Tetris 2

84÷913 kW

General
Reversible units and modular chillers for large systems . Wide range: multiple high efficiency combinations and low noise version

Configurations
HP: reversible heat pump

A and A+: high efficiency configurations

SLN: super low noise version

/HAT: execution for high external air temperatures

/LN: silenced unit

/DS: execution featuring a desuperheater

/DC: execution with recovery condenser

Strengths
- Tier 2 compliance: high efficiency configurations with EC fans.
- Chiller with low refrigerant charge
- Wide operating limits :#down to ambient -20°C
- Intelligent management of defrost cycles: Anti-Ice Circuit
- Night Shift function for noise control (option)
- BlueThink advanced control with integrated web server. Multilogic function and Blueye® supervision system. (options)
- Flowzer: inverter driven pumps (options)

WESTERN™ AIRCONDITIONING WARMTEPOMPEN

BlueBox by Swegon

Tetris 2

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Reversible units and modular chillers for large systems . Wide range: multiple high efficiency combinations and low noise version

STRUCTURE

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.

REFRIGERANT

The unit is charged with refrigerant R410A, with GWP=2088 (value at 100 years).

COMPRESSORS

The compressors are hermetic orbiting spiral scroll compressors connected in tandem or in trio, fitted with oil level sight glass, oil equalization line, crankcase heater and electronic protection.

SOURCE-SIDE HEAT EXCHANGER

(for chiller unit)

The exchangers are made with microchannel aluminium coils.

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.

The use of microchannel coils, as opposed to conventional copper/aluminium coils, reduces the total weight of the unit and reduces the refrigerant charge.

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.

Options are available for installation in environments with a particularly aggressive atmosphere or in coastal or highly industrialized areas. See section: "Description of accessories".

(for HP units)

The exchangers are made with finned pack coils with copper tubes and aluminium fins.

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.

Options are available for installation in environments with a particularly aggressive atmosphere or in coastal or highly industrialized areas. See section: "Description of accessories".

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.

Fan speed is controlled as standard on all units through a phase cutting speed adjuster, in order to optimize the operating conditions and efficiency of the unit.

USER-SIDE HEAT EXCHANGER

The exchanger is a braze-welded stainless steel plate heat exchanger, insulated with a shroud of closed-cell insulating material.

Models with two refrigerant circuits are fitted with dual circuit heat exchanger with a single hydraulic connection.

Models with three or four refrigerant circuits are made with two manifolded heat exchangers.

For dual circuit models, the unit uses two exchangers already manifolded inside the unit and therefore with a single hydraulic connection.

Each heat exchanger is equipped with:

- a thermostat-controlled anti-freeze heater to protect it from ice formation when the unit is not running
- a temperature probe for freeze protection

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
- low pressure switches (only for models with parametric control)

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

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
- automatic circuit breakers for compressors with fixed calibration
- fuses for protecting the fans and auxiliary circuits
- thermal magnetic circuit breakers for pumps (if present)
- contactors for compressors, fans and pumps (if present)
- phase monitor
- potential-free general alarm contacts
- single potential free operating contacts for compressors, fans and pumps (if present)
- microprocessor controller with display accessible from the outside
- external air temperature probe
- summer/winter selection from digital input (only for / HP unit)

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.

Standard power supply of the unit is 400V/3~/50Hz

CONTROL BLUETHINK

The unit is supplied with two types of control according to size and version:

- parametric control: Tetris 2 units from model 10.2 to 16.2. For these units, the advanced control can be ordered as an accessory.
- advanced control: all the other set-ups.

Main controller functions parametric

This is the standard control for models from 10.2 to 16.2. For these units, the advanced control can be ordered as an accessory.

The control allows the following functions:

- water temperature adjustment, with control of the water entering the user-side heat exchanger
- freeze protection
- compressor timings
- automatic rotation of compressor starting sequence
- recording of the alarm log
- RS485 serial port with Modbus protocol
- digital input for general ON/OFF
- digital input for Summer/Winter selection (only for HP units)

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 controller functions advanced

The control allows the following functions:

- water temperature adjustment, with control of the water entering the user-side heat 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
- RS485 serial port with Modbus protocol
- Ethernet serial port with Modbus protocol and integrated web server preloaded web page
- digital input for general ON/OFF
- digital input for Summer/Winter selection (only for HP units)

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, pumps, 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.

Management of defrost cycles (only for HP units)

For defrost management, the control of the unit uses a sliding intervention threshold, depending on the pressures inside the unit and the external air temperature. By putting together all this information, the control can identify the presence of ice on the coil and activates the defrosting sequence only when necessary, so as to maximize the energy efficiency of the unit.

Sliding management of the defrost threshold ensures that, as the absolute humidity of outdoor air decreases, the frequency of the defrost cycles gradually decreases because they are carried out only when the ice formed on the coil actually penalizes performance.

The defrost cycle is fully automatic and is carried out using a patented defrost system (patent n° 1335232): during the initial stage, a defrost is carried out by cycle reversal with fans stopped. When the frost on the coil has melted sufficiently, reverse ventilation is activated, that is, with air flow in the opposite direction to that of normal operation, so as to facilitate the ejection of condensed water and detached ice. When the coil is clean, ventilation is reversed again and the unit resumes operation in heat pump mode.

The combination of the sliding intervention threshold and the patented defrost system allows the number and duration of defrost cycles to be optimized and reduced to the minimum.

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 of the unit, there are various versions that differ in efficiency and noise levels.

A and A+: high efficiency unit

The high efficiency units use larger coils than the basic unit, 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.

SLN and A/SLN: super low noise unit and high efficiency super low noise unit

The SLN and A/SLN version units use a soundproofed compressor compartment and oversize coils compared to the standard efficiency unit.

For SLN/HP version units working in heat pump mode, the fans always operate at 100% speed and therefore guarantee the same performance levels as high efficiency versions.

OPTIONS

/HP: reversible heat pump

In addition to the set-up of a chiller only unit, /HP units comprise (for each refrigerant circuit):

- 4-way reversing valve
- suction separator
- fluid accumulator
- second electronic expansion valve.

For defrost management, the control of the unit uses a sliding intervention threshold, depending on the pressures inside the unit and the external air temperature. By putting together all this information, the control can identify the presence of ice on the coil and activates the defrosting sequence only when necessary, so as to maximize the energy efficiency of the unit.

Sliding management of the defrost threshold ensures that, as the absolute humidity of outdoor air decreases, the frequency of the defrost cycles gradually decreases because they are carried out only when the ice formed on the coil actually penalizes performance.

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The combination of the sliding intervention threshold and the patented defrost system allows the number and duration of defrost cycles to be optimized and reduced to the minimum.

Summer/winter switching can be done from the control keypad, digital input or BMS (requires write enabling).

/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.

/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.

This option is not available for /HP units

/DS: unit with desuperheater

/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 coil. 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).

The desuperheater can be used during operation in cooling mode. However, it can also be used in heating mode on condition that the following measures are taken:

- a valve (either 2- or 3-way) must be installed on the desuperheater water circuit;
- the valve must be monitored using a temperature control system;
- the valve must be operated to regulate the temperature of the input water into the desuperheater = IWTds.

First, enter the unit heating setpoint, which corresponds to the temperature of water delivered to the heating unit=LWTu_Heating. Then set the condition below:

- IWTds > LWTu_Heating + 10 [K]

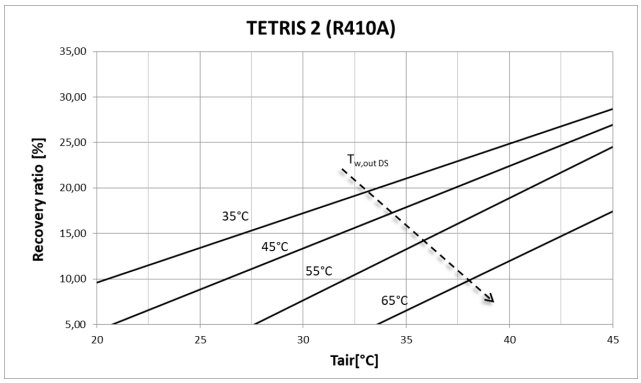
The valve, the control systems and their installation, setup operations, etc. are the responsibility of the client. If heat recovery is not required during operation in heat pump mode, or where the above requirements are not met, the water circuit of the desuperheater must be shut off. Desuperheater operation in heat pump mode reduces the heating capacity transferred from the unit to the user's hydronic circuit. When a desuperheater is fitted, irrespective of it running in either cooling or heating mode, the max. temperature of water delivered to the heating unit (LWTu_Heating) is reduced, as described in the section "Operating limits".

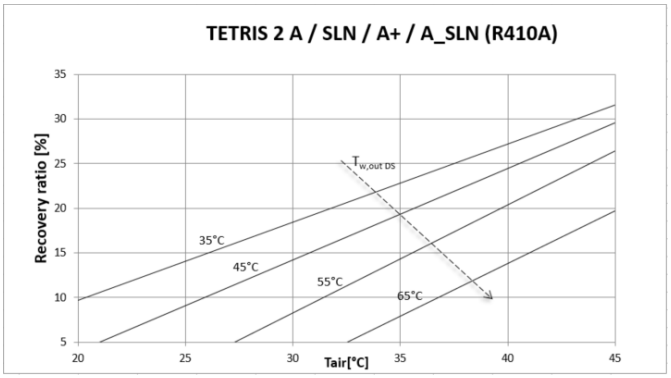
Two illustrative graphs are shown below in which, as the ambient temperature changes, (Tair) and as the temperature of the water leaving the heat recovery heat exchanger changes, (Tw,out DS), the percentage of recovered heat is shown as an indication (Recovery ratio).

Condensation heat recovery is a function of size, version and operating conditions.

The percentage of recovered heat is calculated as the ratio between recovered heat flow to the desuperheater and the heat flow to 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.

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
- /3P: hydraulic module with three pumps
- /1PS: hydraulic module with one pump and buffer tank
- /2PS: hydraulic module with two pumps and buffer tank
- /3PS: hydraulic module with three pumps and buffer tank

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

The following are also available:

- modules /1Pr, /2Pr, /1PrS e /2PrS that have pumps with reduced available discharge head
- modules /1PM, /2PM, /3PM, /1PMS, /2PMS and /3PMS that have pumps with increased available discharge head

Hydraulic modules with one pump have:

- one pump
- an expansion vessel

Hydraulic modules with two pumps have:

- two pumps
- a check valve on the delivery side of each pump
- 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 three pumps have:

- three pumps
- a check valve on the delivery side of each pump
- an expansion vessel

The 3 pumps operate in parallel and each one processes a third of the total flow rate.If one of the three pumps fails, the unit will work in forced capacity reduction mode (to avoid low pressure alarms) and the remaining two pumps will in any case be able to guarantee about 78% of the rated flow rate.

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.

/HAT: unit for high external air temperatures

The unit with /HAT option adopts an electrical control panel made using specific components to withstand high temperatures, special cables and oversize protection parts.

This enables the unit to work with external air temperatures of over 46°C as indicated in the section on operating limits;

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.

DESCRIPTION OF ACCESSORIES

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

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 option uses a condenser as energy storage, and not an ordinary coil. In this way, it is not affected by the memory effect of normal coils and the need for maintenance is avoided.

BT **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 option uses a condenser as energy storage, and not an ordinary coil. In this way, it is not affected by the memory effect of normal coils and the need for maintenance is avoided.

BK **Brine Kit**

This accessory is compulsory if a water temperature set point lower than or equal to +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 allowed limit temperature.

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.

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.

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

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.

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.

The accessory can be applied only to units in LN or SLN set-up.

Fan accessories

VEC **EC fans**

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 head losses and options available for the fan section".

VEM **Oversize EC fans**

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 head losses and options available for the fan section".

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.

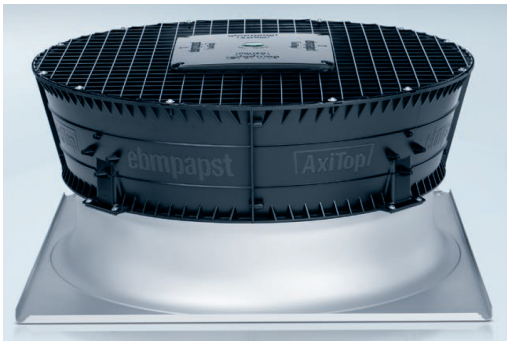
This higher pressure can have at least two possible applications:

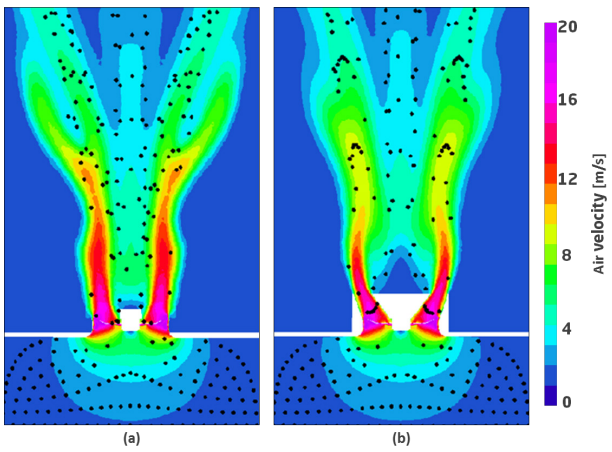
- For the same fan speed, the pressure recuperator allows an increase of about 50Pa in the available pressure of the ventilating section to be obtained. This can be useful for overcoming the head losses that may be present in specific installations. The increase in available pressure is to be considered 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 optimize the performance of the unit, the "VEC" accessory can be combined: the higher efficiency of the EC fans (especially when operating at reduced 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

Hydraulic circuit accessories

FVP FLOWZER VP - Inverter for manual pump adjustment

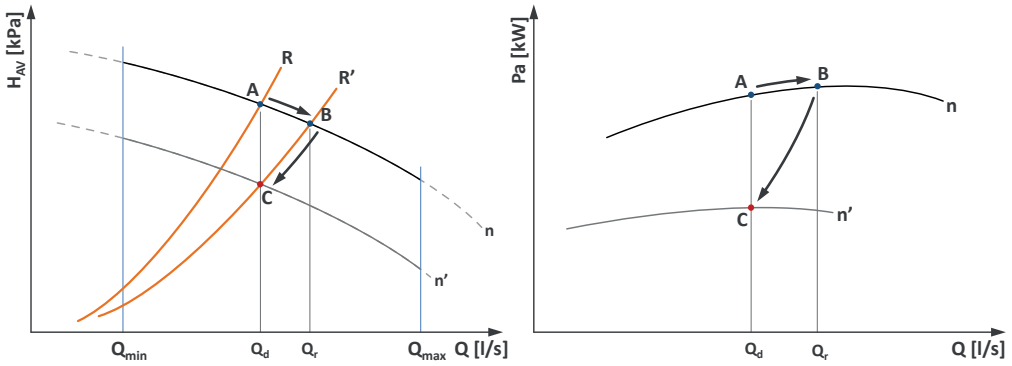
The accessory consists of inserting an inverter in the machine to manually adjust the speed of the pump (or pumps) in order to calibrate the pump flow rate on the head losses of the system.

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 Qd.

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 Qr higher than Qd.

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.

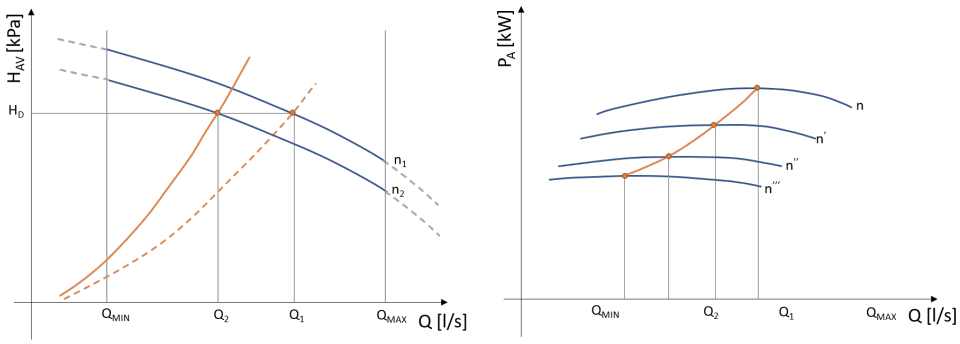


The use of the Flowzer allows the pump speed to be set manually (e.g. at speed n' instead of n) to obtain the design water flow rate and thermal gradient (point C). Once the adjustment procedure has been carried out, the pump will always work at a fixed flow rate.

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%.

FVD FLOWZER VD - control of available pump discharge head for variable flow systems without monitoring the flow rate limits;

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 display, the available discharge head value (Hd) 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).

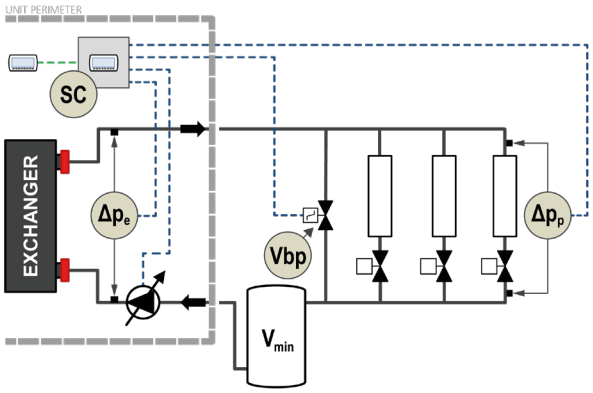
The use of this accessory also allows the pump speed to be adapted to possible fouling of the filter on the hydraulic circuit.

FVF **FLOWZER VFPP - automatic management of variable flow rate in systems with one single primary circuit and a bypass valve;**

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 (Δpe)
- 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 (Δpp) 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.

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
- having a variable flow system, with maximum energy saving
- simplifying the layout of the user circuit
- limiting the capex of the system
- performing a reliable check

The Flowzer VFPP system controller uses an advanced algorithm that enables prevention of unnecessary waste of energy and hunting by the inverter and the bypass valve.

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 controller modulates the pump speed according to the signal detected by the system transducers Δpp
- as the demand from the system goes down, the pump speed will be reduced.
- 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 Δpe
- When the minimum allowed flow rate threshold is exceeded, the control system will open the bypass valve Vbp 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.

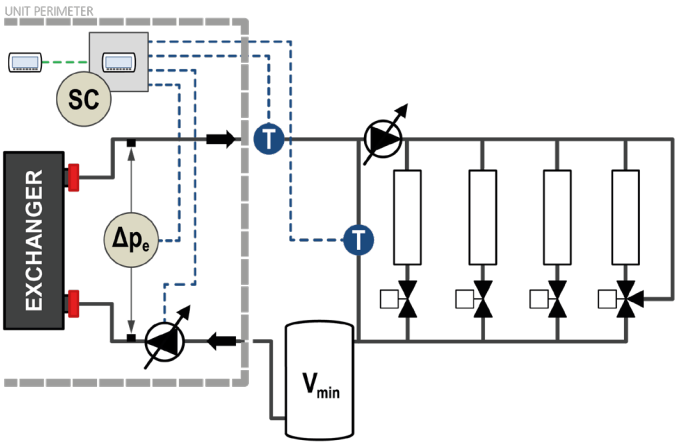
In the required minimum load condition (that is, with all system terminals switched off) the necessary minimum volume (Vmin) must be ensured by the relevant tank to be installed between the unit and the separator or the bypass pipe.
The bypass valve Vbp is controlled through a 0-10 V signal and must therefore be installed within 30 m of the unit.
The pressure transducers of the system Δpp 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	TETRIS 2 FC	TETRIS 2A FC	TETRIS 2 SLN FC	TETRIS 2A+ FC	TETRIS 2A SLN FC
2 1/2"				18.4	18.4
				23.5	23.5
3"	27.4	28.4	28.4	27.6	27.6
	29.4	34.4	34.4	31.4	31.4
	32.4				
4"	33.4	38.4	38.4	36.4	36.4
	37.4	43.4	43.4	41.5	41.5
	41.4	47.4	47.4	44.6	44.6
	43.6	50.6	50.6	49.6	49.6
	47.6			54.6	54.6
5"		57.6	57.6		
		64.6	64.6		
		70.6	70.6		

FVPS **FLOWZER VPS - automatic management of variable flow rate, including balancing of flow rates between primary and secondary circuits;**

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 (Δpe)
- 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.

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 Δpe

In the required minimum load condition (that is, with all system terminals switched off) the necessary minimum volume (Vmin) 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.

COL **Water manifolds for DS**

This accessory provides a pair of manifolds for connection of the partial heat recovery heat exchangers. The installation of the manifolds outside the machine is to be carried out by the customer.

Accessory supplied loose.

PFP **User-side pump with Pulse function**

As standard, the unit is set to keep the system-side circulation pump on all the time, even when the set point temperature is reached.

But when the unit is provided with this accessory, on reaching the set point, the controller will switch off the pump and start it again at regular intervals for a sufficient time to measure the water temperature. If the controller verifies that the water temperature is still in set point condition, it will switch off the pump again. Otherwise the controller will start the compressors again to meet the requirements of the system.

This accessory therefore allows electrical absorption due to pumping to be drastically reduced, especially in spring and autumn when the load is extremely low.

As standard, the unit is set to keep the system-side circulation pump on all the time, even when the set point temperature is reached.

But when the unit is provided with this accessory, on reaching the set point, the controller will switch off the pump and start it again at regular intervals for a sufficient time to measure the water temperature. If the controller verifies that the water temperature is still in set point condition, it will switch off the pump again. Otherwise the controller will start the compressors again to meet the requirements of the system.

This accessory therefore allows electrical absorption due to pumping to be drastically reduced, especially in spring and autumn when the load is extremely low.

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.

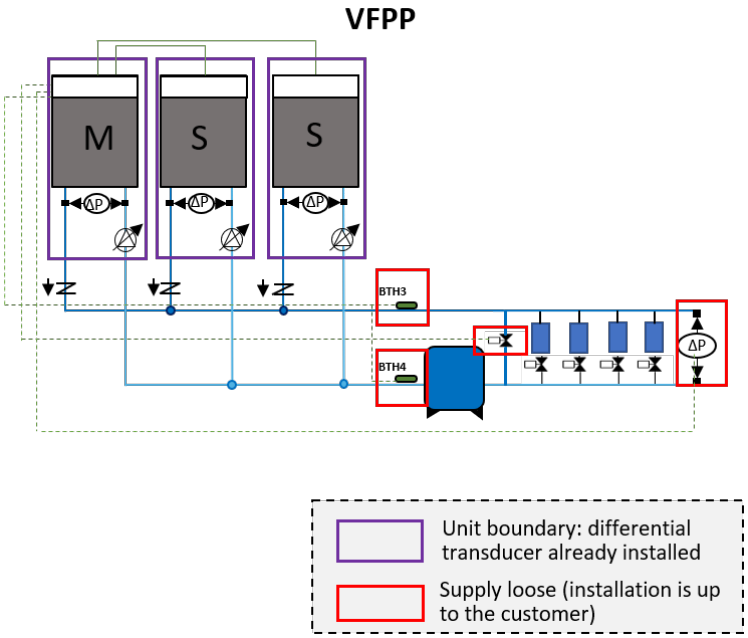
RA **Antifreeze heater**

These are electric heaters inserted on the user-side heat exchanger, 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 stopped.

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.

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.

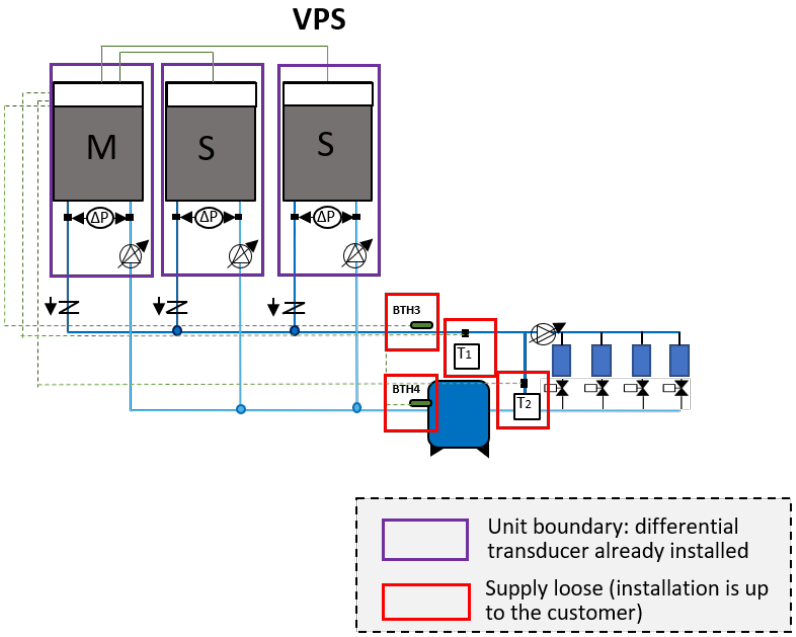
The connection between the master unit and the slave units made with a CAT cable. 5E/UTP (prepared by the customer) with RJ45 connectors. Maximum cable length 100m.
For further details, please refer to the controller manual.

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".

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 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.

The option is supplied with the system for installation on the user side (installation by customer).

Electrical accessories

A41 **Power supply 415/3/50**
Power supply 415/3/50.

A43 **Power supply 400/3/50**
The standard power supply of the unit

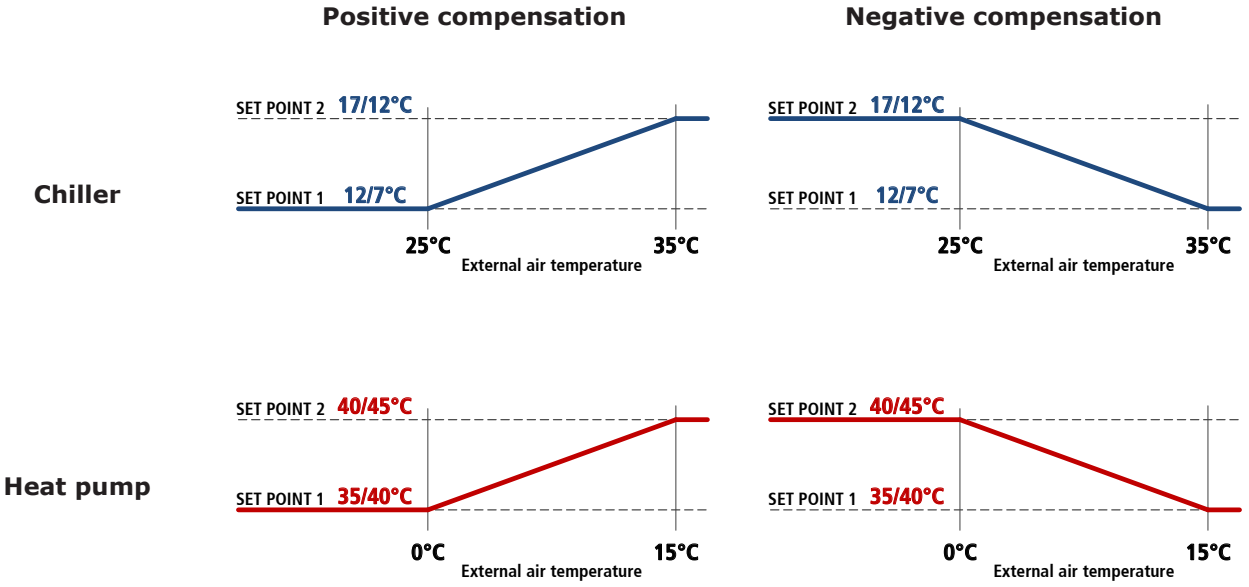
ARU **Stopping of the unit due to temperatures below the operating limit**
With this accessory, it is possible to set the unit so that the controller switches off the compressors when the unit is operating in heat pump mode and the external air temperature falls below a minimum set limit: this will prevent the unit from going into low pressure alarm, so avoiding having to manually restart the machine.
When the external air temperature returns above the set threshold temperature, the unit will automatically resume operation without it being necessary to do anything.
For units equipped with integrated pump, the pump will always be kept running so as to prevent ice formation and ensure correct reading of the temperature and antifreeze safety probes at all times.
The stopping temperature must be set based on the set point temperature and in accordance with what is allowed by the operating limits of the machine.
The same function can be used to set an external air temperature below which to use an alternative heat source because it is more efficient or economically more advantageous.
With the default programming, the limit that considers a production of outgoing water at 45°C is set, therefore:

- -7°C for standard units
- -10°C for /HE and /SLN units.

CA **Advanced control**
With this accessory, the advanced control is used also for sizes/versions provided with the parametric control as standard.

COTW **Outgoing water temperature control**
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.

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.

The two pumps are controlled by two separate relays.

RIF **Power factor correction to cosφ ≥ 0.95**

With this accessory, an electrical control panel (IP54 protection rating), containing power factor correction capacitors to make the cosφ 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

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.

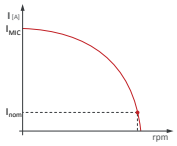
Unless otherwise specified in the order, the controller will be set at the factory with 0-10V analogue input and with the following temperatures:

- 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

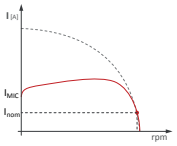
SOFT **Electronic soft-starter**

The scroll compressors have DOL (Direct On Line) starting and therefore the maximum inrush current IMIC will be 4/5 times its nominal current Inom.

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 cosφ ≥ 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.

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.

Network accessories

BEET **Blueye® via Ethernet**

Blueye® is a supervision platform that enables remote monitoring of one or more units in the same system interconnected through a network with Modbus protocol.

This accessory features the Blueye device, as already installed and wired in the unit.

The critical variables to be monitored over time are identified for each connected device. These variables are sampled and saved to the cloud so that they are accessible at all times through a web portal or a mobile APP (available for Android and iOS).

The following options can be selected for connection to the internet:

- a LAN (Ethernet) connection - available in the system;
- a connection to a mobile network - at least 3G. The data SIM card is not included.

Three different types of contracts can be signed.

Blueye® Cloud Basic:

- to monitor a max. of 20 variables in total over max. 5 units/peripherals;
- to set a min. sampling frequency of 60 seconds.

Blueye® Cloud Advanced:

- to monitor a max. of 200 variables in total over max. 10 units/peripherals;
- to set a min. sampling frequency of 5 seconds.

Blueye® Connect:

- To monitor up to 10 units/peripherals.

Subscribing to any of the **Blueye® Cloud** enables:

- viewing the history of the monitored variables, in the form of both numerical values and graphs;
- downloading the history of variables in CSV format;
- the creation of automatic reports;
- setting notifications (via APP or mail) with settable thresholds for each variable;
- switching the unit ON/OFF remotely;;
- changing the set point remotely;
- selection of SUMMER/WINTER mode remotely (for reversible units only).

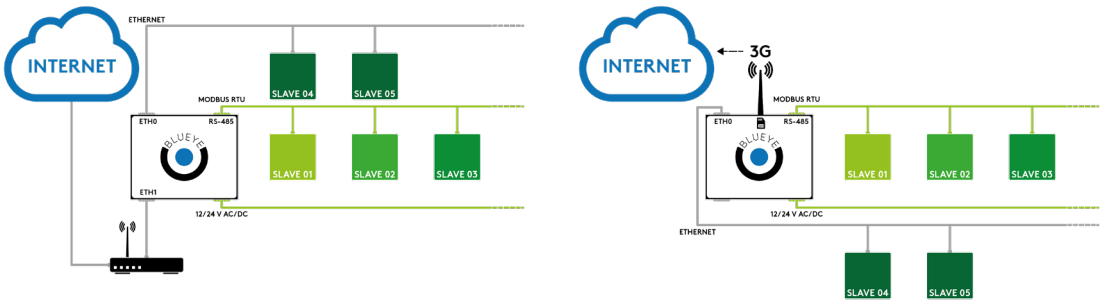
The subscription to the **Blueye® Connect** service offers the advantages below:

- a safe connection (tunnelling) between the user and the remote unit through the Blueye® portal;
- full access to the remote controller;
- real time monitoring;
- software upgrading.

Blueye® via Ethernet is only available for units supplied with an advanced controller and does not include any type of service. This service must be purchased separately based on the number of units/devices to be connected and the number of variables to be monitored. In order to connect multiple units to **Blueye® device, the network switch is required (this accessory is sold separately).**

Units can also be connected to the Blueye device through the RS485 network featuring a Modbus RTU protocol (for this option, refer to BERS accessory).

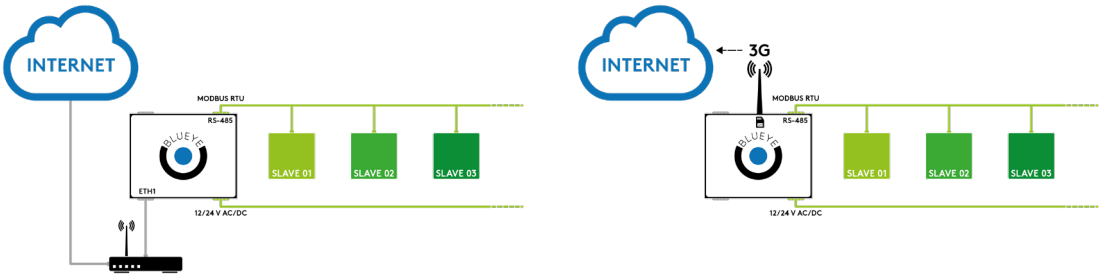
For further details, refer to the specific Blueye® documentation.



BERS Blueye® via RS485

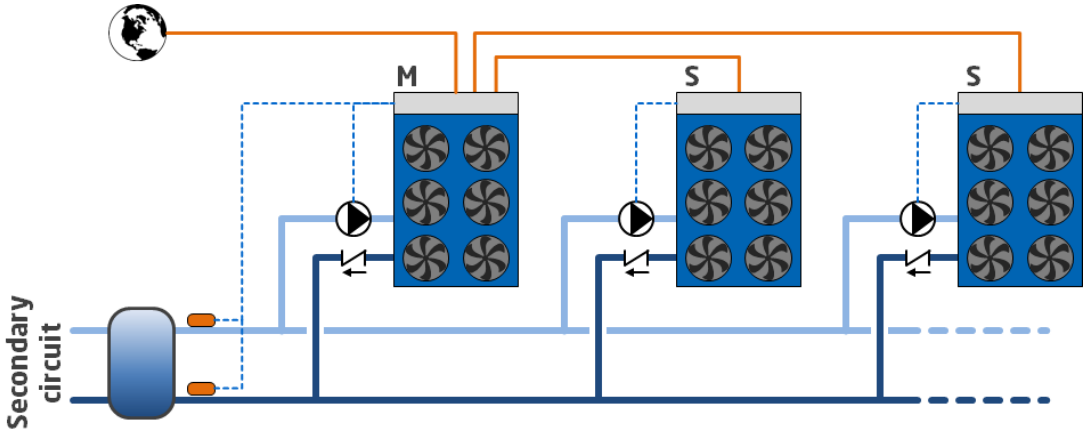
This accessory requires use of the Blueye device, installed and wired in the unit through a RS485 serial port on the ModBus RTU protocol.

This option requires integration with one contract of the Blueye Cloud series. (Basic or Advanced one)



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.

The Multilogic function that can be requested with the unit can be:

- **FM0:** Multilogic function for Slave unit
- **FM2:** Multilogic function for Master unit for managing up to 2 Slaves
- **FM6:** Multilogic function for Master unit for managing up to 6 Slaves

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

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 connection with Modbus protocol

RS485 serial connection with Modbus protocol

SMAR Smartlink function predisposition

This accessory makes it possible to connect the controller of the unit with the controller of a Swegon GOLD™ air handling unit via a simple serial cable, so allowing their operating logi-cs to be merged into a single consciousness that pursues the maximum energy efficiency of the system. The RS485 serial interface is already included and dedicated to connection with Swegon units.

The option is incompatible with:

- double set point
- variable set point with remote signa
- summer/winter selection by digital input
- set point compensation depending on external air temperature
- multilogic
- all communication protocols.

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**

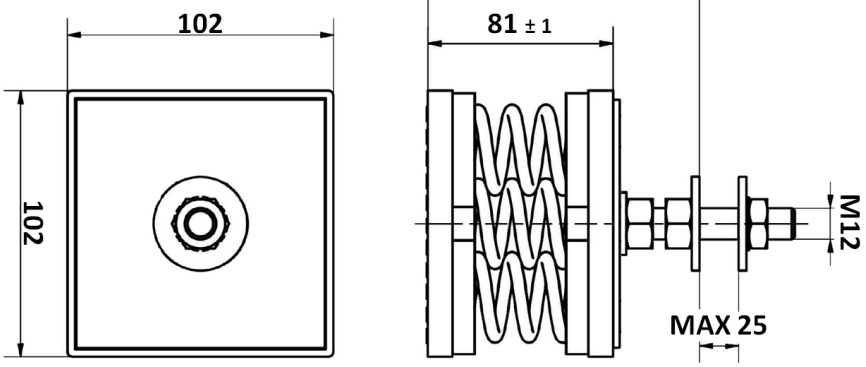
These allow you to reduce the vibrations transmitted from the unit to the surface it is standing on.

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".

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".

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.

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".

SLIT Special pallet/skid for container shipment

The unit is placed on a skid that makes the container loading and unloading operations easier.

The accessory is mandatory if shipping by container is required

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.

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.

TECHNICAL SPECIFICATIONS

TETRIS 2

			10.2	12.2	13.2	15.2	16.2	20.3	24.3
TETRIS 2									
Cooling									
Refrigeration capacity	(1)	kW	109	118	126	139	160	195	230
Total absorbed power	(1)	kW	36	42	48	54	61	75	85
EER	(1)		3,01	2,8	2,6	2,57	2,64	2,59	2,71
TETRIS 2 /HP									
Cooling									
Refrigeration capacity	(1)	kW	106	115	122	135	155	189	223
Total absorbed power	(1)	kW	36	42	48	54	60	75	85
EER	(1)		2,93	2,72	2,53	2,49	2,57	2,52	2,63
Heating									
Heating capacity	(2)	kW	107	119	128	145	162	192	230
Total absorbed power	(2)	kW	38	43	47	51	58	70	86
COP	(2)		2,84	2,76	2,7	2,84	2,81	2,73	2,68
Compressors									
Compressors/Circuits		n°/n°	2/1	2/1	2/1	2/1	2/1	3/1	3/1
Minimum capacity reduction step	(6)	%	50%	44%	50%	45%	50%	33%	33%
Refrigerant charge CH (MCHX)	(3)	kg	11,5	12	12	13	13	19	19
Refrigerant charge CH (Cu/Al)	(3)	kg	12,5	13	13	14	14	19,5	19,5
Refrigerant charge HP	(3)	kg	18,375	18,375	22,125	23,25	23,25	32,25	32,25
Fans									
Quantity		n°	2	2	2	2	2	3	3
Total air flow rate CH (MCHX)		m³/h	42000	42000	42000	42000	42000	63000	63000
Total air flow rate HP		m³/h	40000	40000	40000	40000	40000	60000	60000
User-side heat exchanger									
Quantity		n°	1	1	1	1	1	1	1
Water flow rate CH	(1)	m³/h	18,7	20,4	21,7	24	27,5	33,6	39,5
Pressure drop CH	(1)	kPa	46	51	52	50	50	46	46
Water flow rate HP	(1)	m³/h	18,2	19,8	21,1	23,3	26,7	32,6	38,4
Pressure drop HP	(1)	kPa	44	48	49	47	47	43	43
Noise levels									
Sound power level cooling	(4)	dB(A)	89	89	89	89	89	92	92
Sound pressure level cooling	(5)	dB(A)	57	57	57	57	57	60	60
Sound power level of vers. LN cooling	(4)	dB(A)	86	86	86	86	86	87	88
Sound pressure level of vers. LN cooling	(5)	dB(A)	54	54	54	54	54	55	56
Dimensions and weights**									
Length		mm	1148	1148	1148	1148	1148	2297	2297
Depth		mm	2260	2260	2260	2260	2260	2260	2260
Height		mm	2440	2440	2440	2440	2440	2440	2440
Operating weight		kg	880	900	920	950	970	1430	1480

CH: chiller unit; HP: heat pump unit; MCHX: unit with microchannel coils; CuAl: unit with copper/aluminium tube/fin coils

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

(2) Outside air temperature 7°C and input/output water temperature into/from user-side heat exchanger 40/45°C Values compliant with standard EN 14511

(3) Theoretical values referred to the basic unit. The amount of gas actually charged in the unit may differ.

(4) Unit operating at rated capacity, with no accessories of any kind - external air temperature 35°C and water input/output temperature from/to heat exchanger and user equal to 12/7°C. Values taken by measurements made in accordance with standard ISO 3744 and the Eurovent certification programme, where applicable. Binding values See NOISE LEVELS section.

(5) Values obtained from the sound power level (conditions: note 4), related to a distance of 10 m from the unit in free field with directivity factor Q=2. Non-binding values See NOISE LEVELS section.

(6) 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 unit without included accessories

TETRIS 2

			27.4	29.4	32.4	33.4	37.4	41.4	43.6
TETRIS 2									
Cooling									
Refrigeration capacity	(1)	kW	262	281	306	334	369	407	427
Total absorbed power	(1)	kW	98	112	121	135	135	148	163
EER	(1)		2,69	2,51	2,53	2,48	2,74	2,76	2,62
TETRIS 2 /HP									
Cooling									
Refrigeration capacity	(1)	kW	254	273	297	325	358	395	414
Total absorbed power	(1)	kW	97	112	121	135	134	148	163
EER	(1)		2,62	2,43	2,46	2,41	2,67	2,68	2,54
Heating									
Heating capacity	(2)	kW	256	282	307	340	355	400	422
Total absorbed power	(2)	kW	93	99	107	119	127	137	150
COP	(2)		2,75	2,83	2,87	2,86	2,79	2,91	2,82
Compressors									
Compressors/Circuits		n°/n°	4/2	4/2	4/2	4/2	4/2	4/2	6/2
Minimum capacity reduction step	(6)	%	25%	23%	25%	23%	25%	25%	15%
Refrigerant charge CH (MCHX)	(3)	kg	26	27	28	34	37	37	40
Refrigerant charge CH (Cu/Al)	(3)	kg	28	29,5	30,5	37	40	40	42,5
Refrigerant charge HP	(3)	kg	47,25	48	49,5	57	61,5	63	64,5
Fans									
Quantity		n°	4	4	4	5	6	6	6
Total air flow rate CH (MCHX)		m³/h	84000	84000	84000	105000	126000	126000	126000
Total air flow rate HP		m³/h	80000	80000	80000	100000	120000	120000	120000
User-side heat exchanger									
Quantity		n°	1	1	1	1	1	1	1
Water flow rate CH	(1)	m³/h	45,1	48,4	52,6	57,6	63,6	70,2	73,5
Pressure drop CH	(1)	kPa	42	36	41	35	38	38	42
Water flow rate HP	(1)	m³/h	43,8	47	51,1	56	61,7	68,1	71,4
Pressure drop HP	(1)	kPa	39	34	39	33	36	36	40
Noise levels									
Sound power level cooling	(4)	dB(A)	95	95	96	97	97	97	97
Sound pressure level cooling	(5)	dB(A)	63	63	64	65	65	65	65
Sound power level of vers. LN cooling	(4)	dB(A)	89	90	91	92	93	93	93
Sound pressure level of vers. LN cooling	(5)	dB(A)	57	58	59	60	61	61	61
Dimensions and weights**									
Length		mm	2297	2297	2297	3834	3834	3834	3834
Depth		mm	2260	2260	2260	2260	2260	2260	2260
Height		mm	2440	2440	2440	2440	2440	2440	2440
Operating weight		kg	1790	1840	1870	2240	2300	2370	2770

CH: chiller unit; HP: heat pump unit; MCHX: unit with microchannel coils; CuAl: unit with copper/aluminium tube/fin coils

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

(2) Outside air temperature 7°C and input/output water temperature into/from user-side heat exchanger 40/45°C Values compliant with standard EN 14511

(3) Theoretical values referred to the basic unit. The amount of gas actually charged in the unit may differ.

