MITSUBISHI ELECTRIC
HYDRONICS & IT COOLING SYSTEMS S.p.A.

Data Book

ERACS2_Q_1062_3222_201110_EN

4 PIPE SYSTEM

ERACS2-Q 1062 - 3222

200-826 kW

INTEGRA unit for 4-pipe systems, air source for outdoor installation

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

R HFC R-134a

SCREW

T SHELL & TUBES

EUROVENT CERTIFIED PERFORMANCE

VPF VARIABLE PRIMARY FLOW

- **UNIQUE PROPOSAL**
- **ENERGY SAVING**
- **WIDE OPERATING RANGE**
- **VERSION ´XL-CA-E´ AVAILABLE**
- **HOT WATER SUPPLY**

CLIMAVENETA®

CERTIFICATIONS

Product certifications

System certifications

Climaveneta S.p.A.:

Quality System complying with the requirements of UNI EN ISO9001:2008 regulation

Environmental Management System complying with the requirements of UNI EN ISO14001:2004 regulation

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The units highlighted in this publication contain HFC R134a [GWP_{100} 1430] fluorinated greenhouse gases.

1. PRODUCT PRESENTATION

4-pipe systems
This type of system is suitable for air-conditioning buildings that require separate areas to be heated and cooled at the same time.
It is combined with centralised solutions capable of producing hot and cold water in the two hydronic circuits of the system, assuring maximum comfort in every room of the building, independently and in any period of the year.
From now on, a single intelligent unit is sufficient for the management of these complex systems: INTEGRA.

INTEGRA unit for 4-pipe systems, air source for outdoor installation
The ERACS2-Q series multi-use units are able to simultaneously meet hot and cold water production requests and are thus a valid alternative to traditional systems based on chillers and boilers for applications such as office blocks, pools and shopping centres.
The advanced control logic, developed by Climaveneta, ensures that heating and cooling loads are perfectly met. When these are simultaneous, the unit exchanges evaporation and condensation heat with the system cooling and heating circuits respectively. When heat loads are not balanced or one of the two are missing, the unit automatically switches to a third heat source which can be air or water according to the model.
The ERACS2-Q are units for outdoor installation. For these products. heat is exchanged on the source side by a refrigerant-air coils exchanger; it acts as a condensert or as an evaporator according to machine conditions.

1.1 Unique proposal

Unit designed to satisfy the cold and the hot side requirements simultaneously, for 4-pipe systems without any particular operation mode setting.

1.2 Energy saving

Energy saving guaranteed by the advanced operation's logic. The best operation mode is set completely automatically and independently by the unit's controller, in order to minimize the absorbed energy whatever the cooling and/or heating demand might be.

1.3 Extensive range of operation

Unit´s operation guaranteed with external air temperature down to -10°C during winter and up to 46°C during summer.

1.4 Version ´XL-CA-E´ available

Exclusive Premium version. Together for the first time, the lowest noise level on the market and the maximum efficiency in each operating mode.

1.5 Hot water supply

Supply of hot water in use up to 55°C, offering maximum versatility with respect to different plant engineering solutions.

1.6 Tests

Perfect functionality of Climaveneta units is guaranteed by accurate tests carried out along the productive process, and by final test of every unit at the end of the work cycle, as imposed by ISO9001.
Climaveneta also offers clients the chance to require and witness additional performance and sound level tests be performed; highly skilled technical crew follow these operations in detail, to ensure maximum satisfaction of the customer.
For units of the ERACS2-Q series Climaveneta offers the possibility to conduct visionati or presenziati tests.

Running tests are standard tests similar to those normally conducted at the productive unit that the client can observe without participation.

Witness tests are extra tests that the client can observe and during which can request clarifications upon modalities or work conditions of the unit, receiving test reports at the end. Witness tests can include sound level and performance tests.

Acoustical tests allow to verify levels of sound emissions of the unit; tests are performed repeating measurements of sound pressure in determined points, positioned on an ideal grid with walls 1 meter distance from the unit panels. For every measuring point a spectrum in octave band for sound pressure and the average value is supplied to the customer. Then the average global values for pressure at 1 meter, according to ISO3744, and the average sound power, referred to the whole unit, are counted.

Performance tests are based on the measurement of electric data, water flow, working temperature, electric power absorbed, and capacity delivered.
Measurements can be made at one or three work points while varying the outlet temperatures of the evaporator and condenser conditions. At the clients discretion, performance tests can be conducted under full or part load conditions for every operating mode possible for the unit.

