Multifunction heat pump with hot/chilled simuoltaneous water production for outdoor installation

SPINchiller^3 Multifunction

WSAN-XSC3 MF 260.8-480.8 RANGE

TECHNICAL BULLETIN

R-410A

SIZE	260.8	280.8	300.8	320.8	340.8	360.8	400.8	440.8	480.8
COOLING CAPACITY [kW]	725	770	819	868	937	1006	1090	1204	1300
HEATING CAPACITY [kW]	839	890	937	984	1059	1134	1254	1350	1456

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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

Dedicated series separately documentated

WSAN-XSC3 MULTIFUNCTION

Air cooled heat/cool heat pump with simultaneous operating

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

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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.

Many applications require heating and cooling simultaneous production

Simultaneous opposite loads is a very frequent situation in many applications.

Large size buildings, aspect, variable insulation and different purpose ambient make recurring the request of heating and cooling simultaneously.

Many different technical solutions could be used at this purpose. Clivet believes since ever that solution differentiation is the key for success and consequently present diversified solutions for answering to only apparently similar demands.

Traditional way

The solution very common in the past is the independent production of heating and cooling thermal energy and transferring them to different ambient.

Thermal energy production thanks to one or many boilers and cooling power production with chillers is one possible solution. Low efficiency of such kind system is well known, indeed during the periods where cooling and heating are simultaneously required, cooling energy production rejects a large quantity of thermal energy to a source and this is the working principle of a standard chiller, energy that could be used instead, supporting for example other thermal energy sources or as total replacement.

Enhanced hydronic system

Clivet, since ever pioneer of innovative solutions proposes advanced hydronic system as optimal solution for 90% of applications where simultaneous opposite loads are present.

Building blocks are:

- SPINChiller heat pump;
- primary Energy decentralized system Zephir;
- ELFOSpace fancoils.

Thanks to a proper primary air design and using Clivet products around 30% annual energy saving is achievable and with a more competitive capital investment*.

MULTIFUNCTION Option

Hydronic multifunction units, able to produce hot water and chilled water simultaneously and independently is the optimal solution for some industrial applications or where the four pipe air conditioning system is required.

Heat pump product family called MULTIFUNCTION (MF) is the Clivet answer.

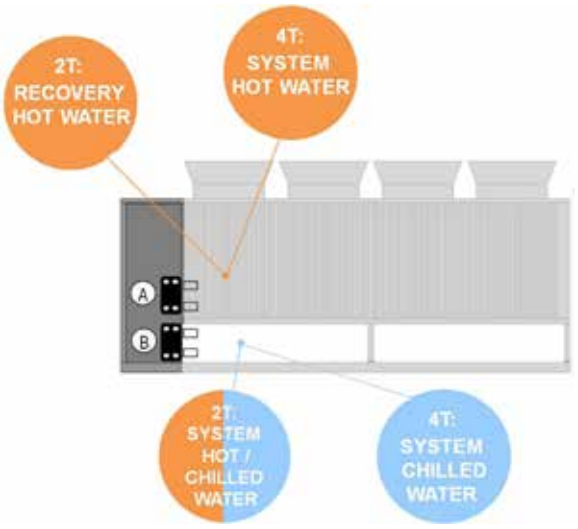
*Dedicated documentated.

MULTIFUNCTION by CLIVET

ELFOEnergy MAGNUM and SPINChiller3 MF are the two air source heat pump families for simultaneous production of hot and chilled water for air conditioning.

Configuration available:

- **4T**: supply water for four pipe systems;
  - produce chilled water and hot water to the system simultaneously and independently during throughout the year.



- **2T:** supply water for two pipe air conditioning systems;
  - produce chilled water or hot water to the system depending on the season;
  - supply hot water using the total recovery device for domestic hot water tanks, pre or post heating simultaneously with chilled water production.

360° of efficiency

During a whole year and during the same day heating and cooling demand hugely vary with hot-cool combinations very unstable, function of many factors, among others: latitude and altitude of installation, building features and functionalities of different ambient.

Unit will mainly work in simultaneous heating-cooling mode with varying combinations over the time.

Clivet unit distinguishes for this working mode offering the best efficiency performance thanks to used solutions.

Refrigerant scheme allows both the partial and the total recovery mode for the MULTIFUNCTION heat exchanger according to thermal energy required.

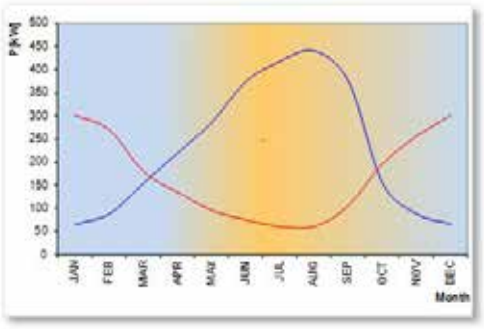
Completely automatic set-up and system control logic adjusts the mode according the most efficient performance.

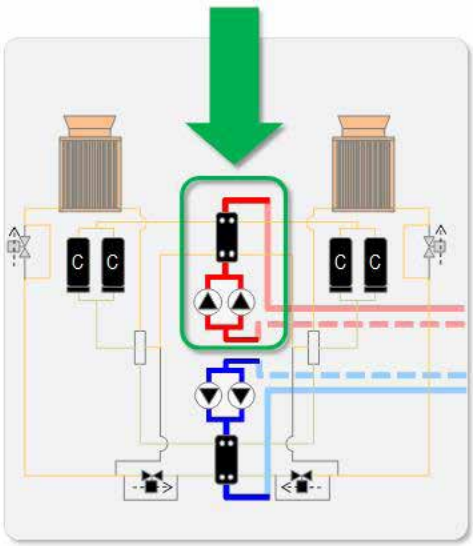
During a whole year more than half of enery provided is produced during unbalanced capacity demand where MULTIFUNCTION offer the best performances.

Using the heat exchanger as a partial recovery device drives to an higher efficiency of 5% compared to solutions not using this working mode.

Real benefits in terms of efficiency and reliability:

- few mode switches, reset where thermal capacity is less than 25% of cooling capacity, thanks to the condensing heat recovery;
- improved reliability thanks to a modulated operating and to a reduced number of switchings on the refrigeration circuit;
- additional 3% savings on annual energy consumption comparing to standard multifunction units.





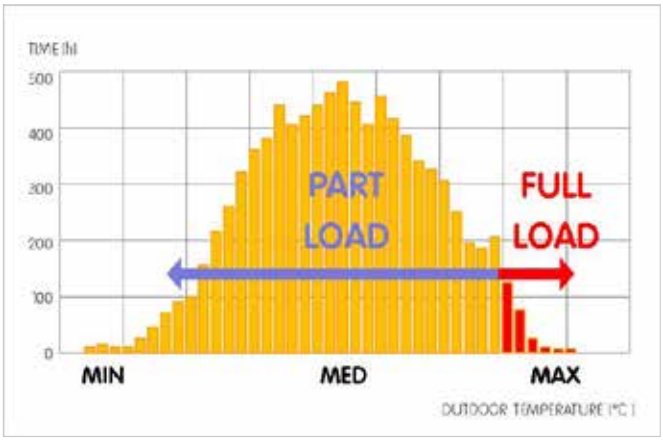
Comfort and energy saving in one solution

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 AHRI. 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 AHRI (IPLV) reference for seasonal efficiency calculations.

SPINchiller technology enhances part-load efficiency

SPINchiller[3] uses high efficiency Scroll compressors.

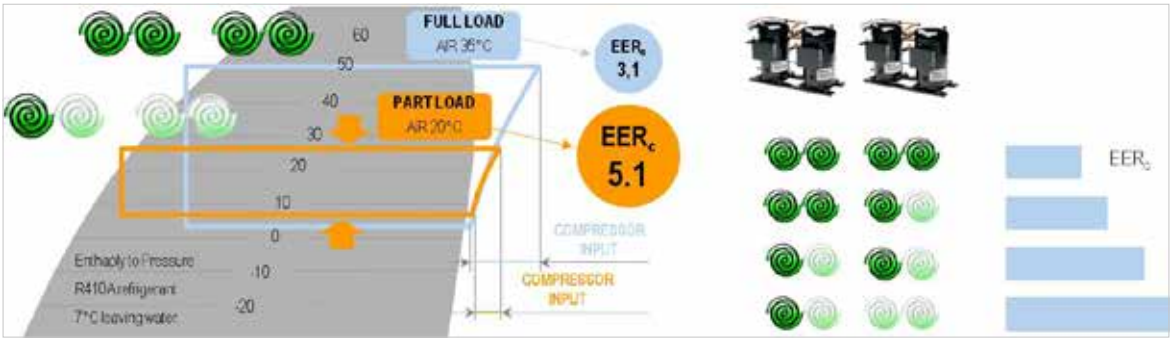
The advantages are:

- 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.



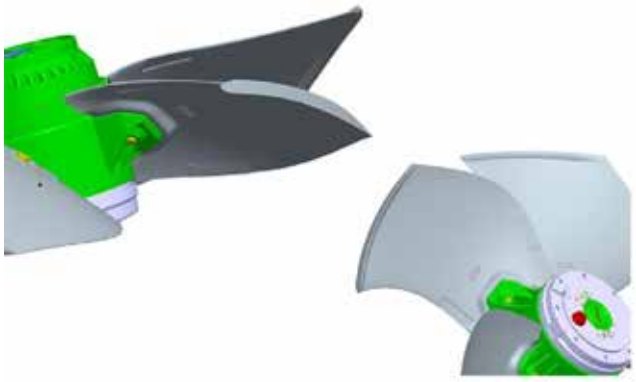
EERc = Energy effieciency referred to compressors

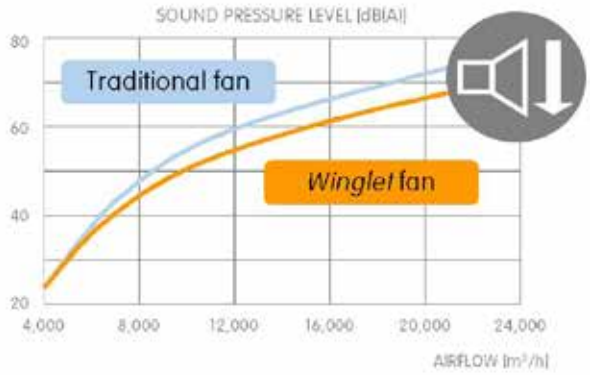
Efficient and silent ventilation technology

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.

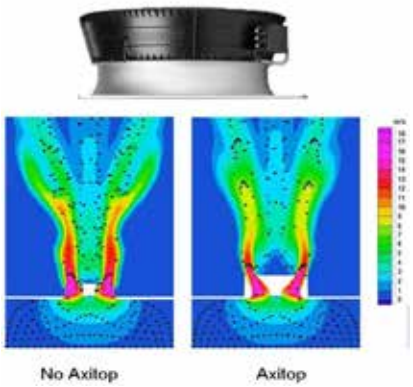




Diffusers for fans

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:

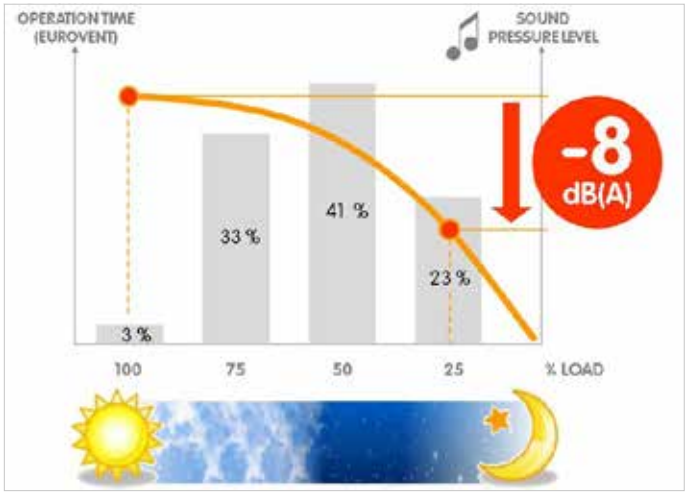
- –3 dB of sound reduction;
- reduction of 3% of the absorbed energy.



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 reaches the value 3.7.

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.

Perfect for LEED certification

The whole EXCELLENCE SC range satisfies both requirements 2 (Minimum Energy Performance) and 3 (Fundamental Refrigerant Management) of Energy and Atmosphere section.

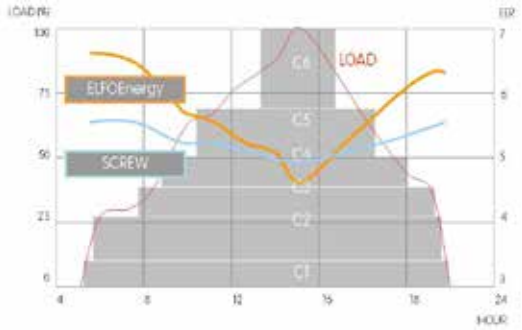
Clivet is committed in promoting the green building principles and has become a member of GBC Italia. This organization collaborates with USGBC, the U.S. nonprofit organization that promotes worldwide the LEED system of indipendent certification.

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.

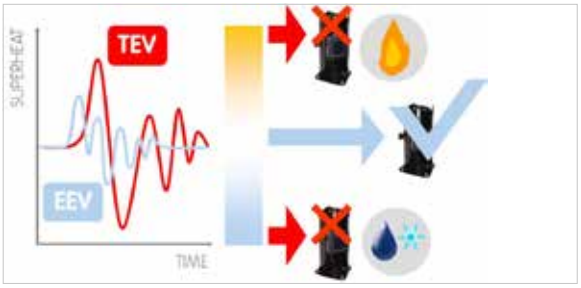


THE NUMBER OF START-UPS DECREASES THEREFORE THE LIFE CYCLE INCREASES

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.

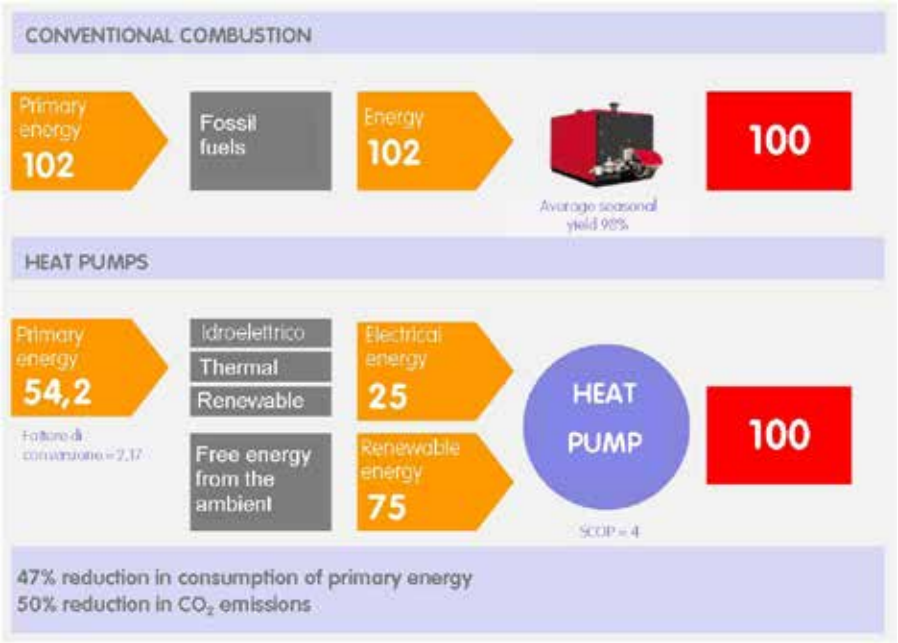
- Controls the presence and the exact sequence of the phases.
- Checks any voltage anomalies (-10%).
- Automatically restarts the unit as soon as the proper power supply is restored.

The EXCELLENCE version is fitted with a multifunction monitor, where limit values and the service schedule of Clivet's Technical Support can be modified.

Advanced heat pump

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.

The defrost cycles are activated one circuit at a time. In this way, the comfort and operation continuity are always ensured by at least one circuit.

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).

Monitoring and remote interaction

Clivet Eye is the solution that makes it possible to monitor the unit operation and to diagnose any anomalies as soon as they arise. The unit is supplied as standard with a dedicated communication device, already installed on board, consisting of: RS485 Modem, Antenna, 4 GB micro SD expansion card.

The device records all data concerning unit operation and all data related to anomalies and alarms and in general all the recorded events, such as the change in a setup parameters, both in the SD card (last 12 months) and in the Cloud (last month). These data are very useful when any anomalies arise, since they make it possible to identify the actual running conditions at that moment.

If a Customer makes a claim, Clivet can display all the data related to each unit for any checks or analysis on the operation and also intervene directly on the machine by changing the parameters, resetting the alarms and performing the remote on / off.

Clivet Eye therefore guarantees significant advantages for plant performance, as it reduces the time needed to solve the problem by intervening directly from Clivet Office and reduces the intervention costs as it could avoid or in any case guide the visit of a specialized technician to the installation plant. The units, which will be installed in all European Countries, are also provided with a Sim Card with internet traffic included valid for the entire period of the standard warranty and for a maximum period of 18 months from the invoice date. The Sim Card must be activated at the commissioning with a request to Clivet Aftersales. Clivet's remote diagnostic service is only available in presence of enabled Sim Cards and covered by the signal of Tim Operator (Italy) or Roaming Tim (Europe).

During the free monitoring period, the Customer can integrate Clivet Eye with even more complete services, such as direct access to read and modify the main parameters of the unit, for a fee. Please contact Clivet Aftersales. Once the terms of the free monitoring period have expired, the Sim Card will be disabled.

Modularity

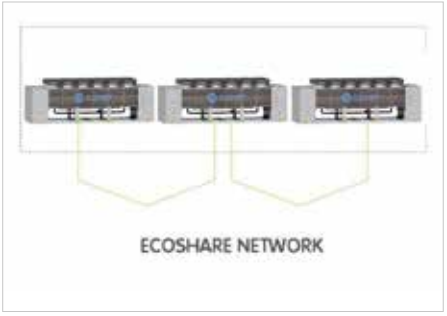
In the event of particularly large buildings requiring high capacities, it is advisable to use several units.

The SPINchiller[3] Multifunctionunits 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.
- serial communication module for Modbus supervisor

The microprocessor control combined with ECOSHARE allows controlling up to 3 units in local network (1 Master unit and 2 Slave).

MODULAR SYSTEM THAT ENHANCES SPINchiller[3] TECHNOLOGY ADVANTAGES



Remote system management

SPINchiller[3] 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.

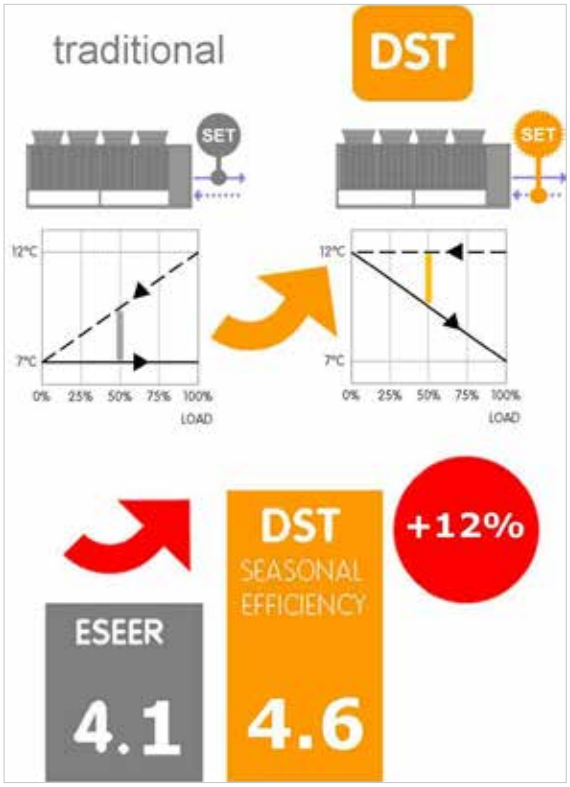
Moreover, the integration with the Demand Limit function supplied as standard allows to act on consumption levels by limiting them if they exceed the expected limit.

Seasonal energy efficiency is further increased with the DST operating logic

SPINchiller[3] is standard provided with thermoregulation logic, named DST (Dynamic Supply Temperature).

In a constant water flow system, 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.



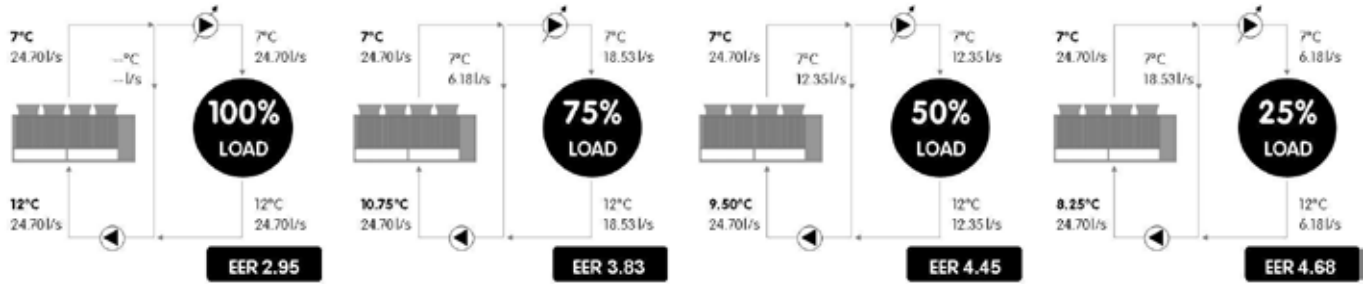
Example

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:

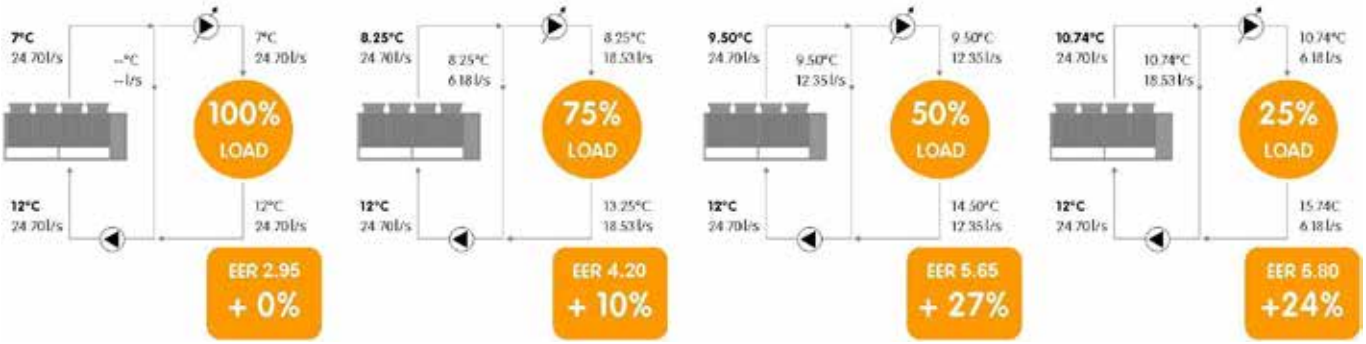
- primary circuit with constant water flow rate;
- secondary circuit with variable water flow-rate according to the load (linear variability for simplicity).

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)

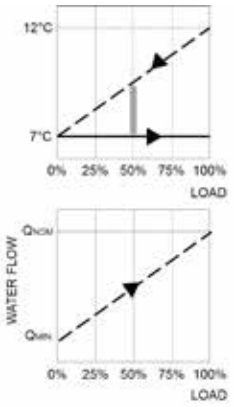


The control logic at variable flow rate

SPINchiller[3] can also manage systems at variable water flow rate.

This control is made available setting the unit with built-in pumps at variable flow rate or, in case of external pumps at variable flow rate, through their direct management by the unit.

In a variable water flow rate system, in addition to the benefits of the control stability given by the control on the return temperature and by the energy saving in the part load operation, thanks to the pump flow rate reduction, is obtained a control aiming to maintain stable the temperature difference and consequently the water supply temperature.



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 MULTIFUNCTION units both on user side and recovery side, driving 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.

In the multifuncion units, the control at variable flow rate is available both on cold user side and on recovery side.

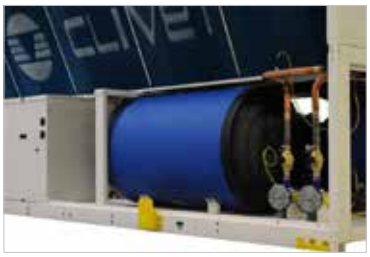
SPINchiller[3] technology industrialised the system

SPINchiller[3] 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 SPINchiller[3] 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.

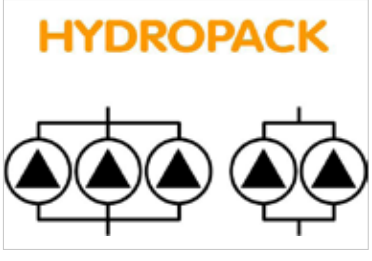


The inertial accumulation is available connected to the hydraulic circuit hot user side or to the hydraulic circuit cold user side.

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.



Switching on and off of pumps externally installed is handled by the MULTIFUNCTION controller. Availability and operation of pumps has to be guaranteed in every working condition.

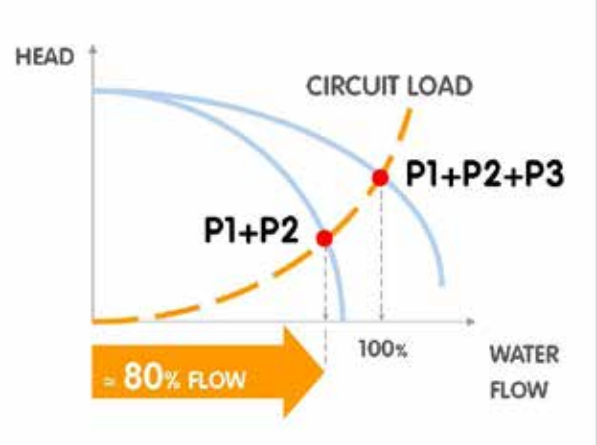
The exceptional HydroPack operation continuity

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 80% of the rated flow (3 ON/OFF pump configuration);
- about 60% of the rated flow (2 ON/OFF pump configuration).

If variable flow-rate control is selected, failure of a pump is balanced by inverter, calibrating flow-rate on remaining pumps.



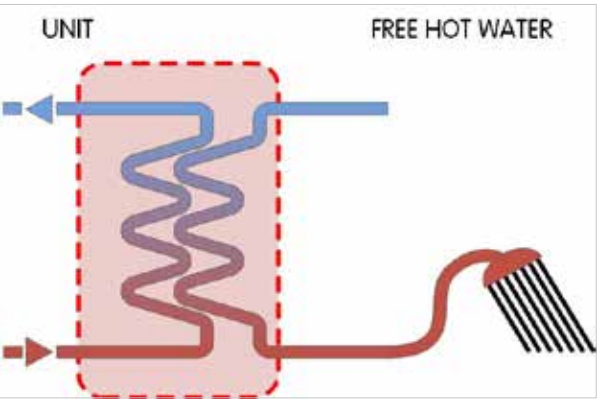
Produces hot water freely

The MULTIFUNCTION both in the 2-pipe and 4-pipe system configuration is standard equipped with an exchanger which can operate the condensation heat recovery up to:

- 100% of the available heat.

When the heat request is simultaneous to the request of chilled water, the thermal energy, otherwise dissipated in the environment, is recovered to produce free hot water for:

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



Further considerations on the application

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

Water flow rate values outside the limits

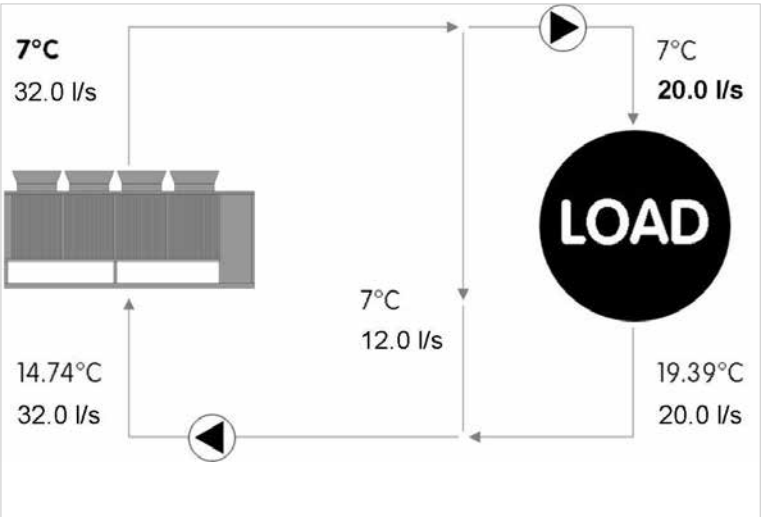
SPINchiller³ operates with constant water flow rate to the evaporator, between a minimum and maximum value indicated in the technical documents.

