

Kappa Rev FC

353÷1291 kW



General

Modular free-cooling chillers for large systems. KAPPA REV RANGE Selectable independent free-cooling module.

Configurations

HE : version high efficiency

SLN : version super low noise

/LN : silenced unit

/DS : execution featuring a desuperheater

/DC : execution with recovery condenser

Configurable free-cooling section: Basic, Custom, Extra

Strengths

- ▶ 3 free-cooling configurations available
- ▶ Chiller with low refrigerant charge
- ▶ Operating in a wide range of external ambient conditions
- ▶ Night Shift function for noise control (option)
- ▶ Dual power supply with automatic switching and Fast restart function (options)
- ▶ BlueThink advanced control with integrated web server. Multilogic function and Blueye® supervision system. (options)
- ▶ Flowzer: inverter driven pumps (options)



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IT PAYS TO USE FREE-COOLING UNITS!

Free cooling units meet growing demands for energy savings, since they have been designed to reduce the operating costs of refrigerating machines that work to serve process applications or in the IT field.

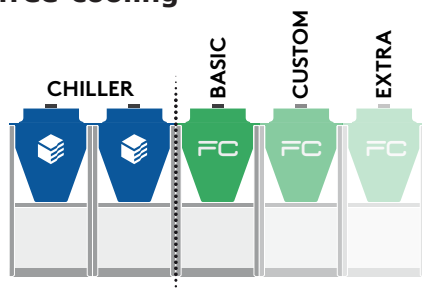
A strong point of our free cooling units is certainly the control system that allows maximum use to be made of the free resource, consisting of outside air, so minimizing the energy used by the compressors. The controller of the unit activates the chiller section and the free cooling section, also in combined mode, based on the actual external air temperatures, the set point and the required load level.

The free cooling section is hydraulically in series with the evaporator and this allows a benefit to be obtained from its activation even when the outside air temperature is sufficient to carry out only a pre-cooling of the water. The missing amount of capacity, in any case lower than the total required, will be provided by the compressors.

As the outside air temperature goes down, the amount of capacity that the free cooling section will be able to transfer to the water will gradually increase. Consequently, the amount of capacity that will have to be covered by the compressors will always be lower.

When the TFT (Total Free-cooling Temperature) is reached, the free cooling section will be able to fully meet the cooling capacity requirement and therefore the compressors can be switched off. In this condition, the unit will be able to provide the system with a cooling capacity equal to that required at design conditions, but with current drawn by the fans alone.

Modular free-cooling



With the free cooling system built into Tetris 2 FC, the chiller section and the free-cooling section are completely independent and this allows important advantages to be obtained.

The main advantage is due to the fact that the condensing coils and the free-cooling coils can have different dimensions (since they are not facing each other) and this makes different combinations possible.

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The main advantage is due to the fact that the condensing coils and the free-cooling coils can have different dimensions (since they are not facing each other) and this makes different combinations possible.

For each model, you can choose from three different free cooling set-ups, called BASIC, CUSTOM, EXTRA, ranging from the lowest to the highest number of water coils:

- **BASIC:** this is the most compact free cooling module. This set-up allows you to obtain, with the smallest investment, a free-cooling contribution that can help the chiller section or be used in applications where the cooling load during the winter is very much lower than the nominal load. Average TFT: -6.5°C .
- **CUSTOM:** this is the free-cooling module with the best price/performance ratio. With this module, the energy contribution provided by the water coil is important and therefore allows a significant capacity reduction of the chiller section with achievement of TFT with outside air temperatures just below zero. Average TFT: -0.4°C .
- **EXTRA:** this is the free cooling module with the best TFT. This module is used to obtain the maximum capacity from the water coils, and therefore makes maximum use of cooling capacity production through free cooling. This is the ideal set-up for applications where the cooling capacity demand is almost constant throughout the year, such as for example in IT applications or the cooling of industrial processes in general. Average TFT: $+2.7^{\circ}\text{C}$.

Also, since there are two separate fan sections, the unit controller will be able to manage them independently and therefore:

- the free-cooling section fans will operate at 100% to extract the maximum capacity from the air
- the chiller section fans will be modulated depending on the instant condensing pressure

Compared to other free cooling systems, such as for example the system with facing coils, the one used by Kappa Rev FC allows:

- much more precise condensation control, which helps the stability of operation of the machine
- the use of a very simple refrigerant circuit (no capacity reduction of the coils), thereby favouring the reliability of the machine
- limitation of the refrigerant charge because it does not use the "flooding" condensation control, but allows the use of microchannel condensing coils

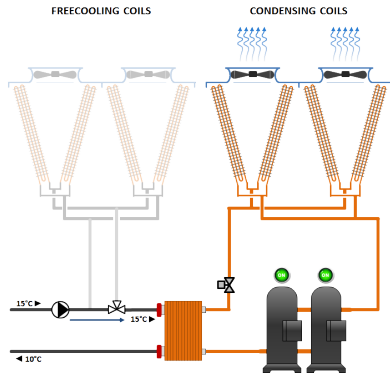
Finally, it should be remembered that the modularity of Kappa Rev FC does not regard only the size of the free cooling section; it also regards the possibility of choosing from various combinations of efficiency and noiselessness of the chiller section.

PRINCIPLE OF OPERATION

How the unit behaves in the various scenarios is explained briefly below.

Chiller only mode

When the ambient temperature is higher than the temperature of the water returning from the system, all the required cooling capacity must be produced by the compressors.

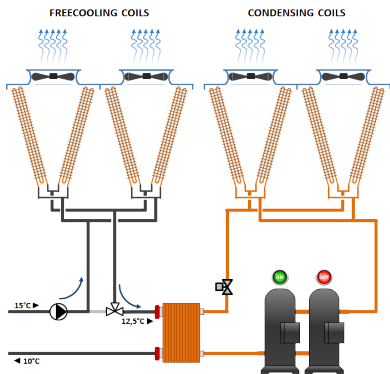


The total cooling capacity is generated by the compressors of the chiller section, and the free cooling coil and relevant fans remain inactive. The operation of the unit is that of a classic chiller.

The 3-way valve bypasses the free cooling coil (so preventing unnecessary head losses) and condensation control is done, when necessary, through fan speed modulation.

Mixed mode

When the ambient temperature is lower than the temperature of the water returning from the system, the controller activates the free cooling section.

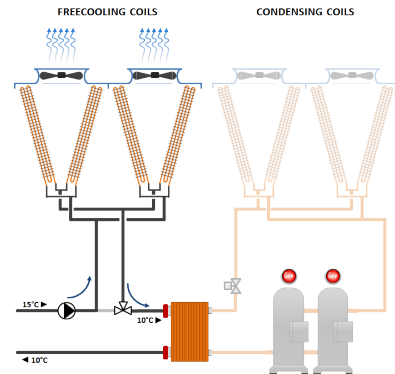


The control switches over the 3-way valve to put the free cooling coil in series with the evaporator and with the free cooling section fans.

The water leaving the free cooling coil will be "pre-cooled" by the outside air (partial free cooling) and is sent to the evaporator inlet. Now the chiller section can operate in reduced capacity mode because it will have to produce only the amount needed to reach total cooling capacity.

Free cooling only mode

For outside air temperatures lower than or equal to the TFT, the unit operates exclusively in free cooling mode.



The output capacity from the water coil fully meets the demand of the system, and therefore the condensing section fans are completely switched off and so are the compressors.

As the outside air temperature falls, the output capacity from the free cooling section will gradually increase and therefore the control of the unit will modulate performance either through stepped management of the fans (standard management) or through fan speed modulation for units that adopt EC fans for the free cooling section.

Kappa Rev FC

Modular free-cooling chillers for large systems. KAPPA REV RANGE Selectable independent free-cooling module.

PRODUCT DESCRIPTION

BODY

The body is modular with a load-bearing frame, made of galvanized sheet-iron coated with polyester powder RAL 5017/7035 which makes it highly resistant to weather conditions. All screws and bolts are stainless steel.

There are yellow lifting brackets at the base of the unit to allow lifting with lifting beam.

Depending on version and customization the units with cooling capacity above 800 kW can present the chiller section separated from the free-cooling section. For more information refer to "Technical specifications" section.

REFRIGERANT

Refrigerant R134a (GWP=1430) standard.

The model can be supplied with refrigerant R513A as an option.

COMPRESSORS

FC, HE FC and SLN FC version

For the FC, HE FC and SLN FC version units, the compressors are semi-hermetic screw compressors with continuous capacity reduction of output capacity from 25 to 100%, which allows the energy efficiency of the unit to be maximized in all operating conditions.

The capacity reduction of the entire unit is always continuous, from the minimum capacity reduction step, based on the number of compressors, up to 100%. Lubrication of the compressors is ensured by the pressure difference between delivery and suction.

All the compressors are fitted with check valve on delivery side, metal mesh filter on suction side and electronic protection with temperature sensors directly inserted in the windings and on the delivery pipe.

The machine is started and switched off with a forced 25% capacity reduction of each compressor and starting is of the "star-delta" type.

All the compressors are fitted as standard with crankcase heater and discharge valve.

Version HEi FC

The HEi FC version units have a semi-hermetic screw compressor (one compressor per section for units with 4 circuits) controlled by AC inverter fully integrated in the compressor. In addition to capacity modulation management (from about 20% up to 100%), the electronics also manages all the safety devices and therefore ensures that the compressor always works within its operating limits to preserve its operation and reliability. Each compressor is fitted with an automatic control of the compression ratio and an optoelectronic control of oil level.

The other compressors of the unit are semi-hermetic screw compressors with stepped capacity reduction. The capacity reduction of the entire unit is always continuous, from the minimum capacity reduction step, based on the number of compressors, up to 100%.

difference between delivery and suction.

Version XEi FC

The XEi FC version units all use semi-hermetic screw compressors controlled by AC inverter fully integrated in the compressor. In addition to capacity modulation management (from about 20% up to 100%), the electronics also manages all the safety devices and therefore ensures that the compressor always works within its operating limits to preserve its operation and reliability. Each compressor is fitted with an automatic control of the compression ratio and an optoelectronic control of oil level.

The capacity reduction of the entire unit is always continuous, from the minimum capacity reduction step, based on the number of compressors, up to 100%.

difference between delivery and suction.

All the compressors are fitted with check valve on delivery side, metal mesh filter on suction side and electronic protection with temperature sensors directly inserted in the windings and on the delivery pipe.

Starting of the inverter-controlled compressors is of the "Direct On Line" type with an acceleration ramp managed by the inverter that allows inrush currents of the compressor below 5A to be obtained. This allows the maximum inrush current to be always lower than the maximum current absorbed by the machine.

In addition to the obvious energy savings arising from greater efficiency, the use of a full inverter unit also brings advantages in terms of installation:

- For these units, the $\cos\phi$ (power factor) is always greater than 0.95, therefore making external power factor correction systems unnecessary.
- The maximum inrush current of the unit is always lower than its maximum absorbed current (calculated in the worst operating condition), therefore making the power cables and line protection devices less onerous.

All the compressors are fitted as standard with crankcase heater and discharge valve.

SOURCE-SIDE HEAT EXCHANGER

The V-shaped arrangement of the coils enables them to be protected from hail and makes the unit compact. It also guarantees an increase in the air intake surface, and leaves ample space for distribution of the components of the refrigerant circuit and the hydraulic circuit.

To protect the exchangers from corrosion and ensure optimal operation of the unit, we advise following the recommendations given in the user, installation and maintenance manual for cleaning the coils. For installations within a kilometre of the coast, use of the accessory is strongly recommended Coil treated with anti-corrosion paints.

The exchangers are made with microchannel aluminium coils. Finned pack coils with copper tubes and aluminium fins can be requested as accessory.

Thanks to continuous research in the alloys field, and sophisticated production methods, microchannel coils are made using specific aluminium alloys for the tubes and for the fins. This allows the effects of galvanic corrosion to be drastically reduced to always ensure protection of the tubes that confine the refrigerant. Tubes and fins are also subjected to SilFLUX coating processes (or equivalent) or have zinc added to further increase their corrosion resistance.

If the unit has to be installed in an environment with a particularly aggressive atmosphere, e-coated microchannel coils are available as an option. This option is strongly recommended for applications in coastal or highly industrialized areas.

The use of microchannel coils compared to conventional copper/aluminium coils reduces the total weight of the unit by about 10% and gives a reduction in refrigerant charge of at least 30%.

USER-SIDE HEAT EXCHANGER

The exchanger is a dry-expansion shell-and-tube exchanger.

It is sized to maximize the efficiency of the unit, by keeping the overall dimensions and the refrigerant charge down to a minimum.

The exchanger consists of a steel shell insulated with a shell made of closed-cell foam material, while the tube bundle is made with copper tubes.

On the hydraulic connections of the exchanger, there are also pipe taps for the differential pressure switch and wells for the temperature probes.

FANS

The fans are axial fans, directly coupled to a three-phase 6-pole electric motor, with integrated thermal overload protection (Klixon®) and IP 54 protection rating.

The fan includes the shroud, designed to optimize its efficiency and reduce noise emission to a minimum, and the safety guard.

The fans of the chiller section are controlled as standard with phase cutting speed governor depending on the condensing pressure.

The fans of the free cooling section are managed as standard with stepped control depending on the temperature of the outgoing water.

EC fans are available as accessory for both sections and, in this case, continuous fan speed modulation is managed for both sections.

REFRIGERANT CIRCUIT

Each refrigerant circuit of the basic unit (cooling only) comprises:

- shut-off valve in the liquid line
- 5/16" charging valves
- liquid sight glass
- replaceable solid cartridge dehydrator filter
- electronic expansion valve
- pressure transducers for reading the high and low pressure values and relevant evaporating and condensing temperatures
- high pressure switches

The pipes of the circuit and the exchanger are insulated with extruded closed-cell expanded elastomer that is resistant to UV rays.

Compared to the mechanical expansion valve, the electronic expansion valve allows machine stability to be reached more quickly and better superheating control to maximize the use of the evaporator in all load conditions. This also acts as shut-off valve on the liquid line, as it closes during compressor stops, so preventing dangerous refrigerant migration.

ELECTRICAL CONTROL PANEL

The electrical control panel is made in a painted galvanized sheet-iron box with forced ventilation and IP54 protection rating. The electrical control panel of the basic unit comprises:

- main disconnect switch
- fuses to protect the compressors, fans and auxiliary circuits
- compressor contactors
- fan contactors
- phase monitor
- potential-free general alarm contacts
- single potential free operating contacts
- external air temperature probe
- microprocessor controller with display accessible from the outside
- Capacitive backup battery for electronic expansion valve

All the electrical cables inside the panel are numbered and the terminal board dedicated to the customer's connections is coloured orange so that it can be quickly identified in the panel.

Where separated from the chiller module, the free-cooling section is provided with its own electrical panel.

CONTROL BLUETHINK

Main controller functions

The microprocessor control allows the following functions:

- water temperature control, with control of the water leaving the user-side exchanger
- freeze protection
- compressor timings
- automatic rotation of compressor starting sequence
- recording of the log of all machine inputs, outputs and states
- automatic rotation of compressor starting sequence
- recording of the alarm log
- digital input for general ON/OFF
- digital input for Summer/Winter selection (only for HP units)
- RS485 serial port with Modbus protocol
- Ethernet serial port with Modbus protocol and integrated web server preloaded web page

For further details on available functions and on displayed information, you can refer to the specific documentation of the control.

By default, the serial connections present as standard are enabled only for reading from BMS. Enabling of writing from BMS is to be requested when ordering.

Main functions of the webserver (only for units with advanced control)

As standard, the Bluethink controller integrates a webserver with a preloaded web page that is accessed via password.

The web page allows the following functions to be carried out (some of these are available only for users with advanced level rights):

- display of the main functions of the unit such as unit serial n°, size, refrigerant
- display of the general status of the machine: water inlet and outlet temperatures, external air temperature, mode (chiller or heat pump), evaporating and condensing pressures, suction and discharge temperatures
- display of the status of compressors, fans, pumps, electronic expansion valves
- display in real time of the graphs of the main quantities
- display of the graphs of logged quantities
- display of alarm log
- management of users on several levels
- remote ON/OFF
- remote set point change
- remote time band change
- remote summer winter mode selection

Human-Machine Interface

The control has a graphic display that allows the following information to be displayed:

- water inlet and outlet temperature
- set temperature and differential set points
- description of alarms
- hour meter of operation and number of start-ups of the unit, the compressors and the pumps (if present)
- high and low pressure values, and relevant condensing and evaporating temperatures
- external air temperature
- superheating at compressor suction.

CONTROLS AND SAFETY DEVICES

All the units are fitted with the following control and safety components:

- high pressure switch with manual reset
- high pressure safety device with automatic reset, for a limited number of occurrences, managed by the controller
- low pressure safety device with automatic reset and limited tripping managed by the controller
- high pressure safety valve
- antifreeze probe at outlet of each evaporator
- Mechanical paddle flow switch factory-mounted, except for single-circuit units. For these units, flow switch is supplied as kit; mounting support (1" female fitting) and installation are care of customer
- overtemperature protection for compressors and fans

TESTING

All the units are factory-tested and supplied complete with oil and refrigerant.

VERSIONS

Alongside the basic version (FC) of the unit, there are various versions that differ in efficiency and noise levels.

Kappa Rev HE FC

The HE FC version unit uses oversize coils, in order to increase the ratio between exchange surfaces and capacity of the compressors. This allows all models to achieve Eurovent Class A for both EER and COP and consequently also high ESEER values.

Kappa Rev SLN FC

The SLN FC version unit uses a soundproofed compressor compartment (see description of the /LN option), oversize coils compared to the standard efficiency unit and fans with speed adjuster and reduced air flow rate. The speed reduction of the fans is such that, under nominal operating conditions, the air flow rate and noise level are lower than those of the basic version of the unit. In any case, the speed adjuster allows rotation of the fans at maximum speed when external air temperature conditions are particularly critical so as to guarantee the same operating limits as the HE FC version.

Kappa Rev HEi FC

The HEi FC version unit uses an inverter-controlled compressor together with one or more compressors with stepped capacity reduction. The control can manage the mix of these compressors to guarantee continuous management of capacity reduction from the minimum step up to 100% of capacity. For units with 4 circuits, there are always 2 inverter-controlled compressors and two conventional compressors.

The HEi FC version unit is high efficiency, with ESEER levels that exceed 4.60. The coupling of EC fans (accessory) to this version allows the efficiency level of the unit to be further improved.

Kappa Rev XEi FC

The XEi FC version unit uses only inverter-controlled compressors. The control manages capacity reduction of the compressors so as to always guarantee maximum efficiency of the unit in all load conditions, to achieve ESEER levels that, in combination with EC fans (accessory), exceed 5.00.

OPTIONS

/DC: unit with total recovery condenser

In addition to the set-up of a chiller only unit, /DC units comprise:

- a heat recovery condenser for recovering 100% of the condensation heat on each refrigerant circuit. The exchanger is a brazed plate heat exchanger; for multi-circuit units, the heat exchangers are to be manifolded outside the unit (by the customer)
- temperature probe at the inlet of each recovery exchanger
- liquid receiver for each refrigerant circuit with system for emptying the refrigerant from the condensing coil
- potential free contact in the electrical control panel for activation of recovery.

When required by the system, through the closing of a contact, the control automatically manages activation of recovery. Recovery management is carried out through a control on the temperature of the return water. The control also automatically manages safety deactivation of recovery if the condensing pressure becomes too high, and changes to using the condensing coils.

/DS: unit with desuperheater

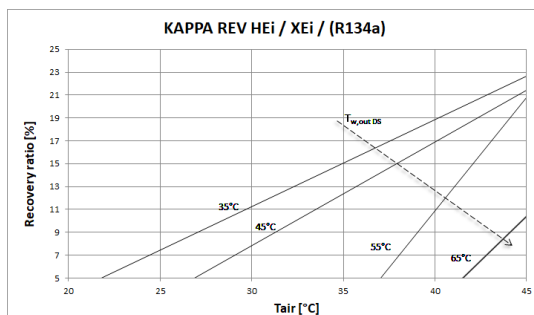
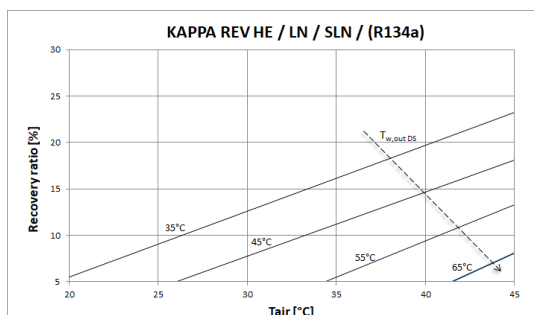
In addition to the set-up of a chiller only unit, /DS units comprise (for each refrigerant circuit) an exchanger for condensation heat recovery of up to 20% (depending on size, version and operating conditions), placed in series with the condensing coils. The exchanger is a braze-welded plate heat exchanger. For multi-circuit units, the exchangers are to be manifolded outside the unit (by the customer).

To maximize the use of the accessory and optimize machine operation, combination with the speed adjuster of the fans or with the EC fans is recommended.

Two illustrative graphs are shown below in which, as the ambient temperature changes, (T_{air}) and as the temperature of the water leaving the heat recovery heat exchanger changes, ($T_{w,out DS}$), the percentage of recovered heat is shown as an indication (Recovery ratio).

The percentage of recovered heat is calculated as the ratio between recovered thermal power to the desuperheater and the thermal power released by the condenser under nominal conditions, that is, evaporator inlet/outlet water temperature 12/7°C.

In the following graphs, a constant temperature delta of 5°C between water inlet and outlet at the heat recovery heat exchanger has been considered.



To maximize the use of the accessory and optimize machine operation, combination with the speed adjuster of the fans or with the EC fans is recommended.

/LN: silenced unit

In the unit with /LN option, all the compressors are enclosed in a compartment that is fully soundproofed with sound absorbing material and soundproofing material.

HYDRAULIC MODULES

All units can be fitted with hydraulic module in various configurations:

- /1P: hydraulic module with one pump
- /2P: hydraulic module with two pumps
- /1PS: hydraulic module with one pump and buffer tank
- /2PS: hydraulic module with two pumps and buffer tank

All the above-mentioned modules have pumps with standard discharge head.

The following are also available:

- modules /1PM, /2PM, /1PMS and /2PMS that have pumps with increased available discharge head
- modules /1PG, /2PG, /1PGS and /2PGS that have pumps suitable for operating with glycol up to 50%

Hydraulic modules with one pump have:

- one pump
- a gate valve on the delivery side of the pump
- an expansion vessel

Hydraulic modules with two pumps have:

- two pumps
- a check valve on the delivery side of each pump
- a gate valve on the outlet of the delivery manifold
- an expansion vessel

In the version with 2 pumps, these are always with one on standby while the other is working. Switching over between the pumps is automatic and is done by time (to balance the hours of operation of each one) or in the event of failure.

Hydraulic modules with tank also have:

- a gate valve at the inlet of the pump or the suction manifold
- a tank with drain valve and air valve

Refer to the table of configurations that are not possible to check for availability of specific set-ups.

For units that are made in two separate sections, the hydraulic module is intended as a single section. The water inlet and outlet of each section are to be manifolded in parallel outside the units (by the customer).

DESCRIPTION OF ACCESSORIES

Some accessories may be incompatible with each other even if not expressly indicated.

REFRIGERANT

R513 R513A

Unit supplied with R513A refrigerant instead of R134a.

R513A is distinguished by its low environmental impact, with GWP=573. It is also a non-toxic and non-flammable fluid: A1 classification in accordance with ASHRAE; PED 2.

These characteristics facilitate the adoption of the model in the presence of any specific local requirements related to the environmental impact caused by the refrigerants. This has positive effects on transport, operation and maintenance and also on overall cost effectiveness, as regards possible taxation or restrictions on the use of refrigerants with high environmental impact.

Refrigerant circuit accessories

BC Capacitive backup battery for electronic expansion valve

When the compressors stop, the controller always closes the electronic expansion valve to prevent dangerous refrigerant migration. The presence of the backup battery ensures that the electronic valve is kept in closed position even when there is no power supply

This accessory uses a condenser, and not an ordinary battery, as energy storage: this allows it to be unaffected by the memory effect of normal batteries and eliminates its need for maintenance.

BK Brine Kit

This accessory is compulsory if a water temperature set point lower than +3°C is used (if the unit is provided with double set point or variable set point, the lower set point is considered).

The accessory consists of increased insulation and suitable sizing and calibration of some components.

The inlet and outlet temperatures of the user-side exchanger must be given on ordering to allow correct setting of the alarm parameters and verification of the sizing of the expansion valve.

The cooling set point can then be changed by the customer in an interval that, compared to the set point given on ordering, ranges from -1K up to the maximum temperature allowed by the above-stated operating limits.

The unit will be optimized to work at the set point temperature given on ordering. For different set points, the cooling capacity provided and the level of efficiency of the machine could decrease and move away from these conditions.

This accessory compulsorily requires the insertion of one of the options: condensing control with speed adjuster or EC fans.

DVS Double safety valve

With this accessory, instead of each individual safety valve per circuit, there is a "candelabrum" with two safety valves and a diverter valve for choosing the valve in operation. This allows the safety valves to be replaced without having to drain the machine and without having to stop it.

MAFR Pressure gauges

The operating pressures of each circuit of the unit can be displayed on the control by accessing the relevant screens. Also, the machine can be fitted with pressure gauges (two for each circuit) installed in a clearly visible position. These allow reading in real time of the working pressures of the refrigerant gas on the low pressure side and on the high pressure side of each refrigerant circuit.

RIC Liquid receiver

The adoption of this accessory always guarantees correct feeding of the expansion valve even when the unit is subjected to wide external air temperature ranges.

This accessory is standard on DC and HP units.

RPR Refrigerant leak detector

With this accessory, a refrigerant leak detector is placed inside each compressor compartment. Detection of a refrigerant leak is managed by the controller through a specific alarm and display of a specific icon on the display of the controller. This alarm stops the unit.

RUB Compressor suction and delivery valves

The valves situated on the delivery side and on the suction side of the compressors allow the compressor to be isolated from the rest of the refrigerant circuit, so making the maintenance operations quicker and less invasive

RPP Refrigerant leak detector with automatic pump down

With this accessory, a refrigerant leak detector is placed inside each compressor compartment. Detection of a refrigerant leak is managed by the control through a specific alarm and display of a specific icon on the display of the control. For all the circuits of the unit, the alarm also starts the machine stopping procedure with pump down, confining all the refrigerant in the coils.

The accessory includes the capacitive backup battery.

Fan accessories

RECP Pressure recuperator

Normally, the air ejected by the fan has a high speed and this manifests itself as kinetic energy that is dissipated into the environment.

The pressure recuperator is a passive element situated on the ejection duct of each individual fan designed to allow better conversion of kinetic energy into static pressure, which manifests itself as a higher pressure generated by the fan.

This higher pressure can have at least two possible applications:

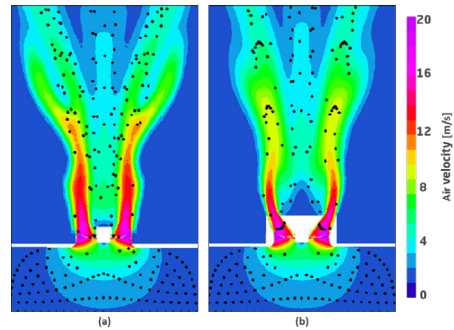
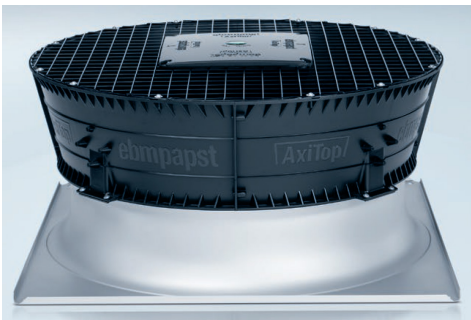
- For the same fan speed, the pressure recuperator allows an increase of about 50Pa in the available pressure of the ventilating section to be obtained. This can be useful for overcoming the head losses that may be present in specific installations. The increase in available pressure is to be considered in addition to the increase that can already be obtained with the application of oversize EC fans
- for the same pressure differential on the air, the pressure recuperator allows the same air flow rate to be obtained with a lower number of revolutions of the fan. This automatically produces a reduction of up to 3 dB(A) in the noise emission of the unit and a reduction in the absorption of the fan, with an immediate increase in the overall efficiency of the unit.

The reduction in total sound power varies depending on the model and version of the unit as it is related to the incidence of noise generated only by the fan section on the total noise emitted by the unit.

For SLN units, which already work with a reduced air flow rate, application of the pressure recuperator has a limited or negligible noise reduction effect.

To allow optimization of the performance of the accessory, combination with the speed adjuster or EC fans is necessary. In this last case, the higher efficiency of the EC fans (especially when operating at low speed) is added to the performance improvement generated by the pressure recuperator.

The accessory is supplied separately from the unit on one or more pallets and it must compulsorily be installed (by the customer) before the first start-up of the machine.



(a) fan only;

(b) fan with pressure recuperator

VCH EC fans for the chiller section

VFC EC fans for the free cooling section

With this accessory, EC fans, with electronically commutated brushless motor, are used for the ventilating section. These guarantee very high efficiency levels for all working conditions and allow a 15% saving on the power absorbed by each fan working at full capacity.

Also, through a 0-10V analogue signal sent to each fan, the microprocessor carries out condensation/evaporation control by continuous adjustment of the air flow rate as the external air temperature changes, with a further reduction in electrical absorption and noise emission.

For further details, see the dedicated chapter: "Aeraulic load losses and options available for the fan section".

VCM Oversize EC fans for the chiller section

VFM Oversize EC fans for the free cooling section

The increased EC fans allow to obtain the same benefits as EC fans and in addition allow to have a residual useful head of about 100Pa.

For further details, see the dedicated chapter: "Aeraulic load losses and options available for the fan section".

Hydraulic circuit accessories

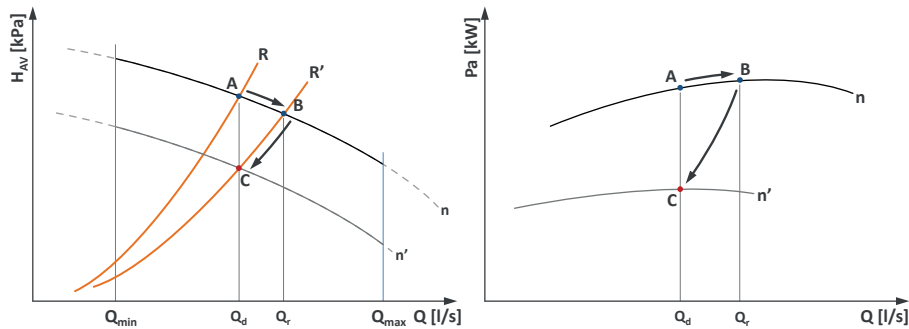
FVP FLOWZER VP - Inverter for manual pump adjustment

The accessory consists of inserting an inverter in the machine to manually adjust the speed of the pump (or pumps) in order to calibrate the pump flow rate on the head losses of the system.

This accessory is to be combined with one of the integrated hydraulic modules that can be selected for the unit. Units equipped with integrated hydraulic module allow a certain level of available discharge head (point A) to be obtained under nominal flow rate conditions Q_d .

But the actual head loss level of the system (e.g. characteristic curve R') normally causes the pump to find a different equilibrium point (point B), with a flow rate Q_r higher than Q_d .

In this condition, in addition to having a different flow from the nominal one (therefore also a different temperature jump), there is also a greater absorption of electric power from the pump itself.



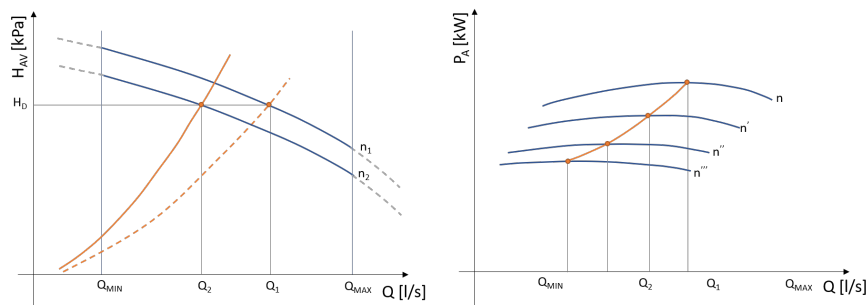
The use of the Flowzer VP allows the pump speed to be set manually (e.g. at speed n' instead of n) to obtain the design water flow rate and thermal gradient (point C). Once the adjustment procedure has been carried out, the pump will always work at a fixed flow rate.

The adoption of the VP Flowzer allows to considerably reduce the electrical power consumption of the pump with a consequent energy saving. By way of example, a reduction in the flow rate of 10% leads to a reduction in power consumption of around 27%.

For the freecooling units the Flowzer VP is able to manage two different speeds of the pump automatically compensating the pressure drops of the water coil.

FVD FLOWZER VD - Transducer for automatic adjustment

Flowzer VD requires two pressure transducers to be installed in the machine. Through these transducers, the inverter can gauge the actual pressure at the ends of the system and it can automatically adapt the pump speed to obtain a set available discharge head value. Flowzer VD must be combined with Flowzer VP. This accessory therefore allows a constant pressure system to be achieved.



With the Flowzer VD, the customer can set, directly on the inverter, the available discharge head value H_d that the unit must maintain. As can be seen from the graph as the user request decreases, the resistant curve of the plant moves to the left, consequently the inverter reduces the speed of the pump in order to maintain the useful head necessary for the unit. With this system a significant reduction in electrical power is achieved. The customer will have to check that, in minimum flow rate conditions (that is, with the maximum number of user points closed), this is always higher than or equal to the minimum flow rate allowed by the unit.

This accessory is useful when the total head losses of the circuit are slightly variable or when they change depending on the seasons (for example, some user points are active only during summer operation and not during winter operation).

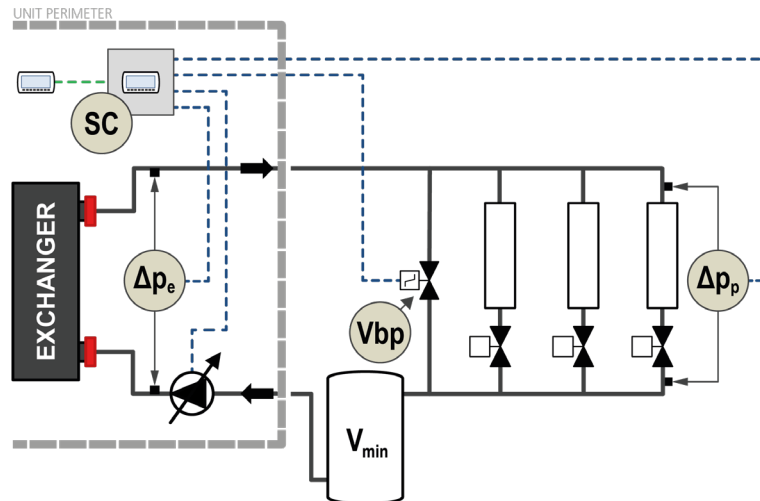
The use of this accessory also allows the pump speed to be adapted to possible fouling of the filter on the hydraulic circuit.

FVF **FLOWZER VFPP – Kit for variable flow rate primary circuit pump with bypass valve included**

Bluethink solution for a variable flow rate system, consisting solely of a user-side primary circuit.

Flowzer VFPP includes:

- a pressure transducer installed at the ends of the user-side exchanger (Δp_e)
- a dedicated control system, installed at the factory in the electrical control panel of the unit (SC)
- a modulating bypass valve with servo-motor supplied separately with it (Vbp), supplied loose (installation by the customer)
- two system pressure transducers (Δp_p) supplied separately (installation by the customer)



It is obligatory for the option to be combined with the Flowzer VP (inverter) and with one of the hydraulic modules that can be selected for the unit. The accessory is not compatible with Multilogic. Please contact our sales department for further details.

The unit must include the advanced Bluethink controller, just one heat exchanger on the user side and a minimum capacity step of 25% or less.

The option offers a complete default package to guarantee simple selection, purchasing and commissioning.

In particular, the unit includes an additional control system, equipped with an advanced algorithm, which interacts with the main advanced Bluethink controller.

Flowzer VFPP has the advantage of:

- implementing an innovative design, which is alternative to the classic system based on fixed flow-rate primary circuit plus secondary circuit
- being ideal for new or entirely redesigned systems, especially for comfort applications
- achieving a complete variable flow system, with maximum energy saving
- simplifying the layout of the user circuit
- limiting the capex of the system
- achieving complete and reliable control of the system

The maximum energy saving is achieved thanks to:

- a hydraulic decoupler managed by the modulating bypass valve, which regulates the bypass flow rate on the lowest possible value
- an advanced algorithm to prevent hunting by the reversing valve and by the bypass valve, thereby balancing the pump speed and the bypass speed to a minimum

The capex of the system is also reduced thanks to:

- single inverter + pumping module, integrated in the unit
- small internal footprint, due to the simplified layout

The operating principle can be summarized as follows:

- Flowzer VFPP carries out constant control of the discharge head

- the system controller modulates the pump speed according to the condition detected by the system transducers Δp_p
- if the system terminals are switched off, the pump speed will decrease
- the pump speed can be reduced until it reaches the minimum allowed flow rate on the heat exchanger of the unit
- this flow rate is indirectly monitored through the losses detected by the differential pressure transducer Δp_e
- When the minimum allowed flow rate threshold is exceeded, the control system will open the bypass valve V_{bp} to recirculate the flow rate that is not required by the system, but is necessary to guarantee the minimum flow rate to the heat exchanger.

In the required minimum load condition (that is, with all system terminals switched off), the required minimum volume (V_{min}) must be concentrated in the relevant tank, to be installed between the unit and the bypass valve.

The bypass valve V_{bp} is controlled through a 0-10 V signal and must therefore be installed within 30 m of the unit.

The pressure transducers of the system Δp_p provide a 4-20 mA signal and require two 1/4" female fittings. These transducers must be installed within 200 m of the unit, near the system terminal that is affected by the highest line head losses or in any case in a position where it is possible to measure an adequate pressure value.

Further details can be found in the relevant manual.

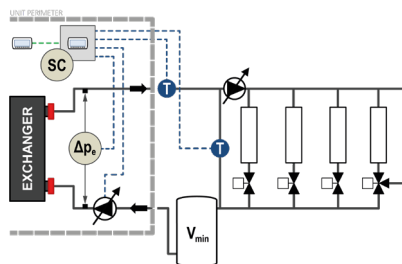
Bypass valve diameter	KAPPA REV FC	KAPPA REV HE FC	KAPPA REV SLN FC	KAPPA REV HEi FC	KAPPA REV XEi FC
4"	33.2	33.2	33.2		30.1
	35.2	35.2	35.2		35.1
	37.2	37.2	37.2		
5"	40.2	40.2	40.2	58.2	45.1
	43.2	43.2	43.2		55.2
	51.2	51.2	51.2		
	54.2	54.2	54.2		
6"	58.2	58.2	58.2	67.2	65.2
	67.2	67.2	67.2	73.2	70.2
	73.2	73.2	73.2	80.2	80.2
	80.2	80.2	80.2	85.2	90.2
	85.2	85.2	85.2		

FVPS FLOWZER VPS – Kit for variable flow rate pump with temperature sensors

Bluethink solution for a variable flow rate system, consisting of a primary circuit plus secondary circuit.

Flowzer VPS includes:

- a differential pressure transducer, installed at the factory at the ends of the user-side heat exchanger of the unit (Δp_e)
- a dedicated control system, installed at the factory in the electrical control panel of the unit (Sc)
- two system temperature sensors (T) - supplied separately; installation by the customer



It is obligatory for the option to be combined with the Flowzer VP (inverter) and with one of the hydraulic modules that can be selected for the unit. The accessory is not compatible with Multilogic. Please contact our sales department for further details.

The unit must include the advanced Bluethink controller, just one heat exchanger on the user side and a minimum capacity step of 25% or less.

The option offers a complete default package to guarantee simple selection, purchasing and commissioning.

In particular, the unit includes an additional control system, equipped with an advanced algorithm, which interacts with the main advanced Bluethink controller.

Flowzer VPS has the advantage of:

- being ideal for renovations of existing systems, especially for comfort applications
- achieving a complete variable flow system, with maximum energy saving
- implementing a flexible design, e.g. for scalable or multi-zone systems

The maximum energy saving is achieved thanks to the advanced algorithm, which prevents hunting by the inverter and balances the pump speed and the recirculation flow rate to a minimum.

With refurbishments, the system's capex is limited to the unit and its commissioning.

The dimensions of the inverter of the unit and of the pump module can be favoured by the low design discharge head of the primary circuit.

The operating principle can be summarized as follows:

- Flowzer VPS performs intelligent control of the flow rate on the primary circuit, and balances it compared to the flow diagram of the secondary circuit
- the system controller modulates the pump speed according to the condition detected by the system sensors T
- if the system terminals are switched off, the flow rate of the secondary circuit will decrease; therefore the direction of flow is detected indirectly as temperature difference by the system sensors through the separator or the bypass pipe
- the system controller will consequently force the primary pump to reduce its speed, until it reaches the minimum allowed flow rate on the heat exchanger of the unit
- this flow rate is indirectly monitored through the losses detected by the differential pressure transducer Δp_e

In the required minimum load condition (that is, with all system terminals switched off), the necessary minimum volume (V_{min}) must be ensured by the relevant tank to be installed between the unit and the decoupler or bypass pipe.

The temperature sensors of the system T provide a 4-20 mA signal and require 1/2" female fittings.

Further details can be found in the relevant manual.

V3M 3-way modulating valve

With this accessory, a 3-way modulating valve is used in place of the three-point 3-way valve normally used.

This accessory is useful in applications where fan management alone is not sufficient to regulate the capacity given by the free cooling coil. This can happen in applications where the load is very variable or when the outside air temperature can fall many degrees below zero.

The controller modulates the free cooling capacity by acting on the speed adjuster of the fans, but if, even with fans off, the capacity given by the water coil is excessive, the water flow rate will be reduced by modulating the opening of the 3-way valve.

IVPO Soundproofed pump compartment

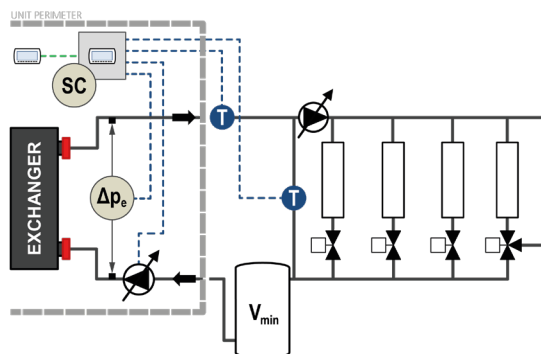
With this accessory, the motor and the impeller of the pumps are enclosed in a compartment that is fully soundproofed with sound absorbing material and soundproofing material.

FVPS FLOWZER VPS – Kit for variable flow rate pump with temperature sensors

Bluethink solution for a variable flow rate system, consisting of a primary circuit plus secondary circuit.

Flowzer VPS includes:

- a differential pressure transducer, installed at the factory at the ends of the user-side heat exchanger of the unit (Δp_e)
- a dedicated control system, installed at the factory in the electrical control panel of the unit (Sc)
- two system temperature sensors (T) - supplied separately; installation by the customer



It is obligatory for the option to be combined with the Flowzer VP (inverter) and with one of the hydraulic modules that can be selected for the unit. The accessory is not compatible with Multilogic. Please contact our sales department for further details.

The unit must include the advanced BlueThink controller and just one heat exchanger on the user side.

The option offers a complete default package to guarantee simple selection, purchasing and commissioning.

In particular, the unit includes an additional control system, equipped with an advanced algorithm, which interacts with the main advanced BlueThink controller.

Flowzer VPS has the advantage of:

- being ideal for renovations of existing systems, especially for comfort applications
- achieving a complete variable flow system, with maximum energy saving
- implementing a flexible design, e.g. for scalable or multi-zone systems

The maximum energy saving is achieved thanks to the advanced algorithm, which prevents hunting by the inverter and balances the pump speed and the recirculation flow rate to a minimum.

With refurbishments, the system's capex is limited to the unit and its commissioning.

The dimensions of the inverter of the unit and of the pump module can be favoured by the low design discharge head of the primary circuit.

The operating principle can be summarized as follows:

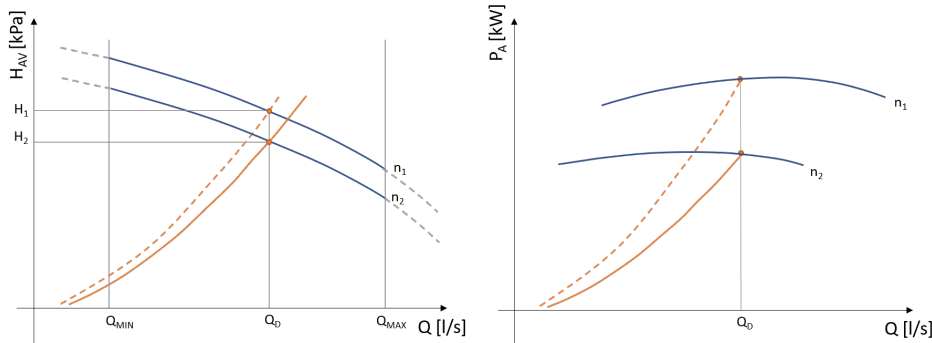
- Flowzer VPS performs a smart check of the flow rate in the primary circuit and balances it with the flow rate in the secondary circuit.
 - the system controller modulates the pump speed according to the condition detected by the system sensors T
 - if the system terminals are switched off, the flow rate of the secondary circuit will decrease; therefore the direction of flow is detected indirectly as temperature difference by the system sensors through the separator or the bypass pipe
 - The check thus contributes to reducing the speed of the primary pump until the min. flow threshold in the heat exchanger of the unit is exceeded.
 - this flow rate is indirectly monitored through the losses detected by the differential pressure transducer Δp_e
- In the required minimum load condition (that is, with all system terminals switched off) the necessary minimum volume (V_{min}) must be ensured by the relevant tank to be installed between the unit and the separator or the bypass pipe.

The temperature sensors of the system T provide a 4-20 mA signal and require 1/2" female fittings.

Further details can be found in the relevant manual.

FVDE FLOWZER VDE - Differential transducer for automatic pump adjustment at a constant flow value

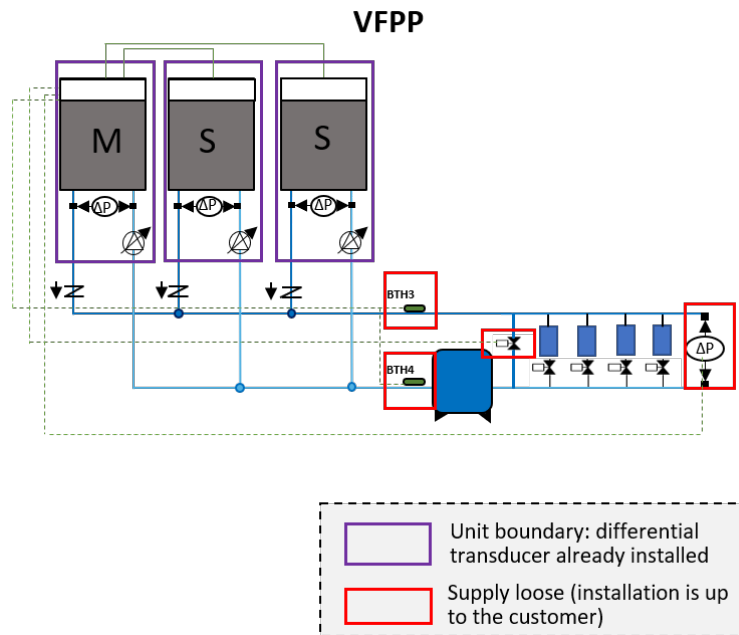
Flowzer VDE requires a differential pressure transducer to be installed in the machine. Through this transducer, the inverter can gauge the actual pressure at the ends of the heat exchanger installed in the machine and it can automatically adapt the pump speed for a constant flow value under all conditions. Flowzer VDE must be combined with Flowzer VP.



Flowzer VDE is used to automatically adjust the pump speed. As the graph shows, the inverter trips and increases the pump speed if a different condition occurs which would cause an undesired drop in the flow rate (e.g. operation of an external dry cooler). This is a more accurate solution than the VP option alone as it always provides for the water flow (Q_d) required by the design conditions.

HFx HYZER E VFPP function

The HYZER E VFPP function combines the Multilogic function, which is designed to manage multi-machine systems, with the FLOWZER VFPP control for variable flow systems.



It is obligatory for the option to be combined with the Flowzer VP (inverter) and with one of the hydraulic modules that can be selected for the unit.

The unit must include the advanced Bluethink controller, just one heat exchanger on the user side and a minimum capacity step of 25% or less.

Units operate according to the Master/Slave logic that is typical of a Multilogic system. For additional details, please refer to the FMx option.

VFPP control requires the installation on the machine of a differential transducer at the ends of the user-side heat exchanger in order to keep the flow rate in the system within a specific min. value allowed.

For additional details on the FLOWZER VFPP logic, please refer to the dedicated FVF option.

The networked units may be of different types, and the same observations as for the Multilogic option apply:

- if there are both chiller units and heat pumps in the network, the Master unit must obligatorily be one of the HP units;
- if there are both free-cooling and non free-cooling units in the network, the Master unit must obligatorily be one of the free-cooling units.

The HYZER E function requested with the unit can be:

- **HF0:** HYZER E VFPP function for Slave units;
- **HF2:** HYZER E VFPP function for the Master unit in order to manage up to 2 Slave units;
- **HF6:** HYZER E VFPP function for the Master unit in order to manage up to 6 Slave units.

If you need to connect more than 6 slaves (up to 31), you can ask for a quotation from our sales department.

For the slave units, the accessory requires:

- programming of the unit as slave of a system of machines in Multilogic network

For the master units, the accessory requires:

- programming of the unit as master of a system of machines in Multilogic network
- entering of the parameters necessary for connection with the individual slave units
- installation in the electrical control panel of a network switch to allow the units to be connected in a LAN network.
- the supply of 2 temperature probes to be positioned on the delivery and return manifold for system thermoregulation (supplied with the system - installation and wiring by the customer);
- the supply of two pressure transducers (supplied with the system - installation and wiring by the customer) to be installed near the system terminal that is affected by the highest head losses in the line or in any case in a position where it is possible to measure an adequate pressure value.
- The option also includes the supply of a bypass valve controlled by a 0-10 V signal, which must be selected in function of the system capacity. Please refer to the VBx options for correct selection.

The connection between the master unit and the slave units made with a CAT cable. 5E/UTP (prepared by the customer) with RJ45 connectors. Maximum cable length 100m.

For further details, please refer to the controller manual.

The connection between the master unit and the slave units made with a CAT cable. 5E/UTP (prepared by the customer) with RJ45 connectors. Maximum cable length 100m.

For further details, please refer to the controller manual.

VBx VFPP bypass valve for HYZER E

The option is supplied with the bypass valve, which is selected according to the system capacity.

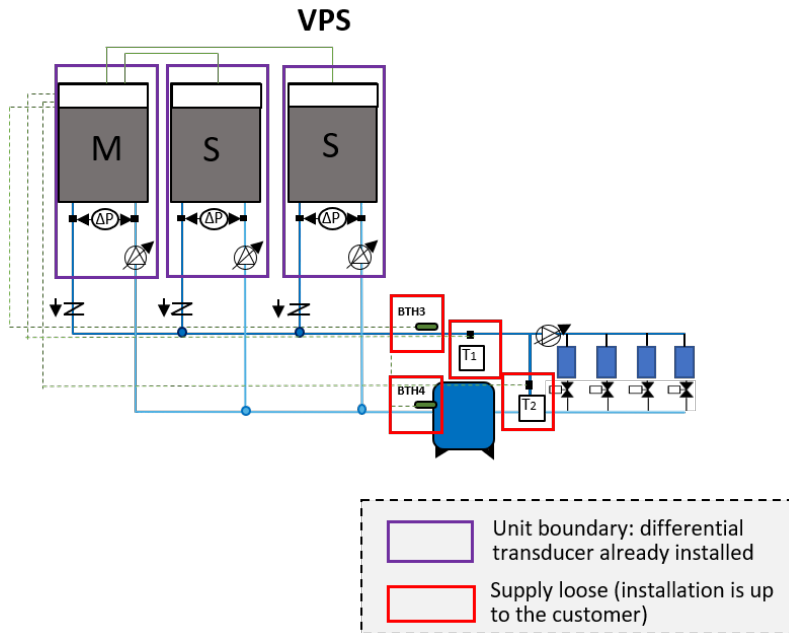
This option must be selected with either the "HYZER E VFPP function for Master unit to manage up to 2 Slave units" or "HYZER E VFPP function for Master unit to manage up to 6 Slave units".

	System capacity range**	Quantity	Diameter	Qmax**
	kW	-	in	m ³ /h
S_A	<240	1	2 1/2"	41.3
S_B	240÷335	1	3"	57.6
S_C	335÷570	1	4"	98
S_D	570÷850	1	5"	146.2
S_E	850÷1250	1	6"	215
S_F	1250÷1700	2	2 x 5"	2 x 146.2
S_G	1700÷2500	2	2 x 6"	2 x 215

** values based on a 5 °C temperature difference between the delivery and the return temperature

HSx HYZER E VPS function

The HYZER E VPS function combines the Multilogic function, which is used to manage multi-machine systems, with the FLOWZER VPS control for variable flow systems.



