FX-FC 1502 - 6002

332 - 1412 kW | Chiller, air source with free-cooling

(The photo of the unit is indicative and may vary depending on the model)

- RANGE
- PATENT PENDING
- ENERGY SAVING
- POSITIVE TEMPERATURE FREE-COOLING 100%
- INTEGRATED HYDRONIC MODULE

SUMMARY

FX-FC 1502 - 6002

CE

ISO 14001 TÜV SÜD ISO 9001

Company quality system certified to UNI EN ISO 9001 and environmental certification UNI EN ISO 14001

Liability disclaimer

This bulletin is not exhaustive about: installation, use, safety precautions, handling and transport. Refer to the "General Manual of Installation" for further information.

This bulletin refers to standard executions, particularly as regards dimensions, weight, electric, hydraulic, aeraulic and refrigerant connections (where applicable). Contact Climaveneta Commercial Office for further drawings and schemes.

Climaveneta declines any liability deriving from use of the bulletin.

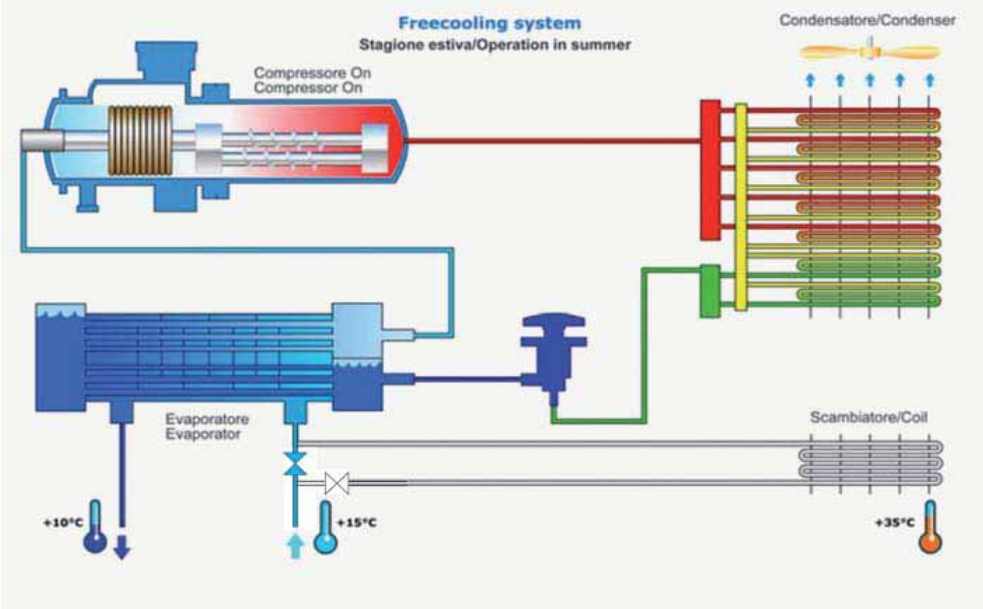
The data contained herein are subject to change without notice.

1. FREE-COOLING SYSTEM REPRESENT

The use of the free-cooling unit becomes a compulsory choice whenever load demands are practically constant, and equal to the nominal power of the unit, all year round.
The benefit gained from the use of this unit is much higher the higher the temperature difference between chilled water temperature desired and the outdoor air temperature.
There are many uses for this unit for both civil and for industrial processes. For example: shopping centres, data elaboration rooms, the plastics industry, the food industry and industrial processes in general.
When the outdoor air temperature is lower than the water temperature at the unit entrance by at least 1°C, the free-cooling system is activated. This unit requires the use of glycol-water or other similar solutions to prevent the formation of ice in the water coil during the exchange with outdoor air at a low temperature.
There are three typical use methods:

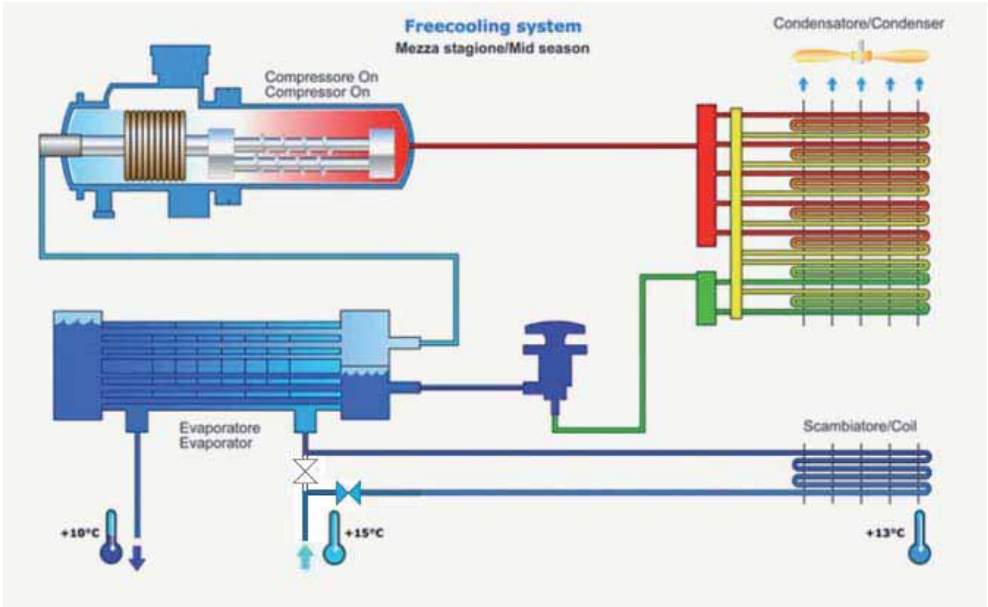
1.2 Summer Season

The water is completely chilled by the compressors during the normal chilling cycle.
The water coil is completely off.



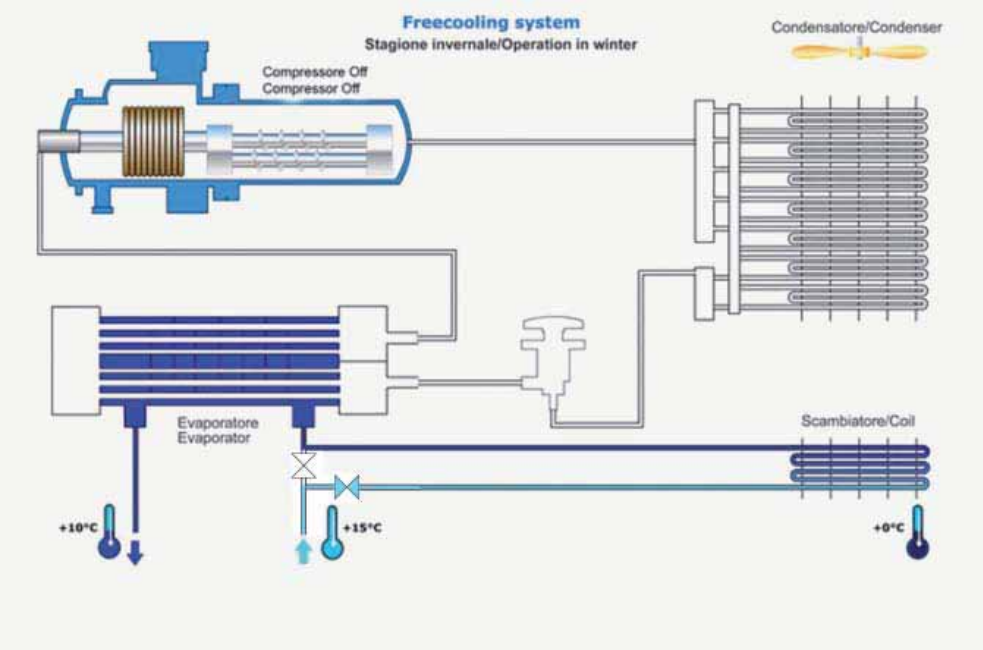
1.3 Mid-Season

The water is partly chilled by the water coil thanks to the action of the outdoor air and partly chilled by the compressors.
The percentage of precooling obtained by freecooling system activity depends on the outdoor air temperature. A threeway valve is used to involve the water coils.
This phase is very important: the freecooling unit makes optimum use of all resources available in order to optimize electrical power consumption.



1.4 Winter Season

The water is chilled only by the water coil because the outdoor air temperature is already low enough.
In this type of chilling, the only power consumed is for the fans.



1.5 The advantage of FX-FC: elevated energy efficiency in all operating modes

Thanks to their advanced design and the innovative patent-pending solutions, the FX-FC chillers with free-cooling optimise efficiency in each of the three operating modes:

Summer Season
The innovative BOOSTER, a patented device, increases the efficiency of the unit in the chiller mode, thus guaranteeing unprecedented EER values (@15/10°C, EG30%, Taria 35°C, EER=3.2).

Mid Season
- the activation of free-cooling at an external temperature of 1°C lower than the temperature of the system return water
- the cooling setpoint variation management
- the ventilation control logic combined with independent condensation circuit ventilation help maximise the effect of direct free-cooling.

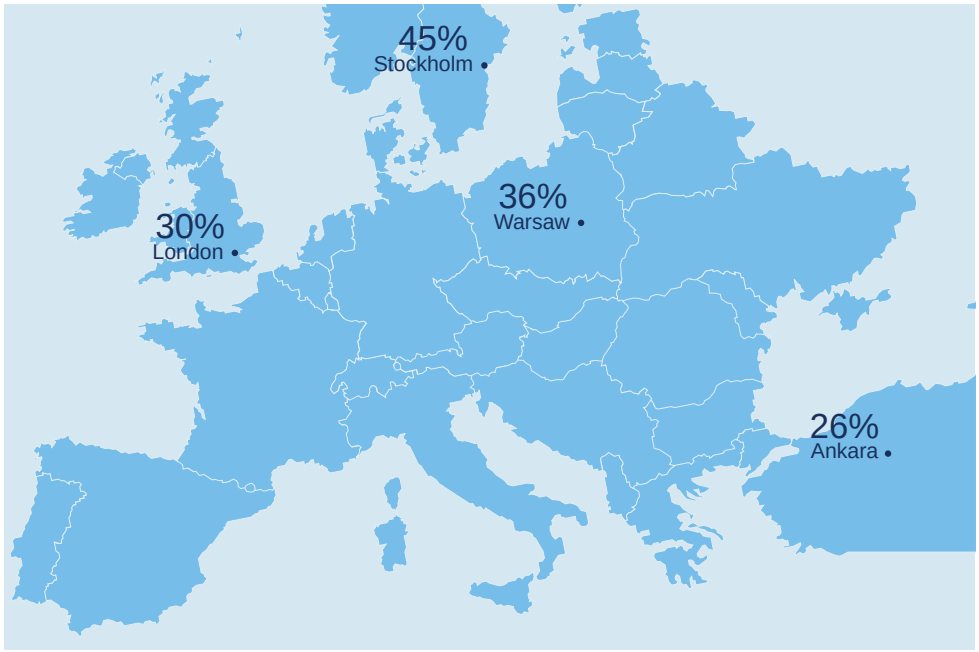
Winter Season
The generously sized free-cooling exchange surfaces already achieves total free-cooling at positive external air temperatures: the entire FX-FC range is available in the T+ configuration, 100% positive free-cooling temperature and equal to 2°C for the standard version. (CC @15/10°C, EG30%, Taria 35°C)
This design choice increases the number of annual unit operating hours in the full free-cooling mode, thus assuring higher energy saving.

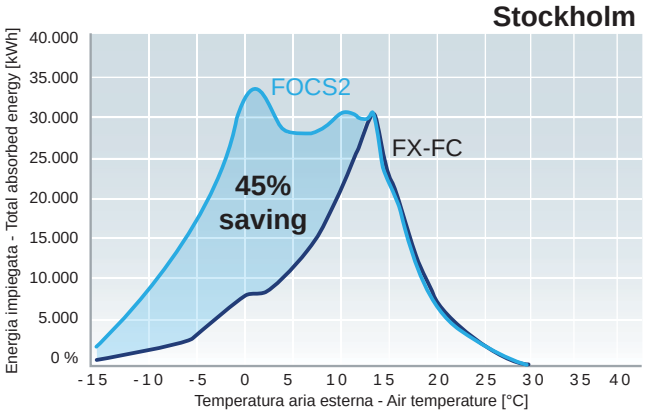
The result of these innovations, some of which are patented, is an FX-FC range that is positioned as an elevated energy-saving product, in both the standard T+ version and the super low noise SL-T+ version.
The FX-FC series offers an average saving of 35% compared with the energy used by similar last-generation chillers.

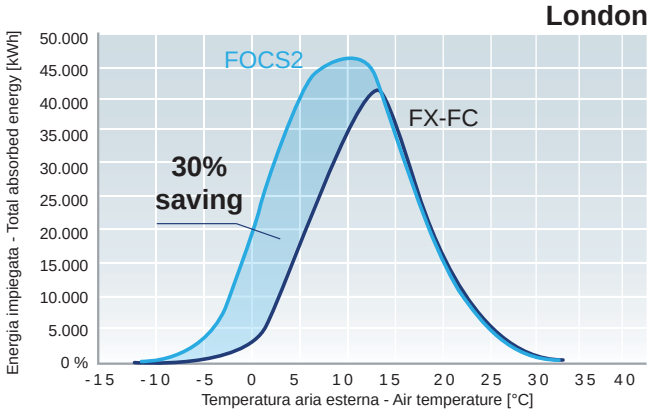
1.6 Why use the free-cooling system?

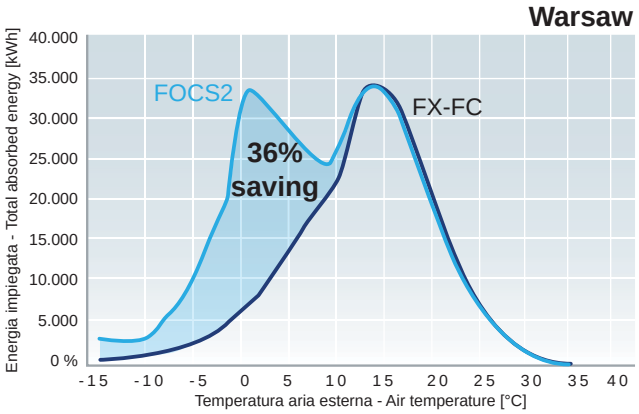
We compared the performance of a FOCS2-K unit with a FX-FC/T+ unit in 4 different European cities.

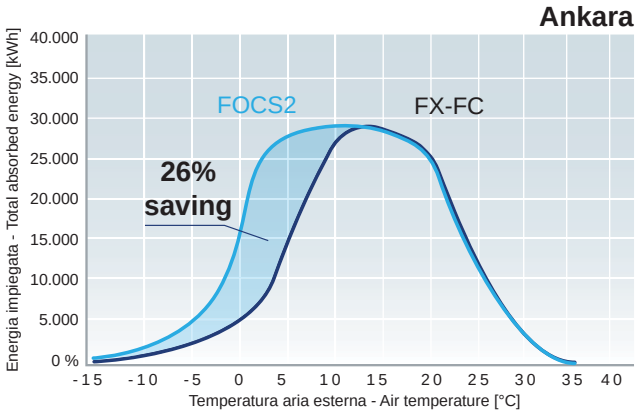
The units being compared were both used under the following conditions: Evaporator water temperature 15/10°C, with 30% ethylene glycol solution. The latitude, type of climate, temperature distribution in hours/year determine the advantages of the freecooling unit and the percentage of energy saved.











1.7 Maximum capacity of adaptation

The adjustments that can be activated for all the FX-FC units can support the various applications.
They set out to improve load adaptability, reduce the number of on and off sequences and maintain a constant evaporator outlet temperature.

Adjustments
The unit leaves the factory set to outlet modulating adjustment with PID (derivative integral proportional) logic on the evaporator outlet temperature; these adjustments, combined with continuous compressor adjustment (minimum compressor separation operation 50%), maintain the outlet water temperature stable and reduce the number of compressor on/off sequences.
Traditional inlet step adjustment, however, can always be selected from the parameter.

The capacity of adaptation is also the outcome of attentive compressor management combined with precise free-cooling valve activation logic.

