Technical Bulletin

BT16C039GB-03

SPINchiller[3]

High efficiency air cooled reversible heat pump for outdoor installation

WSAN-XSC3 260.8-480.8 RANGE

Nominal heating capacity from 800 kW to 1387 kW
Nominal cooling capacity from 663 kW to 1190 kW

- R-410A modular scroll technology
- Four independent refrigeration circuits
- Partial recovery of the condensing heat

EXCELLENCE version

- Eurovent Class A / Up to 48°C outdoor air temperature

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

Dedicated series separately documentated

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 cooled heat pump

- EXCELLENCE high efficiency version
- Eurovent certification

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

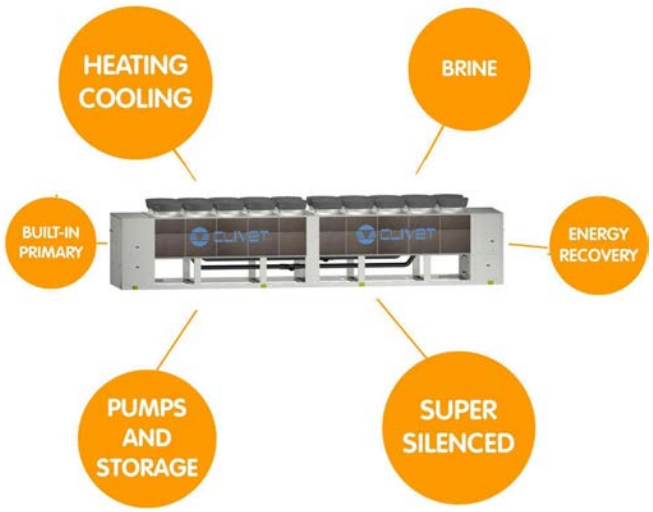
Provides all Clivet technological developments for their medium capacity hydronic systems

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 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)

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

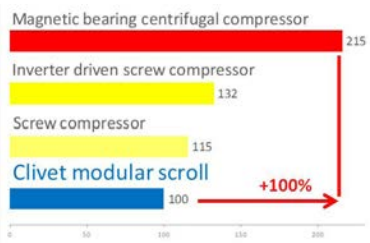
Suitable for any type of terminals, from fan coils to radiant systems and chilled beams, SPINchiller³ heat pump is also available in Super-silenced configuration. Energy recovery for producing hot water free of charge, Master-Slave management devices.

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 SPINchiller 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

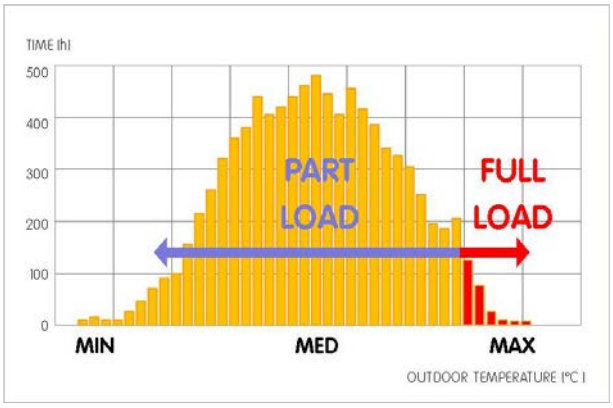
Comfort and energy saving in one solution

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.

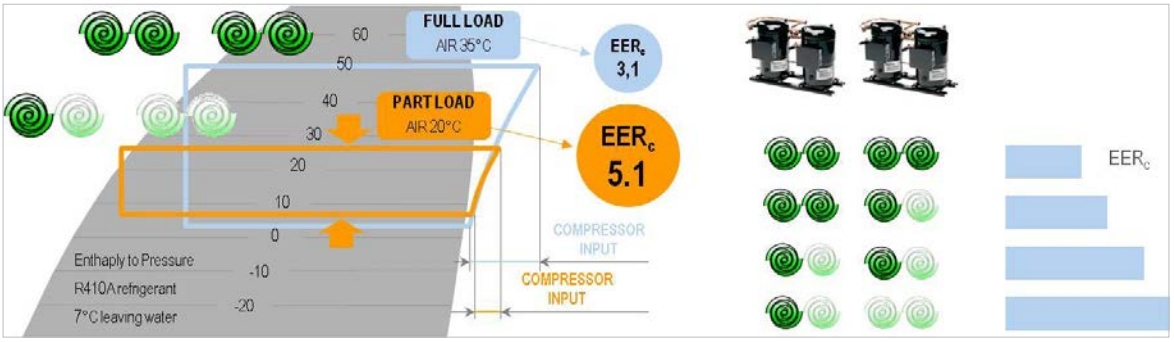
The advantages are:

- 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 or three 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.



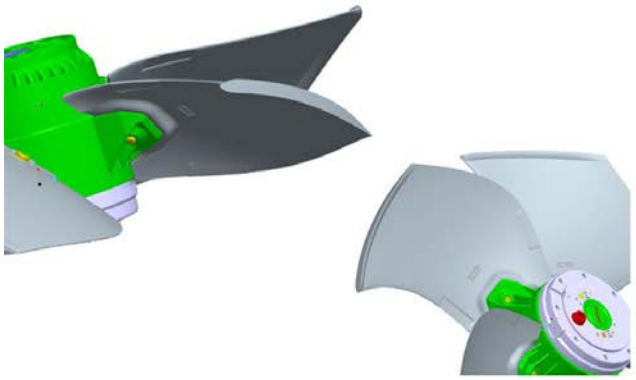
EERc = Energy effieciency referred to compressors

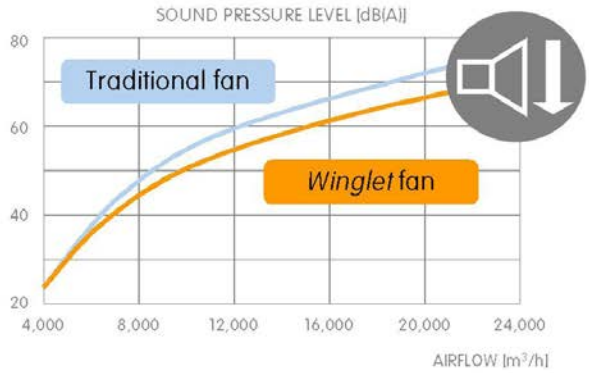
Efficient and silent ventilation technology

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.

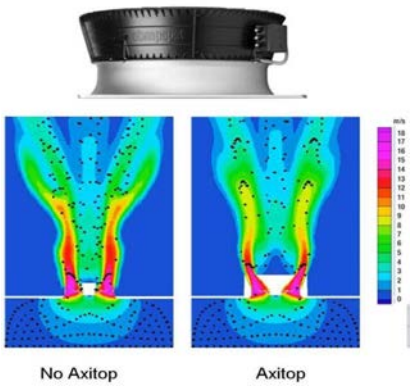




Diffusers for fans

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:

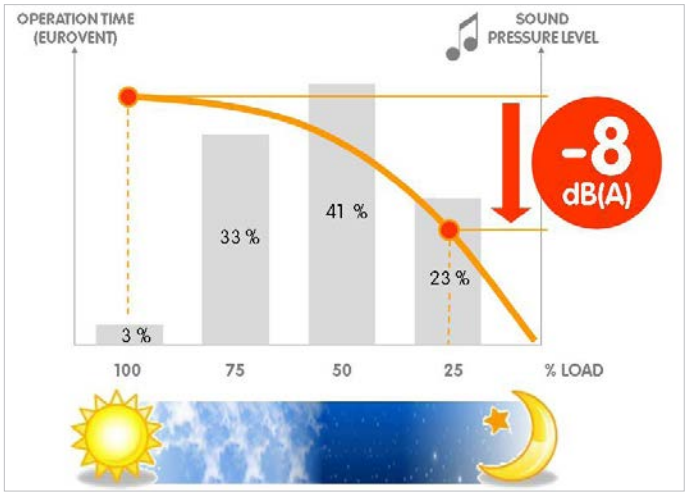
- –3 dB of sound reduction
- reduction of 3% of the absorbed energy



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.



The best choice for every business

EXCELLENCE version: maximum efficiency

All SPINchiller[3] models feature high part-load energy efficiency, which means high ESEER seasonal efficiency.

EXCELLENCE version it's the best match between capital cost and total lifecycle cost.

Apart from the high seasonal efficiency, the standard EXCELLENCE SC version stands out for its extremely high energy efficiency ratio (COP) during full-load heating, which exceeds the value 3.2 and places it in Eurovent Energy Efficiency class A.

This is all possible thanks to Scroll modular technology, high efficiency heat exchangers and ECOBREEZE fans fitted with a permanent-magnet motor and 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.

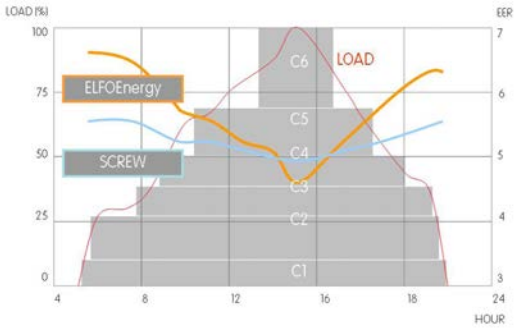
With Eurovent's implementation of the EN14511:2011 standard in 2012, reaching top energy efficiency levels at full load means calculating performance by also taking into account the energy consumption required to overcome pressure drops to allow for the circulation of the solution inside the exchangers.

Superior flexibility and reliability

Efficient precision

Sequential activation of SPINchiller[3] 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.

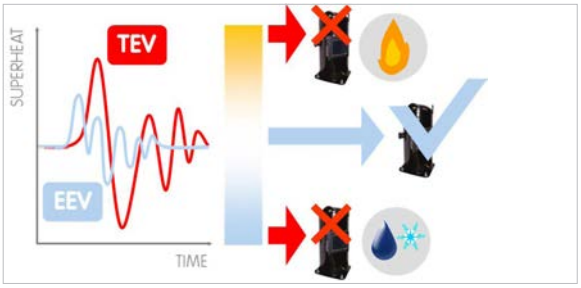


THE NUMBER OF START-UPS DECREASES THEREFORE THE LIFE CYCLE INCREASES

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, SPINchiller[3] 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.

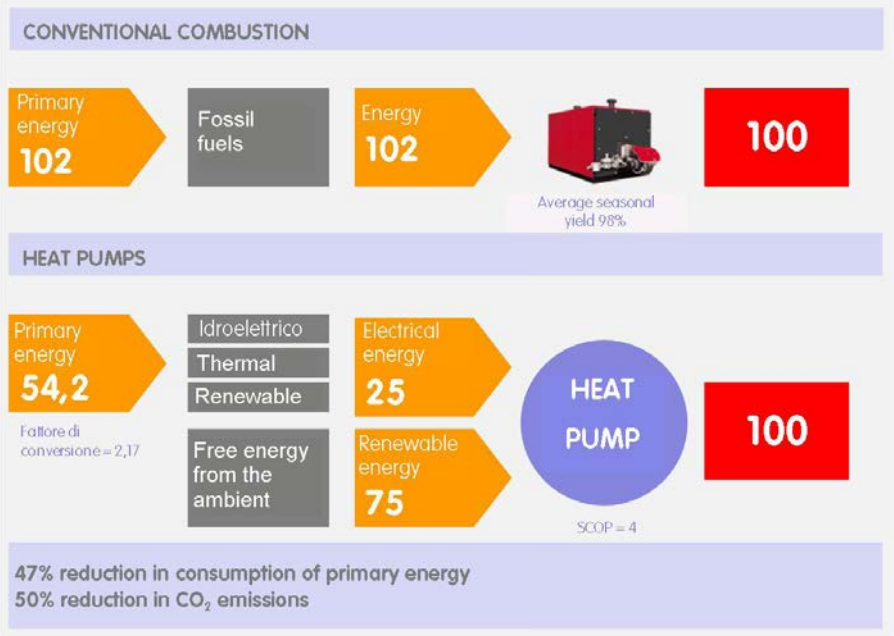
The phase monitor, standard supplied.

- controls the presence and the exact sequence of the phases
- 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.

Renewable energy heat pump technology

The electric Heat pump technology promotes and provides incentives by the European Union with specific standards, such as the EU Directive 2009/28/CE of April 23rd 2009 that recognises ambient heat as a renewable source.



Compared to a combustion system, the electric heat Pump allows:

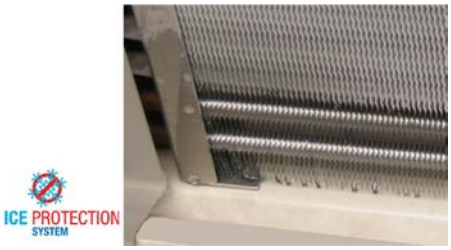
- Energy saving and reduction of the CO2 emissions by an average of 50%
- Use of electric energy, increasingly produced through alternative and renewable sources
- Operation reliability and reduced maintenance
- No fossil combustion and therefore absence of chimney, absence of periodical controls on the emissions in the ambient and no local production of fine dust
- Cost reduction of first investment with the reversible models that use a single system for both heating and cooling.

In heating mode, the reversible heat pump range by SPINchiller[3] offers high efficiency in both full load operation and Partial load. The energy saving cycle operation throughout the year is noteworthy. Thanks to the brilliant half-load performance even when in cooling mode. This result was aided with precise technological choices and a long history of specialised experience.

Coils protected against the formation of ice

The particular technology of the heat pump developed by Clivet guarantees its continued and reliable operation.

The ICE PROTECTION SYSTEM device prevents icing on the base of the external exchanger during winter operation, thanks to a special subcooling circuit. This prevents damages caused by freezing.



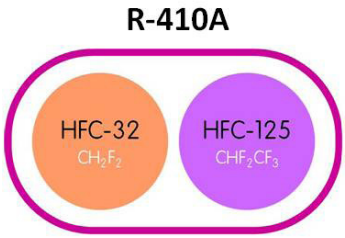
Smart management of defrosts

The automatic defrost cycles on the remaining external exchanger surface are managed in predictive mode, reducing both the frequency and the duration. The electronics on board analyse not only the external conditions, but also the evaporation pressure variation in the exchanger.

High efficient refrigerant

R410A is the mix of two refrigerants used in equal parts: R32 that supplies the heating capacity and R125 that controls the flammability. It is a chlorine free refrigerant (HFC) with numerous advantages:

- ODP (Ozone Depletion Potential) = 0
- high volumetric effect thanks to the high coefficient global thermal exchange and to the pressure variation (glide) which is almost nil during the evaporation phase
- elevated density and efficiency, with greater compactness of the refrigeration circuit and therefore the responsible use of materials and small refrigerant quantity, for a reduced environmental impact.



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).

Versatility

The various supply temperatures that can be set make SPINchiller³ perfectly suitable for various types of systems, such as: - heat dissipation on water loop systems

- distribution to terminal units, such as fan coils or other air treatment units
- distribution to radiant panels, induction terminals or cold beams.

PERFECT FOR THE VARIOUS TYPES OF SYSTEMS

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:

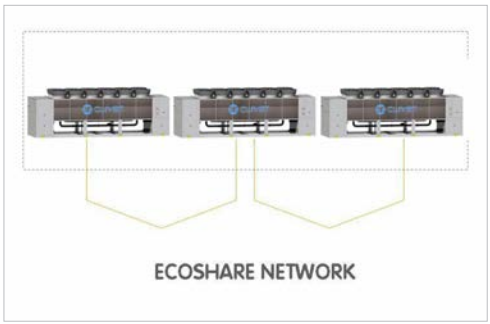
Increased flexibility, enhanced by the control that can adapt to the load

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 SPINchiller² 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

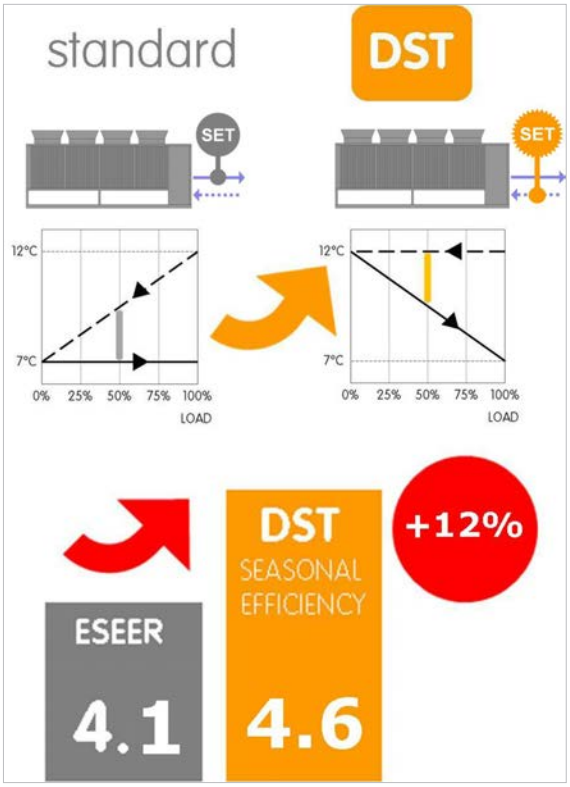
SPINchiller[3] is equipped with standard DST control (Dynamic Supply Temperature) control logic, which can be activated by the user.

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[3], 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:

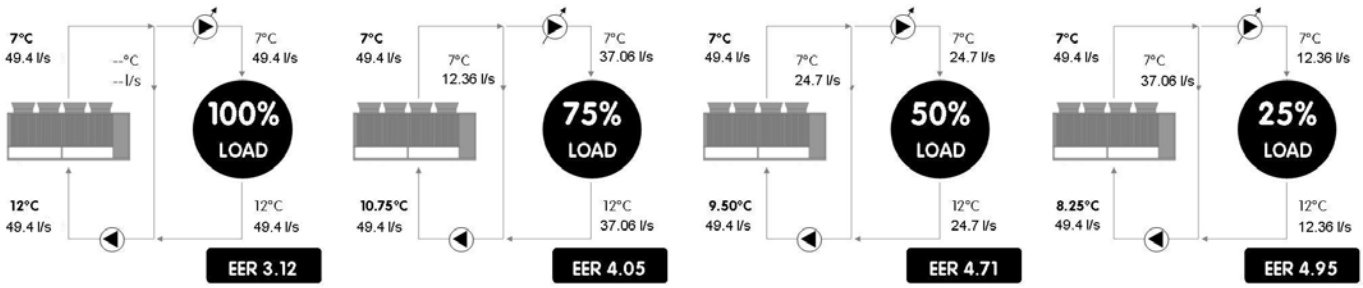
- primary circuit with constant water flow rate
- secondary circuit with variable water flow-rate according to the load (linear variability for simplicity).

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.