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

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

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

A properly sized bypass piping resolves the problem.



Example referred to WSAN-XSC3 MF 400.8 SC EXCELLENCE version.
Appropriate water flow rate for the correct unit operation.

Temperature values outside the limits

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

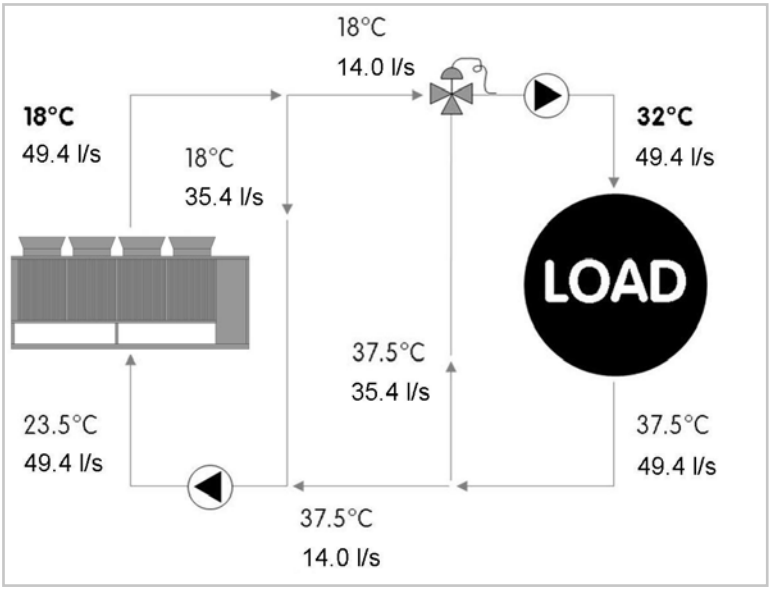
Temperature limits below the limit may cause unwanted formation of ice and the unit to stop following the intervention of built-in safety devices.

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

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

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

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



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

Exchanger thermal gradient

SPINchiller³ nominal capacities refer to internal exchanger 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).

Units connected in parallel

In systems with multiple units connected in hydraulic parallel, it is necessary to provide for a unit coordination system. Clivet proposes the Ecoshare system that offers many advantages:

- greater energy efficiency;
- higher redundancy;
- higher reliability and flexibility.

Alternatively can be used the supervision system of the central station with insertion in cascade of the units or of the set-point shared on the different units.

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.

Cold user side (4T) / user side (2T) exchanger

Direct expansion heat exchanger with braze welded stainless steel INOX AISI 316 plates and complete with external thermal/anti-condensation insulation. The exchanger is complete with:

- 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.

Hot user side (4T) / recovery (2T) exchanger

Direct expansion heat exchanger with braze welded stainless steel INOX AISI 316 plates with a large exchange surface. The exchanger is complete with:

- 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.

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 housed in aerodynamically shaped structures, equipped with accident prevention 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.

External section fan consumption reduction device 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;
- 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

4T - Configuration for 4-pipe system
2T - Configuration for 2-pipe system with total recovery
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;
- input for remote HEAT/COOL control;
- relay for remote cumulative fault signal;
- input for demand limit (absorbed power limit according to an external signal 0÷10V or 4÷20mA);
- potential-free contacts for compressor status;
- digital input for double set-point enabling;
- multifunction phase monitor;
- electrical panel ventilation.
- serial communication module for Modbus supervisor
- RS485 Modem, Antenna, 4 GB micro SD expansion card

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 ON/OFF cold user side (4T) or user side (2T) - n.b.: other types are available by head.
- Inverter driven HYDROPACK for cold user side (4T) or user side (2T).
- Inverter driven HYDROPACK for hot user side (4T) or recovery side (2T).
- Storage tank - n.b.: it is available only one storage tank connected or to cold user side (4T) or to hot user side (4T). For 2T configuration the storage tank is available connected to user side.
- 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
- 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)
- Device for fan consumption reduction of the external section, ECOBREEZE type
- Serial communication module for BACnet-IP supervisor
- Serial communication module for LonWorks supervisor
- 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)
- Refrigerant leak detector in the casing
- Variable flow-rate control

On special request are available:

- copper /copper condenser coil with brass shoulders.

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="4">√ standard unit</td><td rowspan="5">√ standard unit</td><td rowspan="6">√ standard unit[)]</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="2">√ 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>√ water empty unit or with an appropriate glycol percentage
√ electrical panel anti-freeze protection</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>X not suitable: recovery pumps</td><td>NOT POSSIBLE</td></tr>
</table>

Data referred to the following conditions:
*chilled water production only:
internal exchanger water = 12/7 °C
**hot water production only:
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.

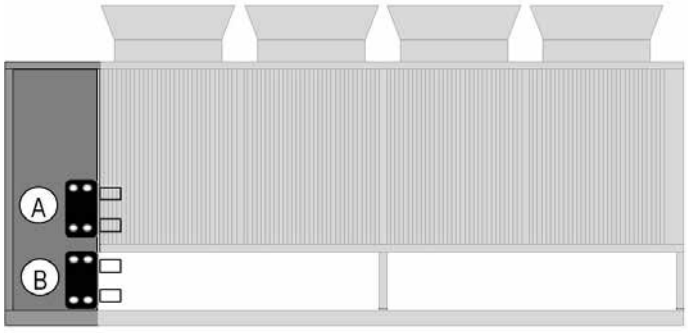
4T configuration - For 4-pipe systems

4T configuration supply air conditioning systems with 4 tubes and it is able to supply hot water and chilled water simultaneously and independently on season.

This configuration allows:

- simultaneous hot water production to the hot user side with chilled water production to the cold user side;
- hot water production to the hot user side with cooling capacity rejection to the external thermal source;
- chilled water production to the cold user side with heating capacity rejection to the external thermal source.

Unit controller guarantees unit operation in mix mode conditions.



A: cold user side exchanger
B: hot user side exchanger

Considerations on the installation

Primary-secondary

The system must necessarily be provided with an hydraulic separator for primary-secondary both for the hot user side and for the cold user side. This allows the unit to effectively fulfil the load avoiding hysteresis of thermal shift. to monitor the secondary circuit load demand, it is necessary to keep operating the primary circuit pump periodics, hot and cold user side.

Suspension of hot load production

It is possible to inhibit the hot water production on hot user side and consequently the operation of the pumping unit connected to it through the appropriate potential free contact present in the electrical panel.

Desuperheater mode

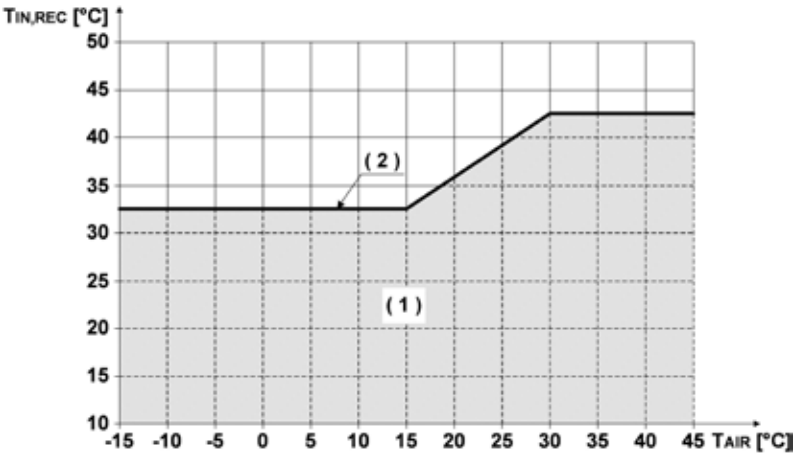
The unit control, at part load, changes the water flow-rate, hot side, maintaining the temperature at the set-point. Through the flow modulation, the unit can produce hot water even over the set-point, up to a settable limit temperature (default 65°C). Thanks to this setting the exchanger operation time, hot user side, is extended in desuperheater mode, improving the unit efficiency of 5%.

The logic of control above described drives to a proper design of hydraulic components and safety devices, considering the upper limit of hot water. It is possible to decrease this temperature down to the set point, not having the energy efficiency benefits that desuperheater solution leads.

Operation with low water temperatures, hot user side

Depending on the outside air temperature, the hot user side set-point is automatically increased, by the unit control, to the minimum operation temperature indicated in the graph.

It is possible to maintain a hot user side temperature under the minimum limit indicated in the graph providing a primary-secundary. The secundary will be maintained at the desired temperature, the primary, managed by the unit, will have temperatures congruent to limits indicated in the graph.



T_{IN},REC [°C] = entering water temperature to recovery
T_{AIR} [°C] = entering external exchanger air temperature (D.B.)

1. Temporary operating range where unit forces the recovery set-point (if the hot load production is enabled).
2. Minimum system water temperature level, hot user side.

Hot side water flow-rate

If the pumping unit hot user side is not built-in installed, **the external pump start signal must be managed by the unit through the appropiate potential free contact present in the electrical panel.**

Cold side water flow-rate

For a proper unit operation is necessary to guarantee the cold user side water flow rate also when chilled water is not required. It is therefore necessary to maintain in stand-by and available at the start-up the primary circuit pumps also in the cold season.

If the pumping unit is not built-in installed, **the external pump start signal must be managed by the unit through the appropiate potential free contact present in the electrical panel.**

System water volume

For a proper unit operation is necessary to contemplate a correct design of water tanks both on cold user side and hot 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. The values indicated guaratee: the operation stability and performance, the protection of all components subject to wear, the maintenance of the set-point even under the most extreme conditions of air conditioning (high heating capacity requests with low cooling capacity requests).
In the presence of a primary-secondary system, in the calculation of the minimum water flow rate volume it is possible to consider also the secondary volume only if it remains active (operating pumps) in all the load conditions.

Operation with outdoor air temperature lower than +5°C

If the system requires only hot load: the unit produces only hot water at hot user side with cool rejection on the external heat source.

If the system requires only cold load: the unit produces only chilled water at cold user side with heat rejection on the external heat source.

If the system requires simultaneously cold and hot load: the unit produces only chilled water at cold user side, and supply the hot user side with the desuperheating heat. The unit remains in chiller mode with partial recovery unitl the cold load is not fulfilled. Once fulfilled it, the unit switches to a only hot water production mode on the hot user side.

Process applications

For process applications with variable heat loads and constant set temperatures throughout the year, please contact Clivet's Technical Department to evaluate the most appropriate solution.

Configuration for 4-pipe system

Unit configuration

WSAN-XSC3 MF	400 . 8	4T	EXC	SC	AXIX	-	-
(1)	(2) (3)	(4)	(5)	(6)	(7)	(8)	(9)

(1) Range
WSAN = Air cooled heat pump with scroll compressor
XSC3 = SPINchiller³ range
MF = Multifunction

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

(3) Compressors
8 = Compressor quantity

(4) System configuration
4T = Configuration for 4 pipe systemsi

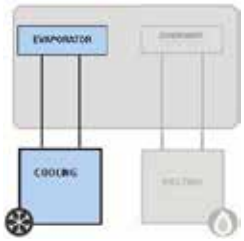
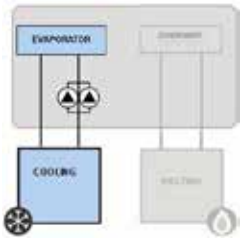
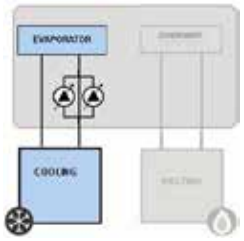
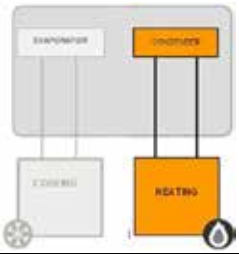
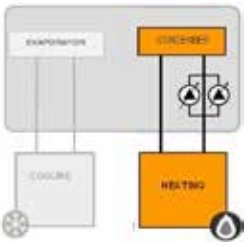
(5) Energy efficiency
EXC = EXCELLENCE version: high energy efficiency

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

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

(8) Pumping unit cold user side
(-) not required
4PM - Hydropack user side with no. 4 of ON/OFF pumps
6PM - Hydropack user side with no. 6 of ON/OFF pumps
4PMV- Hydropack user side with no. 4 of inverter pumps
6PMV - Hydropack user side with no. 6 of inverter pumps

(9) Pumping unit hot user side
(-) not required
HYGR6V - Hydropack recovery side with no. 6 of inverter pumps

Hydraulic side	Hydronic units		
COLD USER SIDE Chilled water production	**1.1** Standard unit 	**1.2** Standard unit with HYDROPACK ON/OFF 	**1.3** Standard unit with HYDROPACK activated by inverter 
HOT USER SIDE Production of hot water	**2.1** Standard unit 		**2.3** Standard unit with HYDROPACK activated by inverter 

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

Configuration for 4-pipe system

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]	725	770	819	868	937	1006	1090	1204	1300
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
EER	1	-	2,86	2,84	2,87	2,90	2,90	2,90	2,91	2,94	2,90
Water flow-rate	1	[l/s]	34,6	36,8	39,1	41,5	44,8	48,1	52,1	57,5	62,1
Cold user side exchanger pressure drops	1	[kPa]	45	47	46	46	43	40	47	44	51
Cooling capacity (EN14511:2018)	3	[kW]	722	767	816	865	934	1003	1087	1200	1295
Total power input (EN14511:2018)	3	[kW]	256	274	288	303	326	350	379	413	453
EER (EN 14511:2018)	3	-	2,82	2,80	2,83	2,86	2,86	2,87	2,87	2,91	2,86
SEER	9	-	4,18	4,23	4,22	4,21	4,23	4,24	4,24	4,22	4,16
Cooling capacity (AHRI 550/590)	7	[kW]	721	765	814	864	934	1004	1087	1200	1296
Compressor power input (AHRI 550/590)	7	[kW]	230	245	259	273	294	315	343	377	417
Total power input (AHRI 550/590)	7	[kW]	252	270	284	299	323	346	375	409	449
COPr	7	-	2,86	2,83	2,86	2,89	2,90	2,90	2,90	2,93	2,89
IPLV	7	-	4,72	4,72	4,83	4,88	4,86	4,92	4,89	5,02	4,98
Heating											
Heating capacity	4	[kW]	839	890	937	984	1059	1134	1254	1350	1456
Compressor power input	4	[kW]	204	216	228	241	261	281	309	342	368
Total power input	2	[kW]	227	241	253	266	289	311	342	374	400
COP	4	-	3,70	3,69	3,70	3,70	3,67	3,64	3,67	3,61	3,64
Water flow-rate	4	[l/s]	40,1	42,5	44,8	47,0	50,6	54,2	59,9	64,5	69,6
Hot user side exchanger pressure drops	4	[kPa]	41	35	39	43	37	32	39	45	46
Heating capacity (EN14511:2018)	5	[kW]	842	892	940	987	1062	1137	1257	1354	1461
Total power input (EN14511:2018)	5	[kW]	230	244	256	269	291	314	345	378	405
COP (EN 14511:2018)	5	[kW]	3,67	3,66	3,67	3,67	3,64	3,62	3,64	3,58	3,61
Cooling 100% - Heating 100%											
Cooling capacity	6	[kW]	741	793	838	883	951	1018	1112	1224	1339
Heating capacity	6	[kW]	961	1027	1087	1147	1231	1316	1439	1587	1733
Total power input	6	[kW]	220	233	248	263	281	298	328	364	393
TER	8	[kW]	7,75	7,80	7,75	7,71	7,77	7,83	7,79	7,72	7,81

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. Internal exchanger fouling factor = 0.44 x 10^(-4) m^2 K/W. Considering cooling only operation.
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. Data compliant to Standard EN 14511:2018 referred to the following conditions: - Internal exchanger water temperature = 12/7°C - Entering external exchanger air temperature = 35°C. Considering cooling only operation.
4. 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. Internal exchanger fouling factor = 0.44 x 10^(-4) m^2 K/W. Considering heating only operation.
5. Data compliant to Standard EN 14511:2018 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. Considering heating only operation.
6. Data referred to the following conditions: exchanger water cooling side = */7 °C. exchanger water heating side = */45°C. Exchanger fouling factor = 0.44 x 10^(-4) m^2 K/W.
7. Data compliant to Standard AHRI 550/590 referred to the following conditions: internal exchanger water temperature = 6,7 °C. Water flow-rate 0,043 l/s per kW. Entering external exchanger air temperature 35°C. Internal exchanger fouling factor = 0.18 x 10^(-4) m2 K/W. Considering cooling only operation.
8. TER = (Cooling capacity + Heating capacity) / Total power input.
9. Data calculated according to the EN 14825:2016 Regulation

Configuration for 4-pipe system

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]	694	737	782	826	894	961	1047	1147	1235
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
EER	1	-	2,67	2,68	2,70	2,72	2,71	2,70	2,75	2,72	2,63
Water flow-rate	1	[l/s]	33,2	35,2	37,4	39,5	42,7	45,9	50,0	54,8	59,0
Cold user side exchanger pressure drops	1	[kPa]	42	43	42	42	39	37	44	40	46
Cooling capacity (EN14511:2013)	3	[kW]	692	735	779	824	891	958	1044	1144	1231
Total power input (EN14511:2013)	3	[kW]	262	278	293	307	333	358	385	425	475
EER (EN 14511:2013)	3	-	2,64	2,64	2,66	2,68	2,68	2,67	2,71	2,69	2,59
SEER	9	-	4,13	4,13	4,13	4,12	4,14	4,15	4,15	4,14	4,14
Cooling capacity (AHRI 550/590)	7	[kW]	692	734	778	823	891	960	1043	1144	1233
Compressor power input (AHRI 550/590)	7	[kW]	243	256	271	285	308	332	357	398	446
Total power input (AHRI 550/590)	7	[kW]	259	274	289	304	329	355	380	421	469
COPr	7	-	2,67	2,68	2,69	2,71	2,71	2,71	2,75	2,72	2,63
IPLV	7	-	4,53	4,61	4,70	4,67	4,65	4,73	4,75	4,83	4,86
Heating											
Heating capacity	4	[kW]	839	890	937	984	1059	1134	1254	1350	1456
Compressor power input	4	[kW]	204	216	228	241	261	281	309	342	368
Total power input	2	[kW]	227	241	253	266	289	311	342	374	400
COP	4	-	3,70	3,69	3,70	3,70	3,67	3,64	3,67	3,61	3,64
Water flow-rate	4	[l/s]	40,1	42,5	44,8	47,0	50,6	54,2	59,9	64,5	69,6
Hot user side exchanger pressure drops	4	[kPa]	41	35	39	43	37	32	39	45	46
Heating capacity (EN14511:2013)	5	[kW]	842	892	940	987	1062	1137	1257	1354	1461
Total power input (EN14511:2013)	5	[kW]	230	244	256	269	291	314	345	378	405
COP (EN 14511:2013)	5	[kW]	3,67	3,66	3,67	3,67	3,64	3,62	3,64	3,58	3,61
Cooling 100% - Heating 100%											
Cooling capacity	6	[kW]	741	793	838	883	951	1018	1112	1224	1339
Heating capacity	6	[kW]	961	1027	1087	1147	1231	1316	1439	1587	1733
Total power input	6	[kW]	220	233	248	263	281	298	328	364	393
TER	8	[kW]	7,75	7,80	7,75	7,71	7,77	7,83	7,79	7,72	7,81

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. Internal exchanger fouling factor = 0.44 x 10^(-4) m^2 K/W. Considering cooling only operation.
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. 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. Considering cooling only operation.
4. 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. Internal exchanger fouling factor = 0.44 x 10^(-4) m^2 K/W. Considering heating only operation.
5. 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. Considering heating only operation.
6. Data referred to the following conditions: exchanger water cooling side = */7 °C. exchanger water heating side = */45°C. Exchanger fouling factor = 0.44 x 10^(-4) m^2 K/W.
7. Data compliant to Standard AHRI 550/590 referred to the following conditions: internal exchanger water temperature = 6,7 °C. Water flow-rate 0,043 l/s per kW. Entering external exchanger air temperature 35°C. Internal exchanger fouling factor = 0.18 x 10^(-4) m2 K/W. Considering cooling only operation.
8. TER = (Cooling capacity + Heating capacity) / Total power input.
9. Data calculated according to the EN 14825:2016 Regulation

Configuration for 4-pipe system

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
Refrigerant		-	R-410A	R-410A	R-410A	R-410A	R-410A	R-410A	R-410A	R-410A	R-410A
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	14	12	14	8	14	12	12	12	8
Oil charge (C1)		[l]	13	13	13	13	13	13	13	13	13
Oil charge (C2)		[l]	13	13	13	13	13	13	13	13	13
Oil charge (C3)		[l]	13	13	13	13	13	13	13	13	13
Oil charge (C4)		[l]	13	13	13	13	13	13	13	13	13
Refrigerant charge (C1)	1	[kg]	57	64	64	65	65	79	79	81	95
Refrigerant charge (C2)	1	[kg]	53	60	60	61	61	74	74	89	89
Refrigerant charge (C3)	1	[kg]	64	64	65	65	79	79	79	81	95
Refrigerant charge (C4)	1	[kg]	60	60	61	61	74	74	74	89	89
Refrigeration circuits		Nr	4	4	4	4	4	4	4	4	4
Internal exchanger											
Type of cold user side exchanger	2	-	PHE	PHE	PHE	PHE	PHE	PHE	PHE	PHE	PHE
Type of hot user side exchanger	2	-	PHE	PHE	PHE	PHE	PHE	PHE	PHE	PHE	PHE
Cold user side exchanger water content		[l]	60	63	69	74	86	99	99	124	124
Hot user side exchanger water content		[l]	43	50	50	50	68	86	86	108	108
Cold user side minimum system water content	3	[l]	6989	6989	7878	7878	9131	9131	9893	10928	11799
Hot user side minimum system water content	3	[l]	5783	5783	6393	6393	7368	7368	8148	8771	9460
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											
Cold user side water fittings		-	6"	6"	6"	6"	8"	8"	8"	8"	8"
Hot user side water fittings		-	6"	6"	6"	6"	8"	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
Electrical data											
F.L.A. - Power line 1		[A]	261,8	299,0	299,0	328,0	328,0	387,6	416,6	456,8	497,0
F.L.I. - Power line 1		[kW]	155,8	180,7	180,7	201,9	201,9	231,2	252,4	275,8	299,2
F.L.A. - Power line 2		[A]	299,0	299,0	328,0	328,0	387,6	387,6	416,6	456,8	497,0
F.L.I. - Power line 2		[kW]	180,7	180,7	201,9	201,9	231,2	231,2	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. Water volume necessary for the proper unit operation (for more details see 'Considerations on the application').
4. AX = axial fan.
5. AC/P = asynchronous three-phase external rotor motor with phase cutting speed automatic control
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. 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.

Configuration for 4-pipe system

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
Refrigerant		-	R-410A	R-410A	R-410A	R-410A	R-410A	R-410A	R-410A	R-410A	R-410A
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	14	12	14	8	14	12	12	12	8
Oil charge (C1)		[l]	13	13	13	13	13	13	13	13	13
Oil charge (C2)		[l]	13	13	13	13	13	13	13	13	13
Oil charge (C3)		[l]	13	13	13	13	13	13	13	13	13
Oil charge (C4)		[l]	13	13	13	13	13	13	13	13	13
Refrigerant charge (C1)	1	[kg]	57	64	64	65	65	79	79	81	95
Refrigerant charge (C2)	1	[kg]	53	60	60	61	61	74	74	89	89
Refrigerant charge (C3)	1	[kg]	64	64	65	65	79	79	79	81	95
Refrigerant charge (C4)	1	[kg]	60	60	61	61	74	74	74	89	89
Refrigeration circuits		Nr	4	4	4	4	4	4	4	4	4
Internal exchanger											
Type of cold user side exchanger	2	-	PHE	PHE	PHE	PHE	PHE	PHE	PHE	PHE	PHE
Type of hot user side exchanger	2	-	PHE	PHE	PHE	PHE	PHE	PHE	PHE	PHE	PHE
Cold user side exchanger water content		[l]	60	63	69	74	86	99	99	124	124
Hot user side exchanger water content		[l]	43	50	50	50	68	86	86	108	108
Cold user side minimum system water content	3	[l]	6989	6989	7878	7878	9131	9131	9893	10928	11799
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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											
Cold user side water fittings		-	6"	6"	6"	6"	8"	8"	8"	8"	8"
Hot user side water fittings		-	6"	6"	6"	6"	8"	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
Electrical data											
F.L.A. - Power line 1		[A]	261,8	299,0	299,0	328,0	328,0	387,6	416,6	456,8	497,0
F.L.I. - Power line 1		[kW]	155,8	180,7	180,7	201,9	201,9	231,2	252,4	275,8	299,2
F.L.A. - Power line 2		[A]	299,0	299,0	328,0	328,0	387,6	387,6	416,6	456,8	497,0
F.L.I. - Power line 2		[kW]	180,7	180,7	201,9	201,9	231,2	231,2	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. Water volume necessary for the proper unit operation (for more details see 'Considerations on the application').
4. AX = axial fan.
5. AC/P = asynchronous three-phase external rotor motor with phase cutting speed automatic control.
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. 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.