(4) Unit operating at rated capacity, with no accessories of any kind - external air temperature 35°C and water input/output temperature from/to heat exchanger and user equal to 12/7°C. Values taken by measurements made in accordance with standard ISO 3744 and the Eurovent certification programme, where applicable. Binding values See NOISE LEVELS section.

(5) Values obtained from the sound power level (conditions: note 4), related to a distance of 10 m from the unit in free field with directivity factor Q=2. Non-binding values See NOISE LEVELS section.

(6) 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 unit without included accessories

TETRIS 2

			47.6	50.7	53.8	58.8	62.8	67.9
TETRIS 2								
Cooling								
Refrigeration capacity	(1)	kW	457	492	524	568	611	653
Total absorbed power	(1)	kW	180	182	194	218	242	255
EER	(1)		2,55	2,7	2,7	2,61	2,53	2,56
TETRIS 2 /HP								
Cooling								
Refrigeration capacity	(1)	kW	444	478	509	551	594	634
Total absorbed power	(1)	kW	180	182	195	218	242	255
EER	(1)		2,47	2,63	2,62	2,53	2,46	2,49
Heating								
Heating capacity	(2)	kW	460	486	512	563	613	652
Total absorbed power	(2)	kW	161	179	186	200	214	231
COP	(2)		2,86	2,72	2,75	2,81	2,87	2,82
Compressors								
Compressors/Circuits		n°/n°	6/2	7/3	8/4	8/4	8/4	9/3
Minimum capacity reduction step	(6)	%	17%	13%	13%	11%	13%	10%
Refrigerant charge CH (MCHX)	(3)	kg	40	45	52	54	56	59
Refrigerant charge CH (Cu/Al)	(3)	kg	42,5	47,5	56	58,5	61	62
Refrigerant charge HP	(3)	kg	64,5	79,5	94,5	96,75	99	96
Fans								
Quantity		n°	6	7	8	8	8	9
Total air flow rate CH (MCHX)		m³/h	126000	147000	168000	168000	168000	189000
Total air flow rate HP		m³/h	120000	140000	160000	160000	160000	180000
User-side heat exchanger								
Quantity		n°	1	2	2	2	2	2
Water flow rate CH	(1)	m³/h	78,8	84,7	90,3	97,8	105,3	112,3
Pressure drop CH	(1)	kPa	47	46	42	42	40,7	45,9
Water flow rate HP	(1)	m³/h	76,5	82,2	87,7	94,9	102,2	109,1
Pressure drop HP	(1)	kPa	44	43	39	39	38	43
Noise levels								
Sound power level cooling	(4)	dB(A)	97	98	100	100	100	100
Sound pressure level cooling	(5)	dB(A)	65	66	68	68	68	67
Sound power level of vers. LN cooling	(4)	dB(A)	93	94	95	95	95	96
Sound pressure level of vers. LN cooling	(5)	dB(A)	61	62	63	63	63	63
Dimensions and weights**								
Length		mm	3834	5019	5019	5019	5019	6168
Depth		mm	2260	2260	2260	2260	2260	2260
Height		mm	2440	2440	2440	2440	2440	2440
Operating weight		kg	2830	3340	3570	3650	3730	4170

CH: chiller unit; HP: heat pump unit; MCHX: unit with microchannel coils; CuAl: unit with copper/aluminium tube/fin coils

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

(2) Outside air temperature 7°C and input/output water temperature into/from user-side heat exchanger 40/45°C Values compliant with standard EN 14511

(3) Theoretical values referred to the basic unit. The amount of gas actually charged in the unit may differ.

(4) Unit operating at rated capacity, with no accessories of any kind - external air temperature 35°C and water input/output temperature from/to heat exchanger and user equal to 12/7°C. Values taken by measurements made in accordance with standard ISO 3744 and the Eurovent certification programme, where applicable. Binding values See NOISE LEVELS section.

(5) Values obtained from the sound power level (conditions: note 4), related to a distance of 10 m from the unit in free field with directivity factor Q=2. Non-binding values See NOISE LEVELS section.

(6) 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 unit without included accessories

TETRIS 2

			70.9	74.10	78.10	80.12	87.12	93.12
TETRIS 2								
Cooling								
Refrigeration capacity	(1)	kW	687	720	763	795	855	915
Total absorbed power	(1)	kW	264	277	301	302	331	359
EER	(1)		2,6	2,6	2,54	2,63	2,59	2,55
TETRIS 2 /HP								
Cooling								
Refrigeration capacity	(1)	kW	667	699	741	772	830	888
Total absorbed power	(1)	kW	264	277	301	302	330	359
EER	(1)		2,53	2,52	2,47	2,56	2,51	2,47
Heating								
Heating capacity	(2)	kW	690	716	767	768	844	920
Total absorbed power	(2)	kW	246	254	268	278	300	321
COP	(2)		2,8	2,82	2,87	2,76	2,82	2,86
Compressors								
Compressors/Circuits		n°/n°	9/3	10/4	10/4	12/4	12/4	12/4
Minimum capacity reduction step	(6)	%	11%	9%	10%	8%	8%	8%
Refrigerant charge CH (MCHX)	(3)	kg	59	66	68	78	78	80
Refrigerant charge CH (Cu/Al)	(3)	kg	62	70,5	73	85	85	85
Refrigerant charge HP	(3)	kg	96,75	111,75	114	126	126	129
Fans								
Quantity		n°	9	10	10	12	12	12
Total air flow rate CH (MCHX)		m³/h	189000	210000	210000	252000	252000	252000
Total air flow rate HP		m³/h	180000	200000	200000	240000	240000	240000
User-side heat exchanger								
Quantity		n°	2	2	2	2	2	2
Water flow rate CH	(1)	m³/h	118,3	123,9	131,4	136,8	147,2	157,5
Pressure drop CH	(1)	kPa	45,5	47,1	47,1	43,9	43,9	47,1
Water flow rate HP	(1)	m³/h	114,9	120,3	127,5	132,8	142,9	152,9
Pressure drop HP	(1)	kPa	43	44	44	41	41	44
Noise levels								
Sound power level cooling	(4)	dB(A)	100	101	101	102	102	102
Sound pressure level cooling	(5)	dB(A)	67	68	68	69	69	69
Sound power level of vers. LN cooling	(4)	dB(A)	96	97	98	99	99	99
Sound pressure level of vers. LN cooling	(5)	dB(A)	63	64	65	66	66	66
Dimensions and weights**								
Length		mm	6168	6168	6168	7316	7316	7316
Depth		mm	2260	2260	2260	2260	2260	2260
Height		mm	2440	2440	2440	2440	2440	2440
Operating weight		kg	4230	4480	4550	5060	5200	5350

CH: chiller unit; HP: heat pump unit; MCHX: unit with microchannel coils; CuAl: unit with copper/aluminium tube/fin coils

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

(2) Outside air temperature 7°C and input/output water temperature into/from user-side heat exchanger 40/45°C Values compliant with standard EN 14511

(3) Theoretical values referred to the basic unit. The amount of gas actually charged in the unit may differ.

(4) Unit operating at rated capacity, with no accessories of any kind - external air temperature 35°C and water input/output temperature from/to heat exchanger and user equal to 12/7°C. Values taken by measurements made in accordance with standard ISO 3744 and the Eurovent certification programme, where applicable. Binding values See NOISE LEVELS section.

(5) Values obtained from the sound power level (conditions: note 4), related to a distance of 10 m from the unit in free field with directivity factor Q=2. Non-binding values See NOISE LEVELS section.

(6) 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 unit without included accessories

TETRIS 2 A

			11.2	17.2	23.2	28.4	34.4	38.4
TETRIS 2 A								
Cooling								
Refrigeration capacity	(1)	kW	112	161	229	274	323	362
Total absorbed power	(1)	kW	36	51	73	86	102	116
EER	(1)		3,13	3,17	3,13	3,17	3,18	3,12
TETRIS 2 A /HP								
Cooling								
Refrigeration capacity	(1)	kW	111	160	228	269	320	360
Total absorbed power	(1)	kW	36	51	73	86	101	116
EER	(1)		3,11	3,15	3,11	3,13	3,16	3,11
Heating								
Heating capacity	(2)	kW	134	179	247	301	355	382
Total absorbed power	(2)	kW	40	56	77	92	110	119
COP	(2)		3,34	3,2	3,21	3,27	3,24	3,22
Compressors								
Compressors/Circuits		n°/n°	2/1	2/1	2/1	4/2	4/2	4/2
Minimum capacity reduction step	(6)	%	50%	45%	50%	21%	23%	25%
Refrigerant charge CH (MCHX)	(3)	kg	12	17,5	23	29,5	34	34
Refrigerant charge CH (Cu/Al)	(3)	kg	13	19	24	30,5	37	37
Refrigerant charge HP	(3)	kg	21	32	43	53	64	64
Fans								
Quantity		n°	2	3	4	5	6	6
Total air flow rate CH (MCHX)		m³/h	42000	63000	84000	105000	126000	126000
Total air flow rate HP		m³/h	40000	60000	80000	100000	120000	120000
User-side heat exchanger								
Quantity		n°	1	1	1	1	1	1
Water flow rate CH	(1)	m³/h	19,3	27,8	39,5	47,1	55,6	62,4
Pressure drop CH	(1)	kPa	47	42	29	32	37	43
Water flow rate HP	(1)	m³/h	19,2	27,5	39,2	46,4	55	62
Pressure drop HP	(1)	kPa	46	41	28	30	35	40
Noise levels								
Sound power level cooling	(4)	dB(A)	86	88	89	90	91	91
Sound pressure level cooling	(5)	dB(A)	54	56	57	58	59	59
Sound power level of vers. LN cooling	(4)	dB(A)	82	84	85	86	87	87
Sound pressure level of vers. LN cooling	(5)	dB(A)	50	52	53	54	55	55
Dimensions and weights**								
Length		mm	1148	2297	2297	3834	3834	3834
Depth		mm	2260	2260	2260	2260	2260	2260
Height		mm	2440	2440	2440	2440	2440	2440
Operating weight		kg	890	1290	1360	2160	2290	2320

CH: chiller unit; HP: heat pump unit; MCHX: unit with microchannel coils; CuAl: unit with copper/aluminium tube/fin coils

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

(2) Outside air temperature 7°C and input/output water temperature into/from user-side heat exchanger 40/45°C Values compliant with standard EN 14511

(3) Theoretical values referred to the basic unit. The amount of gas actually charged in the unit may differ.

(4) Unit operating at rated capacity, with no accessories of any kind - external air temperature 35°C and water input/output temperature from/to heat exchanger and user equal to 12/7°C. Values taken by measurements made in accordance with standard ISO 3744 and the Eurovent certification programme, where applicable. Binding values See NOISE LEVELS section.

(5) Values obtained from the sound power level (conditions: note 4), related to a distance of 10 m from the unit in free field with directivity factor Q=2. Non-binding values See NOISE LEVELS section.

(6) 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 unit without included accessories

TETRIS 2 A

			43.4	47.4	50.6	57.6	64.6	70.6
TETRIS 2 A								
Cooling								
Refrigeration capacity	(1)	kW	419	456	485	542	621	685
Total absorbed power	(1)	kW	134	146	152	171	198	219
EER	(1)		3,12	3,11	3,18	3,18	3,13	3,13
TETRIS 2 A /HP								
Cooling								
Refrigeration capacity	(1)	kW	417	454	480	538	617	680
Total absorbed power	(1)	kW	134	146	152	170	198	219
EER	(1)		3,11	3,1	3,16	3,16	3,11	3,11
Heating								
Heating capacity	(2)	kW	456	486	536	602	686	755
Total absorbed power	(2)	kW	141	150	164	185	212	232
COP	(2)		3,24	3,23	3,26	3,25	3,24	3,25
Compressors								
Compressors/Circuits		n°/n°	4/2	4/2	6/2	6/2	6/2	6/2
Minimum capacity reduction step	(6)	%	21%	25%	15%	17%	14%	17%
Refrigerant charge CH (MCHX)	(3)	kg	44	48	59	59	71	75
Refrigerant charge CH (Cu/Al)	(3)	kg	47,5	51,5	63,5	63,5	73,5	81
Refrigerant charge HP	(3)	kg	77	86	95	106	116	120
Fans								
Quantity		n°	7	8	9	10	11	12
Total air flow rate CH (MCHX)		m³/h	147000	168000	189000	210000	231000	252000
Total air flow rate HP		m³/h	140000	160000	180000	200000	220000	240000
User-side heat exchanger								
Quantity		n°	1	1	1	1	1	1
Water flow rate CH	(1)	m³/h	72,2	78,4	83,4	93,4	106,8	117,9
Pressure drop CH	(1)	kPa	42	25	24	30	31	36
Water flow rate HP	(1)	m³/h	71,8	78,1	82,6	92,5	106,1	117,1
Pressure drop HP	(1)	kPa	39	24	23	28	29	35
Noise levels								
Sound power level cooling	(4)	dB(A)	91	92	93	93	93	93
Sound pressure level cooling	(5)	dB(A)	58	59	61	60	61	61
Sound power level of vers. LN cooling	(4)	dB(A)	87	88	89	89	89	89
Sound pressure level of vers. LN cooling	(5)	dB(A)	54	55	57	57	57	57
Dimensions and weights**								
Length		mm	5019	5019	6168	6168	7316	7316
Depth		mm	2260	2260	2260	2260	2260	2260
Height		mm	2440	2440	2440	2440	2440	2440
Operating weight		kg	2650	2770	3500	3580	3850	3940

CH: chiller unit; HP: heat pump unit; MCHX: unit with microchannel coils; CuAl: unit with copper/aluminium tube/fin coils

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

(2) Outside air temperature 7°C and input/output water temperature into/from user-side heat exchanger 40/45°C Values compliant with standard EN 14511

(3) Theoretical values referred to the basic unit. The amount of gas actually charged in the unit may differ.

(4) Unit operating at rated capacity, with no accessories of any kind - external air temperature 35°C and water input/output temperature from/to heat exchanger and user equal to 12/7°C. Values taken by measurements made in accordance with standard ISO 3744 and the Eurovent certification programme, where applicable. Binding values See NOISE LEVELS section.

(5) Values obtained from the sound power level (conditions: note 4), related to a distance of 10 m from the unit in free field with directivity factor Q=2. Non-binding values See NOISE LEVELS section.

(6) 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 unit without included accessories

Tetris 2 SLN

			11.2	17.2	23.2	28.4	34.4	38.4
TETRIS 2 SLN								
Cooling								
Refrigeration capacity	(1)	kW	105	152	215	257	305	340
Total absorbed power	(1)	kW	37	53	77	90	106	121
EER	(1)		2,83	2,87	2,8	2,86	2,89	2,81
TETRIS 2 SLN /HP								
Cooling								
Refrigeration capacity	(1)	kW	105	151	213	253	301	338
Total absorbed power	(1)	kW	38	53	78	91	107	123
EER	(1)		2,78	2,82	2,75	2,78	2,83	2,76
Heating								
Heating capacity	(2)	kW	134	179	247	301	355	382
Total absorbed power	(2)	kW	40	56	77	92	110	119
COP	(2)		3,34	3,2	3,21	3,27	3,24	3,22
Compressors								
Compressors/Circuits		n°/n°	2/1	2/1	2/1	4/2	4/2	4/2
Minimum capacity reduction step	(6)	%	50%	45%	50%	21%	23%	25%
Refrigerant charge CH (MCHX)	(3)	kg	12	17,5	23	29,5	34	34
Refrigerant charge CH (Cu/Al)	(3)	kg	13	19	24	30,5	37	37
Refrigerant charge HP	(3)	kg	21	32	43	53	64	64
Fans								
Quantity		n°	2	3	4	5	6	6
Total air flow rate CH (MCHX)		m³/h	32000	48000	64000	80000	96000	96000
Total air flow rate HP		m³/h	40000	60000	80000	100000	120000	120000
User-side heat exchanger								
Quantity		n°	1	1	1	1	1	1
Water flow rate CH	(1)	m³/h	18,2	26,2	37	44,2	52,5	58,6
Pressure drop CH	(1)	kPa	45	40	28	30	35	41
Water flow rate HP	(1)	m³/h	18	26	36,8	43,5	51,9	58,2
Pressure drop HP	(1)	kPa	44	39	26	28	33	38
Noise levels								
Sound power level cooling	(4)	dB(A)	79	82	82	84	85	85
Sound pressure level cooling	(5)	dB(A)	47	50	50	52	53	53
Dimensions and weights**								
Length		mm	1148	2297	2297	3834	3834	3834
Depth		mm	2260	2260	2260	2260	2260	2260
Height		mm	2440	2440	2440	2440	2440	2440
Operating weight		kg	890	1290	1360	2160	2290	2320

CH: chiller unit; HP: heat pump unit; MCHX: unit with microchannel coils; CuAl: unit with copper/aluminium tube/fin coils

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

(2) Outside air temperature 7°C and input/output water temperature into/from user-side heat exchanger 40/45°C Values compliant with standard EN 14511

(3) Theoretical values referred to the basic unit. The amount of gas actually charged in the unit may differ.

(4) Unit operating at rated capacity, with no accessories of any kind - external air temperature 35°C and water input/output temperature from/to heat exchanger and user equal to 12/7°C. Values taken by measurements made in accordance with standard ISO 3744 and the Eurovent certification programme, where applicable. Binding values See NOISE LEVELS section.

(5) Values obtained from the sound power level (conditions: note 4), related to a distance of 10 m from the unit in free field with directivity factor Q=2. Non-binding values See NOISE LEVELS section.

(6) 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 unit without included accessories

Tetris 2 SLN

			43.4	47.4	50.6	57.6	64.6	70.6
TETRIS 2 SLN								
Cooling								
Refrigeration capacity	(1)	kW	393	427	456	511	583	643
Total absorbed power	(1)	kW	141	153	158	178	208	229
EER	(1)		2,79	2,79	2,88	2,87	2,8	2,81
TETRIS 2 SLN /HP								
Cooling								
Refrigeration capacity	(1)	kW	391	425	452	506	579	639
Total absorbed power	(1)	kW	143	155	160	180	210	232
EER	(1)		2,74	2,74	2,82	2,81	2,75	2,76
Heating								
Heating capacity	(2)	kW	456	486	536	602	686	755
Total absorbed power	(2)	kW	141	150	164	185	212	232
COP	(2)		3,24	3,23	3,26	3,25	3,24	3,25
Compressors								
Compressors/Circuits		n°/n°	4/2	4/2	6/2	6/2	6/2	6/2
Minimum capacity reduction step	(6)	%	21%	25%	15%	17%	14%	17%
Refrigerant charge CH (MCHX)	(3)	kg	44	48	59	59	71	75
Refrigerant charge CH (Cu/Al)	(3)	kg	47,5	51,5	63,5	63,5	73,5	81
Refrigerant charge HP	(3)	kg	77	86	95	106	116	120
Fans								
Quantity		n°	7	8	9	10	11	12
Total air flow rate CH (MCHX)		m³/h	112000	128000	144000	160000	176000	192000
Total air flow rate HP		m³/h	140000	160000	180000	200000	220000	240000
User-side heat exchanger								
Quantity		n°	1	1	1	1	1	1
Water flow rate CH	(1)	m³/h	67,6	73,5	78,6	87,9	100,3	110,7
Pressure drop CH	(1)	kPa	39	23	23	28	29	34
Water flow rate HP	(1)	m³/h	67,3	73,2	77,8	87,1	99,7	110
Pressure drop HP	(1)	kPa	37	22	22	26	28	33
Noise levels								
Sound power level cooling	(4)	dB(A)	85	85	87	87	87	87
Sound pressure level cooling	(5)	dB(A)	52	53	55	55	54	55
Dimensions and weights**								
Length		mm	5019	5019	6168	6168	7316	7316
Depth		mm	2260	2260	2260	2260	2260	2260
Height		mm	2440	2440	2440	2440	2440	2440
Operating weight		kg	2650	2770	3500	3580	3850	3940

CH: chiller unit; HP: heat pump unit; MCHX: unit with microchannel coils; CuAl: unit with copper/aluminium tube/fin coils

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

(2) Outside air temperature 7°C and input/output water temperature into/from user-side heat exchanger 40/45°C Values compliant with standard EN 14511

(3) Theoretical values referred to the basic unit. The amount of gas actually charged in the unit may differ.

(4) Unit operating at rated capacity, with no accessories of any kind - external air temperature 35°C and water input/output temperature from/to heat exchanger and user equal to 12/7°C. Values taken by measurements made in accordance with standard ISO 3744 and the Eurovent certification programme, where applicable. Binding values See NOISE LEVELS section.

(5) Values obtained from the sound power level (conditions: note 4), related to a distance of 10 m from the unit in free field with directivity factor Q=2. Non-binding values See NOISE LEVELS section.

(6) 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 unit without included accessories

Tetris 2 A+

			8.2	13.3	18.4	23.5	27.6	31.4
TETRIS 2 A+								
Cooling								
Refrigeration capacity	(1)	kW	89	133	181	226	271	311
Total absorbed power	(1)	kW	27	40	54	67	81	93
EER	(1)		3,31	3,3	3,37	3,36	3,36	3,34
TETRIS 2 A+ /HP								
Cooling								
Refrigeration capacity	(1)	kW	86	129	175	219	263	307
Total absorbed power	(1)	kW	27	40	53	67	80	96
EER	(1)		3,23	3,23	3,3	3,29	3,28	3,19
Heating								
Heating capacity	(2)	kW	90	135	180	225	270	322
Total absorbed power	(2)	kW	27	40	54	67	81	100
COP	(2)		3,33	3,34	3,35	3,33	3,33	3,23
Compressors								
Compressors/Circuits		n°/n°	2/1	3/1	4/2	5/2	6/2	4/2
Minimum capacity reduction step	(6)	%	50%	33%	25%	20%	17%	24%
Refrigerant charge CH (MCHX)	(3)	kg	11	16	23	28,5	33	38,5
Refrigerant charge CH (Cu/Al)	(3)	kg	11,5	16,5	25	31	35,5	41,5
Refrigerant charge HP	(3)	kg	21	32	44	53	65	75
Fans								
Quantity		n°	2	3	4	5	6	7
Total air flow rate CH (MCHX)		m³/h	42.000	63000	84000	105000	126000	147000
Total air flow rate HP		m³/h	40.000	60000	80000	100000	120000	140000
User-side heat exchanger								
Quantity		n°	1	1	1	1	1	1
Water flow rate CH	(1)	m³/h	15,3	23	31,1	38,9	46,7	53,6
Pressure drop CH	(1)	kPa	35	36	23	35	35	34
Water flow rate HP	(1)	m³/h	14,8	22,2	30,2	37,7	45,2	52,9
Pressure drop HP	(1)	kPa	33	34	22	33	33	33
Noise levels								
Sound power level cooling	(4)	dB(A)	83	85	86	87	88	93
Sound pressure level cooling	(5)	dB(A)	51	53	54	55	56	61
Sound power level of vers. LN cooling	(4)	dB(A)	79	81	82	83	84	89
Sound pressure level of vers. LN cooling	(5)	dB(A)	47	49	50	51	52	57
Dimensions and weights**								
Length		mm	1.148	2297	2297	3834	3834	5019
Depth		mm	2.260	2260	2260	2260	2260	2260
Height		mm	2.440	2440	2440	2440	2440	2440
Operating weight		kg	720	1100	1380	1830	1970	2560

CH: chiller unit; HP: heat pump unit; MCHX: unit with microchannel coils; CuAl: unit with copper/aluminium tube/fin coils

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

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

(3) Theoretical values referred to the basic unit. The amount of gas actually charged in the unit may differ.

(4) Unit operating at rated capacity, with no accessories of any kind - external air temperature 35°C and water input/output temperature from/to heat exchanger and user equal to 12/7°C. Values taken by measurements made in accordance with standard ISO 3744 and the Eurovent certification programme, where applicable. Binding values See NOISE LEVELS section.

(5) Values obtained from the sound power level (conditions: note 4), related to a distance of 10 m from the unit in free field with directivity factor Q=2. Non-binding values See NOISE LEVELS section.

(6) 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.

(8) Former Eurovent's seasonal efficiency index. Value not certified by Eurovent from 2019. Reference: base unit, without any accessories

** Basic unit without included accessories

Tetris 2 A+

			36.4	41.5	44.6	49.6	54.6
TETRIS 2 A+							
Cooling							
Refrigeration capacity	(1)	kW	373	405	436	498	560
Total absorbed power	(1)	kW	112	121	130	149	167
EER	(1)		3,34	3,36	3,36	3,35	3,35
TETRIS 2 A+ /HP							
Cooling							
Refrigeration capacity	(1)	kW	361	399	433	490	542
Total absorbed power	(1)	kW	111	125	135	153	166
EER	(1)		3,27	3,2	3,21	3,2	3,27
Heating							
Heating capacity	(2)	kW	373	418	453	513	559
Total absorbed power	(2)	kW	112	129	140	158	168
COP	(2)		3,32	3,24	3,22	3,25	3,32
Compressors							
Compressors/Circuits		n°/n°	4/2	5/2	6/2	6/2	6/2
Minimum capacity reduction step	(6)	%	25%	19%	17%	15%	17%
Refrigerant charge CH (MCHX)	(3)	kg	42	46	53	62	67
Refrigerant charge CH (Cu/Al)	(3)	kg	45,5	49,5	57,5	67	72,5
Refrigerant charge HP	(3)	kg	86	98	108	119	131
Fans							
Quantity		n°	8	9	10	11	12
Total air flow rate CH (MCHX)		m³/h	168000	189000	210000	231000	252000
Total air flow rate HP		m³/h	160000	180000	200000	220000	240000
User-side heat exchanger							
Quantity		n°	1	1	1	1	1
Water flow rate CH	(1)	m³/h	64,2	69,7	75,1	85,8	96,4
Pressure drop CH	(1)	kPa	32	33	34	35	34
Water flow rate HP	(1)	m³/h	62,2	68,7	74,5	84,4	93,3
Pressure drop HP	(1)	kPa	30	32	34	34	32
Noise levels							
Sound power level cooling	(4)	dB(A)	93	94	95	95	95
Sound pressure level cooling	(5)	dB(A)	61	62	63	63	63
Sound power level of vers. LN cooling	(4)	dB(A)	89	90	91	91	91
Sound pressure level of vers. LN cooling	(5)	dB(A)	57	58	59	59	59
Dimensions and weights**							
Length		mm	5019	6168	6168	7316	7316
Depth		mm	2260	2260	2260	2260	2260
Height		mm	2440	2440	2440	2440	2440
Operating weight		kg	2680	3140	3330	3710	3820

CH: chiller unit; HP: heat pump unit; MCHX: unit with microchannel coils; CuAl: unit with copper/aluminium tube/fin coils

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

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

(3) Theoretical values referred to the basic unit. The amount of gas actually charged in the unit may differ.

(4) Unit operating at rated capacity, with no accessories of any kind - external air temperature 35°C and water input/output temperature from/to heat exchanger and user equal to 12/7°C. Values taken by measurements made in accordance with standard ISO 3744 and the Eurovent certification programme, where applicable. Binding values See NOISE LEVELS section.

(5) Values obtained from the sound power level (conditions: note 4), related to a distance of 10 m from the unit in free field with directivity factor Q=2. Non-binding values See NOISE LEVELS section.

(6) 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.

(8) Former Eurovent's seasonal efficiency index. Value not certified by Eurovent from 2019. Reference: base unit, without any accessories

** Basic unit without included accessories

Tetris 2 A SLN

			8.2	13.3	18.4	23.5	27.6	31.4
TETRIS 2 A SLN								
Cooling								
Refrigeration capacity	(1)	kW	87	130	176	220	264	304
Total absorbed power	(1)	kW	27	40	54	67	81	93
EER	(1)		3,23	3,23	3,29	3,28	3,28	3,27
TETRIS 2 A SLN /HP								
Cooling								
Refrigeration capacity	(1)	kW	84	126	171	213	256	299
Total absorbed power	(1)	kW	27	41	55	69	83	100
EER	(1)		3,06	3,06	3,11	3,1	3,1	2,99
Heating								
Heating capacity	(2)	kW	90	135	180	225	270	322
Total absorbed power	(2)	kW	27	40	54	67	81	100
COP	(2)		3,33	3,34	3,35	3,33	3,33	3,23
Compressors								
Compressors/Circuits		n°/n°	2/1	3/1	4/2	5/2	6/2	4/2
Minimum capacity reduction step	(6)	%	50%	33%	25%	20%	17%	24%
Refrigerant charge CH (MCHX)	(3)	kg	11	16	23	28,5	33	38,5
Refrigerant charge CH (Cu/Al)	(3)	kg	11,5	16,5	25	31	35,5	41,5
Refrigerant charge HP	(3)	kg	21	32	44	53	65	75
Fans								
Quantity		n°	2	3	4	5	6	7
Total air flow rate CH (MCHX)		m³/h	32000	48000	64000	80000	96000	112000
Total air flow rate HP		m³/h	40000	60000	80000	100000	120000	140000
User-side heat exchanger								
Quantity		n°	1	1	1	1	1	1
Water flow rate CH	(1)	m³/h	14,9	22,4	30,3	37,9	45,5	52,3
Pressure drop CH	(1)	kPa	33	34	22	33	33	32
Water flow rate HP	(1)	m³/h	14,5	21,7	29,4	36,7	44,1	51,6
Pressure drop HP	(1)	kPa	31	32	21	31	31	31
Noise levels								
Sound power level cooling	(4)	dB(A)	76	78	79	80	81	86
Sound pressure level cooling	(5)	dB(A)	44	46	47	48	49	54
Dimensions and weights**								
Length		mm	1148	2297	2297	3834	3834	5019
Depth		mm	2260	2260	2260	2260	2260	2260
Height		mm	2440	2440	2440	2440	2440	2440
Operating weight		kg	720	1100	1380	1830	1970	2560

CH: chiller unit; HP: heat pump unit; MCHX: unit with microchannel coils; CuAl: unit with copper/aluminium tube/fin coils

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

(2) Outside air temperature 7°C and input/output water temperature into/from user-side heat exchanger 40/45°C Values compliant with standard EN 14511

(3) Theoretical values referred to the basic unit. The amount of gas actually charged in the unit may differ.

(4) Unit operating at rated capacity, with no accessories of any kind - external air temperature 35°C and water input/output temperature from/to heat exchanger and user equal to 12/7°C. Values taken by measurements made in accordance with standard ISO 3744 and the Eurovent certification programme, where applicable. Binding values See NOISE LEVELS section.

(5) Values obtained from the sound power level (conditions: note 4), related to a distance of 10 m from the unit in free field with directivity factor Q=2. Non-binding values See NOISE LEVELS section.

(6) 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 unit without included accessories

Tetris 2 A SLN

			36.4	41.5	44.6	49.6	54.6
TETRIS 2 A SLN							
Cooling							
Refrigeration capacity	(1)	kW	363	394	426	485	545
Total absorbed power	(1)	kW	112	121	130	149	168
EER	(1)		3,25	3,27	3,28	3,26	3,25
TETRIS 2 A SLN /HP							
Cooling							
Refrigeration capacity	(1)	kW	352	389	422	478	528
Total absorbed power	(1)	kW	114	130	140	160	172
EER	(1)		3,08	3	3,01	2,99	3,08
Heating							
Heating capacity	(2)	kW	373	418	453	513	559
Total absorbed power	(2)	kW	112	129	140	158	168
COP	(2)		3,32	3,24	3,22	3,25	3,32
Compressors							
Compressors/Circuits		n°/n°	4/2	5/2	6/2	6/2	6/2
Minimum capacity reduction step	(6)	%	25%	19%	17%	15%	17%
Refrigerant charge CH (MCHX)	(3)	kg	42	46	53	62	67
Refrigerant charge CH (Cu/Al)	(3)	kg	45,5	49,5	57,5	67	72,5
Refrigerant charge HP	(3)	kg	86	98	108	119	131
Fans							
Quantity		n°	8	9	10	11	12
Total air flow rate CH (MCHX)		m³/h	128000	144000	160000	176000	192000
Total air flow rate HP		m³/h	160000	180000	200000	220000	240000
User-side heat exchanger							
Quantity		n°	1	1	1	1	1
Water flow rate CH	(1)	m³/h	62,6	67,9	73,3	83,6	93,8
Pressure drop CH	(1)	kPa	31	31	32	33	32
Water flow rate HP	(1)	m³/h	60,6	66,9	72,6	82,2	90,9
Pressure drop HP	(1)	kPa	29	30	32	32	30
Noise levels							
Sound power level cooling	(4)	dB(A)	86	87	88	88	88
Sound pressure level cooling	(5)	dB(A)	54	55	56	56	56
Dimensions and weights**							
Length		mm	5019	6168	6168	7316	7316
Depth		mm	2260	2260	2260	2260	2260
Height		mm	2440	2440	2440	2440	2440
Operating weight		kg	2680	3140	3330	3710	3820

CH: chiller unit; HP: heat pump unit; MCHX: unit with microchannel coils; CuAl: unit with copper/aluminium tube/fin coils

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

(2) Outside air temperature 7°C and input/output water temperature into/from user-side heat exchanger 40/45°C Values compliant with standard EN 14511

(3) Theoretical values referred to the basic unit. The amount of gas actually charged in the unit may differ.

(4) Unit operating at rated capacity, with no accessories of any kind - external air temperature 35°C and water input/output temperature from/to heat exchanger and user equal to 12/7°C. Values taken by measurements made in accordance with standard ISO 3744 and the Eurovent certification programme, where applicable. Binding values See NOISE LEVELS section.

(5) Values obtained from the sound power level (conditions: note 4), related to a distance of 10 m from the unit in free field with directivity factor Q=2. Non-binding values See NOISE LEVELS section.

(6) 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 unit without included accessories

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:

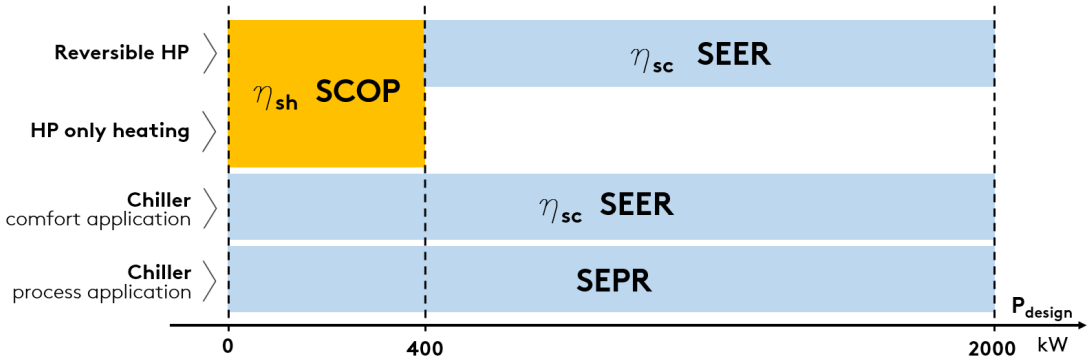
- Regulation 2013/813, for small heat pumps (Pdesign ≤ 400 kW)
- Regulation 2016/2281, for chillers and heat pumps with Pdesign > 400 kW
- Regulation 2013/811, for heat pumps with Pdesign ≤ 70 kW.

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:

- ηsh (SCOP), with reference to regulation 2013/813
- ηsc (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 ηsc (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**	**ηsc [%]**	**SEER**	**ηsc [%]**	**SEER**
air	< 400kW	149	3,8	161	4,1
air	≥ 400kW	161	4,1	179	4,55
water	< 400kW	196	5,1	200	5,2
water	≥ 400kW and < 1500kW	227	5,875	252	6,5
water	≥ 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	≥ 400kW	5	5,5
water	< 400kW	6,5	7
water	≥ 400kW and < 1500kW	7,5	8
water	≥ 1500kW	8	8,5

REGULATION 2013/813

SOURCE	APPLICATION	MINIMUM REQUIREMENT	
		ηsh [%]	**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/ηsc low temperature application	2016/2281
	≥ 18°C	SEER/ηsc medium temperature application	2016/2281
Heat pumps (reversible and only heating) Pdesign≤400kW		SCOP/ηsh	2013/813
Reversible heat pumps Pdesign>400kW	< 18°C	SEER/ηsc low temperature application	2016/2281
	≥ 18°C	SEER/ηsc medium temperature application	2016/2281
Heat pumps only heating Pdesign>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 (ηsc) than the configuration with standard fans.

TETRIS 2 RANGE

As specifically regards the Tetris 2 range, the regulations of interest for the various units in various configurations are indicated below.

Tetris 2:
- chiller version: regulation 2016/2281
- /HP version: up to size 37.4 regulation 2013/813, from size 41.4 regulation 2016/2281

Tetris 2 A and Tetris 2 SLN:
- chiller version: regulation 2016/2281
- /HP version: up to size 43.4 regulation 2013/813, from size 47.4 regulation 2016/2281

Tetris 2 A+ and Tetris 2 A SLN
- chiller version: regulation 2016/2281
- /HP version: up to size 41.5 regulation 2013/813, from size 44.6 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.

TETRIS 2

			10.2	12.2	13.2	15.2	16.2	20.3	24.3
REGULATION 2016/2281									
Pdesign	(1)	kW	108,56	117,98	125,99	139,42	159,67	194,92	229,52
COMFORT									
Standard units									
ηsc	(1)	%	154,4	154,8	153,6	154,4	146,3	160,2	156,9
SEER	(1)		3,93	3,94	3,91	3,93	3,73	4,08	4
Compliance Tier 1	(1)		Y	Y	Y	Y	N	Y	Y
Compliance Tier 2 (2021)	(1)		N	N	N	N	N	N	N
Units with EC fans (VEC)									
ηsc	(1)	%	157,1	160,6	153,7	158,8	153,7	165,6	161,9
SEER	(1)		4	4,09	3,92	4,05	3,92	4,21	4,12
Compliance Tier 1	(1)		Y	Y	Y	Y	Y	Y	Y
Compliance Tier 2 (2021)	(1)		N	N	N	N	N	Y	Y
PROCESS									
SEPR	(3)		(RFQ)	(RFQ)	(RFQ)	(RFQ)	(RFQ)	(RFQ)	(RFQ)
Compliance Tier 1	(3)		(RFQ)	(RFQ)	(RFQ)	(RFQ)	(RFQ)	(RFQ)	(RFQ)
Compliance Tier 2 (2021)	(3)		(RFQ)	(RFQ)	(RFQ)	(RFQ)	(RFQ)	(RFQ)	(RFQ)

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

N = unit not in compliance with Ecodesign at the given condition: it can be installed only in non-EU countries.

- = value not necessary: conformity is already provided at the most restrictive condition (1).

			27.4	29.4	32.4	33.4	37.4	41.4	43.6
REGULATION 2016/2281									
Pdesign	(1)	kW	262,14	281,09	305,62	334,48	369,21	407,49	426,83
COMFORT									
Standard units									
ηsc	(1)	%	158,5	154,8	154	158,9	161	165,9	165,9
SEER	(1)		4,04	3,94	3,92	4,05	4,1	4,22	4,22
Compliance Tier 1	(1)		Y	Y	Y	Y	Y	Y	Y
Compliance Tier 2 (2021)	(1)		N	N	N	N	N	N	N
Units with EC fans (VEC)									
ηsc	(1)	%	162,4	157	155,4	163	165,6	166	169,3
SEER	(1)		4,13	4	3,96	4,15	4,21	4,22	4,31
Compliance Tier 1	(1)		Y	Y	Y	Y	Y	Y	Y
Compliance Tier 2 (2021)	(1)		Y	N	N	Y	Y	N	N
PROCESS									
SEPR	(3)		(RFQ)	(RFQ)	(RFQ)	(RFQ)	(RFQ)	(RFQ)	(RFQ)
Compliance Tier 1	(3)		(RFQ)	(RFQ)	(RFQ)	(RFQ)	(RFQ)	(RFQ)	(RFQ)
Compliance Tier 2 (2021)	(3)		(RFQ)	(RFQ)	(RFQ)	(RFQ)	(RFQ)	(RFQ)	(RFQ)

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N = unit not in compliance with Ecodesign at the given condition: it can be installed only in non-EU countries.

- = value not necessary: conformity is already provided at the most restrictive condition (1).

(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.

TETRIS 2

			47.6	50.7	53.8	58.8	62.8	67.9	70.9
REGULATION 2016/2281									
Pdesign	(1)	kW	457,43	491,9	524,46	567,96	611,38	652,56	687,21
COMFORT									
Standard units									
ηsc	(1)	%	165,9	165,9	165,9	157,6	158,1	165,9	165,9
SEER	(1)		4,22	4,22	4,22	4,01	4,03	4,22	4,22
Compliance Tier 1	(1)		Y	Y	Y	N	N	Y	Y
Compliance Tier 2 (2021)	(1)		N	N	N	N	N	N	N
Units with EC fans (VEC)									
ηsc	(1)	%	167,2	167,1	167,2	166,1	166	168,8	168,7
SEER	(1)		4,25	4,25	4,26	4,23	4,22	4,3	4,29
Compliance Tier 1	(1)		Y	Y	Y	Y	Y	Y	Y
Compliance Tier 2 (2021)	(1)		N	N	N	N	N	N	N
PROCESS									
SEPR	(3)		(RFQ)	(RFQ)	(RFQ)	(RFQ)	(RFQ)	(RFQ)	(RFQ)
Compliance Tier 1	(3)		(RFQ)	(RFQ)	(RFQ)	(RFQ)	(RFQ)	(RFQ)	(RFQ)
Compliance Tier 2 (2021)	(3)		(RFQ)	(RFQ)	(RFQ)	(RFQ)	(RFQ)	(RFQ)	(RFQ)

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

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- = value not necessary: conformity is already provided at the most restrictive condition (1).