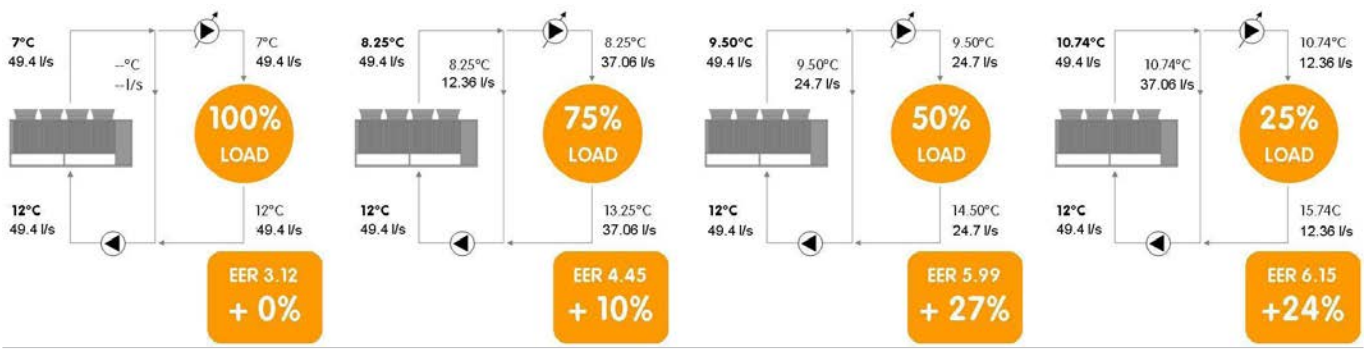
The DST control logic, on the other hand, allows increasing the system water supply temperature during part-load operation, thereby increasing seasonal energy efficiency for SPINchiller[3].

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.

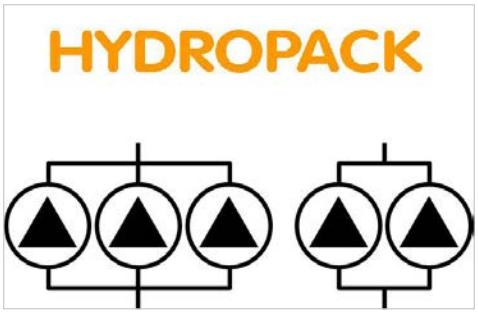
Built-in inertial accumulation available

In most SPINchiller³ systems it can be installed without inertial accumulation 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 accumulation 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 two or three 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.

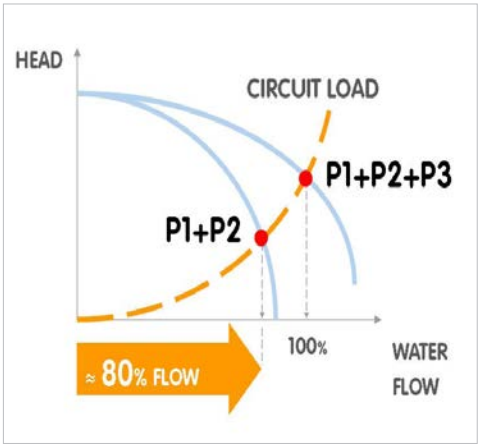
The possibility of independent pump management in case of failure is embedded in the unit keeping operative the system.

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)



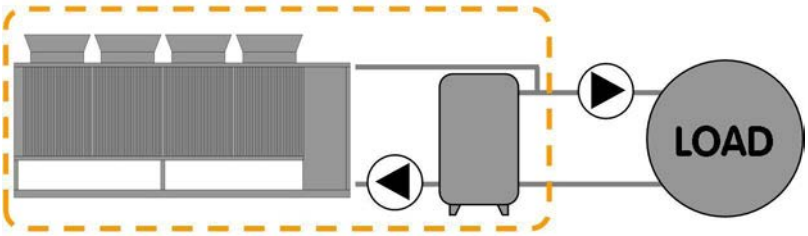
Even the primary circuit can be integrated built-in

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

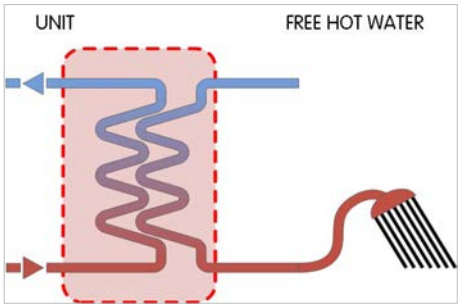
Produces hot water freely

Condensation heat recovery:

- partial: it recovers about the 20% of the available heat (desuperheater)

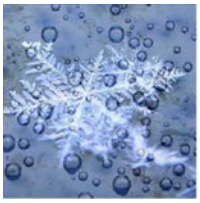
It allows the free DHW production for:

- 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 SPINchiller[3] 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

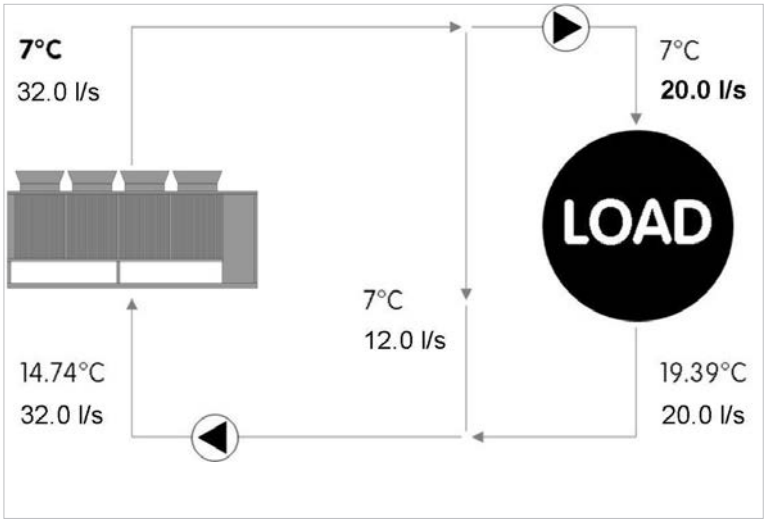
SPINchiller[3] operates with constant water flow rate to the evaporator, between a minimum and maximum value indicated in the technical documents.

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 toWSAN-XSC3 400.8 SC EXCELLENCE version.
Appropriate water flow rate for the correct unit operation.

Temperature values outside the limits

SPINchiller[3] operates with the system supply temperatures indicated in the technical documentation.

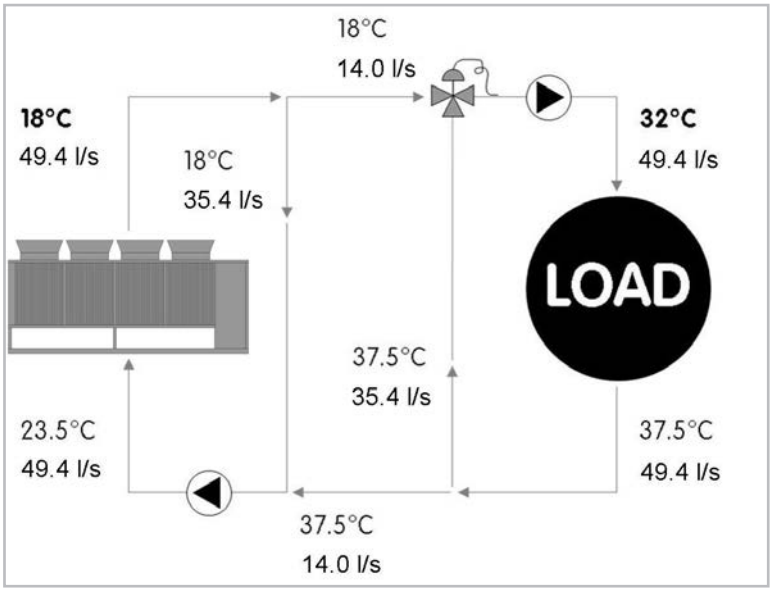
Temperature limits below the limit may cause unwanted formation of ice and the unit to stop following the intervention of built-in safety devices.

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 WSAN-XSC3 400.8 SC EXCELLENCE version.
Appropriate supply water temperature for the correct unit operation. Nominal water flow rate.

Evaporator thermal gradient

SPINchiller[3] 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).

System water volume

For a proper unit operation is necessary to contemplate a correct design of water tanks on user side. Minimum system water volumes are described within 'General technical data' section and they have to be satisfied to avoid continuous compressor switching on and off.
We recommend to double minimum water volumes described for small deviations from set-point and a stable operation mode even in the most extreme conditions, such as a low cooling capacity request for a long time and outdoor air low temperatures.

Standard unit technical specifications

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 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, brazed 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

Four independent refrigeration circuits made of copper, brazed and factory-assembled, complete with:

- anti-acid dehydrator filter with solid cartridge complete with quick-fit connector for refrigerant;
- liquid flow and humidity indicator;
- liquid receiver;
- low pressure transducer;
- refrigerant temperature probe;
- electronic expansion valve;
- non-return valve;
- 4-way cycle reversing valve;
- high-pressure safety pressure switch;
- hight and low pressure safety valve;
- cut-off valve on liquid line
- cut-off valve on compressor supply circuit;
- suction liquid separator.

Suction pipes thermally insulated with highly flexible EPDM rubber closed-cell elastomer insulation. Each cooling circuit is tested under pressure for leaks and is supplied complete with load of refrigerant gas.

Configurations

D - Partial 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);
- potential-free contacts for compressor status;
- digital input for double set-point enabling;
- multifunction phase monitor;
- 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 grilles
- Anti-hail protection grilles
- Copper / aluminium condenser coil with acrylic lining
- Copper / aluminium condenser coil with Energy Guard DCC Aluminum treatment
- High and low pressure gauges
- Cutoff valve on compressor supply and return
- Couple of manual shut-off valves (accessory provided separately)
- Electrical panel antifreeze protection
- 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
- Device for fan consumption reduction of the external section, ECOBREEZE type
- Remote control via microprocessor control (accessory separately supplied)
- Mains power supply (accessory separately supplied)
- Energy meter
- Set up for single power supply
- Set-point compensation with 0-10 V signal
- Set-point compensation with outdoor air temperature probe
- Limit extension kit in heating up to -10°C (W.B.)
- Spring antivibration mounts (supplied separately)
- Leak detector
- Variable flow-rate control

On special request are available:

- copper /copper condenser coil with brass shoulders
- storage tank with primary circuit with pump built-in the unit (n.b.: only for units complete with a Standard pump / Standard pump with a standby pump.

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 equipment with outdoor air low temperatures

<table>
<tr><th colspan="2" rowspan="2">Minimum outdoor air temperature</th><th colspan="2">Operating unit</th><th rowspan="2">Unit in stand-by (5)
(fed unit)</th><th rowspan="2">Unit in storage
(unit not fed)</th></tr>
<tr><th>Cool*</th><th>Heat**</th></tr>
<tr><td>+11°C</td><td>1</td><td rowspan="5">√ standard unit</td><td rowspan="3">√ standard unit</td><td rowspan="5">√ standard unit</td><td rowspan="4">√ standard unit (6)</td></tr>
<tr><td>+2°C</td><td>2</td></tr>
<tr><td>-5°C</td><td>4</td></tr>
<tr><td>-7°C</td><td>3</td></tr>
<tr><td>-10°C</td><td>4</td><td>√ device for extended operating range</td></tr>
<tr><td>Between –10°C and –15°C</td><td rowspan="4"></td><td rowspan="4">NOT POSSIBLE</td><td>√ electrical panel antifreeze protection
√ device for extended operating range
√ glycol in an appropriate percentage</td><td rowspan="4">√ water empty unit or with an appropriate glycol percentage
√ electrical panel anti-freeze protection</td></tr>
<tr><td>Between –15°C and –18°C</td><td rowspan="3">NOT POSSIBLE</td></tr>
<tr><td>Between –18°C and –25°C</td><td>√ standard unit (6)
Not suitable:
X electrical panel anti-freeze 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:
*chilled water production:
internal exchanger water = 12/7 °C
**hot water production:
internal exchanger water = 40/45 °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

WSAN-XSC3	260 . 8	EXC	SC	AXIX	-	-	-
(1)	(2) (3)	(4)	(5)	(6)	(7)	(8)	(9)

(1) Range
WSAN = Air cooled heat pump with scroll compressor
XSC3 = SPINchiller[3] range

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

(3) Compressors
8 = Compressor quantity

(4) Energy efficiency
EXC = EXCELLENCE version: high energy efficiency

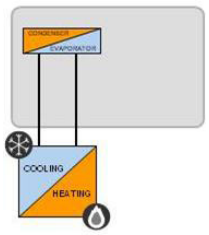
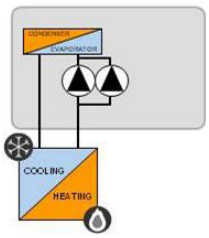
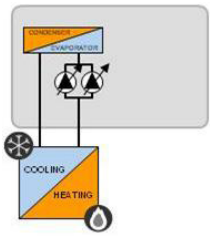
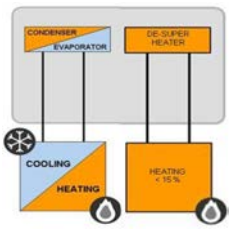
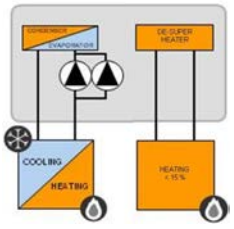
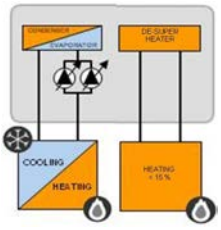
(5) Acoustic configuration
SC = Acoustic configuration with compressor soudproofing
EN = Super-silenced acoustic configuration

(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 (15% 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 

Accessories separately supplied			
• **RCMRX** - Remote control via micro-processor remote control	• **PSX** - Mains power supply unit	• **AMMX** - Spring antivibration mounts	• **CSVX** - Couple of manual shut-off valves

EXCELLENCE VERSION

Acoustic configuration: compressor soundproofing (SC)

General technical data - Performance

Size			260.8	280.8	300.8	320.8	340.8	360.8	400.8	440.8	480.8
Cooling											
Cooling capacity	1	[kW]	694	741	788	835	892	949	1040	1118	1190
Compressor power input	1	[kW]	231	246	260	274	295	316	343	377	417
Total power input	2	[kW]	254	271	285	300	323	347	375	409	449
Partial recovery heating capacity	3	[kW]	185	197	210	222	237	253	277	299	321
EER	1	-	2.74	2.73	2.76	2.79	2.76	2.74	2.77	2.73	2.65
Water flow-rate (User Side)	1	[l/s]	33.2	35.4	37.6	39.9	42.6	45.3	49.7	53.4	56.9
Internal exchanger pressure drops	1	[kPa]	42	43	43	42	39	36	42	38	42
Cooling capacity (EN14511:2013)	4	[kW]	692	739	785	831	888	945	1037	1115	1186
Total power input (EN14511:2013)	4	[kW]	256	273	288	303	326	350	378	412	453
EER (EN 14511:2013)	4	-	2.70	2.70	2.73	2.75	2.72	2.70	2.74	2.70	2.62
SEER	7	-	4,16	4,21	4,20	4,19	4,20	4,20	4,21	4,19	4,11
Heating											
Heating capacity	5	[kW]	800	848	893	938	1010	1081	1196	1287	1387
Compressor power input	5	[kW]	220	233	246	259	281	302	333	368	397
Total power input	2	[kW]	242	257	271	286	310	334	364	399	429
COP	5	-	3.30	3.30	3.29	3.28	3.26	3.24	3.29	3.23	3.23
Heating capacity (EN14511:2013)	6	[kW]	803	852	897	942	1014	1086	1201	1292	1391
Total power input (EN14511:2013)	6	[kW]	246	261	275	290	314	338	369	404	435
COP (EN 14511:2013)	6		3.27	3.26	3.26	3.25	3.23	3.22	3.25	3.20	3.20

The Product is compliant with the Erp (Energy Related Products) European Directive. It includes the Commission delegated Regulation (EU) No 811/2013 (rate heat output ≤70 kW at specified reference conditions) and the Commission delegated Regulation (EU) No 813/2013 (rated heat output ≤400 kW at specified reference conditions) and 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. 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 referred to the following conditions: internal exchanger water = 40/45 °C. Entering external exchanger air temperature = 7°C D.B./6°C W.B. Evaporator fouling factor = 0.44 x 10^(-4) m² K/W
6. Data compliant to Standard EN 14511:2013 referred to the following conditions: - Internal exchanger water temperature = 40/45 °C. Entering external exchanger air temperature = 7°C D.B./6°C W.B.
7. Data calculated according to the EN 14825:2016 Regulation

Acoustic configuration: super-silenced (EN)

General technical data - Performance

Size			260.8	280.8	300.8	320.8	340.8	360.8	400.8	440.8	480.8
Cooling											
Cooling capacity	1	[kW]	663	711	756	800	851	902	999	1073	1127
Compressor power input	1	[kW]	243	257	272	286	309	333	358	399	447
Total power input	2	[kW]	260	275	290	304	330	355	381	422	470
Partial recovery heating capacity	3	[kW]	181	194	206	217	232	247	271	294	315
EER	1	-	2.55	2.58	2.61	2.63	2.58	2.54	2.62	2.54	2.40
Water flow-rate (User Side)	1	[l/s]	31.7	34.0	36.1	38.2	40.7	43.1	47.7	51.3	53.8
Internal exchanger pressure drops	1	[kPa]	38	40	40	39	36	32	39	35	38
Cooling capacity (EN14511:2013)	4	[kW]	661	709	753	798	849	900	996	1071	1123
Total power input (EN14511:2013)	4	[kW]	261	278	292	307	332	358	384	425	474
EER (EN 14511:2013)	4	-	2.53	2.55	2.58	2.60	2.55	2.51	2.59	2.52	2.37
SEER	7	-	4,10	4,11	4,11	4,10	4,12	4,11	4,12	4,11	4,10
Heating											
Heating capacity	5	[kW]	800	848	893	938	1010	1081	1196	1287	1387
Compressor power input	5	[kW]	220	233	246	259	281	302	333	368	397
Total power input	2	[kW]	242	257	271	286	310	334	364	399	429
COP	5	-	3.30	3.30	3.29	3.28	3.26	3.24	3.29	3.23	3.23
Heating capacity (EN14511:2013)	6	[kW]	803	852	897	942	1014	1086	1201	1292	1391
Total power input (EN14511:2013)	6	[kW]	246	261	275	290	314	338	369	404	435
COP (EN 14511:2013)	6		3.27	3.26	3.26	3.25	3.23	3.22	3.25	3.20	3.20

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6. Data compliant to Standard EN 14511:2013 referred to the following conditions: - Internal exchanger water temperature = 40/45 °C. Entering external exchanger air temperature = 7°C D.B./6°C W.B.
7. Data calculated according to the EN 14825:2016 Regulation

EXCELLENCE VERSION

Acoustic configuration: compressor soundproofing (SC)