Full load tests conducted in one or three work points permit two further personalized versions:
• with a mixture of ethyl glycol water in the heat exchanger;
• up to the maximum working temperature of the heat exchanger on the source side.

Part load tests can be conducted using two different load partialization methods: the first one requires to reduce the active resources' number, while second one requires to modulate load on each resource. At part load the unit can be tested just in one working point.

The following two tests can always be requested during final testing:
• **Simulation of the most common alarm states**
• **Measurement of pressure drop of exchanger on hydraulic circuit side**

2. UNIT DESCRIPTION

INTEGRA unit for 4-pipe systems, air source for outdoor installation

Multi-purpose outdoor unit for use in 4-pipe systems for the simultaneous production of chilled and hot water by means of two independent hydronic circuits. These units are able to satisfy the demand for hot and cold water simultaneously through a system that does not require seasonal switching and is therefore a valid alternative to traditional plants with chiller and boiler. Each circuit works with a semi-hermetic screw compressor using R134a, two shell and tubes heat exchangers shared by both circuits, a cold heat exchanger on plant's side that acts as an evaporator in the production of cold water, a heat exchanger on plant's side that works as a condenser in the production of hot water, and a source side coil heat exchanger that works as either condenser or evaporator as required by the loads.

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

2.1 Standard unit composition

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. Sizes from 1062 to 1962 characterized by external panel made from aluminium alloy for total corrosion resistance. In silenced versions, pipes and compressors´ box are covered with an acoustic layer to reduce global noise emissions.

Refrigerant circuit

The unit has two completely independent cooling circuits in order to ensure continuous operation, limited pollution, and easy maintenance. Each cooling circuit is fitted as standard with:
- economizers
- electronic expansion valve
- safety valves and high and low pressure transducers
- check valve on the compressor delivery line
- on-off cock on the compressor´s suction and delivery line and on the refrigerant line
- solenoid valve on the refrigerant line
- dryer filter with replaceable cartridge
- refrigerant line sight glass with humidity indicator
- high-pressure safety pressure-switch
- liquid receivers
- liquid separators.

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 overgears. 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 economiser (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 compression chamber reduction by steps; each compressor can therefore deliver 100%, 75% and 50% 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.

Plant side cold heat exchanger

Direct expansion type shell and tube heat exchanger; it acts as an evaporator with refrigerant flow inside the pipes and water flow on the shell side. The tubes have asymmetrical flows that maintain the correct speed of the refrigerant in the tubes when passing from the liquid phase into steam. The water flow on the shell side is fitted with baffles to increase turbulence and therefore the efficiency of exchange. The steel shell has external foamed closed-cell elastomer insulating lining 10 mm thick and thermal conductivity of 0.033 W/mK at 0°C. The tube nest is manufactured using copper tubes with internal grooves for favouring heat exchange and mechanically expanded onto the tube plates. The heat exchanger is fitted with a differential pressure switch which controls the flow of water when the unit is working, in this way preventing the formation of ice inside. The heat exchanger is made in compliance with PED standard work pressure requisites.

Plant side hot heat exchanger

Direct expansion shell and tube heat exchanger; it acts as a condenser with refrigerant flow inside the pipes and water flow on the shell side. The tubes have asymmetrical flows that maintain the correct speed of the refrigerant in the tubes during phase transition. The water flows on the shell side is fitted with baffles to increase turbulence and therefore the efficiency of exchange. The tube nest is manufactured using copper tubes with internal grooves for favouring heat exchange and mechanically expanded onto the tube plates. The heat exchanger is fitted with a differential pressure switch which controls the flow of water when the unit is working, in this way preventing anomalies and overheating. The heat exchanger is made in compliance with PED standard work pressure requisites.

Source side heat exchanger

Air-refrigerant heat exchager, working as a condenser or an evaporator depending to the specific operating mode. Made with copper tubes and aluminium fins. The aluminium fins are spaced to guarantee the best heat exchange efficiency. The lower part of the exchanger works as a subcooling circuit increasing the cooling capacity, when it is working as a condenser.

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 on LN-CA and SL-CA versions.
Sizes of the versions XL-CA and XL-CA-E adopt electronically commutated fans (EC fans). The brushless motor, governed by a special controller, continuously adjust fans´ speed to minimize energy consumption, electromagnetic noises and current´s absorption even during start-up phase.

