

TETRIS

Air/water chiller and heat pumps, 110÷930 kW



General information

A generation of high energy efficient, personalised chillers with scroll compressors, created to meet the needs of commercial and industrial sectors.

Configurations

A: Energy efficiency class A

A+: Energy efficiency class A+

HP: Reversible heat pump

DS: Desuperheater

DC: Recovery condenser

FC: Free-cooling (see specific catalogue document)

LN: Low sound level

SLN: Superlow sound level

Optional pump-/tank module

Quick facts

- ▶ A customized range
- ▶ Eco-friendly cooling
- ▶ Patented innovation
- ▶ Efficient energy performance
- ▶ Advanced software
- ▶ Electronic thermostatic valve included
- ▶ Low discharge fluid temperature

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TECHNICAL CHARACTERISTICS

TETRIS water chiller

Compact-size air-cooled water chiller with hermetic scroll compressors, axial fans and plate evaporators. Refrigerant R410A.

UNIT FRAME

Modular, galvanized sheet structure with self-supporting frame, with baked-on polyester-powder coating (colour RAL 5014) providing excellent weather resistance. Stainless-steel threaded fasteners.

COMPRESSOR

Hermetic orbiting scroll compressors, connected in parallel, equipped with oil sight glass, internal Klixon thermal circuit-breaker, contactors and oil-equalizing line.

CONDENSERS

In cooling only (standard version) units consisting of aluminum microchannel coils, instead are an aluminium-finned copper-tube multi-row coils in the heat pump, high efficiency and SLN units.

Through continuous research in the field of metal alloys and sophisticated production techniques, microchannel coils are made using specific aluminum alloys for the tubes and the fins. This drastically reduces the effects of galvanic corrosion, always guaranteeing the protection of pipes that contain the refrigerant. Tubes and fins are also subjected to processes of SilFLUX coating (or equivalent) or the addition of zinc to further increase the corrosion resistance.

Optional e-coated microchannel coils are available if the unit needs to be installed in environments with a particularly aggressive atmosphere. They are strongly recommended for use in coastal or highly industrialised areas.

Using microchannel coils instead of those in copper/aluminum reduce the overall weight of the unit by approx. 10% and that of the refrigerant charge by a least 30%.

The layout of the "V" coils makes the unit very compact and simultaneously guarantee an increase in the air intake area leaving ample space for the cooling and hydraulic circuit components to be set.

To protect the exchangers from corrosion and to ensure the unit operates properly, follow the recommendations reported in the use, installation and maintenance manual to clean the coils.

For installations within one kilometre from the coast, we strongly recommend using Cu/Al coils with an anti-corrosion treatment for cold-only units as well.

E-COATED MICROCHANNEL COILS

E-coated microchannel coils undergo a treatment that involves immersing the whole exchanger in an emulsion of organic resins, solvents, ionic stabilizers and deionized water. All the equipment is exposed to the action of a suitable electric field, which leads to the formation of a compact, even deposit on the exchanger. This deposit is used to protect aluminium from corrosion without affecting its thermal and physical properties.

ELECTRIC FANS

Axial fans with sickle-shaped blades and manifold, designed to improve performance and reduce noise, directly coupled to 6-pole three-phase electric motor, with internal Klixon thermal circuit-breaker. Motor protection rating IP 54. The fan comes supplied with a safety grid.

EVAPORATOR

ANSI 316 stainless-steel braze-welded plate evaporator, housed inside a closed-cell insulating casing.

Models with 2 refrigerant circuits are equipped with a 2-circuit exchanger having a single hydraulic coupling, while models with 4 refrigerant circuits are equipped with a double 2-circuit exchanger and hydraulic couplings with manifolds.

Using 2-circuit plate-type heat exchangers presents the following advantages:

- Higher COP/EER values;
- Smaller amount of refrigerant in the circuit;
- Smaller unit size and weight;
- Easier maintenance;

Each evaporator is equipped with a temperature probe for antifreeze protection. The hydraulic manifold is provided with a flow switch and a probe for measuring the temperature of the return water flow.

REFRIGERANT CIRCUIT

Includes: liquid line cut-off valve, 5/16" charge couplings, liquid-level sight glass, replaceable solid-core filter-dryer, electronic expansion valve. Models with 2 compressors are equipped with high and low-pressure gauges and safety valves. Models with 3 to 12 compressors are equipped with pressure transducers for checking high and low pressure values and the relative evaporation and condensation temperatures, high-pressure gauges and safety valves. The electronic expansion valve acts as a solenoid valve on the liquid line: it closes when the circuit is stopped, cutting off the liquid's flow. On request, the electronic valve can be equipped with a buffer battery so that it closes even during power failures.

ELECTRICAL PANEL

The electrical panel includes:

- Main switch;
- Automatic circuit breakers compressors with fixed setting;
- Protection fuses on the auxiliary circuits circuits;
- Fan contactors;
- Thermomagnetic circuit-breakers for pumps (if present);
- A microprocessor controlling the following functions:
 - Regulation of inlet water temperature;
 - Antifreeze protection;
 - Compressor timing;
 - Automatic rotation of compressor starting sequence;
 - Alarms;
 - Alarm reset;
 - Setting the unit's capacity steps;
 - Common alarm contact for remote warning;
 - Forced steps at pressure limits;

- Alarm log recording (“black box” function) (only for models from 3 to 12 compressors);
- Information shown on display:
 - Inlet water temperature;
 - Temperature and differential settings;
 - Explanation of alarms;
 - Compressor working hours counter
 - Number of unit start-ups and pump start-ups counter, (if present) (only for models from 3 to 12 compressors);
 - High and low pressures and relative condensation and evaporation temperatures (only for models from 3 to 12 compressors).

Power supply [V/f/Hz]: 400/3~/50 ±5%.

For models 7 to 12 compressors are equipped with two power panels, each with its own power supply.

CONTROLS AND SAFETY DEVICES

- Manually resettable high pressure gauge;
- High pressure safety gauge, automatically reset at control-operated limited intervals;
- Low pressure safety gauge, automatically reset at control-operated limited intervals;
- High pressure safety valve;
- Antifreeze probe on each evaporator outlet;
- Chilled water temperature probe (located at evaporator discharge);
- Mechanical vane-operated flow switch, supplied installed;
- Compressor and fan overtemperature protection.

TESTING

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

VERSIONS

TETRIS A

With respect to the standard version of TETRIS series, this unit is fitted with smaller compressors and bigger copper tube aluminium finned coils, in order to enhance the ratio between heat exchange surfaces and compressor power. This results in greater energy efficiency (high EER and COP) and high seasonal efficiency ratio (ESEER).

TETRIS A+

This unit has an even greater ratio of heat-exchange surface to compressor power than the TETRIS A version, therefore its energy efficiency is extremely high.

TETRIS SLN

This unit is identical to the TETRIS A /LN version but with the addition of an automatic fan-speed control device.

The unit has a soundproofed compressor compartment as in the /LN version, meaning that the fans can run at lower speeds so that at nominal operating conditions the airflow – and consequently the noise level – is less than in the standard version. However, the fan-speed control makes the fans run at

full speed when required by the outdoor air temperature, so the unit works within the same operating range of the TETRIS A version.

TETRIS A SLN

This unit is identical to the TETRIS A+ /LN version but with the addition of an automatic fan-speed control device.

The unit has a soundproofed compressor compartment as in the /LN version, meaning that the fans can run at lower speeds so that at nominal operating conditions the airflow – and consequently the noise level – is less than in the standard version. However, the fan-speed control makes the fans run at full speed when required by the outdoor air temperature, so the unit works within the same operating range of the TETRIS A+ version.