It is obligatory for the option to be combined with the Flowzer VP (inverter) and with one of the hydraulic modules that can be selected for the unit.

The unit must include the advanced Bluethink controller, just one heat exchanger on the user side and a minimum capacity step of 25% or less.

Units operate according to the Master/Slave logic that is typical of a Multilogic system. For additional details, please refer to the FMx option.

VPS control requires the installation on the machine of a differential transducer at the ends of the user-side heat exchanger in order to keep the flow rate in the system within a specific min. value allowed.

For additional details on the FLOWZER VPS logic, please refer to the dedicated FVPS option.

The networked units may be of different types, and the same observations as for the Multilogic option apply:

- if there are both chiller units and heat pumps in the network, the Master unit must obligatorily be one of the HP units;
- if there are both free-cooling and non free-cooling units in the network, the Master unit must obligatorily be one of the free-cooling units.

The HYZER E function requested with the unit can be:

- **HS0:** HYZER E VPS function for Slave units;
- **HS2:** HYZER E VPS function for the Master unit in order to manage up to 2 Slave units;
- **HS6:** HYZER E VPS function for the Master unit in order to manage up to 6 Slave units.

If you need to connect more than 6 slaves (up to 31), you can ask for a quotation from our sales department.

For the slave units, the accessory requires:

- programming of the unit as slave of a system of machines in Multilogic network

For the master units, the accessory requires:

- programming of the unit as master of a system of machines in Multilogic network
- entering of the parameters necessary for connection with the individual slave units
- installation in the electrical control panel of a network switch to allow the units to be connected in a LAN network.
- the supply of 2 temperature probes to be positioned on the delivery and return manifold for system thermoregulation (supplied with the system - installation and wiring by the customer);
- the supply of 2 temperature probes to be installed on the delivery manifold and on the bypass branch, which are typical of VPS control (supplied with the system - installation and wiring by the customer).

The connection between the master unit and the slave units made with a CAT cable. 5E/UTP (prepared by the customer) with RJ45 connectors. Maximum cable length 100m.
For further details, please refer to the controller manual.

PVX Variable flow setup for HYZER X

The dedicated HYZER X controller is designed to manage the different units, devices and components that make up a hydronic system.

Systems featuring this controller require that the PVX option be installed at the ends of the user-side heat exchanger of a differential pressure transducer so that the machine is set up for variable flow rate control.

This option is mandatory in all units making up the system.

For additional information on the product HYZER X, please refer to the specific technical catalogue.

VIX Shut-off valves for systems with external pumps for HYZER X

Systems featuring the HYZER X controller enable the selection of the shut-off valve used in systems that have an external pumping unit.

The option is always supplied separately from the unit and is for installation by the customer.

FLMX User-side flow meter for HYZER X

Systems featuring the HYZER X controller enable the selection of the flow meter option to calculate the flow rate and the performances of the units.

Two flow meters are supplied together with multifunctional machines that need to be installed on the cold and the hot circuit of the unit (installation by customer).

RA Antifreeze heater

These electric heaters are fitted on the pumps and in the tank (depending on the configuration of the machine) to prevent damage to the hydraulic components due to ice formation during periods when the machine is inactive.

Based on normal operating conditions and the percentage of glycol in the system, an appropriate "antifreeze alarm" temperature is set in the control. When a temperature that is 1K higher than the antifreeze alarm threshold is detected at the outlet from the exchanger, the pump (if present) and the antifreeze heaters are switched on. If the temperature of the outgoing water reaches the antifreeze alarm threshold, the compressors are stopped, keeping the heaters and the pumps active, and the general alarm contact of the machine is activated.

VSIW Water-side safety valve

With this accessory, a safety valve is inserted in the hydraulic circuit of the unit: when the calibration pressure is reached, the valve opens and, by discharging (to be routed by the customer), prevents the system pressure from reaching limits that are dangerous for the components present in the system. The valves have positive action, that is, performance is guaranteed even if the diaphragm deteriorates or breaks.

FLUS Flow switch (instead of the water differential pressure switch)

As an alternative to the differential pressure switch (standard flow sensor), it is possible to request the paddle flow switch as accessory. This detects when there is no water flow to the user-side exchanger and sends a signal to the control of the unit that will stop the compressors to prevent damage to the exchangers.

Application of this accessory is compulsory for units that use non-glycol water and work with a yearly cycle where external air temperatures are zero or below.

The flow switch is supplied loose (installation by the customer) and replaces the water differential pressure switch (standard).

Electrical accessories

Some accessories may be incompatible with each other even if not expressly indicated.

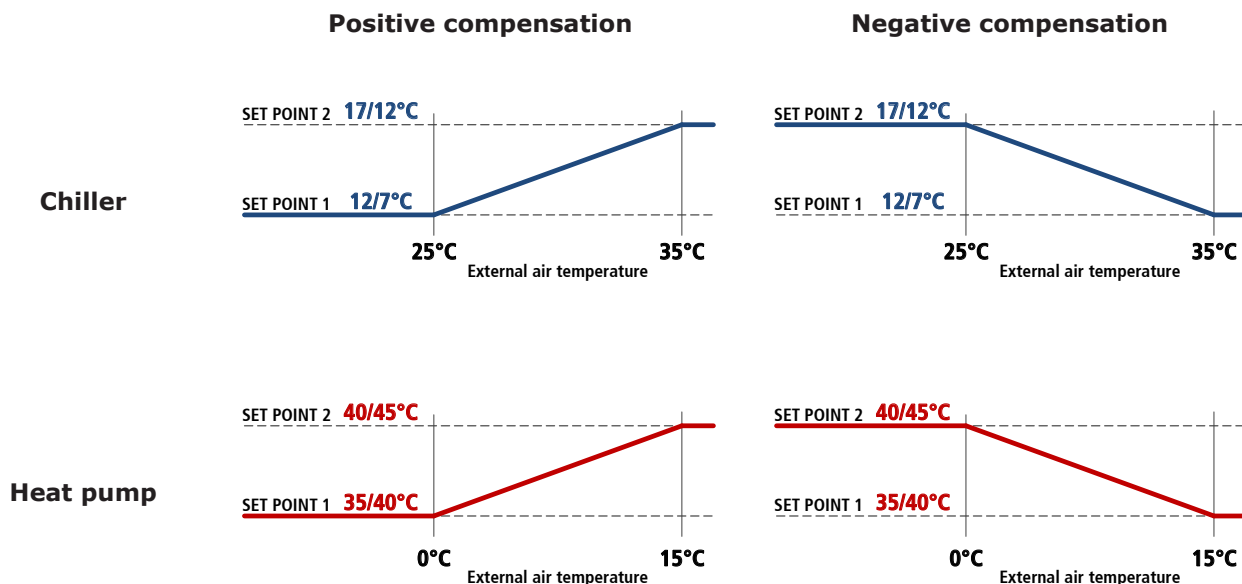
COTW Outgoing water temperature control (S)

With this accessory, outgoing instead of incoming water temperature control is used.

CSP Set point compensation depending on external air temperature

For units fitted with this accessory, the set point of the unit is set so that it can vary between two values, a maximum and a minimum, depending on the external air temperature. The compensation ramp and the maximum and minimum values of the set point can be changed by the user.

Unless otherwise specified in the order, the controller will be set to implement a positive compensation logic according to the temperatures shown in the following diagrams:



DAA Double power supply with automatic switching

A motor-driven automatic switch to which to connect two separate power supply lines (for example, one from the mains power line and one from the uninterruptible power supply unit) is installed in the electrical control panel of the unit.

The switching from one line to another is automatic and obligatorily requires passing through the OFF position. When this accessory is requested, the power supply of the unit must compulsorily include neutral.

DAM Double power supply with manual switching

A manual switch to which to connect two separate power supply lines (for example, one from the mains power line and one from the uninterruptible power supply unit) is installed in the electrical control panel of the unit. The switching from one line to another is manual and obligatorily requires passing through the OFF position.

TERM Remote-controlled user terminal panel

This accessory allows the terminal normally situated on the machine to be replicated on a support situated at a distance. It is particularly suitable when the unit is placed in an area that is not easily accessible.

The accessory is supplied loose and is to be installed by the customer at a maximum distance of 120m from the unit. We advise using a cable of the following type: "TECO O.R. FE 2x2xAWG24 SN/ST/PUR".

For this accessory, there is a dedicated serial port.

IACV Automatic circuit breakers

With this accessory, automatic circuit breakers are installed instead of fuses for the protection of auxiliary loads. Also, the same accessory uses automatic circuit breakers with adjustable thermal overload protection to protect the compressors.

LIID Limitation of the current absorbed by digital input

When this accessory is requested, a digital input is prepared in the terminal board to activate the forced capacity reduction of the unit to a set fixed level.

This accessory is useful when there is a need to necessarily limit the power absorbed by the unit as regards particular conditions.

We point out that, in some conditions (for example, during defrosting, oil return cycles or hourly compressor rotation procedures), the controller could force the unit to operate at full capacity for limited periods of time.

NSS Night Shift System

This accessory is applied to high efficiency units or to SLN units.

In the day time slot, which is normally the one with the highest heat load, priority is given to efficiency and therefore the machine works with a fan control curve that maximises the EER. In this time slot, therefore, the unit is a high efficiency low noise machine (equivalent to A/LN, A+/LN)

In the night time band (or in any case from time band decided by the customer), the priority changes to limiting the noisiness of the machine and therefore the controller carries out an adjustment of the control ramp of the condensing fans, thereby reducing the air flow rate and consequently the noise emission level. So, in this time band, the unit is a super low noise machine (equivalent to SLN).

In any case, if there is a need for additional cooling capacity, the controller will manage the demand, if necessary, by accelerating the fans and keeping condensation within the correct operating limits.

The time slots can be set from the control depending on installation requirements.

When the unit is working in heat pump mode, in order to maximise the COP and to obtain the widest possible operating limits, the control of the unit forces the fans to the maximum speed also during the night time bands.

RE1P Relay for management of 1 external pump

This accessory can be requested for units without pumps and allows a pump outside the machine to be controlled.

RE2P Relay for management of 2 external pumps

This accessory can be requested for units without pumps and allows two pumps outside the machine to be controlled with a running/stand-by logic by implementing a rotation on the hours of operation.

RIF Power factor correction to $\cos\phi \geq 0.95$

With this accessory, an electrical control panel, containing power factor correction capacitors to make the $\cos\phi$ of the unit greater than or equal to 0.95, is supplied with the unit. The capacitors should be connected (by the customer) to the electrical control panel of the unit in the specially prepared terminal board.

Besides reducing the absorbed reactive power, the use of this accessory also allows the maximum absorbed current to be lowered.

RMMT Maximum and minimum voltage relay

This accessory constantly monitors the voltage value and the unit's power supply phase sequence. If the supply voltage does not fall within the set parameters or there is a phase reversal, an alarm is generated that stops the machine to prevent damage to its main parts

LIRA Absorbed current limitation with measurement of absorption

For the unit equipped with this accessory, it is possible to set, directly in the control, a maximum current that can be absorbed by the machine. The control instantly checks the absorptions, through an amperometric transformer, and, in case of need, applies a dynamic forced capacity reduction able to always keep the absorbed current below the set threshold.

SETD Double set point from digital input

The accessory allows you to preset two different operating set points and manage the change from one to the other through a digital signal.

The set point temperatures must be specified when ordering. For optimization of the unit, reference will be made to the lower set point in chiller mode and the higher set point in heat pump mode.

Unless otherwise specified in the order, the controller will be set at the factory with the following temperatures:

- in chiller mode, set point 1 to 7°C and set point 2 to 12°C
- in heat pump mode (only for HP units) set point 1 to 45°C and set point 2 to 40°C

SETV Variable set point with remote signal

The accessory allows the set point to be varied continuously between two preset values, a maximum and a minimum, depending on an external signal that can be of the 0-1V, 0-10V or 4-20mA type.

The set point temperatures and the type of signal to use for the adjustment must be specified when ordering. For optimization of the unit, reference will be made to the lower set point in chiller mode and the higher set point in heat pump mode.

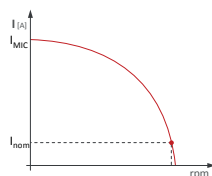
Unless otherwise specified in the order, the controller will be set at the factory with 0-10V analogue input and with the following temperatures:

- in chiller mode, 0V will correspond to a set point of 7°C and 10V will correspond to a set point of 12°C
- in heat pump mode (only for HP units), 0V will correspond to a set point of 45°C and 10V will correspond to a set point of 40°C

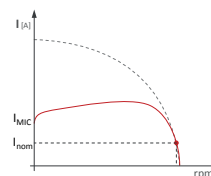
SOFT Electronic soft-starter

The scroll compressors have DOL (Direct On Line) starting and therefore the maximum inrush current I_{MIC} will be 4/5 times its nominal current I_{nom} .

If the unit is equipped with the electronic soft-starter accessory, the starting of each compressor is done with an acceleration ramp that allows the effective value (rms value) of the inrush current of the individual compressor to be lowered.



Current trend without accessory Electronic soft-starter



Current trend with accessory Electronic soft-starter

If the unit is equipped with accessory "Power factor correction to $\cos\phi \geq 0.95$ ", this last will be electro-mechanically connected only at the end of the acceleration ramp of the soft-starter.

SQE Heater for electrical control panel

Electric heaters are positioned inside the electrical control panel and these prevent the formation of ice or condensation inside it.

SUN Heaters for operation with air below -25°C

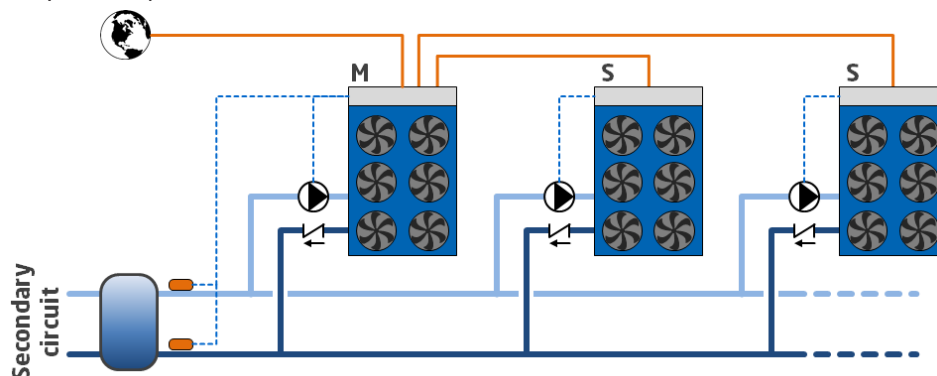
Electric heaters are positioned inside the electrical control panel and these prevent the formation of ice or condensation inside it.

If the operating temperatures of the unit can extend below -25°C, specific measures must be adopted to guarantee correct operation of the unit and the reliability of critical components.

Depending on the limit temperature it is necessary to reach, use will be made of suitably positioned heaters and additional thermal protection up to adoption of special electrical conductors.

FMx Multilogic Function

The Multilogic function allows management of up to 32 units equipped with advanced Bluethink controller and connected in hydraulic parallel with each other.



On the basis of the information recorded by the temperature probes installed on the delivery and return manifolds of the system, with the master unit, a capacity request is generated that is distributed among the units connected in the Multilogic network according to settable priority and optimization logics.

If communication between the units fails or if the master is off-line, the slave units can continue to work according to the set thermoregulation parameters.

The connected units can be different from each other, in terms of capacity and set-up, provided the following rules are complied with:

- if there are both chiller units and heat pumps in the Multilogic network, the Master unit must obligatorily be one of the HP units
- if there are both free cooling and non free-cooling units in the Multilogic network, the Master unit must obligatorily be one of the free-cooling units.

GLO Modbus Lonworks Gateway

With this accessory, a RS485/Lon gateway is installed inside the electrical control panel.

By default, the programming gives read-only access to the control of the unit. Enabling of read/write access should be requested when ordering.

PBA BACnet protocol over IP (Ethernet)

The controller is set for use, in read and write mode, of the BACnet port on IP protocol.

By default, the programming gives read-only access to the control of the unit. Enabling of read/write access should be requested when ordering.

SERI RS485 serial interface with Modbus protocol

RS485 serial interface with Modbus protocol.

SW4P Network switch with 4 ports

The accessory includes installation in DIN rail of a professional 4-port network switch. Requires Blueye via Ethernet.

SW8P Network switch with 8 ports

The accessory includes installation in DIN rail of a professional 8-port network switch.

Requires Blueye via Ethernet.

PSN SNMP protocol

The accessory consists of a gateway that allows Ethernet connection to a SNMP manager supervision system.

The use of this accessory causes the RS485 serial port to be unavailable.

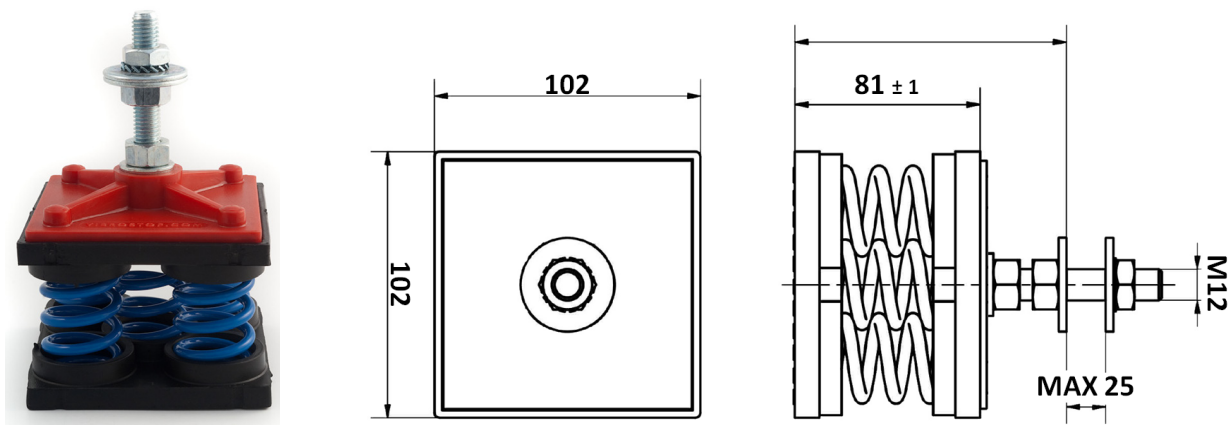
Other accessories

AG Rubber anti-vibration mounts

These allow you to reduce the vibrations transmitted from the unit to the surface it is standing on. Accessory supplied loose.

AM Spring anti-vibration mounts

These allow you to reduce the vibrations transmitted from the unit to the surface it is standing on. Accessory supplied loose.



ANTC Coil treated with anti-corrosion paints

The treatment is applied exclusively to finned pack coils with copper tubes and aluminium fins and consists of aluminium passivation and coating with a polyurethane base; a double layer of paint, of which the first passivates the aluminium and acts as primer and the second is a polyurethane based surface coating. The product has high resistance to corrosion and all environmental conditions.

Protective treatment of the exchanger is strongly recommended if at least one of the points below is verified:

- there are obvious signs of corrosion on the exposed metal surfaces in the installation area
- the installation is located close to the sea coast
- the prevailing winds come from the sea and travel in the direction of the unit
- the environment is industrial with a significant concentration of pollutants
- it is an urban environment with a high population density
- it is a rural environment with the presence of organic discharges and effluents

For chiller units, this accessory also includes the "Cu/Al coil" accessory.

With reference to the protection criteria to follow, especially for installations close to the coast, refer to the section titled "Installations that require the use of treated coils".

BFAN Free cooling coil treated with anti-corrosion paints

Specific option for free-cooling batteries.

The treatment is applied exclusively to finned pack coils with copper tubes and aluminium fins and consists of aluminium passivation and coating with a polyurethane base; a double layer of paint, of which the first passivates the aluminium and acts as primer and the second is a polyurethane based surface coating.

Protective treatment of the exchanger is strongly recommended if at least one of the points below is verified:

- the prevailing winds come from the sea towards the unit
- the installation is located close to the sea coast
- the environment is industrial with a significant concentration of pollutants
- the environment is urban with a high population density
- the environment is rural with the presence of organic discharges and effluents

For chiller units, this accessory also includes the "Cu/Al coil" accessory.

With reference to the protection criteria to follow, especially for installations close to the coast, refer to the section titled "Installations that require the use of treated coils".

FW Water filter

To protect the elements of the hydraulic circuit (in particular, the exchangers), there are Y filters that can stop and settle the particles that are normally present in the water flow and would otherwise settle in the more delicate parts of the hydraulic circuit and damage its heat exchange capacity.

Installation of the water filter is mandatory even when it is not supplied as an accessory.

Accessory supplied loose.

MCHE E-coated microchannel coil

The e-coated microchannel coils are treated by immersion of the whole exchanger in an emulsion of organic resins, solvents, ionic stabilisers and deionised water. This is all subjected to a suitable electric field that causes the formation of a solid, uniform deposit on the exchanger. The function of this deposit will be to protect the aluminium from corrosion without penalising its thermophysical properties.

Protective treatment of the exchanger is strongly recommended if at least one of the points below is verified:

- there are obvious signs of corrosion of the exposed metal surfaces in the installation area
- the installation is located close to the sea coast
- the prevailing winds come from the sea towards the unit
- the environment is industrial with a significant concentration of pollutants
- the environment is urban with a high population density
- the environment is rural with the presence of organic discharges and effluents.

With reference to the protection criteria to follow, especially for installations close to the coast, refer to the section titled "Installations that require the use of treated coils".

BFAP Pre-painted aluminium free-cooling coil

The treatment is applied exclusively to finned pack coils and aluminium fins for the free-cooling part.

PRAC Steel profiles frames for container shipment

This accessory foresees the mounting of steel profiles frames on the unit for its loading into container.

When this accessory is required it's for the shipping of the unit into container and its loading is mandatory to be done at the factory

PREA Unit suitable to be disassembled on site

The unit is delivered so that it can be disassembled easily on site if this makes the installation operations easier.

A unit requested with this option is supplied:

- screwed instead of riveted
- with plugged and not welded pipes
- without refrigerant charge
- untested
- covered by the warranty only if reassembled and screwed together by personnel authorized by the factory

RAAL Cu/Al coils

This accessory uses finned pack coils with copper tubes and aluminium fins instead of microchannel coils.

ALPR Pre-painted aluminium coil

This option uses finned pack coils with copper tubes and pre-painted aluminium fins.

RAT Anti-intrusion nets

An arc-welded, painted net (RAL colour 7035) is installed to close off the external openings so as to prevent access to the technical compartment by unauthorized personnel.

**SLCO Skid for shipping in container**

The accessory provides for the installation of a wooden sled for loading and a fixing system inside the container by a strap. The accessory must be used for shipping in container. Loading on containers must be carried out at the factory. The accessory is incompatible with "Packaging in wooden crate".

STL Brackets for transport over long distances

The accessory consists of adding reinforcing bars to the structural metalwork. This allows the strength of the structure to be increased for long distance road transport.

TECHNICAL SPECIFICATIONS

KAPPA REV FC

			33.2	35.2	37.2	40.2	43.2	51.2	54.2	58.2
Cooling (A30°C; W10°C; e.g.30%)										
Refrigeration capacity	(1)	kW	353	387	425	466	526	551	611	696
Total absorbed power	(1)	kW	102	106	122	141	158	164	185	214
EER	(1)		3,45	3,64	3,47	3,32	3,32	3,36	3,31	3,25
User-side heat exchanger										
Quantity		n°	1	1	1	1	1	1	1	1
Water flow rate (A30°C; W10°C; e.g.30%)	(1)	m³/h	67,7	74,3	81,6	89,6	100,8	105,8	117,4	133,6
FC BASIC (A5°C; W10°C; e.g.30%)										
Free-cooling mudules		n°	1 ½	2	2	2	2	2	2 ½	3
Refrigeration capacity only FC	(2)	kW	160	212	221	228	235	242	291	344
Absorbed power only FC	(2)	kW	5	7	7	7	7	7	9	11
TFT	(3)	°C	-6,1	-2,4	-3,5	-4,7	-6,6	-7,2	-5,3	-4,5
Total head losses	(7)	kPa	84,9	115,5	138,6	163,8	131,7	165,2	164,8	137,2
Total internal volume	(4)	l	145	145	145	140	140	140	280	225
FC CUSTOM (A5°C; W10°C; e.g.30%)										
Free-cooling mudules		n°	2	3	3	3	3	3	3	4
Refrigeration capacity only FC	(2)	kW	207	274	286	296	305	316	332	396
Absorbed power only FC	(2)	kW	7	11	11	11	11	11	11	14
TFT	(3)	°C	-1,3	1,3	0,7	-0,1	-1,4	-1,7	-2,7	-1,8
Total head losses	(7)	kPa	95,4	87,9	105,2	125	87	113	141,3	105,7
Total internal volume	(4)	l	145	210	210	200	200	200	200	305
FC EXTRA (A5°C; W10°C; e.g.30%)										
Free-cooling mudules		n°	3	4	4	4	4	4	4	5
Refrigeration capacity only FC	(2)	kW	274	321	335	347	359	371	391	497
Absorbed power only FC	(2)	kW	11	14	14	14	14	14	14	18
TFT	(3)	°C	2,4	3,1	2,6	1,9	0,9	0,7	0	1,5
Total head losses	(7)	kPa	72,6	77,6	92,9	110,7	70,6	93,8	117,2	90,4
Total internal volume	(4)	l	210	290	290	280	280	280	280	305
Ventilatori										
Chiller fans		n°	5	6	6	6	6	7	8	9
Ventilatori FC BASIC		n°	3	4	4	4	4	4	5	6
Ventilatori FC CUSTOM		n°	4	6	6	6	6	6	6	8
Ventilatori FC EXTRA		n°	6	8	8	8	8	8	8	10
Compressors										
Compressors/Circuits		n°/n°	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2
Minimum capacity reduction step	(8)	%	12%	12%	13%	11%	13%	12%	12%	12%
Refrigerant charge (MCHX)		kg	39	44	44	46	43	48	52	63
Refrigerant charge (Cu/Al)		kg	54	62	62	64	61	69	76	90
Noise levels										
Chiller: Sound power level	(5)	dB(A)	94	95	95	96	96	97	98	98
Chiller: Sound power level of LN version	(5)	dB(A)	89	90	90	91	91	92	93	93
Chiller: Sound pressure level	(6)	dB(A)	62	63	63	64	64	65	66	66
Chiller: Sound pressure level of LN version	(6)	dB(A)	57	58	58	59	59	59	61	60
FC BASIC: Sound power level	(5)	dB(A)	76	77	77	77	77	77	78	79
FC CUSTOM: Sound power level	(5)	dB(A)	77	79	79	79	79	79	79	80
FC EXTRA: Sound power level	(5)	dB(A)	79	80	80	80	80	80	80	81
FC BASIC: Sound pressure level	(6)	dB(A)	44	45	45	45	45	45	46	47
FC CUSTOM: Sound pressure level	(6)	dB(A)	45	47	47	47	47	47	47	48
FC EXTRA: Sound pressure level	(6)	dB(A)	47	48	48	48	48	48	48	49

(MCHX: unit with microchannel coils ; CuAl: unit with copper/aluminium tube/fin coils)

(1) Outside air temperature 30°C; evaporator inlet/outlet fluid temperature 15/10°C; glycol at 30%.

(2) Outside air temperature 5°C; evaporator inlet/outlet fluid temperature 15/10°C; glycol at 30%.

(3) The TFT (Total Free-cooling Temperature) is the outside air temperature at which the cooling performance of the water coils is the same as the performance of the chiller section under the condition of A30°C; E.G.30% 15/10°C

(4) Volume of water contained in the unit when it is working in free cooling mode. If present, the volume contained in the tank should also be considered.

(5) Unit operating at rated engine speed, without any accessory, with external air temperature 30 ° C and inlet / outlet water temperature for user exchanger 15/10 ° C. Binding values. Values obtained from measurements carried out according to ISO 3744. evaporator 15/10 ° C.

(6) Values obtained from the sound power level (conditions: note 5), related to a distance of 10 m from the unit in free field with directivity factor Q=2. Non-binding values.

(7) Data refers to the unit with free-cooling ON

(8) Approximate value. The minimum capacity reached by the unit depends on the operating conditions. The value shown may not be suitable for calculating the minimum volume of water: to do this, consult the "Minimum water content in the system" section.

** Basic CH unit without included accessories

KAPPA REV FC

			67.2	73.2	80.2	85.2	90.2	95.2	100.2	105.2	115.2
Cooling (A30°C; W10°C; e.g.30%)											
Refrigeration capacity	(1)	kW	783	838	899	954	1006	1075	1121	1181	1264
Total absorbed power	(1)	kW	233	242	252	279	307	327	345	364	383
EER	(1)		3,36	3,46	3,56	3,42	3,28	3,29	3,25	3,24	3,3
User-side heat exchanger											
Quantity		n°	1	1	1	1	1	1	1	1	1
Water flow rate (A30°C; W10°C; e.g.30%)	(1)	m³/h	150,5	160,9	172,4	183,2	193,2	206,6	215,8	227,2	242,7
FC BASIC (A5°C; W10°C; e.g.30%)											
Free-cooling modules		n°	3	4	4	4	4	5	5	6	6
Refrigeration capacity only FC	(2)	kW	356	417	431	439	447	553	568	645	656
Absorbed power only FC	(2)	kW	11	14	14	14	14	18	18	21	21
TFT	(3)	°C	-6,4	-4,2	-5	-6	-6,8	-3,7	-4,1	-2,6	-3,5
Total head losses	(7)	kPa	160,2	143,6	129	140,5	156,1	147,2	166,1	137,6	101,9
Total internal volume	(4)	l	215	300	410	410	400	385	385	430	545
FC CUSTOM (A5°C; W10°C; e.g.30%)											
Free-cooling modules		n°	4	5	5	5	5	6	6	7	7
Refrigeration capacity only FC	(2)	kW	411	511	528	538	549	629	646	720	733
Absorbed power only FC	(2)	kW	14	18	18	18	18	21	21	25	25
TFT	(3)	°C	-3,2	-0,7	-1,3	-2	-2,6	-1,4	-1,7	-0,7	-1,5
Total head losses	(7)	kPa	122,8	122,3	104,2	113,3	126,5	128,1	144,3	123,2	86,2
Total internal volume	(4)	l	300	300	410	410	400	385	385	430	545
FC EXTRA (A5°C; W10°C; e.g.30%)											
Free-cooling modules		n°	5	6	6	7	7	8	8	9	9
Refrigeration capacity only FC	(2)	kW	517	595	616	687	700	779	801	873	889
Absorbed power only FC	(2)	kW	18	21	21	25	25	28	28	32	32
TFT	(3)	°C	0,4	1,4	0,9	1,5	1,1	1,6	1,4	1,8	1,3
Total head losses	(7)	kPa	104,7	110,2	90,1	88,5	99,4	108,8	122,5	107,8	69,6
Total internal volume	(4)	l	300	300	410	410	400	385	385	430	545
Ventilatori											
Chiller fans		n°	10	11	12	12	12	13	14	15	16
Ventilatori FC BASIC		n°	6	8	8	8	8	10	10	12	12
Ventilatori FC CUSTOM		n°	8	10	10	10	10	12	12	14	14
Ventilatori FC EXTRA		n°	10	12	12	14	14	16	16	18	18
Compressors											
Compressors/Circuits		n°/n°	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2
Minimum capacity reduction step	(8)	%	13%	12%	13%	12%	13%	12%	13%	13%	13%
Refrigerant charge (MCHX)		kg	70	75	83	83	87	98	102	115	122
Refrigerant charge (Cu/Al)		kg	100	108	119	119	123	137	144	160	170
Noise levels											
Chiller: Sound power level	(5)	dB(A)	99	100	100	100	100	101	101	102	102
Chiller: Sound power level of LN version	(5)	dB(A)	94	95	95	95	95	96	96	97	97
Chiller: Sound pressure level	(6)	dB(A)	67	67	67	68	68	68	68	69	69
Chiller: Sound pressure level of LN version	(6)	dB(A)	62	63	63	63	62	63	63	64	64
FC BASIC: Sound power level	(5)	dB(A)	79	80	80	80	80	81	81	82	82
FC CUSTOM: Sound power level	(5)	dB(A)	80	81	81	81	81	82	82	82	82
FC EXTRA: Sound power level	(5)	dB(A)	81	82	82	82	82	83	83	84	84
FC BASIC: Sound pressure level	(6)	dB(A)	47	48	48	48	48	49	49	50	50
FC CUSTOM: Sound pressure level	(6)	dB(A)	48	49	49	49	49	50	50	50	50
FC EXTRA: Sound pressure level	(6)	dB(A)	49	50	50	50	50	51	51	52	52

(MCHX: unit with microchannel coils ; CuAl: unit with copper/aluminium tube/fin coils)

(1) Outside air temperature 30°C; evaporator inlet/outlet fluid temperature 15/10°C; glycol at 30%.

(2) Outside air temperature 5°C; evaporator inlet/outlet fluid temperature 15/10°C; glycol at 30%.

(3) The TFT (Total Free-cooling Temperature) is the outside air temperature at which the cooling performance of the water coils is the same as the performance of the chiller section under the condition of A30°C; E.G.30% 15/10°C

(4) Volume of water contained in the unit when it is working in free cooling mode. If present, the volume contained in the tank should also be considered.

(5) Unit operating at rated engine speed, without any accessory, with external air temperature 30 ° C and inlet / outlet water temperature for user exchanger 15/10 ° C. Binding values. Values obtained from measurements carried out according to ISO 3744. evaporator 15/10 ° C.

(6) Values obtained from the sound power level (conditions: note 5), related to a distance of 10 m from the unit in free field with directivity factor Q=2. Non-binding values.

(7) Data refers to the unit with free-cooling ON

(8) Approximate value. The minimum capacity reached by the unit depends on the operating conditions. The value shown may not be suitable for calculating the minimum volume of water: to do this, consult the "Minimum water content in the system" section.

** Basic CH unit without included accessories

KAPPA REV FC

			33.2	35.2	37.2	40.2	43.2	51.2	54.2	58.2	
Dimensions and weights**											
FC BASIC											
Modules		n°	1	1	1	1	1	1	1	1	
Length		mm	6162	6162	6162	6162	6162	7312	8460	9605	
Length chiller module		mm	-	-	-	-	-	-	-	-	
Length free-cooling module		mm	-	-	-	-	-	-	-	-	
FC CUSTOM											
Modules		n°	1	1	1	1	1	1	1	1	
Length		mm	6162	7310	7310	7310	7310	8460	8460	10753	
Length chiller module		mm	-	-	-	-	-	-	-	-	
Length free-cooling module		mm	-	-	-	-	-	-	-	-	
FC EXTRA											
Modules		n°	1	1	1	1	1	1	1	1	
Length		mm	7310	8458	8458	8458	8458	9608	9608	11902	
Length chiller module		mm	-	-	-	-	-	-	-	-	
Length free-cooling module		mm	-	-	-	-	-	-	-	-	
Depth		mm	2260	2260	2260	2260	2260	2260	2260	2260	
Height		mm	2440	2440	2440	2440	2440	2440	2440	2440	
			67.2	73.2	80.2	85.2	90.2	95.2	100.2	105.2	115.2
Dimensions and weights**											
FC BASIC											
Modules		n°	1	1	1	1	1	2	2	2	2
Length		mm	9605	11898	11898	11898	11898	14202	14202	16495	16495
Length chiller module		mm	-	-	-	-	-	8465	8465	9610	9610
Length free-cooling module		mm	-	-	-	-	-	5737	5737	6885	6885
FC CUSTOM											
Modules		n°	1	1	1	1	1	2	2	2	2
Length		mm	10753	13047	13047	13047	13047	15350	15350	17644	17644
Length chiller module		mm	-	-	-	-	-	8465	8465	9610	9610
Length free-cooling module		mm	-	-	-	-	-	6885	6885	8034	8034
FC EXTRA											
Modules		n°	1	2	2	2	2	2	2	2	2
Length		mm	11902	14195	14195	15344	15344	17648	17648	19940	19940
Length chiller module		mm	-	7310	7310	7310	7310	8465	8465	9610	9610
Length free-cooling module		mm	-	6885	6885	8034	8034	9183	9183	10330	10330
Depth		mm	2260	2260	2260	2260	2260	2260	2260	2260	2260
Height		mm	2440	2440	2440	2440	2440	2440	2440	2440	2440

KAPPA REV HE FC

			33.2	35.2	37.2	40.2	43.2	51.2	54.2	58.2
Cooling (A30°C; W10°C; e.g.30%)										
Refrigeration capacity	(1)	kW	376	420	444	505	562	592	652	767
Total absorbed power	(1)	kW	100	112	117	133	149	156	174	205
EER	(1)		3,8	3,7	3,8	3,8	3,8	3,8	3,7	3,7
User-side heat exchanger										
Quantity		n°	1	1	1	1	1	1	1	1
Water flow rate (A30°C; W10°C; e.g.30%)	(1)	m³/h	72,2	80,5	85,1	96,9	107,9	113,5	125,1	147,2
FC BASIC (A5°C; W10°C; e.g.30%)										
Free-cooling modules		n°	1 ½	2	2	2	2	2 ½	3	3
Refrigeration capacity only FC	(2)	kW	161	221	228	236	244	287	338	356
Absorbed power only FC	(2)	kW	5	7	7	7	7	9	11	11
TFT	(3)	°C	-7,2	-3,2	-3,8	-5,7	-7,6	-4,9	-3,6	-5,9
Total head losses	(7)	kPa	92	107	124	147	171	121	126	133
Total internal volume	(4)	l	145	140	140	170	170	305	225	330
FC CUSTOM (A5°C; W10°C; e.g.30%)										
Free-cooling modules		n°	2	3	3	3	3	3	4	4
Refrigeration capacity only FC	(2)	kW	210	286	296	307	318	327	388	411
Absorbed power only FC	(2)	kW	7	11	11	11	11	11	14	14
TFT	(3)	°C	-2,1	0,9	0,6	-0,7	-1,9	-2,3	-1	-2,8
Total head losses	(7)	kPa	104	74	85	101	117	99	97	95
Total internal volume	(4)	l	145	200	200	230	230	225	305	410
FC EXTRA (A5°C; W10°C; e.g.30%)										
Free-cooling modules		n°	3	4	4	4	4	4	5	5
Refrigeration capacity only FC	(2)	kW	279	336	347	361	374	385	488	517
Absorbed power only FC	(2)	kW	11	14	14	14	14	14	18	18
TFT	(3)	°C	1,9	2,7	2,5	1,5	0,6	0,3	2	0,7
Total head losses	(7)	kPa	79	62	71	84	97	76	83	77
Total internal volume	(4)	l	210	280	280	315	315	305	305	410
Ventilatori										
Chiller fans		n°	6	7	8	8	8	9	11	12
Ventilatori FC BASIC		n°	3	4	4	4	4	5	6	6
Ventilatori FC CUSTOM		n°	4	6	6	6	6	6	8	8
Ventilatori FC EXTRA		n°	6	8	8	8	8	8	10	10
Compressors										
Compressors/Circuits		n°/n°	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2
Minimum capacity reduction step	(8)	%	12%	12%	13%	12%	13%	12%	12%	12%
Refrigerant charge (MCHX)		kg	46	52	52	56	56	68	77	83
Refrigerant charge (Cu/Al)		kg	64	73	76	80	80	95	110	119
Noise levels										
Chiller: Sound power level	(5)	dB(A)	94	95	95	96	96	97	98	98
Chiller: Sound power level of LN version	(5)	dB(A)	89	90	90	91	91	92	93	93
Chiller: Sound pressure level	(6)	dB(A)	62	62	62	63	63	65	66	66
Chiller: Sound pressure level of LN version	(6)	dB(A)	57	58	58	59	59	59	61	60
FC BASIC: Sound power level	(5)	dB(A)	76	77	77	77	77	78	79	79
FC CUSTOM: Sound power level	(5)	dB(A)	77	79	79	79	79	79	80	80
FC EXTRA: Sound power level	(5)	dB(A)	79	80	80	80	80	80	81	81
FC BASIC: Sound pressure level	(6)	dB(A)	44	45	45	45	45	46	47	47
FC CUSTOM: Sound pressure level	(6)	dB(A)	45	47	47	47	47	47	48	48
FC EXTRA: Sound pressure level	(6)	dB(A)	47	48	48	48	48	48	49	49

Dimensions and weights**

FC BASIC MCHX: unit with microchannel coils ; CuAl: unit with copper/aluminium tube/fin coils)

Modules Outside air temperature 30°C; evaporator inlet/outlet fluid temperature 15/10°C; glycol at 30%.

Length Outside air temperature 5°C; fluid temperature at outlet from free-cooling coils 10°C; glycol at 30%.

Length chiller module The TFT (Total Free-cooling Temperature) is the outside air temperature at which the cooling performance of the water coils is the same as the performance of the chiller section under the condition of A30°C; E.G.30% 15/10°C

Length free-cooling module Volume of water contained in the unit when it is working in free cooling mode. If present, the volume contained in the tank should also be considered.

FC CUSTOM Unit operating at rated engine speed, without any accessory, with external air temperature 30 ° C and inlet / outlet water temperature for user exchanger 15/10 ° C. Binding values. Values obtained from measurements carried out according to ISO 3744. evaporator 15/10 ° C.

Modules Values obtained from the sound power level (conditions: note 5), related to a distance of 10 m from the unit in free field with directivity factor Q=2. Non-binding values.

Length Data refers to the unit with free-cooling ON

Length chiller module Approximate value. The minimum capacity reached by the unit depends on the operating conditions. The value shown may not be suitable for calculating the minimum volume of water: to do this, consult the "Minimum water content in the system" section.

Length free-cooling module Basic CH unit without included accessories

KAPPA REV HE FC

			67.2	73.2	80.2	85.2	90.2	95.2	100.2	105.2
Cooling (A30°C; W10°C; e.g.30%)										
Refrigeration capacity	(1)	kW	835	879	928	1005	1075	1155	1223	1291
Total absorbed power	(1)	kW	223	235	248	270	291	312	331	349
EER	(1)		3,8	3,7	3,7	3,7	3,7	3,7	3,7	3,7
User-side heat exchanger										
Quantity		n°	1	1	1	1	1	1	1	1
Water flow rate (A30°C; W10°C; e.g.30%)	(1)	m³/h	160,1	168,6	178,2	193	206,8	222,2	235,5	248,1
FC BASIC (A5°C; W10°C; e.g.30%)										
Free-cooling modules		n°	4	4	4	4	5	5	6	6
Refrigeration capacity only FC	(2)	kW	413	427	440	451	558	572	654	665
Absorbed power only FC	(2)	kW	14	14	14	14	18	18	21	21
TFT	(3)	°C	-4,3	-4,7	-5,4	-6,6	-3,6	-4,5	-3	-3,7
Total head losses	(7)	kPa	107	124	143	164	153	154	147	108
Total internal volume	(4)	l	410	410	410	400	385	430	430	545
FC CUSTOM (A5°C; W10°C; e.g.30%)										
Free-cooling modules		n°	5	5	5	5	6	6	7	7
Refrigeration capacity only FC	(2)	kW	506	524	540	555	634	651	731	743
Absorbed power only FC	(2)	kW	18	18	18	18	21	21	25	25
TFT	(3)	°C	-0,8	-1,1	-1,5	-2,4	-1,3	-2	-1,1	-1,6
Total head losses	(7)	kPa	87	100	115	133	133	132	132	92
Total internal volume	(4)	l	410	410	410	400	385	430	430	545
FC EXTRA (A5°C; W10°C; e.g.30%)										
Free-cooling modules		n°	6	6	7	7	8	8	9	9
Refrigeration capacity only FC	(2)	kW	590	611	689	709	786	807	887	902
Absorbed power only FC	(2)	kW	21	21	25	25	28	28	32	32
TFT	(3)	°C	1,3	1,1	1,9	1,3	1,7	1,1	1,6	1,2
Total head losses	(7)	kPa	75	87	90	104	113	109	115	74
Total internal volume	(4)	l	410	410	410	400	385	430	430	545
Ventilatori										
Chiller fans		n°	12	13	14	15	16	17	18	19
Ventilatori FC BASIC		n°	8	8	8	8	10	10	12	12
Ventilatori FC CUSTOM		n°	10	10	10	10	12	12	14	14
Ventilatori FC EXTRA		n°	12	12	14	14	16	16	18	18
Compressors										
Compressors/Circuits		n°/n°	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2
Minimum capacity reduction step	(8)	%	13%	12%	13%	12%	13%	12%	13%	12%
Refrigerant charge (MCHX)		kg	83	92	92	105	111	128	128	141
Refrigerant charge (Cu/Al)		kg	119	131	134	150	159	179	182	198
Noise levels										
Chiller: Sound power level	(5)	dB(A)	99	100	100	100	100	101	101	102
Chiller: Sound power level of LN version	(5)	dB(A)	94	95	95	95	95	96	96	97
Chiller: Sound pressure level	(6)	dB(A)	67	67	67	67	67	68	68	69
Chiller: Sound pressure level of LN version	(6)	dB(A)	62	62	62	62	62	63	63	64
FC BASIC: Sound power level	(5)	dB(A)	80	80	80	80	81	81	82	82
FC CUSTOM: Sound power level	(5)	dB(A)	81	81	81	81	82	82	82	82
FC EXTRA: Sound power level	(5)	dB(A)	82	82	82	82	83	83	84	84
FC BASIC: Sound pressure level	(6)	dB(A)	48	48	48	48	49	49	50	50
FC CUSTOM: Sound pressure level	(6)	dB(A)	49	49	49	49	50	50	50	50
FC EXTRA: Sound pressure level	(6)	dB(A)	50	50	50	50	51	51	52	52

Dimensions and weights**

FC BASIC MCHX: unit with microchannel coils ; CuAl: unit with copper/aluminium tube/fin coils)

Modules Outside air temperature 30°C; evaporator inlet/outlet fluid temperature 15/10°C; glycol at 30%.

Length Outside air temperature 5°C; glycol temperature at outlet from free-cooling coils 10°C; glycol at 30%.

Length chiller module The TFT (Total Free-cooling Temperature) is the outside air temperature at which the cooling performance of the water coils is the same as the performance of the chiller section under the condition of A30°C; E.G.30% 15/10°C

Length free-cooling module Volume of water contained in the unit when it is working in free cooling mode. If present, the volume contained in the tank should also be considered.

FC CUSTOM Unit operating at rated engine speed, without any accessory, with external air temperature 30 ° C and inlet / outlet water temperature for user exchanger 15/10 ° C. Binding values. Values obtained from measurements carried out according to ISO 3744. evaporator 15/10 ° C.

Modules Values obtained from the sound power level (conditions: note 5), related to a distance of 10 m from the unit in free field with directivity factor Q=2. Non-binding values.

Length Data refers to the unit with free-cooling ON

Length chiller module Approximate value. The minimum capacity reached by the unit depends on the operating conditions. The value shown may not be suitable for calculating the minimum volume of water: to do this, consult the "Minimum water content in the system" section.

Length free-cooling module Basic CH unit without included accessories

KAPPA REV HE FC

			33.2	35.2	37.2	40.2	43.2	51.2	54.2	58.2
Dimensions and weights**										
FC BASIC										
Modules		n°	1	1	1	1	1	1	1	1
Length		mm	6162	7312	7312	7312	7312	9605	10750	10750
Length chiller module		mm	-	-	-	-	-	-	-	-
Length free-cooling module		mm	-	-	-	-	-	-	-	-
FC CUSTOM										
Modules		n°	1	1	1	1	1	1	1	1
Length		mm	6162	8460	8460	8460	8460	9605	11898	11898
Length chiller module		mm	-	-	-	-	-	-	-	-
Length free-cooling module		mm	-	-	-	-	-	-	-	-
FC EXTRA										
Modules		n°	1	1	1	1	1	1	1	1
Length		mm	7310	9608	9608	9608	9608	10753	13047	13047
Length chiller module		mm	-	-	-	-	-	-	-	-
Length free-cooling module		mm	-	-	-	-	-	-	-	-
Depth		mm	2260	2260	2260	2260	2260	2260	2260	2260
Height		mm	2440	2440	2440	2440	2440	2440	2440	2440
			67.2	73.2	80.2	85.2	90.2	95.2	100.2	105.2
Dimensions and weights**										
FC BASIC										
Modules		n°	1	1	1	2	2	2	2	2
Length		mm	11898	13053	13053	14198	15347	16492	17640	18850
Length chiller module		mm	-	-	-	9610	9610	10755	10755	11965
Length free-cooling module		mm	-	-	-	4588	5737	5737	6885	6885
FC CUSTOM										
Modules		n°	1	2	2	2	2	2	2	2
Length		mm	13047	14202	14202	15347	16495	17640	18789	19999
Length chiller module		mm	-	8465	8465	9610	9610	10755	10755	11965
Length free-cooling module		mm	-	5737	5737	5737	6885	6885	8034	8034
FC EXTRA										
Modules		n°	2	2	2	2	2	2	2	2
Length		mm	14195	15350	16499	17644	18793	19938	21085	22295
Length chiller module		mm	7310	8465	8465	9610	9610	10755	10755	11965
Length free-cooling module		mm	6885	6885	8034	8034	9183	9183	10330	10330
Depth		mm	2260	2260	2260	2260	2260	2260	2260	2260
Height		mm	2440	2440	2440	2440	2440	2440	2440	2440

KAPPA REV SLN FC

			33.2	35.2	37.2	40.2	43.2	51.2	54.2	58.2
Cooling (A30°C; W10°C; e.g.30%)										
Refrigeration capacity	(1)	kW	362	405	431	487	540	570	631	738
Total absorbed power	(1)	kW	104	117	121	139	156	163	181	214
EER	(1)		3,5	3,5	3,6	3,5	3,5	3,5	3,5	3,5
User-side heat exchanger										
Quantity		n°	1	1	1	1	1	1	1	1
Water flow rate (A30°C; W10°C; e.g.30%)	(1)	m³/h	133	125	125	157	157	149	149	255
FC BASIC (A5°C; W10°C; e.g.30%)										
Free-cooling modules		n°	1 ½	2	2	2	2	2	2 ½	3
Refrigeration capacity only FC	(2)	kW	161,0	218	225,1	232,9	240,2	246,6	298,4	351,4
Absorbed power only FC	(2)	kW	5,25	7	7	7	7	7	8,75	10,5
TFT	(3)	°C	-6,5	-2,8	-3,4	-5,2	-6,9	-7,7	-5,6	-5,4
Total head losses	(7)	kPa	91,2	93,2	108	136,7	158,3	149,4	144,9	124,1
Total internal volume	(4)	l	145	140	140	170	170	160	305	330
FC CUSTOM (A5°C; W10°C; e.g.30%)										
Free-cooling modules		n°	2	3	3	3	3	3	3	4
Refrigeration capacity only FC	(2)	kW	209,7	281,8	291,6	302,4	312,5	321,6	340	404,6
Absorbed power only FC	(2)	kW	7	10,5	10,5	10,5	10,5	10,5	10,5	14
TFT	(3)	°C	-1,5	1,1	0,8	-0,4	-1,5	-1,9	-2,8	-2,4
Total head losses	(7)	kPa	102,4	61,9	71,5	93,8	108,3	92,3	118,4	89,3
Total internal volume	(4)	l	145	200	200	230	230	225	225	410
FC EXTRA (A5°C; W10°C; e.g.30%)										
Free-cooling modules		n°	3	4	4	4	4	4	4	5
Refrigeration capacity only FC	(2)	kW	277,9	330,5	342,3	355,4	367,7	378,8	401,4	508,7
Absorbed power only FC	(2)	kW	10,5	14	14	14	14	14	14	17,5
TFT	(3)	°C	2,3	2,9	2,7	1,7	0,9	0,6	-0,1	1
Total head losses	(7)	kPa	78,4	50,3	58,1	78	90	71,5	91,4	72,4
Total internal volume	(4)	l	210	280	280	315	315	305	305	410
Ventilatori										
Chiller fans		n°	6	7	8	8	8	9	11	12
Ventilatori FC BASIC		n°	3	4	4	4	4	4	5	6
Ventilatori FC CUSTOM		n°	4	6	6	6	6	6	6	8
Ventilatori FC EXTRA		n°	6	8	8	8	8	8	8	10
Compressors										
Compressors/Circuits		n°/n°	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2
Minimum capacity reduction step	(8)	%	12%	12%	12,5%	11%	12,5%	12%	12%	12%
Refrigerant charge (MCHX)		kg	46	52	52	56	56	68	77	83
Refrigerant charge (Cu/Al)		kg	64	73	76	80	80	95	110	119
Noise levels										
Chiller: Sound power lev. SLN vers.	(5)	dB(A)	86	87	87	88	88	89	90	90
Chiller: Sound pressure lev. SLN vers.	(5)	dB(A)	54	55	54	56	56	57	58	58
FC BASIC: Sound power lev.	(5)	dB(A)	76	77	77	77	77	77	78	79
FC CUSTOM: Sound power lev.	(5)	dB(A)	77	79	79	79	79	79	79	80
FC EXTRA: Sound power lev.	(5)	dB(A)	79	80	80	80	80	80	80	81
FC BASIC: Sound pressure lev.	(6)	dB(A)	44	45	45	45	45	45	46	47
FC CUSTOM: Sound pressure lev.	(6)	dB(A)	45	47	47	47	47	47	47	48
FC EXTRA: Sound pressure lev.	(6)	dB(A)	47	48	48	48	48	48	48	49

Dimensions and weights**

FC BASIC MCHX: unit with microchannel coils ; CuAl: unit with copper/aluminium tube/fin coils)

Modules Outside air temperature 30°C; evaporator inlet/outlet fluid temperature 15/10°C; glycol at 30%.