Electrical and control panel
Electric power and control panel compliant with EN 60204-1/ IEC 204-1, complete with:
• electronic controller
• transformer for control circuit
• general door lock isolator
• power circuit with bar distribution system
• fuses and contactors for compressors
• terminals for cumulative alarm block
• remote ON/OFF terminals
• spring-type control circuit terminal boards
• phase sequence relays.
Power supply 400/3/50 with part winding start for sizes 1062-1962 and star/delta for sizes 2022-3222.

2.2 Certif cations
EUROVENT Certification program
CE - Product quality 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

2.3 Units' tests
Tests carried out along the all productive process as imposed by ISO9001. Possibility to have performance and acoustical witness tests, with the support of qualified technical operators. Performance tests give the possibility to measure:
• electrical data
• heat exchangers´ waterflow
• operating temperature
• absorbed and given power, both at full load and partial load condition, in each operating mode.
It's even possible to have a simulation of the most common alarms and the pressure drops (water side) measurements.
The acoustical tests allow to verify level of sound emissions of the unit according to ISO3744.

2.4 Electronic control W3000SE Large
The controller W3000 large offers the latest control and functions specially developed for these units. The keypad is generously sized with full operating status display. The controls and detailed LCD make access to machine settings easy and safe. These resources permit to diirectly act on the unit settings through a multilevel menu, available in several languages. The diagnostics includes full management of alarms with black-box functions and alarm record for better analysis of unit performance. For multi-units plants a special device to coordinate and manage all the resources is available as an option; energy metering device is even possible as an option. Supervision is easy through Climaveneta devices or with various options for interfacing to ModBus, Bacnet, Echelon LonTalk protocols. Compatibility with remote keyboard (management up to 10 units). Clock available with programming of operation (standard 4 days and 10 time bands). Temperature regulation managed on the two water circuits, with a proportional logic referred to the return water temperatures. This allows to satisfy simultaneously the different heating- and cooling requests, with no need of mode changeover. Exclusive self-adaptive defrost logic, monitoring multiple operational- and ambient parameters, which allows to reduce the number and duration of the defrost cycles, with a benefit for the overall energy efficiency.

2.5 Versions
CA
Class A of efficiency as per Eurovent.

LN-CA
Low-noise version, Class A of efficiency as per Eurovent. Acoustic insulation on the compressors box and a low fans´ rotational speed gives the minimization of sound emission.

SL-CA
Super Low-noise version, Class A of efficiency as per Eurovent. Acoustic insulation on the compressors box, on pipes and a low fans´ rotational speed gives the minimization of sound emission.

XL-CA
eXtra Low-noise version, Class A of efficiency as per Eurovent. Special acoustic insulation on the compressors box composed by 5 layers, insulation on pipes and a low fans´ rotational speed make the sizes of XL version some of the most silent chillers in the market.

XL-CA-E
Super Low-noise version, exceeds the Class A of efficiency as per Eurovent. Acoustic insulation on the compressors box, on pipes and a low fans´ rotational speed gives the minimization of sound emission. The generous sizing of heat exchange surfaces permits the efficiency at full load on the top of the market: EER higher than 3,1 and COP higher than 3,5 (at standard conditions referred to chiller and heat pump respectively).

2.6 Functions
< >, Standard unit
Multi-purpose units for the simultaneous and indipendent production of chiller/hot water.

2.7 Accessories

ACCESSORIES	DESCRIPTION	BENEFIT
Cu/Cu condensing coils	Air-refrigerant heat exchanger with copper fins and tubes.	Recommended for applications in corrosive atmospheres
Condensing coils with epoxy-coated fins	Painted air-refrigerant heat exchanger.	Recommended for applications in medium level pollution atmospheres.
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.
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.
Hydronic group (see dedicate section).	N° 2 centrifugal pumps, normalized to EN733. Three-phase electrical motor, proteced to IP55, insulation class F. The two pumps are managed in order to balance their running time. Inlet/outlet and discharge valves. Check valve. Air vent.	
Variable flow hydronic group (see dedicate section).	Centrifugal pumps, normalized to EN733. Three-phase electrical motor, proteced to IP55, insulation class F, coupled with an inverter which modulates the current's frequency between 25 and 50 Hz. The two pumps are managed in order to balance their running time. Electronic devices used to manage them setted in the electrical panel, driven directly by the unit's controller. Inlet/outlet and discharge valves. Check valve. Air vent. Overall unit’s dimension could slightly change. Refer to sales dpt for further details.	
kit HWT	Kit for high hot primary heat exchanger leaving water temperature up to 60°C and for high outdoor temperature: up to 50°C at full load and up to 57°C at partial load. The accessory is required for applications with high water temperature requestes (higher then 55°C) or for installation in extremely hot areas.	
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.
ModBUS connectivity	Interface module for ModBUS protocols	Allows integration with BMS operating with ModBUS protocol
BACnet connectivity	Interface module for BACnet protocols	Allows integration with BMS operating with BACnet protocol
Echelon connectivity	Interface module for Echelon systems	Allows integration with BMS operating with LonWorks procotls
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
Automatic circuit breakers	Over-current switch on the major electrical loads.	It protects compressors and/or fans from possible current peaks.
Input remote demand limit	Digital input (voltage free)	It permits to limit the unit's power absorption for safety reasons or in temporary situation.
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.
Coil protection grill in peraluman		
Anti-intrusions grills		Avoid the intrusion of solid bodies into the unit's structure
Numbered cables on electrical board		
Remote signal double SetPoint	Allows to activate the Energy Saving set-point	Enforce Energy Saving policy
Flanged evaporator connection		
Evaporator flowswitch (water side)		
Container packing		
Coil s protection grill and nylon coverage		