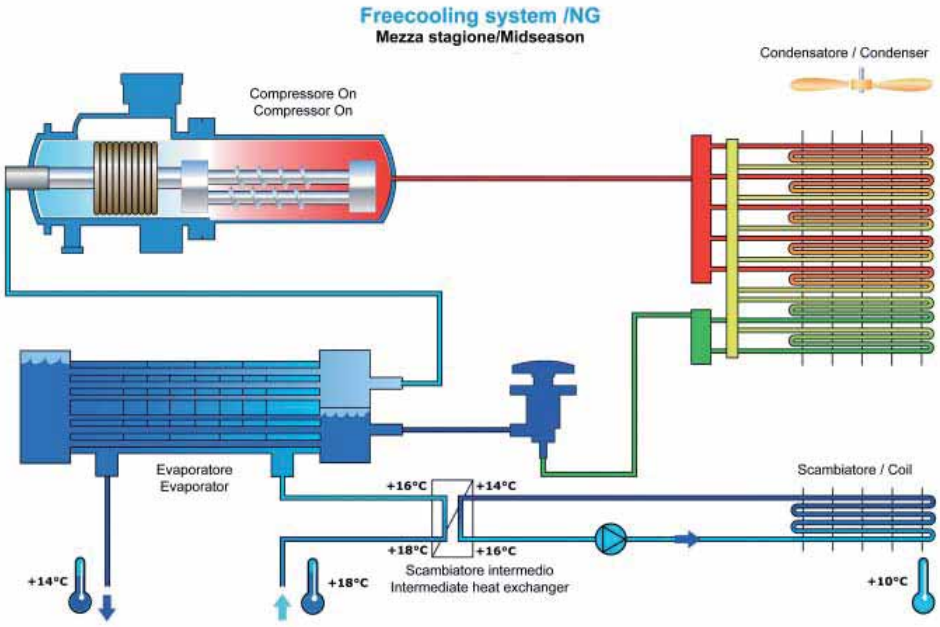
Modulating free-cooling valve option
The modulating free-cooling valves (optional) on the water side offer improved outlet temperature control also at low external air temperatures.
When the unit works entirely in the free-cooling mode with very low external temperatures, it is important to guarantee the required temperature of the chilled water. This is achieved by suitable mixing which is performed by appropriate modulating valves.

EC fan option
The EC (Electronically Commutated) fans feature motor efficiency levels in excess of 90% (EFF-1 classification according to European regulation CEMEP/EU).
The elevated efficiency assured by the DC brushless motor further increases unit performance in all operating modes: Depending on the ambient air temperature, the increase in EER generated by the EC fans can range from a few percent up to as much as 40%.

Further advantages of the EC fans are the low starting currents and the low noise emissions.

1.8 NoGlycol model

FX-FC in the NoGlycol configuration is a unit that is suitable for all applications where ethylene glycol or other anti-freeze mixtures cannot be used in the system.
Thanks to an intermediate hydraulic circuit, integrated inside the unit, the hydraulic circuit can be isolated from the system, loaded with water, from the Free Cooling circuit which uses glycol solutions to prevent ice from forming in the external coil.
Apart from this, the unit has the same characteristics as those described above.



2. PRODUCT PRESENTATION

Outdoor unit for the production of chilled water with semi-hermetic screw compressors optimized for R134a, axial-flow fans, condensing coil with copper tubes and aluminium fins, shell and tube evaporator design by Climaveneta and electronic expansion valve. High efficiency chiller operation guaranteed by a patented-pending booster solution.

2.2 Range

Extended capacity range.

2.3 Patent pending

Booster function to increase chiller efficiency.

2.4 Energy saving

Energy saving guaranteed by free-cooling, which exploits the low external air temperatures; free-cooling control with optional modulating valve.

2.5 Positive temperature free-cooling 100%

Big heat exchangers surfaces: 100% free-cooling cooling load satisfied at positive environment temperature.

2.6 Integrated hydronic module

It consists of 2 pumps, 2 or 4-pole motor, fixed or variable speed, with high or low head options to satisfy different industrial applications and demands for comfort.

3. UNIT DESCRIPTION

Chiller, air source with free-cooling
Outdoor unit for the production of chilled water with semi-hermetic screw compressors optimized for R134a, axial-flow fans, condensing coil with copper tubes and aluminium fins, shell and tube evaporator and electronic expansion valve. Chiller characterized by high efficiency ensured by booster patent pending solution.
Base and supporting structure and panels are of galvanized epoxy powder coated steel with increased thickness.

Installation note
The unit is supplied fully refrigerant charged and factory tested. On site installation only requires power and hydraulic connection.

3.1 Composizione unita' standard

Structure
Base and frame in galvanized steel. The supporting frame are polyester-painted for the highest resitance to external factors: surfaces´ hue and brightness are preserved. In silenced versions compressors´ box is covered with an acoustic layer to reduce global noise emissions.

Refrigerant circuit
Unit designed with dedicated and independent refrigerant circuits in order to ensure continuous operation, limited pollution, and easy maintenance. In addition to main components described in the following sections, each refrigerant circuit is fitted as standard with:
- electronic thermostatic valve
- high and low pressure safety valve with visualization of the pressure´s level directly from the controller´s interface
- liquid line shut-off valve
- compressor's discharge valve
- drier filter with replaceable cartridge
- refrigerant line sight glass with humidity indicator
- high pressure transducer
- high and low pressure transducers
- non -return valve in compressor´s discharge line integrated in the compressor
- liquid line shut-off valve
- BOOSTER patent pending

Water circuit
Free Cooling "FC"
- two way-valve ON-OFF
- water-air heat exchanger

Water circuit NG
Free Cooling "FC NG"
The internal water circuit, filled with a 30% ethylene glycol solution and linked to the water-air exchangers, is made up of:
- circulation pump
- intermediate plate heat exchanger
- antifreeze electric heater for plate heat exchanger
- pump shut off valves
- makeup tap
- Inlet valve
- pressure gauge
- expansion tank.

Heaters and thermal insulance on the hydraulic circuit:

	Electric heaters (Tair > -15°C)		Thermal insulance (Tair > -15°C)	
	STD FC	FC NG	STD FC	FC NG
Evaporator	NO	YES	YES	YES (double layer)
Pipes	NO	YES	YES	YES (double layer)
Pumps (if present)	NO	YES	YES	YES (double layer)
NG exchanger	-	YES	-	YES (double layer)
NG pumps	-	NO	-	YES
NG pipes	-	NO	-	YES
Booster	NO	NO	NO	NO

Compressors
New semi-hermetic screw compressors designed for high efficiency both at full and partial load.
Semi-hermetic screw compressors with 2 five- and six-lobe rotors: the five-lobe rotor is splined directly onto the motor (nominal speed 2950 rpm) without the use of interposed gears.
The bearings provided along the rotor axis in a separate chamber isolated from the compression chamber are made in carbon steel.
Each compressor is provided with an inlet for refrigerant injection (for the extension of operating limits) and the use of the economizer (for the output capacity and efficiency´s increase).
Optimized lubrication guarantees oil´s distribution between mechanical parts, without using an oil pump; the built-in oil separator has 3 stages of separation, and a 10 mm stainless steel mesh filter ensures the constant presence of oil inside.
Cooling power is partialized by a slide valve, which depending on the position assumed, permits a stepless compression chamber reduction; each compressor can therefore smoothly partialize from 25% to 100% of its capacity.
The two pole motors are fitted as standard with electric devices to limit the absorbed current during compressor start-up, and with empty start-up.
Each compressor is fitted with manual-reset motor thermal protection, delivery gas temperature and oil level controls and an electric resistance for the carter´s heating while the compressor is stopped.
A check valve fitted on the refrigerant delivery line prevents the rotors from reversing after stopping.
On-off cocks on the delivery line of each compressor to isolate the refrigerant charge in the heat exchanger when required.

Compressors part-winding start for sizes up1502 to 2002, and star-delta for all other sizes.

Plant side heat exchanger
Direct expansion shell and tube exchanger, with evaporator function, with coolant on tube side and water on shell side. The single-step tube nest provides an almost perfect counter-current exchange with the heat transfer fluid. Shell side fitted with baffles to increase turbulence and therefore improve exchange efficiency. Steel shell covered in a condensation-proof lining in closed-cell foamed elastomer with a thickness of 10 mm and a thermal conductivity of 0.033 W/mK at 0°C (in the NG version,

the lining is 20 mm thick). The tube nest is made from copper tubes with internal and external grooves for favouring heat exchange and mechanically expanded onto the tube plates.
Only for the NG version, the shell and tube exchanger, the intermediate plate exchanger and the water pipes in the primary circuit (user - intermediate exchanger - evaporator) are fitted with an antifreeze electric heater in order to prevent ice forming inside when the unit is electrically powered but not running. For both solutions (standard FC and NG FC) with the unit running, protection is assured by a differential pressure switch.

Source side heat exchanger
The finned coil exchanger, made from copper tubes and aluminium fins spaced to optimise heat exchange efficiency, is divided into two sections. One is dedicated to condensation and the other to air-cooling the water in the Free Cooling mode. The exchanger is suitably sized to cater for pressure drops whilst assuring the best heat exchange and full free cooling already at positive air temperatures (T+).

Fan section source side
Axial electric fans, system of protection IP54 and “F” insulation class, with external rotor, profiled die-cast aluminium blades, housed in aeodynamic hoods complete with guard grille. 6-poles electric motor with built-in thermal protection. Variable Speed low-temperature Device (DVV) to control condensation adjusting the rotational speed with voltage steps (auto-transformer) is standard for all versions.

Quadro elettrico di potenza e controllo
Electrical and control panel built to EN60204-1 and EC204-1 standards, complete with:
- electronic controller
- control circuit transformer
- general door lock isolator
- power circuit with bar distribution system
- fuses for compressors
- compressors protection with internal thermal overload
- terminals for cumulative alarm block
- remote ON/OFF terminals
- spring-type control circuit terminal board
- phases sequence control
- relays for voltage monitoring

Power input 400V/3/50Hz
Compressors part-winding start for sizes up1502 to 2002, and star-delta for all other sizes.

3.2 Certification, reference standard
The unit complies with the following directives and relative amendments:
- CE - Declaration of conformity certificate for the European Union
- GOST - Product quality certificate for Russian Federation
- SAFETY QUALITY LICENCE - Product quality certificate for Popular Republic of China
- M&I - Product quality certificate for Australia and New Zealand
- Machine directive 2006/42/EC
- PED directive 97/23/EC
- Low Voltage directive 2006/95/EC
- ElectroMagnetic compatibility directive 2004/108/EC
- ISO 9001 - Company´s Quality Management System certification
- ISO 14001 - Company´s Environmental Management System certification.

3.3 Tests
Tests performed throughout the production process, as indicated in ISO9001.
Performance or noise tests can be performed by highly qualified staff in the presence of customers.
Performance tests comprise the measurement of:
- electrical data
- water flow rates
- working temperatures
- power input
- power output
- pressure drops on the water-side exchanger both at full load (at the conditions of selection and at the most critical conditions for the condenser) and at part load conditions.

During performance testing it is also possible to simulate the main alarm states.
Noise tests are performed to check noise emissions according to ISO3744.

3.4 W3000SE Large controller
The W3000 SE Large controller offers advanced functions and algorithms. The keypad is generously sized with full operating status display. The commands and detailed LCD display make access to the unit’s settings easy and safe. These resources allow to consult and intervene on the unit by means of a multi-level menu, with selectable language setting. It´s available as option the touch screen interface: WVGA 7´´ colour display with LED adjustable back lighting. The touch screen technology allows an intuitive navigation, ensure a safety data access through 3 different password levels and permits to visualize in diagrams some monitored quantities trend. The diagnostics includes a complete alarm management, with the “black-box” and alarm logging functions for enhanced analysis of the unit operation. For multiple units’ systems, the regulation of the resources, via optional proprietary devices, can be implemented. Energy metering, for both consumption and capacity, can also be developed. Supervision can be easily developed via proprietary devices or the integration in third party systems by means of the most common protocols as ModBus, Bacnet, Bacnet-over-IP, Echelon LonWorks. Compatibility with the remote keyboard managing up to 10 units. Availability of an internal real time clock for operation scheduling (4-day profiles with 10 hour belts). The regulation features the continuous modulation of capacity, based on a dynamic dead band and referring to the leaving water temperature. As alternative, step-wise regulation is also available, referred to the return water temperature with selectable proportional- or proportional-integral logic. As option (VPF package), the modulation of capacity is integrated with the modulation of the water flow, by means of inverter and dedicated resources for the hydraulic circuit

3.5 Version

/T+

Version with positive free-cooling temperature 100%

High efficiency thanks to the patent-pending booster, maximum free-cooling already at positive air temperatures.

/SL-T+

Super low noise version with positive free-cooling temperature 100%

High efficiency thanks to the patent-pending booster, maximum free-cooling already at positive air temperatures and super low noise version.
This configuration features special soundproofing for the compressor chamber and pumps (if present), reduced fan speed and an oversized condensing section.
However, fan speed automatically increases in particularly tough environmental conditions.

3.6 Configurations

< >, Standard unit

Standard FreeCooling unit for water and glycol systems.

NG, No glycol unit

This unit does not require any antifreeze solutions on the chilled water circuit thanks to an intermediate plate exchanger between the evaporator and the water-water exchanger. The water circulating between the intermediate plate exchanger and the water-air exchanger will contain glycol, while the water between the user and the evaporator will not contain an antifreeze solution.

3.7 Accessories

COD.	ACCESSORIES	DESCRIPTION	BENEFIT
881	Cu/Cu condensing coils	Air-refrigerant heat exchanger with copper fins and tubes.	Recommended for applications in corrosive atmospheres.
894	Condensing coils with epoxy-coated fins	Painted air-refrigerant heat exchanger.	Recommended for applications in medium level pollution atmospheres.
895	Condensing coils with Fin Guard Silver treatment	Air-refrigerant heat exchanger with epoxidic treatment on coils and fins.	Recommended for marine exposure conditions, with an high level of pollution or other aggressive atmospheres.
2001	Coil protection grill in peraluman	Protects against the intrusion of solid bodies with mediumlarge dimensions.	
2021	Anti-intrusions grills	Anti-intrusions grills.	Avoid the intrusion of solid bodies into the unit's structure.
1511	Soft start	Electronic device adopted to manage the inrush current.	Break down of the inrush current as soon as the electrical motor is switch on, lower motor's mechanical wear, favourable sizing for the electrical system.
1955	kit HT **(*)**	Kit to increase the unit's operating range.	Full load operation is guaranteed up to 50°C outdoor temperature. Beyond this limit, up to 57°C, the unit is suitable to provide cooling capacity at partial load; in this case electrical panel has to be cooled (refer to sales department for quotation). The accessory is required for installation in extremely hot areas.
808	EC fans **(*)**	Electronically commutated fans (EC fans); the brushless motor, governed by a special controller, continuously adjust fans' speed.	Reduced energy consumption, electromagnetic noises and current's absorption even during start-up phase. Noise reduces proportionally to unit's partialization.
4181	ModBUS connectivity	Interface module for ModBUS protocols.	Allows integration with BMS operating with ModBUS protocol.
4184	BACnet connectivity	Interface module for BACnet protocols.	Allows integration with BMS operating with BACnet protocol.
4182	Echelon connectivity	Interface module for Echelon systems.	Allows integration with BMS operating with LonWorks procotls.
4185	BACnet OVER IP connectivity	Interface module for BACnet OVER-IP protocols.	Allows to interconnect BACnet devices over Internet Protocol within wide-area networks.
6161	AUXILIARY SIGNAL 4-20mA	4..20mA analogue input. Allows to change the operating set-point according to the value of current applied to the analogue input.	Enforce Energy Saving policies
6162	REMOTE SIGNAL DOUBLE SP	Allows to activate the Energy Saving set-point	Enforce Energy Saving policy
3601	Compressors' on/off signal	Auxiliary contacts providing a voltage-free signal	Allows remote signalling of compressor's activation or remote control of any auxiliary loads.
6195	W3000 TOUCH SCREEN	Colour WVGA 7'' display keyboard with adjustable LED backlight (WARNING: with outdoor temperature below 0°C the display responce time may visibly increase).	The touch-screen's technology is characterized by an easy-to-access data, and it allows an effective graphical representation of the main figures protecting the access through 3 privilege levels.
3411	Automatic circuit breakerson compressors	Over-current switch on the major electrical loads.	It protects compressors from possible current peaks.
3412	Automatic circuit breakers	Over-current switch on the major electrical loads.	It protects compressors and/or fans from possible current peaks.
6171	INPUT REMOTE DEMAND LIMIT	Digital input (voltage free).	It permits to limit the unit's power absorption for safety reasons or in temporary situation.
3391	Electric heater on board	Electrical resistance fed directly from the unit, is automatically activated at temperatures internal QE below 30 ° C (off state at T higher than 40 ° C).	It avoids the risk of humidity condensation on the electrical panel.
2301	Compressors' acoustic enclosure	Enclosure realized with peraluman panels lined with an acoustic insulation made by polyester fiber of thickness 30 mm.	A sound power level reduction of 2 dB(A) is achieved.
2315	Noise reducer	Electrical transformer to manage the fan's speed according to the specific condensing pressure + compressors' acoustical enclosure.	The dedicated fans' speed calibration together with the soundproofing of the most critical components permit a noise reduction of 5/6 dB(A) (the precise unit's performance when NOISE REDUCER option is present have to be checked with the selection software).
1901	COMPRESSOR SUCTION VALVE	Shut-off solenoid valve on compressor's suction circuit.	Simplifies maintenance activities.
3301	Power factor correction	Condensators on the compressors' power inlet line.	The unit’s average cos(phi) increases from an average value of 0,87 to a value (average) of 0,92.
1961	PRESSURE RELIEF VALVES	Dual relief valve with switch.	Allows to unselect a relief valve in order to service the unit avoiding medium or long inoperative periods.