Configuration for 4-pipe system

Acoustic configuration: compressor soundproofing (SC)

Sound levels

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

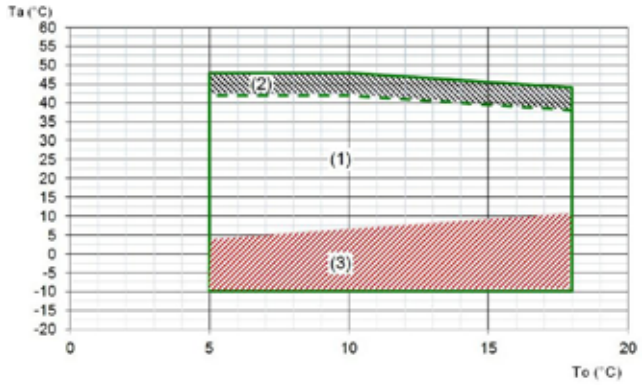
The sound levels refer to standard unit with Axitop (no accessories) at full load, in test nominal conditions. The sound pressure level refers to 1 m. from the standard unit outer surface operating in open field.
Measures are according to UNI EN ISO 9614-2 regulations, with respect to the EUROVENT 8/1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

Configuration for 4-pipe system

Operating range in cooling

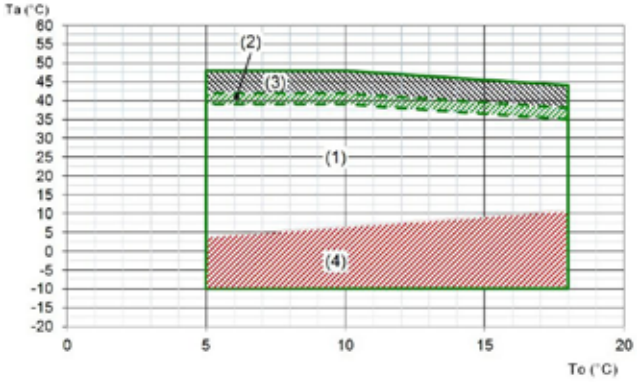
Compressor soundproofing (SC)



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

Super-silenced (EN)

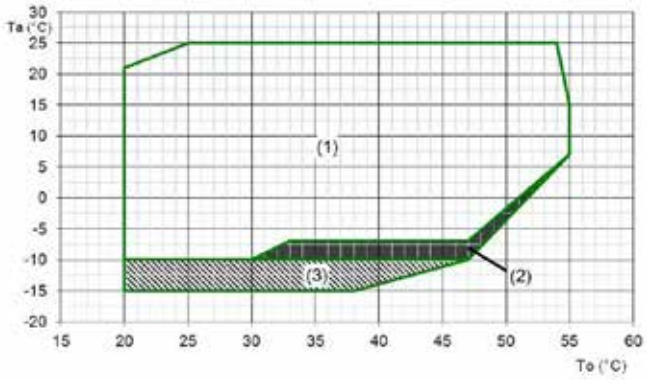


Ta (°C)= external exchanger inlet air temperature (D.B.)
To (°C)= internal exchanger outlet water temperature

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

Operating range in heating

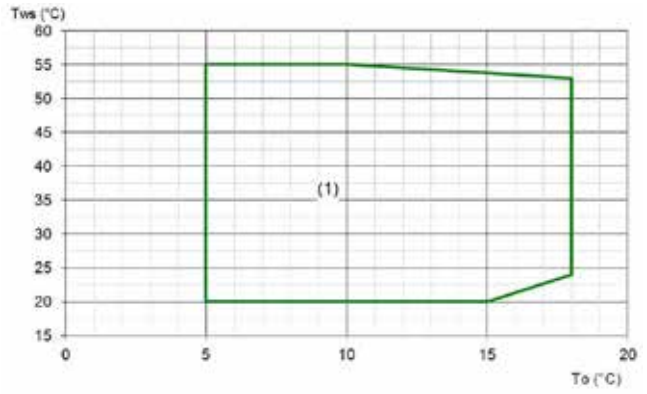
Compressor soundproofing (SC) / Super-silenced (EN)



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. Unit 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)

Operating range - Cooling 100% - Heating 100%



Tws (°C) = leaving hot user side exchanger water temperature
To (°C) = leaving cold user side exchanger water temperature

1. The water-water mode is applied with outdoor air temperatures higher than 5 °C. For lower temperatures the unit guarantees the hot and cold production alternating the chiller plus desuperheater operation, recovery only

Configuration for 4-pipe system

Admissible water flow-rates

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

Cold user side exchanger

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

Hot user side exchanger

EXCELLENCE SC/EN		260.8	280.8	300.8	320.8	340.8	360.8	400.8	440.8	480.8
Qmin	[l/s]	24,0	27,2	27,2	27,2	32,2	37,2	37,2	38,4	39,5
Qmax	[l/s]	64,1	72,7	72,7	72,7	84,6	96,6	96,6	99,7	102,8

Correction factors for glycol use

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

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

Fouling Correction Factors

	Internal exchanger	
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

Configuration for 4-pipe system

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
260.8	5	785	188	739	206	684	227	628	251	604	266	303	121
	6	806	189	759	208	705	229	650	253	627	269	315	122
	7	835	191	786	210	725	231	665	256	642	272	322	123
	10	890	195	832	214	766	236	704	261	679	280	341	127
	15	988	204	926	223	856	245	807	275	471	137	-	-
	18	1084	211	1013	230	940	252	891	288	523	140	-	-
280.8	5	833	200	782	220	725	241	668	267	640	284	307	119
	6	855	202	805	221	746	243	690	269	667	286	320	120
	7	885	205	833	224	770	246	708	271	683	288	328	121
	10	942	209	882	228	811	250	750	276	726	299	348	126
	15	1038	219	975	238	903	261	857	295	521	157	-	-
	18	1151	227	1068	246	995	268	951	307	585	160	-	-
300.8	5	887	212	836	232	773	255	708	283	679	302	344	139
	6	911	215	859	234	796	256	730	285	706	303	357	140
	7	942	217	888	237	819	260	750	288	726	305	368	141
	10	997	222	936	241	863	264	793	292	776	314	393	145
	15	1107	233	1035	252	961	277	900	307	536	152	-	-
	18	1220	240	1141	260	1060	285	994	317	597	155	-	-
320.8	5	942	224	890	244	822	268	748	299	719	320	381	160
	6	966	227	913	247	846	270	770	302	744	321	395	160
	7	999	230	943	249	868	274	793	304	770	323	408	161
	10	1052	235	990	254	915	278	837	309	827	329	438	164
	15	1176	246	1096	265	1019	292	942	319	551	148	-	-
	18	1289	254	1213	274	1125	302	1038	326	610	150	-	-
340.8	5	1024	240	964	263	890	289	812	324	784	342	350	141
	6	1056	242	992	266	918	291	833	327	808	344	361	141
	7	1084	245	1017	268	937	295	854	328	830	347	371	142
	10	1138	250	1067	272	985	299	911	335	879	355	394	145
	15	1274	262	1187	284	1101	313	1021	349	652	191	-	-
	18	1388	270	1296	293	1202	322	1112	357	721	194	-	-
360.8	5	1107	255	1037	282	958	311	877	349	849	365	320	121
	6	1146	258	1070	285	989	313	896	352	872	368	328	122
	7	1169	260	1092	286	1006	316	915	353	889	370	334	123
	10	1225	265	1144	291	1054	319	984	362	932	380	351	127
	15	1371	277	1279	303	1183	333	1101	378	753	234	-	-
	18	1487	285	1379	312	1279	342	1186	388	831	238	-	-
400.8	5	1192	283	1118	309	1039	337	961	369	938	384	575	237
	6	1222	285	1147	311	1072	341	992	373	964	387	590	239
	7	1256	289	1176	315	1090	343	1011	375	987	389	605	240
	10	1312	295	1233	321	1138	350	1058	381	1034	395	634	245
	15	1444	309	1367	337	1275	366	1200	398	797	223	-	-
	18	1585	321	1488	349	1390	377	1312	409	883	227	-	-
440.8	5	1330	310	1252	339	1152	374	1048	418	1016	438	572	238
	6	1363	313	1284	341	1180	376	1075	419	1036	444	583	242
	7	1391	315	1307	342	1204	377	1091	423	1055	452	594	246
	10	1455	320	1359	349	1251	384	1131	436	1119	466	630	254
	15	1622	336	1517	363	1402	403	1306	463	803	244	-	-
	18	1757	345	1639	376	1520	412	1445	470	889	250	-	-
480.8	5	1433	342	1349	375	1245	413	1124	454	1098	484	573	236
	6	1469	346	1387	376	1273	417	1156	459	1122	492	586	241
	7	1497	349	1414	377	1300	417	1187	464	1144	499	598	244
	10	1570	353	1468	384	1352	424	1226	479	1213	519	634	254
	15	1743	368	1625	400	1515	441	1411	509	809	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

Configuration for 4-pipe system

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
260.8	5	761	197	714	217	659	239	617	260	604	266	303	121
	6	788	200	736	219	679	241	636	263	627	269	315	122
	7	806	202	755	221	694	243	649	267	641	272	322	123
	10	855	208	799	227	735	249	687	276	679	280	341	127
	15	951	218	887	237	825	263	775	287	471	137	-	-
	18	1038	224	967	244	902	270	844	295	522	140	-	-
280.8	5	808	209	761	230	702	252	656	274	639	284	307	119
	6	837	211	781	232	720	254	677	278	666	286	320	120
	7	856	214	800	234	737	257	689	282	682	288	327	121
	10	907	220	849	240	781	263	726	295	725	299	348	126
	15	1008	231	938	252	876	278	826	307	520	157	-	-
	18	1101	238	1032	259	963	287	908	316	585	160	-	-
300.8	5	860	221	805	242	744	266	697	290	679	302	344	139
	6	886	223	830	245	764	268	719	293	705	303	357	140
	7	911	226	850	247	782	272	729	297	726	305	368	141
	10	962	232	897	253	825	277	764	307	776	314	393	145
	15	1067	244	993	266	924	294	869	320	536	152	-	-
	18	1159	252	1083	274	1006	302	948	329	598	155	-	-
320.8	5	912	232	850	255	785	280	737	306	719	320	381	160
	6	936	235	879	258	808	282	760	308	744	321	395	160
	7	966	238	900	260	826	286	769	311	770	323	408	161
	10	1018	245	945	266	869	291	802	319	827	329	438	164
	15	1126	257	1048	279	972	310	911	333	551	148	-	-
	18	1217	266	1134	288	1049	317	988	341	611	150	-	-
340.8	5	992	252	925	276	855	303	795	335	784	342	350	141
	6	1019	254	952	279	877	306	816	337	808	344	361	141
	7	1048	257	973	282	894	309	829	339	830	347	371	142
	10	1101	263	1020	288	940	315	873	345	879	355	394	145
	15	1221	276	1136	301	1054	333	973	357	652	191	-	-
	18	1312	285	1222	310	1135	343	1043	367	719	194	-	-
360.8	5	1072	272	1000	298	925	327	853	365	849	365	320	121
	6	1103	274	1025	301	947	330	871	366	872	368	328	122
	7	1129	276	1047	304	961	333	889	367	889	370	334	123
	10	1184	281	1095	309	1011	338	944	371	932	380	351	127
	15	1316	296	1225	323	1137	356	1035	382	753	234	-	-
	18	1407	304	1311	332	1221	369	1099	393	827	238	-	-
400.8	5	1153	296	1078	323	1000	351	945	378	938	384	575	237
	6	1180	299	1103	326	1024	355	970	381	964	387	590	239
	7	1201	302	1126	330	1047	358	990	384	987	389	605	240
	10	1262	310	1178	337	1096	366	1037	391	1034	395	634	245
	15	1390	326	1306	354	1229	384	1178	413	797	223	-	-
	18	1509	337	1409	364	1333	395	1273	420	883	227	-	-
440.8	5	1294	323	1203	355	1103	392	1020	436	1023	438	576	238
	6	1324	326	1231	357	1127	395	1041	443	1043	444	587	242
	7	1352	329	1255	360	1147	399	1061	439	1063	452	599	246
	10	1410	334	1306	366	1191	405	1123	455	1127	466	635	254
	15	1565	351	1451	384	1339	430	1225	473	809	244	-	-
	18	1695	362	1578	396	1457	445	1313	484	888	250	-	-
480.8	5	1390	361	1293	397	1187	438	1099	490	1103	484	576	236
	6	1422	365	1322	400	1215	442	1122	498	1127	492	589	241
	7	1453	368	1350	404	1235	447	1148	497	1149	499	600	244
	10	1515	374	1403	409	1281	454	1204	509	1219	519	637	254
	15	1673	392	1552	429	1436	480	1320	528	813	233	-	-
	18	1812	404	1693	443	1573	492	1421	539	870	236	-	-

kWf = Potenza frigorifera in kW. il dato non tiene conto della quota parte relativa alle pompe e necessaria per vincere le perdite di carico per la circolazione della soluzione all'interno degli scambiatori
kWe = Potenza elettrica assorbita dai compressori in kW
To = Temperatura acqua uscita scambiatore interno (°C) - Salto termico acqua ingresso/uscita =5°C

Configuration for 4-pipe system

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		55	
		kWt	kWe	kWt	kWe	kWt	kWe	kWt	kWe	kWt	kWe
260.8	-7 / -8	611	160	608	178	602	197		-	-	-
	-5 / -6	642	161	638	179	630	198		-	-	-
	0 / -1	734	164	723	181	713	201	696	223	-	-
	2 / 1	774	165	762	183	748	202	732	225	-	-
	7 / 6	881	169	861	186	839	204	819	228	802	258
	12 / 11	1020	173	994	191	964	209	938	233	919	264
280.8	-7 / -8	650	168	647	186	640	206		-	-	-
	-5 / -6	681	170	679	188	669	207		-	-	-
	0 / -1	778	173	769	191	759	211	738	234	-	-
	2 / 1	820	175	810	193	794	212	777	236	-	-
	7 / 6	934	179	912	197	890	216	872	241	853	271
	12 / 11	1080	184	1054	202	1022	221	998	246	975	278
300.8	-7 / -8	684	176	679	195	671	216		-	-	-
	-5 / -6	718	178	713	197	702	217		-	-	-
	0 / -1	819	182	807	201	794	222	775	246	-	-
	2 / 1	864	184	851	203	833	224	816	248	-	-
	7 / 6	981	189	960	208	937	228	915	253	895	285
	12 / 11	1137	195	1108	214	1076	234	1048	260	1023	292
320.8	-7 / -8	718	185	711	204	703	225		-	-	-
	-5 / -6	755	187	747	206	735	227		-	-	-
	0 / -1	861	192	845	211	828	233	813	257	-	-
	2 / 1	907	194	892	213	872	235	855	260	-	-
	7 / 6	1028	199	1008	219	984	241	959	266	938	300
	12 / 11	1195	207	1163	226	1131	247	1099	273	1071	307
340.8	-7 / -8	776	201	770	224	759	249		-	-	-
	-5 / -6	815	203	808	226	796	250		-	-	-
	0 / -1	925	208	915	230	897	255	879	283	-	-
	2 / 1	975	210	962	232	943	256	924	285	-	-
	7 / 6	1105	214	1085	236	1059	261	1034	290	1010	328
	12 / 11	1280	220	1249	242	1213	266	1182	296	1151	334
360.8	-7 / -8	834	218	829	244	816	273		-	-	-
	-5 / -6	875	220	870	245	857	274		-	-	-
	0 / -1	988	223	985	249	965	276	945	308	-	-
	2 / 1	1043	225	1033	250	1013	278	992	310	-	-
	7 / 6	1181	229	1162	253	1134	281	1109	313	1082	356
	12 / 11	1365	234	1335	258	1296	285	1265	318	1231	361
400.8	-7 / -8	920	238	913	264	895	294		-	-	-
	-5 / -6	965	240	958	267	942	296		-	-	-
	0 / -1	1095	245	1084	272	1060	301	1042	336	-	-
	2 / 1	1156	248	1140	274	1118	304	1093	338	-	-
	7 / 6	1301	253	1282	279	1254	309	1218	343	1189	389
	12 / 11	1503	259	1470	285	1435	315	1388	350	1353	396

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.

Configuration for 4-pipe system

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		55	
		kWt	kWe	kWt	kWe	kWt	kWe	kWt	kWe	kWt	kWe
440.8	-7 / -8	993	264	987	295	966	329		-	-	-
	-5 / -6	1040	267	1037	297	1015	331		-	-	-
	0 / -1	1181	272	1165	302	1144	336	1112	375	-	-
	2 / 1	1245	274	1227	304	1203	338	1172	377	-	-
	7 / 6	1401	280	1381	309	1350	342	1316	382	1305	434
	12 / 11	1614	286	1583	315	1539	348	1496	388	1482	440
480.8	-7 / -8	1072	284	1062	317	1038	354		-	-	-
	-5 / -6	1122	286	1113	319	1093	356		-	-	-
	0 / -1	1264	292	1260	324	1228	361	1207	406	-	-
	2 / 1	1336	294	1321	326	1292	363	1265	408	-	-
	7 / 6	1505	299	1480	331	1456	368	1413	412	1378	470
	12 / 11	1729	305	1695	337	1653	373	1606	418	1563	475

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.

Configuration for 4-pipe system

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

Cooling 100% - Heating 100% performance (continued)

Size.	Tw (°C)	Leaving water temperature hot user side																							
		25				35				40				45				50				55			
		kWf	kWe	kWt	TER	kWf	kWe	kWt	TER	kWf	kWe	kWt	TER	kWf	kWe	kWt	TER	kWf	kWe	kWt	TER	kWf	kWe	kWt	TER
260.8	5	851	147	997	12,55	788	178	965	9,85	747	197	943	8,60	693	218	911	7,36	638	243	882	6,26	586	271	859	5,33
	6	880	148	1026	12,85	814	179	992	10,10	771	197	968	8,81	718	219	937	7,57	660	244	904	6,42	608	272	881	5,47
	7	914	149	1061	13,22	845	180	1023	10,38	798	198	995	9,05	741	220	961	7,75	678	245	923	6,54	625	273	899	5,59
	10	986	152	1135	13,98	908	182	1088	10,97	857	200	1057	9,56	796	222	1017	8,18	728	247	976	6,89	669	274	944	5,88
	15	1096	155	1248	15,08	1018	186	1202	11,94	963	204	1165	10,45	904	226	1129	8,99	829	251	1080	7,61	-	-	-	-
	18	1189	158	1344	15,99	1100	189	1286	12,64	1049	207	1254	11,13	976	229	1204	9,51	896	254	1150	8,05	-	-	-	-
280.8	5	907	157	1062	12,52	840	190	1028	9,85	798	209	1007	8,64	745	232	976	7,43	685	257	943	6,33	625	286	911	5,36
	6	936	158	1093	12,81	867	191	1057	10,09	825	210	1034	8,85	769	232	1002	7,62	708	259	967	6,48	651	288	939	5,53
	7	973	160	1131	13,17	900	192	1091	10,38	851	211	1062	9,07	793	233	1027	7,80	725	259	984	6,59	668	288	956	5,63
	10	1047	162	1207	13,88	970	194	1164	10,98	915	213	1128	9,58	852	236	1087	8,23	775	262	1037	6,93	715	291	1006	5,92
	15	1164	167	1329	14,94	1083	199	1281	11,89	1027	217	1244	10,45	965	241	1205	9,02	889	267	1156	7,67	-	-	-	-
	18	1266	171	1434	15,80	1169	202	1370	12,56	1118	221	1338	11,12	1041	244	1284	9,53	961	270	1231	8,12	-	-	-	-
300.8	5	955	168	1122	12,38	888	202	1090	9,79	843	222	1066	8,58	786	246	1032	7,39	720	273	993	6,27	663	303	966	5,37
	6	991	169	1159	12,71	918	203	1121	10,03	873	224	1096	8,80	811	247	1059	7,57	743	274	1018	6,42	688	305	992	5,52
	7	1026	171	1196	13,02	948	204	1152	10,27	900	225	1124	9,01	838	248	1087	7,75	764	275	1039	6,55	705	306	1011	5,62
	10	1103	174	1276	13,69	1021	208	1227	10,83	963	227	1190	9,47	895	251	1146	8,14	820	279	1098	6,89	752	308	1060	5,89
	15	1229	179	1407	14,69	1142	213	1354	11,73	1082	232	1313	10,33	1014	257	1270	8,90	933	283	1216	7,58	-	-	-	-
	18	1327	184	1509	15,43	1236	217	1451	12,39	1176	236	1412	10,95	1096	260	1356	9,42	1007	287	1295	8,01	-	-	-	-
320.8	5	1003	178	1181	12,26	937	214	1151	9,74	888	236	1124	8,54	827	261	1088	7,35	754	289	1043	6,22	700	320	1020	5,37
	6	1046	180	1226	12,61	968	216	1184	9,98	920	237	1158	8,76	854	262	1116	7,52	779	290	1069	6,37	725	322	1046	5,50
	7	1079	182	1260	12,88	997	217	1214	10,18	948	239	1187	8,95	883	263	1147	7,71	803	291	1095	6,52	743	323	1065	5,60
	10	1160	185	1345	13,52	1071	221	1291	10,70	1011	241	1253	9,38	939	266	1205	8,06	864	295	1160	6,85	790	325	1115	5,86
	15	1293	192	1485	14,48	1200	227	1427	11,59	1136	247	1383	10,21	1063	272	1335	8,80	976	300	1277	7,50	-	-	-	-
	18	1389	197	1585	15,10	1302	231	1533	12,25	1234	252	1486	10,81	1151	277	1428	9,31	1053	305	1358	7,92	-	-	-	-
340.8	5	1085	189	1275	12,51	1012	228	1240	9,89	960	251	1212	8,64	894	279	1172	7,41	816	310	1126	6,26	752	347	1097	5,33
	6	1126	190	1317	12,84	1045	229	1275	10,13	992	252	1245	8,87	922	280	1202	7,59	842	311	1153	6,41	774	348	1120	5,45
	7	1161	191	1353	13,14	1077	230	1308	10,37	1022	253	1276	9,06	951	281	1231	7,77	864	312	1176	6,53	794	348	1141	5,55
	10	1243	194	1437	13,81	1148	233	1381	10,87	1086	256	1343	9,50	1007	283	1290	8,13	921	315	1235	6,84	841	350	1190	5,80
	15	1385	199	1585	14,92	1293	238	1532	11,88	1226	260	1487	10,42	1144	288	1433	8,94	1057	320	1377	7,61	-	-	-	-
	18	1495	203	1700	15,74	1398	242	1641	12,57	1327	264	1592	11,04	1241	292	1534	9,51	1136	323	1460	8,03	-	-	-	-
360.8	5	1168	199	1369	12,72	1088	241	1330	10,02	1032	267	1299	8,73	961	297	1257	7,47	878	332	1209	6,29	803	373	1173	5,30
	6	1205	200	1407	13,05	1122	242	1365	10,27	1065	268	1333	8,96	991	298	1288	7,66	905	333	1237	6,44	824	374	1195	5,40
	7	1243	201	1446	13,38	1158	243	1402	10,53	1095	268	1364	9,16	1018	298	1316	7,83	925	333	1257	6,55	845	374	1216	5,51
	10	1325	203	1530	14,08	1225	245	1471	11,02	1161	270	1433	9,61	1076	300	1376	8,18	977	335	1311	6,84	892	375	1265	5,75
	15	1477	206	1686	15,33	1387	249	1638	12,14	1316	274	1592	10,60	1225	304	1530	9,06	1138	339	1477	7,72	-	-	-	-
	18	1602	209	1814	16,34	1494	252	1748	12,87	1419	277	1698	11,25	1332	307	1640	9,68	1219	342	1561	8,14	-	-	-	-
400.8	5	1271	220	1492	12,54	1184	266	1450	9,92	1125	293	1419	8,67	1045	326	1370	7,42	955	363	1318	6,26	875	407	1280	5,30
	6	1311	222	1534	12,84	1221	267	1489	10,16	1161	295	1456	8,88	1078	327	1405	7,60	986	364	1350	6,41	903	408	1309	5,43
	7	1352	223	1576	13,14	1259	268	1528	10,39	1197	296	1493	9,10	1112	328	1439	7,79	1010	365	1375	6,53	926	409	1333	5,53
	10	1447	226	1674	13,84	1338	271	1610	10,88	1269	298	1568	9,52	1175	330	1505	8,13	1068	367	1435	6,82	977	410	1386	5,76
	15	1605	231	1837	14,92	1493	276	1770	11,82	1414	303	1718	10,35	1323	335	1659	8,90	1230	373	1603	7,60	-	-	-	-
	18	1741	235	1978	15,81	1627	281	1909	12,60	1546	307	1854	11,07	1434	339	1773	9,46	1322	376	1699	8,03	-	-	-	-

kWf = Cold user side cooling 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.
kWt = Hot user side 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.
kWe = Compressor power input in kW.
Tw = Leaving water temperature cold user side.
TER = (Cooling capacity + Heating capacity) / Total power input.

Configuration for 4-pipe system

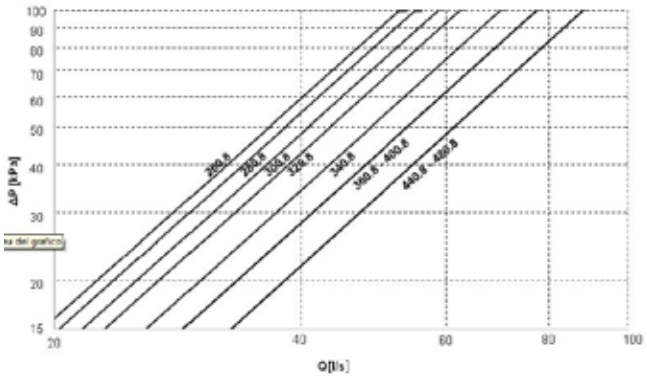
Acoustic configuration: compressor soundproofing (SC) / Acoustic configuration: super-silenced (EN)

Cooling 100% - Heating 100% performance

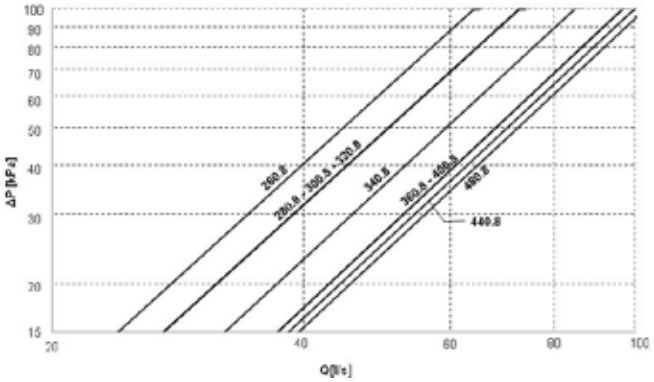
Size	Tw (°C)	Leaving water temperature hot user side																							
		25				35				40				45				50				55			
		kWf	kWe	kWt	TER	kWf	kWe	kWt	TER	kWf	kWe	kWt	TER	kWf	kWe	kWt	TER	kWf	kWe	kWt	TER	kWf	kWe	kWt	TER
440.8	5	1421	244	1666	12,66	1323	295	1618	9,98	1254	326	1580	8,70	1163	362	1525	7,41	1055	405	1459	6,20	967	455	1419	5,24
	6	1466	245	1712	12,98	1363	296	1660	10,21	1293	327	1620	8,91	1198	363	1561	7,59	1084	406	1489	6,33	991	456	1444	5,34
	7	1509	246	1756	13,28	1397	297	1695	10,41	1325	328	1653	9,08	1224	364	1587	7,72	1110	407	1516	6,45	1013	457	1466	5,43
	10	1587	248	1836	13,82	1468	299	1768	10,81	1392	330	1722	9,44	1284	366	1649	8,02	1165	409	1573	6,70	1067	458	1522	5,65
	15	1774	253	2029	15,03	1652	305	1958	11,84	1576	335	1912	10,40	1466	372	1838	8,89	1350	415	1764	7,51	-	-	-	-
	18	1921	257	2181	15,96	1794	309	2105	12,61	1700	339	2040	11,03	1584	375	1960	9,45	1453	418	1871	7,94	-	-	-	-
480.8	5	1536	262	1799	12,74	1440	318	1759	10,06	1368	352	1721	8,78	1268	392	1660	7,47	1154	439	1591	6,25	1053	495	1545	5,25
	6	1584	263	1848	13,07	1485	319	1806	10,31	1402	353	1755	8,95	1309	393	1701	7,66	1189	440	1628	6,40	1080	495	1572	5,35
	7	1632	264	1898	13,40	1524	320	1845	10,52	1445	354	1799	9,17	1339	393	1733	7,81	1217	440	1656	6,52	1107	496	1600	5,46
	10	1726	265	1993	14,02	1602	322	1925	10,95	1521	356	1878	9,56	1407	395	1802	8,12	1281	442	1722	6,79	1168	497	1662	5,70
	15	1912	269	2184	15,21	1786	327	2115	11,94	1691	360	2052	10,40	1581	399	1981	8,92	1468	446	1914	7,58	-	-	-	-
	18	2073	273	2348	16,21	1942	330	2275	12,77	1846	364	2211	11,15	1721	403	2125	9,55	1589	450	2039	8,06	-	-	-	-

kWf = Cold user side cooling 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.
kWt = Hot user side 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.
kWe = Compressor power input in kW.
Tw = Leaving water temperature cold user side.
TER = (Cooling capacity + Heating capacity) / Total power input.

Cold user side exchanger pressure drops



Hot user side exchanger pressure drops



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

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

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.

