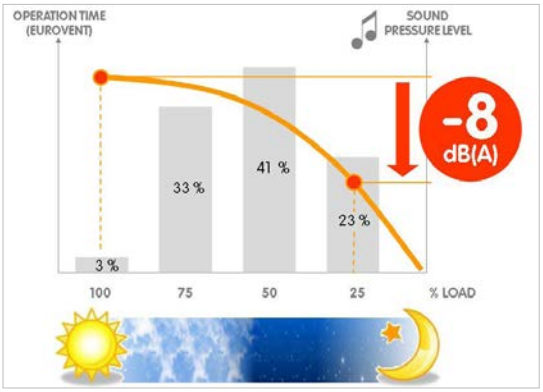
- –3 dB of sound reduction;
- reduction of 3% of the absorbed energy.



Energy efficiency improved by Axitop

Fans at variable speed for minimal noise emission

All SPINchiller³ units are equipped with electronic condensation control. It automatically reduces the fan speed when the heat load is reduced. Since the fans are the unit's main noise source, the benefits are evident especially during the night hours, when the load is reduced but sensitivity to noise is enhanced. All this translates into a sound pressure reduced down to 8 dB(A) compared to full load operation in 90% of operating time of the unit.



Two versions available for the various investment dynamics

Business oriented

All SPINchiller³ models feature high part-load energy efficiency, which means high ESEER seasonal efficiency. The two versions available allow choosing the best combination between the initial investment and the costs throughout the entire life-cycle of the system.

Excellence version: maximum efficiency

Apart from the high seasonal efficiency, the standard EXCELLENCE SC version stands out for its extremely high energy efficiency ratio (EER) during full-load cooling, which exceeds the value 3.1 and places it in Eurovent Energy Efficiency class A.

This is all possible thanks to Scroll modular technology, high efficiency heat exchangers, to the speed electronic control of the phase cutting fans and to Axitop diffusers and to an electronic control device supplied as standard.

This allows for:

- energy efficiencies equal to or higher than most units on the market equipped with screw compressors, even when inverter driven;
- efficient use even in a large number of industrial and process applications;
- upgrade of the building's energy class and, therefore, increased value;
- maximum savings on running and maintenance costs.

With Eurovent's implementation of the EN14511:2011 standard in 2012, reaching top energy efficiency levels at full load means calculating performance by also taking into account the energy consumption required to overcome pressure drops to allow for the circulation of the solution inside the exchangers.

Premium version: compact and aggressive

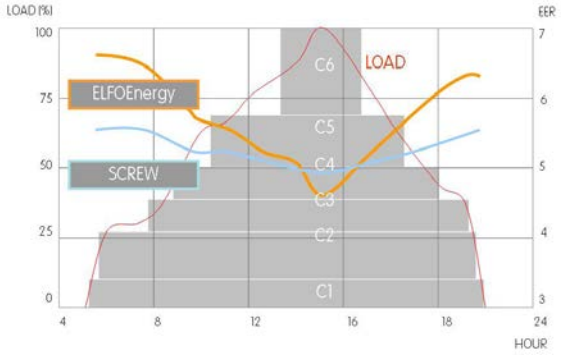
The optional PREMIUM version develops excellent part-load efficiency, but features a compact design for the heat exchangers and structure. Therefore this solution is intended for applications that favour the initial investment rather than overall cost reduction throughout the lifespan of the system.

Superior flexibility and reliability

Efficient precision

Sequential activation of SPINchiller³ compressors allow:

- adapting to the load required for use, thereby ensuring added comfort;
- reducing the number of compressor start-ups, i.e., the main cause of wear;
- increasing the unit's useful life;
- reducing repair times and costs, thanks to the modular components, their reduced dimensions and reduced cost compared to semi-hermetic compressors.

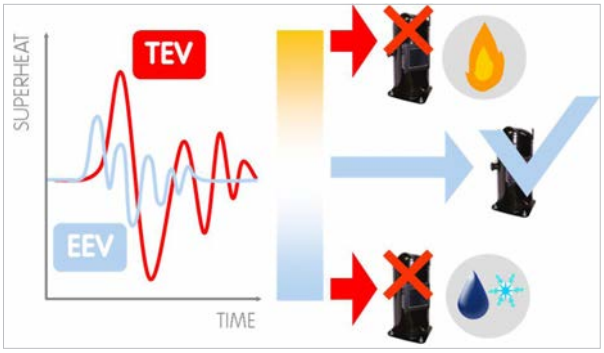


THE NUMBER OF START-UPS DECREASES THEREFORE THE LIFE CYCLE INCREASES

Stable and reliable operation

The electronic expansion valve (EEV) adapts rapidly and precisely to the actual load required for usage, allowing stable and reliable adjustment in comparison with mechanical thermostatic valves (TEV). This results also in a further increase in efficiency and longer compressor life.

The overheating control allows preventing phenomena that are hazardous to the compressors, such as overtemperature and return fluids, thereby increasing even more efficiency and durability.



Simplified maintenance

Besides being efficient, SPINchiller³ improves the system maintenance.

In fact, the malfunction of a compressor does not compromise overall operation.

Furthermore, Scroll compressors are very compact, easy to find and easy to handle in case of replacement.

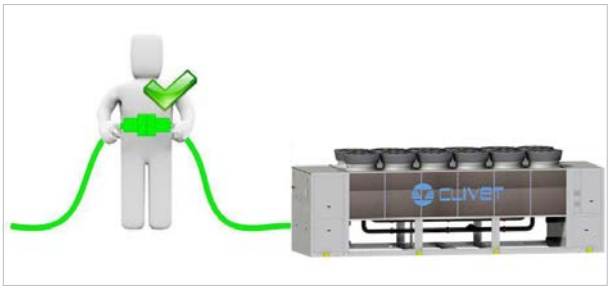
Controlled power supply

Proper power supply ensures optimal unit operation and protects its many electrical components.

The phase monitor is standard supplied:

- it controls the presence and the exact sequence of the phases;
- it checks any voltage anomalies (-10%);
- automatically restarts the unit as soon as the proper power supply is restored.

The monitor is multifunction type, where limit values and the service schedule of Clivet's Technical Support can be modified.



The automatic control device coordinates resources ensuring maximum efficiency

Operating completely automatic

The microprocessor control automatically manages operation according to the maximum efficiency criterion and includes many safety and alarm management functions.

It also includes advanced functions, such as daily and weekly programming and automatic maximum power consumption limitation (demand limit).

Perfect for LEED certification

The whole EXCELLENCE range satisfies both requirements 2 (Minimum Energy Performance) and 3 (Fundamental Refrigerant Management) of Energy and Atmosphere section. They also meet Credit 4 parameters (Enhanced Refrigerant Management) allowing 1 point acquisition.

Clivet is committed in promoting the green building principles and has become a member of GBC Italia. This organization collaborates with USGBC, the U.S. nonprofit organization that promotes worldwide the LEED system of indipendent certification.

Modularity

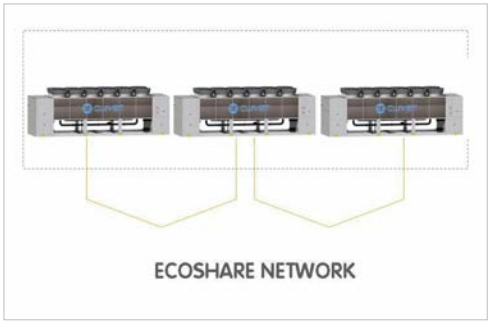
In the event of particularly large buildings requiring high capacities, it is advisable to use several units.

The SPINchiller³ units are designed to be connected in parallel in modular logic, thereby granting the following advantages:

- increased flexibility, enhanced by the control that can adapt to the load;
- increased reliability, since the malfunction of one unit does not compromise the capacity supply of the other units;
- increased efficiency, since energy is produced where and when required, according to the served area.

The microprocessor control combined with ECOSHARE allows controlling up to 3 units in local network.

MODULAR SYSTEM THAT ENHANCES SPINchiller³ TECHNOLOGY ADVANTAGES



Remote system management

SPINchiller³ is standard equipped with:

- potential-free contact for remote on/off control;
- potential-free contacts for remote display of the compressor status;
- setting from user interface: Off / local On / serial On;
- potential-free contact to remote any possible alarm.

The various communication protocols allow the unit to exchange information with the main supervision systems by means of serial connections.

Energy measuring

Monitoring energy consumption and instant power employed is the starting point to improve the system's energy management and efficiency. With the optional energy meter, the user displays all the information related to the unit's electrical parameters on the interface built-in the unit or via the serial connection.

Moreover, the integration with the Demand Limit function supplied as standard allows to act on consumption levels by limiting them if they exceed the expected limit.

Seasonal energy efficiency is further increased with the DST operating logic

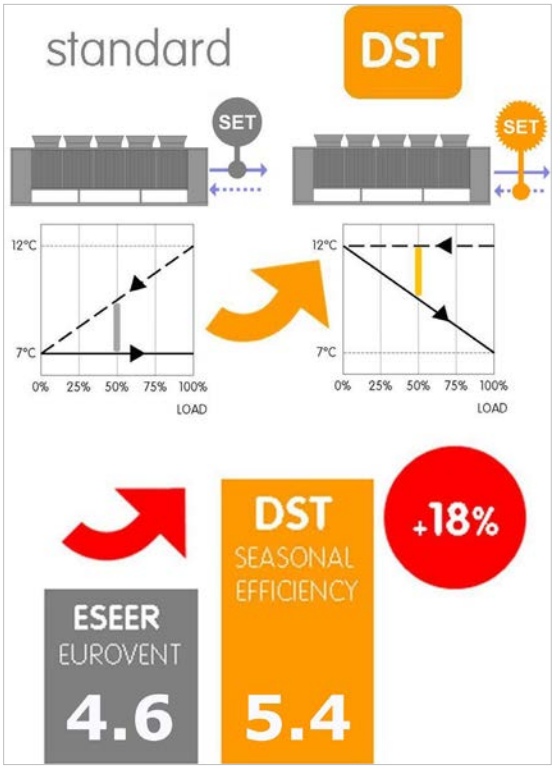
SPINchiller[3] is equipped with standard DST control (Dynamic Supply Temperature) control logic, which can be activated by the user.

Unlike the traditional control logic that aims at maintaining the water supply temperature constant, the DST logic aims at keeping constant the water return temperature, modifying the supply temperature dynamically according to the load. This way, evaporation temperature increases during part-load cooling, thereby increasing seasonal energy efficiency.

The DST control allows a considerable consumption and operation costs reduction, especially in civil applications, upon verification of the air treatment system's dehumidification capacity during cooling at part load.

The DST control allows considerable consumption and operation costs reduction, especially in civil applications, upon verification of the air treatment system's dehumidification capacity during part-load cooling. The DST control is particularly interesting when combined with active thermodynamic fresh air systems. The direct expansion circuit allows them to operate the outdoor air treatment independently from SPINchiller[2], which can vary the system water supply temperature, thereby optimising energy efficiency in the yearly cycle.

The DST control logic is as an alternative to the control logic at variable flow-rate.



Example

The following diagram represents the various operating temperatures in the production of chilled water under various load conditions for a typical civil system consisting of:

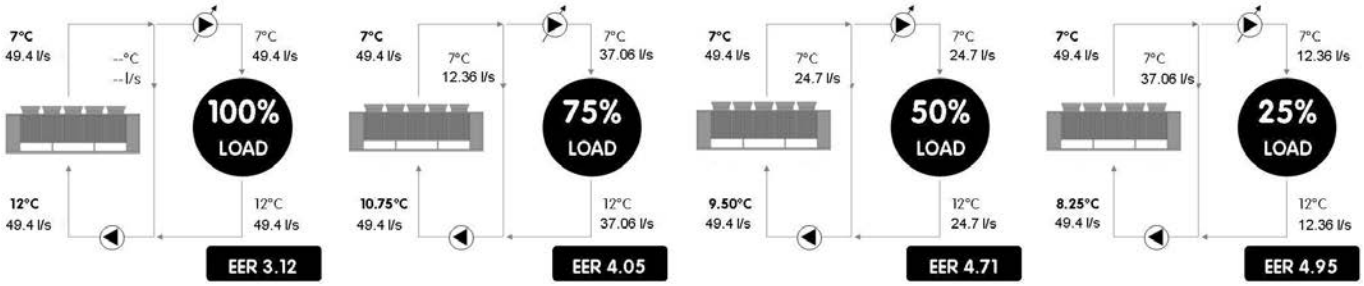
- primary circuit with constant water flow rate;
- secondary circuit with variable water flow-rate according to the load (linear variability for simplicity).

The traditional control logic keeps the water supply temperature to room terminals and outdoor air treatment units constant, in order for the latter to carry out the dehumidification.

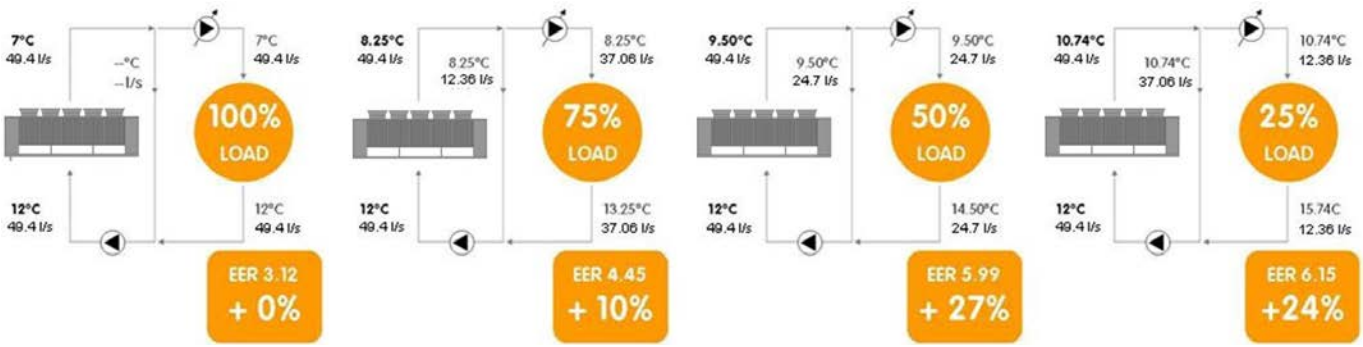
The DST control logic, on the other hand, allows increasing the system water supply temperature during part-load operation, thereby increasing seasonal energy efficiency for SPINchiller[3].

The DST application must be verified during the design stage according to specific system constraints.

Traditional control logic (system water flow rate temperature = constant)



DST control logic (system water return temperature = constant)



SPINchiller³ technology industrialised the system

SPINchiller³ can be supplied equipped with components that are often provided separately.

This allows reducing:

- design times: all accessories are made to ensure the best overall efficiency;
- installation costs: the accessories already mechanically connected, electrically wired and individually tested are ready to be put to operate immediately;
- overall dimensions: system components are integrated with the unit, thereby reducing the technical area and increasing the area available for other uses.

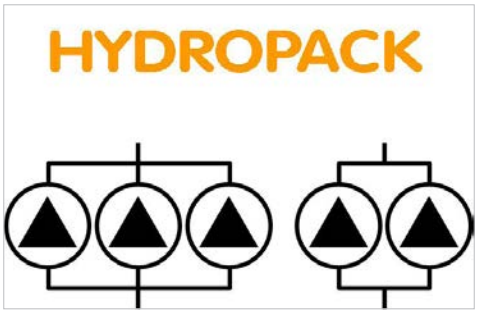
Integrated inertial storage tank available

In most SPINchiller³ systems it can be installed without inertial storage tank on the system. In fact, the unit quickly adapts to the load due to modular compressors, electronic thermostatic valve and low water content plate heat exchangers. However, in the event of hydraulic distribution networks with reduced dimensions, it is important to provide the system with a hydraulic flywheel. In such cases, inertial storage tank is available built-in, equipped with insulating coating and all the necessary safety devices. This allows eliminating installation times and costs and freeing space inside the building.

The built-in pumps are versatile, ready-for-use and reliable

The various solutions available are:

- HYDROPACK, the modular solution with four or six parallel pumps. Automatically reduces the water flow rate when in critical conditions, thereby preventing jams due to overloading, requiring the subsequent intervention of specialised technical personnel;
- it is very useful during start-ups, when restarting after operating breaks (e.g. at the weekend) or after a long period of inactivity;
- Inverter driven HYDROPACK allows water flow-rate-head calibration.



Variable flow-rate advantages

Pumping energy for moving the water has an heavy impact on seasonal efficiency. The variable flow control is available for all units and drives to energy savings during partial load.

Pump energy consumption is proportional with cubic rotation speed. Evident the advantage when reducing flow-rate of 40% comparing to nominal conditions: energy saving is of 75% on pump energy consumption.

The control logic I based on keeping stable the water temperature entering and leaving difference, guaranteeing at the same time the best efficiency and a working envelope within an acceptable range for the heat exchanger (pressure losses).

The control logic applies to both flow-rate and compressor regulation thanks to steps. Proportional-Integral-Derivative guarantees a precise and stable operation.

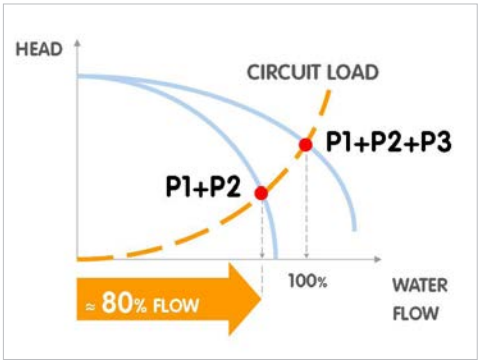
The possibility of independent pump management in case of failure is embedded in the unit keeping operative the system.

The exceptional HydroPack operation continuity

Due to its modularity, HYDROPACK maintains good water flow in the system even in the event of one of the pumps being temporarily unavailable.

In fact, with a deactivated pump, the residual flow is:

- about 90% of the rated flow (6 pump configuration);
- about 80% of the rated flow (4 pump configuration).



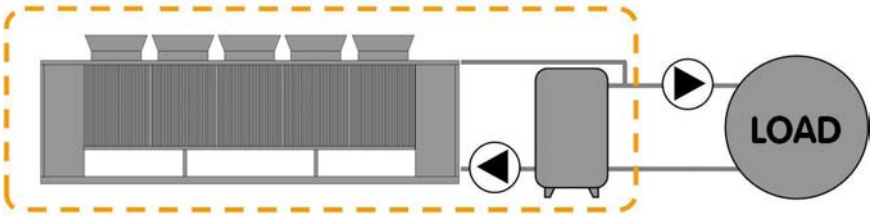
Even the primary circuit can be integrated built-in

A connection to the secondary use circuit is all that's needed. In this way, the system results even more simple and reliable.

The units are complete with quick connections on the hydraulic side, which further reduce start-up times by eliminating pipe threading operations.

Furthermore, other system components are also available as accessories, such as hydraulic connections reported on the external walls of the unit and the required water filter.

SPINchiller² CAN CONTAIN MOST OF THE SYSTEM COMPONENTS



THE QUICK CONNECTIONS ARE STANDARD SUPPLIED

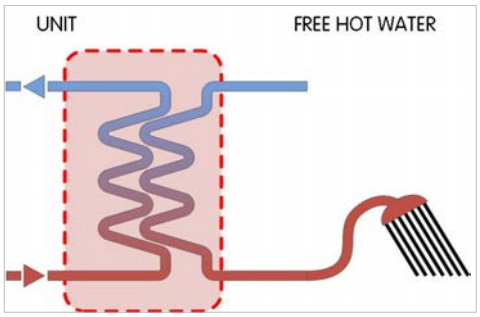
Produces hot water freely

Condensation heat recovery:

- partial: it recovers about the 20% of the available heat (desuperheater);
- total: it recovers the 100% of the available heat.

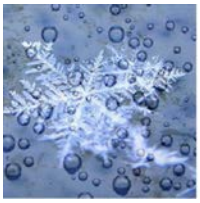
It allows the free DHW production for:

- hot water coil supply for reheat;
- domestic hot water production (with intermediate exchanger);
- other processes or operations.



Even for low water temperature

The unit is also perfectly adapted for use in process cooling where the low temperature version (Brine) together with the addition of glycol to the thermo-vector liquid produces chilled water down to –8 °C.



Further considerations on the installation

The vast operating field of SPINchiller³ allows it to adapt to most system applications. In some cases, special duty conditions may exceed the unit operating field. Simple devices on the system allow proper operation and meeting any requirement. Here are two examples.

Water flow rate values outside the limits

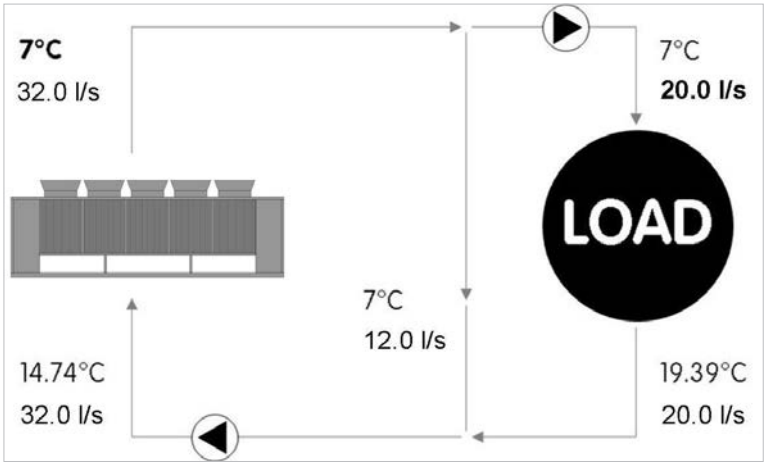
SPINchiller³ operates with constant water flow rate to the evaporator, between a minimum and maximum value indicated in the technical documents.

Flow rate values below the limit may cause unwanted formation of ice, incrustations, reduced control precision, and the unit to stop following the intervention of built-in safety devices.

Flow values above the limit may cause high pressure drops, high pumping costs, and reduced control precision, and erosion damages to the exchangers.

In this example, the required flow-rate is lower than the maximum value allowed to the evaporator, while the operating temperatures fall within the functional field of the unit.

A properly sized bypass piping resolves the problem.



Example referred to WSAT-XSC3 360.6 SC EXCELLENCE version.
Appropriate water flow rate for the correct unit operation.

Temperature values outside the limits

SPINchiller³ operates with the system supply temperatures indicated in the technical documentation.

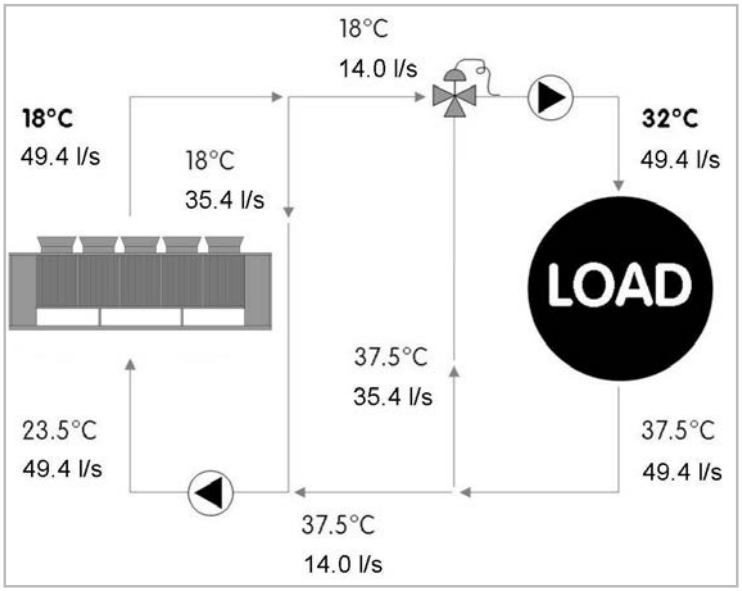
Temperature limits below the limit may cause unwanted formation of ice and the unit to stop following the intervention of built-in safety devices.

Temperature values under the limit may cause malfunctions and damages to the compressors, reduced control precision, and the unit to stop following the intervention of built-in safety devices.

In this example, the required temperature exceeds the maximum value allowed to the evaporator, while the water flow rate falls within the functional field of the unit.

A properly sized bypass piping and mixing system resolve the problem.

Should both the water flow rate and the operating temperature exceed the values intended for the chiller, all you have to do is combine the two cases described above.



Example referred to WSAT-XSC3 360.6 SC EXCELLENCE version.
Appropriate supply water temperature for the correct unit operation. Nominal water flow rate.

Evaporator thermal gradient

SPINchiller³ nominal capacities refer to an evaporator thermal gradient equal to 5 °C. A different thermal gradient may be used in full load operation, provided that both the operating flow and temperatures fall within the limits. As an indication, this corresponds to a minimum thermal gradient of approximately 3 °C and a maximum of 10 °C (the exact values must be determined based on the allowed flows and temperatures).

Standard unit technical specifications - Excellence version

Compressor

High efficiency hermetic orbiting scroll compressor complete with oil charge, motor over-temperature and over-current devices and protection against excessive gas discharge temperature with oil heater, which starts automatically, keeps the oil from being diluted by the refrigerant when the compressor stops.

Compressors, fitted on rubber antivibration mounts to prevent transmission of noise and vibration, are connected in TANDEM or TRIO on a single refrigerating circuit with biphasic oil equalisation, it allows to reach high efficiency at partial load.

Uniform compression process with reduced number of moving parts which ensure very low levels of noise and vibration.

Structure

Structure and base made entirely of sturdy sheet steel, thickness of 30/10 or 40/10, with the surface treatment in Zinc–Magnesium painted, for the parts in view, with polyester powder RAL 9001 that guarantees excellent mechanical characteristics and high corrosion strength over time.

Panelling

External pre-painted zinc-magnesium paneling, thickness 10/10, with the surface treatment in Zinc–Magnesium painted with polyester powder RAL 9001 that ensures superior resistance to corrosion for outdoor installation and eliminates the need for periodical painting. The panels can be easily removed to fully access internal components and are lined with sound-proof material on the inside to contain the unit's sound levels.

Internal exchanger

Direct expansion heat exchanger, braze-welded AISI 316 stainless steel plates, in pack without seals using copper as the brazing material, with low refrigerant charge and large exchange surface, complete with:

- external thermal insulation no-condensation, thickness 9,5 mm, in extruded elastomer foam with closed cells;
- differential pressure switch, water side;
- antifreeze heater to protect the water side exchanger, preventing the formation of frost if the water temperature falls below a set value.

Maximum operating pressure exchanger: 10 bar on the water side and 45 bar on the refrigerant side.

External exchanger

Finned exchanger, made from copper pipes arranged in staggered rows and mechanically expanded for better adherence to the collar of the fins. The exchangers are planned, designed and produced directly by CLIVET. The fins are made of aluminium with a special corrugated surface, set a suitable distance apart to ensure maximum heat exchange efficiency.

A proper liquid supply of the expansion valve is ensured by the subcooling circuit.

Each finned heat exchanger is directly cooled by the air flow of its specific fans.

Fan

Axial fans with high performance and low-noise, balanced statically and dynamically, with blades in aluminum sheet coated in PP and sickle profile terminating with "Winglets", Wall ring in sheet steel pre-galvanised, directly coupled to the three-phase electric motor with external rotor and IP54 protection and class F insulation. Fans are located in aerodynamically shaped structures, equipped with accident prevention steel guards.