COD.	ACCESSORIES	DESCRIPTION	BENEFIT
1221	Modulating Valve	2 way modulating valve for the control of the water temperature	Ensure the control of the leaving water temperature when the outdoor temperaure is very low. The use of this option is mandatory when the differenco between the leaving water temperature and the outdoor temperature is higher than 15°K
1801	Evaporator flowswitch (water side)		
2911	Flanged heat exchangers connection		
3183 + 3184	Hydronic group	(See dedicate section)	
3360	Relay for pump(s) managment	Relay for the pump(s) on/off.	It permits the pumps on/off. In case of 2 pumps, one in stand-by to the other, it's possible to balance the operating hours between them.
	DEMETRA (see dedicated manual)	Software to monitor capacity and energy absorbed by the units.	Allows a dynamic monitoring of the installed units and therefore a data (hourly based) downloading to support the current needs of energy management.
5921	Network analyzer per DEMETRA	Tools to measure the electricity absorbed by the unit.	They meter the electricity absorbed and are connec-ted with RS485 bus to an external device for energy metering (DEMETRA - see dedicated manual).
	Group regulation device	(See dedicate section)	
	Supervisory device	(See dedicate section)	
381	Numbered cables on electrical board		
382	Coloured cables on electrical board for UK market		
383	Numbered cables and coloured cables on electrical board for UK market		
2101	Rubber anti vibration device		
2102	Spring anti vibration device		
9965	Coil s protection grill and nylon coverage		
9979	Container packing		
1971	REINFORCING BARS	Bars used to reinforce the structure.	Improve resistance during long transportation.

(*) : EC fans (808) are not compatible with the accessory kit HT (1955).

3.8 Group regulation device MANAGER 3000

Manager3000 allows the regulation within a group of hydronic units. The controller features high-level algorithms and user interface. The controller is suitable for the management of 2- or 4-pipe systems, with regulation on one water circuit, for chiller- or heat pump units and relevant mode change-over, and also with regulation on two circuits, with independent set-points and parameters, thus exploiting the simultaneous supply of chilled- and hot water.

The controller manages up to 8 units, with activation logic focused at the balancing of operation times and at the achievement of the highest energy efficiency. It is possible to define conditions of dynamic stand-by and priority as regards the units' activation. It is also feasible the rotation among the system's units, also in cases of constant load.
The alarm management is featured, with plain text descriptions and possible notification to remote recipients. Two relay outputs are available, associated to unit- and device alarms.
The user interface allows a safe and easy use, thanks to its touch-screen display, back-lit 8.4" type.
The multi-level menu features the language selection and differentiated access profiles(user and maintenance).The circuit temperatures and the status of both system- and unit- operation are displayed, via one overview page plus detailed pages. The regulation can be based on proportional- or proportional+integral logics, or also on a dead-band algorithm with dynamic adjustment, with relevant temperature inputs managed by the device.
Features as set-point offset, also referred to the outdoor temperature, and demand limit are included, with relevant analog inputs.
The device is integrated in the best way with the units, preventing simultaneous activations or resources and optimizing efficiency, overall inrush current values and also operation of water pumps possibly associated to the units.
The WebManager option allows the access to the device and its settings, via any computer, with direct- or LAN-based connection, therefore also via internet resources; this is associated to the availability of historical charts for the main operating variables.
The "Variable Primary Flow" option represents a unique regulation dedicated to hydronic systems with variable water flow.
This represents a crucial contribution to the reduction of the costs related to the hydraulic plant and its operation.
It is available as option the interface with the Demetra metering device: thus it is possible to acquire and log the values of the system units' electric consumption, together with their operating status; this allows therefore to analyze the system's operating performances throughout time, in terms of both absorbed energy and cooling / heating capacities, consistently with the implementation of enhanced energy management policies for the building.

3.9 Supervisory device FWS 3000

Supervisory device for a system composed of Climaveneta units.
Supervision can be operated via any computer, with direct- or LAN-based connection. It is therefore achieved the internet-based management of the resources, thanks to the built-in web-server and to the availability of web pages specifically defined both for the overall system monitoring and the access to detailed information about each unit.
The supervision achieved by this way does not require the installation of any additional software on the computer and utilizes the most common browsers. This allows the use of any computer connected to the network or web. A RS-485 serial connection is available for the communication with the slave devices, up to 15 connected units. FWS3000 is particularly effective for the supervision of systems composed of packaged or WET units.
The access to the supervision is easy and safe, thanks to the use of password. It is possible to visualize a complete list of unit operational variables: temperatures, humidity, indoor air quality, status of the unit. This is associated to the availability of historical charts for the main operating variables. It is also available the display of alarms, with plain text descriptions and possible notification to remote recipient.

The setting of the main operational parameters, for each unit, is also allowed: unit status, mode, set-point, time scheduling (based on 4 days, 10 time belts per day).
Various levels of customization are offered, for both the web pages and connectivity-related functions.
It is available as option the interface with the Demetra metering device: thus it is possible to acquire and log the values of the system units' electric consumption, together with their operating status; this allows therefore to analyze the system's operating performances throughout time, in terms of both absorbed energy and cooling / heating capacities, consistently with the implementation of enhanced energy management policies for the building.

3.10 Energy metering device DEMETRA

DEMETRA represents the solution for the most evolved and up-to-date requirements concerning the energy management of HVAC hydraulic systems.
DEMETRA (DEvice for Metering of Energy TRAnsfers) in fact, enables the metering of both electric energy consumption and cooling performances; thanks to the intimate connection to each Climaveneta units controlling alghoritms, with DEMETRA the final user can even measure the freecooling quote, get for free with the direct air/water heat exchanger.
DEMETRA can monitor up to 8 units connected together.
DEMETRA continuously acquires the electric energy consumption, the primary circuit and outdoor air temperature, and the water flow rates on the user side heat exchanger. These values are integrated with the operating status of each unit, as detected by Manager3000 or FWS3000,to calculate the final unit performance.
Thanks to the web-based structure of DEMETRA, the final user can, in every moment after authentication, access to the its homepage and visualize or download the data for the relevant variables in a chiller operation.

APPLICATION STANDARD

FX-FC /T+			1502	1702	1902	2002	2202	2602	2702	3002	3202	3402
Power supply		V/ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
PERFORMANCE												
FREE-COOLING OFF												
Cooling capacity	(1)	**kW**	**335**	**372**	**433**	**481**	**530**	**619**	**665**	**695**	**753**	**826**
Compressor power input	(1)	kW	76,9	86,6	98,6	113	121	148	161	175	183	192
Total power input	(1)	kW	88,9	103	115	133	141	172	185	199	211	224
EER	(1)		**3,77**	**3,63**	**3,77**	**3,62**	**3,77**	**3,59**	**3,60**	**3,49**	**3,57**	**3,69**
Free Cooling (Tae = 10,0°C)												
Power	(1)	**kW**	**108**	**122**	**141**	**156**	**173**	**205**	**218**	**223**	**248**	**266**
% Free cooling	(1)	%	32	33	33	32	33	33	33	32	33	32
FREE-COOLING ON 100%												
Cooling capacity	(2)	**kW**	**335**	**372**	**433**	**481**	**530**	**619**	**665**	**695**	**753**	**826**
Total power input	(2)	kW	12,0	16,0	16,0	20,0	20,0	24,0	24,0	24,0	28,0	32,0
EER	(2)		**28,0**	**23,3**	**27,0**	**24,0**	**26,5**	**25,8**	**27,7**	**29,0**	**26,9**	**25,8**
Total FC temperature	(2)	°C	1,2	1,4	1,4	1,4	1,5	1,8	1,8	1,4	1,8	1,2
EXCHANGERS												
HEAT EXCHANGER USER SIDE IN REFRIGERATION												
Glycol	(1)	%	30	30	30	30	30	30	30	30	30	30
Water flow	(1)	m³/h	64,0	71,0	82,5	91,7	101	118	127	133	144	158
Pressure drop	(1)	kPa	68,7	84,7	78,3	86,3	63,2	77,5	65,2	71,1	62,4	75,1
COMPRESSORS												
Compressors nr.		N°	2	2	2	2	2	2	2	2	2	2
Number of capacity		N°	0	0	0	0	0	0	0	0	0	0
No. Circuits		N°	2	2	2	2	2	2	2	2	2	2
Regulation			STEPLESS	STEPLESS	STEPLESS	STEPLESS	STEPLESS	STEPLESS	STEPLESS	STEPLESS	STEPLESS	STEPLESS
Min. capacity step		%	25	25	25	25	25	25	25	25	25	25
Refrigerant			R134a	R134a	R134a	R134a	R134a	R134a	R134a	R134a	R134a	R134a
Refrigerant charge		kg	85,0	90,0	108	119	128	141	145	175	180	190
Oil charge		kg	30,0	30,0	30,0	30,0	44,0	44,0	38,0	38,0	38,0	49,0
FANS												
Quantity		N°	6	8	8	10	10	12	12	12	14	16
Air flow		m³/s	35,9	43,3	47,5	54,9	58,8	64,3	67,4	67,4	77,2	90,8
Fans power		kW	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00
NOISE LEVEL												
Noise Pressure	(3)	dB(A)	67	68	68	68	69	70	69	69	69	69
Noise Power	(4)	dB(A)	99	100	100	100	101	102	102	102	102	102
SIZE AND WEIGHT												
A	(5)	mm	4000	4000	4900	4900	5800	5800	6400	6400	7000	7900
B	(5)	mm	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260
H	(5)	mm	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500
Operating weight	(5)	kg	4880	4990	5520	5700	7000	7410	8270	8310	8750	9600

Notes:
1 Plant (side) cooling exchanger water (in/out) 15°C/10°C; Source (side) heat exchanger air (in) 30°C; Ethylene glycol 30% (not applicabile to NG configuration)
2 Plant (side) cooling exchanger water (in/out) 15°C/10°C; Ethylene glycol 30% (not applicabile to NG configuration)
3 Average sound pressure level, at 10m distance, unit in a free field on a reflective surface; non-binding value obtained from the sound power level.
4 Sound power on the basis of measurements made in compliance with ISO 9614 and Eurovent 8/1 for Eurovent certified units; in compliance with ISO 3744 for non-certified units.
5 Unit in standard configuration/execution, without optional accessories.
- Unavailable

APPLICATION STANDARD

FX-FC /T+			3602	3902	4202	4502	4802	5402	6002
Power supply		V/ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
PERFORMANCE									
FREE-COOLING OFF									
Cooling capacity	(1)	**kW**	**881**	**944**	**1013**	**1093**	**1189**	**1325**	**1412**
Compressor power input	(1)	kW	213	234	245	266	270	323	368
Total power input	(1)	kW	245	266	277	306	318	371	416
EER	(1)		**3,59**	**3,55**	**3,65**	**3,57**	**3,74**	**3,57**	**3,40**
Free Cooling (Tae = 10,0°C)									
Power	(1)	**kW**	**286**	**295**	**316**	**346**	**383**	**421**	**449**
% Free cooling	(1)	%	33	31	31	32	32	32	32
FREE-COOLING ON 100%									
Cooling capacity	(2)	**kW**	**881**	**944**	**1013**	**1093**	**1189**	**1325**	**1412**
Total power input	(2)	kW	32,0	32,0	32,0	40,0	48,0	48,0	48,0
EER	(2)		**27,5**	**29,5**	**31,7**	**27,3**	**24,8**	**27,6**	**29,4**
Total FC temperature	(2)	°C	1,6	1,1	1,1	1,3	1,2	1,3	1,3
EXCHANGERS									
HEAT EXCHANGER USER SIDE IN REFRIGERATION									
Glycol	(1)	%	30	30	30	30	30	30	30
Water flow	(1)	m³/h	168	180	193	208	227	253	269
Pressure drop	(1)	kPa	77,0	95,0	98,1	83,3	98,5	89,7	102
COMPRESSORS									
Compressors nr.		N°	2	2	2	2	2	2	2
Number of capacity		N°	0	0	0	0	0	0	0
No. Circuits		N°	2	2	2	2	2	2	2
Regulation			STEPLESS	STEPLESS	STEPLESS	STEPLESS	STEPLESS	STEPLESS	STEPLESS
Min. capacity step		%	25	25	25	25	25	25	25
Refrigerant			R134a	R134a	R134a	R134a	R134a	R134a	R134a
Refrigerant charge		kg	199	220	244	290	295	310	330
Oil charge		kg	60,0	60,0	60,0	60,0	60,0	60,0	64,0
FANS									
Quantity		N°	16	16	16	20	24	24	24
Air flow		m³/s	88,2	88,2	92,4	106	133	129	135
Fans power		kW	2,00	2,00	2,00	2,00	2,00	2,00	2,00
NOISE LEVEL									
Noise Pressure	(3)	dB(A)	70	70	70	72	73	73	73
Noise Power	(4)	dB(A)	103	103	103	105	106	106	106
SIZE AND WEIGHT									
A	(5)	mm	7900	7900	10000	10000	11800	11800	13000
B	(5)	mm	2260	2260	2260	2260	2260	2260	2260
H	(5)	mm	2500	2500	2500	2500	2500	2500	2500
Operating weight	(5)	kg	10470	10570	12680	13180	13710	14930	15810

Notes:
1 Plant (side) cooling exchanger water (in/out) 15°C/10°C; Source (side) heat exchanger air (in) 30°C; Ethylene glycol 30% (not applicabile to NG configuration)
2 Plant (side) cooling exchanger water (in/out) 15°C/10°C; Ethylene glycol 30% (not applicabile to NG configuration)
3 Average sound pressure level, at 10m distance, unit in a free field on a reflective surface; non-binding value obtained from the sound power level.
4 Sound power on the basis of measurements made in compliance with ISO 9614 and Eurovent 8/1 for Eurovent certified units; in compliance with ISO 3744 for non-certified units.
5 Unit in standard configuration/execution, without optional accessories.
- Unavailable