General technical data - Construction

Size			260.8	280.8	300.8	320.8	340.8	360.8	400.8	440.8	480.8
Compressor											
Type of compressors		-	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll
No. of compressors		Nr	8	8	8	8	8	8	8	8	8
Rated power (C1)		[HP]	60	70	70	80	80	90	100	100	120
Rated power (C2)		[HP]	60	70	70	80	80	90	100	120	120
Rated power (C3)		[HP]	70	70	80	80	90	90	100	100	120
Rated power (C4)		[HP]	70	70	80	80	90	90	100	120	120
Std Capacity control steps		Nr	10	12	10	8	10	12	12	10	8
Oil charge (C1)		[l]	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
Oil charge (C2)		[l]	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
Oil charge (C3)		[l]	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
Oil charge (C4)		[l]	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
Refrigerant charge (C1)	1	[kg]	52	53	53	54	54	65	65	65	82
Refrigerant charge (C2)	1	[kg]	49	52	52	53	53	63	63	79	82
Refrigerant charge (C3)		[kg]	53	53	54	54	65	65	65	65	82
Refrigerant charge (C4)		[kg]	52	52	53	53	63	63	63	79	82
Refrigeration circuits		Nr	4	4	4	4	4	4	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]	60.0	63.0	69.0	74.0	86.0	99.0	99.0	124	124
Minimum system water content	3	[l]	2578	1911	2439	3231	2761	2447	2682	3461	4604
External Section Fans											
Type of fans	4	-	AX	AX	AX	AX	AX	AX	AX	AX	AX
Number of fans		Nr	14	16	16	16	18	20	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]	86172	99614	98871	98127	111741	125354	122438	121708	120979
Connections											
Water fittings		-	6"	6"	6"	6"	6"	8"	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]	261,8	299,0	299,0	328,0	328,0	379,7	416,6	457,1	497,0
F.L.I. - Power line 1		[kW]	155,8	180,7	180,7	201,9	201,9	227,5	252,4	275,8	299,2
F.L.A. - Power line 2		[A]	299,0	299,0	328,0	328,0	379,7	379,7	416,6	457,1	497,0
F.L.I. - Power line 2		[kW]	180,7	180,7	201,9	201,9	227,5	227,5	252,4	275,8	299,2
M.I.C. - Value	6	A	881,0	918,2	947,2	976,3	977,7	1029,1	1103,5	1183,9	1264,3
M.I.C. - with soft start accessory	6	A	709,0	746,2	775,2	804,3	977,7	1029,1	1103,5	1183,9	1264,3

1. Indicative values for standard units with possible +/-10% variation. The actual data are indicated on the label of the unit.
2. PHE = Plate exchanger
3. The minimum system water content calculated value does not consider the internal exchanger water content. 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			260.8	280.8	300.8	320.8	340.8	360.8	400.8	440.8	480.8
Compressor											
Type of compressors		-	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll
No. of compressors		Nr	8	8	8	8	8	8	8	8	8
Rated power (C1)		[HP]	60	70	70	80	80	90	100	100	120
Rated power (C2)		[HP]	60	70	70	80	80	90	100	120	120
Rated power (C3)		[HP]	70	70	80	80	90	90	100	100	120
Rated power (C4)		[HP]	70	70	80	80	90	90	100	120	120
Std Capacity control steps		Nr	10	12	10	8	10	12	12	10	8
Oil charge (C1)		[l]	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
Oil charge (C2)		[l]	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
Oil charge (C3)		[l]	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
Oil charge (C4)		[l]	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
Refrigerant charge (C1)	1	[kg]	52	53	53	54	54	65	65	65	82
Refrigerant charge (C2)	1	[kg]	49	52	52	53	53	63	63	79	82
Refrigerant charge (C3)		[kg]	53	53	54	54	65	65	65	65	82
Refrigerant charge (C4)		[kg]	52	52	53	53	63	63	63	79	82
Refrigeration circuits		Nr	4	4	4	4	4	4	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
Totale water content		[l]	60.0	63.0	69.0	74.0	86.0	99.0	99.0	124	124
Minimum system water content	3	[l]	2578	1911	2439	3231	2761	2447	2682	3461	4604
External Section Fans											
Type of fans	4	-	AX	AX	AX	AX	AX	AX	AX	AX	AX
Number of fans		Nr	14	16	16	16	18	20	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]	70353	81567	80708	79848	90794	101740	99552	98935	98318
Connections											
Water fittings		-	6″	6″	6″	6″	6″	8″	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]	261,8	299,0	299,0	328,0	328,0	379,7	416,6	457,1	497,0
F.L.I. - Power line 1		[kW]	155,8	180,7	180,7	201,9	201,9	227,5	252,4	275,8	299,2
F.L.A. - Power line 2		[A]	299,0	299,0	328,0	328,0	379,7	379,7	416,6	457,1	497,0
F.L.I. - Power line 2		[kW]	180,7	180,7	201,9	201,9	227,5	227,5	252,4	275,8	299,2
M.I.C. - Value	6	A	881,0	918,2	947,2	976,3	977,7	1029,1	1103,5	1183,9	1264,3
M.I.C. - with soft start accessory	6	A	709,0	746,2	775,2	804,3	977,7	1029,1	1103,5	1183,9	1264,3

1. Indicative values for standard units with possible +/-10% variation. The actual data are indicated on the label of the unit.
2. PHE = Plate exchanger
3. The minimum system water content calculated value does not consider the internal exchanger water content. 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.

Sound levels

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)
260.8	97	94	94	92	92	89	75	66	95	73
280.8	97	94	94	92	92	89	75	66	95	73
300.8	97	94	94	92	92	89	75	66	96	74
320.8	98	95	95	93	93	90	76	67	96	74
340.8	102	98	97	95	92	88	79	73	97	74
360.8	104	100	99	96	92	87	81	75	98	75
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	75

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)
260.8	91	88	88	86	86	83	69	60	89	67
280.8	91	88	88	86	86	83	69	60	89	67
300.8	91	88	88	86	86	83	69	60	90	68
320.8	92	89	89	87	87	84	70	61	90	68
340.8	97	93	92	89	87	83	74	67	92	69
360.8	99	95	94	91	87	82	76	70	93	70
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	70

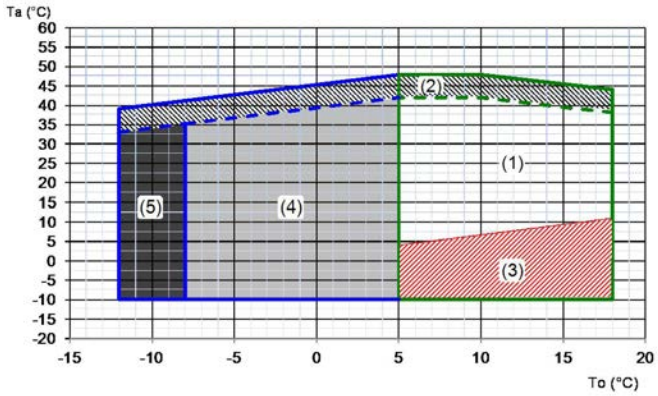
The sound levels refer to standard unit with Axitop (no accessories) at full load, in test nominal conditions. The sound pressure level refers to 1 m. from the standard unit outer surface operating in open field.
Measures are according to UNI EN ISO 9614-2 regulations, with respect to the EUROVENT 8/1 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 - Cooling

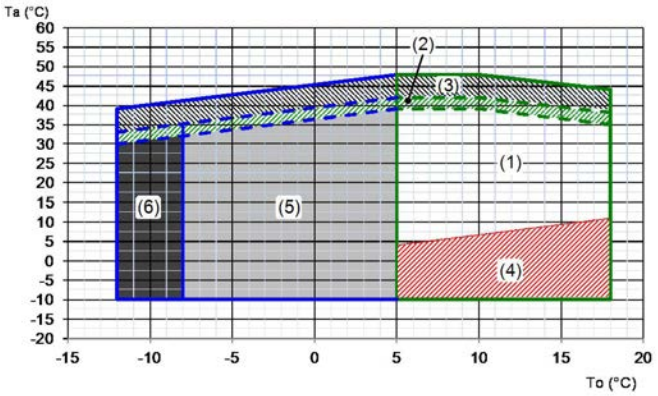
Compressor soundproofing (SC)



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. Extended of operating range (extremely low water temperature option available on request)

Super-silenced (EN)

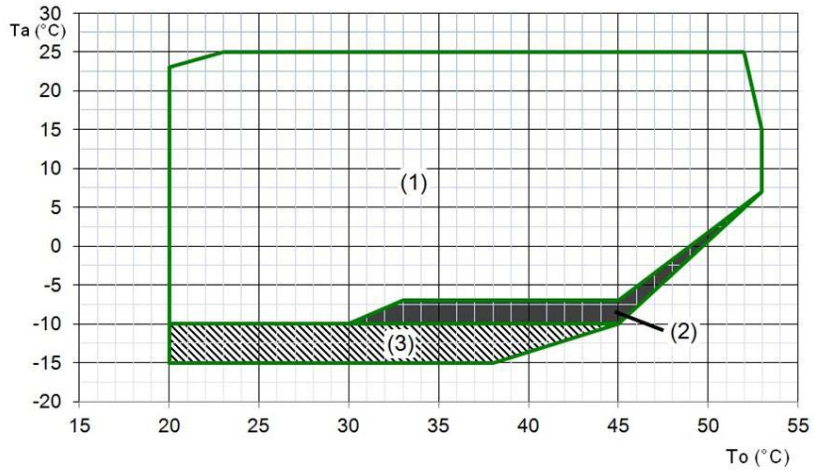


Ta (°C)= external exchanger inlet air temperature (D.B.)
To (°C)= internal exchanger outlet water temperature

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

Operating range - Heating

Compressor soundproofing (SC) / super-silenced (EN)



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. Unti operating range with 'OHE - operating range extension kit up to -10°C (W.B.)
3. Range in which the unit operation is allowed only for a limited period (max 1 hour).

Admissible water flow-rates

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

EXCELLENCE SC/EN		260.8	280.8	300.8	320.8	340.8	360.8	400.8	440.8	480.8
Qmin	[l/s]	19,4	20,3	21,7	23,1	25,9	28,7	28,7	32,9	32,9
Qmax	[l/s]	52,6	54,9	58,6	62,3	69,8	77,2	77,2	87,9	87,9

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	
m^2 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]	3	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		42		48	
		kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe
260.8	5	751	188	707	206	654	227	601	251	578	266	290	121
	6	772	189	727	208	675	229	622	253	601	269	301	122
	7	800	191	752	210	694	231	637	256	614	272	308	123
	10	852	195	796	214	733	236	674	261	650	280	326	127
	15	980	204	918	223	849	245	800	275	468	137	-	-
	18	1084	211	1013	230	940	252	891	288	523	140	-	-
280.8	5	802	200	753	220	698	241	643	267	616	284	296	119
	6	824	202	775	221	718	243	665	269	642	286	308	120
	7	853	205	802	224	741	246	682	271	658	288	316	121
	10	907	209	850	228	781	250	722	276	699	299	336	126
	15	1035	219	972	238	901	261	855	295	519	157	-	-
	18	1151	227	1068	246	995	268	951	307	585	160	-	-
300.8	5	854	212	805	232	744	255	681	283	654	302	331	139
	6	876	215	826	234	766	256	703	285	679	303	344	140
	7	907	217	854	237	788	260	722	288	699	305	354	141
	10	959	222	901	241	831	264	764	292	747	314	378	145
	15	1104	233	1033	252	959	277	897	307	534	152	-	-
	18	1220	240	1141	260	1060	285	994	317	597	155	-	-
320.8	5	906	224	856	244	790	268	719	299	691	320	366	160
	6	929	227	878	247	813	270	741	302	716	321	380	160
	7	960	230	906	249	835	274	762	304	741	323	393	161
	10	1011	235	952	254	880	278	805	309	795	329	421	164
	15	1173	246	1093	265	1016	292	939	319	550	148	-	-
	18	1289	254	1213	274	1125	302	1038	326	610	150	-	-
340.8	5	975	240	917	263	847	289	773	324	746	342	334	141
	6	1005	242	944	266	873	291	793	327	769	344	344	141
	7	1032	245	968	268	892	295	812	328	789	347	354	142
	10	1083	250	1015	272	937	299	867	335	837	355	376	145
	15	1257	262	1172	284	1087	313	1008	349	643	191	-	-
	18	1388	270	1296	293	1202	322	1112	357	721	194	-	-
360.8	5	1044	255	979	282	904	311	827	349	801	365	301	121
	6	1081	258	1010	285	933	313	845	352	823	368	309	122
	7	1103	260	1030	286	949	316	863	353	838	370	315	123
	10	1156	265	1079	291	994	319	929	362	879	380	331	127
	15	1341	277	1250	303	1157	333	1076	378	736	234	-	-
	18	1487	285	1379	312	1279	342	1186	388	831	238	-	-
400.8	5	1137	283	1067	309	991	337	917	369	895	384	548	237
	6	1166	285	1094	311	1023	341	946	373	919	387	563	239
	7	1199	289	1122	315	1040	343	965	375	942	389	577	240
	10	1252	295	1176	321	1086	350	1009	381	987	395	605	245
	15	1426	309	1350	337	1259	366	1184	398	787	223	-	-
	18	1585	321	1488	349	1390	377	1312	409	883	227	-	-

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)

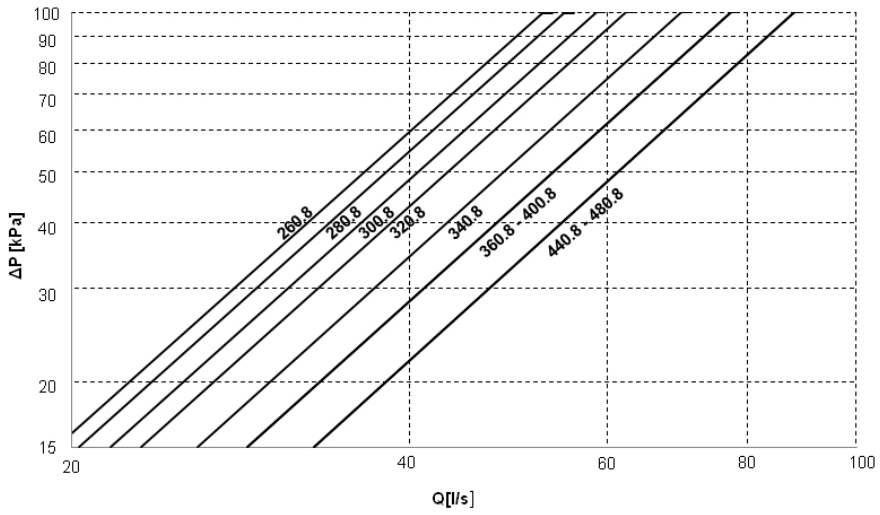
Cooling performance

Size	To (°C)	ENTERING EXTERNAL EXCHANGER AIR TEMPERATURE (°C)											
		25		30		35		40		42		48	
		kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe
440.8	5	1234	310	1161	339	1069	374	972	418	943	438	531	238
	6	1265	313	1192	341	1095	376	997	419	961	444	541	242
	7	1291	315	1213	342	1118	377	1013	423	979	452	551	246
	10	1350	320	1261	349	1161	384	1050	436	1038	466	585	254
	15	1577	336	1475	363	1364	403	1269	463	780	244	-	-
	18	1757	345	1639	376	1520	412	1445	470	889	250	-	-
480.8	5	1311	342	1235	375	1140	413	1029	454	1005	484	525	236
	6	1344	346	1269	376	1166	417	1058	459	1027	492	536	241
	7	1370	349	1294	377	1190	417	1087	464	1047	499	547	244
	10	1437	353	1343	384	1238	424	1122	479	1110	519	580	254
	15	1671	368	1558	400	1452	441	1352	509	775	233	-	-
	18	1858	379	1731	416	1615	454	1536	516	869	236	-	-

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 = Different between entering/leaving water temperature

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) / Acoustic configuration: super-silenced (EN)

Heating performance (continued)

Size	Ta (°C) D.B./W.B.	LEAVING INTERNAL EXCHANGER WATER TEMPERATURE (°C)									
		35		40		45		50		53	
		kWt	kWe	kWt	kWe	kWt	kWe	kWt	kWe	kWt	kWe
260.8	-7 / -8	583	173	580	192	574	213	-	-	-	-
	-5 / -6	612	174	608	193	601	213	-	-	-	-
	0 / -1	700	177	689	196	679	216	-	-	-	-
	2 / 1	738	178	726	197	713	217	-	-	-	-
	7 / 6	839	182	821	201	800	220	781	246	779	260
	12 / 11	972	187	947	206	919	226	894	251	893	266
280.8	-7 / -8	619	182	617	201	611	222	-	-	-	-
	-5 / -6	650	183	648	202	638	224	-	-	-	-
	0 / -1	742	187	733	206	724	228	-	-	-	-
	2 / 1	782	188	772	208	758	229	-	-	-	-
	7 / 6	891	193	870	212	848	233	831	259	829	273
	12 / 11	1030	198	1005	218	974	239	951	265	947	280
300.8	-7 / -8	652	190	648	210	640	232	-	-	-	-
	-5 / -6	685	192	680	212	670	234	-	-	-	-
	0 / -1	781	197	769	217	757	239	-	-	-	-
	2 / 1	823	199	811	219	794	241	-	-	-	-
	7 / 6	935	204	915	224	893	246	873	273	870	288
	12 / 11	1084	210	1057	231	1026	253	999	280	994	295
320.8	-7 / -8	684	199	678	220	669	243	-	-	-	-
	-5 / -6	720	201	712	222	701	245	-	-	-	-
	0 / -1	821	207	805	227	789	251	-	-	-	-
	2 / 1	865	209	850	230	831	253	-	-	-	-
	7 / 6	980	215	961	236	938	259	914	287	911	302
	12 / 11	1138	222	1108	244	1078	267	1047	294	1040	310
340.8	-7 / -8	740	217	734	241	724	268	-	-	-	-
	-5 / -6	777	219	771	243	759	270	-	-	-	-
	0 / -1	881	224	872	247	855	274	-	-	-	-
	2 / 1	930	226	917	249	898	276	-	-	-	-
	7 / 6	1053	231	1034	254	1010	281	986	312	981	331
	12 / 11	1220	237	1191	261	1157	287	1127	318	1118	337
360.8	-7 / -8	795	235	791	262	778	293	-	-	-	-
	-5 / -6	834	236	829	264	817	294	-	-	-	-
	0 / -1	942	241	939	268	920	298	-	-	-	-
	2 / 1	995	242	985	269	966	299	-	-	-	-
	7 / 6	1126	247	1108	273	1081	302	1057	337	1051	359
	12 / 11	1302	252	1273	278	1236	307	1206	342	1196	364
400.8	-7 / -8	877	256	871	285	854	317	-	-	-	-
	-5 / -6	920	258	914	287	899	319	-	-	-	-
	0 / -1	1045	264	1034	292	1011	324	-	-	-	-
	2 / 1	1103	267	1087	295	1067	327	-	-	-	-
	7 / 6	1241	272	1223	300	1196	333	1162	369	1155	392
	12 / 11	1434	279	1403	307	1369	339	1324	376	1315	399

kWt = Internal exchanger heating capacity (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.
The kWt heating capacity does not consider any defrosting cycles. For the real heating capacity calculation, including defrosting cycles, please refer to "Integrated heating capacities" table.
kWe = Compressor power input in kW
Ta = Entering external exchanger air temperature
D.B. = Dry bulb
W.B. = Wet bulb
With Ta below -5°C 'OHE - Limit extension kit in heating' accessory included.