			70.9	74.10	78.10	80.12	87.12	93.12
REGULATION 2016/2281								
Pdesign	(1)	kW	687,21	719,76	763,19	794,9	854,98	915,04
COMFORT								
Standard units								
ηsc	(1)	%	165,9	165,9	165,9	165,9	165,9	165,9
SEER	(1)		4,22	4,22	4,22	4,22	4,22	4,22
Compliance Tier 1	(1)		Y	Y	Y	Y	Y	Y
Compliance Tier 2 (2021)	(1)		N	N	N	N	N	N
Units with EC fans (VEC)								
ηsc	(1)	%	168,7	168,8	167,1	173,1	171,2	169,4
SEER	(1)		4,29	4,29	4,25	4,4	4,36	4,31
Compliance Tier 1	(1)		Y	Y	Y	Y	Y	Y
Compliance Tier 2 (2021)	(1)		N	N	N	N	N	N
PROCESS								
SEPR	(3)		(RFQ)	(RFQ)	(RFQ)	(RFQ)	(RFQ)	(RFQ)
Compliance Tier 1	(3)		(RFQ)	(RFQ)	(RFQ)	(RFQ)	(RFQ)	(RFQ)
Compliance Tier 2 (2021)	(3)		(RFQ)	(RFQ)	(RFQ)	(RFQ)	(RFQ)	(RFQ)

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

N = unit not in compliance with Ecodesign at the given condition: it can be installed only in non-EU countries.

- = value not necessary: conformity is already provided at the most restrictive condition (1).

(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.

TETRIS 2 /HP

			10.2	12.2	13.2	15.2	16.2	20.3
REGULATION 2013/813								
Pdesign	(4)	kW	104,1	114,7	126,4	141,6	155,2	189,9
COMFORT								
Standard Unit								
ηsh	(4)	%	133,4	135,4	133	139,5	136,3	141,5
SCOP	(4)		3,41	3,46	3,4	3,56	3,48	3,61
Conformity with Tier 2	(4)		Y	Y	Y	Y	Y	Y
Units with EC fans (VEC)								
ηsh	(4)	%	135,5	137,5	135,1	141,6	138,3	143,7
SCOP	(4)		3,46	3,51	3,45	3,62	3,53	3,67
Conformity with Tier 2	(4)		Y	Y	Y	Y	Y	Y

			24.3	27.4	29.4	32.4	33.4	37.4	41.4
REGULATION 2013/813									
Pdesign	(4)	kW	228	232,7	256,6	282,7	318,9	388,5	356
COMFORT									
Standard Unit									
ηsh	(4)	%	139,9	141,9	141,5	140,7	144,8	143,2	133,8
SCOP	(4)		3,57	3,62	3,61	3,59	3,69	3,65	3,42
Conformity with Tier 2	(4)		Y	Y	Y	Y	Y	Y	Y
Units with EC fans (VEC)									
ηsh	(4)	%	142,1	144,1	143,7	142,9	147	145,4	135,9
SCOP	(4)		3,63	3,68	3,67	3,65	3,75	3,71	3,47
Conformity with Tier 2	(4)		Y	Y	Y	Y	Y	Y	Y

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

(4) User-side heat exchanger water inlet/outlet temperature 30/35, Average climate profile, with reference to regulation 2013/813 and norm EN 14825.

TETRIS 2 /HP

			43.6	47.6	50.7	53.8	58.8	62.8
REGULATION 2016/2281								
Pdesign	(1)	kW	414,45	444,12	477,57	509,23	551,43	593,59
COMFORT								
Standard units								
ηsc (12/7)	(1)	%	160,4	161,8	159,2	157,5	151,5	151,5
SEER (12/7)	(1)		4,08	4,12	4,05	4,01	3,86	3,86
Compliance Tier 1	(1)		N	Y	N	N	N	N
Compliance Tier 2 (2021)	(1)		N	N	N	N	N	N
Units with EC fans (VEC)								
ηsc (12/7)	(1)	%	165,3	166,7	164	162,3	156,1	156,1
SEER (12/7)	(1)		4,21	4,24	4,18	4,13	3,98	3,98
Compliance Tier 1	(1)		Y	Y	Y	Y	N	N
Compliance Tier 2 (2021)	(1)		N	N	N	N	N	N

			67.9	70.9	74.10	78.10	80.12	87.12	93.12
REGULATION 2016/2281									
Pdesign	(1)	kW	633,56	667,24	698,78	740,96	771,74	830,06	888,37
COMFORT									
Standard units									
ηsc (12/7)	(1)	%	161,3	160,7	160,7	160,6	162,5	161,3	160,7
SEER (12/7)	(1)		4,11	4,09	4,09	4,09	4,14	4,11	4,09
Compliance Tier 1	(1)		Y	N	N	N	Y	Y	N
Compliance Tier 2 (2021)	(1)		N	N	N	N	N	N	N
Units with EC fans (VEC)									
ηsc (12/7)	(1)	%	166,2	165,6	165,7	165,5	167,5	166,3	165,6
SEER (12/7)	(1)		4,23	4,21	4,22	4,21	4,26	4,23	4,22
Compliance Tier 1	(1)		Y	Y	Y	Y	Y	Y	Y
Compliance Tier 2 (2021)	(1)		N	N	N	N	N	N	N

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

N = unit not in compliance with Ecodesign at the given condition: it can be installed only in non-EU countries.

(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.

TETRIS 2 A

			11.2	17.2	23.2	28.4	34.4	38.4
REGULATION 2016/2281								
Pdesign	(1)	kW	111,84	161,21	229,39	273,51	323,14	362,11
COMFORT								
Standard units								
ηsc	(1)	%	161,8	166,3	161,8	170,4	173,3	167,8
SEER	(1)		4,12	4,23	4,12	4,34	4,41	4,27
Compliance Tier 1	(1)		Y	Y	Y	Y	Y	Y
Compliance Tier 2 (2021)	(1)		Y	Y	Y	Y	Y	Y
Units with EC fans (VEC)								
ηsc	(1)	%	165,9	172,7	166,2	178,6	181,7	171,3
SEER	(1)		4,22	4,39	4,23	4,54	4,62	4,36
Compliance Tier 1	(1)		Y	Y	Y	Y	Y	Y
Compliance Tier 2 (2021)	(1)		Y	Y	Y	Y	Y	Y
PROCESS								
SEPR	(3)		(RFQ)	(RFQ)	(RFQ)	(RFQ)	(RFQ)	(RFQ)
Compliance Tier 1	(3)		Y	Y	Y	Y	Y	Y
Compliance Tier 2 (2021)	(3)		Y	Y	Y	Y	Y	Y

			43.4	47.4	50.6	57.6	64.6	70.6
REGULATION 2016/2281								
Pdesign	(1)	kW	419,24	455,69	484,55	542,44	620,55	684,85
COMFORT								
Standard units								
ηsc	(1)	%	170,3	173,1	179,8	180,2	179,8	179,4
SEER	(1)		4,33	4,4	4,57	4,58	4,57	4,56
Compliance Tier 1	(1)		Y	Y	Y	Y	Y	Y
Compliance Tier 2 (2021)	(1)		N	N	Y	Y	Y	Y
Units with EC fans (VEC)								
ηsc	(1)	%	179	179,4	186,4	186,5	185,8	184,8
SEER	(1)		4,55	4,56	4,74	4,74	4,72	4,7
Compliance Tier 1	(1)		Y	Y	Y	Y	Y	Y
Compliance Tier 2 (2021)	(1)		Y	Y	Y	Y	Y	Y
PROCESS								
SEPR	(3)		(RFQ)	(RFQ)	(RFQ)	(RFQ)	(RFQ)	(RFQ)
Compliance Tier 1	(3)		Y	Y	Y	Y	Y	Y
Compliance Tier 2 (2021)	(3)		Y	Y	(RFQ)	Y	Y	Y

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

N = unit not in compliance with Ecodesign at the given condition: it can be installed only in non-EU countries.

(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.

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

TETRIS 2 A /HP

			11.2	17.2	23.2	28.4	34.4	38.4	43.4
REGULATION 2013/813									
Pdesign	(4)	kW	(RFQ)	(RFQ)	(RFQ)	(RFQ)	(RFQ)	337,284	388,8
COMFORT									
Standard Unit									
ηsh	(4)	%	140,7	144,8	144,4	146,4	146,4	146,4	148,4
SCOP	(4)		3,59	3,69	3,68	3,74	3,74	3,74	3,79
Conformity with Tier 2	(4)		Y	Y	Y	Y	Y	Y	Y
Units with EC fans (VEC)									
ηsh	(4)	%	143,6	147,7	147,3	149,4	149,4	149,4	151,5
SCOP	(4)		3,66	3,77	3,76	3,81	3,81	3,81	3,86
Conformity with Tier 2	(4)		Y	Y	Y	Y	Y	Y	Y

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

(4) User-side heat exchanger water inlet/outlet temperature 30/35, Average climate profile, with reference to regulation 2013/813 and norm EN 14825.

TETRIS 2 A /HP

			47.4	50.6	57.6	64.6	70.6
REGULATION 2016/2281							
Pdesign	(1)	kW	453,65	479,65	537,6	616,54	680,48
COMFORT							
Standard units							
ηsc	(1)	%	167,2	170,9	172,9	170,9	170,5
SEER	(1)		4,25	4,35	4,4	4,35	4,34
Compliance Tier 1	(1)		Y	Y	Y	Y	Y
Compliance Tier 2 (2021)	(1)		N	N	N	N	N
Units with EC fans (VEC)							
ηsc	(1)	%	179,4	184,2	183,9	183,8	183,6
SEER	(1)		4,56	4,68	4,67	4,67	4,67
Compliance Tier 1	(1)		Y	Y	Y	Y	Y
Compliance Tier 2 (2021)	(1)		Y	Y	Y	Y	Y

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

N = unit not in compliance with Ecodesign at the given condition: it can be installed only in non-EU countries.

(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.

TETRIS 2 SLN

			11.2	17.2	23.2	28.4	34.4	38.4
REGULATION 2016/2281								
Pdesign	(1)	kW	105,3	152	215	256,6	304,6	340,1
COMFORT								
Standard units								
ηsc	(1)	%	161	163,4	161	168,4	169,2	164,6
SEER	(1)		4,1	4,16	4,1	4,28	4,31	4,19
Compliance Tier 1	(1)		Y	Y	Y	Y	Y	Y
Compliance Tier 2 (2021)	(1)		Y	Y	Y	Y	Y	Y
Units with EC fans (VEC)								
ηsc	(1)	%	166,8	172,5	166,8	179,4	180,5	170,6
SEER	(1)		4,25	4,39	4,25	4,56	4,59	4,34
Compliance Tier 1	(1)		Y	Y	Y	Y	Y	Y
Compliance Tier 2 (2021)	(1)		Y	Y	Y	Y	Y	Y
PROCESS								
SEPR	(3)		(RFQ)	(RFQ)	(RFQ)	(RFQ)	(RFQ)	(RFQ)
Compliance Tier 1	(3)		Y	Y	Y	Y	Y	Y
Compliance Tier 2 (2021)	(3)		Y	Y	Y	Y	Y	Y

			43.4	47.4	50.6	57.6	64.6	70.6
REGULATION 2016/2281								
Pdesign	(1)	kW	392,9	427	456,4	510,8	582,8	643,1
COMFORT								
Standard units								
ηsc	(1)	%	164,6	167,6	179	179,4	179,4	179
SEER	(1)		4,19	4,26	4,55	4,56	4,56	4,55
Compliance Tier 1	(1)		Y	Y	Y	Y	Y	Y
Compliance Tier 2 (2021)	(1)		Y	N	Y	Y	Y	Y
Units with EC fans (VEC)								
ηsc	(1)	%	171,3	179	186	185,3	183,4	182,7
SEER	(1)		4,36	4,55	4,72	4,71	4,66	4,64
Compliance Tier 1	(1)		Y	Y	Y	Y	Y	Y
Compliance Tier 2 (2021)	(1)		Y	Y	Y	Y	Y	Y
PROCESS								
SEPR	(3)		(RFQ)	(RFQ)	(RFQ)	(RFQ)	(RFQ)	(RFQ)
Compliance Tier 1	(3)		Y	Y	Y	Y	Y	Y
Compliance Tier 2 (2021)	(3)		Y	Y	(RFQ)	Y	Y	Y

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

N = unit not in compliance with Ecodesign at the given condition: it can be installed only in non-EU countries.

- = value not necessary: conformity is already provided at the most restrictive condition (1).

(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.

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

TETRIS 2 SLN /HP

			11.2	17.2	23.2	28.4	34.4	38.4	43.4
REGULATION 2013/813									
Pdesign	(4)	kW	(RFQ)	(RFQ)	(RFQ)	(RFQ)	(RFQ)	337,3	388,8
COMFORT									
Standard units									
ηsh	(4)	%	140,7	144,8	144,4	146,4	146,4	146,4	148,4
SCOP	(4)		3,59	3,69	3,68	3,74	3,74	3,74	3,79
Conformity with Tier 2	(4)		Y	Y	Y	Y	Y	Y	Y
Units with EC fans (VEC)									
ηsh	(4)	%	143,6	147,7	147,3	149,4	149,4	149,4	151,5
SCOP	(4)		3,66	3,77	3,76	3,81	3,81	3,81	3,86
Conformity with Tier 2	(4)		Y	Y	Y	Y	Y	Y	Y

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

(4) User-side heat exchanger water inlet/outlet temperature 30/35, Average climate profile, with reference to regulation 2013/813 and norm EN 14825.

TETRIS 2 SLN /HP

			47.4	50.6	57.6	64.6	70.6
REGULATION 2016/2281							
Pdesign	(1)	kW	425,42	452,14	506,63	579,53	639,5
COMFORT							
Standard units							
ηsc	(1)	%	166	167,5	169,5	170,1	169,8
SEER	(1)		4,22	4,26	4,31	4,33	4,32
Compliance Tier 1	(1)		Y	Y	Y	Y	Y
Compliance Tier 2 (2021)	(1)		N	N	N	N	N
Units with EC fans (VEC)							
ηsc	(1)	%	179	184,5	185	183,8	183,6
SEER	(1)		4,55	4,69	4,7	4,67	4,67
Compliance Tier 1	(1)		Y	Y	Y	Y	Y
Compliance Tier 2 (2021)	(1)		Y	Y	Y	Y	Y

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

N = unit not in compliance with Ecodesign at the given condition: it can be installed only in non-EU countries.

(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.

TETRIS 2 A+

			8.2	13.3	18.4	23.5	27.6	31.4
REGULATION 2016/2281								
Pdesign	(1)	kW	88,8	133,1	180,6	225,7	270,9	311
COMFORT								
Standard units								
ηsc	(1)	%	161	168	170	172	173	173
SEER	(1)		4,11	4,29	4,33	4,37	4,41	4,39
Compliance Tier 1	(1)		Y	Y	Y	Y	Y	Y
Compliance Tier 2 (2021)	(1)		Y	Y	Y	Y	Y	Y
Units with EC fans (VEC)								
ηsc	(1)	%	168	183	179	187	186	183
SEER	(1)		4,28	4,64	4,55	4,74	4,72	4,66
Compliance Tier 1	(1)		Y	Y	Y	Y	Y	Y
Compliance Tier 2 (2021)	(1)		Y	Y	Y	Y	Y	Y
PROCESS								
SEPR	(3)		(RFQ)	(RFQ)	(RFQ)	(RFQ)	(RFQ)	(RFQ)
Compliance Tier 1	(3)		Y	Y	Y	Y	Y	Y
Compliance Tier 2 (2021)	(3)		Y	Y	Y	Y	Y	Y

			36.4	41.5	44.6	49.6	54.6
REGULATION 2016/2281							
Pdesign	(1)	kW	372,7	404,8	436,3	498,1	559,9
COMFORT							
Standard units							
ηsc	(1)	%	173	180	180	180	180
SEER	(1)		4,39	4,58	4,57	4,58	4,58
Compliance Tier 1	(1)		Y	Y	Y	Y	Y
Compliance Tier 2 (2021)	(1)		Y	Y	Y	Y	Y
Units with EC fans (VEC)							
ηsc	(1)	%	181	189	188	189	189
SEER	(1)		4,61	4,8	4,77	4,8	4,8
Compliance Tier 1	(1)		Y	Y	Y	Y	Y
Compliance Tier 2 (2021)	(1)		Y	Y	Y	Y	Y
PROCESS							
SEPR	(3)		(RFQ)	(RFQ)	(RFQ)	(RFQ)	(RFQ)
Compliance Tier 1	(3)		Y	Y	Y	Y	Y
Compliance Tier 2 (2021)	(3)		Y	Y	Y	Y	Y

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

N = unit not in compliance with Ecodesign at the given condition: it can be installed only in non-EU countries.

- = value not necessary: conformity is already provided at the most restrictive condition (1).

(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.

TETRIS 2 A+ /HP

			8.2	13.3	18.4	23.5
REGULATION 2013/813						
Pdesign	(4)	kW	(RFQ)	(RFQ)	(RFQ)	(RFQ)
COMFORT						
Standard units						
ηsh	(4)	%	141,5	146,4	146,8	143,2
SCOP	(4)		3,61	3,74	3,75	3,65
Conformity with Tier 2	(4)		Y	Y	Y	Y
Units with EC fans (VEC)						
ηsh	(4)	%	144,4	149,4	149,8	146,1
SCOP	(4)		3,69	3,81	3,82	3,73
Conformity with Tier 2	(4)		Y	Y	Y	Y

			27.6	31.4	36.4	41.5
REGULATION 2013/813						
Pdesign	(4)	kW	(RFQ)	(RFQ)	(RFQ)	380,592
COMFORT						
Standard units						
ηsh	(4)	%	143,6	146	145,2	147,2
SCOP	(4)		3,66	3,73	3,7	3,76
Conformity with Tier 2	(4)		Y	Y	Y	Y
Units with EC fans (VEC)						
ηsh	(4)	%	146,5	149	148,2	150,2
SCOP	(4)		3,74	3,8	3,78	3,83
Conformity with Tier 2	(4)		Y	Y	Y	Y

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

(4) User-side heat exchanger water inlet/outlet temperature 30/35, Average climate profile, with reference to regulation 2013/813 and norm EN 14825.

TETRIS 2 A+ /HP

			44.6	49.6	54.6
REGULATION 2016/2281					
Pdesign	(1)	kW	432,9	490,4	542,3
COMFORT					
Standard units					
ηsc	(1)	%	169,2	169,2	169,6
SEER	(1)		4,31	4,31	4,32
Compliance Tier 1	(1)		Y	Y	Y
Compliance Tier 2 (2021)	(1)		N	N	N
Units with EC fans (VEC)					
ηsc	(1)	%	189,5	184,8	185,8
SEER	(1)		4,81	4,69	4,72
Compliance Tier 1	(1)		Y	Y	Y
Compliance Tier 2 (2021)	(1)		Y	Y	Y

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

N = unit not in compliance with Ecodesign at the given condition: it can be installed only in non-EU countries.

(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.

TETRIS 2 A SLN

			8.2	13.3	18.4	23.5	27.6	31.4
REGULATION 2016/2281								
Pdesign	(1)	kW	86,5	129,8	176,1	220,1	264,2	303,5
COMFORT								
Standard units								
ηsc	(1)	%	161	166,7	168,8	170,1	172,1	170,9
SEER	(1)		4,1	4,24	4,29	4,33	4,38	4,35
Compliance Tier 1	(1)		Y	Y	Y	Y	Y	Y
Compliance Tier 2 (2021)	(1)		Y	Y	Y	Y	Y	Y
Units with EC fans (VEC)								
ηsc	(1)	%	167,5	181,7	177,8	185,1	185,2	183,3
SEER	(1)		4,26	4,62	4,52	4,7	4,7	4,66
Compliance Tier 1	(1)		Y	Y	Y	Y	Y	Y
Compliance Tier 2 (2021)	(1)		Y	Y	Y	Y	Y	Y
PROCESS								
SEPR	(3)		(RFQ)	(RFQ)	(RFQ)	(RFQ)	(RFQ)	(RFQ)
Compliance Tier 1	(3)		Y	Y	Y	Y	Y	Y
Compliance Tier 2 (2021)	(3)		Y	Y	Y	Y	Y	Y

			36.4	41.5	44.6	49.6	54.6
REGULATION 2016/2281							
Pdesign	(1)	kW	363,4	394,5	425,6	485,4	545,1
COMFORT							
Standard units							
ηsc	(1)	%	170,9	174,7	179	179,4	179
SEER	(1)		4,35	4,44	4,55	4,56	4,55
Compliance Tier 1	(1)		Y	Y	Y	Y	Y
Compliance Tier 2 (2021)	(1)		Y	Y	Y	Y	Y
Units with EC fans (VEC)							
ηsc	(1)	%	181	188,6	186,8	188,1	188,6
SEER	(1)		4,6	4,79	4,75	4,78	4,79
Compliance Tier 1	(1)		Y	Y	Y	Y	Y
Compliance Tier 2 (2021)	(1)		Y	Y	Y	Y	Y
PROCESS							
SEPR	(3)		(RFQ)	(RFQ)	(RFQ)	(RFQ)	(RFQ)
Compliance Tier 1	(3)		Y	Y	Y	Y	Y
Compliance Tier 2 (2021)	(3)		Y	Y	Y	Y	Y

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

N = unit not in compliance with Ecodesign at the given condition: it can be installed only in non-EU countries.

- = value not necessary: conformity is already provided at the most restrictive condition (1).

(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.

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

TETRIS 2 A SLN /HP

			8.2	13.3	18.4	23.5
REGULATION 2013/813						
Pdesign	(4)	kW	(RFQ)	(RFQ)	(RFQ)	(RFQ)
COMFORT						
Standard units						
ηsh	(4)	%	141,5	146,4	146,8	143,2
SCOP	(4)		3,61	3,74	3,75	3,65
Conformity with Tier 2	(4)		Y	Y	Y	Y
Units with EC fans (VEC)						
ηsh	(4)	%	144,4	149,4	149,8	146,1
SCOP	(4)		3,69	3,81	3,82	3,73
Conformity with Tier 2	(4)		Y	Y	Y	Y

			27.6	31.4	36.4	41.5
REGULATION 2013/813						
Pdesign	(4)	kW	(RFQ)	(RFQ)	(RFQ)	380,592
COMFORT						
Standard units						
ηsh	(4)	%	143,6	146	145,2	147,2
SCOP	(4)		3,66	3,73	3,7	3,76
Conformity with Tier 2	(4)		Y	Y	Y	Y
Units with EC fans (VEC)						
ηsh	(4)	%	146,5	149	148,2	150,2
SCOP	(4)		3,74	3,8	3,78	3,83
Conformity with Tier 2	(4)		Y	Y	Y	Y

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

(4) User-side heat exchanger water inlet/outlet temperature 30/35, Average climate profile, with reference to regulation 2013/813 and norm EN 14825.

TETRIS 2 A SLN /HP

			44.6	49.6	54.6
REGULATION 2016/2281					
Pdesign	(1)	kW	422	477,6	528
COMFORT					
Standard units					
ηsc	(1)	%	170,5	170,5	172,5
SEER	(1)		4,34	4,34	4,39
Compliance Tier 1	(1)		Y	Y	Y
Compliance Tier 2 (2021)	(1)		N	N	N
Units with EC fans (VEC)					
ηsc	(1)	%	185,1	184,5	185,4
SEER	(1)		4,7	4,69	4,71
Compliance Tier 1	(1)		Y	Y	Y
Compliance Tier 2 (2021)	(1)		Y	Y	Y

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

N = unit not in compliance with Ecodesign at the given condition: it can be installed only in non-EU countries.

(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.

ELECTRICAL SPECIFICATIONS

TETRIS 2

			10.2	12.2	13.2	15.2	16.2	20.3	24.3
General electrical specifications									
Max. absorbed power (FLI)	(1)	kW	52,7	58,5	64,3	71,6	78,9	96,5	118,4
Max. absorbed current (FLA)	(1)	A	79,8	87,9	96,0	110,7	125,4	144,0	188,1
Rated current (Inom)	(2)	A	68	76	83	94	103	124	156
cosφ standard unit	(2)		0,83	0,84	0,85	0,85	0,85	0,85	0,85
Nominal current with power factor correction (Inom)	(2)	A	58,8	66,5	74,3	85	93,1	110,9	141,1
cosφ unit with power factor correction	(2)		0,96	0,96	0,95	0,94	0,94	0,95	0,94
Max. inrush current (MIC)	(3)	A	268	315	323	361	376	371	439
Maximum inrush current with soft-starter (MIC)	(4)	A	178	207	215	237	252	263	315
Power supply		V/ph/Hz	400/3~/50						
Power supply for auxiliary circuits		V/ph/Hz	230-24/1~/50						
Suggested line section	(5)	mm²	4x35 mm² FG7OR	4x35 mm² FG7OR	4x35 mm² FG7OR	4x50 mm² FG7OR	4x50 mm² FG7OR	4x70 mm² FG7OR	4x95 mm² FG7OR
Suggested line protection	(6)		NH00 125A	NH00 125A	NH00 125A	NH00 160A	NH00 160A	NH1 200A	NH1 250A
Electrical specifications for fans									
Rated power of fan standard		n° x kW	2 x 2.0	2 x 2.0	2 x 2.0	2 x 2.0	2 x 2.0	3 x 2.0	3 x 2.0
Rated current of fan standard		n° x A	2 x 4.3	2 x 4.3	2 x 4.3	2 x 4.3	2 x 4.3	3 x 4.3	3 x 4.3
Rated power of fan EC		n° x kW	2 x 1.9	2 x 1.9	2 x 1.9	2 x 1.9	2 x 1.9	3 x 1.9	3 x 1.9
Rated current of fan EC		n° x A	2 x 2.9	2 x 2.9	2 x 2.9	2 x 2.9	2 x 2.9	3 x 2.9	3 x 2.9
Rated power of fan oversize EC		n° x kW	2 x 3.0	2 x 3.0	2 x 3.0	2 x 3.0	2 x 3.0	3 x 3.0	3 x 3.0
Rated current of fan oversize EC		n° x A	2 x 4.5	2 x 4.5	2 x 4.5	2 x 4.5	2 x 4.5	3 x 4.5	3 x 4.5

			27.4	29.4	32.4	33.4	37.4	41.4	43.6
General electrical specifications									
Max. absorbed power (FLI)	(1)	kW	128,6	143,2	157,8	171,3	182,7	197,1	214,8
Max. absorbed current (FLA)	(1)	A	192,0	221,4	250,8	283,4	305,6	327,2	332,1
Rated current (Inom)	(2)	A	166	187	207	233	249	264	280
cosφ standard unit	(2)		0,82	0,84	0,84	0,87	0,86	0,87	0,84
Nominal current with power factor correction (Inom)	(2)	A	144,8	167,1	185	215,6	230,3	247	250,2
cosφ unit with power factor correction	(2)		0,94	0,94	0,94	0,94	0,93	0,93	0,94
Max. inrush current (MIC)	(3)	A	419	472	502	538	560	577	583
Maximum inrush current with soft-starter (MIC)	(4)	A	311	348	378	408	430	446	459
Power supply		V/ph/Hz	400/3~/50						
Power supply for auxiliary circuits		V/ph/Hz	230-24/1~/50						
Suggested line section	(5)	mm²	4x95 mm² FG7OR	4x150 mm² FG7OR	4x150 mm² FG7OR	2x(4x70 mm²) FG7OR	2x(4x70 mm²) FG7OR	2x(4x70 mm²) FG7OR	2x(4x70 mm²) FG7OR
Suggested line protection	(6)		NH1 250A	NH2 315A	NH2 315A	NH2 400A	NH2 400A	NH2 400A	NH2 400A
Electrical specifications for fans									
Rated power of fan standard		n° x kW	4 x 2.0	4 x 2.0	4 x 2.0	5 x 2.0	6 x 2.0	6 x 2.0	6 x 2.0
Rated current of fan standard		n° x A	4 x 4.3	4 x 4.3	4 x 4.3	5 x 4.3	6 x 4.3	6 x 4.3	6 x 4.3
Rated power of fan EC		n° x kW	4 x 1.9	4 x 1.9	4 x 1.9	5 x 1.9	6 x 1.9	6 x 1.9	6 x 1.9
Rated current of fan EC		n° x A	4 x 2.9	4 x 2.9	4 x 2.9	5 x 2.9	6 x 2.9	6 x 2.9	6 x 2.9
Rated power of fan oversize EC		n° x kW	4 x 3.0	4 x 3.0	4 x 3.0	5 x 3.0	6 x 3.0	6 x 3.0	6 x 3.0
Rated current of fan oversize EC		n° x A	4 x 4.5	4 x 4.5	4 x 4.5	5 x 4.5	6 x 4.5	6 x 4.5	6 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 (A35°C; W12/7°C)

(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)

(4) Maximum effective RMS value of the current when the last compressor starts (FLA of the entire unit - FLA of the largest compressor + 0.6 x 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.

TETRIS 2

			47.6	50.7	53.8	58.8	62.8	67.9
General electrical specifications								
Max. absorbed power (FLI)	(1)	kW	236,7	247,0	257,2	286,4	315,6	333,2
Max. absorbed current (FLA)	(1)	A	376,2	380,1	384,0	442,8	501,6	520,2
Rated current (Inom)	(2)	A	311	277	289	321	353	374
cosφ standard unit	(2)		0,85	0,85	0,85	0,85	0,85	0,85
Nominal current with power factor correction (Inom)	(2)	A	281,2	245,3	255,9	287,2	315,8	334,6
cosφ unit with power factor correction	(2)		0,94	0,96	0,96	0,95	0,95	0,95
Max. inrush current (MIC)	(3)	A	627	631	611	694	752	771
Maximum inrush current with soft-starter (MIC)	(4)	A	503	507	503	570	628	647
Power supply		V/ph/Hz	400/3~/50					
Power supply for auxiliary circuits		V/ph/Hz	230-24/1~/50					
Suggested line section	(5)	mm²	2x(4x120 mm²) FG7OR	2x(4x120 mm²) FG7OR	2x(4x120 mm²) FG7OR	2x(4x150 mm²) FG7OR	2x(4x150 mm²) FG7OR	2x(4x150 mm²) FG7OR
Suggested line protection	(6)		NH3 500A	NH3 500A	NH3 500A	NH3 630A	NH3 630A	NH3 630A
Electrical specifications for fans								
Rated power of fan standard		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
Rated current of fan standard		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
Rated power of fan EC		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
Rated current of fan EC		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
Rated power of fan oversize EC		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
Rated current of fan oversize EC		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

			70.9	74.10	78.10	80.12	87.12	93.12
General electrical specifications								
Max. absorbed power (FLI)	(1)	kW	355,1	365,3	394,5	385,8	429,6	473,4
Max. absorbed current (FLA)	(1)	A	564,3	568,2	627,0	576,0	664,2	752,4
Rated current (Inom)	(2)	A	398	410	442	434	482	530
cosφ standard unit	(2)		0,85	0,85	0,85	0,85	0,85	0,85
Nominal current with power factor correction (Inom)	(2)	A	356,1	366,8	395,5	384,3	426,8	474,2
cosφ unit with power factor correction	(2)		0,95	0,95	0,95	0,96	0,96	0,95
Max. inrush current (MIC)	(3)	A	815	819	878	803	915	1.003
Maximum inrush current with soft-starter (MIC)	(4)	A	691	695	754	695	791	879
Power supply		V/ph/Hz	400/3~/50					
Power supply for auxiliary circuits		V/ph/Hz	230-24/1~/50					
Suggested line section	(5)	mm²	3x(4x120 mm²) FG7OR	3x(4x120 mm²) FG7OR	3x(4x120 mm²) FG7OR	3x(4x120 mm²) FG7OR	3x(4x120 mm²) FG7OR	4x(4x120 mm²) FG7OR
Suggested line protection	(6)		NH4 800A	NH4 800A	NH4 800A	NH4 800A	NH4 800A	NH4 1000A
Electrical specifications for fans								
Rated power of fan standard		n° x kW	9 x 2.0	10 x 2.0	10 x 2.0	12 x 2.0	12 x 2.0	12 x 2.0
Rated current of fan standard		n° x A	9 x 4.3	10 x 4.3	10 x 4.3	12 x 4.3	12 x 4.3	12 x 4.3
Rated power of fan EC		n° x kW	9 x 1.9	10 x 1.9	10 x 1.9	12 x 1.9	12 x 1.9	12 x 1.9
Rated current of fan EC		n° x A	9 x 2.9	10 x 2.9	10 x 2.9	12 x 2.9	12 x 2.9	12 x 2.9
Rated power of fan oversize EC		n° x kW	9 x 3.0	10 x 3.0	10 x 3.0	12 x 3.0	12 x 3.0	12 x 3.0
Rated current of fan oversize EC		n° x A	9 x 4.5	10 x 4.5	10 x 4.5	12 x 4.5	12 x 4.5	12 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 (A35°C; W12/7°C)

(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)

(4) Maximum effective RMS value of the current when the last compressor starts (FLA of the entire unit - FLA of the largest compressor + 0.6 x 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.

TETRIS 2 A - TETRIS 2 SLN

			11.2	17.2	23.2	28.4	34.4	38.4
General electrical specifications								
Max. absorbed power (FLI)	(1)	kW	52,7	73,1	100,0	125,8	146,1	160,7
Max. absorbed current (FLA)	(1)	A	79,8	114,1	167,0	193,9	228,2	257,6
Rated current (Inom)	(2)	A	69	85	136	153	169	185
cosφ standard unit	(2)		0,82	0,84	0,86	0,83	0,84	0,84
Nominal current with power factor correction (Inom)	(2)	A	58,9	75,2	123,1	133,7	149,4	163,6
cosφ unit with power factor correction	(2)		0,96	0,95	0,95	0,95	0,95	0,95
Max. inrush current (MIC)	(3)	A	268	365	416	445	479	508
Maximum inrush current with soft-starter (MIC)	(4)	A	178	241	286	321	355	384
Power supply		V/ph/Hz	400/3~/50					
Power supply for auxiliary circuits		V/ph/Hz	230-24/1~/50					
Suggested line section	(5)	mm²	4x25 mm² FG7OR	4x50 mm² FG7OR	4x70 mm² FG7OR	4x120 mm² FG7OR	4x150 mm² FG7OR	4x150 mm² FG7OR
Suggested line protection	(6)		NH00 100A	NH00 160A	NH1 200A	NH1 250A	NH2 315A	NH2 315A
Electrical specifications for fans								
Rated power of fan standard		n° x kW	2 x 2,0	3 x 2,0	4 x 2,0	5 x 2,0	6 x 2,0	6 x 2,0
Rated current of fan standard		n° x A	2 x 4,3	3 x 4,3	4 x 4,3	5 x 4,3	6 x 4,3	6 x 4,3
Rated power of fan EC		n° x kW	2 x 1,9	3 x 1,9	4 x 1,9	5 x 1,9	6 x 1,9	6 x 1,9
Rated current of fan EC		n° x A	2 x 2,9	3 x 2,9	4 x 2,9	5 x 2,9	6 x 2,9	6 x 2,9
Rated power of fan oversize EC		n° x kW	2 x 3,0	3 x 3,0	4 x 3,0	5 x 3,0	6 x 3,0	6 x 3,0
Rated current of fan oversize EC		n° x A	2 x 4,5	3 x 4,5	4 x 4,5	5 x 4,5	6 x 4,5	6 x 4,5

			43.4	47.4	50.6	57.6	64.6	70.6
General electrical specifications								
Max. absorbed power (FLI)	(1)	kW	181,4	200,0	219,2	242,5	272,8	300,0
Max. absorbed current (FLA)	(1)	A	301,0	334,0	342,3	389,8	453,2	501,0
Rated current (Inom)	(2)	A	245	273	254	282	463	512
cosφ standard unit	(2)		0,87	0,86	0,84	0,84	0,87	0,87
Nominal current with power factor correction (Inom)	(2)	A	224,4	247,1	224,6	249,3	424	468,9
cosφ unit with power factor correction	(2)		0,95	0,95	0,95	0,95	0,95	0,95
Max. inrush current (MIC)	(3)	A	550	583	593	641	703	750
Maximum inrush current with soft-starter (MIC)	(4)	A	420	453	469	517	572	620
Power supply		V/ph/Hz	400/3~/50					
Power supply for auxiliary circuits		V/ph/Hz	230-24/1~/50					
Suggested line section	(5)	mm²	2x(4x70 mm²) FG7OR	2x(4x120 mm²) FG7OR	2x(4x120 mm²) FG7OR	2x(4x120 mm²) FG7OR	2x(4x150 mm²) FG7OR	2x(4x150 mm²) FG7OR
Suggested line protection	(6)		NH2 400A	NH3 500A	NH3 500A	NH3 500A	NH3 630A	NH3 630A
Electrical specifications for fans								
Rated power of fan standard		n° x kW	7 x 2,0	8 x 2,0	9 x 2,0	10 x 2,0	11 x 2,0	12 x 2,0
Rated current of fan standard		n° x A	7 x 4,3	8 x 4,3	9 x 4,3	10 x 4,3	11 x 4,3	12 x 4,3
Rated power of fan EC		n° x kW	7 x 1,9	8 x 1,9	9 x 1,9	10 x 1,9	11 x 1,9	12 x 1,9
Rated current of fan EC		n° x A	7 x 2,9	8 x 2,9	9 x 2,9	10 x 2,9	11 x 2,9	12 x 2,9
Rated power of fan oversize EC		n° x kW	7 x 3,0	8 x 3,0	9 x 3,0	10 x 3,0	11 x 3,0	12 x 3,0
Rated current of fan oversize EC		n° x A	7 x 4,5	8 x 4,5	9 x 4,5	10 x 4,5	11 x 4,5	12 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 (A35°C; W12/7°C)

(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)

(4) Maximum effective RMS value of the current when the last compressor starts (FLA of the entire unit - FLA of the largest compressor + 0.6 x 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.