APPLICATION NG

FX-FC /NG /T+			1502	1702	1902	2002	2202	2602	2702	3002	3202	3402
Power supply		V/ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
PERFORMANCE												
FREE-COOLING OFF												
Cooling capacity	(1)	**kW**	**345**	**383**	**444**	**494**	**545**	**636**	**683**	**714**	**774**	**849**
Compressor power input	(1)	kW	77,5	87,0	99,1	114	122	149	161	176	184	193
Total power input	(1)	kW	89,5	103	115	134	142	173	185	200	212	225
EER	(1)		**3,85**	**3,71**	**3,86**	**3,70**	**3,85**	**3,67**	**3,68**	**3,57**	**3,65**	**3,78**
Free Cooling (Tae = 10,0°C)												
Power	(1)	**kW**	**90,0**	**102**	**117**	**131**	**145**	**171**	**183**	**186**	**208**	**223**
% Free cooling	(1)	%	26	27	26	26	27	27	27	26	27	26
FREE-COOLING ON 100%												
Cooling capacity	(2)	**kW**	**345**	**383**	**444**	**494**	**545**	**636**	**683**	**714**	**774**	**849**
Total power input	(2)	kW	12,0	16,0	16,0	20,0	20,0	24,0	24,0	24,0	28,0	32,0
EER	(2)		**28,7**	**23,9**	**27,8**	**24,7**	**27,2**	**26,5**	**28,5**	**29,7**	**27,6**	**26,5**
Total FC temperature	(2)	°C	-1,9	-1,6	-1,7	-1,7	-1,6	-1,3	-1,3	-1,7	-1,3	-1,9
EXCHANGERS												
HEAT EXCHANGER USER SIDE IN REFRIGERATION												
Glycol	(1)	%	0	0	0	0	0	0	0	0	0	0
Water flow	(1)	m³/h	59,4	65,9	76,5	85,1	93,8	110	118	123	133	146
Pressure drop	(1)	kPa	100	123	113	121	117	118	107	116	123	107
COMPRESSORS												
Compressors nr.		N°	2	2	2	2	2	2	2	2	2	2
Number of capacity		N°	0	0	0	0	0	0	0	0	0	0
No. Circuits		N°	2	2	2	2	2	2	2	2	2	2
Regulation			STEPLESS	STEPLESS	STEPLESS	STEPLESS	STEPLESS	STEPLESS	STEPLESS	STEPLESS	STEPLESS	STEPLESS
Min. capacity step		%	25	25	25	25	25	25	25	25	25	25
Refrigerant			R134a	R134a	R134a	R134a	R134a	R134a	R134a	R134a	R134a	R134a
Refrigerant charge		kg	85,0	90,0	108	119	128	141	145	175	180	190
Oil charge		kg	30,0	30,0	30,0	30,0	44,0	44,0	38,0	38,0	38,0	49,0
FANS												
Quantity		N°	6	8	8	10	10	12	12	12	14	16
Air flow		m³/s	35,9	43,3	47,5	54,9	58,8	64,3	67,4	67,4	77,2	90,8
Fans power		kW	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00
NOISE LEVEL												
Noise Pressure	(3)	dB(A)	67	68	68	68	69	70	69	69	69	69
Noise Power	(4)	dB(A)	99	100	100	100	101	102	102	102	102	102
SIZE AND WEIGHT												
A	(5)	mm	4000	4000	4900	4900	5800	5800	6400	6400	7000	7900
B	(5)	mm	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260
H	(5)	mm	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500
Operating weight	(5)	kg	5270	5470	6020	6250	7520	8000	9020	9060	9420	10300

Notes:
1 Plant (side) cooling exchanger water (in/out) 15°C/10°C; Source (side) heat exchanger air (in) 30°C; Ethylene glycol 0% (not applicabile to NG configuration)
2 Plant (side) cooling exchanger water (in/out) 15°C/10°C; Ethylene glycol 0% (not applicabile to NG configuration)
3 Average sound pressure level, at 10m distance, unit in a free field on a reflective surface; non-binding value obtained from the sound power level.
4 Sound power on the basis of measurements made in compliance with ISO 9614 and Eurovent 8/1 for Eurovent certified units; in compliance with ISO 3744 for non-certified units.
5 Unit in standard configuration/execution, without optional accessories.
- Unavailable

APPLICATION NG

FX-FC /NG /T+			3602	3902	4202	4502	4802	5402	6002
Power supply		V/ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
PERFORMANCE									
FREE-COOLING OFF									
Cooling capacity	(1)	**kW**	**905**	**970**	**1040**	**1123**	**1221**	**1361**	**1450**
Compressor power input	(1)	kW	215	235	247	268	271	325	370
Total power input	(1)	kW	246	267	279	308	319	373	418
EER	(1)		**3,67**	**3,63**	**3,73**	**3,65**	**3,82**	**3,65**	**3,47**
Free Cooling (Tae = 10,0°C)									
Power	(1)	**kW**	**240**	**247**	**264**	**290**	**321**	**353**	**376**
% Free cooling	(1)	%	26	26	25	26	26	26	26
FREE-COOLING ON 100%									
Cooling capacity	(2)	**kW**	**905**	**970**	**1040**	**1123**	**1221**	**1361**	**1450**
Total power input	(2)	kW	32,0	32,0	32,0	40,0	48,0	48,0	48,0
EER	(2)		**28,3**	**30,3**	**32,5**	**28,1**	**25,4**	**28,4**	**30,2**
Total FC temperature	(2)	°C	-1,5	-2,0	-2,0	-1,8	-1,8	-1,7	-1,7
EXCHANGERS									
HEAT EXCHANGER USER SIDE IN REFRIGERATION									
Glycol	(1)	%	0	0	0	0	0	0	0
Water flow	(1)	m³/h	156	167	179	193	210	234	250
Pressure drop	(1)	kPa	114	137	157	131	155	165	187
COMPRESSORS									
Compressors nr.		N°	2	2	2	2	2	2	2
Number of capacity		N°	0	0	0	0	0	0	0
No. Circuits		N°	2	2	2	2	2	2	2
Regulation			STEPLESS	STEPLESS	STEPLESS	STEPLESS	STEPLESS	STEPLESS	STEPLESS
Min. capacity step		%	25	25	25	25	25	25	25
Refrigerant			R134a	R134a	R134a	R134a	R134a	R134a	R134a
Refrigerant charge		kg	199	220	244	290	295	310	330
Oil charge		kg	60,0	60,0	60,0	60,0	60,0	60,0	64,0
FANS									
Quantity		N°	16	16	16	20	24	24	24
Air flow		m³/s	88,2	88,2	92,4	106	133	129	135
Fans power		kW	2,00	2,00	2,00	2,00	2,00	2,00	2,00
NOISE LEVEL									
Noise Pressure	(3)	dB(A)	70	70	70	72	73	73	73
Noise Power	(4)	dB(A)	103	103	103	105	106	106	106
SIZE AND WEIGHT									
A	(5)	mm	7900	7900	10000	10000	11800	11800	13000
B	(5)	mm	2260	2260	2260	2260	2260	2260	2260
H	(5)	mm	2500	2500	2500	2500	2500	2500	2500
Operating weight	(5)	kg	11280	11370	13070	13570	14490	15760	16680

Notes:
1 Plant (side) cooling exchanger water (in/out) 15°C/10°C; Source (side) heat exchanger air (in) 30°C; Ethylene glycol 0% (not applicabile to NG configuration)
2 Plant (side) cooling exchanger water (in/out) 15°C/10°C; Ethylene glycol 0% (not applicabile to NG configuration)
3 Average sound pressure level, at 10m distance, unit in a free field on a reflective surface; non-binding value obtained from the sound power level.
4 Sound power on the basis of measurements made in compliance with ISO 9614 and Eurovent 8/1 for Eurovent certified units; in compliance with ISO 3744 for non-certified units.
5 Unit in standard configuration/execution, without optional accessories.
- Unavailable

APPLICATION STANDARD

FX-FC /SL-T+			1502	1702	1902	2002	2202	2602	2702	3002	3202	3402
Power supply		V/ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
PERFORMANCE												
FREE-COOLING OFF												
Cooling capacity	(1)	**kW**	**332**	**372**	**426**	**476**	**522**	**625**	**656**	**712**	**745**	**787**
Compressor power input	(1)	kW	81,0	90,0	105	119	129	151	171	175	193	215
Total power input	(1)	kW	89,8	98,8	116	130	142	167	186	193	210	232
EER	(1)		**3,69**	**3,77**	**3,69**	**3,66**	**3,66**	**3,75**	**3,53**	**3,70**	**3,54**	**3,39**
Free Cooling (Tae = 10,0°C)												
Power	(1)	**kW**	**105**	**114**	**133**	**147**	**169**	**195**	**207**	**223**	**236**	**243**
% Free cooling	(1)	%	32	31	31	31	32	31	31	31	32	31
FREE-COOLING ON 100%												
Cooling capacity	(2)	**kW**	**332**	**372**	**426**	**476**	**522**	**625**	**656**	**712**	**745**	**787**
Total power input	(2)	kW	9,60	9,60	12,0	12,0	14,4	16,8	16,8	19,2	19,2	19,2
EER	(2)		**34,6**	**38,8**	**35,5**	**39,7**	**36,2**	**37,2**	**39,1**	**37,1**	**38,8**	**41,0**
Total FC temperature	(2)	°C	0,6	0,7	0,6	0,6	0,7	0,5	0,9	0,7	0,9	0,6
EXCHANGERS												
HEAT EXCHANGER USER SIDE IN REFRIGERATION												
Glycol	(1)	%	30	30	30	30	30	30	30	30	30	30
Water flow	(1)	m³/h	63,3	71,0	81,3	90,8	99,5	119	125	136	142	150
Pressure drop	(1)	kPa	67,2	84,5	76,1	84,6	61,2	79,0	63,4	74,6	61,0	68,2
COMPRESSORS												
Compressors nr.		N°	2	2	2	2	2	2	2	2	2	2
Number of capacity		N°	0	0	0	0	0	0	0	0	0	0
No. Circuits		N°	2	2	2	2	2	2	2	2	2	2
Regulation			STEPLESS	STEPLESS	STEPLESS	STEPLESS	STEPLESS	STEPLESS	STEPLESS	STEPLESS	STEPLESS	STEPLESS
Min. capacity step		%	25	25	25	25	25	25	25	25	25	25
Refrigerant			R134a	R134a	R134a	R134a	R134a	R134a	R134a	R134a	R134a	R134a
Refrigerant charge		kg	98,0	104	124	137	147	162	167	201	207	219
Oil charge		kg	30,0	30,0	30,0	30,0	44,0	44,0	38,0	38,0	38,0	49,0
FANS												
Quantity		N°	8	8	10	10	12	14	14	16	16	16
Air flow		m³/s	30,1	33,7	38,3	41,5	46,3	55,3	53,6	63,3	61,2	61,2
Fans power		kW	1,10	1,10	1,10	1,10	1,10	1,10	1,10	1,10	1,10	1,10
NOISE LEVEL												
Noise Pressure	(3)	dB(A)	57	57	57	58	59	58	58	59	59	59
Noise Power	(4)	dB(A)	89	89	89	90	91	91	91	92	92	92
SIZE AND WEIGHT												
A	(5)	mm	4000	4900	4900	5800	5800	7000	7000	7900	7900	7900
B	(5)	mm	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260
H	(5)	mm	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500
Operating weight	(5)	kg	5380	5950	6040	6600	7500	8250	9070	9550	10040	10590

Notes:
1 Plant (side) cooling exchanger water (in/out) 15°C/10°C; Source (side) heat exchanger air (in) 30°C; Ethylene glycol 30% (not applicabile to NG configuration)
2 Plant (side) cooling exchanger water (in/out) 15°C/10°C; Ethylene glycol 30% (not applicabile to NG configuration)
3 Average sound pressure level, at 10m distance, unit in a free field on a reflective surface; non-binding value obtained from the sound power level.
4 Sound power on the basis of measurements made in compliance with ISO 9614 and Eurovent 8/1 for Eurovent certified units; in compliance with ISO 3744 for non-certified units.
5 Unit in standard configuration/execution, without optional accessories.
- Unavailable

APPLICATION STANDARD

FX-FC /SL-T+			3602	3902	4202	4502	4802	5402
Power supply		V/ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
PERFORMANCE								
FREE-COOLING OFF								
Cooling capacity	(1)	**kW**	**878**	**938**	**984**	**1097**	**1139**	**1288**
Compressor power input	(1)	kW	223	244	263	274	301	351
Total power input	(1)	kW	245	266	285	301	328	377
EER	(1)		**3,59**	**3,52**	**3,46**	**3,65**	**3,48**	**3,41**
Free Cooling (Tae = 10,0°C)								
Power	(1)	**kW**	**280**	**289**	**296**	**346**	**352**	**384**
% Free cooling	(1)	%	32	31	30	32	31	30
FREE-COOLING ON 100%								
Cooling capacity	(2)	**kW**	**878**	**938**	**984**	**1097**	**1139**	**1288**
Total power input	(2)	kW	24,0	24,0	24,0	28,8	28,8	28,8
EER	(2)		**36,6**	**39,1**	**41,0**	**38,1**	**39,5**	**44,7**
Total FC temperature	(2)	°C	0,9	0,5	0,1	0,8	0,5	0,0
EXCHANGERS								
HEAT EXCHANGER USER SIDE IN REFRIGERATION								
Glycol	(1)	%	30	30	30	30	30	30
Water flow	(1)	m³/h	167	179	188	209	217	246
Pressure drop	(1)	kPa	69,8	86,2	92,6	83,8	90,4	84,8
COMPRESSORS								
Compressors nr.		N°	2	2	2	2	2	2
Number of capacity		N°	0	0	0	0	0	0
No. Circuits		N°	2	2	2	2	2	2
Regulation			STEPLESS	STEPLESS	STEPLESS	STEPLESS	STEPLESS	STEPLESS
Min. capacity step		%	25	25	25	25	25	25
Refrigerant			R134a	R134a	R134a	R134a	R134a	R134a
Refrigerant charge		kg	229	253	281	334	339	357
Oil charge		kg	60,0	60,0	60,0	60,0	60,0	60,0
FANS								
Quantity		N°	20	20	20	24	24	24
Air flow		m³/s	73,3	73,3	73,3	88,8	88,8	94,1
Fans power		kW	1,10	1,10	1,10	1,10	1,10	1,10
NOISE LEVEL								
Noise Pressure	(3)	dB(A)	59	59	59	61	61	62
Noise Power	(4)	dB(A)	92	92	92	94	94	95
SIZE AND WEIGHT								
A	(5)	mm	10000	10000	10000	11800	11800	13000
B	(5)	mm	2260	2260	2260	2260	2260	2260
H	(5)	mm	2500	2500	2500	2500	2500	2500
Operating weight	(5)	kg	13020	13060	13560	14970	15060	16360

Notes:
1 Plant (side) cooling exchanger water (in/out) 15°C/10°C; Source (side) heat exchanger air (in) 30°C; Ethylene glycol 30% (not applicabile to NG configuration)
2 Plant (side) cooling exchanger water (in/out) 15°C/10°C; Ethylene glycol 30% (not applicabile to NG configuration)
3 Average sound pressure level, at 10m distance, unit in a free field on a reflective surface; non-binding value obtained from the sound power level.
4 Sound power on the basis of measurements made in compliance with ISO 9614 and Eurovent 8/1 for Eurovent certified units; in compliance with ISO 3744 for non-certified units.
5 Unit in standard configuration/execution, without optional accessories.
- Unavailable