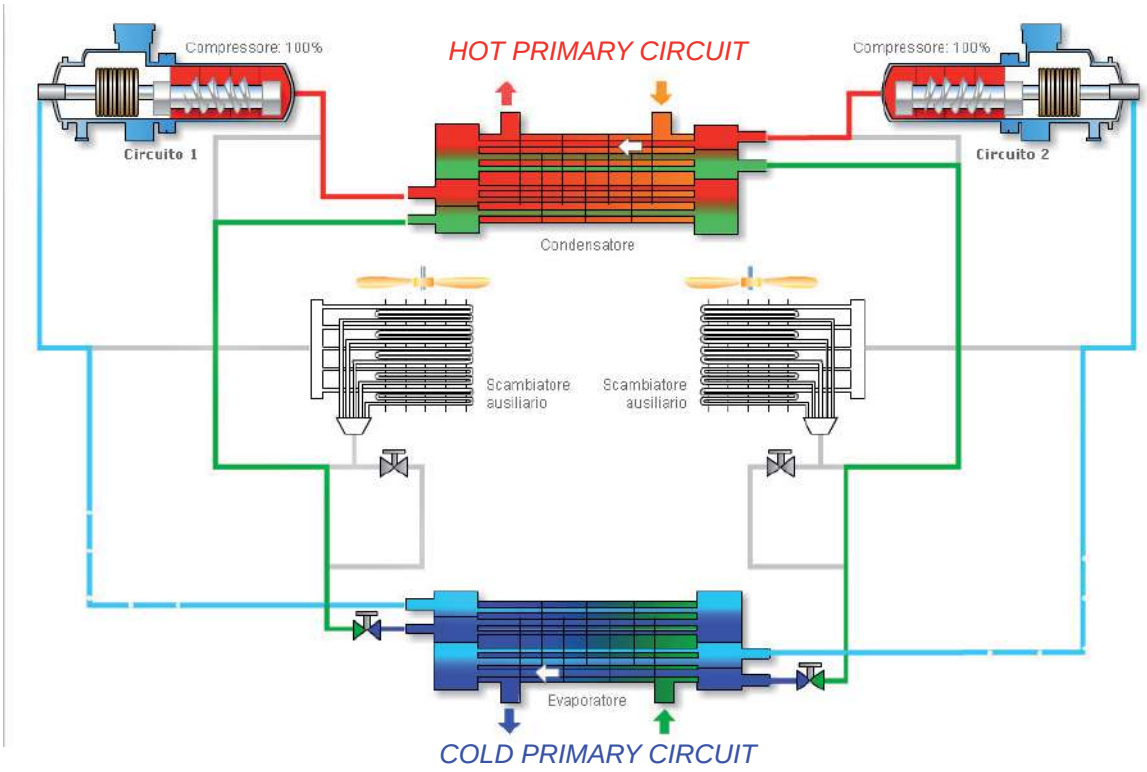
ACCESSORIES	DESCRIPTION	BENEFIT
Rubber anti vibration device		
Spring anti vibration device		
Relay for pump(s) management	Relay for the pump(s) on/off.	It permits the pumps on/off. In case of 2 pumps, one in stand-by to the other, it's possible to balance the operating hours between them.
Power factor 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.
BACnet OVER IP connectivity	Interface module for BACnet OVER-IP protocols	Allows to interconnect BACnet devices over Internet Protocol within wide-area networks
Double antifreeze heater		
Double insulation on evaporator (water side)		
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.
Network analyzer per DEMETRA	Tools to measure the electricity absorbed by the unit.	They meter the electricity absorbed and are connected 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)	

2.8 Operating principle

The ERACS2-Q units are especially designed for 4 pipes systems. Their hydraulic circuits are therefore divided into two separated sections: one hot (condenser side) and one cold (evaporator side). [See picture below].
These units can produce hot and chilled water at the same time and totally independently, adapting to the variable requests inside the building.