EXCELLENCE VERSION

Acoustic configuration: compressor soundproofing (SC) /

Acoustic configuration: super-silenced (EN)

Heating performance

Size	Ta (°C) D.B./W.B.	LEAVING INTERNAL EXCHANGER WATER TEMPERATURE (°C)									
		35		40		45		50		53	
		kWt	kWe	kWt	kWe	kWt	kWe	kWt	kWe	kWt	kWe
440.8	-7 / -8	946	284	940	317	920	354	-	-	-	-
	-5 / -6	991	287	988	319	967	356	-	-	-	-
	0 / -1	1125	292	1110	324	1090	361	-	-	-	-
	2 / 1	1186	295	1169	327	1146	363	-	-	-	-
	7 / 6	1334	300	1316	332	1287	368	1253	411	1244	438
	12 / 11	1538	307	1508	339	1466	374	1425	417	1412	443
480.8	-7 / -8	1021	306	1011	342	988	382	-	-	-	-
	-5 / -6	1068	309	1060	344	1041	384	-	-	-	-
	0 / -1	1204	315	1200	349	1169	389	-	-	-	-
	2 / 1	1272	317	1258	352	1230	391	-	-	-	-
	7 / 6	1433	322	1409	357	1387	397	1345	444	1338	474
	12 / 11	1646	328	1614	364	1574	402	1529	450	1517	479

kWt = Internal exchanger heating capacity (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.
The kWt heating capacity does not consider any defrosting cycles. For the real heating capacity calculation, including defrosting cycles, please refer to "Integrated heating capacities" table.
kWe = Compressor power input in kW
Ta = Entering external exchanger air temperature
D.B. = Dry bulb
W.B. = Wet bulb
With Ta below -5°C 'OHE - Limit extension kit in heating' accessory included.

Integrated heating capacities

Entering external exchanger air temperature °C (D.B. / W.B.)	-7 / -8	-5 / -6	0 / -1	2 / 1	Other
Heating capacity multiplication coefficient	0,90	0,89	0,88	0,90	1,00

The integrated heating capacity represents the real heating capacity considering the defrost cycles too.
To obtain the integrated heating capacity multiply the heating performance value in kWt (shown in the heating performance tables) by the coefficients indicated in the table.
DB = dry bulb
WB = wet bulb
In case of below zero outdoor air temperature with a long period of heat pump operating mode it is necessary to help the evacuation of the water produced during the defrost cycle; this to avoid the formation of ice in the unit basement. Pay attention that the evacuation will not create inconveniences to things or persons.

EXCELLENCE VERSION

Acoustic configuration: super-silenced (EN)

Cooling performance

(continued)

Size	To (°C)	ENTERING EXTERNAL EXCHANGER AIR TEMPERATURE (°C)											
		25		30		35		39		42		48	
		kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe
260.8	5	726	197	682	217	629	239	585	262	578	266	290	121
	6	752	200	703	219	648	241	605	265	601	269	301	122
	7	769	202	720	221	663	243	618	269	614	272	308	123
	10	816	208	763	227	702	249	654	277	650	280	326	127
	15	941	218	877	237	816	263	667	237	469	137	-	-
	18	1038	224	967	244	902	270	737	243	522	140	-	-
280.8	5	779	209	733	230	677	252	627	277	616	284	296	119
	6	807	211	753	232	694	254	650	281	642	286	308	120
	7	825	214	772	234	711	257	662	284	658	288	316	121
	10	875	220	818	240	753	263	700	296	699	299	336	126
	15	1006	231	936	252	874	278	723	257	519	157	-	-
	18	1101	238	1032	259	963	287	800	264	585	160	-	-
300.8	5	831	221	778	242	719	266	667	294	654	302	331	139
	6	857	223	802	245	738	268	690	297	679	303	344	140
	7	881	226	822	247	756	272	703	300	699	305	354	141
	10	930	232	867	253	797	277	741	309	747	314	378	145
	15	1062	244	988	266	920	294	755	264	535	152	-	-
	18	1159	252	1083	274	1006	302	831	271	598	155	-	-
320.8	5	884	232	823	255	761	280	707	311	691	320	366	160
	6	907	235	851	258	783	282	730	313	716	321	380	160
	7	936	238	872	260	800	286	744	315	741	323	393	161
	10	986	245	915	266	842	291	783	323	795	329	421	164
	15	1118	257	1040	279	965	310	787	271	551	148	-	-
	18	1217	266	1134	288	1049	317	862	277	611	150	-	-
340.8	5	945	252	881	276	815	303	754	338	746	342	334	141
	6	971	254	907	279	836	306	774	340	769	344	344	141
	7	998	257	927	282	851	309	790	342	789	347	354	142
	10	1048	263	972	288	895	315	833	348	837	355	376	145
	15	1199	276	1116	301	1036	333	852	302	645	191	-	-
	18	1312	285	1222	310	1135	343	935	309	719	194	-	-
360.8	5	1006	272	938	298	868	327	801	365	801	365	301	121
	6	1036	274	962	301	889	330	819	367	823	368	309	122
	7	1060	276	983	304	902	333	836	368	838	370	315	123
	10	1111	281	1028	309	949	338	884	374	879	380	331	127
	15	1281	296	1192	323	1107	356	918	332	738	234	-	-
	18	1407	304	1311	332	1221	369	1008	341	827	238	-	-
400.8	5	1099	296	1028	323	953	351	899	380	895	384	548	237
	6	1125	299	1051	326	976	355	923	383	919	387	563	239
	7	1145	302	1074	330	999	358	943	385	942	389	577	240
	10	1203	310	1123	337	1045	366	988	392	987	395	605	245
	15	1372	326	1289	354	1213	384	1038	350	787	223	-	-
	18	1509	337	1409	364	1333	395	1143	356	883	227	-	-

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)

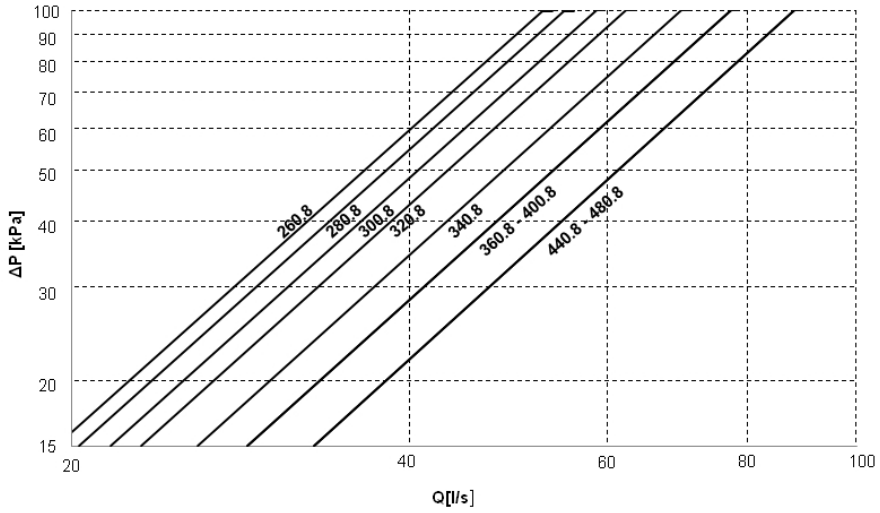
Cooling performance

Size	To (°C)	ENTERING EXTERNAL EXCHANGER AIR TEMPERATURE (°C)											
		25		30		35		39		42		48	
		kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe
440.8	5	1211	323	1126	355	1032	392	950	437	943	438	531	238
	6	1239	326	1152	357	1055	395	970	443	961	444	541	242
	7	1265	329	1174	360	1073	399	988	444	979	452	551	246
	10	1319	334	1222	366	1114	405	1047	459	1038	466	585	254
	15	1531	351	1419	384	1310	430	1058	397	778	244	-	-
	18	1695	362	1578	396	1457	445	1171	406	888	250	-	-
480.8	5	1268	361	1179	397	1083	438	1003	488	1005	484	525	236
	6	1297	365	1206	400	1108	442	1025	496	1027	492	536	241
	7	1325	368	1231	404	1127	447	1047	498	1047	499	547	244
	10	1382	374	1280	409	1169	454	1102	512	1110	519	580	254
	15	1618	392	1501	429	1389	480	1109	430	775	233	-	-
	18	1812	404	1693	443	1573	492	1237	438	870	236	-	-

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 = Different between entering/leaving water temperature

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 (continued)

Size	STEP	External exchanger entering air temperature (°C)											
		20			25			30			35		
		kWf	kWe_tot	EER	kWf	kWe_tot	EER	kWf	kWe_tot	EER	kWf	kWe_tot	EER
260.8	14	834	196	4,26	800	214	3,74	752	232	3,24	694	254	2,74
	13	756	172	4,40	724	187	3,86	681	204	3,34	628	223	2,82
	12	752	172	4,36	720	188	3,83	678	204	3,32	625	223	2,81
	11	673	148	4,54	645	162	3,99	607	176	3,45	560	192	2,92
	10	589	123	4,78	565	134	4,20	531	146	3,64	490	160	3,07
	9	586	124	4,74	562	135	4,16	528	146	3,61	488	160	3,05
	8	502	99	5,09	481	108	4,48	453	117	3,87	418	128	3,27
	7	476	93	5,15	457	101	4,52	429	110	3,92	396	120	3,31
	6	390	78	5,03	374	85	4,42	352	92	3,83	325	100	3,24
	5	365	72	5,10	349	78	4,48	329	85	3,88	303	92	3,29
	4	340	66	5,20	326	71	4,57	307	78	3,96	283	85	3,35
	2	219	44	5,03	210	48	4,42	198	52	3,83	182	56	3,23
	1	111	22	5,00	107	24	4,40	100	26	3,82	93	29	3,25
280.8	12	890	211	4,22	853	230	3,71	802	249	3,22	741	271	2,74
	11	811	187	4,34	777	204	3,82	731	221	3,31	676	240	2,82
	10	732	163	4,50	702	177	3,96	660	192	3,44	610	209	2,92
	9	648	138	4,71	621	150	4,14	584	162	3,60	540	177	3,06
	8	564	112	5,02	541	123	4,41	509	133	3,83	470	144	3,25
	7	539	106	5,06	516	116	4,45	486	126	3,86	449	137	3,28
	6	513	100	5,11	492	109	4,49	463	119	3,90	427	129	3,32
	5	489	94	5,18	468	103	4,55	441	111	3,96	407	121	3,36
	4	464	88	5,26	445	96	4,62	419	104	4,02	387	113	3,41
	2	222	44	5,00	213	48	4,40	201	52	3,82	185	57	3,25
	1	111	22	5,00	107	24	4,40	100	26	3,82	93	29	3,25
300.8	14	946	223	4,25	907	243	3,74	854	262	3,26	788	285	2,76
	13	867	199	4,37	831	216	3,84	783	234	3,35	722	254	2,84
	12	839	192	4,37	804	209	3,84	757	226	3,35	699	246	2,84
	11	760	168	4,53	728	183	3,98	686	197	3,48	633	215	2,94
	10	676	143	4,74	648	155	4,17	611	168	3,64	563	183	3,08
	9	647	137	4,72	620	149	4,15	584	161	3,62	539	176	3,07
	8	563	112	5,03	539	122	4,42	508	132	3,86	469	143	3,27
	7	537	106	5,08	515	115	4,46	485	125	3,90	447	136	3,30
	6	420	84	4,99	403	92	4,39	379	99	3,82	350	108	3,24
	5	395	78	5,05	378	85	4,44	356	92	3,87	329	100	3,28
	4	370	72	5,13	355	79	4,52	334	85	3,94	309	92	3,34
	2	249	50	4,97	239	55	4,37	225	59	3,81	208	64	3,23
	1	111	22	5,00	107	24	4,40	100	26	3,82	93	29	3,25
320.8	8	1002	234	4,28	960	255	3,76	906	275	3,30	834	300	2,78
	7	895	204	4,39	858	222	3,87	809	239	3,39	745	260	2,86
	6	788	173	4,56	755	188	4,01	712	203	3,51	656	221	2,97
	5	675	142	4,75	647	155	4,18	610	167	3,66	562	182	3,09
	4	562	111	5,05	538	121	4,44	508	131	3,89	467	142	3,28
	2	276	56	4,94	265	61	4,34	250	66	3,81	230	72	3,21
	1	138	28	4,94	132	30	4,34	125	33	3,81	115	36	3,21

kWf = Cooling capacity in kW kWe_tot = Unit total power input in kW
STEP = Active capacity steps (the maximum number indicates full capacity / the minimum number indicates the smallest partialization step)
Internal exchanger water = output temperature 7°C/ input * (variable) / constant flow equal to the max. step nominal value.

Cooling performance at part load

Size	STEP	External exchanger entering air temperature (°C)											
		20			25			30			35		
		kWf	kWe_tot	EER	kWf	kWe_tot	EER	kWf	kWe_tot	EER	kWf	kWe_tot	EER
340.8	14	1076	251	4,29	1032	273	3,77	968	296	3,27	891	323	2,76
	13	998	226	4,42	957	246	3,88	898	267	3,37	827	291	2,84
	12	969	220	4,40	929	240	3,87	871	260	3,35	802	284	2,82
	11	891	195	4,56	854	213	4,01	801	231	3,48	738	252	2,93
	10	819	171	4,80	785	186	4,22	737	201	3,66	678	220	3,08
	9	778	164	4,73	745	179	4,16	699	194	3,60	643	212	3,03
	8	706	140	5,04	676	153	4,43	634	165	3,84	584	181	3,23
	7	585	119	4,91	561	130	4,32	526	141	3,74	485	154	3,15
	6	563	112	5,02	540	122	4,41	505	133	3,80	465	145	3,20
	5	442	92	4,83	424	100	4,25	397	108	3,67	366	118	3,09
	4	380	73	5,24	364	79	4,60	341	86	3,98	314	94	3,36
	2	247	50	4,94	237	55	4,34	223	59	3,77	205	65	3,18
	1	109	22	4,94	105	24	4,34	98	26	3,73	90	29	3,14
360.8	12	1150	267	4,30	1103	292	3,78	1030	317	3,25	948	347	2,73
	11	1072	242	4,42	1028	264	3,89	960	288	3,34	884	315	2,81
	10	994	218	4,57	953	237	4,01	890	258	3,45	819	282	2,90
	9	922	193	4,77	884	211	4,20	825	229	3,60	760	251	3,03
	8	850	169	5,04	815	184	4,43	761	200	3,80	701	219	3,20
	7	729	148	4,93	699	161	4,34	653	175	3,72	601	192	3,13
	6	609	127	4,79	584	139	4,21	545	151	3,61	502	165	3,04
	5	546	108	5,05	524	118	4,44	489	128	3,81	450	140	3,21
	4	484	89	5,43	464	97	4,77	433	106	4,09	399	116	3,45
	2	219	44	4,94	210	48	4,34	196	53	3,73	180	57	3,14
	1	109	22	4,94	105	24	4,34	98	26	3,73	90	29	3,14
400.8	12	1251	295	4,24	1199	321	3,74	1122	347	3,24	1040	375	2,77
	11	1151	263	4,38	1103	286	3,85	1033	309	3,34	957	335	2,86
	10	1051	231	4,55	1008	252	4,00	943	272	3,47	874	294	2,97
	9	951	200	4,76	911	218	4,19	853	235	3,63	791	254	3,11
	8	850	169	5,04	815	184	4,44	763	198	3,84	707	215	3,30
	7	780	153	5,09	747	167	4,48	699	180	3,88	648	195	3,32
	6	709	138	5,14	679	150	4,52	636	162	3,92	589	175	3,36
	5	650	124	5,26	623	135	4,63	583	145	4,01	540	157	3,44
	4	591	109	5,40	566	119	4,76	530	129	4,12	491	139	3,53
	2	295	55	5,35	282	60	4,71	264	65	4,08	245	70	3,50
	1	147	28	5,35	141	30	4,71	132	32	4,08	123	35	3,50
440.8	12	1347	318	4,23	1291	347	3,72	1213	374	3,24	1118	409	2,73
	11	1243	288	4,32	1191	314	3,80	1120	338	3,31	1032	370	2,79
	10	1139	257	4,43	1092	280	3,89	1026	302	3,40	946	330	2,86
	9	987	211	4,67	946	230	4,11	889	248	3,58	820	271	3,02
	8	835	165	5,05	800	180	4,44	752	194	3,87	693	212	3,26
	7	768	150	5,12	736	164	4,50	692	176	3,92	637	193	3,31
	6	700	135	5,20	671	147	4,57	631	158	3,99	582	173	3,36
	5	557	107	5,19	534	117	4,56	502	126	3,98	463	138	3,35
	4	414	80	5,16	396	87	4,54	373	94	3,96	343	103	3,34
	2	281	55	5,11	270	60	4,49	253	65	3,92	234	71	3,30
	1	141	28	5,11	135	30	4,49	127	32	3,92	117	35	3,30
480.8	8	1430	350	4,08	1370	382	3,59	1294	409	3,17	1190	449	2,65
	7	1280	303	4,22	1227	330	3,71	1159	354	3,27	1066	389	2,74
	6	1131	256	4,41	1084	279	3,88	1024	299	3,42	941	328	2,87
	5	990	210	4,72	949	228	4,15	896	245	3,66	824	269	3,07
	4	849	163	5,21	814	178	4,59	769	190	4,04	707	209	3,39
	2	423	82	5,17	406	89	4,55	383	96	4,01	352	105	3,36
	1	212	41	5,17	203	45	4,55	191	48	4,01	176	52	3,36

kWf = Cooling capacity in kW kWe_tot = Unit total power input in kW
STEP = Active capacity steps (the maximum number indicates full capacity / the minimum number indicates the smallest partialization step)
Internal exchanger water = output temperature 7°C/ input * (variable) / constant flow equal to the max. step nominal value.