TETRIS 2 A+ - TETRIS 2 A SLN

			8.2	13.3	18.4	23.5	27.6	31.4
General electrical specifications								
Max. absorbed power (FLI)	(1)	kW	39,7	59,6	79,4	99,3	119,1	140,3
Max. absorbed current (FLA)	(1)	A	67,4	101,1	134,8	168,5	202,2	216,9
Rated current (Inom)	(2)	A	60	90	120	149	179	165
cosφ standard unit	(2)		0,76	0,76	0,76	0,76	0,76	0,83
Nominal current with power factor correction (Inom)	(2)	A	48	72	96	119,2	143,2	144,2
cosφ unit with power factor correction	(2)		0,95	0,95	0,95	0,95	0,95	0,95
Max. inrush current (MIC)	(3)	A	211	245	279	312	346	468
Maximum inrush current with soft-starter (MIC)	(4)	A	142	175	209	243	276	344
Power supply		V/ph/Hz	400/3~/50					
Power supply for auxiliary circuits		V/ph/Hz	230-24/1~/50					
Suggested line section	(5)	mm²	4x25 mm² FG7OR	4x35 mm² FG7OR	4x70 mm² FG7OR	4x120 mm² FG7OR	4x120 mm² FG7OR	4x150 mm² FG7OR
Suggested line protection	(6)		NH00 100A	NH00 125A	NH1 200A	NH1 250A	NH1 250A	NH2 315A
Electrical specifications for fans								
Rated power of fan standard		n° x kW	2 x 2,0	3 x 2,0	4 x 2,0	5 x 2,0	6 x 2,0	7 x 2,0
Rated current of fan standard		n° x A	2 x 4,3	3 x 4,3	4 x 4,3	5 x 4,3	6 x 4,3	7 x 4,3
Rated power of fan EC		n° x kW	2 x 1,9	3 x 1,9	4 x 1,9	5 x 1,9	6 x 1,9	7 x 1,9
Rated current of fan EC		n° x A	2 x 2,9	3 x 2,9	4 x 2,9	5 x 2,9	6 x 2,9	7 x 2,9
Rated power of fan oversize EC		n° x kW	2 x 3,0	3 x 3,0	4 x 3,0	5 x 3,0	6 x 3,0	7 x 3,0
Rated current of fan oversize EC		n° x A	2 x 4,5	3 x 4,5	4 x 4,5	5 x 4,5	6 x 4,5	7 x 4,5

			36.4	41.5	44.6	49.6	54.6
General electrical specifications							
Max. absorbed power (FLI)	(1)	kW	163,6	181,2	198,7	222,1	245,4
Max. absorbed current (FLA)	(1)	A	264,4	283,0	301,6	349,1	396,6
Rated current (Inom)	(2)	A	193	214	234	262	290
cosφ standard unit	(2)		0,83	0,84	0,83	0,84	0,84
Nominal current with power factor correction (Inom)	(2)	A	168,6	189,2	204,4	231,7	256,4
cosφ unit with power factor correction	(2)		0,95	0,95	0,95	0,95	0,95
Max. inrush current (MIC)	(3)	A	515	534	529	600	647
Maximum inrush current with soft-starter (MIC)	(4)	A	391	410	420	476	523
Power supply		V/ph/Hz	400/3~/50				
Power supply for auxiliary circuits		V/ph/Hz	230-24/1~/50				
Suggested line section	(5)	mm²	2x(4x70 mm²) FG7OR	2x(4x70 mm²) FG7OR	2x(4x70 mm²) FG7OR	2x(4x120 mm²) FG7OR	2x(4x120 mm²) FG7OR
Suggested line protection	(6)		NH2 400A	NH2 400A	NH2 400A	NH3 500A	NH3 500A
Electrical specifications for fans							
Rated power of fan standard		n° x kW	8 x 2,0	9 x 2,0	10 x 2,0	11 x 2,0	12 x 2,0
Rated current of fan standard		n° x A	8 x 4,3	9 x 4,3	10 x 4,3	11 x 4,3	12 x 4,3
Rated power of fan EC		n° x kW	8 x 1,9	9 x 1,9	10 x 1,9	11 x 1,9	12 x 1,9
Rated current of fan EC		n° x A	8 x 2,9	9 x 2,9	10 x 2,9	11 x 2,9	12 x 2,9
Rated power of fan oversize EC		n° x kW	8 x 3,0	9 x 3,0	10 x 3,0	11 x 3,0	12 x 3,0
Rated current of fan oversize EC		n° x A	8 x 4,5	9 x 4,5	10 x 4,5	11 x 4,5	12 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 (A35°C; W12/7°C)

(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)

(4) Maximum effective RMS value of the current when the last compressor starts (FLA of the entire unit - FLA of the largest compressor + 0.6 x 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

TETRIS 2

			10.2	12.2	13.2	15.2	16.2	20.3	24.3
Volume of the expansion vessel		l	18	18	18	18	18	18	18
Volume of the buffer tank		l	300	300	300	300	300	300	300
Standard pumps									
Pump model 1P			P3	P9	P9	P9	P9	P10	P17
Pump model 2P			P3	P9	P9	P9	P9	P10	P17
Pump model 3P			-	-	-	-	-	-	-
Available head 1P	(1)	kPa	154	143	130	144	135	160	219
Available head 2P	(1)	kPa	136	128	110	133	122	138	190
Available head 3P	(1)	kPa	-	-	-	-	-	-	-
Oversize pumps									
Pump model 1PM			P10	P11	P11	P11	P11	P17	P22
Pump model 2PM			P10	P11	P11	P11	P11	P17	P22
Pump model 3PM			-	-	-	-	-	-	-
Available head 1PM	(1)	kPa	233	287	274	277	267	235	282
Available head 2PM	(1)	kPa	214	263	244	265	254	214	252
Available head 3PM	(1)	kPa	-	-	-	-	-	-	-

			27.4	29.4	32.4	33.4	37.4	41.4	43.6
Volume of the expansion vessel		l	18	18	18	18	18	18	18
Volume of the buffer tank		l	300	300	300	300	300	300	300
Standard pumps									
Pump model 1P			P17	P17	P17	P17	P17	P25	P25
Pump model 2P			-	-	-	-	-	-	-
Pump model 3P			P3	P3	P3	P10	P10	P10	P10
Available head 1P	(1)	kPa	219	212	193	214	203	248	228
Available head 2P	(1)	kPa	-	-	-	-	-	-	-
Available head 3P	(1)	kPa	154	150	135	243	234	213	206
Oversize pumps									
Pump model 1PM			P22	P22	P22	P22	P22	P28	P28
Pump model 2PM			-	-	-	-	-	-	-
Pump model 3PM			P7	P7	P7	P11	P11	P11	P11
Available head 1PM	(1)	kPa	288	287	274	299	290	276	274
Available head 2PM	(1)	kPa	-	-	-	-	-	-	-
Available head 3PM	(1)	kPa	285	274	249	312	303	281	275

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

TETRIS 2

			47.6	50.7	53.8	58.8	62.8	67.9
Volume of the expansion vessel		l	18	25	25	25	25	25
Volume of the buffer tank		l	300	500	500	500	500	500
Standard pumps								
Pump model 1P			P25	P25	P25	P25	P25	P27
Pump model 2P			-	-	-	-	-	-
Pump model 3P			P10	P10	P10	P10	P11	P11
Available head 1P	(1)	kPa	212	195	178	180	160	153
Available head 2P	(1)	kPa	-	-	-	-	-	-
Available head 3P	(1)	kPa	188	174	163	142	214	191
Oversize pumps								
Pump model 1PM			P28	P28	P28	P28	P28	P29
Pump model 2PM			-	-	-	-	-	-
Pump model 3PM			P11	P11	P11	P11	P18	P18
Available head 1PM	(1)	kPa	260	251	244	254	244	281
Available head 2PM	(1)	kPa	-	-	-	-	-	-
Available head 3PM	(1)	kPa	258	244	233	213	305	292

			70.9	74.10	78.10	80.12	87.12	93.12
Volume of the expansion vessel		l	25	25	25	25	25	25
Volume of the buffer tank		l	500	500	500	700	700	700
Standard pumps								
Pump model 1P			P27	P27	P27	P27	P28	P28
Pump model 2P			-	-	-	-	-	-
Pump model 3P			P11	P11	P17	P17	P17	P17
Available head 1P	(1)	kPa	142	149	134	131	170	144
Available head 2P	(1)	kPa	-	-	-	-	-	-
Available head 3P	(1)	kPa	175	155	183	180	162	138
Oversize pumps								
Pump model 1PM			P29	P29	P29	P29	P31	P31
Pump model 2PM			-	-	-	-	-	-
Pump model 3PM			P18	P18	P18	P18	P18	P18
Available head 1PM	(1)	kPa	273	260	247	244	283	249
Available head 2PM	(1)	kPa	-	-	-	-	-	-
Available head 3PM	(1)	kPa	286	275	264	262	244	222

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

TETRIS 2 A

			11.2	17.2	23.2	28.4	34.4	38.4
Volume of the expansion vessel		l	18	18	18	18	18	18
Volume of the buffer tank		l	300	300	300	300	300	300
Standard pumps								
Pump model 1P			P9	P9	P10	P17	P17	P17
Pump model 2P			P9	P9	-	-	-	-
Pump model 3P			-	-	P3	P3	P3	P3
Available head 1P	(1)	kPa	165	147	170	234	201	175
Available head 2P	(1)	kPa	146	135	-	-	-	-
Available head 3P	(1)	kPa	-	-	183	167	142	122
Oversize pumps								
Pump model 1PM			P11	P11	P14	P18	P18	P18
Pump model 2PM			P11	P11	-	-	-	-
Pump model 3PM			-	-	P7	P7	P7	P7
Available head 1PM	(1)	kPa	302	279	303	315	285	260
Available head 2PM	(1)	kPa	283	267	-	-	-	-
Available head 3PM	(1)	kPa	-	-	335	302	259	227
Small pumps								
Pump model 1Pr			P33	P33	P9	P15	P15	P15
Pump model 2Pr			P33	P33	P9	P15	P15	P15
Available head 1Pr	(1)	kPa	112	85	102	178	145	121
Available head 2Pr	(1)	kPa	100	71	75	141	116	86

			43.4	47.4	50.6	57.6	64.6	70.6
Volume of the expansion vessel		l	25	25	25	25	25	25
Volume of the buffer tank		l	500	500	500	500	700	700
Standard pumps								
Pump model 1P			P17	P21	P21	P21	P27	P27
Pump model 2P			-	-	-	-	-	-
Pump model 3P			P9	P9	P9	P10	P10	P10
Available head 1P	(1)	kPa	167	197	190	186	215	199
Available head 2P	(1)	kPa	-	-	-	-	-	-
Available head 3P	(1)	kPa	155	161	152	188	162	155
Oversize pumps								
Pump model 1PM			P18	P26	P26	P26	P29	P29
Pump model 2PM			-	-	-	-	-	-
Pump model 3PM			P11	P11	P11	P14	P14	P14
Available head 1PM	(1)	kPa	255	354	346	364	325	309
Available head 2PM	(1)	kPa	-	-	-	-	-	-
Available head 3PM	(1)	kPa	289	294	284	359	299	289
Small pumps								
Pump model 1Pr			P15	P34	P34	P34	P21	P35
Pump model 2Pr			P15	P34	P34	P34	P21	P35
Available head 1Pr	(1)	kPa	92	154	144	116	132	122
Available head 2Pr	(1)	kPa	88	149	139	109	130	120

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

TETRIS 2 SLN

			11.2	17.2	23.2	28.4	34.4	38.4
Volume of the expansion vessel		l	18	18	18	18	18	18
Volume of the buffer tank		l	300	300	300	300	300	300
Standard pumps								
Pump model 1P			P9	P9	P10	P17	P17	P17
Pump model 2P			P9	P9	-	-	-	-
Pump model 3P			-	-	P3	P3	P3	P3
Available head 1P	(1)	kPa	165	147	170	234	201	175
Available head 2P	(1)	kPa	146	135	-	-	-	-
Available head 3P	(1)	kPa	-	-	183	167	142	122
Oversize pumps								
Pump model 1PM			P11	P11	P14	P18	P18	P18
Pump model 2PM			P11	P11	-	-	-	-
Pump model 3PM			-	-	P7	P7	P7	P7
Available head 1PM	(1)	kPa	302	279	303	315	285	260
Available head 2PM	(1)	kPa	283	267	-	-	-	-
Available head 3PM	(1)	kPa	-	-	335	302	259	227
Small pumps								
Pump model 1Pr			P33	P33	P9	P15	P15	P15
Pump model 2Pr			P33	P33	P9	P15	P15	P15
Available head 1Pr	(1)	kPa	123	93	113	185	156	134
Available head 2Pr	(1)	kPa	112	80	88	148	130	103

			43.4	47.4	50.6	57.6	64.6	70.6
Volume of the expansion vessel		l	25	25	25	25	25	25
Volume of the buffer tank		l	500	500	500	500	700	700
Standard pumps								
Pump model 1P			P17	P21	P21	P21	P27	P27
Pump model 2P			-	-	-	-	-	-
Pump model 3P			P9	P9	P9	P10	P10	P10
Available head 1P	(1)	kPa	167	197	190	186	215	199
Available head 2P	(1)	kPa	-	-	-	-	-	-
Available head 3P	(1)	kPa	155	161	152	188	162	155
Oversize pumps								
Pump model 1PM			P18	P26	P26	P26	P29	P29
Pump model 2PM			-	-	-	-	-	-
Pump model 3PM			P11	P11	P11	P14	P14	P14
Available head 1PM	(1)	kPa	255	354	346	364	325	309
Available head 2PM	(1)	kPa	-	-	-	-	-	-
Available head 3PM	(1)	kPa	289	294	284	359	299	289
Small pumps								
Pump model 1Pr			P15	P34	P34	P34	P21	P35
Pump model 2Pr			P15	P34	P34	P34	P21	P35
Available head 1Pr	(1)	kPa	108	164	154	127	145	128
Available head 2Pr	(1)	kPa	105	159	148	120	143	126

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

TETRIS 2 A+

			8.2	13.3	18.4	23.5	27.6	31.4
Volume of the expansion vessel		l	18	18	18	18	18	24
Volume of the buffer tank		l	300	300	300	300	300	500
Standard pumps								
Pump model 1P			P2	P3	P9	P10	P15	P15
Pump model 2P			P2	P3	-	-	-	-
Pump model 3P			-	-	P1	P2	P2	P3
Available head 1P	(1)	kPa	160	141	140	158	159	150
Available head 2P	(1)	kPa	142	127	-	-	-	-
Available head 3P	(1)	kPa	-	-	126	156	130	130
Oversize pumps								
Pump model 1PM			P5	P7	P11	P14	P18	P18
Pump model 2PM			P5	P7	-	-	-	-
Pump model 3PM			-	-	P5	P5	P7	P7
Available head 1PM	(1)	kPa	239	227	270	290	305	294
Available head 2PM	(1)	kPa	221	213	-	-	-	-
Available head 3PM	(1)	kPa	-	-	262	241	276	251
Small pumps								
Pump model 1Pr			P1	P36	P33	P9	P37	P37
Pump model 2Pr			P1	P36	P33	P9	P37	P37
Available head 1Pr	(1)	kPa	116	96	78	103	124	94
Available head 2Pr	(1)	kPa	108	86	60	77	105	68

			36.4	41.5	44.6	49.6	54.6
Volume of the expansion vessel		l	24	24	24	24	24
Volume of the buffer tank		l	500	500	500	700	700
Standard pumps							
Pump model 1P			P15	P17	P21	P21	P21
Pump model 2P			-	-	-	-	-
Pump model 3P			P3	P3	P9	P9	P9
Available head 1P	(1)	kPa	140	174	183	173	164
Available head 2P	(1)	kPa	-	-	-	-	-
Available head 3P	(1)	kPa	120	128	130	115	100
Oversize pumps							
Pump model 1PM			P18	P18	P22	P22	P22
Pump model 2PM			-	-	-	-	-
Pump model 3PM			P7	P11	P11	P11	P11
Available head 1PM	(1)	kPa	278	261	269	257	246
Available head 2PM	(1)	kPa	-	-	-	-	-
Available head 3PM	(1)	kPa	218	282	263	246	230
Small pumps							
Pump model 1Pr			P37	P15	P34	P34	P34
Pump model 2Pr			P37	P15	P34	P34	P34
Available head 1Pr	(1)	kPa	80	102	145	117	85
Available head 2Pr	(1)	kPa	76	98	141	111	78

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

TETRIS 2 A SLN

			8.2	13.3	18.4	23.5	27.6	31.4
Volume of the expansion vessel		l	18	18	18	18	18	24
Volume of the buffer tank		l	300	300	300	300	300	500
Standard pumps								
Pump model 1P			P2	P3	P9	P10	P15	P15
Pump model 2P			P2	P3	-	-	-	-
Pump model 3P			-	-	P1	P2	P2	P3
Available head 1P	(1)	kPa	160	141	140	158	159	150
Available head 2P	(1)	kPa	142	127	-	-	-	-
Available head 3P	(1)	kPa	-	-	126	156	130	130
Oversize pumps								
Pump model 1PM			P5	P7	P11	P14	P18	P18
Pump model 2PM			P5	P7	-	-	-	-
Pump model 3PM			-	-	P5	P5	P7	P7
Available head 1PM	(1)	kPa	239	227	270	290	305	294
Available head 2PM	(1)	kPa	221	213	-	-	-	-
Available head 3PM	(1)	kPa	-	-	262	241	276	251
Small pumps								
Pump model 1Pr			P1	P36	P33	P9	P37	P37
Pump model 2Pr			P1	P36	P33	P9	P37	P37
Available head 1Pr	(1)	kPa	121	102	84	111	129	102
Available head 2Pr	(1)	kPa	114	93	68	87	112	77

			36.4	41.5	44.6	49.6	54.6
Volume of the expansion vessel		l	24	24	24	24	24
Volume of the buffer tank		l	500	500	500	700	700
Standard pumps							
Pump model 1P			P15	P17	P21	P21	P21
Pump model 2P			-	-	-	-	-
Pump model 3P			P3	P3	P9	P9	P9
Available head 1P	(1)	kPa	140	174	183	173	164
Available head 2P	(1)	kPa	-	-	-	-	-
Available head 3P	(1)	kPa	120	128	130	115	100
Oversize pumps							
Pump model 1PM			P18	P18	P22	P22	P22
Pump model 2PM			-	-	-	-	-
Pump model 3PM			P7	P11	P11	P11	P11
Available head 1PM	(1)	kPa	278	261	269	257	246
Available head 2PM	(1)	kPa	-	-	-	-	-
Available head 3PM	(1)	kPa	218	282	263	246	230
Small pumps							
Pump model 1Pr			P37	P15	P34	P34	P34
Pump model 2Pr			P37	P15	P34	P34	P34
Available head 1Pr	(1)	kPa	88	112	151	125	95
Available head 2Pr	(1)	kPa	85	108	147	120	88

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

HYDRAULIC MODULES

	Rated power	Rated current	Min. flow rate	Max. flow rate
	kW	A	m³/h	m³/h
P1	1,1	2,5	7	19,8
P2	1,5	3,2	7	19,8
P3	1,85	4,5	12	34,3
P4	3	5,9	12	34,3
P5	2,2	4,5	6	20
P6	3	6,1	6	20
P7	3	6,1	5,7	24,2
P8	4	8,7	5,7	24,2
P9	2,2	4,5	12	50,8
P10	3	6,1	12	50,8
P11	4	8,7	12	50,8
P12	4	8,7	12	50,8
P13	5,5	10,4	12	50,8
P14	5,5	10,4	12	50,8
P15	4	8,7	24	72
P16	5,5	10,4	24	72
P17	5,5	10,4	24	87,1
P18	7,5	13,7	24	87,1
P19	7,5	13,7	24	87,1
P20	9,2	17,2	24	87,1
P21	7,5	13,6	42	132
P22	11	21,3	42	138
P23	11	21,3	42	138
P24	15	27,7	42	138
P25	9,2	17,2	42	132
P26	15	26,6	35	168,4
P27	11	20,2	58	237
P28	15	26,6	65	255
P29	18,5	33	70	270
P30	18,5	33	70	270
P31	22	40,4	50	233
P32	7,5	13,6	42	132
P33	1,5	3,2	12	50,8
P34	5,5	10,4	42	126
P35	7,5	14,1	31,7	158
P36	1,5	3,4	12	31,7

USER-SIDE EXCHANGER FLOW RATE FIELDS

The units are sized and optimized for the following nominal conditions: external air 35°C, inlet-outlet of the user-side exchanger 12/7°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)
- 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.

TETRIS 2

	Qmin	Qmax
	m³/h	m³/h
10.2	9,4	28,1
12.2	10,2	30,5
13.2	10,9	32,6
15.2	12,0	36,1
16.2	13,8	41,3
20.3	16,8	50,4
24.3	19,8	59,3
27.4	22,6	67,7
29.4	24,2	72,6
32.4	26,3	78,9
33.4	28,8	86,4
37.4	31,8	95,4
41.4	35,1	105,2
43.6	36,7	110,2
47.6	39,4	118,1
50.7	42,3	127,0
53.8	45,1	135,4
58.8	48,9	146,7
62.8	52,6	157,9
67.9	56,2	168,5
70.9	59,2	177,5
74.10	62,0	185,9
78.10	65,7	197,1
80.12	68,4	205,2
87.12	73,6	220,8
93.12	78,8	236,3

TETRIS 2 A

	Qmin	Qmax
	m³/h	m³/h
11.2	9,6	28,9
17.2	13,9	41,7
23.2	19,8	59,3
28.4	23,6	70,7
34.4	27,8	83,5
38.4	31,2	93,5
43.4	36,1	108,3
47.4	39,2	117,7
50.6	41,7	125,1
57.6	46,7	140,1
64.6	53,4	160,2
70.6	58,9	176,8

TETRIS 2 A+

	Qmin	Qmax
	m³/h	m³/h
8.2	7,7	23,0
13.3	11,5	34,4
18.4	15,6	46,7
23.5	19,4	58,3
27.6	23,3	70,0
31.4	26,8	80,3
36.4	32,1	96,3
41.5	34,8	104,5
44.6	37,6	112,7
49.6	42,9	128,6
54.6	48,2	144,6

TETRIS 2 SLN

	Qmin	Qmax
	m³/h	m³/h
11.2	9,1	27,3
17.2	13,1	39,3
23.2	18,5	55,6
28.4	22,1	66,3
34.4	26,2	78,7
38.4	29,3	87,8
43.4	33,8	101,5
47.4	36,8	110,3
50.6	39,3	117,8
57.6	44,0	131,9
64.6	50,2	150,5
70.6	55,3	166,0

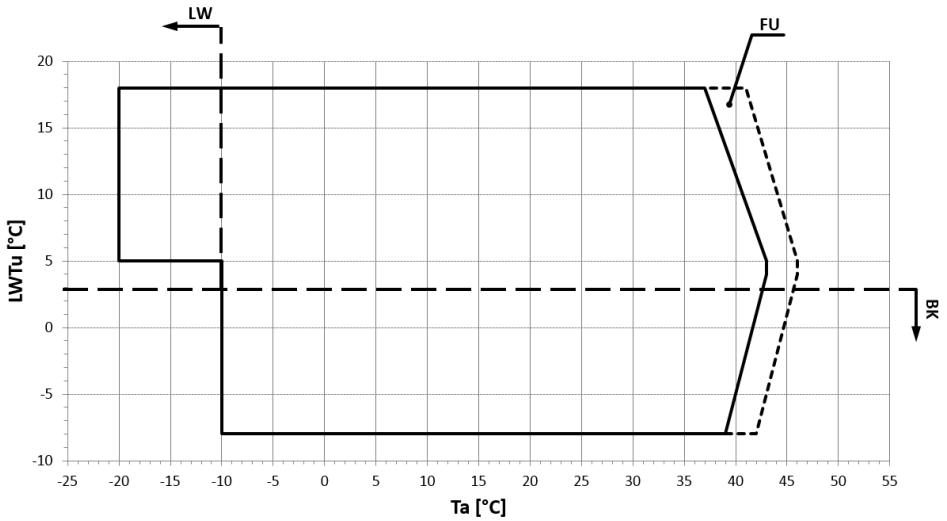
TETRIS 2 A SLN

	Qmin	Qmax
	m³/h	m³/h
8.2	7,5	22,4
13.3	11,2	33,6
18.4	15,2	45,5
23.5	19,0	56,9
27.6	22,7	68,2
31.4	26,1	78,4
36.4	31,3	93,8
41.5	34,0	101,9
44.6	36,6	109,9
49.6	41,8	125,3
54.6	46,9	140,8

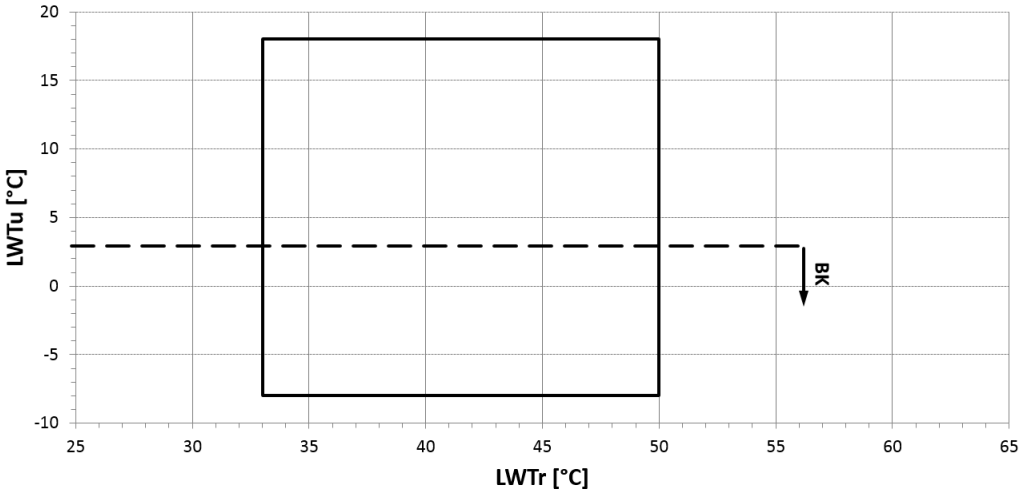
OPERATING LIMITS

TETRIS 2

COOLING



TOTAL RECOVERY



Ta: external air temperature

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

LWTr: water outlet temperature from the recovery exchanger

LW: in the indicated area, the unit can work only where there is no wind

/HAT: the /HAT version is obligatory in the area indicated by the arrow. The /HAT unit adopts an electrical control panel made using specific components to withstand high temperatures, special cables and oversize protection parts that guarantee operation 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.

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 lower or equal to +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.

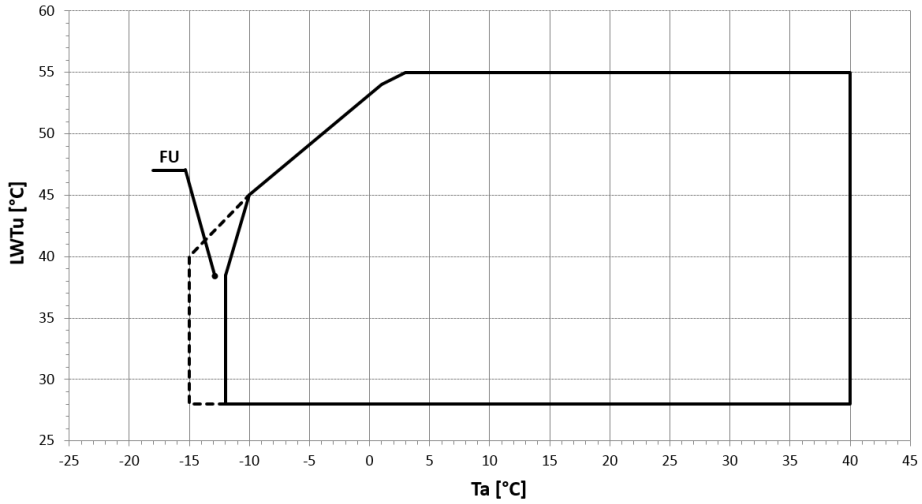
The inlet and outlet temperatures of the user-side exchanger must be given on ordering to allow correct setting of the alarm parameters and verification of the sizing of the expansion valve.

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.

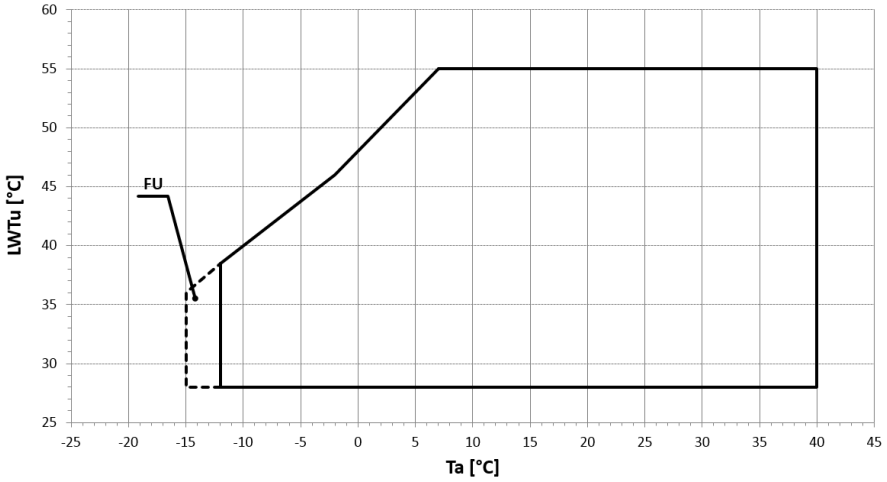
The unit will be optimized to work at the set point temperatures given on ordering. For different set points, the cooling capacity provided and the level of efficiency of the machine could decrease and move away from these conditions.

HEATING

For models Tetris 2 10.2, 16.2, 24.3, 32.4, 33.4, 37.4, 41.4, 47.6, 62.8, 70.9, 78.10, 93.12

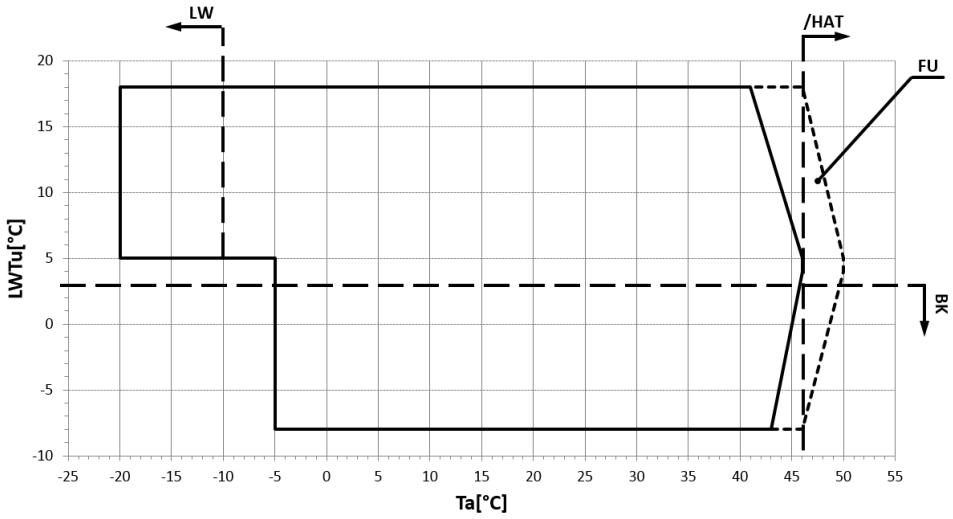


For models Tetris 2 12.2, 13.2, 15.2, 20.3, 27.4, 29.4, 43.6, 50.7, 53.8, 58.8, 67.9, 74.10, 80.12, 87.12

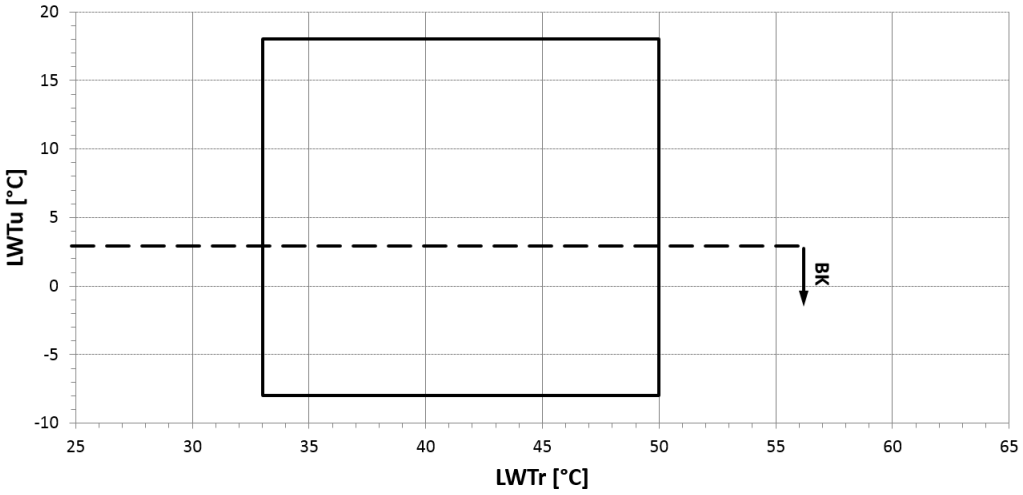


TETRIS 2 A - TETRIS 2 SLN

COOLING



TOTAL RECOVERY



Ta: external air temperature

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

LWTr: water outlet temperature from the recovery exchanger

LW: in the indicated area, the unit can work only where there is no wind

/HAT: the /HAT version is obligatory in the area indicated by the arrow. The /HAT unit adopts an electrical control panel made using specific components to withstand high temperatures, special cables and oversize protection parts that guarantee operation 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.

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 lower or equal to +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.

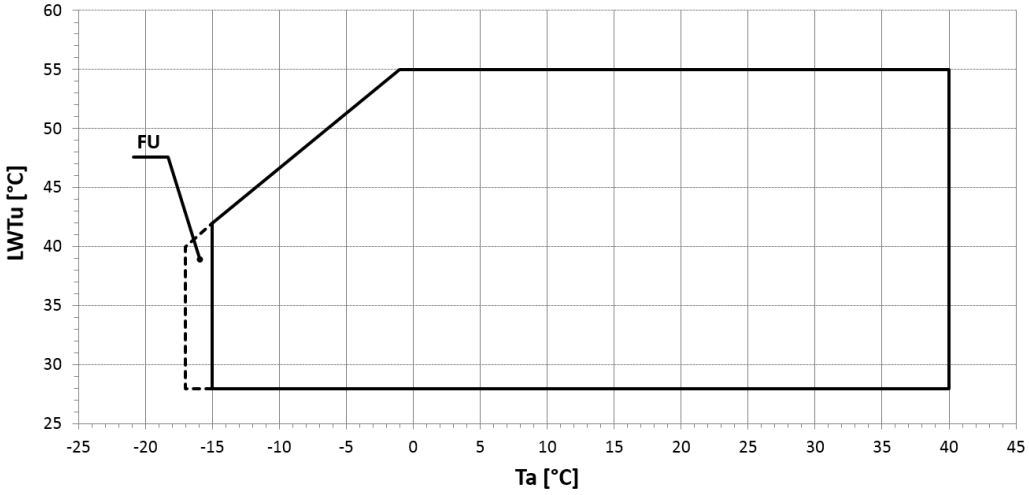
The inlet and outlet temperatures of the user-side exchanger must be given on ordering to allow correct setting of the alarm parameters and verification of the sizing of the expansion valve.

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.

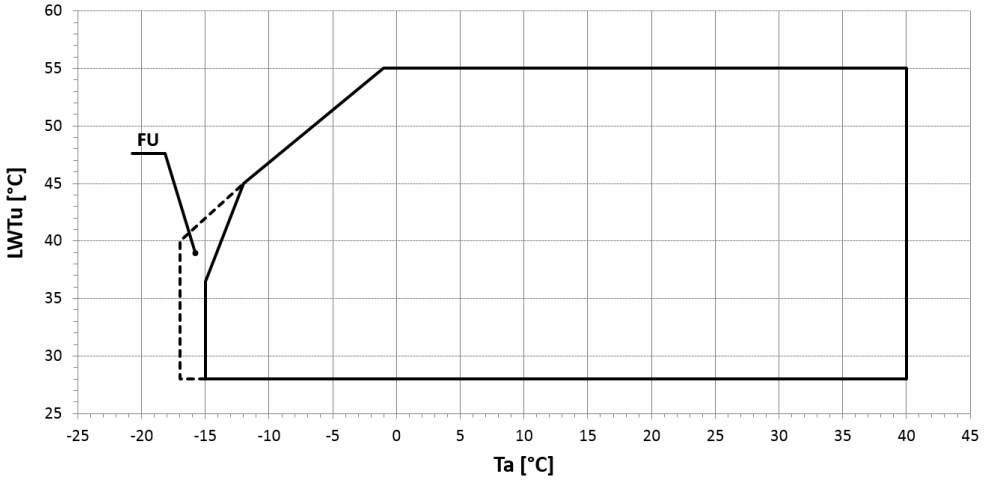
The unit will be optimized to work at the set point temperatures given on ordering. For different set points, the cooling capacity provided and the level of efficiency of the machine could decrease and move away from these conditions.

HEATING

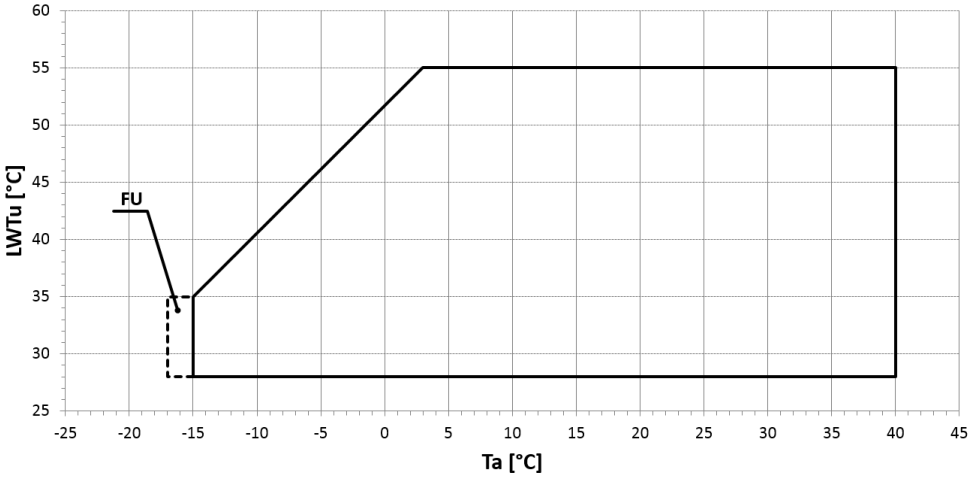
For models Tetris 2 A / Tetris 2 SLN 23.2



For models Tetris 2 A / Tetris 2 SLN 11.2, 38.4, 43.4, 47.4, 57.6, 64.6, 70.6

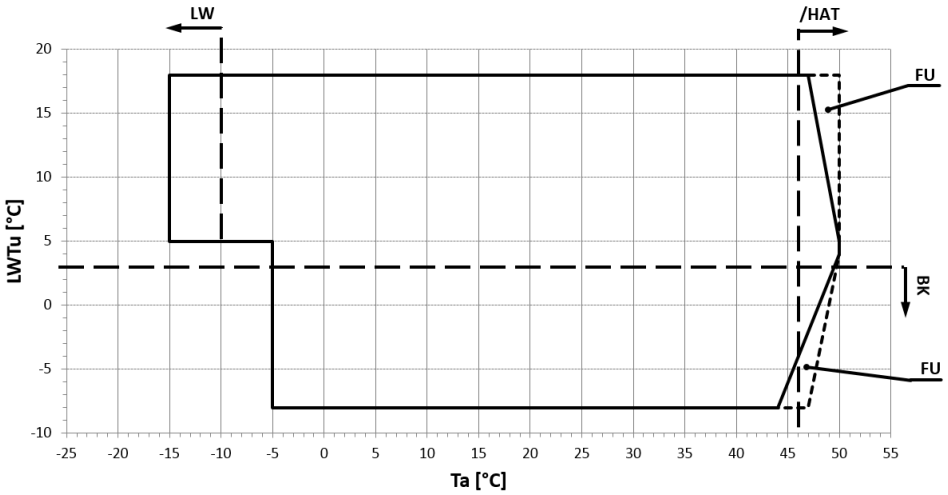


For models Tetris 2 A / Tetris 2 SLN 17.2, 28.4, 34.4, 50.6

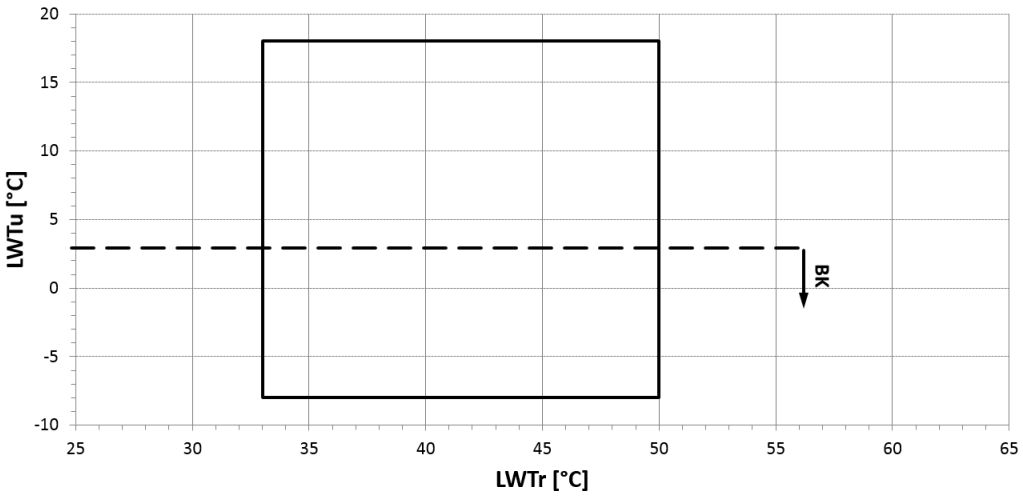


TETRIS 2 A+ - TETRIS 2 A SLN

COOLING



TOTAL RECOVERY



Ta: external air temperature

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

LWTr: water outlet temperature from the recovery exchanger

LW: in the indicated area, the unit can work only where there is no wind

/HAT: the /HAT version is obligatory in the area indicated by the arrow. The /HAT unit adopts an electrical control panel made using specific components to withstand high temperatures, special cables and oversize protection parts that guarantee operation 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.

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 lower or equal to +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.

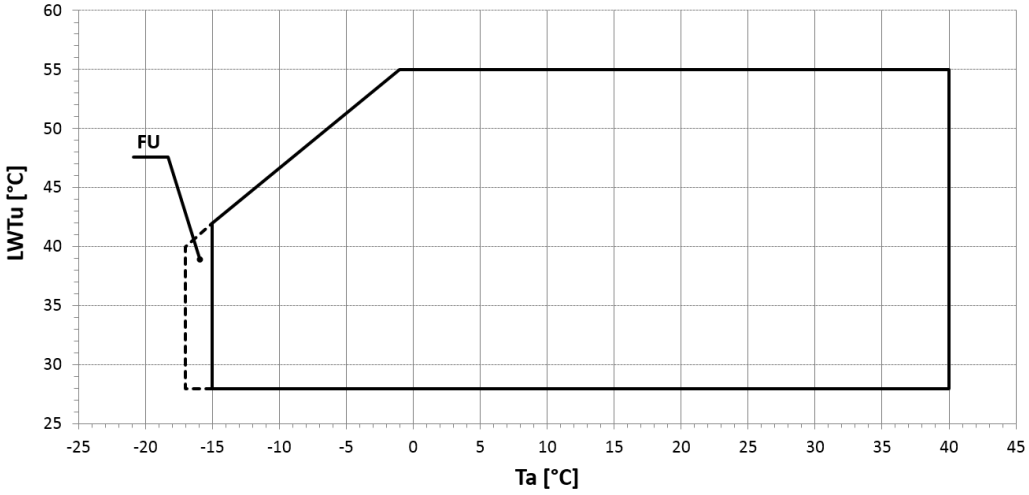
The inlet and outlet temperatures of the user-side exchanger must be given on ordering to allow correct setting of the alarm parameters and verification of the sizing of the expansion valve.

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.

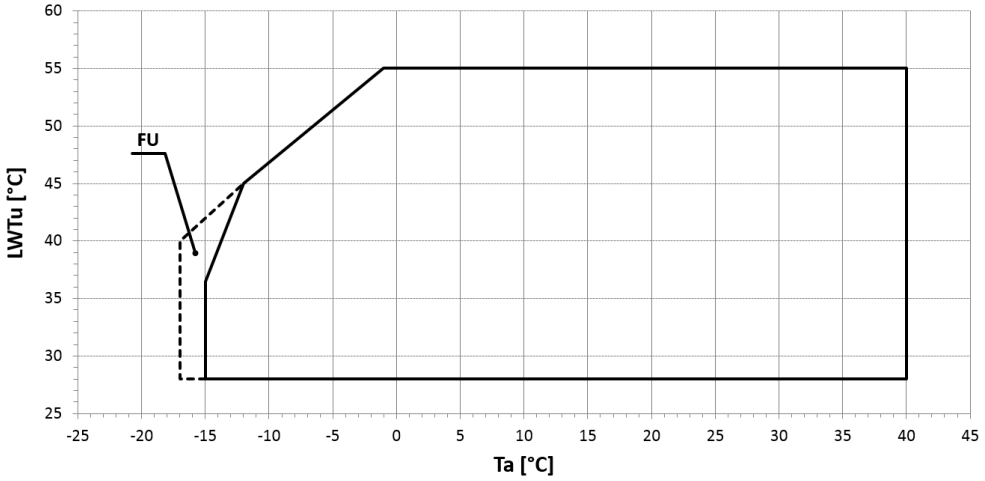
The unit will be optimized to work at the set point temperatures given on ordering. For different set points, the cooling capacity provided and the level of efficiency of the machine could decrease and move away from these conditions.