Length Outside air temperature 5°C; evaporator inlet/outlet fluid temperature 15/10°C; glycol at 30%.

Length chiller module The TFT (Total Free-cooling Temperature) is the outside air temperature at which the cooling performance of the water coils is the same as the performance of the chiller section under the condition of A30°C; E.G.30% 15/10°C

Length free-cooling module Volume of water contained in the unit when it is working in free cooling mode. If present, the volume contained in the tank should also be considered.

FC CUSTOM Unit operating at rated engine speed, without any accessory, with external air temperature 30 ° C and inlet / outlet water temperature for user exchanger 15/10 ° C. Binding values. Values obtained from measurements carried out according to ISO 3744. evaporator 15/10 ° C.

Modules Values obtained from the sound power level (conditions: note 5), related to a distance of 10 m from the unit in free field with directivity factor Q=2. Non-binding values.

Length Data refers to the unit with free-cooling ON

Length chiller module Approximate value. The minimum capacity reached by the unit depends on the operating conditions. The value shown may not be suitable for calculating the minimum volume of water: to do this, consult the "Minimum water content in the system" section.

Length free-cooling module Basic CH unit without included accessories

KAPPA REV SLN FC

			67.2	73.2	80.2	85.2	90.2	95.2	100.2	105.2
Cooling (A30°C; W10°C; e.g.30%)										
Refrigeration capacity	(1)	kW	802	845	894	968	1038	1113	1179	1246
Total absorbed power	(1)	kW	233	244	257	280	303	325	345	364
EER	(1)		3,4	3,5	3,5	3,5	3,4	3,4	3,4	3,4
User-side heat exchanger										
Quantity		n°	1	1	1	1	1	1	1	1
Water flow rate (A30°C; W10°C; e.g.30%)	(1)	m³/h	255	255	255	246	228	276	276	390
FC BASIC (A5°C; W10°C; e.g.30%)										
Free-cooling modules		n°	3	4	4	4	5	5	6	6
Refrigeration capacity only FC	(2)	kW	359,7	420,5	433,5	444,8	549,4	563,9	644,3	655
Absorbed power only FC	(2)	kW	10,5	14	14	14	17,5	17,5	21	21
TFT	(3)	°C	-6,7	-4,2	-4,9	-6,1	-3,1	-4	-2,6	-3,2
Total head losses	(7)	kPa	138,8	115,7	132,9	153,1	142,7	144,1	137,2	101,3
Total internal volume	(4)	l	330	410	410	400	385	430	430	545
FC CUSTOM (A5°C; W10°C; e.g.30%)										
Free-cooling modules		n°	4	5	5	5	6	6	7	7
Refrigeration capacity only FC	(2)	kW	414,8	515,2	531,7	546,2	624,2	641,2	719,6	731,8
Absorbed power only FC	(2)	kW	14	17,5	17,5	17,5	21	21	24,5	24,5
TFT	(3)	°C	-3,4	-0,7	-1,1	-2	-0,9	-1,6	-0,7	-1,3
Total head losses	(7)	kPa	99,7	93,5	107,3	124,1	124,1	123,1	122,9	85,7
Total internal volume	(4)	l	410	410	410	400	385	430	430	545
FC EXTRA (A5°C; W10°C; e.g.30%)										
Free-cooling modules		n°	5	6	6	7	8	8	9	9
Refrigeration capacity only FC	(2)	kW	521,9	600,4	620,2	697,1	773,1	794,9	872,5	887,8
Absorbed power only FC	(2)	kW	17,5	21	21	24,5	28	28	31,5	31,5
TFT	(3)	°C	0,2	1,4	1,1	1,5	1,9	1,4	1,8	1,4
Total head losses	(7)	kPa	80,7	80,9	92,8	97,5	105,4	102	107,5	69,2
Total internal volume	(4)	l	410	410	410	400	385	430	430	545
Ventilatori										
Chiller fans		n°	12	13	14	15	16	17	18	19
Ventilatori FC BASIC		n°	6	8	8	8	10	10	12	12
Ventilatori FC CUSTOM		n°	8	10	10	10	12	12	14	14
Ventilatori FC EXTRA		n°	10	12	12	14	16	16	18	18
Compressors										
Compressors/Circuits		n°/n°	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2
Minimum capacity reduction step	(8)	%	13%	12%	13%	12%	13%	12%	13%	12%
Refrigerant charge (MCHX)		kg	83	92	92	105	111	128	128	141
Refrigerant charge (Cu/Al)		kg	119	131	134	150	159	179	182	198
Noise levels										
Chiller: Sound power lev. SLN vers.	(5)	dB(A)	91	92	92	92	92	93	93	94
Chiller: Sound pressure lev. SLN vers.	(5)	dB(A)	59	59	59	59	59	60	60	61
FC BASIC: Sound power lev.	(5)	dB(A)	79	80	80	80	81	81	82	82
FC CUSTOM: Sound power lev.	(5)	dB(A)	80	81	81	81	82	82	82	82
FC EXTRA: Sound power lev.	(5)	dB(A)	81	82	82	82	83	83	84	84
FC BASIC: Sound pressure lev.	(6)	dB(A)	47	48	48	48	49	49	50	50
FC CUSTOM: Sound pressure lev.	(6)	dB(A)	48	49	49	49	50	50	50	50
FC EXTRA: Sound pressure lev.	(6)	dB(A)	49	50	50	50	51	51	52	52

Dimensions and weights**

FC BASIC MCHX: unit with microchannel coils ; CuAl: unit with copper/aluminium tube/fin coils)

Modules Outside air temperature 30°C; evaporator inlet/outlet fluid temperature 15/10°C; glycol at 30%.

Length Outside air temperature 5°C; evaporator inlet/outlet fluid temperature 15/10°C; glycol at 30%.

Length chiller module The TFT (Total Free-cooling Temperature) is the outside air temperature at which the cooling performance of the water coils is the same as the performance of the chiller section under the condition of A30°C; E.G.30% 15/10°C

Length free-cooling module Volume of water contained in the unit when it is working in free cooling mode. If present, the volume contained in the tank should also be considered.

FC CUSTOM Unit operating at rated engine speed, without any accessory, with external air temperature 30 ° C and inlet / outlet water temperature for user exchanger 15/10 ° C. Binding values. Values obtained from measurements carried out according to ISO 3744. evaporator 15/10 ° C.

Modules Values obtained from the sound power level (conditions: note 5), related to a distance of 10 m from the unit in free field with directivity factor Q=2. Non-binding values.

Length Data refers to the unit with free-cooling ON

Length chiller module Approximate value. The minimum capacity reached by the unit depends on the operating conditions. The value shown may not be suitable for calculating the minimum volume of water: to do this, consult the "Minimum water content in the system" section.

Length free-cooling module Basic CH unit without included accessories

KAPPA REV SLN FC

			33.2	35.2	37.2	40.2	43.2	51.2	54.2	58.2
Dimensions and weights**										
FC BASIC										
Modules		n°	1	1	1	1	1	1	1	1
Length		mm	6162	7312	7312	7312	7312	8457	10750	10750
Length chiller module		mm	-	-	-	-	-	-	-	-
Length free-cooling module		mm	-	-	-	-	-	-	-	-
FC CUSTOM										
Modules		n°	1	1	1	1	1	1	1	1
Length		mm	6162	8460	8460	8460	8460	9605	10750	11898
Length chiller module		mm	-	-	-	-	-	-	-	-
Length free-cooling module		mm	-	-	-	-	-	-	-	-
FC EXTRA										
Modules		n°	1	1	1	1	1	1	1	1
Length		mm	7310	9608	9608	9608	9608	10753	11898	13047
Length chiller module		mm	-	-	-	-	-	-	-	-
Length free-cooling module		mm	-	-	-	-	-	-	-	-
Depth		mm	2260	2260	2260	2260	2260	2260	2260	2260
Height		mm	2440	2440	2440	2440	2440	2440	2440	2440
			67.2	73.2	80.2	85.2	90.2	95.2	100.2	105.2
Dimensions and weights**										
FC BASIC										
Modules		n°	1	1	1	2	2	2	2	2
Length		mm	10750	13053	13053	14198	15347	16492	17640	18850
Length chiller module		mm	-	-	-	9610	9610	10755	10755	11965
Length free-cooling module		mm	-	-	-	4588	5737	5737	6885	6885
FC CUSTOM										
Modules		n°	1	2	2	2	2	2	2	2
Length		mm	11898	14202	14202	15347	16495	17640	18789	19999
Length chiller module		mm	-	8465	8465	9610	9610	10755	10755	11965
Length free-cooling module		mm	-	5737	5737	5737	6885	6885	8034	8034
FC EXTRA										
Modules		n°	1	2	2	2	2	2	2	2
Length		mm	13047	15350	15350	17644	18793	19938	21085	22295
Length chiller module		mm	-	8465	8465	9610	9610	10755	10755	11965
Length free-cooling module		mm	-	6885	6885	8034	9183	9183	10330	10330
Depth		mm	2260	2260	2260	2260	2260	2260	2260	2260
Height		mm	2440	2440	2440	2440	2440	2440	2440	2440

KAPPA REV HEI FC

			58.2	67.2	73.2	80.2	85.2	90.2	100.3	105.3
Cooling (A30°C; W10°C; e.g.30%)										
Refrigeration capacity	(1)	kW	643	742	826	889	1010	1070	1171	1242
Total absorbed power	(1)	kW	166	196	220	235	271	289	308	333
EER	(1)		3,9	3,8	3,8	3,8	3,7	3,7	3,8	3,7
User-side heat exchanger										
Quantity		n°	1	1	1	1	1	1	1	1
Water flow rate (A30°C; W10°C; e.g.30%)	(1)	m³/h	123	142	159	171	194	206	225	239
FC BASIC (A5°C; W10°C; e.g.30%)										
Free-cooling modules		n°	3	3	4	4	5	5	6	6
Refrigeration capacity only FC	(2)	kW	309	360	422	436	546	562	653	670
Absorbed power only FC	(2)	kW	11	11	14	14	18	18	21	21
TFT	(3)	°C	-4,6	-5,1	-3,8	-4,7	-2,8	-3,4	-2,2	-2,9
Total head losses	(7)	kPa	106	141	123	143	124	139	99	111
Total internal volume	(4)	l	330	320	385	385	435	545	525	525
FC CUSTOM (A5°C; W10°C; e.g.30%)										
Free-cooling modules		n°	4	4	5	5	6	6	7	7
Refrigeration capacity only FC	(2)	kW	354	415	518	535	620	639	730	749
Absorbed power only FC	(2)	kW	14	14	18	18	21	21	25	25
TFT	(3)	°C	-2,1	-2,2	-0,3	-1	-0,6	-1,1	-0,4	-1
Total head losses	(7)	kPa	77	102	100	116	106	118	84	94
Total internal volume	(4)	l	410	400	385	385	435	545	525	525
FC EXTRA (A5°C; W10°C; e.g.30%)										
Free-cooling modules		n°	5	5	6	6	8	8	9	9
Refrigeration capacity only FC	(2)	kW	443	522	603	625	768	792	886	909
Absorbed power only FC	(2)	kW	18	18	21	21	28	28	32	32
TFT	(3)	°C	1,1	1,2	1,7	1,2	2,2	1,8	2,1	1,7
Total head losses	(7)	kPa	62	83	87	101	88	98	68	76
Total internal volume	(4)	l	410	400	385	385	435	545	525	525
Ventilatori										
Chiller fans		n°	12	13	14	15	16	18	20	21
Ventilatori FC BASIC		n°	6	6	8	8	10	10	12	12
Ventilatori FC CUSTOM		n°	8	8	10	10	12	12	14	14
Ventilatori FC EXTRA		n°	10	10	12	12	16	16	18	18
Compressors										
Compressors/Circuits		n°/n°	2/2	2/2	2/2	2/2	2/2	2/2	3/3	3/3
Minimum capacity reduction step	(8)	%	12,5%	11%	10%	9%	8%	8%	7%	7%
Refrigerant charge (MCHX)		kg	83	91	102	107	119	132	178	182
Refrigerant charge (Cu/Al)		kg	119	130	144	152	167	186	238	245
Noise levels										
Chiller: Sound power level	(5)	dB(A)	99	100	101	101	101	103	102	103
Chiller: Sound pressure level	(6)	dB(A)	67	67	68	68	68	70	69	69
Chiller: Sound power level of LN version	(5)	dB(A)	95	96	97	97	97	99	98	99
Chiller: Sound pressure level of LN version	(6)	dB(A)	63	63	64	64	64	66	65	65
FC BASIC: Sound power level	(5)	dB(A)	79	79	80	80	81	81	82	82
FC CUSTOM: Sound power level	(5)	dB(A)	80	80	81	81	82	82	82	82
FC EXTRA: Sound power level	(5)	dB(A)	81	81	82	82	83	83	84	84
FC BASIC: Sound pressure level	(6)	dB(A)	47	47	48	48	49	49	50	50
FC CUSTOM: Sound pressure level	(6)	dB(A)	48	48	49	49	50	50	50	50
FC EXTRA: Sound pressure level	(6)	dB(A)	49	49	50	50	51	51	52	52

Dimensions and weights**

FC BASIC MCHX: unit with microchannel coils ; CuAl: unit with copper/aluminium tube/fin coils)

Modules Outside air temperature 30°C; evaporator inlet/outlet fluid temperature 15/10°C; glycol at 30%.

Length Outside air temperature 5°C; fluid temperature at outlet from free-cooling coils 10°C; glycol at 30%.

Length chiller module The TFT (Total Free-cooling Temperature) is the outside air temperature at which the cooling performance of the water coils is the same as the performance of the chiller section under the condition of A30°C; E.G.30% 15/10°C

Length free-cooling module Volume of water contained in the unit when it is working in free cooling mode. If present, the volume contained in the tank should also be considered.

FC CUSTOM Unit operating at rated engine speed, without any accessory, with external air temperature 30 ° C and inlet / outlet water temperature for user exchanger 15/10 ° C. Binding values. Values obtained from measurements carried out according to ISO 3744. evaporator 15/10 ° C.

Modules Values obtained from the sound power level (conditions: note 5), related to a distance of 10 m from the unit in free field with directivity factor Q=2. Non-binding values.

Length Data refers to the unit with free-cooling ON

Length chiller module Approximate value. The minimum capacity reached by the unit depends on the operating conditions. The value shown may not be suitable for calculating the minimum volume of water: to do this, consult the "Minimum water content in the system" section.

Length free-cooling module Basic CH unit without included accessories

KAPPA REV HEi FC

			58.2	67.2	73.2	80.2	85.2	90.2	100.3	105.3
Dimensions and weights**										
FC BASIC										
Modules		n°	1	1	1	2	2	2	2	2
Length		mm	10750	11905	13053	14198	15347	16492	18850	19995
Length chiller module		mm	-	-	-	9610	9610	10755	11965	13110
Length free-cooling module		mm	-	-	-	4588	5737	5737	6885	6885
FC CUSTOM										
Modules		n°	1	1	2	2	2	2	2	2
Length		mm	11898	13053	14202	15347	16495	17640	19999	21144
Length chiller module		mm	-	-	8465	9610	9610	10755	11965	13110
Length free-cooling module		mm	-	-	5737	5737	6885	6885	8034	8034
FC EXTRA										
Modules		n°	1	2	2	2	2	2	2	2
Length		mm	13047	14202	15350	16495	18793	19938	22295	23440
Length chiller module		mm	-	8465	8465	9610	9610	10755	11965	13110
Length free-cooling module		mm	-	5737	6885	6885	9183	9183	10330	10330
Depth		mm	2260	2260	2260	2260	2260	2260	2260	2260
Height		mm	2440	2440	2440	2440	2440	2440	2440	2440

KAPPA REV XEi FC

			30.1	35.1	45.1	55.2	65.2	70.2	80.2	90.2	100.3
Cooling (A30°C; W10°C; e.g.30%)											
Refrigeration capacity	(1)	kW	322	402	504	640	723	817	902	1003	1140
Total absorbed power	(1)	kW	85	109	141	169	194	218	251	285	304
EER	(1)		3,8	3,7	3,6	3,8	3,7	3,7	3,6	3,5	3,7
User-side heat exchanger											
Quantity		n°	1	1	1	1	1	1	1	1	1
Water flow rate (A30°C; W10°C; e.g.30%)	(1)	m³/h	61,8	77,2	96,5	122,7	138,9	156,7	173,2	192,7	218,8
FC BASIC (A5°C; W10°C; e.g.30%)											
Free-cooling modules		n°	1 ½	2	2	3	3	4	4	4	5
Refrigeration capacity only FC	(2)	kW	159	222	241	340	356	421	441	459	579
Absorbed power only FC	(2)	kW	5	7	7	11	11	14	14	14	18
TFT	(3)	°C	-4,4	-2,5	-5,3	-3,1	-4,8	-3,6	-4,8	-6,4	-4,1
Total head losses	(7)	kPa	82	143	135	106	134	120	149	166	118
Total internal volume	(4)	l	145	140	160	330	320	385	385	435	525
FC CUSTOM (A5°C; W10°C; e.g.30%)											
Free-cooling modules		n°	2	3	3	4	4	5	5	5	6
Refrigeration capacity only FC	(2)	kW	206	287	314	391	411	516	541	564	659
Absorbed power only FC	(2)	kW	7	11	11	14	14	18	18	18	21
TFT	(3)	°C	0	1,4	-0,4	-0,7	-1,9	-0,2	-1	-2,1	-1,6
Total head losses	(7)	kPa	92	109	83	77	97	98	122	132	94
Total internal volume	(4)	l	145	200	225	410	400	385	385	435	525
FC EXTRA (A5°C; W10°C; e.g.30%)											
Free-cooling modules		n°	3	4	4	5	5	6	7	7	8
Refrigeration capacity only FC	(2)	kW	272	336	370	491	517	601	690	721	817
Absorbed power only FC	(2)	kW	11	14	14	18	18	21	25	25	28
TFT	(3)	°C	3,3	3,2	1,8	2,3	1,4	1,8	2,2	1,5	1,5
Total head losses	(7)	kPa	70	97	65	62	79	86	96	101	70
Total internal volume	(4)	l	210	280	305	410	400	385	385	435	525
Ventilatori											
Chiller fans		n°	6	8	10	12	14	16	18	20	22
Ventilatori FC BASIC		n°	3	4	4	6	6	8	8	8	10
Ventilatori FC CUSTOM		n°	4	6	6	8	8	10	10	10	12
Ventilatori FC EXTRA		n°	6	8	8	10	10	12	14	14	16
Compressors											
Compressors/Circuits		n°/n°	1/1	1/1	1/1	2/2	2/2	2/2	2/2	2/2	3/3
Minimum capacity reduction step	(8)	%	25%	20%	16%	12,5%	11,2%	10%	8%	8%	5,6%
Refrigerant charge (MCHX)		kg	44	56	68	83	96	111	140	160	187
Refrigerant charge (Cu/Al)		kg	62	80	98	119	138	159	194	220	253
Noise levels											
Chiller: Sound power level	(5)	dB(A)	99	100	101	102	103	103	104	104	105
Chiller: Sound pressure level	(6)	dB(A)	67	68	69	69	70	70	71	71	71
Chiller: Sound power level of LN version	(5)	dB(A)	95	96	97	98	99	99	100	100	101
Chiller: Sound pressure level of LN version	(6)	dB(A)	63	64	65	65	66	66	67	67	67
FC BASIC: Sound power level	(5)	dB(A)	76	77	77	79	79	80	80	80	81
FC CUSTOM: Sound power level	(5)	dB(A)	77	79	79	80	80	81	81	81	82
FC EXTRA: Sound power level	(5)	dB(A)	79	80	80	81	81	82	82	82	83
FC BASIC: Sound pressure level	(6)	dB(A)	44	45	45	47	47	48	48	48	49
FC CUSTOM: Sound pressure level	(6)	dB(A)	45	47	47	48	48	49	49	49	50
FC EXTRA: Sound pressure level	(6)	dB(A)	47	48	48	49	49	50	50	50	51

Dimensions and weights**

FC BASIC MCHX: unit with microchannel coils ; Cu/Al: unit with copper/aluminium tube/fin coils)

Modules Outside air temperature 30°C; evaporator inlet/outlet fluid temperature 15/10°C; glycol at 30%.

Length Outside air temperature 5°C; fluid temperature at outlet from free-cooling coils 10°C; glycol at 30%.

Length chiller module The TFT (Total Free-cooling Temperature) is the outside air temperature at which the cooling performance of the water coils is the same as the performance of the chiller section under the condition of A30°C; E.G.30% 15/10°C

Length free-cooling module Volume of water contained in the unit when it is working in free cooling mode. If present, the volume contained in the tank should also be considered.

FC CUSTOM Unit operating at rated engine speed, without any accessory, with external air temperature 30 ° C and inlet / outlet water temperature for user exchanger 15/10 ° C. Binding values. Values obtained from measurements carried out according to ISO 3744. evaporator 15/10 ° C.

Modules Values obtained from the sound power level (conditions: note 5), related to a distance of 10 m from the unit in free field with directivity factor Q=2. Non-binding values.

Length Data refers to the unit with free-cooling ON

Length chiller module Approximate value. The minimum capacity reached by the unit depends on the operating conditions. The value shown may not be suitable for calculating the minimum volume of water: to do this, consult the "Minimum water content in the system" section.

Length free-cooling module Basic CH unit without included accessories

KAPPA REV XEi FC

			30.1	35.1	45.1	55.2	65.2	70.2	80.2	90.2	100.3
Dimensions and weights**											
FC BASIC											
Modules		n°	1	1	1	1	1	2	2	2	2
Length		mm	6162	7312	7457	10750	11905	14198	15343	16553	18847
Length chiller module		mm	-	-	-	-	-	9610	10755	11965	13110
Length free-cooling module		mm	-	-	-	-	-	4588	4588	4588	5737
FC CUSTOM											
Modules		n°	1	1	1	1	1	2	2	2	2
Length		mm	6162	8460	8605	11898	13053	15347	16492	17702	19995
Length chiller module		mm	-	-	-	-	-	9610	10755	11965	13110
Length free-cooling module		mm	-	-	-	-	-	5737	5737	5737	6885
FC CUSTOM											
Modules		n°	1	1	1	1	2	2	2	2	2
Length		mm	7310	9608	9753	13047	14202	16495	18789	19999	22293
Length chiller module		mm	-	-	-	-	8465	9610	10755	11965	13110
Length free-cooling module		mm	-	-	-	-	5737	6885	8034	8034	9183
Depth		mm	2260	2260	2260	2260	2260	2260	2260	2260	2260
Height		mm	2440	2440	2440	2440	2440	2440	2440	2440	2440

KAPPA REV FC (R513A)

			33.2	35.2	37.2	40.2	43.2	51.2	54.2	58.2	67.2
Cooling (A30°C; W10°C; e.g.30%)											
Refrigeration capacity	(1)	kW	356	399	425	468	516	559	641	686	777
Total absorbed power	(1)	kW	110	109	131	151	166	178	203	225	245
EER	(1)		3,32	3,78	3,35	3,2	3,18	3,23	3,28	3,14	3,28
User-side heat exchanger											
Quantity		n°	1	1	1	1	1	1	1	1	1
Water flow rate (A30°C; W10°C; e.g.30%)	(1)	m³/h	68	77	82	90	99	107	123	132	149
FC BASIC (A5°C; W10°C; e.g.30%)											
Free-cooling modules		n°	1 ½	2	2	2	2	2	2 ½	3	3
Refrigeration capacity only FC	(2)	kW	160	212	221	228	235	242	291	344	356
Absorbed power only FC	(2)	kW	5	7	7	7	7	7	9	11	11
TFT	(3)	°C	-6,2	-2,7	-3,5	-4,7	-6,4	-7,4	-5,8	-4,4	-6,3
Total head losses	(7)	kPa	86	123	139	165	127	170	182	133	158
Total internal volume	(4)	l	145	145	145	140	140	140	280	225	215
FC CUSTOM (A5°C; W10°C; e.g.30%)											
Free-cooling modules		n°	2	3	3	3	3	3	3	4	4
Refrigeration capacity only FC	(2)	kW	207	274	286	296	305	316	332	396	411
Absorbed power only FC	(2)	kW	7	11	11	11	11	11	11	14	14
TFT	(3)	°C	-1,4	1,2	0,7	-0,1	-1,3	-1,8	-3,1	-1,7	-3,1
Total head losses	(7)	kPa	97	94	106	126	84	116	156	103	121
Total internal volume	(4)	l	145	210	210	200	200	200	200	305	300
FC EXTRA (A5°C; W10°C; e.g.30%)											
Free-cooling modules		n°	3	4	4	4	4	4	4	5	5
Refrigeration capacity only FC	(2)	kW	274	321	335	347	359	371	391	497	517
Absorbed power only FC	(2)	kW	11	14	14	14	14	14	14	18	18
TFT	(3)	°C	2,4	3	2,6	1,9	1	0,7	-0,2	1,5	0,4
Total head losses	(7)	kPa	74	83	93	111	68	97	129	88	103
Total internal volume	(4)	l	210	290	290	280	280	280	280	305	300
Ventilatori											
Chiller fans		n°	5	6	6	6	6	7	8	9	10
Ventilatori FC BASIC		n°	3	4	4	4	4	4	5	6	6
Ventilatori FC CUSTOM		n°	4	6	6	6	6	6	6	8	8
Ventilatori FC EXTRA		n°	6	8	8	8	8	8	8	10	10
Compressors											
Compressors/Circuits		n°/n°	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2
Minimum capacity reduction step	(8)	%	12%	12%	13%	11%	13%	12%	12%	12%	13%
Refrigerant charge (MCHX)		kg	39	44	44	46	43	48	52	63	70
Refrigerant charge (Cu/Al)		kg	54	62	62	64	61	69	76	90	100
Noise levels											
Chiller: Sound power level	(5)	dB(A)	94	95	95	96	96	97	98	98	99
Chiller: Sound power level of LN version	(5)	dB(A)	89	90	90	91	91	92	93	93	94
Chiller: Sound pressure level	(6)	dB(A)	62	63	63	64	64	65	66	66	67
Chiller: Sound pressure level of LN version	(6)	dB(A)	57	58	58	59	59	59	61	60	62
FC BASIC: Sound power level	(5)	dB(A)	76	77	77	77	77	77	78	79	79
FC CUSTOM: Sound power level	(5)	dB(A)	77	79	79	79	79	79	79	80	80
FC EXTRA: Sound power level	(5)	dB(A)	79	80	80	80	80	80	80	81	81
FC BASIC: Sound pressure level	(6)	dB(A)	44	45	45	45	45	45	46	47	47
FC CUSTOM: Sound pressure level	(6)	dB(A)	45	47	47	47	47	47	47	48	48
FC EXTRA: Sound pressure level	(6)	dB(A)	47	48	48	48	48	48	48	49	49

Dimensions and weights**

Length FC BASIC ; CuAl: unit with copper/aluminium tube/fin coils)

Length FC CUSTOM

Length FC EXTRA

Depth The TFT (Total Free-cooling Temperature) is the outside air temperature at which the cooling performance of the water coils is the same as the performance of the chiller section under the condition of A30°C; E.G.30% 15/10°C

Height Volume of water contained in the unit when it is working in free cooling mode. If present, the volume contained in the tank should also be considered.

Unit operating at rated engine speed, without any accessory, with external air temperature 30 ° C and inlet / outlet water temperature for user exchanger 15/10 ° C. Binding values. Values obtained from measurements carried out according to ISO 3744. evaporator 15/10 ° C.

(MCHX: unit with microchannel coils

(1) Outside air temperature 30°C; evaporator inlet/outlet fluid temperature 15/10°C; glycol at 30%.

(2) Outside air temperature 5°C; evaporator inlet/outlet fluid temperature 15/10°C; glycol at 30%.

(3) The TFT (Total Free-cooling Temperature) is the outside air temperature at which the cooling performance of the water coils is the same as the performance of the chiller section under the condition of A30°C; E.G.30% 15/10°C

KAPPA REV FC (R513A)

			67.2	73.2	80.2	85.2	90.2	95.2	100.2	105.2	115.2
Cooling (A30°C; W10°C; e.g.30%)											
Refrigeration capacity	(1)	kW	777	831	878	936	1010	1055	1103	1171	1246
Total absorbed power	(1)	kW	245	257	267	294	329	347	365	380	398
EER	(1)		3,28	3,33	3,38	3,27	3,16	3,14	3,13	3,2	3,22
User-side heat exchanger											
Quantity		n°	1	1	1	1	1	1	1	1	1
Water flow rate (A30°C; W10°C; e.g.30%)	(1)	m³/h	149	160	168	180	194	203	212	225	239
FC BASIC (A5°C; W10°C; e.g.30%)											
Free-cooling modules		n°	3	4	4	4	4	5	5	6	6
Refrigeration capacity only FC	(2)	kW	356	417	431	439	447	553	568	645	656
Absorbed power only FC	(2)	kW	11	14	14	14	14	18	18	21	21
TFT	(3)	°C	-6,3	-4,1	-4,8	-5,8	-6,9	-3,5	-3,9	-2,5	-3,3
Total head losses	(7)	kPa	158	141	123	135	157	142	161	135	99
Total internal volume	(4)	l	215	300	410	410	400	385	385	430	545
FC CUSTOM (A5°C; W10°C; e.g.30%)											
Free-cooling modules		n°	4	5	5	5	5	6	6	7	7
Refrigeration capacity only FC	(2)	kW	411	511	528	538	549	629	646	720	733
Absorbed power only FC	(2)	kW	14	18	18	18	18	21	21	25	25
TFT	(3)	°C	-3,1	-0,7	-1,2	-1,9	-2,6	-1,3	-1,6	-0,7	-1,4
Total head losses	(7)	kPa	121	120	99	109	127	124	140	121	84
Total internal volume	(4)	l	300	300	410	410	400	385	385	430	545
FC EXTRA (A5°C; W10°C; e.g.30%)											
Free-cooling modules		n°	5	6	6	7	7	8	8	9	9
Refrigeration capacity only FC	(2)	kW	517	595	616	687	700	779	801	873	889
Absorbed power only FC	(2)	kW	18	21	21	25	25	28	28	32	32
TFT	(3)	°C	0,4	1,4	1	1,6	1,1	1,7	1,5	1,9	1,3
Total head losses	(7)	kPa	103	108	86	85	100	105	119	106	68
Total internal volume	(4)	l	300	300	410	410	400	385	385	430	545
Ventilatori											
Chiller fans		n°	10	11	12	12	12	13	14	15	16
Ventilatori FC BASIC		n°	6	8	8	8	8	10	10	12	12
Ventilatori FC CUSTOM		n°	8	10	10	10	10	12	12	14	14
Ventilatori FC EXTRA		n°	10	12	12	14	14	16	16	18	18
Compressors											
Compressors/Circuits		n°/n°	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2
Minimum capacity reduction step	(8)	%	13%	12%	13%	12%	13%	12%	13%	13%	13%
Refrigerant charge (MCHX)		kg	70	75	83	83	87	98	102	115	122
Refrigerant charge (Cu/Al)		kg	100	108	119	119	123	137	144	160	170
Noise levels											
Chiller: Sound power level	(5)	dB(A)	99	100	100	100	100	101	101	102	102
Chiller: Sound power level of LN version	(5)	dB(A)	94	95	95	95	95	96	96	97	97
Chiller: Sound pressure level	(6)	dB(A)	67	67	67	68	68	68	68	69	69
Chiller: Sound pressure level of LN version	(6)	dB(A)	62	63	63	63	62	63	63	64	64
FC BASIC: Sound power level	(5)	dB(A)	79	80	80	80	80	81	81	82	82
FC CUSTOM: Sound power level	(5)	dB(A)	80	81	81	81	81	82	82	82	82
FC EXTRA: Sound power level	(5)	dB(A)	81	82	82	82	82	83	83	84	84
FC BASIC: Sound pressure level	(6)	dB(A)	47	48	48	48	48	49	49	50	50
FC CUSTOM: Sound pressure level	(6)	dB(A)	48	49	49	49	49	50	50	50	50
FC EXTRA: Sound pressure level	(6)	dB(A)	49	50	50	50	50	51	51	52	52

Dimensions and weights**

Length FC BASIC ; CuAl: unit with copper/aluminium tube/fin coils)

Length FC CUSTOM

Length FC EXTRA

Depth The TFT (Total Free-cooling Temperature) is the outside air temperature at which the cooling performance of the water coils is the same as the performance of the chiller section under the condition of A30°C; E.G.30% 15/10°C

Height Volume of water contained in the unit when it is working in free cooling mode. If present, the volume contained in the tank should also be considered.

Unit operating at rated engine speed, without any accessory, with external air temperature 30 ° C and inlet / outlet water temperature for user exchanger 15/10 ° C. Binding values. Values obtained from measurements carried out according to ISO 3744. evaporator 15/10 ° C.

(MCHX: unit with microchannel coils

(1) Outside air temperature 30°C; evaporator inlet/outlet fluid temperature 15/10°C; glycol at 30%.

(2) Outside air temperature 5°C; evaporator inlet/outlet fluid temperature 15/10°C; glycol at 30%.

(3) The TFT (Total Free-cooling Temperature) is the outside air temperature at which the cooling performance of the water coils is the same as the performance of the chiller section under the condition of A30°C; E.G.30% 15/10°C

KAPPA REV FC (R513A)

			33.2	35.2	37.2	40.2	43.2	51.2	54.2	58.2	
Dimensions and weights**											
FC BASIC											
Modules		n°	1	1	1	1	1	1	1	1	
Length		mm	6162	6162	6162	6162	6162	7312	8460	9605	
Length chiller module		mm	-	-	-	-	-	-	-	-	
Length free-cooling module		mm	-	-	-	-	-	-	-	-	
FC CUSTOM											
Modules		n°	1	1	1	1	1	1	1	1	
Length		mm	6162	7310	7310	7310	7310	8460	8460	10753	
Length chiller module		mm	-	-	-	-	-	-	-	-	
Length free-cooling module		mm	-	-	-	-	-	-	-	-	
FC EXTRA											
Modules		n°	1	1	1	1	1	1	1	1	
Length		mm	7310	8458	8458	8458	8458	9608	9608	11902	
Length chiller module		mm	-	-	-	-	-	-	-	-	
Length free-cooling module		mm	-	-	-	-	-	-	-	-	
Depth		mm	2260	2260	2260	2260	2260	2260	2260	2260	
Height		mm	2440	2440	2440	2440	2440	2440	2440	2440	
			67.2	73.2	80.2	85.2	90.2	95.2	100.2	105.2	115.2
Dimensions and weights**											
FC BASIC											
Modules		n°	1	1	1	1	1	2	2	2	2
Length		mm	9605	11898	11898	11898	11898	14202	14202	16495	16495
Length chiller module		mm	-	-	-	-	-	8465	8465	9610	9610
Length free-cooling module		mm	-	-	-	-	-	5737	5737	6885	6885
FC CUSTOM											
Modules		n°	1	1	1	1	1	2	2	2	2
Length		mm	10753	13047	13047	13047	13047	15350	15350	17644	17644
Length chiller module		mm	-	-	-	-	-	8465	8465	9610	9610
Length free-cooling module		mm	-	-	-	-	-	6885	6885	8034	8034
FC EXTRA											
Modules		n°	1	2	2	2	2	2	2	2	2
Length		mm	11902	14195	14195	15344	15344	17648	17648	19940	19940
Length chiller module		mm	-	7310	7310	7310	7310	8465	8465	9610	9610
Length free-cooling module		mm	-	6885	6885	8034	8034	9183	9183	10330	10330
Depth		mm	2260	2260	2260	2260	2260	2260	2260	2260	2260
Height		mm	2440	2440	2440	2440	2440	2440	2440	2440	2440

KAPPA REV HE FC (R513A)

			33.2	35.2	37.2	40.2	43.2	51.2	54.2	58.2
Cooling (A30°C; W10°C; e.g.30%)										
Refrigeration capacity	(1)	kW	382	438	461	526	582	591	655	765
Total absorbed power	(1)	kW	106	122	127	146	163	167	185	218
EER	(1)		3,7	3,72	3,73	3,71	3,69	3,62	3,66	3,61
User-side heat exchanger										
Quantity		n°	1	1	1	1	1	1	1	1
Water flow rate (A30°C; W10°C; e.g.30%)	(1)	m³/h	73	84	88	101	112	113	126	147
FC BASIC (A5°C; W10°C; e.g.30%)										
Free-cooling modules		n°	1 ½	2	2	2	2	2 ½	3	3
Refrigeration capacity only FC	(2)	kW	161	221	228	236	244	287	338	356
Absorbed power only FC	(2)	kW	5	7	7	7	7	9	11	11
TFT	(3)	°C	-7,4	-3,6	-4,1	-6,2	-8	-4,9	-3,6	-5,9
Total head losses	(7)	kPa	95	117	134	159	183	120	127	132
Total internal volume	(4)	l	145	140	140	170	170	305	225	330
FC CUSTOM (A5°C; W10°C; e.g.30%)										
Free-cooling modules		n°	2	3	3	3	3	3	4	4
Refrigeration capacity only FC	(2)	kW	210	286	296	307	318	327	388	411
Absorbed power only FC	(2)	kW	7	11	11	11	11	11	14	14
TFT	(3)	°C	-2,2	0,7	0,4	-0,9	-2,1	-2,3	-1	-2,8
Total head losses	(7)	kPa	107	80	92	109	125	98	98	95
Total internal volume	(4)	l	145	200	200	230	230	225	305	410
FC EXTRA (A5°C; W10°C; e.g.30%)										
Free-cooling modules		n°	3	4	4	4	4	4	5	5
Refrigeration capacity only FC	(2)	kW	279	336	347	361	374	385	488	517
Absorbed power only FC	(2)	kW	11	14	14	14	14	14	18	18
TFT	(3)	°C	1,9	2,6	2,4	1,4	0,4	0,3	2	0,7
Total head losses	(7)	kPa	82	67	76	91	104	76	84	77
Total internal volume	(4)	l	210	280	280	315	315	305	305	410
Ventilatori										
Chiller fans		n°	6	7	8	8	8	9	11	12
Ventilatori FC BASIC		n°	3	4	4	4	4	5	6	6
Ventilatori FC CUSTOM		n°	4	6	6	6	6	6	8	8
Ventilatori FC EXTRA		n°	6	8	8	8	8	8	10	10
Compressors										
Compressors/Circuits		n°/n°	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2
Minimum capacity reduction step	(8)	%	12%	12%	13%	12%	13%	12%	12%	12%
Refrigerant charge (MCHX)		kg	46	52	52	56	56	68	77	83
Refrigerant charge (Cu/Al)		kg	64	73	76	80	80	95	110	119
Noise levels										
Chiller: Sound power level	(5)	dB(A)	94	95	95	96	96	97	98	98
Chiller: Sound power level of LN version	(5)	dB(A)	89	90	90	91	91	92	93	93
Chiller: Sound pressure level	(6)	dB(A)	62	62	62	63	63	65	66	66
Chiller: Sound pressure level of LN version	(6)	dB(A)	57	58	58	59	59	59	61	60
FC BASIC: Sound power level	(5)	dB(A)	76	77	77	77	77	78	79	79
FC CUSTOM: Sound power level	(5)	dB(A)	77	79	79	79	79	79	80	80
FC EXTRA: Sound power level	(5)	dB(A)	79	80	80	80	80	80	81	81
FC BASIC: Sound pressure level	(6)	dB(A)	44	45	45	45	45	46	47	47
FC CUSTOM: Sound pressure level	(6)	dB(A)	45	47	47	47	47	47	48	48
FC EXTRA: Sound pressure level	(6)	dB(A)	47	48	48	48	48	48	49	49

Dimensions and weights**

Length FC BASIC ; CuAl: unit with copper/aluminium tube/fin coils)

Length FC CUSTOM

Length FC EXTRA

Depth The TFT (Total Free-cooling Temperature) is the outside air temperature at which the cooling performance of the water coils is the same as the performance of the chiller section under the condition of A30°C; E.G.30% 15/10°C

Height Volume of water contained in the unit when it is working in free cooling mode. If present, the volume contained in the tank should also be considered.

Unit operating at rated engine speed, without any accessory, with external air temperature 30 ° C and inlet / outlet water temperature for user exchanger 15/10 ° C. Binding values. Values obtained from measurements carried out according to ISO 3744. evaporator 15/10 ° C.

(MCHX: unit with microchannel coils

(1) Outside air temperature 30°C; evaporator inlet/outlet fluid temperature 15/10°C; glycol at 30%.

(2) Outside air temperature 5°C; evaporator inlet/outlet fluid temperature 15/10°C; glycol at 30%.

(3) The TFT (Total Free-cooling Temperature) is the outside air temperature at which the cooling performance of the water coils is the same as the performance of the chiller section under the condition of A30°C; E.G.30% 15/10°C

KAPPA REV HE FC (R513A)

			67.2	73.2	80.2	85.2	90.2	95.2	100.2	105.2
Cooling (A30°C; W10°C; e.g.30%)										
Refrigeration capacity	(1)	kW	833	876	921	1003	1079	1142	1209	1291
Total absorbed power	(1)	kW	236	247	261	285	309	329	348	365
EER	(1)		3,61	3,64	3,63	3,65	3,63	3,61	3,62	3,66
User-side heat exchanger										
Quantity		n°	1	1	1	1	1	1	1	1
Water flow rate (A30°C; W10°C; e.g.30%)	(1)	m³/h	160	168	177	193	207	220	233	248
FC BASIC (A5°C; W10°C; e.g.30%)										
Free-cooling modules		n°	4	4	4	4	5	5	6	6
Refrigeration capacity only FC	(2)	kW	413	427	440	451	558	572	654	665
Absorbed power only FC	(2)	kW	14	14	14	14	18	18	21	21
TFT	(3)	°C	-4,3	-4,7	-5,3	-6,6	-3,6	-4,4	-2,9	-3,7
Total head losses	(7)	kPa	107	123	140	164	154	151	143	108
Total internal volume	(4)	l	410	410	410	400	385	430	430	545
FC CUSTOM (A5°C; W10°C; e.g.30%)										
Free-cooling modules		n°	5	5	5	5	6	6	7	7
Refrigeration capacity only FC	(2)	kW	506	524	540	555	634	651	731	743
Absorbed power only FC	(2)	kW	18	18	18	18	21	21	25	25
TFT	(3)	°C	-0,8	-1,1	-1,4	-2,4	-1,3	-1,9	-1	-1,6
Total head losses	(7)	kPa	86	100	113	133	134	129	128	92
Total internal volume	(4)	l	410	410	410	400	385	430	430	545
FC EXTRA (A5°C; W10°C; e.g.30%)										
Free-cooling modules		n°	6	6	7	7	8	8	9	9
Refrigeration capacity only FC	(2)	kW	590	611	689	709	786	807	887	902
Absorbed power only FC	(2)	kW	21	21	25	25	28	28	32	32
TFT	(3)	°C	1,3	1,1	1,9	1,3	1,7	1,1	1,6	1,2
Total head losses	(7)	kPa	75	86	88	104	114	106	112	74
Total internal volume	(4)	l	410	410	410	400	385	430	430	545
Ventilatori										
Chiller fans		n°	12	13	14	15	16	17	18	19
Ventilatori FC BASIC		n°	8	8	8	8	10	10	12	12
Ventilatori FC CUSTOM		n°	10	10	10	10	12	12	14	14
Ventilatori FC EXTRA		n°	12	12	14	14	16	16	18	18
Compressors										
Compressors/Circuits		n°/n°	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2
Minimum capacity reduction step	(8)	%	13%	12%	13%	12%	13%	12%	13%	12%
Refrigerant charge (MCHX)		kg	83	92	92	105	111	128	128	141
Refrigerant charge (Cu/Al)		kg	119	131	134	150	159	179	182	198
Noise levels										
Chiller: Sound power level	(5)	dB(A)	99	100	100	100	100	101	101	102
Chiller: Sound power level of LN version	(5)	dB(A)	94	95	95	95	95	96	96	97
Chiller: Sound pressure level	(6)	dB(A)	67	67	67	67	67	68	68	69
Chiller: Sound pressure level of LN version	(6)	dB(A)	62	62	62	62	62	63	63	64
FC BASIC: Sound power level	(5)	dB(A)	80	80	80	80	81	81	82	82
FC CUSTOM: Sound power level	(5)	dB(A)	81	81	81	81	82	82	82	82
FC EXTRA: Sound power level	(5)	dB(A)	82	82	82	82	83	83	84	84
FC BASIC: Sound pressure level	(6)	dB(A)	48	48	48	48	49	49	50	50
FC CUSTOM: Sound pressure level	(6)	dB(A)	49	49	49	49	50	50	50	50
FC EXTRA: Sound pressure level	(6)	dB(A)	50	50	50	50	51	51	52	52

Dimensions and weights**

Length FC BASIC ; CuAl: unit with copper/aluminium tube/fin coils)

Length FC CUSTOM

Length FC EXTRA

Depth The TFT (Total Free-cooling Temperature) is the outside air temperature at which the cooling performance of the water coils is the same as the performance of the chiller section under the condition of A30°C; E.G.30% 15/10°C

Height Volume of water contained in the unit when it is working in free cooling mode. If present, the volume contained in the tank should also be considered.

Unit operating at rated engine speed, without any accessory, with external air temperature 30 ° C and inlet / outlet water temperature for user exchanger 15/10 ° C. Binding values. Values obtained from measurements carried out according to ISO 3744. evaporator 15/10 ° C.

(MCHX: unit with microchannel coils

(1) Outside air temperature 30°C; evaporator inlet/outlet fluid temperature 15/10°C; glycol at 30%.

(2) Outside air temperature 5°C; evaporator inlet/outlet fluid temperature 15/10°C; glycol at 30%.

(3) The TFT (Total Free-cooling Temperature) is the outside air temperature at which the cooling performance of the water coils is the same as the performance of the chiller section under the condition of A30°C; E.G.30% 15/10°C

KAPPA REV HE FC (R513A)

			33.2	35.2	37.2	40.2	43.2	51.2	54.2	58.2
Dimensions and weights**										
FC BASIC										
Modules		n°	1	1	1	1	1	1	1	1
Length		mm	6162	7312	7312	7312	7312	9605	10750	10750
Length chiller module		mm	-	-	-	-	-	-	-	-
Length free-cooling module		mm	-	-	-	-	-	-	-	-
FC CUSTOM										
Modules		n°	1	1	1	1	1	1	1	1
Length		mm	6162	8460	8460	8460	8460	9605	11898	11898
Length chiller module		mm	-	-	-	-	-	-	-	-
Length free-cooling module		mm	-	-	-	-	-	-	-	-
FC EXTRA										
Modules		n°	1	1	1	1	1	1	1	1
Length		mm	7310	9608	9608	9608	9608	10753	13047	13047
Length chiller module		mm	-	-	-	-	-	-	-	-
Length free-cooling module		mm	-	-	-	-	-	-	-	-
Depth		mm	2260	2260	2260	2260	2260	2260	2260	2260
Height		mm	2440	2440	2440	2440	2440	2440	2440	2440
			67.2	73.2	80.2	85.2	90.2	95.2	100.2	105.2
Dimensions and weights**										
FC BASIC										
Modules		n°	1	1	1	2	2	2	2	2
Length		mm	11898	13053	13053	14198	15347	16492	17640	18850
Length chiller module		mm	-	-	-	9610	9610	10755	10755	11965
Length free-cooling module		mm	-	-	-	4588	5737	5737	6885	6885
FC CUSTOM										
Modules		n°	1	2	2	2	2	2	2	2
Length		mm	13047	14202	14202	15347	16495	17640	18789	19999
Length chiller module		mm	-	8465	8465	9610	9610	10755	10755	11965
Length free-cooling module		mm	-	5737	5737	5737	6885	6885	8034	8034
FC EXTRA										
Modules		n°	2	2	2	2	2	2	2	2
Length		mm	14195	15350	16499	17644	18793	19938	21085	22295
Length chiller module		mm	7310	8465	8465	9610	9610	10755	10755	11965
Length free-cooling module		mm	6885	6885	8034	8034	9183	9183	10330	10330
Depth		mm	2260	2260	2260	2260	2260	2260	2260	2260
Height		mm	2440	2440	2440	2440	2440	2440	2440	2440

KAPPA REV SLN FC (R513A)

			33.2	35.2	37.2	40.2	43.2	51.2	54.2	58.2
Cooling (A30°C; W10°C; e.g.30%)										
Refrigeration capacity	(1)	kW	377	423	451	519	569	587	644	761
Total absorbed power	(1)	kW	108	121	127	146	162	166	183	217
EER	(1)		3,60	3,57	3,64	3,65	3,62	3,63	3,63	3,61
User-side heat exchanger										
Quantity		n°	1	1	1	1	1	1	1	1
Water flow rate (A30°C; W10°C; e.g.30%)	(1)	m³/h	72	81	86	100	109	112	124	146
FC BASIC (A5°C; W10°C; e.g.30%)										
Free-cooling modules		n°	1 ½	2	2	2	2	2	2 ½	3
Refrigeration capacity only FC	(2)	kW	161	218	225	233	240	247	298	351
Absorbed power only FC	(2)	kW	5	7	7	7	7	7	9	11
TFT	(3)	°C	-7	-3,1	-3,8	-5,9	-7,5	-8,1	-5,8	-5,7
Total head losses	(7)	kPa	99	101	119	156	176	158	151	132
Total internal volume	(4)	l	145	140	140	170	170	160	305	330
FC CUSTOM (A5°C; W10°C; e.g.30%)										
Free-cooling modules		n°	2	3	3	3	3	3	3	4
Refrigeration capacity only FC	(2)	kW	210	282	292	302	313	322	340	405
Absorbed power only FC	(2)	kW	7	11	11	11	11	11	11	14
TFT	(3)	°C	-1,8	0,9	0,6	-0,8	-1,9	-2,1	-3	-2,6
Total head losses	(7)	kPa	111	67	79	107	120	98	124	95
Total internal volume	(4)	l	145	200	200	230	230	225	225	410
FC EXTRA (A5°C; W10°C; e.g.30%)										
Free-cooling modules		n°	3	4	4	4	4	4	4	5
Refrigeration capacity only FC	(2)	kW	278	331	342	355	368	379	401	509
Absorbed power only FC	(2)	kW	11	14	14	14	14	14	14	18
TFT	(3)	°C	2,2	2,8	2,6	1,5	0,7	0,5	-0,2	0,9
Total head losses	(7)	kPa	85	55	64	89	100	76	95	77
Total internal volume	(4)	l	210	280	280	315	315	305	305	410
Ventilatori										
Chiller fans		n°	6	7	8	8	8	9	11	12
Ventilatori FC BASIC		n°	3	4	4	4	4	4	5	6
Ventilatori FC CUSTOM		n°	4	6	6	6	6	6	6	8
Ventilatori FC EXTRA		n°	6	8	8	8	8	8	8	10
Compressors										
Compressors/Circuits		n°/n°	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2
Minimum capacity reduction step	(8)	%	12%	12%	12,5%	11%	12,5%	12%	12%	12%
Refrigerant charge (MCHX)		kg	46	52	52	56	56	68	77	83
Refrigerant charge (Cu/Al)		kg	64	73	76	80	80	95	110	119
Noise levels										
Chiller: Sound power lev. SLN vers.	(5)	dB(A)	86	87	87	88	88	89	90	90
Chiller: Sound pressure lev. SLN vers.	(5)	dB(A)	54	55	54	56	56	57	58	58
FC BASIC: Sound power lev.	(5)	dB(A)	76	77	77	77	77	77	78	79
FC CUSTOM: Sound power lev.	(5)	dB(A)	77	79	79	79	79	79	79	80
FC EXTRA: Sound power lev.	(5)	dB(A)	79	80	80	80	80	80	80	81
FC BASIC: Sound pressure lev.	(6)	dB(A)	44	45	45	45	45	45	46	47
FC CUSTOM: Sound pressure lev.	(6)	dB(A)	45	47	47	47	47	47	47	48
FC EXTRA: Sound pressure lev.	(6)	dB(A)	47	48	48	48	48	48	48	49

Dimensions and weights**

Length FC BASIC ; CuAl: unit with copper/aluminium tube/fin coils)

Length FC CUSTOM

Length FC EXTRA

Depth The TFT (Total Free-cooling Temperature) is the outside air temperature at which the cooling performance of the water coils is the same as the performance of the chiller section under the condition of A30°C; E.G.30% 15/10°C

Height Volume of water contained in the unit when it is working in free cooling mode. If present, the volume contained in the tank should also be considered.

Unit operating at rated engine speed, without any accessory, with external air temperature 30 ° C and inlet / outlet water temperature for user exchanger 15/10 ° C. Binding values. Values obtained from measurements carried out according to ISO 3744. evaporator 15/10 ° C.

(MCHX: unit with microchannel coils

(1) Outside air temperature 30°C; evaporator inlet/outlet fluid temperature 15/10°C; glycol at 30%.

(2) Outside air temperature 5°C; evaporator inlet/outlet fluid temperature 15/10°C; glycol at 30%.