HYDRAULIC MODULE OPTIONS

TETRIS /ST:

Unit with tank e pumps

In addition to the features of the TETRIS version, this unit can be supplied with an insulated inertial storage tank and circulation pumps. The following configurations are available:

- ST 1PS: with 1 pump and tank;
- ST 1P: with 1 pump without tank;
- ST 2PS: with 2 pumps and tank (only for models with 2 or 3 compressors);
- ST 2P: with 2 pumps without tank (only for models with 2 or 3 compressors);
- ST 3PS: with 3 pumps and tank (only for models from 4 to 12 compressors);
- ST 3P: with 3 pumps without tank (only for models from 4 to 12 compressors);

On the version with 2 circulation pumps (one on standby for the other, both sized for 100% of total flow), switching from one pump to the other is automatic in case of breakdowns or can be set by time. On the version with 3 pumps (each sized for 33% of total flow) all 3 pumps work at the same time; if one pump breaks down, up to 78% of the cooling capacity can still be provided.

The following accessories are also provided: expansion tank, check valves (except for versions 1P and 1PS) and gate valve at suction intake (only on versions with tank).

ACCESSORY VERSIONS

TETRIS /HP:

Reversible heat pump

In addition to the features of the TETRIS version, this version includes:

4-way switch-over valve;

liquid storage tank;

microprocessor enabling for summer/winter switching and automatic defrosting, with patented Blue Box logic to optimize defrosting time independently on each circuit.

TETRIS /DC:

Unit with recovery condenser

In addition to the features of the TETRIS version, this unit includes a recovery condenser on each refrigerant circuit for recovering 100% of the heat of condensation from the plates for hot water, and a liquid collector.

The control automatically starts heat recovery depending on the water temperature, and stops recovery for safety reasons when the pressure is too high. For best performance, this accessory should be used together with a fan speed control.

TETRIS /DS:

Unit with desuperheaters

In addition to the features of the TETRIS version, this unit includes a recovery condenser on each refrigerant circuit for recovering 20% of the heat of condensation, installed in series with the condensing coil.

The condenser is a plate-type condenser. For best performance, this accessory should be used together with a fan speed control. This version is also available in the HP configuration. In this case, the installation must include a cut-off on the recovery water circuit during HP operation, as indicated in the manual.

TETRIS /LN:

Low-noise unit

In addition to having the features of the TETRIS version, on this unit the compressor compartment is completely soundproofed with sound-absorbing material and the insertion of sound-deadening material.

ACCESSORIES

REFRIGERANT CIRCUIT ACCESSORY

- Condensation pressure controlled by fan speed control for working in low outdoor temperatures (standard on SLN version);
- Dual set point (high/low temperature) with single electronic thermostatic valve at no extra cost. Evaporator sized for working at high temperature. Set points can be changed from the keyboard or by digital input (in this case must be requested at time of order);
- High and low pressure gauges are available for all models (suction and discharge pressures are shown on the control's display even on standard configurations on for models from 3 to 12 compressors);

HYDRAULIC CIRCUIT ACCESSORIES

- Antifreeze heater for evaporator (the /ST version also has antifreeze heaters on the tank and on the pump pipes and volute), and on recovery heat exchangers, if present;
- Safety valve on water side (/ST version only);
- Victaulic Y-filter on water side.

ELECTRICAL ACCESSORIES

- RS485 serial interface;
- Support for Carel, Modbus-Jbus communication protocols;

- Support for Echelon and Bacnet communication protocols, can be integrated with Johnson and Trend supervision (only for models from 3 to 12 compressors);
- Potential-free operation contacts;
- Power factor correction $\cos\phi \geq 0.9$ at nominal operating conditions; standard on external panel of units having IP 55 (power supply to be provided by installer directly from the mains); this accessory is designed for use with potential-free operation contacts;
- Remote user terminal (in addition to standard terminal);
- Set point adjustable by remote signal (0-1V, 0-10V, 0-4mA, 0-20mA) This accessory is available only for models from 3 to 12 compressors);
- Buffer battery for electronic expansion valve;
- Outlet water temperature control;
- Electronic soft-starter.
- Automatic circuit breakers instead of fuses
- Maximum and minimum voltage relay
- SLAT: Set Low Air Temperature

OTHER ACCESSORIES

- EC fans. TETRIS units can be used with the new direct current EC (Electronically Commutated) axial fans with electronically commutated brushless motors.
- Rubber or spring-type anti-vibration mounts;
- Prepainted copper/aluminium condensing coil;
- Copper/aluminium condensing coil treatment with passivated aluminium and polyurethane-based coating. The treatment consists of two layers, the first an aluminium passivating agent acting as a primer, and the second a polyurethane-based surface coating. The product is highly corrosion-resistant and can support almost any environmental conditions, including marine installations, rural environments, industrial areas and urban environments;
- Coil protection grid with anti-hail metal filter, available only for finned coil /copper pipe exchanger;
- Shipped in wooden crate;
- Special pallet/sled for container shipment;
- Delivered preassembled. The unit is delivered without refrigerant charge and untested;
- Non-standard RAL paint colours.

NORMAL FUNCTIONING CONDITIONS OF THE SYSTEM IN COOLING Mode with ST 3P – 3PS

During the summer start-up phase of units equipped with three pumps, the unit with two pumps is automatically activated by the control when the water temperature is higher than the maximum limit.

This way, by reducing the water flow rate, the evaporation pressure is also reduced and consequently that of the flow rate, preventing the blocking of the unit.

The third pump automatically starts when the reference water temperature is within the set limits.

DOUBLE SET POINT

The microprocessor enables you to set two set temperatures for the production of cold and hot water. Unless specified otherwise in the order, the default values are 12/7 °C and 15/10 °C for chiller mode and 40/45 °C and 35/40 °C for heat pump mode. The set temperatures must, in any case, remain within the operating ranges of the unit.

Use either the keypad or the digital input to switch between the first and second set. For series that do not permit the simultaneous selection of "Select summer/winter mode with digital input" and "Double set point with digital input", summer/winter mode can be selected only on the keypad while the double set point still uses the digital input, as per our standard.

EC FANS

Units can be coupled to the innovative direct current EC axial fans with electronically commutated brushless motor.

These motors with permanent magnets rotor ensure a high level of efficiency for all work conditions and allow to obtain a 15% saving per fan.

Moreover, through a 0-10V analogical signal sent to every fan, the microprocessor allows to control the condensation through continuous air flow regulations on variation of the outdoor air temperature and a consequent sound emission reduction

"BRINE KIT" ACCESSORY

It is applied if the evaporator output temperature is included within +3°C and -8°C. It consists in a higher thermal insulation of the exchanger and piping, a specific calibration of the low pressure switches and of the anti-freeze alarm, and dimensioning check of the mechanical thermostatic valve.

If it is not included in the set-up, the "Check condensation" accessory must be added.

ELECTRONIC THERMOSTATIC VALVE

The use of this accessory is particularly indicated for units that operate in very unstable heat load conditions or in unstable functional mode, as in the case of joint management of air conditioning and production of high temperature water. Use of the electronic thermostatic valve in fact allows to:

- maximise the heat exchange to the evaporator
- minimise response times on load variation and on operative conditions
- optimise the regulation of the over-heating
- guarantee maximum energy efficiency

"NIGHT SHIFT SYSTEM" ACCESSORY

This accessory is available for TETRIS SLN FC and TETRIS A SLN FC and allows the units, by setting the daily time slot, to operate in high efficiency or low noise mode, depending on the requirements.

For example, in the daytime during the summer, the machine can be set to operate at full energy efficiency, while at night, the machine will run in super low-noise mode, with great sensitivity to noise perception.

From the default time slot settings below, the user can reset

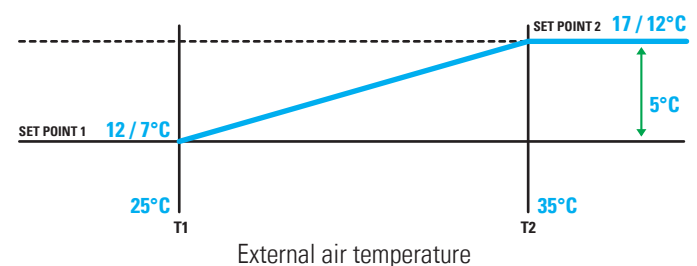
the new time slots directly from the keyboard of the microprocessor.