Configuration for 4-pipe system

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	872	196	4,45	835	214	3,91	786	232	3,38	725	254	2,86
	13	790	172	4,60	757	187	4,04	712	204	3,49	657	223	2,95
	12	784	172	4,55	752	188	4,00	707	204	3,46	653	223	2,93
	11	703	148	4,74	674	162	4,17	633	176	3,61	584	192	3,05
	10	616	123	5,00	590	134	4,39	555	146	3,80	512	160	3,21
	9	611	124	4,94	586	135	4,34	551	146	3,76	509	160	3,18
	8	524	99	5,32	502	108	4,67	472	117	4,05	436	128	3,42
	7	498	93	5,38	477	101	4,73	449	110	4,09	414	120	3,46
	6	407	78	5,24	390	85	4,60	366	92	3,99	338	100	3,38
	5	380	72	5,31	364	78	4,67	342	85	4,04	316	92	3,42
	4	355	66	5,42	340	71	4,76	320	78	4,12	295	85	3,49
	2	229	44	5,26	220	48	4,62	207	52	4,00	191	56	3,38
	1	115	22	5,19	111	24	4,56	104	26	3,97	96	29	3,37
280.8	12	923	211	4,37	885	230	3,85	832	249	3,34	770	271	2,84
	11	841	187	4,50	806	204	3,96	759	221	3,44	701	240	2,92
	10	760	163	4,67	728	177	4,10	685	192	3,56	633	209	3,03
	9	672	138	4,89	644	150	4,30	606	162	3,73	560	177	3,17
	8	585	112	5,20	561	123	4,58	528	133	3,97	488	144	3,38
	7	559	106	5,25	535	116	4,62	504	126	4,01	466	137	3,41
	6	532	100	5,30	510	109	4,66	480	119	4,05	444	129	3,44
	5	507	94	5,37	486	103	4,72	457	111	4,10	423	121	3,49
	4	482	88	5,46	462	96	4,80	434	104	4,17	402	113	3,54
	2	231	44	5,19	221	48	4,56	208	52	3,97	192	57	3,37
	1	115	22	5,19	111	24	4,56	104	26	3,97	96	29	3,37
300.8	14	983	223	4,41	941	243	3,88	887	262	3,39	819	285	2,87
	13	901	199	4,54	863	216	3,99	813	234	3,48	751	254	2,95
	12	871	192	4,54	835	209	3,99	787	226	3,48	726	246	2,95
	11	790	168	4,71	757	183	4,14	713	197	3,61	658	215	3,06
	10	703	143	4,92	673	155	4,33	635	168	3,78	585	183	3,20
	9	672	137	4,90	644	149	4,31	607	161	3,76	560	176	3,19
	8	585	112	5,23	561	122	4,60	528	132	4,01	487	143	3,40
	7	558	106	5,27	535	115	4,64	504	125	4,05	465	136	3,43
	6	436	84	5,18	418	92	4,56	394	99	3,97	364	108	3,37
	5	410	78	5,24	393	85	4,61	370	92	4,02	341	100	3,41
	4	385	72	5,33	369	79	4,69	347	85	4,09	320	92	3,46
	2	259	50	5,16	248	55	4,54	234	59	3,96	216	64	3,35
	1	115	22	5,19	111	24	4,56	104	26	3,97	96	29	3,37
320.8	8	1043	234	4,45	998	255	3,91	942	275	3,43	868	300	2,90
	7	931	204	4,57	892	222	4,02	842	239	3,52	775	260	2,98
	6	820	173	4,74	786	188	4,17	741	203	3,66	682	221	3,09
	5	702	142	4,94	673	155	4,35	635	167	3,81	584	182	3,22
	4	584	111	5,25	560	121	4,62	528	131	4,05	486	142	3,42
	2	288	56	5,14	276	61	4,52	260	66	3,96	239	72	3,34
	1	144	28	5,14	138	30	4,52	130	33	3,96	120	36	3,34

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 nominal value.

Configuration for 4-pipe system

Acoustic configuration: compressor soundproofing (SC)

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	1132	251	4,51	1083	273	3,96	1017	296	3,44	937	323	2,90
	13	1049	226	4,64	1004	246	4,08	943	267	3,54	869	291	2,98
	12	1020	220	4,64	977	240	4,07	917	260	3,53	844	284	2,97
	11	937	195	4,80	898	213	4,22	843	231	3,66	776	252	3,08
	10	861	171	5,04	825	186	4,43	774	201	3,84	713	220	3,24
	9	819	164	4,98	785	179	4,38	736	194	3,79	678	212	3,19
	8	743	140	5,31	712	153	4,67	668	165	4,04	615	181	3,40
	7	615	119	5,16	590	130	4,54	553	141	3,93	509	154	3,32
	6	595	112	5,30	570	122	4,66	534	133	4,02	491	145	3,38
	5	467	92	5,10	447	100	4,48	419	108	3,87	386	118	3,26
	4	400	73	5,52	384	79	4,85	360	86	4,20	331	94	3,54
	2	260	50	5,18	249	55	4,56	234	59	3,96	215	65	3,34
	1	116	22	5,24	111	24	4,60	104	26	3,95	96	29	3,33
360.8	12	1220	267	4,57	1168	292	4,01	1092	317	3,44	1006	347	2,90
	11	1137	242	4,69	1089	264	4,12	1018	288	3,54	938	315	2,98
	10	1054	218	4,85	1011	237	4,26	944	258	3,66	869	282	3,08
	9	978	193	5,07	938	211	4,45	876	229	3,82	806	251	3,22
	8	902	169	5,35	864	184	4,70	807	200	4,04	743	219	3,40
	7	774	148	5,23	742	161	4,60	693	175	3,95	638	192	3,32
	6	646	127	5,08	619	139	4,47	578	151	3,83	532	165	3,23
	5	579	108	5,36	556	118	4,71	519	128	4,04	478	140	3,40
	4	513	89	5,76	492	97	5,06	459	106	4,34	423	116	3,66
	2	232	44	5,24	222	48	4,60	208	53	3,95	191	57	3,33
	1	116	22	5,24	111	24	4,60	104	26	3,95	96	29	3,33
400.8	12	1311	295	4,45	1256	321	3,92	1176	347	3,39	1090	375	2,91
	11	1207	263	4,59	1156	286	4,04	1082	309	3,50	1003	335	3,00
	10	1102	231	4,77	1056	252	4,19	989	272	3,63	917	294	3,11
	9	997	200	4,99	955	218	4,39	894	235	3,80	829	254	3,26
	8	891	169	5,29	854	184	4,65	800	198	4,03	741	215	3,45
	7	817	153	5,33	783	167	4,69	733	180	4,07	680	195	3,49
	6	743	138	5,39	712	150	4,74	667	162	4,11	618	175	3,52
	5	681	124	5,51	653	135	4,85	611	145	4,20	567	157	3,60
	4	620	109	5,66	594	119	4,99	556	129	4,32	515	139	3,70
	2	309	55	5,61	296	60	4,94	277	65	4,28	257	70	3,67
	1	154	28	5,61	148	30	4,94	139	32	4,28	128	35	3,67
440.8	12	1451	318	4,56	1391	347	4,01	1308	374	3,50	1204	409	2,94
	11	1339	288	4,65	1283	314	4,09	1207	338	3,57	1112	370	3,01
	10	1227	257	4,77	1176	280	4,20	1106	302	3,66	1019	330	3,08
	9	1063	211	5,03	1019	230	4,43	958	248	3,86	883	271	3,25
	8	900	165	5,44	862	180	4,78	810	194	4,17	747	212	3,51
	7	827	150	5,51	793	164	4,85	745	176	4,23	687	193	3,56
	6	755	135	5,60	723	147	4,93	680	158	4,30	627	173	3,62
	5	600	107	5,59	575	117	4,92	541	126	4,29	498	138	3,61
	4	446	80	5,56	427	87	4,89	401	94	4,27	370	103	3,60
	2	303	55	5,50	291	60	4,84	273	65	4,22	252	71	3,56
	1	152	28	5,50	145	30	4,84	137	32	4,22	126	35	3,56
480.8	8	1563	350	4,46	1496	382	3,92	1414	409	3,46	1300	449	2,90
	7	1399	303	4,61	1340	330	4,06	1267	354	3,58	1165	389	3,00
	6	1236	256	4,82	1185	279	4,24	1119	299	3,74	1029	328	3,13
	5	1082	210	5,16	1037	228	4,54	980	245	4,00	901	269	3,35
	4	928	163	5,70	890	178	5,01	840	190	4,42	773	209	3,70
	2	463	82	5,65	443	89	4,97	419	96	4,38	385	105	3,67
	1	231	41	5,65	222	45	4,97	209	48	4,38	193	52	3,67

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 nominal value.

Configuration for 4-pipe system

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	841	200	4,20	806	218	3,69	754	237	3,18	694	260	2,67
	13	765	175	4,37	734	191	3,84	687	207	3,31	632	227	2,78
	12	762	175	4,35	730	191	3,82	683	207	3,30	629	227	2,77
	11	686	150	4,58	658	163	4,03	616	177	3,47	567	194	2,92
	10	611	125	4,90	585	136	4,31	548	148	3,71	504	162	3,12
	9	605	125	4,86	580	136	4,27	543	148	3,68	500	162	3,09
	8	530	99	5,33	508	108	4,68	475	118	4,04	437	129	3,39
	7	503	93	5,38	482	102	4,73	451	111	4,08	415	121	3,43
	6	411	78	5,27	394	85	4,63	368	92	3,99	339	101	3,36
	5	384	72	5,34	368	78	4,69	344	85	4,04	317	93	3,40
	4	358	66	5,44	344	72	4,78	321	78	4,12	296	85	3,47
	2	232	44	5,26	222	48	4,63	208	52	3,99	191	57	3,35
	1	117	22	5,26	112	24	4,62	104	26	3,98	96	29	3,36
280.8	12	893	213	4,19	856	233	3,68	801	252	3,17	737	275	2,68
	11	818	188	4,35	784	205	3,82	733	222	3,30	675	243	2,78
	10	743	163	4,56	712	177	4,01	666	193	3,46	613	210	2,92
	9	667	137	4,85	639	150	4,27	598	163	3,68	550	178	3,10
	8	591	112	5,27	567	122	4,63	530	133	3,99	488	145	3,37
	7	564	106	5,32	541	116	4,67	506	126	4,03	466	137	3,40
	6	537	100	5,37	515	109	4,72	482	118	4,07	444	129	3,43
	5	512	94	5,44	491	103	4,78	459	111	4,12	423	122	3,48
	4	486	88	5,52	466	96	4,86	436	104	4,19	402	114	3,53
	2	233	44	5,26	223	48	4,62	209	52	3,98	192	57	3,36
	1	117	22	5,26	112	24	4,62	104	26	3,98	96	29	3,36
300.8	14	951	224	4,24	911	245	3,73	850	266	3,20	782	290	2,70
	13	875	199	4,40	839	217	3,87	783	236	3,32	720	257	2,80
	12	847	193	4,40	812	210	3,86	758	228	3,32	697	249	2,80
	11	771	167	4,61	740	182	4,05	690	198	3,48	634	216	2,93
	10	696	142	4,90	667	155	4,31	622	168	3,70	572	184	3,11
	9	668	136	4,91	641	148	4,31	598	161	3,71	550	176	3,12
	8	592	111	5,34	568	121	4,70	530	131	4,04	487	143	3,40
	7	565	105	5,39	542	114	4,74	506	124	4,08	465	135	3,43
	6	441	84	5,28	423	91	4,64	395	99	3,99	364	108	3,36
	5	415	78	5,34	398	85	4,70	371	92	4,04	341	100	3,40
	4	389	72	5,44	373	78	4,78	348	85	4,11	320	92	3,46
	2	262	50	5,28	252	54	4,64	235	59	3,99	216	64	3,36
	1	117	22	5,26	112	24	4,62	104	26	3,98	96	29	3,36
320.8	8	1008	235	4,28	967	257	3,77	900	279	3,23	826	304	2,72
	7	904	204	4,44	867	222	3,90	807	241	3,35	741	263	2,81
	6	800	172	4,65	767	188	4,09	714	204	3,51	656	222	2,95
	5	697	141	4,95	668	153	4,35	622	167	3,73	571	182	3,14
	4	593	110	5,42	569	119	4,76	530	130	4,08	486	142	3,43
	2	292	55	5,30	280	60	4,66	261	65	4,00	239	71	3,36
	1	146	28	5,30	140	30	4,66	130	33	4,00	120	36	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 nominal value.

Configuration for 4-pipe system

Acoustic configuration: super-silenced (EN)

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	1093	255	4,29	1048	278	3,77	974	303	3,22	894	330	2,71
	13	1016	228	4,45	974	249	3,91	905	271	3,34	831	296	2,81
	12	989	223	4,44	949	243	3,90	881	265	3,32	809	289	2,80
	11	912	197	4,64	874	214	4,08	812	234	3,47	745	255	2,93
	10	835	170	4,91	801	185	4,32	744	202	3,68	683	220	3,10
	9	808	165	4,89	775	180	4,30	720	197	3,66	661	214	3,08
	8	731	139	5,27	701	151	4,64	651	165	3,95	598	180	3,33
	7	608	118	5,15	583	129	4,53	542	140	3,86	497	153	3,25
	6	581	111	5,21	557	122	4,58	517	133	3,90	474	144	3,28
	5	457	91	5,04	439	99	4,43	407	108	3,77	374	118	3,18
	4	393	72	5,47	377	78	4,81	350	86	4,09	322	93	3,45
	2	258	50	5,20	247	54	4,57	230	59	3,90	211	64	3,28
	1	112	22	5,07	107	24	4,46	99	26	3,78	91	29	3,19
360.8	12	1178	274	4,30	1130	299	3,78	1048	327	3,21	961	355	2,70
	11	1101	248	4,45	1056	270	3,91	979	295	3,31	898	321	2,80
	10	1023	221	4,63	981	241	4,07	910	264	3,45	835	287	2,91
	9	946	194	4,87	908	212	4,28	842	232	3,63	772	252	3,06
	8	869	168	5,18	834	183	4,56	773	200	3,86	709	218	3,26
	7	746	147	5,07	715	160	4,46	663	176	3,78	609	191	3,19
	6	623	127	4,92	597	138	4,33	554	151	3,67	508	164	3,10
	5	559	108	5,19	536	117	4,56	497	128	3,87	456	140	3,26
	4	495	89	5,57	474	97	4,90	440	106	4,15	404	115	3,51
	2	224	44	5,07	215	48	4,46	199	53	3,78	183	57	3,19
	1	112	22	5,07	107	24	4,46	99	26	3,78	91	29	3,19
400.8	12	1253	298	4,20	1201	325	3,70	1126	353	3,19	1047	381	2,75
	11	1156	265	4,37	1107	288	3,84	1039	313	3,32	966	338	2,86
	10	1058	231	4,58	1014	252	4,03	951	273	3,48	885	295	3,00
	9	961	198	4,86	921	216	4,27	864	234	3,69	804	253	3,18
	8	864	165	5,25	828	180	4,61	777	195	3,99	723	211	3,43
	7	802	151	5,32	768	164	4,68	721	178	4,04	670	193	3,48
	6	739	137	5,40	708	149	4,75	664	162	4,11	618	175	3,54
	5	678	123	5,53	649	134	4,86	609	145	4,20	567	157	3,61
	4	616	108	5,68	590	118	4,99	554	128	4,32	515	139	3,71
	2	307	55	5,63	294	59	4,95	276	65	4,28	257	70	3,68
	1	154	27	5,63	147	30	4,95	138	32	4,28	128	35	3,68
440.8	12	1409	322	4,38	1352	352	3,84	1255	383	3,27	1147	422	2,72
	11	1306	290	4,51	1253	316	3,96	1163	345	3,37	1063	379	2,80
	10	1202	257	4,68	1153	281	4,11	1071	306	3,50	979	337	2,91
	9	1051	208	5,05	1008	227	4,44	936	247	3,78	856	272	3,14
	8	900	159	5,67	863	173	4,98	801	189	4,24	733	208	3,52
	7	835	145	5,75	801	159	5,05	743	173	4,30	680	190	3,57
	6	769	132	5,84	738	144	5,13	685	157	4,37	627	173	3,63
	5	612	105	5,82	587	115	5,12	545	125	4,36	498	138	3,62
	4	454	78	5,80	436	86	5,09	405	93	4,34	370	103	3,60
	2	309	54	5,73	296	59	5,04	275	64	4,29	252	71	3,56
	1	155	27	5,73	148	29	5,04	138	32	4,29	126	35	3,56
480.8	8	1515	359	4,22	1453	392	3,71	1350	427	3,16	1235	470	2,63
	7	1364	308	4,42	1308	337	3,89	1215	367	3,31	1112	404	2,75
	6	1212	258	4,70	1163	282	4,13	1080	307	3,52	989	338	2,92
	5	1062	208	5,10	1018	227	4,48	946	248	3,82	866	273	3,18
	4	911	158	5,76	874	173	5,06	812	188	4,32	743	207	3,58
	2	454	79	5,71	435	87	5,02	404	95	4,28	370	104	3,55
	1	227	40	5,71	218	43	5,02	202	47	4,28	185	52	3,55

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 nominal value.

Configuration for 4-pipe system

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

Heating performance at part load (continued)

Size	STEP	Entering external exchanger 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
	14	612	183	3,35	643	184	3,49	734	187	3,93	774	188	4,12	881	191	4,61	1020	196	5,20
	13	570	166	3,44	599	167	3,60	681	169	4,03	720	170	4,24	816	173	4,73	939	176	5,33
	12	544	161	3,38	572	162	3,53	654	164	3,98	690	165	4,17	788	169	4,67	907	173	5,25
	11	502	144	3,49	529	145	3,66	602	147	4,10	636	148	4,31	723	150	4,82	825	153	5,40
	10	454	126	3,59	478	127	3,76	547	129	4,24	577	130	4,44	658	132	4,98	750	135	5,57
	9	436	122	3,56	459	123	3,73	523	125	4,19	555	126	4,41	630	128	4,93	720	130	5,53
260.8	8	388	105	3,70	409	106	3,87	468	107	4,36	495	108	4,58	565	110	5,14	645	112	5,76
	7	333	91	3,67	352	91	3,86	406	93	4,37	429	93	4,60	492	95	5,18	563	97	5,81
	6	312	84	3,70	328	85	3,87	375	86	4,36	396	87	4,57	451	88	5,12	514	90	5,73
	5	257	70	3,67	271	70	3,85	312	72	4,36	330	72	4,59	378	73	5,16	432	75	5,79
	4	202	56	3,62	215	56	3,83	249	57	4,37	264	57	4,60	304	58	5,22	350	59	5,89
	2	139	39	3,56	148	39	3,75	171	40	4,29	182	40	4,52	209	41	5,12	241	42	5,77
	1	63	17	3,61	67	18	3,82	78	18	4,38	82	18	4,61	95	18	5,23	110	19	5,93
	12	650	194	3,36	682	195	3,50	778	198	3,92	820	200	4,10	934	204	4,58	1080	209	5,16
	11	608	177	3,44	638	178	3,59	725	181	4,02	766	182	4,21	869	185	4,69	999	189	5,27
	10	566	159	3,55	595	160	3,71	673	163	4,13	712	164	4,34	804	167	4,82	917	170	5,41
	9	519	142	3,65	544	143	3,81	618	145	4,25	653	146	4,46	739	149	4,97	842	151	5,56
	8	471	125	3,77	494	126	3,93	563	128	4,40	594	129	4,62	673	131	5,15	767	133	5,76
280.8	7	416	111	3,76	438	111	3,93	500	113	4,41	528	114	4,63	600	116	5,18	685	118	5,80
	6	362	97	3,74	381	97	3,92	437	99	4,43	462	99	4,65	527	101	5,22	603	103	5,86
	5	307	82	3,72	325	83	3,92	374	84	4,44	396	85	4,67	454	86	5,27	521	88	5,94
	4	252	68	3,69	268	69	3,90	311	70	4,47	330	70	4,71	380	71	5,34	439	73	6,05
	2	126	35	3,61	134	35	3,82	156	36	4,38	165	36	4,61	190	36	5,23	220	37	5,93
	1	63	17	3,61	67	18	3,82	78	18	4,38	82	18	4,61	95	18	5,23	110	19	5,93
	14	684	202	3,39	719	204	3,53	820	208	3,94	864	210	4,12	981	214	4,57	1137	220	5,16
	13	642	185	3,47	675	186	3,62	767	190	4,03	810	192	4,22	916	196	4,68	1056	201	5,26
	12	597	177	3,36	629	179	3,52	719	181	3,97	758	182	4,15	866	186	4,66	996	190	5,23
	11	555	160	3,46	585	161	3,63	666	163	4,08	704	165	4,28	801	167	4,79	914	170	5,37
	10	507	143	3,55	535	144	3,72	611	146	4,19	645	147	4,39	736	149	4,93	839	152	5,51
	9	473	133	3,55	499	134	3,72	569	136	4,18	603	137	4,40	686	139	4,92	784	142	5,52
300.8	8	425	116	3,67	448	117	3,84	514	119	4,34	544	119	4,56	621	121	5,11	708	124	5,72
	7	370	102	3,64	392	102	3,82	451	104	4,34	478	105	4,56	547	106	5,14	627	109	5,77
	6	330	90	3,68	348	90	3,85	398	92	4,33	420	92	4,55	479	94	5,10	546	96	5,70
	5	276	76	3,64	291	76	3,83	335	77	4,33	354	78	4,56	405	79	5,13	464	81	5,76
	4	221	61	3,59	235	62	3,79	272	63	4,34	288	63	4,57	332	64	5,18	382	65	5,84
	2	158	45	3,52	168	45	3,72	194	46	4,25	206	46	4,48	237	47	5,07	272	48	5,71
	1	63	17	3,61	67	18	3,82	78	18	4,38	82	18	4,61	95	18	5,23	110	19	5,93
	8	718	210	3,42	756	212	3,56	862	218	3,96	908	220	4,13	1028	225	4,57	1194	232	5,15
	7	631	186	3,40	666	187	3,56	761	191	3,99	802	192	4,17	913	196	4,65	1053	201	5,23
	6	544	161	3,37	575	162	3,55	660	164	4,02	696	165	4,22	798	168	4,76	912	171	5,33
320.8	5	462	134	3,44	489	135	3,62	563	137	4,12	595	138	4,32	683	140	4,88	781	143	5,47
	4	379	107	3,54	402	108	3,73	466	109	4,26	493	110	4,48	568	112	5,07	650	114	5,69
	2	190	55	3,47	201	55	3,66	233	56	4,17	247	56	4,39	284	57	4,97	325	58	5,58
	1	95	27	3,47	101	27	3,66	116	28	4,17	123	28	4,39	142	29	4,97	163	29	5,58

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 max. step nominal value.

Configuration for 4-pipe system

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

Heating performance at part load

Size	STEP	Entering external exchanger 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	776	230	3,38	815	232	3,51	925	237	3,91	976	239	4,09	1104	243	4,54	1280	249	5,15
	13	717	207	3,47	754	208	3,62	856	213	4,03	905	215	4,22	1023	219	4,67	1177	224	5,25
	12	689	205	3,36	725	207	3,50	824	210	3,93	870	211	4,12	989	215	4,61	1139	218	5,22
	11	630	182	3,46	664	183	3,62	756	186	4,06	799	187	4,27	908	190	4,77	1036	194	5,34
	10	570	160	3,56	600	161	3,72	686	164	4,19	724	165	4,40	825	167	4,93	941	171	5,52
	9	548	155	3,53	577	156	3,70	658	159	4,15	697	160	4,37	792	162	4,88	905	165	5,47
	8	488	133	3,66	514	134	3,83	589	136	4,32	622	137	4,54	710	139	5,09	810	142	5,70
	7	418	115	3,63	442	116	3,82	509	118	4,33	539	118	4,55	617	120	5,12	706	123	5,75
	6	393	107	3,67	413	108	3,84	472	109	4,32	499	110	4,53	568	112	5,07	647	114	5,67
	5	324	89	3,64	342	89	3,82	393	91	4,32	416	91	4,54	475	93	5,11	544	95	5,74
	4	254	71	3,59	270	71	3,79	313	72	4,33	332	73	4,56	383	74	5,17	440	75	5,84
	2	175	50	3,52	185	50	3,72	215	51	4,25	228	51	4,47	262	52	5,07	301	53	5,71
	1	80	22	3,58	85	22	3,79	98	23	4,34	104	23	4,57	120	23	5,19	139	24	5,88
360.8	12	834	249	3,34	874	251	3,48	988	255	3,87	1044	257	4,05	1180	261	4,51	1366	265	5,15
	11	775	226	3,42	813	228	3,57	919	232	3,97	973	233	4,17	1099	237	4,63	1263	241	5,24
	10	716	203	3,52	752	205	3,68	851	208	4,09	901	209	4,30	1017	213	4,78	1160	217	5,36
	9	656	181	3,62	689	182	3,78	781	185	4,21	826	187	4,42	934	190	4,92	1065	193	5,51
	8	596	159	3,74	625	160	3,90	712	163	4,37	751	164	4,58	852	167	5,11	970	170	5,71
	7	527	141	3,73	554	142	3,90	632	144	4,38	668	145	4,59	759	148	5,14	866	151	5,75
	6	457	123	3,71	482	124	3,89	553	126	4,39	584	127	4,61	667	129	5,17	763	131	5,81
	5	388	105	3,69	411	106	3,88	473	107	4,41	501	108	4,63	574	110	5,23	659	112	5,89
	4	319	87	3,66	339	88	3,87	394	89	4,43	417	89	4,67	481	91	5,30	556	93	6,00
	2	160	45	3,58	170	45	3,79	197	45	4,34	209	46	4,57	241	46	5,19	278	47	5,88
	1	80	22	3,58	85	22	3,79	98	23	4,34	104	23	4,57	120	23	5,19	139	24	5,88
400.8	12	920	270	3,41	964	272	3,55	1096	278	3,95	1156	280	4,13	1300	284	4,58	1504	292	5,15
	11	854	246	3,47	896	248	3,62	1017	252	4,03	1074	254	4,22	1210	258	4,69	1391	264	5,27
	10	789	222	3,55	829	223	3,71	937	227	4,13	992	229	4,34	1120	232	4,82	1278	237	5,40
	9	722	198	3,65	759	199	3,81	860	203	4,25	910	204	4,46	1029	207	4,96	1173	211	5,56
	8	656	174	3,77	689	175	3,93	784	178	4,40	827	179	4,61	938	182	5,15	1068	186	5,75
	7	580	154	3,76	610	155	3,93	696	158	4,41	736	159	4,63	836	161	5,18	954	165	5,80
	6	504	135	3,74	531	135	3,92	609	138	4,42	644	139	4,65	734	141	5,22	840	143	5,86
	5	428	115	3,72	452	116	3,91	521	117	4,44	552	118	4,67	632	120	5,27	726	122	5,93
	4	351	95	3,69	373	96	3,90	434	97	4,47	460	98	4,70	530	99	5,34	612	101	6,05
	2	176	49	3,61	187	49	3,82	217	50	4,37	230	50	4,60	265	51	5,23	306	52	5,92
	1	88	24	3,61	93	24	3,82	108	25	4,37	115	25	4,60	132	25	5,23	153	26	5,92
440.8	12	994	296	3,36	1040	298	3,49	1180	304	3,88	1246	306	4,07	1400	312	4,49	1614	318	5,08
	11	921	270	3,42	966	271	3,56	1094	276	3,96	1157	278	4,16	1302	283	4,60	1494	288	5,18
	10	848	243	3,49	891	245	3,64	1008	249	4,06	1068	250	4,26	1205	254	4,74	1375	259	5,31
	9	777	217	3,58	816	218	3,74	926	222	4,17	979	223	4,38	1107	227	4,88	1262	231	5,46
	8	706	191	3,70	741	192	3,86	843	195	4,32	890	196	4,53	1009	199	5,06	1149	203	5,65
	7	624	169	3,69	656	170	3,86	749	173	4,33	791	174	4,55	899	177	5,09	1026	180	5,70
	6	542	147	3,68	571	148	3,85	655	151	4,35	692	152	4,57	790	154	5,13	904	157	5,75
	5	460	126	3,66	486	127	3,85	561	128	4,37	593	129	4,59	680	131	5,18	781	134	5,83
	4	378	104	3,63	402	105	3,83	466	106	4,39	495	107	4,62	570	109	5,25	658	111	5,94
	2	189	53	3,55	201	54	3,75	233	54	4,30	247	55	4,53	285	55	5,14	329	57	5,82
	1	94	27	3,55	100	27	3,75	117	27	4,30	124	27	4,53	143	28	5,14	165	28	5,82
480.8	8	1072	316	3,39	1122	318	3,53	1264	324	3,90	1336	326	4,10	1506	330	4,56	1728	336	5,14
	7	933	277	3,37	981	278	3,52	1114	283	3,94	1176	285	4,13	1336	289	4,63	1530	294	5,20
	6	795	237	3,35	841	239	3,52	965	242	3,99	1017	243	4,18	1167	247	4,72	1332	252	5,28
	5	674	198	3,41	714	199	3,59	823	202	4,08	869	203	4,29	998	206	4,84	1141	210	5,43
	4	554	158	3,51	588	159	3,70	680	161	4,22	721	162	4,44	830	165	5,03	950	168	5,64
	2	277	81	3,44	294	81	3,63	340	82	4,13	361	83	4,35	415	84	4,93	475	86	5,53
	1	139	40	3,44	147	41	3,63	170	41	4,13	180	41	4,35	207	42	4,93	237	43	5,53

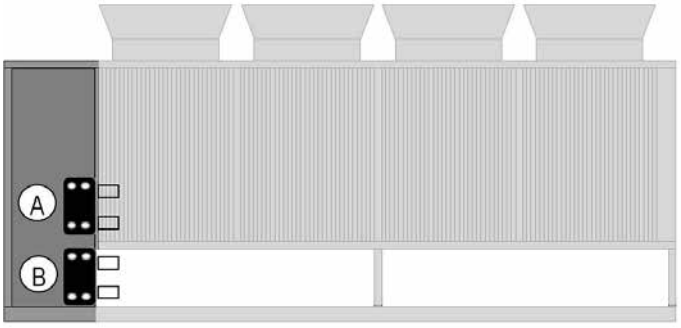
kWt = Heating capacity in kW
kWe_tot = Unit total power input in kW
STEP = Active capacity steps (the maximum number indicates full capacity / the minimum number indicates the smallest partialization step)
Internal exchanger water = output temperature 35°C/ input * (variable) / constant flow equal to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

2T configuration - For 2-pipe systems

2T configuration supply air conditioning systems with 2 tubes and it is able to supply hot water or chilled water dependently on season, with the total condensation heat recovery possibility. 2T configuration is designed for air conditioning systems, chilling and heating mode is defined depending on season and continuous changing modes are not allowed.