HEATING

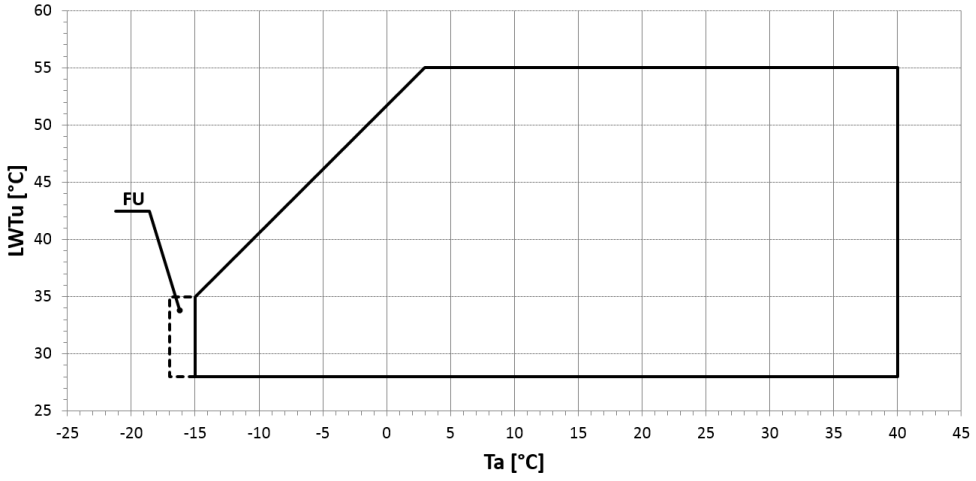
For models Tetris 2 A+ / Tetris 2 A SLN 8.2, 13.3, 18.4, 23.5, 27.6



For models Tetris 2 A+ / Tetris 2 A SLN 36.4, 54.6



For models Tetris 2 A+ / Tetris 2 A SLN 31.4, 41.5, 44.6, 49.6



NOISE LEVELS

TETRIS 2

	Octave bands [dB]																Total [dB(A)]	
	63 Hz		125 Hz		250 Hz		500 Hz		1000 Hz		2000 Hz		4000 Hz		8000 Hz			
	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw_tot	Lp_tot
10.2	87	55	86	54	85	53	84	52	85	53	82	50	73	41	66	34	**89**	**57**
12.2	87	55	86	54	85	53	84	52	85	53	82	50	73	41	66	34	**89**	**57**
13.2	87	55	86	54	85	53	84	52	85	53	82	50	73	41	66	34	**89**	**57**
15.2	88	56	87	55	86	54	85	53	85	53	83	51	74	42	67	35	**89**	**57**
16.2	88	56	87	55	86	54	85	53	85	53	83	51	74	42	67	35	**89**	**57**
20.3	91	59	90	58	89	57	88	56	88	56	85	53	77	45	70	38	**92**	**60**
24.3	91	59	90	58	89	57	88	56	88	56	85	53	77	45	70	38	**92**	**60**
27.3	94	62	93	61	92	60	91	59	91	59	88	56	80	48	73	41	**95**	**63**
29.4	94	62	93	61	92	60	91	59	91	59	88	56	80	48	73	41	**95**	**63**
32.4	95	63	94	62	93	61	92	60	92	60	89	57	81	49	74	42	**96**	**64**
33.4	96	64	95	63	94	62	93	61	93	61	90	58	82	50	75	43	**97**	**65**
37.4	96	64	95	63	94	62	93	61	93	61	90	58	82	50	75	43	**97**	**65**
41.4	96	64	95	63	94	62	93	61	93	61	90	58	82	50	75	43	**97**	**65**
43.6	96	64	95	63	94	62	93	61	93	61	90	58	82	50	75	43	**97**	**65**
47.6	96	64	95	63	94	62	93	61	93	61	90	58	82	50	75	43	**97**	**65**
50.7	97	65	96	64	95	63	94	62	94	62	91	59	83	51	76	44	**98**	**66**
53.8	99	67	98	66	97	65	96	64	95	63	93	61	85	53	77	45	**100**	**68**
58.8	99	67	98	66	97	65	96	64	95	63	93	61	85	53	77	45	**100**	**68**
62.8	99	67	98	66	97	65	96	64	95	63	93	61	85	53	77	45	**100**	**68**
67.9	99	66	98	65	97	64	96	63	95	62	93	60	85	52	77	44	**100**	**67**
70.9	99	66	98	65	97	64	96	63	95	62	93	60	85	52	77	44	**100**	**67**
74.10	100	67	99	66	98	65	97	64	96	63	94	61	86	53	78	45	**101**	**68**
78.10	100	67	99	66	98	65	97	64	96	63	94	61	86	53	78	45	**101**	**68**
80.12	101	68	100	67	99	66	98	65	97	64	95	62	87	54	79	46	**102**	**69**
87.12	101	68	100	67	99	66	98	65	97	64	95	62	87	54	79	46	**102**	**69**
93.12	101	68	100	67	99	66	98	65	97	64	95	62	87	54	79	46	**102**	**69**

Reference conditions: outside air temperature 35°C; input/output water temperature into/from user-side heat exchanger 12/7°C; unit operating at rated capacity, without any option.

Lw: sound power levels.

Values obtained from measures taken according to standard ISO 3744.

Lw_tot is the only binding value.

Lp: sound pressure levels.

Binding values starting from noise power levels referred to a distance of 10 m from the unit; source installed on a reflective surface and in ideal free field conditions 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.

TETRIS 2 /LN

	Octave bands [dB]																Total [dB(A)]	
	63 Hz		125 Hz		250 Hz		500 Hz		1000 Hz		2000 Hz		4000 Hz		8000 Hz			
	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw_tot	Lp_tot
10.2	86	54	82	50	84	52	84	52	82	50	74	42	66	34	59	27	**86**	**54**
12.2	86	54	82	50	84	52	84	52	82	50	74	42	66	34	59	27	**86**	**54**
13.2	86	54	82	50	84	52	84	52	82	50	74	42	66	34	59	27	**86**	**54**
15.2	87	55	83	51	85	53	85	53	82	50	75	43	67	35	60	28	**86**	**54**
16.2	87	55	83	51	85	53	85	53	82	50	75	43	67	35	60	28	**86**	**54**
20.3	88	56	85	53	86	54	86	54	83	51	76	44	69	37	62	30	**87**	**55**
24.3	89	57	87	55	87	55	87	55	84	52	76	44	69	37	62	30	**88**	**56**
27.3	90	58	87	55	88	56	88	56	85	53	77	45	70	38	63	31	**89**	**57**
29.4	91	59	87	55	89	57	88	56	86	54	77	45	70	38	63	31	**90**	**58**
32.4	92	60	88	56	90	58	90	58	87	55	79	47	72	40	65	33	**91**	**59**
33.4	93	61	89	57	91	59	91	59	88	56	80	48	73	41	66	34	**92**	**60**
37.4	93	61	89	57	91	59	91	59	88	56	80	48	73	41	66	34	**92**	**60**
41.4	94	62	90	58	92	60	92	60	89	57	81	49	74	42	67	35	**93**	**61**
43.6	94	62	90	58	92	60	92	60	89	57	81	49	74	42	67	35	**93**	**61**
47.6	94	62	90	58	92	60	92	60	89	57	81	49	74	42	67	35	**93**	**61**
50.7	95	63	91	59	93	61	93	61	90	58	82	50	75	43	68	36	**94**	**62**
53.8	96	64	92	60	94	62	94	62	91	59	83	51	76	44	69	37	**95**	**63**
58.8	96	64	92	60	94	62	94	62	91	59	83	51	76	44	69	37	**95**	**63**
62.8	96	64	92	60	94	62	94	62	91	59	83	51	76	44	69	37	**95**	**63**
67.9	97	64	93	60	95	62	95	62	93	60	84	51	77	44	70	37	**96**	**63**
70.9	97	64	93	60	95	62	95	62	93	60	84	51	77	44	70	37	**96**	**63**
74.10	98	65	94	61	96	63	96	63	92	59	85	52	78	45	70	37	**97**	**64**
78.10	99	66	95	62	97	64	97	64	93	60	86	53	79	46	71	38	**98**	**65**
80.12	100	67	96	63	98	65	98	65	94	61	87	54	80	47	72	39	**99**	**66**
87.12	100	67	96	63	98	65	98	65	94	61	87	54	80	47	72	39	**99**	**66**
93.12	100	67	96	63	98	65	98	65	94	61	87	54	80	47	72	39	**99**	**66**

Reference conditions: outside air temperature 35°C; input/output water temperature into/from user-side heat exchanger 12/7°C; unit operating at rated capacity, without any option.

Lw: sound power levels.

Values obtained from measures taken according to standard ISO 3744.

Lw_tot is the only binding value.

Lp: sound pressure levels.

Binding values starting from noise power levels referred to a distance of 10 m from the unit; source installed on a reflective surface and in ideal free field conditions 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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TETRIS 2 A

	Octave bands [dB]																Total [dB(A)]	
	63 Hz		125 Hz		250 Hz		500 Hz		1000 Hz		2000 Hz		4000 Hz		8000 Hz			
	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw_tot	Lp_tot
11.2	76	44	66	34	77	45	79	47	79	47	83	51	75	43	65	33	**86**	**54**
17.2	71	39	62	30	77	45	79	47	83	51	84	52	78	46	71	39	**88**	**56**
23.2	68	36	68	36	82	50	86	54	86	54	81	49	76	44	72	40	**89**	**57**
28.4	77	45	67	35	80	48	82	50	84	52	86	54	79	47	72	40	**90**	**58**
34.4	74	42	65	33	80	48	82	50	86	54	87	55	81	49	74	42	**91**	**59**
38.4	73	41	64	32	80	47	83	51	87	54	87	54	81	48	73	41	**91**	**59**
43.4	77	45	72	39	82	50	87	55	87	55	84	51	79	47	76	44	**91**	**58**
47.4	71	38	71	38	85	52	89	56	89	56	84	51	79	47	75	43	**92**	**59**
50.6	76	43	66	34	82	49	84	52	88	56	89	56	83	50	76	43	**93**	**61**
57.6	75	43	66	34	82	49	85	52	89	56	88	56	82	50	75	43	**93**	**61**
64.6	79	47	74	41	84	52	89	57	89	57	86	54	81	49	79	46	**93**	**61**
70.6	72	40	72	40	86	54	90	58	90	58	85	53	81	48	77	44	**93**	**61**

TETRIS 2 A/LN

	Octave bands [dB]																Total [dB(A)]	
	63 Hz		125 Hz		250 Hz		500 Hz		1000 Hz		2000 Hz		4000 Hz		8000 Hz			
	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw_tot	Lp_tot
11.2	73	41	63	31	74	42	75	43	75	43	79	47	71	39	62	30	**82**	**50**
17.2	67	35	59	27	73	41	75	43	79	47	80	48	74	42	68	36	**84**	**52**
23.2	65	33	65	33	78	46	82	50	82	50	77	45	73	41	69	37	**85**	**53**
28.4	73	41	64	32	76	44	78	46	80	48	82	50	76	44	69	37	**86**	**54**
34.4	70	38	62	30	76	44	79	47	82	50	83	51	77	45	71	39	**87**	**55**
38.4	70	37	61	29	76	44	79	47	83	50	83	50	77	44	70	37	**87**	**55**
43.4	74	41	68	36	78	46	83	51	83	51	80	48	75	43	73	40	**87**	**54**
47.4	68	35	67	35	81	48	84	52	85	52	80	48	76	43	72	39	**88**	**55**
50.6	72	40	63	31	78	46	80	48	84	52	85	52	79	46	72	40	**89**	**57**
57.6	72	39	63	31	78	45	81	48	85	52	84	52	79	46	72	39	**89**	**57**
64.6	76	43	70	38	80	48	85	53	85	53	82	50	78	45	75	42	**89**	**57**
70.6	69	37	69	37	82	50	86	53	86	54	82	49	77	45	73	41	**89**	**57**

Reference conditions: outside air temperature 35°C; input/output water temperature into/from user-side heat exchanger 12/7°C; unit operating at rated capacity, without any option.

Lw: sound power levels.

Values obtained from measures taken according to standard ISO 3744.

Lw_tot is the only binding value.

Lp: sound pressure levels.

Binding values starting from noise power levels referred to a distance of 10 m from the unit; source installed on a reflective surface and in ideal free field conditions 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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TETRIS 2 SLN

	Octave bands [dB]																Total [dB(A)]	
	63 Hz		125 Hz		250 Hz		500 Hz		1000 Hz		2000 Hz		4000 Hz		8000 Hz			
	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw_tot	Lp_tot
11.2	70	38	61	29	71	39	72	40	72	40	76	44	69	37	60	28	**79**	**47**
17.2	66	34	57	25	71	39	74	42	77	45	78	46	72	40	66	34	**82**	**50**
23.2	63	31	62	30	75	43	79	47	79	47	75	43	70	38	67	35	**82**	**50**
28.4	71	39	62	30	74	42	76	44	78	46	80	48	74	42	67	35	**84**	**52**
34.4	69	37	60	28	74	42	77	45	80	48	81	49	75	43	69	37	**85**	**53**
38.4	68	36	60	27	74	42	77	45	81	48	81	48	75	42	68	36	**85**	**53**
43.4	72	39	66	34	76	44	81	48	81	48	78	45	73	41	71	38	**85**	**52**
47.4	65	33	65	33	78	46	82	49	82	49	78	45	73	41	70	37	**85**	**53**
50.6	70	38	62	29	76	44	78	46	82	50	83	50	77	44	71	38	**87**	**55**
57.6	70	38	62	29	76	44	79	46	83	50	82	50	77	44	70	37	**87**	**55**
64.6	74	41	68	36	78	45	83	50	83	50	80	47	75	43	73	40	**87**	**54**
70.6	67	35	67	35	80	47	84	51	84	51	79	47	75	42	71	39	**87**	**55**

TETRIS 2 A+

	Octave bands [dB]																Total [dB(A)]	
	63 Hz		125 Hz		250 Hz		500 Hz		1000 Hz		2000 Hz		4000 Hz		8000 Hz			
	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw_tot	Lp_tot
8.2	62	30	60	28	75	43	75	43	80	48	74	42	72	40	66	34	**83**	**51**
13.3	62	30	60	28	76	44	77	45	83	51	76	44	73	41	66	34	**85**	**53**
18.4	76	44	66	34	77	45	79	47	79	47	83	51	75	43	65	33	**86**	**54**
23.5	66	34	64	32	79	47	79	47	84	52	78	46	76	44	71	39	**87**	**55**
27.6	71	39	62	30	77	45	79	47	83	51	84	52	78	46	71	39	**88**	**56**
31.4	76	43	66	34	82	49	84	52	88	56	89	56	83	50	76	43	**93**	**61**
36.4	76	43	66	34	82	49	84	52	88	56	89	56	83	50	76	43	**93**	**61**
41.5	95	63	91	59	93	61	93	61	90	58	82	50	75	43	68	36	**94**	**62**
44.6	96	64	92	60	94	62	94	62	91	59	83	51	76	44	69	37	**95**	**63**
49.6	96	64	92	60	94	62	94	62	91	59	83	51	76	44	69	37	**95**	**63**
54.6	96	64	92	60	94	62	94	62	91	59	83	51	76	44	69	37	**95**	**63**

Reference conditions: outside air temperature 35°C; input/output water temperature into/from user-side heat exchanger 12/7°C; unit operating at rated capacity, without any option.

Lw: sound power levels.

Values obtained from measures taken according to standard ISO 3744.

Lw_tot is the only binding value.

Lp: sound pressure levels.

Binding values starting from noise power levels referred to a distance of 10 m from the unit; source installed on a reflective surface and in ideal free field conditions 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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TETRIS 2 A+ /LN

	Octave bands [dB]																Total [dB(A)]	
	63 Hz		125 Hz		250 Hz		500 Hz		1000 Hz		2000 Hz		4000 Hz		8000 Hz			
	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw_tot	Lp_tot
8.2	61	29	56	24	74	42	75	43	77	45	66	34	65	33	59	27	**79**	**47**
13.3	61	29	56	24	75	43	77	45	79	47	68	36	66	34	59	27	**81**	**49**
18.4	64	32	59	27	77	45	79	47	80	48	69	37	68	36	63	31	**82**	**50**
23.5	65	33	60	28	78	46	79	47	81	49	70	38	69	37	64	32	**83**	**51**
27.6	65	33	60	28	79	47	80	48	82	50	72	40	70	38	64	32	**84**	**52**
31.4	68	36	68	36	82	50	86	54	86	54	81	49	76	44	72	40	**89**	**57**
36.4	68	36	68	36	82	50	86	54	86	54	81	49	76	44	72	40	**89**	**57**
41.5	77	45	67	35	80	48	82	50	84	52	86	54	79	47	72	40	**90**	**58**
44.6	74	42	65	33	80	48	82	50	86	54	87	55	81	49	74	42	**91**	**59**
49.6	73	41	64	32	80	47	83	51	87	54	87	54	81	48	73	41	**91**	**59**
54.6	73	41	64	32	80	47	83	51	87	54	87	54	81	48	73	41	**91**	**59**

TETRIS 2 A SLN

	Octave bands [dB]																Total [dB(A)]	
	63 Hz		125 Hz		250 Hz		500 Hz		1000 Hz		2000 Hz		4000 Hz		8000 Hz			
	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw_tot	Lp_tot
8.2	60	28	52	20	73	41	74	42	73	41	57	25	57	25	51	19	**76**	**44**
13.3	60	28	52	20	74	42	76	44	75	43	60	28	58	26	51	19	**78**	**46**
18.4	63	31	55	23	76	44	78	46	76	44	60	28	60	28	55	23	**79**	**47**
23.5	64	32	56	24	77	45	78	46	77	45	61	29	61	29	56	24	**80**	**48**
27.6	64	32	56	24	78	46	79	47	78	46	63	31	62	30	56	24	**81**	**49**
31.4	73	41	64	32	76	44	78	46	80	48	82	50	76	44	69	37	**86**	**54**
36.4	73	41	64	32	76	44	78	46	80	48	82	50	76	44	69	37	**86**	**54**
41.5	70	38	62	30	76	44	79	47	82	50	83	51	77	45	71	39	**87**	**55**
44.6	89	57	87	55	87	55	87	55	84	52	76	44	69	37	62	30	**88**	**56**
49.6	89	57	87	55	87	55	87	55	84	52	76	44	69	37	62	30	**88**	**56**
54.6	89	57	87	55	87	55	87	55	84	52	76	44	69	37	62	30	**88**	**56**

Reference conditions: outside air temperature 35°C; input/output water temperature into/from user-side heat exchanger 12/7°C; unit operating at rated capacity, without any option.

Lw: sound power levels.

Values obtained from measures taken according to standard ISO 3744.

Lw_tot is the only binding value.

Lp: sound pressure levels.

Binding values starting from noise power levels referred to a distance of 10 m from the unit; source installed on a reflective surface and in ideal free field conditions with directivity factor Q=2. Non-binding values

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CONFIGURATIONS THAT ARE NOT POSSIBLE

TETRIS 2

	CHILLER ONLY												HEAT PUMP					
	/DC /1P	/DC /2P	/DC /3P	/DC /1PS	/DC /2PS	/DC /3PS	/DS /1P	/DS /2P	/DS /3P	/DS /1PS	/DS /2PS	/DS /3PS	HP /DS /1P	HP /DS /2P	HP /DS /3P	HP /DS /1PS	HP /DS /2PS	HP /DS /3PS
10.2			n.a.			n.a.			n.a.			n.a.		n.a.	n.a.		n.a.	n.a.
12.2			n.a.			n.a.			n.a.			n.a.		n.a.	n.a.		n.a.	n.a.
13.2			n.a.			n.a.			n.a.			n.a.		n.a.	n.a.		n.a.	n.a.
15.2			n.a.			n.a.			n.a.			n.a.		n.a.	n.a.		n.a.	n.a.
16.2			n.a.			n.a.			n.a.			n.a.		n.a.	n.a.		n.a.	n.a.
20.3			n.a.	n.a.	n.a.	n.a.			n.a.	n.a.	n.a.	n.a.			n.a.	n.a.	n.a.	n.a.
24.3			n.a.	n.a.	n.a.	n.a.			n.a.	n.a.	n.a.	n.a.			n.a.	n.a.	n.a.	n.a.
27.4		n.a.		n.a.	n.a.	n.a.		n.a.		n.a.	n.a.	n.a.		n.a.		n.a.	n.a.	n.a.
29.4		n.a.		n.a.	n.a.	n.a.		n.a.		n.a.	n.a.	n.a.		n.a.		n.a.	n.a.	n.a.
32.4		n.a.		n.a.	n.a.	n.a.		n.a.		n.a.	n.a.	n.a.		n.a.		n.a.	n.a.	n.a.
33.4		n.a.			n.a.			n.a.			n.a.			n.a.			n.a.	
37.4		n.a.			n.a.			n.a.			n.a.			n.a.			n.a.	
41.4		n.a.			n.a.			n.a.			n.a.			n.a.			n.a.	
43.6		n.a.			n.a.			n.a.			n.a.			n.a.			n.a.	
47.6		n.a.			n.a.			n.a.			n.a.			n.a.			n.a.	
50.7	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
53.8	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
58.8	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
62.8	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
67.9	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
70.9	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
74.10	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
78.10	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
80.12	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
87.12	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
93.12	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

n.a.: configuration not available

TETRIS 2 A - TETRIS 2 SLN

	CHILLER ONLY												HEAT PUMP					
	/DC / 1P	/DC / 2P	/DC / 3P	/DC /1PS	/DC /2PS	/DC /3PS	/DS / 1P	/DS / 2P	/DS / 3P	/DS /1PS	/DS /2PS	/DS /3PS	HP /DS /1P	HP /DS / 2P	HP /DS / 3P	HP /DS /1PS	HP /DS /2PS	HP /DS /3PS
11.2			n.a.			n.a.			n.a.			n.a.		n.a.	n.a.		n.a.	n.a.
17.2			n.a.	n.a.	n.a.	n.a.			n.a.	n.a.	n.a.	n.a.			n.a.	n.a.	n.a.	n.a.
23.2		n.a.		n.a.	n.a.	n.a.		n.a.		n.a.	n.a.	n.a.		n.a.		n.a.	n.a.	n.a.
28.4		n.a.			n.a.			n.a.			n.a.			n.a.			n.a.	
34.4		n.a.			n.a.			n.a.			n.a.			n.a.			n.a.	
38.4		n.a.			n.a.			n.a.			n.a.			n.a.			n.a.	
43.4		n.a.			n.a.			n.a.			n.a.			n.a.			n.a.	
47.4		n.a.			n.a.			n.a.			n.a.			n.a.			n.a.	
50.6		n.a.			n.a.			n.a.			n.a.			n.a.			n.a.	
57.6		n.a.			n.a.			n.a.			n.a.			n.a.			n.a.	
64.6		n.a.			n.a.			n.a.			n.a.			n.a.			n.a.	
70.6		n.a.			n.a.			n.a.			n.a.			n.a.			n.a.	

n.a.: configuration not available

TETRIS 2 A+ - TETRIS 2 A SLN

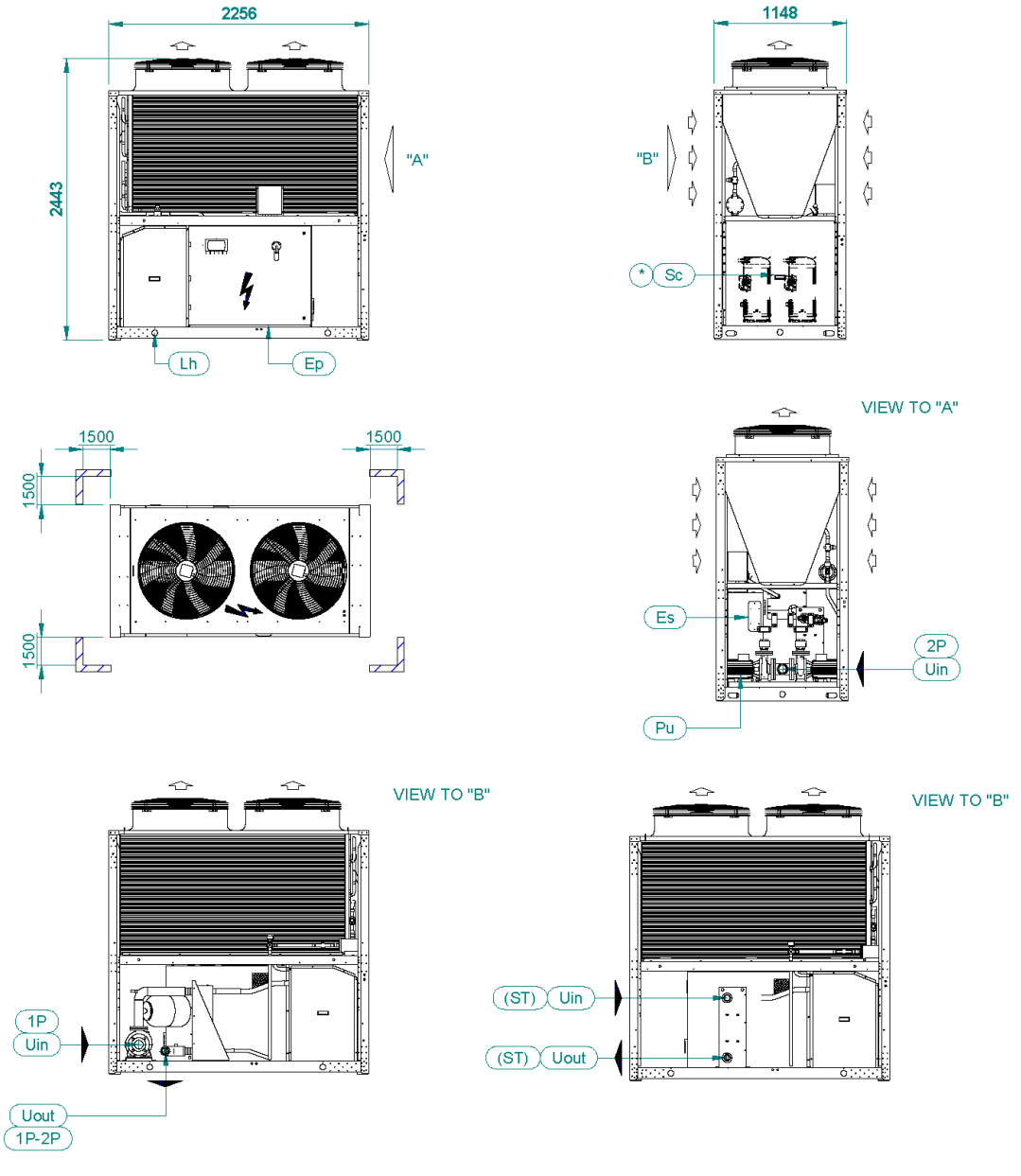
	CHILLER ONLY												HEAT PUMP					
	/DC / 1P	/DC / 2P	/DC / 3P	/DC /1PS	/DC /2PS	/DC /3PS	/DS / 1P	/DS / 2P	/DS / 3P	/DS /1PS	/DS /2PS	/DS /3PS	HP /DS /1P	HP /DS / 2P	HP /DS / 3P	HP /DS /1PS	HP /DS /2PS	HP /DS /3PS
8.2			n.a.			n.a.			n.a.			n.a.		n.a.	n.a.		n.a.	n.a.
13.3			n.a.	n.a.	n.a.	n.a.			n.a.	n.a.	n.a.	n.a.			n.a.	n.a.	n.a.	n.a.
18.4		n.a.		n.a.	n.a.	n.a.		n.a.		n.a.	n.a.	n.a.		n.a.		n.a.	n.a.	n.a.
23.5		n.a.			n.a.			n.a.			n.a.			n.a.			n.a.	
27.6		n.a.			n.a.			n.a.			n.a.			n.a.			n.a.	
31.4		n.a.			n.a.			n.a.			n.a.			n.a.			n.a.	
36.4		n.a.			n.a.			n.a.			n.a.			n.a.			n.a.	
41.5		n.a.			n.a.			n.a.			n.a.			n.a.			n.a.	
46.6		n.a.			n.a.			n.a.			n.a.			n.a.			n.a.	
49.6		n.a.			n.a.			n.a.			n.a.			n.a.			n.a.	
54.6		n.a.			n.a.			n.a.			n.a.			n.a.			n.a.	

n.a.: configuration not available

DIMENSIONAL DIAGRAMS

TETRIS 2 10.2-16.2 (ST)-1P-2P

A4F849A

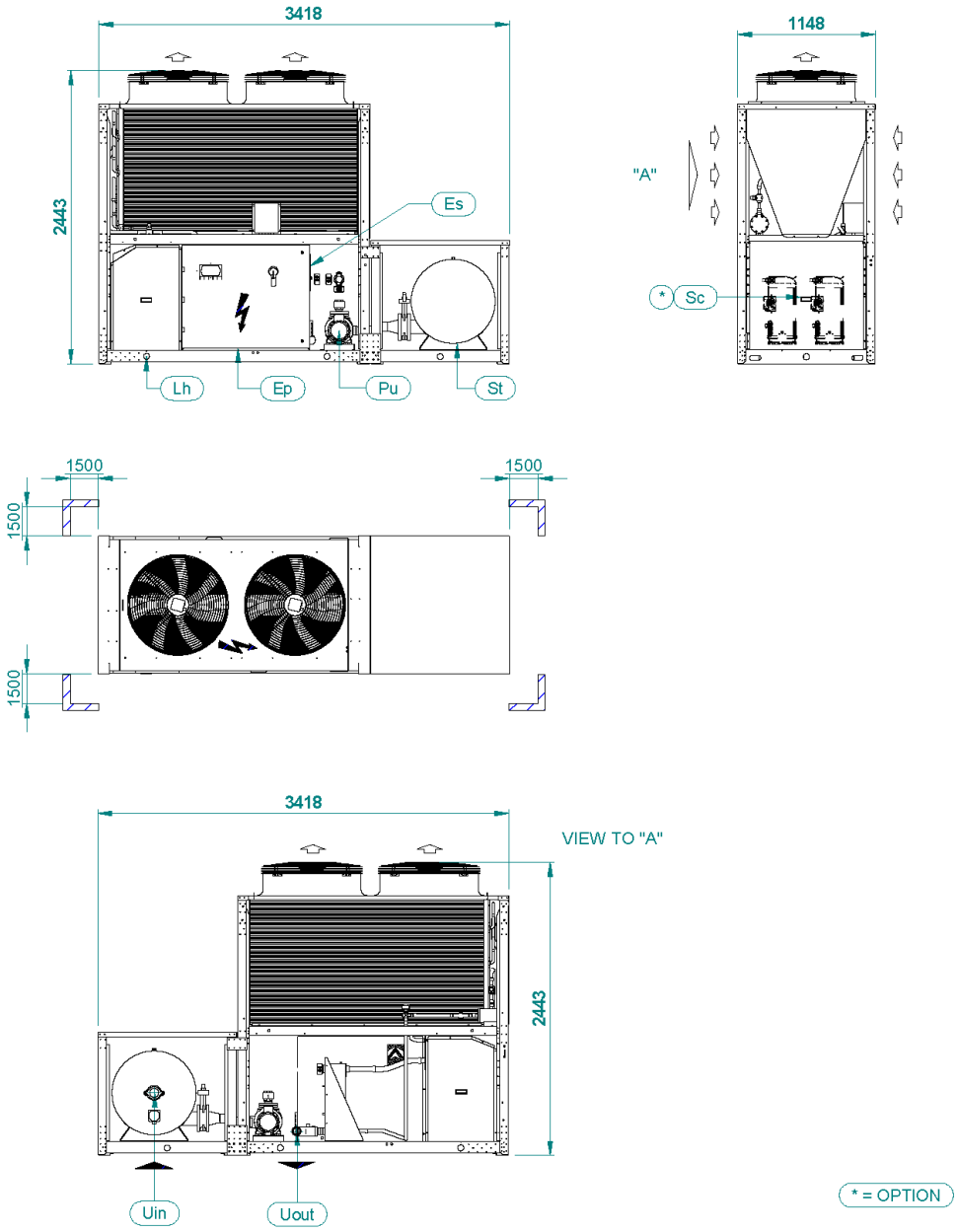


SIZE	10.2	12.2	13.2	15.2	16.2
Uin (ST)	G 2"M	G 2"M	G 2"M	G 2"M	G 2"M
Uin 1P	OD 60.3	G 2"1/2 F	G 2"1/2 F	G 2"1/2 F	G 2"1/2 F
Uin 2P	G 2"F	G 2"1/2 F	G 2"1/2 F	G 2"1/2 F	G 2"1/2 F
Uout	G 2"M	G 2"M	G 2"M	G 2"M	G 2"M
	OD 60.3 grooved connection				

Note: These drawings are not contractually binding. For the installation design, refer to the specific dimensional drawing available on request.

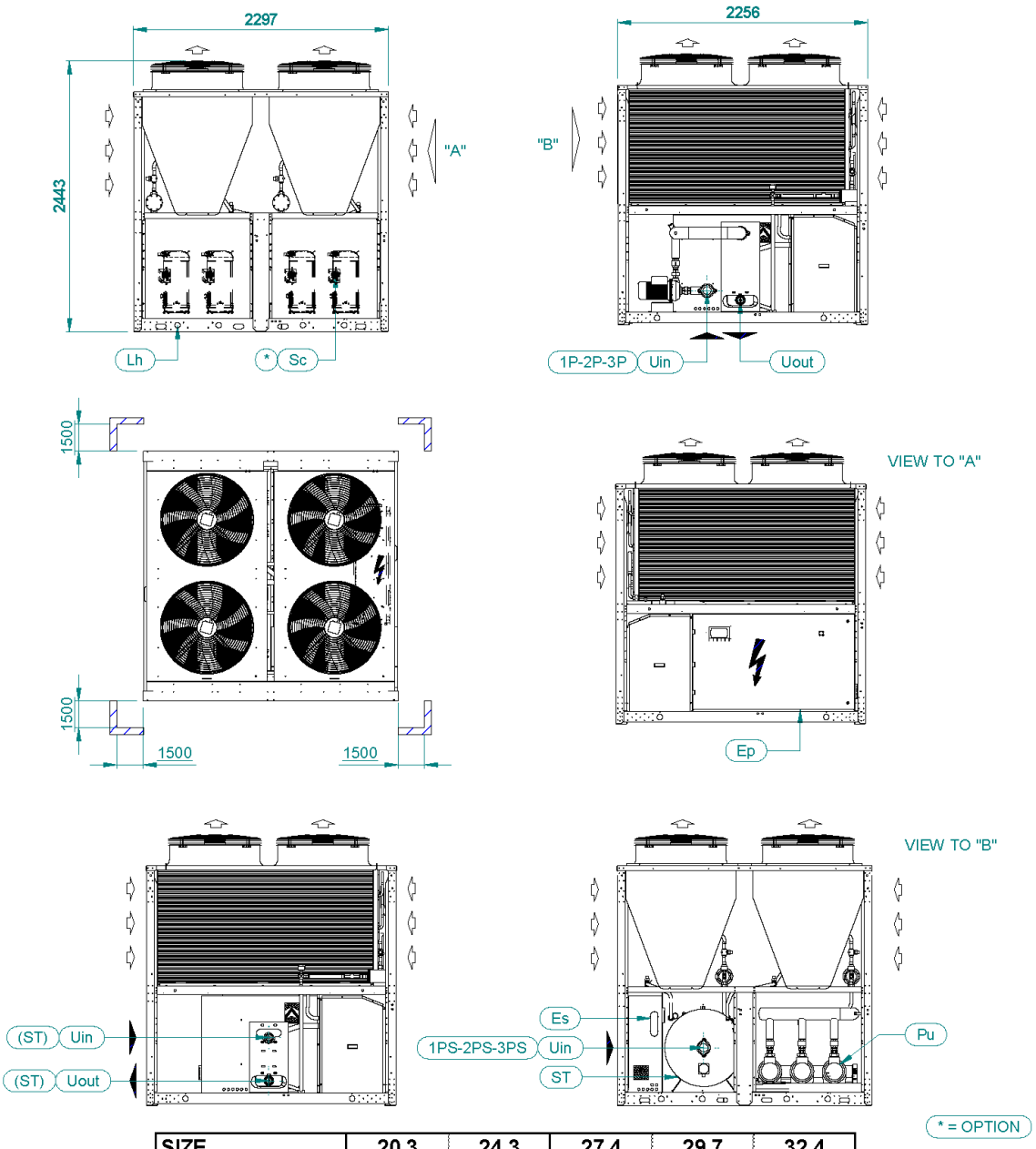
TETRIS 2 10.2-16.2 1PS-2PS

A4F850A



SIZE	10.2	12.2	13.2	15.2	16.2
Uin 1PS -2PS	OD 88.9	OD 88.9	OD 88.9	OD 88.9	OD 88.9
Uout	G 2"M	G 2"M	G 2"M	G 2"M	G 2"M
	OD 88.9 grooved connection				

Note: These drawings are not contractually binding. For the installation design, refer to the specific dimensional drawing available on request.

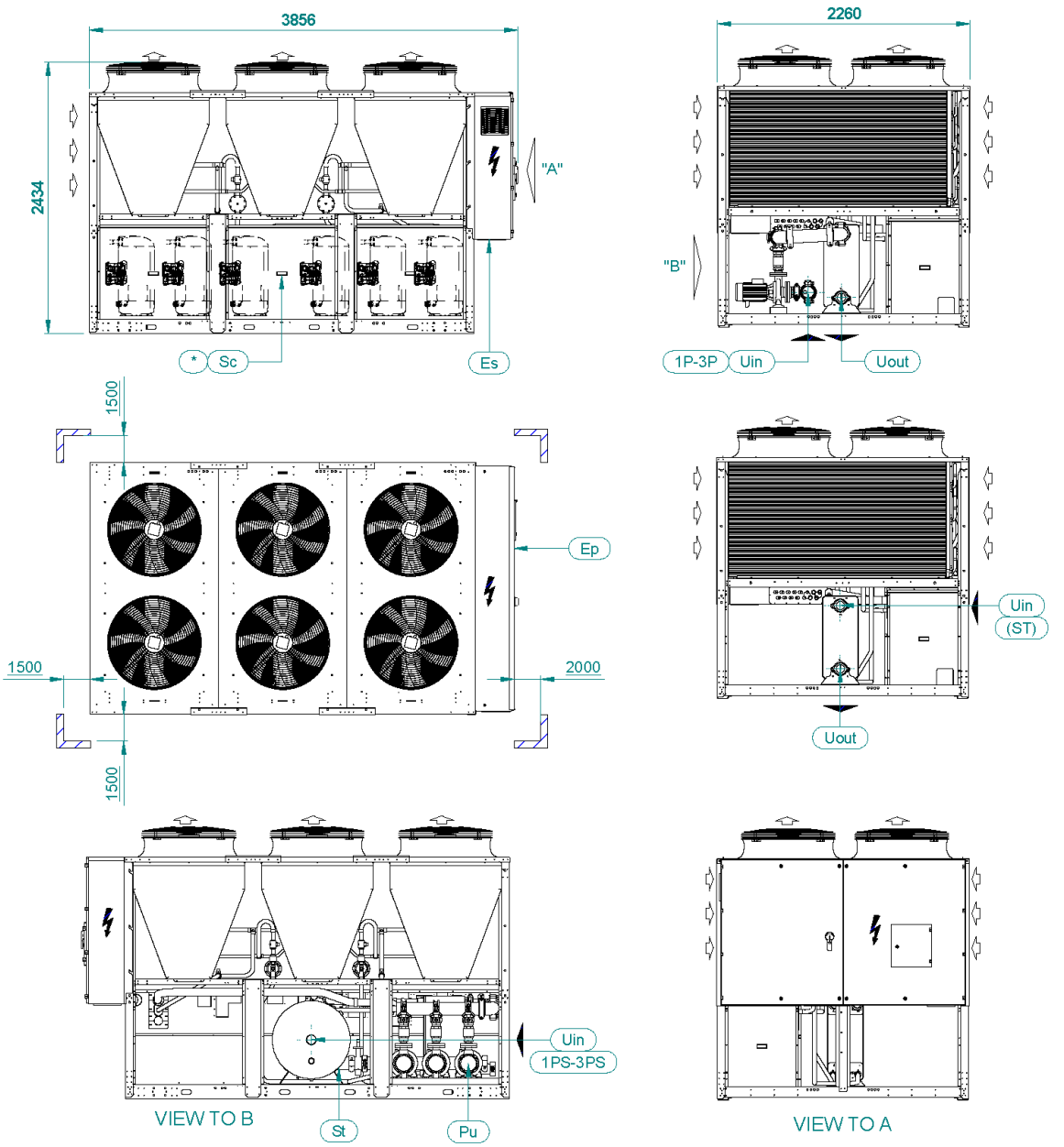


SIZE	20.3	24.3	27.4	29.7	32.4
Uin (ST)	G 2"M	G 2"M	OD 88.9	OD 88.9	OD 88.9
Uin 1P	OD 76.1	OD 76.1	OD 76.1	OD 76.1	OD 76.1
Uin 2P	OD 76.1	OD 76.1	-	-	-
Uin 3P	-	-	OD 114.3	OD 114.3	OD 114.3
Uin 1PS-2PS-3SP	OD 88.9	OD 88.9	OD 88.9	OD 88.9	OD 88.9
Uout	G 2"M	G 2"M	OD 88.9	OD 88.9	OD 88.9
	OD 76.1, OD 88.9 and OD 114.3 are grooved connections				

Note: These drawings are not contractually binding. For the installation design, refer to the specific dimensional drawing available on request.

TETRIS 2 33.4-47.6

A4F852A



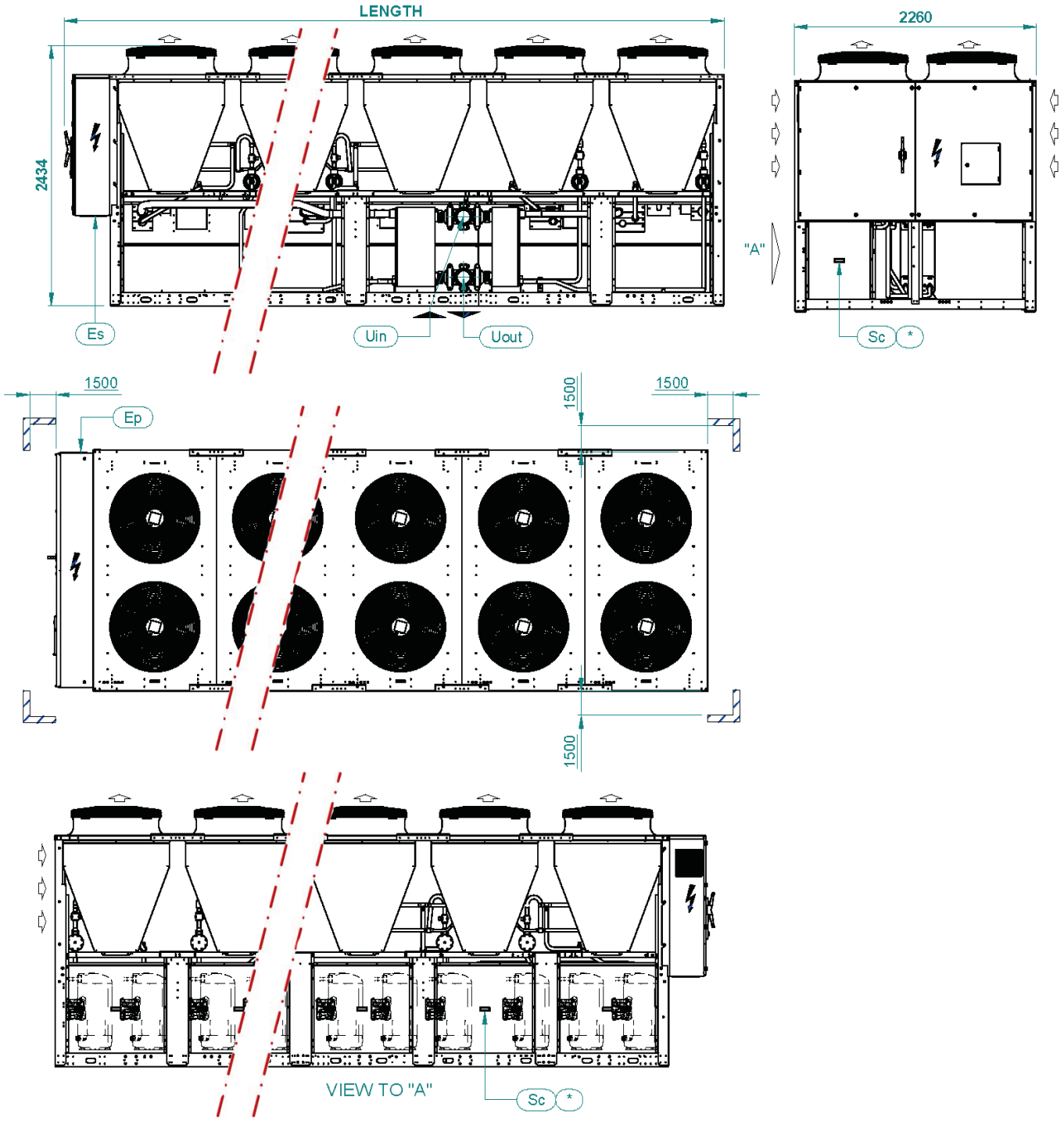
* = OPTION

SIZE	33.4	37.4	41.4	43.6	47.6
Uin (ST)	OD 88.9	OD 88.9	OD 88.9	OD 88.9	OD 88.9
Uin 1P	OD 76.1	OD 76.1	OD 88.9	OD 88.9	OD 88.9
Uin 3P	OD 114.3	OD 114.3	OD 114.3	OD 114.3	OD 114.3
Uin 1PS-3PS	OD 88.9	OD 88.9	OD 88.9	OD 88.9	OD 88.9
Uout	OD 88.9	OD 88.9	OD 88.9	OD 88.9	OD 88.9
	OD 76.1, OD 88.9 and OD 114.3 are grooved connections				

Note: These drawings are not contractually binding. For the installation design, refer to the specific dimensional drawing available on request.