COMPENSATION OF THE SET-POINT to the external air temperature

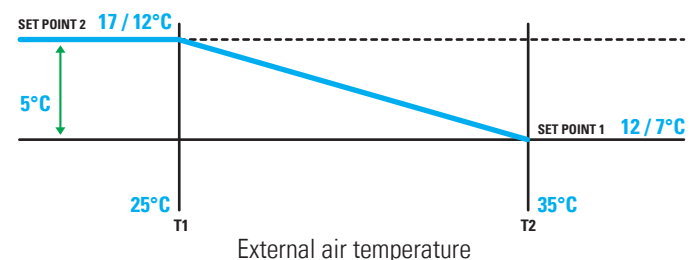
The unit microprocessor control can compensate the set point in a dynamic way, on variation of the external air temperature. The compensation can be positive or negative: with positive compensation, on increase of the air temperature the functioning set also increases. With negative compensation on increase of the air temperature the set decreases. Compensation can be made either on the summer set point or on the winter set point (heat pumps).

By default, both summer and winter negative compensation is set, but this configuration can be modified from the microprocessor keyboard. Unless otherwise specified, default values are indicated in the graphics below.

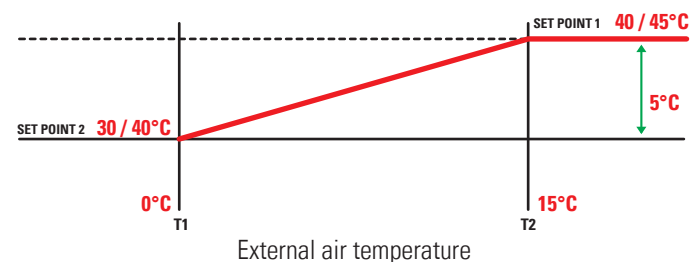
SUMMER COMPENSATION-POSITIVE



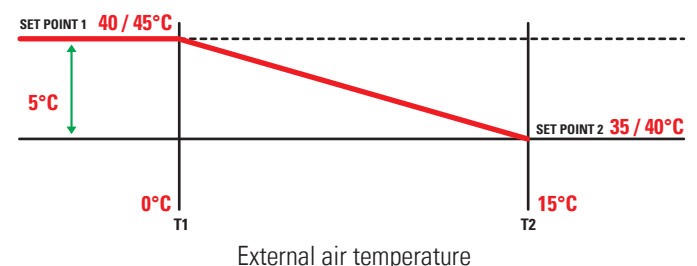
SUMMER COMPENSATION-NEGATIVE



WINTER COMPENSATION-POSITIVE



WINTER COMPENSATION-NEGATIVE



"SLAT (Set Low Air Temperature)" ACCESSORY

This accessory is available for the TETRIS units, but only in the

chiller version (heat pump excluded): in the absence of wind and added to the

“Condensation control with fan speed regulator” accessory, it allows to extend the external air operating temperature range from -10 °C to -20 °C (refer to the relevant set point chart). This extension is achieved thanks to a different setting of control parameters.

The accessory is not available for TETRIS A/A+/SLN/A SLN versions.

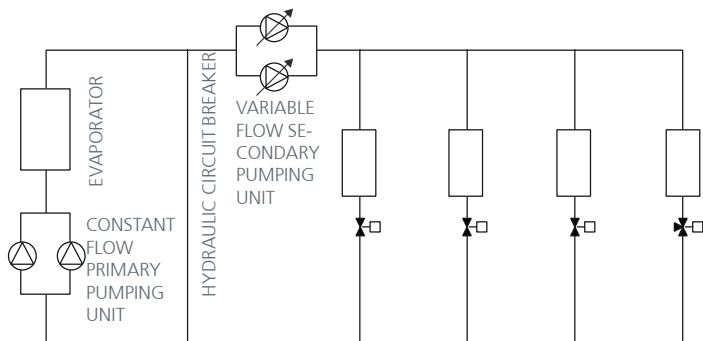
INVERTER DRIVEN PUMP (PER ST1P/S O ST2P/S)

Energy savings:

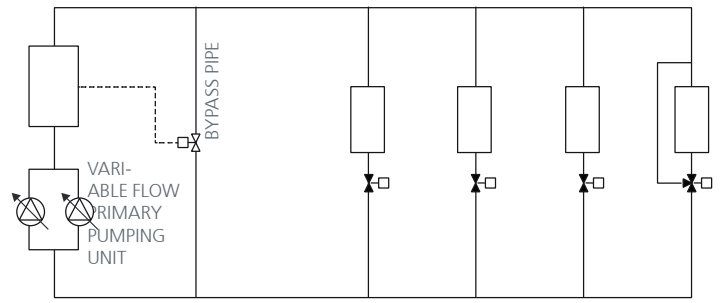
Variable flow pumps have become more widespread over the years to optimise air conditioning and cooling systems. Thanks to the Inverter Driven Pump, Blue Box offers an alternative method that differs from conventional layouts: a constant flow primary pump and a variable flow secondary pump

Let’s compare the two solutions:

1) The figure below shows the layout of a constant flow primary pump and a variable flow secondary pump. Please note the use of the decoupling pipe between the primary and secondary system (designed to cover the entire flow rate): if the utilities only require a percentage of the nominal power, the decoupling pipe recirculates the excess flow, which means wasting pumping energy.



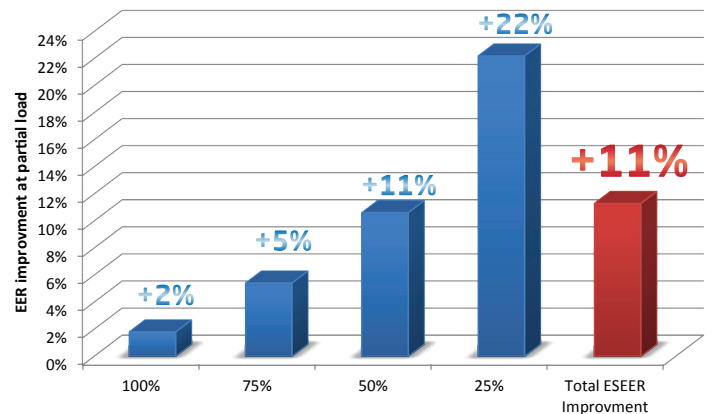
The figure below shows a system with only variable flow primary pumps, which also serve the secondary system. The bypass pipe and the two-way control valve ensure minimum water flow through the evaporator when the request is below the allowed minimum water flow limit to guarantee a correct heat exchange for the evaporator. The pipe and the two-way control valve are designed for a much lower water flow rate than the nominal one. This allows to considerably reduce energy losses related to the mixing process, which in traditional systems are caused by the hydraulic circuit breaker.



Benefits of the Inverter Driven Pump:

- Saving a set of pumps
- Reduced overall dimensions of the machines’ housings
- Lower piping costs
- Reduced pressure drops
- Greater energy efficiency on the pump side

As we can see from the graph under EUROVENT conditions, the systems in the diagrams have higher efficiency under part-load conditions, considering the energy consumed by the pumps as well as by the chiller (compressors plus fans)

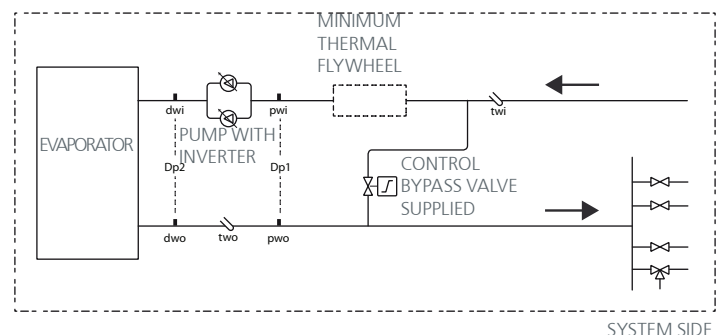


Energy savings in these conditions can be as high as 11% per year and sometimes even more!