This configuration allows:

- simultaneous free hot water production to the recovery side with chilled water production to the user side;
- hot water production to the recovery side with cooling capacity rejection to the external thermal source;
- chilled water production to the user side with heating capacity rejection to the external thermal source;
- hot water production to the user side with cooling capacity rejection to the external thermal source;
- simultaneous hot water production to the user side and to the recovery side (total heating capacity is the heating capacity declared within 'General technical data' section.



A: user side exchanger
B: recovery exchanger

Unit controller guarantees unit operation in mix mode conditions.

It is possible a prioritary set on request of recovery hot water (prioritary DHW). The hot water unit production request can be performed by a proper potential-free contact.

Considerations on the installation

Primary-secondary

The system must necessarily be provided with an hydraulic separator for primary-secondary both for the hot user side and for the cold user side. This allows the unit to effectively fulfil the load avoiding hysteresis of thermal shift. To monitor the secondary circuit load request, it is necessary to keep operating the primary circuit pump periodics, user and recovery side.

Suspension of hot load production

It is possible to inhibit the hot water production on hot user side and consequently the operation of the pumping unit connected to it through the appropriate potential free contact present in the electrical panel.

Desuperheater mode

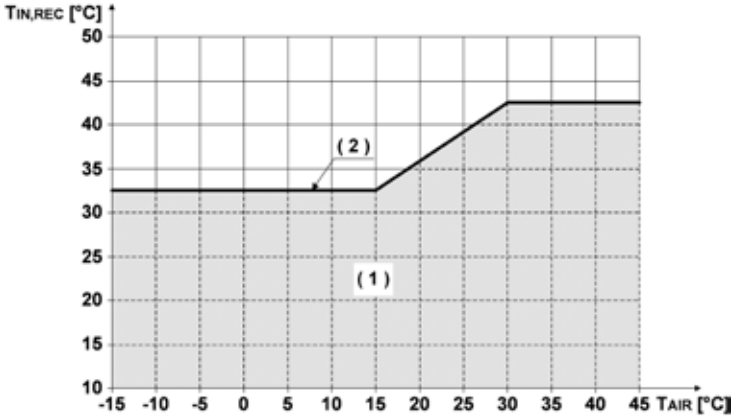
The unit control, at part load, changes the water flow-rate, hot side, maintaining the temperature at the set-point. Through the flow modulation, the unit can produce hot water even over the set-point, up to a settable limit temperature (default 65°C). Thanks to this setting the exchanger operation time, hot user side, is extended in desuperheater mode, improving the unit efficiency of 5%.

The logic of control above described drives to a proper design of hydraulic components and safety devices, considering the upper limit of hot water. It is possible to decrease this temperature down to the set point, not having the energy efficiency benefits that desuperheater solution leads.

Operation with low water temperatures, recovery side

Depending on the outside air temperature, the recovery side set-point is automatically increased, by the unit control, to the minimum operation temperature indicated in the graph.

It is possible to maintain a recovery side temperature under the minimum limit indicated in the graph providing a primary-secondary. The secondary will be maintained at the desired temperature, the primary, managed by the unit, will have temperatures congruent to limits indicated in the graph.



T_{IN},REC [°C] = entering water temperature to recovery
T_{AIR} [°C] = entering external exchanger air temperature (D.B.)

1. Temporary operating range where unit forces the recovery set-point (if the hot load production is enabled)
2. Minimum system water temperature level, recovery side

Recovery side water flow-rate

If the pumping unit recovery side is not built-in installed, **the external pump start signal must be managed by the unit through the appropiate potential free contact present in the electrical panel.**

User side water flow-rate

For a proper unit operation is necessary to guarantee the user side water flow rate also when chilled water is not required. It is therefore necessary to maintain in stand-by and available at the start-up the primary circuit pumps also in the cold season.

If the pumping unit is not built-in installed, **the external pump start signal must be managed by the unit through the appropiate potential free contact present in the electrical panel.**

System water volume

For a proper unit operation is necessary to contemplate a correct design of water tanks both on user side and recovery 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. The values indicated guaratee: the operation stability and performance, the protection of all components subject to wear, the maintenance of the set-point even under the most extreme conditions of air conditioning (high heating capacity requests with low cooling capacity requests).
In the presence of a primary-secondary system, in the calculation of the minimum water flow rate volume it is possible to consider also the secondary volume only if it remains active (operating pumps) in all the load conditions.

Operation with outdoor air temperature lower than +5°C

If the system requires only hot load: the unit produces only hot water at recovery side with cool rejection on the external heat source.

If the system requires only cold load: the unit produces only chilled water at user side with heat rejection on the external heat source.

If the system requires simultaneously cold and hot load: the unit produces only chilled water at user side, and supply the user side with the desuperheating heat. The unit remains in chiller mode with partial recovery until the cold load is not fulfilled. Once fulfilled it, the unit switches to a only hot water production mode on the recovery side.

Process applications

For process applications with variable heat loads and constant set temperatures throughout the year, please contact Clivet's Technical Department to evaluate the most appropriate solution.

Configuration for 2-pipe system

Unit configuration

WSAN-XSC3 MF	400 . 8	2T	EXC	SC	AXIX	-	-
(1)	(2) (3)	(4)	(5)	(6)	(7)	(8)	(9)

(1) Range
WSAN = Air cooled heat pump with scroll compressor
XSC3 = SPINchiller³ range
MF = Multifunction

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

(3) Compressors
8 = Compressor quantity

(4) System configuration
2T = Configuration for 2-pipe systems with total recovery

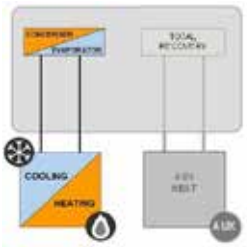
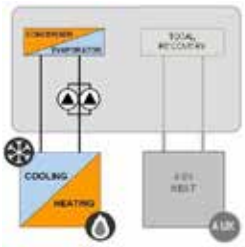
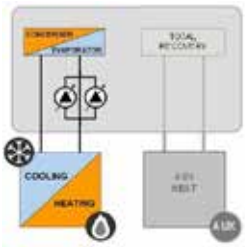
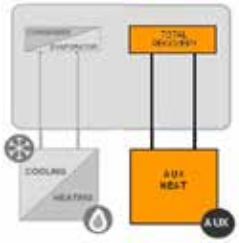
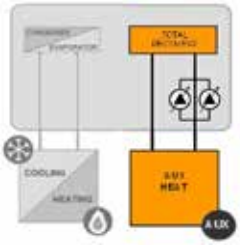
(5) Energy efficiency
EXC = EXCELLENCE version: high energy efficiency

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

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

(8) Pumping unit user side
(-) not required
4PM - Hydropack user side with no. 4 of ON/OFF pumps
6PM - Hydropack user side con no. 6 of ON/OFF pumps
4PMV- Hydropack user side with no. 4 of inverter pumps
6PMV - Hydropack user side with no. 6 of inverter pumps

(9) Pumping unit recovery side
(-) not required
HYGR6V - Hydropack recovery side with no. 6 of inverter pumps

Hydraulic side	Hydronic units		
USER SIDE Chilled water production or hot water production for installation	**1.1** Standard unit 	**1.2** Standard unit with HYDROPACK ON/OFF 	**1.3** Standard unit with HYDROPACK activated by inverter 
RECOVERY SIDE Production of hot water	**2.1** Standard unit 		**2.3** Standard unit with HYDROPACK activated by inverter 

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

Configuration for 2-pipe system

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]	725	770	819	868	937	1006	1090	1204	1300
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
EER	1	-	2,86	2,84	2,87	2,90	2,90	2,90	2,91	2,94	2,90
Water flow-rate	1	[l/s]	34,6	36,8	39,1	41,5	44,8	48,1	52,1	57,5	62,1
User side exchanger pressure drops	1	[kPa]	45	47	46	46	43	40	47	44	51
Cooling capacity (EN14511:2018)	3	[kW]	722	767	816	865	934	1003	1087	1200	1295
Total power input (EN14511:2018)	3	[kW]	256	274	288	303	326	350	379	413	453
EER (EN 14511:2018)	3	-	2,82	2,80	2,83	2,86	2,86	2,87	2,87	2,91	2,86
SEER	9	-	4,18	4,23	4,22	4,21	4,23	4,24	4,24	4,22	4,16
Cooling capacity (AHRI 550/590)	7	[kW]	721	765	814	864	934	1004	1087	1200	1296
Compressor power input (AHRI 550/590)	7	[kW]	230	245	259	273	294	315	343	377	417
Total power input (AHRI 550/590)	7	[kW]	252	270	284	299	323	346	375	409	449
COPr	7	-	2,86	2,83	2,86	2,89	2,90	2,90	2,90	2,93	2,89
IPLV	7	-	4,72	4,72	4,83	4,88	4,86	4,92	4,89	5,02	4,98
Heating											
Heating capacity	4	[kW]	800	848	893	938	1010	1081	1196	1287	1387
Compressor power input	4	[kW]	220	233	246	259	281	302	333	368	397
Total power input	2	[kW]	243	258	271	285	309	334	364	400	429
COP	4	-	3,29	3,29	3,29	3,29	3,27	3,24	3,28	3,22	3,23
Heating capacity (EN14511:2018)	5	[kW]	803	851	896	942	1014	1085	1201	1291	1392
Total power input (EN14511:2018)	5	[kW]	246	261	275	288	313	337	369	405	434
COP (EN 14511:2018)	5	[kW]	3,27	3,26	3,26	3,27	3,24	3,22	3,25	3,19	3,21
Cooling 100% - Recovery 100%											
Cooling capacity	6	[kW]	741	793	838	883	951	1018	1112	1224	1339
Total recovery heating capacity	6	[kW]	961	1027	1087	1147	1231	1316	1439	1587	1733
Total power input	6	[kW]	220	233	248	263	281	298	328	364	393
TER	8	[kW]	7,75	7,80	7,75	7,71	7,77	7,83	7,79	7,72	7,81

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. Internal exchanger fouling factor = 0.44 x 10^(-4) m^2 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. Data compliant to Standard EN 14511:2018 referred to the following conditions: - Internal exchanger water temperature = 12/7°C - Entering external exchanger air temperature = 35°C.
4. 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. Internal exchanger fouling factor = 0.44 x 10^(-4) m^2 K/W.
5. Data compliant to Standard EN 14511:2018 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.
6. Data referred to the following conditions: exchanger water cooling side = */7 °C. exchanger water heating side = */45°C. Exchanger fouling factor = 0.44 x 10^(-4) m^2 K/W.
7. Data compliant to Standard AHRI 550/590 referred to the following conditions: internal exchanger water temperature = 6,7 °C. Water flow-rate 0,043 l/s per kW. Entering external exchanger air temperature 35°C. Internal exchanger fouling factor = 0.18 x 10^(-4) m2 K/W.
8. TER = (Cooling capacity + Heating capacity) / Total power input.
9. Data calculated according to the EN 14825:2016 Regulation

Configuration for 2-pipe system

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]	694	737	782	826	894	961	1047	1147	1235
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
EER	1	-	2,67	2,68	2,70	2,72	2,71	2,70	2,75	2,72	2,63
Water flow-rate	1	[l/s]	33,2	35,2	37,4	39,5	42,7	45,9	50,0	54,8	59,0
User side exchanger pressure drops	1	[kPa]	42	43	42	42	39	37	44	40	46
Cooling capacity (EN14511:2013)	3	[kW]	692	735	779	824	891	958	1044	1144	1231
Total power input (EN14511:2013)	3	[kW]	262	278	293	307	333	358	385	425	475
EER (EN 14511:2013)	3	-	2,64	2,64	2,66	2,68	2,68	2,67	2,71	2,69	2,59
SEER	9	-	4,13	4,13	4,13	4,12	4,14	4,15	4,15	4,14	4,14
Cooling capacity (AHRI 550/590)	7	[kW]	692	734	778	823	891	960	1043	1144	1233
Compressor power input (AHRI 550/590)	7	[kW]	243	256	271	285	308	332	357	398	446
Total power input (AHRI 550/590)	7	[kW]	259	274	289	304	329	355	380	421	469
COPr	7	-	2,67	2,68	2,69	2,71	2,71	2,71	2,75	2,72	2,63
IPLV	7	-	4,53	4,61	4,70	4,67	4,65	4,73	4,75	4,83	4,86
Heating											
Heating capacity	4	[kW]	800	848	893	938	1010	1081	1196	1287	1387
Compressor power input	4	[kW]	220	233	246	259	281	302	333	368	397
Total power input	2	[kW]	243	258	271	285	309	334	364	400	429
COP	4	-	3,29	3,29	3,29	3,29	3,27	3,24	3,28	3,22	3,23
Heating capacity (EN14511:2013)	5	[kW]	803	851	896	942	1014	1085	1201	1291	1392
Total power input (EN14511:2013)	5	[kW]	246	261	275	288	313	337	369	405	434
COP (EN 14511:2013)	5	[kW]	3,27	3,26	3,26	3,27	3,24	3,22	3,25	3,19	3,21
Cooling 100% - Recovery 100%											
Cooling capacity	6	[kW]	741	793	838	883	951	1018	1112	1224	1339
Total recovery heating capacity	6	[kW]	961	1027	1087	1147	1231	1316	1439	1587	1733
Total power input	6	[kW]	220	233	248	263	281	298	328	364	393
TER	8	[kW]	7,75	7,80	7,75	7,71	7,77	7,83	7,79	7,72	7,81

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. Internal exchanger fouling factor = 0.44 x 10^(-4) m^2 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. 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.
4. 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. Internal exchanger fouling factor = 0.44 x 10^(-4) m^2 K/W.
5. 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.
6. Data referred to the following conditions: exchanger water cooling side = */7 °C. exchanger water heating side = */45°C. Exchanger fouling factor = 0.44 x 10^(-4) m^2 K/W.
7. Data compliant to Standard AHRI 550/590 referred to the following conditions: internal exchanger water temperature = 6,7 °C. Water flow-rate 0,043 l/s per kW. Entering external exchanger air temperature 35°C. Internal exchanger fouling factor = 0.18 x 10^(-4) m2 K/W.
8. TER = (Cooling capacity + Heating capacity) / Total power input.
9. Data calculated according to the EN 14825:2016 Regulation

Configuration for 2-pipe system

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
Refrigerant		-	R-410A	R-410A	R-410A	R-410A	R-410A	R-410A	R-410A	R-410A	R-410A
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	14	12	14	8	14	12	12	12	8
Oil charge (C1)		[l]	13	13	13	13	13	13	13	13	13
Oil charge (C2)		[l]	13	13	13	13	13	13	13	13	13
Oil charge (C3)		[l]	13	13	13	13	13	13	13	13	13
Oil charge (C4)		[l]	13	13	13	13	13	13	13	13	13
Refrigerant charge (C1)	1	[kg]	57	64	64	65	65	79	79	81	95
Refrigerant charge (C2)	1	[kg]	53	60	60	61	61	74	74	89	89
Refrigerant charge (C3)	1	[kg]	64	64	65	65	79	79	79	81	95
Refrigerant charge (C4)	1	[kg]	60	60	61	61	74	74	74	89	89
Refrigeration circuits		Nr	4	4	4	4	4	4	4	4	4
Internal exchanger											
Type of cold user side exchanger	2	-	PHE	PHE	PHE	PHE	PHE	PHE	PHE	PHE	PHE
Type of hot user side exchanger	2	-	PHE	PHE	PHE	PHE	PHE	PHE	PHE	PHE	PHE
Cold user side exchanger water content		[l]	60	63	69	74	86	99	99	124	124
Hot user side exchanger water content		[l]	43	50	50	50	68	86	86	108	108
User side minimum system water content	3	[l]	6989	6989	7878	7878	9131	9131	9893	10928	11799
Recovery side minimum system water content	3	[l]	5783	5783	6393	6393	7368	7368	8148	8771	9460
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											
User side water fittings		-	6"	6"	6"	6"	8"	8"	8"	8"	8"
Recovery side water fittings		-	6"	6"	6"	6"	8"	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
Electrical data											
F.L.A. - Power line 1		[A]	261,8	299,0	299,0	328,0	328,0	387,6	416,6	456,8	497,0
F.L.I. - Power line 1		[kW]	155,8	180,7	180,7	201,9	201,9	231,2	252,4	275,8	299,2
F.L.A. - Power line 2		[A]	299,0	299,0	328,0	328,0	387,6	387,6	416,6	456,8	497,0
F.L.I. - Power line 2		[kW]	180,7	180,7	201,9	201,9	231,2	231,2	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. Water volume necessary for the proper unit operation (for more details see 'Considerations on the application').
4. AX = axial fan.
5. AC/P = asynchronous three-phase external rotor motor with phase cutting speed automatic control.
6. 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.

Configuration for 2-pipe system

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
Refrigerant		-	R-410A	R-410A	R-410A	R-410A	R-410A	R-410A	R-410A	R-410A	R-410A
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	14	12	14	8	14	12	12	12	8
Oil charge (C1)		[l]	13	13	13	13	13	13	13	13	13
Oil charge (C2)		[l]	13	13	13	13	13	13	13	13	13
Oil charge (C3)		[l]	13	13	13	13	13	13	13	13	13
Oil charge (C4)		[l]	13	13	13	13	13	13	13	13	13
Refrigerant charge (C1)	1	[kg]	57	64	64	65	65	79	79	81	95
Refrigerant charge (C2)	1	[kg]	53	60	60	61	61	74	74	76	89
Refrigerant charge (C3)	1	[kg]	64	64	65	65	79	79	79	81	95
Refrigerant charge (C4)	1	[kg]	60	60	61	61	74	74	74	76	89
Refrigeration circuits		Nr	4	4	4	4	4	4	4	4	4
Internal exchanger											
Type of cold user side exchanger	2	-	PHE	PHE	PHE	PHE	PHE	PHE	PHE	PHE	PHE
Type of hot user side exchanger	2	-	PHE	PHE	PHE	PHE	PHE	PHE	PHE	PHE	PHE
Cold user side exchanger water content		[l]	60	63	69	74	86	99	99	124	124
Hot user side exchanger water content		[l]	43	50	50	50	68	86	86	108	108
User side minimum system water content	3	[l]	6989	6989	7878	7878	9131	9131	9893	10928	11799
Recovery side minimum system water content	3	[l]	5783	5783	6393	6393	7368	7368	8148	8771	9460
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											
User side water fittings		-	6"	6"	6"	6"	8"	8"	8"	8"	8"
Recovery side water fittings		-	6"	6"	6"	6"	8"	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
Electrical data											
F.L.A. - Power line 1		[A]	261,8	299,0	299,0	328,0	328,0	387,6	416,6	456,8	497,0
F.L.I. - Power line 1		[kW]	155,8	180,7	180,7	201,9	201,9	231,2	252,4	275,8	299,2
F.L.A. - Power line 2		[A]	299,0	299,0	328,0	328,0	387,6	387,6	416,6	456,8	497,0
F.L.I. - Power line 2		[kW]	180,7	180,7	201,9	201,9	231,2	231,2	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

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4. AX = axial fan.
5. AC/P = asynchronous three-phase external rotor motor with phase cutting speed automatic control.
6. 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.

Configuration for 2-pipe system

Acoustic configuration: compressor soundproofing (SC)

Sound levels

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).

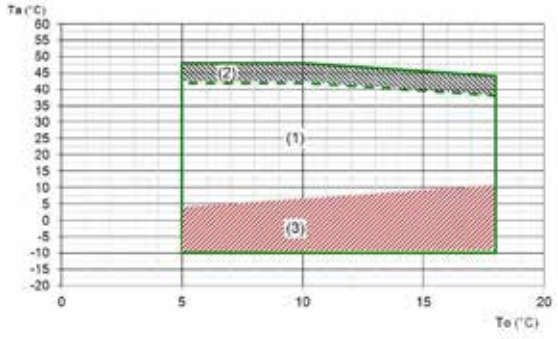
Data referred to the following conditions:
- internal exchanger water = 12/7 °C
- ambient temperature = 35 °C

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.

Configuration for 2-pipe system

Operating range in cooling

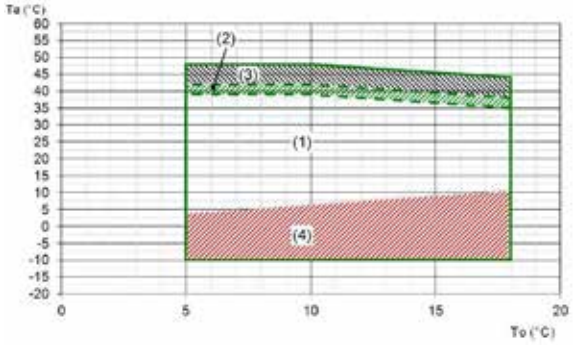
Compressor soundproofing (SC)



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

Super-silenced (EN)

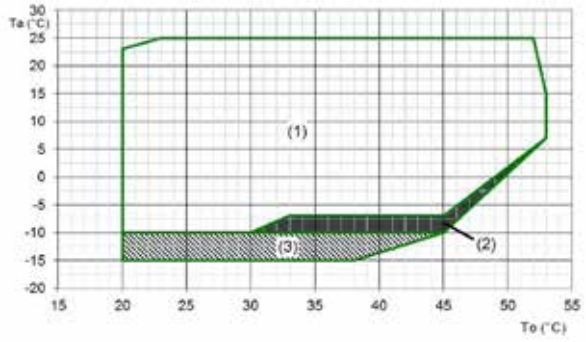


Ta (°C)= external exchanger inlet air temperature (D.B.)
To (°C)= internal exchanger outlet water temperature

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

Operating range in heating

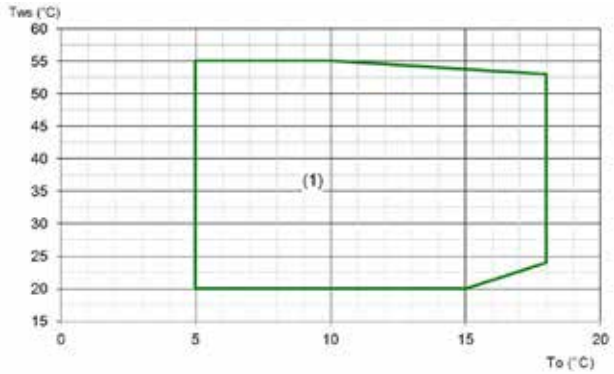
Compressor soundproofing (SC) / Super-silenced (EN)



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. Unit 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)

Operating range - Cooling 100% - Recovery 100%



Tws (°C) = leaving recovery side exchanger water temperature
To (°C) = leaving user side exchanger water temperature

1. The water-water mode is applied with outdoor air temperatures higher than 5 °C. For lower temperatures the unit guarantees the hot and cold production alternating the chiller plus desuperheater operation, recovery only

Configuration for 2-pipe system

Admissible water flow-rates

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

User side exchanger

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

Recovery exchanger

EXCELLENCE SC/EN		260.8	280.8	300.8	320.8	340.8	360.8	400.8	440.8	480.8
Qmin	[l/s]	24,0	27,2	27,2	27,2	32,2	37,2	37,2	38,4	39,5
Qmax	[l/s]	64,1	72,7	72,7	72,7	84,6	96,6	96,6	99,7	102,8

Correction factors for glycol use

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

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

Fouling Correction Factors

	Internal exchanger	
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

Configuration for 2-pipe system

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
260.8	5	785	188	739	206	684	227	628	251	604	266	303	121
	6	806	189	759	208	705	229	650	253	627	269	315	122
	7	835	191	786	210	725	231	665	256	642	272	322	123
	10	890	195	832	214	766	236	704	261	679	280	341	127
	15	988	204	926	223	856	245	807	275	471	137	-	-
	18	1084	211	1013	230	940	252	891	288	523	140	-	-
280.8	5	833	200	782	220	725	241	668	267	640	284	307	119
	6	855	202	805	221	746	243	690	269	667	286	320	120
	7	885	205	833	224	770	246	708	271	683	288	328	121
	10	942	209	882	228	811	250	750	276	726	299	348	126
	15	1038	219	975	238	903	261	857	295	521	157	-	-
	18	1151	227	1068	246	995	268	951	307	585	160	-	-
300.8	5	887	212	836	232	773	255	708	283	679	302	344	139
	6	911	215	859	234	796	256	730	285	706	303	357	140
	7	942	217	888	237	819	260	750	288	726	305	368	141
	10	997	222	936	241	863	264	793	292	776	314	393	145
	15	1107	233	1035	252	961	277	900	307	536	152	-	-
	18	1220	240	1141	260	1060	285	994	317	597	155	-	-
320.8	5	942	224	890	244	822	268	748	299	719	320	381	160
	6	966	227	913	247	846	270	770	302	744	321	395	160
	7	999	230	943	249	868	274	793	304	770	323	408	161
	10	1052	235	990	254	915	278	837	309	827	329	438	164
	15	1176	246	1096	265	1019	292	942	319	551	148	-	-
	18	1289	254	1213	274	1125	302	1038	326	610	150	-	-
340.8	5	1024	240	964	263	890	289	812	324	784	342	350	141
	6	1056	242	992	266	918	291	833	327	808	344	361	141
	7	1084	245	1017	268	937	295	854	328	830	347	371	142
	10	1138	250	1067	272	985	299	911	335	879	355	394	145
	15	1274	262	1187	284	1101	313	1021	349	652	191	-	-
	18	1388	270	1296	293	1202	322	1112	357	721	194	-	-
360.8	5	1107	255	1037	282	958	311	877	349	849	365	320	121
	6	1146	258	1070	285	989	313	896	352	872	368	328	122
	7	1169	260	1092	286	1006	316	915	353	889	370	334	123
	10	1225	265	1144	291	1054	319	984	362	932	380	351	127
	15	1371	277	1279	303	1183	333	1101	378	753	234	-	-
	18	1487	285	1379	312	1279	342	1186	388	831	238	-	-
400.8	5	1192	283	1118	309	1039	337	961	369	938	384	575	237
	6	1222	285	1147	311	1072	341	992	373	964	387	590	239
	7	1256	289	1176	315	1090	343	1011	375	987	389	605	240
	10	1312	295	1233	321	1138	350	1058	381	1034	395	634	245
	15	1444	309	1367	337	1275	366	1200	398	797	223	-	-
	18	1585	321	1488	349	1390	377	1312	409	883	227	-	-
440.8	5	1330	310	1252	339	1152	374	1048	418	1016	438	572	238
	6	1363	313	1284	341	1180	376	1075	419	1036	444	583	242
	7	1391	315	1307	342	1204	377	1091	423	1055	452	594	246
	10	1455	320	1359	349	1251	384	1131	436	1119	466	630	254
	15	1622	336	1517	363	1402	403	1306	463	803	244	-	-
	18	1757	345	1639	376	1520	412	1445	470	889	250	-	-
480.8	5	1433	342	1349	375	1245	413	1124	454	1098	484	573	236
	6	1469	346	1387	376	1273	417	1156	459	1122	492	586	241
	7	1497	349	1414	377	1300	417	1187	464	1144	499	598	244
	10	1570	353	1468	384	1352	424	1226	479	1213	519	634	254
	15	1743	368	1625	400	1515	441	1411	509	809	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