There are three basic operating configurations which are totally independent from external temperature conditions:
- only chilled water production (the unit works as a simple chiller);
- only hot water production (the unit works as an heat pump);
- combined production of hot and chilled water (the unit produces simultaneously and autonomously cold and hot water for the two plant's sections).

The above working configurations are selected automatically (on-board microprocessor) in order to minimize the absorbed energy and satisfy each thermal building's requests.



PRODUCTION OF ONLY CHILLED WATER
The unit works like a simple chiller and therefore rejects the condensation heat to the atmosphere through an air-refrigerant finned tube heat exchanger (condensation coil). The water is cooled in a refrigerant-water exchanger (evaporator).

PRODUCTION OF ONLY HOT WATER
In this case, the unit works exactly like a heat pump which channels the heat of the external atmosphere through an air-refrigerant finned coil (evaporator) in order to heat the water sent inside the building through a refrigerant-water exchanger (condenser). The main difference compared with traditional reverse cycle heat pumps is that the hot water is produced in a different heat exchanger from the one previously used to produce chilled water, featuring a dedicated evaporator. This is necessary in order to keep the hot and cold sections separate, as required by four-tube systems.

COMBINED PRODUCTION OF HOT AND CHILLED WATER
If users required hot and chilled water at the same time, the unit behaves like a water-water unit, managing condensation and evaporation on two separate heat exchangers connected with the two separate circuits (hot and cold) of the 4-pipes plant.
The cooling and heating energy are provided respectively to evaporator and condenser. These heat exchangers are then hydraulically coupled to the two circuits (cold and heat) of the 4-pipes plant.

The multi-purpose units are designed with two separate refrigerant circuits. Thanks to the advanced control logic specifically developed for these units, this solution ensures the units are always able to respond to building loads. The two refrigerant circuits are intelligently managed by the unit's controller and are able to adopt independently one from the other the most convenient operation mode to satisfy the building's requirements with the highest efficiency.
The use of suitable thermal storage tanks, both on the cold and hot sides, offers effective system operating modularity and optimises running costs.

2.9 TER - Total Eff ciency Ratio

Completely integrated functions and maximum performance synergy require an advanced measurement rating for the total efficiency of the unit:

TER - TOTAL EFFICIENCY RATIO

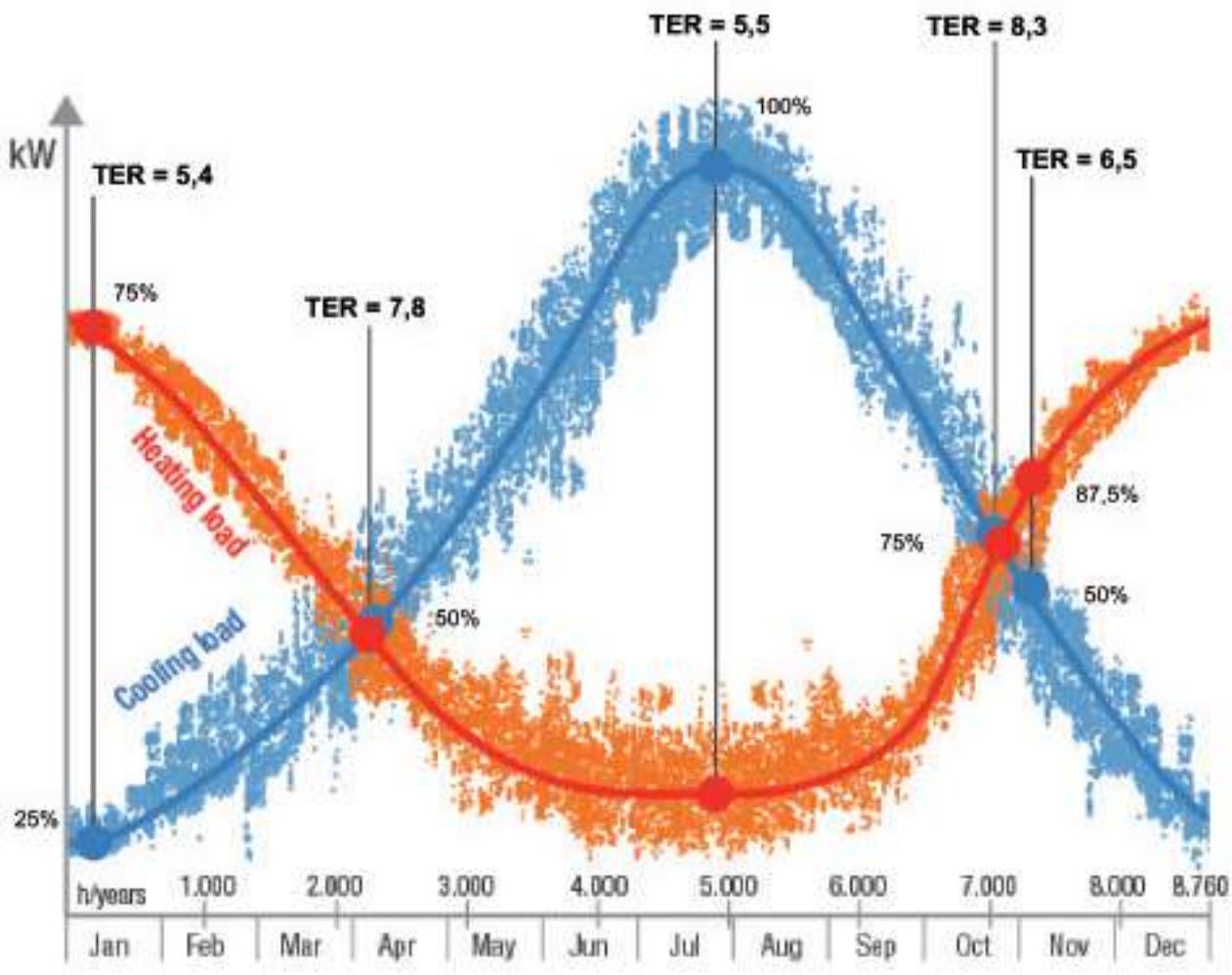
If you have a unit that can provide for heating and cooling simultaneously, then measuring efficiency with the traditional ratings such as EER and COP would be limiting.

In all the cases in which INTEGRA produces hot and cold water simultaneously, the real efficiency of the unit is the sum of its performance in the hot and cold modes.
To objectively measure performance under simultaneous load conditions, Climaveneta, a pioneer in the development of this technology, has concieved TER – total efficiency ratio.

The **TER** is calculated as the ratio between the sum of the delivered heating and cooling power and electrical power input.

The **TER** reaches its maximum value when the loads are co pletely balanced and is the most effective way of representing the real efficiency of the unit.

TER = (COOLING POWER + HEATING POWER) / TOTAL ABSORBED POWER



Operating conditions:
Evaporator in/out temperature 12/7 °C - Condenser in/out temperature 40/45 °C - Out air temperature 15 °C

2.10 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.

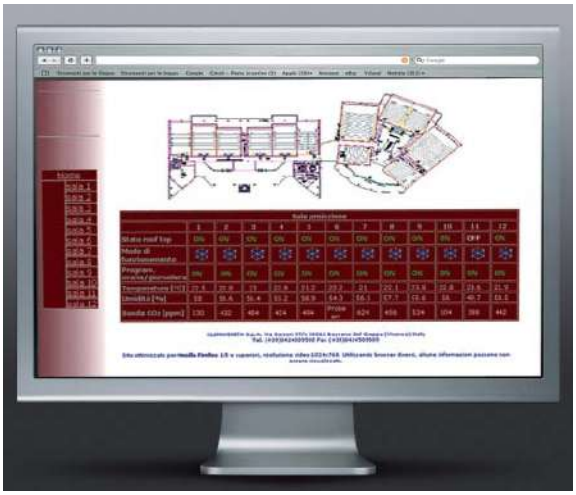
This represents a crucial contribution to the reduction of the costs related to the hydraulic plant and its operation.

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.

2.11 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.