Diffusers for external section fans - Axitop

Axitop diffusers, to be installed on the outdoor section fans, to recover dynamic energy, resulting in increased efficiency and minimal sound emission. It creates an ideal air distribution: it aerodynamically decelerates the flow and transforms a big part of its dynamic energy in static pressure. The Axitop diffuser installation is provided by the Customer.

Device for consumption reduction of the external section at variable speed (phase-cutting)

Automatic device for reducing of the outdoor section consumption with variable speed fans. The speed of the fan motors is continuously adjusted according to the condensing pressure to ensure the right working of the unit at low outside temperatures.

Refrigeration circuit

Two or four independent refrigeration circuits made of copper, brazed and factory-assembled, complete with:

- liquid flow and moisture indicator;
- low pressure transducer:
- refrigerant temperature probe;
- electronic expansion valve;
- high pressure safety pressure switch;
- high pressure safety valve;
- low pressure safety valve;
- cutoff valve on liquid line;
- cutoff valve on compressor supply.

Thermal insulated of suction line with insulation material in highly flexible closed-cell elastomer based on EPDM rubber. Refrigeration circuit pressure tested to check leaks and supplied complete of refrigerant charge.

Configurations

D - Partial energy recovery

R - Totale energy recovery

B - Low water temperature

SC - Acoustic configuration with compressor soundproofing

EN - Super-silenced acoustic configuration

Electrical panel

Fully constructed and wired in accordance with EN 60204. The capacity section includes:

- main door lock isolator switch;
- terminals main power (400V / 3Ph / 50Hz);
- isolating transformer for auxiliary circuit power supply (230V/24V);
- compressor circuit breaker;
- fan overload circuit breakers;
- compressor control contactor.

The control section includes:

- interface terminal with graphic display;
- display of the set values, the error codes and the parameter index;
- ON/OFF and alarm reset buttons;
- proportional-integral-derivative water temperature control;
- daily, weekly programmer of temperature set-point and unit on/off;
- unit switching on management by local or remote (serial);
- antifreeze protection water side;
- compressor overload protection and timer;
- pre-alarm function for water antifreeze and high refrigerant gas pressure;
- self-diagnosis system with immediate display of the fault code;
- automatic rotation control for compressor starts;
- compressor operating hour display;
- remote ON/OFF control;
- relay for remote cumulative fault signal;
- input for demand limit (absorbed power limit according to an external signal 0÷10V or 4÷20mA);
- potential-free contacts for compressor status;
- multifunction phase monitor (only EXCELLENCE version);
- digital input for double set-point enabling;
- electrical panel ventilation.

All device functions can be repeated with a normal portable PC connected to the unit with an Ethernet cable and equipped with an internet navigation browser. All electrical cables are colored and numbered in accordance with the wiring diagram.

Accessories - Hydronic assembly

- HYDROPACK (n.b.: other types are available by head)
- Inverter driven HYDROPACK
- Storage tank
- Steel mesh mechanical strainer (accessory separately provided). Note: To be located at the exchanger inlet. We disclaim any liability and make the guarantee void, if an appropriate mechanical filter is not provided inside the system.

Accessories

- Finned coil protection grill
- Anti-hail protection grilles
- Copper / aluminium condenser coil with acrylic lining
- Condenser coil with Aluminum Energy Guard DCC treatment
- High and low pressure gauges
- Cutoff valve on compressor supply and return
- Electrical panel antifreeze protection
- Multi-function phase monitor (only Premuim version)
- Power factor correction capacitors (cosfi > 0.9)
- ECOSHARE function for the automatic management of a group of units
- Disposal for inrush current reduction (SOFT STARTER)
- Serial communication module for BACnet-IP supervisor
- Serial communication module for Modbus supervisor
- Serial communication module for LonWorks supervisor
- Set up for single power supply
- Device for fan consumption reduction of the external section, ECOBREEZE type
- Device for fan consumption reduction of the external section, on/off type
- Device for the condensing coil partialization
- Energy meter
- Set-point compensation with 0-10 V signal
- Set-point compensation with outdoor air temperature probe
- Variable flow-rate control
- Leak detector
- Couple of manually operated shut-off valves (accessory separately supplied)
- Remote control via microprocessor control (accessory separately supplied)
- Mains power supply (accessory separately supplied)
- Spring antivibration mounts (accessory separately supplied)

On special request are available:

- copper /copper condenser coil with brass shoulders
- storage tank with primary circuit with pump built-in the unit.

Test

Unit subjected to factory-tested in specific steps and test pressure of the piping of the refrigerant circuit (with nitrogen and hydrogen), before shipping them. After the approval, the moisture contents present in all circuits are analyzed, in order to ensure the respect of the limits set by the manufacturers of the different components.

Unit technical specifications for Premium version

Technical specifications as EXCELLENCE version, except the Phase Monitor which is at fixed calibration (multifunction optional).

Unit equipment with outdoor air low temperatures

<table>
<tr><th colspan="2">Minimum outdoor air temperature</th><th>Operating unit</th><th>Unit in stand-by (5)
(fed unit)</th><th>Unit in storage
(unit not fed)</th></tr>
<tr><td>+11°C</td><td>1</td><td rowspan="4">√ standard unit</td><td rowspan="4">√ standard unit</td><td rowspan="3">√ standard unit (6)</td></tr>
<tr><td>+2°C</td><td>2</td></tr>
<tr><td>-7°C</td><td>3</td></tr>
<tr><td>-10°C</td><td>4</td></tr>
<tr><td>Between –10°C and –18°C</td><td></td><td>√ electrical panel antifreeze protection
√ glycol in an appropriate percentage
√ device for the condensing coil partialization</td><td rowspan="3">√ water empty unit or with an appropriate glycol percentage
√ electrical panel antifreeze protection</td></tr>
<tr><td>Between –18°C and –25°C</td><td rowspan="2"></td><td rowspan="2">NOT POSSIBLE</td><td>√ standard unit (6)
Not suitable:
X electrical panel antifreeze protection
X energy meter (CONTA2)
X high and low pressure gauges (MHP)</td></tr>
<tr><td>Between –25°C and –39°C</td><td>NOT POSSIBLE</td></tr>
</table>

Data referred to the following conditions:
- internal exchanger water = 12/7°C

1. Part load unit and air speed equal to 1 m/s.
2. Part load unit and air speed equal to 0.5 m/s.
3. Part load unit and outdoor air temperature at rest.
4. Full load unit and outdoor air temperature at rest.

(5) The water pumping unit must be fed and connected to the unit according to the manual.
(6) Unit without water or containing water with an appropriate quantity of glycol.
At the unit start-up the water temperature or water with glycol must be inside the operating range indicated in the "Operating range" graph.
To know the water freezing temperature on varying the glycol percentage refer to the specific 'Correction factors for glycol use' table.

Air conditions which are at rest are defined as the absence of air flowing towards the unit. Weak winds can induce air to flow through the exchanger and air-levels which can cause a reduction in the operating range. In the presence of predominant winds it is necessary to use suitable windbreak barriers

The unit, with an outdoor air temperature on average lower than -10°C, can remain stored for a maximum of 1 month.

Unit configuration

WSAT-XSC3 260 . 6 EXC SC AXIX - - -

(1) (2) (3) (4) (5) (6) (7) (8) (9)

(1) Range
WSAT = Air-cooled liquid chiller with scroll compressor
XSC3 = SPINchiller³ range

(2) Size
260 = Nominal compressor capacity (HP)

(3) Compressors
6 = Compressor quantity

(4) Energy efficiency
EXC = EXCELLENCE version: high energy eciency
PRM = Compact PREMIUM version

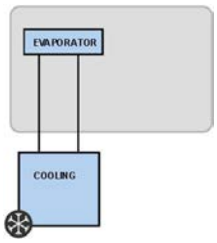
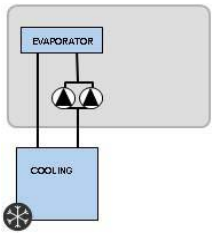
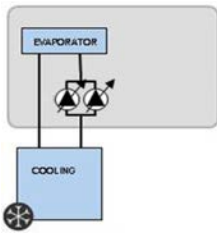
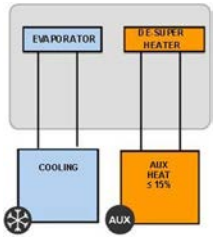
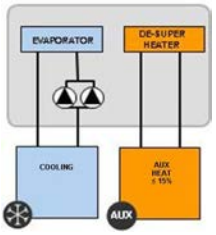
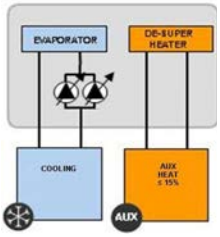
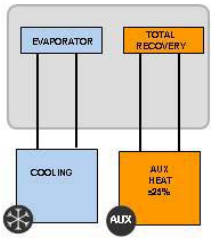
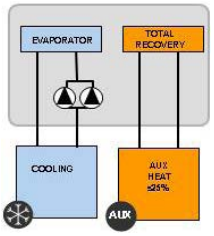
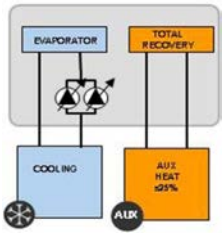
(5) Acoustic configuration
SC = Acoustic configuration with compressor soudproofing
EN = Super-silenced acoustic configuration

(6) Fan diffusers
AXIX - Diffuser for high efficiency fan (standard - separately supplied)
NAXI - Diffuser not required

(7) Condensation heat recovery
(-) Recovery not required (standard)
D - Partial energy recovery (20% of available heat)
R - Total energy recovery (100% of available heat)

(8) Low evaporator water temperature configuration
(-) Low water temperature: not required (standard)
B - Low water temperature, down to –8°C (Brine)

(9) Pumping unit user side
(-) Not required
4PM - Hydropack user side with no. 4 of pumps
6PM - Hydropack user side with no. 6 of pumps
6PMV - Hydropack user side with no. 6 of inverter pumps

Functionalities	Hydronic units		
2-PIPE SYSTEM Chilled water production for installation	**1.1** Standard unit 	**1.2** Standard unit with HYDROPACK 	**1.3** Standard unit with inverter driven HYDROPACK 
2-PIPE SYSTEM + PARTIAL RECOVERY Production of chilled water Free production of hot water from partial recovery	**2.1** Standard unit with partial recovery 	**2.2** Standard unit with partial recovery and HYDROPACK 	**2.3** Standard unit with partial recovery and inverter driven HYDROPACK 
2-PIPE SYSTEM + TOTAL RECOVERY Chilled water production for installation Hot water free production from total recovery	**3.1** Standard unit with total recovery 	**3.2** Standard unit with total recovery and HYDROPACK 	**3.3** Standard unit with total recovery and inverter driven HYDROPACK 

Accessories separately supplied		
• **RCMRX** - Remote control via microprocessor remote control	• **PSX** - Mains power supply unit	• **AMMX** - Spring antivibration mounts

EXCELLENCE VERSION

Acoustic configuration: compressor soundproofing (SC)

General technical data - Performance

Size			260.6	280.6	300.6	320.6	340.6	360.6	400.8	440.8	480.8
Cooling											
Cooling capacity	1	[kW]	736	794	856	909	965	1020	1148	1248	1356
Compressor power input	1	[kW]	213	230	244	262	279	297	325	363	396
Total power input	2	[kW]	231	248	269	287	304	322	358	394	430
Partial recovery heating capacity	3	[kW]	189,9	204,8	220,0	234,1	248,8	263,4	294,6	322,2	350,4
Total recovery heating capacity	3	[kW]	892,0	964,0	1035,0	1106,0	1178,0	1249,0	1407,6	1549,8	1692,0
EER	1	-	3,19	3,20	3,18	3,17	3,17	3,17	3,21	3,17	3,15
Water flow-rate (User Side)	1	[l/s]	34,9	37,6	40,6	43,1	45,7	48,4	54,4	59,2	64,3
Internal exchanger pressure drops	1	[kPa]	53,5	52,5	53,4	56,9	57,3	57,7	51,2	50,1	54,6
Cooling capacity (EN14511:2013)	4	[kW]	734	791	852	905	961	1016	1143	1242	1350
Total power input (EN14511:2013)	4	[kW]	236	253	274	292	309	328	362	400	435
EER (EN 14511:2013)	4	-	3,11	3,12	3,11	3,10	3,10	3,10	3,16	3,10	3,10
SEER	6	-	4,61	4,59	4,60	4,65	4,62	4,56	4,66	4,62	4,56
Cooling capacity (AHRI 550/590)	5	[kW]	733	790	853	906	962	1017	1140	1240	1351
Total power input (AHRI 550/590)	5	[kW]	231	248	269	286	304	322	357	393	429
COP_R	5	-	3,17	3,19	3,17	3,17	3,16	3,16	3,19	3,16	3,15
IPLV	5	-	5,06	5,09	5,07	5,06	5,04	5,03	5,00	5,00	5,08

The Product is compliant with the Erp (Energy Related Products) European Directive. It includes the Commission delegated Regulation (EU) No 2016/2281, also known as Ecodesign LOT21.
'Contains fluorinated greenhouse gases'(GWP 2087,5)

1. Data referred to the following conditions: internal exchanger water = 12/7 °C. Entering external exchanger air temperature 35°C. Evaporator fouling factor = 0.44 x 10^(-4) m2 K/W
2. The Total Power Input value does not take into account the part related to the pumps and required to overcome the pressure drops for the circulation of the solution inside the exchangers
3. Option. Recovery exchanger water=40/45°C
4. Data compliant to Standard EN 14511:2013 referred to the following conditions: - Internal exchanger water temperature = 12/7°C - Entering external exchanger air temperature = 35°C
5. Data compliant to Standard AHRI 550/590 referred to the following conditions: internal exchanger water temperature = 6,7 °C. Water flow-rate 0,043 l/s per kW. Entering external exchanger air temperature 35°C. Evaporator fouling factor = 0.18 x 10^(-4) m² K/W
6. Data calculated according to the EN 14825:2016 Regulation

Acoustic configuration: super-silenced (EN)

General technical data - Performance

Size			260.6	280.6	300.6	320.6	340.6	360.6	400.8	440.8	480.8
Cooling											
Cooling capacity	1	[kW]	707	758	822	871	922	972	1098	1198	1284
Compressor power input	1	[kW]	224	243	255	274	294	313	340	382	420
Total power input	2	[kW]	237	256	273	292	312	331	364	406	443
Partial recovery heating capacity	3	[kW]	186,1	200,3	215,5	229,0	243,0	257,1	287,6	316,0	340,8
Total recovery heating capacity	3	[kW]	892,0	964,0	1035,0	1106,0	1178,0	1249,0	1393,5	1526,0	1673,9
EER	1	-	2,98	2,96	3,01	2,98	2,95	2,94	3,02	2,95	2,90
Water flow-rate (User Side)	1	[l/s]	33,5	35,9	39,0	41,3	43,7	46,1	52,0	56,8	60,8
Internal exchanger pressure drops	1	[kPa]	49,5	48,2	49,6	52,6	52,7	52,7	47,0	46,2	49,2
Cooling capacity (EN14511:2013)	4	[kW]	704	756	819	868	918	969	1094	1194	1279
Total power input (EN14511:2013)	4	[kW]	241	261	278	297	317	336	367	409	448
EER (EN 14511:2013)	4	-	2,92	2,90	2,95	2,92	2,90	2,88	2,98	2,92	2,86
SEER	6	-	4,57	4,55	4,59	4,64	4,59	4,55	4,62	4,58	4,55
Cooling capacity (AHRI 550/590)	5	[kW]	704	756	819	869	919	968	1082	1191	1280
Total power input (AHRI 550/590)	5	[kW]	236	256	273	291	311	330	365	405	442
COP_R	5	-	2,98	2,95	3,00	2,99	2,95	2,93	2,96	2,94	2,90
IPLV	5	-	4,99	5,01	5,06	5,02	4,99	4,96	4,92	4,96	4,97

The Product is compliant with the Erp (Energy Related Products) European Directive. It includes the Commission delegated Regulation (EU) No 2016/2281, also known as Ecodesign LOT21.
'Contains fluorinated greenhouse gases'(GWP 2087,5)

1. Data referred to the following conditions: internal exchanger water = 12/7 °C. Entering external exchanger air temperature 35°C. Evaporator fouling factor = 0.44 x 10^(-4) m2 K/W
2. The Total Power Input value does not take into account the part related to the pumps and required to overcome the pressure drops for the circulation of the solution inside the exchangers
3. Option. Recovery exchanger water=40/45°C
4. Data compliant to Standard EN 14511:2013 referred to the following conditions: - Internal exchanger water temperature = 12/7°C - Entering external exchanger air temperature = 35°C
5. Data compliant to Standard AHRI 550/590 referred to the following conditions: internal exchanger water temperature = 6,7 °C. Water flow-rate 0,043 l/s per kW. Entering external exchanger air temperature 35°C. Evaporator fouling factor = 0.18 x 10^(-4) m² K/W
6. Data calculated according to the EN 14825:2016 Regulation

PREMIUM VERSION

Acoustic configuration: compressor soundproofing (SC)

General technical data - Performance

Size			260.6	280.6	300.6	320.6	340.6	360.6	400.8	440.8	480.8
Cooling											
Cooling capacity	1	[kW]	695	745	801	851	898	946	1062	1192	1297
Compressor power input	1	[kW]	224	243	261	280	300	319	349	387	420
Total power input	2	[kW]	241	260	281	300	320	339	373	417	451
Partial recovery heating capacity	3	[kW]	184	198	213	226	240	253	282	316	343
Total recovery heating capacity	3	[kW]	892	964	1035	1106	1178	1249	1381	1534	1665
EER	1	-	2,89	2,87	2,85	2,84	2,81	2,79	2,85	2,86	2,88
Water flow-rate (User Side)	1	[l/s]	32,9	35,3	38,0	40,3	42,6	44,8	50,3	56,5	61,5
Internal exchanger pressure drops	1	[kPa]	62,3	60,4	62,5	59,8	62,8	61,3	54,7	55,0	53,9
Cooling capacity (EN14511:2013)	4	[kW]	693	742	798	848	895	942	1058	1187	1291
Total power input (EN14511:2013)	4	[kW]	246	266	287	306	326	346	382	427	462
EER (EN 14511:2013)	4	-	2,81	2,79	2,78	2,77	2,75	2,72	2,77	2,78	2,80
SEER	6	-	4,42	4,39	4,37	4,35	4,35	4,34	4,22	4,19	4,15
Cooling capacity (AHRI 550/590)	5	[kW]	691	742	798	849	895	942	1056	1184	1288
Total power input (AHRI 550/590)	5	[kW]	240	259	280	299	319	338	371	416	450
COP_R	5	-	2,88	2,86	2,85	2,84	2,80	2,79	2,85	2,85	2,86
IPLV	5	-	4,95	4,90	4,90	4,88	4,83	4,77	4,57	4,57	4,62

The Product is compliant with the Erp (Energy Related Products) European Directive. It includes the Commission delegated Regulation (EU) No 2016/2281, also known as Ecodesign LOT21.
'Contains fluorinated greenhouse gases'(GWP 2087,5)

1. Data referred to the following conditions: internal exchanger water = 12/7 °C. Entering external exchanger air temperature 35°C. Evaporator fouling factor = 0.44 x 10^(-4) m2 K/W
2. The Total Power Input value does not take into account the part related to the pumps and required to overcome the pressure drops for the circulation of the solution inside the exchangers
3. Option. Recovery exchanger water=40/45°C
4. Data compliant to Standard EN 14511:2013 referred to the following conditions: - Internal exchanger water temperature = 12/7°C - Entering external exchanger air temperature = 35°C
5. Data compliant to Standard AHRI 550/590 referred to the following conditions: internal exchanger water temperature = 6,7 °C. Water flow-rate 0,043 l/s per kW. Entering external exchanger air temperature 35°C. Evaporator fouling factor = 0.18 x 10^(-4) m² K/W
6. Data calculated according to the EN 14825:2016 Regulation

Acoustic configuration: super-silenced (EN)

General technical data - Performance

Size			260.6	280.6	300.6	320.6	340.6	360.6	400.8	440.8	480.8
Cooling											
Cooling capacity	1	[kW]	662	710	765	809	853	898	1008	1146	1228
Compressor power input	1	[kW]	235	255	274	295	317	339	370	404	442
Total power input	2	[kW]	247	267	288	309	332	354	388	426	465
Partial recovery heating capacity	3	[kW]	180	193	208	221	234	248	276	310	334
Total recovery heating capacity	3	[kW]	892	964	1035	1106	1178	1249	1370	1515	1648
EER	1	-	2,68	2,66	2,66	2,61	2,57	2,54	2,60	2,69	2,64
Water flow-rate (User Side)	1	[l/s]	31,4	33,7	36,3	38,3	40,4	42,6	47,8	54,3	58,2
Internal exchanger pressure drops	1	[kPa]	57,0	55,1	57,4	54,3	57,2	55,8	49,4	51,0	48,5
Cooling capacity (EN14511:2013)	4	[kW]	660	708	762	806	851	895	1004	1142	1224
Total power input (EN14511:2013)	4	[kW]	252	272	293	315	338	360	396	435	474
EER (EN 14511:2013)	4	-	2,62	2,60	2,60	2,56	2,52	2,48	2,54	2,62	2,58
SEER	6	-	4,19	4,10	4,13	4,15	4,13	4,11	4,10	4,13	4,14
Cooling capacity (AHRI 550/590)	5	[kW]	260,6	280,6	300,6	320,6	340,6	360,6	400,8	440,8	480,8
Total power input (AHRI 550/590)	5	[kW]	660	707	762	806	849	893	1002	1137	1221
COP_R	5	-	245,0	266,0	287	308	331	352	387	424	464
IPLV	5	-	4,59	4,57	4,58	4,51	4,43	4,34	4,44	4,62	4,52

The Product is compliant with the Erp (Energy Related Products) European Directive. It includes the Commission delegated Regulation (EU) No 2016/2281, also known as Ecodesign LOT21.
'Contains fluorinated greenhouse gases'(GWP 2087,5)

1. Data referred to the following conditions: internal exchanger water = 12/7 °C. Entering external exchanger air temperature 35°C. Evaporator fouling factor = 0.44 x 10^(-4) m2 K/W
2. The Total Power Input value does not take into account the part related to the pumps and required to overcome the pressure drops for the circulation of the solution inside the exchangers
3. Option. Recovery exchanger water=40/45°C
4. Data compliant to Standard EN 14511:2013 referred to the following conditions: - Internal exchanger water temperature = 12/7°C - Entering external exchanger air temperature = 35°C
5. Data compliant to Standard AHRI 550/590 referred to the following conditions: internal exchanger water temperature = 6,7 °C. Water flow-rate 0,043 l/s per kW. Entering external exchanger air temperature 35°C. Evaporator fouling factor = 0.18 x 10^(-4) m² K/W
6. Data calculated according to the EN 14825:2016 Regulation

EXCELLENCE VERSION

Acoustic configuration: compressor soundproofing (SC)

General technical data - Construction

Size			260.6	280.6	300.6	320.6	340.6	360.6	400.8	440.8	480.8
Compressor											
Type of compressors		-	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll
No. of compressors		Nr	6	6	6	6	6	6	8	8	8
Rated power (C1)		[HP]	120	140	140	160	160	180	100	100	120
Rated power (C2)		[HP]	140	140	160	160	180	180	100	120	120
Rated power (C3)		[HP]	-	-	-	-	-	-	100	100	120
Rated power (C4)		[HP]	-	-	-	-	-	-	100	120	120
Std Capacity control steps		-	11	12	13	14	11	6	12	10	8
Oil charge (C1)		[l]	19	19	19	19	19	19	13	13	13
Oil charge (C2)		[l]	19	19	19	19	19	19	13	13	13
Oil charge (C3)		[l]	-	-	-	-	-	-	13	13	13
Oil charge (C4)		[l]	-	-	-	-	-	-	13	13	13
Refrigerant charge (C1)	1	[kg]	59	62	75	77	77	85	54	55	65
Refrigerant charge (C2)	1	[kg]	62	62	77	77	85	85	53	61	63
Refrigerant charge (C3)	1	[kg]	-	-	-	-	-	-	54	55	65
Refrigerant charge (C4)	1	[kg]	-	-	-	-	-	-	53	61	63
Refrigeration circuits		-	2	2	2	2	2	2	4	4	4
Internal exchanger											
Type of internal exchanger	2	-	PHE	PHE	PHE	PHE	PHE	PHE	PHE	PHE	PHE
Number of internal exchangers		Nr	2	2	2	2	2	2	2	2	2
Total water content		[l]	65,0	74,0	79,0	84,0	87,0	90,0	98,8	115,4	123,8
Minimum system water content	3	l	1824	1365	1766	2345	1990	1753	1973	2575	3498
External Section Fans											
Type of fans	4	-	AX	AX	AX	AX	AX	AX	AX	AX	AX
Number of fans		Nr	12	12	16	16	16	16	20	20	20
Type of motor	5	-	AC/P	AC/P	AC/P	AC/P	AC/P	AC/P	AC/P	AC/P	AC/P
Standard airflow		[l/s]	73120	72035	97494	96046	95118	94191	116663	115405	114147
Connections											
Water fittings		-	6"	6"	6"	6"	6"	6"	8"	8"	8"
Power supply											
Standard power supply		V	400/3~/50	400/3~/50	400/3~/50	400/3~/50	400/3~/50	400/3~/50	400/3~/50	400/3~/50	400/3~/50
Power line		Nr	2	2	2	2	2	2	2	2	2
Electrical data											
F.L.A. -Power line 1		[A]	246,2	286,4	294,6	334,8	334,8	375,0	416,9	457,1	497,3
F.L.I. - Power line 1		[kW]	151,4	174,8	178,5	201,9	201,9	225,3	252,4	275,8	299,2
F.L.A. - Power line 2		[A]	286,4	286,4	334,8	334,8	375,0	375,0	416,9	457,1	497,3
F.L.I. - Power line 2		[kW]	174,8	174,8	201,9	201,9	225,3	225,3	252,4	275,8	299,2
M.I.C. - Value	6	A	802,3	842,4	899,0	939,2	979,4	1019,6	1103,5	1183,9	1264,3
M.I.C. - with soft start accessory	6	A	802,3	842,4	899,0	939,2	979,4	1019,6	1103,5	1183,9	1264,3

1. Indicative values for standard units with possible +/-10% variation. The actual data are indicated on the unit label
2. PHE = plate exchanger
3. The minimum system water content calculated value does not consider the internal exchanger water content (evaporator). With outdoor air low temperature applications or low medium requested loads, the minimum installation water volume is obtained doubling the indicated value.
4. AX = axial fan
5. AC/P = asynchronous three-phase external rotor motor with phase cutting speed automatic control
   Unbalance between phase max 2 % Voltage variation: max +/- 10%
   Electrical data refer to standard units; according to the installed accessories, the data can suffer some variations.
6. M.I.C.=Maximum unit starting current.
   The M.I.C. value is obtained adding the max. compressor starting current of the highest size to the power input at max. admissible conditions (F.L.A.) of the remaining electric components.