Configuration for 2-pipe system

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
260.8	5	761	197	714	217	659	239	617	260	604	266	303	121
	6	788	200	736	219	679	241	636	263	627	269	315	122
	7	806	202	755	221	694	243	649	267	641	272	322	123
	10	855	208	799	227	735	249	687	276	679	280	341	127
	15	951	218	887	237	825	263	775	287	471	137	-	-
	18	1038	224	967	244	902	270	844	295	522	140	-	-
280.8	5	808	209	761	230	702	252	656	274	639	284	307	119
	6	837	211	781	232	720	254	677	278	666	286	320	120
	7	856	214	800	234	737	257	689	282	682	288	327	121
	10	907	220	849	240	781	263	726	295	725	299	348	126
	15	1008	231	938	252	876	278	826	307	520	157	-	-
	18	1101	238	1032	259	963	287	908	316	585	160	-	-
300.8	5	860	221	805	242	744	266	697	290	679	302	344	139
	6	886	223	830	245	764	268	719	293	705	303	357	140
	7	911	226	850	247	782	272	729	297	726	305	368	141
	10	962	232	897	253	825	277	764	307	776	314	393	145
	15	1067	244	993	266	924	294	869	320	536	152	-	-
	18	1159	252	1083	274	1006	302	948	329	598	155	-	-
320.8	5	912	232	850	255	785	280	737	306	719	320	381	160
	6	936	235	879	258	808	282	760	308	744	321	395	160
	7	966	238	900	260	826	286	769	311	770	323	408	161
	10	1018	245	945	266	869	291	802	319	827	329	438	164
	15	1126	257	1048	279	972	310	911	333	551	148	-	-
	18	1217	266	1134	288	1049	317	988	341	611	150	-	-
340.8	5	992	252	925	276	855	303	795	335	784	342	350	141
	6	1019	254	952	279	877	306	816	337	808	344	361	141
	7	1048	257	973	282	894	309	829	339	830	347	371	142
	10	1101	263	1020	288	940	315	873	345	879	355	394	145
	15	1221	276	1136	301	1054	333	973	357	652	191	-	-
	18	1312	285	1222	310	1135	343	1043	367	719	194	-	-
360.8	5	1072	272	1000	298	925	327	853	365	849	365	320	121
	6	1103	274	1025	301	947	330	871	366	872	368	328	122
	7	1129	276	1047	304	961	333	889	367	889	370	334	123
	10	1184	281	1095	309	1011	338	944	371	932	380	351	127
	15	1316	296	1225	323	1137	356	1035	382	753	234	-	-
	18	1407	304	1311	332	1221	369	1099	393	827	238	-	-
400.8	5	1153	296	1078	323	1000	351	945	378	938	384	575	237
	6	1180	299	1103	326	1024	355	970	381	964	387	590	239
	7	1201	302	1126	330	1047	358	990	384	987	389	605	240
	10	1262	310	1178	337	1096	366	1037	391	1034	395	634	245
	15	1390	326	1306	354	1229	384	1178	413	797	223	-	-
	18	1509	337	1409	364	1333	395	1273	420	883	227	-	-
440.8	5	1294	323	1203	355	1103	392	1020	436	1023	438	576	238
	6	1324	326	1231	357	1127	395	1041	443	1043	444	587	242
	7	1352	329	1255	360	1147	399	1061	439	1063	452	599	246
	10	1410	334	1306	366	1191	405	1123	455	1127	466	635	254
	15	1565	351	1451	384	1339	430	1225	473	809	244	-	-
	18	1695	362	1578	396	1457	445	1313	484	888	250	-	-
480.8	5	1390	361	1293	397	1187	438	1099	490	1103	484	576	236
	6	1422	365	1322	400	1215	442	1122	498	1127	492	589	241
	7	1453	368	1350	404	1235	447	1148	497	1149	499	600	244
	10	1515	374	1403	409	1281	454	1204	509	1219	519	637	254
	15	1673	392	1552	429	1436	480	1320	528	813	233	-	-
	18	1812	404	1693	443	1573	492	1421	539	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

Configuration for 2-pipe system

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	566	-	-	-
	-5 / -6	612	174	608	193	601	213	593	-	-	-
	0 / -1	700	177	689	196	679	216	664	-	-	-
	2 / 1	738	178	726	197	713	217	698	242	-	-
	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	601	-	-	-
	-5 / -6	650	183	648	202	638	224	630	-	-	-
	0 / -1	742	187	733	206	724	228	704	-	-	-
	2 / 1	782	188	772	208	758	229	741	255	-	-
	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	630	-	-	-
	-5 / -6	685	192	680	212	670	234	660	-	-	-
	0 / -1	781	197	769	217	757	239	739	-	-	-
	2 / 1	823	199	811	219	794	241	778	267	-	-
	7 / 6	935	204	915	224	893	246	872	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	659	-	-	-
	-5 / -6	720	201	712	222	701	245	691	-	-	-
	0 / -1	821	207	805	227	789	251	774	-	-	-
	2 / 1	865	209	850	230	831	253	815	280	-	-
	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	709	-	-	-
	-5 / -6	777	219	771	243	759	270	744	-	-	-
	0 / -1	881	224	872	247	855	274	838	-	-	-
	2 / 1	930	226	917	249	898	276	880	307	-	-
	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	760	-	-	-
	-5 / -6	834	236	829	264	817	294	797	-	-	-
	0 / -1	942	241	939	268	920	298	901	-	-	-
	2 / 1	995	242	985	269	966	299	946	333	-	-
	7 / 6	1126	247	1108	273	1081	302	1057	337	1051	359
	12 / 11	1302	252	1273	278	1235	307	1206	342	1196	364
400.8	-7 / -8	877	256	871	285	854	317	833	-	-	-
	-5 / -6	920	258	914	287	899	319	877	-	-	-
	0 / -1	1045	264	1034	292	1011	324	994	-	-	-
	2 / 1	1103	267	1087	295	1067	327	1043	364	-	-
	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.

Configuration for 2-pipe system

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	891	-	-	-
	-5 / -6	991	287	987	319	967	356	937	-	-	-
	0 / -1	1125	292	1110	324	1090	361	1060	-	-	-
	2 / 1	1186	295	1169	327	1146	363	1116	406	-	-
	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	958	-	-	-
	-5 / -6	1068	309	1060	344	1041	384	1010	-	-	-
	0 / -1	1204	315	1200	349	1169	389	1149	-	-	-
	2 / 1	1272	317	1258	352	1230	391	1205	440	-	-
	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.

Configuration for 2-pipe system

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

Cooling 100% - Recovery 100% performance (continued)

Size.	Tw (°C)	Leaving water temperature recovery side																							
		25				35				40				45				50				55			
		kWf	kWe	kWt	TER	kWf	kWe	kWt	TER	kWf	kWe	kWt	TER	kWf	kWe	kWt	TER	kWf	kWe	kWt	TER	kWf	kWe	kWt	TER
260.8	5	851	147	997	12,55	788	178	965	9,85	747	197	943	8,60	693	218	911	7,36	638	243	882	6,26	586	271	859	5,33
	6	880	148	1026	12,85	814	179	992	10,10	771	197	968	8,81	718	219	937	7,57	660	244	904	6,42	608	272	881	5,47
	7	914	149	1061	13,22	845	180	1023	10,38	798	198	995	9,05	741	220	961	7,75	678	245	923	6,54	625	273	899	5,59
	10	986	152	1135	13,98	908	182	1088	10,97	857	200	1057	9,56	796	222	1017	8,18	728	247	976	6,89	669	274	944	5,88
	15	1096	155	1248	15,08	1018	186	1202	11,94	963	204	1165	10,45	904	226	1129	8,99	829	251	1080	7,61	-	-	-	-
	18	1189	158	1344	15,99	1100	189	1286	12,64	1049	207	1254	11,13	976	229	1204	9,51	896	254	1150	8,05	-	-	-	-
280.8	5	907	157	1062	12,52	840	190	1028	9,85	798	209	1007	8,64	745	232	976	7,43	685	257	943	6,33	625	286	911	5,36
	6	936	158	1093	12,81	867	191	1057	10,09	825	210	1034	8,85	769	232	1002	7,62	708	259	967	6,48	651	288	939	5,53
	7	973	160	1131	13,17	900	192	1091	10,38	851	211	1062	9,07	793	233	1027	7,80	725	259	984	6,59	668	288	956	5,63
	10	1047	162	1207	13,88	970	194	1164	10,98	915	213	1128	9,58	852	236	1087	8,23	775	262	1037	6,93	715	291	1006	5,92
	15	1164	167	1329	14,94	1083	199	1281	11,89	1027	217	1244	10,45	965	241	1205	9,02	889	267	1156	7,67	-	-	-	-
	18	1266	171	1434	15,80	1169	202	1370	12,56	1118	221	1338	11,12	1041	244	1284	9,53	961	270	1231	8,12	-	-	-	-
300.8	5	955	168	1122	12,38	888	202	1090	9,79	843	222	1066	8,58	786	246	1032	7,39	720	273	993	6,27	663	303	966	5,37
	6	991	169	1159	12,71	918	203	1121	10,03	873	224	1096	8,80	811	247	1059	7,57	743	274	1018	6,42	688	305	992	5,52
	7	1026	171	1196	13,02	948	204	1152	10,27	900	225	1124	9,01	838	248	1087	7,75	764	275	1039	6,55	705	306	1011	5,62
	10	1103	174	1276	13,69	1021	208	1227	10,83	963	227	1190	9,47	895	251	1146	8,14	820	279	1098	6,89	752	308	1060	5,89
	15	1229	179	1407	14,69	1142	213	1354	11,73	1082	232	1313	10,33	1014	257	1270	8,90	933	283	1216	7,58	-	-	-	-
	18	1327	184	1509	15,43	1236	217	1451	12,39	1176	236	1412	10,95	1096	260	1356	9,42	1007	287	1295	8,01	-	-	-	-
320.8	5	1003	178	1181	12,26	937	214	1151	9,74	888	236	1124	8,54	827	261	1088	7,35	754	289	1043	6,22	700	320	1020	5,37
	6	1046	180	1226	12,61	968	216	1184	9,98	920	237	1158	8,76	854	262	1116	7,52	779	290	1069	6,37	725	322	1046	5,50
	7	1079	182	1260	12,88	997	217	1214	10,18	948	239	1187	8,95	883	263	1147	7,71	803	291	1095	6,52	743	323	1065	5,60
	10	1160	185	1345	13,52	1071	221	1291	10,70	1011	241	1253	9,38	939	266	1205	8,06	864	295	1160	6,85	790	325	1115	5,86
	15	1293	192	1485	14,48	1200	227	1427	11,59	1136	247	1383	10,21	1063	272	1335	8,80	976	300	1277	7,50	-	-	-	-
	18	1389	197	1585	15,10	1302	231	1533	12,25	1234	252	1486	10,81	1151	277	1428	9,31	1053	305	1358	7,92	-	-	-	-
340.8	5	1085	189	1275	12,51	1012	228	1240	9,89	960	251	1212	8,64	894	279	1172	7,41	816	310	1126	6,26	752	347	1097	5,33
	6	1126	190	1317	12,84	1045	229	1275	10,13	992	252	1245	8,87	922	280	1202	7,59	842	311	1153	6,41	774	348	1120	5,45
	7	1161	191	1353	13,14	1077	230	1308	10,37	1022	253	1276	9,06	951	281	1231	7,77	864	312	1176	6,53	794	348	1141	5,55
	10	1243	194	1437	13,81	1148	233	1381	10,87	1086	256	1343	9,50	1007	283	1290	8,13	921	315	1235	6,84	841	350	1190	5,80
	15	1385	199	1585	14,92	1293	238	1532	11,88	1226	260	1487	10,42	1144	288	1433	8,94	1057	320	1377	7,61	-	-	-	-
	18	1495	203	1700	15,74	1398	242	1641	12,57	1327	264	1592	11,04	1241	292	1534	9,51	1136	323	1460	8,03	-	-	-	-
360.8	5	1168	199	1369	12,72	1088	241	1330	10,02	1032	267	1299	8,73	961	297	1257	7,47	878	332	1209	6,29	803	373	1173	5,30
	6	1205	200	1407	13,05	1122	242	1365	10,27	1065	268	1333	8,96	991	298	1288	7,66	905	333	1237	6,44	824	374	1195	5,40
	7	1243	201	1446	13,38	1158	243	1402	10,53	1095	268	1364	9,16	1018	298	1316	7,83	925	333	1257	6,55	845	374	1216	5,51
	10	1325	203	1530	14,08	1225	245	1471	11,02	1161	270	1433	9,61	1076	300	1376	8,18	977	335	1311	6,84	892	375	1265	5,75
	15	1477	206	1686	15,33	1387	249	1638	12,14	1316	274	1592	10,60	1225	304	1530	9,06	1138	339	1477	7,72	-	-	-	-
	18	1602	209	1814	16,34	1494	252	1748	12,87	1419	277	1698	11,25	1332	307	1640	9,68	1219	342	1561	8,14	-	-	-	-
400.8	5	1271	220	1492	12,54	1184	266	1450	9,92	1125	293	1419	8,67	1045	326	1370	7,42	955	363	1318	6,26	875	407	1280	5,30
	6	1311	222	1534	12,84	1221	267	1489	10,16	1161	295	1456	8,88	1078	327	1405	7,60	986	364	1350	6,41	903	408	1309	5,43
	7	1352	223	1576	13,14	1259	268	1528	10,39	1197	296	1493	9,10	1112	328	1439	7,79	1010	365	1375	6,53	926	409	1333	5,53
	10	1447	226	1674	13,84	1338	271	1610	10,88	1269	298	1568	9,52	1175	330	1505	8,13	1068	367	1435	6,82	977	410	1386	5,76
	15	1605	231	1837	14,92	1493	276	1770	11,82	1414	303	1718	10,35	1323	335	1659	8,90	1230	373	1603	7,60	-	-	-	-
	18	1741	235	1978	15,81	1627	281	1909	12,60	1546	307	1854	11,07	1434	339	1773	9,46	1322	376	1699	8,03	-	-	-	-

kWf = Cold user side cooling 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
kWt = Hot user side 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.
kWe = Compressor power input in kW
Tw = Leaving water temperature cold user side
TER = (Cooling capacity + Heating capacity) / Total power input

Configuration for 2-pipe system

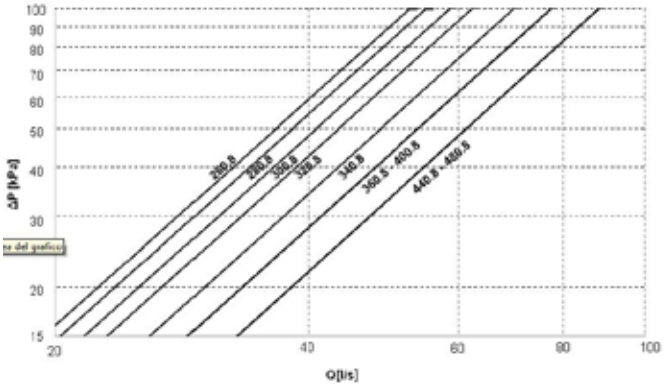
Acoustic configuration: compressor soundproofing (SC) / Acoustic configuration: super-silenced (EN)

Cooling 100% - Recovery 100% performance

Size	Tw (°C)	Leaving water temperature recovery side																							
		25				35				40				45				50				55			
		kWf	kWe	kWt	TER	kWf	kWe	kWt	TER	kWf	kWe	kWt	TER	kWf	kWe	kWt	TER	kWf	kWe	kWt	TER	kWf	kWe	kWt	TER
440.8	5	1421	244	1666	12,66	1323	295	1618	9,98	1254	326	1580	8,70	1163	362	1525	7,41	1055	405	1459	6,20	967	455	1419	5,24
	6	1466	245	1712	12,98	1363	296	1660	10,21	1293	327	1620	8,91	1198	363	1561	7,59	1084	406	1489	6,33	991	456	1444	5,34
	7	1509	246	1756	13,28	1397	297	1695	10,41	1325	328	1653	9,08	1224	364	1587	7,72	1110	407	1516	6,45	1013	457	1466	5,43
	10	1587	248	1836	13,82	1468	299	1768	10,81	1392	330	1722	9,44	1284	366	1649	8,02	1165	409	1573	6,70	1067	458	1522	5,65
	15	1774	253	2029	15,03	1652	305	1958	11,84	1576	335	1912	10,40	1466	372	1838	8,89	1350	415	1764	7,51	-	-	-	-
	18	1921	257	2181	15,96	1794	309	2105	12,61	1700	339	2040	11,03	1584	375	1960	9,45	1453	418	1871	7,94	-	-	-	-
480.8	5	1536	262	1799	12,74	1440	318	1759	10,06	1368	352	1721	8,78	1268	392	1660	7,47	1154	439	1591	6,25	1053	495	1545	5,25
	6	1584	263	1848	13,07	1485	319	1806	10,31	1402	353	1755	8,95	1309	393	1701	7,66	1189	440	1628	6,40	1080	495	1572	5,35
	7	1632	264	1898	13,40	1524	320	1845	10,52	1445	354	1799	9,17	1339	393	1733	7,81	1217	440	1656	6,52	1107	496	1600	5,46
	10	1726	265	1993	14,02	1602	322	1925	10,95	1521	356	1878	9,56	1407	395	1802	8,12	1281	442	1722	6,79	1168	497	1662	5,70
	15	1912	269	2184	15,21	1786	327	2115	11,94	1691	360	2052	10,40	1581	399	1981	8,92	1468	446	1914	7,58	-	-	-	-
	18	2073	273	2348	16,21	1942	330	2275	12,77	1846	364	2211	11,15	1721	403	2125	9,55	1589	450	2039	8,06	-	-	-	-

kWf = Cold user side cooling 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
kWt = Hot user side 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.
kWe = Compressor power input in kW
Tw = Leaving water temperature cold user side
TER = (Cooling capacity + Heating capacity) / Total power input

User side exchanger pressure drops



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

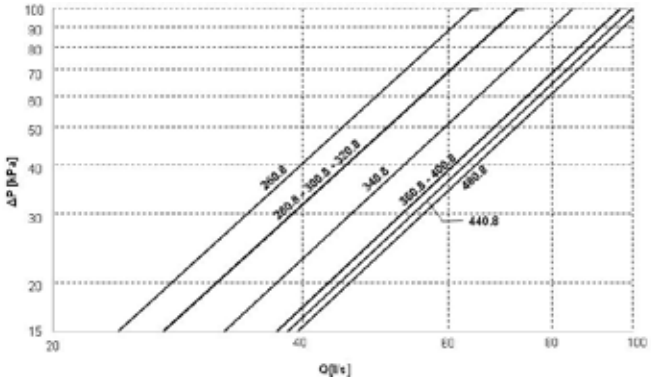
Q = water flow-rate[l/s]
DP = water side pressure drops (kPa)

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

Recovery exchanger pressure drops



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

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.

Configuration for 2-pipe system

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	872	196	4,45	835	214	3,91	786	232	3,38	725	254	2,86
	13	790	172	4,60	757	187	4,04	712	204	3,49	657	223	2,95
	12	784	172	4,55	752	188	4,00	707	204	3,46	653	223	2,93
	11	703	148	4,74	674	162	4,17	633	176	3,61	584	192	3,05
	10	616	123	5,00	590	134	4,39	555	146	3,80	512	160	3,21
	9	611	124	4,94	586	135	4,34	551	146	3,76	509	160	3,18
	8	524	99	5,32	502	108	4,67	472	117	4,05	436	128	3,42
	7	498	93	5,38	477	101	4,73	449	110	4,09	414	120	3,46
	6	407	78	5,24	390	85	4,60	366	92	3,99	338	100	3,38
	5	380	72	5,31	364	78	4,67	342	85	4,04	316	92	3,42
	4	355	66	5,42	340	71	4,76	320	78	4,12	295	85	3,49
	2	229	44	5,26	220	48	4,62	207	52	4,00	191	56	3,38
	1	115	22	5,19	111	24	4,56	104	26	3,97	96	29	3,37
280.8	12	923	211	4,37	885	230	3,85	832	249	3,34	770	271	2,84
	11	841	187	4,50	806	204	3,96	759	221	3,44	701	240	2,92
	10	760	163	4,67	728	177	4,10	685	192	3,56	633	209	3,03
	9	672	138	4,89	644	150	4,30	606	162	3,73	560	177	3,17
	8	585	112	5,20	561	123	4,58	528	133	3,97	488	144	3,38
	7	559	106	5,25	535	116	4,62	504	126	4,01	466	137	3,41
	6	532	100	5,30	510	109	4,66	480	119	4,05	444	129	3,44
	5	507	94	5,37	486	103	4,72	457	111	4,10	423	121	3,49
	4	482	88	5,46	462	96	4,80	434	104	4,17	402	113	3,54
	2	231	44	5,19	221	48	4,56	208	52	3,97	192	57	3,37
	1	115	22	5,19	111	24	4,56	104	26	3,97	96	29	3,37
300.8	14	983	223	4,41	941	243	3,88	887	262	3,39	819	285	2,87
	13	901	199	4,54	863	216	3,99	813	234	3,48	751	254	2,95
	12	871	192	4,54	835	209	3,99	787	226	3,48	726	246	2,95
	11	790	168	4,71	757	183	4,14	713	197	3,61	658	215	3,06
	10	703	143	4,92	673	155	4,33	635	168	3,78	585	183	3,20
	9	672	137	4,90	644	149	4,31	607	161	3,76	560	176	3,19
	8	585	112	5,23	561	122	4,60	528	132	4,01	487	143	3,40
	7	558	106	5,27	535	115	4,64	504	125	4,05	465	136	3,43
	6	436	84	5,18	418	92	4,56	394	99	3,97	364	108	3,37
	5	410	78	5,24	393	85	4,61	370	92	4,02	341	100	3,41
	4	385	72	5,33	369	79	4,69	347	85	4,09	320	92	3,46
	2	259	50	5,16	248	55	4,54	234	59	3,96	216	64	3,35
	1	115	22	5,19	111	24	4,56	104	26	3,97	96	29	3,37
320.8	8	1043	234	4,45	998	255	3,91	942	275	3,43	868	300	2,90
	7	931	204	4,57	892	222	4,02	842	239	3,52	775	260	2,98
	6	820	173	4,74	786	188	4,17	741	203	3,66	682	221	3,09
	5	702	142	4,94	673	155	4,35	635	167	3,81	584	182	3,22
	4	584	111	5,25	560	121	4,62	528	131	4,05	486	142	3,42
	2	288	56	5,14	276	61	4,52	260	66	3,96	239	72	3,34
	1	144	28	5,14	138	30	4,52	130	33	3,96	120	36	3,34

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 nominal value.

Configuration for 2-pipe system

Acoustic configuration: compressor soundproofing (SC)

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	1132	251	4,51	1083	273	3,96	1017	296	3,44	937	323	2,90
	13	1049	226	4,64	1004	246	4,08	943	267	3,54	869	291	2,98
	12	1020	220	4,64	977	240	4,07	917	260	3,53	844	284	2,97
	11	937	195	4,80	898	213	4,22	843	231	3,66	776	252	3,08
	10	861	171	5,04	825	186	4,43	774	201	3,84	713	220	3,24
	9	819	164	4,98	785	179	4,38	736	194	3,79	678	212	3,19
	8	743	140	5,31	712	153	4,67	668	165	4,04	615	181	3,40
	7	615	119	5,16	590	130	4,54	553	141	3,93	509	154	3,32
	6	595	112	5,30	570	122	4,66	534	133	4,02	491	145	3,38
	5	467	92	5,10	447	100	4,48	419	108	3,87	386	118	3,26
	4	400	73	5,52	384	79	4,85	360	86	4,20	331	94	3,54
	2	260	50	5,18	249	55	4,56	234	59	3,96	215	65	3,34
	1	116	22	5,24	111	24	4,60	104	26	3,95	96	29	3,33
360.8	12	1220	267	4,57	1168	292	4,01	1092	317	3,44	1006	347	2,90
	11	1137	242	4,69	1089	264	4,12	1018	288	3,54	938	315	2,98
	10	1054	218	4,85	1011	237	4,26	944	258	3,66	869	282	3,08
	9	978	193	5,07	938	211	4,45	876	229	3,82	806	251	3,22
	8	902	169	5,35	864	184	4,70	807	200	4,04	743	219	3,40
	7	774	148	5,23	742	161	4,60	693	175	3,95	638	192	3,32
	6	646	127	5,08	619	139	4,47	578	151	3,83	532	165	3,23
	5	579	108	5,36	556	118	4,71	519	128	4,04	478	140	3,40
	4	513	89	5,76	492	97	5,06	459	106	4,34	423	116	3,66
	2	232	44	5,24	222	48	4,60	208	53	3,95	191	57	3,33
	1	116	22	5,24	111	24	4,60	104	26	3,95	96	29	3,33
400.8	12	1311	295	4,45	1256	321	3,92	1176	347	3,39	1090	375	2,91
	11	1207	263	4,59	1156	286	4,04	1082	309	3,50	1003	335	3,00
	10	1102	231	4,77	1056	252	4,19	989	272	3,63	917	294	3,11
	9	997	200	4,99	955	218	4,39	894	235	3,80	829	254	3,26
	8	891	169	5,29	854	184	4,65	800	198	4,03	741	215	3,45
	7	817	153	5,33	783	167	4,69	733	180	4,07	680	195	3,49
	6	743	138	5,39	712	150	4,74	667	162	4,11	618	175	3,52
	5	681	124	5,51	653	135	4,85	611	145	4,20	567	157	3,60
	4	620	109	5,66	594	119	4,99	556	129	4,32	515	139	3,70
	2	309	55	5,61	296	60	4,94	277	65	4,28	257	70	3,67
	1	154	28	5,61	148	30	4,94	139	32	4,28	128	35	3,67
440.8	12	1451	318	4,56	1391	347	4,01	1308	374	3,50	1204	409	2,94
	11	1339	288	4,65	1283	314	4,09	1207	338	3,57	1112	370	3,01
	10	1227	257	4,77	1176	280	4,20	1106	302	3,66	1019	330	3,08
	9	1063	211	5,03	1019	230	4,43	958	248	3,86	883	271	3,25
	8	900	165	5,44	862	180	4,78	810	194	4,17	747	212	3,51
	7	827	150	5,51	793	164	4,85	745	176	4,23	687	193	3,56
	6	755	135	5,60	723	147	4,93	680	158	4,30	627	173	3,62
	5	600	107	5,59	575	117	4,92	541	126	4,29	498	138	3,61
	4	446	80	5,56	427	87	4,89	401	94	4,27	370	103	3,60
	2	303	55	5,50	291	60	4,84	273	65	4,22	252	71	3,56
	1	152	28	5,50	145	30	4,84	137	32	4,22	126	35	3,56
480.8	8	1563	350	4,46	1496	382	3,92	1414	409	3,46	1300	449	2,90
	7	1399	303	4,61	1340	330	4,06	1267	354	3,58	1165	389	3,00
	6	1236	256	4,82	1185	279	4,24	1119	299	3,74	1029	328	3,13
	5	1082	210	5,16	1037	228	4,54	980	245	4,00	901	269	3,35
	4	928	163	5,70	890	178	5,01	840	190	4,42	773	209	3,70
	2	463	82	5,65	443	89	4,97	419	96	4,38	385	105	3,67
	1	231	41	5,65	222	45	4,97	209	48	4,38	193	52	3,67

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 nominal value.

Configuration for 2-pipe system

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	841	200	4,20	806	218	3,69	754	237	3,18	694	260	2,67
	13	765	175	4,37	734	191	3,84	687	207	3,31	632	227	2,78
	12	762	175	4,35	730	191	3,82	683	207	3,30	629	227	2,77
	11	686	150	4,58	658	163	4,03	616	177	3,47	567	194	2,92
	10	611	125	4,90	585	136	4,31	548	148	3,71	504	162	3,12
	9	605	125	4,86	580	136	4,27	543	148	3,68	500	162	3,09
	8	530	99	5,33	508	108	4,68	475	118	4,04	437	129	3,39
	7	503	93	5,38	482	102	4,73	451	111	4,08	415	121	3,43
	6	411	78	5,27	394	85	4,63	368	92	3,99	339	101	3,36
	5	384	72	5,34	368	78	4,69	344	85	4,04	317	93	3,40
	4	358	66	5,44	344	72	4,78	321	78	4,12	296	85	3,47
	2	232	44	5,26	222	48	4,63	208	52	3,99	191	57	3,35
	1	117	22	5,26	112	24	4,62	104	26	3,98	96	29	3,36
280.8	12	893	213	4,19	856	233	3,68	801	252	3,17	737	275	2,68
	11	818	188	4,35	784	205	3,82	733	222	3,30	675	243	2,78
	10	743	163	4,56	712	177	4,01	666	193	3,46	613	210	2,92
	9	667	137	4,85	639	150	4,27	598	163	3,68	550	178	3,10
	8	591	112	5,27	567	122	4,63	530	133	3,99	488	145	3,37
	7	564	106	5,32	541	116	4,67	506	126	4,03	466	137	3,40
	6	537	100	5,37	515	109	4,72	482	118	4,07	444	129	3,43
	5	512	94	5,44	491	103	4,78	459	111	4,12	423	122	3,48
	4	486	88	5,52	466	96	4,86	436	104	4,19	402	114	3,53
	2	233	44	5,26	223	48	4,62	209	52	3,98	192	57	3,36
	1	117	22	5,26	112	24	4,62	104	26	3,98	96	29	3,36
300.8	14	951	224	4,24	911	245	3,73	850	266	3,20	782	290	2,70
	13	875	199	4,40	839	217	3,87	783	236	3,32	720	257	2,80
	12	847	193	4,40	812	210	3,86	758	228	3,32	697	249	2,80
	11	771	167	4,61	740	182	4,05	690	198	3,48	634	216	2,93
	10	696	142	4,90	667	155	4,31	622	168	3,70	572	184	3,11
	9	668	136	4,91	641	148	4,31	598	161	3,71	550	176	3,12
	8	592	111	5,34	568	121	4,70	530	131	4,04	487	143	3,40
	7	565	105	5,39	542	114	4,74	506	124	4,08	465	135	3,43
	6	441	84	5,28	423	91	4,64	395	99	3,99	364	108	3,36
	5	415	78	5,34	398	85	4,70	371	92	4,04	341	100	3,40
	4	389	72	5,44	373	78	4,78	348	85	4,11	320	92	3,46
	2	262	50	5,28	252	54	4,64	235	59	3,99	216	64	3,36
	1	117	22	5,26	112	24	4,62	104	26	3,98	96	29	3,36
320.8	8	1008	235	4,28	967	257	3,77	900	279	3,23	826	304	2,72
	7	904	204	4,44	867	222	3,90	807	241	3,35	741	263	2,81
	6	800	172	4,65	767	188	4,09	714	204	3,51	656	222	2,95
	5	697	141	4,95	668	153	4,35	622	167	3,73	571	182	3,14
	4	593	110	5,42	569	119	4,76	530	130	4,08	486	142	3,43
	2	292	55	5,30	280	60	4,66	261	65	4,00	239	71	3,36
	1	146	28	5,30	140	30	4,66	130	33	4,00	120	36	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 nominal value.