EXCELLENCE VERSION

Acoustic configuration: super-silenced (EN)

Cooling performance at part load (continued)

Size	STEP	External exchanger entering air temperature (°C)											
		20			25			30			35		
		kWf	kWe_tot	EER	kWf	kWe_tot	EER	kWf	kWe_tot	EER	kWf	kWe_tot	EER
260.8	14	803	200	4,01	769	218	3,52	720	237	3,04	663	260	2,55
	13	730	175	4,17	700	191	3,67	655	207	3,16	603	227	2,65
	12	728	175	4,16	698	191	3,65	653	207	3,15	601	227	2,65
	11	655	150	4,37	628	163	3,84	588	177	3,31	541	194	2,79
	10	582	125	4,67	558	136	4,11	523	148	3,54	481	162	2,97
	9	579	125	4,64	555	136	4,08	519	148	3,52	478	162	2,96
	8	506	99	5,09	485	108	4,47	454	118	3,86	418	129	3,24
	7	480	93	5,14	460	102	4,52	431	111	3,89	396	121	3,27
	6	394	78	5,05	377	85	4,44	353	92	3,83	325	101	3,22
	5	368	72	5,11	352	78	4,50	330	85	3,87	304	93	3,26
	4	343	66	5,21	329	72	4,58	308	78	3,95	283	85	3,32
	2	221	44	5,02	212	48	4,41	198	52	3,80	182	57	3,20
	1	112	22	5,07	108	24	4,46	101	26	3,84	93	29	3,24
280.8	12	861	213	4,04	825	233	3,55	772	252	3,06	711	276	2,58
	11	788	188	4,19	756	205	3,69	707	222	3,18	651	243	2,68
	10	716	163	4,40	686	177	3,87	642	193	3,33	591	210	2,81
	9	643	137	4,68	616	150	4,11	576	163	3,54	531	178	2,99
	8	570	112	5,08	546	122	4,47	511	133	3,85	470	145	3,25
	7	544	106	5,12	521	116	4,51	488	126	3,88	449	137	3,27
	6	518	100	5,17	497	109	4,55	464	118	3,92	428	129	3,31
	5	493	94	5,25	473	103	4,61	442	111	3,97	407	122	3,35
	4	469	88	5,33	450	96	4,68	420	104	4,04	387	114	3,40
	2	225	44	5,07	215	48	4,46	201	52	3,84	185	57	3,24
	1	112	22	5,07	108	24	4,46	101	26	3,84	93	29	3,24
300.8	14	919	224	4,09	881	245	3,60	822	266	3,09	755	290	2,61
	13	846	199	4,25	811	217	3,74	757	236	3,21	696	257	2,70
	12	818	193	4,25	784	210	3,73	732	228	3,21	673	249	2,70
	11	745	167	4,45	715	182	3,92	667	198	3,37	613	216	2,83
	10	672	142	4,73	645	155	4,16	601	168	3,58	553	184	3,01
	9	645	136	4,74	619	148	4,17	577	161	3,58	531	176	3,02
	8	572	111	5,16	549	121	4,54	512	131	3,90	471	143	3,28
	7	546	105	5,21	524	114	4,58	489	124	3,94	449	135	3,32
	6	426	84	5,10	409	91	4,48	382	99	3,86	351	108	3,25
	5	400	78	5,16	384	85	4,54	358	92	3,90	330	100	3,29
	4	376	72	5,25	360	78	4,62	336	85	3,97	309	92	3,35
	2	254	50	5,10	243	54	4,49	227	59	3,86	209	64	3,25
	1	112	22	5,07	108	24	4,46	101	26	3,84	93	29	3,24
320.8	8	976	235	4,15	936	257	3,65	872	279	3,13	800	304	2,63
	7	875	204	4,30	840	222	3,78	782	241	3,24	718	263	2,72
	6	775	172	4,51	743	188	3,96	692	204	3,40	635	222	2,86
	5	675	141	4,79	647	153	4,22	603	167	3,61	553	182	3,04
	4	575	110	5,25	551	119	4,61	513	130	3,96	471	142	3,32
	2	283	55	5,13	271	60	4,51	252	65	3,87	232	71	3,25
	1	141	28	5,13	136	30	4,51	126	33	3,87	116	36	3,25

kWf = Cooling capacity in kW kWe_tot = Unit total power input in kW
STEP = Active capacity steps (the maximum number indicates full capacity / the minimum number indicates the smallest partialization step)
Internal exchanger water = output temperature 7°C/ input * (variable) / constant flow equal to the max. step nominal value.

Cooling performance at part load

Size	STEP	External exchanger entering air temperature (°C)											
		20			25			30			35		
		kWf	kWe_tot	EER	kWf	kWe_tot	EER	kWf	kWe_tot	EER	kWf	kWe_tot	EER
340.8	14	1041	255	4,09	998	278	3,59	927	303	3,06	851	330	2,58
	13	968	228	4,24	928	249	3,73	863	271	3,18	792	296	2,68
	12	940	223	4,22	901	243	3,71	837	265	3,16	769	289	2,66
	11	867	197	4,41	832	214	3,88	773	234	3,31	709	255	2,78
	10	795	170	4,68	763	185	4,12	709	202	3,51	650	220	2,96
	9	767	165	4,64	736	180	4,08	683	197	3,47	627	214	2,93
	8	695	139	5,01	667	151	4,41	619	165	3,75	568	180	3,16
	7	579	118	4,91	556	129	4,32	516	140	3,68	474	153	3,10
	6	549	111	4,93	527	122	4,33	489	133	3,68	449	144	3,11
	5	433	91	4,77	416	99	4,20	386	108	3,57	354	118	3,01
	4	373	72	5,19	358	78	4,57	333	86	3,89	305	93	3,28
	2	246	50	4,97	236	54	4,37	220	59	3,73	202	64	3,14
	1	105	22	4,76	101	24	4,18	93	26	3,55	86	29	2,99
360.8	12	1105	274	4,03	1060	299	3,55	983	327	3,01	902	355	2,54
	11	1032	248	4,17	990	270	3,67	918	295	3,11	843	321	2,62
	10	960	221	4,34	921	241	3,82	854	264	3,23	783	287	2,73
	9	888	194	4,56	851	212	4,01	789	232	3,40	724	252	2,87
	8	815	168	4,86	782	183	4,27	725	200	3,62	665	218	3,06
	7	700	147	4,76	671	160	4,18	622	176	3,55	571	191	2,99
	6	584	127	4,62	560	138	4,06	519	151	3,44	477	164	2,90
	5	524	108	4,87	503	117	4,28	466	128	3,63	428	140	3,06
	4	464	89	5,23	445	97	4,60	413	106	3,90	379	115	3,29
	2	210	44	4,76	201	48	4,18	187	53	3,55	171	57	2,99
	1	105	22	4,76	101	24	4,18	93	26	3,55	86	29	2,99
400.8	12	1195	298	4,01	1145	325	3,52	1074	353	3,04	999	381	2,62
	11	1102	265	4,16	1056	288	3,66	990	313	3,16	921	338	2,72
	10	1009	231	4,37	967	252	3,84	907	273	3,32	844	295	2,86
	9	916	198	4,63	878	216	4,07	824	234	3,52	766	253	3,03
	8	824	165	5,00	790	180	4,40	741	195	3,80	689	211	3,27
	7	764	151	5,07	732	164	4,46	687	178	3,85	639	193	3,32
	6	705	137	5,15	675	149	4,53	633	162	3,92	589	175	3,37
	5	646	123	5,27	619	134	4,63	581	145	4,00	540	157	3,45
	4	587	108	5,41	563	118	4,76	528	128	4,11	491	139	3,54
	2	293	55	5,36	281	59	4,72	263	65	4,08	245	70	3,51
	1	146	27	5,36	140	30	4,72	132	32	4,08	122	35	3,51
440.8	12	1319	322	4,09	1265	352	3,60	1174	383	3,06	1074	422	2,55
	11	1222	290	4,22	1172	316	3,71	1088	345	3,16	995	379	2,62
	10	1125	257	4,38	1079	281	3,85	1002	306	3,27	916	337	2,72
	9	984	208	4,73	944	227	4,16	876	247	3,54	801	272	2,94
	8	842	159	5,30	808	173	4,66	750	189	3,97	686	208	3,30
	7	781	145	5,38	749	159	4,72	696	173	4,02	636	190	3,34
	6	720	132	5,46	691	144	4,80	641	157	4,09	586	173	3,40
	5	573	105	5,45	549	115	4,79	510	125	4,08	466	138	3,39
	4	425	78	5,42	408	86	4,77	379	93	4,06	346	103	3,37
	2	289	54	5,36	277	59	4,71	258	64	4,01	236	71	3,33
	1	145	27	5,36	139	29	4,71	129	32	4,01	118	35	3,33
480.8	8	1382	359	3,85	1325	392	3,38	1231	427	2,88	1127	470	2,40
	7	1244	308	4,03	1193	337	3,54	1108	367	3,02	1014	404	2,51
	6	1106	258	4,29	1060	282	3,77	985	307	3,21	902	338	2,67
	5	968	208	4,65	929	227	4,09	863	248	3,49	789	273	2,90
	4	831	158	5,25	797	173	4,62	740	188	3,93	677	207	3,27
	2	414	79	5,21	397	87	4,58	369	95	3,90	337	104	3,24
	1	207	40	5,21	198	43	4,58	184	47	3,90	169	52	3,24

kWf = Cooling capacity in kW kWe_tot = Unit total power input in kW
STEP = Active capacity steps (the maximum number indicates full capacity / the minimum number indicates the smallest partialization step)
Internal exchanger water = output temperature 7°C/ input * (variable) / constant flow equal to the max. step nominal value.

EXCELLENCE VERSION

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

Heating performance at part load (continued)

Size	STEP	External exchanger entering air temperature (°C)																	
		-7 / -8			-5 / -6			0 / -1			2 / 1			7 / 6			12 / 11		
		kWt	kWe_tot	COP	kWt	kWe_tot	COP	kWt	kWe_tot	COP	kWt	kWe_tot	COP	kWt	kWe_tot	COP	kWt	kWe_tot	COP
260.8	14	583	195	2,98	612	197	3,11	700	199	3,51	738	201	3,68	839	204	4,10	972	210	4,64
	13	543	178	3,05	570	179	3,19	649	181	3,59	686	182	3,77	777	185	4,20	894	189	4,73
	12	518	172	3,01	545	173	3,14	624	176	3,54	657	177	3,71	751	181	4,16	864	185	4,67
	11	478	154	3,09	503	155	3,24	573	158	3,63	606	159	3,82	689	161	4,27	786	164	4,78
	10	433	136	3,18	456	137	3,33	521	139	3,75	549	140	3,93	626	142	4,41	714	145	4,93
	9	415	131	3,16	437	132	3,31	499	134	3,71	528	135	3,90	600	137	4,37	686	140	4,90
	8	370	113	3,27	389	114	3,43	446	115	3,87	472	116	4,06	538	118	4,55	614	120	5,10
	7	317	98	3,25	336	98	3,42	386	100	3,87	409	100	4,07	468	102	4,59	536	104	5,15
	6	297	90	3,28	312	91	3,43	357	93	3,86	377	93	4,05	429	95	4,53	489	96	5,07
	5	245	75	3,25	259	76	3,41	297	77	3,86	314	77	4,06	360	79	4,57	412	80	5,13
	4	193	60	3,21	205	60	3,39	237	61	3,87	252	62	4,08	290	63	4,62	334	64	5,22
	2	133	42	3,15	141	42	3,33	163	43	3,80	173	43	4,00	199	44	4,53	229	45	5,11
	1	60	19	3,20	64	19	3,38	74	19	3,88	79	19	4,08	91	20	4,63	105	20	5,25
280.8	12	620	207	3,00	650	208	3,12	742	212	3,50	782	214	3,66	890	218	4,08	1030	224	4,60
	11	580	189	3,06	608	190	3,20	691	194	3,57	730	195	3,74	828	199	4,17	952	203	4,69
	10	539	171	3,15	566	172	3,29	641	175	3,66	678	176	3,84	766	179	4,27	873	182	4,79
	9	494	153	3,23	519	154	3,37	588	156	3,76	622	157	3,95	703	160	4,40	802	163	4,92
	8	449	134	3,34	471	135	3,48	536	137	3,90	566	138	4,09	641	141	4,56	730	143	5,10
	7	397	119	3,33	417	120	3,48	476	122	3,91	503	123	4,10	571	125	4,59	652	127	5,14
	6	344	104	3,32	363	104	3,48	416	106	3,92	440	107	4,12	502	109	4,62	574	111	5,19
	5	292	89	3,30	309	89	3,47	356	90	3,94	377	91	4,14	432	93	4,67	496	94	5,26
	4	240	73	3,27	255	74	3,46	296	75	3,96	314	75	4,17	362	77	4,73	418	78	5,36
	2	120	38	3,20	128	38	3,38	148	38	3,88	157	39	4,08	181	39	4,63	209	40	5,25
	1	60	19	3,20	64	19	3,38	74	19	3,88	79	19	4,08	91	20	4,63	105	20	5,25
300.8	14	652	216	3,02	685	218	3,14	781	222	3,52	823	225	3,66	935	229	4,08	1084	236	4,60
	13	612	198	3,09	643	200	3,22	730	203	3,59	771	206	3,74	873	210	4,16	1006	215	4,68
	12	569	190	2,99	599	191	3,13	685	194	3,53	722	195	3,70	825	199	4,14	949	204	4,65
	11	528	172	3,07	557	173	3,22	635	176	3,61	671	177	3,79	763	180	4,24	871	183	4,75
	10	483	154	3,14	509	155	3,29	582	157	3,71	614	158	3,89	701	160	4,37	799	164	4,88
	9	450	143	3,14	475	144	3,30	542	146	3,70	574	147	3,89	653	150	4,36	746	153	4,89
	8	405	125	3,25	427	125	3,40	490	128	3,84	518	128	4,03	591	131	4,53	675	133	5,07
	7	353	110	3,22	373	110	3,39	430	112	3,84	455	113	4,04	521	115	4,55	597	117	5,11
	6	315	97	3,26	331	97	3,41	379	99	3,84	400	99	4,03	456	101	4,51	520	103	5,05
	5	263	81	3,23	277	82	3,39	319	83	3,84	337	84	4,04	386	85	4,54	442	87	5,10
	4	210	66	3,18	223	66	3,36	259	67	3,84	275	68	4,04	316	69	4,58	364	70	5,17
	2	150	48	3,12	160	48	3,30	185	49	3,76	196	49	3,96	226	50	4,49	259	51	5,06
	1	60	19	3,20	64	19	3,38	74	19	3,88	79	19	4,08	91	20	4,63	105	20	5,25
320.8	8	684	224	3,05	720	228	3,16	820	232	3,54	864	236	3,67	980	240	4,08	1138	248	4,60
	7	601	199	3,02	634	201	3,15	724	204	3,55	763	207	3,70	870	210	4,13	1003	216	4,65
	6	518	173	2,99	548	174	3,14	629	176	3,56	663	177	3,74	760	180	4,21	868	184	4,72
	5	440	144	3,05	466	145	3,21	536	147	3,65	566	148	3,83	651	150	4,32	744	153	4,85
	4	361	115	3,14	383	116	3,31	443	118	3,77	470	118	3,97	541	120	4,49	619	123	5,04
	2	181	59	3,07	192	59	3,24	222	60	3,69	235	60	3,89	270	61	4,40	310	63	4,94
	1	90	29	3,07	96	30	3,24	111	30	3,69	117	30	3,89	135	31	4,40	155	31	4,94

kWt = Heating capacity in kW kWe_tot = Unit total power input in kW
STEP = Active capacity steps (the maximum number indicates full capacity / the minimum number indicates the smallest partialization step)
Internal exchanger water = output temperature 35°C/ input * (variable) / constant flow equal to the nominal value.

Heating performance at part load

Size	STEP	External exchanger entering air temperature (°C)																	
		-7 / -8			-5 / -6			0 / -1			2 / 1			7 / 6			12 / 11		
		kWt	kWe_tot	COP	kWt	kWe_tot	COP	kWt	kWe_tot	COP	kWt	kWe_tot	COP	kWt	kWe_tot	COP	kWt	kWe_tot	COP
340.8	14	740	245	3,02	777	248	3,14	881	252	3,50	929	255	3,65	1053	259	4,06	1220	266	4,59
	13	683	221	3,08	718	224	3,21	815	228	3,58	861	230	3,74	974	235	4,15	1122	240	4,67
	12	657	219	2,99	691	221	3,13	785	224	3,51	828	225	3,67	943	229	4,11	1085	234	4,64
	11	600	196	3,06	632	197	3,21	720	200	3,60	760	201	3,78	865	205	4,23	987	208	4,73
	10	543	172	3,15	572	173	3,30	653	176	3,71	689	177	3,89	786	180	4,37	896	183	4,88
	9	522	167	3,13	550	168	3,28	627	171	3,68	664	172	3,87	755	175	4,32	862	178	4,85
	8	464	143	3,24	489	144	3,40	561	146	3,83	593	147	4,02	676	150	4,51	771	153	5,05
	7	398	124	3,22	421	125	3,38	485	127	3,83	513	127	4,03	588	129	4,54	673	132	5,10
	6	374	115	3,25	394	116	3,40	450	118	3,82	475	118	4,01	541	120	4,49	617	123	5,03
	5	308	96	3,22	325	96	3,38	374	98	3,83	396	98	4,02	453	100	4,53	518	102	5,08
	4	242	76	3,18	257	77	3,36	298	78	3,84	316	78	4,04	364	80	4,58	419	81	5,17
	2	166	53	3,12	177	54	3,29	205	54	3,76	217	55	3,96	250	56	4,49	287	57	5,06
	1	76	24	3,17	81	24	3,36	94	24	3,84	99	25	4,05	115	25	4,59	132	25	5,20
360.8	12	796	265	3,00	834	267	3,12	942	271	3,47	994	273	3,63	1126	278	4,05	1302	283	4,59
	11	739	242	3,05	775	244	3,18	876	247	3,54	926	249	3,71	1047	253	4,13	1204	258	4,66
	10	682	219	3,12	717	220	3,26	810	223	3,63	858	225	3,81	969	229	4,24	1105	233	4,75
	9	625	195	3,20	656	196	3,34	744	199	3,73	787	201	3,92	890	204	4,36	1014	208	4,88
	8	568	171	3,31	596	172	3,45	678	175	3,87	716	176	4,05	811	179	4,52	924	183	5,05
	7	502	152	3,30	527	153	3,45	602	155	3,88	636	156	4,07	723	159	4,55	825	162	5,09
	6	436	133	3,29	459	133	3,45	526	135	3,89	557	136	4,08	635	139	4,58	726	141	5,15
	5	370	113	3,27	391	114	3,44	451	115	3,90	477	116	4,10	547	118	4,63	628	120	5,21
	4	304	94	3,24	323	94	3,43	375	96	3,93	398	96	4,13	458	98	4,69	529	100	5,31
	2	152	48	3,17	161	48	3,36	188	49	3,84	199	49	4,05	229	50	4,59	265	51	5,20
	1	76	24	3,17	81	24	3,36	94	24	3,84	99	25	4,05	115	25	4,59	132	25	5,20
400.8	12	878	288	3,05	920	290	3,17	1044	296	3,53	1102	298	3,70	1240	304	4,08	1434	310	4,63
	11	815	263	3,09	855	265	3,22	968	270	3,59	1024	272	3,76	1153	277	4,17	1325	282	4,70
	10	751	239	3,15	789	240	3,28	893	244	3,66	945	246	3,84	1067	250	4,27	1217	254	4,78
	9	688	213	3,23	722	214	3,37	819	218	3,76	867	219	3,95	980	223	4,40	1117	227	4,92
	8	625	187	3,34	656	188	3,48	746	192	3,90	788	193	4,09	893	196	4,56	1017	200	5,09
	7	552	166	3,33	581	167	3,48	663	170	3,91	700	171	4,10	796	174	4,59	909	177	5,13
	6	480	145	3,31	506	146	3,47	580	148	3,92	613	149	4,12	699	151	4,62	800	154	5,19
	5	407	124	3,29	431	124	3,47	496	126	3,93	525	127	4,14	602	129	4,66	691	132	5,26
	4	335	102	3,27	356	103	3,46	413	104	3,96	438	105	4,17	505	107	4,73	583	109	5,35
	2	167	52	3,20	178	53	3,38	206	53	3,87	219	54	4,08	252	54	4,63	291	56	5,25
	1	84	26	3,20	89	26	3,38	103	27	3,87	109	27	4,08	126	27	4,63	146	28	5,25
440.8	12	946	316	2,99	990	318	3,11	1126	324	3,48	1186	326	3,64	1334	333	4,01	1538	340	4,52
	11	877	289	3,04	919	290	3,17	1043	296	3,53	1101	298	3,70	1241	303	4,09	1424	309	4,60
	10	808	261	3,09	849	263	3,23	960	267	3,59	1017	269	3,78	1148	274	4,20	1309	278	4,70
	9	740	233	3,17	777	235	3,31	882	238	3,70	932	240	3,88	1054	244	4,32	1202	248	4,84
	8	672	205	3,28	706	206	3,42	803	210	3,83	848	211	4,02	961	214	4,48	1094	219	5,01
	7	594	182	3,27	625	183	3,42	713	186	3,84	754	187	4,03	857	190	4,51	977	194	5,05
	6	516	159	3,26	544	159	3,41	624	162	3,85	659	163	4,04	752	166	4,54	861	169	5,10
	5	438	135	3,24	463	136	3,41	534	138	3,87	565	139	4,06	648	141	4,58	744	144	5,17
	4	360	112	3,21	383	113	3,40	444	114	3,89	471	115	4,09	543	117	4,65	627	119	5,26
	2	180	57	3,14	191	58	3,32	222	58	3,81	236	59	4,01	272	60	4,55	314	61	5,16
	1	90	29	3,14	96	29	3,32	111	29	3,81	118	29	4,01	136	30	4,55	157	30	5,16
480.8	8	1020	338	3,02	1068	340	3,14	1204	346	3,48	1272	348	3,65	1432	354	4,04	1646	360	4,57
	7	888	297	2,99	934	298	3,13	1061	303	3,50	1120	305	3,68	1272	310	4,10	1457	316	4,62
	6	757	255	2,96	801	257	3,12	919	260	3,53	968	261	3,70	1111	266	4,18	1269	271	4,68
	5	642	213	3,02	680	214	3,18	783	217	3,62	827	218	3,80	951	222	4,29	1087	226	4,81
	4	528	170	3,11	560	171	3,28	648	173	3,74	687	174	3,94	790	178	4,45	905	181	5,00
	2	264	87	3,05	280	87	3,21	324	88	3,66	343	89	3,86	395	91	4,36	452	92	4,90
	1	132	43	3,05	140	44	3,21	162	44	3,66	172	45	3,86	198	45	4,36	226	46	4,90