EXCELLENCE VERSION

Acoustic configuration: super-silenced (EN)

General technical data - Construction

Size			260.6	280.6	300.6	320.6	340.6	360.6	400.8	440.8	480.8
Compressor											
Type of compressors		-	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll
No. of compressors		Nr	6	6	6	6	6	6	8	8	8
Rated power (C1)		[HP]	120	140	140	160	160	180	100	100	120
Rated power (C2)		[HP]	140	140	160	160	180	180	100	120	120
Rated power (C3)		[HP]	-	-	-	-	-	-	100	100	120
Rated power (C4)		[HP]	-	-	-	-	-	-	100	120	120
Std Capacity control steps		-	11	12	13	14	11	6	12	10	8
Oil charge (C1)		[l]	19	19	19	19	19	19	13	13	13
Oil charge (C2)		[l]	19	19	19	19	19	19	13	13	13
Oil charge (C3)		[l]	-	-	-	-	-	-	13	13	13
Oil charge (C4)		[l]	-	-	-	-	-	-	13	13	13
Refrigerant charge (C1)	1	[kg]	58	59	64	64	64	80	45	44	58
Refrigerant charge (C2)	1	[kg]	59	59	64	64	80	80	44	53	56
Refrigerant charge (C3)	1	[kg]	-	-	-	-	-	-	45	44	58
Refrigerant charge (C4)	1	[kg]	-	-	-	-	-	-	44	53	56
Refrigeration circuits		-	2	2	2	2	2	2	4	4	4
Internal exchanger											
Type of internal exchanger	2	-	PHE	PHE	PHE	PHE	PHE	PHE	PHE	PHE	PHE
Number of internal exchangers		Nr	2	2	2	2	2	2	2	2	2
Total water content		[l]	65,0	74,0	79,0	84,0	87,0	90,0	98,8	115,4	123,8
Minimum system water content	3	l	1824	1365	1766	2345	1990	1753	1973	2575	3498
External Section Fans											
Type of fans	4	-	AX	AX	AX	AX	AX	AX	AX	AX	AX
Number of fans		Nr	12	12	16	16	16	16	20	20	20
Type of motor	5	-	AC/P	AC/P	AC/P	AC/P	AC/P	AC/P	AC/P	AC/P	AC/P
Standard airflow		[l/s]	58647	57409	78196	76545	75617	74690	95681	95681	93362
Connections											
Water fittings		-	6"	6"	6"	6"	6"	6"	8"	8"	8"
Power supply											
Standard power supply		V	400/3~/50	400/3~/50	400/3~/50	400/3~/50	400/3~/50	400/3~/50	400/3~/50	400/3~/50	400/3~/50
Power input supply		Nr	2	2	2	2	2	2	2	2	2
Electrical data											
F.L.A. -Power line 1		[A]	246,2	286,4	294,6	334,8	334,8	375,0	416,9	457,1	497,3
F.L.I. - Power line 1		[kW]	151,4	174,8	178,5	201,9	201,9	225,3	252,4	275,8	299,2
F.L.A. - Power line 2		[A]	286,4	286,4	334,8	334,8	375,0	375,0	416,9	457,1	497,3
F.L.I. - Power line 2		[kW]	174,8	174,8	201,9	201,9	225,3	225,3	252,4	275,8	299,2
M.I.C. - Value	6	A	802,3	842,4	899,0	939,2	979,4	1019,6	1103,5	1183,9	1264,3
M.I.C. - with soft start accessory	6	A	802,3	842,4	899,0	939,2	979,4	1019,6	1103,5	1183,9	1264,3

1. Indicative values for standard units with possible +/-10% variation. The actual data are indicated on the unit label
2. PHE = plate exchanger
3. The minimum system water content calculated value does not consider the internal exchanger water content (evaporator). With outdoor air low temperature applications or low medium requested loads, the minimum installation water volume is obtained doubling the indicated value.
4. AX = axial fan
5. AC/P = asynchronous three-phase external rotor motor with phase cutting speed automatic control
   Unbalance between phase max 2 % Voltage variation: max +/- 10%
   Electrical data refer to standard units; according to the installed accessories, the data can suffer some variations.
6. M.I.C.=Maximum unit starting current.
   The M.I.C. value is obtained adding the max. compressor starting current of the highest size to the power input at max. admissible conditions (F.L.A.) of the remaining electric components.

PREMIUM VERSION

Acoustic configuration: compressor soundproofing (SC)

General technical data - Construction

Size			260.6	280.6	300.6	320.6	340.6	360.6	400.8	440.8	480.8
Compressor											
Type of compressors		-	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll
No. of compressors		Nr	6	6	6	6	6	6	8	8	8
Rated power (C1)		[HP]	120	140	140	160	160	180	100	100	120
Rated power (C2)		[HP]	140	140	160	160	180	180	100	120	120
Rated power (C3)		[HP]	-	-	-	-	-	-	100	100	120
Rated power (C4)		[HP]	-	-	-	-	-	-	100	120	120
Std Capacity control steps		-	11	12	13	14	11	6	12	10	8
Oil charge (C1)		[l]	19	19	19	19	19	19	13	13	13
Oil charge (C2)		[l]	19	19	19	19	19	19	13	13	13
Oil charge (C3)		[l]	-	-	-	-	-	-	13	13	13
Oil charge (C4)		[l]	-	-	-	-	-	-	13	13	13
Refrigerant charge (C1)	1	[kg]	58	59	64	64	64	80	45	44	58
Refrigerant charge (C2)	1	[kg]	59	59	64	64	80	80	44	53	56
Refrigerant charge (C3)	1	[kg]	-	-	-	-	-	-	45	44	58
Refrigerant charge (C4)	1	[kg]	-	-	-	-	-	-	44	53	56
Refrigeration circuits		-	2	2	2	2	2	2	4	4	4
Internal exchanger											
Type of internal exchanger	2	-	PHE	PHE	PHE	PHE	PHE	PHE	PHE	PHE	PHE
Number of internal exchangers		Nr	2	2	2	2	2	2	2	2	2
Total water content		[l]	53	56	65	74	79	84	84	99	115
Minimum system water content	3	[l]	1291	1230	1322	1229	1670	3319	2849	3198	4279
External Section Fans											
Type of fans	4	-	AX	AX	AX	AX	AX	AX	AX	AX	AX
Number of fans		Nr	10	10	12	12	12	12	16	20	20
Type of motor	5	-	AC/P	AC/P	AC/P	AC/P	AC/P	AC/P	AC/P	AC/P	AC/P
Standard airflow		[l/s]	60934	60029	73120	72035	71339	70643	98941	124271	120057
Connections											
Water fittings		-	6"	6"	6"	6"	6"	6"	8"	8"	8"
Power supply											
Standard power supply		V	400/3~/50	400/3~/50	400/3~/50	400/3~/50	400/3~/50	400/3~/50	400/3~/50	400/3~/50	400/3~/50
Power line		Nr	2	2	2	2	2	2	2	2	2
Electrical data											
F.L.A. -Power line 1		[A]	242,1	282,3	286,4	326,6	326,6	366,8	408,4	457,1	497,3
F.L.I. - Power line 1		[kW]	149,5	172,9	174,8	198,2	198,2	221,6	248,5	275,8	299,2
F.L.A. - Power line 2		[A]	282,3	282,3	326,6	326,6	366,8	366,8	408,4	457,1	497,3
F.L.I. - Power line 2		[kW]	172,9	172,9	198,2	198,2	221,6	221,6	248,5	275,8	299,2
M.I.C. - Value	6	A	794,1	834,2	882,6	922,8	963,0	1003,2	1095,0	1183,9	1264,3
M.I.C. - with soft start accessory	6	A	794,1	834,2	882,6	922,8	963,0	1003,2	1095,0	1183,9	1264,3

1. Indicative values for standard units with possible +/-10% variation. The actual data are indicated on the unit label
2. PHE = plate exchanger
3. The minimum system water content calculated value does not consider the internal exchanger water content (evaporator). With outdoor air low temperature applications or low medium requested loads, the minimum installation water volume is obtained doubling the indicated value.
4. AX = axial fan
5. AC/P = asynchronous three-phase external rotor motor with phase cutting speed automatic control
   Unbalance between phase max 2 % Voltage variation: max +/- 10%
   Electrical data refer to standard units; according to the installed accessories, the data can suffer some variations.
6. M.I.C.=Maximum unit starting current.
   The M.I.C. value is obtained adding the max. compressor starting current of the highest size to the power input at max. admissible conditions (F.L.A.) of the remaining electric components.

PREMIUM VERSION

Acoustic configuration: super-silenced (EN)

General technical data - Construction

Size			260.6	280.6	300.6	320.6	340.6	360.6	400.8	440.8	480.8
Compressor											
Type of compressors		-	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll
No. of compressors		Nr	6	6	6	6	6	6	8	8	8
Rated power (C1)		[HP]	120	140	140	160	160	180	100	100	120
Rated power (C2)		[HP]	140	140	160	160	180	180	100	120	120
Rated power (C3)		[HP]	-	-	-	-	-	-	100	100	120
Rated power (C4)		[HP]	-	-	-	-	-	-	100	120	120
Std Capacity control steps		-	11	12	13	14	11	6	12	10	8
Oil charge (C1)		[l]	19	19	19	19	19	19	13	13	13
Oil charge (C2)		[l]	19	19	19	19	19	19	13	13	13
Oil charge (C3)		[l]	-	-	-	-	-	-	13	13	13
Oil charge (C4)		[l]	-	-	-	-	-	-	13	13	13
Refrigerant charge (C1)	1	[kg]	58	59	64	64	64	80	45	44	58
Refrigerant charge (C2)	1	[kg]	59	59	64	64	80	80	44	53	56
Refrigerant charge (C3)	1	[kg]	-	-	-	-	-	-	45	44	58
Refrigerant charge (C4)	1	[kg]	-	-	-	-	-	-	44	53	56
Refrigeration circuits		-	2	2	2	2	2	2	4	4	4
Internal exchanger											
Type of internal exchanger	2	-	PHE	PHE	PHE	PHE	PHE	PHE	PHE	PHE	PHE
Number of internal exchangers		Nr	2	2	2	2	2	2	2	2	2
Total water content		[l]	53	56	65	74	79	84	84	99	115
Minimum system water content	3	[l]	1291	1230	1322	1229	1670	3319	2849	3198	4279
External Section Fans											
Type of fans	4	-	AX	AX	AX	AX	AX	AX	AX	AX	AX
Number of fans		Nr	10	10	12	12	12	12	16	20	20
Type of motor	5	-	AC/P	AC/P	AC/P	AC/P	AC/P	AC/P	AC/P	AC/P	AC/P
Standard airflow		[l/s]	48873	47841	58647	57409	56713	56017	79848	100941	95681
Connections											
Water fittings		-	6"	6"	6"	6"	6"	6"	8"	8"	8"
Power supply											
Standard power supply		V	400/3~/50	400/3~/50	400/3~/50	400/3~/50	400/3~/50	400/3~/50	400/3~/50	400/3~/50	400/3~/50
Power line		Nr	2	2	2	2	2	2	2	2	2
Electrical data											
F.L.A. -Power line 1		[A]	242,1	282,3	286,4	326,6	326,6	366,8	408,4	457,1	497,3
F.L.I. - Power line 1		[kW]	149,5	172,9	174,8	198,2	198,2	221,6	248,5	275,8	299,2
F.L.A. - Power line 2		[A]	282,3	282,3	326,6	326,6	366,8	366,8	408,4	457,1	497,3
F.L.I. - Power line 2		[kW]	172,9	172,9	198,2	198,2	221,6	221,6	248,5	275,8	299,2
M.I.C. - Value	6	A	794,1	834,2	882,6	922,8	963,0	1003,2	1095,0	1183,9	1264,3
M.I.C. - with soft start accessory	6	A	794,1	834,2	882,6	922,8	963,0	1003,2	1095,0	1183,9	1264,3

1. Indicative values for standard units with possible +/-10% variation. The actual data are indicated on the unit label
2. PHE = plate exchanger
3. The minimum system water content calculated value does not consider the internal exchanger water content (evaporator). With outdoor air low temperature applications or low medium requested loads, the minimum installation water volume is obtained doubling the indicated value.
4. AX = axial fan
5. AC/P = asynchronous three-phase external rotor motor with phase cutting speed automatic control
   Unbalance between phase max 2 % Voltage variation: max +/- 10%
   Electrical data refer to standard units; according to the installed accessories, the data can suffer some variations.
6. M.I.C.=Maximum unit starting current.
   The M.I.C. value is obtained adding the max. compressor starting current of the highest size to the power input at max. admissible conditions (F.L.A.) of the remaining electric components.

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Sound levels

EXCELLENCE VERSION

Acoustic configuration: compressor soundproofing (SC)

Size	Sound power level (dB)								Sound power level	Sound pressure level
	Octave band (Hz)									
	63	125	250	500	1000	2000	4000	8000	dB(A)	dB(A)
260.6	101	98	92	90	90	87	73	64	94	73
280.6	101	98	93	91	91	88	74	65	95	73
300.6	109	106	99	93	88	83	85	81	97	75
320.6	110	107	100	94	88	83	85	81	97	75
340.6	110	107	100	94	89	83	86	82	98	75
360.6	111	107	101	94	89	84	86	82	98	76
400.8	104	100	99	96	92	87	81	75	98	75
440.8	105	101	100	97	93	88	82	76	98	75
480.8	105	101	100	97	93	88	82	76	98	76

The sound levels refer to standard unit with Axitop (no accessories) at full load, in test nominal conditions. The sound pressure level refers to 1 m. from the standard unit outer surface operating in open field.
Measures are according to UNI EN ISO 9614-2 regulations, with respect to the EUROVENT 8/1 certification, which provides for a tolerance of 3 dB(A) on the sound power level, which is the only acoustic data to be considered binding.
If unit is set without Axitop, the sound power level presents an increase up to 3 dB(A).

Data referred to the following conditions:
- internal exchanger water = 12/7 °C
- ambient temperature = 35 °C

Acoustic configuration: super-silenced (EN)

Size	Sound power level (dB)								Sound power level	Sound pressure level
	Octave band (Hz)									
	63	125	250	500	1000	2000	4000	8000	dB(A)	dB(A)
260.6	96	93	88	86	86	83	69	60	90	68
280.6	97	94	88	86	86	83	69	60	90	69
300.6	105	101	95	88	83	78	80	76	92	70
320.6	105	102	95	89	84	78	80	76	92	70
340.6	105	102	95	89	84	79	81	77	93	70
360.6	105	102	96	89	84	79	81	77	93	71
400.8	99	95	94	91	87	82	76	70	93	70
440.8	100	96	95	92	88	83	77	71	93	70
480.8	100	96	95	92	88	83	77	71	93	71

The sound levels refer to standard unit with Axitop (no accessories) at full load, in test nominal conditions. The sound pressure level refers to 1 m. from the standard unit outer surface operating in open field.
Measures are according to UNI EN ISO 9614-2 regulations, with respect to the EUROVENT 8/1 certification, which provides for a tolerance of 3 dB(A) on the sound power level, which is the only acoustic data to be considered binding.
If unit is set without Axitop, the sound power level presents an increase up to 3 dB(A).

Data referred to the following conditions:
- internal exchanger water = 12/7 °C
- ambient temperature = 35 °C

The indicated sound levels are only valid within the operating field of the standard unit at full load as indicated in the 'Operating range - cooling' graph in the "Super-silenced EN" configuration. With outdoor air temperatures the unit operates at full load automatically increasing the airflow and taking the same sound levels of the "Soundproofed Compressors SC" configuration.

Sound levels

PREMIUM VERSION

Acoustic configuration: compressor soundproofing (SC)

Size	Sound power level (dB)								Sound power level	Sound pressure level
	Octave band (Hz)									
	63	125	250	500	1000	2000	4000	8000	dB(A)	dB(A)
260.6	100	97	91	89	89	86	72	63	93	72
280.6	100	97	92	90	90	87	73	64	94	73
300.6	108	105	98	92	87	81	83	79	95	74
320.6	108	105	99	92	87	82	84	80	96	74
340.6	109	106	99	93	88	82	84	80	96	75
360.6	109	106	99	93	88	83	85	81	97	75
400.8	104	100	99	96	92	87	81	75	98	76
440.8	105	101	100	97	93	88	82	76	98	75
480.8	105	101	100	97	93	88	82	76	98	76

The sound levels refer to standard unit with Axitop (no accessories) at full load, in test nominal conditions. The sound pressure level refers to 1 m. from the standard unit outer surface operating in open field.
Measures are according to UNI EN ISO 9614-2 regulations, with respect to the EUROVENT 8/1 certification, which provides for a tolerance of 3 dB(A) on the sound power level, which is the only acoustic data to be considered binding.
If unit is set without Axitop, the sound power level presents an increase up to 3 dB(A).

Data referred to the following conditions:
- internal exchanger water = 12/7 °C
- ambient temperature = 35 °C

Acoustic configuration: super-silenced (EN)

Size	Sound power level (dB)								Sound power level	Sound pressure level
	Octave band (Hz)									
	63	125	250	500	1000	2000	4000	8000	dB(A)	dB(A)
260.6	96	93	87	85	85	82	68	59	89	68
280.6	96	93	88	86	86	83	69	60	90	68
300.6	103	100	93	87	82	77	79	75	91	69
320.6	104	100	94	88	82	77	79	75	91	69
340.6	104	101	94	88	83	77	80	76	91	70
360.6	104	101	94	88	83	78	80	76	92	70
400.8	99	95	94	91	87	82	76	70	93	71
440.8	100	96	95	92	88	83	77	71	93	70
480.8	100	96	95	92	88	83	77	71	93	71

The sound levels refer to standard unit with Axitop (no accessories) at full load, in test nominal conditions. The sound pressure level refers to 1 m. from the standard unit outer surface operating in open field.
Measures are according to UNI EN ISO 9614-2 regulations, with respect to the EUROVENT 8/1 certification, which provides for a tolerance of 3 dB(A) on the sound power level, which is the only acoustic data to be considered binding.
If unit is set without Axitop, the sound power level presents an increase up to 3 dB(A).

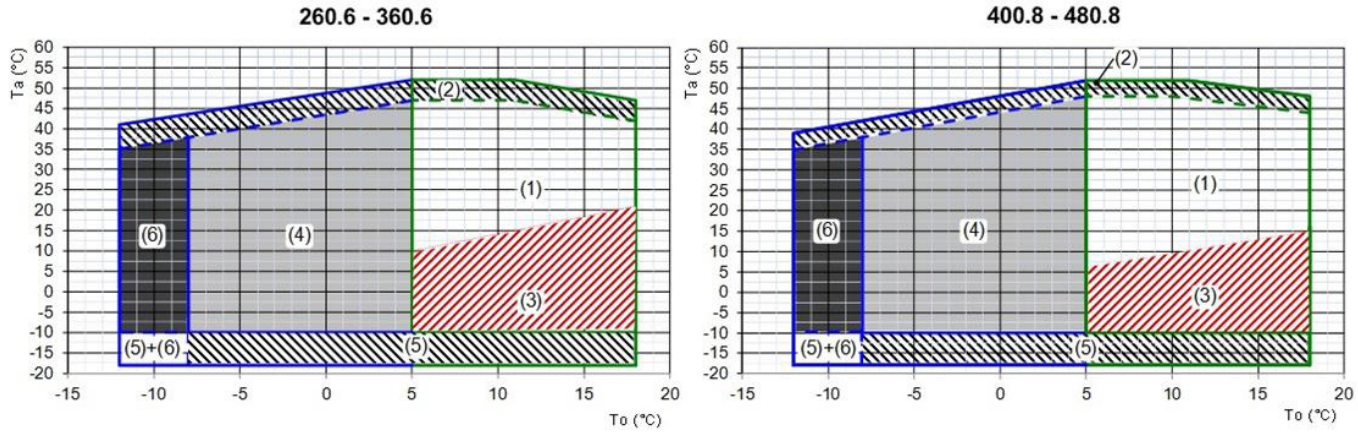
Data referred to the following conditions:
- internal exchanger water = 12/7 °C
- ambient temperature = 35 °C

The indicated sound levels are only valid within the operating field of the standard unit at full load as indicated in the 'Operating range - cooling ' graph in the "Super-silenced EN" configuration. With outdoor air temperatures the unit operates at full load automatically increasing the airflow and taking the same sound levels of the "Soundproofed Compressors SC" configuration.

Operating range

EXCELLENCE VERSION

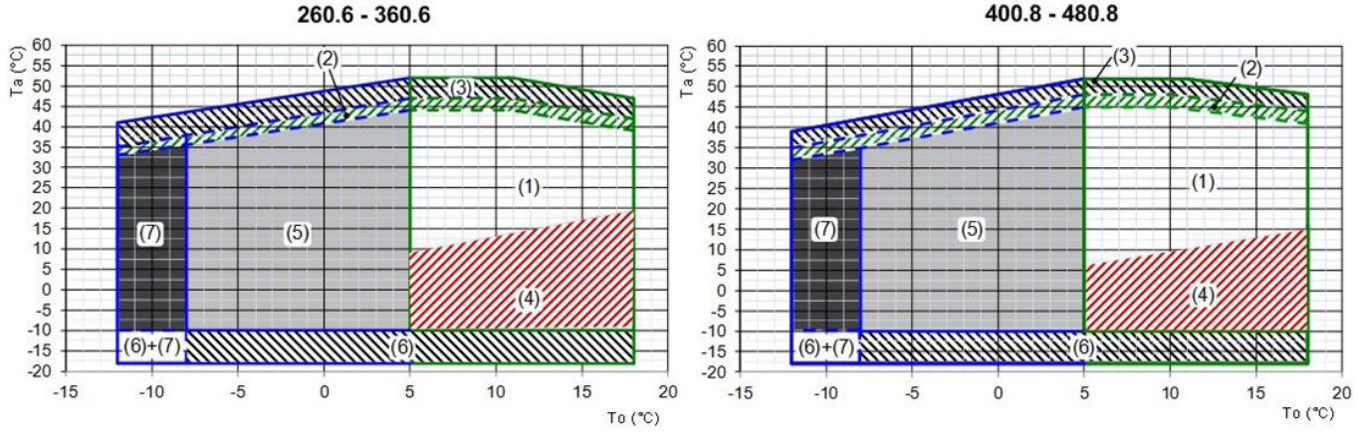
Acoustic configuration: compressor soundproofing (SC)



Ta (°C) = external exchanger inlet air temperature (D.B.)
To (°C) = internal exchanger outlet water temperature

1. Standard unit operating range at full load
2. Unit operating range with automatic staging of the compressor capacity
3. Standard unit operating range with air flow automatic modulation
4. Unit operating range in 'B - Low water temperature' configuration (40% ethylene glycol)
5. Unit operating range with 'REGBT - device for the condensing coil partialization'
6. Extended of operating range (extremely low water temperature option available on request)

Acoustic configuration: super-silenced (EN)



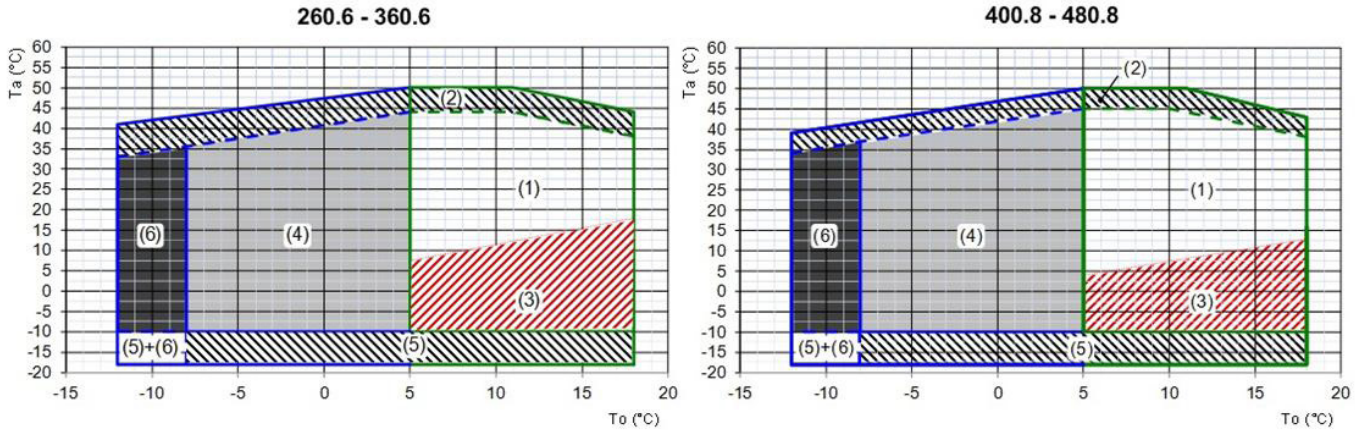
Ta (°C)= entering external exchanger air temperature (D.B.)
To (°C)= leaving internal exchanger water temperature

1. Standard unit operating range at full load
2. Extended operating range with air flow-rate automatic increasing. Inside this field the sound levels are the same of the 'compressor soundproofing (SC)' acoustic configuration
3. Unit operating range with compressor capacity automatic partialization.
4. Standard unit operating range with air flow-rate automatic modulation
5. Operation field extension for unit in 'B - Low water temperature (Brine)' configuration (40% ethylene glycol)
6. Unit operating range with 'REGBT - device for the condensing coil partialization'
7. Extended of operating range (extremely low water temperature option available on request)

Operating range

PREMIUM VERSION

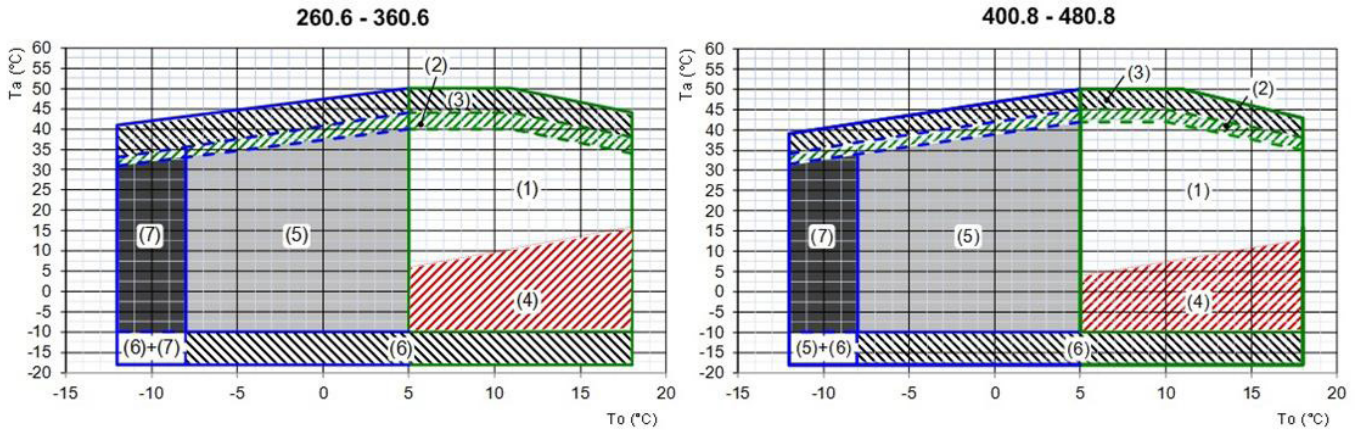
Acoustic configuration: compressor soundproofing (SC)



Ta (°C) = external exchanger inlet air temperature (D.B.)
To (°C) = internal exchanger outlet water temperature

1. Standard unit operating range at full load
2. Unit operating range with automatic partialization of the compressor capacity
3. Standard unit operating range with air flow automatic modulation
4. Unit operating range in 'B - Low water temperature' configuration (40% ethylene glycol)
5. Unit operating range with 'REGBT - device for the condensing coil partialization'
6. Extended of operating range (extremely low water temperature option available on request)

Acoustic configuration: super-silenced (EN)



Ta (°C)= entering external exchanger air temperature (D.B.)
To (°C)= leaving internal exchanger water temperature

1. Standard unit operating range at full load
2. Extended operating range with air flow-rate automatic increasing. Inside this field the sound levels are the same of the 'compressor soundproofing (SC)' acoustic configuration
3. Unit operating range with compressor capacity automatic partialization.
4. Standard unit operating range with air flow-rate automatic modulation
5. Operation field extension for unit in 'B - Low water temperature (Brine)' configuration (40% ethylene glycol)
6. Unit operating range with 'REGBT - device for the condensing coil partialization'
7. Extended of operating range (extremely low water temperature option available on request)

Admissible water flow-rates

Minimum (Qmin) and maximum (Qmax) admissible water flow for the unit to operate correctly.