Configuration for 2-pipe system

Acoustic configuration: super-silenced (EN)

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	1093	255	4,29	1048	278	3,77	974	303	3,22	894	330	2,71
	13	1016	228	4,45	974	249	3,91	905	271	3,34	831	296	2,81
	12	989	223	4,44	949	243	3,90	881	265	3,32	809	289	2,80
	11	912	197	4,64	874	214	4,08	812	234	3,47	745	255	2,93
	10	835	170	4,91	801	185	4,32	744	202	3,68	683	220	3,10
	9	808	165	4,89	775	180	4,30	720	197	3,66	661	214	3,08
	8	731	139	5,27	701	151	4,64	651	165	3,95	598	180	3,33
	7	608	118	5,15	583	129	4,53	542	140	3,86	497	153	3,25
	6	581	111	5,21	557	122	4,58	517	133	3,90	474	144	3,28
	5	457	91	5,04	439	99	4,43	407	108	3,77	374	118	3,18
	4	393	72	5,47	377	78	4,81	350	86	4,09	322	93	3,45
	2	258	50	5,20	247	54	4,57	230	59	3,90	211	64	3,28
	1	112	22	5,07	107	24	4,46	99	26	3,78	91	29	3,19
360.8	12	1178	274	4,30	1130	299	3,78	1048	327	3,21	961	355	2,70
	11	1101	248	4,45	1056	270	3,91	979	295	3,31	898	321	2,80
	10	1023	221	4,63	981	241	4,07	910	264	3,45	835	287	2,91
	9	946	194	4,87	908	212	4,28	842	232	3,63	772	252	3,06
	8	869	168	5,18	834	183	4,56	773	200	3,86	709	218	3,26
	7	746	147	5,07	715	160	4,46	663	176	3,78	609	191	3,19
	6	623	127	4,92	597	138	4,33	554	151	3,67	508	164	3,10
	5	559	108	5,19	536	117	4,56	497	128	3,87	456	140	3,26
	4	495	89	5,57	474	97	4,90	440	106	4,15	404	115	3,51
	2	224	44	5,07	215	48	4,46	199	53	3,78	183	57	3,19
	1	112	22	5,07	107	24	4,46	99	26	3,78	91	29	3,19
400.8	12	1253	298	4,20	1201	325	3,70	1126	353	3,19	1047	381	2,75
	11	1156	265	4,37	1107	288	3,84	1039	313	3,32	966	338	2,86
	10	1058	231	4,58	1014	252	4,03	951	273	3,48	885	295	3,00
	9	961	198	4,86	921	216	4,27	864	234	3,69	804	253	3,18
	8	864	165	5,25	828	180	4,61	777	195	3,99	723	211	3,43
	7	802	151	5,32	768	164	4,68	721	178	4,04	670	193	3,48
	6	739	137	5,40	708	149	4,75	664	162	4,11	618	175	3,54
	5	678	123	5,53	649	134	4,86	609	145	4,20	567	157	3,61
	4	616	108	5,68	590	118	4,99	554	128	4,32	515	139	3,71
	2	307	55	5,63	294	59	4,95	276	65	4,28	257	70	3,68
	1	154	27	5,63	147	30	4,95	138	32	4,28	128	35	3,68
440.8	12	1409	322	4,38	1352	352	3,84	1255	383	3,27	1147	422	2,72
	11	1306	290	4,51	1253	316	3,96	1163	345	3,37	1063	379	2,80
	10	1202	257	4,68	1153	281	4,11	1071	306	3,50	979	337	2,91
	9	1051	208	5,05	1008	227	4,44	936	247	3,78	856	272	3,14
	8	900	159	5,67	863	173	4,98	801	189	4,24	733	208	3,52
	7	835	145	5,75	801	159	5,05	743	173	4,30	680	190	3,57
	6	769	132	5,84	738	144	5,13	685	157	4,37	627	173	3,63
	5	612	105	5,82	587	115	5,12	545	125	4,36	498	138	3,62
	4	454	78	5,80	436	86	5,09	405	93	4,34	370	103	3,60
	2	309	54	5,73	296	59	5,04	275	64	4,29	252	71	3,56
	1	155	27	5,73	148	29	5,04	138	32	4,29	126	35	3,56
480.8	8	1515	359	4,22	1453	392	3,71	1350	427	3,16	1235	470	2,63
	7	1364	308	4,42	1308	337	3,89	1215	367	3,31	1112	404	2,75
	6	1212	258	4,70	1163	282	4,13	1080	307	3,52	989	338	2,92
	5	1062	208	5,10	1018	227	4,48	946	248	3,82	866	273	3,18
	4	911	158	5,76	874	173	5,06	812	188	4,32	743	207	3,58
	2	454	79	5,71	435	87	5,02	404	95	4,28	370	104	3,55
	1	227	40	5,71	218	43	5,02	202	47	4,28	185	52	3,55

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 nominal value.

Configuration for 2-pipe system

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

Heating performance at part load

Size	STEP	Entering external exchanger 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 max. step nominal value.

Configuration for 2-pipe system

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

Heating performance at part load

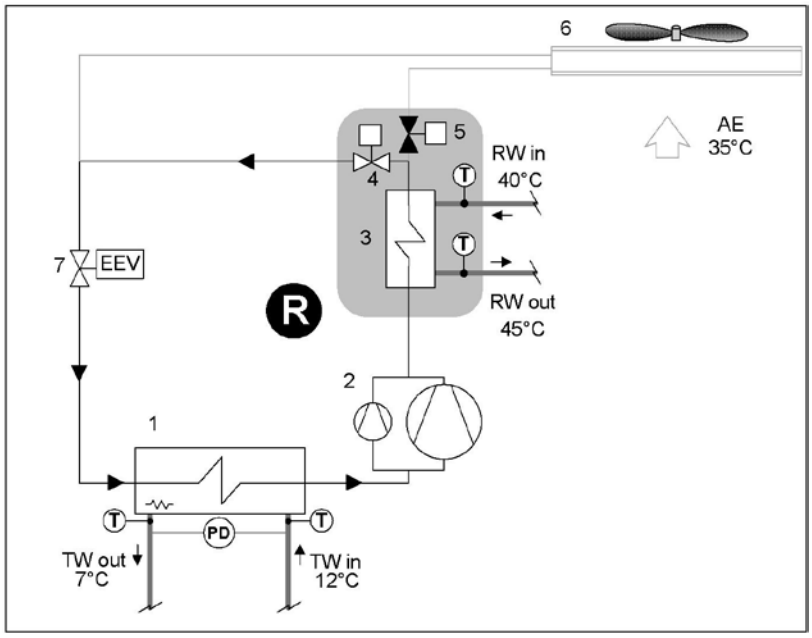
Size	STEP	Entering external exchanger air temperature (°C)																	
		-7 / -8			-5 / -6			0 / -1			2 / 1			7 / 6			12 / 11		
		kWt	kWe_tot	COP	kWt	kWe_tot	COP	kWt	kWe_tot	COP	kWt	kWe_tot	COP	kWt	kWe_tot	COP	kWt	kWe_tot	COP
340.8	14	740	245	3,02	777	248	3,14	881	252	3,50	929	255	3,65	1053	259	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 max. step nominal value.

Total recovery device operation

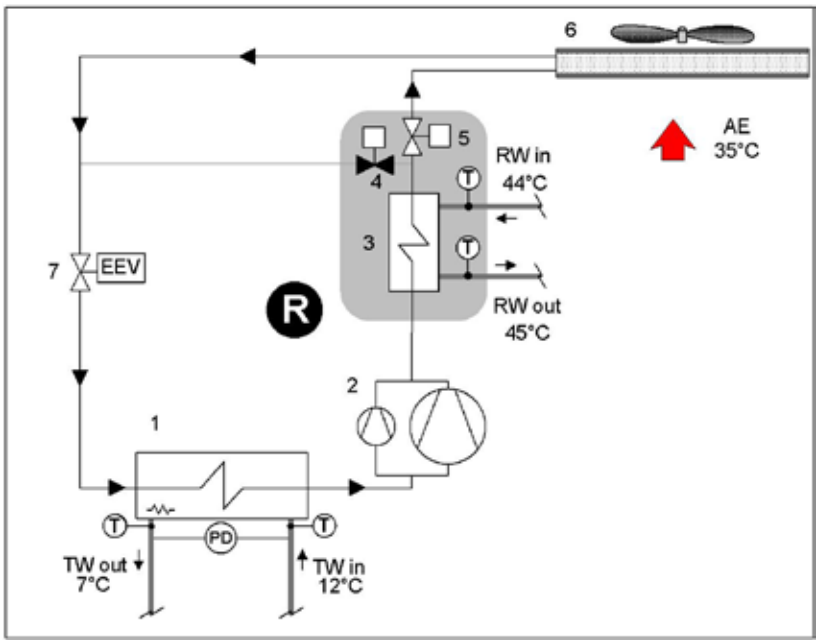
TOTAL OPERATING ENERGY RECOVERY

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



TOTAL NON-OPERATING ENERGY RECOVERY

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



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

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

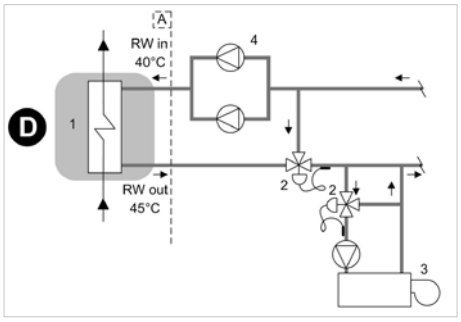
Preheating of hot water for domestic use or for industrial process

Heating of water in swimming pools, showers and SPAS

Preheating of hot water for laundries and industrial kitchens

Air heating

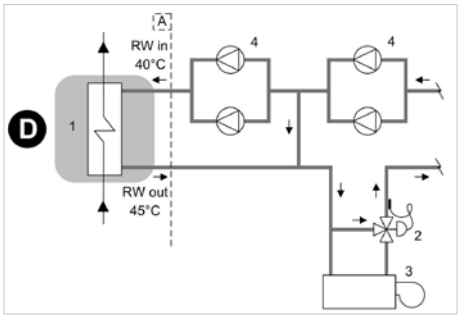
The heat recovery device can be used to cover the entire heat load required. The hot water supply temperature is controlled via a modulating control valve that needs to be fitted on the system at the outlet of the recovery unit. The auxiliary heating device is recommended to cover the thermal energy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

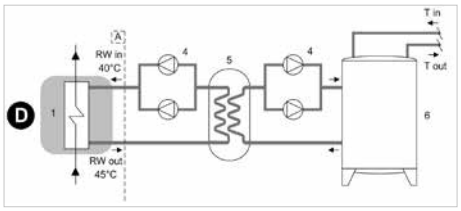
The heat recovery device can be used to preheat water at the inlet of the main heating device (e.g. boiler). In this case, the demand for hot water is greater than the amount of heat recovered by condensation and the recovery device only covers part of the required heat load. By preheating the water,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

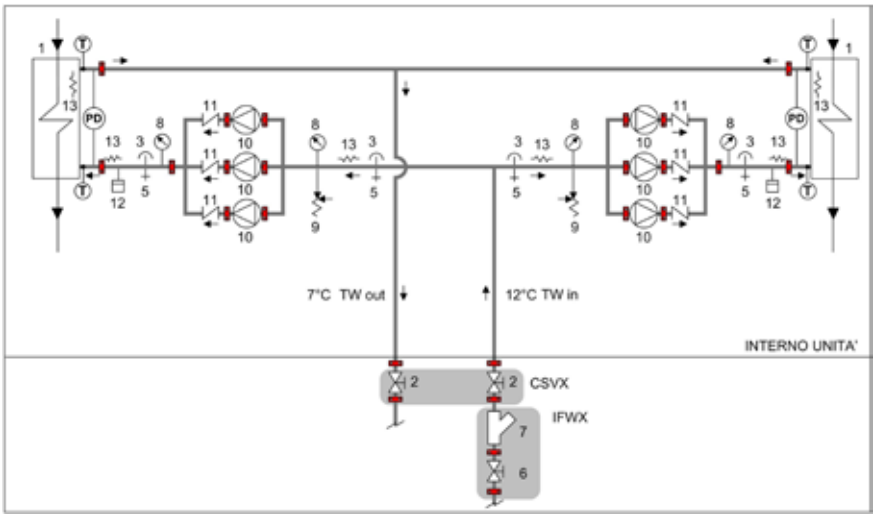
Three-phase electric motor with IP55-protection. Complete with thermoformed insulated casing, quick connections with insulated casing,non return valve, safety valve, pressure gauges, system load safety pressure switch, stainless steel antifreeze immersion heaters located at the return and supply point.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

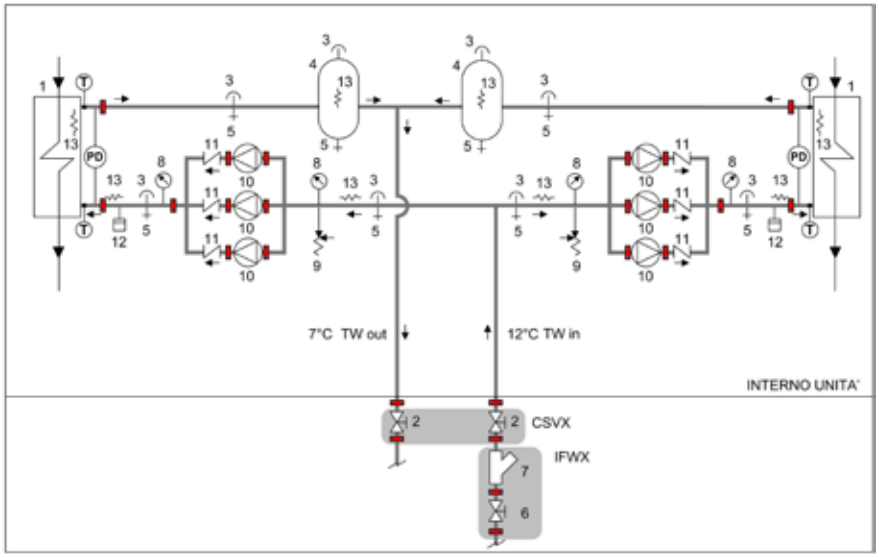
Check the option compatibility table for combinations with storage tank.

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



HYDROPACK WITH STORAGE TANK



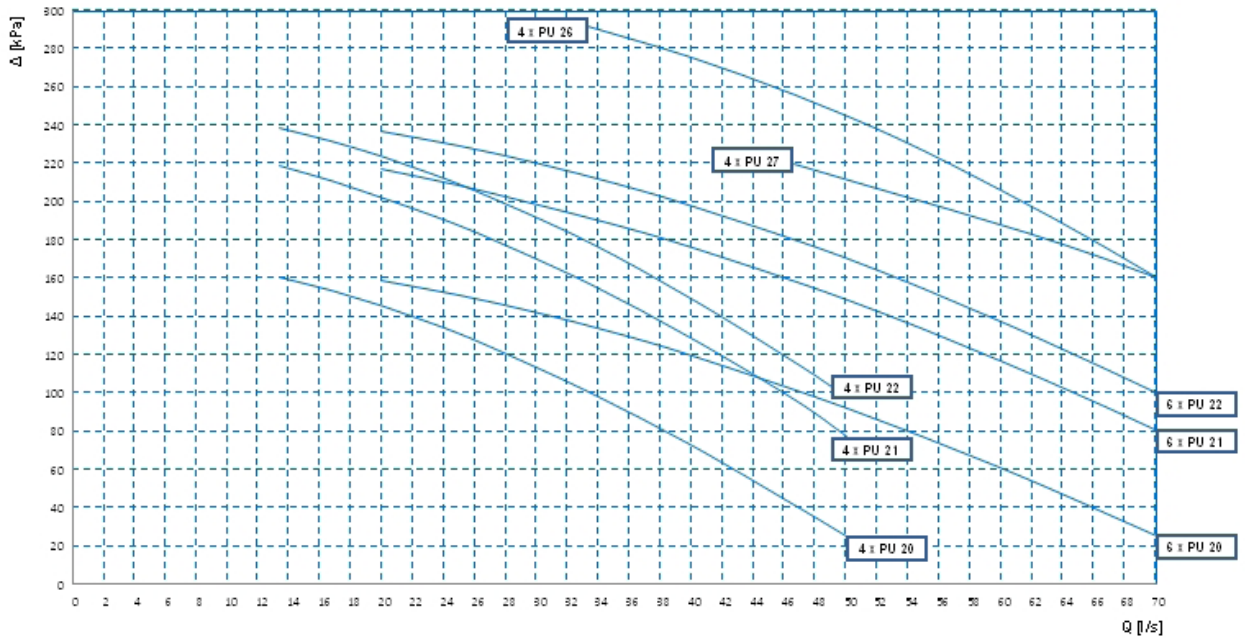
Illustrative diagram referred to unit size 320.8 with Hydropack with no. 6 of pumps

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

Check the "Option compatibility" table for the pumping unit availability in the different sizes and configurations.

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

HYGR6V - Hydronic assembly recovery 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).

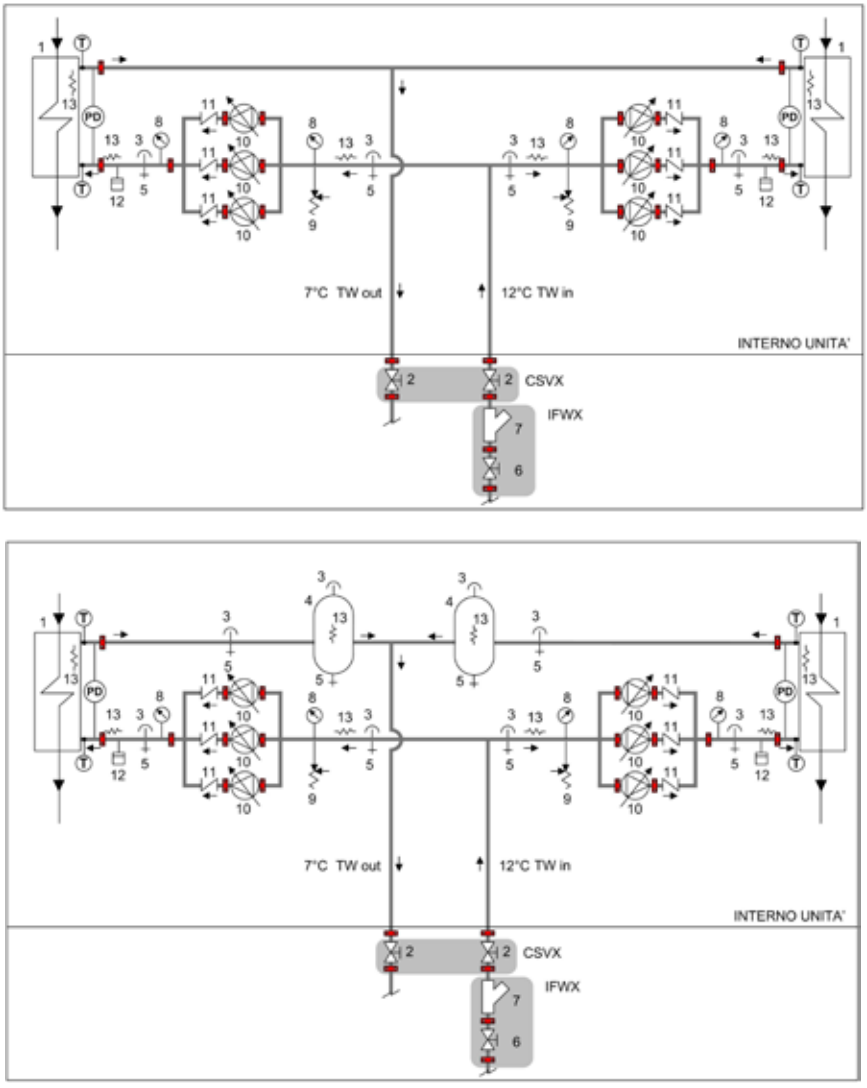
Mechanical seal using ceramic, carbon and EPDM elastomer components.

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 and HYGR6V options are 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.

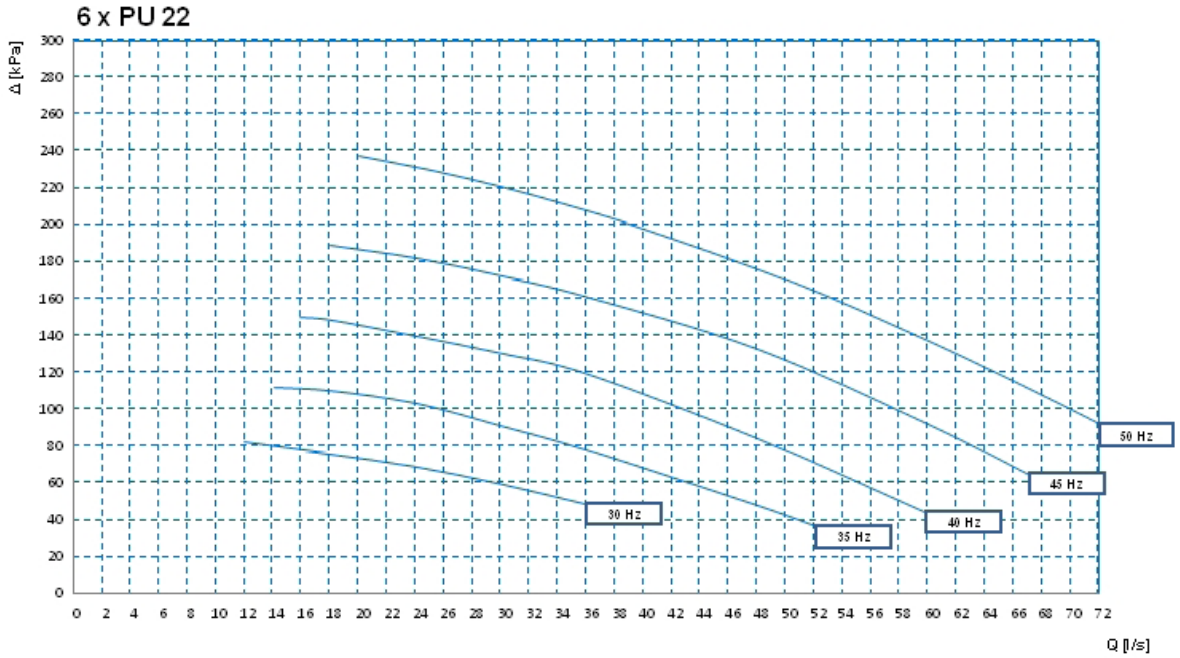
Provided with hydraulic interceptions to the outside of the unit (option 'CSVX - A pair of manually operated shut-off valves') to facilitate any major maintenance operations.



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

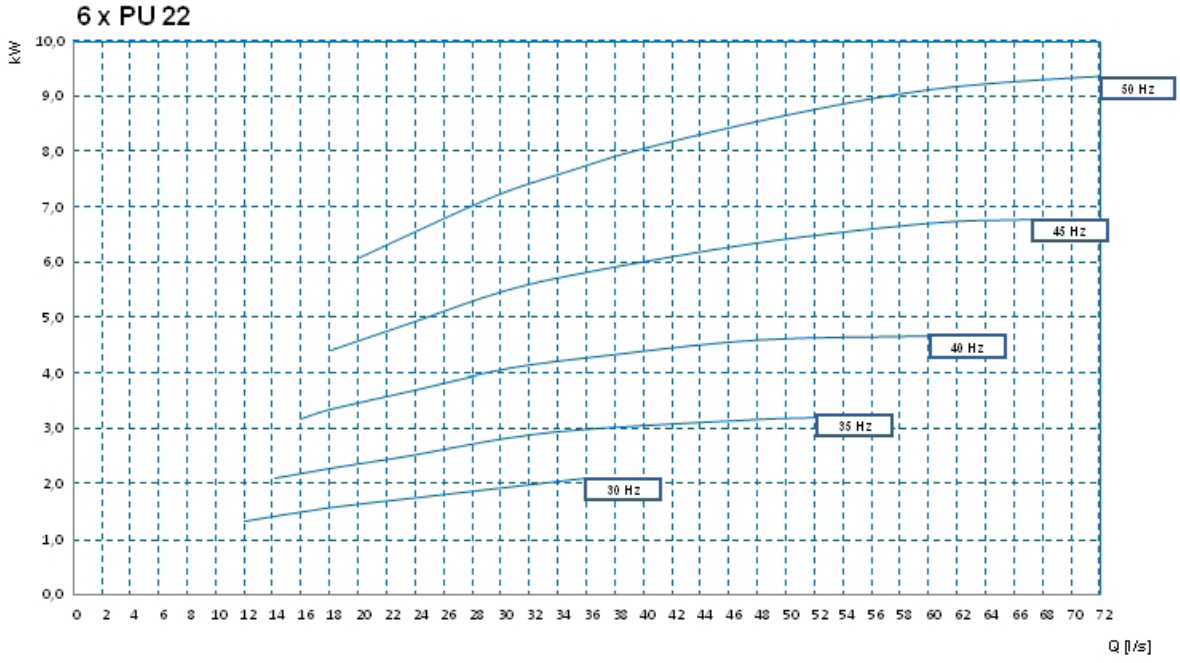


Q[l/s]= water flow rate
Δ [kPa] = pump head

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

Built-in pump electrical data

PUMP	Rated power [kW]	Nominal power [A]
6×PU22	6×3.3	6×5.6

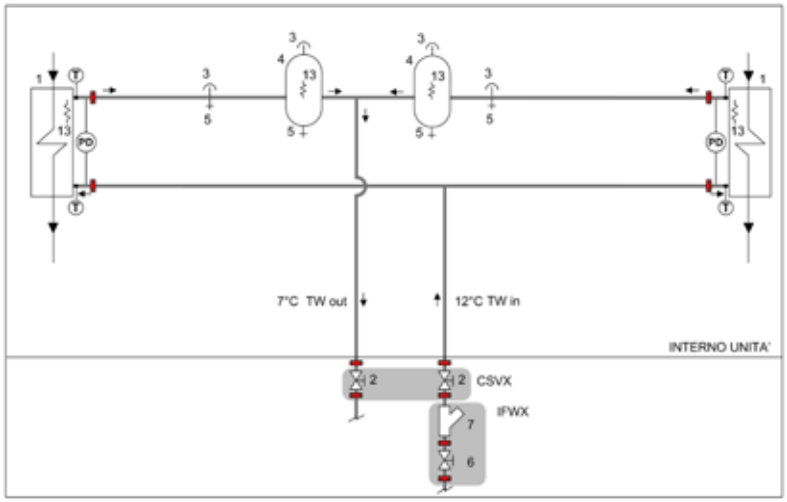
Accessories - Hydronic assembly

A1200 / A1400 / A1600 / A1800 - litre storage tank

Carbon steel storage tank built-in supplied, complete with external double layer covering with closed-cell insulation 30mm thick, stainless steel anti-freeze immersion, bleed valve, discharge stop valve, Victaulic type quick connections with insulated casing. Massima pressione di esercizio 10 bar. Maximum operating pressure of 10 bar. Suitable for operation with mixtures of glycol-water.