APPLICATION NG

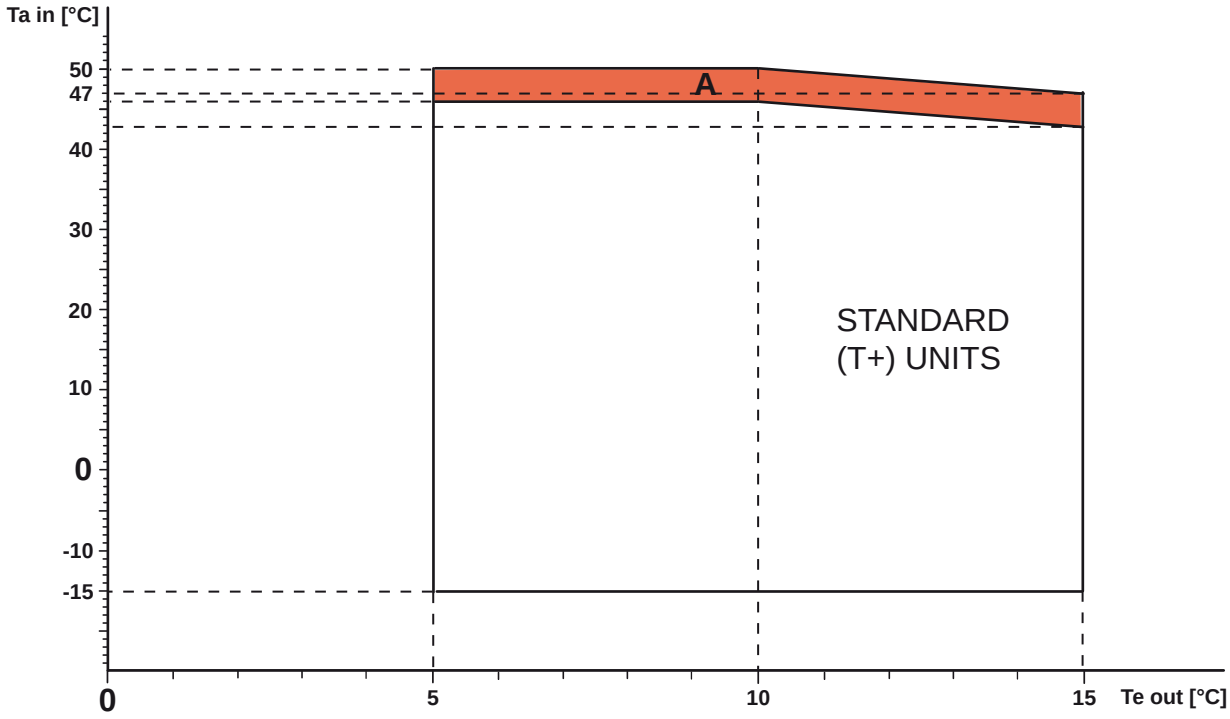
FX-FC /NG /ST-T+			1502	1702	1902	2002	2202	2602	2702	3002	3202	3402
Power supply		V/ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
PERFORMANCE												
FREE-COOLING OFF												
Cooling capacity	(1)	**kW**	**341**	**382**	**438**	**489**	**536**	**642**	**674**	**731**	**765**	**808**
Compressor power input	(1)	kW	81,4	90,4	105	120	130	152	171	176	194	216
Total power input	(1)	kW	90,2	99,2	116	131	143	168	187	193	212	234
EER	(1)		**3,78**	**3,85**	**3,77**	**3,74**	**3,74**	**3,82**	**3,61**	**3,78**	**3,61**	**3,46**
Free Cooling (Tae = 10,0°C)												
Power	(1)	**kW**	**87,1**	**95,2**	**111**	**122**	**141**	**162**	**172**	**186**	**197**	**203**
% Free cooling	(1)	%	26	25	25	25	26	25	26	25	26	25
FREE-COOLING ON 100%												
Cooling capacity	(2)	**kW**	**341**	**382**	**438**	**489**	**536**	**642**	**674**	**731**	**765**	**808**
Total power input	(2)	kW	9,60	9,60	12,0	12,0	14,4	16,8	16,8	19,2	19,2	19,2
EER	(2)		**35,5**	**39,8**	**36,5**	**40,7**	**37,2**	**38,2**	**40,1**	**38,1**	**39,8**	**42,1**
Total FC temperature	(2)	°C	-2,5	-2,4	-2,5	-2,5	-2,4	-2,6	-2,2	-2,5	-2,2	-2,5
EXCHANGERS												
HEAT EXCHANGER USER SIDE IN REFRIGERATION												
Glycol	(1)	%	0	0	0	0	0	0	0	0	0	0
Water flow	(1)	m³/h	58,7	65,8	75,4	84,2	92,3	111	116	126	132	139
Pressure drop	(1)	kPa	97,8	123	110	118	113	120	104	122	120	97,0
COMPRESSORS												
Compressors nr.		N°	2	2	2	2	2	2	2	2	2	2
Number of capacity		N°	0	0	0	0	0	0	0	0	0	0
No. Circuits		N°	2	2	2	2	2	2	2	2	2	2
Regulation			STEPLESS	STEPLESS	STEPLESS	STEPLESS	STEPLESS	STEPLESS	STEPLESS	STEPLESS	STEPLESS	STEPLESS
Min. capacity step		%	25	25	25	25	25	25	25	25	25	25
Refrigerant			R134a	R134a	R134a	R134a	R134a	R134a	R134a	R134a	R134a	R134a
Refrigerant charge		kg	98,0	104	124	137	147	162	167	201	207	219
Oil charge		kg	30,0	30,0	30,0	30,0	44,0	44,0	38,0	38,0	38,0	49,0
FANS												
Quantity		N°	8	8	10	10	12	14	14	16	16	16
Air flow		m³/s	30,1	33,7	38,3	41,5	46,3	55,3	53,6	63,3	61,2	61,2
Fans power		kW	1,10	1,10	1,10	1,10	1,10	1,10	1,10	1,10	1,10	1,10
NOISE LEVEL												
Noise Pressure	(3)	dB(A)	57	57	57	58	59	58	58	59	59	59
Noise Power	(4)	dB(A)	89	89	89	90	91	91	91	92	92	92
SIZE AND WEIGHT												
A	(5)	mm	4000	4900	4900	5800	5800	7000	7000	7900	7900	7900
B	(5)	mm	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260
H	(5)	mm	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500
Operating weight	(5)	kg	5770	6360	6520	7160	8020	8890	9590	10070	10570	11290

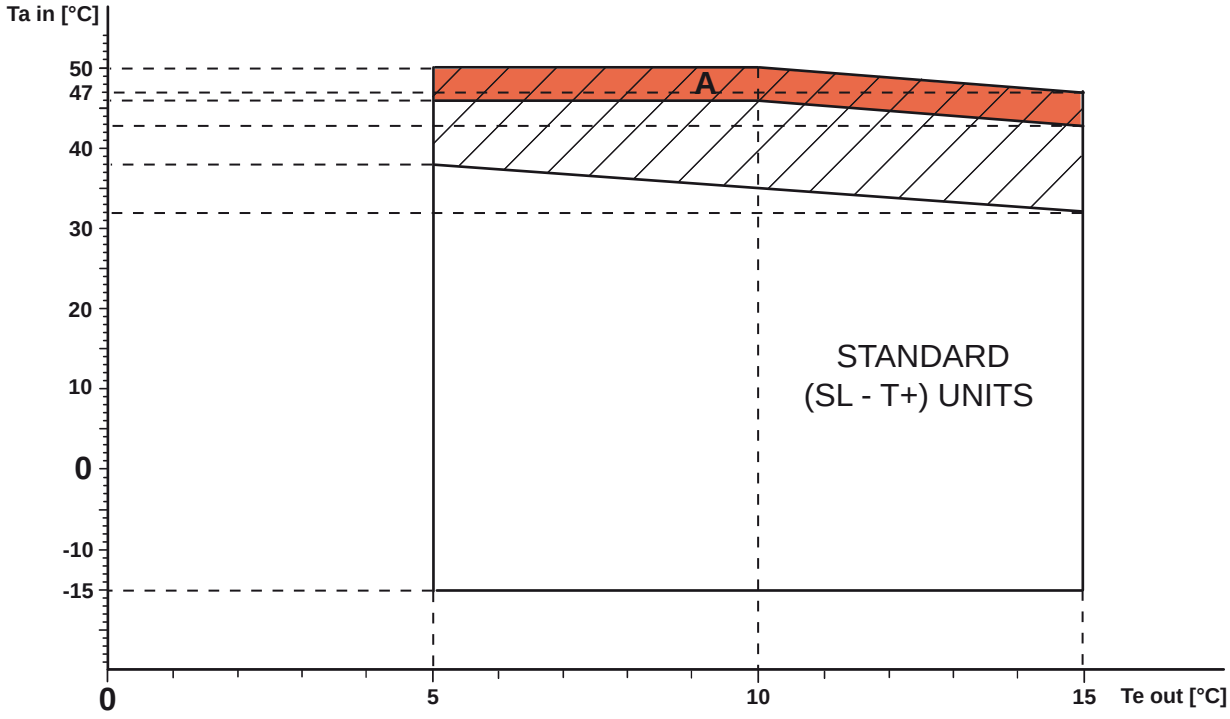
Notes:
1 Plant (side) cooling exchanger water (in/out) 15°C/10°C; Source (side) heat exchanger air (in) 30°C; Ethylene glycol 0% (not applicabile to NG configuration)
2 Plant (side) cooling exchanger water (in/out) 15°C/10°C; Ethylene glycol 0% (not applicabile to NG configuration)
3 Average sound pressure level, at 10m distance, unit in a free field on a reflective surface; non-binding value obtained from the sound power level.
4 Sound power on the basis of measurements made in compliance with ISO 9614 and Eurovent 8/1 for Eurovent certified units; in compliance with ISO 3744 for non-certified units.
5 Unit in standard configuration/execution, without optional accessories.
- Unavailable

APPLICATION NG

FX-FC /NG /ST-T+			3602	3902	4202	4502	4802	5402
Power supply		V/ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
PERFORMANCE								
FREE-COOLING OFF								
Cooling capacity	(1)	**kW**	**902**	**964**	**1010**	**1126**	**1169**	**1323**
Compressor power input	(1)	kW	224	245	264	276	303	353
Total power input	(1)	kW	246	267	286	302	329	380
EER	(1)		**3,67**	**3,61**	**3,54**	**3,73**	**3,55**	**3,48**
Free Cooling (Tae = 10,0°C)								
Power	(1)	**kW**	**234**	**241**	**247**	**288**	**294**	**320**
% Free cooling	(1)	%	26	25	24	26	25	24
FREE-COOLING ON 100%								
Cooling capacity	(2)	**kW**	**902**	**964**	**1010**	**1126**	**1169**	**1323**
Total power input	(2)	kW	24,0	24,0	24,0	28,8	28,8	28,8
EER	(2)		**37,6**	**40,2**	**42,1**	**39,1**	**40,6**	**45,9**
Total FC temperature	(2)	°C	-2,2	-2,6	-3,0	-2,3	-2,6	-3,1
EXCHANGERS								
HEAT EXCHANGER USER SIDE IN REFRIGERATION								
Glycol	(1)	%	0	0	0	0	0	0
Water flow	(1)	m³/h	155	166	174	194	201	228
Pressure drop	(1)	kPa	113	135	148	132	142	156
COMPRESSORS								
Compressors nr.		N°	2	2	2	2	2	2
Number of capacity		N°	0	0	0	0	0	0
No. Circuits		N°	2	2	2	2	2	2
Regulation			STEPLESS	STEPLESS	STEPLESS	STEPLESS	STEPLESS	STEPLESS
Min. capacity step		%	25	25	25	25	25	25
Refrigerant			R134a	R134a	R134a	R134a	R134a	R134a
Refrigerant charge		kg	229	253	281	334	339	357
Oil charge		kg	60,0	60,0	60,0	60,0	60,0	60,0
FANS								
Quantity		N°	20	20	20	24	24	24
Air flow		m³/s	73,3	73,3	73,3	88,8	88,8	94,1
Fans power		kW	1,10	1,10	1,10	1,10	1,10	1,10
NOISE LEVEL								
Noise Pressure	(3)	dB(A)	59	59	59	61	61	62
Noise Power	(4)	dB(A)	92	92	92	94	94	95
SIZE AND WEIGHT								
A	(5)	mm	10000	10000	10000	11800	11800	13000
B	(5)	mm	2260	2260	2260	2260	2260	2260
H	(5)	mm	2500	2500	2500	2500	2500	2500
Operating weight	(5)	kg	13810	13850	13970	15590	15680	17220

Notes:
1 Plant (side) cooling exchanger water (in/out) 15°C/10°C; Source (side) heat exchanger air (in) 30°C; Ethylene glycol 0% (not applicabile to NG configuration)
2 Plant (side) cooling exchanger water (in/out) 15°C/10°C; Ethylene glycol 0% (not applicabile to NG configuration)
3 Average sound pressure level, at 10m distance, unit in a free field on a reflective surface; non-binding value obtained from the sound power level.
4 Sound power on the basis of measurements made in compliance with ISO 9614 and Eurovent 8/1 for Eurovent certified units; in compliance with ISO 3744 for non-certified units.
5 Unit in standard configuration/execution, without optional accessories.
- Unavailable





Ta in Outdoor air temperature [°C]

Te out Evaporator outlet temperature [°C]

A kit HT option (1955) required

Low-noise operating mode

For limits to individual sizes and versions, consult ELCA CHILLER.
Please check with our Sales Department the technical feasibility and special quotation in case of working point external to the operating range.

5.2 ETHYLENE GLYCOL MIXTURE

Ethylene glycol and water mixture, used as a heat-conveying fluid, cause a variation in unit performance. For correct data, use the factors indicated in the following tabel.

	Freezing point (°C)							
	0	-5	-10	-15	-20	-25	-30	-35
	Ethylene glycol percentage by weight							
	0	12%	20%	30%	35%	40%	45%	50%
cPf	1	0,985	0,98	0,974	0,97	0,965	0,964	0,96
cQ	1	1,02	1,04	1,075	1,11	1,14	1,17	1,2
cdp	1	1,07	1,11	1,18	1,22	1,24	1,27	1,3

cPf: cooling power correction factor
cQ: flow correction factor
cdp: pressure drop correction factor

For data concerning other kind of anti-freeze solutions (e,g, propylene glycol) please contact our Sale Department.

5.3 FOULING FACTORS

Performances are based on clean condition of tubes (fouling factor = 1). For different fouling values, performance should be adjusted using the correction factors shown in the following table.

FOULING FACTORS	EVAPORATOR			HEAT RECOVERY			DESUPERHEATER
ff (m² °CW)	F1	FK1	KE [°C]	F2	FK2	KC [°C]	R3
0	1,000	1,000	0,0	1,000	1,000	0,0	1,000
$1{,}80 \times 10^{-5}$	1,000	1,000	0,0	1,000	1,000	0,0	1,000
$4{,}40 \times 10^{-5}$	1,000	1,000	0,0	0,990	1,030	1,0	0,990
$8{,}80 \times 10^{-5}$	0,960	0,990	0,7	0,980	1,040	1,5	0,980
$13{,}20 \times 10^{-5}$	0,944	0,985	1,0	0,964	1,050	2,3	0,964
$17{,}20 \times 10^{-5}$	0,930	0,980	1,5	0,950	1,060	3,0	0,950

ff: fouling factors
f1 - f2: potential correction factors
fk1 - fk2: compressor power input correction factors
r3: capacity correction factors
KE: minimum condenser outlet temperature increase
KC: maximum condenser outlet temperature decrease

6.1 HYDRAULIC DATA

Water flow and pressure drop

Water flow in the heat exchangers is given by: Q=Px0,86/Dt
Q: water flow (m³/h)
Dt: difference between inlet and outlet water temp. (°C)
P: heat exchanger capacity (kW)

Pressure drop is given by: Dp= K x Q²/1000
Q: water flow (m³/h)
Dp: pressure drop (kPa)
K: unit size ratio