kWt = Heating capacity in kW kWe_tot = Unit total power input in kW
STEP = Active capacity steps (the maximum number indicates full capacity / the minimum number indicates the smallest partialization step)
Internal exchanger water = output temperature 35°C/ input * (variable) / constant flow equal to the nominal value.

Configurations

Consult the special prospective reported in the final section to check for compatibility between different options.

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 wter production down to -12°C is available on request.

D - Partial energy recovery

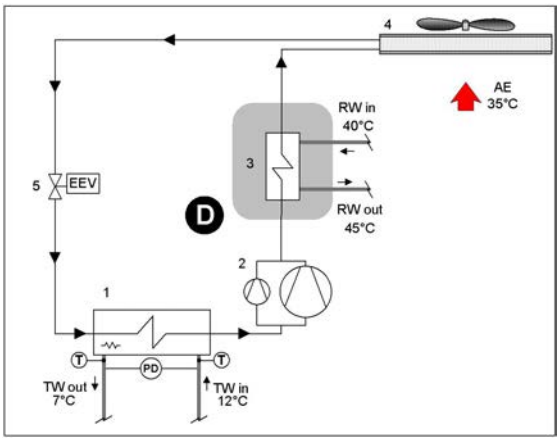
A configuration which enables the production of hot water free-of-charge while operating in the cooling mode, thanks to the partial recovery of condensation heat that would otherwise be disposed of into the external heat source.

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

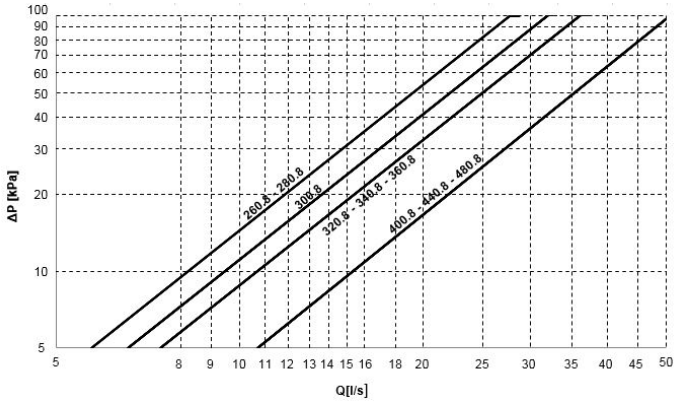
1 - Internal exchanger
2 - Compressors
3 - Recovery exchanger
4 - External exchanger
5 - Expansion electronic valve

TW in chilled water inlet
TW out chilled water outlet

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

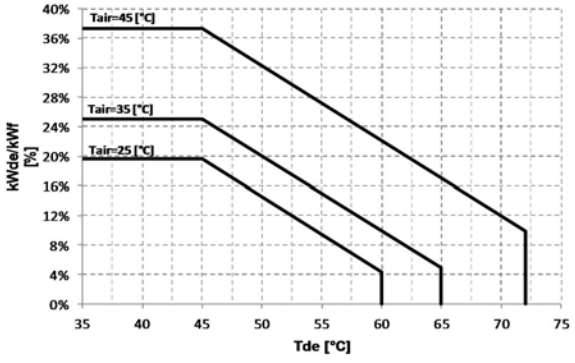
T - Temperature probe
PD - Differential pressure switch
AE Outdoor air

Pressure drops of partial energy recovery exchanger



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

Partial recovery heating capacity



kWde/kWf = Heating capacity/cooling capacity [%]
Tde = Leaving recovery exchanger water temperature [°C]

Example: Requested cooling capacity: 1040 kW with chilled water at 12/7°C and 35°C outdoor air.
Size purpose of the study: WSAN-XSC3 EXC SC 400.8
Hot water required temperature: +45°C
Recovery capacity: 26% di 1040 kW = 270 kW
Design flow-rate: 12,9 l/s
Recovery pressure drop: 7 kPa

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

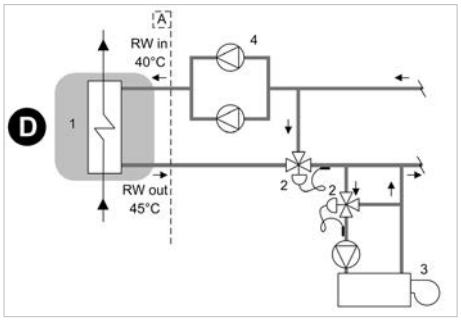
Preheating of hot water for domestic use or for industrial process

Heating of water in swimming pools, showers and SPAS

Preheating of hot water for laundries and industrial kitchens

Air heating

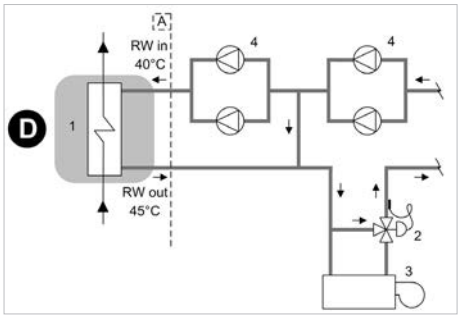
The heat recovery device can be used to cover the entire heat load required. The hot water supply temperature is controlled via a modulating control valve that needs to be fitted on the system at the outlet of the recovery unit. The auxiliary heating device is recommended to cover the thermal energy 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

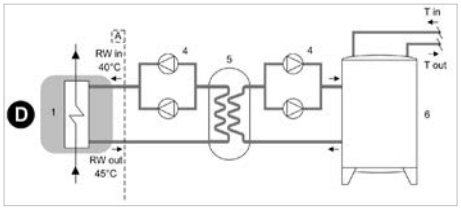
The heat recovery device can be used to preheat water at the inlet of the main heating device (e.g. boiler). In this case, the demand for hot water is greater than the amount of heat recovered by condensation and the recovery device only covers part of the required heat load. By preheating the water, 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 - HydroPack user side with 4/6 ON/OFF pumps

Option supplied on the unit. Pumping unit consisting of parallel 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.

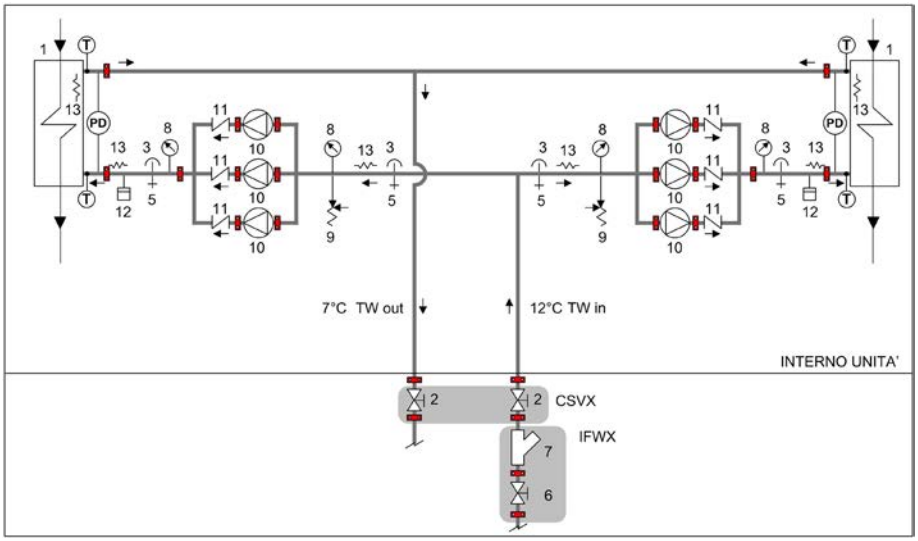
The various models which are available can be differentiated by the system available pressure.

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

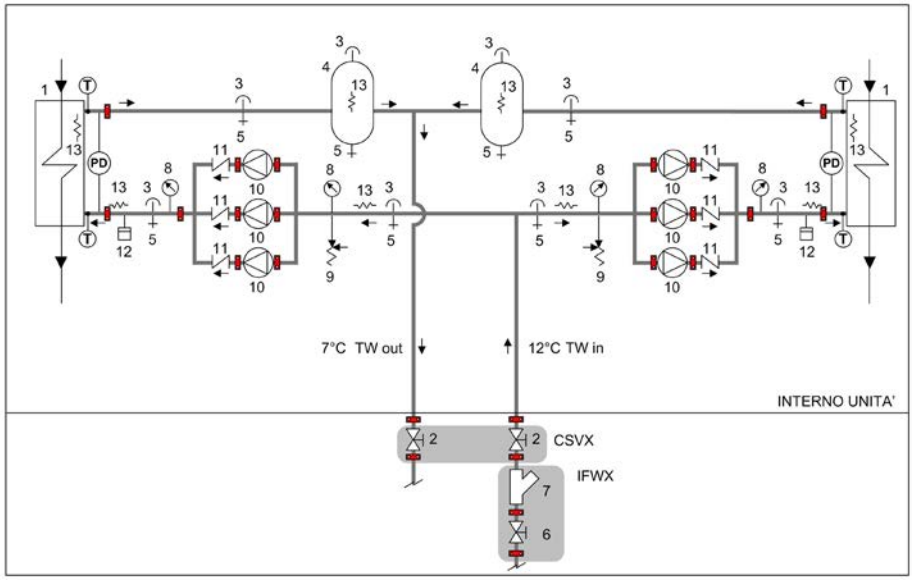
HYDROPACK



Illustrative diagram referred to unit size 320.8 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

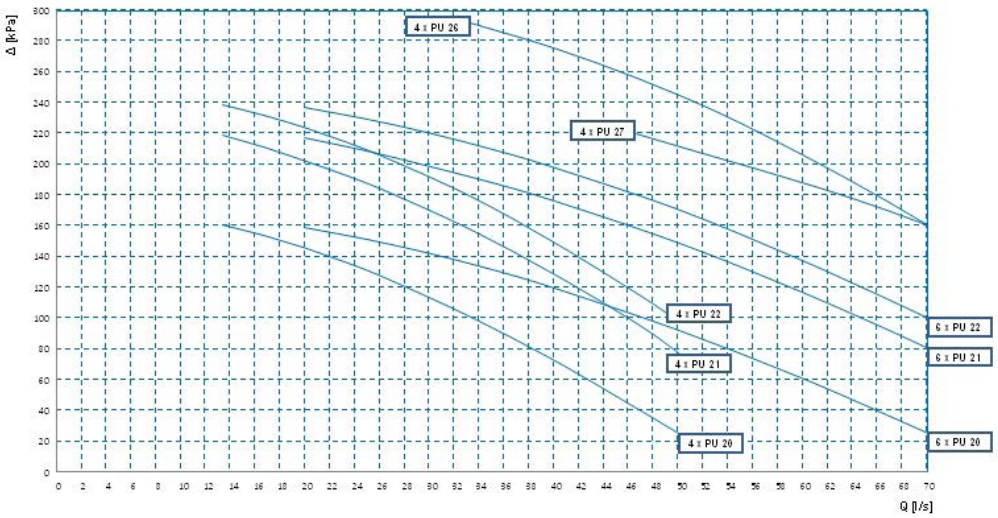


Illustrative diagram referred to unit size 320.8 with Hydropack with no. 6 of pumps

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)

Hydropack electrical data

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

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

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).

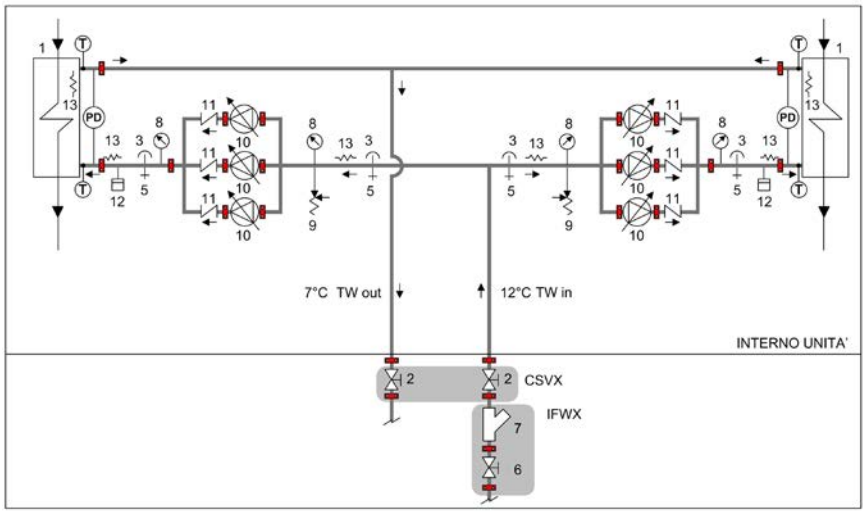
Mechanical seal using ceramic, carbon and EPDM elastomer components.

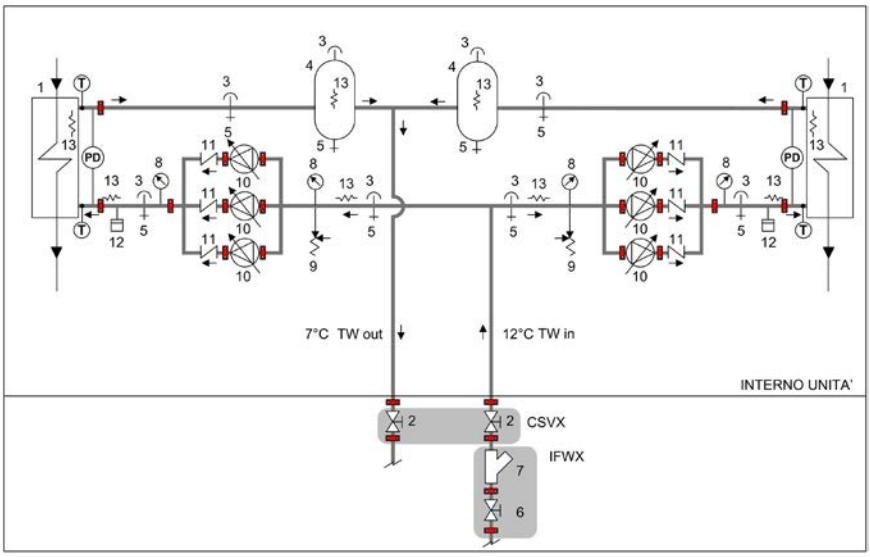
Three-phase electric motor with IP55-protection. Complete with thermoformed insulated casing, quick connections with insulated casing,non return valve, safety valve, pressure gauges, system load safety pressure switch, stainless steel antifreeze immersion heaters located at the return and supply point.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

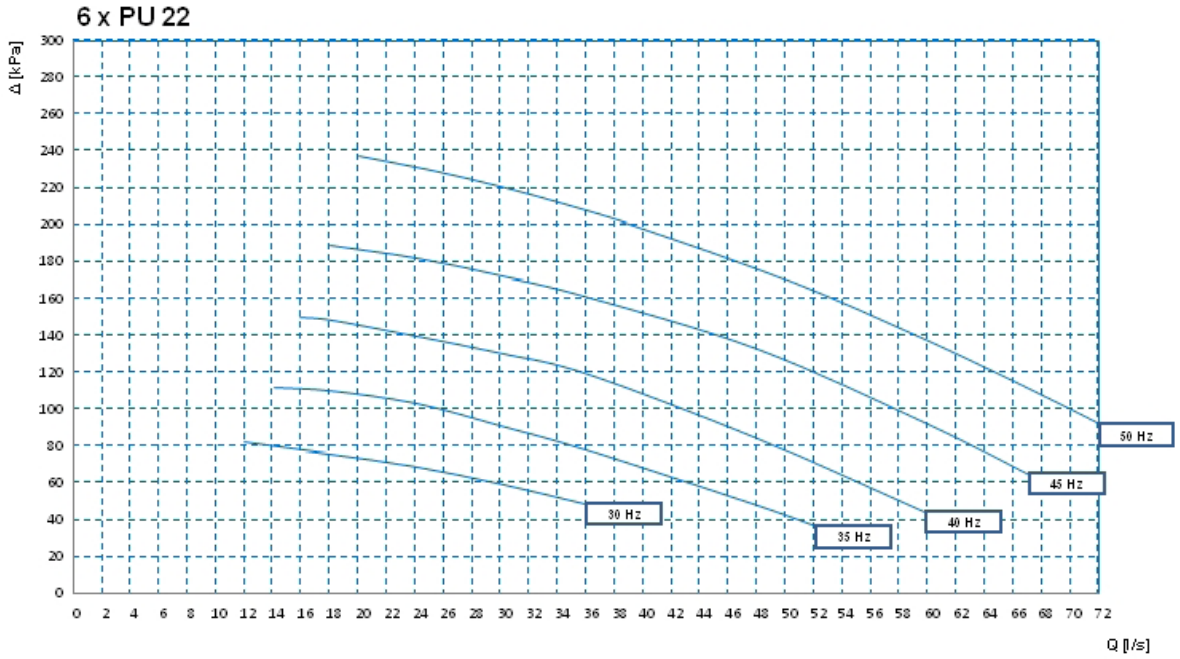




1 - Internal exchanger
2 - Cutoff valve
3 - Purge valve
4- Storage tank
5 - Draw off cock
6 - Cutoff valve with quick joints
7 - Steel mesh strainer water side
8 - Manometer
9 - Safety valve (6 Bar)
10 - Packaged electric pump with high efficiency impeller activated by inverter
11 - Non return valve
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