The storage tank connection can be user side "CAU" (2T or 4T) or recovery side "CAR" (only 4T).

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 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.

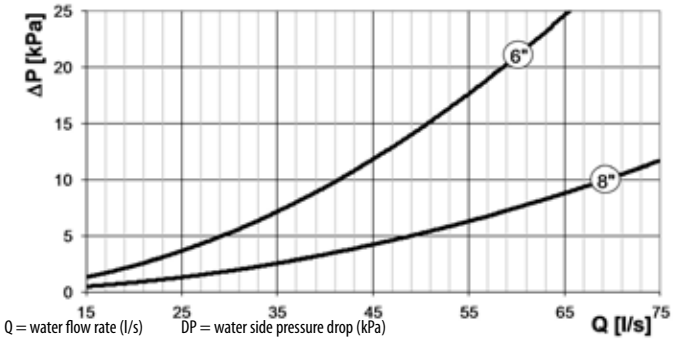
The water outlet user side with "Storage tank" option is positioned in correspondence of the storage tank itself. The outlet position will be defined when ordering. The water inlet user side remains in the same position of the standard unit.

IFWX - Steel mesh strainer on the water side

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

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

STEEL KNIT FILTER PRESSURE DROP



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

STEEL MESH FILTER FEATURES

Size	260.8-320.8	340.8-480.8
Diameter	6"	8"
Degree of filtration	1,6 mm	

Pressure drop referred to a clean filter

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

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

Separately supplied accessory and available both for user side and recovery side exchanger.

CSVX - Couple of manually operated shut-off valves

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

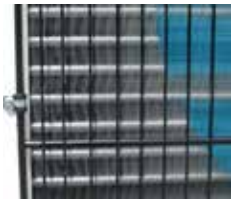
- no. 2 cast-iron shut-off butterfly valves with fast fittings and activation lever with a mechanical calibration lock
- no. 2 of quick connections

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

Separately supplied accessory and available both for user side and recovery side exchanger.

Accessories

PGFC- Finned coil protection grill



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

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

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

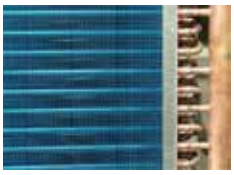
Accessories supplied and installed built-in the unit.

PGCCH - Anti-hail protection grilles

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

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

CCCA - Copper / aluminium condenser coil with acrylic lining



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

Attention!

- Cooling capacity variation -2.7%

- Variation in compressor power input +4.2%

- Operating range reduction -2.1°C

Option available on special request.

CCCA1 - Condenser coil 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.

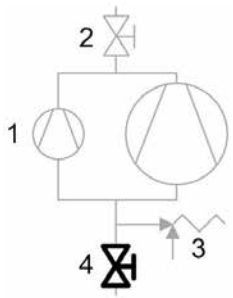
The two liquid pressure gauges and corresponding pressure sockets are installed on the machine in an easily accessible location.

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. Units must be of the same type: all reversible heat pumps, or all cool only, or all heat only. Sizes can be different. 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.

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.

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

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

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

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

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

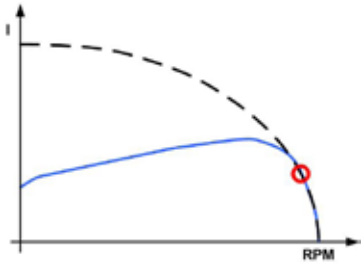
SFSTR – Disposal for inrush current reduction

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

Device installed and wired built-in the unit.

In sizes 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).

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).

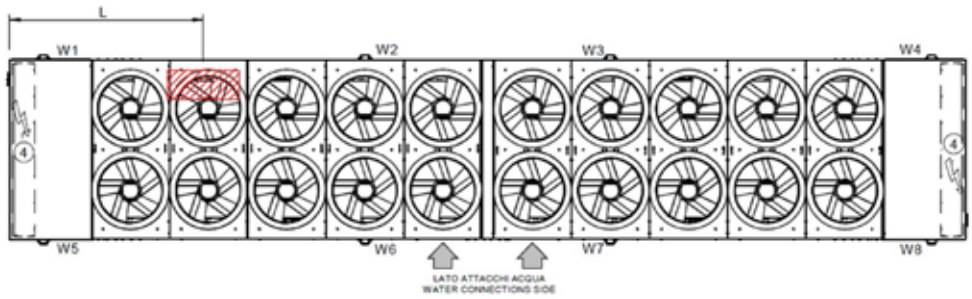
CREFB - Device for fan consumption reduction of the external section, ECOBREEZE type

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.

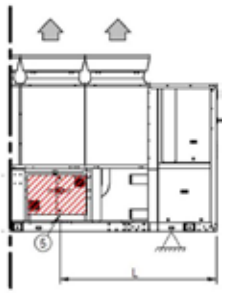
PSPS - Set up for single power supply

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 (%).

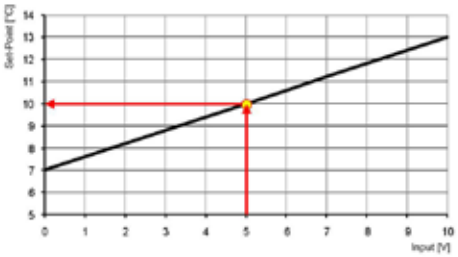
The device is installed and wired built-in the unit.

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.

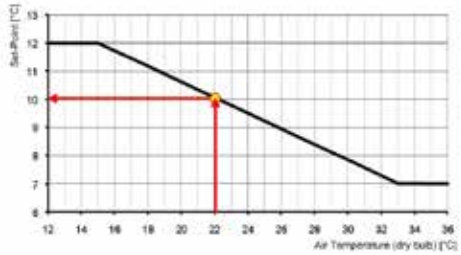
The device is installed and wired built-in the unit.



SPC2 - Set-point compensation with outdoor 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.

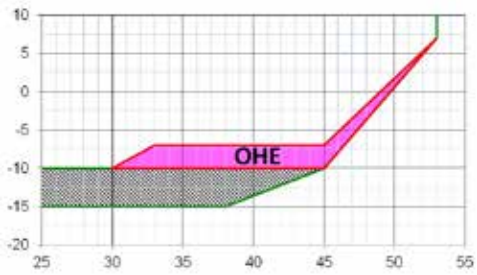
The device is installed and wired built-in the unit.



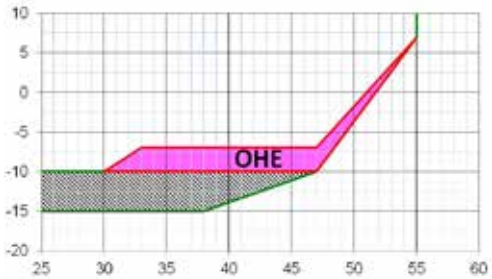
OHE - Limit extension kit in heating up to -10°C (W.B.)

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.



2-pipe configuration - Extended operating range with OHE kit



4-pipe configuration - Extended operating range with OHE kit

RPRI - Refrigerant leak detector in the casing

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

Accessories separately supplied

RCMRX - Remote control via microprocessor remote control

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

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

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

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

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

Installation provided by the Customer.

PSX - Mains power supply unit

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 the 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 the Customer.

Option compatiblity - Configuration for 2-pipe and 4-pipe system

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										
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
+ CAU + 4T	+ Storage connection utility side + Configuration for 4-pipe system	0	0	0	0	0	0	0	0	0
+ CAR + 4T	+ Storage connection recovery side + Configuration for 4-pipe system	0	0	0	0	0	0	0	0	0
+ CAU + 2T	+ Storage connection utility side + Configuration for 2-pipe system	0	0	0	0	0	0	0	0	0
+ CAR + 2T	+ Storage connection recovery side + Configuration for 2-pipe system	-	-	-	-	-	-	-	-	-
4PM - Hydropack user side with no. 4 of pumps										
(PU20)	Pump 20	0	0	-	-	-	-	-	-	-
(PU21) / (PU22)	Pump 21 / Pump 22	0	0	0	0	0	0	-	-	-
(PU26)	Pump 26	-	-	-	-	-	-	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
6PM - Hydropack user side with no. 6 of 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
+ 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
HYGR6V - Hydronic assembly recovery side with no.6 of inverter pumps										
(PU22)	Pump 22	0	0	0	0	0	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 fan 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
0* Necessary matching: variable flow-rate control and built-in inverter pumps
- Not available

Option compatiblity - Configuration for 2-pipe and 4-pipe system

Acoustic configuration: super-silenced (EN)

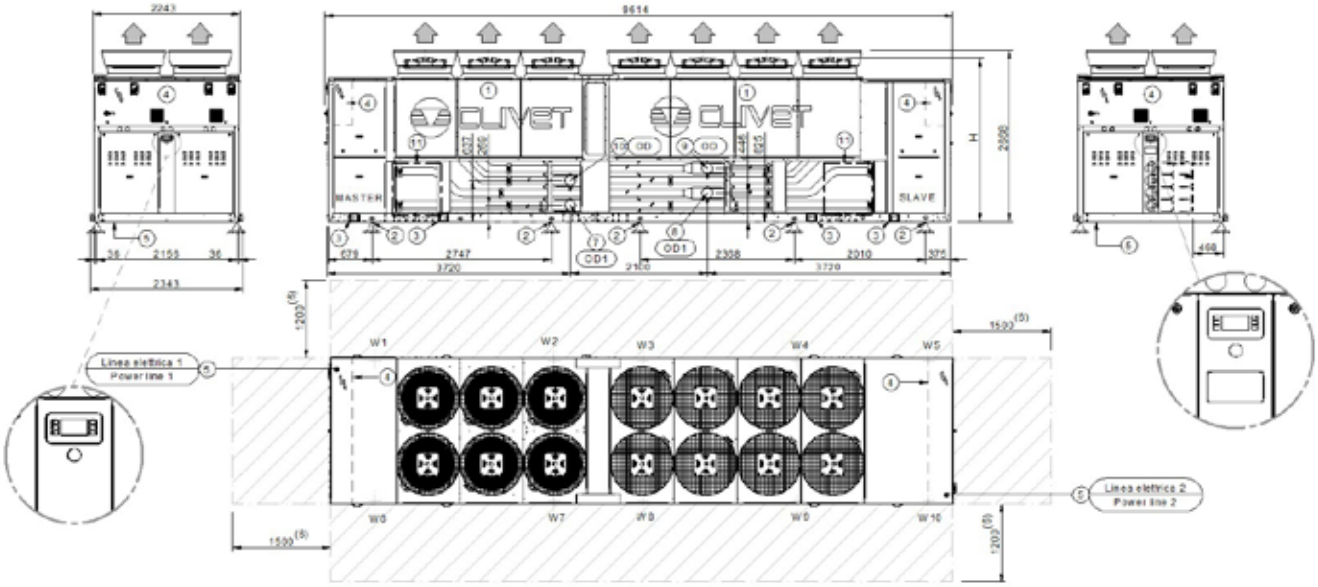
REFERENCE	DESCRIPTION	260.8	280.8	300.8	320.8	340.8	360.8	400.8	440.8	480.8
Configurations and main accessories										
A1200	1200 l. storage tank	0	-	-	-	-	-	-	-	-
A1400	1400 l. storage tank	-	0	0	0	-	-	-	-	-
A1600	1600 l. storage tank	-	-	-	-	0	-	-	-	-
A1800	1800 l. storage tank	-	-	-	-	-	0	0	0	0
+ CAU + 4T	+ Storage connection utility side + Configuration for 4-pipe system	0	0	0	0	0	0	0	0	0
+ CAR + 4T	+ Storage connection recovery side + Configuration for 4-pipe system	0	0	0	0	0	0	0	0	0
+ CAU + 2T	+ Storage connection utility side + Configuration for 2-pipe system	0	0	0	0	0	0	0	0	0
+ CAR + 2T	+ Storage connection recovery side + Configuration for 2-pipe system	-	-	-	-	-	-	-	-	-
4PM - Hydropack user side with no. 4 of pumps										
(PU20)	Pump 20	0	0	0	0	0	0	0	-	-
(PU21) / (PU22)	Pump 21 / Pump 22	0	0	0	0	0	0	0	-	-
(PU27)	Pump 27	-	-	-	-	-	-	-	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
6PM - Hydropack user side with no. 6 of 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
+ 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
HYGR6V - Hydronic assembly recovery side with no.6 of inverter pumps										
(PU22)	Pump 22	0	0	0	0	0	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 fan 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
0* Necessary matching: variable flow-rate control and built-in inverter pumps
- Not available

Dimensional drawings

Size 260.8 - Acoustic configuration : Compressor soundproofing (SC) / Super-silenced (EN)

DAB2M260.8_EXC_SC_EN_1
Data/Date 11/05/2018



1. External exchanger (condenser)
2. Antivibration fixing holes Ø 25mm
3. Lifting brackets (removable, if required, after unit positioning)
4. Main electrical panel
5. Power input supply
6. Recommended functional clearances
7. Entering exchanger water recovery side
8. Leaving exchanger water recovery side
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)
11. Hydronic assembly recovery side (optional)

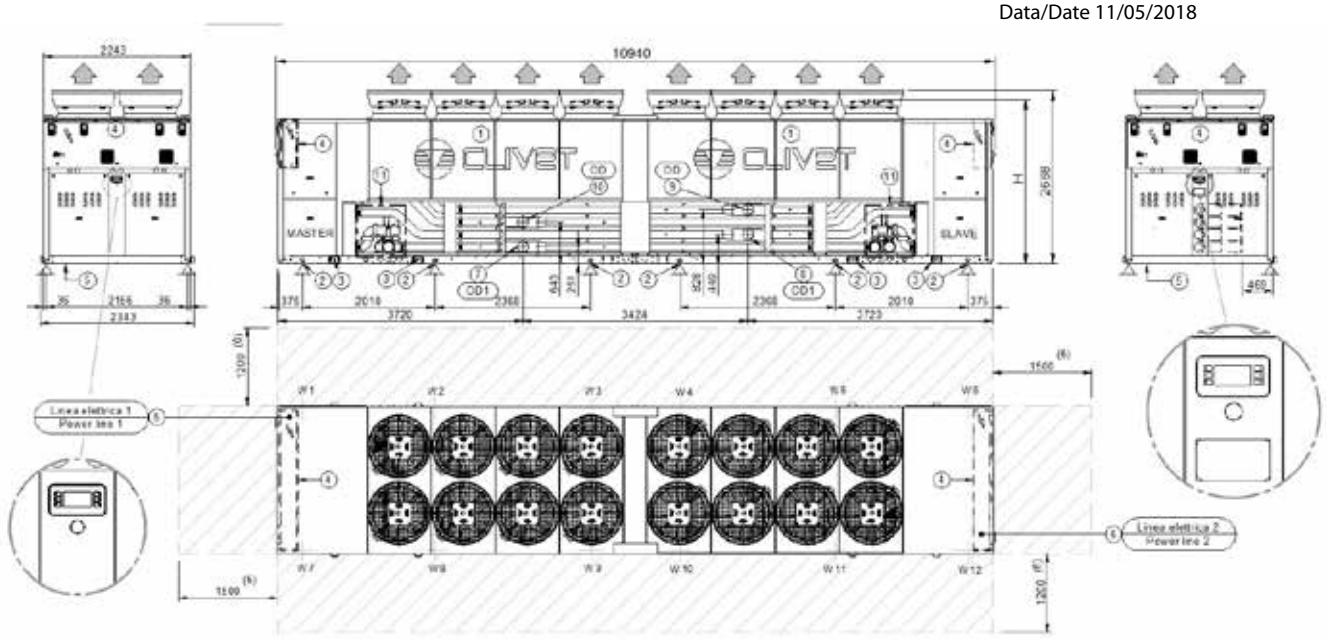
Size		SC-EXC	EN-EXC
		260.8	260.8
H (without Axitop)	mm	2484	2484
H (without Axitop with ECOBREEZE - optional)	mm	2510	2510
OD (user side)	mm	168,3	168,3
OD1 (recovery side)	mm	168,3	168,3
A - Length	mm	9614	9614
B - Depth	mm	2246	2246
C - Height	mm	2668	2668
W1 Supporting point	kg	1147	1147
W2 Supporting point	kg	700	700
W3 Supporting point	kg	339	339
W4 Supporting point	kg	523	523
W5 Supporting point	kg	1172	1172
W6 Supporting point	kg	1140	1140
W7 Supporting point	kg	693	693
W8 Supporting point	kg	329	329
W9 Supporting point	kg	603	603
W10 Supporting point	kg	1338	1338
Shipping weight	kg	7336	7336
Operating weight	kg	7984	7984

Size		SC-EXC	EN-EXC
		260.8	260.8
Container shipping length	mm	9719	9719
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 280.8-320.8 - Acoustic configuration : Compressor soundproofing (SC) / Super-silenced (EN)

DAB2M280.8_320.8_EXC_SC_EN_1
Data/Date 11/05/2018



1. External exchanger (condenser)
2. Antivibration fixing holes Ø 25mm
3. Lifting brackets (removable, if required, after unit positioning)
4. Main electrical panel
5. Power input supply
6. Recommended functional clearances
7. Entering exchanger water recovery side
8. Leaving exchanger water recovery side
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)
11. Hydronic assembly recovery side (optional)

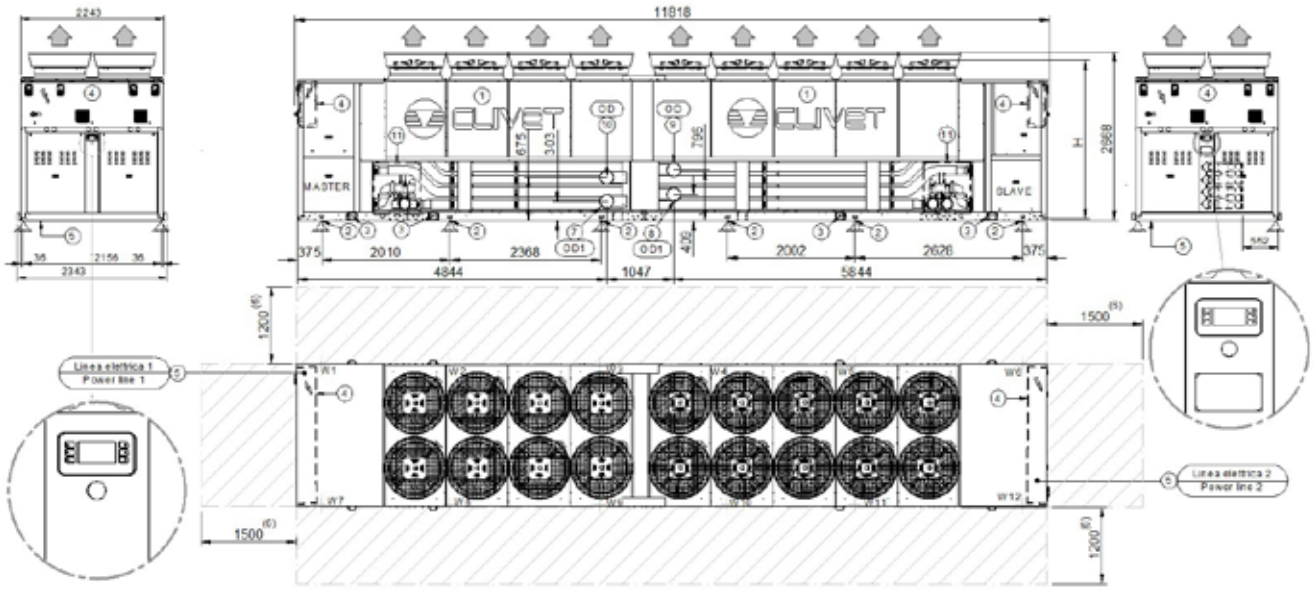
Size		SC-EXC			EN-EXC		
		280.8	300.8	320.8	280.8	300.8	320.8
H (without Axitop)	mm	2484	2484	2484	2484	2484	2484
H (without Axitop with ECOBREEZE - optional)	mm	2510	2510	2510	2510	2510	2510
OD (user side)	mm	168,3	168,3	168,3	168,3	168,3	168,3
OD1 (recovery side)	mm	168,3	168,3	168,3	168,3	168,3	168,3
A - Length	mm	10940	10940	10940	10940	10940	10940
B - Depth	mm	2246	2246	2246	2246	2246	2246
C - Height	mm	2668	2668	2668	2668	2668	2668
W1 Supporting point	kg	1343	1342	1361	1343	1342	1361
W2 Supporting point	kg	605	605	612	605	605	612
W3 Supporting point	kg	330	330	335	330	330	335
W4 Supporting point	kg	341	345	345	341	345	345
W5 Supporting point	kg	525	534	533	525	534	533
W6 Supporting point	kg	1176	1208	1207	1176	1208	1207
W7 Supporting point	kg	1176	1175	1207	1176	1175	1207
W8 Supporting point	kg	525	524	533	525	524	533
W9 Supporting point	kg	341	340	345	341	340	345
W10 Supporting point	kg	330	335	335	330	335	335
W11 Supporting point	kg	605	613	612	605	613	612
W12 Supporting point	kg	1343	1363	1361	1343	1363	1361
Shipping weight	kg	7888	7958	8028	7888	7958	8028
Operating weight	kg	8640	8714	8788	8640	8714	8788

Size		SC-EXC			EN-EXC		
		280.8	300.8	320.8	280.8	300.8	320.8
Container shipping length	mm	11045	11045	11045	11045	11045	11045
Container shipping depth	mm	2315	2315	2315	2315	2315	2315

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

Size 340.8 - Acoustic configuration : Compressor soundproofing (SC) / Super-silenced (EN)

DAB2M340 8_EXC_SC_EN_2
Data/Date 11/05/2018



1. External exchanger (condenser)
2. Antivibration fixing holes Ø 25mm
3. Lifting brackets (removable, if required, after unit positioning)
4. Main electrical panel
5. Power input supply
6. Recommended functional clearances
7. Entering exchanger water recovery side
8. Leaving exchanger water recovery side
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)
11. Hydronic assembly recovery side (optional)

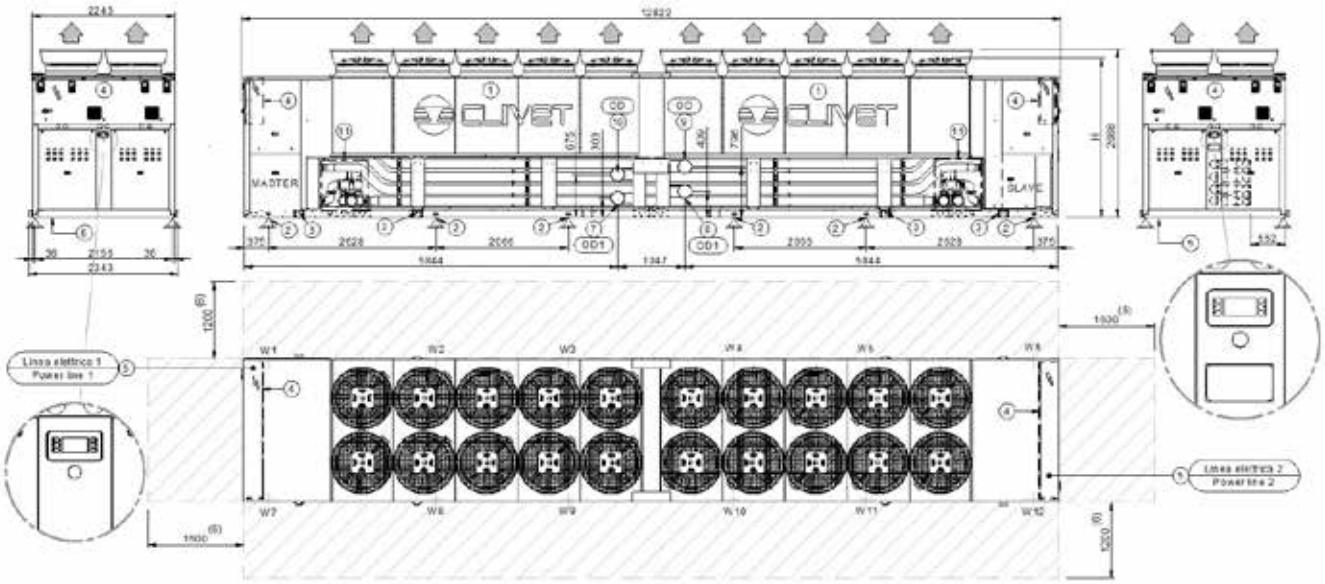
Size		SC-EXC	EN-EXC
		340.8	340.8
H (without Axitop)	mm	2484	2484
H (without Axitop with ECOBREEZE - optional)	mm	2510	2510
OD (user side)	mm	219,1	219,1
OD1 (recovery side)	mm	219,1	219,1
A - Length	mm	11818	11818
B - Depth	mm	2246	2246
C - Height	mm	2668	2668
W1 Supporting point	kg	1406	1406
W2 Supporting point	kg	632	632
W3 Supporting point	kg	345	345
W4 Supporting point	kg	551	551
W5 Supporting point	kg	550	550
W6 Supporting point	kg	1460	1460
W7 Supporting point	kg	1247	1247
W8 Supporting point	kg	551	551
W9 Supporting point	kg	356	356
W10 Supporting point	kg	529	529
W11 Supporting point	kg	652	652
W12 Supporting point	kg	1661	1661
Shipping weight	kg	8905	8905
Operating weight	kg	9941	9940

Size		SC-EXC	EN-EXC
		340.8	340.8
Container shipping length	mm	11923	11923
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 360.8 - 480.8 - Acoustic configuration : Compressor soundproofing (SC) / Super-silenced (EN)

DAB2M360.8_480.8_EXC_SC_EN_1
Data/Date 11/05/2018



1. External exchanger (condenser)
2. Antivibration fixing holes Ø 25mm
3. Lifting brackets (removable, if required, after unit positioning)
4. Main electrical panel
5. Power input supply
6. Recommended functional clearances
7. Entering exchanger water recovery side
8. Leaving exchanger water recovery side
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)
11. Hydronic assembly recovery side (optional)

Size		SC-EXC				EN-EXC			
		360.8	400.8	440.8	480.8	360.8	400.8	440.8	480.8
H (without Axitop)	mm	2484	2484	2484	2484	2484	2484	2484	2484
H (without Axitop with ECOBREEZE - optional)	mm	2510	2510	2510	2510	2510	2510	2510	2510
OD (user side)	mm	219,1	219,1	219,1	219,1	219,1	219,1	219,1	219,1
OD1 (recovery side)	mm	219,1	219,1	219,1	219,1	219,1	219,1	219,1	219,1
A - Length	mm	12822	12822	12822	12822	12822	12822	12822	12822
B - Depth	mm	2246	2246	2246	2246	2246	2246	2246	2246
C - Height	mm	2668	2668	2668	2668	2668	2668	2668	2668
W1 Supporting point	kg	1664	1679	1767	1806	1664	1679	1767	1806
W2 Supporting point	kg	653	659	683	707	653	659	683	707
W3 Supporting point	kg	530	537	548	563	530	537	548	563
W4 Supporting point	kg	552	559	571	588	552	559	571	588
W5 Supporting point	kg	550	557	578	592	550	557	578	592
W6 Supporting point	kg	1462	1479	1561	1619	1462	1479	1561	1619
W7 Supporting point	kg	1462	1479	1561	1619	1462	1479	1561	1619
W8 Supporting point	kg	550	557	578	592	550	557	578	592
W9 Supporting point	kg	552	559	571	588	552	559	571	588
W10 Supporting point	kg	530	537	548	563	530	537	548	563
W11 Supporting point	kg	653	659	683	707	653	659	683	707
W12 Supporting point	kg	1664	1679	1767	1806	1664	1679	1767	1806
Shipping weight	kg	9672	9793	10241	10564	9672	9793	10241	10564
Operating weight	kg	10820	10941	11417	11750	10820	10941	11417	11750

Size		SC-EXC				EN-EXC			
		360.8	400.8	440.8	480.8	360.8	400.8	440.8	480.8
Container shipping length	mm	12927	12927	12927	12927	12927	12927	12927	12927
Container shipping depth	mm	2315	2315	2315	2315	2315	2315	2315	2315

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

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