TETRIS 2 50.7-93.12 (ST)

A4F853A

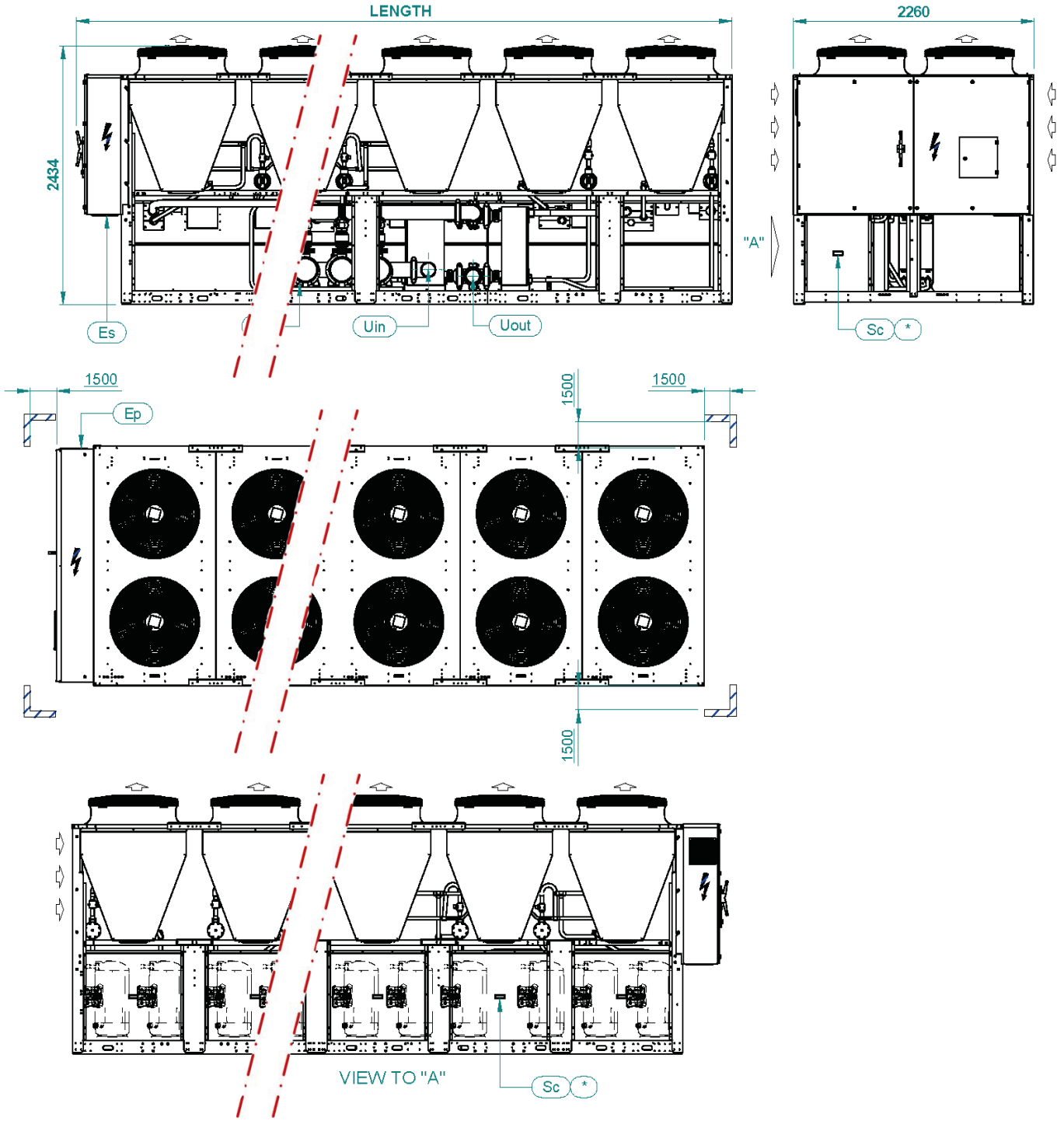


SIZE	50.7	53.8	58.8	62.8	67.9	70.9	74.10	78.10	80.12	87.12	93.12
LENGTH (mm)	5022	5022			6153		6153		7302		
Uin	OD 114.3	OD 114.3	OD 114.3	OD 114.3	OD 139.7	OD 139.7	OD 139.7	OD 139.7	OD 139.7	OD 139.7	OD 139.7
Uout	OD 114.3	OD 114.3	OD 114.3	OD 114.3	OD 139.7	OD 139.7	OD 139.7	OD 139.7	OD 139.7	OD 139.7	OD 139.7
	OD 114.3 and OD 139.7 are grooved connections										

Note: These drawings are not contractually binding. For the installation design, refer to the specific dimensional drawing available on request.

TETRIS 2 50.7-93.12 1P-3P

A4F854A

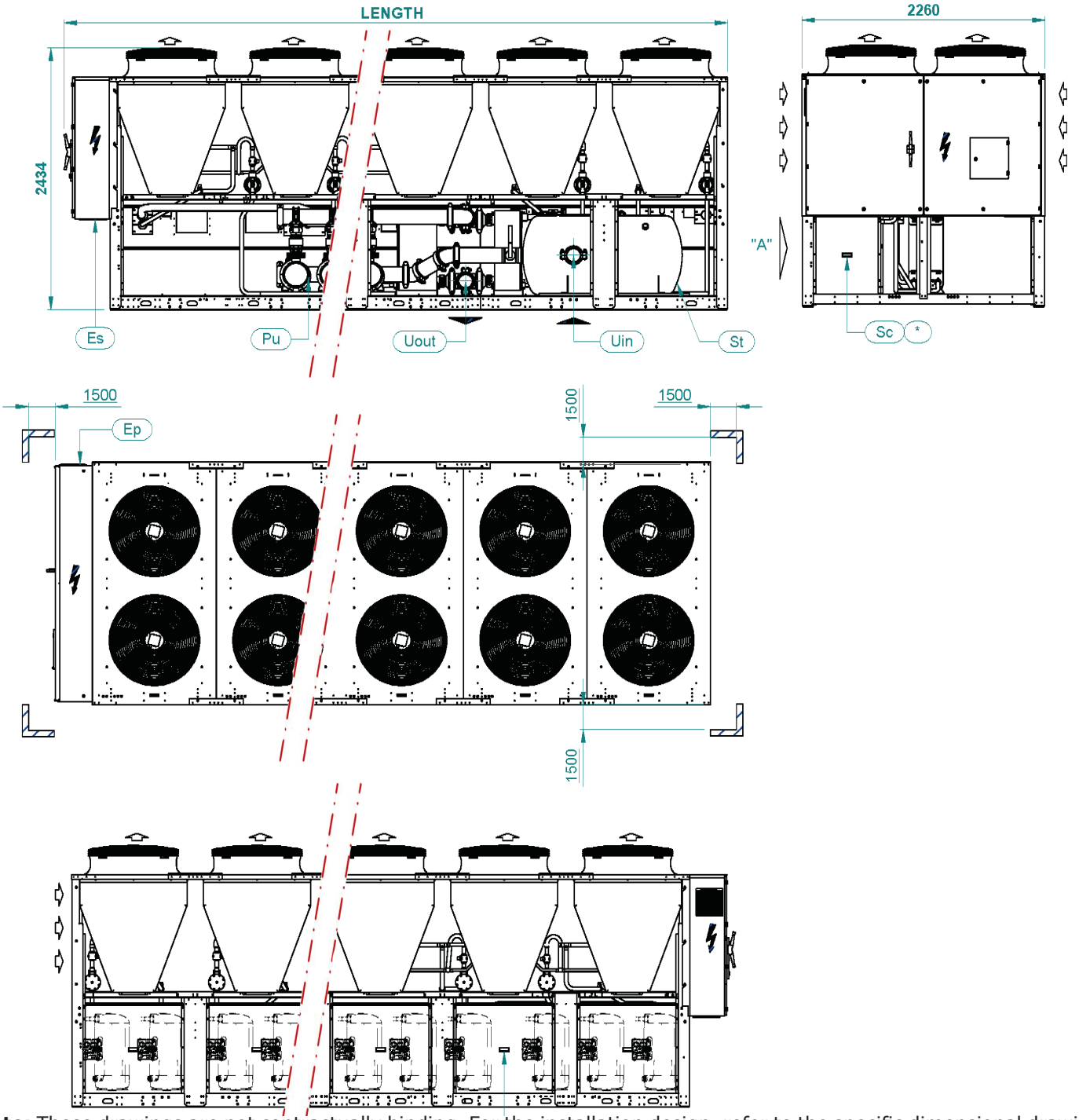


SIZE	50.7	53.8	58.8	62.8	67.9	70.9	74.10	78.10	80.12	87.12	93.12
LENGTH (mm)	5022	5022			6153		6153		7302		
Uin 1P	OD 114.3	OD 114.3	OD 114.3	OD 114.3	OD 139.7	OD 139.7	OD 139.7	OD 139.7	OD 139.7	OD 139.7	OD 139.7
Uin 3P	OD 114.3	OD 114.3	OD 139.7	OD 139.7	OD 139.7	OD 139.7	OD 139.7	OD 139.7	OD 139.7	OD 139.7	OD 139.7
Uout 1P-3P	OD 114.3	OD 114.3	OD 114.3	OD 114.3	OD 139.7	OD 139.7	OD 139.7	OD 139.7	OD 139.7	OD 139.7	OD 139.7
	OD 114.3 and OD 139.7 are grooved connections										

Note: These drawings are not contractually binding. For the installation design, refer to the specific dimensional drawing available on request.

TETRIS 2 50.7-93.12 1PS-3PS

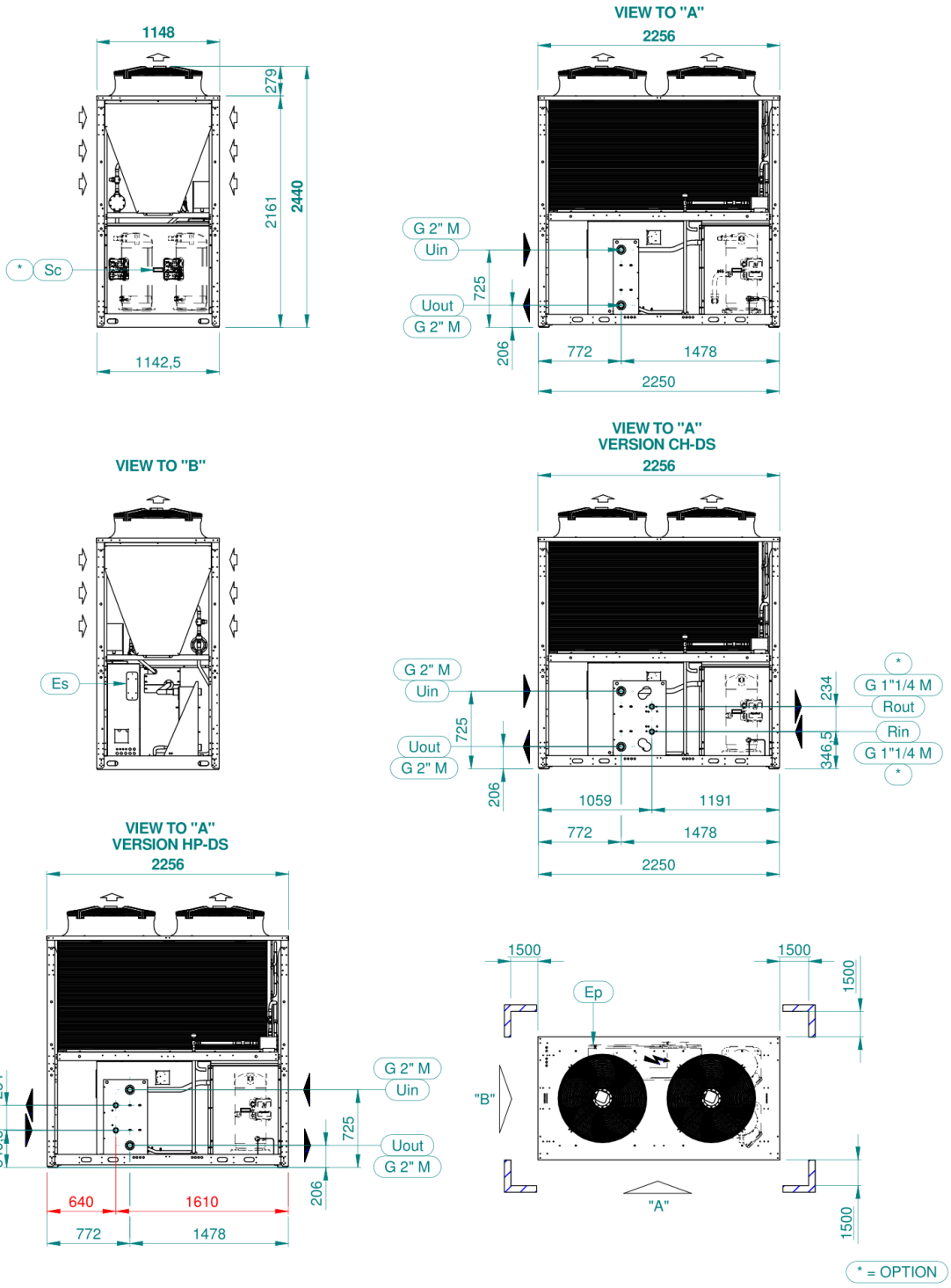
A4F855A



Note: These drawings are not contractually binding. For the installation design, refer to the specific dimensional drawing available on request.

TETRIS 2 A / TETRIS 2 SLN 11.2

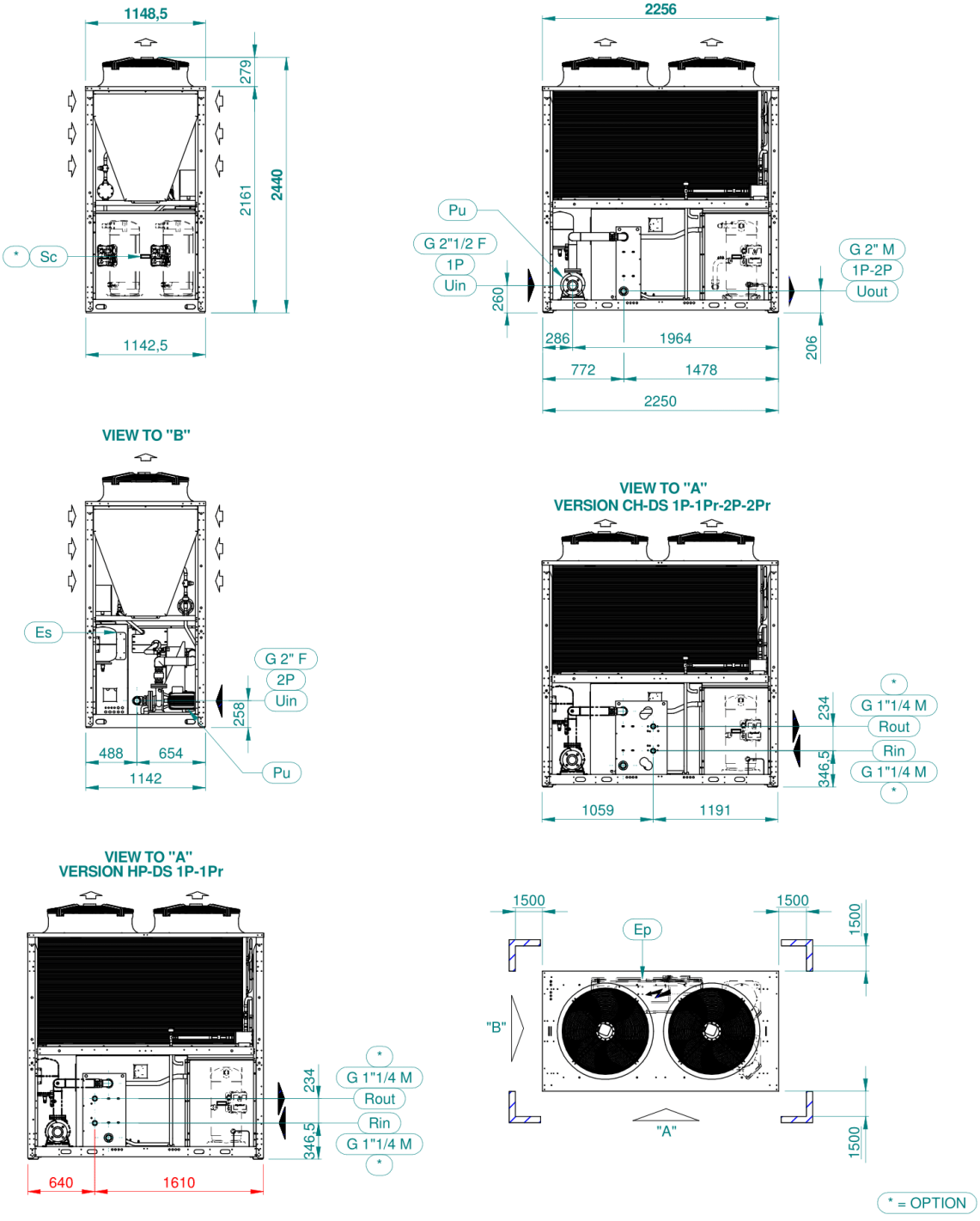
A4F385C



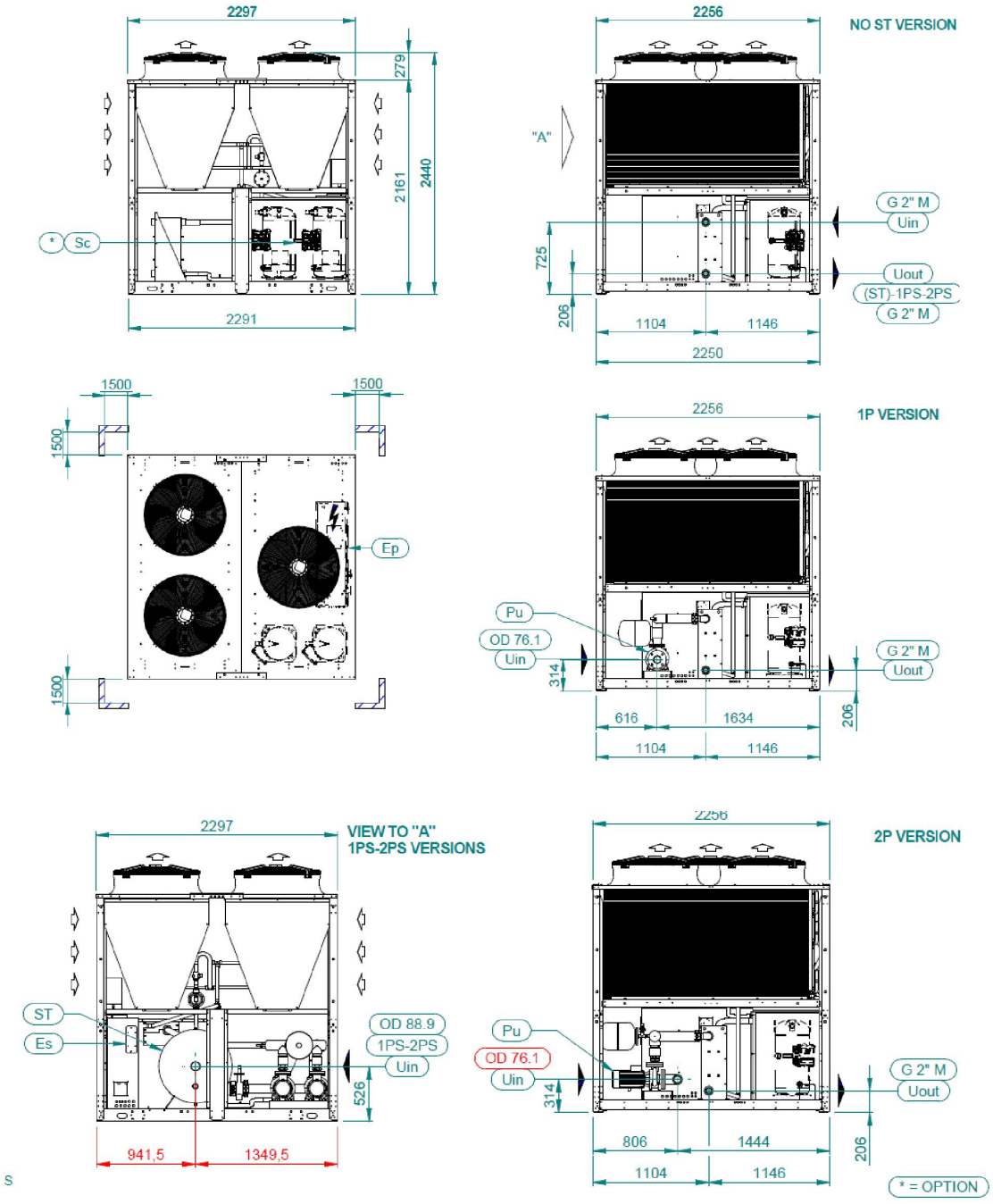
Note: These drawings are not contractually binding. For the installation design, refer to the specific dimensional drawing available on request.

TETRIS 2 A / TETRIS 2 SLN 11.2 1P-1PR-2P-2PR

A4F386C



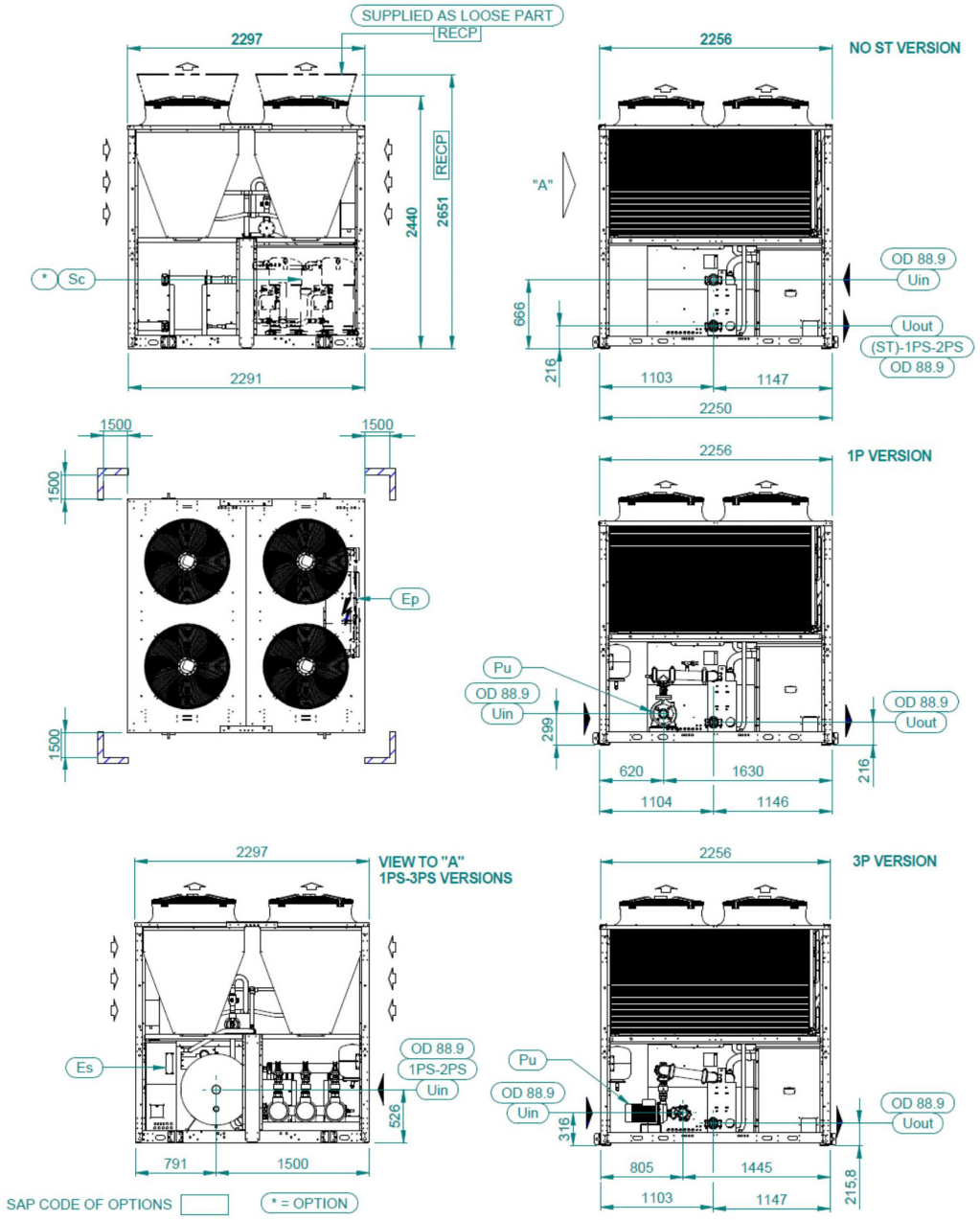
Note: These drawings are not contractually binding. For the installation design, refer to the specific dimensional drawing available on request.



SIZE	17.2
Uin (ST)	G 2"M
Uin 1P	OD 76.1
Uin 2P	OD 76.1
Uin 3P	-
Uin 1PS-2PS-3SP	OD 88.9
Uout	G 2"M

OD 76.1, OD 88.9 are grooved connections

Note: These drawings are not contractually binding. For the installation design, refer to the specific dimensional drawing available on request.



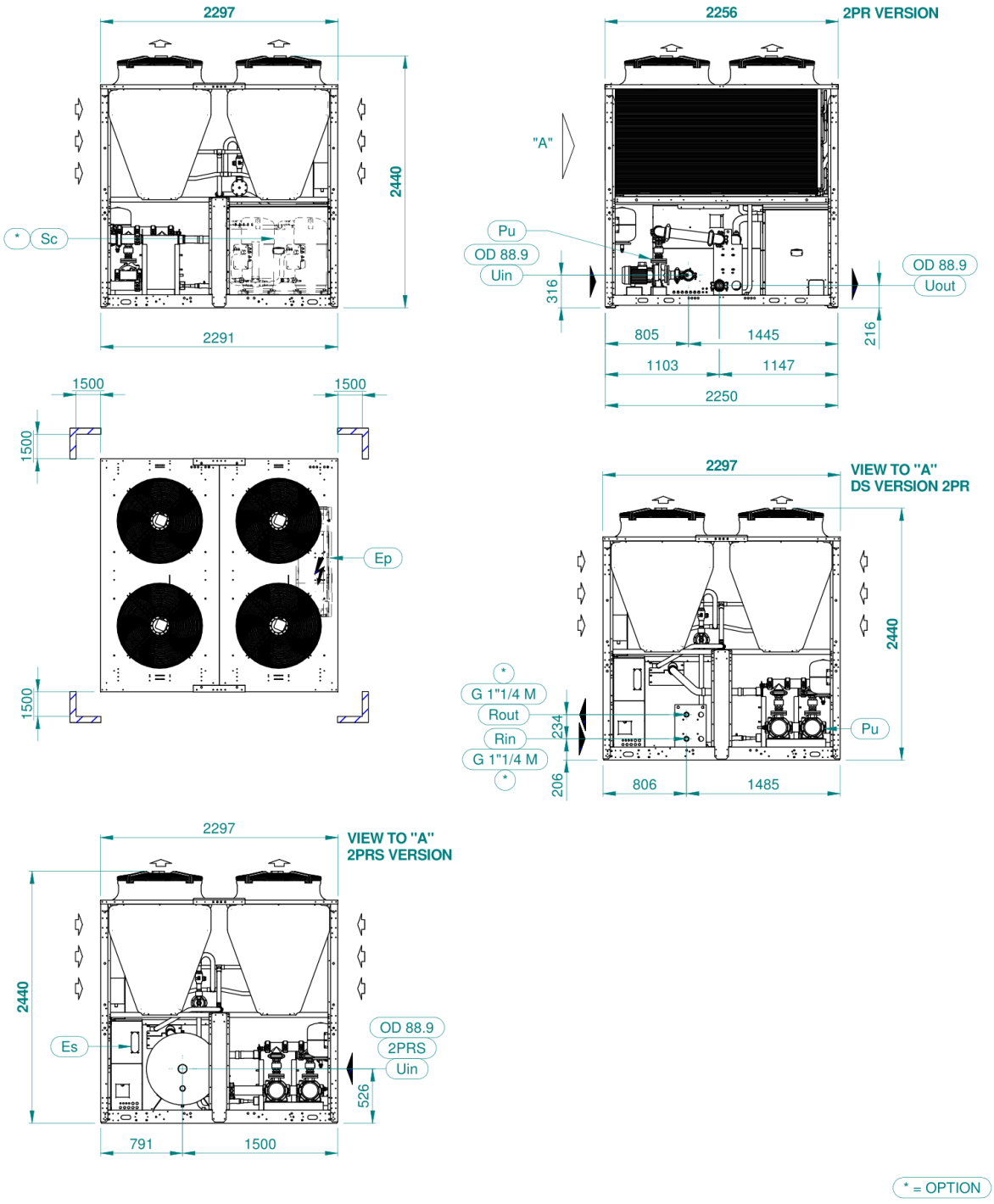
SIZE	23.2
Uin (ST)	OD 88.9
Uin 1P	OD 88.9
Uin 2P	-
Uin 3P	OD 88.9
Uin 1PS-2PS-3SP	OD 88.9
Uout	OD 88.9

OD 88.9 are grooved connections

Note: These drawings are not contractually binding. For the installation design, refer to the specific dimensional drawing available on request.

TETRIS 2 A / TETRIS 2 SLN 23.2 2PR-2PRS

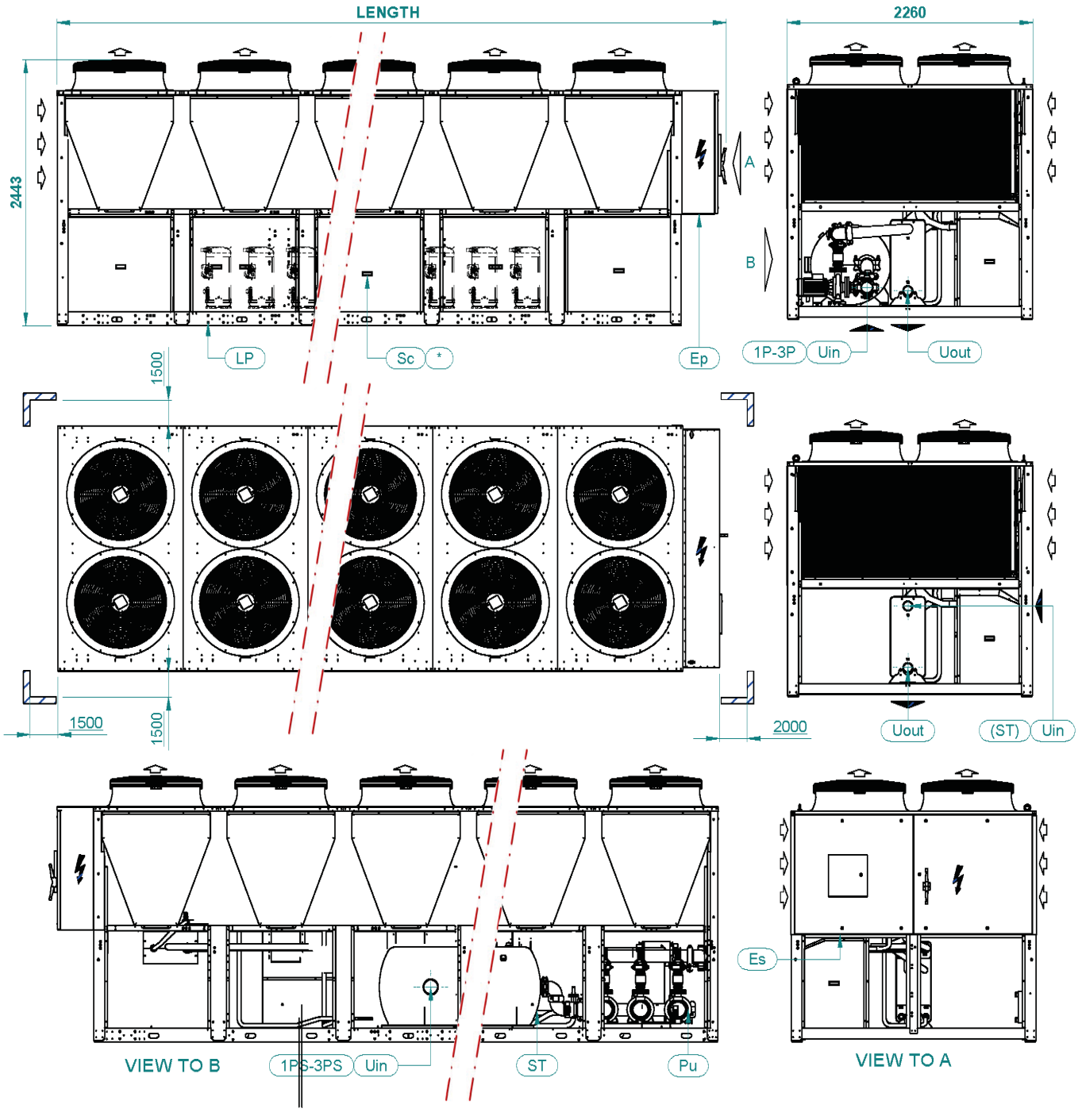
DDIM000311A



Note: These drawings are not contractually binding. For the installation design, refer to the specific dimensional drawing available on request.

TETRIS 2 A / TETRIS 2 SLN 28.4 - 70.6

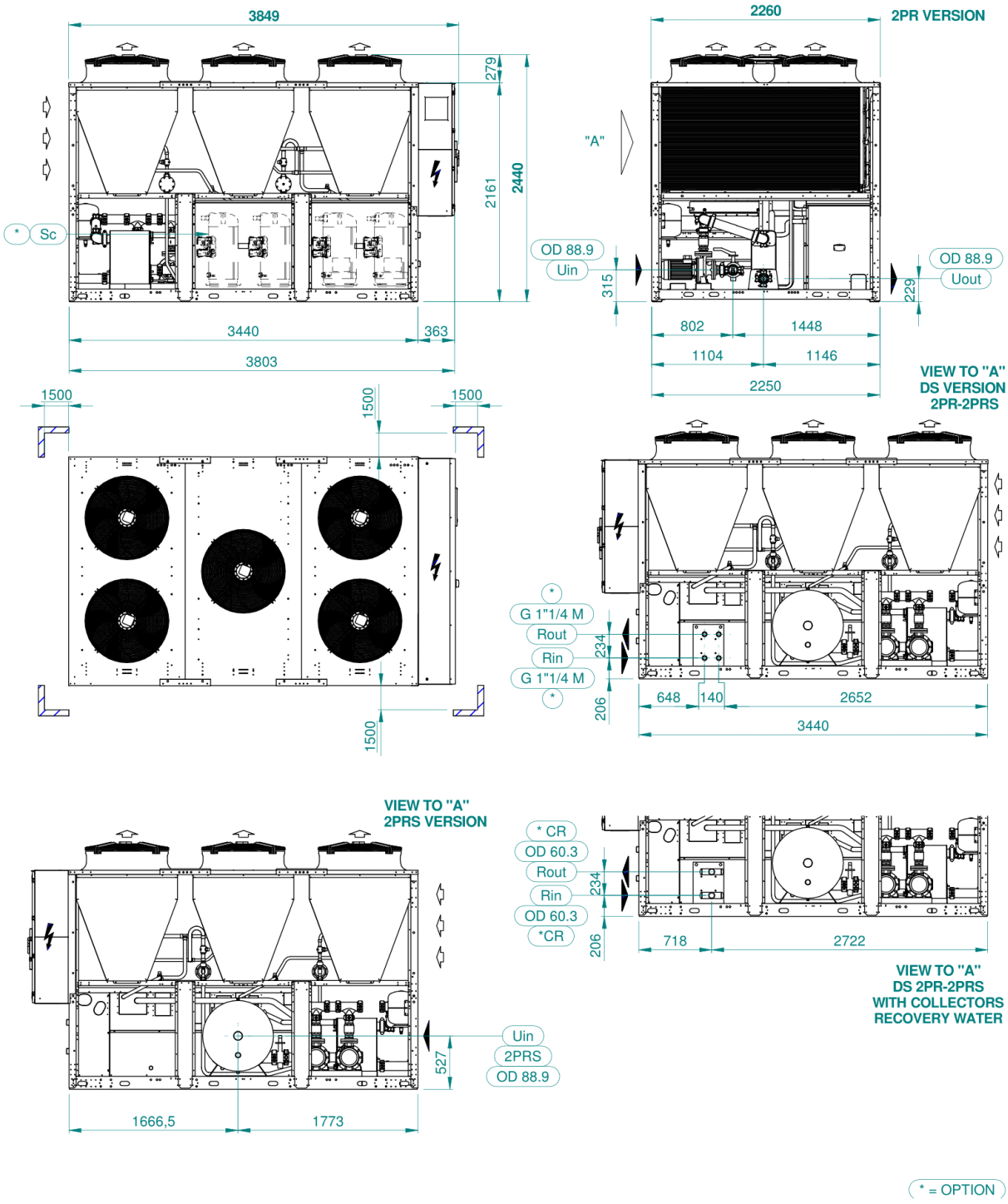
A4F862A



Note: These drawings are not contractually binding. For the installation design, refer to the specific dimensional drawing available on request.

TETRIS 2 A / TETRIS 2 SLN 28.4 2PR-2PRS

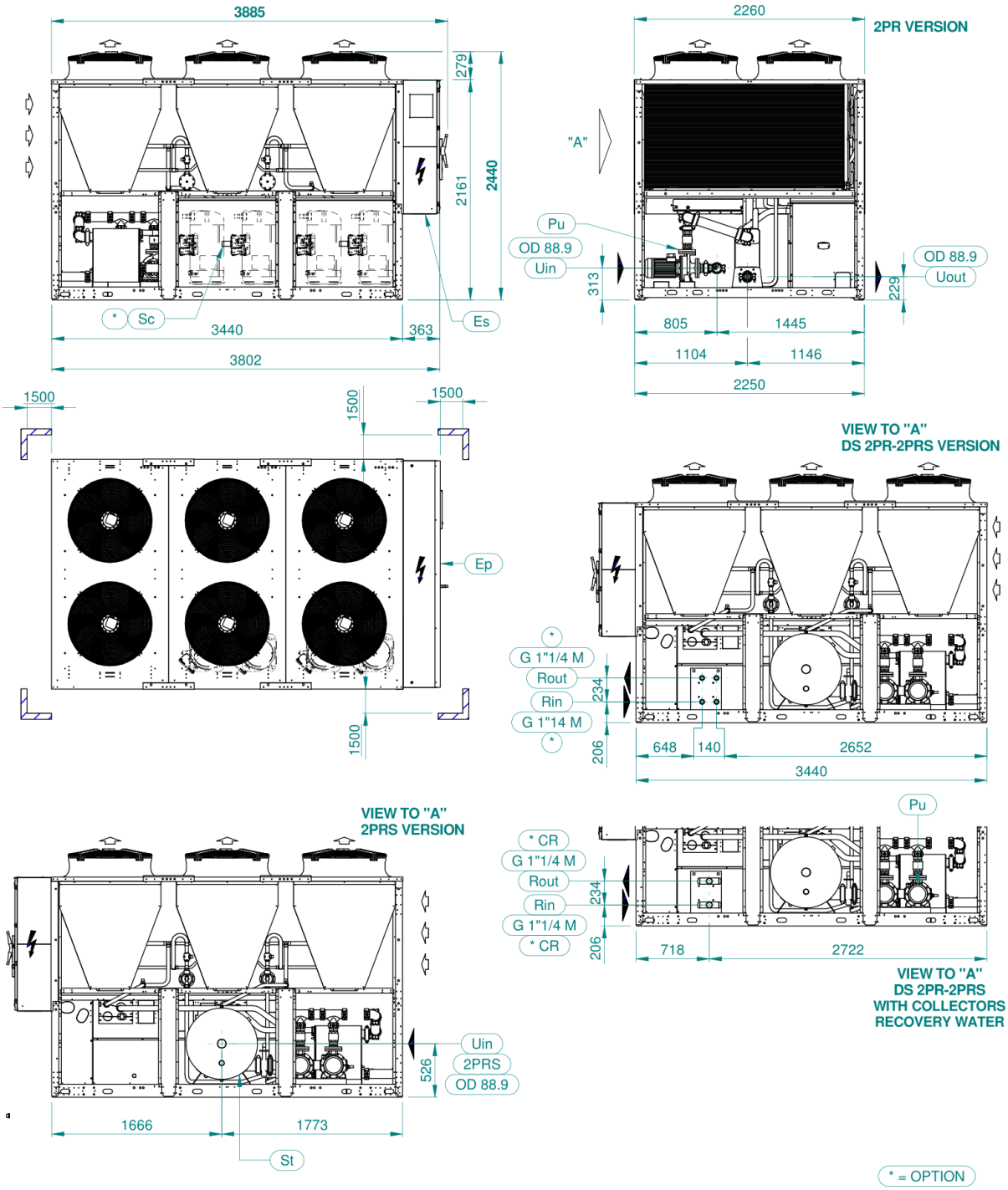
DDIM000312A



Note: These drawings are not contractually binding. For the installation design, refer to the specific dimensional drawing available on request.