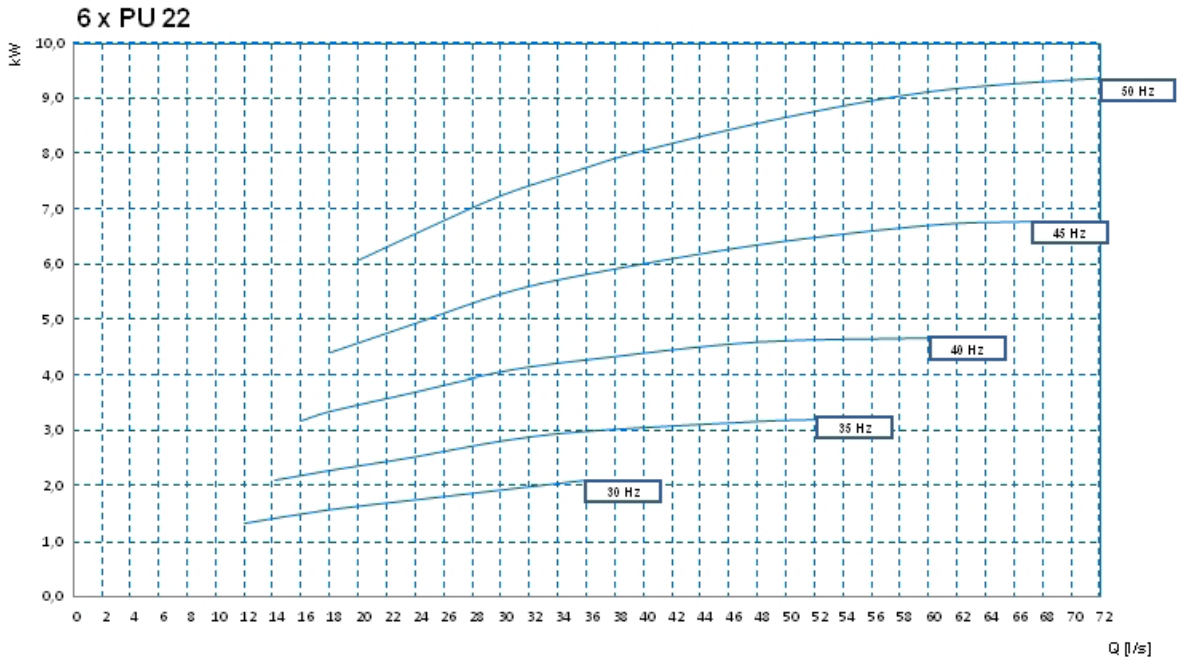


Q[l/s]= water flow rate
Δ [kPa] = pump head

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

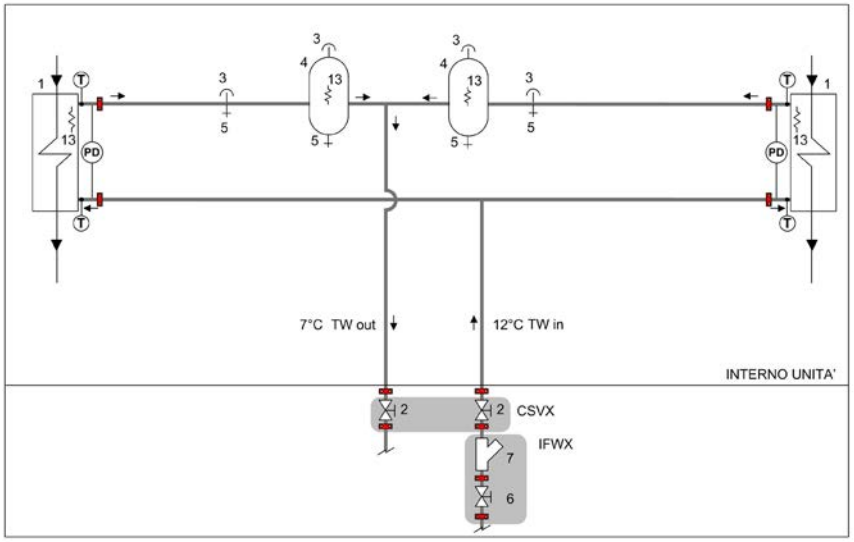
Accessories - Hydronic assembly

A1200 / A1400 / A1600 / A1800 - 1200 / 1400 / 1600 / 1800 - liter storage tank

Steel storage tank supplied on the unit, complete with double layer covering with closed-cell insulation 30mm thick, stainless steel anti-freeze immersion resistance, bleed valve, drain cock, Victaulic type quick connections with insulated casing. Maximum operating pressure of 10 bar. Suitable for operation with mixtures of glycol-water.

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.

A1200P / A1400P / A1600P / A1800P - 1200 / 1400 / 1600 / 1800 - liter storage tank with primary circuit with pump built-in

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 A1200 / A1400 / A1600 / A1800 option, as well as:

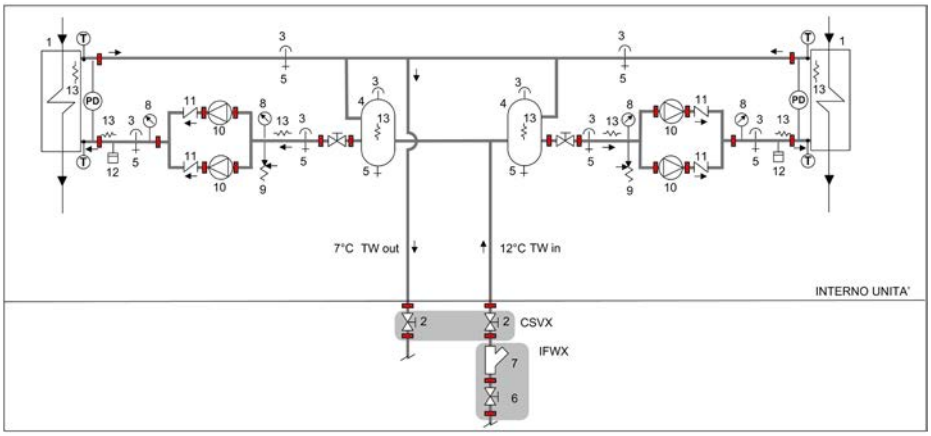
- primary circuit, already set up and tested inside the unit;
- cast-iron butterfly shut-off valve, with quick connections and activating handle and mechanical calibration lock on the pump supply.
- 4PM - HYDROPACK with no. 4 of pumps or 6PM - HYDROPACK with no. 6 of pumps according to the size

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.

Illustrative diagram referred to unit size 260.8 with Hydropack with no. 4 of pumps

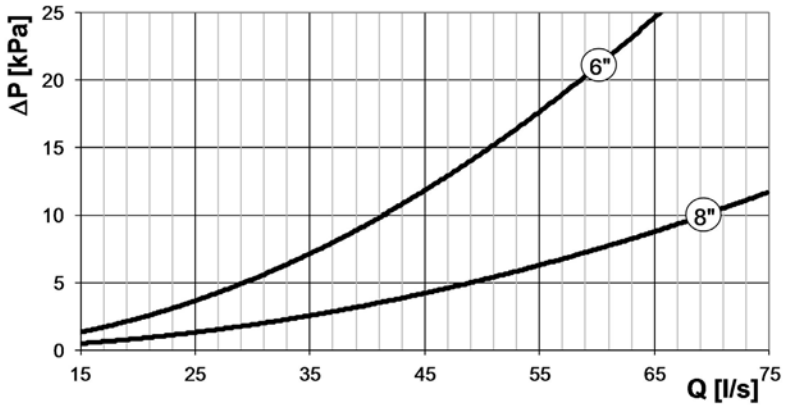
Built-in pump electrical data

Size		260.8	280.8	300.8	320.8	340.8	360.8	400.8	440.8	480.8
EXCELLENCE SC/EN										
		4 x PU20	4 x PU20	4 x PU20	4 x PU20	4 x PU20	4 x PU20	6 x PU20	6 x PU20	6 x PU20
FLI	[kW]	7,2	7,2	7,2	7,2	7,2	7,2	10,8	10,8	10,8
FLA	[A]	13,6	13,6	13,6	13,6	13,6	13,6	20,4	20,4	20,4

IFWX - Steel mesh strainer 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



STEEL MESH FILTER FEATURES

Size	260.8-340.8	360.8-480.8
Diameter	6"	8"
Degree of filtration	1,6 mm	

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

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 grilles

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.

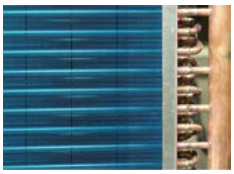
Accessories supplied and installed built-in the unit.

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

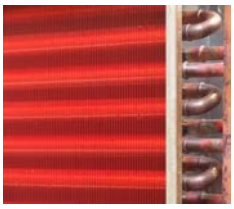
Option available on special request

CCCA1 - Copper / aluminium condensing 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.

Option available on special request

CCCC - Copper / copper condensing 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 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.

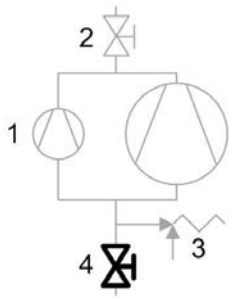
The two liquid pressure gauges and corresponding pressure sockets are installed on the machine in an easily accessible location.

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 anti-freeze 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.

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.

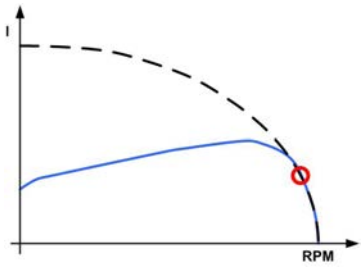
SFSTR – Disposal for inrush current reduction (SOFT STARTER)

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

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

In sizes 340.8, 360.8, 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.

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



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

CMSC11 - Serial communication module for BACnet-IP 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)

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.

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)

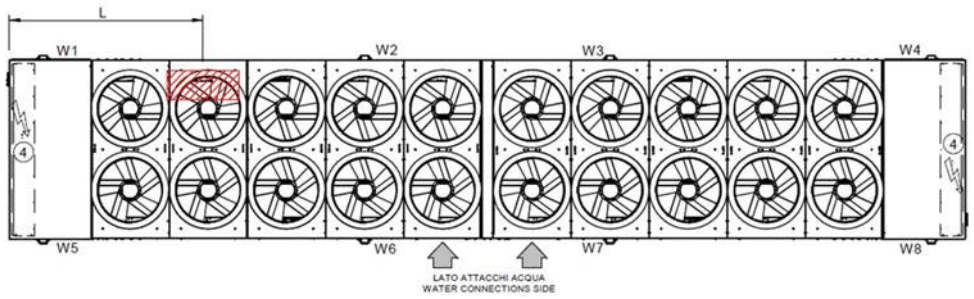
Flow-rate modulation is managed by embedded logic thanks to built-in flow-rate control device and temperature probes. This device is installed and wired.

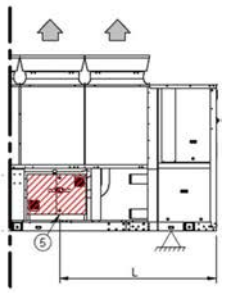
This option is available only with inverter driven HYDROPACK selected (6PMV)

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.





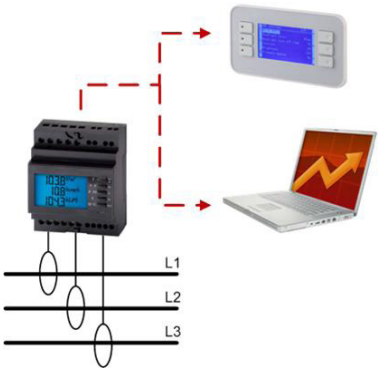
L = 3350 mm +/- 350 mm

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

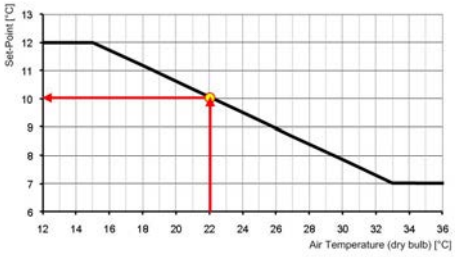
This device enables the set-point to be varied which is pre-set using an external 0÷10 V signal.

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

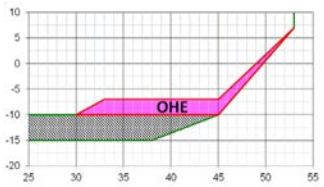
SPC2 - Set-point compensation with outdoor air temperature probe

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.



OHE - Limit extension kit in heating up to -10°C (W.B.)



The device allows to extend heating unit operation fields up to -10°C wet bulb outdoor yemperature. Clivet automatic control ensures the ongoing operation at the unit full capacity.

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

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 manual shut-off valves

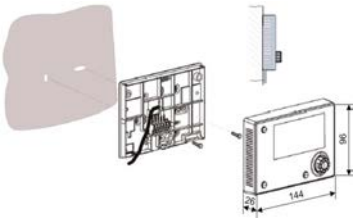
Il kit allows to isolate the hydraulic circuit at the inlet and outlet.

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 provided by the Clustomer, 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 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 provided by Customer

Option compatiblity - EXCELLENCE version

Acoustic configuration: compressor soundproofing (SC)

REFERENCE	DESCRIPTION	260.8	280.8	300.8	320.8	340.8	360.8	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
B + D	Water low temperature + Partial energy recovery	0	0	0	0	0	0	0	0	0
A1200	1200 l. storage tank	0	-	-	-	-	-	-	-	-
A1400	1400 l. storage tank	-	0	0	0	-	-	-	-	-
A1600	1600 l. storage tank	-	-	-	-	0	-	-	-	-
A1800	1800 l. storage tank	-	-	-	-	-	0	0	0	0
A1200P	1200 l. storage tank with primary circuitwith pump built-in	◊	-	-	-	-	-	-	-	-
A1400P	1400 l. storage tank with primary circuitwith pump built-in	-	◊	◊	◊	-	-	-	-	-
A1600P	1600 l. storage tank with primary circuitwith pump built-in	-	-	-	-	◊	-	-	-	-
A1800P	1800 l. storage tank with primary circuitwith pump built-in	-	-	-	-	-	◊	◊	◊	◊
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
+ A1200P / A1400P	+ 1200 l. storage tank with primary circuitwith pump built-in / 1400 l. storage tank with primary circuitwith pump built-in	-	-	-	-	-	-	-	-	-
+ A1600P / A1800P	+ 1600 l. storage tank with primary circuitwith pump built-in / 1800 l. storage tank with primary circuitwith pump built-in	-	-	-	-	-	-	-	-	-
+ A1200	+ 1200 l. storage tank	0	-	-	-	-	-	-	-	-
+ A1400	+ 1400 l. storage tank	-	0	0	0	-	-	-	-	-
+ A1600	+ 1600 l. storage tank	-	-	-	-	0	-	-	-	-
+ A1800	+ 1800 l. storage tank	-	-	-	-	-	0	0	0	0
6PM - HYDROPACK USER SIDE WITH 6 PUMPS										
(PU20)	Pump 20	-	-	-	-	-	-	0	0	-
(PU21)	Pump 21	-	0	0	0	0	0	0	0	0
(PU22)	Pump 22	0	0	0	0	0	0	0	0	0
+ A1200P / A1400P	+ 1200 l. storage tank with primary circuitwith pump built-in / 1400 l. storage tank with primary circuitwith pump built-in	-	-	-	-	-	-	-	-	-
+ A1600P / A1800P	+ 1600 l. storage tank with primary circuitwith pump built-in / 1800 l. storage tank with primary circuitwith pump built-in	-	-	-	-	-	-	-	-	-
+ A1200	+ 1200 l. storage tank	0	-	-	-	-	-	-	-	-
+ A1400	+ 1400 l. storage tank	-	0	0	0	-	-	-	-	-
+ A1600	+ 1600 l. storage tank	-	-	-	-	0	-	-	-	-
+ A1800	+ 1800 l. storage tank	-	-	-	-	-	0	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 - CONTROLLO PORTATA VARIABILE LATO UTILIZZO TRAMITE INVERTER IN FUNZIONE DEL SALTO TERMICO										
(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	Soft Start	0	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.