Inverter Driven Pump operating logic:

Dp1: System side pressure drops

Dp2: Evaporator pressure drops



When all the utilities are in operation, the unit’s pump runs at the nominal flow rate and with an available head on the system side equal to Dp1 and evaporator pressure drops equal to Dp2.

The system’s heat load drop causes the shut-off valves of the utilities to close, which results in an increase in the pressure drops that the pump needs to overcome. At the same time, the inverter’s control logic will reduce the flow rate, which will determine lower evaporator pressure drops and bring back the available head to the nominal Dp1 value.

Key points for a variable flow primary system:

In order for the components of the system to operate optimally, it is important to take some key points into account:

1) Minimum water flow and bypass valve supplied:

The Inverter Driven Pump also includes the two-way bypass valve supplied with it and adequately designed in relation to the size of the unit.

If on the system side the heat load is very low, this means that many utilities are closed, which results in an increase in pressure drops. The inverter counters the Dp1 variation detected by the sensor by reducing the speed of the pump and the flow rate as a result. However, there is a limit lower than the flow rate value below which the heat exchange towards the evaporator is not performed properly and the temperature drop processed by the evaporator increases, which might activate the anti-freeze alarm. The two-way control valve adequately selected based on the machine model prevents this alarm from being triggered, thereby ensuring the minimum water flow rate towards the evaporator.

2) “Minimum thermal flywheel”:

In the event of a heat load close to zero, with the unit in maximum power partialisation conditions, the pump set at the minimum flow rate and closed system valves, the machine might stop due to the anti-freeze alarm.

To prevent this problem, there must be a “minimum thermal flywheel” in the evaporator / bypass valve section.

Below is the formula to determine it:

$$Vol = \frac{P_0 * k}{N} \quad [l]$$

P_0 : Machine overall chilling power [kW]

N : Inverse of the unit’s minimum partialisation

k : parameter [l/kW]

Scroll compressors		2	3	4	5	6	7	8	9	10	12
k	[l / kW]	17.4	13	13.9	17.4	16.3	15.3	14.8	14.6	13.9	13.4
N		2	3	4	5	6	7	8	9	10	12

The water content of the evaporator, of the hydraulic module’s inertial tank (if there is one) and of the pipes between the bypass and the evaporator itself may contribute to determine the “minimum thermal flywheel”.

However, it is advisable to use three-way valves on a certain number of utilities on the system to ensure a minimum flow of water towards the system in any condition.

Please note: if this accessory is installed, the minimum cold water temperature at the outlet cannot drop below 7°C. Moreover, the temperature variation considered under the conditions specified in the project must be 5°C. Please contact our sales department for the minimum water temperature at the outlet (production of cold water) and for different temperature drop values.

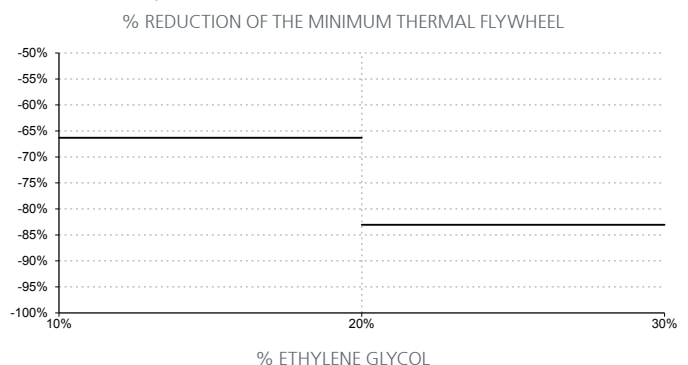
You should also contact the sales department in the event of production of hot water for water temperatures at the outlet below 40°C.

Attention: the “minimum thermal flywheel” must be between the bypass valve and the evaporator. This is a part of the “minimum water content of the system” described in the relative chapter of the manual; the difference between the “minimum water content of the system” and the “minimum thermal flywheel” can instead be positioned in any area of the system.

The “minimum thermal flywheel” allows the unit to operate correctly also in heat pump mode.

For cooling-only machines, if using ethylene glycol mixes, it is possible to reduce the “minimum thermal flywheel” based on the curves below

For scroll compressors:



If the unit is in heat pump mode, the “minimum thermal flywheel” is not reduced even if there is glycol.

TETRIS TECHNICAL DATA

UNIT SIZE			27.4	29.4	32.4	33.4	37.4	41.4	43.6
Cooling (Gross values)									
Nominal cooling capacity	(1)	kW	263	281	306	335	370	408	427
Total power input for cooling	(1),(2)	kW	96	111	120	134	134	147	162
EER	(1)		2,72	2,53	2,55	2,50	2,77	2,78	2,64
ESEER			4,23	3,87	4,10	4,09	4,23	4,29	4,32
Efficiency class			C	D	D	D	C	C	D
Cooling (EN 14511 values)									
Nominal cooling capacity	(1),(8)	kW	262	280	305	334	368	407	426
EER	(1),(8)		2,68	2,50	2,52	2,48	2,73	2,75	2,61
ESEER	(8)		4,00	3,68	3,88	3,89	4,02	4,07	4,09
Efficiency class			D	D	D	E	C	C	D
Cooling (Gross values)									
Nominal cooling capacity	(1)	kW	255	273	297	325	359	396	415
Total power input for cooling	(1),(2)	kW	96	111	120	133	133	147	162
EER	(1)		2,64	2,46	2,48	2,44	2,69	2,70	2,56
ESEER			4,11	3,76	3,98	3,98	4,11	4,17	4,19
Efficiency class			D	E	E	E	D	C	D
Cooling (EN 14511 values)									
Nominal cooling capacity	(1),(8)	kW	254	272	296	324	357	395	413
EER	(1),(8)		2,61	2,43	2,45	2,41	2,66	2,67	2,53
ESEER	(8)		3,90	3,58	3,78	3,80	3,91	3,97	3,97
Efficiency class			D	E	E	E	D	D	D
Heating (Gross values)									
Nominal heating capacity	(3)	kW	256	281	306	340	355	399	422
Total power input for heating	(2),(3)	kW	92	99	106	118	126	136	148
COP	(3)		2,78	2,85	2,90	2,88	2,82	2,93	2,85
Efficiency class			D	C	C	C	C	C	C
Heating (EN 14511 values)									
Nominal heating capacity	(3),(8)	kW	257	282	308	341	356	401	423
COP	(3),(8)		2,76	2,84	2,88	2,87	2,80	2,92	2,83
Efficiency class			D	C	C	C	C	C	C
Compressor									
Type						Scroll			
Quantity/Circuits		n°/n°	4 / 2	4 / 2	4 / 2	4 / 2	4 / 2	4 / 2	6 / 2
Capacity steps		n°	4	4	4	4	4	4	6
Total oil charge		l	26,8	27,8	28,8	21,2	21,2	21,2	41,7
Refrigerant charge TETRIS (with micro-channels coils)		kg	26,0	28,0	31,0	39,0	47,0	50,0	49,0
Refrigerant charge TETRIS (with copper/aluminium coils)			38,0	42,0	46,0	51,0	56,0	62,0	62,0
Refrigerant charge TETRIS /HP		kg	64,0	64,0	64,0	78,0	90,0	90,0	90,0
Fans									
Type						Axial			
Quantity		n°	4	4	4	5	6	6	6
Air flow		m ³ /h	84.000	84.000	84.000	105.000	126.000	126.000	126.000
Evaporator									
Type						Plates			
Quantity			1	1	1	1	1	1	1
Water flow TETRIS	(6)	l/h	45.142	48.392	52.623	57.632	63.543	70.146	73.482
Water flow TETRIS /HP	(6)	l/h	43.827	46.983	51.090	55.947	61.658	68.062	71.342
Pressure drop TETRIS	(7)	l/h	43.990	48.363	52.702	58.482	60.972	68.679	72.535
Pressure drop TETRIS	(6)	kPa	41,9	36,4	41,0	34,9	37,9	38,4	42,1
Pressure drop TETRIS /HP	(6)	kPa	39,5	34,3	38,6	32,9	35,7	36,1	39,7
Pressure drop TETRIS /HP	(7)	kPa	39,8	36,4	41,1	35,9	34,9	36,8	41,0
Hydraulic module									
Available static pressure ST 1P, ST 1PS		kPa	219	212	193	214	203	248	228
Available static pressure ST 2P, ST 2PS		kPa	-	-	-	-	-	-	-
Available static pressure ST 3P, ST 3PS		kPa	154	150	135	246	240	230	206
Tank capacity		l	300	300	300	300	300	300	300
Expansion vessel		l	18	18	18	18	18	18	18
Sound level									
Sound power value (standard unit)	(4)	dB(A)	95	95	96	97	97	97	97
Sound pressure value (standard unit)	(5)	dB(A)	63	63	64	65	65	65	65
Sound power value (LN version)	(4)	dB(A)	89	90	91	92	93	93	93
Sound pressure value (LN version)	(5)	dB(A)	57	58	59	60	61	61	61
Basic unit size and weights									
Length		mm	2.302	2.302	2.302	3.447	3.447	3.447	3.447
Width		mm	2.302	2.302	2.302	2.302	2.302	2.302	2.302
Height		mm	2.397	2.397	2.397	2.397	2.397	2.397	2.397
Operating weigh (with micro-channels coils)		kg	1.760	1.826	1.877	2.048	2.102	2.241	2.475
Operating weigh (with copper/aluminium coils)		kg	1.955	2.029	2.085	2.275	2.336	2.490	2.750