EXCELLENCE		260.6	280.6	300.6	320.6	340.6	360.6	400.8	440.8	480.8
Qmin	[l/s]	17,6	19,2	20,5	21,0	22,3	23,6	28,7	31,6	32,9
Qmax	[l/s]	48,9	53,2	56,8	58,3	61,6	64,8	77,2	84,8	87,9

PREMIUM		260.6	280.6	300.6	320.6	340.6	360.6	400.8	440.8	480.8
Qmin	[l/s]	15,2	16,6	17,6	19,2	19,7	21,0	25,6	28,7	31,6
Qmax	[l/s]	42,6	46,5	48,9	53,2	54,6	58,3	69,1	77,2	84,8

Correction factors for glycol use

% ethylene glycol by weight		5%	10%	15%	20%	25%	30%	35%	40%
Freezing temperature	°C	-2,0	-3,9	-6,5	-8,9	-11,8	-15,6	-19,0	-23,4
Safety temperature	°C	3,0	1,0	-1,0	-4,0	-6,0	-10,0	-14,0	-19,0
Cooling Capacity Factor	Nr	0,997	0,994	0,99	0,986	0,981	0,976	0,970	0,964
Compressor power input Factor	Nr	1,000	1,001	1,001	1,001	1,001	1,002	1,002	1,002
Internal exchanger glycol solution flow factor	Nr	1,003	1,010	1,020	1,033	1,05	1,072	1,095	1,124
Pressure drop Factor	Nr	0,989	0,983	0,979	0,980	0,984	0,993	1,004	1,020

The correction factors shown refer to water and glycol ethylene mixes used to prevent the formation of frost on the exchangers in the water circuit during inactivity in winter.

Fouling Correction Factors

	Internal exchanger	
m2 K / W	F1	FK1
0.44 x 10 (-4)	1,0	1,0
0.88 x 10 (-4)	0,97	0,99
1.76 x 10 (-4)	0,94	0,98

F1 = Cooling capacity correction factors
FK1 = Compressor power input correction factor

Overload and control device calibrations

			open	closed	value
High pressure safety pressure switch		[kPa]	4050	3300	-
Antifreeze protection		[°C]	4	5.5	-
High pressure safety valve		[kPa]	-	-	4500
Low pressure safety valve		[kPa]	-	-	2950
Max no. of compressor starts per hour		[n°]	-	-	10
High compressor discharge temperature safety thermostat		[°C]	-	-	140

Exchanger operating range

	Internal exchanger		
	DPr		DPw
PED (CE)	4500	4500	1000

DPr = Maximum operating pressure on refrigerant side in kPa
DPw = Maximum operating pressure on water side in kPa

EXCELLENCE VERSION

Acoustic configuration: compressor soundproofing (SC)

Cooling performance (continued)

Size	To (°C)	Entering external exchanger air temperature (°C)											
		25		30		35		40		48		52	
		kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe
260.6	5	790	176	748	192	699	209	649	229	524	229	259	110
	6	816	179	769	194	719	211	669	231	540	231	267	110
	7	834	180	789	196	736	213	683	233	554	232	276	111
	10	895	186	847	202	792	220	738	239	605	239	304	113
	15	1017	198	958	214	895	231	845	252	294	75.0	-	-
	18	1093	206	1029	222	956	238	615	145	-	-	-	-
280.6	5	853	190	805	207	752	226	697	247	561	246	266	113
	6	879	192	830	209	775	228	720	250	578	248	275	113
	7	898	194	850	211	794	230	736	252	591	250	283	114
	10	963	200	913	218	852	237	794	258	647	256	314	116
	15	1094	212	1033	230	961	249	907	271	295	73.3	-	-
	18	1175	220	1106	238	1027	256	648	152	-	-	-	-
300.6	5	910	202	867	220	812	240	753	264	594	264	271	117
	6	940	204	895	223	839	243	777	267	612	265	280	118
	7	965	206	916	225	856	244	792	269	629	267	289	119
	10	1036	213	982	231	918	251	853	275	680	273	317	121
	15	1182	226	1118	244	1042	264	974	288	292	74.3	-	-
	18	1272	234	1201	253	1122	273	690	160	-	-	-	-
320.6	5	965	215	919	235	861	257	799	283	628	282	278	121
	6	999	218	950	238	889	260	823	286	647	283	287	122
	7	1029	221	974	240	909	262	840	288	665	285	297	122
	10	1101	227	1044	247	973	268	903	294	718	291	325	124
	15	1253	241	1183	261	1105	283	1032	308	293	74.1	-	-
	18	1353	250	1271	270	1191	292	722	168	-	-	-	-
340.6	5	1028	229	979	251	915	275	848	303	672	305	324	144
	6	1064	232	1011	254	945	277	874	306	692	307	333	145
	7	1091	234	1033	256	965	279	891	307	712	309	344	145
	10	1174	241	1112	263	1036	287	961	315	772	315	379	146
	15	1334	256	1261	277	1174	301	1097	329	360	93.0	-	-
	18	1433	265	1350	286	1260	310	795	186	-	-	-	-
360.6	5	1091	243	1037	266	968	292	897	323	717	329	369	168
	6	1128	246	1072	269	1001	295	924	326	737	331	379	168
	7	1152	248	1092	271	1020	297	942	327	758	333	392	167
	10	1246	256	1179	279	1098	305	1019	335	826	340	433	169
	15	1414	270	1339	294	1244	320	1160	350	428	112	-	-
	18	1513	279	1429	303	1329	328	868	203	-	-	-	-
400.8	5	1207	267	1152	291	1081	319	1000	349	884	407	541	251
	6	1239	269	1185	294	1110	322	1034	352	910	410	558	253
	7	1283	274	1226	297	1148	325	1061	355	943	413	578	255
	10	1395	283	1317	307	1234	334	1148	365	1026	423	629	261
	15	1597	301	1502	325	1412	354	1314	382	736	222	-	-
	18	1757	312	1663	337	1555	363	1445	393	-	-	-	-

kWf = Cooling capacity in kW. The data do not consider the part related to the pumps, required to overcome the pressure drop for the solution circulation inside the exchangers
kWe = Compressor power input in kW
To (°C) = Leaving internal exchanger water temperature (°C) - Performances in function of the inlet/outlet water temperature differential = 5°C

EXCELLENCE VERSION

Acoustic configuration: compressor soundproofing (SC)

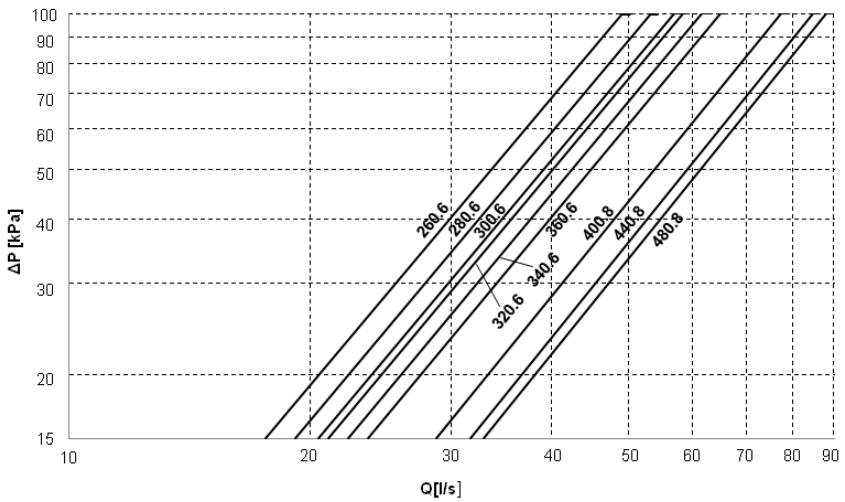
Cooling performance

Size	To (°C)	Entering external exchanger air temperature (°C)											
		25		30		35		40		48		52	
		kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe
440.8	5	1316	296	1254	324	1179	356	1095	392	971	458	547	250
	6	1358	300	1294	328	1211	359	1124	395	999	462	563	251
	7	1399	303	1329	331	1248	363	1150	397	1020	464	574	253
	10	1478	310	1399	338	1322	371	1226	409	1098	470	618	256
	15	1612	321	1533	351	1446	384	1362	424	788	247	-	-
	18	1784	332	1702	362	1596	394	1484	435	-	-	-	-
480.8	5	1456	324	1384	356	1294	390	1190	430	1056	504	552	246
	6	1496	328	1422	358	1326	394	1228	434	1088	508	568	248
	7	1536	330	1458	362	1356	396	1252	436	1104	510	576	248
	10	1610	336	1520	368	1420	402	1322	446	1164	516	608	252
	15	1764	350	1670	382	1574	420	1456	458	776	232	-	-
	18	1902	362	1808	394	1680	430	1556	468	-	-	-	-

kWf = Cooling capacity in kW. The data do not consider the part related to the pumps, required to overcome the pressure drop for the solution circulation inside the exchangers
kWe = Compressor power input in kW
To (°C) = Leaving internal exchanger water temperature (°C) - Performances in function of the inlet/outlet water temperature differential = 5°C

Internal exchanger pressure drop

Acoustic configuration: compressor soundproofing (SC)



The pressure drops are calculated considering a water temperature of 7°C

Q = water flow-rate[l/s]
DP = water side pressure drops (kPa)

The water flow-rate must be calculated with the following formula

Q [l/s] = kWf / (4,186 x DT)

kWf = Cooling capacity in kW.
DT = Temperature difference between inlet / outlet water

To the internal exchanger pressure drops must be added the pressure drops of the steel mesh mechanical strainer that must be placed on the water input line. It is a device compulsory for the correct unit operation, and it is available as Clivet option (see the HYDRONIC ASSEMBLY ACCESSORIES). If the mechanical filter is selected and installed by the Customer, it is forbidden the use of filters with the mesh pitch higher than 1,6 mm, because they can cause a bad unit operation and also its serious damaging.

EXCELLENCE VERSION

Acoustic configuration: super-silenced (EN)

Cooling performance (continued)

Size	To (°C)	Entering external exchanger air temperature (°C)											
		25		30		35		40		48		52	
		kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe
260.6	5	770	186	724	202	673	219	629	240	524	229	259	110
	6	791	188	744	204	693	222	648	242	540	231	267	110
	7	810	190	759	206	707	224	662	244	554	232	276	111
	10	867	197	813	213	759	230	715	251	605	239	304	113
	15	978	210	917	227	856	244	828	258	294	75.0	-	-
	18	1042	218	976	234	920	253	599	152	-	-	-	-
280.6	5	827	201	777	219	723	238	674	261	561	246	266	113
	6	849	204	799	222	743	241	694	263	578	248	275	113
	7	869	206	812	223	758	243	711	265	591	250	283	114
	10	931	213	872	230	812	250	765	272	647	256	314	116
	15	1050	227	983	245	916	264	886	279	295	73.3	-	-
	18	1117	236	1045	253	985	273	629	160	-	-	-	-
300.6	5	887	211	841	230	782	251	726	275	594	264	271	117
	6	915	213	862	233	805	253	747	278	612	265	280	118
	7	936	216	884	235	822	255	765	280	629	267	289	119
	10	1001	222	948	242	882	263	823	287	680	273	317	121
	15	1136	237	1070	257	998	277	952	294	292	74.3	-	-
	18	1220	246	1143	266	1068	286	665	166	-	-	-	-
320.6	5	943	226	891	247	829	269	770	295	628	282	278	121
	6	970	228	913	249	856	272	792	298	647	283	287	122
	7	998	231	939	252	871	274	810	300	665	285	297	122
	10	1063	238	1005	259	935	281	873	308	718	291	325	124
	15	1202	254	1135	275	1057	297	1009	314	293	74.1	-	-
	18	1290	263	1211	284	1129	307	694	175	-	-	-	-
340.6	5	999	241	944	264	879	289	815	317	672	305	324	144
	6	1030	244	970	267	904	291	838	320	692	307	333	145
	7	1055	247	995	269	922	294	857	323	712	309	344	145
	10	1130	254	1065	277	990	302	925	331	772	315	379	146
	15	1276	270	1200	293	1117	318	1068	337	360	93.0	-	-
	18	1367	280	1283	304	1193	328	764	194	-	-	-	-
360.6	5	1055	256	995	280	927	308	860	339	717	329	369	168
	6	1089	259	1027	284	950	310	882	342	737	331	379	168
	7	1111	261	1050	286	972	313	904	345	758	333	392	167
	10	1196	270	1123	294	1044	321	976	353	826	340	433	169
	15	1348	287	1264	311	1175	338	1126	359	428	112	-	-
	18	1441	296	1353	322	1254	348	833	212	-	-	-	-
400.8	5	1143	285	1081	313	1003	342	928	372	874	410	535	254
	6	1180	290	1108	316	1033	344	957	377	909	413	557	255
	7	1219	294	1144	320	1098	340	990	382	952	423	583	262
	10	1323	306	1244	332	1158	360	1078	393	1035	435	634	269
	15	1493	326	1392	353	1306	382	1228	416	798	246	-	-
	18	1593	342	1492	367	1403	394	1348	434	-	-	-	-

kWf = Cooling capacity in kW. The data do not consider the part related to the pumps, required to overcome the pressure drop for the solution circulation inside the exchangers
kWe = Compressor power input in kW
To (°C) = Leaving internal exchanger water temperature (°C) - Performances in function of the inlet/outlet water temperature differential = 5°C

EXCELLENCE VERSION

Acoustic configuration: super-silenced (EN)

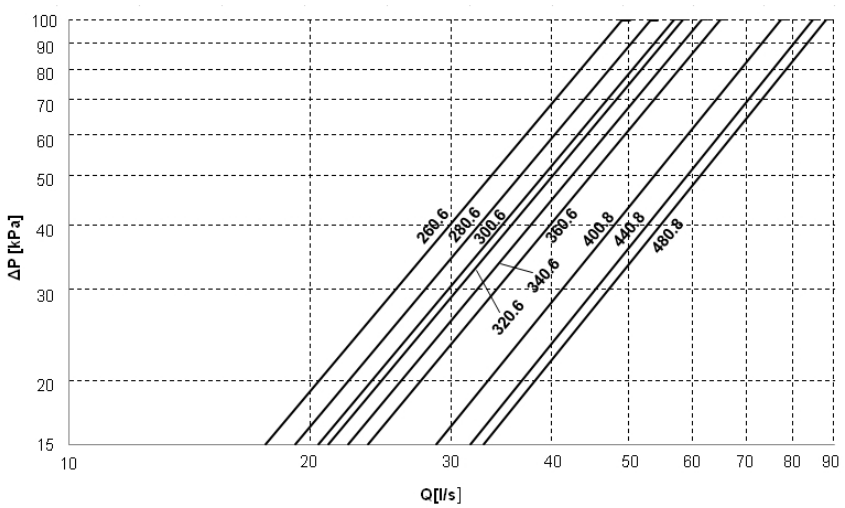
Cooling performance

Size	To (°C)	Entering external exchanger air temperature (°C)											
		25		30		35		40		48		52	
		kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe
440.8	5	1284	312	1214	341	1136	375	1046	410	968	460	545	250
	6	1321	316	1249	345	1165	378	1077	414	996	463	561	252
	7	1355	319	1284	349	1198	382	1103	417	1017	466	573	254
	10	1432	326	1344	356	1247	388	1150	424	1095	472	616	257
	15	1559	340	1471	370	1375	403	1286	441	785	247	-	-
	18	1727	353	1623	383	1524	417	1422	451	-	-	-	-
480.8	5	1400	343	1319	376	1230	414	1130	455	1053	507	550	248
	6	1436	346	1352	380	1261	418	1161	457	1084	511	566	250
	7	1472	350	1389	384	1284	420	1181	461	1100	513	575	251
	10	1547	357	1447	390	1341	427	1232	467	1161	520	606	254
	15	1683	372	1579	406	1476	443	1385	486	774	233	-	-
	18	1883	386	1763	420	1635	456	1547	497	-	-	-	-

kWf = Cooling capacity in kW. The data do not consider the part related to the pumps, required to overcome the pressure drop for the solution circulation inside the exchangers
kWe = Compressor power input in kW
To (°C) = Leaving internal exchanger water temperature (°C) - Performances in function of the inlet/outlet water temperature differential = 5°C

Internal exchanger pressure drop

Acoustic configuration: super-silenced (EN)



The pressure drops are calculated considering a water temperature of 7°C

Q = water flow-rate[l/s]
DP = water side pressure drops (kPa)

The water flow-rate must be calculated with the following formula

Q [l/s] = kWf / (4,186 x DT)

kWf = Cooling capacity in kW.
DT = Temperature difference between inlet / outlet water

To the internal exchanger pressure drops must be added the pressure drops of the steel mesh mechanical strainer that must be placed on the water input line. It is a device compulsory for the correct unit operation, and it is available as Clivet option (see the HYDRONIC ASSEMBLY ACCESSORIES). If the mechanical filter is selected and installed by the Customer, it is forbidden the use of filters with the mesh pitch higher than 1,6 mm, because they can cause a bad unit operation and also its serious damaging.

PREMIUM VERSION

Acoustic configuration: compressor soundproofing (SC)

Cooling performance (continued)

Size	To (°C)	Entering external exchanger air temperature (°C)											
		25		30		35		40		45		50	
		kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe
260.6	5	748	185	705	202	657	220	610	238	535	234	290	124
	6	767	187	723	204	677	223	630	241	552	236	299	125
	7	792	190	746	207	695	224	645	243	568	238	309	125
	10	841	196	791	212	742	231	692	250	263	68.3	238	76.4
	15	950	209	890	226	835	243	795	263	306	71.1	-	-
	18	1016	218	955	234	895	251	351	66.6	-	-	-	-
280.6	5	802	201	756	219	705	239	654	259	572	253	300	130
	6	821	203	775	221	726	241	676	262	590	255	310	130
	7	848	206	799	224	745	243	694	264	607	258	320	131
	10	902	212	848	230	792	249	743	271	268	67.1	239	75.9
	15	1016	226	953	244	895	263	853	285	312	70.1	-	-
	18	1086	235	1025	253	962	272	351	65.8	-	-	-	-
300.6	5	864	216	814	235	761	256	706	279	612	272	309	136
	6	890	218	838	238	785	260	730	282	630	274	319	136
	7	913	221	863	241	801	261	745	284	648	277	328	137
	10	975	228	919	247	858	268	800	292	505	186	305	111
	15	1102	242	1034	262	969	283	915	307	304	70.7	-	-
	18	1176	251	1107	271	1044	293	709	202	-	-	-	-
320.6	5	917	231	868	252	809	276	752	299	650	291	319	141
	6	948	235	890	255	835	279	777	303	668	293	329	142
	7	967	237	915	258	851	280	791	305	687	296	338	142
	10	1039	244	976	265	912	288	851	313	749	304	374	145
	15	1172	259	1102	280	1030	303	973	328	303	70.7	-	-
	18	1252	269	1179	291	1114	314	1059	339	-	-	-	-
340.6	5	966	246	913	269	851	294	793	321	690	314	366	163
	6	999	250	940	272	879	298	817	324	713	317	379	164
	7	1021	252	964	275	898	300	834	326	731	320	389	164
	10	1094	260	1029	283	961	308	896	334	564	204	362	131
	15	1233	276	1158	299	1085	324	1026	352	373	89.6	-	-
	18	1315	286	1241	310	1168	335	785	219	-	-	-	-
360.6	5	1018	262	960	286	895	313	835	343	732	338	414	184
	6	1051	265	992	290	924	317	858	345	760	342	429	185
	7	1077	268	1015	293	946	319	879	348	777	345	441	186
	10	1151	276	1084	301	1011	328	943	356	381	106	351	118
	15	1296	293	1217	318	1142	345	1082	377	442	108	-	-
	18	1380	304	1304	329	1224	356	513	100	-	-	-	-
400.8	5	1143	285	1081	313	1003	342	928	372	874	410	535	254
	6	1180	290	1108	316	1033	344	957	377	909	413	557	255
	7	1219	294	1144	320	1062	349	990	382	952	423	583	262
	10	1323	306	1244	332	1158	360	1078	393	1035	435	634	269
	15	1493	326	1392	353	1306	382	1228	416	798	246	-	-
	18	1593	342	1492	367	1403	394	1348	434	-	-	-	-

kWf = Cooling capacity in kW. The data do not consider the part related to the pumps, required to overcome the pressure drop for the solution circulation inside the exchangers
kWe = Compressor power input in kW
To (°C) = Leaving internal exchanger water temperature (°C) - Performances in function of the inlet/outlet water temperature differential = 5°C

PREMIUM VERSION

Acoustic configuration: compressor soundproofing (SC)

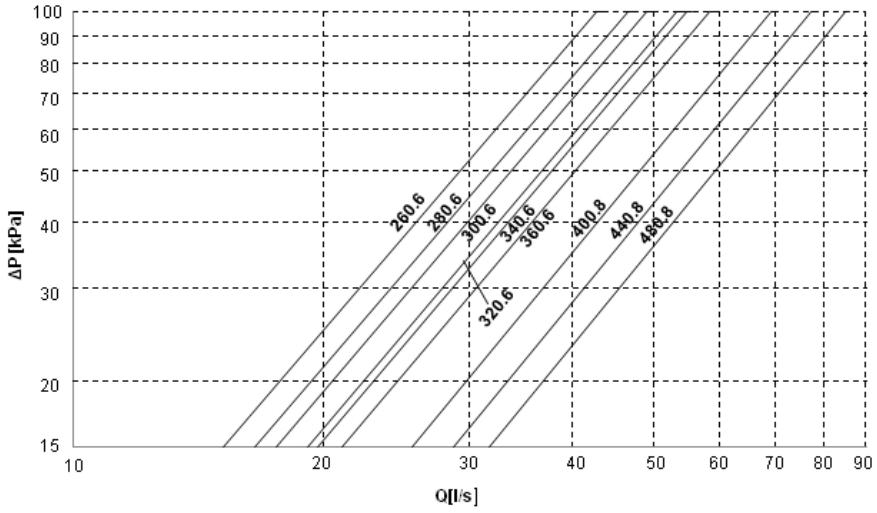
Cooling performance

Size	To (°C)	Entering external exchanger air temperature (°C)											
		25		30		35		40		45		50	
		kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe
440.8	5	1281	316	1203	347	1125	379	1039	415	970	457	546	249
	6	1326	321	1245	350	1156	382	1068	419	1002	461	564	251
	7	1358	325	1279	354	1192	387	1101	423	1040	467	586	254
	10	1486	339	1394	368	1297	400	1201	435	1150	484	647	264
	15	1670	360	1568	390	1455	422	1368	458	825	254	-	-
	18	1800	375	1682	405	1568	436	1486	475	-	-	-	-
480.8	5	1394	344	1311	376	1226	412	1128	451	1044	497	545	243
	6	1438	348	1354	381	1257	416	1164	455	1079	503	563	246
	7	1473	353	1389	385	1297	420	1208	461	1117	508	583	248
	10	1612	369	1514	400	1414	434	1298	473	1210	518	632	253
	15	1814	392	1710	425	1588	459	1477	497	807	233	-	-
	18	1962	411	1837	442	1708	475	1601	515	-	-	-	-

kWf = Cooling capacity in kW. The data do not consider the part related to the pumps, required to overcome the pressure drop for the solution circulation inside the exchangers
kWe = Compressor power input in kW
To (°C) = Leaving internal exchanger water temperature (°C) - Performances in function of the inlet/outlet water temperature differential = 5°C

Internal exchanger pressure drop

Acoustic configuration: compressor soundproofing (SC)



The pressure drops are calculated considering a water temperature of 7°C

Q = water flow-rate[l/s]
DP = water side pressure drops (kPa)

The water flow-rate must be calculated with the following formula

Q [l/s] = kWf / (4,186 x DT)

kWf = Cooling capacity in kW.
DT = Temperature difference between inlet / outlet water

To the internal exchanger pressure drops must be added the pressure drops of the steel mesh mechanical strainer that must be placed on the water input line. It is a device compulsory for the correct unit operation, and it is available as Clivet option (see the HYDRONIC ASSEMBLY ACCESSORIES). If the mechanical filter is selected and installed by the Customer, it is forbidden the use of filters with the mesh pitch higher than 1,6 mm, because they can cause a bad unit operation and also its serious damaging.