Option compatiblity - EXCELLENCE version

Acoustic configuration: super-silenced (EN

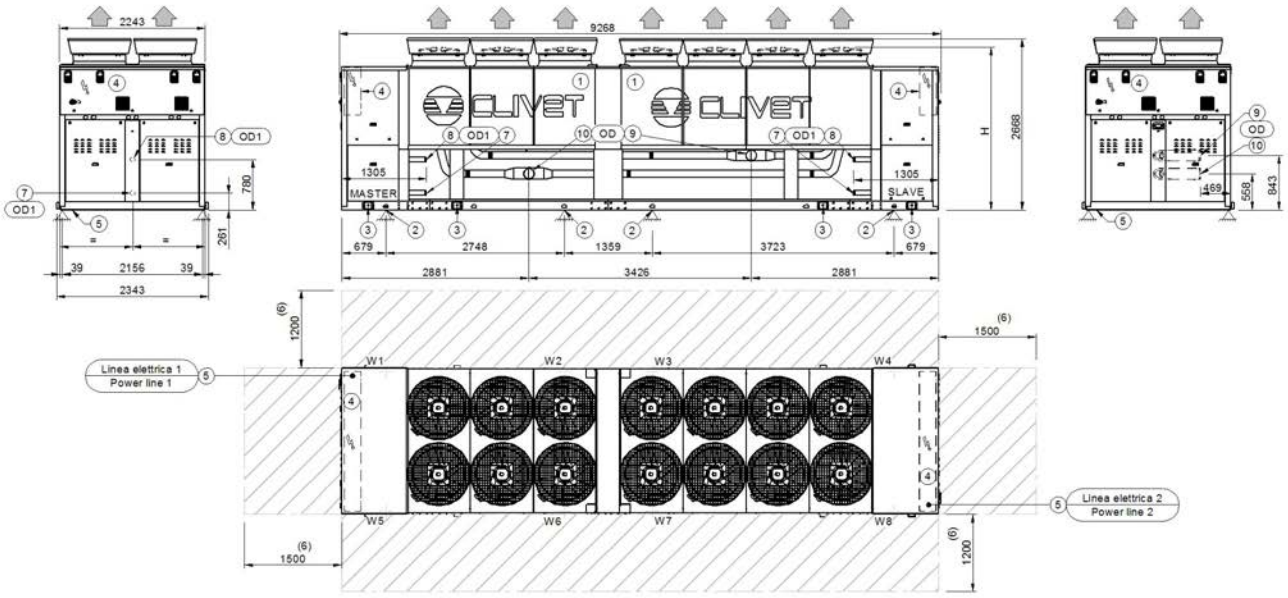
REFERENCE	DESCRIPTION	260.8	280.8	300.8	320.8	340.8	360.8	400.8	440.8	480.8
CONFIGURATIONS AND MAIN ACCESSORIES										
B	Water low temperature	0	0	0	0	0	0	0	0	0
D	Partial energy recovery	0	0	0	0	0	0	0	0	0
B + D	Water low temperature + Partial energy recovery	0	0	0	0	0	0	0	0	0
A1200	1200 l. storage tank	0	-	-	-	-	-	-	-	-
A1400	1400 l. storage tank	-	0	0	0	-	-	-	-	-
A1600	1600 l. storage tank	-	-	-	-	0	-	-	-	-
A1800	1800 l. storage tank	-	-	-	-	-	0	0	0	0
A1200P	1200 l. storage tank with primary circuitwith pump built-in	◊	-	-	-	-	-	-	-	-
A1400P	1400 l. storage tank with primary circuitwith pump built-in	-	◊	◊	◊	-	-	-	-	-
A1600P	1600 l. storage tank with primary circuitwith pump built-in	-	-	-	-	◊	-	-	-	-
A1800P	1800 l. storage tank with primary circuitwith pump built-in	-	-	-	-	-	◊	◊	◊	◊
4PM - HYDROPACK USER SIDE WITH 4 PUMPS										
(PU20)	Pump 20	0	0	0	0	0	0	0	-	-
(PU21) / (PU22)	Pump 21 / Pump 22	0	0	0	0	0	0	0	-	-
(PU26)	Pump 26	-	-	-	-	-	-	-	0	0
+ A1200P / A1400P	+ 1200 l. storage tank with primary circuitwith pump built-in / 1400 l. storage tank with primary circuitwith pump built-in	-	-	-	-	-	-	-	-	-
+ A1600P / A1800P	+ 1600 l. storage tank with primary circuitwith pump built-in / 1800 l. storage tank with primary circuitwith pump built-in	-	-	-	-	-	-	-	-	-
+ A1200	+ 1200 l. storage tank	0	-	-	-	-	-	-	-	-
+ A1400	+ 1400 l. storage tank	-	0	0	0	-	-	-	-	-
+ A1600	+ 1600 l. storage tank	-	-	-	-	0	-	-	-	-
+ A1800	+ 1800 l. storage tank	-	-	-	-	-	0	0	0	0
6PM - HYDROPACK USER SIDE WITH 6 PUMPS										
(PU20)	Pump 20	-	-	-	-	-	-	-	0	0
(PU21)	Pump 21	-	0	0	0	0	0	0	0	0
(PU22)	Pump 22	0	0	0	0	0	0	0	0	0
+ A1200P / A1400P	+ 1200 l. storage tank with primary circuitwith pump built-in / 1400 l. storage tank with primary circuitwith pump built-in	-	-	-	-	-	-	-	-	-
+ A1600P / A1800P	+ 1600 l. storage tank with primary circuitwith pump built-in / 1800 l. storage tank with primary circuitwith pump built-in	-	-	-	-	-	-	-	-	-
+ A1200	+ 1200 l. storage tank	0	-	-	-	-	-	-	-	-
+ A1400	+ 1400 l. storage tank	-	0	0	0	-	-	-	-	-
+ A1600	+ 1600 l. storage tank	-	-	-	-	0	-	-	-	-
+ A1800	+ 1800 l. storage tank	-	-	-	-	-	0	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	Soft Start	0	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 260.8 - Acoustic configuration : Compressor soundproofing (SC) / Super-silenced (EN)

DAB8N260.8_EXC_SC_EN_2
Data/Date 07/10/2016



1. External exchanger
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)

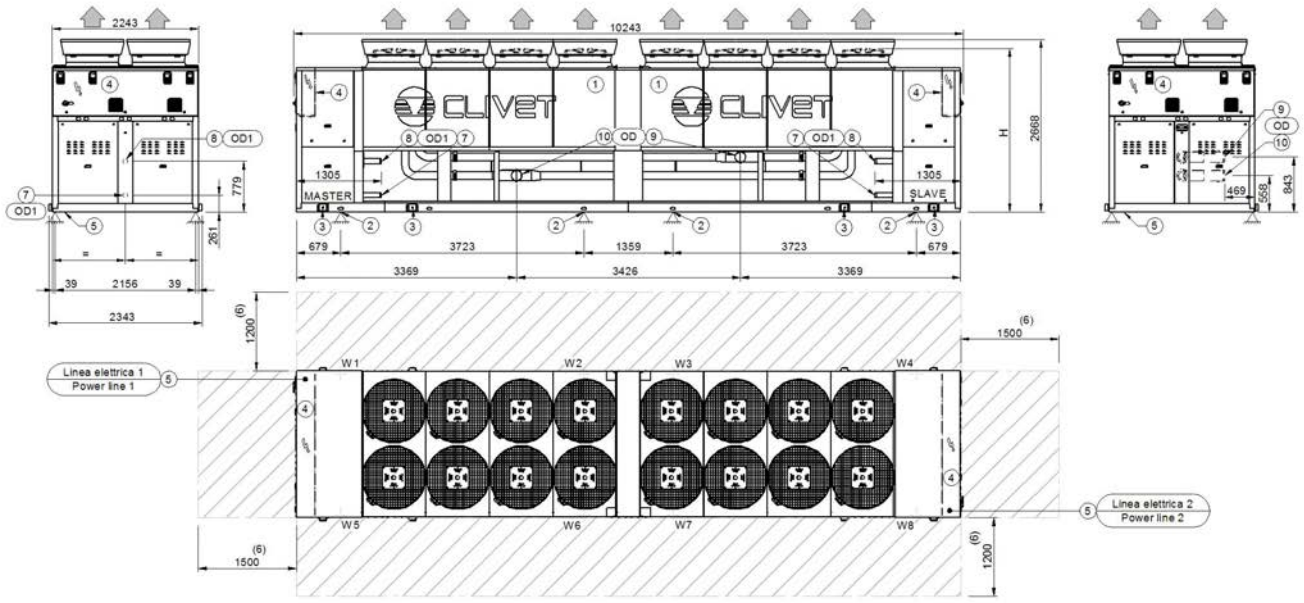
Size		SC / EN-EXC
		260.8
H without Axitop	mm	2484
H without Axitop with ECOBREEZE (optional)	mm	2510
OD (internal exchanger)	mm	168,3
OD1 (partial recovery)	mm	76,1
A - Length	mm	9268
B - Depth	mm	2246
C - Height	mm	2668
W1 Supporting point	kg	977
W2 Supporting point	kg	610
W3 Supporting point	kg	689
W4 Supporting point	kg	1094
W5 Supporting point	kg	971
W6 Supporting point	kg	604
W7 Supporting point	kg	699
W8 Supporting point	kg	1104
Shipping weight	kg	6473
Operating weight	kg	6750

Size		SC / EN-EXC
		260.8
Container shipping length	mm	9373
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 280.8 - 300.8 - 320.8 - Acoustic configuration : Compressor soundproofing (SC) / Super-silenced (EN)

DAB8N280.8_320 8_EXC_SC_EN_2
Date: 10/10/2016



1. External exchanger
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)

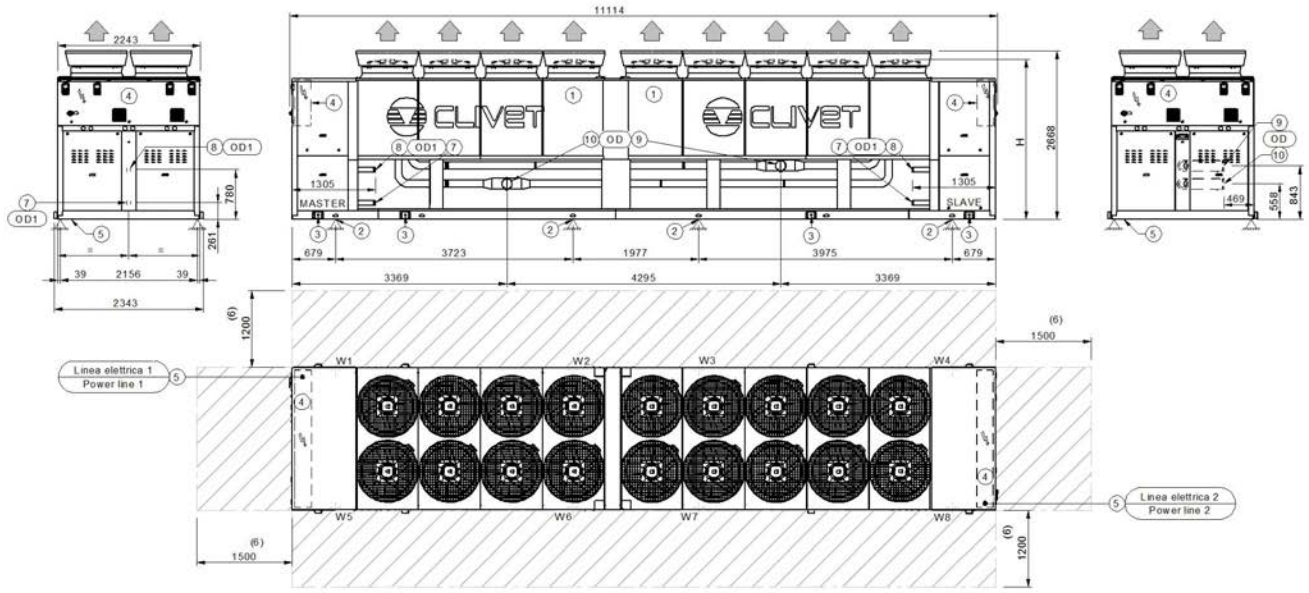
Size		SC / EN-EXC		
		280.8	300.8	320.8
H without Axitop	mm	2484	2484	2484
H without Axitop with ECOBREEZE (optional)	mm	2510	2510	2510
OD (internal exchanger)	mm	168,3	168,3	168,3
OD1 (partial recovery)	mm	76,1	76,1	76,1
A - Length	mm	10243	10243	10243
B - Depth	mm	2246	2246	2246
C - Height	mm	2668	2668	2668
W1 Supporting point	kg	1104	1104	1108
W2 Supporting point	kg	699	699	701
W3 Supporting point	kg	689	693	693
W4 Supporting point	kg	1094	1099	1099
W5 Supporting point	kg	1094	1094	1099
W6 Supporting point	kg	689	689	693
W7 Supporting point	kg	699	701	701
W8 Supporting point	kg	1104	1108	1108
Shipping weight	kg	6861	6875	6889
Operating weight	kg	7175	7189	7203

Size		SC / EN-EXC		
		280.8	300.8	320.8
Container shipping length	mm	10348	10348	10348
Container shipping depth	mm	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 340.8 - Acoustic configuration : Compressor soundproofing (SC) / Super-silenced (EN)

DAB8N340.8_EXC_SC_EN_2
Data/Date 10/10/2016



1. External exchanger
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)

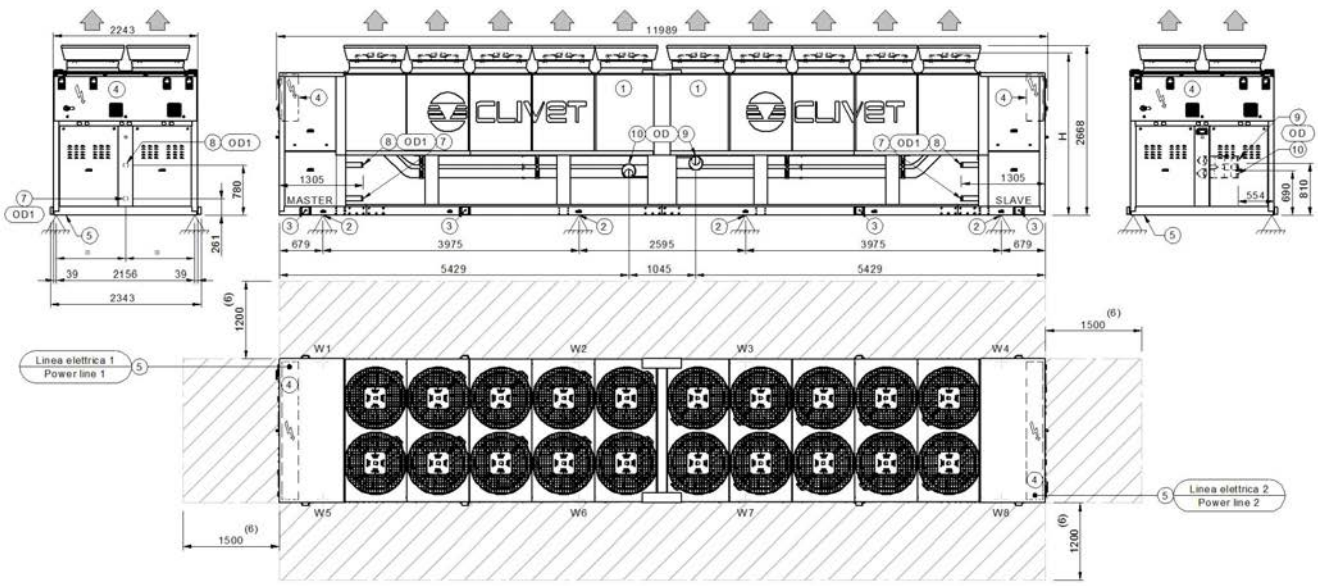
Size		SC / EN-EXC
		340.8
H without Axitop	mm	2484
H without Axitop with ECOBREEZE (optional)	mm	2510
OD (internal exchanger)	mm	168,3
OD1 (partial recovery)	mm	76,1
A - Length	mm	11114
B - Depth	mm	2246
C - Height	mm	2668
W1 Supporting point	kg	1108
W2 Supporting point	kg	701
W3 Supporting point	kg	851
W4 Supporting point	kg	1312
W5 Supporting point	kg	1099
W6 Supporting point	kg	693
W7 Supporting point	kg	862
W8 Supporting point	kg	1322
Shipping weight	kg	7592
Operating weight	kg	7948

Size		SC / EN-EXC
		340.8
Container shipping length	mm	11219
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 360.8 - 400.8 - Compressor soundproofing (SC) / Super-silenced (EN)

DAB8N360.8_400 8_EXC_SC_EN_2
Data/Date 31/10/2016



1. External exchanger
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)

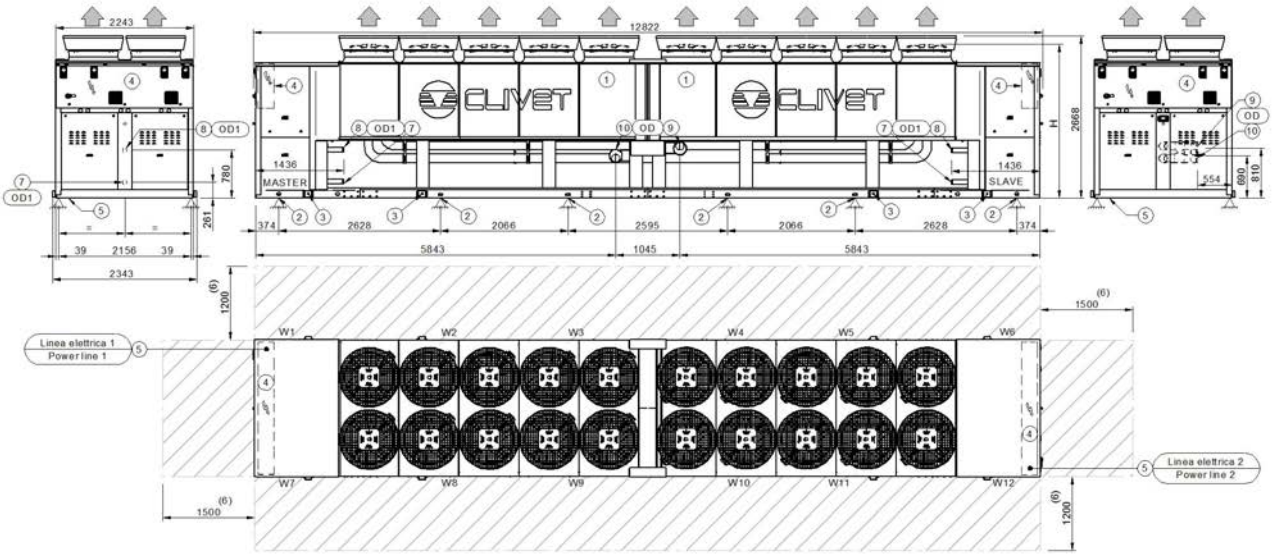
Size		SC / EN-EXC	
		360.8	400.8
H without Axitop	mm	2484	2484
H without Axitop with ECOBREEZE (optional)	mm	2510	2510
OD (internal exchanger)	mm	219,1	219,1
OD1 (partial recovery)	mm	76,1	76,1
A - Length	mm	11989	11989
B - Depth	mm	2246	2246
C - Height	mm	2668	2668
W1 Supporting point	kg	1322	1337
W2 Supporting point	kg	862	873
W3 Supporting point	kg	851	862
W4 Supporting point	kg	1312	1327
W5 Supporting point	kg	1312	1327
W6 Supporting point	kg	851	862
W7 Supporting point	kg	862	873
W8 Supporting point	kg	1322	1337
Shipping weight	kg	8295	8399
Operating weight	kg	8693	8797

Size		SC / EN-EXC	
		360.8	400.8
Container shipping length	mm	12030	12030
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 440.8 - 480.8 - Compressor soundproofing (SC) / Super-silenced (EN)

DAB8N440.8_480 8_EXC_SC_EN_2
Data/Date 18/10/2016



1. External exchanger
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		SC / EN-EXC	
		440.8	480.8
H without Axitop	mm	2484	2484
H without Axitop with ECOBREEZE (optional)	mm	2510	2510
OD (internal exchanger)	mm	219,1	219,1
OD1 (partial recovery)	mm	76,1	76,1
A - Length	mm	12822	12822
B - Depth	mm	2246	2246
C - Height	mm	2668	2668
W1 Supporting point	kg	1402	1424
W2 Supporting point	kg	518	533
W3 Supporting point	kg	506	523
W4 Supporting point	kg	508	525
W5 Supporting point	kg	507	521
W6 Supporting point	kg	1375	1431
W7 Supporting point	kg	1375	1431
W8 Supporting point	kg	507	521
W9 Supporting point	kg	508	525
W10 Supporting point	kg	506	523
W11 Supporting point	kg	518	533
W12 Supporting point	kg	1402	1424
Shipping weight	kg	9121	9402
Operating weight	kg	9631	9912

Size		SC / EN-EXC	
		440.8	480.8
Container shipping length	mm	12927	12927
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.

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