(1) External air temperature 35°C; evaporator inlet/outlet water temperature 12-7°C

(2) Total power input is sum of compressors and fans power input

(3) External air temperature 7°C BS, 6°C BU; condenser inlet/outlet water temperature 40-45°C

(4) Sound power values calculate in compliance with ISO 3744; nominal conditions

(5) Sound pressure values measured at 10 meters distance from the unit in free field and

at nominal working conditions (ISO 3744)

(6) Evaporator inlet/outlet water temperature 12-7°C

(7) Evaporator inlet/outlet water temperature 40-45°C

(8) Values in compliance with EN 14511-3:2011

ELECTRICAL DATA STANDARD UNIT

UNIT SIZE			8.2	13.3	18.4	23.5	27.6	32.7		
Max. absorbed power	(1),(3)	kW	55,1 (57,0)	61,5 (63,7)	67,9 (70,1)	73,7 (75,9)	79,5 (81,7)	101,9 (104,9)	119,3 (124,8)	
Max. absorbed current	(2),(3)	A	81,6 (86,6)	89,7 (94,3)	97,8 (102,4)	112,5 (117,1)	127,2 (131,8)	146,7 (152,8)	190,8 (201,5)	
Max. starting current	(4)	A	270 (275)	317 (322)	325 (330)	363 (368)	378 (383)	374 (380)	442 (452)	
Max. starting current with soft-starter	(4)	A	180 (185)	208 (213)	216 (221)	239 (244)	254 (259)	265 (271)	318 (328)	
Fan rated power		rF _{max} 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	
Fan rated current		rF _{max} 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	
Pump rated power	(5)	kW	1,9	2,2	2,2	2,2	2,2	3,0	5,5	
Pump rated current	(5)	A	5,0	4,6	4,6	4,6	4,6	6,1	10,7	
Pump rated power	(6)	kW	-	-	-	-	-	-	-	
Pump rated current	(6)	A	-	-	-	-	-	-	-	
Electric power supply		V _{ph} Hz	400/3~/50 ± 5							
Control power supply		V _{ph} Hz	230-24/1~/50 ± 5							

UNIT SIZE			27.4	29.4	32.4	33.4	37.4	41.4	43.6	
Max. absorbed power	(1),(3)	kW	135,9 (141,5)	147,5 (153,1)	159,0 (164,6)	174,6 (183,6)	185,2 (194,2)	197,6 (206,8)	221,2 (230,4)	
Max. absorbed current	(2),(3)	A	195,6 (210,5)	225,0 (239,9)	254,4 (269,3)	287,9 (306,2)	311,0 (329,3)	332,6 (351,6)	337,5 (356,5)	
Max. starting current	(4)	A	423 (438)	476 (491)	505 (520)	504 (522)	507 (525)	554 (573)	588 (607)	
Max. starting current with soft-starter	(4)	A	314 (329)	352 (367)	381 (396)	389 (407)	400 (418)	435 (454)	464 (483)	
Fan rated power		rF _{max} 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	
Fan rated current		rF _{max} 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	
Pump rated power	(5)	kW	5,5	5,5	5,5	5,5	5,5	9,2	9,2	
Pump rated current	(5)	A	10,7	10,7	10,7	10,7	10,7	19,0	19,0	
Pump rated power	(6)	kW	5,6	5,6	5,6	9,0	9,0	9,0	9,0	
Pump rated current	(6)	A	14,9	14,9	14,9	18,3	18,3	18,3	18,3	
Electric power supply		V _{ph} Hz	400/3~/50 ± 5							
Control power supply		V _{ph} Hz	230-24/1~/50 ± 5							

(1) Mains power supply to allow unit operation

(2) Maximum current before safety cut-outs stop the unit. This value is never exceeded and must be used to size the electrical supply cables and relevant safety devices (refer to electrical wiring diagram supplied with the unit)

(3) Values in brackets refer to ST version units (units with storage tank and pumps or units with exclusively pumps)

(4) Maximum starting current calculated considering the bigger size compressor starting current plus the maximum absorbed power of the other electrical devices (pumps, fans)

(5) Versions: ST 1P, ST 1PS, ST 2P, ST 2PS. Datas are referred to a single pump

(6) Versions: ST 3P, ST 3PS. Datas are referred to all 3 pumps

ELECTRICAL DATA STANDARD UNIT

UNIT SIZE		8.2	13.3	18.4	23.5	27.6	32.7		
Max. absorbed power	(1),(3) kW	238,6 (247,8)	255,2 (264,4)	271,8 (281,0)	294,9 (304,1)	318,1 (330,1)	340,5 (352,5)	357,8 (369,8)	
Max. absorbed current	(2),(3) A	381,6 (400,6)	386,4 (405,4)	391,2 (410,2)	450,0 (469,0)	508,8 (533,2)	528,3 (552,7)	572,4 (596,8)	
Max. starting current	(4) A	632 (651)	637 (656)	619 (638)	701 (720)	760 (784)	779 (803)	823 (848)	
Max. starting current with soft-starter	(4) A	508 (527)	513 (532)	510 (529)	577 (596)	636 (660)	655 (679)	699 (724)	
Fan rated power	r ^p 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	9 x 2,0	
Fan rated current	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	9 x 4,3	
Pump rated power	(5) kW	9,2	9,2	9,2	9,2	9,2	11,0	11,0	
Pump rated current	(5) A	19,0	19,0	19,0	19,0	19,0	21,6	21,6	
Pump rated power	(6) kW	9,0	9,0	9,0	9,0	12,0	12,0	12,0	
Pump rated current	(6) A	18,3	18,3	18,3	18,3	24,4	24,4	24,4	
Electric power supply	V/ph~Hz	400/3~/50 ± 5							
Control power supply	V/ph~Hz	230-24/1~/50 ± 5							