(3) The TFT (Total Free-cooling Temperature) is the outside air temperature at which the cooling performance of the water coils is the same as the performance of the chiller section under the condition of A30°C; E.G.30% 15/10°C

KAPPA REV SLN FC (R513A)

			67.2	73.2	80.2	85.2	90.2	95.2	100.2	105.2
Cooling (A30°C; W10°C; e.g.30%)										
Refrigeration capacity	(1)	kW	833	862	908	993	1076	1148	1222	1268
Total absorbed power	(1)	kW	239	247	262	290	311	334	355	368
EER	(1)		3,60	3,59	3,56	3,54	3,59	3,58	3,60	3,56
User-side heat exchanger										
Quantity		n°	1	1	1	1	1	1	1	1
Water flow rate (A30°C; W10°C; e.g.30%)	(1)	m³/h	160	165	174	191	207	221	235	244
FC BASIC (A5°C; W10°C; e.g.30%)										
Free-cooling modules		n°	3	4	4	4	5	5	6	6
Refrigeration capacity only FC	(2)	kW	360	421	434	445	549	564	644	655
Absorbed power only FC	(2)	kW	11	14	14	14	18	18	21	21
TFT	(3)	°C	-7,2	-4,4	-5	-6,4	-3,4	-4,3	-2,9	-3,3
Total head losses	(7)	kPa	150	120	137	161	153	153	148	105
Total internal volume	(4)	l	330	410	410	400	385	430	430	545
FC CUSTOM (A5°C; W10°C; e.g.30%)										
Free-cooling modules		n°	4	5	5	5	6	6	7	7
Refrigeration capacity only FC	(2)	kW	415	515	532	546	624	641	720	732
Absorbed power only FC	(2)	kW	14	18	18	18	21	21	25	25
TFT	(3)	°C	-3,7	-0,8	-1,2	-2,2	-1,1	-1,8	-0,9	-1,4
Total head losses	(7)	kPa	108	97	110	130	133	131	132	89
Total internal volume	(4)	l	410	410	410	400	385	430	430	545
FC EXTRA (A5°C; W10°C; e.g.30%)										
Free-cooling modules		n°	5	6	6	7	8	8	9	9
Refrigeration capacity only FC	(2)	kW	522	600	620	697	773	795	873	888
Absorbed power only FC	(2)	kW	18	21	21	25	28	28	32	32
TFT	(3)	°C	0	1,3	1	1,4	1,8	1,3	1,7	1,3
Total head losses	(7)	kPa	87	84	96	103	113	109	116	72
Total internal volume	(4)	l	410	410	410	400	385	430	430	545
Ventilatori										
Chiller fans		n°	12	13	14	15	16	17	18	19
Ventilatori FC BASIC		n°	6	8	8	8	10	10	12	12
Ventilatori FC CUSTOM		n°	8	10	10	10	12	12	14	14
Ventilatori FC EXTRA		n°	10	12	12	14	16	16	18	18
Compressors										
Compressors/Circuits		n°/n°	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2
Minimum capacity reduction step	(8)	%	13%	12%	13%	12%	13%	12%	13%	12%
Refrigerant charge (MCHX)		kg	83	92	92	105	111	128	128	141
Refrigerant charge (Cu/Al)		kg	119	131	134	150	159	179	182	198
Noise levels										
Chiller: Sound power lev. SLN vers.	(5)	dB(A)	91	92	92	92	92	93	93	94
Chiller: Sound pressure lev. SLN vers.	(5)	dB(A)	59	59	59	59	59	60	60	61
FC BASIC: Sound power lev.	(5)	dB(A)	79	80	80	80	81	81	82	82
FC CUSTOM: Sound power lev.	(5)	dB(A)	80	81	81	81	82	82	82	82
FC EXTRA: Sound power lev.	(5)	dB(A)	81	82	82	82	83	83	84	84
FC BASIC: Sound pressure lev.	(6)	dB(A)	47	48	48	48	49	49	50	50
FC CUSTOM: Sound pressure lev.	(6)	dB(A)	48	49	49	49	50	50	50	50
FC EXTRA: Sound pressure lev.	(6)	dB(A)	49	50	50	50	51	51	52	52

Dimensions and weights**

Length FC BASIC ; CuAl: unit with copper/aluminium tube/fin coils)

Length FC CUSTOM

Length FC EXTRA

Depth The TFT (Total Free-cooling Temperature) is the outside air temperature at which the cooling performance of the water coils is the same as the performance of the chiller section under the condition of A30°C; E.G.30% 15/10°C

Height Volume of water contained in the unit when it is working in free cooling mode. If present, the volume contained in the tank should also be considered.

Unit operating at rated engine speed, without any accessory, with external air temperature 30 ° C and inlet / outlet water temperature for user exchanger 15/10 ° C. Binding values. Values obtained from measurements carried out according to ISO 3744. evaporator 15/10 ° C.

(MCHX: unit with microchannel coils

(1) Outside air temperature 30°C; evaporator inlet/outlet fluid temperature 15/10°C; glycol at 30%.

(2) Outside air temperature 5°C; evaporator inlet/outlet fluid temperature 15/10°C; glycol at 30%.

(3) The TFT (Total Free-cooling Temperature) is the outside air temperature at which the cooling performance of the water coils is the same as the performance of the chiller section under the condition of A30°C; E.G.30% 15/10°C

KAPPA REV SLN FC (R513A)

			33.2	35.2	37.2	40.2	43.2	51.2	54.2	58.2
Dimensions and weights**										
FC BASIC										
Modules		n°	1	1	1	1	1	1	1	1
Length		mm	6162	7312	7312	7312	7312	8457	10750	10750
Length chiller module		mm	-	-	-	-	-	-	-	-
Length free-cooling module		mm	-	-	-	-	-	-	-	-
FC CUSTOM										
Modules		n°	1	1	1	1	1	1	1	1
Length		mm	6162	8460	8460	8460	8460	9605	10750	11898
Length chiller module		mm	-	-	-	-	-	-	-	-
Length free-cooling module		mm	-	-	-	-	-	-	-	-
FC EXTRA										
Modules		n°	1	1	1	1	1	1	1	1
Length		mm	7310	9608	9608	9608	9608	10753	11898	13047
Length chiller module		mm	-	-	-	-	-	-	-	-
Length free-cooling module		mm	-	-	-	-	-	-	-	-
Depth		mm	2260	2260	2260	2260	2260	2260	2260	2260
Height		mm	2440	2440	2440	2440	2440	2440	2440	2440
			67.2	73.2	80.2	85.2	90.2	95.2	100.2	105.2
Dimensions and weights**										
FC BASIC										
Modules		n°	1	1	1	2	2	2	2	2
Length		mm	10750	13053	13053	14198	15347	16492	17640	18850
Length chiller module		mm	-	-	-	9610	9610	10755	10755	11965
Length free-cooling module		mm	-	-	-	4588	5737	5737	6885	6885
FC CUSTOM										
Modules		n°	1	2	2	2	2	2	2	2
Length		mm	11898	14202	14202	15347	16495	17640	18789	19999
Length chiller module		mm	-	8465	8465	9610	9610	10755	10755	11965
Length free-cooling module		mm	-	5737	5737	5737	6885	6885	8034	8034
FC EXTRA										
Modules		n°	1	2	2	2	2	2	2	2
Length		mm	13047	15350	15350	17644	18793	19938	21085	22295
Length chiller module		mm	-	8465	8465	9610	9610	10755	10755	11965
Length free-cooling module		mm	-	6885	6885	8034	9183	9183	10330	10330
Depth		mm	2260	2260	2260	2260	2260	2260	2260	2260
Height		mm	2440	2440	2440	2440	2440	2440	2440	2440

KAPPA REV HEi FC (R513A)

			58.2	67.2	73.2	80.2	85.2	90.2	100.3	105.3
Cooling (A30°C; W10°C; e.g.30%)										
Refrigeration capacity	(1)	kW	643	737	824	875	1000	1056	1125	1185
Total absorbed power	(1)	kW	174	204	230	247	284	301	314	342
EER	(1)		3,80	3,72	3,67	3,65	3,64	3,64	3,69	3,58
User-side heat exchanger										
Quantity		n°	1	1	1	1	1	1	1	1
Water flow rate (A30°C; W10°C; e.g.30%)	(1)	m³/h	123	142	158	168	192	203	216	228
FC BASIC (A5°C; W10°C; e.g.30%)										
Free-cooling modules		n°	3	3	4	4	5	5	6	6
Refrigeration capacity only FC	(2)	kW	309	360	422	436	546	562	653	670
Absorbed power only FC	(2)	kW	11	11	14	14	18	18	21	21
TFT	(3)	°C	-4,6	-5	-3,8	-4,5	-2,7	-3,3	-1,9	-2,5
Total head losses	(7)	kPa	106	139	122	138	122	135	91	101
Total internal volume	(4)	l	330	320	385	385	435	545	525	525
FC CUSTOM (A5°C; W10°C; e.g.30%)										
Free-cooling modules		n°	4	4	5	5	6	6	7	7
Refrigeration capacity only FC	(2)	kW	354	415	518	535	620	639	730	749
Absorbed power only FC	(2)	kW	14	14	18	18	21	21	25	25
TFT	(3)	°C	-2,1	-2,2	-0,3	-0,9	-0,5	-1	-0,2	-0,7
Total head losses	(7)	kPa	77	100	99	112	104	115	77	85
Total internal volume	(4)	l	410	400	385	385	435	545	525	525
FC EXTRA (A5°C; W10°C; e.g.30%)										
Free-cooling modules		n°	5	5	6	6	8	8	9	9
Refrigeration capacity only FC	(2)	kW	443	522	603	625	768	792	886	909
Absorbed power only FC	(2)	kW	18	18	21	21	28	28	32	32
TFT	(3)	°C	1,1	1,2	1,7	1,3	2,2	1,8	2,2	1,9
Total head losses	(7)	kPa	62	82	87	98	86	95	62	69
Total internal volume	(4)	l	410	400	385	385	435	545	525	525
Ventilatori										
Chiller fans		n°	12	13	14	15	16	18	20	21
Ventilatori FC BASIC		n°	6	6	8	8	10	10	12	12
Ventilatori FC CUSTOM		n°	8	8	10	10	12	12	14	14
Ventilatori FC EXTRA		n°	10	10	12	12	16	16	18	18
Compressors										
Compressors/Circuits		n°/n°	2/2	2/2	2/2	2/2	2/2	2/2	3/3	3/3
Minimum capacity reduction step	(8)	%	12,5%	11%	10%	9%	8%	8%	7%	7%
Refrigerant charge (MCHX)		kg	83	91	102	107	119	132	178	182
Refrigerant charge (Cu/Al)		kg	119	130	144	152	167	186	238	245
Noise levels										
Chiller: Sound power level	(5)	dB(A)	99	100	101	101	101	103	102	103
Chiller: Sound pressure level	(6)	dB(A)	67	67	68	68	68	70	69	69
Chiller: Sound power level of LN version	(5)	dB(A)	95	96	97	97	97	99	98	99
Chiller: Sound pressure level of LN version	(6)	dB(A)	63	63	64	64	64	66	65	65
FC BASIC: Sound power level	(5)	dB(A)	79	79	80	80	81	81	82	82
FC CUSTOM: Sound power level	(5)	dB(A)	80	80	81	81	82	82	82	82
FC EXTRA: Sound power level	(5)	dB(A)	81	81	82	82	83	83	84	84
FC BASIC: Sound pressure level	(6)	dB(A)	47	47	48	48	49	49	50	50
FC CUSTOM: Sound pressure level	(6)	dB(A)	48	48	49	49	50	50	50	50
FC EXTRA: Sound pressure level	(6)	dB(A)	49	49	50	50	51	51	52	52

Dimensions and weights**

Length FC BASIC ; CuAl: unit with copper/aluminium tube/fin coils)

Length FC CUSTOM

Length FC EXTRA

Depth The TFT (Total Free-cooling Temperature) is the outside air temperature at which the cooling performance of the water coils is the same as the performance of the chiller section under the condition of A30°C; E.G.30% 15/10°C

Height Volume of water contained in the unit when it is working in free cooling mode. If present, the volume contained in the tank should also be considered.

Unit operating at rated engine speed, without any accessory, with external air temperature 30 ° C and inlet / outlet water temperature for user exchanger 15/10 ° C. Binding values. Values obtained from measurements carried out according to ISO 3744. evaporator 15/10 ° C.

(MCHX: unit with microchannel coils

(1) Outside air temperature 30°C; evaporator inlet/outlet fluid temperature 15/10°C; glycol at 30%.

(2) Outside air temperature 5°C; evaporator inlet/outlet fluid temperature 15/10°C; glycol at 30%.

(3) The TFT (Total Free-cooling Temperature) is the outside air temperature at which the cooling performance of the water coils is the same as the performance of the chiller section under the condition of A30°C; E.G.30% 15/10°C

KAPPA REV HEi FC (R513A)

		58.2	67.2	73.2	80.2	85.2	90.2	100.3	105.3
Dimensions and weights**									
FC BASIC									
Modules	n°	1	1	1	2	2	2	2	2
Length	mm	10750	11905	13053	14198	15347	16492	18850	19995
Length chiller module	mm	-	-	-	9610	9610	10755	11965	13110
Length free-cooling module	mm	-	-	-	4588	5737	5737	6885	6885
FC CUSTOM									
Modules	n°	1	1	2	2	2	2	2	2
Length	mm	11898	13053	14202	15347	16495	17640	19999	21144
Length chiller module	mm	-	-	8465	9610	9610	10755	11965	13110
Length free-cooling module	mm	-	-	5737	5737	6885	6885	8034	8034
FC EXTRA									
Modules	n°	1	2	2	2	2	2	2	2
Length	mm	13047	14202	15350	16495	18793	19938	22295	23440
Length chiller module	mm	-	8465	8465	9610	9610	10755	11965	13110
Length free-cooling module	mm	-	5737	6885	6885	9183	9183	10330	10330
Depth	mm	2260	2260	2260	2260	2260	2260	2260	2260
Height	mm	2440	2440	2440	2440	2440	2440	2440	2440

KAPPA REV XEi FC (R513A)

			30.1	35.1	45.1	55.2	65.2	70.2	80.2	90.2	100.3
Cooling (A30°C; W10°C; e.g.30%)											
Refrigeration capacity	(1)	kW	319	399	500	635	713	806	884	978	1093
Total absorbed power	(1)	kW	88	114	147	177	202	227	261	297	313
EER	(1)		3,71	3,64	3,46	3,69	3,63	3,64	3,49	3,40	3,54
User-side heat exchanger											
Quantity		n°	1	1	1	1	1	1	1	1	1
Water flow rate (A30°C; W10°C; e.g.30%)	(1)	m³/h	61	77	96	122	137	154	170	188	209
FC BASIC (A5°C; W10°C; e.g.30%)											
Free-cooling modules		n°	1 ½	2	2	3	3	4	4	4	5
Refrigeration capacity only FC	(2)	kW	159	222	241	340	356	421	441	459	579
Absorbed power only FC	(2)	kW	5	7	7	11	11	14	14	14	18
TFT	(3)	°C	-4,3	-2,5	-5,2	-3	-4,7	-3,5	-4,6	-6,1	-3,7
Total head losses	(7)	kPa	80	141	133	105	130	117	143	158	107
Total internal volume	(4)	l	145	140	160	330	320	385	385	435	525
FC CUSTOM (A5°C; W10°C; e.g.30%)											
Free-cooling modules		n°	2	3	3	4	4	5	5	5	6
Refrigeration capacity only FC	(2)	kW	206	287	314	391	411	516	541	564	659
Absorbed power only FC	(2)	kW	7	11	11	14	14	18	18	18	21
TFT	(3)	°C	0	1,4	-0,4	-0,7	-1,8	-0,1	-0,9	-1,9	-1,3
Total head losses	(7)	kPa	91	108	82	75	94	96	117	125	86
Total internal volume	(4)	l	145	200	225	410	400	385	385	435	525
FC EXTRA (A5°C; W10°C; e.g.30%)											
Free-cooling modules		n°	3	4	4	5	5	6	7	7	8
Refrigeration capacity only FC	(2)	kW	272	336	370	491	517	601	690	721	817
Absorbed power only FC	(2)	kW	11	14	14	18	18	21	25	25	28
TFT	(3)	°C	3,3	3,2	1,8	2,3	1,5	1,8	2,3	1,6	1,7
Total head losses	(7)	kPa	69	96	64	61	77	83	92	96	64
Total internal volume	(4)	l	210	280	305	410	400	385	385	435	525
Ventilatori											
Chiller fans		n°	6	8	10	12	14	16	18	20	22
Ventilatori FC BASIC		n°	3	4	4	6	6	8	8	8	10
Ventilatori FC CUSTOM		n°	4	6	6	8	8	10	10	10	12
Ventilatori FC EXTRA		n°	6	8	8	10	10	12	14	14	16
Compressors											
Compressors/Circuits		n°/n°	1/1	1/1	1/1	2/2	2/2	2/2	2/2	2/2	3/3
Minimum capacity reduction step	(8)	%	25%	20%	16%	12,5%	11,2%	10%	8%	8%	5,6%
Refrigerant charge (MCHX)		kg	44	56	68	83	96	111	140	160	187
Refrigerant charge (Cu/Al)		kg	62	80	98	119	138	159	194	220	253
Noise levels											
Chiller: Sound power level	(5)	dB(A)	99	100	101	102	103	103	104	104	105
Chiller: Sound pressure level	(6)	dB(A)	67	68	69	69	70	70	71	71	71
Chiller: Sound power level of LN version	(5)	dB(A)	95	96	97	98	99	99	100	100	101
Chiller: Sound pressure level of LN version	(6)	dB(A)	63	64	65	65	66	66	67	67	67
FC BASIC: Sound power level	(5)	dB(A)	76	77	77	79	79	80	80	80	81
FC CUSTOM: Sound power level	(5)	dB(A)	77	79	79	80	80	81	81	81	82
FC EXTRA: Sound power level	(5)	dB(A)	79	80	80	81	81	82	82	82	83
FC BASIC: Sound pressure level	(6)	dB(A)	44	45	45	47	47	48	48	48	49
FC CUSTOM: Sound pressure level	(6)	dB(A)	45	47	47	48	48	49	49	49	50
FC EXTRA: Sound pressure level	(6)	dB(A)	47	48	48	49	49	50	50	50	51

Dimensions and weights**

Length FC BASIC ; CuAl: unit with copper/aluminium tube/fin coils)

Length FC CUSTOM

Length FC EXTRA

Depth The TFT (Total Free-cooling Temperature) is the outside air temperature at which the cooling performance of the water coils is the same as the performance of the chiller section under the condition of A30°C; E.G.30% 15/10°C

Height Volume of water contained in the unit when it is working in free cooling mode. If present, the volume contained in the tank should also be considered.

Unit operating at rated engine speed, without any accessory, with external air temperature 30 ° C and inlet / outlet water temperature for user exchanger 15/10 ° C. Binding values. Values obtained from measurements carried out according to ISO 3744. evaporator 15/10 ° C.

(MCHX: unit with microchannel coils

(1) Outside air temperature 30°C; evaporator inlet/outlet fluid temperature 15/10°C; glycol at 30%.

(2) Outside air temperature 5°C; evaporator inlet/outlet fluid temperature 15/10°C; glycol at 30%.

(3) The TFT (Total Free-cooling Temperature) is the outside air temperature at which the cooling performance of the water coils is the same as the performance of the chiller section under the condition of A30°C; E.G.30% 15/10°C

KAPPA REV XEi FC (R513A)

		30.1	35.1	45.1	55.2	65.2	70.2	80.2	90.2	100.3
Dimensions and weights**										
FC BASIC										
Modules	n°	1	1	1	1	1	2	2	2	2
Length	mm	6162	7312	7457	10750	11905	14198	15343	16553	18847
Length chiller module	mm	-	-	-	-	-	9610	10755	11965	13110
Length free-cooling module	mm	-	-	-	-	-	4588	4588	4588	5737
FC CUSTOM										
Modules	n°	1	1	1	1	1	2	2	2	2
Length	mm	6162	8460	8605	11898	13053	15347	16492	17702	19995
Length chiller module	mm	-	-	-	-	-	9610	10755	11965	13110
Length free-cooling module	mm	-	-	-	-	-	5737	5737	5737	6885
FC EXTRA										
Modules	n°	1	1	1	1	2	2	2	2	2
Length	mm	7310	9608	9753	13047	14202	16495	18789	19999	22293
Length chiller module	mm	-	-	-	-	8465	9610	10755	11965	13110
Length free-cooling module	mm	-	-	-	-	5737	6885	8034	8034	9183
Depth	mm	2260	2260	2260	2260	2260	2260	2260	2260	2260
Height	mm	2440	2440	2440	2440	2440	2440	2440	2440	2440

ECODESIGN

INTRODUCTION

The Ecodesign/ErP Directive (2009/125/EC) lays down new standards for more efficient energy use.

The Directive contains various regulations; as regards chiller products and heat pumps, the regulations of interest are the following:

- Regulation 2013/813, for small heat pumps ($P_{\text{design}} \leq 400$ kW)
- Regulation 2016/2281, for chillers and heat pumps with $P_{\text{design}} > 400$ kW
- Regulation 2013/811, for heat pumps with $P_{\text{design}} \leq 70$ kW.

The last-mentioned regulation (2013/811) regards the labelling (Ecolabel certification) of small heat pumps.

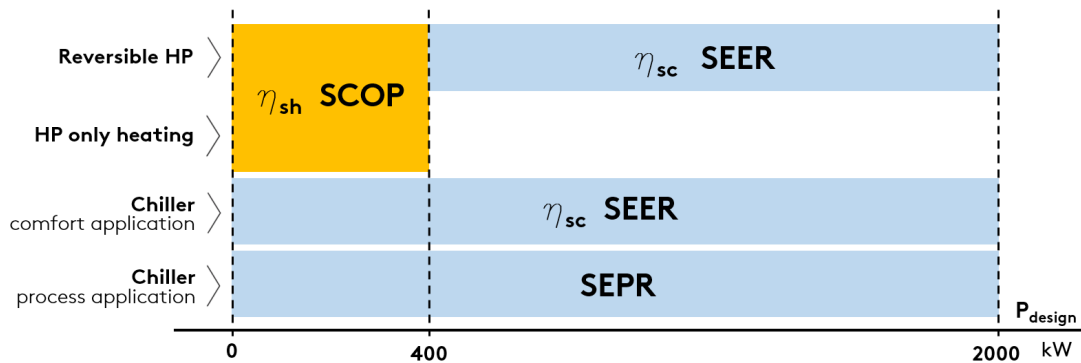
The other two regulations (2013/813 and 2016/2281) set seasonal efficiency targets that the products must comply with to be sold and installed in the European Union (essential requirement for CE marking).

These efficiency limits are defined through ratios, which are respectively:

- η_{sh} (SCOP), with reference to regulation 2013/813
- η_{sc} (SEER) for comfort applications and SEPR for process applications, with reference to regulation 2016/2281.

As regards regulation 2016/2281, with effect from 1st January 2021, the required minimum efficiency limit will be raised (Tier 2) from the current threshold (Tier 1).

The figure below schematically illustrates the correspondence between product and reference energy ratio.



Some notes and clarifications:

For comfort applications, regulation 2016/2281 sets the η_{sc} (SEER) ratio in two different operating conditions:

- SEER calculated with machine inlet/outlet water temperature of 12/7°C (low temperature application),
- SEER calculated with machine inlet/outlet water temperature of 23/18°C (medium temperature application).

The minimum efficiency requirement is the same, but can be met at condition 12/7°C or at condition 23/18°C, depending on the application envisaged for the machine.

Regulation 2013/813 distinguishes two different types: at low temperature and at medium temperature.

The following refer to the application at low temperature: (low temperature application) all heat pumps whose maximum delivery temperature for heating purposes is lower than 52°C with source at temperature of -7°C and -8°C wet bulb (air-water unit) or inlet 10°C (water-water unit), at the reference design conditions for an average climate. For these, the efficiency ratio is "low temperature application" (outlet water temperature 35°C).

For all the other heat pumps, the efficiency ratio is related to "medium temperature application" (outlet water temperature 55°C).

The ratios must be calculated according to the reference European heating season in average climatic conditions.

The minimum efficiency requirements set by the regulations are indicated below.

REGULATION 2016/2281, comfort application

TYPE OF UNIT		MINIMUM REQUIREMENT			
		Tier 1		Tier 2 (2021)	
SOURCE	Pdesign	η_{sc} [%]	SEER	η_{sc} [%]	SEER
air	< 400kW	149	3,8	161	4,1
air	$\geq$ 400kW	161	4,1	179	4,55
water	< 400kW	196	5,1	200	5,2
water	$\geq$ 400kW and < 1500kW	227	5,875	252	6,5
water	$\geq$ 1500kW	245	6,325	272	7

REGULATION 2016/2281, process application

TYPE OF UNIT		MINIMUM REQUIREMENT	
		Tier 1	Tier 2 (2021)
SOURCE	Pdesign	SEPR	SEPR
air	< 400kW	4,5	5
air	$\geq$ 400kW	5	5,5
water	< 400kW	6,5	7
water	$\geq$ 400kW and < 1500kW	7,5	8
water	$\geq$ 1500kW	8	8,5

REGULATION 2013/813

SOURCE	APPLICATION	MINIMUM REQUIREMENT	
		η_{sh} [%]	SCOP
air	low temperature application	125	3,2
water	low temperature application	125	3,325
air	medium temperature application	110	2,825
water	medium temperature application	110	2,95

The conformity of the product must be checked according to the type of application, whether comfort or process, and at the required outlet water temperature.

The two schematic tables below, respectively for comfort application and for process application, indicate the reference of the required conformity according to the type of product and the set point temperature (reference to regulations 2016/2281 and 2013/813).

Important note: for mixed comfort and process applications, the reference application for conformity is the comfort application.

COMFORT APPLICATION

PRODUCT	OUTLET WATER TEMPERATURE	COMPLIANCE INDEX	REGULATION
Chiller	< 18°C	SEER/η _{sc} low temperature application	2016/2281
	≥ 18°C	SEER/η _{sc} medium temperature application	2016/2281
Heat pumps (reversible and only heating) P_{design} ≤ 400kW		SCOP/η _{sh}	2013/813
Reversible heat pumps P_{design} > 400kW	< 18°C	SEER/η _{sc} low temperature application	2016/2281
	≥ 18°C	SEER/η _{sc} medium temperature application	2016/2281
Heat pumps only heating P_{design} > 400kW		-	-

- = exemption from Ecodesign

PROCESS APPLICATION

PRODUCT	OUTLET WATER TEMPERATURE	COMPLIANCE INDEX	REGULATION
Chiller	≥ +2°C , ≤ 12°C	SEPR	2016/2281
	> 12°C	-	-
	> -8°C , < +2°C	-	-

- = exemption from Ecodesign

Some specifications and notes follow.

Partly completed machinery

The term partly completed machinery refers to all units without a user-side or source-side heat exchanger, and therefore to all LC, LE, LC/HP and LE/HP versions. Since these are “non-complete” machines, conformity with Ecodesign depends on combination with the remote heat exchanger.

All the partly completed machinery is CE marked and accompanied by a declaration of conformity. Installation in European Union countries is therefore allowed; correct selection and installation of the remote heat exchanger must be ensured, in accordance with the above cases.

EC fans:

The only option that positively affects the performance of the unit, by increasing its seasonal energy efficiency ratio, is the VEC accessory.

A unit equipped with EC fans has a higher SEER (η_{sc}) than the configuration with standard fans.

KAPPA REV FC RANGE

As specifically regards the Kappa Rev FC range, the regulations of interest for the various units in various configurations are indicated below.

Kappa Rev FC /HE FC /SLN FC /HEi FC /XEi FC:

- chiller version: regulation 2016/2281.

The tables below give information on the conformity of the units and the seasonal energy performance ratios with regard to the reference regulation.

For each size, the possible set-ups (BASIC, CUSTOM, EXTRA) are included for conformity assessments.

KAPPA REV FC

			33.2	35.2	37.2	40.2	43.2	51.2
REGULATION 2016/2281								
Pdesign	(1)	kW	353	387	425	466	526	551
Compliance 12/7								
Compliance	(1)		N	N	N	N	N	N
η_{sc}	(1)	%	-	-	-	-	-	-
SEER	(1)		-	-	-	-	-	-
Compliance Tier 2 (2021)	(1)		N	N	N	N	N	N
Compliance 12/7 unit with EC fans								
Compliance	(1)		Y	Y	Y	N	N	N
η_{sc}	(1)	%	158	153,3	154,2	-	-	-
SEER	(1)		4,02	3,9	3,92	-	-	-
Compliance Tier 2 (2021)	(1)		N	N	N	N	N	N
Compliance 23/18								
Compliance	(2)		Y	Y	Y	Y	Y	Y
η_{sc}	(2)	%	172,4	172,5	165,3	167,4	165,3	166,2
SEER	(2)		4,39	4,39	4,21	4,26	4,21	4,23
Compliance SEPR								
Compliance	(3)		Y	Y	Y	Y	Y	Y
SEPR	(3)		5,18	5,46	5,37	5,13	5,05	5,02
			54.2	58.2	67.2	73.2	80.2	85.2
REGULATION 2016/2281								
Pdesign	(1)	kW	611	696	783	838	899	954
Compliance 12/7								
Compliance	(1)		N	N	N	N	N	N
η_{sc}	(1)	%	-	-	-	-	-	-
SEER	(1)		-	-	-	-	-	-
Compliance Tier 2 (2021)	(1)		N	N	N	N	N	N
Compliance 12/7 unit with EC fans								
Compliance	(1)		N	N	N	N	N	N
η_{sc}	(1)	%	-	-	-	-	-	-
SEER	(1)		-	-	-	-	-	-
Compliance Tier 2 (2021)	(1)		N	N	N	N	N	N
Compliance 23/18								
Compliance	(2)		Y	Y	Y	Y	Y	Y
η_{sc}	(2)	%	166,4	168,3	168,2	167,8	171	168,7
SEER	(2)		4,24	4,28	4,28	4,27	4,35	4,29
Compliance SEPR								
Compliance	(3)		Y	Y	Y	Y	Y	Y
SEPR	(3)		5,03	5,1	5,13	5,1	5	5,13

Y = unit in compliance with Ecodesign at the indicated condition.

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(1) User-side heat exchanger water inlet/outlet temperature 12/7°C (low temperature application), with reference to regulation 2016/2281 and standard EN 14825.

(2) User-side heat exchanger water inlet/outlet temperature 23/18°C (medium temperature application), with reference to regulation 2016/2281 and standard EN 14825.

(3) User-side heat exchanger water inlet/outlet temperature 12/7°C, with reference to regulation 2016/2281 and norm EN 14825.

KAPPA REV FC

			90.2	95.2	100.2	105.2	115.2
REGULATION 2016/2281							
Pdesign	(1)	kW	1006	1075	1121	1181	1264
Compliance 12/7							
Compliance	(1)		N	N	N	N	N
η _{sc}	(1)	%	-	-	-	-	-
SEER	(1)		-	-	-	-	-
Compliance Tier 2 (2021)	(1)		N	N	N	N	N
Compliance 12/7 unit with EC fans							
Compliance	(1)		N	N	N	N	N
η _{sc}	(1)	%	-	-	-	-	-
SEER	(1)		-	-	-	-	-
Compliance Tier 2 (2021)	(1)		N	N	N	N	N
Compliance 23/18							
Compliance	(2)		Y	Y	Y	Y	Y
η _{sc}	(2)	%	169,3	171,4	170,8	165,2	165,9
SEER	(2)		4,31	4,36	4,35	4,21	4,22
Compliance SEPR							
Compliance	(3)		Y	Y	Y	Y	Y
SEPR	(3)		5,07	5,1	5,06	5,02	5,02

			33.2	35.2	37.2	40.2	43.2	51.2
REGULATION 2016/2281								
Pdesign	(1)	kW	376	420	444	505	562	592
Compliance 12/7								
Compliance	(1)		Y	Y	Y	Y	Y	Y
η _{sc}	(1)	%	156,6	159,1	155,7	162,6	162,2	162,2
SEER	(1)		3,99	4,05	3,97	4,14	4,13	4,13
Compliance Tier 2 (2021)	(1)		N	N	N	N	N	N
Compliance 12/7 unit with EC fans								
Compliance	(1)		Y	Y	Y	Y	Y	Y
η _{sc}	(1)	%	162,7	167,3	164,4	168,8	167,5	169,5
SEER	(1)		4,14	4,25	4,18	4,29	4,26	4,31
Compliance Tier 2 (2021)	(1)		N	N	N	N	N	N
Compliance 23/18								
Compliance	(2)		Y	Y	Y	Y	Y	Y
η _{sc}	(2)	%	172,4	172,5	165,3	167,4	165,3	166,2
SEER	(2)		4,39	4,39	4,21	4,26	4,21	4,23
Compliance SEPR								
Compliance	(3)		Y	Y	Y	Y	Y	Y
SEPR	(3)		5,56	5,52	5,56	5,52	5,44	5,43

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(3) User-side heat exchanger water inlet/outlet temperature 12/7°C, with reference to regulation 2016/2281 and norm EN 14825.

KAPPA REV HE FC

			54.2	58.2	67.2	73.2	80.2
REGULATION 2016/2281							
Pdesign	(1)	kW	652	767	835	879	928
Compliance 12/7							
Compliance	(1)		Y	Y	Y	Y	Y
η _{sc}	(1)	%	163,4	161,8	162,6	162,6	162,2
SEER	(1)		4,16	4,12	4,14	4,14	4,13
Compliance Tier 2 (2021)	(1)		N	N	N	N	N
Compliance 12/7 unit with EC fans							
Compliance	(1)		Y	Y	Y	Y	Y
η _{sc}	(1)	%	169,8	168,2	167,7	167,9	167,4
SEER	(1)		4,32	4,28	4,26	4,27	4,25
Compliance Tier 2 (2021)	(1)		N	N	N	N	N
Compliance 23/18							
Compliance	(2)		Y	Y	Y	Y	Y
η _{sc}	(2)	%	166,4	168,3	168,2	167,8	171
SEER	(2)		4,24	4,28	4,28	4,27	4,35
Compliance SEPR							
Compliance	(3)		Y	Y	Y	Y	Y
SEPR	(3)		5,41	5,57	5,57	5,5	5,43
			85.2	90.2	95.2	100.2	105.2
REGULATION 2016/2281							
Pdesign	(1)	kW	1005	1075	1155	1223	1291
Compliance 12/7							
Compliance	(1)		Y	Y	Y	Y	Y
η _{sc}	(1)	%	163,4	162,2	162,2	162,6	163
SEER	(1)		4,16	4,13	4,13	4,14	4,15
Compliance Tier 2 (2021)	(1)		N	N	N	N	N
Compliance 12/7 unit with EC fans							
Compliance	(1)		Y	Y	Y	Y	Y
η _{sc}	(1)	%	169,6	168	168,6	168,7	169,2
SEER	(1)		4,31	4,27	4,29	4,29	4,3
Compliance Tier 2 (2021)	(1)		N	N	N	N	N
Compliance 23/18							
Compliance	(2)		Y	Y	Y	Y	Y
η _{sc}	(2)	%	168,7	169,3	171,4	170,8	165,2
SEER	(2)		4,29	4,31	4,36	4,35	4,21
Compliance SEPR							
Compliance	(3)		Y	Y	Y	Y	Y
SEPR	(3)		5,48	5,47	5,53	5,63	5,56

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(3) User-side heat exchanger water inlet/outlet temperature 12/7°C, with reference to regulation 2016/2281 and norm EN 14825.

KAPPA REV SLN FC

			33.2	35.2	37.2	40.2	43.2	51.2
REGULATION 2016/2281								
Pdesign	(1)	kW	362	405	431	487	540	570
Compliance 12/7								
Compliance	(1)		Y	Y	Y	Y	Y	Y
η_{sc}	(1)	%	150,5	154	154,5	162,2	161,8	161,8
SEER	(1)		3,84	3,93	3,94	4,13	4,12	4,12
Compliance Tier 2 (2021)	(1)		N	N	N	N	N	N
Compliance 12/7 unit with EC fans								
Compliance	(1)		Y	Y	Y	Y	Y	Y
η_{sc}	(1)	%	161,8	166,4	163,5	167,9	166,7	167,8
SEER	(1)		4,12	4,23	4,16	4,27	4,24	4,27
Compliance Tier 2 (2021)	(1)		N	N	N	N	N	N
Compliance 23/18								
Compliance	(2)		Y	Y	Y	Y	Y	Y
η_{sc}	(2)	%	-	-	-	-	-	-
SEER	(2)		-	-	-	-	-	-
Compliance SEPR								
Compliance	(3)		Y	Y	Y	Y	Y	Y
SEPR	(3)		5,56	5,52	5,56	5,52	5,44	5,43
			54.2	58.2	67.2	73.2	80.2	100.2
REGULATION 2016/2281								
Pdesign	(1)	kW	631	738	802	845	894	1179
Compliance 12/7								
Compliance	(1)		Y	Y	Y	Y	Y	Y
η_{sc}	(1)	%	163	161,4	162,2	162,2	161,8	161,7
SEER	(1)		4,15	4,11	4,13	4,13	4,12	4,12
Compliance Tier 2 (2021)	(1)		N	N	N	N	N	N
Compliance 12/7 unit with EC fans								
Compliance	(1)		Y	Y	Y	Y	Y	Y
η_{sc}	(1)	%	168,9	167,4	166,9	167,1	166,5	167,9
SEER	(1)		4,29	4,26	4,24	4,25	4,23	4,27
Compliance Tier 2 (2021)	(1)		N	N	N	N	N	N
Compliance 23/18								
Compliance	(2)		Y	Y	Y	Y	Y	Y
η_{sc}	(2)	%	-	-	-	-	-	-
SEER	(2)		-	-	-	-	-	-
Compliance SEPR								
Compliance	(3)		Y	Y	Y	Y	Y	Y
SEPR	(3)		5,41	5,57	5,57	5,5	5,43	5,63

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(3) User-side heat exchanger water inlet/outlet temperature 12/7°C, with reference to regulation 2016/2281 and norm EN 14825.

KAPPA REV SLN FC

			85.2	90.2	95.2	100.2	105.2
REGULATION 2016/2281							
Pdesign	(1)	kW	968	1038	1113	1179	1246
Compliance 12/7							
Compliance	(1)		Y	Y	Y	Y	Y
η_{sc}	(1)	%	163	161,3	161,3	161,7	162,1
SEER	(1)		4,15	4,11	4,11	4,12	4,13
Compliance Tier 2 (2021)	(1)		N	N	N	N	N
Compliance 12/7 unit with EC fans							
Compliance	(1)		Y	Y	Y	Y	Y
η_{sc}	(1)	%	168,4	167,2	167,7	167,9	168,4
SEER	(1)		4,28	4,25	4,26	4,27	4,28
Compliance Tier 2 (2021)	(1)		N	N	N	N	N
Compliance 23/18							
Compliance	(2)		Y	Y	Y	Y	Y
η_{sc}	(2)	%	-	-	-	-	-
SEER	(2)		-	-	-	-	-
Compliance SEPR							
Compliance	(3)		Y	Y	Y	Y	Y
SEPR	(3)		5,48	5,47	5,53	5,63	5,56

			58.2	67.2	73.2	80.2
REGULATION 2016/2281						
Pdesign	(1)	kW	643	742	826	889
Compliance 12/7						
Compliance	(1)		Y	Y	Y	Y
η_{sc}	(1)	%	181,3	181,6	180,5	179,9
SEER	(1)		4,61	4,62	4,59	4,57
Compliance Tier 2 (2021)	(1)		N	N	N	N
Compliance 12/7 unit with EC fans						
Compliance	(1)		Y	Y	Y	Y
η_{sc}	(1)	%	188,8	189	187,9	187,3
SEER	(1)		4,79	4,8	4,77	4,75
Compliance Tier 2 (2021)	(1)		N	N	N	N
Compliance 23/18						
Compliance	(2)		Y	Y	Y	Y
η_{sc}	(2)	%	-	-	-	-
SEER	(2)		-	-	-	-
Compliance SEPR						
Compliance	(3)		Y	Y	Y	Y
SEPR	(3)		5,81	5,82	5,73	5,65

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(1) User-side heat exchanger water inlet/outlet temperature 12/7°C (low temperature application), with reference to regulation 2016/2281 and standard EN 14825.

(2) User-side heat exchanger water inlet/outlet temperature 23/18°C (medium temperature application), with reference to regulation 2016/2281 and standard EN 14825.

(3) User-side heat exchanger water inlet/outlet temperature 12/7°C, with reference to regulation 2016/2281 and norm EN 14825.

KAPPA REV HEi FC

			85.2	90.2	100.3	105.3
REGULATION 2016/2281						
Pdesign	(1)	kW	1010	1070	1171	1242
Compliance 12/7						
Compliance	(1)		Y	Y	Y	Y
η _{sc}	(1)	%	181,1	181,9	181,2	180,2
SEER	(1)		4,6	4,62	4,61	4,58
Compliance Tier 2 (2021)	(1)		N	N	N	N
Compliance 12/7 unit with EC fans						
Compliance	(1)		Y	Y	Y	Y
η _{sc}	(1)	%	188,5	189,4	188,6	187,6
SEER	(1)		4,78	4,8	4,79	4,76
Compliance Tier 2 (2021)	(1)		N	N	N	N
Compliance 23/18						
Compliance	(2)		Y	Y	Y	Y
η _{sc}	(2)	%	-	-	-	-
SEER	(2)		-	-	-	-
Compliance SEPR						
Compliance	(3)		Y	Y	Y	Y
SEPR	(3)		5,74	5,59	5,82	5,69

			30.1	35.1	45.1	55.2	65.2
REGULATION 2016/2281							
Pdesign	(1)	kW	322	402	504	640	723
Compliance 12/7							
Compliance	(1)		N	N	N	N	N
η _{sc}	(1)	%	181,9	181,9	182,3	189,5	188
SEER	(1)		4,62	4,62	4,63	4,81	4,78
Compliance Tier 2 (2021)	(1)		N	N	N	N	N
Compliance 12/7 unit with EC fans							
Compliance	(1)		Y	Y	Y	N	N
η _{sc}	(1)	%	193	191,2	191,6	199,1	197,6
SEER	(1)		4,9	4,85	4,86	5,05	5,01
Compliance Tier 2 (2021)	(1)		N	N	N	N	N
Compliance 23/18							
Compliance	(2)		Y	Y	Y	Y	Y
η _{sc}	(2)	%	-	-	-	-	-
SEER	(2)		-	-	-	-	-
Compliance SEPR							
Compliance	(3)		Y	Y	Y	Y	Y
SEPR	(3)		6,12	5,86	5,78	6,19	5,98

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(1) User-side heat exchanger water inlet/outlet temperature 12/7°C (low temperature application), with reference to regulation 2016/2281 and standard EN 14825.

(2) User-side heat exchanger water inlet/outlet temperature 23/18°C (medium temperature application), with reference to regulation 2016/2281 and standard EN 14825.

(3) User-side heat exchanger water inlet/outlet temperature 12/7°C, with reference to regulation 2016/2281 and norm EN 14825.

KAPPA REV XEi FC

			70.2	80.2	90.2	100.3
REGULATION 2016/2281						
Pdesign	(1)	kW	817	902	1003	1140
Compliance 12/7						
Compliance	(1)		N	N	N	N
η_{sc}	(1)	%	187,1	187,5	187,5	189,7
SEER	(1)		4,75	4,76	4,76	4,82
Compliance Tier 2 (2021)	(1)		N	N	N	N
Compliance 12/7 unit with EC fans						
Compliance	(1)		N	N	N	N
η_{sc}	(1)	%	196,6	197,1	197,1	199,4
SEER	(1)		4,99	5	5	5,06
Compliance Tier 2 (2021)	(1)		N	N	N	N
Compliance 23/18						
Compliance	(2)		Y	Y	Y	Y
η_{sc}	(2)	%	-	-	-	-
SEER	(2)		-	-	-	-
Compliance SEPR						
Compliance	(3)		Y	Y	Y	Y
SEPR	(3)		5,9	5,85	5,84	5,96

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(3) User-side heat exchanger water inlet/outlet temperature 12/7°C, with reference to regulation 2016/2281 and norm EN 14825.

KAPPA REV FC (R513A)

			33.2	35.2	37.2	40.2	43.2	51.2	54.2	58.2	
REGULATION 2016/2281											
Pdesign	(1)	kW	311	350	372	409	452	488	562	605	
Compliance 12/7											
Compliance	(1)		N	N	N	N	N	N	N	N	
ηsc	(1)	%	-	-	-	-	-	-	-	-	
SEER	(1)		-	-	-	-	-	-	-	-	
Compliance Tier 2 (2021)	(1)		N	N	N	N	N	N	N	N	
Compliance 12/7 unit with EC fans											
Compliance	(1)		Y	Y	Y	N	N	N	N	N	
ηsc	(1)	%	-	-	-	-	-	-	-	-	
SEER	(1)		-	-	-	-	-	-	-	-	
Compliance Tier 2 (2021)	(1)		N	N	N	N	N	N	N	N	
Compliance 23/18											
Compliance	(2)		Y	Y	Y	Y	Y	Y	Y	Y	
ηsc	(2)	%	166	177	172	162	161	165	164	162	
SEER	(2)		4,2	4,5	4,4	4,1	4,1	4,2	4,2	4,1	
Compliance SEPR											
Compliance	(3)		Y	Y	Y	Y	Y	Y	Y	Y	
SEPR	(3)		5,14	5,58	5,14	5,05	5,08	5,04	5,11	5,05	
			67.2	73.2	80.2	85.2	90.2	95.2	100.2	105.2	115.2
REGULATION 2016/2281											
Pdesign	(1)	kW	680	734	773	825	890	935	977	1037	1110
Compliance 12/7											
Compliance	(1)		N	N	N	N	N	N	N	N	
ηsc	(1)	%	-	-	-	-	-	-	-	-	
SEER	(1)		-	-	-	-	-	-	-	-	
Compliance Tier 2 (2021)	(1)		N	N	N	N	N	N	N	N	
Compliance 12/7 unit with EC fans											
Compliance	(1)		N	N	N	N	N	N	N	N	
ηsc	(1)	%	-	-	-	-	-	-	-	-	
SEER	(1)		-	-	-	-	-	-	-	-	
Compliance Tier 2 (2021)	(1)		N	N	N	N	N	N	N	N	
Compliance 23/18											
Compliance	(2)		Y	Y	Y	Y	Y	Y	Y	Y	
ηsc	(2)	%	161	163	167	168	164	167	166	170	179
SEER	(2)		4,1	4,1	4,2	4,3	4,2	4,2	4,2	4,3	4,6
Compliance SEPR											
Compliance	(3)		Y	Y	Y	Y	Y	Y	Y	Y	
SEPR	(3)		5,07	5,03	5,01	5,01	5,05	5,03	5,02	5,08	5,28

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(1) User-side heat exchanger water inlet/outlet temperature 12/7°C (low temperature application), with reference to regulation 2016/2281 and standard EN 14825.

(2) User-side heat exchanger water inlet/outlet temperature 23/18°C (medium temperature application), with reference to regulation 2016/2281 and standard EN 14825.

(3) User-side heat exchanger water inlet/outlet temperature 12/7°C, with reference to regulation 2016/2281 and norm EN 14825.

KAPPA REV HE FC (R513A)

			33.2	35.2	37.2	40.2	43.2	51.2	54.2	58.2
REGULATION 2016/2281										
Pdesign	(1)	kW	336	385	405	462	511	522	581	676
Compliance 12/7										
Compliance	(1)		Y	Y	Y	Y	Y	Y	Y	Y
η _{sc}	(1)	%	152	156	161	161	161	162	162	161
SEER	(1)		3,9	4	4,1	4,1	4,1	4,1	4,1	4,1
Compliance Tier 2 (2021)	(1)		N	N	N	N	N	N	N	N
Compliance 12/7 unit with EC fans										
Compliance	(1)		Y	Y	Y	Y	Y	Y	Y	Y
η _{sc}	(1)	%	-	-	-	-	-	-	-	-
SEER	(1)		-	-	-	-	-	-	-	-
Compliance Tier 2 (2021)	(1)		N	N	N	N	N	N	N	N
Compliance 23/18										
Compliance	(2)		Y	Y	Y	Y	Y	Y	Y	Y
η _{sc}	(2)	%	-	-	-	-	-	-	-	-
SEER	(2)		-	-	-	-	-	-	-	-
Compliance SEPR										
Compliance	(3)		Y	Y	Y	Y	Y	Y	Y	Y
SEPR	(3)		5,4	5,7	5,7	5,6	5,5	5,5	5,5	5,6
			67.2	73.2	80.2	85.2	90.2	95.2	100.2	105.2
REGULATION 2016/2281										
Pdesign	(1)	kW	732	773	815	889	960	1014	1076	1148
Compliance 12/7										
Compliance	(1)		Y	Y	Y	Y	Y	Y	Y	Y
η _{sc}	(1)	%	162	161	161	162	162	161	162	163
SEER	(1)		4,1	4,1	4,1	4,1	4,1	4,1	4,1	4,1
Compliance Tier 2 (2021)	(1)		N	N	N	N	N	N	N	N
Compliance 12/7 unit with EC fans										
Compliance	(1)		Y	Y	Y	Y	Y	Y	Y	Y
η _{sc}	(1)	%	-	-	-	-	-	-	-	-
SEER	(1)		-	-	-	-	-	-	-	-
Compliance Tier 2 (2021)	(1)		N	N	N	N	N	N	N	N
Compliance 23/18										
Compliance	(2)		Y	Y	Y	Y	Y	Y	Y	Y
η _{sc}	(2)	%	-	-	-	-	-	-	-	-
SEER	(2)		-	-	-	-	-	-	-	-
Compliance SEPR										
Compliance	(3)		Y	Y	Y	Y	Y	Y	Y	Y
SEPR	(3)		5,6	5,5	5,4	5,5	5,5	5,5	5,5	5,7

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(3) User-side heat exchanger water inlet/outlet temperature 12/7°C, with reference to regulation 2016/2281 and norm EN 14825.

KAPPA REV SLN FC (R513A)

			33.2	35.2	37.2	40.2	43.2	51.2	54.2	58.2
REGULATION 2016/2281										
Pdesign	(1)	kW	329	372	395	456	498	513	566	669
Compliance 12/7										
Compliance	(1)		Y	Y	Y	Y	Y	Y	Y	Y
η _{sc}	(1)	%	165	156	153	161	161	162	162	161
SEER	(1)		3,9	4	3,9	4,1	4,1	4,1	4,1	4,1
Compliance Tier 2 (2021)	(1)		N	N	N	N	N	N	N	N
Compliance 12/7 unit with EC fans										
Compliance	(1)		Y	Y	Y	Y	Y	Y	Y	Y
η _{sc}	(1)	%	-	-	-	-	-	-	-	-
SEER	(1)		-	-	-	-	-	-	-	-
Compliance Tier 2 (2021)	(1)		N	N	N	N	N	N	N	N
Compliance 23/18										
Compliance	(2)		Y	Y	Y	Y	Y	Y	Y	Y
η _{sc}	(2)	%	-	-	-	-	-	-	-	-
SEER	(2)		-	-	-	-	-	-	-	-
Compliance SEPR										
Compliance	(3)		Y	Y	Y	Y	Y	Y	Y	Y
SEPR	(3)		5,6	5,8	5,6	5,8	5,7	5,7	5,7	5,8
			67.2	73.2	80.2	85.2	90.2	95.2	100.2	105.2
REGULATION 2016/2281										
Pdesign	(1)	kW	732	773	815	889	960	1014	1076	1148
Compliance 12/7										
Compliance	(1)		Y	Y	Y	Y	Y	Y	Y	Y
η _{sc}	(1)	%	162	161	161	162	162	161	162	163
SEER	(1)		4,1	4,1	4,1	4,1	4,1	4,1	4,1	4,1
Compliance Tier 2 (2021)	(1)		N	N	N	N	N	N	N	N
Compliance 12/7 unit with EC fans										
Compliance	(1)		Y	Y	Y	Y	Y	Y	Y	Y
η _{sc}	(1)	%	-	-	-	-	-	-	-	-
SEER	(1)		-	-	-	-	-	-	-	-
Compliance Tier 2 (2021)	(1)		N	N	N	N	N	N	N	N
Compliance 23/18										
Compliance	(2)		Y	Y	Y	Y	Y	Y	Y	Y
η _{sc}	(2)	%	-	-	-	-	-	-	-	-
SEER	(2)		-	-	-	-	-	-	-	-
Compliance SEPR										
Compliance	(3)		Y	Y	Y	Y	Y	Y	Y	Y
SEPR	(3)		5,6	5,5	5,4	5,5	5,5	5,5	5,5	5,7

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(2) User-side heat exchanger water inlet/outlet temperature 23/18°C (medium temperature application), with reference to regulation 2016/2281 and standard EN 14825.

(3) User-side heat exchanger water inlet/outlet temperature 12/7°C, with reference to regulation 2016/2281 and norm EN 14825.