SIZE		1062	1162	1362	1562	1762	1962	2022
ERACS2-Q /CA								
COOLING	(1)							
Cooling capacity	**kW**	**210**	**248**	**302**	**329**	**380**	**425**	**483**
Total power input (unit)	kW	72,1	84,8	101	109	129	144	156
EER		2,91	2,93	2,98	3,01	2,95	2,95	3,10
ESEER		-	-	-	-	-	-	-
Heat exchanger water flow	m³/h	36,2	42,8	52,1	56,7	65,5	73,2	83,1
Heat exchanger pressure drop	kPa	28,8	40,2	36,6	43,4	40,3	27,9	26,7
ERACS2-Q /CA								
HEATING	(2)							
Heating capacity	**kW**	**218**	**258**	**308**	**339**	**396**	**434**	**492**
Total power input (unit)	kW	67,0	80,7	92,2	101	122	131	149
COP		3,64	3,52	3,63	3,70	3,53	3,66	3,60
Heat exchanger water flow	m³/h	37,8	44,9	53,6	58,9	68,7	75,4	85,5
Heat exchanger pressure drop	kPa	31,5	44,3	38,8	46,9	44,4	29,6	28,2
ERACS2-Q /CA								
REFRIGERATION AND HEATING	(3)							
Cooling capacity	kW	209	248	305	329	381	428	484
Total power input (unit)	kW	60,6	72,2	87,1	92,5	111	122	134
Heat exchanger water flow	m³/h	36,2	42,8	52,1	56,7	65,5	73,2	83,1
Heat exchanger pressure drop	kPa	28,8	40,2	36,6	43,4	40,3	27,9	26,7
Heat recovery thermal capacity	**kW**	**266**	**316**	**386**	**416**	**486**	**542**	**609**
TER - Total Efficiency Ratio		7,83	7,81	7,94	8,06	7,80	7,96	8,17
Heat exchanger recovery water flow	m³/h	46,1	54,9	67,2	72,4	84,4	94,2	106
Plant side heat exchanger recovery pressure drop	kPa	46,8	66,3	60,9	70,7	67,0	46,1	43,3
COMPRESSORS								
Number	N°.	2	2	2	2	2	2	2
Number of capacity	N°.	6	6	6	6	6	6	6
Number of circuits	N°.	2	2	2	2	2	2	2
Type of regulation		STEPS	STEPS	STEPS	STEPS	STEPS	STEPS	STEPS
Minimum capacity steps	%	25	25	25	25	25	25	25
Type of refrigerant		R134a	R134a	R134a	R134a	R134a	R134a	R134a
Refrigerant charge	kg.	83	97	132	132	160	167	210
Oil charge	kg.	19	20	20	30	30	30	44
FANS								
Number	N°.	6	6	6	8	8	10	10
Air flow	m³/s	30,4	32,5	34,6	43,4	45,6	54,2	50,6
Singol power input	kW	2	2	2	2	2	2	2
NOISE LEVELS	(4)							
Total sound power	dB(A)	97	97	97	98	99	99	99
Total sound pressure	dB(A)	65	65	65	66	66	66	66
DIMENSIONS AND WEIGHTS	(5)							
Length	mm.	4610	4610	5610	5610	6610	6610	6300
Width	mm.	2220	2220	2220	2220	2220	2220	2260
Height	mm.	2150	2420	2430	2430	2430	2430	2350
Weight	kg.	3600	3870	4620	5040	5520	5670	7580

1 Plant (side) cooling exchanger water (in/out) 12/7 °C
Source (side) heat exchanger air (in) 35 °C

2 Plant (side) heating exchanger water (in/out) 40/45 °C
Source (side) heat exchanger air (in) 7 °C R.H. 87%

3 Plant (side) cooling exchanger water (in/out) 12/7 °C
Source (side) heat exchanger air (in) 35 °C
Plant (side) heating exchanger water (in/out) 40/45 °C
Source (side) heat exchanger air (in) 7 °C R.H. 87%

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
Average sound pressure level, at 10 (m.) distance, unit in a free field on a reflective surface; non-binding value obtained from the sound power level