UNIT SIZE		27.4	29.4	32.4	33.4	37.4	
Max. absorbed power	(1),(3) kW	374,4 (386,4)	397,6 (414,1)	407,6 (424,1)	442,4 (458,9)	477,1 (493,6)	
Max. absorbed current	(2),(3) A	577,2 (601,6)	636,0 (668,1)	586,8 (618,9)	675,0 (707,1)	763,2 (795,3)	
Max. starting current	(4) A	828 (852)	887 (919)	814 (846)	926 (958)	1.014 (1.046)	
Max. starting current with soft-starter	(4) A	704 (728)	763 (795)	705 (737)	802 (834)	890 (922)	
Fan rated power	r ^p x kW	10 x 2,0	10 x 2,0	12 x 2,0	12 x 2,0	12 x 2,0	
Fan rated current	n° x A	10 x 4,3	10 x 4,3	12 x 4,3	12 x 4,3	12 x 4,3	
Pump rated power	(5) kW	11,0	11,0	11,0	15,0	15,0	
Pump rated current	(5) A	21,6	21,6	21,6	28,6	28,6	
Pump rated power	(6) kW	12,0	16,5	16,5	16,5	16,5	
Pump rated current	(6) A	24,4	32,1	32,1	32,1	32,1	
Electric power supply	V/ph~Hz	400/3~/50 ± 5					
Control power supply	V/ph~Hz	230-24/1~/50 ± 5					

(1) Mains power supply to allow unit operation

(2) Maximum current before safety cut-outs stop the unit. This value is never exceeded and must be used to size the electrical supply cables and relevant safety devices (refer to electrical wiring diagram supplied with the unit)

(3) Values in brackets refer to ST version units (units with storage tank and pumps or units with exclusively pumps)

(4) Maximum starting current calculated considering the bigger size compressor starting current plus the maximum absorbed power of the other electrical devices (pumps, fans)

(5) Versions: ST 1P, ST 1PS, ST 2P, ST 2PS. Datas are referred to a single pump

(6) Versions: ST 3P, ST 3PS. Datas are referred to all 3 pumps

TETRIS - COOLING CAPACITY

Model	To	EXTERNAL AIR TEMPERATURE [°C]							
	[°C]	25		30		35		40	
		Pf	Pe	Pf	Pe	Pf	Pe	Pf	Pe
32.4	5	329,6	91,7	310,3	100,7	289,4	110,8	267,1	122,2
	6	338,9	92,6	319,0	101,7	297,7	111,9	274,8	123,3
	7	348,4	93,6	327,9	102,7	305,9	112,9	282,3	124,4
	8	358,0	94,6	336,9	103,8	314,3	114,1	290,0	125,6
	9	367,7	95,6	346,0	104,9	322,7	115,2	297,7	126,8
33.4	5	377,4	96,6	355,1	106,0	331,1	116,4	305,5	128,1
	6	383,0	98,0	362,0	109,6	344,1	122,7	316,6	137,6
	7	393,4	99,0	369,5	110,6	353,4	123,9	325,3	138,8
	8	404,2	100,0	379,6	111,8	362,8	128,8	334,0	144,1
	9	415,0	101,1	389,7	112,9	372,7	129,9	344,1	150,3
37.4	5	395,9	96,5	373,2	107,9	349,0	121,0	323,0	136,0
	6	407,4	97,3	384,1	108,9	359,3	122,0	332,6	137,1
	7	419,5	98,2	395,2	109,8	369,6	123,1	342,2	138,2
	8	431,2	99,1	406,5	110,8	380,2	124,1	352,0	139,3
	9	443,3	100,0	418,0	111,8	390,9	125,2	361,9	140,5
41.4	5	455,5	101,0	429,5	112,8	401,7	126,3	371,9	141,7
	6	440,3	108,2	413,8	120,1	385,7	133,7	355,6	149,0
	7	452,8	109,3	425,7	121,3	396,7	134,9	365,9	150,3
	8	465,7	110,4	437,7	122,5	407,9	136,2	376,1	151,6
	9	478,7	111,6	449,9	123,7	419,2	137,5	386,5	152,9
43.6	5	491,9	112,8	462,3	125,0	430,7	138,8	397,0	154,3
	6	505,2	114,0	474,7	126,3	442,2	140,1	407,6	155,7
	7	458,3	122,9	432,1	135,0	403,8	148,7	373,3	164,0
	8	471,4	124,0	444,5	136,3	415,4	150,0	384,2	165,4
	9	485,1	125,2	457,2	137,5	427,2	151,3	395,0	166,8
47.6	5	498,3	126,4	469,8	138,8	439,1	152,7	406,0	168,2
	6	512,0	127,6	482,7	140,1	451,1	154,1	417,1	169,7
	7	525,8	128,9	495,6	141,5	463,2	155,5	428,2	171,2
	8	494,1	136,0	464,7	149,4	433,3	164,3	399,5	181,2
	9	507,8	137,4	477,9	150,9	445,6	165,9	411,0	182,9
50.7	5	522,0	138,9	491,0	152,4	457,7	167,6	422,0	184,6
	6	536,3	140,4	504,4	154,0	470,1	169,3	433,4	186,4
	7	550,6	141,9	517,8	155,7	482,6	171,0	444,8	188,2
	8	565,1	143,5	531,3	157,3	495,1	172,7	456,3	190,0
	9	531,9	136,7	500,3	150,1	466,0	165,0	429,3	181,8
53.8	5	546,8	138,0	514,3	151,5	479,3	166,6	441,8	183,5
	6	562,1	139,4	528,6	153,0	492,6	168,1	453,9	185,1
	7	577,6	140,8	543,1	154,5	506,1	169,7	466,3	186,7
	8	593,2	142,3	557,7	156,1	519,6	171,4	478,8	188,5
	9	608,9	143,8	572,4	157,6	533,3	173,0	491,4	190,2
58.8	5	564,6	145,6	531,9	159,9	496,0	175,9	457,6	193,7
	6	580,6	146,9	546,8	161,3	510,3	177,4	471,1	195,3
	7	597,4	148,2	562,4	162,7	524,9	178,9	484,6	196,9
	8	614,1	149,6	578,2	164,2	539,6	180,4	498,3	198,5
	9	631,0	151,0	594,1	165,7	554,5	182,0	512,0	200,1
58.8	5	648,1	152,4	610,2	167,2	569,5	183,6	525,9	201,8
	6	615,5	164,6	578,4	180,7	538,1	198,5	494,9	218,5
	7	632,5	166,3	594,1	182,4	553,0	200,4	509,0	220,6
	8	650,2	168,1	610,7	184,3	568,4	202,4	523,1	222,6
	9	667,9	169,8	627,2	186,2	583,8	204,4	537,2	224,7
58.8	5	685,7	171,7	644,0	188,1	599,3	206,4	551,5	226,8
	6	703,8	173,5	660,8	190,1	615,0	208,5	565,9	229,0

All data are referred to the basic versions

Pf:cooling capacity [kW]

Pe:electrical power absorbed by the compressors [kW]

T0:evaporator outgoing water temperature [°C]