KAPPA REV HEi FC (R513A)

			58.2	67.2	73.2	80.2	85.2	90.2	100.3	105.3
REGULATION 2016/2281										
Pdesign	(1)	kW	568	654	729	777	879	937	1001	1056
Compliance 12/7										
Compliance	(1)		Y	Y	Y	Y	Y	Y	Y	Y
η _{sc}	(1)	%	180	180	179	179	180	180	180	179
SEER	(1)		4,6	4,6	4,6	4,6	4,6	4,6	4,6	4,6
Compliance Tier 2 (2021)	(1)		N	N	N	N	N	N	N	N
Compliance 12/7 unit with EC fans										
Compliance	(1)		Y	Y	Y	Y	Y	Y	Y	Y
η _{sc}	(1)	%	-	-	-	-	-	-	-	-
SEER	(1)		-	-	-	-	-	-	-	-
Compliance Tier 2 (2021)	(1)		N	N	N	N	N	N	N	N
Compliance 23/18										
Compliance	(2)		Y	Y	Y	Y	Y	Y	Y	Y
η _{sc}	(2)	%	-	-	-	-	-	-	-	-
SEER	(2)		-	-	-	-	-	-	-	-
Compliance SEPR										
Compliance	(3)		Y	Y	Y	Y	Y	Y	Y	Y
SEPR	(3)		5,8	5,5	5,7	5,7	5,7	5,6	5,6	5,6

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(3) User-side heat exchanger water inlet/outlet temperature 12/7°C, with reference to regulation 2016/2281 and norm EN 14825.

KAPPA REV XEi FC (R513A)

			30.1	35.1	45.1	55.2	65.2	70.2	80.2	90.2	100.3
REGULATION 2016/2281											
Pdesign	(1)	kW	322	402	504	640	723	817	902	1003	1140
Compliance 12/7											
Compliance	(1)		N	N	N	N	N	N	N	N	N
η _{sc}	(1)	%	182	182	182	190	188	187	188	188	190
SEER	(1)		4,62	4,62	4,63	4,81	4,78	4,75	4,76	4,76	4,82
Compliance Tier 2 (2021)	(1)		N	N	N	N	N	N	N	N	N
Compliance 12/7 unit with EC fans											
Compliance	(1)		Y	Y	Y	N	N	N	N	N	N
η _{sc}	(1)	%	193	191,2	191,6	199,1	197,6	196,6	197,1	197,1	199,4
SEER	(1)		4,9	4,85	4,86	5,05	5,01	4,99	5	5	5,06
Compliance Tier 2 (2021)	(1)		N	N	N	N	N	N	N	N	N
Compliance 23/18											
Compliance	(2)		Y	Y	Y	Y	Y	Y	Y	Y	Y
η _{sc}	(2)	%	-	-	-	-	-	-	-	-	-
SEER	(2)		-	-	-	-	-	-	-	-	-
Compliance SEPR											
Compliance	(3)		Y	Y	Y	Y	Y	Y	Y	Y	Y
SEPR	(3)		-	-	-	-	-	-	-	-	-

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(3) User-side heat exchanger water inlet/outlet temperature 12/7°C, with reference to regulation 2016/2281 and norm EN 14825.

ELECTRICAL SPECIFICATIONS

KAPPA REV FC

			33.2	35.2	37.2	40.2	43.2	51.2
General electrical specifications chiller section								
Nominal current (Inom)	(2)	A	181	195	211	235	260	280
cosφ standard unit	(2)		0,83	0,83	0,86	0,85	0,84	0,83
Nominal current with power factor correction (Inom)	(2)	A	156,5	170,4	187,1	208,1	227,5	244,6
cosφ unit with power factor correction	(2)		0,96	0,95	0,97	0,96	0,96	0,95
General electrical specifications FC BASIC								
Max. absorbed power (FLI)	(1)	kW	149	161	181	200	218	233
Max. absorbed current (FLA)	(1)	A	250,6	272,6	300,6	333,6	366,6	392,9
Max. inrush current (MIC)	(3)	A	327,1	348,8	399,8	405,8	438,8	494,8
General electrical specifications FC CUSTOM								
Max. absorbed power (FLI)	(1)	kW	151	164	184	203	222	236
Max. absorbed current (FLA)	(1)	A	254,3	280	308	341	374	400,3
Max. inrush current (MIC)	(3)	A	330,8	356,2	407,2	413,2	446,2	502,2
General electrical specifications FC EXTRA								
Max. absorbed power (FLI)	(1)	kW	154	168	188	207	225	240
Max. absorbed current (FLA)	(1)	A	261,7	287,4	315,4	348,4	381,4	407,7
Max. inrush current (MIC)	(3)	A	338,2	363,6	414,6	420,6	453,6	509,6
Power supply		V/ph/Hz	400/3~/50					
Power supply for auxiliary circuits		V/ph/Hz	230-24/1~/50					
Electrical specifications for fans chiller section								
Rated power of standard fan		n° x kW	5 x 2,0	6 x 2,0	6 x 2,0	6 x 2,0	6 x 2,0	7 x 2,0
Rated current of standard fan		n° x A	5 x 4,3	6 x 4,3	6 x 4,3	6 x 4,3	6 x 4,3	7 x 4,3
Rated power of EC fan		n° x kW	5 x 1,9	6 x 1,9	6 x 1,9	6 x 1,9	6 x 1,9	7 x 1,9
Rated current of EC fan		n° x A	5 x 2,9	6 x 2,9	6 x 2,9	6 x 2,9	6 x 2,9	7 x 2,9
Rated power of oversize EC fans		n° x kW	5 x 3,0	6 x 3,0	6 x 3,0	6 x 3,0	6 x 3,0	7 x 3,0
Rated current of oversize EC fans		n° x A	5 x 4,5	6 x 4,5	6 x 4,5	6 x 4,5	6 x 4,5	7 x 4,5
Electrical specifications for fans FC BASIC								
Rated power of standard fan		n° x kW	3 x 2,0	4 x 2,0	4 x 2,0	4 x 2,0	4 x 2,0	4 x 2,0
Rated current of standard fan		n° x A	3 x 4,3	4 x 4,3	4 x 4,3	4 x 4,3	4 x 4,3	4 x 4,3
Rated power of EC fan		n° x kW	3 x 1,9	4 x 1,9	4 x 1,9	4 x 1,9	4 x 1,9	4 x 1,9
Rated current of EC fan		n° x A	3 x 2,9	4 x 2,9	4 x 2,9	4 x 2,9	4 x 2,9	4 x 2,9
Rated power of oversize EC fans		n° x kW	3 x 3,0	4 x 3,0	4 x 3,0	4 x 3,0	4 x 3,0	4 x 3,0
Rated current of oversize EC fans		n° x A	3 x 4,5	4 x 4,5	4 x 4,5	4 x 4,5	4 x 4,5	4 x 4,5
Electrical specifications for fans FC CUSTOM								
Rated power of fan		n° x kW	4 x 2,0	6 x 2,0	6 x 2,0	6 x 2,0	6 x 2,0	6 x 2,0
Rated current of fan		n° x A	4 x 4,3	6 x 4,3	6 x 4,3	6 x 4,3	6 x 4,3	6 x 4,3
Rated power of EC fan		n° x kW	4 x 1,9	6 x 1,9	6 x 1,9	6 x 1,9	6 x 1,9	6 x 1,9
Rated current of EC fan		n° x A	4 x 2,9	6 x 2,9	6 x 2,9	6 x 2,9	6 x 2,9	6 x 2,9
Rated power of oversize EC fans		n° x kW	4 x 3,0	6 x 3,0	6 x 3,0	6 x 3,0	6 x 3,0	6 x 3,0
Rated current of oversize EC fans		n° x A	4 x 4,5	6 x 4,5	6 x 4,5	6 x 4,5	6 x 4,5	6 x 4,5
Electrical specifications for fans FC EXTRA								
Rated power of fan		n° x kW	6 x 2,0	8 x 2,0	8 x 2,0	8 x 2,0	8 x 2,0	8 x 2,0
Rated current of fan		n° x A	6 x 4,3	8 x 4,3	8 x 4,3	8 x 4,3	8 x 4,3	8 x 4,3
Rated power of EC fan		n° x kW	6 x 1,9	8 x 1,9	8 x 1,9	8 x 1,9	8 x 1,9	8 x 1,9
Rated current of EC fan		n° x A	6 x 2,9	8 x 2,9	8 x 2,9	8 x 2,9	8 x 2,9	8 x 2,9
Rated power of oversize EC fans		n° x kW	6 x 3,0	8 x 3,0	8 x 3,0	8 x 3,0	8 x 3,0	8 x 3,0
Rated current of oversize EC fans		n° x A	6 x 4,5	8 x 4,5	8 x 4,5	8 x 4,5	8 x 4,5	8 x 4,5

- (1) Data regarding the unit without accessories working in maximum power absorption conditions
- (2) Datum related to the unit without accessories working in standard conditions (A30°C; W15/10°C; e.g.30%)
- (3) Maximum effective RMS value of the current when the last compressor starts (FLA of the entire unit - FLA of the largest compressor + LRA of the largest compressor)
- (5) These values are determined for cables with operating temperature of 40°C, EPR insulation and a line with a maximum length of 50m. The line section must be determined by a qualified technician based on the protection devices, the length of the line, the type of cable used and the type of installation.
- (6) The correct line protection part must be determined by a qualified technician based on the length of the line, the type of cable used and the type of installation.

KAPPA REV FC

			54.2	58.2	67.2	73.2	80.2	85.2
General electrical specifications chiller section								
Nominal current (Inom)	(2)	A	317	358	383	417	451	474
cosφ standard unit	(2)		0,83	0,85	0,86	0,87	0,88	0,86
Nominal current with power factor correction (Inom)	(2)	A	274,1	317	339,6	374	409,2	420,2
cosφ unit with power factor correction	(2)		0,96	0,96	0,97	0,97	0,97	0,97
General electrical specifications FC BASIC								
Max. absorbed power (FLI)	(1)	kW	264	300	319	341	361	387
Max. absorbed current (FLA)	(1)	A	446,9	503,9	533,2	568,9	597,2	645,2
Max. inrush current (MIC)	(3)	A	543,5	706,2	735,2	775,6	804,6	925,6
General electrical specifications FC CUSTOM								
Max. absorbed power (FLI)	(1)	kW	266	304	322	345	364	390
Max. absorbed current (FLA)	(1)	A	450,6	511,3	540,6	576,3	604,6	652,6
Max. inrush current (MIC)	(3)	A	547,2	713,6	742,6	783	812	933
General electrical specifications FC EXTRA								
Max. absorbed power (FLI)	(1)	kW	270	307	326	348	368	397
Max. absorbed current (FLA)	(1)	A	458	518,7	548	583,7	612	667,4
Max. inrush current (MIC)	(3)	A	554,6	721	750	790,4	819,4	947,8
Power supply		V/ph/Hz	400/3~/50					
Power supply for auxiliary circuits		V/ph/Hz	230-24/1~/50					
Electrical specifications for fans chiller section								
Rated power of standard fan		n° x kW	8 x 2,0	9 x 2,0	10 x 2,0	11 x 2,0	12 x 2,0	12 x 2,0
Rated current of standard fan		n° x A	8 x 4,3	9 x 4,3	10 x 4,3	11 x 4,3	12 x 4,3	12 x 4,3
Rated power of EC fan		n° x kW	8 x 1,9	9 x 1,9	10 x 1,9	11 x 1,9	12 x 1,9	12 x 1,9
Rated current of EC fan		n° x A	8 x 2,9	9 x 2,9	10 x 2,9	11 x 2,9	12 x 2,9	12 x 2,9
Rated power of oversize EC fans		n° x kW	8 x 3,0	9 x 3,0	10 x 3,0	11 x 3,0	12 x 3,0	12 x 3,0
Rated current of oversize EC fans		n° x A	8 x 4,5	9 x 4,5	10 x 4,5	11 x 4,5	12 x 4,5	12 x 4,5
Electrical specifications for fans FC BASIC								
Rated power of standard fan		n° x kW	5 x 2,0	6 x 2,0	6 x 2,0	8 x 2,0	8 x 2,0	8 x 2,0
Rated current of standard fan		n° x A	5 x 4,3	6 x 4,3	6 x 4,3	8 x 4,3	8 x 4,3	8 x 4,3
Rated power of EC fan		n° x kW	5 x 1,9	6 x 1,9	6 x 1,9	8 x 1,9	8 x 1,9	8 x 1,9
Rated current of EC fan		n° x A	5 x 2,9	6 x 2,9	6 x 2,9	8 x 2,9	8 x 2,9	8 x 2,9
Rated power of oversize EC fans		n° x kW	5 x 3,0	6 x 3,0	6 x 3,0	8 x 3,0	8 x 3,0	8 x 3,0
Rated current of oversize EC fans		n° x A	5 x 4,5	6 x 4,5	6 x 4,5	8 x 4,5	8 x 4,5	8 x 4,5
Electrical specifications for fans FC CUSTOM								
Rated power of fan		n° x kW	6 x 2,0	8 x 2,0	8 x 2,0	10 x 2,0	10 x 2,0	10 x 2,0
Rated current of fan		n° x A	6 x 4,3	8 x 4,3	8 x 4,3	10 x 4,3	10 x 4,3	10 x 4,3
Rated power of EC fan		n° x kW	6 x 1,9	8 x 1,9	8 x 1,9	10 x 1,9	10 x 1,9	10 x 1,9
Rated current of EC fan		n° x A	6 x 2,9	8 x 2,9	8 x 2,9	10 x 2,9	10 x 2,9	10 x 2,9
Rated power of oversize EC fans		n° x kW	6 x 3,0	8 x 3,0	8 x 3,0	10 x 3,0	10 x 3,0	10 x 3,0
Rated current of oversize EC fans		n° x A	6 x 4,5	8 x 4,5	8 x 4,5	10 x 4,5	10 x 4,5	10 x 4,5
Electrical specifications for fans FC EXTRA								
Rated power of fan		n° x kW	8 x 2,0	10 x 2,0	10 x 2,0	12 x 2,0	12 x 2,0	14 x 2,0
Rated current of fan		n° x A	8 x 4,3	10 x 4,3	10 x 4,3	12 x 4,3	12 x 4,3	14 x 4,3
Rated power of EC fan		n° x kW	8 x 1,9	10 x 1,9	10 x 1,9	12 x 1,9	12 x 1,9	14 x 1,9
Rated current of EC fan		n° x A	8 x 2,9	10 x 2,9	10 x 2,9	12 x 2,9	12 x 2,9	14 x 2,9
Rated power of oversize EC fans		n° x kW	8 x 3,0	10 x 3,0	10 x 3,0	12 x 3,0	12 x 3,0	14 x 3,0
Rated current of oversize EC fans		n° x A	8 x 4,5	10 x 4,5	10 x 4,5	12 x 4,5	12 x 4,5	14 x 4,5

- (1) Data regarding the unit without accessories working in maximum power absorption conditions
- (2) Datum related to the unit without accessories working in standard conditions (A30°C; W15/10°C; e.g.30%)
- (3) Maximum effective RMS value of the current when the last compressor starts (FLA of the entire unit - FLA of the largest compressor + LRA of the largest compressor)
- (5) These values are determined for cables with operating temperature of 40°C, EPR insulation and a line with a maximum length of 50m. The line section must be determined by a qualified technician based on the protection devices, the length of the line, the type of cable used and the type of installation.
- (6) The correct line protection part must be determined by a qualified technician based on the length of the line, the type of cable used and the type of installation.

KAPPA REV FC

			90.2	95.2	100.2	105.2	115.2
General electrical specifications chiller section							
Nominal current (Inom)	(2)	A	498	529	560	599	638
cosφ standard unit	(2)		0,85	0,86	0,86	0,86	0,86
Nominal current with power factor correction (Inom)	(2)	A	440,9	473,9	506,9	542,3	577,6
cosφ unit with power factor correction	(2)		0,96	0,96	0,95	0,95	0,95
General electrical specifications FC BASIC							
Max. absorbed power (FLI)	(1)	kW	413	443	470	503	533
Max. absorbed current (FLA)	(1)	A	693,2	743,9	787,2	841,9	889,2
Max. inrush current (MIC)	(3)	A	973,6	1049	1092	1259,4	1306,4
General electrical specifications FC CUSTOM							
Max. absorbed power (FLI)	(1)	kW	417	447	473	507	537
Max. absorbed current (FLA)	(1)	A	700,6	751,3	794,6	849,3	896,6
Max. inrush current (MIC)	(3)	A	981	1056,4	1099,4	1266,8	1313,8
General electrical specifications FC EXTRA							
Max. absorbed power (FLI)	(1)	kW	424	454	480	514	544
Max. absorbed current (FLA)	(1)	A	715,4	766,1	809,4	864,1	911,4
Max. inrush current (MIC)	(3)	A	995,8	1071,2	1114,2	1281,6	1328,6
Power supply		V/ph/Hz	400/3~/50			400/3~/51	400/3~/52
Power supply for auxiliary circuits		V/ph/Hz	230-24/1~/50			230-24/1~/51	230-24/1~/52
Electrical specifications for fans chiller section							
Rated power of standard fan		n° x kW	12 x 2,0	13 x 2,0	14 x 2,0	15 x 2,0	16 x 2,0
Rated current of standard fan		n° x A	12 x 4,3	13 x 4,3	14 x 4,3	15 x 4,3	16 x 4,3
Rated power of EC fan		n° x kW	12 x 1,9	13 x 1,9	14 x 1,9	15 x 1,9	16 x 1,9
Rated current of EC fan		n° x A	12 x 2,9	13 x 2,9	14 x 2,9	15 x 2,9	16 x 2,9
Rated power of oversize EC fans		n° x kW	12 x 3,0	13 x 3,0	14 x 3,0	15 x 3,0	16 x 3,0
Rated current of oversize EC fans		n° x A	12 x 4,5	13 x 4,5	14 x 4,5	15 x 4,5	16 x 4,5
Electrical specifications for fans FC BASIC							
Rated power of standard fan		n° x kW	8 x 2,0	10 x 2,0	10 x 2,0	12 x 2,0	12 x 2,0
Rated current of standard fan		n° x A	8 x 4,3	10 x 4,3	10 x 4,3	12 x 4,3	12 x 4,3
Rated power of EC fan		n° x kW	8 x 1,9	10 x 1,9	10 x 1,9	12 x 1,9	12 x 1,9
Rated current of EC fan		n° x A	8 x 2,9	10 x 2,9	10 x 2,9	12 x 2,9	12 x 2,9
Rated power of oversize EC fans		n° x kW	8 x 3,0	10 x 3,0	10 x 3,0	12 x 3,0	12 x 3,0
Rated current of oversize EC fans		n° x A	8 x 4,5	10 x 4,5	10 x 4,5	12 x 4,5	12 x 4,5
Electrical specifications for fans FC CUSTOM							
Rated power of fan		n° x kW	10 x 2,0	12 x 2,0	12 x 2,0	14 x 2,0	14 x 2,0
Rated current of fan		n° x A	10 x 4,3	12 x 4,3	12 x 4,3	14 x 4,3	14 x 4,3
Rated power of EC fan		n° x kW	10 x 1,9	12 x 1,9	12 x 1,9	14 x 1,9	14 x 1,9
Rated current of EC fan		n° x A	10 x 2,9	12 x 2,9	12 x 2,9	14 x 2,9	14 x 2,9
Rated power of oversize EC fans		n° x kW	10 x 3,0	12 x 3,0	12 x 3,0	14 x 3,0	14 x 3,0
Rated current of oversize EC fans		n° x A	10 x 4,5	12 x 4,5	12 x 4,5	14 x 4,5	14 x 4,5
Electrical specifications for fans FC EXTRA							
Rated power of fan		n° x kW	14 x 2,0	16 x 2,0	16 x 2,0	18 x 2,0	18 x 2,0
Rated current of fan		n° x A	14 x 4,3	16 x 4,3	16 x 4,3	18 x 4,3	18 x 4,3
Rated power of EC fan		n° x kW	14 x 1,9	16 x 1,9	16 x 1,9	18 x 1,9	18 x 1,9
Rated current of EC fan		n° x A	14 x 2,9	16 x 2,9	16 x 2,9	18 x 2,9	18 x 2,9
Rated power of oversize EC fans		n° x kW	14 x 3,0	16 x 3,0	16 x 3,0	18 x 3,0	18 x 3,0
Rated current of oversize EC fans		n° x A	14 x 4,5	16 x 4,5	16 x 4,5	18 x 4,5	18 x 4,5

- (1) Data regarding the unit without accessories working in maximum power absorption conditions
- (2) Datum related to the unit without accessories working in standard conditions (A30°C; W15/10°C; e.g.30%)
- (3) Maximum effective RMS value of the current when the last compressor starts (FLA of the entire unit - FLA of the largest compressor + LRA of the largest compressor)
- (5) These values are determined for cables with operating temperature of 40°C, EPR insulation and a line with a maximum length of 50m. The line section must be determined by a qualified technician based on the protection devices, the length of the line, the type of cable used and the type of installation.
- (6) The correct line protection part must be determined by a qualified technician based on the length of the line, the type of cable used and the type of installation.

KAPPA REV HE FC

			33.2	35.2	37.2	40.2	43.2	51.2	54.2	58.2
General electrical specifications chiller section										
Nominal current (Inom)	(2)	A	185	199	219	243	268	288	329	370
cosφ standard unit	(2)		0,83	0,83	0,86	0,85	0,84	0,83	0,83	0,85
Nominal current with power factor correction (Inom)	(2)	A	160	174	194	215	235	252	284	328
cosφ unit with power factor correction	(2)		0,96	0,95	0,97	0,96	0,96	0,95	0,96	0,96
General electrical specifications FC BASIC										
Max. absorbed power (FLI)	(1)	kW	151	173	185	204	222	238	272	306
Max. absorbed current (FLA)	(1)	A	255	291	309	342	375	405	464	517
Max. inrush current (MIC)	(3)	A	331	390	408	414	447	508	560	719
General electrical specifications FC CUSTOM										
Max. absorbed power (FLI)	(1)	kW	153	176	188	207	226	240	276	310
Max. absorbed current (FLA)	(1)	A	259	298	317	350	383	409	471	524
Max. inrush current (MIC)	(3)	A	335	397	415	421	454	511	568	727
General electrical specifications FC EXTRA										
Max. absorbed power (FLI)	(1)	kW	156	180	192	211	229	244	279	313
Max. absorbed current (FLA)	(1)	A	266	306	324	357	390	416	478	532
Max. inrush current (MIC)	(3)	A	342	405	423	429	462	519	575	734
Power supply		V/ph/Hz	400/3~/50							
Power supply for auxiliary circuits		V/ph/Hz	230-24/1~/50							
Electrical specifications for fans chiller section										
Rated power of standard fan		n° x kW	6 x 2,0	7 x 2,0	8 x 2,0	8 x 2,0	8 x 2,0	9 x 2,0	11 x 2,0	12 x 2,0
Rated current of standard fan		n° x A	6 x 4,3	7 x 4,3	8 x 4,3	8 x 4,3	8 x 4,3	9 x 4,3	11 x 4,3	12 x 4,3
Rated power of EC fan		n° x kW	6 x 1,9	7 x 1,9	8 x 1,9	8 x 1,9	8 x 1,9	9 x 1,9	11 x 1,9	12 x 1,9
Rated current of EC fan		n° x A	6 x 2,9	7 x 2,9	8 x 2,9	8 x 2,9	8 x 2,9	9 x 2,9	11 x 2,9	12 x 2,9
Rated power of oversize EC fans		n° x kW	6 x 3,0	7 x 3,0	8 x 3,0	8 x 3,0	8 x 3,0	9 x 3,0	11 x 3,0	12 x 3,0
Rated current of oversize EC fans		n° x A	6 x 4,5	7 x 4,5	8 x 4,5	8 x 4,5	8 x 4,5	9 x 4,5	11 x 4,5	12 x 4,5
Electrical specifications for fans FC BASIC										
Rated power of standard fan		n° x kW	3 x 2,0	4 x 2,0	4 x 2,0	4 x 2,0	4 x 2,0	5 x 2,0	6 x 2,0	6 x 2,0
Rated current of standard fan		n° x A	3 x 4,3	4 x 4,3	4 x 4,3	4 x 4,3	4 x 4,3	5 x 4,3	6 x 4,3	6 x 4,3
Rated power of EC fan		n° x kW	3 x 1,9	4 x 1,9	4 x 1,9	4 x 1,9	4 x 1,9	5 x 1,9	6 x 1,9	6 x 1,9
Rated current of EC fan		n° x A	3 x 2,9	4 x 2,9	4 x 2,9	4 x 2,9	4 x 2,9	5 x 2,9	6 x 2,9	6 x 2,9
Rated power of oversize EC fans		n° x kW	3 x 3,0	4 x 3,0	4 x 3,0	4 x 3,0	4 x 3,0	5 x 3,0	6 x 3,0	6 x 3,0
Rated current of oversize EC fans		n° x A	3 x 4,5	4 x 4,5	4 x 4,5	4 x 4,5	4 x 4,5	5 x 4,5	6 x 4,5	6 x 4,5
Electrical specifications for fans FC CUSTOM										
Rated power of fan		n° x kW	4 x 2,0	6 x 2,0	6 x 2,0	6 x 2,0	6 x 2,0	6 x 2,0	8 x 2,0	8 x 2,0
Rated current of fan		n° x A	4 x 4,3	6 x 4,3	6 x 4,3	6 x 4,3	6 x 4,3	6 x 4,3	8 x 4,3	8 x 4,3
Rated power of EC fan		n° x kW	4 x 1,9	6 x 1,9	6 x 1,9	6 x 1,9	6 x 1,9	6 x 1,9	8 x 1,9	8 x 1,9
Rated current of EC fan		n° x A	4 x 2,9	6 x 2,9	6 x 2,9	6 x 2,9	6 x 2,9	6 x 2,9	8 x 2,9	8 x 2,9
Rated power of oversize EC fans		n° x kW	4 x 3,0	6 x 3,0	6 x 3,0	6 x 3,0	6 x 3,0	6 x 3,0	8 x 3,0	8 x 3,0
Rated current of oversize EC fans		n° x A	4 x 4,5	6 x 4,5	6 x 4,5	6 x 4,5	6 x 4,5	6 x 4,5	8 x 4,5	8 x 4,5
Electrical specifications for fans FC EXTRA										
Rated power of fan		n° x kW	6 x 2,0	8 x 2,0	8 x 2,0	8 x 2,0	8 x 2,0	8 x 2,0	10 x 2,0	10 x 2,0
Rated current of fan		n° x A	6 x 4,3	8 x 4,3	8 x 4,3	8 x 4,3	8 x 4,3	8 x 4,3	10 x 4,3	10 x 4,3
Rated power of EC fan		n° x kW	6 x 1,9	8 x 1,9	8 x 1,9	8 x 1,9	8 x 1,9	8 x 1,9	10 x 1,9	10 x 1,9
Rated current of EC fan		n° x A	6 x 2,9	8 x 2,9	8 x 2,9	8 x 2,9	8 x 2,9	8 x 2,9	10 x 2,9	10 x 2,9
Rated power of oversize EC fans		n° x kW	6 x 3,0	8 x 3,0	8 x 3,0	8 x 3,0	8 x 3,0	8 x 3,0	10 x 3,0	10 x 3,0
Rated current of oversize EC fans		n° x A	6 x 4,5	8 x 4,5	8 x 4,5	8 x 4,5	8 x 4,5	8 x 4,5	10 x 4,5	10 x 4,5

- (1) Data regarding the unit without accessories working in maximum power absorption conditions
- (2) Datum related to the unit without accessories working in standard conditions (A30°C; W15/10°C; e.g.30%)
- (3) Maximum effective RMS value of the current when the last compressor starts (FLA of the entire unit - FLA of the largest compressor + LRA of the largest compressor)
- (5) These values are determined for cables with operating temperature of 40°C, EPR insulation and a line with a maximum length of 50m. The line section must be determined by a qualified technician based on the protection devices, the length of the line, the type of cable used and the type of installation.
- (6) The correct line protection part must be determined by a qualified technician based on the length of the line, the type of cable used and the type of installation.

KAPPA REV HE FC

			67.2	73.2	80.2	85.2	90.2	95.2	100.2	105.2	
General electrical specifications chiller section											
Nominal current (Inom)	(2)	A	391	425	459	486	515	546	577	616	
cosφ standard unit	(2)		0,86	0,87	0,88	0,86	0,85	0,86	0,86	0,86	
Nominal current with power factor correction (Inom)	(2)	A	347	381	416	431	456	489	522	558	
cosφ unit with power factor correction	(2)		0,97	0,97	0,97	0,97	0,96	0,96	0,95	0,95	
General electrical specifications FC BASIC											
Max. absorbed power (FLI)	(1)	kW	326	345	365	393	425	451	481	511	
Max. absorbed current (FLA)	(1)	A	549	578	606	658	718	761	812	859	
Max. inrush current (MIC)	(3)	A	752	785	813	939	998	1066	1116	1276	
General electrical specifications FC CUSTOM											
Max. absorbed power (FLI)	(1)	kW	330	349	368	396	428	455	485	515	
Max. absorbed current (FLA)	(1)	A	557	585	613	666	725	769	819	867	
Max. inrush current (MIC)	(3)	A	759	792	820	946	1005	1073	1124	1284	
General electrical specifications FC EXTRA											
Max. absorbed power (FLI)	(1)	kW	333	352	375	403	435	462	492	522	
Max. absorbed current (FLA)	(1)	A	564	592	628	680	740	783	834	881	
Max. inrush current (MIC)	(3)	A	766	799	835	961	1020	1088	1139	1299	
Power supply		V/ph/Hz	400/3~/50							400/3~/51	
Power supply for auxiliary circuits		V/ph/Hz	230-24/1~/50							230-24/1~/51	
Electrical specifications for fans chiller section											
Rated power of standard fan		n° x kW	12 x 2,0	13 x 2,0	14 x 2,0	15 x 2,0	16 x 2,0	17 x 2,0	18 x 2,0	19 x 2,0	
Rated current of standard fan		n° x A	12 x 4,3	13 x 4,3	14 x 4,3	15 x 4,3	16 x 4,3	17 x 4,3	18 x 4,3	19 x 4,3	
Rated power of EC fan		n° x kW	12 x 1,9	13 x 1,9	14 x 1,9	15 x 1,9	16 x 1,9	17 x 1,9	18 x 1,9	19 x 1,9	
Rated current of EC fan		n° x A	12 x 2,9	13 x 2,9	14 x 2,9	15 x 2,9	16 x 2,9	17 x 2,9	18 x 2,9	19 x 2,9	
Rated power of oversize EC fans		n° x kW	12 x 3,0	13 x 3,0	14 x 3,0	15 x 3,0	16 x 3,0	17 x 3,0	18 x 3,0	19 x 3,0	
Rated current of oversize EC fans		n° x A	12 x 4,5	13 x 4,5	14 x 4,5	15 x 4,5	16 x 4,5	17 x 4,5	18 x 4,5	19 x 4,5	
Electrical specifications for fans FC BASIC											
Rated power of standard fan		n° x kW	8 x 2,0	8 x 2,0	8 x 2,0	8 x 2,0	10 x 2,0	10 x 2,0	12 x 2,0	12 x 2,0	
Rated current of standard fan		n° x A	8 x 4,3	8 x 4,3	8 x 4,3	8 x 4,3	10 x 4,3	10 x 4,3	12 x 4,3	12 x 4,3	
Rated power of EC fan		n° x kW	8 x 1,9	8 x 1,9	8 x 1,9	8 x 1,9	10 x 1,9	10 x 1,9	12 x 1,9	12 x 1,9	
Rated current of EC fan		n° x A	8 x 2,9	8 x 2,9	8 x 2,9	8 x 2,9	10 x 2,9	10 x 2,9	12 x 2,9	12 x 2,9	
Rated power of oversize EC fans		n° x kW	8 x 3,0	8 x 3,0	8 x 3,0	8 x 3,0	10 x 3,0	10 x 3,0	12 x 3,0	12 x 3,0	
Rated current of oversize EC fans		n° x A	8 x 4,5	8 x 4,5	8 x 4,5	8 x 4,5	10 x 4,5	10 x 4,5	12 x 4,5	12 x 4,5	
Electrical specifications for fans FC CUSTOM											
Rated power of fan		n° x kW	10 x 2,0	10 x 2,0	10 x 2,0	10 x 2,0	12 x 2,0	12 x 2,0	14 x 2,0	14 x 2,0	
Rated current of fan		n° x A	10 x 4,3	10 x 4,3	10 x 4,3	10 x 4,3	12 x 4,3	12 x 4,3	14 x 4,3	14 x 4,3	
Rated power of EC fan		n° x kW	10 x 1,9	10 x 1,9	10 x 1,9	10 x 1,9	12 x 1,9	12 x 1,9	14 x 1,9	14 x 1,9	
Rated current of EC fan		n° x A	10 x 2,9	10 x 2,9	10 x 2,9	10 x 2,9	12 x 2,9	12 x 2,9	14 x 2,9	14 x 2,9	
Rated power of oversize EC fans		n° x kW	10 x 3,0	10 x 3,0	10 x 3,0	10 x 3,0	12 x 3,0	12 x 3,0	14 x 3,0	14 x 3,0	
Rated current of oversize EC fans		n° x A	10 x 4,5	10 x 4,5	10 x 4,5	10 x 4,5	12 x 4,5	12 x 4,5	14 x 4,5	14 x 4,5	
Electrical specifications for fans FC EXTRA											
Rated power of fan		n° x kW	12 x 2,0	12 x 2,0	14 x 2,0	14 x 2,0	16 x 2,0	16 x 2,0	18 x 2,0	18 x 2,0	
Rated current of fan		n° x A	12 x 4,3	12 x 4,3	14 x 4,3	14 x 4,3	16 x 4,3	16 x 4,3	18 x 4,3	18 x 4,3	
Rated power of EC fan		n° x kW	12 x 1,9	12 x 1,9	14 x 1,9	14 x 1,9	16 x 1,9	16 x 1,9	18 x 1,9	18 x 1,9	
Rated current of EC fan		n° x A	12 x 2,9	12 x 2,9	14 x 2,9	14 x 2,9	16 x 2,9	16 x 2,9	18 x 2,9	18 x 2,9	
Rated power of oversize EC fans		n° x kW	12 x 3,0	12 x 3,0	14 x 3,0	14 x 3,0	16 x 3,0	16 x 3,0	18 x 3,0	18 x 3,0	
Rated current of oversize EC fans		n° x A	12 x 4,5	12 x 4,5	14 x 4,5	14 x 4,5	16 x 4,5	16 x 4,5	18 x 4,5	18 x 4,5	

- (1) Data regarding the unit without accessories working in maximum power absorption conditions
- (2) Datum related to the unit without accessories working in standard conditions (A30°C; W15/10°C; e.g.30%)
- (3) Maximum effective RMS value of the current when the last compressor starts (FLA of the entire unit - FLA of the largest compressor + LRA of the largest compressor)
- (5) These values are determined for cables with operating temperature of 40°C, EPR insulation and a line with a maximum length of 50m. The line section must be determined by a qualified technician based on the protection devices, the length of the line, the type of cable used and the type of installation.
- (6) The correct line protection part must be determined by a qualified technician based on the length of the line, the type of cable used and the type of installation.

KAPPA REV SLN FC

			33.2	35.2	37.2	40.2	43.2	51.2	54.2	58.2
General electrical specifications chiller section										
Nominal current (Inom)	(2)	A	185	199	219	243	268	288	329	370
cosφ standard unit	(2)		0,83	0,83	0,86	0,85	0,84	0,83	0,83	0,85
Nominal current with power factor correction (Inom)	(2)	A	160	174	194	215	235	252	284	328
cosφ unit with power factor correction	(2)		0,96	0,95	0,97	0,96	0,96	0,95	0,96	0,96
General electrical specifications FC BASIC										
Max. absorbed power (FLI)	(1)	kW	150,75	172,8	184,6	203,5	222,3	236,7	270,35	306
Max. absorbed current (FLA)	(1)	A	254,9	290,9	309,2	342,2	375,2	401,5	459,8	516,8
Max. inrush current (MIC)	(3)	A	331,1	389,8	407,8	413,8	446,8	503,8	556,5	719,2
General electrical specifications FC CUSTOM										
Max. absorbed power (FLI)	(1)	kW	152,5	176,3	188,1	207	225,8	240,2	272,1	309,5
Max. absorbed current (FLA)	(1)	A	258,6	298,3	316,6	349,6	382,6	408,9	463,5	524,2
Max. inrush current (MIC)	(3)	A	334,8	397,2	415,2	421,2	454,2	511,2	560,2	726,6
General electrical specifications FC EXTRA										
Max. absorbed power (FLI)	(1)	kW	156	179,8	191,6	210,5	229,3	243,7	275,6	313
Max. absorbed current (FLA)	(1)	A	266	305,7	324	357	390	416,3	470,9	531,6
Max. inrush current (MIC)	(3)	A	342,2	404,6	422,6	428,6	461,6	518,6	567,6	734
Power supply		V/ph/Hz	400/3~/50							
Power supply for auxiliary circuits		V/ph/Hz	230-24/1~/50							
Electrical specifications for fans chiller section										
Rated power of standard fan		n° x kW	6 x 2,0	7 x 2,0	8 x 2,0	8 x 2,0	8 x 2,0	9 x 2,0	11 x 2,0	12 x 2,0
Rated current of standard fan		n° x A	6 x 4,3	7 x 4,3	8 x 4,3	8 x 4,3	8 x 4,3	9 x 4,3	11 x 4,3	12 x 4,3
Rated power of EC fan		n° x kW	6 x 1,9	7 x 1,9	8 x 1,9	8 x 1,9	8 x 1,9	9 x 1,9	11 x 1,9	12 x 1,9
Rated current of EC fan		n° x A	6 x 2,9	7 x 2,9	8 x 2,9	8 x 2,9	8 x 2,9	9 x 2,9	11 x 2,9	12 x 2,9
Rated power of oversize EC fans		n° x kW	6 x 3,0	7 x 3,0	8 x 3,0	8 x 3,0	8 x 3,0	9 x 3,0	11 x 3,0	12 x 3,0
Rated current of oversize EC fans		n° x A	6 x 4,5	7 x 4,5	8 x 4,5	8 x 4,5	8 x 4,5	9 x 4,5	11 x 4,5	12 x 4,5
Electrical specifications for fans FC BASIC										
Rated power of standard fan		n° x kW	3 x 2,0	4 x 2,0	4 x 2,0	4 x 2,0	4 x 2,0	4 x 2,0	5 x 2,0	6 x 2,0
Rated current of standard fan		n° x A	3 x 4,3	4 x 4,3	4 x 4,3	4 x 4,3	4 x 4,3	4 x 4,3	5 x 4,3	6 x 4,3
Rated power of EC fan		n° x kW	3 x 1,9	4 x 1,9	4 x 1,9	4 x 1,9	4 x 1,9	4 x 1,9	5 x 1,9	6 x 1,9
Rated current of EC fan		n° x A	3 x 2,9	4 x 2,9	4 x 2,9	4 x 2,9	4 x 2,9	4 x 2,9	5 x 2,9	6 x 2,9
Rated power of oversize EC fans		n° x kW	3 x 3,0	4 x 3,0	4 x 3,0	4 x 3,0	4 x 3,0	4 x 3,0	5 x 3,0	6 x 3,0
Rated current of oversize EC fans		n° x A	3 x 4,5	4 x 4,5	4 x 4,5	4 x 4,5	4 x 4,5	4 x 4,5	5 x 4,5	6 x 4,5
Electrical specifications for fans FC CUSTOM										
Rated power of fan		n° x kW	4 x 2,0	6 x 2,0	6 x 2,0	6 x 2,0	6 x 2,0	6 x 2,0	6 x 2,0	8 x 2,0
Rated current of fan		n° x A	4 x 4,3	6 x 4,3	6 x 4,3	6 x 4,3	6 x 4,3	6 x 4,3	6 x 4,3	8 x 4,3
Rated power of EC fan		n° x kW	4 x 1,9	6 x 1,9	6 x 1,9	6 x 1,9	6 x 1,9	6 x 1,9	6 x 1,9	8 x 1,9
Rated current of EC fan		n° x A	4 x 2,9	6 x 2,9	6 x 2,9	6 x 2,9	6 x 2,9	6 x 2,9	6 x 2,9	8 x 2,9
Rated power of oversize EC fans		n° x kW	4 x 3,0	6 x 3,0	6 x 3,0	6 x 3,0	6 x 3,0	6 x 3,0	6 x 3,0	8 x 3,0
Rated current of oversize EC fans		n° x A	4 x 4,5	6 x 4,5	6 x 4,5	6 x 4,5	6 x 4,5	6 x 4,5	6 x 4,5	8 x 4,5
Electrical specifications for fans FC EXTRA										
Rated power of fan		n° x kW	6 x 2,0	8 x 2,0	8 x 2,0	8 x 2,0	8 x 2,0	8 x 2,0	8 x 2,0	10 x 2,0
Rated current of fan		n° x A	6 x 4,3	8 x 4,3	8 x 4,3	8 x 4,3	8 x 4,3	8 x 4,3	8 x 4,3	10 x 4,3
Rated power of EC fan		n° x kW	6 x 1,9	8 x 1,9	8 x 1,9	8 x 1,9	8 x 1,9	8 x 1,9	8 x 1,9	10 x 1,9
Rated current of EC fan		n° x A	6 x 2,9	8 x 2,9	8 x 2,9	8 x 2,9	8 x 2,9	8 x 2,9	8 x 2,9	10 x 2,9
Rated power of oversize EC fans		n° x kW	6 x 3,0	8 x 3,0	8 x 3,0	8 x 3,0	8 x 3,0	8 x 3,0	8 x 3,0	10 x 3,0
Rated current of oversize EC fans		n° x A	6 x 4,5	8 x 4,5	8 x 4,5	8 x 4,5	8 x 4,5	8 x 4,5	8 x 4,5	10 x 4,5

- (1) Data regarding the unit without accessories working in maximum power absorption conditions
- (2) Datum related to the unit without accessories working in standard conditions (A30°C; W15/10°C; e.g.30%)
- (3) Maximum effective RMS value of the current when the last compressor starts (FLA of the entire unit - FLA of the largest compressor + LRA of the largest compressor)
- (5) These values are determined for cables with operating temperature of 40°C, EPR insulation and a line with a maximum length of 50m. The line section must be determined by a qualified technician based on the protection devices, the length of the line, the type of cable used and the type of installation.
- (6) The correct line protection part must be determined by a qualified technician based on the length of the line, the type of cable used and the type of installation.

KAPPA REV SLN FC

			67.2	73.2	80.2	85.2	90.2	95.2	100.2	105.2	
General electrical specifications chiller section											
Nominal current (Inom)	(2)	A	391	425	459	486	515	546	577	616	
cosφ standard unit	(2)		0,86	0,87	0,88	0,86	0,85	0,86	0,86	0,86	
Nominal current with power factor correction (Inom)	(2)	A	347	381	416	431	456	489	522	558	
cosφ unit with power factor correction	(2)		0,97	0,97	0,97	0,97	0,96	0,96	0,95	0,95	
General electrical specifications FC BASIC											
Max. absorbed power (FLI)	(1)	kW	322,5	345,2	364,5	392,9	424,9	451,3	481,3	511,3	
Max. absorbed current (FLA)	(1)	A	541,8	577,5	605,8	658,1	717,8	761,1	811,8	859,1	
Max. inrush current (MIC)	(3)	A	744,2	784,6	812,6	938,6	998	1066	1116,4	1276,4	
General electrical specifications FC CUSTOM											
Max. absorbed power (FLI)	(1)	kW	326	348,7	368	396,4	428,4	454,8	484,8	514,8	
Max. absorbed current (FLA)	(1)	A	549,2	584,9	613,2	665,5	725,2	768,5	819,2	866,5	
Max. inrush current (MIC)	(3)	A	751,6	792	820	946	1005,4	1073,4	1123,8	1283,8	
General electrical specifications FC EXTRA											
Max. absorbed power (FLI)	(1)	kW	329,5	352,2	371,5	403,4	435,4	461,8	491,8	521,8	
Max. absorbed current (FLA)	(1)	A	556,6	592,3	620,6	680,3	740	783,3	834	881,3	
Max. inrush current (MIC)	(3)	A	759	799,4	827,4	960,8	1020,2	1088,2	1138,6	1298,6	
Power supply		V/ph/Hz	400/3~/50							400/3~/51	
Power supply for auxiliary circuits		V/ph/Hz	230-24/1~/50							230-24/1~/51	
Electrical specifications for fans chiller section											
Rated power of standard fan		n° x kW	12 x 2,0	13 x 2,0	14 x 2,0	15 x 2,0	16 x 2,0	17 x 2,0	18 x 2,0	19 x 2,0	
Rated current of standard fan		n° x A	12 x 4,3	13 x 4,3	14 x 4,3	15 x 4,3	16 x 4,3	17 x 4,3	18 x 4,3	19 x 4,3	
Rated power of EC fan		n° x kW	12 x 1,9	13 x 1,9	14 x 1,9	15 x 1,9	16 x 1,9	17 x 1,9	18 x 1,9	19 x 1,9	
Rated current of EC fan		n° x A	12 x 2,9	13 x 2,9	14 x 2,9	15 x 2,9	16 x 2,9	17 x 2,9	18 x 2,9	19 x 2,9	
Rated power of oversize EC fans		n° x kW	12 x 3,0	13 x 3,0	14 x 3,0	15 x 3,0	16 x 3,0	17 x 3,0	18 x 3,0	19 x 3,0	
Rated current of oversize EC fans		n° x A	12 x 4,5	13 x 4,5	14 x 4,5	15 x 4,5	16 x 4,5	17 x 4,5	18 x 4,5	19 x 4,5	
Electrical specifications for fans FC BASIC											
Rated power of standard fan		n° x kW	6 x 2,0	8 x 2,0	8 x 2,0	8 x 2,0	10 x 2,0	10 x 2,0	12 x 2,0	12 x 2,0	
Rated current of standard fan		n° x A	6 x 4,3	8 x 4,3	8 x 4,3	8 x 4,3	10 x 4,3	10 x 4,3	12 x 4,3	12 x 4,3	
Rated power of EC fan		n° x kW	6 x 1,9	8 x 1,9	8 x 1,9	8 x 1,9	10 x 1,9	10 x 1,9	12 x 1,9	12 x 1,9	
Rated current of EC fan		n° x A	6 x 2,9	8 x 2,9	8 x 2,9	8 x 2,9	10 x 2,9	10 x 2,9	12 x 2,9	12 x 2,9	
Rated power of oversize EC fans		n° x kW	6 x 3,0	8 x 3,0	8 x 3,0	8 x 3,0	10 x 3,0	10 x 3,0	12 x 3,0	12 x 3,0	
Rated current of oversize EC fans		n° x A	6 x 4,5	8 x 4,5	8 x 4,5	8 x 4,5	10 x 4,5	10 x 4,5	12 x 4,5	12 x 4,5	
Electrical specifications for fans FC CUSTOM											
Rated power of fan		n° x kW	8 x 2,0	10 x 2,0	10 x 2,0	10 x 2,0	12 x 2,0	12 x 2,0	14 x 2,0	14 x 2,0	
Rated current of fan		n° x A	8 x 4,3	10 x 4,3	10 x 4,3	10 x 4,3	12 x 4,3	12 x 4,3	14 x 4,3	14 x 4,3	
Rated power of EC fan		n° x kW	8 x 1,9	10 x 1,9	10 x 1,9	10 x 1,9	12 x 1,9	12 x 1,9	14 x 1,9	14 x 1,9	
Rated current of EC fan		n° x A	8 x 2,9	10 x 2,9	10 x 2,9	10 x 2,9	12 x 2,9	12 x 2,9	14 x 2,9	14 x 2,9	
Rated power of oversize EC fans		n° x kW	8 x 3,0	10 x 3,0	10 x 3,0	10 x 3,0	12 x 3,0	12 x 3,0	14 x 3,0	14 x 3,0	
Rated current of oversize EC fans		n° x A	8 x 4,5	10 x 4,5	10 x 4,5	10 x 4,5	12 x 4,5	12 x 4,5	14 x 4,5	14 x 4,5	
Electrical specifications for fans FC EXTRA											
Rated power of fan		n° x kW	10 x 2,0	12 x 2,0	12 x 2,0	14 x 2,0	16 x 2,0	16 x 2,0	18 x 2,0	18 x 2,0	
Rated current of fan		n° x A	10 x 4,3	12 x 4,3	12 x 4,3	14 x 4,3	16 x 4,3	16 x 4,3	18 x 4,3	18 x 4,3	
Rated power of EC fan		n° x kW	10 x 1,9	12 x 1,9	12 x 1,9	14 x 1,9	16 x 1,9	16 x 1,9	18 x 1,9	18 x 1,9	
Rated current of EC fan		n° x A	10 x 2,9	12 x 2,9	12 x 2,9	14 x 2,9	16 x 2,9	16 x 2,9	18 x 2,9	18 x 2,9	
Rated power of oversize EC fans		n° x kW	10 x 3,0	12 x 3,0	12 x 3,0	14 x 3,0	16 x 3,0	16 x 3,0	18 x 3,0	18 x 3,0	
Rated current of oversize EC fans		n° x A	10 x 4,5	12 x 4,5	12 x 4,5	14 x 4,5	16 x 4,5	16 x 4,5	18 x 4,5	18 x 4,5	

- (1) Data regarding the unit without accessories working in maximum power absorption conditions
- (2) Datum related to the unit without accessories working in standard conditions (A30°C; W15/10°C; e.g.30%)
- (3) Maximum effective RMS value of the current when the last compressor starts (FLA of the entire unit - FLA of the largest compressor + LRA of the largest compressor)
- (5) These values are determined for cables with operating temperature of 40°C, EPR insulation and a line with a maximum length of 50m. The line section must be determined by a qualified technician based on the protection devices, the length of the line, the type of cable used and the type of installation.
- (6) The correct line protection part must be determined by a qualified technician based on the length of the line, the type of cable used and the type of installation.

KAPPA REV HEI FC

			58.2	67.2	73.2	80.2	85.2	90.2	100.2	105.2	
General electrical specifications chiller section											
Nominal current (Inom)	(2)	A	315	357	398	432	485	516	596	598	
cosφ standard unit	(2)		0,87	0,88	0,88	0,89	0,89	0,88	0,87	0,87	
Nominal current with power factor correction (Inom)	(2)	A	288	331	365	405	454	473	535	542	
cosφ unit with power factor correction	(2)		0,95	0,95	0,96	0,95	0,95	0,96	0,97	0,96	
General electrical specifications FC BASIC											
Max. absorbed power (FLI)	(1)	kW	246,3	280,2	316,5	335,7	387,7	418,2	448,7	481,5	
Max. absorbed current (FLA)	(1)	A	429,8	483,1	540,8	569,1	650,8	707,4	769,4	819,7	
Max. inrush current (MIC)	(3)	A	532,2	685,2	742,6	776,6	829	987	971,4	1021,4	
General electrical specifications FC CUSTOM											
Max. absorbed power (FLI)	(1)	kW	249,8	283,7	320	339,2	391,2	421,7	452,2	485	
Max. absorbed current (FLA)	(1)	A	437,2	490,5	548,2	576,5	658,2	714,8	776,8	827,1	
Max. inrush current (MIC)	(3)	A	539,6	692,6	750	784	836,4	994,4	978,8	1028,8	
General electrical specifications FC EXTRA											
Max. absorbed power (FLI)	(1)	kW	253,3	287,2	323,5	342,7	398,2	428,7	459,2	492	
Max. absorbed current (FLA)	(1)	A	444,6	497,9	555,6	583,9	673	729,6	791,6	841,9	
Max. inrush current (MIC)	(3)	A	547	700	757,4	791,4	851,2	1009,2	993,6	1043,6	
Power supply		V/ph/Hz	400/3~/50							400/3~/51	
Power supply for auxiliary circuits		V/ph/Hz	230-24/1~/50							230-24/1~/51	
Electrical specifications for fans chiller section											
Rated power of standard fan		n° x kW	12 x 2,0	13 x 2,0	14 x 2,0	15 x 2,0	16 x 2,0	18 x 2,0	20 x 2,0	21 x 2,0	
Rated current of standard fan		n° x A	12 x 4,3	13 x 4,3	14 x 4,3	15 x 4,3	16 x 4,3	18 x 4,3	20 x 4,3	21 x 4,3	
Rated power of EC fan		n° x kW	12 x 1,9	13 x 1,9	14 x 1,9	15 x 1,9	16 x 1,9	18 x 1,9	20 x 1,9	21 x 1,9	
Rated current of EC fan		n° x A	12 x 2,9	13 x 2,9	14 x 2,9	15 x 2,9	16 x 2,9	18 x 2,9	20 x 2,9	21 x 2,9	
Rated power of oversize EC fans		n° x kW	12 x 3,0	13 x 3,0	14 x 3,0	15 x 3,0	16 x 3,0	18 x 3,0	20 x 3,0	21 x 3,0	
Rated current of oversize EC fans		n° x A	12 x 4,5	13 x 4,5	14 x 4,5	15 x 4,5	16 x 4,5	18 x 4,5	20 x 4,5	21 x 4,5	
Electrical specifications for fans FC BASIC											
Rated power of standard fan		n° x kW	6 x 2,0	6 x 2,0	8 x 2,0	8 x 2,0	10 x 2,0	10 x 2,0	12 x 2,0	12 x 2,0	
Rated current of standard fan		n° x A	6 x 4,3	6 x 4,3	8 x 4,3	8 x 4,3	10 x 4,3	10 x 4,3	12 x 4,3	12 x 4,3	
Rated power of EC fan		n° x kW	6 x 1,9	6 x 1,9	8 x 1,9	8 x 1,9	10 x 1,9	10 x 1,9	12 x 1,9	12 x 1,9	
Rated current of EC fan		n° x A	6 x 2,9	6 x 2,9	8 x 2,9	8 x 2,9	10 x 2,9	10 x 2,9	12 x 2,9	12 x 2,9	
Rated power of oversize EC fans		n° x kW	6 x 3,0	6 x 3,0	8 x 3,0	8 x 3,0	10 x 3,0	10 x 3,0	12 x 3,0	12 x 3,0	
Rated current of oversize EC fans		n° x A	6 x 4,5	6 x 4,5	8 x 4,5	8 x 4,5	10 x 4,5	10 x 4,5	12 x 4,5	12 x 4,5	
Electrical specifications for fans FC CUSTOM											
Rated power of fan		n° x kW	8 x 2,0	8 x 2,0	10 x 2,0	10 x 2,0	12 x 2,0	12 x 2,0	14 x 2,0	14 x 2,0	
Rated current of fan		n° x A	8 x 4,3	8 x 4,3	10 x 4,3	10 x 4,3	12 x 4,3	12 x 4,3	14 x 4,3	14 x 4,3	
Rated power of EC fan		n° x kW	8 x 1,9	8 x 1,9	10 x 1,9	10 x 1,9	12 x 1,9	12 x 1,9	14 x 1,9	14 x 1,9	
Rated current of EC fan		n° x A	8 x 2,9	8 x 2,9	10 x 2,9	10 x 2,9	12 x 2,9	12 x 2,9	14 x 2,9	14 x 2,9	
Rated power of oversize EC fans		n° x kW	8 x 3,0	8 x 3,0	10 x 3,0	10 x 3,0	12 x 3,0	12 x 3,0	14 x 3,0	14 x 3,0	
Rated current of oversize EC fans		n° x A	8 x 4,5	8 x 4,5	10 x 4,5	10 x 4,5	12 x 4,5	12 x 4,5	14 x 4,5	14 x 4,5	
Electrical specifications for fans FC EXTRA											
Rated power of fan		n° x kW	10 x 2,0	10 x 2,0	12 x 2,0	12 x 2,0	16 x 2,0	16 x 2,0	18 x 2,0	18 x 2,0	
Rated current of fan		n° x A	10 x 4,3	10 x 4,3	12 x 4,3	12 x 4,3	16 x 4,3	16 x 4,3	18 x 4,3	18 x 4,3	
Rated power of EC fan		n° x kW	10 x 1,9	10 x 1,9	12 x 1,9	12 x 1,9	16 x 1,9	16 x 1,9	18 x 1,9	18 x 1,9	
Rated current of EC fan		n° x A	10 x 2,9	10 x 2,9	12 x 2,9	12 x 2,9	16 x 2,9	16 x 2,9	18 x 2,9	18 x 2,9	
Rated power of oversize EC fans		n° x kW	10 x 3,0	10 x 3,0	12 x 3,0	12 x 3,0	16 x 3,0	16 x 3,0	18 x 3,0	18 x 3,0	
Rated current of oversize EC fans		n° x A	10 x 4,5	10 x 4,5	12 x 4,5	12 x 4,5	16 x 4,5	16 x 4,5	18 x 4,5	18 x 4,5	

- (1) Data regarding the unit without accessories working in maximum power absorption conditions
- (2) Datum related to the unit without accessories working in standard conditions (A30°C; W15/10°C; e.g.30%)
- (3) Maximum effective RMS value of the current when the last compressor starts (FLA of the entire unit - FLA of the largest compressor + LRA of the largest compressor)
- (5) These values are determined for cables with operating temperature of 40°C, EPR insulation and a line with a maximum length of 50m. The line section must be determined by a qualified technician based on the protection devices, the length of the line, the type of cable used and the type of installation.
- (6) The correct line protection part must be determined by a qualified technician based on the length of the line, the type of cable used and the type of installation.