TETRIS 2 A / TETRIS 2 SLN 34.4-38.4 2PR-2PRS

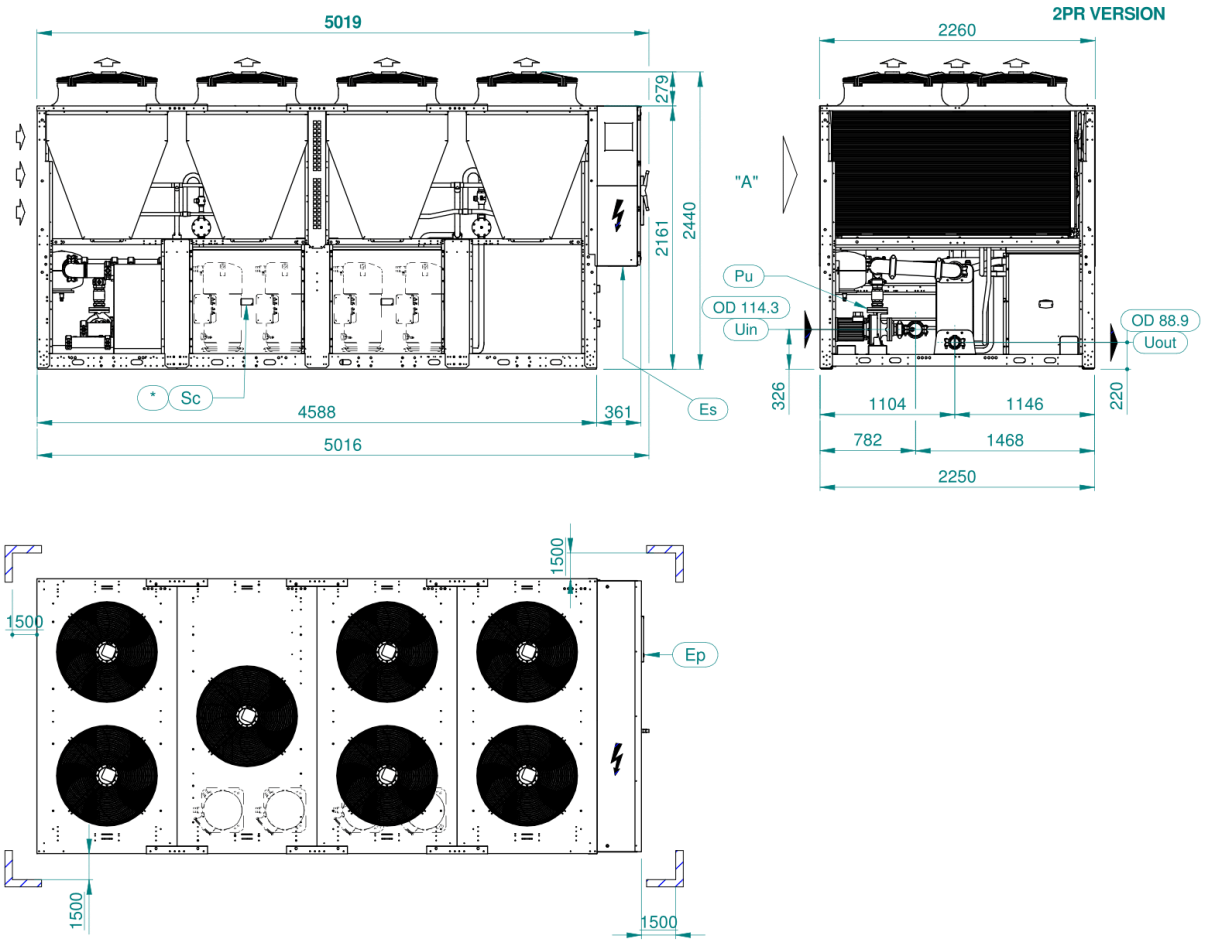
DDIM000316A



Note: These drawings are not contractually binding. For the installation design, refer to the specific dimensional drawing available on request.

TETRIS 2 A / TETRIS 2 SLN 43.4 2PR-2PRS

DDIM000318A

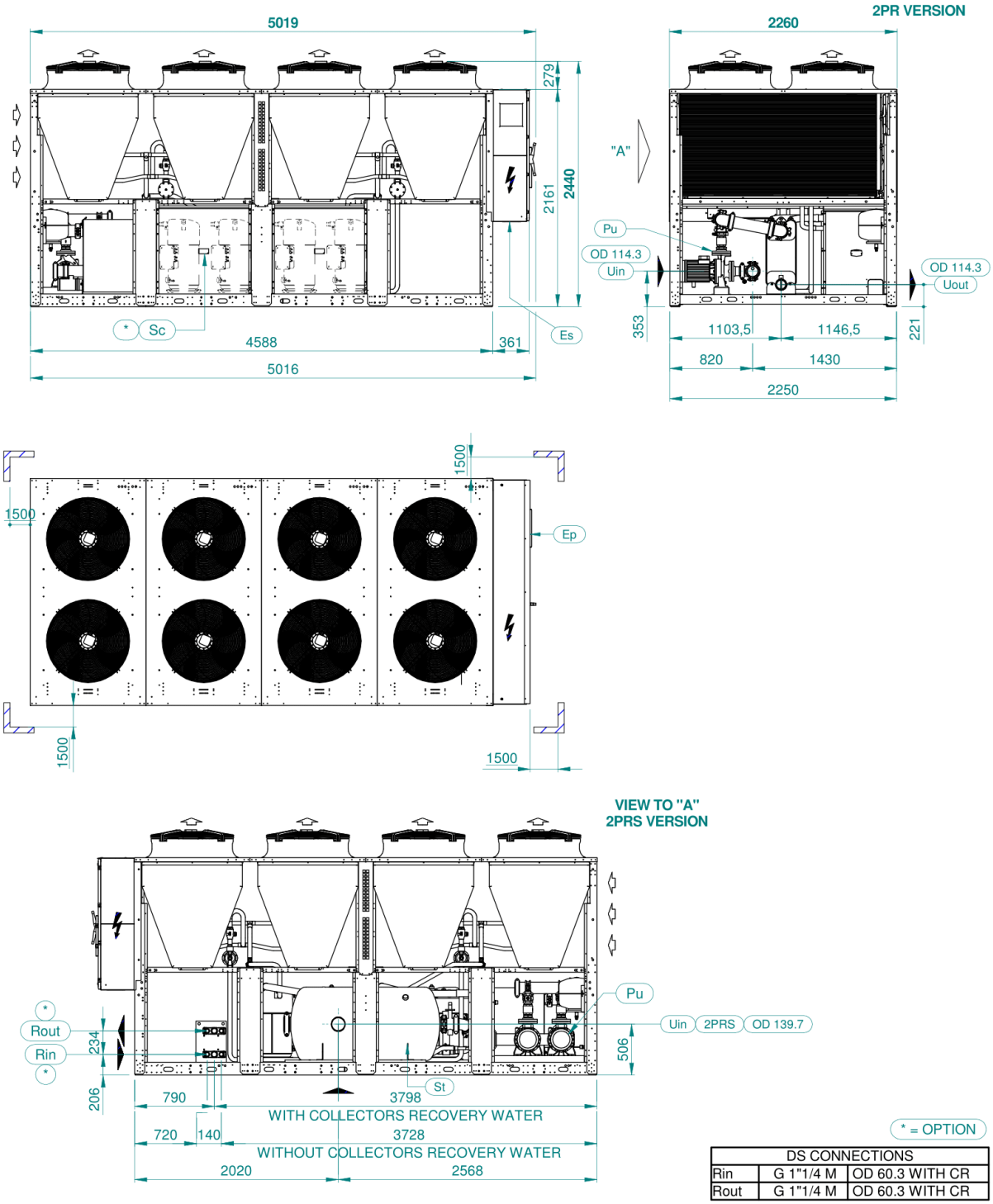


DS CONNECTIONS		
Rin	G 1"1/4 M	OD 60.3 WITH CR
Rout	G 1"1/4 M	OD 60.3 WITH CR

Note: These drawings are not contractually binding. For the installation design, refer to the specific dimensional drawing available on request.

TETRIS 2 A / TETRIS 2 SLN 47.4 2PR-2PRS

DDIM000319A



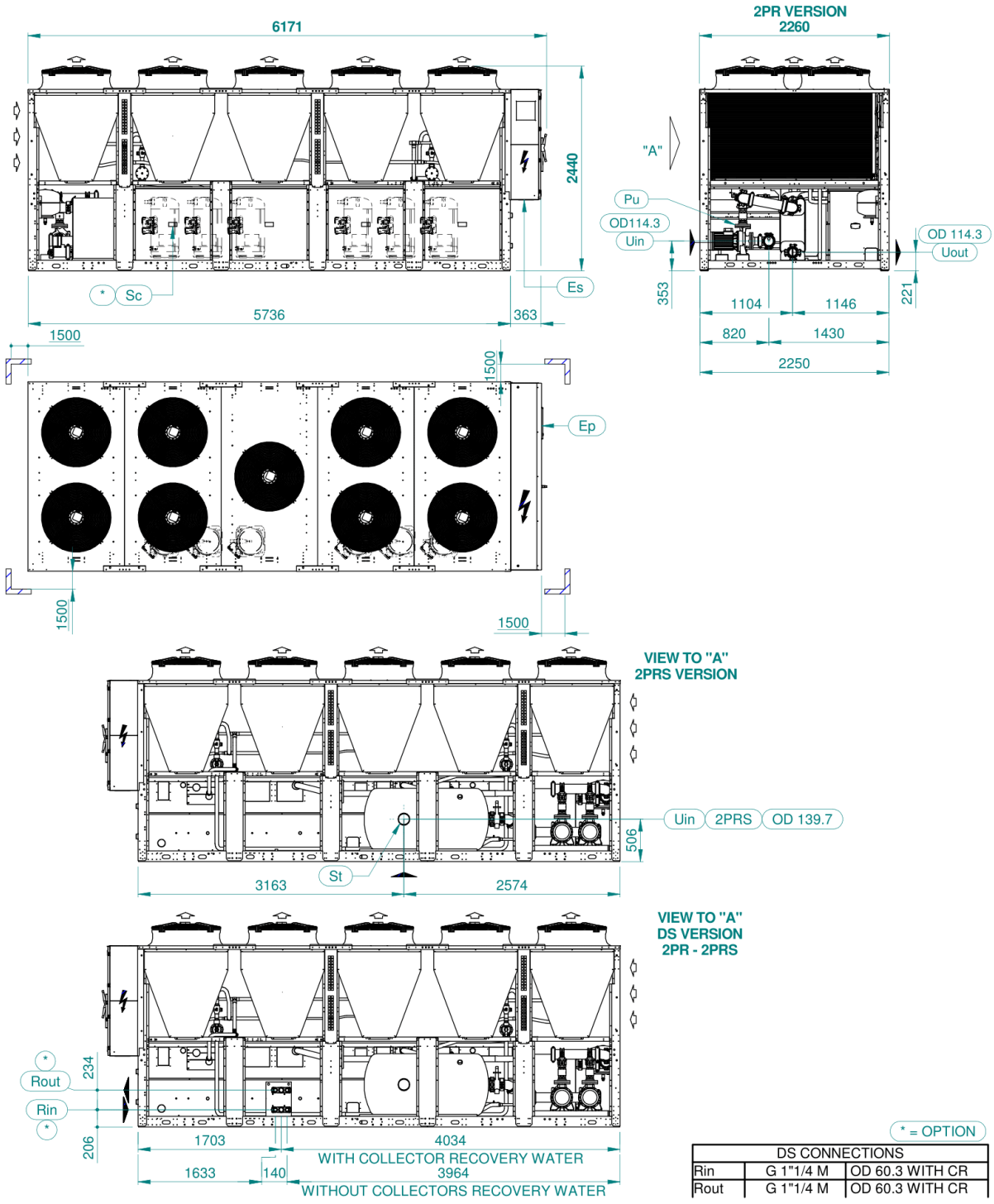
* = OPTION

DS CONNECTIONS		
Rin	G 1"1/4 M	OD 60.3 WITH CR
Rout	G 1"1/4 M	OD 60.3 WITH CR

Note: These drawings are not contractually binding. For the installation design, refer to the specific dimensional drawing available on request.

TETRIS 2 A / TETRIS 2 SLN 50.6 2PR-2PRS

DDIM000320A

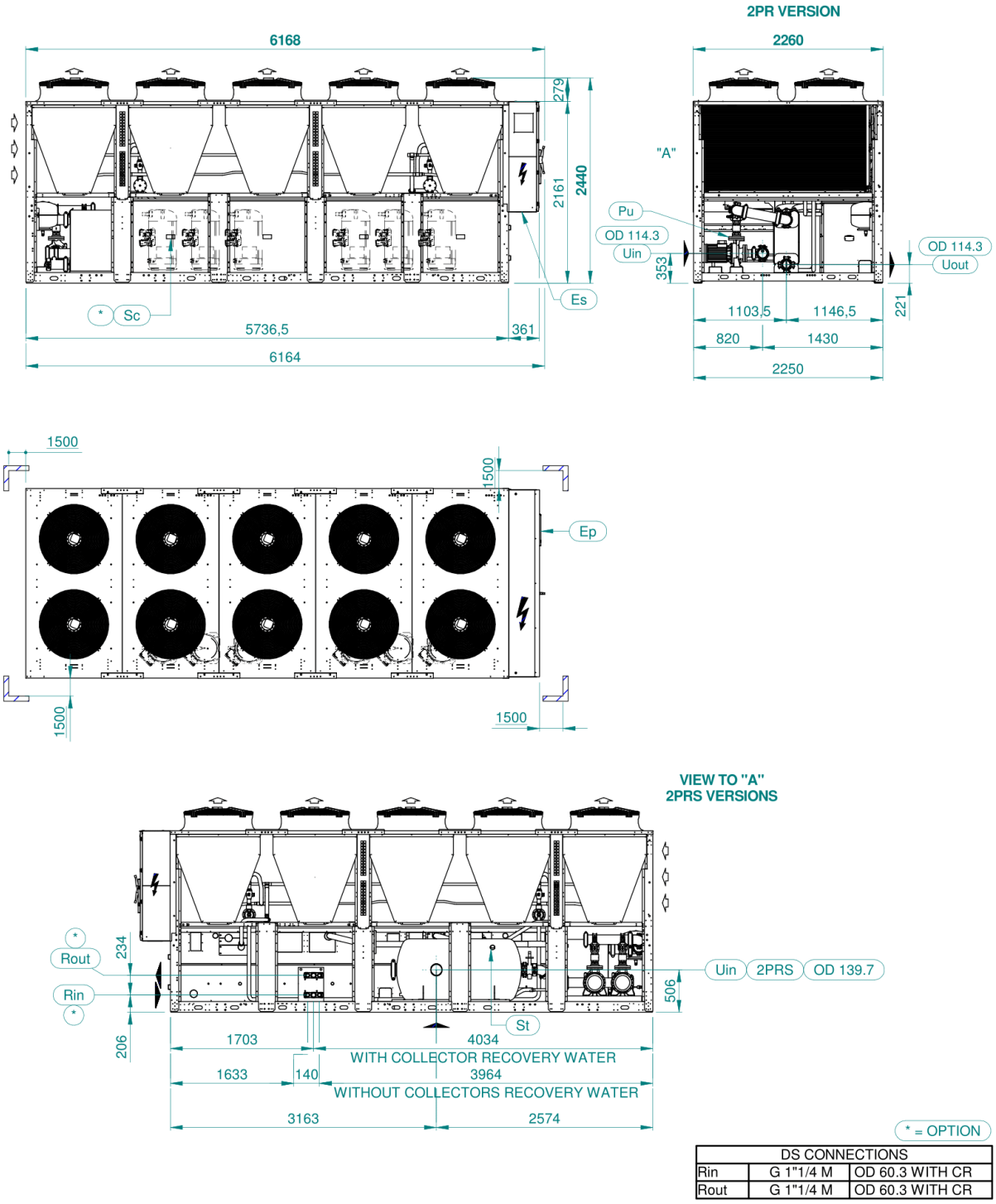


DS CONNECTIONS		
Rin	G 1"1/4 M	OD 60.3 WITH CR
Rout	G 1"1/4 M	OD 60.3 WITH CR

Note: These drawings are not contractually binding. For the installation design, refer to the specific dimensional drawing available on request.

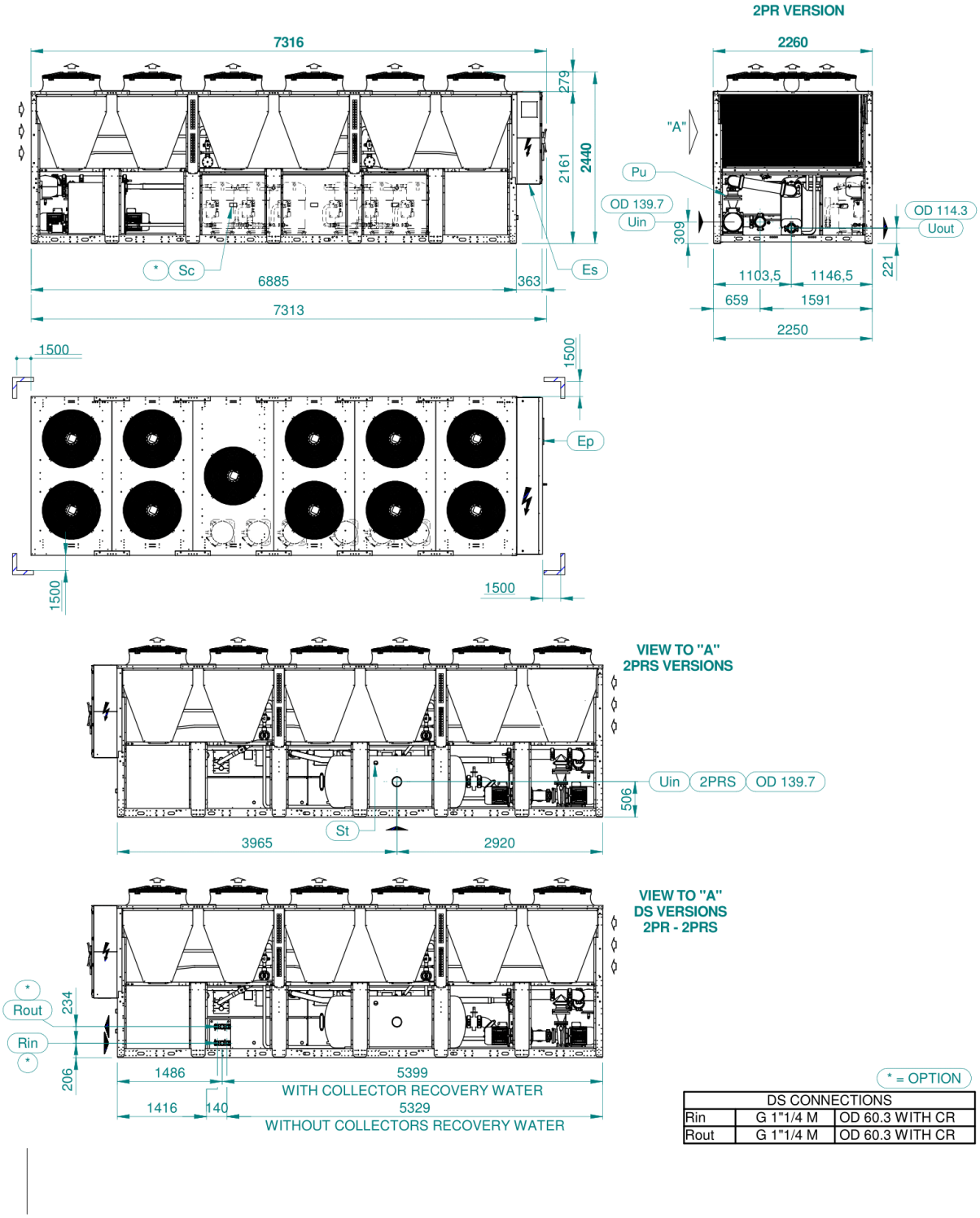
TETRIS 2 A / TETRIS 2 SLN 57.6 2PR-2PRS

DDIM000321A



DS CONNECTIONS		
Rin	G 1"1/4 M	OD 60.3 WITH CR
Rout	G 1"1/4 M	OD 60.3 WITH CR

Note: These drawings are not contractually binding. For the installation design, refer to the specific dimensional drawing available on request.

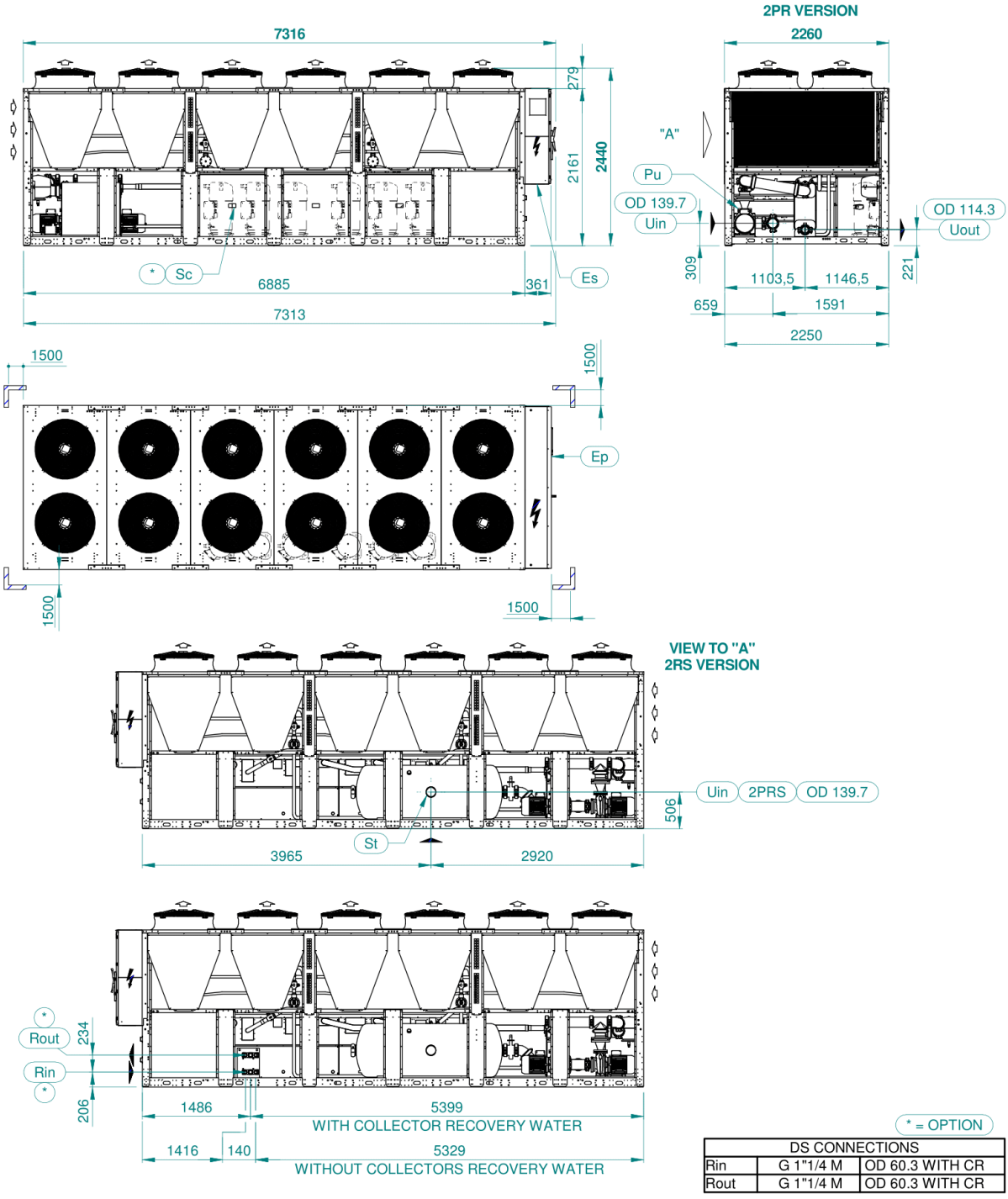


DS CONNECTIONS		
Rin	G 1"1/4 M	OD 60.3 WITH CR
Rout	G 1"1/4 M	OD 60.3 WITH CR

Note: These drawings are not contractually binding. For the installation design, refer to the specific dimensional drawing available on request.

TETRIS 2 A / TETRIS 2 SLN 70.6 2PR-2PRS

DDIM000323A

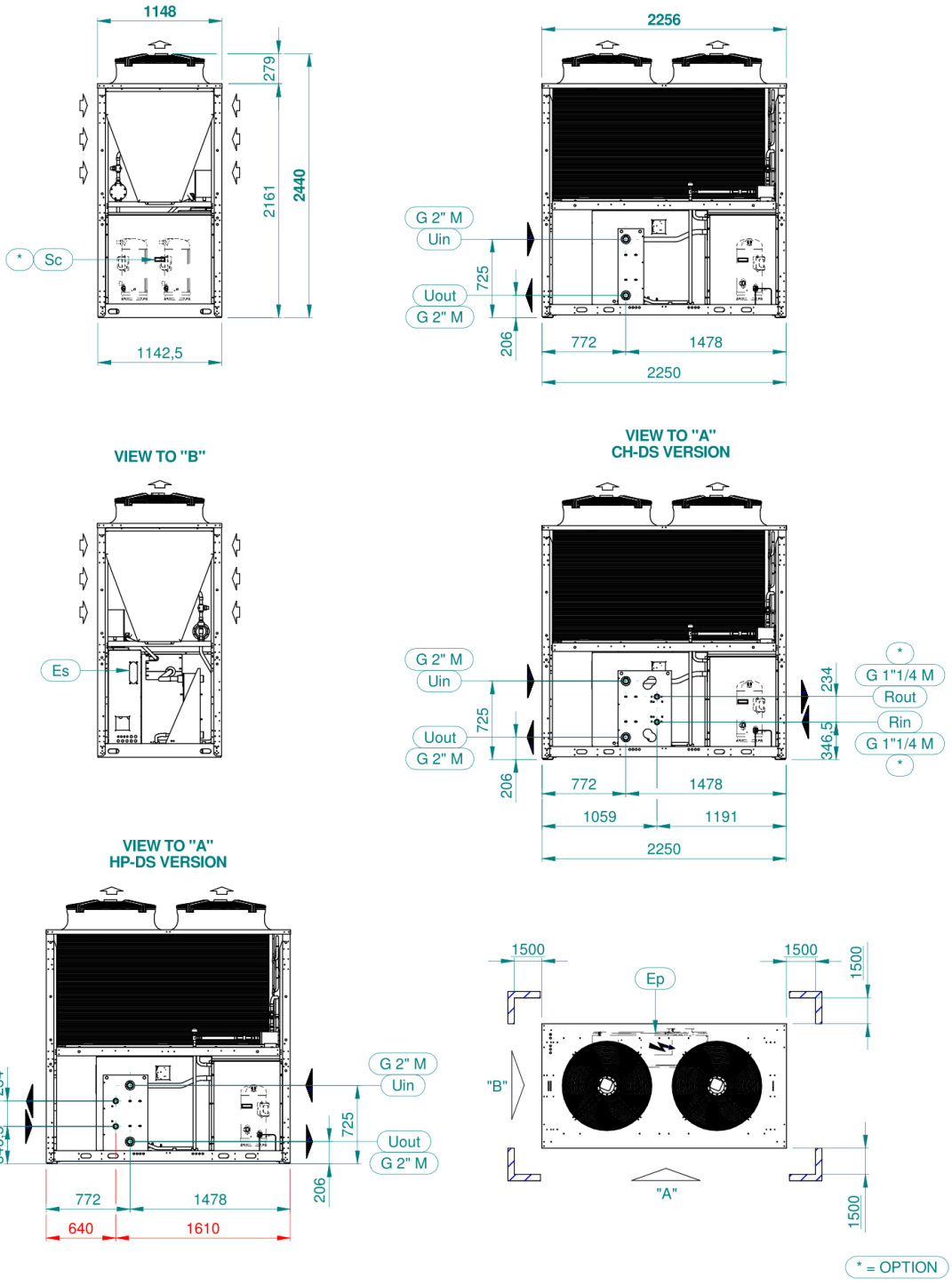


DS CONNECTIONS		
Rin	G 1"1/4 M	OD 60.3 WITH CR
Rout	G 1"1/4 M	OD 60.3 WITH CR

Note: These drawings are not contractually binding. For the installation design, refer to the specific dimensional drawing available on request.

TETRIS 2 A+ / TETRIS 2 A SLN 8.2

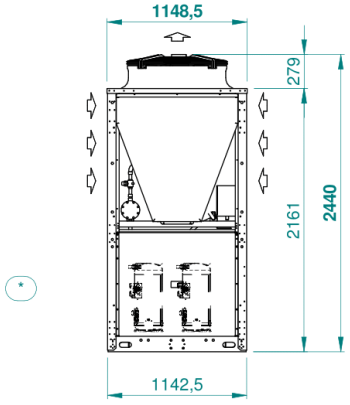
A4F274C

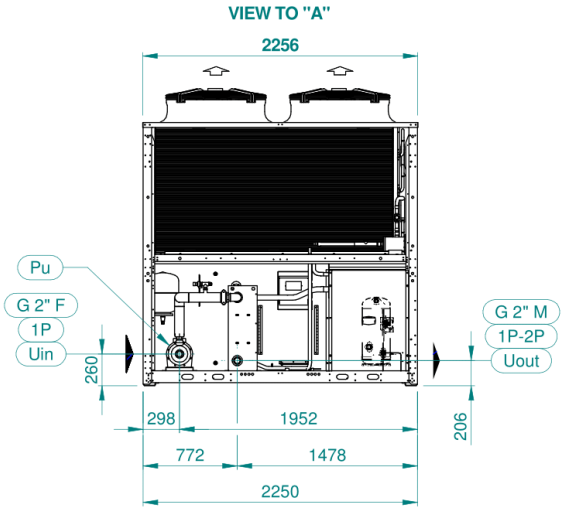


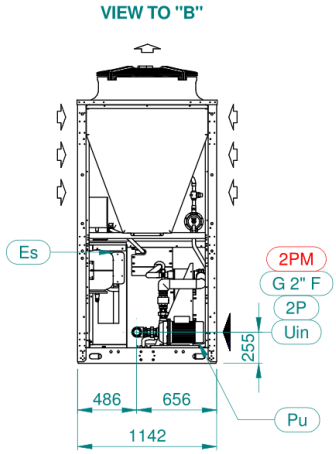
Note: These drawings are not contractually binding. For the installation design, refer to the specific dimensional drawing available on request.

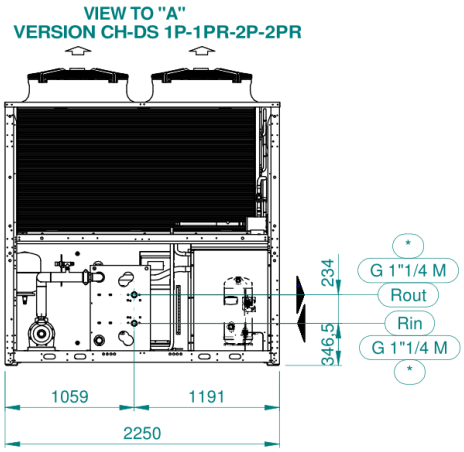
TETRIS 2 A+ / TETRIS 2 A SLN 8.2 1P-1PR-2P-2PR

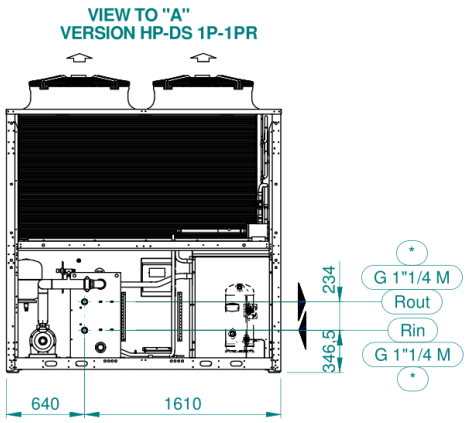
A4F279D

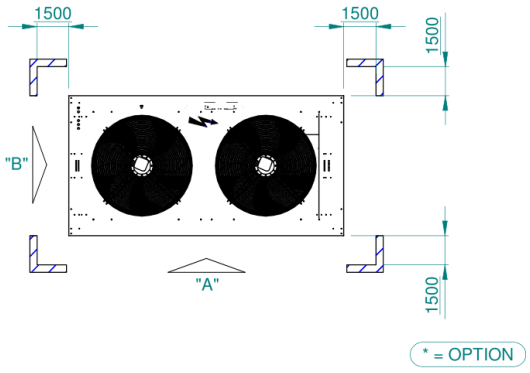








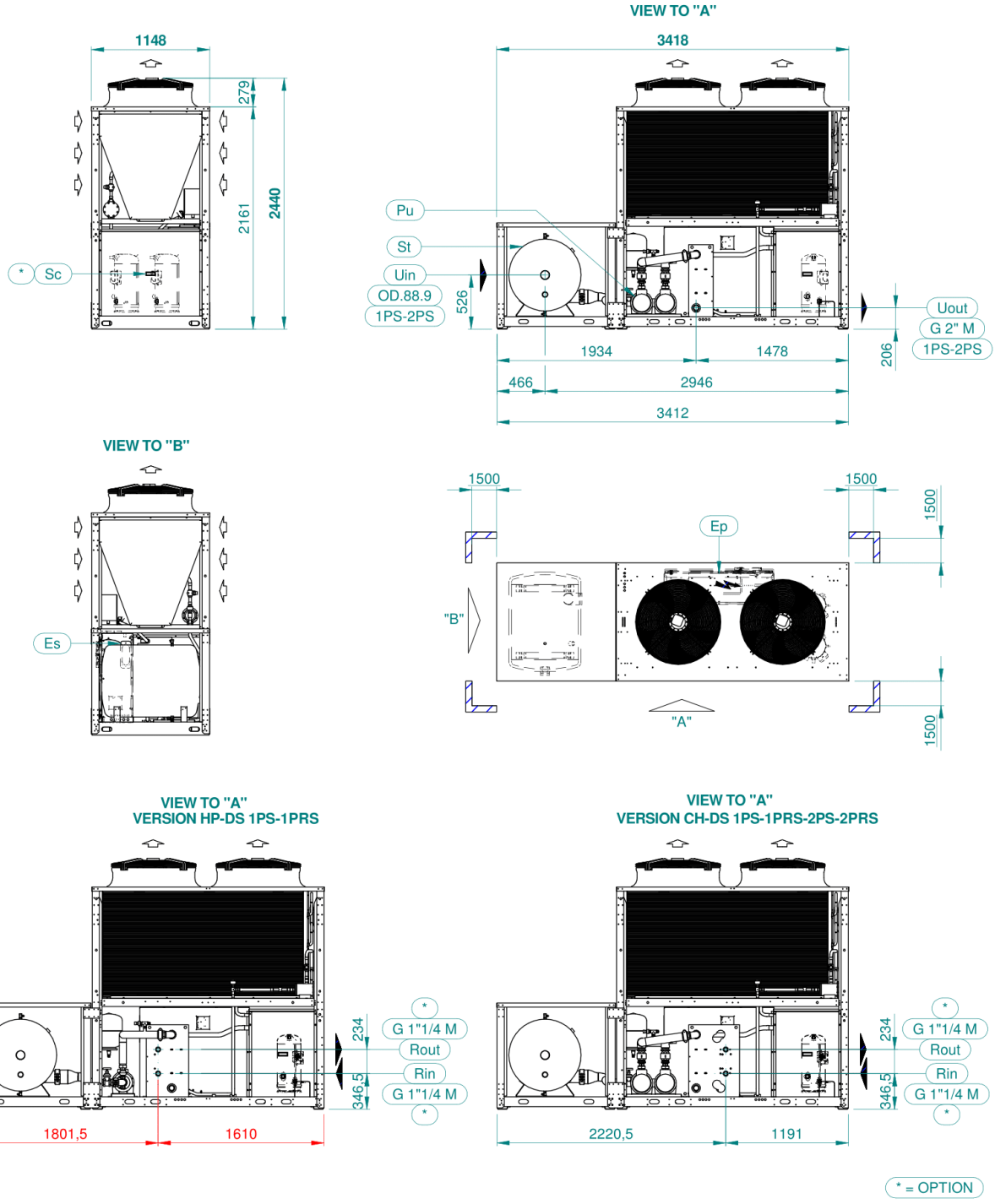




Note: These drawings are not contractually binding. For the installation design, refer to the specific dimensional drawing available on request.

TETRIS 2 A+/TETRIS 2ASLN 8.2 1PS-1PRS-2PS-2PRS

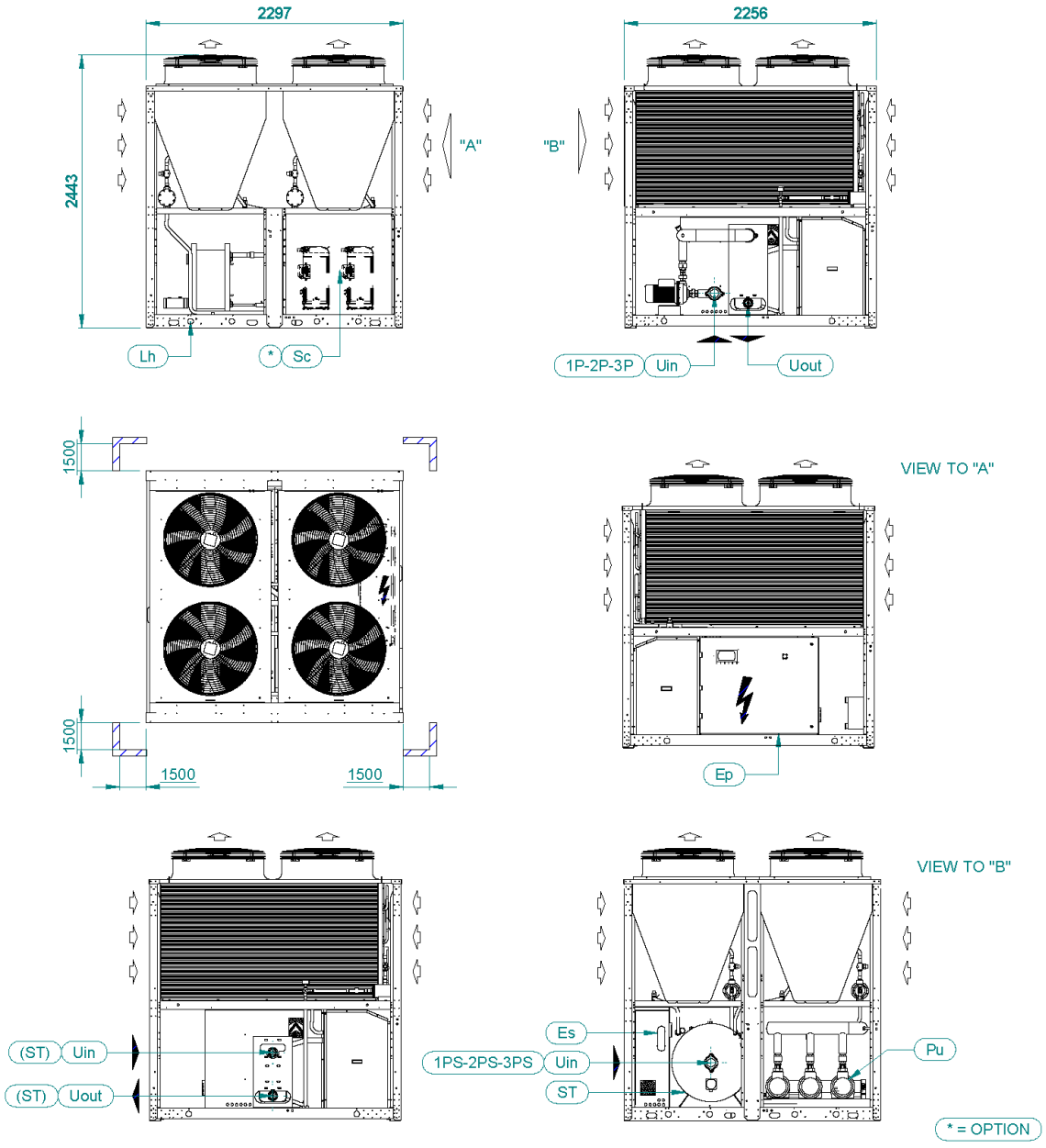
A4F280C



Note: These drawings are not contractually binding. For the installation design, refer to the specific dimensional drawing available on request.

TETRIS 2 A+ / TETRIS 2 A SLN 13.3-18.4

A4F175B

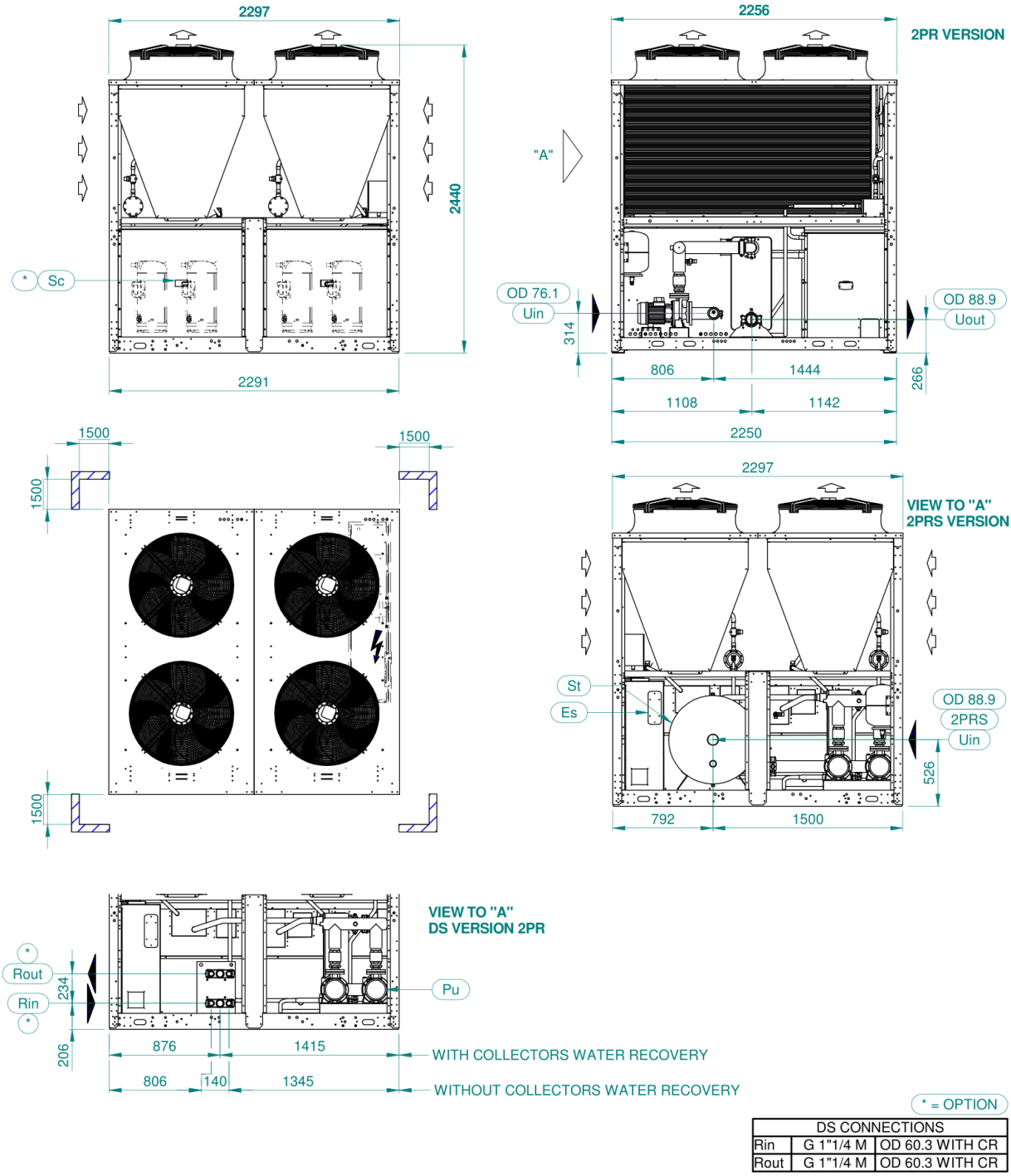


SIZE	Uin (ST)	Uin 1P-2P	Uin 1PS-2PS	Uout
13.3	G 2" M	OD 76.1	OD 88.9	G 2" M
	Uin (ST)	Uin 1P-3P	Uin 1PS-3PS	Uout
18.4	OD 88.9	OD 76.1	OD 88.9	OD 88.9
	OD 76.1 and OD 88.9 ARE Grooved Connections			

Note: These drawings are not contractually binding. For the installation design, refer to the specific dimensional drawing available on request.