TETRIS - RECOVERY CAPACITY

Model	To	CONDENSER WATER OUTLET TEMPERATURE [°C]														
	[°C]	30			35			40			45			50		
		Pf	Pe	Pr	Pf	Pe	Pr	Pf	Pe	Pr	Pf	Pe	Pr	Pf	Pe	Pr
29.4	5	319,7	77,0	396,7	300,9	85,6	386,4	280,1	95,3	375,5	266,5	102,0	368,5	256,8	106,9	363,6
	6	330,0	77,3	407,2	310,7	85,9	396,6	289,4	95,7	385,1	275,4	102,4	377,8	265,4	107,3	372,6
	7	340,7	77,6	418,2	320,7	86,2	406,9	298,6	96,1	394,7	284,1	102,8	386,9	273,8	107,7	381,5
	8	351,3	77,8	429,1	330,8	86,5	417,3	308,2	96,4	404,6	293,2	103,2	396,4	282,5	108,2	390,7
	9	362,2	78,1	440,3	341,1	86,8	428,0	317,8	96,8	414,6	302,4	103,6	406,0	291,3	108,7	400,0
32.4	5	348,6	83,1	431,7	328,4	92,2	420,7	306,3	102,6	408,9	291,8	109,6	401,4	281,6	114,8	396,3
	6	359,8	83,4	443,2	339,0	92,6	431,6	316,3	103,0	419,3	301,4	110,1	411,5	290,9	115,2	406,1
	7	371,6	83,8	455,4	350,1	93,0	443,0	326,4	103,4	429,8	311,0	110,5	421,6	300,1	115,7	415,9
	8	383,0	84,1	467,0	361,0	93,3	454,3	336,8	103,9	440,6	321,0	111,0	432,0	309,7	116,2	425,9
33.4	5	387,6	84,4	472,1	366,4	95,0	461,4	344,3	106,8	451,2	330,7	114,6	445,2	321,3	120,0	441,3
	6	400,0	84,6	484,6	378,2	95,1	473,4	355,9	106,8	462,7	341,9	114,6	456,5	332,3	120,0	452,4
	7	413,1	84,7	497,8	391,0	95,2	486,2	368,0	106,8	474,8	353,4	114,6	468,0	343,5	120,0	463,5
	8	425,9	84,9	510,7	403,5	95,2	498,6	379,9	106,8	486,8	365,2	114,5	479,8	355,1	120,0	475,1
	9	439,4	85,0	524,4	416,5	95,2	511,7	392,4	106,8	499,2	377,2	114,5	491,8	366,9	120,0	486,9
37.4	5	409,6	89,2	498,8	386,2	100,8	487,0	362,5	113,4	476,0	347,9	121,7	469,6	337,9	127,5	465,4
	6	422,2	89,5	511,7	398,5	101,0	499,5	374,7	113,4	488,2	359,8	121,7	481,5	349,6	127,5	477,1
	7	435,8	89,8	525,6	412,3	101,0	513,3	387,2	113,4	500,6	371,8	121,7	493,5	361,4	127,5	488,8
	8	448,9	90,0	538,9	425,1	101,0	526,1	400,0	113,4	513,4	384,3	121,6	505,9	373,5	127,5	501,0
41.4	5	459,4	99,0	558,4	433,9	110,4	544,3	406,7	123,2	529,9	389,6	131,7	521,3	377,9	137,6	515,5
	6	474,3	99,1	573,4	448,1	110,5	558,6	420,3	123,4	543,6	402,8	131,8	534,6	390,8	137,7	528,6
	7	490,1	99,3	589,3	463,4	110,7	574,1	434,1	123,5	557,6	416,1	131,9	548,1	403,8	137,9	541,7
	8	505,4	99,4	604,7	477,8	110,8	588,6	448,4	123,6	572,1	430,0	132,1	562,0	417,3	138,0	555,3
	9	521,4	99,5	620,9	493,1	111,0	604,1	462,9	123,8	586,7	444,0	132,2	576,2	431,0	138,1	569,1
43.6	5	478,2	113,9	592,1	450,5	126,4	577,0	420,0	140,8	560,8	400,0	150,5	550,5	385,7	157,7	543,4
	6	493,4	114,2	607,7	465,0	126,9	591,9	433,7	141,3	575,0	413,1	151,1	564,2	398,4	158,3	556,7
	7	509,5	114,6	624,1	480,0	127,3	607,4	447,9	141,8	589,7	426,7	151,7	578,4	411,2	158,9	570,1
	8	525,2	115,0	640,2	495,2	127,8	623,0	461,9	142,3	604,2	440,0	152,3	592,3	424,4	159,5	583,9
47.6	5	520,7	124,3	645,0	489,6	138,0	627,6	455,3	153,8	609,1	432,8	164,6	597,4	416,7	172,5	589,2
	6	537,2	124,8	662,0	505,3	138,6	643,9	470,1	154,5	624,5	447,0	165,3	612,3	430,4	173,3	603,7
	7	554,9	125,4	680,3	521,2	139,2	660,4	484,9	155,2	640,1	461,0	166,1	627,1	443,8	174,1	617,9
	8	571,5	125,9	697,4	537,6	139,9	677,5	500,2	155,9	656,0	475,5	166,9	642,3	457,7	175,0	632,7
	9	589,1	126,4	715,5	554,2	140,5	694,7	515,6	156,6	672,2	490,1	167,7	657,8	471,7	175,9	647,6

All data are referred to the basic versions

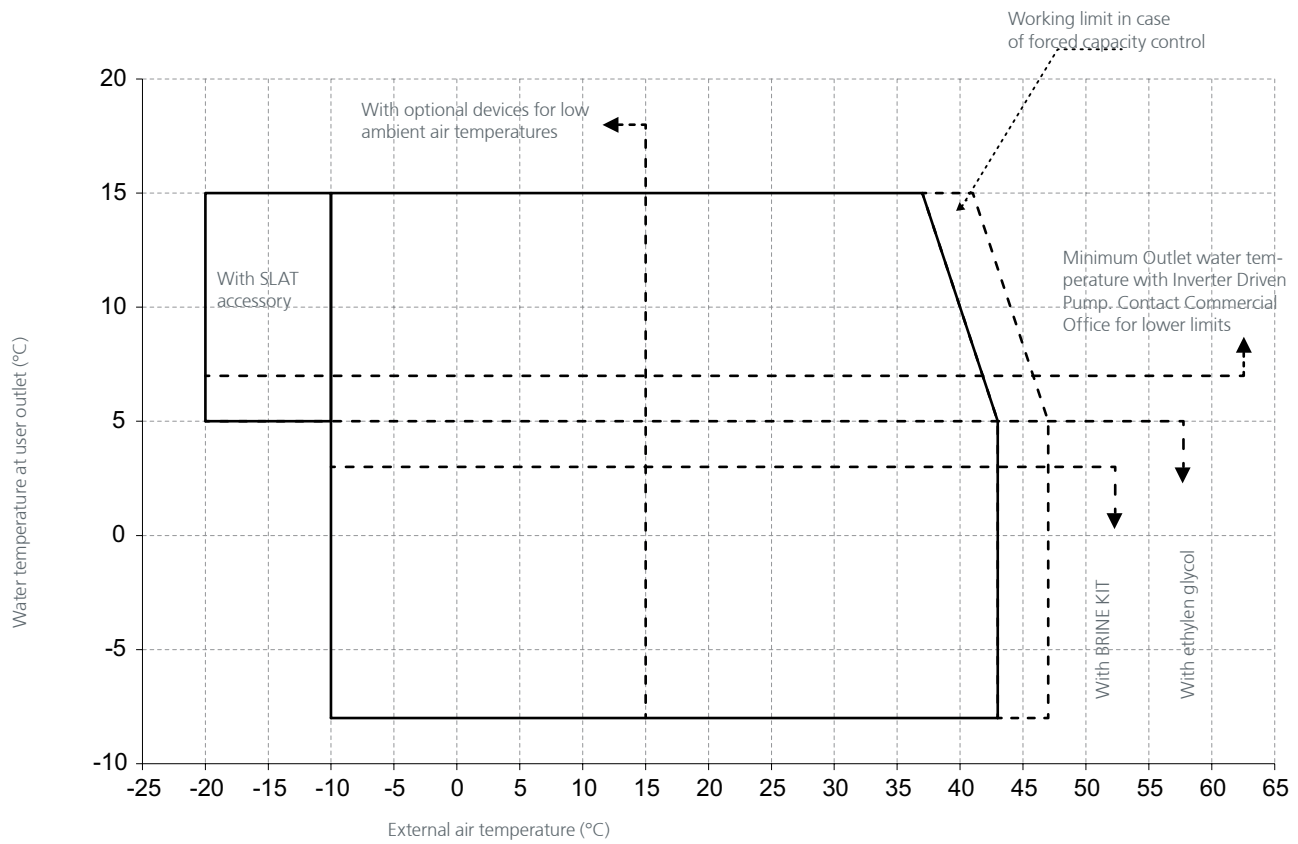
Pf:cooling capacity [kW]

Pe:electrical power absorbed by the compressors [kW]

Pr: recovery condenser heating capacity [kW]

T0:evaporator outgoing water temperature [°C]