PREMIUM VERSION

Acoustic configuration: super-silenced (EN)

Cooling performance (continued)

Size	To (°C)	Entering external exchanger air temperature (°C)											
		25		30		35		40		45		50	
		kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe
260.6	5	721	195	676	212	629	230	592	250	584	256	304	131
	6	741	198	694	215	649	233	609	252	602	258	313	131
	7	761	201	712	218	662	235	626	255	620	261	324	131
	10	808	207	757	225	706	242	673	263	268	66.6	239	75.9
	15	902	222	848	239	803	257	794	263	311	69.6	-	-
	18	966	231	905	247	895	251	350	66.6	-	-	-	-
280.6	5	770	212	722	230	677	250	635	271	627	277	316	137
	6	794	215	744	233	693	253	653	274	646	280	326	137
	7	818	218	765	237	710	255	673	277	664	283	337	138
	10	867	225	811	243	759	263	723	286	273	65.3	240	75.4
	15	967	240	908	258	864	278	853	285	318	68.6	-	-
	18	1034	249	970	267	963	272	351	65.7	-	-	-	-
300.6	5	830	227	780	247	727	268	680	291	673	299	326	143
	6	854	230	803	250	747	271	699	294	692	302	336	144
	7	873	233	820	253	765	274	714	297	712	305	347	145
	10	931	240	873	260	816	282	770	305	545	201	317	115
	15	1044	256	981	277	924	298	909	306	309	69.2	-	-
	18	1116	267	1050	287	1037	292	704	202	-	-	-	-
320.6	5	881	245	828	266	772	289	721	314	716	321	338	149
	6	905	247	849	269	792	291	742	316	736	324	348	150
	7	923	250	868	272	809	295	758	319	757	327	358	151
	10	987	258	927	281	868	304	816	328	824	336	395	154
	15	1107	275	1039	297	981	321	965	328	308	69.1	-	-
	18	1182	287	1113	308	1105	313	1050	338	-	-	-	-
340.6	5	928	262	871	286	811	311	759	338	755	344	385	171
	6	953	264	892	289	832	314	782	341	780	348	398	172
	7	976	269	915	293	853	317	801	345	800	351	409	173
	10	1040	277	973	301	911	327	869	355	604	219	374	135
	15	1166	295	1094	319	1033	345	1020	353	378	87.6	-	-
	18	1242	306	1170	331	1160	335	779	219	-	-	-	-
360.6	5	976	280	915	305	851	332	799	361	796	369	432	193
	6	999	283	936	308	872	335	822	365	826	373	448	194
	7	1030	286	962	313	898	339	846	370	844	376	460	195
	10	1095	296	1020	321	956	349	922	383	387	104	353	117
	15	1225	314	1150	341	1086	369	1075	378	449	106	-	-
	18	1303	326	1230	353	1217	357	510	100	-	-	-	-
400.8	5	1091	305	1021	332	948	360	885	393	861	415	527	257
	6	1125	310	1055	335	978	366	913	399	895	418	549	258
	7	1154	313	1075	341	1008	370	955	406	938	428	575	265
	10	1253	328	1174	354	1093	384	1032	420	1020	440	625	272
	15	1403	350	1305	376	1233	406	1161	446	786	249	-	-
	18	1495	365	1405	392	1330	425	1238	457	-	-	-	-

kWf = Cooling capacity in kW. The data do not consider the part related to the pumps, required to overcome the pressure drop for the solution circulation inside the exchangers
kWe = Compressor power input in kW
To (°C) = Leaving internal exchanger water temperature (°C) - Performances in function of the inlet/outlet water temperature differential = 5°C

PREMIUM VERSION

Acoustic configuration: super-silenced (EN)

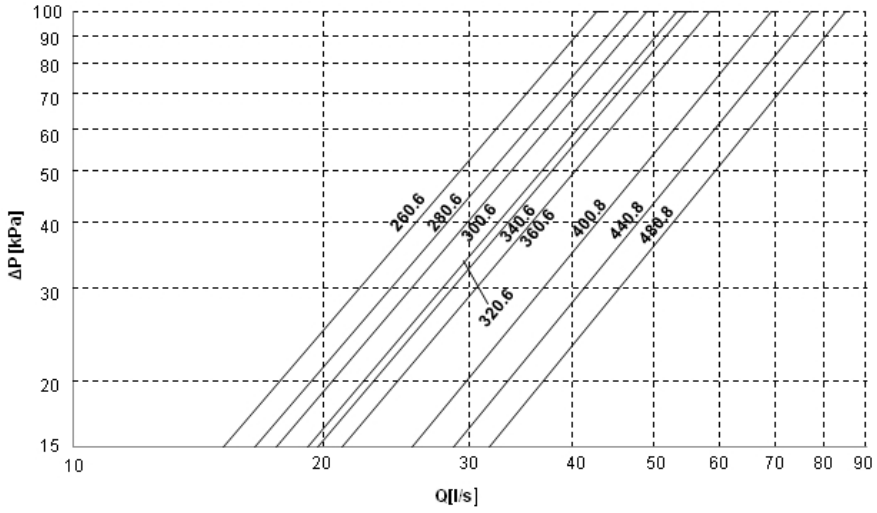
Cooling performance

Size	To (°C)	Entering external exchanger air temperature (°C)											
		25		30		35		40		45		50	
		kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe
440.8	5	1237	330	1159	360	1073	393	995	431	963	455	542	248
	6	1272	335	1191	365	1106	398	1028	436	995	459	560	250
	7	1315	340	1230	370	1146	404	1060	440	1032	465	581	253
	10	1424	354	1326	384	1232	418	1155	456	1141	482	643	263
	15	1590	378	1485	408	1388	441	1302	477	819	253	-	-
	18	1708	395	1596	424	1498	457	1389	490	-	-	-	-
480.8	5	1331	363	1249	395	1158	431	1072	473	1030	497	538	243
	6	1363	367	1287	401	1193	436	1102	477	1065	503	556	246
	7	1399	372	1319	406	1228	442	1135	484	1102	508	576	248
	10	1533	389	1427	422	1322	457	1234	502	1194	518	624	253
	15	1712	416	1597	447	1490	483	1390	533	796	233	-	-
	18	1843	435	1719	467	1605	502	1484	552	-	-	-	-

kWf = Cooling capacity in kW. The data do not consider the part related to the pumps, required to overcome the pressure drop for the solution circulation inside the exchangers
kWe = Compressor power input in kW
To (°C) = Leaving internal exchanger water temperature (°C) - Performances in function of the inlet/outlet water temperature differential = 5°C

Internal exchanger pressure drop

Acoustic configuration: super-silenced (EN)



The pressure drops are calculated considering a water temperature of 7°C

Q = water flow-rate[l/s]
DP = water side pressure drops (kPa)

The water flow-rate must be calculated with the following formula

Q [l/s] = kWf / (4,186 x DT)

kWf = Cooling capacity in kW.
DT = Temperature difference between inlet / outlet water

To the internal exchanger pressure drops must be added the pressure drops of the steel mesh mechanical strainer that must be placed on the water input line. It is a device compulsory for the correct unit operation, and it is available as Clivet option (see the HYDRONIC ASSEMBLY ACCESSORIES). If the mechanical filter is selected and installed by the Customer, it is forbidden the use of filters with the mesh pitch higher than 1,6 mm, because they can cause a bad unit operation and also its serious damaging.

EXCELLENCE VERSION

Acoustic configuration: compressor soundproofing (SC)

Cooling performance at part load

Size	STEP	Entering external exchanger air temperature (°C)											
		35			30			25			20		
		kWf	kWe_tot	EER	kWf	kWe_tot	EER	kWf	kWe_tot	EER	kWf	kWe_tot	EER
260.6	100%	736	231	3,19	789	214	3,69	834	199	4,19	893	174	5,13
	75%	552	142	3,89	592	135	4,38	626	126	4,96	670	122	5,49
	50%	368	101	3,64	395	96	4,13	417	90	4,65	447	86	5,20
	25%	184	50	3,69	197	48	4,14	209	45	4,60	223	44	5,09
	Minimum	140	37	3,83	147	34	4,27	154	32	4,78	159	30	5,26
280.6	100%	794	248	3,20	850	230	3,70	898	212	4,24	962	186	5,17
	75%	596	152	3,92	638	144	4,43	674	135	4,99	722	131	5,51
	50%	397	107	3,71	425	102	4,17	449	95	4,72	481	91	5,28
	25%	199	54	3,70	213	51	4,15	225	48	4,64	241	47	5,11
	Minimum	141	37	3,85	148	34	4,31	154	32	4,80	160	30	5,30
300.6	100%	856	269	3,18	916	249	3,68	965	231	4,18	1033	203	5,09
	75%	642	166	3,87	687	158	4,35	724	148	4,89	775	144	5,38
	50%	428	119	3,60	458	113	4,05	483	106	4,55	517	102	5,06
	25%	214	62	3,46	229	59	3,86	241	56	4,29	258	55	4,72
	Minimum	139	40	3,48	146	38	3,86	151	36	4,24	157	34	4,67
320.6	100%	909	287	3,17	974	265	3,68	1029	246	4,18	1102	216	5,10
	75%	682	177	3,85	731	167	4,37	772	157	4,92	827	153	5,40
	50%	455	126	3,61	487	119	4,09	515	112	4,59	551	108	5,10
	25%	227	65	3,50	244	62	3,90	257	59	4,36	276	58	4,78
	Minimum	140	40	3,50	148	38	3,93	154	36	4,34	159	34	4,73
340.6	100%	965	304	3,17	1033	281	3,68	1091	260	4,20	1168	228	5,12
	75%	724	187	3,87	775	176	4,40	818	166	4,93	876	160	5,48
	50%	483	133	3,63	517	126	4,10	546	118	4,62	584	113	5,17
	25%	241	69	3,51	258	65	3,95	273	62	4,39	292	60	4,84
	Minimum	141	40	3,52	148	38	3,93	155	36	4,37	160	34	4,76
360.6	100%	1020	322	3,17	1092	296	3,69	1152	273	4,22	1234	240	5,14
	75%	765	197	3,88	819	185	4,43	864	174	4,97	926	169	5,48
	50%	510	140	3,64	546	132	4,14	576	123	4,68	617	118	5,23
	25%	255	68	3,73	273	65	4,20	288	62	4,68	309	60	5,14
	Minimum	208	54	3,85	218	50	4,33	227	47	4,84	235	44	5,34
400.8	100%	1148	358	3,21	1226	329	3,73	1283	305	4,21	1355	268	5,06
	75%	861	225	3,83	919	212	4,33	962	197	4,88	1016	188	5,40
	50%	574	147	3,90	613	140	4,38	642	131	4,90	677	126	5,37
	25%	287	74	3,90	306	70	4,37	321	66	4,85	339	64	5,31
	Minimum	139	36	3,92	146	33	4,38	151	31	4,84	157	30	5,30
440.8	100%	1248	394	3,17	1329	363	3,66	1399	335	4,18	1477	297	4,97
	75%	936	271	3,45	996	251	3,97	1049	235	4,46	1108	222	4,99
	50%	624	163	3,83	664	153	4,34	699	144	4,85	739	137	5,39
	25%	312	81	3,83	332	76	4,35	350	72	4,87	369	69	5,37
	Minimum	199	52	3,84	209	48	4,36	217	45	4,87	225	42	5,38
480.8	100%	1356	430	3,15	1458	394	3,70	1536	363	4,23	1624	323	5,03
	75%	1017	374	2,72	1094	346	3,16	1152	319	3,61	1218	295	4,13
	50%	678	196	3,46	729	181	4,03	768	167	4,60	812	157	5,17
	25%	339	98	3,45	364	91	4,02	384	84	4,59	406	78	5,19
	Minimum	181	53	3,45	194	48	4,02	204	45	4,57	213	41	5,18

kWf = Cooling capacity in kW

kWe_tot = Unit total power input in kW

Load = % of cooling capacity compared to the value at full load

Internal exchanger water = output temperature 7°C/ input * (variable) / constant flow equal to the nominal value.

EXCELLENCE VERSION

Acoustic configuration: super-silenced (EN)

Cooling performance at part load

Size	STEP	Entering external exchanger air temperature (°C)											
		35			30			25			20		
		kWf	kWe_tot	EER	kWf	kWe_tot	EER	kWf	kWe_tot	EER	kWf	kWe_tot	EER
260.6	100%	707	237	2,98	759	219	3,47	810	203	3,99	898	169	5,31
	75%	530	131	4,05	569	124	4,59	607	116	5,23	674	117	5,76
	50%	353	92	3,85	379	87	4,35	405	82	4,95	449	81	5,57
	25%	177	45	3,92	190	43	4,40	202	41	4,94	225	41	5,49
	Minimum	139	35	4,03	145	32	4,50	152	30	5,07	158	28	5,64
280.6	100%	758	256	2,96	812	236	3,44	869	219	3,97	930	191	4,87
	75%	569	154	3,69	609	145	4,20	652	137	4,76	698	132	5,29
	50%	379	107	3,54	406	101	4,02	434	95	4,59	465	90	5,15
	25%	190	51	3,75	203	48	4,20	217	46	4,75	233	44	5,26
	Minimum	139	35	4,02	146	32	4,53	154	30	5,12	160	28	5,69
300.6	100%	822	273	3,01	884	252	3,51	936	233	4,02	1003	204	4,92
	75%	616	166	3,71	663	157	4,22	702	147	4,78	752	142	5,30
	50%	411	116	3,54	442	110	4,02	468	103	4,54	501	98	5,09
	25%	206	58	3,57	221	55	4,02	234	52	4,50	251	50	4,98
	Minimum	137	37	3,73	144	34	4,19	151	32	4,69	156	30	5,17
320.6	100%	871	292	2,98	939	269	3,49	998	249	4,01	1068	218	4,90
	75%	653	176	3,71	704	167	4,22	748	156	4,79	801	151	5,30
	50%	435	124	3,51	469	117	4,01	499	109	4,58	534	104	5,13
	25%	218	61	3,59	235	58	4,06	249	55	4,55	267	53	5,04
	Minimum	139	37	3,81	147	34	4,29	155	32	4,84	160	30	5,32
340.6	100%	922	312	2,96	995	287	3,47	1055	264	4,00	1130	231	4,89
	75%	691	188	3,68	747	177	4,22	791	165	4,79	847	160	5,29
	50%	461	131	3,52	498	124	4,02	528	115	4,59	565	110	5,14
	25%	230	65	3,56	249	62	4,05	264	58	4,57	282	56	5,04
	Minimum	140	37	3,81	148	34	4,31	155	32	4,84	161	30	5,35
360.6	100%	972	331	2,94	1050	304	3,45	1111	279	3,98	1190	244	4,88
	75%	729	199	3,66	788	187	4,21	833	174	4,79	892	169	5,28
	50%	486	139	3,50	525	130	4,04	556	121	4,60	595	116	5,13
	25%	243	64	3,80	263	61	4,32	278	55	5,10	297	55	5,36
	Minimum	204	51	3,99	217	48	4,57	226	44	5,16	234	41	5,72
400.8	100%	1098	364	3,02	1144	344	3,33	1219	318	3,83	1316	274	4,80
	75%	823	216	3,81	858	209	4,11	915	194	4,72	987	190	5,19
	50%	549	138	3,98	572	134	4,27	610	126	4,84	658	123	5,35
	25%	274	69	3,97	286	67	4,28	305	63	4,82	329	62	5,32
	Minimum	135	34	3,97	138	32	4,27	145	30	4,80	151	28	5,32
440.8	100%	1198	406	2,95	1284	372	3,45	1355	342	3,96	1461	294	4,97
	75%	898	238	3,77	963	224	4,30	1016	207	4,91	1096	203	5,40
	50%	599	151	3,97	642	142	4,52	677	134	5,05	731	130	5,62
	25%	299	75	3,97	321	71	4,52	339	67	5,07	365	65	5,60
	Minimum	177	45	3,97	186	41	4,51	194	38	5,07	201	36	5,60
480.8	100%	1284	443	2,90	1389	406	3,42	1472	372	3,96	1574	327	4,81
	75%	963	272	3,54	1042	256	4,07	1104	239	4,62	1180	229	5,15
	50%	642	163	3,94	695	154	4,51	736	144	5,11	787	138	5,70
	25%	321	82	3,94	347	77	4,51	368	72	5,10	393	69	5,69
	Minimum	193	49	3,94	204	45	4,53	212	42	5,10	219	38	5,70

kWf = Cooling capacity in kW

kWe_tot = Unit total power input in kW

Load = % of cooling capacity compared to the value at full load

Internal exchanger water = output temperature 7°C/ input * (variable) / constant flow equal to the nominal value.

PREMIUM VERSION

Acoustic configuration: compressor soundproofing (SC)

Cooling performance at part load

Size	STEP	Entering external exchanger air temperature (°C)											
		35			30			25			20		
		kWf	kWe_tot	EER	kWf	kWe_tot	EER	kWf	kWe_tot	EER	kWf	kWe_tot	EER
260.6	100%	695	241	2,88	746	222	3,36	792	206	3,84	860	179	4,80
	75%	521	141	3,70	559	131	4,27	594	124	4,79	645	122	5,29
	50%	348	99	3,52	373	93	4,02	396	88	4,52	430	85	5,08
	25%	174	49	3,54	187	47	4,01	198	44	4,49	215	43	4,97
	Minimum	133	37	3,63	141	34	4,13	147	32	4,60	153	30	5,10
280.6	100%	745	260	2,87	799	239	3,34	848	221	3,84	921	193	4,77
	75%	559	152	3,68	599	141	4,25	636	133	4,78	691	131	5,27
	50%	373	106	3,52	399	99	4,01	424	94	4,53	461	91	5,09
	25%	186	53	3,53	200	50	4,03	212	47	4,50	230	46	4,98
	Minimum	133	36	3,65	141	34	4,15	148	32	4,63	153	30	5,13
300.6	100%	801	281	2,85	863	259	3,33	913	239	3,82	991	209	4,74
	75%	601	165	3,64	647	154	4,20	685	144	4,76	743	142	5,23
	50%	400	116	3,45	431	109	3,95	456	102	4,47	496	99	5,01
	25%	200	59	3,41	216	55	3,90	228	53	4,33	248	52	4,81
	Minimum	132	38	3,47	141	36	3,95	147	34	4,39	153	32	4,84
320.6	100%	851	300	2,84	915	277	3,30	967	255	3,79	1050	222	4,73
	75%	638	176	3,63	686	164	4,18	725	153	4,74	788	152	5,18
	50%	426	123	3,46	457	116	3,94	484	109	4,44	525	105	5,00
	25%	213	63	3,39	229	59	3,86	242	56	4,31	263	55	4,78
	Minimum	131	38	3,42	139	36	3,88	145	34	4,32	151	32	4,76
340.6	100%	898	320	2,81	964	294	3,28	1021	271	3,77	1109	236	4,70
	75%	673	187	3,60	723	173	4,18	766	162	4,73	832	160	5,20
	50%	449	131	3,43	482	122	3,95	511	115	4,44	554	111	4,99
	25%	224	67	3,37	241	62	3,86	255	59	4,31	277	58	4,79
	Minimum	131	38	3,42	139	36	3,89	145	33	4,33	150	31	4,78
360.6	100%	946	339	2,79	1015	311	3,26	1077	287	3,75	1169	249	4,69
	75%	709	198	3,58	761	183	4,16	808	171	4,73	877	169	5,19
	50%	473	138	3,43	508	129	3,94	538	121	4,45	585	116	5,04
	25%	237	67	3,51	254	63	4,03	269	60	4,53	292	58	5,01
	Minimum	194	54	3,61	206	50	4,14	215	46	4,65	223	43	5,17
400.8	100%	1062	373	2,85	1144	344	3,33	1219	318	3,83	1309	281	4,66
	75%	796	217	3,67	858	204	4,21	915	194	4,72	982	188	5,22
	50%	531	133	3,99	572	127	4,50	610	122	5,00	655	119	5,50
	25%	265	67	3,97	286	64	4,50	305	61	5,01	327	59	5,51
	Minimum	137	34	3,99	144	32	4,50	150	30	5,02	156	28	5,53
440.8	100%	1192	417	2,86	1279	385	3,32	1358	355	3,83	1458	314	4,64
	75%	894	244	3,66	960	230	4,17	1019	218	4,67	1094	212	5,16
	50%	596	152	3,92	640	144	4,44	679	138	4,92	729	135	5,40
	25%	298	76	3,93	320	72	4,43	340	69	4,91	364	68	5,39
	Minimum	153	39	3,92	161	36	4,44	167	34	4,91	173	32	5,39
480.8	100%	1297	451	2,88	1389	416	3,34	1473	384	3,84	1618	325	4,98
	75%	972	256	3,80	1042	240	4,34	1105	228	4,85	1213	253	4,79
	50%	648	158	4,10	694	149	4,66	737	141	5,23	809	139	5,82
	25%	324	79	4,09	347	75	4,65	368	70	5,23	404	69	5,82
	Minimum	203	50	4,08	213	46	4,64	222	43	5,22	230	40	5,82

kWf = Cooling capacity in kW

kWe_tot = Unit total power input in kW

Load = % of cooling capacity compared to the value at full load

Internal exchanger water = output temperature 7°C/ input * (variable) / constant flow equal to the nominal value.

PREMIUM VERSION

Acoustic configuration: super-silenced (EN)

Cooling performance at part load

Size	STEP	Entering external exchanger air temperature (°C)											
		35			30			25			20		
		kWf	kWe_tot	EER	kWf	kWe_tot	EER	kWf	kWe_tot	EER	kWf	kWe_tot	EER
260.6	100%	662	247	2,68	712	229	3,11	761	212	3,59	826	184	4,49
	75%	497	143	3,48	534	133	4,02	571	125	4,57	620	123	5,04
	50%	331	99	3,35	356	93	3,85	381	87	4,37	413	84	4,92
	25%	165	47	3,51	178	45	4,00	190	42	4,50	207	41	5,00
	Minimum	129	35	3,67	137	33	4,19	144	30	4,72	149	28	5,26
280.6	100%	710	267	2,66	765	248	3,08	818	229	3,57	888	199	4,46
	75%	533	154	3,46	574	144	3,99	613	135	4,54	666	133	5,01
	50%	355	106	3,35	383	100	3,85	409	94	4,36	444	90	4,92
	25%	178	50	3,53	191	48	4,01	204	45	4,52	222	44	5,02
	Minimum	130	35	3,76	139	32	4,29	146	30	4,84	152	28	5,39
300.6	100%	765	288	2,66	820	266	3,08	873	246	3,55	948	214	4,43
	75%	574	166	3,46	615	155	3,97	655	146	4,49	711	144	4,94
	50%	383	115	3,33	410	108	3,80	436	102	4,27	474	98	4,84
	25%	191	56	3,40	205	53	3,88	218	50	4,35	237	49	4,84
	Minimum	130	36	3,61	137	33	4,11	144	31	4,60	150	29	5,11
320.6	100%	809	309	2,62	868	285	3,05	923	264	3,50	1002	229	4,38
	75%	606	178	3,40	651	166	3,92	692	156	4,44	752	154	4,88
	50%	404	123	3,28	434	115	3,77	462	108	4,28	501	105	4,77
	25%	202	60	3,36	217	57	3,83	231	54	4,31	251	52	4,79
	Minimum	128	36	3,57	136	33	4,07	143	31	4,56	148	29	5,07
340.6	100%	853	332	2,57	915	306	2,99	976	282	3,46	1060	244	4,34
	75%	640	191	3,35	686	178	3,85	732	166	4,41	795	164	4,85
	50%	427	132	3,23	457	123	3,72	488	115	4,24	530	111	4,77
	25%	213	64	3,31	229	60	3,79	244	57	4,28	265	56	4,76
	Minimum	128	36	3,55	136	34	4,05	143	31	4,56	148	29	5,06
360.6	100%	898	354	2,54	962	326	2,95	1030	300	3,43	1119	260	4,30
	75%	674	203	3,32	721	189	3,81	773	176	4,39	839	174	4,82
	50%	449	140	3,21	481	131	3,67	515	122	4,22	559	118	4,74
	25%	225	65	3,44	241	61	3,92	258	58	4,47	280	56	4,96
	Minimum	188	52	3,60	199	48	4,12	210	45	4,70	218	42	5,24
	100%	1008	388	2,60	1075	358	3,00	1154	331	3,49	1269	287	4,42
	75%	756	200	3,78	806	186	4,33	866	178	4,87	952	180	5,29
	50%	504	127	3,97	538	119	4,52	577	115	5,02	635	115	5,52
	25%	252	63	3,97	269	60	4,51	289	58	5,02	317	58	5,51
	Minimum	137	34	3,99	144	32	4,50	150	30	5,02	156	28	5,53
	100%	1146	426	2,69	1230	392	3,14	1315	362	3,63	1446	315	4,59
	75%	859	222	3,87	923	206	4,48	986	197	5,01	1085	199	5,45
	50%	573	142	4,04	615	134	4,59	657	129	5,09	723	129	5,60
	25%	287	72	3,99	308	68	4,54	329	66	5,02	362	66	5,53
	Minimum	124	32	3,83	132	30	4,36	137	29	4,81	142	27	5,26
	100%	1228	466	2,64	1319	428	3,08	1399	394	3,55	1561	331	4,72
	75%	921	252	3,65	990	237	4,18	1049	223	4,70	1171	228	5,14
	50%	614	153	4,01	660	144	4,58	700	135	5,19	780	135	5,78
	25%	307	77	4,01	330	72	4,59	350	68	5,19	390	67	5,79
	Minimum	196	49	4,02	206	45	4,59	215	42	5,18	223	38	5,81

kWf = Cooling capacity in kW

kWe_tot = Unit total power input in kW

Load = % of cooling capacity compared to the value at full load

Internal exchanger water = output temperature 7°C/ input * (variable) / constant flow equal to the nominal value.

Configurations

Consult the "Option compatibility" section.

B - Low water temperature (Brine)

Configuration also known as "Brine". Enables an "unfreezable" solution to be cooled (for example, water and ethylene glycol in suitable quantities) up to a temperature of between +4°C and –8°C. It includes:

- suitable exchangers with extra-thick closed-cell insulation
- electronic expansion valve, functional calibration and safety devices suitable for particular uses.

During the selection phase it is necessary to indicate the required operating type, the unit will be optimised on the basis of this: - Unit with single operating set-point (only at low temperature) - Unit with double operating set-point

The unit in this configuration has a different operation range, indicated in the operating range section.

In low temperature operation, some staging steps could not be available.

The glycol concentration must be chosen based on the minimum temperature the water can reach. The presence of glycol influences pressure drops on the water side and the unit's output as indicated in the table reporting the "correction factors for use with glycol".

The "Extremely low water temperature" option for the chilled water production down to -12°C is available on request.

D - Partial energy recovery

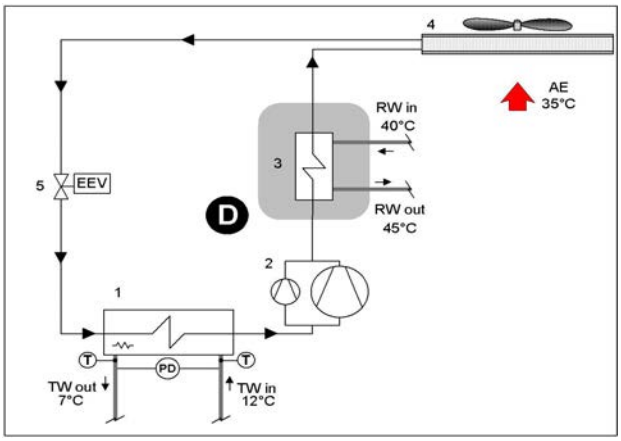
A configuration which enables the production of hot water free-of-charge while operating in the cooling mode, thanks to the partial recovery of condensation heat that would otherwise be disposed of into the external heat source.

This option is also known as "desuperheater". It is made up of a Inox 316 stainless steel brazed plate heat exchangers, suitable for recovering a part of the capacity dispersed by the unit (the dispersed heating capacity is equal to the sum of the cooling capacity and the electrical input capacity of the compressors).

The partial recovery device is considered to be operating when it is powered by the water flow which is to be heated. This condition improves the unit performance, since it reduces the condensation temperature: in nominal conditions the cooling capacity increases indicatively by 3.2% and the power input of the compressors is reduced by 3.6%.

When the temperature of the water to be heated is particularly low, it is opportune to insert a flow regulation valve in the hydraulic circuit, to maintain the recovery output temperature at higher than 35°C and thus avoid refrigerant condensation in the partial energy recovery device.