TETRIS 2 A+ / TETRIS 2 A SLN 18.4 2PR-2PRS

DDIM000298A



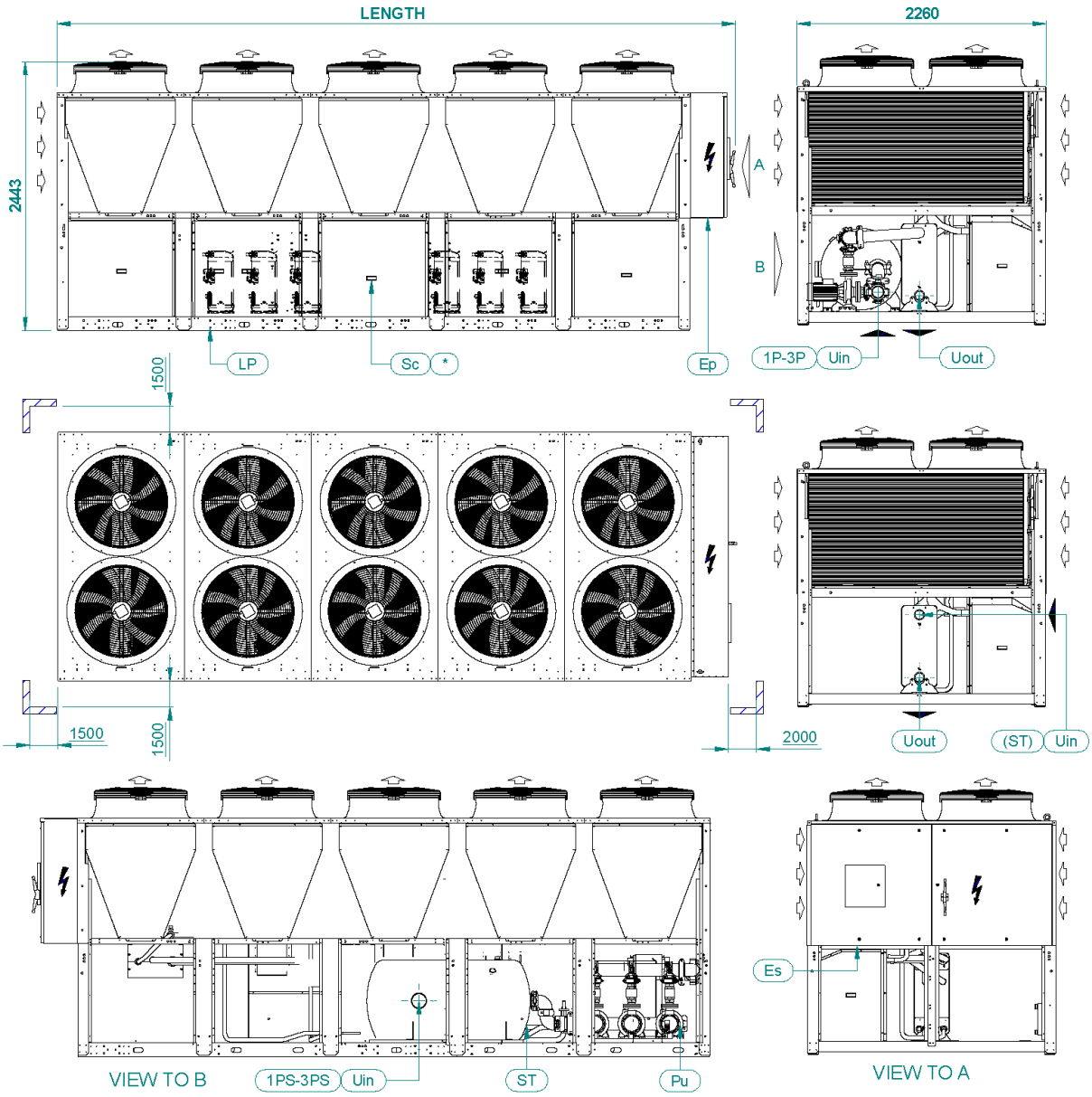
* = OPTION

DS CONNECTIONS		
Rin	G 1"1/4 M	OD 60.3 WITH CR
Rout	G 1"1/4 M	OD 60.3 WITH CR

Note: These drawings are not contractually binding. For the installation design, refer to the specific dimensional drawing available on request.

TETRIS 2 A+ / TETRIS 2 A SLN 23.5 - 54.6

A4F176A

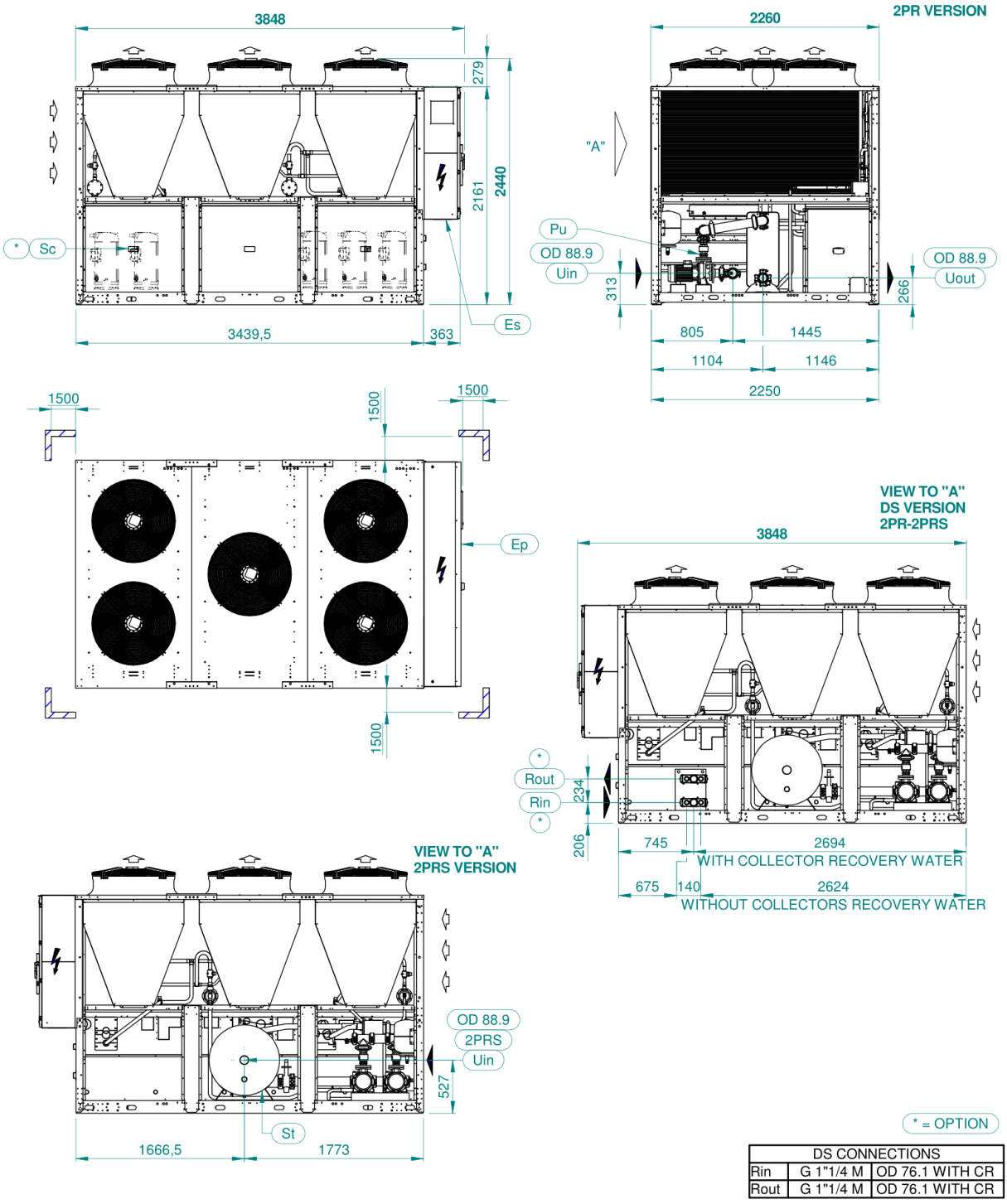


SIZE	23.5	27.6	31.4	36.4	41.5	44.6	49.6	54.6
LENGTH (mm)	3856	3856	5022	5022	6153	6153	7302	7302
Uin (ST)	OD 88.9	OD 88.9	OD 88.9	OD 88.9	OD 114.3	OD 114.3	OD 114.3	OD 114.3
Uin 1P-3P	OD 88.9	OD 88.9	OD 88.9	OD 88.9	OD 114.3	OD 114.3	OD 114.3	OD 114.3
Uin 1PS-3PS	OD 88.9	OD 88.9	OD 139.7	OD 139.7	OD 139.7	OD 139.7	OD 139.7	OD 139.7
Uout	OD 88.9	OD 88.9	OD 88.9	OD 88.9	OD 114.3	OD 114.3	OD 114.3	OD 114.3

Note: These drawings are not contractually binding. For the installation design, refer to the specific dimensional drawing available on request.

TETRIS 2 A+ / TETRIS 2 A SLN 23.5 2PR-2PRS

DDIM000299A

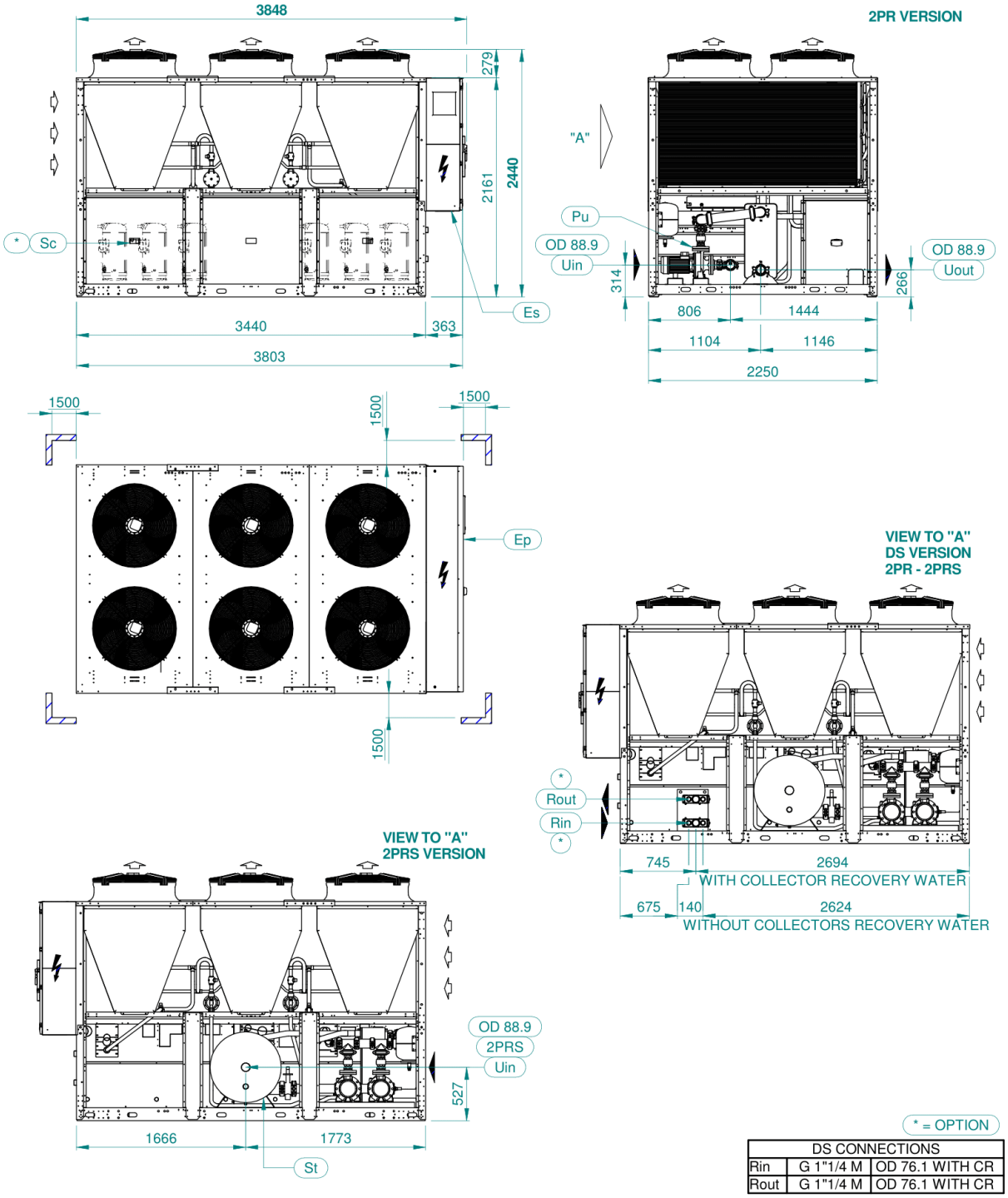


DS CONNECTIONS		
Rin	G 1"1/4 M	OD 76.1 WITH CR
Rout	G 1"1/4 M	OD 76.1 WITH CR

Note: These drawings are not contractually binding. For the installation design, refer to the specific dimensional drawing available on request.

TETRIS 2 A+ / TETRIS 2 A SLN 27.6 2PR-2PRS

DDIM000302A



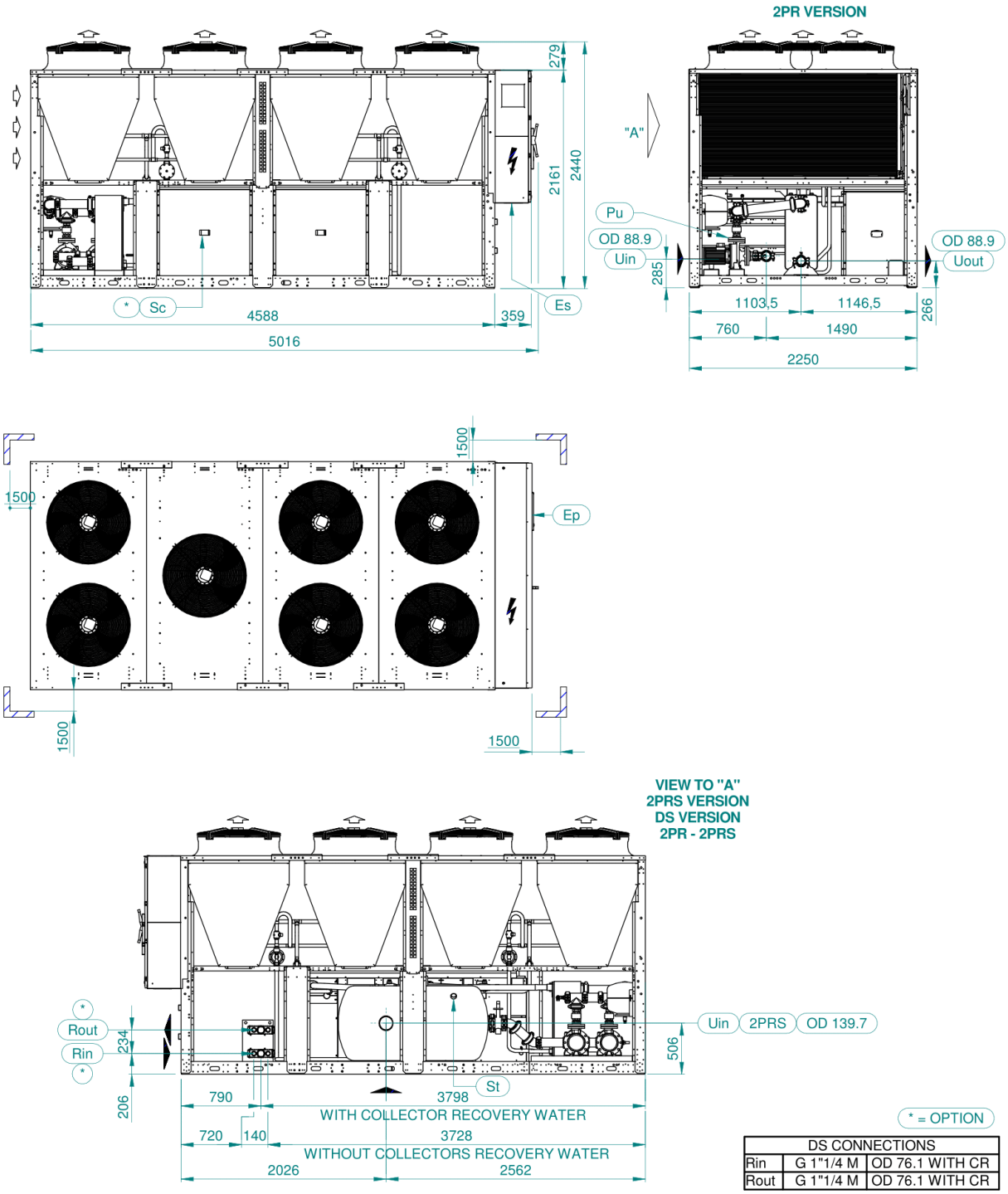
* = OPTION

DS CONNECTIONS		
Rin	G 1"1/4 M	OD 76.1 WITH CR
Rout	G 1"1/4 M	OD 76.1 WITH CR

Note: These drawings are not contractually binding. For the installation design, refer to the specific dimensional drawing available on request.

TETRIS 2 A+ / TETRIS 2 A SLN 31.4 2PR-2PRS

DDIM000303A

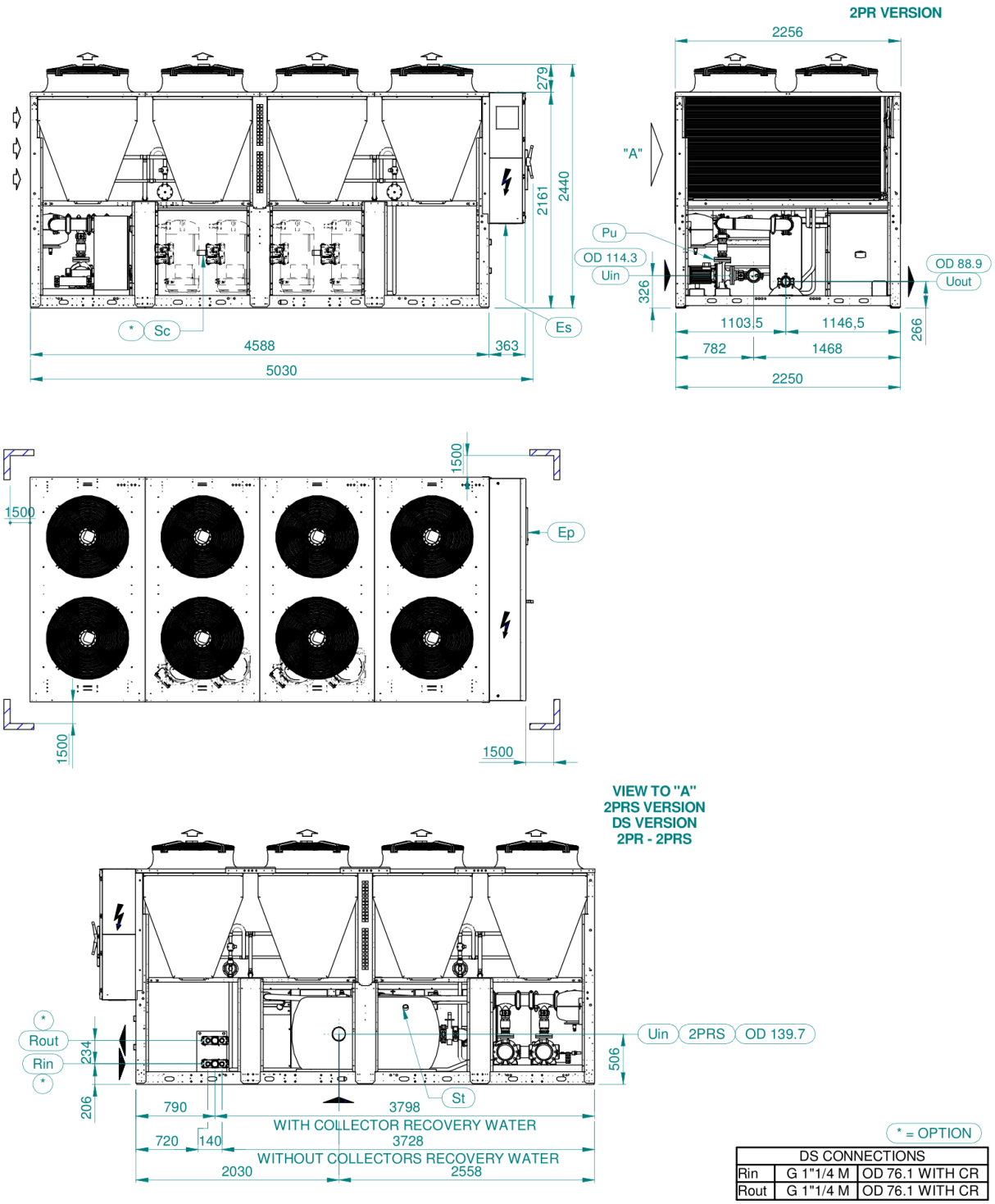


DS CONNECTIONS		
Rin	G 1"1/4 M	OD 76.1 WITH CR
Rout	G 1"1/4 M	OD 76.1 WITH CR

Note: These drawings are not contractually binding. For the installation design, refer to the specific dimensional drawing available on request.

TETRIS 2 A+ / TETRIS 2 A SLN 36.4 2PR-2PRS

DDIM000304A

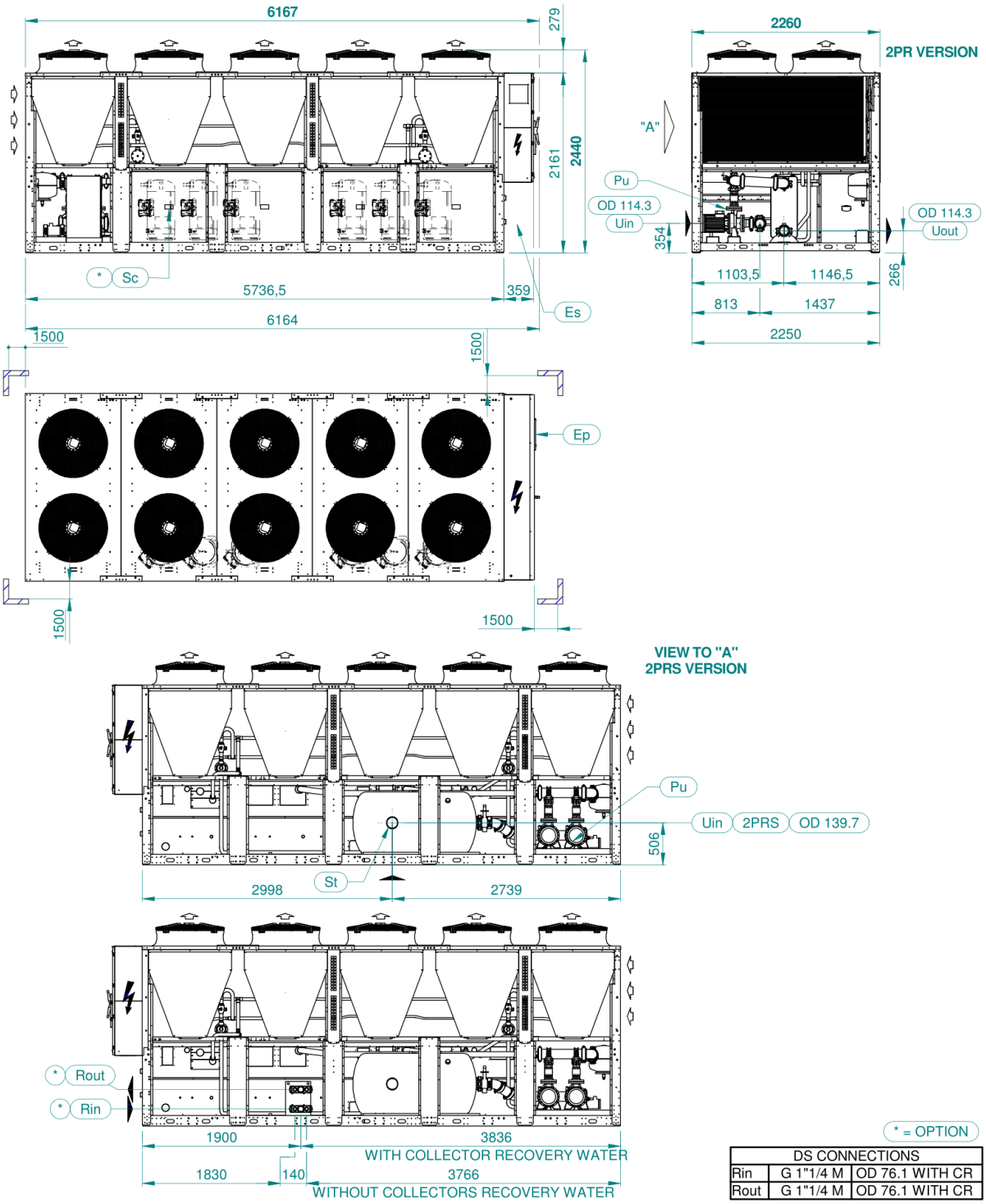


DS CONNECTIONS		
Rin	G 1"1/4 M	OD 76.1 WITH CR
Rout	G 1"1/4 M	OD 76.1 WITH CR

Note: These drawings are not contractually binding. For the installation design, refer to the specific dimensional drawing available on request.

TETRIS 2 A+ / TETRIS 2 A SLN 44.6 2PR-2PRS

DDIM000306A

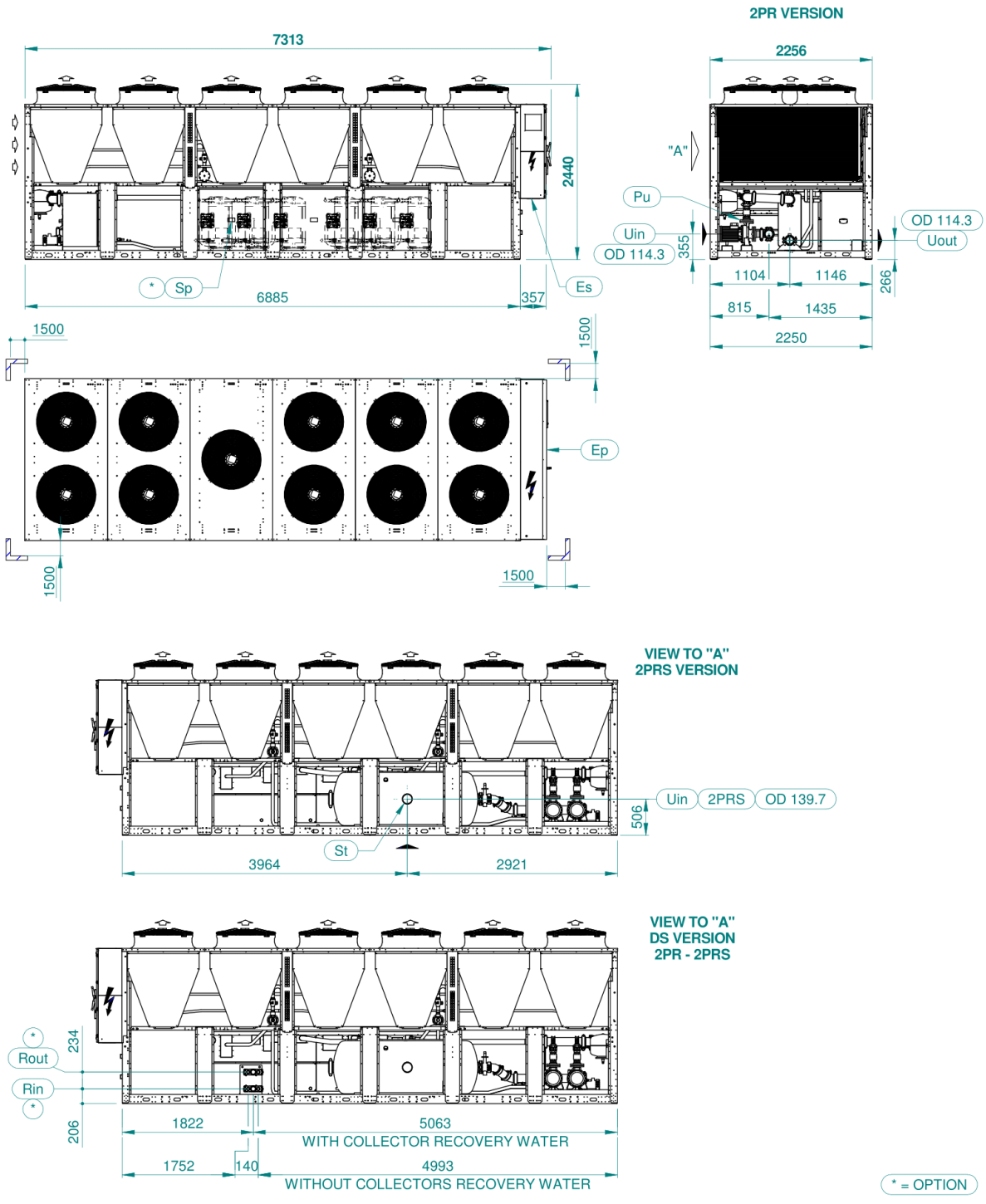


DS CONNECTIONS		
Rin	G 1"1/4 M	OD 76.1 WITH CR
Rout	G 1"1/4 M	OD 76.1 WITH CR

Note: These drawings are not contractually binding. For the installation design, refer to the specific dimensional drawing available on request.

TETRIS 2 A+ / TETRIS 2 A SLN 49.6 2PR-2PRS

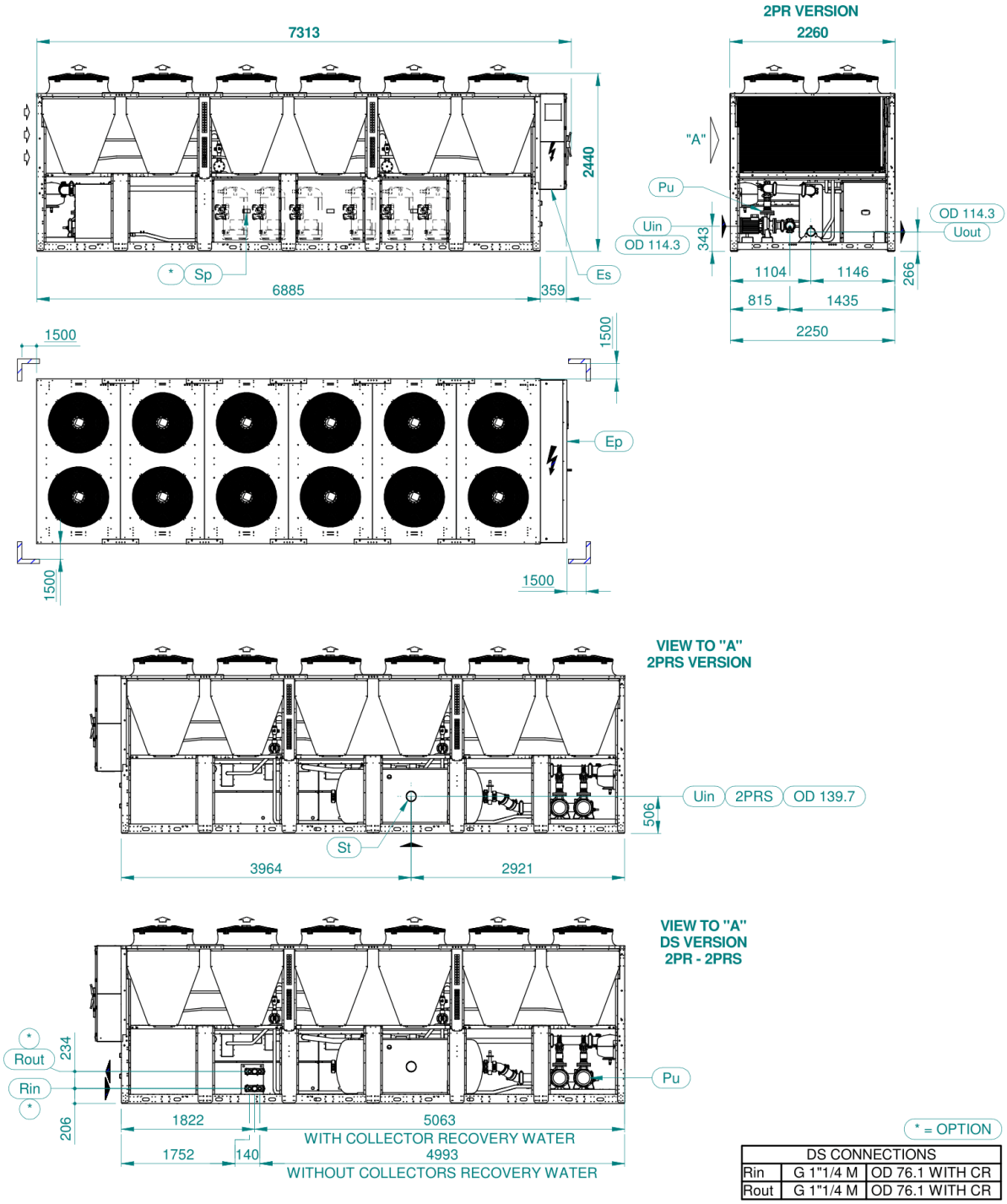
DDIM000307A



Note: These drawings are not contractually binding. For the installation design, refer to the specific dimensional drawing available on request.

TETRIS 2 A+ / TETRIS 2 A SLN 54.6 2PR-2PRS

DDIM000308A

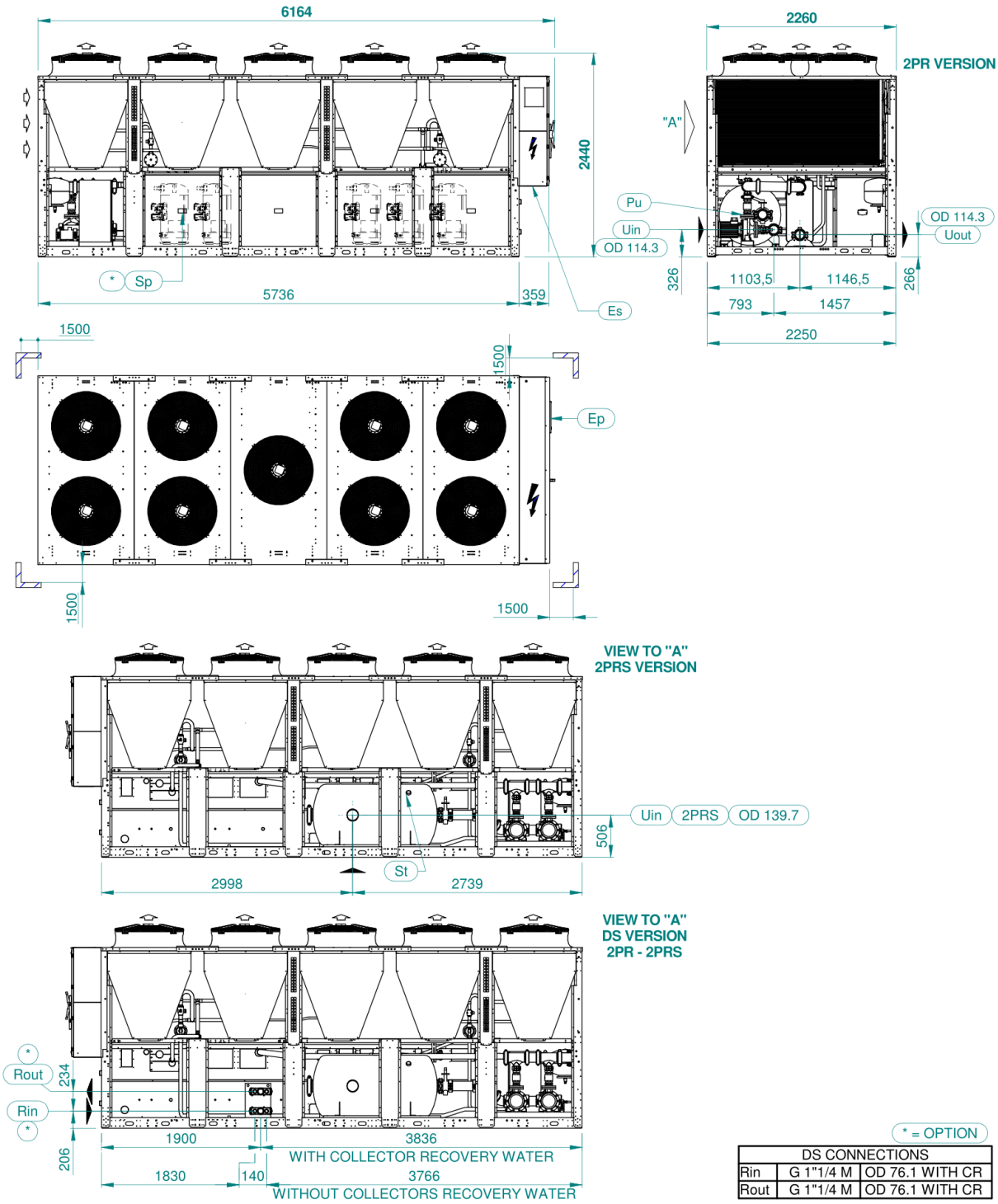


DS CONNECTIONS		
Rin	G 1"1/4 M	OD 76.1 WITH CR
Rout	G 1"1/4 M	OD 76.1 WITH CR

Note: These drawings are not contractually binding. For the installation design, refer to the specific dimensional drawing available on request.

TETRIS 2 A+ / TETRIS 2 A SLN 41.5 2PR-2PRS

DDIM000310A



DS CONNECTIONS		
Rin	G 1"1/4 M	OD 76.1 WITH CR
Rout	G 1"1/4 M	OD 76.1 WITH CR

Note: These drawings are not contractually binding. For the installation design, refer to the specific dimensional drawing available on request.

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.

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.

In case of installation in cold climates where the unit has to perform defrostying cycles, it is suggested to use higher water content than that calculated with previous formula; due to very high volumes needed to completely compensate the negative effect of defrost on produced water temperature, are usually accepted higher temperature deviations than typical values accapetd for cooling-only unit.

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.

It should also be pointed out that, for air-water units working in heat pump mode, the minimum amount of water must consider the need of the unit to carry out defrosting. Having an adequate buffering volume will allow prevention of too high drifts of the delivered water temperature at the end of the defrost cycle.

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 (accessory not available for HP units)
- coils with anti-corrosion treatment (accessory available only for HP units or with Cu/Al coil)

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 installations between 1 and 20 km from the coast of units with microchannel coil, we strongly recommend using the accessory "E-coated microchannel coils"**
- **for installations between 1 and 20 km from the coast of reversible units or units with Cu/Al coils, is strongly recommended using the accessory "Coil treated with anti-corrosion paints"**
- **for distances within a kilometre of the coast, we strongly recommend using the accessory "Coil treated with anti-corrosion paints" for all units**

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.

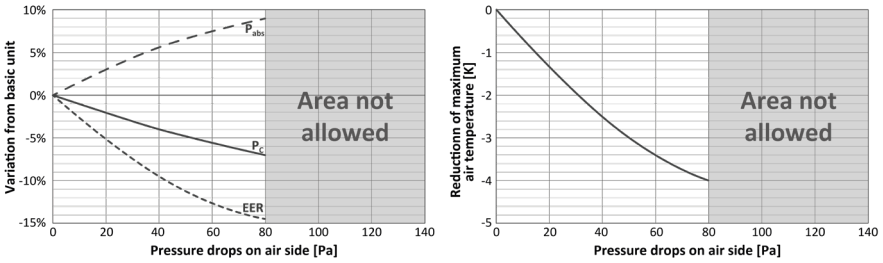
Aeraulic head losses and options available for the ventilating section

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.

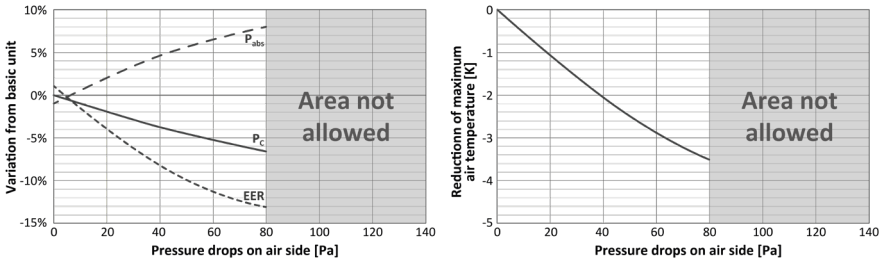
If there are obstacles to free air flow, you should consider the additional aeraulic head losses that will cause a reduction of the air flow rate and a consequent deterioration of performance.

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.

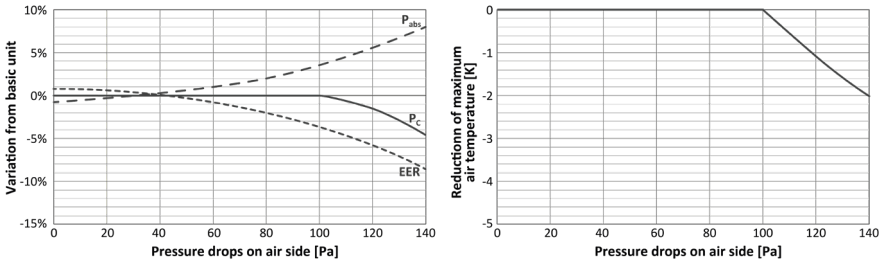
AC fans (Ø 800)



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.

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