SIZE	HEAT EXCHANGER USER SIDE					
	K	Q min m³/h	Q max m³/h	C.A.S. dm³	C.a. min m³	C.a. min* m³
FX-FC /T+ /1502	14,1	48,6	98,0	91	1,09	2,4
FX-FC /T+ /1702	14,1	48,6	98,0	91	1,22	2,7
FX-FC /T+ /1902	9,67	54,0	119	85	1,41	3,1
FX-FC /T+ /2002	8,62	54,0	119	85	1,57	3,5
FX-FC /T+ /2202	5,19	32,0	151	133	1,74	3,9
FX-FC /T+ /2602	4,67	40,0	169	124	2,02	4,5
FX-FC /T+ /2702	3,40	41,0	181	230	2,17	4,8
FX-FC /T+ /3002	3,40	41,0	181	230	2,27	5,0
FX-FC /T+ /3202	2,54	49,0	196	220	2,46	5,5
FX-FC /T+ /3402	2,54	49,0	196	220	2,70	6,0
FX-FC /T+ /3602	2,29	49,0	202	210	2,87	6,4
FX-FC /T+ /3902	2,46	49,0	210	209	3,07	6,8
FX-FC /T+ /4202	2,21	49,0	210	209	3,29	7,3
FX-FC /T+ /4502	1,61	65,0	241	269	3,57	7,9
FX-FC /T+ /4802	1,61	65,0	241	269	3,91	8,7
FX-FC /T+ /5402	1,18	163	363	310	4,34	9,6
FX-FC /T+ /6002	1,18	163	363	310	4,62	10,2
FX-FC /NG /T+ /1502	28,4	48,6	98,0	91	1,09	2,4
FX-FC /NG /T+ /1702	28,4	48,6	98,0	91	1,22	2,7
FX-FC /NG /T+ /1902	19,3	54,0	119	85	1,41	3,1
FX-FC /NG /T+ /2002	16,7	54,0	119	85	1,57	3,5
FX-FC /NG /T+ /2202	13,3	32,0	151	133	1,74	3,9
FX-FC /NG /T+ /2602	9,80	40,0	169	124	2,02	4,5
FX-FC /NG /T+ /2702	7,70	41,0	181	230	2,17	4,8
FX-FC /NG /T+ /3002	7,70	41,0	181	230	2,27	5,0
FX-FC /NG /T+ /3202	6,90	49,0	196	220	2,46	5,5
FX-FC /NG /T+ /3402	5,00	49,0	196	220	2,70	6,0
FX-FC /NG /T+ /3602	4,70	49,0	202	210	2,87	6,4
FX-FC /NG /T+ /3902	4,90	49,0	210	209	3,07	6,8
FX-FC /NG /T+ /4202	4,90	49,0	210	209	3,29	7,3
FX-FC /NG /T+ /4502	3,50	65,0	241	269	3,57	7,9
FX-FC /NG /T+ /4802	3,50	65,0	241	269	3,91	8,7
FX-FC /NG /T+ /5402	3,00	163	363	310	4,34	9,6
FX-FC /NG /T+ /6002	3,00	163	363	310	4,62	10,2
FX-FC /SL-T+ /1502	14,1	48,6	98,0	91	1,09	2,4
FX-FC /SL-T+ /1702	14,1	48,6	98,0	91	1,22	2,7
FX-FC /SL-T+ /1902	9,67	54,0	119	85	1,41	3,1
FX-FC /SL-T+ /2002	8,62	54,0	119	85	1,57	3,5
FX-FC /SL-T+ /2202	5,19	32,0	151	133	1,74	3,9
FX-FC /SL-T+ /2602	4,67	40,0	169	124	2,02	4,5
FX-FC /SL-T+ /2702	3,40	41,0	181	230	2,17	4,8
FX-FC /SL-T+ /3002	3,40	41,0	181	230	2,27	5,0
FX-FC /SL-T+ /3202	2,54	49,0	196	220	2,46	5,5
FX-FC /SL-T+ /3402	2,54	49,0	196	220	2,70	6,0
FX-FC /SL-T+ /3602	2,09	49,0	202	210	2,87	6,4

Q min: minimum water flow admitted to the heat exchanger
Q max: maximum water flow admitted to the heat exchanger
C.a. min: minimum water content admitted in the plant with delta T evaporator up to 5°C and output logic control
C. a. min *: minimum water content admitted in the plant with delta T evaporator exceeding 5 ° C and / or input steps logic control
C.A.S.: Exchanger water content

HYDRAULIC DATA

SIZE	HEAT EXCHANGER USER SIDE					
	K	Q min m³/h	Q max m³/h	C.A.S. dm³	C.a. min m³	C.a. min* m³
FX-FC /SL-T+ /3902	2,26	49,0	210	209	3,07	6,8
FX-FC /SL-T+ /4202	2,21	49,0	210	209	3,29	7,3
FX-FC /SL-T+ /4502	1,61	65,0	241	269	3,57	7,9
FX-FC /SL-T+ /4802	1,61	65,0	241	269	3,91	8,7
FX-FC /SL-T+ /5402	1,18	163	363	310	4,34	9,6
FX-FC /NG /SL-T+ /1502	28,4	48,6	98,0	91	1,09	2,4
FX-FC /NG /SL-T+ /1702	28,4	48,6	98,0	91	1,22	2,7
FX-FC /NG /SL-T+ /1902	19,3	54,0	119	85	1,41	3,1
FX-FC /NG /SL-T+ /2002	16,7	54,0	119	85	1,57	3,5
FX-FC /NG /SL-T+ /2202	13,3	32,0	151	133	1,74	3,9
FX-FC /NG /SL-T+ /2602	9,80	40,0	169	124	2,02	4,5
FX-FC /NG /SL-T+ /2702	7,70	41,0	181	230	2,17	4,8
FX-FC /NG /SL-T+ /3002	7,70	41,0	181	230	2,27	5,0
FX-FC /NG /SL-T+ /3202	6,90	49,0	196	220	2,46	5,5
FX-FC /NG /SL-T+ /3402	5,00	49,0	196	220	2,70	6,0
FX-FC /NG /SL-T+ /3602	4,70	49,0	202	210	2,87	6,4
FX-FC /NG /SL-T+ /3902	4,90	49,0	210	209	3,07	6,8
FX-FC /NG /SL-T+ /4202	4,90	49,0	210	209	3,29	7,3
FX-FC /NG /SL-T+ /4502	3,50	65,0	241	269	3,57	7,9
FX-FC /NG /SL-T+ /4802	3,50	65,0	241	269	3,91	8,7
FX-FC /NG /SL-T+ /5402	3,00	163	363	310	4,34	9,6

Q min: minimum water flow admitted to the heat exchanger
Q max: maximum water flow admitted to the heat exchanger
C.a. min: minimum water content admitted in the plant with delta T evaporator up to 5°C and output logic control
C. a. min *: minimum water content admitted in the plant with delta T evaporator exceeding 5 ° C and / or input steps logic control
C.A.S.: Exchanger water content

SIZE	Power supply V/ph/Hz	Maximum values								
		Compressor				Fans (1)		Total (1)(2)		
		n	F.L.I. [kW]	F.L.A. [A]	L.R.A. [A]	F.L.I. [kW]	F.L.A. [A]	F.L.I. [kW]	F.L.A. [A]	S.A. [A]
1502	400/3/50	2	2 x 51.7	2 x 91.7	2 x 267	2,00	3,80	116	234	356
1702	400/3/50	2	2 x 64.3	2 x 105	2 x 290	2,00	3,80	145	241	389
1902	400/3/50	2	2 x 70.2	2 x 115	2 x 350	2,00	3,80	157	262	463
2002	400/3/50	2	2 x 82.1	2 x 132	2 x 423	2,00	3,80	185	303	545
2202	400/3/50	2	2 x 85.4	2 x 137	2 x 246	2,00	3,80	192	314	379
2602	400/3/50	2	2 x 101	2 x 165	2 x 300	2,00	3,80	226	377	451
2702	400/3/50	2	2 x 112	2 x 184	2 x 360	2,00	3,80	248	414	536
3002	400/3/50	2	112 +127	184 + 208	360 + 404	2,00	3,80	264	439	539
3202	400/3/50	2	2 x 127	2 x 208	2 x 404	2,00	3,80	284	471	590
3402	400/3/50	2	127 + 145	208 + 235	404 + 436	2,00	3,80	306	506	627
3602	400/3/50	2	2 x 145	2 x 235	2 x 436	2,00	3,80	324	533	660
3902	400/3/50	2	145 + 171	235 + 272	436 + 465	2,00	3,80	350	572	666
4202	400/3/50	2	2 x 171	2 x 272	2 x 465	2,00	3,80	375	609	695
4502	400/3/50	2	171 + 191	272 + 310	465 + 586	2,00	3,80	404	663	760
4802	400/3/50	2	2 x 191	2 x 310	2 x 586	2,00	3,80	433	716	896
5402	400/3/50	2	2 x 217	2 x 351	2 x 650	2,00	3,80	485	800	964
6002	400/3/50	2	2 x 243	2 x 392	2 x 805	2,00	3,80	537	882	1173

F.L.I.: Full load power
F.L.A.: Full load current
L.R.A.: Locked rotor amperes for single compressor
S.A.: Inrush current

(1) Values calculated referring to the version with the maximum number of fans working at the max absorbed current
(1)(2) Safety values to be considered when cabling the unit for power supply and line-protections

Plant (side) cooling exchanger water (in/out) 15°C/10°C; Source (side) heat exchanger air (in) 30°C; Ethylene glycol 30% (not applicabile to NG configuration)

Voltage tolerance: 10%
Maximum voltage unbalance: 3%

Give the typical operating conditions of units designed for outdoor installation, which can be associated (according to reference document IEC 60721) to the following classes:
- climatic conditions class 4K4H: air temperature range from -20 up to 55°C (*), relative humidity range from 4 up to 100%, with possible precipitations, at air pressure from 70 and 106 kPa and a maximum solar radiation of 1120 W/m2
- special climatic conditions negligible
- biological conditions class 4B1 and 4C2: locations in a generic urban area
- mechanically active substances class 4S2: locations in areas with sand or dust representative of urban areas
- mechanical conditions class 4M1: locations protected from significant vibrations or shocks

The required protection level for safe operation, according to reference document IEC 60529, is IP43XW (protection against access, to the most critical unit's parts, of external devices with diameter larger than 1 mm and rain).
The unit can be considered IP44XW protected, i.e. protected against access of external devices (with diameter larger than 1 mm) and water in general.

(*) for the unit's operating limits, see "selection limits" section

SIZE	Power supply V/ph/Hz	Maximum values								
		Compressor				Fans (1)		Total (1)(2)		
		n	F.L.I. [kW]	F.L.A. [A]	L.R.A. [A]	F.L.I. [kW]	F.L.A. [A]	F.L.I. [kW]	F.L.A. [A]	S.A. [A]
1502	400/3/50	2	2 x 51.7	2 x 91.7	2 x 267	2,00	3,80	116	234	356
1702	400/3/50	2	2 x 64.3	2 x 105	2 x 290	2,00	3,80	145	241	389
1902	400/3/50	2	2 x 70.2	2 x 115	2 x 350	2,00	3,80	157	262	463
2002	400/3/50	2	2 x 82.1	2 x 132	2 x 423	2,00	3,80	185	303	545
2202	400/3/50	2	2 x 85.4	2 x 137	2 x 246	2,00	3,80	192	314	379
2602	400/3/50	2	2 x 101	2 x 165	2 x 300	2,00	3,80	226	377	451
2702	400/3/50	2	2 x 112	2 x 184	2 x 360	2,00	3,80	248	414	536
3002	400/3/50	2	112 +127	184 + 208	360 + 404	2,00	3,80	264	439	539
3202	400/3/50	2	2 x 127	2 x 208	2 x 404	2,00	3,80	284	471	590
3402	400/3/50	2	127 + 145	208 + 235	404 + 436	2,00	3,80	306	506	627
3602	400/3/50	2	2 x 145	2 x 235	2 x 436	2,00	3,80	324	533	660
3902	400/3/50	2	145 + 171	235 + 272	436 + 465	2,00	3,80	350	572	666
4202	400/3/50	2	2 x 171	2 x 272	2 x 465	2,00	3,80	375	609	695
4502	400/3/50	2	171 + 191	272 + 310	465 + 586	2,00	3,80	404	663	760
4802	400/3/50	2	2 x 191	2 x 310	2 x 586	2,00	3,80	433	716	896
5402	400/3/50	2	2 x 217	2 x 351	2 x 650	2,00	3,80	485	800	964
6002	400/3/50	2	2 x 243	2 x 392	2 x 805	2,00	3,80	537	882	1173

F.L.I.: Full load power
F.L.A.: Full load current
L.R.A.: Locked rotor amperes for single compressor
S.A.: Inrush current

(1) Values calculated referring to the version with the maximum number of fans working at the max absorbed current
(1)(2) Safety values to be considered when cabling the unit for power supply and line-protections

Plant (side) cooling exchanger water (in/out) 15°C/10°C; Source (side) heat exchanger air (in) 30°C; Ethylene glycol 30% (not applicabile to NG configuration)

Voltage tolerance: 10%
Maximum voltage unbalance: 3%

Give the typical operating conditions of units designed for outdoor installation, which can be associated (according to reference document IEC 60721) to the following classes:
- climatic conditions class 4K4H: air temperature range from -20 up to 55°C (*), relative humidity range from 4 up to 100%, with possible precipitations, at air pressure from 70 and 106 kPa and a maximum solar radiation of 1120 W/m2
- special climatic conditions negligible
- biological conditions class 4B1 and 4C2: locations in a generic urban area
- mechanically active substances class 4S2: locations in areas with sand or dust representative of urban areas
- mechanical conditions class 4M1: locations protected from significant vibrations or shocks

The required protection level for safe operation, according to reference document IEC 60529, is IP43XW (protection against access, to the most critical unit's parts, of external devices with diameter larger than 1 mm and rain).
The unit can be considered IP44XW protected, i.e. protected against access of external devices (with diameter larger than 1 mm) and water in general.

(*) for the unit's operating limits, see "selection limits" section

SIZE	Power supply V/ph/Hz	Maximum values								
		Compressor				Fans (1)		Total (1)(2)		
		n	F.L.I. [kW]	F.L.A. [A]	L.R.A. [A]	F.L.I. [kW]	F.L.A. [A]	F.L.I. [kW]	F.L.A. [A]	S.A. [A]
1502	400/3/50	2	2 x 51.7	2 x 91.7	2 x 267	2,00	3,80	120	241	364
1702	400/3/50	2	2 x 64.3	2 x 105	2 x 290	2,00	3,80	145	241	389
1902	400/3/50	2	2 x 70.2	2 x 115	2 x 350	2,00	3,80	161	269	470
2002	400/3/50	2	2 x 82.1	2 x 132	2 x 423	2,00	3,80	185	303	545
2202	400/3/50	2	2 x 85.4	2 x 137	2 x 246	2,00	3,80	196	321	387
2602	400/3/50	2	2 x 101	2 x 165	2 x 300	2,00	3,80	230	384	458
2702	400/3/50	2	2 x 112	2 x 184	2 x 360	2,00	3,80	252	422	543
3002	400/3/50	2	112 +127	184 + 208	360 + 404	2,00	3,80	272	454	554
3202	400/3/50	2	2 x 127	2 x 208	2 x 404	2,00	3,80	288	479	598
3402	400/3/50	2	127 + 145	208 + 235	404 + 436	2,00	3,80	306	506	627
3602	400/3/50	2	2 x 145	2 x 235	2 x 436	2,00	3,80	332	549	675
3902	400/3/50	2	145 + 171	235 + 272	436 + 465	2,00	3,80	358	587	681
4202	400/3/50	2	2 x 171	2 x 272	2 x 465	2,00	3,80	383	624	710
4502	400/3/50	2	171 + 191	272 + 310	465 + 586	2,00	3,80	412	678	775
4802	400/3/50	2	2 x 191	2 x 310	2 x 586	2,00	3,80	433	716	896
5402	400/3/50	2	2 x 217	2 x 351	2 x 650	2,00	3,80	485	800	964

F.L.I.: Full load power
F.L.A.: Full load current
L.R.A.: Locked rotor amperes for single compressor
S.A.: Inrush current

(1) Values calculated referring to the version with the maximum number of fans working at the max absorbed current
(1)(2) Safety values to be considered when cabling the unit for power supply and line-protections

Plant (side) cooling exchanger water (in/out) 15°C/10°C; Source (side) heat exchanger air (in) 30°C; Ethylene glycol 30% (not applicabile to NG configuration)

Voltage tolerance: 10%
Maximum voltage unbalance: 3%

Give the typical operating conditions of units designed for outdoor installation, which can be associated (according to reference document IEC 60721) to the following classes:
- climatic conditions class 4K4H: air temperature range from -20 up to 55°C (*), relative humidity range from 4 up to 100%, with possible precipitations, at air pressure from 70 and 106 kPa and a maximum solar radiation of 1120 W/m2
- special climatic conditions negligible
- biological conditions class 4B1 and 4C2: locations in a generic urban area
- mechanically active substances class 4S2: locations in areas with sand or dust representative of urban areas
- mechanical conditions class 4M1: locations protected from significant vibrations or shocks

The required protection level for safe operation, according to reference document IEC 60529, is IP43XW (protection against access, to the most critical unit's parts, of external devices with diameter larger than 1 mm and rain).
The unit can be considered IP44XW protected, i.e. protected against access of external devices (with diameter larger than 1 mm) and water in general.