The power delivered by the partial recovery is 20% of the thermal power dissipation (cooling + electrical power absorbed by the compressors)



D - Partial recovery device

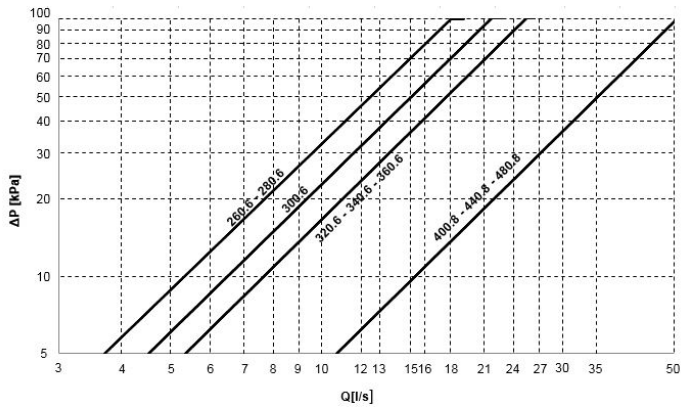
1 - Internal exchanger
2 - Compressors
3 - Recovery exchanger
4 - External exchanger
5 - Expansion electronic valve

TW in chilled water inlet
TW out chilled water outlet

RW in - Recovery water input
RW out - Recovery water output

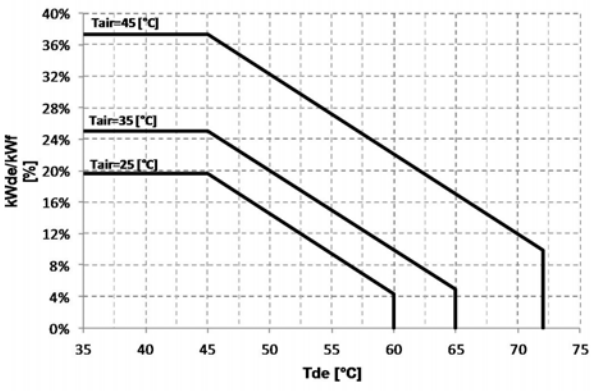
T - Temperature probe
PD - Differential pressure switch
AE Outdoor air

Pressure drops of partial energy recovery exchanger



Q = water flow-rate[l/s]
DP = water side pressure drops (kPa)

Partial recovery heating capacity



kWde/kWf = Heat recovered/Cooling capacity [%]
Tde = Heat recovering device outlet water temperature [°C]

Example: Requested cooling capacity: 1020 kW with chilled water at 12/7°C and 35°C outdoor air.
Size purpose of the study: WSAT-XSC3 EXC SC 360.6
Hot water required temperature: +45°C
Recovery capacity: 25% di 1020 kW = 255 kW
Design flow-rate: 12,2 l/s
Recovery pressure drop: 24 kPa

R - Total energy recovery

A configuration which enables the production of hot water free-of-charge while operating in the cooling mode, thanks to the total recovery of condensation heat that would otherwise be disposed of into the external heat source. This solution increases the overall efficiency of the system in all cases where a high-level of hot water production is required. It is made up of a brazed plate heat exchanger made of 316 stainless steel, suitable for recovering all the unit heat capacity (equal to the sum of the cooling capacity and the electrical input capacity of the compressors), from the on-off type solenoid valve, from the supply and return temperature sensors in the hot water circuit and the related two-step integrated control logic.

Hot water availability is always subordinate to the production of chilled water.

See the following example:

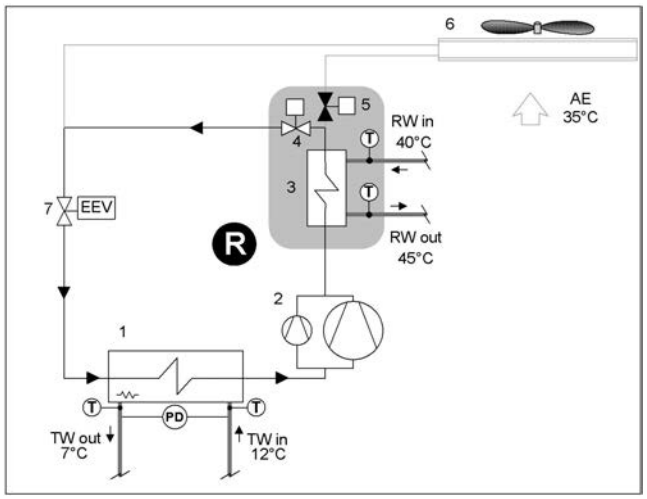
1. cooling capacity request = 100% / Heating capacity request = 0% >Production only of cooling capacity;
2. cooling capacity request = 100% / Heating capacity request = 0% >Production of cooling and heating capacity by recovery;
3. cooling capacity request = 50% / Heating capacity request = 100% >Production of cooling and heating capacity by recovery, equal to the 50% of the requested heating capacity.

To prevent constant switching in the unit's refrigeration circuit, it is necessary to install a storage tank with an adequate capacity in the system's hot water circuit.

In the absence of hot water circulation in the recovery exchanger, the maximum inlet air temperature is reduced by approximately 2°C compared with the unit without "Total Energy Recovery" mode.

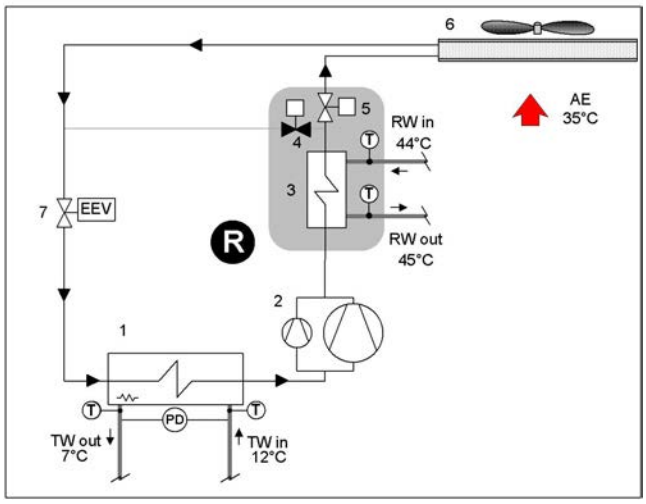
TOTAL OPERATING ENERGY RECOVERY

When hot water is requested, the condensing coil is deactivated.
Condensation takes place wholly within the recovery circuit.



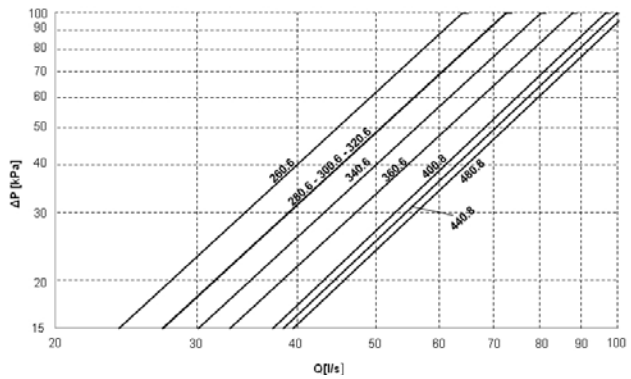
TOTAL NON-OPERATING ENERGY RECOVERY

When the recovery set-point has been satisfied, the condensing coil is reactivated. In this condition, the total recovery circuit operates as a Partial recovery circuit (Desuperheater).



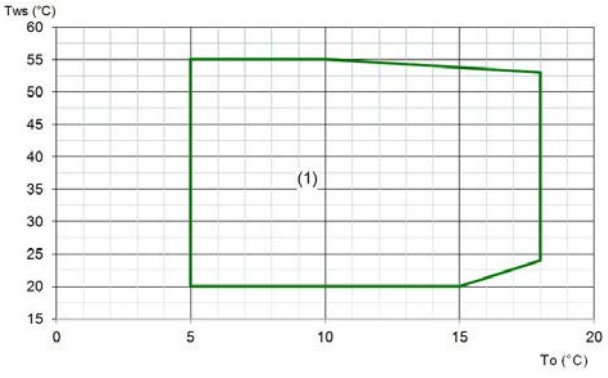
R - Total recovery device
1 - Internal exchanger
2 - Compressors
3 - Recovery exchanger
4 - Total recovery enabling valve
5 - External exchanger enabling valve
6 - External exchanger
7 - Expansion electronic valve
T - Temperature probe
PD - Differential pressure switch
TW in - Chilled water inlet
TW out - Chilled water outlet
RW in - Recovery water input
RW out - Recovery water output
AE Outdoor air

Pressure drops of the total energy recovery exchanger



Q = water flow-rate[l/s]
DP = water side pressure drops (kPa)

Operating range with recovery



To = leaving internal exchanger water temperature (evaporator)
Tws = leaving recovery exchanger water temperature

1. Standard unit operating range at full load

Efficient use of energy with heat recovery

In almost all systems fitted with a chiller used to produce chilled water there is also the need to have hot water. The recovery of condensation heat is an efficient way of producing hot water while the chiller is in operation. It has the double benefit of both reducing the heat load to the condenser, thereby eliminating dissipation costs and generating free hot water, thereby reducing the costs of the auxiliary heater.

Application versatility of recovery devices

The hot water produced by heat recovery can be used in a number of ways: to reheat air in handling units, to preheat hot water for domestic use or industrial processes, to heat up water in swimming pools, showers and spas, to preheat hot water for laundries or industrial kitchens.

Post-heating in air handling units to control humidity levels in hospitals and labs

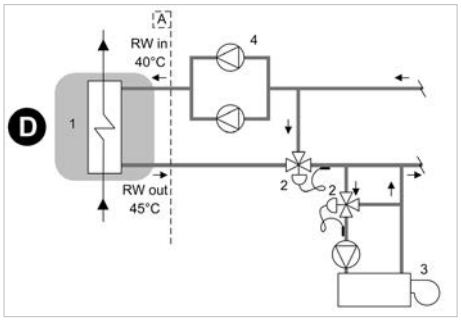
Preheating of hot water for domestic use or for industrial process

Heating of water in swimming pools, showers and SPAS

Preheating of hot water for laundries and industrial kitchens

Air heating

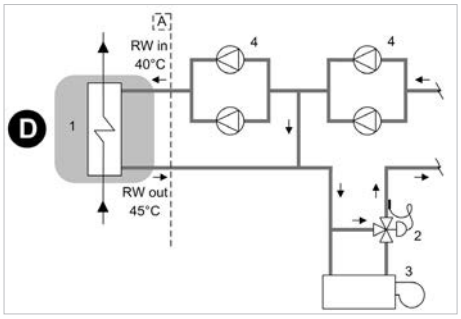
The heat recovery device can be used to cover the entire heat load required. The hot water supply temperature is controlled via a modulating control valve that needs to be fitted on the system at the outlet of the recovery unit. The auxiliary heating device is recommended to cover the thermal energy demand when the chiller is not in operation or is operating at part load.



Example of how heat recovery is used to cover the entire heat demand and control the operating temperature

Water preheating

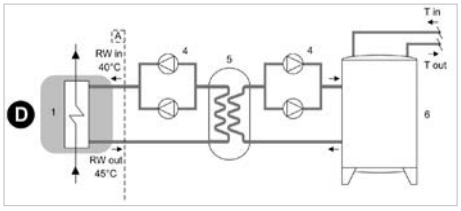
The heat recovery device can be used to preheat water at the inlet of the main heating device (e.g. boiler). In this case, the demand for hot water is greater than the amount of heat recovered by condensation and the recovery device only covers part of the required heat load. By preheating the water, heating consumption levels are therefore reduced and the main heating device has a lower installed power requirement.



Example of how heat recovery is used to preheat hot water in the system

Domestic hot water production

The heat recovery device can be used to produce water for domestic use. In order to prevent contamination of domestic water with the chiller's process fluid, it is necessary to insert an intermediate heat exchanger. Using an inertial heat storage tank allows to have a reserve of preheated water and enables the intermediate exchanger to operate more efficiently.



Example of how heat recovery is used to preheat hot water for domestic use

A - Unit supply limit
1 - Recovery exchanger
3 - Auxiliary heating device (ex.boiler)
5 - Intermediate heat exchanger
RW in - Recovery water input
T in - Drinkable water inlet

D - Partial energy recovery
2 - Control modulating valve
4 - Electric pump with standby pump
6 - Inertial heat storage
RW out - Recovery water output
T out - Drinkable water outlet to the auxiliary heater

The diagrams refer to partial energy recovery, though they also apply to total energy recovery (Clivet R). Please note that the diagrams are only meant as a guide.

HydroPack

4PM/6PM - Hydronic assembly user side with 4/6 ON/OFF pumps

Option supplied on the unit. Pumping unit consisting of electric pumps with a self-adaptive modular activation logic.

It enables the automatic reduction of the liquid flow rate in critical conditions, avoiding blocks due to overloading and consequential intervention work by specialised technical personnel.

Centrifugal electric pump with impeller made with AISI 304 steel and AISI 304 stainless steel body or grey cast iron (depending on models).

Mechanical seal using ceramic, carbon and EPDM elastomer components.

Three-phase electric motor with IP55-protection. Complete with thermoformed insulated casing, quick connections with insulated casing,non return valve, safety valve, pressure gauges, system load safety pressure switch, stainless steel antifreeze immersion heaters located at the return and supply point.

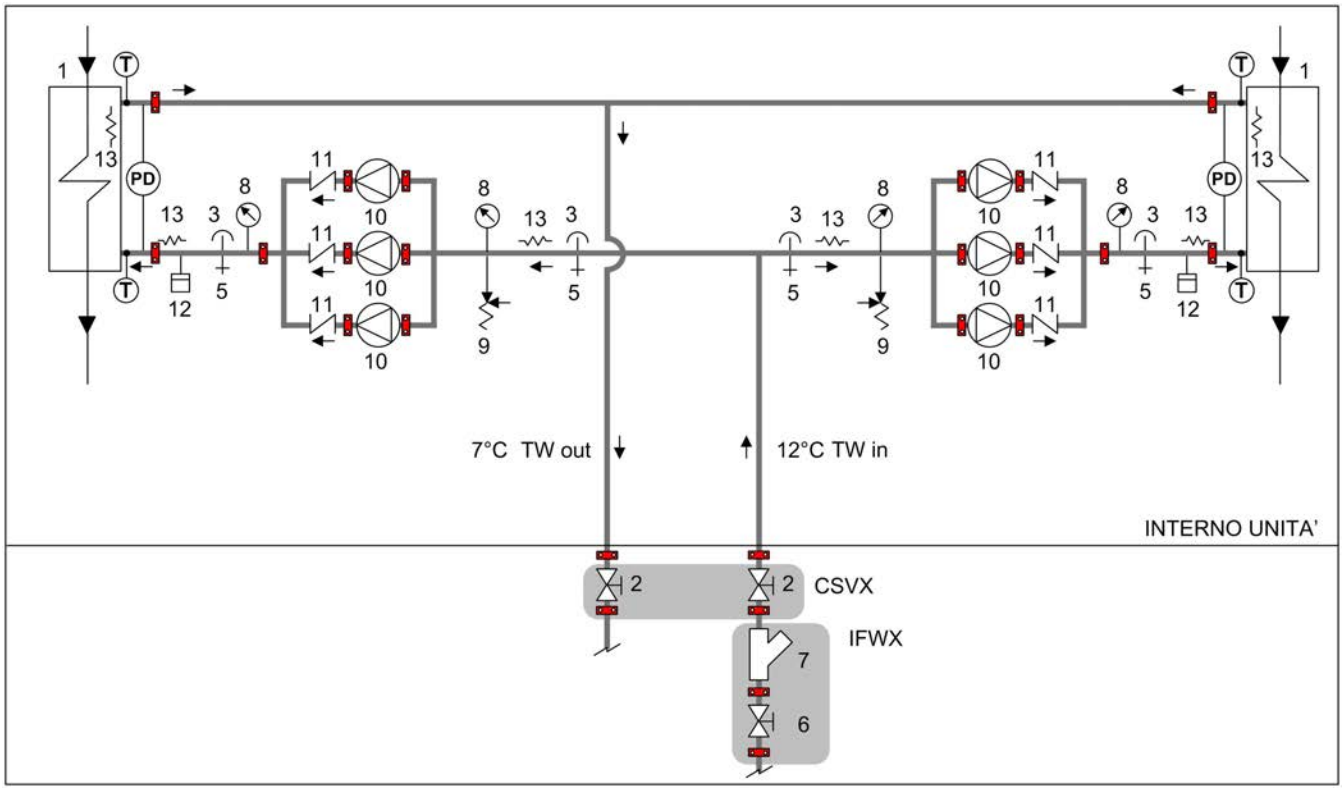
The various models which are available can be differentiated by the system available pressure.

The 4PM / 6PM option is supplied with a kit made up of 2 quick blind connections, for the removal of one pump in case of maintenance.

Check the option compatibility table for combinations with storage tank

Provided with hydraulic interceptions to the outside of the unit (option 'CSVX - A pair of manually operated shut-off valves') to facilitate any major maintenance operations

HYDROPACK



Illustrative diagram referred to unit size 320.6 with Hydropack with no. 6 of pumps

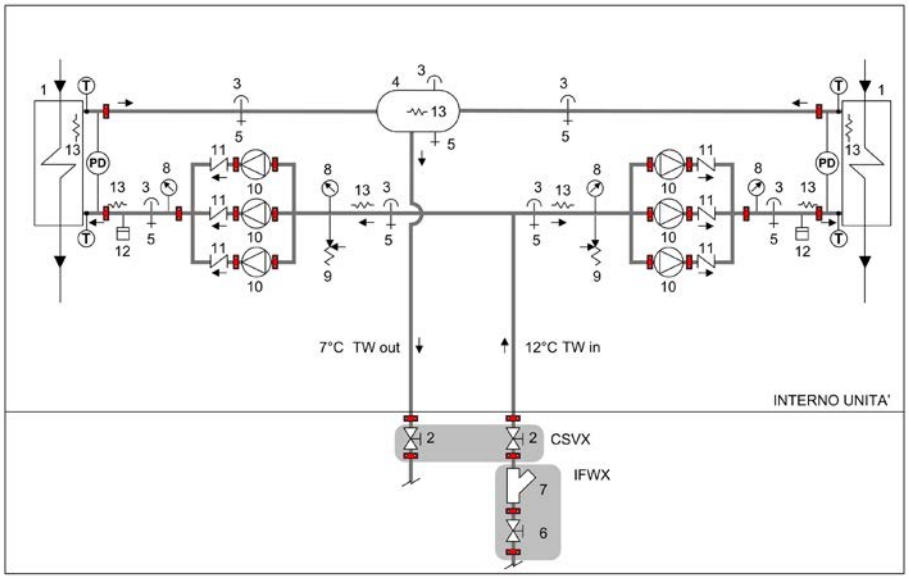
1 - Internal exchanger
2 - Cutoff valve
3 - Purge valve
4 - Storage tank with antifreeze heater
5 - Draw off cock
6 - Cutoff valve with quick joints
7 - Steel mesh strainer water side
8 - Manometer
9 - Safety valve (6 Bar)
10 - Packaged electric pump with high efficiency impeller
11 - Non return valve
12 - System safety pressure switch (prevents the pumps from operating if no water is present)
13 - Antifreeze heater
T - Temperature probe
PD - Differential pressure switch

TW in chilled water inlet
TW out chilled water outlet

IFWX = Steel mesh strainer water side
CSVX - Couple of manual shut-off valves

The grey area indicates further optional components.

HYDROPACK WITH STORAGE TANK



Illustrative diagram referred to unit size 320.6 with Hydropack with no. 6 of pumps

1 - Internal exchanger
2 - Cutoff valve
3 - Purge valve
4 - Storage tank with antifreeze heater
5 - Draw off cock
6 - Cutoff valve with quick joints
7 - Steel mesh strainer water side
8 - Manometer
9 - Safety valve (6 Bar)
10 - Packaged electric pump with high efficiency impeller
11 - Non return valve
12 - System safety pressure switch (prevents the pumps from operating if no water is present)
13 - Antifreeze heater
T - Temperature probe
PD - Differential pressure switch

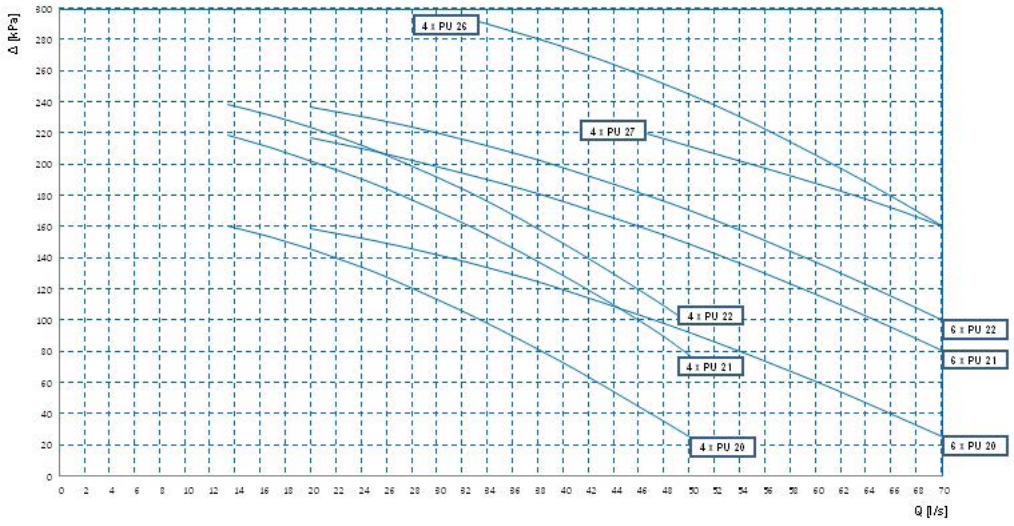
TW in chilled water inlet
TW out chilled water outlet

IFWX = Steel mesh strainer water side
CSVX - Couple of manual shut-off valves

The grey area indicates further optional components.

4PM/6PM option performances (HydroPack)

Head



Q[l/s]= water flow rate
Δ [kPa] = pump head
PU2* = 2-pole pump

Caution: to obtain the available pressure values, you need to subtract the following from the head values represented in these diagrams:

- User side exchanger pressure drops
- IFVX accessory –Steel mesh filter on the water side (where applicable)

PUMP	Rated power [kW]	Nominal power [A]
4 x PU20	4 x 1.8	4 x 3.4
4 x PU21	4 x 2.9	4 x 4.8
4 x PU22	4 x 3.3	4 x 5.6
4 x PU26	4 x 5.5	4 x 10.4

PUMP	Rated power [kW]	Nominal power [A]
4 x PU27	4 x 5.5	4 x 10.4
6 x PU20	6 x 1.8	6 x 3.4
6 x PU21	6 x 2.9	6 x 4.8
6 x PU22	6 x 3.3	6 x 5.6

6PMV - Hydronic assembly user side with 6 inverter pumps

Option supplied on the unit. Pumping unit consisting of parallel electric pumps and controlled by inverter to adapt to the different application conditions. It enables the automatic reduction of the liquid flow rate in critical conditions, avoiding blocks due to overloading and consequential intervention work by specialised technical personnel. Through the inverter calibration, standard supplied, it is possible to adapt the pump flow-rate/head to the installation feature. Centrifugal electric pump with impeller made with AISI 304 steel and AISI 304 stainless steel body or grey cast iron (depending on models).

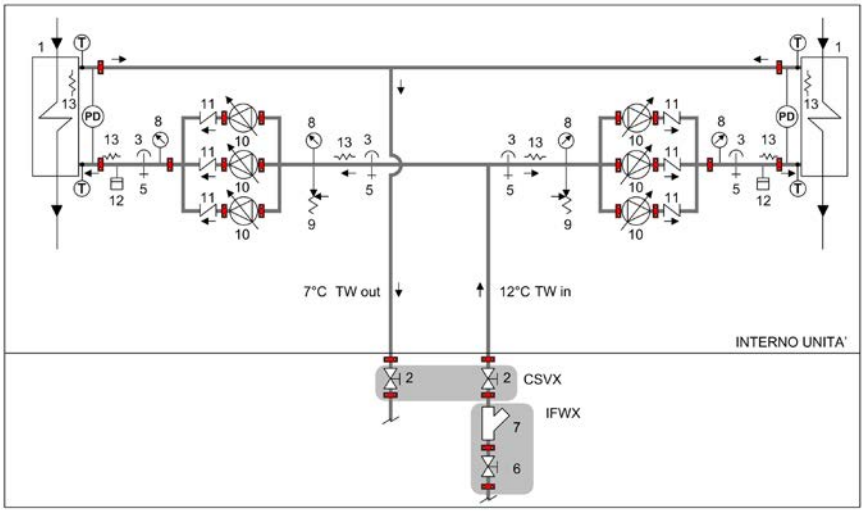
Mechanical seal using ceramic, carbon and EPDM elastomer components.

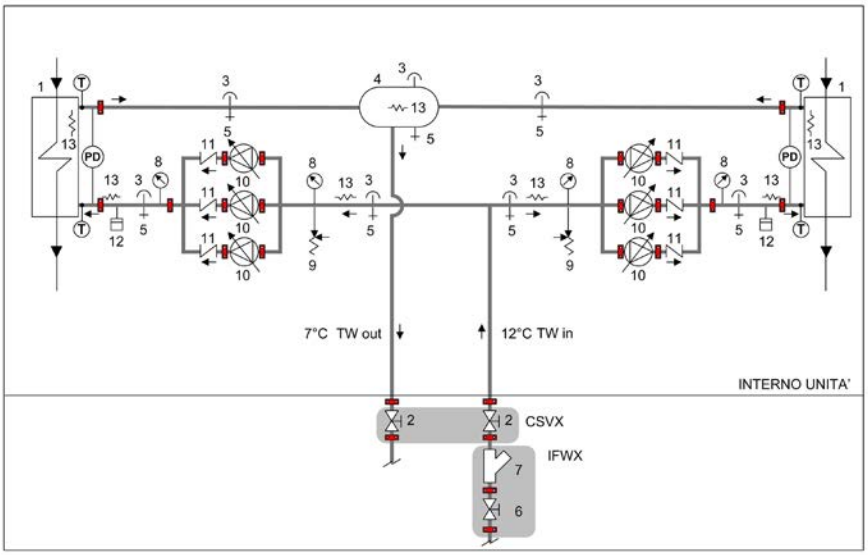
Three-phase electric motor with IP55-protection. Complete with thermoformed insulated casing, quick connections with insulated casing,non return valve, safety valve, pressure gauges, system load safety pressure switch, stainless steel antifreeze immersion heaters located at the return and supply point. In combination with the "IVFDT" - Variable flow-rate control option, it allows the water flow rate variation to the installation in part load operation to obtain the maximum unit efficiency and lower pumping unit consumption.

The 6PMV option is supplied with a kit made up of 2 quick blind connections, for the removal of one pump in case of maintenance.

Check the option compatibility table for combinations with storage tank.