OPERATING LIMITS COOLING - TETRIS

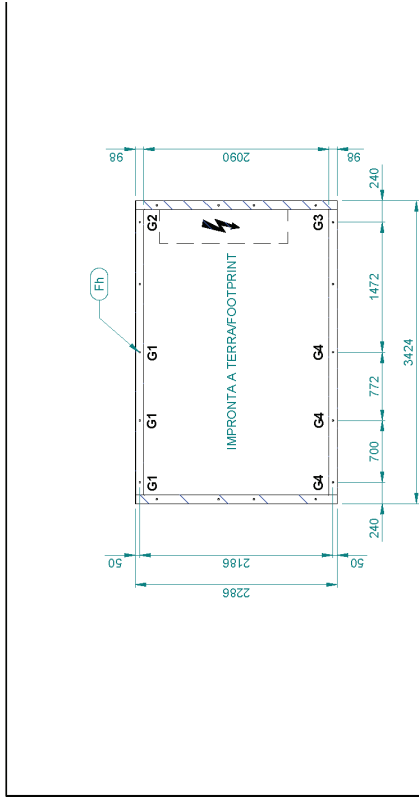


	63 Hz		125 Hz		250 Hz		500 Hz		1000 Hz		2000 Hz		4000 Hz		8000 Hz		[dB(A)]	
	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp
10.2	87	55	86	54	85	53	84	52	85	53	82	50	73	41	66	34	89	57
12.2	87	55	86	54	85	53	84	52	85	53	82	50	73	41	66	34	89	57
13.2	87	55	86	54	85	53	84	52	85	53	82	50	73	41	66	34	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

	63 Hz		125 Hz		250 Hz		500 Hz		1000 Hz		2000 Hz		4000 Hz		8000 Hz		[dB(A)]	
	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp
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

DIMENSIONAL LAYOUT

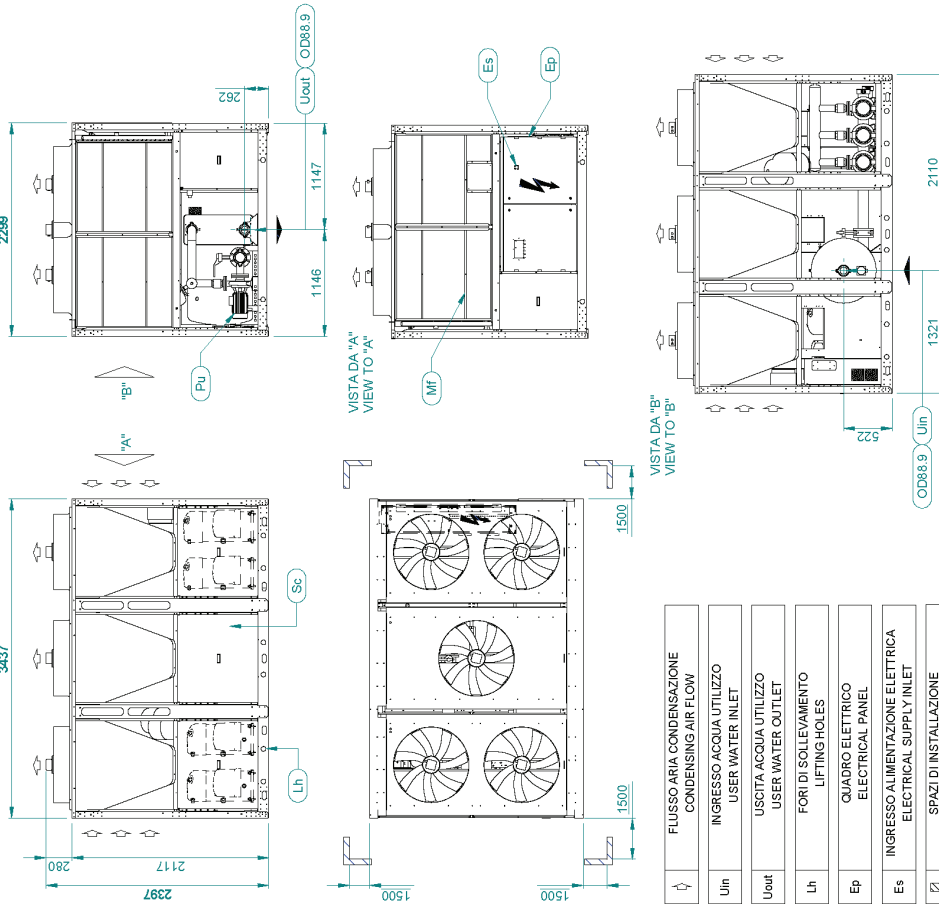
TETRIS 33.4 CH-HP-LN-ST 1PS-3PS



MODELLO MODEL	PESO (kg) WEIGHT (kg)	PESO IN FUNZIONE (kg) OPERATING WEIGHT (kg)	G1 (kg)	G2 (kg)	G3 (kg)	G4 (kg)
TETRIS 33.4 CH_1PS	2424	2779	270	473	551	315
TETRIS 33.4 CH_1PS LN	2713	3068	281	485	636	368
TETRIS 33.4 HP_1PS	2482	2837	275	480	563	323
TETRIS 33.4 HP_1PS LN	2772	3127	286	493	648	376
TETRIS 33.4 CH_3PS	2496	2851	286	481	543	323
TETRIS 33.4 CH_3PS LN	2782	3137	286	494	627	376
TETRIS 33.4 HP_3PS	2553	2908	291	488	554	331
TETRIS 33.4 HP_3PS LN	2843	3198	302	501	639	384

G.	PUNTI DI APPoggio ANTIVIBRANTI VIBRATION DAMPER FOOT HOLDS
Fh	FORI DI FISSAGGIO FIXING HOLES

For units with a microchannel battery weight is reduced by about 10% in proportion of the various points of support.



↑	FLUSSO ARIA CONDENSAZIONE CONDENSING AIR FLOW
Uin	INGRESSO ACQUA UTILIZZO USER WATER INLET
Uout	USCITA ACQUA UTILIZZO USER WATER OUTLET
Lh	FORI DI SOLLEVAMENTO LIFTING HOLES
Ep	QUADRO ELETTRICO ELECTRICAL PANEL
Es	INGRESSO ALIMENTAZIONE ELETTRICA ELECTRICAL SUPPLY INLET
□	SPAZI DI INSTALLAZIONE CLEARANCES

Pu	POMPA PUMP
St	SERBATOIO DI ACCUMULO STORAGE TANK

A4E033 /

INSTALLATIONS RECOMMENDATIONS

LOCATION

Strictly allow clearances as indicated in the catalogue.

Please check that there isn't any obstructions on the suction of the finned coil and on the discharge of the fans

Locate the unit in order to be compatible with environmental requirements (sound level, integration into the site, etc.).

ELECTRICAL CONNECTIONS

Check the wiring diagram enclosed with the unit, in which are always present all the instructions necessary to the electrical connections.

Supply the unit at least 12 hours before start-up, in order to turn crankcase heaters on. Do not disconnect electrical supply during temporary stop periods (i.e. weekends).

Before opening the main switch, stop the unit by acting on the suitable running switches or, if lacking, on the remote control.

Before servicing the inner components, disconnect electrical supply by opening the main switch.

The electric supply line must be equipped with an automatic circuit breaker (to be provided by the installer).

HYDRAULIC CONNECTIONS

Carefully vent the system, with pump turned off, by acting on the vent valves. This procedure is fundamental: little air bubbles can freeze the evaporator causing the general failure of the system.

Drain the system during seasonal stops (wintertime) or use proper mixtures with low freezing point. In case of temporary stop periods an electric heater should be installed on the evaporator and hydraulic circuit.

Install the hydraulic circuit including all the components indicated in the recommended hydraulic circuit diagrams (expansion vessel, flow switch, strainer, storage tank, vent valves, shut off valves, flexible connections, etc.).

Connect the flow switch, which is furnished on all units, not fitted. Follow the instructions enclosed with the units.

START UP AND MAINTENANCE OPERATIONS

Strictly follow what reported in use and maintenance manual. All these operations must be carried on by trained personnel only.