(*) for the unit's operating limits, see "selection limits" section

SIZE	Power supply V/ph/Hz	Maximum values								
		Compressor				Fans (1)		Total (1)(2)		
		n	F.L.I. [kW]	F.L.A. [A]	L.R.A. [A]	F.L.I. [kW]	F.L.A. [A]	F.L.I. [kW]	F.L.A. [A]	S.A. [A]
1502	400/3/50	2	2 x 51.7	2 x 91.7	2 x 267	2,00	3,80	120	241	364
1702	400/3/50	2	2 x 64.3	2 x 105	2 x 290	2,00	3,80	145	241	389
1902	400/3/50	2	2 x 70.2	2 x 115	2 x 350	2,00	3,80	161	269	470
2002	400/3/50	2	2 x 82.1	2 x 132	2 x 423	2,00	3,80	185	303	545
2202	400/3/50	2	2 x 85.4	2 x 137	2 x 246	2,00	3,80	196	321	387
2602	400/3/50	2	2 x 101	2 x 165	2 x 300	2,00	3,80	230	384	458
2702	400/3/50	2	2 x 112	2 x 184	2 x 360	2,00	3,80	252	422	543
3002	400/3/50	2	112 +127	184 + 208	360 + 404	2,00	3,80	272	454	554
3202	400/3/50	2	2 x 127	2 x 208	2 x 404	2,00	3,80	288	479	598
3402	400/3/50	2	127 + 145	208 + 235	404 + 436	2,00	3,80	306	506	627
3602	400/3/50	2	2 x 145	2 x 235	2 x 436	2,00	3,80	332	549	675
3902	400/3/50	2	145 + 171	235 + 272	436 + 465	2,00	3,80	358	587	681
4202	400/3/50	2	2 x 171	2 x 272	2 x 465	2,00	3,80	383	624	710
4502	400/3/50	2	171 + 191	272 + 310	465 + 586	2,00	3,80	412	678	775
4802	400/3/50	2	2 x 191	2 x 310	2 x 586	2,00	3,80	433	716	896
5402	400/3/50	2	2 x 217	2 x 351	2 x 650	2,00	3,80	485	800	964

F.L.I.: Full load power
F.L.A.: Full load current
L.R.A.: Locked rotor amperes for single compressor
S.A.: Inrush current

(1) Values calculated referring to the version with the maximum number of fans working at the max absorbed current
(1)(2) Safety values to be considered when cabling the unit for power supply and line-protections

Plant (side) cooling exchanger water (in/out) 15°C/10°C; Source (side) heat exchanger air (in) 30°C; Ethylene glycol 30% (not applicabile to NG configuration)

Voltage tolerance: 10%
Maximum voltage unbalance: 3%

Give the typical operating conditions of units designed for outdoor installation, which can be associated (according to reference document IEC 60721) to the following classes:
- climatic conditions class 4K4H: air temperature range from -20 up to 55°C (*), relative humidity range from 4 up to 100%, with possible precipitations, at air pressure from 70 and 106 kPa and a maximum solar radiation of 1120 W/m2
- special climatic conditions negligible
- biological conditions class 4B1 and 4C2: locations in a generic urban area
- mechanically active substances class 4S2: locations in areas with sand or dust representative of urban areas
- mechanical conditions class 4M1: locations protected from significant vibrations or shocks

The required protection level for safe operation, according to reference document IEC 60529, is IP43XW (protection against access, to the most critical unit's parts, of external devices with diameter larger than 1 mm and rain).
The unit can be considered IP44XW protected, i.e. protected against access of external devices (with diameter larger than 1 mm) and water in general.

(*) for the unit's operating limits, see "selection limits" section

SOUND POWER									
SIZE	Octave band [Hz]								Total sound level dB(A)
	63	125	250	500	1000	2000	4000	8000	
	Sound power level dB								
1502	91	96	98	96	95	89	83	73	**99**
1702	92	97	99	97	96	90	84	74	**100**
1902	92	97	99	97	96	90	84	74	**100**
2002	92	97	99	97	96	90	84	74	**100**
2202	93	98	100	98	97	91	85	75	**101**
2602	94	99	101	99	98	92	86	76	**102**
2702	94	99	101	99	98	92	86	76	**102**
3002	94	99	101	99	98	92	86	76	**102**
3202	94	99	101	99	98	92	86	76	**102**
3402	94	99	101	99	98	92	86	76	**102**
3602	95	100	102	100	99	93	87	77	**103**
3902	95	100	102	100	99	93	87	77	**103**
4202	95	100	102	100	99	93	87	77	**103**
4502	97	102	104	102	101	95	89	79	**105**
4802	98	103	105	103	102	96	90	80	**106**
5402	98	103	105	103	102	96	90	80	**106**
6002	98	103	105	103	102	96	90	80	**106**

Working conditions

Plant (side) cooling exchanger water (in/out) 15°C/10°C; Source (side) heat exchanger air (in) 30°C; Ethylene glycol 30% (not applicabile to NG configuration)
Sound power in compliance with ISO 3744 for non-certified units.
Such certification refers specifically to the sound Power Level in dB(A). This is therefore the only acoustic data to be considered as binding.

SOUND PRESSURE LEVEL									
SIZE	Octave band [Hz]								Total sound level dB(A)
	63	125	250	500	1000	2000	4000	8000	
	Sound pressure level dB								
1502	59	64	66	64	63	57	51	41	**67**
1702	60	65	67	65	64	58	52	42	**68**
1902	60	65	67	65	64	58	52	42	**68**
2002	60	65	67	65	64	58	52	42	**68**
2202	61	66	68	66	65	59	53	43	**69**
2602	62	67	69	67	66	60	54	44	**70**
2702	61	66	68	66	65	59	53	43	**69**
3002	61	66	68	66	65	59	53	43	**69**
3202	61	66	68	66	65	59	53	43	**69**
3402	61	66	68	66	65	59	53	43	**69**
3602	62	67	69	67	66	60	54	44	**70**
3902	62	67	69	67	66	60	54	44	**70**
4202	62	67	69	67	66	60	54	44	**70**
4502	64	69	71	69	68	62	56	46	**72**
4802	65	70	72	70	69	63	57	47	**73**
5402	65	70	72	70	69	63	57	47	**73**
6002	65	70	72	70	69	63	57	47	**73**

Working conditions

Plant (side) cooling exchanger water (in/out) 15°C/10°C; Source (side) heat exchanger air (in) 30°C; Ethylene glycol 30% (not applicabile to NG configuration)
Average sound pressure level, at 10m distance, unit in a free field on a reflective surface; non-binding value obtained from the sound power level.

SOUND POWER									
SIZE	Octave band [Hz]								Total sound level dB(A)
	63	125	250	500	1000	2000	4000	8000	
	Sound power level dB								
1502	91	96	98	96	95	89	83	73	**99**
1702	92	97	99	97	96	90	84	74	**100**
1902	92	97	99	97	96	90	84	74	**100**
2002	92	97	99	97	96	90	84	74	**100**
2202	93	98	100	98	97	91	85	75	**101**
2602	94	99	101	99	98	92	86	76	**102**
2702	94	99	101	99	98	92	86	76	**102**
3002	94	99	101	99	98	92	86	76	**102**
3202	94	99	101	99	98	92	86	76	**102**
3402	94	99	101	99	98	92	86	76	**102**
3602	95	100	102	100	99	93	87	77	**103**
3902	95	100	102	100	99	93	87	77	**103**
4202	95	100	102	100	99	93	87	77	**103**
4502	97	102	104	102	101	95	89	79	**105**
4802	98	103	105	103	102	96	90	80	**106**
5402	98	103	105	103	102	96	90	80	**106**
6002	98	103	105	103	102	96	90	80	**106**

Working conditions

Plant (side) cooling exchanger water (in/out) 15°C/10°C; Source (side) heat exchanger air (in) 30°C; Ethylene glycol 30% (not applicabile to NG configuration)
Sound power in compliance with ISO 3744 for non-certified units.
Such certification refers specifically to the sound Power Level in dB(A). This is therefore the only acoustic data to be considered as binding.

SOUND PRESSURE LEVEL									
SIZE	Octave band [Hz]								Total sound level dB(A)
	63	125	250	500	1000	2000	4000	8000	
	Sound pressure level dB								
1502	59	64	66	64	63	57	51	41	**67**
1702	60	65	67	65	64	58	52	42	**68**
1902	60	65	67	65	64	58	52	42	**68**
2002	60	65	67	65	64	58	52	42	**68**
2202	61	66	68	66	65	59	53	43	**69**
2602	62	67	69	67	66	60	54	44	**70**
2702	61	66	68	66	65	59	53	43	**69**
3002	61	66	68	66	65	59	53	43	**69**
3202	61	66	68	66	65	59	53	43	**69**
3402	61	66	68	66	65	59	53	43	**69**
3602	62	67	69	67	66	60	54	44	**70**
3902	62	67	69	67	66	60	54	44	**70**
4202	62	67	69	67	66	60	54	44	**70**
4502	64	69	71	69	68	62	56	46	**72**
4802	65	70	72	70	69	63	57	47	**73**
5402	65	70	72	70	69	63	57	47	**73**
6002	65	70	72	70	69	63	57	47	**73**

Working conditions

Plant (side) cooling exchanger water (in/out) 15°C/10°C; Source (side) heat exchanger air (in) 30°C; Ethylene glycol 30% (not applicabile to NG configuration)
Average sound pressure level, at 10m distance, unit in a free field on a reflective surface; non-binding value obtained from the sound power level.

SOUND POWER									
SIZE	Octave band [Hz]								Total sound level dB(A)
	63	125	250	500	1000	2000	4000	8000	
	Sound power level dB								
1502	81	79	82	86	87	78	66	59	**89**
1702	81	79	82	86	87	78	66	59	**89**
1902	81	79	82	86	87	78	66	59	**89**
2002	82	80	83	87	88	79	67	60	**90**
2202	84	83	86	88	89	77	67	59	**91**
2602	84	83	86	88	89	77	67	59	**91**
2702	84	83	86	88	89	77	67	59	**91**
3002	85	84	87	89	90	78	68	60	**92**
3202	85	84	87	89	90	78	68	60	**92**
3402	85	84	87	89	90	78	68	60	**92**
3602	85	84	87	89	90	78	68	60	**92**
3902	85	84	87	89	90	78	68	60	**92**
4202	85	84	87	89	90	78	68	60	**92**
4502	87	86	89	92	92	79	69	61	**94**
4802	87	86	89	92	92	79	69	61	**94**
5402	88	87	90	93	93	80	70	62	**95**

Working conditions

Plant (side) cooling exchanger water (in/out) 15°C/10°C; Source (side) heat exchanger air (in) 30°C; Ethylene glycol 30% (not applicabile to NG configuration)
Sound power in compliance with ISO 3744 for non-certified units.
Such certification refers specifically to the sound Power Level in dB(A). This is therefore the only acoustic data to be considered as binding.

SOUND PRESSURE LEVEL									
SIZE	Octave band [Hz]								Total sound level dB(A)
	63	125	250	500	1000	2000	4000	8000	
	Sound pressure level dB								
1502	49	47	50	54	55	46	34	27	**57**
1702	49	47	50	54	55	46	34	27	**57**
1902	49	47	50	54	55	46	34	27	**57**
2002	50	48	51	55	56	47	35	28	**58**
2202	52	51	54	56	57	45	35	27	**59**
2602	51	50	53	55	56	44	34	26	**58**
2702	51	50	53	55	56	44	34	26	**58**
3002	52	51	54	56	57	45	35	27	**59**
3202	52	51	54	56	57	45	35	27	**59**
3402	52	51	54	56	57	45	35	27	**59**
3602	52	51	54	56	57	45	35	27	**59**
3902	52	51	54	56	57	45	35	27	**59**
4202	52	51	54	56	57	45	35	27	**59**
4502	54	53	56	59	59	46	36	28	**61**
4802	54	53	56	59	59	46	36	28	**61**
5402	55	54	57	60	60	47	37	29	**62**

Working conditions

Plant (side) cooling exchanger water (in/out) 15°C/10°C; Source (side) heat exchanger air (in) 30°C; Ethylene glycol 30% (not applicabile to NG configuration)
Average sound pressure level, at 10m distance, unit in a free field on a reflective surface; non-binding value obtained from the sound power level.

SOUND POWER									
SIZE	Octave band [Hz]								Total sound level dB(A)
	63	125	250	500	1000	2000	4000	8000	
	Sound power level dB								
1502	81	79	82	86	87	78	66	59	**89**
1702	81	79	82	86	87	78	66	59	**89**
1902	81	79	82	86	87	78	66	59	**89**
2002	82	80	83	87	88	79	67	60	**90**
2202	84	83	86	88	89	77	67	59	**91**
2602	84	83	86	88	89	77	67	59	**91**
2702	84	83	86	88	89	77	67	59	**91**
3002	85	84	87	89	90	78	68	60	**92**
3202	85	84	87	89	90	78	68	60	**92**
3402	85	84	87	89	90	78	68	60	**92**
3602	85	84	87	89	90	78	68	60	**92**
3902	85	84	87	89	90	78	68	60	**92**
4202	85	84	87	89	90	78	68	60	**92**
4502	87	86	89	92	92	79	69	61	**94**
4802	87	86	89	92	92	79	69	61	**94**
5402	88	87	90	93	93	80	70	62	**95**

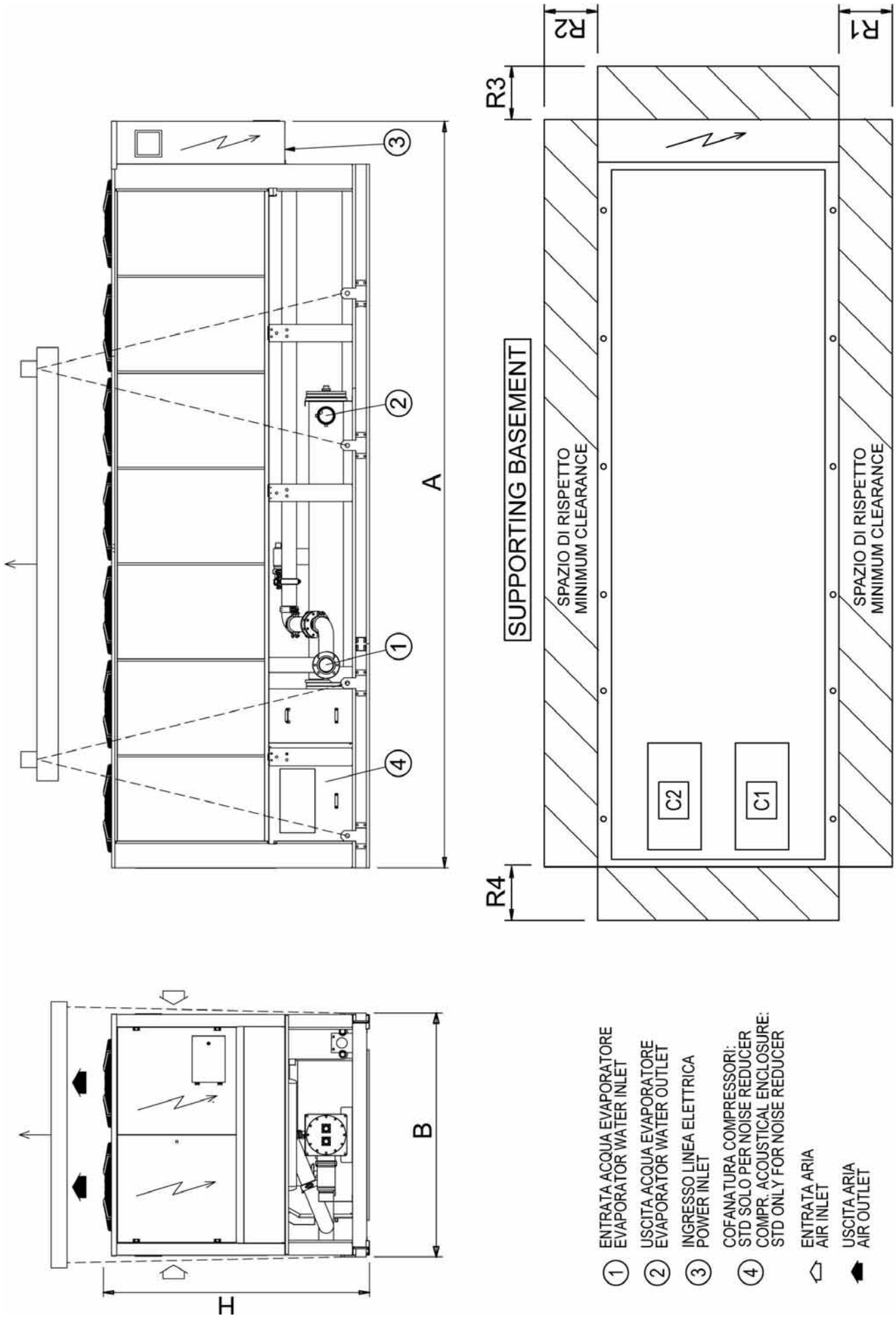
Working conditions

Plant (side) cooling exchanger water (in/out) 15°C/10°C; Source (side) heat exchanger air (in) 30°C; Ethylene glycol 30% (not applicabile to NG configuration)
Sound power in compliance with ISO 3744 for non-certified units.
Such certification refers specifically to the sound Power Level in dB(A). This is therefore the only acoustic data to be considered as binding.