Provided with hydraulic interceptions to the outside of the unit (option 'CSVX - A pair of manually operated shut-off valves') to facilitate any major maintenance operations

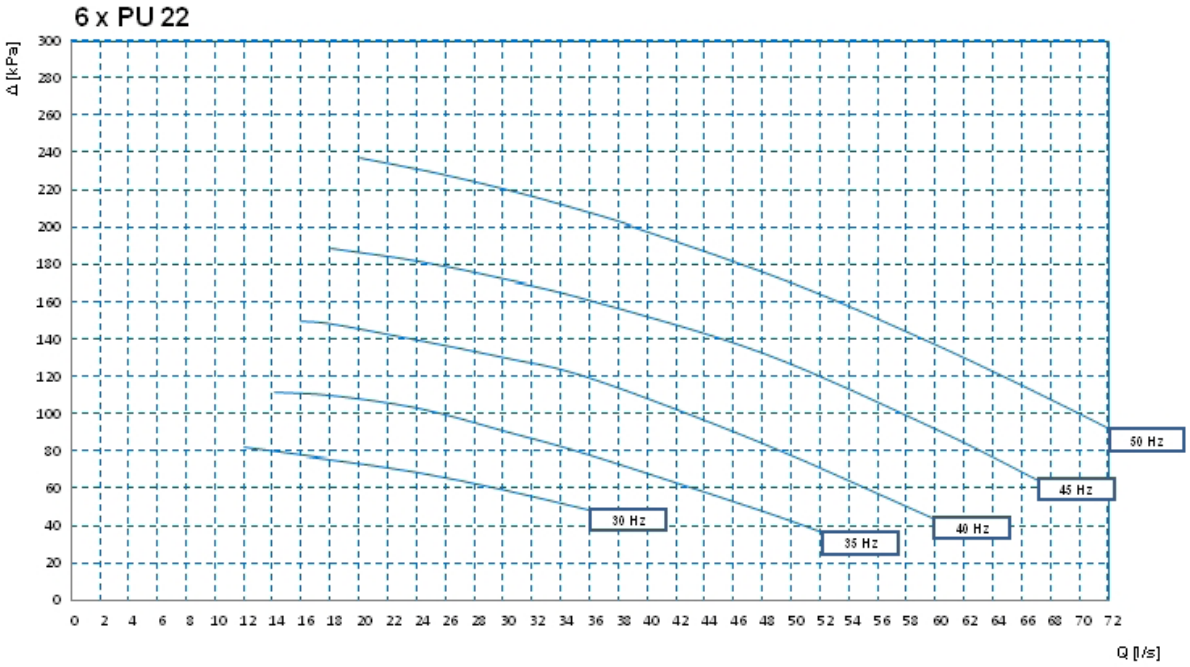




1 - Internal exchanger
2 - Cutoff valve
3 - Purge valve
4- Storage tank
5 - Draw off cock
6 - Cutoff valve with quick joints
7 - Steel mesh strainer water side
8 - Manometer
9 - Safety valve (6 Bar)
10 - Packaged electric pump with high efficiency impeller activated by inverter
11 - Non return valve
12 - System safety pressure switch (prevents the pumps from operating if no water is present)
13 - Antifreeze heater
T - Temperature probe
PD - Differential pressure switch
TW in chilled water inlet
TW out chilled water outlet
IFWX = Steel mesh strainer water side
CSVX - Couple of manual shut-off valves
The grey area indicates further optional components.

6PMV option performances

Head

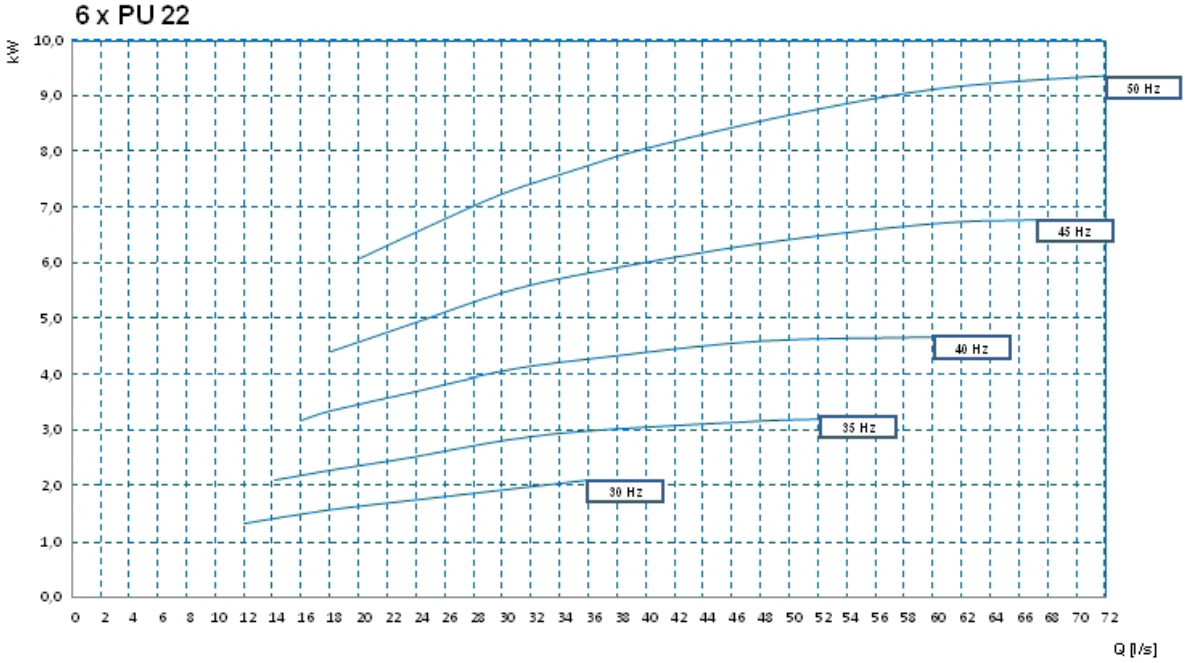


Q[l/s]= water flow rate
Δ [kPa] = pump head

Caution: to obtain the available pressure values, you need to subtract the following from the head values represented in these diagrams:

- internal exchanger pressure drops
- IFVX accessory –Steel mesh filter on the water side (where applicable)

Power input



Q[l/s]= water flow rate
kW = power input

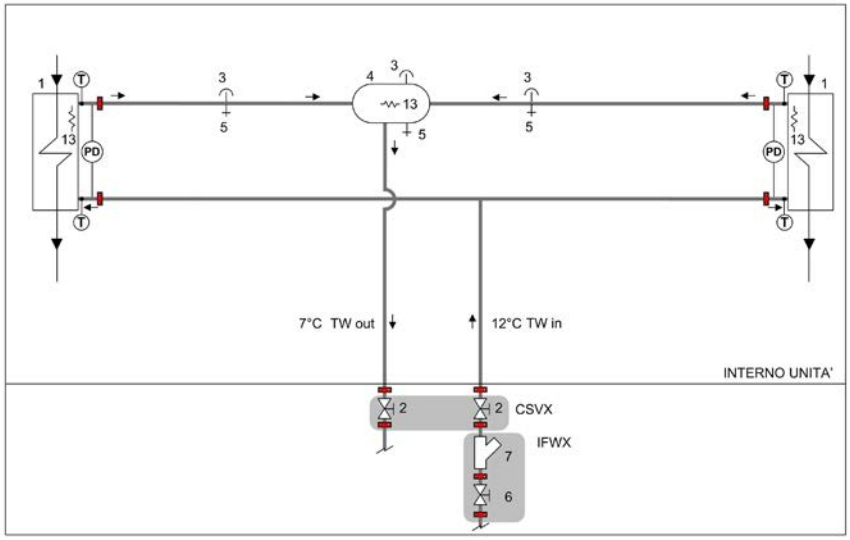
Accessories - Hydronic assembly

A900 / A1800 - 900 / 1800 l. storage tank

Option supplied built-in the unit. Steel storage tank complete with double layer covering with closed-cell insulation, stainless steel anti-freeze immersion resistance, bleed valve, draw off cock, quick connections with insulated casing. The various available models can be differentiated by capacity.

Provided with hydraulic interceptions to the outside of the unit (option 'CSVX - A pair of manually operated shut-off valves') to facilitate any major maintenance operations

The water outlet user side with "Storage tank" option is positioned in correspondence of the storage tank itself. The outlet position will be defined when ordering. The water inlet user side remains in the same position of the standard unit.



1 - Internal exchanger
2 - Cutoff valve
3 - Purge valve
4 - Storage tank with antifreeze heater
5 - Draw off cock
6 - Cutoff valve with quick joints
7 - Steel mesh strainer water side
13 - Antifreeze heater

T - Temperature probe
PD - Differential pressure switch

TW in chilled water inlet
TW out chilled water outlet

IFWX = Steel mesh strainer water side
CSVX - Couple of manual shut-off valves

The grey area indicates further optional components.

A900PPS / A1800P - 900 / 1800 l. storage tank with primary circuit built-in pump

Option supplied built-in and availale only in case of special request. Simplifies system design and manufacture. This accessory includes the components provided for the A900 / A1800 options, as well as:

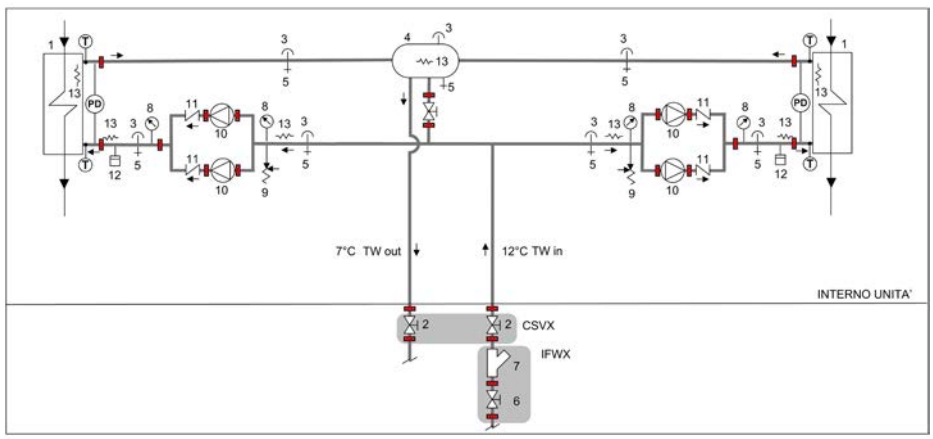
- primary circuit, already set up and tested inside the unit;
- cast-iron butterfly shut-off valve, with quick connections and activating handle and mechanical calibration lock on the pump supply.
- 4PM - HYDROPACK with no. 4 of pumps or 6PM - HYDROPACK with no. 6 of pumps according to the size

Option available only in case of special request.

The water inlet user side with "Storage tank with primary circuit with pump built-in" option is positioned in correspondence of the storage tank. The water outlet user side remains in the same position of the standard unit. The outlet position will be defined when ordering.

Attention: option not compatible with DST control logic (Dynamic Supply Temperature) activable by the User.

If the water flow rate on the primary circuit is greater than the one on the secondary circuit, this allows to directly control the supply temperature to the secondary one. Vice versa, if the water flow rate on the primary circuit is lower than the one on the secondary circuit, this means the supply water is mixed with the system's return water and therefore there is no direct control over the temperature of the chilled water produced



1 - Internal exchanger
2 - Cutoff valve
3 - Purge valve
4 - Storage tank with antifreeze heater
5 - Draw off cock
6 - Cutoff valve with quick joints
7 - Steel mesh strainer water side
8 - Manometer
9 - Safety valve (6 Bar)
10 - Packaged electric pump with high efficiency impeller
11 - Non return valve
12 - System safety pressure switch (prevents the pumps from operating if no water is present)
13 - Antifreeze heater

T - Temperature probe
PD - Differential pressure switch

TW in chilled water inlet
TW out chilled water outlet

IFWX = Steel mesh strainer water side
CSVX - Couple of manual shut-off valves

The grey area indicates further optional components.

Diagram referred to unit 320.6 with Hydropack with no. 4 of pumps

Built-in pump electrical data

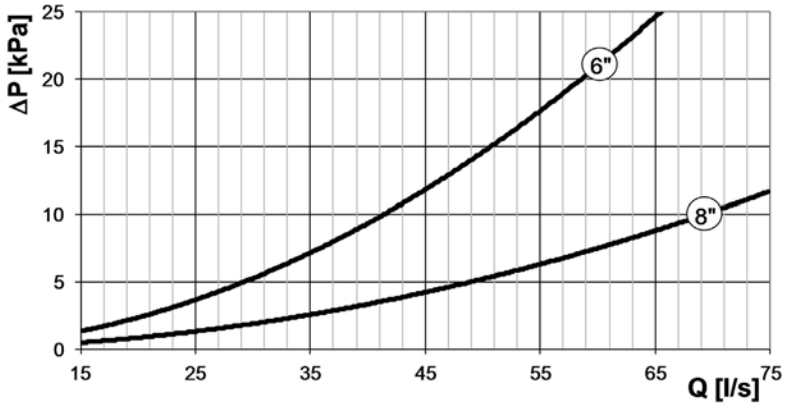
Size		260.6	280.6	300.6	320.6	340.6	360.6	400.8	440.8	480.8
EXCELLENCE / PREMIUM										
		4 x PU20	4 x PU20	4 x PU21	4 x PU21	4 x PU21	4 x PU21	6 x PU20	6 x PU20	6 x PU21
FLI	[kW]	7,2	7,2	11,6	11,6	11,6	11,6	10,8	10,8	17,4
FLA	[A]	13,6	13,6	19,2	19,2	19,2	19,2	20,4	20,4	28,8

IFWX - Steel mesh strainer on the water side

The device stops the exchanger from being clogged by any impurities which are in the hydraulic circuit. The mechanical steel mesh strainer must be placed on the water input line. It can be easily dismantled for periodical maintenance and cleaning. It also includes:

- cast-iron shut-off butterfly valve with quick connections and activation lever with a mechanical calibration lock;
- quick connections with insulated casing.

STEEL MESH FILTER PRESSURE DROP



Q = water flow rate (l/s) DP = water side pressure drop (kPa)

STEEL MESH FILTER FEATURES

Size	260.6-360.6	400.8-480.8
Diameter	6"	8"
Degree of filtration	1,6 mm	

Pressure drop referred to a clean filter

IInstallation is the responsibility of the Client, externally to the unit

Check for the presence of the required hydraulic shut-off valves in the system, in order to undertake periodical maintenance

Separately supplied accessory

Accessories

PGFC- Finned coil protection grill

Grilles made in drawn of electro-welded steel and coated to protect the external coil from accidental contact with people and things.

The protection grill has a height equal to the whole unit. Therefore, all areas under the coils are protected.

Ideal for installation in places where persons can pass from, such as car parks, terraces, etc.

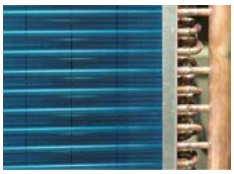
Accessories supplied and installed built-in the unit.

PGCCH - Anti-hail protection grilles

These accessories are to protect the external coil from hail damage. Indeed, hail impact can deform the coil fins worsening the heat exchange with the air.

The accessory is provided and installed built-in the unit.

CCCA - Copper / aluminium condenser coil with acrylic lining



Coils with copper pipes and aluminium fins with acrylic lacquering. Can be used in settings with moderately aggressive low saline concentrations and other chemical agents.

Attention!

- Cooling capacity variation -2.7%

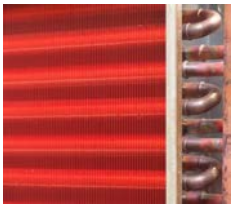
- Variation in compressor power input +4.2%

- Operating range reduction -2.1°C

CCCA1 - Condenser coils with Aluminium Energy Guard DCC treatment

A treatment which offers an optimal thermal exchange and guarantees and protects the finned coil exchangers from corrosion over time. Can be used in settings with very aggressive saline concentrations and other chemical agents in the air thus maintaining the performance of the coils over time.

CCCC - Copper / copper condenser coil



Coils with copper pipes, copper fins and brass structure. Can be used in settings with moderately aggressive saline concentrations and other chemical agents.

This option is not suitable for application in sulphuric environments

Option available only on special request

MHP - High and low pressure gauges

Although the standard unit already displays digital parameters of pressures in the refrigeration circuit, this option allows analog display of refrigerant pressures on suction and discharge lines for ease of use by maintenance technicians.

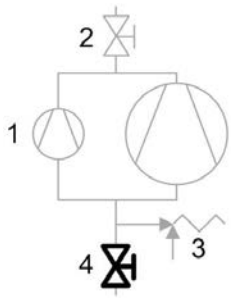
The two liquid pressure gauges and corresponding pressure sockets are installed on the machine in an easily accessible location.

The device is installed built-in the unit.

SDV - Cutoff valve on compressor supply and return

An option which integrates the supply cutoff valve, which is supplied as standard. The presence of the cock at the intake as well enables the compressors to be isolated and substituted without discharging the refrigerant from within the refrigeration circuit. This means that the extraordinary maintenance activities are facilitated.

The device is installed built-in the unit.



1. Compressors
2. Cutoff valve
3. Safety valve
4. SDV option

RE-20 / RE-25 / RE-30 / RE-35 / RE-39 - Electrical panel antifreeze protection

This option is necessary for very cold climates, where the external temperature can be between -10°C and -39°C. It includes self-regulating temperature maintaining resistances which are able to protect the electrical panel against condensation and frost guaranteeing that it functions correctly. The choice of device should be carried out on the basis of the minimum temperatures reached at the unit installation site.

The device is installed built-in the unit.

This accessory operates even when the unit is switched off provided that the power supply is maintained active and the unit continues to be connected.

This accessory does not lead to substantial variations in the electrical data for the unit which has been declared in the Electrical Data section.

MF2 - Multi-function phase monitor (only Premium version)

The phase monitor controls the electrical parameters of the power line to the unit. It works on the command circuit and orders the unit to be switched off when one of the following cases is present: when the phase connections do not respect the correct sequence, or when there is over voltage or under voltage for a certain amount of time (limit values of over and under voltage and the time interval can be manually and separately set). When the line conditions are re-established, the unit is re-armed automatically.

The device is installed and wired built-in the unit.

This accessory is available only in the PREMIUM version. Supplied as standard in the EXCELLENCE version

The device prevents sudden changes of voltage; however, the voltage must always be in a range between 380V and 480V.

PFCP - Power-factor correction capacitors (cosfi > 0.9)

The component is necessary to lower the phase difference between current and voltage in the electromagnetic components of the unit (e.g. asynchronous motors). The component allows to put the cosfi power factor to values on average higher than 0.9, reducing the network reactive power. This often leads to an economic benefit which the energy provider grants to the final user.

The device is installed and wired built-in the unit.

ECS - ECOSHARE function for the automatic management of a group of units

The device allows automatic management of units that operate on the same hydraulic circuit, by creating a local communication network.

There are two control modes that can be set via a parameter during the activation stage. They both distribute the heat load on the available units by following the distribution logic to benefit from efficiency levels at part load.

Moreover:

Mode 1 - it keeps all the pumps active

Mode 2 - it activates only the pumps of the unit required to operate

The device allows for rotation based on the criterion of minimum wear and management of units in stand-by. There are various unit sizes. Every unit must be fitted with the ECOSHARE feature. The set of units is controlled by a Master unit.

The local network can be extended up to 3 units.

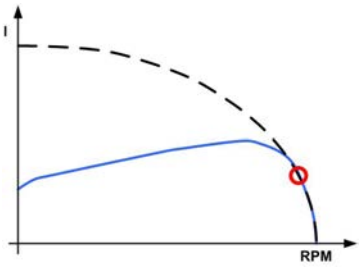
The unit supplied with this device can also be equipped at the same time with the RCMRX option and one of the CMSC11 / CMSC9 / CMSC10 options.

SFSTR – Disposal for inrush current reduction (SOFT STARTER)

Electronic device which automatically starts up the compressors gradually, reducing the starting current for the unit by around 40% in comparison with the nominal value. This results in the reduction of the starting torque of the ON/OFF compressor, it is more protected from mechanical stresses leading to an increased life of the component. The noise is also reduced.

Device installed and wired built-in the unit.

In sizes 260.6, 280.6, 300.6, 320.6, 340.6, 360.6, 400.8, 440.8 and 480.8 the larger size compressor is standard equipped with device for progressive start-up, defined part-winding. For these units the soft-starter bene fits are guaranteed on lower size compressors, maintaining unchanged the M.I.C. (max. inrush current) of the standard unit.



–– Absorbed current without SFSTR option
– Absorbed current without SFSTR option

The compressors with 60 HP of nominal capacity need the standard device for the progressive start-up defined part-winding.

CMSC11 - Serial communication module for BACnet supervisor

This enables the serial connection of the supervision system, using BACnet/IP as the communication protocol. It enables access to the complete list of operational variables, commands and alarms. Using this accessory every unit can dialogue with the main supervision systems.

The device is installed and wired built-in the unit.

The configuration and management activities for the BACnet networks are the responsibility of the client.

The total length of each serial line do not exceed 1000 meters and the line must be connected in bus typology (in/out)

CMSC9 - Serial communication module for Modbus supervisor

This enables the serial connection of the supervision system, using Modbus as the communication protocol. It enables access to the complete list of operational variables, commands and alarms. Using this accessory every unit can dialogue with the main supervision systems.

The device is installed and wired built-in the unit.

The total length of each serial line do not exceed 1000 meters and the line must be connected in bus typology (in/out)

CMSC10 - Serial communication module for LonWorks supervisor

This enables the serial connection of the supervision system which uses the LonWorks communication protocol. It enables access to a list of operating variables, commands and alarms which comply with the Echelon® standard.

The device is installed and wired built-in the unit.

The configuration and management activities for the LonWorks networks are the responsibility of the client.

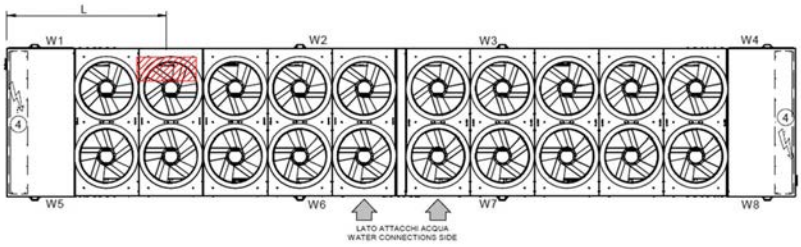
LonWorks technology uses the LonTalk® protocol for communicating between the network nodes. Contact the service supplier for further information.

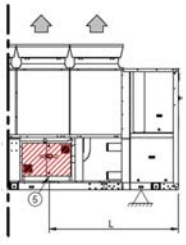
The total length of each serial line do not exceed 1000 meters and the line must be connected in bus typology (in/out)

PSPS - Set up for single power supply

Option that allows the electric power supply to the unit by a single power line, facilitating the installaton operations and making them faster.

The units can be supplied as standard with double power line.





L = 2200 mm +/- 150 mm

CREFB - Device for fan consumption reduction of the external section, ECOBREEZE type

An option which regards the external helical fans, as an alternative to the phase-cut device. It provides for an IP54 brushless electronically commutated electrical motor and incorporated thermal protection. Supplied with variable speed control.

Standard in EN version.

CREFO - Device for fan consumption reduction of the external section, on/off type

Option that affects the external axial fans, as an alternative of the control device at variable speed, standard supplied. It requires the three-phase electric motor with an external rotor and built-in thermal protection, IP54 in progress. The condensation pressure automatic control occurs by the switching on or off of fans of the whole fan section

The choice of this option limits the operating range in cooling with outdoor air temperatures higher than +5°C..

REGBT - Device for the condensing coil partialization

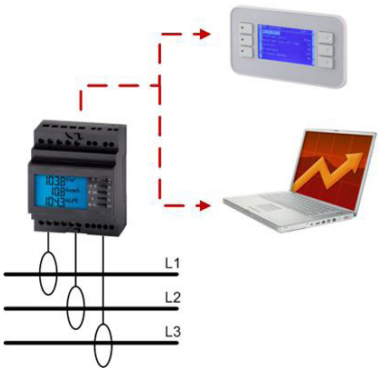
The built-in device allows to extend the unit operating range in cooling down to an outdoor air temperature of -18°C. It has to be matched to CREFB option.

CONTA2 - Energy meter

Allows to display and record the unit's main electrical parameters. The data can be displayed on the device display or via the supervisor through the specific protocol variables.

It is possible to control:
- voltage (V),
- absorbed current (A),
- frequency (Hz),
- cosfi,
- power input (KW),
- absorbed energy (KWh),
- harmonic components (%).

The device is installed and wired built-in the unit.



On the device is present a serial port with Modbus protocol for the connection to the supervision system.

SCP4 - Set-point compensation with 0-10 V signal

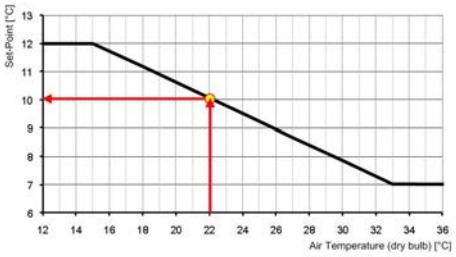
This device enables the set-point to be varied which is pre-set using an external 0÷10 V signal.

The device is installed and wired built-in the unit.

SPC2 - Set-point compensation with outdoor air temperature probe

This device enables the set-point to be varied automatically which is pre-set depending on the enthalpy of the outdoor air. This device enables the liquid flow temperature to be obtained, which varies depending on external conditions, enabling energy savings throughout the entire system.

The device is installed and wired built-in the unit.



IVFDT - Inverter driven variable flow-rate user side control depending on the temperature differential

This option allows water flow-rate modulation to the unit during partial load conditions, maintaining stable the temperature difference between inlet and outlet to the heat exchanger.

The option is available only when the unit thermoregulation is set on the return temperature.

Designed for systems with primary circuit variable flow-rate systems decoupled from secondary circuit. With no building load the unit switches off the compressors while concerning pumps is possible to select:

- Active pumps with minimum flow-rate, monitoring secondary circuit temperature variations
- Pump switching off, periodically activating them (settable time) leading secondary circuit temperatures on primary circuit
- Pump switching off and waiting for the user signal for activation (free potential)

Flow-rate modulation is managed by embedded logic thanks to built-in flow-rate control device and temperature probes. This device is installed and wired.

This option is available only with inverter driven HYDROPACK selected (6PMV)

The water flow control is active only with thermoregulation on the return temperature.

RPRPDI - Refrigerant leak detector with pump down function in the casing

The leak detector is built-in installed and positioned inside the compressor compartment.

It detects leaks of the internal refrigeration circuit and automatically enables the "pump-down" function, storing the refrigerant inside the finned coil exchanger. During pump-down, cooling capacity is not produced by the unit. At the end of the operation the unit is switched off and a dedicated alarm signal is available directly inside the electrical panel.

The device respects BREEAM regulations.

Accessories separately supplied

CSVX - Couple of manually operated shut-off valves

Il kit allows to isolate the hydraulic circuit at the inlet and outlet. It includes:

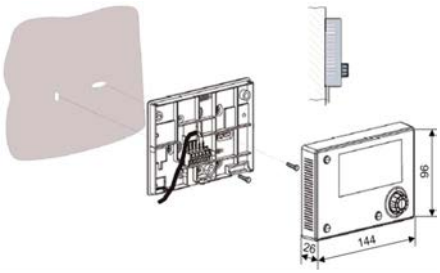
- no. 2 cast-iron shut-off butterfly valves with fast fittings and activation lever with a mechanical calibration lock
- no. 2 of quick connections

Installation is the responsibility of the Client, externally to the unit.

RCMRX - Remote control via microprocessor control

This option allows to have full control over all the unit functions from a remote position.

It can be easily installed on the wall and has the same aspect and functions of the user interface on the unit.



All device functions can be repeated with a normal portable PC connected to the unit with an Ethernet cable and equipped with an internet navigation browser.

The device must be installed on the wall with suitable plugs and connected to the unit (installation and wiring to be conducted by the Customer). Maximum remote control distance 350 m without auxiliary power supply. For distances greater than 350 m and in any case less than 700 m it is necessary to install the 'PSX - Mains power unit' accessory.

Data and power supply serial connection cable n.1 twisted and shielded pair. Diameter of the individual conductor 0.8 mm.

Installation provided by the Customer

PSX - Mains power supply

The device allows the unit and the remote control to communicate with the user interface even when the serial line is longer than 350m.

It must be connected to the serial line at a distance of 350m from the unit and allows to extend the length to 700m maximum in total. The device requires an external power supply at 230V AC.

Power supply at 230V AC provided by Customer

AMMX - Spring antivibration mounts

The spring antivibration mounts are attached in special housing on the support frame and serve to smooth the vibrations produced by the unit thus reducing the noise transmitted to the support structure.