KAPPA REV XEi FC

			30.1	35.1	45.1	55.2	65.2
General electrical specifications chiller section							
Nominal current (Inom)	(2)	A	158	203	260	316	361
cosφ standard unit	(2)		0,91	0,91	0,91	0,91	0,91
Nominal current with power factor correction (Inom)	(2)	A	148	192	247	299	341
cosφ unit with power factor correction	(2)		0,98	0,97	0,97	0,97	0,97
General electrical specifications FC BASIC							
Max. absorbed power (FLI)	(1)	kW	117	154	204	135	169
Max. absorbed current (FLA)	(1)	A	207,9	266,2	344,8	415,8	470,4
Max. inrush current (MIC)	(3)	A	42,1	53,8	62,8	250,2	258,2
General electrical specifications FC CUSTOM							
Max. absorbed power (FLI)	(1)	kW	118,7	157	207,5	138	172,8
Max. absorbed current (FLA)	(1)	A	211,6	273,6	352,2	423,2	477,8
Max. inrush current (MIC)	(3)	A	45,8	61,2	70,2	257,6	265,6
General electrical specifications FC EXTRA							
Max. absorbed power (FLI)	(1)	kW	122,2	160,5	211	141,5	176,3
Max. absorbed current (FLA)	(1)	A	219	281	359,6	430,6	485,2
Max. inrush current (MIC)	(3)	A	53,2	68,6	77,6	265	273
Power supply		V/ph/Hz	400/3~/50				
Power supply for auxiliary circuits		V/ph/Hz	230-24/1~/50				
Electrical specifications for fans chiller section							
Rated power of standard fan		n° x kW	6 x 2,0	8 x 2,0	10 x 2,0	12 x 2,0	14 x 2,0
Rated current of standard fan		n° x A	6 x 4,3	8 x 4,3	10 x 4,3	12 x 4,3	14 x 4,3
Rated power of EC fan		n° x kW	6 x 1,9	8 x 1,9	10 x 1,9	12 x 1,9	14 x 1,9
Rated current of EC fan		n° x A	6 x 2,9	8 x 2,9	10 x 2,9	12 x 2,9	14 x 2,9
Rated power of oversize EC fans		n° x kW	6 x 3,0	8 x 3,0	10 x 3,0	12 x 3,0	14 x 3,0
Rated current of oversize EC fans		n° x A	6 x 4,5	8 x 4,5	10 x 4,5	12 x 4,5	14 x 4,5
Electrical specifications for fans FC BASIC							
Rated power of standard fan		n° x kW	3 x 2,0	4 x 2,0	4 x 2,0	6 x 2,0	6 x 2,0
Rated current of standard fan		n° x A	3 x 4,3	4 x 4,3	4 x 4,3	6 x 4,3	6 x 4,3
Rated power of EC fan		n° x kW	3 x 1,9	4 x 1,9	4 x 1,9	6 x 1,9	6 x 1,9
Rated current of EC fan		n° x A	3 x 2,9	4 x 2,9	4 x 2,9	6 x 2,9	6 x 2,9
Rated power of oversize EC fans		n° x kW	3 x 3,0	4 x 3,0	4 x 3,0	6 x 3,0	6 x 3,0
Rated current of oversize EC fans		n° x A	3 x 4,5	4 x 4,5	4 x 4,5	6 x 4,5	6 x 4,5
Electrical specifications for fans FC CUSTOM							
Rated power of fan		n° x kW	4 x 2,0	6 x 2,0	6 x 2,0	8 x 2,0	8 x 2,0
Rated current of fan		n° x A	4 x 4,3	6 x 4,3	6 x 4,3	8 x 4,3	8 x 4,3
Rated power of EC fan		n° x kW	4 x 1,9	6 x 1,9	6 x 1,9	8 x 1,9	8 x 1,9
Rated current of EC fan		n° x A	4 x 2,9	6 x 2,9	6 x 2,9	8 x 2,9	8 x 2,9
Rated power of oversize EC fans		n° x kW	4 x 3,0	6 x 3,0	6 x 3,0	8 x 3,0	8 x 3,0
Rated current of oversize EC fans		n° x A	4 x 4,5	6 x 4,5	6 x 4,5	8 x 4,5	8 x 4,5
Electrical specifications for fans FC EXTRA							
Rated power of fan		n° x kW	6 x 2,0	8 x 2,0	8 x 2,0	10 x 2,0	10 x 2,0
Rated current of fan		n° x A	6 x 4,3	8 x 4,3	8 x 4,3	10 x 4,3	10 x 4,3
Rated power of EC fan		n° x kW	6 x 1,9	8 x 1,9	8 x 1,9	10 x 1,9	10 x 1,9
Rated current of EC fan		n° x A	6 x 2,9	8 x 2,9	8 x 2,9	10 x 2,9	10 x 2,9
Rated power of oversize EC fans		n° x kW	6 x 3,0	8 x 3,0	8 x 3,0	10 x 3,0	10 x 3,0
Rated current of oversize EC fans		n° x A	6 x 4,5	8 x 4,5	8 x 4,5	10 x 4,5	10 x 4,5

- (1) Data regarding the unit without accessories working in maximum power absorption conditions
- (2) Datum related to the unit without accessories working in standard conditions (A30°C; W15/10°C; e.g.30%)
- (3) Maximum effective RMS value of the current when the last compressor starts (FLA of the entire unit - FLA of the largest compressor + LRA of the largest compressor)
- (5) These values are determined for cables with operating temperature of 40°C, EPR insulation and a line with a maximum length of 50m. The line section must be determined by a qualified technician based on the protection devices, the length of the line, the type of cable used and the type of installation.
- (6) The correct line protection part must be determined by a qualified technician based on the length of the line, the type of cable used and the type of installation.

KAPPA REV XEi FC

			70.2	80.2	90.2	100.3
General electrical specifications chiller section						
Nominal current (Inom)	(2)	A	439	463	520	564
cosφ standard unit	(2)		0,91	0,91	0,91	0,91
Nominal current with power factor correction (Inom)	(2)	A	382	438	493	533
cosφ unit with power factor correction	(2)		0,97	0,97	0,97	0,97
General electrical specifications FC BASIC						
Max. absorbed power (FLI)	(1)	kW	177	227	231	162
Max. absorbed current (FLA)	(1)	A	532,4	611	689,6	736,6
Max. inrush current (MIC)	(3)	A	320,6	328,6	407,6	525
General electrical specifications FC CUSTOM						
Max. absorbed power (FLI)	(1)	kW	180,2	230,7	234,7	165,2
Max. absorbed current (FLA)	(1)	A	539,8	618,4	697	744
Max. inrush current (MIC)	(3)	A	328	336	415	532,4
General electrical specifications FC EXTRA						
Max. absorbed power (FLI)	(1)	kW	183,7	237,7	241,7	172,2
Max. absorbed current (FLA)	(1)	A	547,2	633,2	711,8	758,8
Max. inrush current (MIC)	(3)	A	335,4	350,8	429,8	547,2
Power supply		V/ph/Hz	400/3~/50			
Power supply for auxiliary circuits		V/ph/Hz	230-24/1~/50			
Electrical specifications for fans chiller section						
Rated power of standard fan		n° x kW	16 x 2,0	18 x 2,0	20 x 2,0	22 x 2,0
Rated current of standard fan		n° x A	16 x 4,3	18 x 4,3	20 x 4,3	22 x 4,3
Rated power of EC fan		n° x kW	16 x 1,9	18 x 1,9	20 x 1,9	22 x 1,9
Rated current of EC fan		n° x A	16 x 2,9	18 x 2,9	20 x 2,9	22 x 2,9
Rated power of oversize EC fans		n° x kW	16 x 3,0	18 x 3,0	20 x 3,0	22 x 3,0
Rated current of oversize EC fans		n° x A	16 x 4,5	18 x 4,5	20 x 4,5	22 x 4,5
Electrical specifications for fans FC BASIC						
Rated power of standard fan		n° x kW	8 x 2,0	8 x 2,0	8 x 2,0	10 x 2,0
Rated current of standard fan		n° x A	8 x 4,3	8 x 4,3	8 x 4,3	10 x 4,3
Rated power of EC fan		n° x kW	8 x 1,9	8 x 1,9	8 x 1,9	10 x 1,9
Rated current of EC fan		n° x A	8 x 2,9	8 x 2,9	8 x 2,9	10 x 2,9
Rated power of oversize EC fans		n° x kW	8 x 3,0	8 x 3,0	8 x 3,0	10 x 3,0
Rated current of oversize EC fans		n° x A	8 x 4,5	8 x 4,5	8 x 4,5	10 x 4,5
Electrical specifications for fans FC CUSTOM						
Rated power of fan		n° x kW	10 x 2,0	10 x 2,0	10 x 2,0	12 x 2,0
Rated current of fan		n° x A	10 x 4,3	10 x 4,3	10 x 4,3	12 x 4,3
Rated power of EC fan		n° x kW	10 x 1,9	10 x 1,9	10 x 1,9	12 x 1,9
Rated current of EC fan		n° x A	10 x 2,9	10 x 2,9	10 x 2,9	12 x 2,9
Rated power of oversize EC fans		n° x kW	10 x 3,0	10 x 3,0	10 x 3,0	12 x 3,0
Rated current of oversize EC fans		n° x A	10 x 4,5	10 x 4,5	10 x 4,5	12 x 4,5
Electrical specifications for fans FC EXTRA						
Rated power of fan		n° x kW	12 x 2,0	14 x 2,0	14 x 2,0	16 x 2,0
Rated current of fan		n° x A	12 x 4,3	14 x 4,3	14 x 4,3	16 x 4,3
Rated power of EC fan		n° x kW	12 x 1,9	14 x 1,9	14 x 1,9	16 x 1,9
Rated current of EC fan		n° x A	12 x 2,9	14 x 2,9	14 x 2,9	16 x 2,9
Rated power of oversize EC fans		n° x kW	12 x 3,0	14 x 3,0	14 x 3,0	16 x 3,0
Rated current of oversize EC fans		n° x A	12 x 4,5	14 x 4,5	14 x 4,5	16 x 4,5

- (1) Data regarding the unit without accessories working in maximum power absorption conditions
- (2) Datum related to the unit without accessories working in standard conditions (A30°C; W15/10°C; e.g.30%)
- (3) Maximum effective RMS value of the current when the last compressor starts (FLA of the entire unit - FLA of the largest compressor + LRA of the largest compressor)
- (5) These values are determined for cables with operating temperature of 40°C, EPR insulation and a line with a maximum length of 50m. The line section must be determined by a qualified technician based on the protection devices, the length of the line, the type of cable used and the type of installation.
- (6) The correct line protection part must be determined by a qualified technician based on the length of the line, the type of cable used and the type of installation.

KAPPA REV FC (R513A)

			33.2	35.2	37.2	40.2	43.2	51.2
General electrical specifications chiller section								
Nominal current (Inom)	(2)	A	186	200	216	239	266	287
cosφ standard unit	(2)		0,83	0,83	0,86	0,85	0,84	0,83
Nominal current with power factor correction (Inom)	(2)	A	160	175	191	212	233	250
cosφ unit with power factor correction	(2)		0,96	0,95	0,97	0,96	0,96	0,95
General electrical specifications FC BASIC								
Max. absorbed power (FLI)	(1)	kW	154	167	187	207	226	241
Max. absorbed current (FLA)	(1)	A	260	282	311	346	381	407
Max. inrush current (MIC)	(3)	A	339	361	414	420	455	513
General electrical specifications FC CUSTOM								
Max. absorbed power (FLI)	(1)	kW	156	170	191	210	230	245
Max. absorbed current (FLA)	(1)	A	264	290	318	353	388	414
Max. inrush current (MIC)	(3)	A	343	368	421	427	462	520
General electrical specifications FC EXTRA								
Max. absorbed power (FLI)	(1)	kW	159	174	194	214	233	248
Max. absorbed current (FLA)	(1)	A	271	297	325	360	395	422
Max. inrush current (MIC)	(3)	A	350	376	429	435	470	528
Power supply		V/ph/Hz	400/3~ /50					
Power supply for auxiliary circuits		V/ph/Hz	230-24/1~ /50					
Electrical specifications for fans chiller section								
Rated power of standard fan		n° x kW	5 x 2,0	6 x 2,0	6 x 2,0	6 x 2,0	6 x 2,0	7 x 2,0
Rated current of standard fan		n° x A	5 x 4,3	6 x 4,3	6 x 4,3	6 x 4,3	6 x 4,3	7 x 4,3
Rated power of EC fan		n° x kW	5 x 1,9	6 x 1,9	6 x 1,9	6 x 1,9	6 x 1,9	7 x 1,9
Rated current of EC fan		n° x A	5 x 2,9	6 x 2,9	6 x 2,9	6 x 2,9	6 x 2,9	7 x 2,9
Rated power of oversize EC fans		n° x kW	5 x 3,0	6 x 3,0	6 x 3,0	6 x 3,0	6 x 3,0	7 x 3,0
Rated current of oversize EC fans		n° x A	5 x 4,5	6 x 4,5	6 x 4,5	6 x 4,5	6 x 4,5	7 x 4,5
Electrical specifications for fans FC BASIC								
Rated power of standard fan		n° x kW	3 x 2,0	4 x 2,0	4 x 2,0	4 x 2,0	4 x 2,0	4 x 2,0
Rated current of standard fan		n° x A	3 x 4,3	4 x 4,3	4 x 4,3	4 x 4,3	4 x 4,3	4 x 4,3
Rated power of EC fan		n° x kW	3 x 1,9	4 x 1,9	4 x 1,9	4 x 1,9	4 x 1,9	4 x 1,9
Rated current of EC fan		n° x A	3 x 2,9	4 x 2,9	4 x 2,9	4 x 2,9	4 x 2,9	4 x 2,9
Rated power of oversize EC fans		n° x kW	3 x 3,0	4 x 3,0	4 x 3,0	4 x 3,0	4 x 3,0	4 x 3,0
Rated current of oversize EC fans		n° x A	3 x 4,5	4 x 4,5	4 x 4,5	4 x 4,5	4 x 4,5	4 x 4,5
Electrical specifications for fans FC CUSTOM								
Rated power of fan		n° x kW	4 x 2,0	6 x 2,0	6 x 2,0	6 x 2,0	6 x 2,0	6 x 2,0
Rated current of fan		n° x A	4 x 4,3	6 x 4,3	6 x 4,3	6 x 4,3	6 x 4,3	6 x 4,3
Rated power of EC fan		n° x kW	4 x 1,9	6 x 1,9	6 x 1,9	6 x 1,9	6 x 1,9	6 x 1,9
Rated current of EC fan		n° x A	4 x 2,9	6 x 2,9	6 x 2,9	6 x 2,9	6 x 2,9	6 x 2,9
Rated power of oversize EC fans		n° x kW	4 x 3,0	6 x 3,0	6 x 3,0	6 x 3,0	6 x 3,0	6 x 3,0
Rated current of oversize EC fans		n° x A	4 x 4,5	6 x 4,5	6 x 4,5	6 x 4,5	6 x 4,5	6 x 4,5
Electrical specifications for fans FC EXTRA								
Rated power of fan		n° x kW	6 x 2,0	8 x 2,0	8 x 2,0	8 x 2,0	8 x 2,0	8 x 2,0
Rated current of fan		n° x A	6 x 4,3	8 x 4,3	8 x 4,3	8 x 4,3	8 x 4,3	8 x 4,3
Rated power of EC fan		n° x kW	6 x 1,9	8 x 1,9	8 x 1,9	8 x 1,9	8 x 1,9	8 x 1,9
Rated current of EC fan		n° x A	6 x 2,9	8 x 2,9	8 x 2,9	8 x 2,9	8 x 2,9	8 x 2,9
Rated power of oversize EC fans		n° x kW	6 x 3,0	8 x 3,0	8 x 3,0	8 x 3,0	8 x 3,0	8 x 3,0
Rated current of oversize EC fans		n° x A	6 x 4,5	8 x 4,5	8 x 4,5	8 x 4,5	8 x 4,5	8 x 4,5

- (1) Data regarding the unit without accessories working in maximum power absorption conditions
- (2) Datum related to the unit without accessories working in standard conditions (A30°C; W15/10°C; e.g.30%)
- (3) Maximum effective RMS value of the current when the last compressor starts (FLA of the entire unit - FLA of the largest compressor + LRA of the largest compressor)
- (5) These values are determined for cables with operating temperature of 40°C, EPR insulation and a line with a maximum length of 50m. The line section must be determined by a qualified technician based on the protection devices, the length of the line, the type of cable used and the type of installation.
- (6) The correct line protection part must be determined by a qualified technician based on the length of the line, the type of cable used and the type of installation.

KAPPA REV FC (R513A)

			54.2	58.2	67.2	73.2	80.2	85.2
General electrical specifications chiller section								
Nominal current (Inom)	(2)	A	323	365	389	424	457	481
cosφ standard unit	(2)		0,83	0,85	0,86	0,87	0,88	0,86
Nominal current with power factor correction (Inom)	(2)	A	279	323	345	380	415	426
cosφ unit with power factor correction	(2)		0,96	0,96	0,97	0,97	0,97	0,97
General electrical specifications FC BASIC								
Max. absorbed power (FLI)	(1)	kW	274	311	330	353	373	401
Max. absorbed current (FLA)	(1)	A	462	522	552	589	618	668
Max. inrush current (MIC)	(3)	A	564	731	762	804	833	959
General electrical specifications FC CUSTOM								
Max. absorbed power (FLI)	(1)	kW	276	314	334	357	377	404
Max. absorbed current (FLA)	(1)	A	466	529	559	596	625	675
Max. inrush current (MIC)	(3)	A	567	739	770	811	840	966
General electrical specifications FC EXTRA								
Max. absorbed power (FLI)	(1)	kW	279	318	337	360	380	411
Max. absorbed current (FLA)	(1)	A	473	536	567	603	633	690
Max. inrush current (MIC)	(3)	A	575	746	777	818	847	981
Power supply		V/ph/Hz	400/3~ /50					
Power supply for auxiliary circuits		V/ph/Hz	230-24/1~ /50					
Electrical specifications for fans chiller section								
Rated power of standard fan		n° x kW	8 x 2,0	9 x 2,0	10 x 2,0	11 x 2,0	12 x 2,0	12 x 2,0
Rated current of standard fan		n° x A	8 x 4,3	9 x 4,3	10 x 4,3	11 x 4,3	12 x 4,3	12 x 4,3
Rated power of EC fan		n° x kW	8 x 1,9	9 x 1,9	10 x 1,9	11 x 1,9	12 x 1,9	12 x 1,9
Rated current of EC fan		n° x A	8 x 2,9	9 x 2,9	10 x 2,9	11 x 2,9	12 x 2,9	12 x 2,9
Rated power of oversize EC fans		n° x kW	8 x 3,0	9 x 3,0	10 x 3,0	11 x 3,0	12 x 3,0	12 x 3,0
Rated current of oversize EC fans		n° x A	8 x 4,5	9 x 4,5	10 x 4,5	11 x 4,5	12 x 4,5	12 x 4,5
Electrical specifications for fans FC BASIC								
Rated power of standard fan		n° x kW	5 x 2,0	6 x 2,0	6 x 2,0	8 x 2,0	8 x 2,0	8 x 2,0
Rated current of standard fan		n° x A	5 x 4,3	6 x 4,3	6 x 4,3	8 x 4,3	8 x 4,3	8 x 4,3
Rated power of EC fan		n° x kW	5 x 1,9	6 x 1,9	6 x 1,9	8 x 1,9	8 x 1,9	8 x 1,9
Rated current of EC fan		n° x A	5 x 2,9	6 x 2,9	6 x 2,9	8 x 2,9	8 x 2,9	8 x 2,9
Rated power of oversize EC fans		n° x kW	5 x 3,0	6 x 3,0	6 x 3,0	8 x 3,0	8 x 3,0	8 x 3,0
Rated current of oversize EC fans		n° x A	5 x 4,5	6 x 4,5	6 x 4,5	8 x 4,5	8 x 4,5	8 x 4,5
Electrical specifications for fans FC CUSTOM								
Rated power of fan		n° x kW	6 x 2,0	8 x 2,0	8 x 2,0	10 x 2,0	10 x 2,0	10 x 2,0
Rated current of fan		n° x A	6 x 4,3	8 x 4,3	8 x 4,3	10 x 4,3	10 x 4,3	10 x 4,3
Rated power of EC fan		n° x kW	6 x 1,9	8 x 1,9	8 x 1,9	10 x 1,9	10 x 1,9	10 x 1,9
Rated current of EC fan		n° x A	6 x 2,9	8 x 2,9	8 x 2,9	10 x 2,9	10 x 2,9	10 x 2,9
Rated power of oversize EC fans		n° x kW	6 x 3,0	8 x 3,0	8 x 3,0	10 x 3,0	10 x 3,0	10 x 3,0
Rated current of oversize EC fans		n° x A	6 x 4,5	8 x 4,5	8 x 4,5	10 x 4,5	10 x 4,5	10 x 4,5
Electrical specifications for fans FC EXTRA								
Rated power of fan		n° x kW	8 x 2,0	10 x 2,0	10 x 2,0	12 x 2,0	12 x 2,0	14 x 2,0
Rated current of fan		n° x A	8 x 4,3	10 x 4,3	10 x 4,3	12 x 4,3	12 x 4,3	14 x 4,3
Rated power of EC fan		n° x kW	8 x 1,9	10 x 1,9	10 x 1,9	12 x 1,9	12 x 1,9	14 x 1,9
Rated current of EC fan		n° x A	8 x 2,9	10 x 2,9	10 x 2,9	12 x 2,9	12 x 2,9	14 x 2,9
Rated power of oversize EC fans		n° x kW	8 x 3,0	10 x 3,0	10 x 3,0	12 x 3,0	12 x 3,0	14 x 3,0
Rated current of oversize EC fans		n° x A	8 x 4,5	10 x 4,5	10 x 4,5	12 x 4,5	12 x 4,5	14 x 4,5

- (1) Data regarding the unit without accessories working in maximum power absorption conditions
- (2) Datum related to the unit without accessories working in standard conditions (A30°C; W15/10°C; e.g.30%)
- (3) Maximum effective RMS value of the current when the last compressor starts (FLA of the entire unit - FLA of the largest compressor + LRA of the largest compressor)
- (5) These values are determined for cables with operating temperature of 40°C, EPR insulation and a line with a maximum length of 50m. The line section must be determined by a qualified technician based on the protection devices, the length of the line, the type of cable used and the type of installation.
- (6) The correct line protection part must be determined by a qualified technician based on the length of the line, the type of cable used and the type of installation.

KAPPA REV FC (R513A)

			90.2	95.2	100.2	105.2	115.2
General electrical specifications chiller section							
Nominal current (Inom)	(2)	A	504	536	566	606	644
cosφ standard unit	(2)		0,85	0,86	0,86	0,86	0,86
Nominal current with power factor correction (Inom)	(2)	A	446	480	512	548	583
cosφ unit with power factor correction	(2)		0,96	0,96	0,95	0,95	0,95
General electrical specifications FC BASIC							
Max. absorbed power (FLI)	(1)	kW	428	459	487	521	553
Max. absorbed current (FLA)	(1)	A	718	770	815	871	920
Max. inrush current (MIC)	(3)	A	1009	1087	1132	1304	1353
General electrical specifications FC CUSTOM							
Max. absorbed power (FLI)	(1)	kW	432	463	490	525	556
Max. absorbed current (FLA)	(1)	A	725	777	822	879	928
Max. inrush current (MIC)	(3)	A	1016	1094	1139	1312	1361
General electrical specifications FC EXTRA							
Max. absorbed power (FLI)	(1)	kW	439	470	497	532	563
Max. absorbed current (FLA)	(1)	A	740	792	837	893	942
Max. inrush current (MIC)	(3)	A	1031	1109	1154	1327	1376
Power supply		V/ph/Hz	400/3~/50			400/3~/51	400/3~/52
Power supply for auxiliary circuits		V/ph/Hz	230-24/1~/50			230-24/1~/51	230-24/1~/52
Electrical specifications for fans chiller section							
Rated power of standard fan		n° x kW	12 x 2,0	13 x 2,0	14 x 2,0	15 x 2,0	16 x 2,0
Rated current of standard fan		n° x A	12 x 4,3	13 x 4,3	14 x 4,3	15 x 4,3	16 x 4,3
Rated power of EC fan		n° x kW	12 x 1,9	13 x 1,9	14 x 1,9	15 x 1,9	16 x 1,9
Rated current of EC fan		n° x A	12 x 2,9	13 x 2,9	14 x 2,9	15 x 2,9	16 x 2,9
Rated power of oversize EC fans		n° x kW	12 x 3,0	13 x 3,0	14 x 3,0	15 x 3,0	16 x 3,0
Rated current of oversize EC fans		n° x A	12 x 4,5	13 x 4,5	14 x 4,5	15 x 4,5	16 x 4,5
Electrical specifications for fans FC BASIC							
Rated power of standard fan		n° x kW	8 x 2,0	10 x 2,0	10 x 2,0	12 x 2,0	12 x 2,0
Rated current of standard fan		n° x A	8 x 4,3	10 x 4,3	10 x 4,3	12 x 4,3	12 x 4,3
Rated power of EC fan		n° x kW	8 x 1,9	10 x 1,9	10 x 1,9	12 x 1,9	12 x 1,9
Rated current of EC fan		n° x A	8 x 2,9	10 x 2,9	10 x 2,9	12 x 2,9	12 x 2,9
Rated power of oversize EC fans		n° x kW	8 x 3,0	10 x 3,0	10 x 3,0	12 x 3,0	12 x 3,0
Rated current of oversize EC fans		n° x A	8 x 4,5	10 x 4,5	10 x 4,5	12 x 4,5	12 x 4,5
Electrical specifications for fans FC CUSTOM							
Rated power of fan		n° x kW	10 x 2,0	12 x 2,0	12 x 2,0	14 x 2,0	14 x 2,0
Rated current of fan		n° x A	10 x 4,3	12 x 4,3	12 x 4,3	14 x 4,3	14 x 4,3
Rated power of EC fan		n° x kW	10 x 1,9	12 x 1,9	12 x 1,9	14 x 1,9	14 x 1,9
Rated current of EC fan		n° x A	10 x 2,9	12 x 2,9	12 x 2,9	14 x 2,9	14 x 2,9
Rated power of oversize EC fans		n° x kW	10 x 3,0	12 x 3,0	12 x 3,0	14 x 3,0	14 x 3,0
Rated current of oversize EC fans		n° x A	10 x 4,5	12 x 4,5	12 x 4,5	14 x 4,5	14 x 4,5
Electrical specifications for fans FC EXTRA							
Rated power of fan		n° x kW	14 x 2,0	16 x 2,0	16 x 2,0	18 x 2,0	18 x 2,0
Rated current of fan		n° x A	14 x 4,3	16 x 4,3	16 x 4,3	18 x 4,3	18 x 4,3
Rated power of EC fan		n° x kW	14 x 1,9	16 x 1,9	16 x 1,9	18 x 1,9	18 x 1,9
Rated current of EC fan		n° x A	14 x 2,9	16 x 2,9	16 x 2,9	18 x 2,9	18 x 2,9
Rated power of oversize EC fans		n° x kW	14 x 3,0	16 x 3,0	16 x 3,0	18 x 3,0	18 x 3,0
Rated current of oversize EC fans		n° x A	14 x 4,5	16 x 4,5	16 x 4,5	18 x 4,5	18 x 4,5

- (1) Data regarding the unit without accessories working in maximum power absorption conditions
- (2) Datum related to the unit without accessories working in standard conditions (A30°C; W15/10°C; e.g.30%)
- (3) Maximum effective RMS value of the current when the last compressor starts (FLA of the entire unit - FLA of the largest compressor + LRA of the largest compressor)
- (5) These values are determined for cables with operating temperature of 40°C, EPR insulation and a line with a maximum length of 50m. The line section must be determined by a qualified technician based on the protection devices, the length of the line, the type of cable used and the type of installation.
- (6) The correct line protection part must be determined by a qualified technician based on the length of the line, the type of cable used and the type of installation.

KAPPA REV HE FC (R513A)

				33.2	35.2	37.2	40.2	43.2	51.2	54.2	58.2
General electrical specifications chiller section											
Nominal current (Inom)	(2)	A	190	204	224	247	274	295	335	377	
cosφ standard unit	(2)		0,83	0,83	0,86	0,85	0,84	0,83	0,83	0,85	
Nominal current with power factor correction (Inom)	(2)	A	164	178	198	219	240	257	290	333	
cosφ unit with power factor correction	(2)		0,96	0,95	0,97	0,96	0,96	0,95	0,96	0,96	
General electrical specifications FC BASIC											
Max. absorbed power (FLI)	(1)	kW	156	179	191	211	230	247	282	317	
Max. absorbed current (FLA)	(1)	A	264	301	319	354	389	419	479	535	
Max. inrush current (MIC)	(3)	A	343	404	423	429	464	526	580	744	
General electrical specifications FC CUSTOM											
Max. absorbed power (FLI)	(1)	kW	157	182	195	214	234	249	285	320	
Max. absorbed current (FLA)	(1)	A	268	308	327	362	397	423	486	542	
Max. inrush current (MIC)	(3)	A	347	411	430	436	471	529	588	752	
General electrical specifications FC EXTRA											
Max. absorbed power (FLI)	(1)	kW	161	186	198	218	237	252	289	324	
Max. absorbed current (FLA)	(1)	A	275	316	334	369	404	430	494	549	
Max. inrush current (MIC)	(3)	A	354	419	438	444	479	537	595	759	
Power supply		V/ph/Hz	400/3~/50								
Power supply for auxiliary circuits		V/ph/Hz	230-24/1~/50								
Electrical specifications for fans chiller section											
Rated power of standard fan		n° x kW	6 x 2,0	7 x 2,0	8 x 2,0	8 x 2,0	8 x 2,0	9 x 2,0	11 x 2,0	12 x 2,0	
Rated current of standard fan		n° x A	6 x 4,3	7 x 4,3	8 x 4,3	8 x 4,3	8 x 4,3	9 x 4,3	11 x 4,3	12 x 4,3	
Rated power of EC fan		n° x kW	6 x 1,9	7 x 1,9	8 x 1,9	8 x 1,9	8 x 1,9	9 x 1,9	11 x 1,9	12 x 1,9	
Rated current of EC fan		n° x A	6 x 2,9	7 x 2,9	8 x 2,9	8 x 2,9	8 x 2,9	9 x 2,9	11 x 2,9	12 x 2,9	
Rated power of oversize EC fans		n° x kW	6 x 3,0	7 x 3,0	8 x 3,0	8 x 3,0	8 x 3,0	9 x 3,0	11 x 3,0	12 x 3,0	
Rated current of oversize EC fans		n° x A	6 x 4,5	7 x 4,5	8 x 4,5	8 x 4,5	8 x 4,5	9 x 4,5	11 x 4,5	12 x 4,5	
Electrical specifications for fans FC BASIC											
Rated power of standard fan		n° x kW	3 x 2,0	4 x 2,0	4 x 2,0	4 x 2,0	4 x 2,0	5 x 2,0	6 x 2,0	6 x 2,0	
Rated current of standard fan		n° x A	3 x 4,3	4 x 4,3	4 x 4,3	4 x 4,3	4 x 4,3	5 x 4,3	6 x 4,3	6 x 4,3	
Rated power of EC fan		n° x kW	3 x 1,9	4 x 1,9	4 x 1,9	4 x 1,9	4 x 1,9	5 x 1,9	6 x 1,9	6 x 1,9	
Rated current of EC fan		n° x A	3 x 2,9	4 x 2,9	4 x 2,9	4 x 2,9	4 x 2,9	5 x 2,9	6 x 2,9	6 x 2,9	
Rated power of oversize EC fans		n° x kW	3 x 3,0	4 x 3,0	4 x 3,0	4 x 3,0	4 x 3,0	5 x 3,0	6 x 3,0	6 x 3,0	
Rated current of oversize EC fans		n° x A	3 x 4,5	4 x 4,5	4 x 4,5	4 x 4,5	4 x 4,5	5 x 4,5	6 x 4,5	6 x 4,5	
Electrical specifications for fans FC CUSTOM											
Rated power of fan		n° x kW	4 x 2,0	6 x 2,0	6 x 2,0	6 x 2,0	6 x 2,0	6 x 2,0	8 x 2,0	8 x 2,0	
Rated current of fan		n° x A	4 x 4,3	6 x 4,3	6 x 4,3	6 x 4,3	6 x 4,3	6 x 4,3	8 x 4,3	8 x 4,3	
Rated power of EC fan		n° x kW	4 x 1,9	6 x 1,9	6 x 1,9	6 x 1,9	6 x 1,9	6 x 1,9	8 x 1,9	8 x 1,9	
Rated current of EC fan		n° x A	4 x 2,9	6 x 2,9	6 x 2,9	6 x 2,9	6 x 2,9	6 x 2,9	8 x 2,9	8 x 2,9	
Rated power of oversize EC fans		n° x kW	4 x 3,0	6 x 3,0	6 x 3,0	6 x 3,0	6 x 3,0	6 x 3,0	8 x 3,0	8 x 3,0	
Rated current of oversize EC fans		n° x A	4 x 4,5	6 x 4,5	6 x 4,5	6 x 4,5	6 x 4,5	6 x 4,5	8 x 4,5	8 x 4,5	
Electrical specifications for fans FC EXTRA											
Rated power of fan		n° x kW	6 x 2,0	8 x 2,0	8 x 2,0	8 x 2,0	8 x 2,0	8 x 2,0	10 x 2,0	10 x 2,0	
Rated current of fan		n° x A	6 x 4,3	8 x 4,3	8 x 4,3	8 x 4,3	8 x 4,3	8 x 4,3	10 x 4,3	10 x 4,3	
Rated power of EC fan		n° x kW	6 x 1,9	8 x 1,9	8 x 1,9	8 x 1,9	8 x 1,9	8 x 1,9	10 x 1,9	10 x 1,9	
Rated current of EC fan		n° x A	6 x 2,9	8 x 2,9	8 x 2,9	8 x 2,9	8 x 2,9	8 x 2,9	10 x 2,9	10 x 2,9	
Rated power of oversize EC fans		n° x kW	6 x 3,0	8 x 3,0	8 x 3,0	8 x 3,0	8 x 3,0	8 x 3,0	10 x 3,0	10 x 3,0	
Rated current of oversize EC fans		n° x A	6 x 4,5	8 x 4,5	8 x 4,5	8 x 4,5	8 x 4,5	8 x 4,5	10 x 4,5	10 x 4,5	

- (1) Data regarding the unit without accessories working in maximum power absorption conditions
- (2) Datum related to the unit without accessories working in standard conditions (A30°C; W15/10°C; e.g.30%)
- (3) Maximum effective RMS value of the current when the last compressor starts (FLA of the entire unit - FLA of the largest compressor + LRA of the largest compressor)
- (5) These values are determined for cables with operating temperature of 40°C, EPR insulation and a line with a maximum length of 50m. The line section must be determined by a qualified technician based on the protection devices, the length of the line, the type of cable used and the type of installation.
- (6) The correct line protection part must be determined by a qualified technician based on the length of the line, the type of cable used and the type of installation.

KAPPA REV HE FC (R513A)

				67.2	73.2	80.2	85.2	90.2	95.2	100.2	105.2
General electrical specifications chiller section											
Nominal current (Inom)	(2)	A	397	432	465	493	521	553	583	623	
cosφ standard unit	(2)		0,86	0,87	0,88	0,86	0,85	0,86	0,86	0,86	
Nominal current with power factor correction (Inom)	(2)	A	352	387	422	437	461	495	528	564	
cosφ unit with power factor correction	(2)		0,97	0,97	0,97	0,97	0,96	0,96	0,95	0,95	
General electrical specifications FC BASIC											
Max. absorbed power (FLI)	(1)	kW	338	357	377	407	440	467	498	529	
Max. absorbed current (FLA)	(1)	A	568	597	626	681	742	787	839	888	
Max. inrush current (MIC)	(3)	A	778	813	842	972	1034	1104	1156	1322	
General electrical specifications FC CUSTOM											
Max. absorbed power (FLI)	(1)	kW	341	361	381	410	443	471	502	533	
Max. absorbed current (FLA)	(1)	A	575	605	634	688	750	795	847	896	
Max. inrush current (MIC)	(3)	A	785	820	849	979	1041	1111	1164	1330	
General electrical specifications FC EXTRA											
Max. absorbed power (FLI)	(1)	kW	345	364	388	417	450	478	509	540	
Max. absorbed current (FLA)	(1)	A	583	612	649	703	765	809	862	911	
Max. inrush current (MIC)	(3)	A	792	827	864	994	1056	1126	1179	1345	
Power supply		V/ph/Hz	400/3~/50							400/3~/51	
Power supply for auxiliary circuits		V/ph/Hz	230-24/1~/50							230-24/1~/51	
Electrical specifications for fans chiller section											
Rated power of standard fan		n° x kW	12 x 2,0	13 x 2,0	14 x 2,0	15 x 2,0	16 x 2,0	17 x 2,0	18 x 2,0	19 x 2,0	
Rated current of standard fan		n° x A	12 x 4,3	13 x 4,3	14 x 4,3	15 x 4,3	16 x 4,3	17 x 4,3	18 x 4,3	19 x 4,3	
Rated power of EC fan		n° x kW	12 x 1,9	13 x 1,9	14 x 1,9	15 x 1,9	16 x 1,9	17 x 1,9	18 x 1,9	19 x 1,9	
Rated current of EC fan		n° x A	12 x 2,9	13 x 2,9	14 x 2,9	15 x 2,9	16 x 2,9	17 x 2,9	18 x 2,9	19 x 2,9	
Rated power of oversize EC fans		n° x kW	12 x 3,0	13 x 3,0	14 x 3,0	15 x 3,0	16 x 3,0	17 x 3,0	18 x 3,0	19 x 3,0	
Rated current of oversize EC fans		n° x A	12 x 4,5	13 x 4,5	14 x 4,5	15 x 4,5	16 x 4,5	17 x 4,5	18 x 4,5	19 x 4,5	
Electrical specifications for fans FC BASIC											
Rated power of standard fan		n° x kW	8 x 2,0	8 x 2,0	8 x 2,0	8 x 2,0	10 x 2,0	10 x 2,0	12 x 2,0	12 x 2,0	
Rated current of standard fan		n° x A	8 x 4,3	8 x 4,3	8 x 4,3	8 x 4,3	10 x 4,3	10 x 4,3	12 x 4,3	12 x 4,3	
Rated power of EC fan		n° x kW	8 x 1,9	8 x 1,9	8 x 1,9	8 x 1,9	10 x 1,9	10 x 1,9	12 x 1,9	12 x 1,9	
Rated current of EC fan		n° x A	8 x 2,9	8 x 2,9	8 x 2,9	8 x 2,9	10 x 2,9	10 x 2,9	12 x 2,9	12 x 2,9	
Rated power of oversize EC fans		n° x kW	8 x 3,0	8 x 3,0	8 x 3,0	8 x 3,0	10 x 3,0	10 x 3,0	12 x 3,0	12 x 3,0	
Rated current of oversize EC fans		n° x A	8 x 4,5	8 x 4,5	8 x 4,5	8 x 4,5	10 x 4,5	10 x 4,5	12 x 4,5	12 x 4,5	
Electrical specifications for fans FC CUSTOM											
Rated power of fan		n° x kW	10 x 2,0	10 x 2,0	10 x 2,0	10 x 2,0	12 x 2,0	12 x 2,0	14 x 2,0	14 x 2,0	
Rated current of fan		n° x A	10 x 4,3	10 x 4,3	10 x 4,3	10 x 4,3	12 x 4,3	12 x 4,3	14 x 4,3	14 x 4,3	
Rated power of EC fan		n° x kW	10 x 1,9	10 x 1,9	10 x 1,9	10 x 1,9	12 x 1,9	12 x 1,9	14 x 1,9	14 x 1,9	
Rated current of EC fan		n° x A	10 x 2,9	10 x 2,9	10 x 2,9	10 x 2,9	12 x 2,9	12 x 2,9	14 x 2,9	14 x 2,9	
Rated power of oversize EC fans		n° x kW	10 x 3,0	10 x 3,0	10 x 3,0	10 x 3,0	12 x 3,0	12 x 3,0	14 x 3,0	14 x 3,0	
Rated current of oversize EC fans		n° x A	10 x 4,5	10 x 4,5	10 x 4,5	10 x 4,5	12 x 4,5	12 x 4,5	14 x 4,5	14 x 4,5	
Electrical specifications for fans FC EXTRA											
Rated power of fan		n° x kW	12 x 2,0	12 x 2,0	14 x 2,0	14 x 2,0	16 x 2,0	16 x 2,0	18 x 2,0	18 x 2,0	
Rated current of fan		n° x A	12 x 4,3	12 x 4,3	14 x 4,3	14 x 4,3	16 x 4,3	16 x 4,3	18 x 4,3	18 x 4,3	
Rated power of EC fan		n° x kW	12 x 1,9	12 x 1,9	14 x 1,9	14 x 1,9	16 x 1,9	16 x 1,9	18 x 1,9	18 x 1,9	
Rated current of EC fan		n° x A	12 x 2,9	12 x 2,9	14 x 2,9	14 x 2,9	16 x 2,9	16 x 2,9	18 x 2,9	18 x 2,9	
Rated power of oversize EC fans		n° x kW	12 x 3,0	12 x 3,0	14 x 3,0	14 x 3,0	16 x 3,0	16 x 3,0	18 x 3,0	18 x 3,0	
Rated current of oversize EC fans		n° x A	12 x 4,5	12 x 4,5	14 x 4,5	14 x 4,5	16 x 4,5	16 x 4,5	18 x 4,5	18 x 4,5	

(1) Data regarding the unit without accessories working in maximum power absorption conditions

(2) Datum related to the unit without accessories working in standard conditions (A30°C; W15/10°C; e.g.30%)

(3) Maximum effective RMS value of the current when the last compressor starts (FLA of the entire unit - FLA of the largest compressor + LRA of the largest compressor)

(5) These values are determined for cables with operating temperature of 40°C, EPR insulation and a line with a maximum length of 50m. The line section must be determined by a qualified technician based on the protection devices, the length of the line, the type of cable used and the type of installation.

(6) The correct line protection part must be determined by a qualified technician based on the length of the line, the type of cable used and the type of installation.

KAPPA REV SLN FC (R513A)

			33.2	35.2	37.2	40.2	43.2	51.2	54.2	58.2
General electrical specifications chiller section										
Nominal current (Inom)	(2)	A	190	204	224	247	274	295	335	377
cosφ standard unit	(2)		0,83	0,83	0,86	0,85	0,84	0,83	0,83	0,85
Nominal current with power factor correction (Inom)	(2)	A	164	178	198	219	240	257	290	333
cosφ unit with power factor correction	(2)		0,96	0,95	0,97	0,96	0,96	0,95	0,96	0,96
General electrical specifications FC BASIC										
Max. absorbed power (FLI)	(1)	kW	156	179	191	211	230	245	280	317
Max. absorbed current (FLA)	(1)	A	264	301	319	354	389	416	475	535
Max. inrush current (MIC)	(3)	A	343	404	423	429	464	522	577	744
General electrical specifications FC CUSTOM										
Max. absorbed power (FLI)	(1)	kW	157	182	195	214	234	249	282	320
Max. absorbed current (FLA)	(1)	A	268	308	327	362	397	423	479	542
Max. inrush current (MIC)	(3)	A	347	411	430	436	471	529	580	752
General electrical specifications FC EXTRA										
Max. absorbed power (FLI)	(1)	kW	161	186	198	218	237	252	285	324
Max. absorbed current (FLA)	(1)	A	275	316	334	369	404	430	486	549
Max. inrush current (MIC)	(3)	A	354	419	438	444	479	537	588	759
Power supply		V/ph/Hz	400/3~/50							
Power supply for auxiliary circuits		V/ph/Hz	230-24/1~/50							
Electrical specifications for fans chiller section										
Rated power of standard fan		n° x kW	6 x 2,0	7 x 2,0	8 x 2,0	8 x 2,0	8 x 2,0	9 x 2,0	11 x 2,0	12 x 2,0
Rated current of standard fan		n° x A	6 x 4,3	7 x 4,3	8 x 4,3	8 x 4,3	8 x 4,3	9 x 4,3	11 x 4,3	12 x 4,3
Rated power of EC fan		n° x kW	6 x 1,9	7 x 1,9	8 x 1,9	8 x 1,9	8 x 1,9	9 x 1,9	11 x 1,9	12 x 1,9
Rated current of EC fan		n° x A	6 x 2,9	7 x 2,9	8 x 2,9	8 x 2,9	8 x 2,9	9 x 2,9	11 x 2,9	12 x 2,9
Rated power of oversize EC fans		n° x kW	6 x 3,0	7 x 3,0	8 x 3,0	8 x 3,0	8 x 3,0	9 x 3,0	11 x 3,0	12 x 3,0
Rated current of oversize EC fans		n° x A	6 x 4,5	7 x 4,5	8 x 4,5	8 x 4,5	8 x 4,5	9 x 4,5	11 x 4,5	12 x 4,5
Electrical specifications for fans FC BASIC										
Rated power of standard fan		n° x kW	3 x 2,0	4 x 2,0	4 x 2,0	4 x 2,0	4 x 2,0	4 x 2,0	5 x 2,0	6 x 2,0
Rated current of standard fan		n° x A	3 x 4,3	4 x 4,3	4 x 4,3	4 x 4,3	4 x 4,3	4 x 4,3	5 x 4,3	6 x 4,3
Rated power of EC fan		n° x kW	3 x 1,9	4 x 1,9	4 x 1,9	4 x 1,9	4 x 1,9	4 x 1,9	5 x 1,9	6 x 1,9
Rated current of EC fan		n° x A	3 x 2,9	4 x 2,9	4 x 2,9	4 x 2,9	4 x 2,9	4 x 2,9	5 x 2,9	6 x 2,9
Rated power of oversize EC fans		n° x kW	3 x 3,0	4 x 3,0	4 x 3,0	4 x 3,0	4 x 3,0	4 x 3,0	5 x 3,0	6 x 3,0
Rated current of oversize EC fans		n° x A	3 x 4,5	4 x 4,5	4 x 4,5	4 x 4,5	4 x 4,5	4 x 4,5	5 x 4,5	6 x 4,5
Electrical specifications for fans FC CUSTOM										
Rated power of fan		n° x kW	4 x 2,0	6 x 2,0	6 x 2,0	6 x 2,0	6 x 2,0	6 x 2,0	6 x 2,0	8 x 2,0
Rated current of fan		n° x A	4 x 4,3	6 x 4,3	6 x 4,3	6 x 4,3	6 x 4,3	6 x 4,3	6 x 4,3	8 x 4,3
Rated power of EC fan		n° x kW	4 x 1,9	6 x 1,9	6 x 1,9	6 x 1,9	6 x 1,9	6 x 1,9	6 x 1,9	8 x 1,9
Rated current of EC fan		n° x A	4 x 2,9	6 x 2,9	6 x 2,9	6 x 2,9	6 x 2,9	6 x 2,9	6 x 2,9	8 x 2,9
Rated power of oversize EC fans		n° x kW	4 x 3,0	6 x 3,0	6 x 3,0	6 x 3,0	6 x 3,0	6 x 3,0	6 x 3,0	8 x 3,0
Rated current of oversize EC fans		n° x A	4 x 4,5	6 x 4,5	6 x 4,5	6 x 4,5	6 x 4,5	6 x 4,5	6 x 4,5	8 x 4,5
Electrical specifications for fans FC EXTRA										
Rated power of fan		n° x kW	6 x 2,0	8 x 2,0	8 x 2,0	8 x 2,0	8 x 2,0	8 x 2,0	8 x 2,0	10 x 2,0
Rated current of fan		n° x A	6 x 4,3	8 x 4,3	8 x 4,3	8 x 4,3	8 x 4,3	8 x 4,3	8 x 4,3	10 x 4,3
Rated power of EC fan		n° x kW	6 x 1,9	8 x 1,9	8 x 1,9	8 x 1,9	8 x 1,9	8 x 1,9	8 x 1,9	10 x 1,9
Rated current of EC fan		n° x A	6 x 2,9	8 x 2,9	8 x 2,9	8 x 2,9	8 x 2,9	8 x 2,9	8 x 2,9	10 x 2,9
Rated power of oversize EC fans		n° x kW	6 x 3,0	8 x 3,0	8 x 3,0	8 x 3,0	8 x 3,0	8 x 3,0	8 x 3,0	10 x 3,0
Rated current of oversize EC fans		n° x A	6 x 4,5	8 x 4,5	8 x 4,5	8 x 4,5	8 x 4,5	8 x 4,5	8 x 4,5	10 x 4,5

- (1) Data regarding the unit without accessories working in maximum power absorption conditions
- (2) Datum related to the unit without accessories working in standard conditions (A30°C; W15/10°C; e.g.30%)
- (3) Maximum effective RMS value of the current when the last compressor starts (FLA of the entire unit - FLA of the largest compressor + LRA of the largest compressor)
- (5) These values are determined for cables with operating temperature of 40°C, EPR insulation and a line with a maximum length of 50m. The line section must be determined by a qualified technician based on the protection devices, the length of the line, the type of cable used and the type of installation.
- (6) The correct line protection part must be determined by a qualified technician based on the length of the line, the type of cable used and the type of installation.