SOUND PRESSURE LEVEL									
SIZE	Octave band [Hz]								Total sound level dB(A)
	63	125	250	500	1000	2000	4000	8000	
	Sound pressure level dB								
1502	49	47	50	54	55	46	34	27	**57**
1702	49	47	50	54	55	46	34	27	**57**
1902	49	47	50	54	55	46	34	27	**57**
2002	50	48	51	55	56	47	35	28	**58**
2202	52	51	54	56	57	45	35	27	**59**
2602	51	50	53	55	56	44	34	26	**58**
2702	51	50	53	55	56	44	34	26	**58**
3002	52	51	54	56	57	45	35	27	**59**
3202	52	51	54	56	57	45	35	27	**59**
3402	52	51	54	56	57	45	35	27	**59**
3602	52	51	54	56	57	45	35	27	**59**
3902	52	51	54	56	57	45	35	27	**59**
4202	52	51	54	56	57	45	35	27	**59**
4502	54	53	56	59	59	46	36	28	**61**
4802	54	53	56	59	59	46	36	28	**61**
5402	55	54	57	60	60	47	37	29	**62**

Working conditions

Plant (side) cooling exchanger water (in/out) 15°C/10°C; Source (side) heat exchanger air (in) 30°C; Ethylene glycol 30% (not applicabile to NG configuration)
Average sound pressure level, at 10m distance, unit in a free field on a reflective surface; non-binding value obtained from the sound power level.



"REMARKS:
For installation purposes, please refer to the documentation sent after the purchase-contract. This technical data should be considered as indicative. CLIMAVENETA may modify them at any moment."

SIZE	DIMENSIONS AND WEIGHTS				CLEARANCE				HEAT EXCHANGER USER SIDE	
	A	B	H	WEIGHT	R1	R2	R3	R4	IN/OUT	
	[mm]	[mm]	[mm]	[kg]	[mm]	[mm]	[mm]	[mm]	TYPE	Ø
FX-FC /T+ /1502	4000	2260	2500	4880	2000	2000	1800	2000	FLEXIBLE JOINT	5"
FX-FC /T+ /1702	4000	2260	2500	4990	2000	2000	1800	2000	FLEXIBLE JOINT	5"
FX-FC /T+ /1902	4900	2260	2500	5520	2000	2000	1800	2000	FLEXIBLE JOINT	5"
FX-FC /T+ /2002	4900	2260	2500	5700	2000	2000	1800	2000	FLEXIBLE JOINT	5"
FX-FC /T+ /2202	5800	2260	2500	7000	2000	2000	1800	2000	FLEXIBLE JOINT	6"
FX-FC /T+ /2602	5800	2260	2500	7410	2000	2000	1800	2000	FLEXIBLE JOINT	6"
FX-FC /T+ /2702	6400	2260	2500	8270	2000	2000	1800	2000	FLEXIBLE JOINT	6"
FX-FC /T+ /3002	6400	2260	2500	8310	2000	2000	1800	2000	FLEXIBLE JOINT	6"
FX-FC /T+ /3202	7000	2260	2500	8750	2000	2000	1800	2000	FLEXIBLE JOINT	6"
FX-FC /T+ /3402	7900	2260	2500	9600	2000	2000	1800	2000	FLEXIBLE JOINT	6"
FX-FC /T+ /3602	7900	2260	2500	10470	2000	2000	1800	2000	FLEXIBLE JOINT	6"
FX-FC /T+ /3902	7900	2260	2500	10570	2000	2000	1800	2000	FLEXIBLE JOINT	8"
FX-FC /T+ /4202	10000	2260	2500	12680	2000	2000	1800	2000	FLEXIBLE JOINT	8"
FX-FC /T+ /4502	10000	2260	2500	13180	2000	2000	1800	2000	FLEXIBLE JOINT	8"
FX-FC /T+ /4802	11800	2260	2500	13710	2000	2000	1800	2000	FLEXIBLE JOINT	8"
FX-FC /T+ /5402	11800	2260	2500	14930	2000	2000	1800	2000	FLEXIBLE JOINT	6" / 8"
FX-FC /T+ /6002	13000	2260	2500	15810	2000	2000	1800	2000	FLEXIBLE JOINT	6" / 8"
FX-FC /NG /T+ /1502	4000	2260	2500	5270	2000	2000	1800	2000	FLEXIBLE JOINT	5"
FX-FC /NG /T+ /1702	4000	2260	2500	5470	2000	2000	1800	2000	FLEXIBLE JOINT	5"
FX-FC /NG /T+ /1902	4900	2260	2500	6020	2000	2000	1800	2000	FLEXIBLE JOINT	5"
FX-FC /NG /T+ /2002	4900	2260	2500	6250	2000	2000	1800	2000	FLEXIBLE JOINT	5"
FX-FC /NG /T+ /2202	5800	2260	2500	7520	2000	2000	1800	2000	FLEXIBLE JOINT	6"
FX-FC /NG /T+ /2602	5800	2260	2500	8000	2000	2000	1800	2000	FLEXIBLE JOINT	6"
FX-FC /NG /T+ /2702	6400	2260	2500	9020	2000	2000	1800	2000	FLEXIBLE JOINT	6"
FX-FC /NG /T+ /3002	6400	2260	2500	9060	2000	2000	1800	2000	FLEXIBLE JOINT	6"
FX-FC /NG /T+ /3202	7000	2260	2500	9420	2000	2000	1800	2000	FLEXIBLE JOINT	6"
FX-FC /NG /T+ /3402	7900	2260	2500	10300	2000	2000	1800	2000	FLEXIBLE JOINT	6"
FX-FC /NG /T+ /3602	7900	2260	2500	11280	2000	2000	1800	2000	FLEXIBLE JOINT	6"
FX-FC /NG /T+ /3902	7900	2260	2500	11370	2000	2000	1800	2000	FLEXIBLE JOINT	8"
FX-FC /NG /T+ /4202	10000	2260	2500	13070	2000	2000	1800	2000	FLEXIBLE JOINT	8"
FX-FC /NG /T+ /4502	10000	2260	2500	13570	2000	2000	1800	2000	FLEXIBLE JOINT	8"
FX-FC /NG /T+ /4802	11800	2260	2500	14490	2000	2000	1800	2000	FLEXIBLE JOINT	8"
FX-FC /NG /T+ /5402	11800	2260	2500	15760	2000	2000	1800	2000	FLEXIBLE JOINT	6" / 8"
FX-FC /NG /T+ /6002	13000	2260	2500	16680	2000	2000	1800	2000	FLEXIBLE JOINT	6" / 8"
FX-FC /SL-T+ /1502	4000	2260	2500	5380	2000	2000	1800	2000	FLEXIBLE JOINT	5"
FX-FC /SL-T+ /1702	4900	2260	2500	5950	2000	2000	1800	2000	FLEXIBLE JOINT	5"
FX-FC /SL-T+ /1902	4900	2260	2500	6040	2000	2000	1800	2000	FLEXIBLE JOINT	5"
FX-FC /SL-T+ /2002	5800	2260	2500	6600	2000	2000	1800	2000	FLEXIBLE JOINT	5"
FX-FC /SL-T+ /2202	5800	2260	2500	7500	2000	2000	1800	2000	FLEXIBLE JOINT	6"
FX-FC /SL-T+ /2602	7000	2260	2500	8250	2000	2000	1800	2000	FLEXIBLE JOINT	6"
FX-FC /SL-T+ /2702	7000	2260	2500	9070	2000	2000	1800	2000	FLEXIBLE JOINT	6"
FX-FC /SL-T+ /3002	7900	2260	2500	9550	2000	2000	1800	2000	FLEXIBLE JOINT	6"
FX-FC /SL-T+ /3202	7900	2260	2500	10040	2000	2000	1800	2000	FLEXIBLE JOINT	6"
FX-FC /SL-T+ /3402	7900	2260	2500	10590	2000	2000	1800	2000	FLEXIBLE JOINT	6"
FX-FC /SL-T+ /3602	10000	2260	2500	13020	2000	2000	1800	2000	FLEXIBLE JOINT	6"
FX-FC /SL-T+ /3902	10000	2260	2500	13060	2000	2000	1800	2000	FLEXIBLE JOINT	8"
FX-FC /SL-T+ /4202	10000	2260	2500	13560	2000	2000	1800	2000	FLEXIBLE JOINT	8"
FX-FC /SL-T+ /4502	11800	2260	2500	14970	2000	2000	1800	2000	FLEXIBLE JOINT	8"
FX-FC /SL-T+ /4802	11800	2260	2500	15060	2000	2000	1800	2000	FLEXIBLE JOINT	8"
FX-FC /SL-T+ /5402	13000	2260	2500	16360	2000	2000	1800	2000	FLEXIBLE JOINT	6" / 8"
FX-FC /NG /SL-T+ /1502	4000	2260	2500	5770	2000	2000	1800	2000	FLEXIBLE JOINT	5"
FX-FC /NG /SL-T+ /1702	4900	2260	2500	6360	2000	2000	1800	2000	FLEXIBLE JOINT	5"
FX-FC /NG /SL-T+ /1902	4900	2260	2500	6520	2000	2000	1800	2000	FLEXIBLE JOINT	5"

SIZE	DIMENSIONS AND WEIGHTS				CLEARANCE				HEAT EXCHANGER USER SIDE	
	A	B	H	VEIGH	R1	R2	R3	R4	IN/OUT	
	[mm]	[mm]	[mm]	[kg]	[mm]	[mm]	[mm]	[mm]	TYPE	Ø
FX-FC /NG /SL-T+ /2002	5800	2260	2500	7160	2000	2000	1800	2000	FLEXIBLE JOINT	5"
FX-FC /NG /SL-T+ /2202	5800	2260	2500	8020	2000	2000	1800	2000	FLEXIBLE JOINT	6"
FX-FC /NG /SL-T+ /2602	7000	2260	2500	8890	2000	2000	1800	2000	FLEXIBLE JOINT	6"
FX-FC /NG /SL-T+ /2702	7000	2260	2500	9590	2000	2000	1800	2000	FLEXIBLE JOINT	6"
FX-FC /NG /SL-T+ /3002	7900	2260	2500	10070	2000	2000	1800	2000	FLEXIBLE JOINT	6"
FX-FC /NG /SL-T+ /3202	7900	2260	2500	10570	2000	2000	1800	2000	FLEXIBLE JOINT	6"
FX-FC /NG /SL-T+ /3402	7900	2260	2500	11290	2000	2000	1800	2000	FLEXIBLE JOINT	6"
FX-FC /NG /SL-T+ /3602	10000	2260	2500	13810	2000	2000	1800	2000	FLEXIBLE JOINT	6"
FX-FC /NG /SL-T+ /3902	10000	2260	2500	13850	2000	2000	1800	2000	FLEXIBLE JOINT	8"
FX-FC /NG /SL-T+ /4202	10000	2260	2500	13970	2000	2000	1800	2000	FLEXIBLE JOINT	8"
FX-FC /NG /SL-T+ /4502	11800	2260	2500	15590	2000	2000	1800	2000	FLEXIBLE JOINT	8"
FX-FC /NG /SL-T+ /4802	11800	2260	2500	15680	2000	2000	1800	2000	FLEXIBLE JOINT	8"
FX-FC /NG /SL-T+ /5402	13000	2260	2500	17220	2000	2000	1800	2000	FLEXIBLE JOINT	6" / 8"

LEGEND OF PIPE CONNECTIONS

UNI ISO 228/1

Pipe threads where pressure-tight joints are not made on the threads - Designation, dimensions and tolerances

Used terminology:

G: Pipe threads where pressure-tight joints are not made on the threads
A: Close tolerance class for external pipe threads where pressure-tight joints are not made on the threads
B: Wider tolerance class for external pipe threads where pressure-tight joints are not made on the threads
Internal threads: G letter followed by thread mark (only tolerance class)
External threads: G letter followed by thread mark and by A letter for A class external threads or by B letter for B class external threads.

UNI ISO 7/1

Pipe threads where pressure-tight joints are made on the threads - Designation, dimensions and tolerances

Used terminology:

Rp: Internal cylindrical threads where pressure-tight joints are made on the threads
Rc: Internal conical threads where pressure-tight joints are made on the threads
R: External conical threads where pressure-tight joints are made on the threads
Internal cylindrical threads: R letter followed by p letter
Internal conical threads: R letter followed by c letter
External conical threads: R letter

Designation	Description
UNI ISO 7/1 - Rp 1 1/2	Internal cylindrical threads where pressure-tight joints are made on the threads, defined by standard UNI ISO 7/1 Conventional ø 1 1/2”
UNI ISO 7/1 - Rp 2 1/2	Internal cylindrical threads where pressure-tight joints are made on the threads, defined by standard UNI ISO 7/1 Conventional ø 2 1/2”
UNI ISO 7/1 - Rp 3	Internal cylindrical threads where pressure-tight joints are made on the threads, defined by standard UNI ISO 7/1 Conventional ø 3”
UNI ISO 7/1 - R 3	External conical threads where pressure-tight joints are made on the threads, defined by standard UNI ISO 7/1 Conventional ø 3”
UNI ISO 228/1 - G 4 B	Internal cylindrical threads where pressure-tight joints are not made on the threads, defined by standard UNI ISO 228/1 Tolerance class B for external thread Conventional ø 4”
DN 80 PN 16	Flange Nominal Diameter: 80 mm Nominal Pressure: 16 bar

Notes:

Conventional diameter value [in inches] identifies short thread designation, based upon the relative standard.
All relative values are defined by standards.
As example, here below some values:

	UNI ISO 7/1	UNI ISO 228/1
Conventional ø	1"	1"
Pitch	2.309 mm	2.309 mm
External ø	33.249 mm	33.249 mm
Core ø	30.291 mm	30.291 mm
Thread height	1.479 mm	1.479 mm

Climaveneta S.p.A.
Via Sarson 57/c
36061 Bassano del Grappa (VI)
Italy
Tel +39 0424 509500
Fax +39 0424 509509
info@climaveneta.com
www.climaveneta.com

Climaveneta France
3, Village d'Entreprises
ZA de la Couronne des Prés
Avenue de la Mauldre
78680 Epone
France
Tel +33 (0)1 30 95 19 19
Fax +33 (0)1 30 95 18 18
info@climaveneta.fr
www.climaveneta.fr

Climaveneta Deutschland
Rhenus Platz, 2
59439 Holzwickede
Germany
Tel +49 2301 91222-0
Fax +49 2301 91222-99
info@climaveneta.de
www.climaveneta.de

Climaveneta
Espana - Top Clima
Londres 67, 1° 4°
08036 Barcelona
Spain
Tel +34 963 195 600
Fax +34 963 615 167
topclima@topclima.com
www.climaveneta.com

Climaveneta Chat Union
Refrig. Equipment Co Ltd
88 Bai Yun Rd, Pudong Xinghuo
New dev. zone 201419 Shanghai
China
Tel 008 621 575 055 66
Fax 008 621 575 057 97

Climaveneta Polska Sp. z o.o.
Ul. Sienkiewicza 13A
05-120 Legionowo
Poland
Tel +48 22 766 34 55-57
Fax +48 22 784 39 09
info@climaveneta.pl
www.climaveneta.pl

Climaveneta India
Climate Technologies (P) LTD
#3487, 14th Main, HAL 2nd stage
Indiranagar, Bangalore 560008
India
Tel +91-80-42466900 - 949
Fax +91-80-25203540
sales@climaveneta.in

Climaveneta UK LTD
Highlands Road,
Shirley Solihull
West Midlands B90 4NL
Tel: +44 (0)871 663 0664
Fax: +44 (0)871 663 1664
Freephone: 0800 801 819
response@climaveneta.co.uk
www.climaveneta.co.uk