Installation is the responsibility of the Client,

Option compatiblity - EXCELLENCE and PREMIUM version

Acoustic configuration: Compressor soundproofing (SC) / Super-silenced (EN)

REFERENCE	DESCRIPTION	260.6	280.6	300.6	320.6	340.6	360.6	400.8	440.8	480.8
CONFIGURATIONS AND MAIN ACCESSORIES										
B	Water low temperature	0	0	0	0	0	0	0	0	0
D	Partial energy recovery	0	0	0	0	0	0	0	0	0
R	Total energy recovery	0	0	0	0	0	0	0	0	0
B + D	Water low temperature + Partial energy recovery	0	0	0	0	0	0	0	0	0
B + R	Water low temperature + Total energy recovery	0	0	0	0	0	0	0	0	0
A900	900 l. storage tank	0	0	0	0	0	0	-	-	-
A900PPS	900 l. storage tank with primary circuit with built-in pump	◊	◊	◊	◊	◊	◊	-	-	-
A1800	1800 l. storage tank	-	-	-	-	-	-	0	0	0
A1800P	1800 l. storage tank with primary circuit with built-in pump	-	-	-	-	-	-	◊	◊	◊
REGBT - DEVICE FOR THE CONDENSER COIL PARTIALIZATION										
+ R	+ Total energy recovery	-	-	-	-	-	-	-	-	-
+ CREFO	+ Device for fan consumption reduction of the external section type on/off	-	-	-	-	-	-	-	-	-
4PM - HYDROPACK USER SIDE WITH 4 PUMPS										
(PU20)	Pump 20	0	0	-	-	-	-	-	-	-
(PU21) / (PU22)	Pump 21 / Pump 22	0	0	0	0	0	0	-	-	-
(PU26)	Pump 26	-	-	0	0	0	0	0	0	0
(PU27)	Pump 27	-	-	-	-	-	-	0	0	-
+ A900PPS	+ 900 l. storage tank with primary circuitwith built-in pump	-	-	-	-	-	-	-	-	-
+ A900	+ 900 l. storage tank	0	0	0	0	0	0	-	-	-
+ A1800P	+ 1800 l. storage tank with primary circuitwith built-in pump	-	-	-	-	-	-	-	-	-
+ A1800	+ 1800 l. storage tank	-	-	-	-	-	-	0	0	0
6PM - HYDROPACK USER SIDE WITH 6 PUMPS										
(PU20)	Pump 20	0	0	-	-	-	-	-	-	-
(PU21) / (PU22)	Pump 21 / Pump 22	0	0	0	0	0	0	0	0	0
+ A900PPS	+ 900 l. storage tank with primary circuitwith built-in pump	-	-	-	-	-	-	-	-	-
+ A900	+ 900 l. storage tank	0	0	0	0	0	0	-	-	-
+ A1800P	+ 1800 l. storage tank with primary circuitwith built-in pump	-	-	-	-	-	-	-	-	-
+ A1800	+ 1800 l. storage tank	-	-	-	-	-	-	0	0	0
6PMV - HYDROPACK USER SIDE WITH NO.6 OF INVERTER PUMPS										
(PU22)	Pump 22	0	0	0	0	0	0	0	0	0
IVFDT - INVERTER DRIVEN VARIABLE FLOW-RATE USER SIDE CONTROL DEPENDING ON THE TEMPERATURE DIFFERENTIAL										
(6PM)	Hydropack user side with no. 6 of pumps	-	-	-	-	-	-	-	-	-
(6PMV)	Hydropack user side with no.6 of inverter pumps	0*	0*	0*	0*	0*	0*	0*	0*	0*
OTHER ACCESSORIES										
CREFB	Device for fan consumption reduction of the external section, ECOBREEZE type	0	0	0	0	0	0	0	0	0
CREFP	Device for consumption reduction of the external section at variable speed (phase-cutting)	●	●	●	●	●	●	●	●	●
SFSTR	Disposal for inrush current reduction	0	0	0	0	0	●	0	0	●

● Standard

0 Option

- Not available

0* Necessary matching: variable flow-rate control and built-in inverter pumps

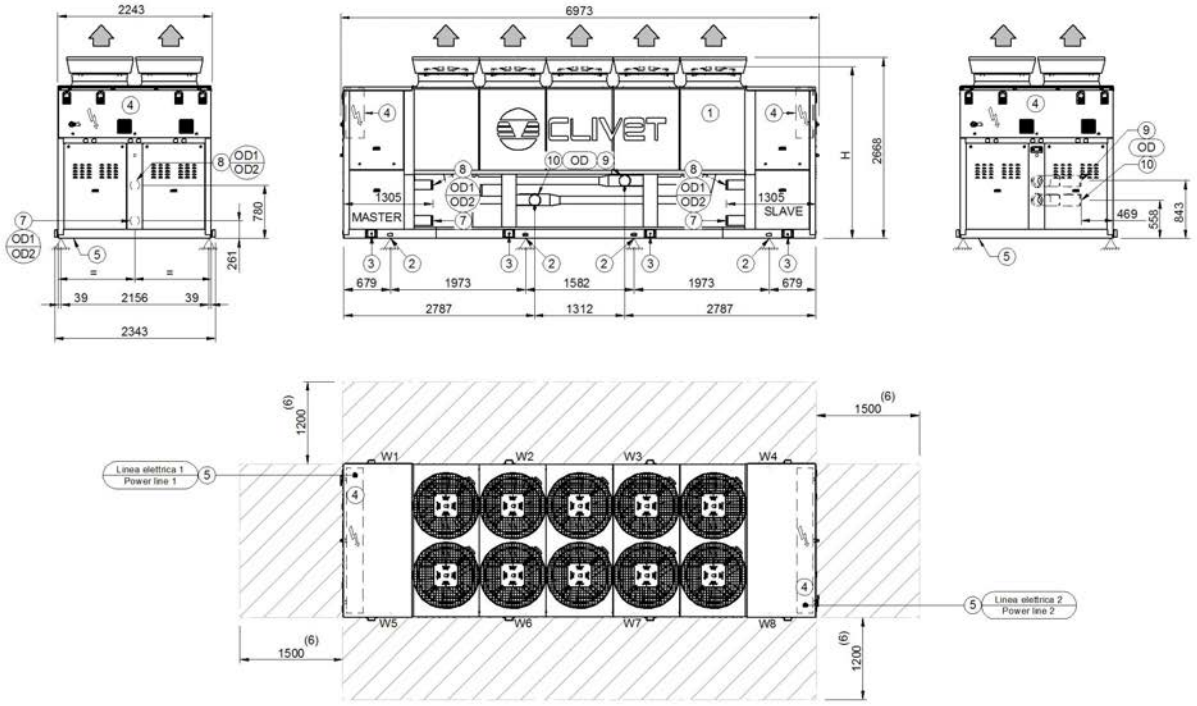
◊ Option available only on special request.

Dimensional drawings

Size 260.6 - 280.6 - PREMIUM version

Acoustic configuration : Compressor soundproofing (SC) / Super-silenced (EN)

DAB8T260.6_280.6_PRM_SC_EN_3
Data/Date 30/11/2016



1. External exchanger (condenser)
2. Antivibration fixing holes Ø 25mm
3. Lifting brackets (removable, if required, after unit positioning)
4. Main electrical panel
5. Power line nput
6. Recommended functional clearances
7. Entering exchanger water recovery side (optional)
8. Leaving exchanger water recovery side (optional)
9. Water inlet user side of no pumps unit / Water outlet user side of unit with pumps (optional)
10. Water outlet user side of no pumps unit / Water inlet user side of unit with pumps (optional)

Size		PREMIUM SC-EN	
		260.6	280.6
H without Axitop	mm	2484	2484
H without Axitop with ECOBREEZE (optional)	mm	2510	2510
OD (internal exchanger)	mm	168,3	168,3
OD1 (partial recovery)	mm	76,1	76,1
OD2 (total recovery)	mm	139,7	139,7
A - Length	mm	6973	6973
B - Depth	mm	2243	2243
C - Height	mm	2668	2668
W1 Supporting point	kg	969	1012
W2 Supporting point	kg	314	310
W3 Supporting point	kg	259	267
W4 Supporting point	kg	1173	1175
W5 Supporting point	kg	1114	1175
W6 Supporting point	kg	274	267
W7 Supporting point	kg	301	310
W8 Supporting point	kg	1009	1012
Operating weight	kg	5413	5527
Shipping weight	kg	5214	5323

Size		PREMIUM SC-EN	
		260.6	280.6
Container shipping length	mm	7078	7078
Container shipping depth	mm	2315	2315

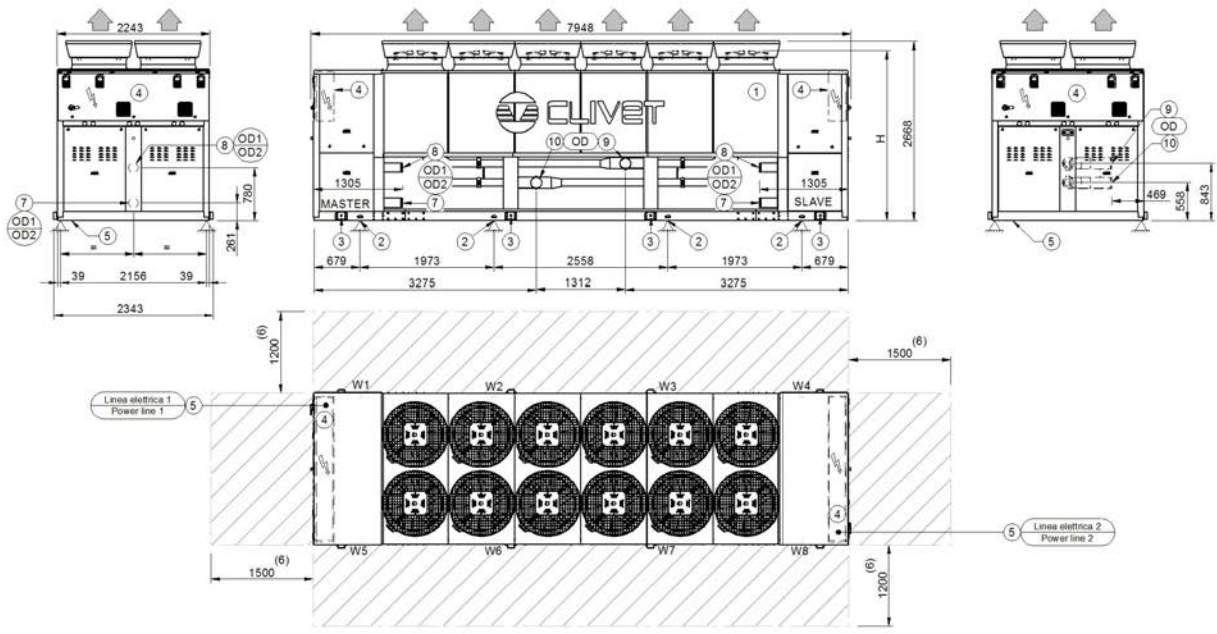
The presence of optional accessories may result in a substantial variation of the weights shown in the table. Fan diffusers are separately supplied.

Size 260.6 - 280.6 - EXCELLENCE version

Size 300.6 - 320.6 - 340.6 - 360.6 - PREMIUM version

Acoustic configuration : Compressor soundproofing (SC) / Super-silenced (EN)

DAB8T300.6_360.6_PRM_260.6-280.6_EXC_SC_EN_3
Data/Date 30/11/2016



1. External exchanger (condenser)
2. Antivibration fixing holes Ø 25mm
3. Lifting brackets (removable, if required, after unit positioning)
4. Main electrical panel
5. Power line input
6. Recommended functional clearances
7. Entering exchanger water recovery side (optional)
8. Leaving exchanger water recovery side (optional)
9. Water inlet user side of no pumps unit / Water outlet user side of unit with pumps (optional)
10. Water outlet user side of no pumps unit / Water inlet user side of unit with pumps (optional)

Size		EXCELLENCE SC-EN		PREMIUM SC-EN			
		260.6	280.6	300.6	320.6	340.6	360.6
H without Axitop	mm	2484	2484	2484	2484	2484	2484
H without Axitop with ECOBREEZE (optional)	mm	2510	2510	2510	2510	2510	2510
OD (internal exchanger)	mm	168,3	168,3	168,3	168,3	168,3	168,3
OD1 (partial recovery)	mm	76,1	76,1	76,1	76,1	76,1	76,1
OD2 (total recovery)	mm	139,7	139,7	139,7	139,7	139,7	139,7
A - Length	mm	7948	7948	7948	7948	7948	7948
B - Depth	mm	2243	2243	2243	2243	2243	2243
C - Height	mm	2668	2668	2668	2668	2668	2668
W1 Supporting point	kg	983	1029	1017	1070	1081	1134
W2 Supporting point	kg	395	393	390	388	411	421
W3 Supporting point	kg	350	358	341	350	359	380
W4 Supporting point	kg	1199	1201	1250	1252	1327	1333
W5 Supporting point	kg	1135	1201	1180	1252	1263	1333
W6 Supporting point	kg	363	358	356	350	372	380
W7 Supporting point	kg	385	393	379	388	399	421
W8 Supporting point	kg	1027	1029	1068	1070	1127	1134
Operating weight	kg	5837	5963	5982	6119	6338	6537
Shipping weight	kg	5601	5718	5746	5874	6088	6282

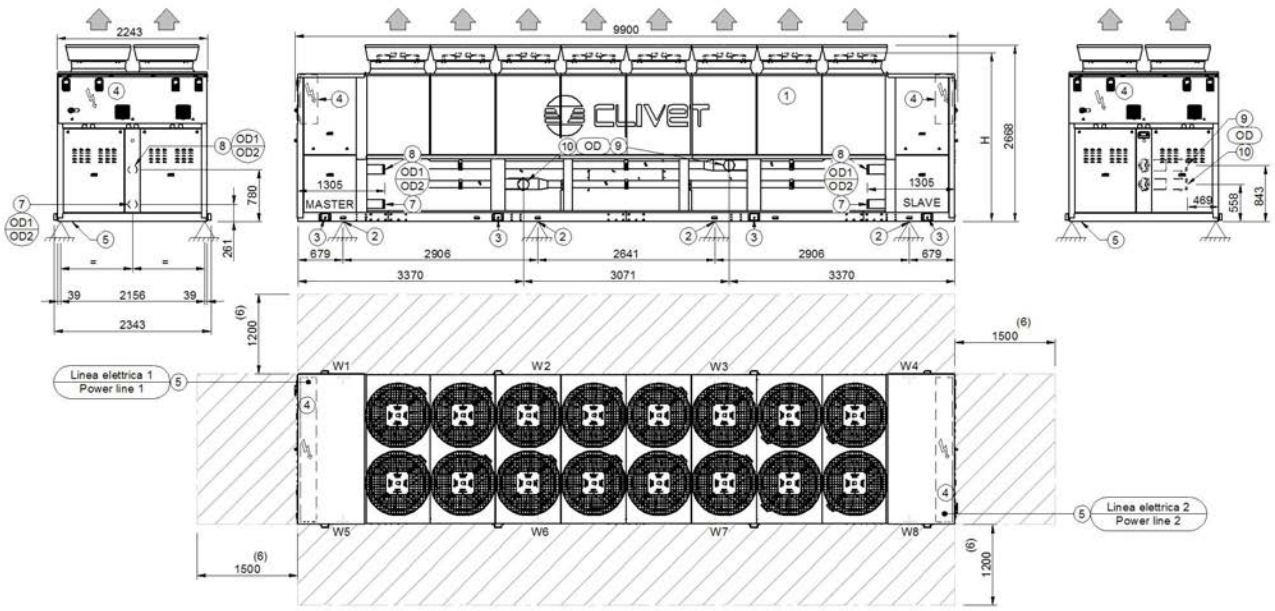
Size		EXCELLENCE SC-EN		PREMIUM SC-EN			
		260.6	280.6	300.6	320.6	340.6	360.6
Container shipping length	mm	8053	8053	8053	8053	8053	8053
Container shipping depth	mm	2315	2315	2315	2315	2315	2315

The presence of optional accessories may result in a substantial variation of the weights shown in the table. Fan diffusers are separately supplied.

Size 300.6 - 320.6 - 340.6 - 360.6 - EXCELLENCE version

Acoustic configuration : Compressor soundproofing (SC) / Super-silenced (EN)

DAB8T300.6_360.6_EXC_SC_EN_3
Data/Date 30/11/2016



1. External exchanger (condenser)
2. Antivibration fixing holes Ø 25mm
3. Lifting brackets (removable, if required, after unit positioning)
4. Main electrical panel
5. Power line input
6. Recommended functional clearances
7. Entering exchanger water recovery side (optional)
8. Leaving exchanger water recovery side (optional)
9. Water inlet user side of no pumps unit / Water outlet user side of unit with pumps (optional)
10. Water outlet user side of no pumps unit / Water inlet user side of unit with pumps (optional)

Size		EXCELLENCE SC-EN			
		300.6	320.6	340.6	360.6
H without Axitop	mm	2484	2484	2484	2484
H without Axitop with ECOBREEZE (optional)	mm	2510	2510	2510	2510
OD (internal exchanger)	mm	168,3	168,3	168,3	168,3
OD1 (partial recovery)	mm	76,1	76,1	76,1	76,1
OD2 (total recovery)	mm	139,7	139,7	139,7	139,7
A - Length	mm	9900	9900	9900	9900
B - Depth	mm	2243	2243	2243	2243
C - Height	mm	2668	2668	2668	2668
W1 Supporting point	kg	1046	1097	1111	1164
W2 Supporting point	kg	538	548	578	598
W3 Supporting point	kg	498	517	536	564
W4 Supporting point	kg	1272	1278	1352	1362
W5 Supporting point	kg	1210	1278	1292	1362
W6 Supporting point	kg	509	517	546	564
W7 Supporting point	kg	529	548	569	598
W8 Supporting point	kg	1091	1097	1155	1164
Operating weight	kg	6692	6881	7138	7375
Shipping weight	kg	6425	6610	6862	7094

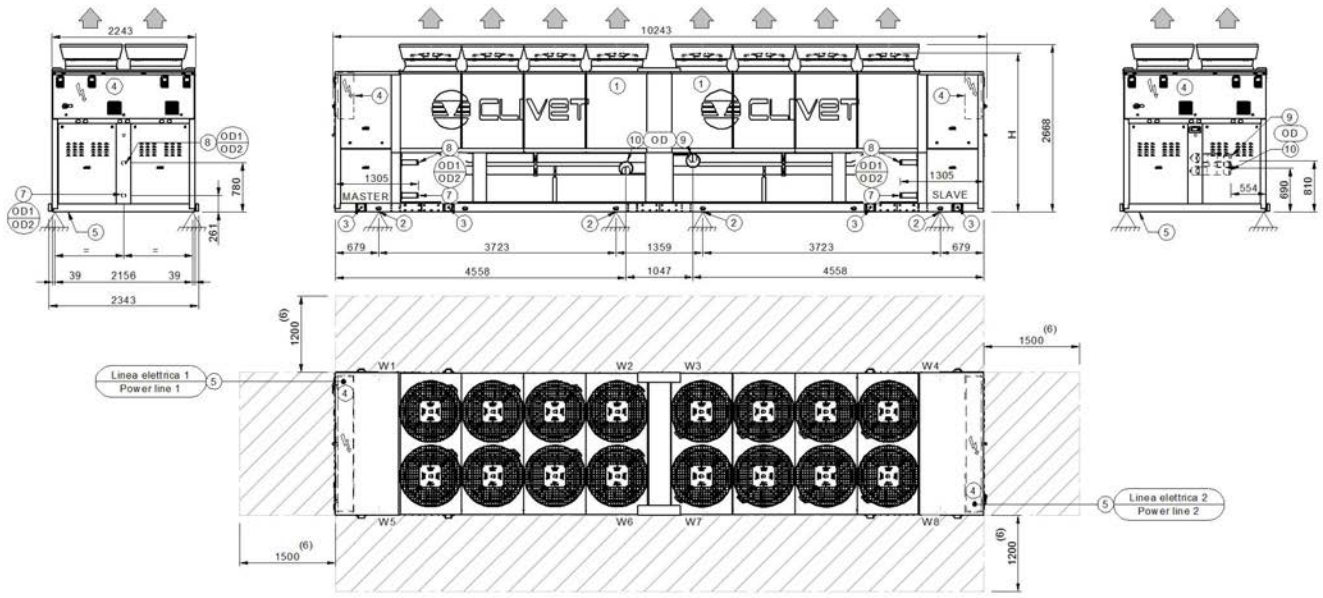
Size		EXCELLENCE SC-EN			
		300.6	320.6	340.6	360.6
Container shipping length	mm	10005	10005	10005	10005
Container shipping depth	mm	2315	2315	2315	2315

The presence of optional accessories may result in a substantial variation of the weights shown in the table. Fan diffusers are separately supplied.

Size 400.8 - PREMIUM version

Acoustic configuration : Compressor soundproofing (SC) / Super-silenced (EN)

DAB8T400.8_PRM_SC_EN_3
Data/Date 30/11/2016



1. External exchanger (condenser)
2. Antivibration fixing holes Ø 25mm
3. Lifting brackets (removable, if required, after unit positioning)
4. Main electrical panel
5. Power line input
6. Recommended functional clearances
7. Entering exchanger water recovery side (optional)
8. Leaving exchanger water recovery side (optional)
9. Water inlet user side of no pumps unit / Water outlet user side of unit with pumps (optional)
10. Water outlet user side of no pumps unit / Water inlet user side of unit with pumps (optional)

Size		PREMIUM SC-EN
		400.8
H without Axitop	mm	2484
H without Axitop with ECOBREEZE (optional)	mm	2510
OD (internal exchanger)	mm	219,1
OD1 (partial recovery)	mm	76,1
OD2 (total recovery)	mm	139,7
A - Length	mm	10243
B - Depth	mm	2243
C - Height	mm	2668
W1 Supporting point	kg	1177
W2 Supporting point	kg	704
W3 Supporting point	kg	700
W4 Supporting point	kg	1173
W5 Supporting point	kg	1173
W6 Supporting point	kg	700
W7 Supporting point	kg	704
W8 Supporting point	kg	1177
Operating weight	kg	7508
Shipping weight	kg	7186

Size		PREMIUM SC-EN
		400.8
Container shipping length	mm	10348
Container shipping depth	mm	2315

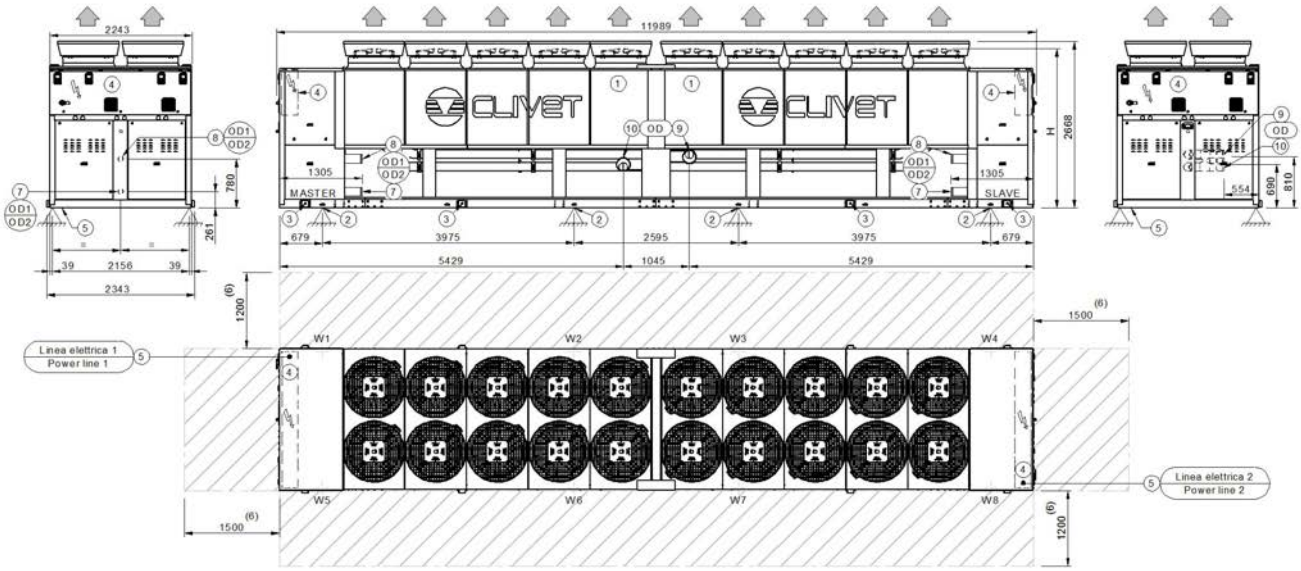
The presence of optional accessories may result in a substantial variation of the weights shown in the table. Fan diffusers are separately supplied.

Size 400.8 - 440.8 - 480.8 - EXCELLENCE version

Size 440.8 - 480.8 - PREMIUM version

Acoustic configuration : Compressor soundproofing (SC) / Super-silenced (EN)

DAB8T440.8_480_PRM_400-480_EXC_SC_EN_3
Data/Date 30/11/2016



1. External exchanger (condenser)
2. Antivibration fixing holes Ø 25mm
3. Lifting brackets (removable, if required, after unit positioning)
4. Main electrical panel
5. Power line input
6. Recommended functional clearances
7. Entering exchanger water recovery side (optional)
8. Leaving exchanger water recovery side (optional)
9. Water inlet user side of no pumps unit / Water outlet user side of unit with pumps (optional)
10. Water outlet user side of no pumps unit / Water inlet user side of unit with pumps (optional)

Size		EXCELLENCE SC-EN			PREMIUM SC-EN	
		400.8	440.8	480.8	440.8	480.8
H without Axitop	mm	2484	2484	2484	2484	2484
H without Axitop with ECOBREEZE (optional)	mm	2510	2510	2510	2510	2510
OD (internal exchanger)	mm	219,1	219,1	219,1	219,1	219,1
OD1 (partial recovery)	mm	76,1	76,1	76,1	76,1	76,1
OD2 (total recovery)	mm	139,7	139,7	139,7	139,7	139,7
A - Length	mm	11989	11989	11989	11989	11989
B - Depth	mm	2243	2243	2243	2243	2243
C - Height	mm	2668	2668	2668	2668	2668
W1 Supporting point	kg	1331	1366	1414	1310	1376
W2 Supporting point	kg	871	889	925	833	883
W3 Supporting point	kg	861	903	924	838	879
W4 Supporting point	kg	1321	1380	1413	1315	1372
W5 Supporting point	kg	1321	1380	1413	1315	1372
W6 Supporting point	kg	861	903	924	838	879
W7 Supporting point	kg	871	889	925	833	883
W8 Supporting point	kg	1331	1366	1414	1310	1376
Operating weight	kg	8768	9076	9352	8592	9020
Shipping weight	kg	8370	8664	8936	8194	8610

Size		EXCELLENCE SC-EN			PREMIUM SC-EN	
		400.8	440.8	480.8	440.8	480.8
Container shipping length	mm	12030	12030	12030	12030	12030
Container shipping depth	mm	2315	2315	2315	2315	2315

The presence of optional accessories may result in a substantial variation of the weights shown in the table. Fan diffusers are separately supplied.

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