KAPPA REV SLN FC (R513A)

			33.2	35.2	37.2	40.2	43.2	51.2	54.2	58.2
General electrical specifications chiller section										
Nominal current (Inom)	(2)	A	190	204	224	247	274	295	335	377
cosφ standard unit	(2)		0,83	0,83	0,86	0,85	0,84	0,83	0,83	0,85
Nominal current with power factor correction (Inom)	(2)	A	164	178	198	219	240	257	290	333
cosφ unit with power factor correction	(2)		0,96	0,95	0,97	0,96	0,96	0,95	0,96	0,96
General electrical specifications FC BASIC										
Max. absorbed power (FLI)	(1)	kW	156	179	191	211	230	245	280	317
Max. absorbed current (FLA)	(1)	A	264	301	319	354	389	416	475	535
Max. inrush current (MIC)	(3)	A	343	404	423	429	464	522	577	744
General electrical specifications FC CUSTOM										
Max. absorbed power (FLI)	(1)	kW	157	182	195	214	234	249	282	320
Max. absorbed current (FLA)	(1)	A	268	308	327	362	397	423	479	542
Max. inrush current (MIC)	(3)	A	347	411	430	436	471	529	580	752
General electrical specifications FC EXTRA										
Max. absorbed power (FLI)	(1)	kW	161	186	198	218	237	252	285	324
Max. absorbed current (FLA)	(1)	A	275	316	334	369	404	430	486	549
Max. inrush current (MIC)	(3)	A	354	419	438	444	479	537	588	759
Power supply		V/ph/Hz	400/3~/50							
Power supply for auxiliary circuits		V/ph/Hz	230-24/1~/50							
Electrical specifications for fans chiller section										
Rated power of standard fan		n° x kW	6 x 2,0	7 x 2,0	8 x 2,0	8 x 2,0	8 x 2,0	9 x 2,0	11 x 2,0	12 x 2,0
Rated current of standard fan		n° x A	6 x 4,3	7 x 4,3	8 x 4,3	8 x 4,3	8 x 4,3	9 x 4,3	11 x 4,3	12 x 4,3
Rated power of EC fan		n° x kW	6 x 1,9	7 x 1,9	8 x 1,9	8 x 1,9	8 x 1,9	9 x 1,9	11 x 1,9	12 x 1,9
Rated current of EC fan		n° x A	6 x 2,9	7 x 2,9	8 x 2,9	8 x 2,9	8 x 2,9	9 x 2,9	11 x 2,9	12 x 2,9
Rated power of oversize EC fans		n° x kW	6 x 3,0	7 x 3,0	8 x 3,0	8 x 3,0	8 x 3,0	9 x 3,0	11 x 3,0	12 x 3,0
Rated current of oversize EC fans		n° x A	6 x 4,5	7 x 4,5	8 x 4,5	8 x 4,5	8 x 4,5	9 x 4,5	11 x 4,5	12 x 4,5
Electrical specifications for fans FC BASIC										
Rated power of standard fan		n° x kW	3 x 2,0	4 x 2,0	4 x 2,0	4 x 2,0	4 x 2,0	4 x 2,0	5 x 2,0	6 x 2,0
Rated current of standard fan		n° x A	3 x 4,3	4 x 4,3	4 x 4,3	4 x 4,3	4 x 4,3	4 x 4,3	5 x 4,3	6 x 4,3
Rated power of EC fan		n° x kW	3 x 1,9	4 x 1,9	4 x 1,9	4 x 1,9	4 x 1,9	4 x 1,9	5 x 1,9	6 x 1,9
Rated current of EC fan		n° x A	3 x 2,9	4 x 2,9	4 x 2,9	4 x 2,9	4 x 2,9	4 x 2,9	5 x 2,9	6 x 2,9
Rated power of oversize EC fans		n° x kW	3 x 3,0	4 x 3,0	4 x 3,0	4 x 3,0	4 x 3,0	4 x 3,0	5 x 3,0	6 x 3,0
Rated current of oversize EC fans		n° x A	3 x 4,5	4 x 4,5	4 x 4,5	4 x 4,5	4 x 4,5	4 x 4,5	5 x 4,5	6 x 4,5
Electrical specifications for fans FC CUSTOM										
Rated power of fan		n° x kW	4 x 2,0	6 x 2,0	6 x 2,0	6 x 2,0	6 x 2,0	6 x 2,0	6 x 2,0	8 x 2,0
Rated current of fan		n° x A	4 x 4,3	6 x 4,3	6 x 4,3	6 x 4,3	6 x 4,3	6 x 4,3	6 x 4,3	8 x 4,3
Rated power of EC fan		n° x kW	4 x 1,9	6 x 1,9	6 x 1,9	6 x 1,9	6 x 1,9	6 x 1,9	6 x 1,9	8 x 1,9
Rated current of EC fan		n° x A	4 x 2,9	6 x 2,9	6 x 2,9	6 x 2,9	6 x 2,9	6 x 2,9	6 x 2,9	8 x 2,9
Rated power of oversize EC fans		n° x kW	4 x 3,0	6 x 3,0	6 x 3,0	6 x 3,0	6 x 3,0	6 x 3,0	6 x 3,0	8 x 3,0
Rated current of oversize EC fans		n° x A	4 x 4,5	6 x 4,5	6 x 4,5	6 x 4,5	6 x 4,5	6 x 4,5	6 x 4,5	8 x 4,5
Electrical specifications for fans FC EXTRA										
Rated power of fan		n° x kW	6 x 2,0	8 x 2,0	8 x 2,0	8 x 2,0	8 x 2,0	8 x 2,0	8 x 2,0	10 x 2,0
Rated current of fan		n° x A	6 x 4,3	8 x 4,3	8 x 4,3	8 x 4,3	8 x 4,3	8 x 4,3	8 x 4,3	10 x 4,3
Rated power of EC fan		n° x kW	6 x 1,9	8 x 1,9	8 x 1,9	8 x 1,9	8 x 1,9	8 x 1,9	8 x 1,9	10 x 1,9
Rated current of EC fan		n° x A	6 x 2,9	8 x 2,9	8 x 2,9	8 x 2,9	8 x 2,9	8 x 2,9	8 x 2,9	10 x 2,9
Rated power of oversize EC fans		n° x kW	6 x 3,0	8 x 3,0	8 x 3,0	8 x 3,0	8 x 3,0	8 x 3,0	8 x 3,0	10 x 3,0
Rated current of oversize EC fans		n° x A	6 x 4,5	8 x 4,5	8 x 4,5	8 x 4,5	8 x 4,5	8 x 4,5	8 x 4,5	10 x 4,5

- (1) Data regarding the unit without accessories working in maximum power absorption conditions
- (2) Datum related to the unit without accessories working in standard conditions (A30°C; W15/10°C; e.g.30%)
- (3) Maximum effective RMS value of the current when the last compressor starts (FLA of the entire unit - FLA of the largest compressor + LRA of the largest compressor)
- (5) These values are determined for cables with operating temperature of 40°C, EPR insulation and a line with a maximum length of 50m. The line section must be determined by a qualified technician based on the protection devices, the length of the line, the type of cable used and the type of installation.
- (6) The correct line protection part must be determined by a qualified technician based on the length of the line, the type of cable used and the type of installation.

KAPPA REV HEi FC (R513A)

			58.2	67.2	73.2	80.2	85.2	90.2	100.2	105.2	
General electrical specifications chiller section											
Nominal current (Inom)	(2)	A	320	362	403	436	491	523	602	605	
cosφ standard unit	(2)		0,87	0,88	0,88	0,89	0,89	0,88	0,87	0,87	
Nominal current with power factor correction (Inom)	(2)	A	293	335	369	409	460	479	540	548	
cosφ unit with power factor correction	(2)		0,95	0,95	0,96	0,95	0,95	0,96	0,97	0,96	
General electrical specifications FC BASIC											
Max. absorbed power (FLI)	(1)	kW	259	296	334	354	408	441	464	499	
Max. absorbed current (FLA)	(1)	A	444	499	559	588	673	731	786	838	
Max. inrush current (MIC)	(3)	A	550	709	769	804	858	1022	995	1047	
General electrical specifications FC CUSTOM											
Max. absorbed power (FLI)	(1)	kW	263	299	337	358	412	444	468	502	
Max. absorbed current (FLA)	(1)	A	451	507	566	596	680	739	793	845	
Max. inrush current (MIC)	(3)	A	558	717	776	811	865	1029	1003	1055	
General electrical specifications FC EXTRA											
Max. absorbed power (FLI)	(1)	kW	266	303	341	361	419	451	475	509	
Max. absorbed current (FLA)	(1)	A	459	514	574	603	695	753	808	860	
Max. inrush current (MIC)	(3)	A	565	724	783	818	880	1044	1018	1070	
Power supply		V/ph/Hz	400/3~/50							400/3~/51	
Power supply for auxiliary circuits		V/ph/Hz	230-24/1~/50							230-24/1~/51	
Electrical specifications for fans chiller section											
Rated power of standard fan		n° x kW	12 x 2,0	13 x 2,0	14 x 2,0	15 x 2,0	16 x 2,0	18 x 2,0	20 x 2,0	21 x 2,0	
Rated current of standard fan		n° x A	12 x 4,3	13 x 4,3	14 x 4,3	15 x 4,3	16 x 4,3	18 x 4,3	20 x 4,3	21 x 4,3	
Rated power of EC fan		n° x kW	12 x 1,9	13 x 1,9	14 x 1,9	15 x 1,9	16 x 1,9	18 x 1,9	20 x 1,9	21 x 1,9	
Rated current of EC fan		n° x A	12 x 2,9	13 x 2,9	14 x 2,9	15 x 2,9	16 x 2,9	18 x 2,9	20 x 2,9	21 x 2,9	
Rated power of oversize EC fans		n° x kW	12 x 3,0	13 x 3,0	14 x 3,0	15 x 3,0	16 x 3,0	18 x 3,0	20 x 3,0	21 x 3,0	
Rated current of oversize EC fans		n° x A	12 x 4,5	13 x 4,5	14 x 4,5	15 x 4,5	16 x 4,5	18 x 4,5	20 x 4,5	21 x 4,5	
Electrical specifications for fans FC BASIC											
Rated power of standard fan		n° x kW	6 x 2,0	6 x 2,0	8 x 2,0	8 x 2,0	10 x 2,0	10 x 2,0	12 x 2,0	12 x 2,0	
Rated current of standard fan		n° x A	6 x 4,3	6 x 4,3	8 x 4,3	8 x 4,3	10 x 4,3	10 x 4,3	12 x 4,3	12 x 4,3	
Rated power of EC fan		n° x kW	6 x 1,9	6 x 1,9	8 x 1,9	8 x 1,9	10 x 1,9	10 x 1,9	12 x 1,9	12 x 1,9	
Rated current of EC fan		n° x A	6 x 2,9	6 x 2,9	8 x 2,9	8 x 2,9	10 x 2,9	10 x 2,9	12 x 2,9	12 x 2,9	
Rated power of oversize EC fans		n° x kW	6 x 3,0	6 x 3,0	8 x 3,0	8 x 3,0	10 x 3,0	10 x 3,0	12 x 3,0	12 x 3,0	
Rated current of oversize EC fans		n° x A	6 x 4,5	6 x 4,5	8 x 4,5	8 x 4,5	10 x 4,5	10 x 4,5	12 x 4,5	12 x 4,5	
Electrical specifications for fans FC CUSTOM											
Rated power of fan		n° x kW	8 x 2,0	8 x 2,0	10 x 2,0	10 x 2,0	12 x 2,0	12 x 2,0	14 x 2,0	14 x 2,0	
Rated current of fan		n° x A	8 x 4,3	8 x 4,3	10 x 4,3	10 x 4,3	12 x 4,3	12 x 4,3	14 x 4,3	14 x 4,3	
Rated power of EC fan		n° x kW	8 x 1,9	8 x 1,9	10 x 1,9	10 x 1,9	12 x 1,9	12 x 1,9	14 x 1,9	14 x 1,9	
Rated current of EC fan		n° x A	8 x 2,9	8 x 2,9	10 x 2,9	10 x 2,9	12 x 2,9	12 x 2,9	14 x 2,9	14 x 2,9	
Rated power of oversize EC fans		n° x kW	8 x 3,0	8 x 3,0	10 x 3,0	10 x 3,0	12 x 3,0	12 x 3,0	14 x 3,0	14 x 3,0	
Rated current of oversize EC fans		n° x A	8 x 4,5	8 x 4,5	10 x 4,5	10 x 4,5	12 x 4,5	12 x 4,5	14 x 4,5	14 x 4,5	
Electrical specifications for fans FC EXTRA											
Rated power of fan		n° x kW	10 x 2,0	10 x 2,0	12 x 2,0	12 x 2,0	16 x 2,0	16 x 2,0	18 x 2,0	18 x 2,0	
Rated current of fan		n° x A	10 x 4,3	10 x 4,3	12 x 4,3	12 x 4,3	16 x 4,3	16 x 4,3	18 x 4,3	18 x 4,3	
Rated power of EC fan		n° x kW	10 x 1,9	10 x 1,9	12 x 1,9	12 x 1,9	16 x 1,9	16 x 1,9	18 x 1,9	18 x 1,9	
Rated current of EC fan		n° x A	10 x 2,9	10 x 2,9	12 x 2,9	12 x 2,9	16 x 2,9	16 x 2,9	18 x 2,9	18 x 2,9	
Rated power of oversize EC fans		n° x kW	10 x 3,0	10 x 3,0	12 x 3,0	12 x 3,0	16 x 3,0	16 x 3,0	18 x 3,0	18 x 3,0	
Rated current of oversize EC fans		n° x A	10 x 4,5	10 x 4,5	12 x 4,5	12 x 4,5	16 x 4,5	16 x 4,5	18 x 4,5	18 x 4,5	

(1) Data regarding the unit without accessories working in maximum power absorption conditions

(2) Datum related to the unit without accessories working in standard conditions (A30°C; W15/10°C; e.g.30%)

(3) Maximum effective RMS value of the current when the last compressor starts (FLA of the entire unit - FLA of the largest compressor + LRA of the largest compressor)

(5) These values are determined for cables with operating temperature of 40°C, EPR insulation and a line with a maximum length of 50m. The line section must be determined by a qualified technician based on the protection devices, the length of the line, the type of cable used and the type of installation.

(6) The correct line protection part must be determined by a qualified technician based on the length of the line, the type of cable used and the type of installation.

KAPPA REV XEi FC (R513A)

			30.1	35.1	45.1	55.2	65.2	70.2	80.2	90.2	100.3
General electrical specifications chiller section											
Nominal current (Inom)	(2)	A	163	208	265	322	368	445	470	526	571
cosφ standard unit	(2)		0,91	0,91	0,91	0,91	0,91	0,91	0,91	0,91	0,91
Nominal current with power factor correction (Inom)	(2)	A	-	-	-	-	-	-	-	-	-
cosφ unit with power factor correction	(2)		-	-	-	-	-	-	-	-	-
General electrical specifications FC BASIC											
Max. absorbed power (FLI)	(1)	kW	121	159	211	138	175	182	234	238	198
Max. absorbed current (FLA)	(1)	A	215	275	356	423	479	541	623	701	791
Max. inrush current (MIC)	(3)	A	42	54	63	250	258	321	329	408	571
General electrical specifications FC CUSTOM											
Max. absorbed power (FLI)	(1)	kW	123	162	215	142	178	185	238	242	201
Max. absorbed current (FLA)	(1)	A	218	282	364	430	487	549	630	709	799
Max. inrush current (MIC)	(3)	A	46	61	70	258	266	328	336	415	578
General electrical specifications FC EXTRA											
Max. absorbed power (FLI)	(1)	kW	126	166	218	145	182	189	245	249	208
Max. absorbed current (FLA)	(1)	A	226	290	371	437	494	556	645	723	814
Max. inrush current (MIC)	(3)	A	53	69	78	265	273	335	351	430	593
Power supply		V/ph/Hz	400/3~/50								
Power supply for auxiliary circuits		V/ph/Hz	230-24/1~/50								
Electrical specifications for fans chiller section											
Rated power of standard fan		n° x kW	6 x 2,0	8 x 2,0	10 x 2,0	12 x 2,0	14 x 2,0	16 x 2,0	18 x 2,0	20 x 2,0	22 x 2,0
Rated current of standard fan		n° x A	6 x 4,3	8 x 4,3	10 x 4,3	12 x 4,3	14 x 4,3	16 x 4,3	18 x 4,3	20 x 4,3	22 x 4,3
Rated power of EC fan		n° x kW	6 x 1,9	8 x 1,9	10 x 1,9	12 x 1,9	14 x 1,9	16 x 1,9	18 x 1,9	20 x 1,9	22 x 1,9
Rated current of EC fan		n° x A	6 x 2,9	8 x 2,9	10 x 2,9	12 x 2,9	14 x 2,9	16 x 2,9	18 x 2,9	20 x 2,9	22 x 2,9
Rated power of oversize EC fans		n° x kW	6 x 3,0	8 x 3,0	10 x 3,0	12 x 3,0	14 x 3,0	16 x 3,0	18 x 3,0	20 x 3,0	22 x 3,0
Rated current of oversize EC fans		n° x A	6 x 4,5	8 x 4,5	10 x 4,5	12 x 4,5	14 x 4,5	16 x 4,5	18 x 4,5	20 x 4,5	22 x 4,5
Electrical specifications for fans FC BASIC											
Rated power of standard fan		n° x kW	3 x 2,0	4 x 2,0	4 x 2,0	6 x 2,0	6 x 2,0	8 x 2,0	8 x 2,0	8 x 2,0	10 x 2,0
Rated current of standard fan		n° x A	3 x 4,3	4 x 4,3	4 x 4,3	6 x 4,3	6 x 4,3	8 x 4,3	8 x 4,3	8 x 4,3	10 x 4,3
Rated power of EC fan		n° x kW	3 x 1,9	4 x 1,9	4 x 1,9	6 x 1,9	6 x 1,9	8 x 1,9	8 x 1,9	8 x 1,9	10 x 1,9
Rated current of EC fan		n° x A	3 x 2,9	4 x 2,9	4 x 2,9	6 x 2,9	6 x 2,9	8 x 2,9	8 x 2,9	8 x 2,9	10 x 2,9
Rated power of oversize EC fans		n° x kW	3 x 3,0	4 x 3,0	4 x 3,0	6 x 3,0	6 x 3,0	8 x 3,0	8 x 3,0	8 x 3,0	10 x 3,0
Rated current of oversize EC fans		n° x A	3 x 4,5	4 x 4,5	4 x 4,5	6 x 4,5	6 x 4,5	8 x 4,5	8 x 4,5	8 x 4,5	10 x 4,5
Electrical specifications for fans FC CUSTOM											
Rated power of fan		n° x kW	4 x 2,0	6 x 2,0	6 x 2,0	8 x 2,0	8 x 2,0	10 x 2,0	10 x 2,0	10 x 2,0	12 x 2,0
Rated current of fan		n° x A	4 x 4,3	6 x 4,3	6 x 4,3	8 x 4,3	8 x 4,3	10 x 4,3	10 x 4,3	10 x 4,3	12 x 4,3
Rated power of EC fan		n° x kW	4 x 1,9	6 x 1,9	6 x 1,9	8 x 1,9	8 x 1,9	10 x 1,9	10 x 1,9	10 x 1,9	12 x 1,9
Rated current of EC fan		n° x A	4 x 2,9	6 x 2,9	6 x 2,9	8 x 2,9	8 x 2,9	10 x 2,9	10 x 2,9	10 x 2,9	12 x 2,9
Rated power of oversize EC fans		n° x kW	4 x 3,0	6 x 3,0	6 x 3,0	8 x 3,0	8 x 3,0	10 x 3,0	10 x 3,0	10 x 3,0	12 x 3,0
Rated current of oversize EC fans		n° x A	4 x 4,5	6 x 4,5	6 x 4,5	8 x 4,5	8 x 4,5	10 x 4,5	10 x 4,5	10 x 4,5	12 x 4,5
Electrical specifications for fans FC EXTRA											
Rated power of fan		n° x kW	6 x 2,0	8 x 2,0	8 x 2,0	10 x 2,0	10 x 2,0	12 x 2,0	14 x 2,0	14 x 2,0	16 x 2,0
Rated current of fan		n° x A	6 x 4,3	8 x 4,3	8 x 4,3	10 x 4,3	10 x 4,3	12 x 4,3	14 x 4,3	14 x 4,3	16 x 4,3
Rated power of EC fan		n° x kW	6 x 1,9	8 x 1,9	8 x 1,9	10 x 1,9	10 x 1,9	12 x 1,9	14 x 1,9	14 x 1,9	16 x 1,9
Rated current of EC fan		n° x A	6 x 2,9	8 x 2,9	8 x 2,9	10 x 2,9	10 x 2,9	12 x 2,9	14 x 2,9	14 x 2,9	16 x 2,9
Rated power of oversize EC fans		n° x kW	6 x 3,0	8 x 3,0	8 x 3,0	10 x 3,0	10 x 3,0	12 x 3,0	14 x 3,0	14 x 3,0	16 x 3,0
Rated current of oversize EC fans		n° x A	6 x 4,5	8 x 4,5	8 x 4,5	10 x 4,5	10 x 4,5	12 x 4,5	14 x 4,5	14 x 4,5	16 x 4,5

- (1) Data regarding the unit without accessories working in maximum power absorption conditions
- (2) Datum related to the unit without accessories working in standard conditions (A30°C; W15/10°C; e.g.30%)
- (3) Maximum effective RMS value of the current when the last compressor starts (FLA of the entire unit - FLA of the largest compressor + LRA of the largest compressor)
- (5) These values are determined for cables with operating temperature of 40°C, EPR insulation and a line with a maximum length of 50m. The line section must be determined by a qualified technician based on the protection devices, the length of the line, the type of cable used and the type of installation.
- (6) The correct line protection part must be determined by a qualified technician based on the length of the line, the type of cable used and the type of installation.

HYDRAULIC MODULES

KAPPA REV FC

			33.2	35.2	37.2	40.2	43.2	51.2	54.2
Volume of the expansion vessel		l	24	24	24	24	24	24	24
Volume of the buffer tank		l	300	300	300	300	300	300	740
FC BASIC standard pumps									
Pump model 1P,2P			P2	P2	P4	P4	P4	P5	P7
Available head 1P	(1) (8)	kPa	222	175	180	193	222	256	220
Available head 2P	(1) (8)	kPa	207	156	156	186	214	246	208
Available head 1P	(1) (7)	kPa	188	121	115	118	136	155	136
Available head 2P	(1) (7)	kPa	172	101	91	111	127	146	124
FC BASIC oversized pumps									
Pump model 1PM, 2PM			P5	P5	P5	P5	P5	P6	P8
Available head 1PM	(1) (8)	kPa	222	175	180	193	222	256	220
Available head 2PM	(1) (8)	kPa	207	156	156	186	214	246	208
Available head 1PM	(1) (7)	kPa	188	121	115	118	136	155	136
Available head 2PM	(1) (7)	kPa	172	101	91	111	127	146	124
FC CUSTOM standard pumps									
Pump model 1P,2P			P2	P3	P3	P3	P4	P4	P7
Available head 1P	(1) (8)	kPa	222	173	141	156	221	183	219
Available head 2P	(1) (8)	kPa	206	153	117	149	213	173	207
Available head 1P	(1) (7)	kPa	177	146	109	119	179	134	159
Available head 2P	(1) (7)	kPa	161	127	85	112	171	125	147
FC CUSTOM oversized pumps									
Pump model 1PM, 2PM			P5	P5	P5	P5	P5	P5	P8
Available head 1PM	(1) (8)	kPa	311	282	248	263	292	254	296
Available head 2PM	(1) (8)	kPa	295	262	225	256	284	245	284
Available head 1PM	(1) (7)	kPa	266	255	217	226	250	206	236
Available head 2PM	(1) (7)	kPa	250	235	193	219	242	196	223
FC EXTRA standard pumps									
Pump model 1P,2P			P1	P3	P3	P3	P3	P4	P7
Available head 1P	(1) (8)	kPa	133	171	138	155	183	181	217
Available head 2P	(1) (8)	kPa	117	151	115	148	175	172	205
Available head 1P	(1) (7)	kPa	110	154	119	132	158	152	181
Available head 2P	(1) (7)	kPa	95	135	95	125	150	142	169
FC EXTRA oversized pumps									
Pump model 1PM, 2PM			P2	P5	P5	P5	P5	P5	P8
Available head 1PM	(1) (8)	kPa	220	279	246	262	290	253	294
Available head 2PM	(1) (8)	kPa	204	260	222	255	282	243	282
Available head 1PM	(1) (7)	kPa	198	263	226	239	265	223	258
Available head 2PM	(1) (7)	kPa	182	243	202	232	257	214	245

(1) External air temperature 35°C, user-side heat exchanger water inlet/outlet temperature 12/7°C. Values in accordance with EN 14511.

(7) Data refers to the unit with free-cooling ON

(8) Data refers to the unit with free-cooling OFF

KAPPA REV FC

			58.2	67.2	73.2	80.2	85.2
Volume of the expansion vessel		l	24	24	24	24	24
Volume of the buffer tank		l	740	740	900	900	900
FC BASIC standard pumps							
Pump model 1P,2P			P7	P8	P8	P8	P10
Available head 1P	(1) (8)	kPa	206	232	240	228	275
Available head 2P	(1) (8)	kPa	190	213	229	215	260
Available head 1P	(1) (7)	kPa	128	140	176	154	193
Available head 2P	(1) (7)	kPa	111	120	164	141	179
FC BASIC oversize pumps							
Pump model 1PM, 2PM			P8	P9	P11	P11	P12
Available head 1PM	(1) (8)	kPa	206	232	240	228	275
Available head 2PM	(1) (8)	kPa	190	213	229	215	260
Available head 1PM	(1) (7)	kPa	128	140	176	154	193
Available head 2PM	(1) (7)	kPa	111	120	164	141	179
FC CUSTOM standard pumps							
Pump model 1P,2P			P7	P8	P8	P8	P8
Available head 1P	(1) (8)	kPa	203	229	238	226	196
Available head 2P	(1) (8)	kPa	187	210	227	213	182
Available head 1P	(1) (7)	kPa	156	174	195	177	142
Available head 2P	(1) (7)	kPa	140	154	184	164	128
FC CUSTOM oversized pumps							
Pump model 1PM, 2PM			P8	P9	P11	P11	P11
Available head 1PM	(1) (8)	kPa	273	365	300	307	290
Available head 2PM	(1) (8)	kPa	257	346	289	294	275
Available head 1PM	(1) (7)	kPa	226	310	257	257	235
Available head 2PM	(1) (7)	kPa	210	291	246	244	221
FC EXTRA standard pumps							
Pump model 1P,2P			P7	P7	P7	P7	P13
Available head 1P	(1) (8)	kPa	201	162	180	177	177
Available head 2P	(1) (8)	kPa	184	143	169	163	162
Available head 1P	(1) (7)	kPa	169	125	149	141	147
Available head 2P	(1) (7)	kPa	153	106	138	128	133
FC EXTRA oversized pumps							
Pump model 1PM, 2PM			P8	P10	P10	P10	P10
Available head 1PM	(1) (8)	kPa	270	245	275	285	269
Available head 2PM	(1) (8)	kPa	254	225	264	272	254
Available head 1PM	(1) (7)	kPa	239	208	244	249	239
Available head 2PM	(1) (7)	kPa	222	188	233	236	225

(1) External air temperature 35°C, user-side heat exchanger water inlet/outlet temperature 12/7°C. Values in accordance with EN 14511.

(7) Data refers to the unit with free-cooling ON

(8) Data refers to the unit with free-cooling OFF

KAPPA REV FC

			85.2	90.2	95.2	100.2	105.2	115.2
Volume of the expansion vessel		l	24	24	24	24	24	24
Volume of the buffer tank		l	900	900	900	900	900	900
FC BASIC standard pumps								
Pump model 1P,2P			P10	P10	P10	P10	P10	P10
Available head 1P	(1) (8)	kPa	275	256	223	193	186	210
Available head 2P	(1) (8)	kPa	260	240	205	172	164	186
Available head 1P	(1) (7)	kPa	193	168	156	118	128	148
Available head 2P	(1) (7)	kPa	179	152	138	97	105	123
FC BASIC oversize pumps								
Pump model 1PM, 2PM			P12	P12	P12	P12	P12	P12
Available head 1PM	(1) (8)	kPa	275	256	223	193	186	210
Available head 2PM	(1) (8)	kPa	260	240	205	172	164	186
Available head 1PM	(1) (7)	kPa	193	168	156	118	128	148
Available head 2PM	(1) (7)	kPa	179	152	138	97	105	123
FC CUSTOM standard pumps								
Pump model 1P,2P			P8	P10	P10	P10	P10	P10
Available head 1P	(1) (8)	kPa	196	254	221	190	183	207
Available head 2P	(1) (8)	kPa	182	238	202	170	160	182
Available head 1P	(1) (7)	kPa	142	195	173	137	139	160
Available head 2P	(1) (7)	kPa	128	179	155	116	117	135
FC CUSTOM oversized pumps								
Pump model 1PM, 2PM			P11	P12	P12	P12	P12	P12
Available head 1PM	(1) (8)	kPa	290	355	318	284	273	293
Available head 2PM	(1) (8)	kPa	275	340	300	263	250	268
Available head 1PM	(1) (7)	kPa	235	297	271	230	229	246
Available head 2PM	(1) (7)	kPa	221	281	253	209	207	221
FC EXTRA standard pumps								
Pump model 1P,2P			P13	P13	P10	P10	P10	P10
Available head 1P	(1) (8)	kPa	177	157	215	184	176	200
Available head 2P	(1) (8)	kPa	162	141	197	164	154	175
Available head 1P	(1) (7)	kPa	147	125	187	153	148	169
Available head 2P	(1) (7)	kPa	133	109	169	132	126	145
FC EXTRA oversized pumps								
Pump model 1PM, 2PM			P10	P10	P12	P12	P12	P12
Available head 1PM	(1) (8)	kPa	269	249	313	278	267	286
Available head 2PM	(1) (8)	kPa	254	234	295	257	244	262
Available head 1PM	(1) (7)	kPa	239	218	285	246	238	256
Available head 2PM	(1) (7)	kPa	225	202	267	225	216	231

(1) External air temperature 35°C, user-side heat exchanger water inlet/outlet temperature 12/7°C. Values in accordance with EN 14511.

(7) Data refers to the unit with free-cooling ON

(8) Data refers to the unit with free-cooling OFF

KAPPA REV HE FC

			33.2	35.2	37.2	40.2	43.2	51.2	54.2	58.2
Volume of the expansion vessel		l	24	24	24	24	24	24	24	24
Volume of the buffer tank		l	300	300	300	300	300	740	740	740
FC BASIC standard pumps										
Pump model 1P,2P			P2	P4	P4	P4	P5	P7	P7	P8
Available head 1P	(1) (8)	kPa	206	211	233	206	249	267	224	260
Available head 2P	(1) (8)	kPa	189	187	226	198	239	255	209	240
Available head 1P	(1) (7)	kPa	169	146	158	117	145	188	152	167
Available head 2P	(1) (7)	kPa	152	122	151	109	135	177	137	148
FC BASIC oversized pumps										
Pump model 1PM, 2PM			P5	P5	P5	P5	P6	P8	P8	P9
Available head 1PM	(1) (8)	kPa	301	282	304	277	347	344	296	396
Available head 2PM	(1) (8)	kPa	284	258	297	269	337	333	281	377
Available head 1PM	(1) (7)	kPa	264	217	229	188	243	266	224	304
Available head 2PM	(1) (7)	kPa	247	193	222	180	233	255	209	284
FC CUSTOM standard pumps										
Pump model 1P,2P			P2	P3	P3	P4	P4	P7	P7	P8
Available head 1P	(1) (8)	kPa	205	172	196	205	175	266	221	256
Available head 2P	(1) (8)	kPa	188	148	189	197	166	255	206	237
Available head 1P	(1) (7)	kPa	157	140	159	162	125	210	178	201
Available head 2P	(1) (7)	kPa	140	116	153	153	115	198	163	182
FC CUSTOM oversized pumps										
Pump model 1PM, 2PM			P5	P5	P5	P5	P5	P8	P8	P9
Available head 1PM	(1) (8)	kPa	301	280	303	276	247	344	294	393
Available head 2PM	(1) (8)	kPa	284	256	296	268	237	333	279	373
Available head 1PM	(1) (7)	kPa	253	248	266	233	197	288	251	338
Available head 2PM	(1) (7)	kPa	236	224	259	224	187	276	236	318
FC EXTRA standard pumps										
Pump model 1P,2P			P1	P3	P3	P3	P4	P7	P7	P7
Available head 1P	(1) (8)	kPa	115	170	195	168	174	264	219	189
Available head 2P	(1) (8)	kPa	98	146	188	159	164	253	204	170
Available head 1P	(1) (7)	kPa	92	150	173	141	143	230	190	152
Available head 2P	(1) (7)	kPa	75	126	166	133	133	219	175	133
FC EXTRA oversized pumps										
Pump model 1PM, 2PM			P2	P5	P5	P5	P5	P8	P8	P10
Available head 1PM	(1) (8)	kPa	204	277	302	275	245	342	291	272
Available head 2PM	(1) (8)	kPa	187	253	295	266	236	331	276	253
Available head 1PM	(1) (7)	kPa	180	257	279	248	215	308	262	235
Available head 2PM	(1) (7)	kPa	163	233	272	240	205	297	247	216

(1) External air temperature 35°C, user-side heat exchanger water inlet/outlet temperature 12/7°C. Values in accordance with EN 14511.

(7) Data refers to the unit with free-cooling ON

(8) Data refers to the unit with free-cooling OFF

KAPPA REV HE FC

			67.2	73.2	80.2	85.2	90.2	95.2	100.2	105.2
Volume of the expansion vessel		l	24	24	24	24	24	24	24	24
Volume of the buffer tank		l	740	900	900	900	900	900	900	900
FC BASIC standard pumps										
Pump model 1P,2P			P8	P8	P10	P10	P10	P10	P10	P10
Available head 1P	(1) (8)	kPa	283	240	272	246	214	202	167	194
Available head 2P	(1) (8)	kPa	272	228	258	229	196	180	143	168
Available head 1P	(1) (7)	kPa	221	169	190	153	145	123	105	127
Available head 2P	(1) (7)	kPa	210	156	175	136	126	102	81	101
FC BASIC oversize pumps										
Pump model 1PM, 2PM			P11	P11	P12	P12	P12	P12	P12	P12
Available head 1PM	(1) (8)	kPa	340	316	375	346	311	294	254	277
Available head 2PM	(1) (8)	kPa	329	303	361	330	292	272	229	251
Available head 1PM	(1) (7)	kPa	278	244	293	253	242	216	192	210
Available head 2PM	(1) (7)	kPa	267	231	278	236	223	194	167	184
FC CUSTOM standard pumps										
Pump model 1P,2P			P8	P8	P8	P10	P10	P10	P10	P10
Available head 1P	(1) (8)	kPa	281	239	191	244	212	198	163	190
Available head 2P	(1) (8)	kPa	271	226	176	227	193	177	139	164
Available head 1P	(1) (7)	kPa	240	191	136	182	162	143	117	140
Available head 2P	(1) (7)	kPa	229	178	121	165	143	121	93	114
FC CUSTOM oversized pumps										
Pump model 1PM, 2PM			P11	P11	P11	P12	P12	P12	P12	P12
Available head 1PM	(1) (8)	kPa	338	314	287	344	308	291	250	273
Available head 2PM	(1) (8)	kPa	328	301	272	327	289	269	226	247
Available head 1PM	(1) (7)	kPa	297	266	232	282	259	235	204	223
Available head 2PM	(1) (7)	kPa	286	253	217	265	240	214	179	197
FC EXTRA standard pumps										
Pump model 1P,2P			P7	P7	P13	P13	P10	P10	P10	P10
Available head 1P	(1) (8)	kPa	221	186	174	146	206	192	157	183
Available head 2P	(1) (8)	kPa	211	174	159	129	187	171	132	157
Available head 1P	(1) (7)	kPa	191	152	144	113	177	159	126	151
Available head 2P	(1) (7)	kPa	181	139	130	96	158	138	102	124
FC EXTRA oversized pumps										
Pump model 1PM, 2PM			P10	P10	P10	P10	P12	P12	P12	P12
Available head 1PM	(1) (8)	kPa	312	291	266	239	303	284	243	266
Available head 2PM	(1) (8)	kPa	302	278	251	222	284	263	219	240
Available head 1PM	(1) (7)	kPa	283	257	236	206	274	252	213	234
Available head 2PM	(1) (7)	kPa	272	244	222	189	255	230	189	207

(1) External air temperature 35°C, user-side heat exchanger water inlet/outlet temperature 12/7°C. Values in accordance with EN 14511.

(7) Data refers to the unit with free-cooling ON

(8) Data refers to the unit with free-cooling OFF

KAPPA REV SLN FC

			33.2	35.2	37.2	40.2	43.2	51.2	54.2	58.2
Volume of the expansion vessel		l	24	24	24	24	24	24	24	24
Volume of the buffer tank		l	300	300	300	300	300	300	740	740
FC BASIC standard pumps										
Pump model 1P,2P			P2	P4	P4	P4	P5	P5	P7	P7
Available head 1P	(1) (8)	kPa	209	229	250	218	264	269	236	211
Available head 2P	(1) (8)	kPa	192	206	243	210	255	258	222	193
Available head 1P	(1) (7)	kPa	173	167	179	135	167	159	142	124
Available head 2P	(1) (7)	kPa	156	145	172	127	158	149	128	106
FC BASIC oversize pumps										
Pump model 1PM, 2PM			P5	P5	P5	P5	P6	P6	P8	P8
Available head 1PM	(1) (8)	kPa	303	300	321	289	364	366	310	277
Available head 2PM	(1) (8)	kPa	286	278	314	281	355	355	296	259
Available head 1PM	(1) (7)	kPa	267	238	250	206	268	256	216	191
Available head 2PM	(1) (7)	kPa	250	216	243	198	259	246	202	173
FC CUSTOM standard pumps										
Pump model 1P,2P			P2	P3	P3	P4	P4	P4	P7	P7
Available head 1P	(1) (8)	kPa	208	190	213	217	191	195	235	208
Available head 2P	(1) (8)	kPa	192	167	206	209	182	184	221	190
Available head 1P	(1) (7)	kPa	161	160	178	177	145	142	168	156
Available head 2P	(1) (7)	kPa	144	137	172	169	135	132	154	138
FC CUSTOM oversized pumps										
Pump model 1PM, 2PM			P5	P5	P5	P5	P5	P5	P8	P8
Available head 1PM	(1) (8)	kPa	303	297	320	288	262	267	309	274
Available head 2PM	(1) (8)	kPa	286	275	313	280	253	257	296	256
Available head 1PM	(1) (7)	kPa	255	267	285	247	216	214	242	223
Available head 2PM	(1) (7)	kPa	238	245	279	240	207	204	228	205
FC EXTRA standard pumps										
Pump model 1P,2P			P1	P3	P3	P3	P4	P4	P7	P7
Available head 1P	(1) (8)	kPa	119	187	212	180	189	193	233	205
Available head 2P	(1) (8)	kPa	102	165	205	172	180	183	219	187
Available head 1P	(1) (7)	kPa	95	169	191	155	161	161	192	170
Available head 2P	(1) (7)	kPa	78	146	184	147	152	151	179	152
FC EXTRA oversized pumps										
Pump model 1PM, 2PM			P2	P5	P5	P5	P5	P5	P8	P8
Available head 1PM	(1) (8)	kPa	207	295	319	286	261	265	307	271
Available head 2PM	(1) (8)	kPa	190	273	312	279	252	255	293	253
Available head 1PM	(1) (7)	kPa	183	276	298	262	232	234	266	237
Available head 2PM	(1) (7)	kPa	166	254	291	254	223	223	253	219

(1) External air temperature 35°C, user-side heat exchanger water inlet/outlet temperature 12/7°C. Values in accordance with EN 14511.

(7) Data refers to the unit with free-cooling ON

(8) Data refers to the unit with free-cooling OFF

KAPPA REV SLN FC

			67.2	73.2	80.2	85.2	90.2	95.2	100.2	105.2
Volume of the expansion vessel		l	24	24	24	24	24	24	24	24
Volume of the buffer tank		l	740	900	900	900	900	900	900	900
FC BASIC standard pumps										
Pump model 1P,2P			P8	P8	P8	P10	P10	P10	P10	P10
Available head 1P	(1) (8)	kPa	247	262	218	260	230	218	187	212
Available head 2P	(1) (8)	kPa	227	250	205	244	213	198	164	187
Available head 1P	(1) (7)	kPa	151	195	141	173	166	145	129	149
Available head 2P	(1) (7)	kPa	130	184	128	158	148	125	107	125
FC BASIC oversize pumps										
Pump model 1PM, 2PM			P9	P11	P11	P12	P12	P12	P12	P12
Available head 1PM	(1) (8)	kPa	384	328	303	362	329	313	277	298
Available head 2PM	(1) (8)	kPa	363	316	289	346	312	293	255	274
Available head 1PM	(1) (7)	kPa	287	261	226	275	264	240	219	236
Available head 2PM	(1) (7)	kPa	266	249	213	260	247	220	197	212
FC CUSTOM standard pumps										
Pump model 1P,2P			P8	P8	P8	P10	P10	P10	P10	P10
Available head 1P	(1) (8)	kPa	244	260	216	258	228	215	184	208
Available head 2P	(1) (8)	kPa	223	249	203	242	210	195	161	184
Available head 1P	(1) (7)	kPa	186	216	165	200	182	163	140	161
Available head 2P	(1) (7)	kPa	166	204	151	184	164	143	118	137
FC CUSTOM oversized pumps										
Pump model 1PM, 2PM			P9	P11	P11	P12	P12	P12	P12	P12
Available head 1PM	(1) (8)	kPa	380	326	301	360	327	310	274	295
Available head 2PM	(1) (8)	kPa	360	315	287	344	309	290	251	270
Available head 1PM	(1) (7)	kPa	323	282	250	302	280	258	230	248
Available head 2PM	(1) (7)	kPa	302	270	236	286	263	238	208	224
FC EXTRA standard pumps										
Pump model 1P,2P			P7	P7	P7	P13	P10	P10	P10	P10
Available head 1P	(1) (8)	kPa	179	204	168	161	223	210	177	201
Available head 2P	(1) (8)	kPa	158	193	155	145	205	190	155	177
Available head 1P	(1) (7)	kPa	140	172	132	130	195	179	149	171
Available head 2P	(1) (7)	kPa	120	160	118	114	178	159	127	147
FC EXTRA oversized pumps										
Pump model 1PM, 2PM			P10	P10	P10	P10	P12	P12	P12	P12
Available head 1PM	(1) (8)	kPa	264	302	280	253	322	304	268	288
Available head 2PM	(1) (8)	kPa	244	290	267	238	304	285	245	264
Available head 1PM	(1) (7)	kPa	226	270	243	222	294	274	239	258
Available head 2PM	(1) (7)	kPa	205	258	230	207	277	254	217	233

(1) External air temperature 35°C, user-side heat exchanger water inlet/outlet temperature 12/7°C. Values in accordance with EN 14511.

(7) Data refers to the unit with free-cooling ON

(8) Data refers to the unit with free-cooling OFF

KAPPA REV HEi FC

			33.2	35.2	37.2	40.2	43.2	51.2	54.2	58.2
Volume of the expansion vessel		l	24	24	24	24	24	24	24	24
Volume of the buffer tank		l	740	740	900	900	900	900	900	900
FC BASIC standard pumps										
Pump model 1P,2P			P7	P8	P8	P8	P10	P10	P10	P10
Available head 1P	(1) (8)	kPa	242	246	251	202	251	225	215	185
Available head 2P	(1) (8)	kPa	226	225	240	188	234	205	191	157
Available head 1P	(1) (7)	kPa	168	149	183	123	188	153	154	116
Available head 2P	(1) (7)	kPa	152	129	171	109	171	133	130	88
FC BASIC oversized pumps										
Pump model 1PM, 2PM			P8	P9	P11	P11	P12	P12	P12	P12
Available head 1PM	(1) (8)	kPa	313	382	320	291	351	320	303	266
Available head 2PM	(1) (8)	kPa	298	362	308	277	334	300	278	238
Available head 1PM	(1) (7)	kPa	239	286	252	212	288	248	241	197
Available head 2PM	(1) (7)	kPa	224	265	240	198	271	229	217	169
FC CUSTOM standard pumps										
Pump model 1P,2P			P7	P8	P8	P8	P10	P10	P10	P10
Available head 1P	(1) (8)	kPa	239	242	250	200	249	222	212	181
Available head 2P	(1) (8)	kPa	224	222	238	186	232	202	188	154
Available head 1P	(1) (7)	kPa	195	185	204	147	204	171	166	129
Available head 2P	(1) (7)	kPa	180	165	192	133	187	151	142	102
FC CUSTOM oversized pumps										
Pump model 1PM, 2PM			P8	P9	P11	P11	P12	P12	P12	P12
Available head 1PM	(1) (8)	kPa	311	379	318	289	349	317	299	262
Available head 2PM	(1) (8)	kPa	295	358	306	275	332	298	275	235
Available head 1PM	(1) (7)	kPa	266	321	273	237	304	266	253	210
Available head 2PM	(1) (7)	kPa	251	301	261	223	287	246	229	183
FC EXTRA standard pumps										
Pump model 1P,2P			P7	P7	P7	P7	P10	P10	P10	P10
Available head 1P	(1) (8)	kPa	236	177	195	154	244	216	205	173
Available head 2P	(1) (8)	kPa	221	157	183	140	227	197	181	146
Available head 1P	(1) (7)	kPa	207	139	162	116	217	186	175	140
Available head 2P	(1) (7)	kPa	191	118	150	102	200	166	151	112
FC EXTRA oversized pumps										
Pump model 1PM, 2PM			P8	P10	P10	P10	P12	P12	P12	P12
Available head 1PM	(1) (8)	kPa	308	263	294	270	344	312	292	254
Available head 2PM	(1) (8)	kPa	293	242	282	256	327	292	268	227
Available head 1PM	(1) (7)	kPa	278	224	261	232	317	281	262	221
Available head 2PM	(1) (7)	kPa	263	204	250	218	300	262	238	193

(1) External air temperature 35°C, user-side heat exchanger water inlet/outlet temperature 12/7°C. Values in accordance with EN 14511.

(7) Data refers to the unit with free-cooling ON

(8) Data refers to the unit with free-cooling OFF

KAPPA REV XEi FC

			30.1	35.1	45.1	55.2	65.2	70.2	80.2	90.2	100.3
Volume of the expansion vessel		l	24	24	24	24	24	24	24	24	24
Volume of the buffer tank		l	300	300	300	740	740	900	900	900	900
FC BASIC standard pumps											
Pump model 1P,2P			P2	P4	P4	P7	P7	P8	P10	P10	P10
Available head 1P	(1) (8)	kPa	229,7	174,8	215,4	241,3	193,8	256,5	265,3	241,1	231,7
Available head 2P	(1) (8)	kPa	214,4	150,6	206	226,1	174,4	244,8	250,6	223	209
Available head 1P	(1) (7)	kPa	196,2	108,7	116,5	167,4	101,4	189,4	182,3	140,5	149,4
Available head 2P	(1) (7)	kPa	181	84,6	107,1	152,2	82	177,7	167,6	122,4	126,7
FC BASIC oversize pumps											
Pump model 1PM, 2PM			P5	P5	P5	P8	P8	P11	P12	P12	P12
Available head 1PM	(1) (8)	kPa	316	245,8	286,7	312,9	257,6	322,8	368,3	339	321,4
Available head 2PM	(1) (8)	kPa	300,8	221,6	277,3	297,7	238,2	311,2	353,6	320,9	298,7
Available head 1PM	(1) (7)	kPa	282,6	179,8	187,8	239	165,1	255,7	285,3	238,4	239,1
Available head 2PM	(1) (7)	kPa	267,3	155,6	178,4	223,8	145,7	244	270,5	220,3	216,4
FC CUSTOM standard pumps											
Pump model 1P,2P			P2	P3	P4	P7	P7	P8	P8	P10	P10
Available head 1P	(1) (8)	kPa	229,3	135,8	213,8	238,8	190,6	254,8	182,6	238,5	228,5
Available head 2P	(1) (8)	kPa	214,1	111,6	204,4	223,5	171,2	243,1	167,9	220,4	205,7
Available head 1P	(1) (7)	kPa	185,7	103,6	166,2	194,5	135,5	209,9	127,3	171,8	170
Available head 2P	(1) (7)	kPa	170,5	79,4	156,8	179,3	116,1	198,3	112,6	153,7	147,2
FC CUSTOM oversized pumps											
Pump model 1PM, 2PM			P5	P5	P5	P8	P8	P11	P11	P12	P12
Available head 1PM	(1) (8)	kPa	315,7	243,1	285,1	310,4	254,4	321,1	279,5	336,4	318,2
Available head 2PM	(1) (8)	kPa	300,4	218,9	275,7	295,1	235	309,5	264,8	318,3	295,5
Available head 1PM	(1) (7)	kPa	272,1	210,9	237,5	266,1	199,3	276,3	224,2	269,7	259,7
Available head 2PM	(1) (7)	kPa	256,8	186,7	228,1	250,9	179,8	264,6	209,5	251,6	236,9
FC EXTRA standard pumps											
Pump model 1P,2P			P1	P3	P3	P7	P7	P7	P13	P13	P10
Available head 1P	(1) (8)	kPa	140,5	133,1	175,8	236,2	187,4	198,7	166,9	139,6	222
Available head 2P	(1) (8)	kPa	125,3	108,9	166,4	221	168	187,1	152,2	121,5	199,3
Available head 1P	(1) (7)	kPa	118,9	113,3	147	206,4	150,4	166,5	136,9	103,7	187,4
Available head 2P	(1) (7)	kPa	103,7	89,2	137,6	191,1	131	154,8	122,2	85,6	164,7
FC EXTRA oversized pumps											
Pump model 1PM, 2PM			P2	P5	P5	P8	P8	P10	P10	P10	P12
Available head 1PM	(1) (8)	kPa	227,6	240,4	283,5	307,8	251,2	296,7	259	233,4	311,7
Available head 2PM	(1) (8)	kPa	212,3	216,3	274,1	292,6	231,7	285,1	244,3	215,3	289
Available head 1PM	(1) (7)	kPa	206	220,7	254,7	278	214,2	264,5	229	197,5	277,1
Available head 2PM	(1) (7)	kPa	190,7	196,5	245,3	262,7	194,8	252,8	214,3	179,3	254,4

(1) External air temperature 35°C, user-side heat exchanger water inlet/outlet temperature 12/7°C. Values in accordance with EN 14511.

(7) Data refers to the unit with free-cooling ON

(8) Data refers to the unit with free-cooling OFF

HYDRAULIC MODULES

Model	Rated power	Rated current	Min. flow rate	Max. flow rate
	kW	A	m³/h	m³/h
P1	5,5	10,4	24	87,12
P2	7,5	13,7	24	87,12
P3	9,2	17,2	42	132
P4	11	21,3	42	138
P5	15	26,6	35	168,4
P6	18,5	33	30	168,4
P7	18,5	33	70	270
P8	22	40,4	50	233
P9	30	53,5	55	266,1
P10	30	53,5	76	359
P11	30	53,5	76	324
P12	37	65,6	76	324
P13	22	40,4	76	324

USER-SIDE EXCHANGER FLOW RATE FIELDS

The units are sized and optimized for the following nominal conditions: external air 30°C, inlet-outlet of the user-side heat exchanger 15/10°C.

The units can work at design conditions different from nominal conditions, provided that:

- the design condition falls within the operating limits specified below
- the unit is equipped with all the accessories necessary for operation of the unit (e.g. brine kit, fan speed adjuster, HAT)
- the flow rate at design conditions (that is, of the specific application) must always come within the allowed flow rate ranges specified below. If the design conditions require a water flow rate that does not come within the allowed operating range, you must contact our sales department that will identify the most suitable solution for the specific application.

KAPPA REV FC

	Qmin	Qmax
	m³/h	m³/h
33.2	34	102
35.2	37	111
37.2	41	122
40.2	45	134
43.2	50	151
51.2	53	159
54.2	59	176
58.2	67	200
67.2	75	226
73.2	80	241
80.2	86	259
85.2	92	275
90.2	97	290
95.2	103	310
100.2	108	324
105.2	114	341
115.2	121	364

KAPPA REV HE FC

	Qmin	Qmax
	m³/h	m³/h
33.2	36	108
35.2	40	121
37.2	43	128
40.2	48	145
43.2	54	162
51.2	57	170
54.2	63	188
58.2	74	221
67.2	80	240
73.2	84	253
80.2	89	267
85.2	96	289
90.2	103	310
95.2	111	333
100.2	118	353
105.2	124	372

KAPPA REV SLN FC

	Qmin	Qmax
	m³/h	m³/h
33.2	35	104
35.2	39	117
37.2	41	124
40.2	47	140
43.2	52	155
51.2	55	164
54.2	61	182
58.2	71	213
67.2	77	231
73.2	81	243
80.2	86	257
85.2	93	279
90.2	100	299
95.2	107	321
100.2	113	340
105.2	120	359

KAPPA REV HEi FC

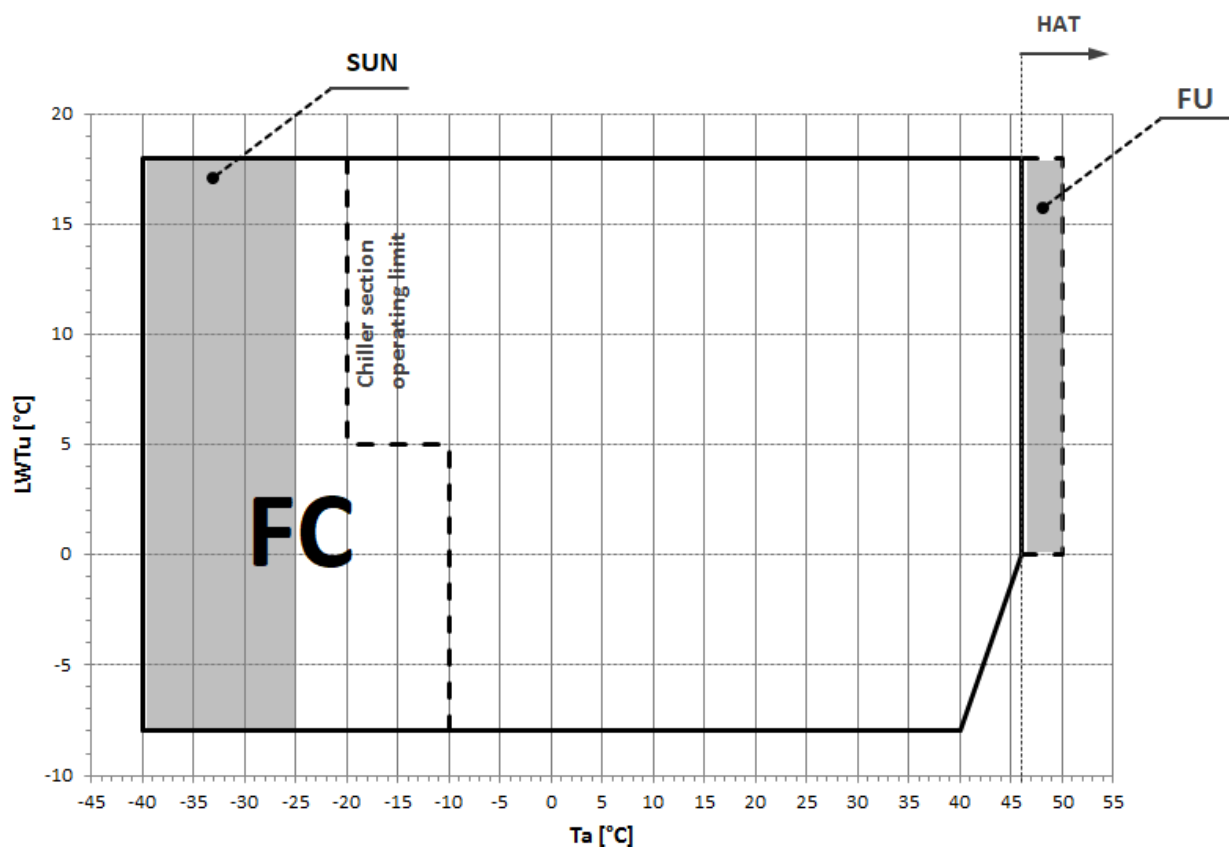
	Qmin	Qmax
	m³/h	m³/h
58.2	62	185
67.2	71	214
73.2	79	238
80.2	85	256
85.2	97	291
90.2	103	308
100.3	112	337
105.3	119	358

KAPPA REV XEi FC

	Qmin	Qmax
	m³/h	m³/h
30.1	31	93
35.1	39	116
45.1	48	145
55.2	61	184
65.2	69	208
70.2	78	235
80.2	87	260
90.2	96	289
100.3	109	328

OPERATING LIMITS

KAPPA REV FC COOLING



Ta: external air temperature

LWTu: water outlet temperature from the user-side heat exchanger

FC: in the indicated area, the unit can work only in free-cooling mode

HAT: the "HAT" accessory is obligatory in the area indicated by the arrow. With this accessory, operation is guaranteed with external air temperature up to 52°C. For higher temperatures up to about 55°C, a set-up with air conditioning of the electrical control panel is necessary; the unit works in capacity reduction mode. The feasibility of this set-up must be assessed: please contact our sales department.

SUN: in the indicated area, the unit can work only if fitted with the "SUN" accessory

FU: in the indicated area, the control could actuate a forced capacity reduction of the compressors so as to prevent tripping of the safety devices

BK: For LWTu below +3°C, it is mandatory to fit the "Brine Kit" accessory

For LWTu below +5°C, it is compulsory to use suitable percentages of antifreeze additives (glycols) to prevent ice formation in the exchanger.

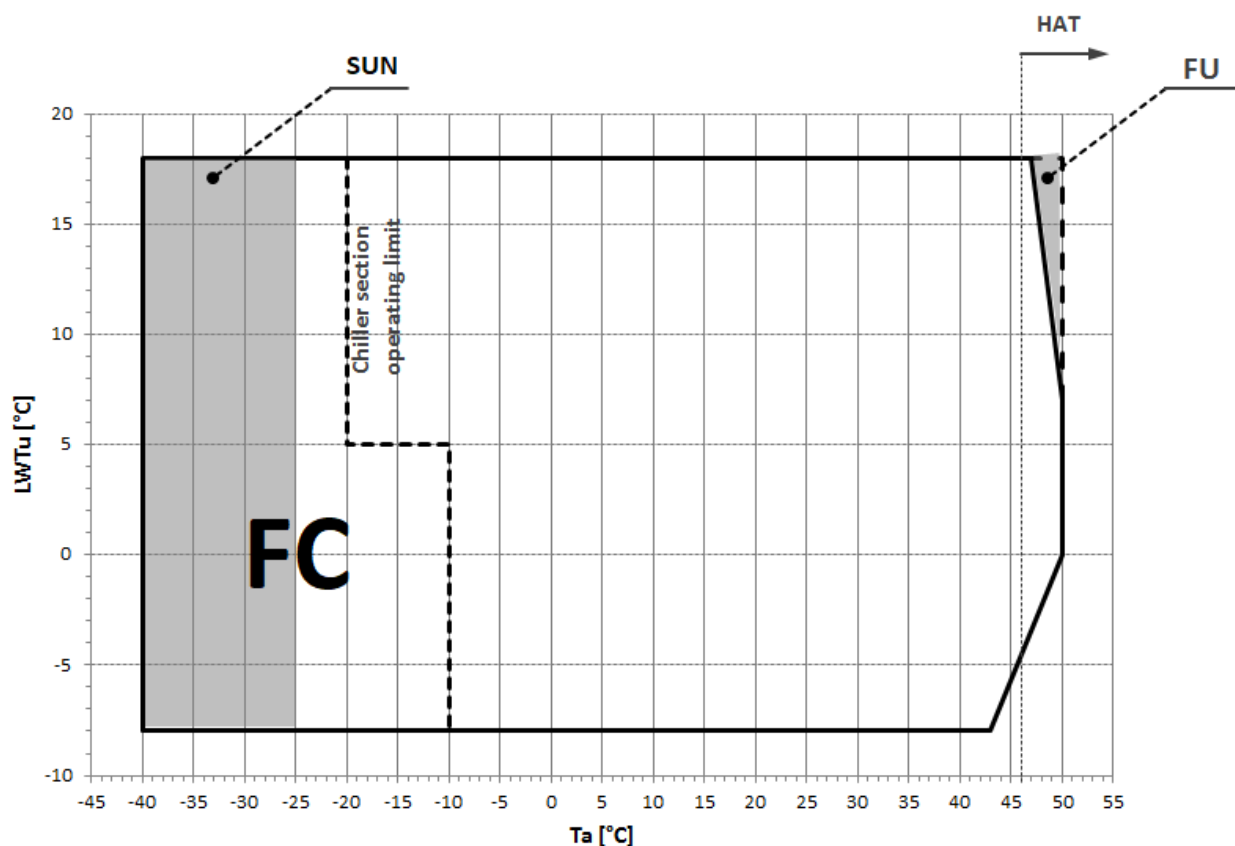
The inlet and outlet temperatures of the user-side exchanger must be given on ordering to allow correct setting of the alarm parameters and verification of the sizing of the expansion valve.

The cooling set point can then be changed by the customer in an interval that, compared to the set point given on ordering, ranges from -1K up to the maximum temperature allowed by the above-stated operating limits.

The unit will be optimized to work at the set point temperatures given on ordering. For different set points, the cooling capacity provided and the level of efficiency of the machine could decrease and move away from these conditions.

OPERATING LIMITS

KAPPA REV HE FC - SLN FC COOLING



Ta: external air temperature

LWTu: water outlet temperature from the user-side heat exchanger

FC: in the indicated area, the unit can work only in free-cooling mode

HAT: the "HAT" accessory is obligatory in the area indicated by the arrow. With this accessory, operation is guaranteed with external air temperature up to 52°C. For higher temperatures up to about 55°C, a set-up with air conditioning of the electrical control panel is necessary; the unit works in capacity reduction mode. The feasibility of this set-up must be assessed: please contact our sales department.

SUN: in the indicated area, the unit can work only if fitted with the "SUN" accessory

FU: in the indicated area, the control could actuate a forced capacity reduction of the compressors so as to prevent tripping of the safety devices

BK: For LWTu below +3°C, it is mandatory to fit the "Brine Kit" accessory

For LWTu below +5°C, it is compulsory to use suitable percentages of antifreeze additives (glycols) to prevent ice formation in the exchanger.

The inlet and outlet temperatures of the user-side exchanger must be given on ordering to allow correct setting of the alarm parameters and verification of the sizing of the expansion valve.

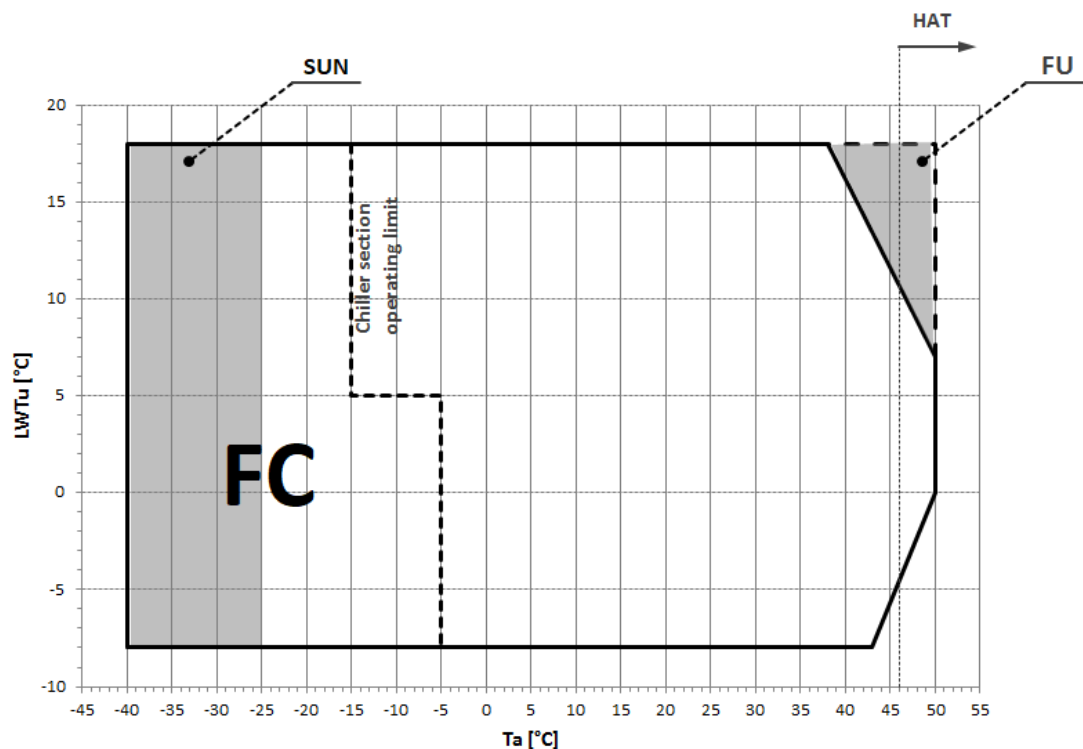
The cooling set point can then be changed by the customer in an interval that, compared to the set point given on ordering, ranges from -1K up to the maximum temperature allowed by the above-stated operating limits.

The unit will be optimized to work at the set point temperatures given on ordering. For different set points, the cooling capacity provided and the level of efficiency of the machine could decrease and move away from these conditions.

OPERATING LIMITS

KAPPA REV HEI FC

COOLING



Ta: external air temperature

LWTu: water outlet temperature from the user-side heat exchanger

FC: in the indicated area, the unit can work only in free-cooling mode

HAT: the "HAT" accessory is obligatory in the area indicated by the arrow. With this accessory, operation is guaranteed with external air temperature up to 52°C. For higher temperatures up to about 55°C, a set-up with air conditioning of the electrical control panel is necessary; the unit works in capacity reduction mode. The feasibility of this set-up must be assessed: please contact our sales department.

SUN: in the indicated area, the unit can work only if fitted with the "SUN" accessory

FU: in the indicated area, the control could actuate a forced capacity reduction of the compressors so as to prevent tripping of the safety devices

BK: For LWTu below +3°C, it is mandatory to fit the "Brine Kit" accessory

For LWTu below +5°C, it is compulsory to use suitable percentages of antifreeze additives (glycols) to prevent ice formation in the exchanger.

The inlet and outlet temperatures of the user-side exchanger must be given on ordering to allow correct setting of the alarm parameters and verification of the sizing of the expansion valve.

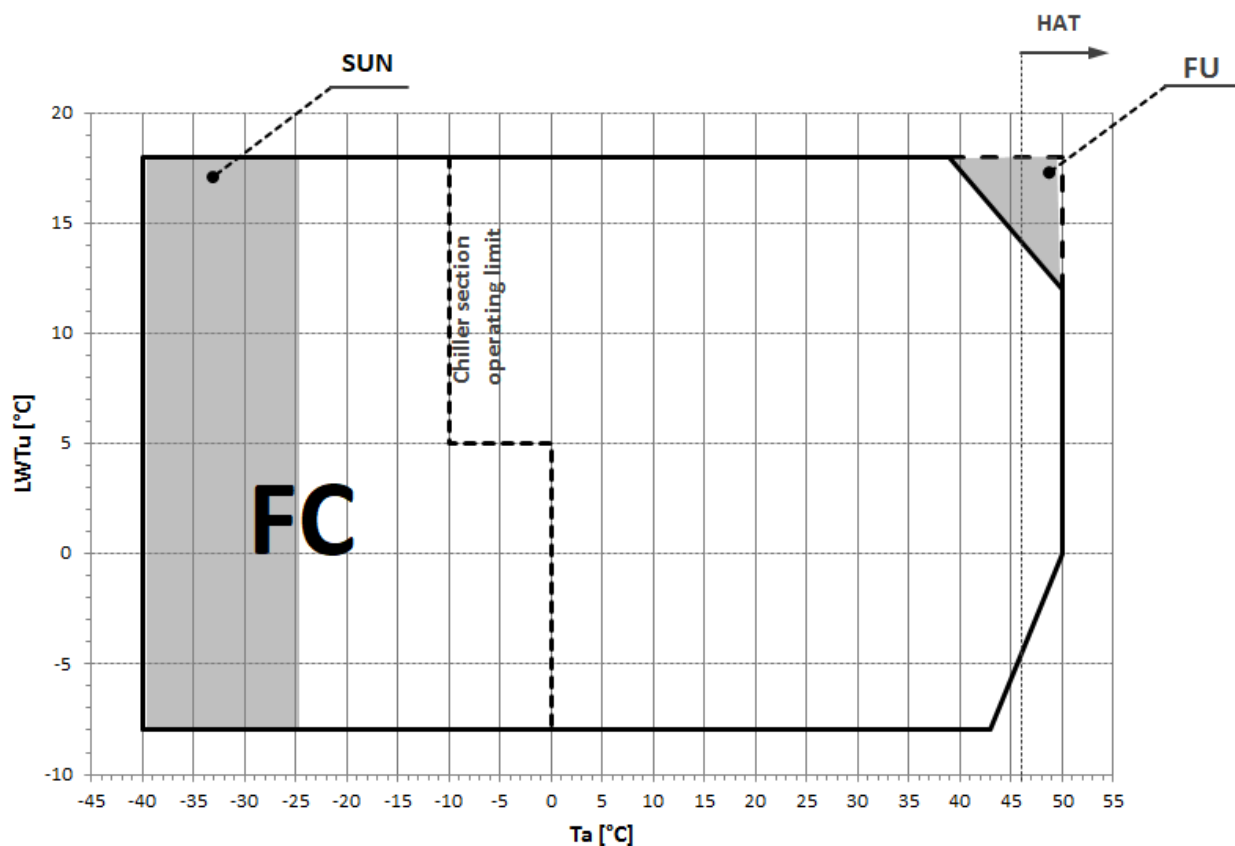
The cooling set point can then be changed by the customer in an interval that, compared to the set point given on ordering, ranges from -1K up to the maximum temperature allowed by the above-stated operating limits.

The unit will be optimized to work at the set point temperatures given on ordering. For different set points, the cooling capacity provided and the level of efficiency of the machine could decrease and move away from these conditions.

OPERATING LIMITS

KAPPA REV XEI FC

COOLING



Ta: external air temperature

LWTu: water outlet temperature from the user-side heat exchanger

FC: in the indicated area, the unit can work only in free-cooling mode

HAT: the "HAT" accessory is obligatory in the area indicated by the arrow. With this accessory, operation is guaranteed with external air temperature up to 52°C. For higher temperatures up to about 55°C, a set-up with air conditioning of the electrical control panel is necessary; the unit works in capacity reduction mode. The feasibility of this set-up must be assessed: please contact our sales department.

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The inlet and outlet temperatures of the user-side exchanger must be given on ordering to allow correct setting of the alarm parameters and verification of the sizing of the expansion valve.

The cooling set point can then be changed by the customer in an interval that, compared to the set point given on ordering, ranges from -1K up to the maximum temperature allowed by the above-stated operating limits.

The unit will be optimized to work at the set point temperatures given on ordering. For different set points, the cooling capacity provided and the level of efficiency of the machine could decrease and move away from these conditions.

NOISE LEVELS

KAPPA REV FC - Chiller section

	Octave bands [dB]																Total [dB(A)]	
	63 Hz		125 Hz		250 Hz		500 Hz		1000 Hz		2000 Hz		4000 Hz		8000 Hz		Lw_tot	Lp_tot
	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp		
33.2	71	39	74	42	89	57	90	58	91	59	86	54	79	47	71	39	94	62
35.2	73	41	82	50	90	58	91	59	92	60	87	55	79	47	71	39	95	63
37.2	73	41	84	52	90	58	91	59	92	60	88	56	78	46	70	38	95	63
40.2	70	38	79	47	88	56	95	63	93	61	86	54	76	44	68	36	96	64
43.2	66	34	67	35	86	54	95	63	93	61	85	53	74	42	67	35	96	64
51.2	68	36	71	39	87	55	95	63	94	62	88	55	75	42	68	35	97	65
54.2	76	44	77	45	87	55	95	62	95	63	90	58	76	44	70	37	98	66
58.2	77	45	87	55	94	61	95	62	96	63	88	56	80	48	71	39	98	66
67.2	77	44	90	58	97	64	94	62	97	64	88	56	83	51	73	40	99	67
73.2	77	44	90	58	99	66	96	63	97	65	90	57	83	50	73	41	100	67
80.2	76	43	88	56	100	67	97	64	97	64	90	58	82	49	73	41	100	67
85.2	76	43	87	55	101	69	97	65	96	64	91	58	80	47	72	40	100	68
90.2	76	43	86	53	102	70	97	65	95	63	91	58	77	44	71	38	100	68
95.2	76	43	87	54	102	69	98	65	97	64	92	59	80	47	73	40	101	68
100.2	75	42	87	54	101	68	97	64	98	65	91	58	82	49	73	40	101	68
105.2	81	48	87	54	101	68	97	64	100	67	91	58	82	49	74	41	102	69
115.2	82	49	86	53	100	67	96	63	100	67	90	57	81	48	74	41	102	69

Unit operating at nominal operating capacity, with no options of any kind, with external air temperature of 30°C and user-side heat exchanger water inlet/outlet temperature of 15/10°C.

Lw: sound power levels.

Lw_tot is the only binding value.

Values obtained from measures taken according to standard ISO 3744.

Lp: sound pressure levels calculated from sound power levels, related to distance of 10 m from the unit in free field with directivity factor Q=2. Non-binding values.

The acoustic data are related to standard conditions in referable and reproducible operating conditions. All data with the exception of Lw_tot are provided for illustrative purposes only and can not be used for forecasting purposes or for the verification of binding limits.

With special reference to noise emissions, the Manufacturer takes liability for their conformity, limited to the declared Lw_tot value. Any and all other Manufacturer's liability for the impact of such emissions in relation to the location of the machine and other conditions related to machine installation is excluded. The environment and the installation conditions, as well as the operating modes, can alter the sound emissions. Any assessment concerning these conditions falls within the area of competence of the plant designer and/or the fitter.

KAPPA REV FC /LN - Chiller section

	Octave bands [dB]																Total [dB(A)]	
	63 Hz		125 Hz		250 Hz		500 Hz		1000 Hz		2000 Hz		4000 Hz		8000 Hz		Lw_tot	Lp_tot
	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp		
33.2	67	35	70	38	84	52	85	53	86	54	81	49	75	43	67	35	89	57
35.2	69	37	77	45	85	53	86	54	87	55	82	50	75	43	67	35	90	58
37.2	69	37	80	48	85	53	86	54	87	55	83	51	74	42	66	34	90	58
40.2	66	34	75	43	83	51	90	58	88	56	81	49	72	40	64	32	91	59
43.2	63	31	64	32	82	50	90	58	88	56	80	48	70	38	63	31	91	59
51.2	65	32	67	35	82	50	90	58	89	56	83	51	71	38	64	32	92	59
54.2	72	40	73	41	82	50	90	57	90	58	85	53	72	40	66	33	93	61
58.2	73	41	83	50	89	56	89	57	90	58	84	51	76	44	67	35	93	60
67.2	73	40	86	53	92	59	89	57	92	59	84	51	79	46	69	36	94	62
73.2	73	40	85	53	94	61	91	58	92	60	85	52	79	46	70	37	95	63
80.2	72	39	84	51	95	62	91	59	92	59	85	53	77	45	70	37	95	63
85.2	72	39	83	50	96	64	92	59	91	59	86	53	76	43	68	36	95	63
90.2	72	39	81	49	97	65	92	60	90	58	86	54	73	40	67	35	95	62
95.2	72	39	82	49	97	64	93	60	92	59	87	54	76	43	69	36	96	63
100.2	71	38	82	49	96	63	92	59	93	60	86	53	77	44	69	36	96	63
105.2	76	43	83	50	96	63	92	59	95	62	86	53	78	45	70	37	97	64
115.2	78	45	82	49	95	62	91	58	95	62	86	53	77	44	70	37	97	64

Unit operating at nominal operating capacity, with no options of any kind, with external air temperature of 30°C and user-side heat exchanger water inlet/outlet temperature of 15/10°C.

Lw: sound power levels.

Lw_tot is the only binding value.

Values obtained from measures taken according to standard ISO 3744.

Lp: sound pressure levels calculated from sound power levels, related to distance of 10 m from the unit in free field with directivity factor Q=2. Non-binding values.

The acoustic data are related to standard conditions in referable and reproducible operating conditions. All data with the exception of Lw_tot are provided for illustrative purposes only and can not be used for forecasting purposes or for the verification of binding limits.

With special reference to noise emissions, the Manufacturer takes liability for their conformity, limited to the declared Lw_tot value. Any and all other Manufacturer's liability for the impact of such emissions in relation to the location of the machine and other conditions related to machine installation is excluded. The environment and the installation conditions, as well as the operating modes, can alter the sound emissions. Any assessment concerning these conditions falls within the area of competence of the plant designer and/or the fitter.

KAPPA REV HE FC - Chiller section

	Octave bands [dB]																Total [dB(A)]	
	63 Hz		125 Hz		250 Hz		500 Hz		1000 Hz		2000 Hz		4000 Hz		8000 Hz		Lw_tot	Lp_tot
	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp		
33.2	71	39	74	42	89	57	90	58	91	59	86	54	79	47	71	39	94	62
35.2	73	40	82	49	90	57	91	59	92	60	87	55	79	47	72	39	95	62
37.2	73	41	84	52	90	57	91	58	92	59	88	55	79	46	71	39	95	62
40.2	70	37	79	47	88	55	95	62	93	60	86	53	76	44	69	36	96	63
43.2	67	34	68	35	86	54	95	63	93	60	85	52	74	42	67	35	96	63
51.2	68	36	71	39	87	54	95	63	94	62	88	55	76	43	69	36	97	65
54.2	76	44	77	45	87	55	95	62	95	63	90	58	77	45	71	38	98	66
58.2	77	45	87	55	94	61	94	62	95	63	89	56	81	48	72	39	98	66
67.2	77	44	90	58	97	64	94	62	97	64	88	56	83	51	73	41	99	67
73.2	77	44	90	57	99	66	96	63	97	64	90	57	83	50	74	41	100	67
80.2	76	43	88	55	100	67	97	64	97	64	90	57	82	49	74	41	100	67
85.2	76	43	87	54	101	68	97	64	96	63	91	58	80	47	73	40	100	67
90.2	76	43	86	53	102	69	97	64	95	62	91	58	78	45	72	39	100	67
95.2	76	43	87	54	102	69	98	65	97	64	92	59	81	48	73	40	101	68
100.2	75	42	87	54	101	68	97	64	98	65	91	58	82	49	74	41	101	68
105.2	81	48	87	54	101	68	97	64	100	67	91	58	82	49	75	42	102	69

KAPPA REV HE FC /LN - Chiller section

	Octave bands [dB]																Total [dB(A)]	
	63 Hz		125 Hz		250 Hz		500 Hz		1000 Hz		2000 Hz		4000 Hz		8000 Hz		Lw_tot	Lp_tot
	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp		
33.2	67	35	70	38	84	52	85	53	86	54	81	49	75	43	67	35	89	57
35.2	69	36	77	45	85	52	86	54	87	54	82	50	75	42	68	35	90	58
37.2	69	37	80	47	85	52	86	53	87	54	83	50	74	42	67	35	90	58
40.2	66	34	75	42	83	51	90	57	88	55	81	49	72	40	65	33	91	59
43.2	63	30	64	31	82	49	90	58	88	55	80	48	70	38	64	31	91	59
51.2	65	32	67	35	82	50	90	58	89	56	83	51	71	39	65	33	92	59
54.2	72	40	73	41	82	50	90	57	90	58	85	53	73	41	67	34	93	61
58.2	73	41	82	50	89	56	89	57	90	58	84	51	76	44	68	36	93	60
67.2	73	40	86	53	92	59	89	57	92	59	84	51	79	46	69	37	94	62
73.2	73	40	85	52	94	61	91	58	92	59	85	52	79	46	70	37	95	62
80.2	72	39	84	51	94	61	91	58	92	59	85	52	78	45	70	37	95	62
85.2	72	39	83	50	96	63	92	59	91	58	86	53	76	43	69	36	95	62
90.2	72	39	81	48	97	64	92	59	90	57	86	53	74	41	68	35	95	62
95.2	72	39	82	49	97	64	92	59	92	59	87	54	77	44	70	37	96	63
100.2	71	38	82	49	96	63	92	59	93	60	87	54	78	45	70	37	96	63
105.2	76	43	82	49	96	63	92	59	95	62	87	54	78	45	71	38	97	64

Unit operating at nominal operating capacity, with no options of any kind, with external air temperature of 30°C and user-side heat exchanger water inlet/outlet temperature of 15/10°C.

Lw: sound power levels.

Lw_tot is the only binding value.

Values obtained from measures taken according to standard ISO 3744.

Lp: sound pressure levels calculated from sound power levels, related to distance of 10 m from the unit in free field with directivity factor Q=2. Non-binding values.

The acoustic data are related to standard conditions in referable and reproducible operating conditions. All data with the exception of Lw_tot are provided for illustrative purposes only and can not be used for forecasting purposes or for the verification of binding limits.

With special reference to noise emissions, the Manufacturer takes liability for their conformity, limited to the declared Lw_tot value. Any and all other Manufacturer's liability for the impact of such emissions in relation to the location of the machine and other conditions related to machine installation is excluded. The environment and the installation conditions, as well as the operating modes, can alter the sound emissions. Any assessment concerning these conditions falls within the area of competence of the plant designer and/or the fitter.

KAPPA REV SLN FC - Chiller section

	Octave bands [dB]																Total [dB(A)]	
	63 Hz		125 Hz		250 Hz		500 Hz		1000 Hz		2000 Hz		4000 Hz		8000 Hz		Lw_tot	Lp_tot
	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp		
33.2	65	33	68	36	81	49	82	50	83	51	78	46	72	40	65	33	86	54
35.2	66	34	74	42	82	49	83	51	84	51	79	47	72	40	65	33	87	55
37.2	67	34	77	44	82	49	83	50	84	51	80	48	72	39	65	32	87	54
40.2	64	31	72	40	80	48	87	54	85	52	78	46	70	37	63	30	88	56
43.2	61	28	62	29	79	46	87	55	85	52	77	45	68	36	62	29	88	56
51.2	62	30	65	33	80	47	87	54	86	53	80	48	69	37	63	30	89	57
54.2	70	37	71	38	80	47	87	54	87	55	82	50	71	38	65	32	90	58
58.2	71	38	80	47	86	53	86	54	87	55	81	48	74	41	66	33	90	58
67.2	70	38	83	50	89	56	86	54	89	56	81	48	76	44	67	34	91	59
73.2	70	37	83	50	91	58	88	55	89	56	82	49	76	43	68	35	92	59
80.2	69	36	81	48	91	58	88	55	89	56	83	50	75	42	68	35	92	59
85.2	69	36	80	47	93	60	89	56	88	55	83	50	73	40	67	34	92	59
90.2	69	36	79	46	94	61	89	56	87	54	83	50	71	38	66	33	92	59
95.2	70	37	80	47	94	61	89	56	89	56	84	51	74	41	67	34	93	60
100.2	69	36	80	47	93	60	89	56	90	57	84	51	75	42	68	35	93	60
105.2	74	41	80	47	93	60	89	56	92	59	84	51	76	43	69	36	94	61

Unit operating at nominal operating capacity, with no options of any kind, with external air temperature of 30°C and user-side heat exchanger water inlet/outlet temperature of 15/10°C.

Lw: sound power levels.

Lw_tot is the only binding value.

Values obtained from measures taken according to standard ISO 3744.

Lp: sound pressure levels calculated from sound power levels, related to distance of 10 m from the unit in free field with directivity factor Q=2. Non-binding values.

The acoustic data are related to standard conditions in referable and reproducible operating conditions. All data with the exception of Lw_tot are provided for illustrative purposes only and can not be used for forecasting purposes or for the verification of binding limits.

With special reference to noise emissions, the Manufacturer takes liability for their conformity, limited to the declared Lw_tot value. Any and all other Manufacturer's liability for the impact of such emissions in relation to the location of the machine and other conditions related to machine installation is excluded. The environment and the installation conditions, as well as the operating modes, can alter the sound emissions. Any assessment concerning these conditions falls within the area of competence of the plant designer and/or the fitter.

KAPPA REV HEi FC - Chiller section

	Octave bands [dB]																Total [dB(A)]	
	63 Hz		125 Hz		250 Hz		500 Hz		1000 Hz		2000 Hz		4000 Hz		8000 Hz		Lw_tot	Lp_tot
	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp		
58.2	82	49	75	43	84	52	92	59	98	65	91	58	80	48	73	40	99	67
67.2	82	49	87	54	93	60	92	59	98	65	90	57	83	50	74	41	100	67
73.2	97	64	92	59	94	61	98	65	96	63	94	61	85	52	74	41	101	68
80.2	97	64	91	58	96	63	99	66	96	63	95	62	84	51	74	41	101	68
85.2	98	65	92	59	96	63	99	66	96	63	95	62	85	52	75	42	101	68
90.2	99	66	92	59	100	67	101	68	97	64	97	64	86	53	75	42	103	70
100.3	84	51	91	58	97	64	96	63	101	68	92	59	85	52	76	43	102	69
105.3	98	64	94	60	98	64	100	67	99	66	96	62	87	54	77	43	103	69

KAPPA REV HEi FC /LN - Chiller section

	Octave bands [dB]																Total [dB(A)]	
	63 Hz		125 Hz		250 Hz		500 Hz		1000 Hz		2000 Hz		4000 Hz		8000 Hz		Lw_tot	Lp_tot
	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp		
58.2	78	46	72	40	81	48	88	55	94	61	87	55	77	44	70	37	95	63
67.2	79	46	84	51	89	56	89	56	94	61	87	54	79	46	71	38	96	63
73.2	93	60	88	55	90	57	94	61	92	59	90	57	81	48	71	38	97	64
80.2	93	60	87	54	92	59	94	61	92	59	91	58	81	48	71	38	97	64
85.2	94	61	88	55	92	59	95	62	92	59	91	58	82	49	72	39	97	64
90.2	95	62	89	56	96	63	97	64	93	60	93	60	82	49	72	39	99	66
100.3	80	47	87	54	93	60	92	59	97	64	89	56	82	49	73	40	98	65
105.3	94	60	90	57	94	60	96	63	95	61	92	58	84	50	73	40	99	65

Unit operating at nominal operating capacity, with no options of any kind, with external air temperature of 30°C and user-side heat exchanger water inlet/outlet temperature of 15/10°C.

Lw: sound power levels.

Lw_tot is the only binding value.

Values obtained from measures taken according to standard ISO 3744.

Lp: sound pressure levels calculated from sound power levels, related to distance of 10 m from the unit in free field with directivity factor Q=2. Non-binding values.

The acoustic data are related to standard conditions in referable and reproducible operating conditions. All data with the exception of Lw_tot are provided for illustrative purposes only and can not be used for forecasting purposes or for the verification of binding limits.

With special reference to noise emissions, the Manufacturer takes liability for their conformity, limited to the declared Lw_tot value. Any and all other Manufacturer's liability for the impact of such emissions in relation to the location of the machine and other conditions related to machine installation is excluded. The environment and the installation conditions, as well as the operating modes, can alter the sound emissions. Any assessment concerning these conditions falls within the area of competence of the plant designer and/or the fitter.

KAPPA REV XEi FC - Chiller section

	Octave bands [dB]																Total [dB(A)]	
	63 Hz		125 Hz		250 Hz		500 Hz		1000 Hz		2000 Hz		4000 Hz		8000 Hz		Lw_tot	Lp_tot
	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp		
30.1	82	50	74	42	76	44	88	56	98	66	90	58	80	48	72	40	99	67
35.1	98	65	91	58	88	56	98	66	94	61	95	62	84	52	73	41	100	68
45.1	99	66	92	59	89	57	99	67	95	62	96	63	85	53	74	42	101	69
55.2	86	53	77	45	79	47	91	58	101	68	93	60	83	50	75	42	102	69
65.2	98	65	91	58	89	56	99	66	99	66	96	63	86	53	76	43	103	70
70.2	101	68	94	61	92	59	101	68	97	64	98	65	87	54	76	43	103	70
80.2	101	68	94	61	92	59	102	69	97	64	98	65	88	55	77	44	104	71
90.2	102	69	95	62	92	59	102	69	98	65	99	66	88	55	77	44	104	71
100.3	101	67	94	60	92	58	102	68	100	67	98	65	88	55	78	44	105	71

KAPPA REV XEi FC /LN - Chiller section

	Octave bands [dB]																Total [dB(A)]	
	63 Hz		125 Hz		250 Hz		500 Hz		1000 Hz		2000 Hz		4000 Hz		8000 Hz		Lw_tot	Lp_tot
	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp		
30.1	79	47	71	39	73	41	84	52	94	62	86	54	76	44	69	37	95	63
35.1	94	61	87	55	85	52	94	62	90	57	91	58	81	48	70	38	96	64
45.1	95	62	88	55	86	53	95	63	91	58	92	59	82	49	71	38	97	65
55.2	82	50	74	42	76	43	87	55	97	64	89	56	79	47	72	39	98	65
65.2	94	61	87	54	85	52	95	62	95	62	92	59	82	49	73	40	99	66
70.2	97	64	90	57	88	55	97	64	93	60	94	61	84	51	73	40	99	66
80.2	97	64	91	58	88	55	98	65	93	60	94	61	84	51	74	41	100	67
90.2	98	65	91	58	89	56	98	65	94	61	95	62	85	52	74	41	100	67
100.3	97	63	90	57	88	54	98	64	96	63	95	61	84	51	75	41	101	67

Unit operating at nominal operating capacity, with no options of any kind, with external air temperature of 30°C and user-side heat exchanger water inlet/outlet temperature of 15/10°C.

Lw: sound power levels.

Lw_tot is the only binding value.

Values obtained from measures taken according to standard ISO 3744.

Lp: sound pressure levels calculated from sound power levels, related to distance of 10 m from the unit in free field with directivity factor Q=2. Non-binding values.

The acoustic data are related to standard conditions in referable and reproducible operating conditions. All data with the exception of Lw_tot are provided for illustrative purposes only and can not be used for forecasting purposes or for the verification of binding limits.

With special reference to noise emissions, the Manufacturer takes liability for their conformity, limited to the declared Lw_tot value. Any and all other Manufacturer's liability for the impact of such emissions in relation to the location of the machine and other conditions related to machine installation is excluded. The environment and the installation conditions, as well as the operating modes, can alter the sound emissions. Any assessment concerning these conditions falls within the area of competence of the plant designer and/or the fitter.

Delta wired free cooling module

FC modules	FC fans	Octave bands [dB]																Total [dB(A)]	
		63 Hz		125 Hz		250 Hz		500 Hz		1000 Hz		2000 Hz		4000 Hz		8000 Hz		Lw_tot	Lp_tot
		Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp		
1 ½	3	71	39	70	38	69	37	71	39	70	38	71	39	67	35	66	34	76	44
2	4	72	40	71	39	70	38	72	40	71	39	72	40	68	36	67	35	77	45
2 ½	5	73	41	72	40	71	39	73	41	72	40	73	41	69	37	68	36	78	46
3	6	74	42	73	41	72	40	74	42	73	41	74	42	70	38	69	37	79	47
4	8	75	43	74	42	73	41	75	43	74	42	75	43	71	39	70	38	80	48
5	10	76	44	75	43	74	42	76	44	75	43	76	44	72	40	71	39	81	49
6	12	77	45	76	44	75	43	77	45	76	44	77	45	73	41	72	40	82	50
7	14	77	45	76	44	75	43	77	45	76	44	77	45	73	41	72	40	83	51
8	16	78	46	77	45	76	44	78	46	77	45	78	46	74	42	73	41	83	51
9	18	79	47	78	46	77	45	79	47	78	46	79	47	75	43	74	42	84	52

Star wired free cooling module (SLN)

FC modules	FC fans	Octave bands [dB]																Total [dB(A)]	
		63 Hz		125 Hz		250 Hz		500 Hz		1000 Hz		2000 Hz		4000 Hz		8000 Hz		Lw_tot	Lp_tot
		Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp		
1	2	66	34	65	33	64	32	66	34	65	33	66	34	62	30	61	29	71	39
1 ½	3	68	36	67	35	66	34	68	36	67	35	68	36	64	32	63	31	73	41
2	4	69	37	68	36	67	35	69	37	68	36	69	37	65	33	64	32	74	42
2 ½	5	70	38	69	37	68	36	70	38	69	37	70	38	66	34	65	33	75	43
3	6	71	39	70	38	69	37	71	39	70	38	71	39	67	35	66	34	76	44
4	8	72	40	71	39	70	38	72	40	71	39	72	40	68	36	67	35	77	45
5	10	73	41	72	40	71	39	73	41	72	40	73	41	69	37	68	36	78	46
6	12	74	42	73	41	72	40	74	42	73	41	74	42	70	38	69	37	79	47
7	14	74	42	73	41	72	40	74	42	73	41	74	42	70	38	69	37	80	48
8	16	75	43	74	42	73	41	75	43	74	42	75	43	71	39	70	38	80	48
9	18	76	44	75	43	74	42	76	44	75	43	76	44	72	40	71	39	81	49

Unit operating at nominal operating capacity, with no options of any kind, with external air temperature of 30°C and user-side heat exchanger water inlet/outlet temperature of 15/10°C.

Lw: sound power levels.

Lw_tot is the only binding value.

Values obtained from measures taken according to standard ISO 3744.

Lp: sound pressure levels calculated from sound power levels, related to distance of 10 m from the unit in free field with directivity factor Q=2. Non-binding values.

The acoustic data are related to standard conditions in referable and reproducible operating conditions. All data with the exception of Lw_tot are provided for illustrative purposes only and can not be used for forecasting purposes or for the verification of binding limits.

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INSTALLATION ADVICE

The units described in this document are, by nature, strongly affected by the characteristics of the system, the working conditions and the installation site.

Remember that the unit must be installed by a qualified and skilled technician, and in compliance with the national legislation in force in the destination country.

The installation must be done in such a way that it will be possible to carry out all routine and non-routine maintenance operations.

Before starting any work, you must carefully read the "Installation, operation and maintenance manual" of the machine and do the necessary safety checks to prevent any malfunctioning or hazards.

We give some advice below that will allow you to increase the efficiency and reliability of the unit and therefore of the system into which it is inserted.

Water characteristics

To preserve the life of the exchangers, the water is required to comply with some quality parameters and it is therefore necessary to make sure its values fall within the ranges indicated in the following table:

Total hardness	2,0 ÷ 6,0 °f
Langelier index	- 0,4 ÷ 0,4
pH	7,5 ÷ 8,5
Electrical conductivity	10 ÷ 500 µS/cm
Organic elements	-
Hydrogen carbonate (HCO₃⁻)	70 ÷ 300 ppm
Sulphates (SO₄²⁻)	< 50 ppm
Hydrogen carbonate / Sulphates (HCO₃⁻/SO₄²⁻)	> 1
Chlorides (Cl⁻)	< 50 ppm
Nitrates (NO₃⁻)	< 50 ppm
Hydrogen sulphide (H₂S)	< 0,05 ppm
Ammonia (NH₃)	< 0,05 ppm
Sulphites (SO₃), free chlorine (Cl₂)	< 1 ppm
Carbon dioxide (CO₂)	< 5 ppm
Metal cations	< 0,2 ppm
Manganese ions (Mn⁺⁺)	< 0,2 ppm
Iron ions (Fe²⁺, Fe³⁺)	< 0,2 ppm
Iron + Manganese	< 0,4 ppm
Phosphates (PO₄³⁻)	< 2 ppm
Oxygen	< 0,1 ppm

Installation of water filters on all the hydraulic circuits is obligatory.

The supply of the most suitable filters for the unit can be requested as accessory. In this case, the filters are supplied loose and must be installed by the customer following the instructions given in the installation, operation and maintenance manual.

Glycol mixtures

With temperatures below 5°C, it is mandatory to work with water and anti-freeze mixtures, and also change the safety devices (anti-freeze, etc.), which must be carried out by qualified authorised personnel or by the manufacturer.

Liquid outlet temperature or minimum ambient temperature	°C	0	-5	-10	-15	-20	-25	-30	-35	-40
Freezing point	°C	-5	-10	-15	-20	-25	-30	-35	-40	-45
Ethylene glycol	%	6	22	30	36	41	46	50	53	56
Propylene glycol	%	15	25	33	39	44	48	51	54	57

The quantity of antifreeze should be considered as % on weight

Minimum water content in the system

For correct operation of the unit, it is necessary to ensure a buffering on the system such as to comply with the minimum operating time considering the greater between the minimum OFF time and the minimum ON time. In short, these contribute to limiting the number of times the compressors are switched on per hour and to preventing undesired deviations from the set point of the delivered water temperature.

Larger amounts of water are in any case always preferable, because they allow a smaller number of starts and switch-offs of the compressors, less wear of them and an increase in the efficiency of the system as a consequence of a reduction in the number of transients.

The following experimental formula allows to calculate the minimum water volume of the plant. The formula refers only to the operation of the unit in cooling mode.

$$V_{min} = \frac{P_{tot} \cdot 1.000}{N} \cdot \frac{300}{\Delta T \cdot \rho \cdot c_p} + P_{tot} \cdot 0,25$$

where

Vmin is the minimum water content of the system [l]

Ptot is the total cooling capacity of the machine [kW]

N: number of capacity reduction steps

ΔT: differential allowed on the water temperature. Unless otherwise specified, this value is considered to be 2.5K

ρ: density of the heat-carrying fluid. Unless otherwise specified, the density of water is considered

cp: specific heat of the heat-carrying fluid. Unless otherwise specified, the specific heat of water is considered

Considering the use of water and grouping together some terms, the formula can be re-written as follows:

$$V_{min} = \frac{P_{tot}}{N} \cdot 17,2 + P_{tot} \cdot 0,25$$

N is equal to the number of compressors installed in the unit.

Installation site

To determine the best installation site for the unit and its orientation, you should pay attention to the following points:

- compliance with the clearance spaces indicated in the official dimensional drawing of the unit must be guaranteed so as to ensure accessibility for routine and non-routine maintenance operations
- you should consider the origin of the hydraulic pipes and their diameters because these affect the radiuses of curvature and therefore the spaces needed for installing them
- you should consider the position of the cable inlet on the electrical control panel of the unit as regards the origin of the power supply
- if the installation includes several units side by side, you should consider the position and dimensions of the manifolds of the user-side exchangers and of any recovery exchangers
- if the installation includes several units side by side, you should consider that the minimum distance between units is 3 metres
- you should avoid all obstructions that can limit air circulation to the source-side exchanger or that can cause recirculation between air supply and intake
- you should consider the orientation of the unit to limit, as far as possible, exposure of the source-side exchanger to solar radiation
- if the installation area is particularly windy, the orientation and positioning of the unit must be such as to avoid air recirculation on the coils. If necessary, we advise making windbreak barriers in order to prevent malfunctioning.

Once the best position for the unit has been identified, you must check that the support slab has the following characteristics:

- its dimensions must be proportionate to those of the unit: if possible, longer and wider than the unit by at least 30 cm and 15/20cm higher than the surrounding surface
- it must be able to bear at least 4 times the operating weight of the unit
- it must allow level installation of the unit: although the unit is installed on a horizontal base, make slopes in the support surface to convey rain water or defrost water to drains, wells or in any case to places where it cannot generate an accident hazard due to ice formation. All heat pump version units are equipped with discharge manifolds for the condensed water; these can be manifolded to facilitate condensate discharge.

The units are designed and built to reduce to a minimum the level of vibration transmitted to the ground, but it is in any case advisable to use rubber or spring anti-vibration mounts, which are available as accessory and should be requested when ordering.

The anti-vibration mounts must be fixed on before positioning the unit on the ground.

In the event of installation on roofs or intermediate floors, the pipes must be isolated from the walls and ceilings.

It is advisable to avoid installation in cramped places, to prevent reverberations, reflections, resonances and acoustic interactions with elements outside the unit.

It is essential that any work done to soundproof the unit does not affect its correct installation or correct operation and, in particular, does not reduce the air flow rate to the source-side exchanger.

Installations that require the use of treated coils

If the unit has to be installed in an environment with a particularly aggressive atmosphere, coils with special treatments are available as options.

- e-coated microchannel coils for condensing section
- coils with anti-corrosion treatment for condensing section (option available only for Cu/Al coil)
- Coil treated with anti-corrosion paints for freecooling section

A description of the individual accessories is available in the "Description of accessories" section.

The type of coil treatment should be chosen with regard to the environment in which the unit is to be installed, through observation of other structures and machinery with exposed metal surfaces present in the destination environment.

The cross observation criterion is the most valid method of selection currently available without having to carry out preliminary tests or measurements with instruments. The identified reference environments are:

- coastal/marine
- industrial
- urban with a high housing density
- rural

Please note that in cases where different conditions co-exist, even for short periods, the choice must be suitable for preserving the exchanger in the harsher environmental conditions and not in conditions between the worst and best situation.

Particular attention must be given in cases where an environment that is not particularly aggressive becomes aggressive as a consequence of a concomitant cause, for example, the presence of a flue outlet or an extraction fan.

We strongly suggest choosing one of the treatment options if at least one of the points listed below is verified:

- there are obvious signs of corrosion of the exposed metal surfaces in the installation area
- the prevailing winds come from the sea towards the unit
- the environment is industrial with a significant concentration of pollutants
- the environment is urban with a high population density
- the environment is rural with the presence of organic discharges and effluents

In particular, for installations near the coast, the following instructions apply:

- For units with a microchannel coil for the condensing section to be installed between 1 and 20 km from the coast, the use of the option "E-coated microchannel coils" and the option "Coil treated with anti-corrosion paints" for freecooling section is strongly recommended.
- For units with Cu/Al coils to be installed between 1 and 20 km from the coast, the use of the option "Coil treated with anti-corrosion paints" for both the condensing and the freecooling sections is strongly recommended.
- for distances within one kilometer from the coast it is strongly recommended to use the "Battery treated with anti-corrosion paints" accessory both for the condensing section and for the freecooling section

To protect the exchangers from corrosion and ensure optimal operation of the unit, we advise following the recommendations given in the user, installation and maintenance manual for cleaning the coils.

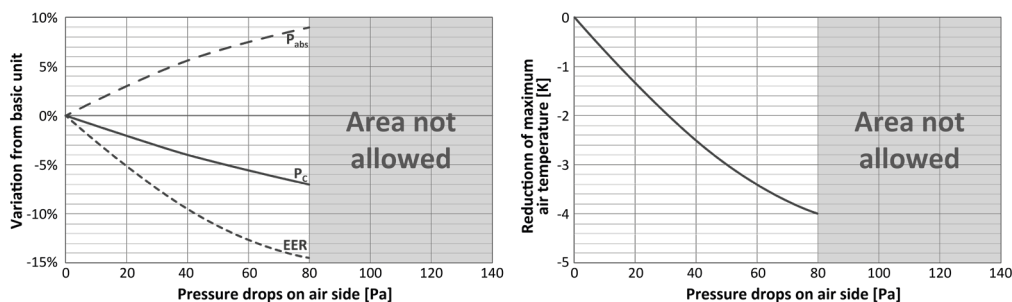
Aeraulic head losses and options available for the ventilating section

With the exception of units for which oversize fans are required, as standard, the units are designed considering that, at the nominal air flow rate, the fans work with null available pressure.

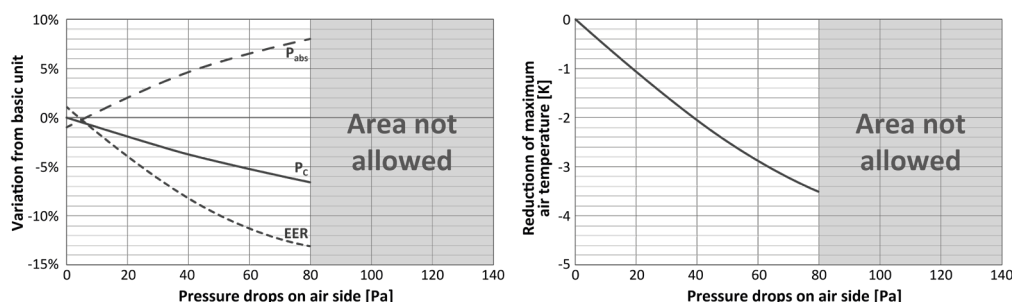
If there are obstacles to free air flow, you should consider the additional aeraulic head losses that will cause a reduction of the air flow rate and a consequent deterioration of performance.

The following diagrams show the trend of cooling capacity (PC), EER, total absorbed power (Pabs) and reduction of the maximum external air temperature in chiller operating mode, depending on the aeraulic head losses that the fans will have to overcome.

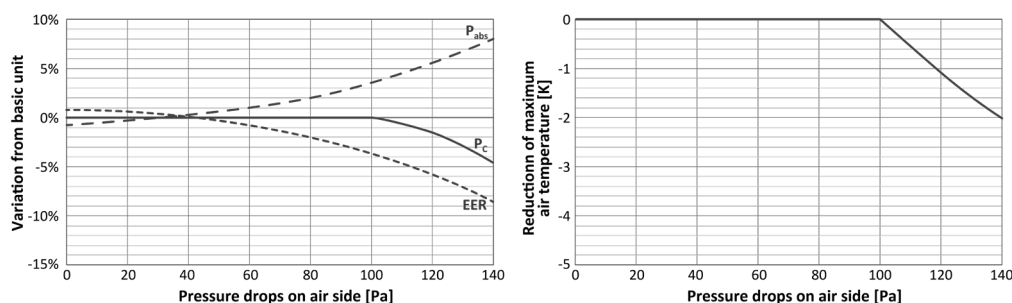
AC fans (Ø 800)



EC fans (Ø 800)



Oversize EC fans (Ø 800)



The indicated values are for the standard machine, without accessories, with AC fans and in any case in the absence of air recirculation.

Example: supposing you expect there to be obstacles that will generate an estimated aeraulic head loss of 60Pa. In this case, there are 3 possibilities:

- use the unit with standard AC fans: compared to ideal conditions, the output power will be reduced by about 5.5%, the total absorbed power will increase by about 7.5%, the EER will be reduced by about 12.5% and the maximum allowed external air temperature for operation at 100% will be reduced by about 3.4K compared to the nominal limit
- use the unit with EC fans: compared to the unit with AC fans working in ideal conditions, the output power will be reduced by about 5%, the total absorbed power will increase by about 6.5%, the EER will be reduced by about 11.5% and the maximum allowed external air temperature for operation at 100% will be reduced by about 2.8K compared to the nominal limit
- use the unit with oversize EC fans: compared to the unit with AC fans working in ideal conditions, the output power of the unit will be unchanged, the total absorbed power will increase by about 1%, the EER will be reduced by about 2% and the maximum external air temperature will remain the one shown in the diagram of the operating limits.

It is emphasized that, as indicated in the diagrams and based on the diameter and type of fan, for aeraulic head losses higher than 60 or 80Pa, only the use of oversize EC fan is allowed.

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