5 Standard configuration

- Not available

SIZE		2222	2422	2622	2722	3222		
ERACS2-Q /CA								
COOLING	(1)							
Cooling capacity	**kW**	**525**	**554**	**624**	**701**	**826**		
Total power input (unit)	kW	167	176	201	222	264		
EER		3,14	3,16	3,10	3,15	3,13		
ESEER		-	-	-	-	-		
Heat exchanger water flow	m³/h	90,4	95,3	107	121	142		
Heat exchanger pressure drop	kPa	29,0	32,3	23,1	30,5	30,9		
ERACS2-Q /CA								
HEATING	(2)							
Heating capacity	**kW**	**541**	**571**	**615**	**711**	**826**		
Total power input (unit)	kW	159	169	178	207	240		
COP		3,74	3,70	3,76	3,74	3,74		
Heat exchanger water flow	m³/h	94,1	99,2	107	124	143		
Heat exchanger pressure drop	kPa	31,4	34,9	22,8	31,9	31,5		
ERACS2-Q /CA								
REFRIGERATION AND HEATING	(3)							
Cooling capacity	kW	522	550	631	701	826		
Total power input (unit)	kW	145	153	170	193	228		
Heat exchanger water flow	m³/h	90,4	95,3	107	121	142		
Heat exchanger pressure drop	kPa	29,0	32,3	23,1	30,5	30,9		
Heat recovery thermal capacity	**kW**	**658**	**694**	**791**	**883**	**1041**		
TER - Total Efficiency Ratio		8,14	8,12	8,35	8,19	8,17		
Heat exchanger recovery water flow	m³/h	114	121	138	153	181		
Plant side heat exchanger recovery pressure drop	kPa	46,4	51,7	37,8	49,2	50,1		
COMPRESSORS								
Number	N°.	2	2	2	2	2		
Number of capacity	N°.	6	6	6	6	6		
Number of circuits	N°.	2	2	2	2	2		
Type of regulation		STEPS	STEPS	STEPS	STEPS	STEPS		
Minimum capacity steps	%	25	25	25	25	25		
Type of refrigerant		R134a	R134a	R134a	R134a	R134a		
Refrigerant charge	kg.	240	250	254	312	360		
Oil charge	kg.	44	44	38	38	70		
FANS								
Number	N°.	12	12	12	14	16		
Air flow	m³/s	65,6	61,0	61,0	72,5	82,9		
Singol power input	kW	2	2	2	2	2		
NOISE LEVELS	(4)							
Total sound power	dB(A)	101	101	101	101	102		
Total sound pressure	dB(A)	68	68	68	68	69		
DIMENSIONS AND WEIGHTS	(5)							
Length	mm.	7200	7200	7200	8400	9700		
Width	mm.	2260	2260	2260	2260	2260		
Height	mm.	2350	2350	2350	2350	2350		
Weight	kg.	8060	8160	8600	9160	11380		

1 Plant (side) cooling exchanger water (in/out) 12/7 °C
Source (side) heat exchanger air (in) 35 °C

2 Plant (side) heating exchanger water (in/out) 40/45 °C
Source (side) heat exchanger air (in) 7 °C R.H. 87%

3 Plant (side) cooling exchanger water (in/out) 12/7 °C
Source (side) heat exchanger air (in) 35 °C
Plant (side) heating exchanger water (in/out) 40/45 °C
Source (side) heat exchanger air (in) 7 °C R.H. 87%

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
Average sound pressure level, at 10 (m.) distance, unit in a free field on a reflective surface; non-binding value obtained from the sound power level

5 Standard configuration

\- Not available

ERACS2-Q LN-CA

SIZE		1062	1162	1362	1562	1762	1962	2022
ERACS2-Q /LN-CA								
COOLING	(1)							
Cooling capacity	**kW**	**205**	**241**	**294**	**322**	**369**	**414**	**469**
Total power input (unit)	kW	70,8	84,6	103	109	130	144	163
EER		2,89	2,85	2,86	2,96	2,83	2,87	2,88
ESEER		-	-	-	-	-	-	-
Heat exchanger water flow	m³/h	35,3	41,5	50,6	55,4	63,6	71,2	80,7
Heat exchanger pressure drop	kPa	27,4	37,9	34,5	41,4	38,0	26,4	25,1
ERACS2-Q /LN-CA								
HEATING	(2)							
Heating capacity	**kW**	**218**	**258**	**308**	**339**	**396**	**434**	**492**
Total power input (unit)	kW	67,0	80,7	92,2	101	122	131	149
COP		3,64	3,52	3,63	3,70	3,53	3,66	3,60
Heat exchanger water flow	m³/h	37,8	44,9	53,6	58,9	68,7	75,4	85,5
Heat exchanger pressure drop	kPa	31,5	44,3	38,8	46,9	44,4	29,6	28,2
ERACS2-Q /LN-CA								
REFRIGERATION AND HEATING	(3)							
Cooling capacity	kW	209	248	305	329	381	428	484
Total power input (unit)	kW	60,6	72,2	87,1	92,5	111	122	134
Heat exchanger water flow	m³/h	35,3	41,5	50,6	55,4	63,6	71,2	80,7
Heat exchanger pressure drop	kPa	27,4	37,9	34,5	41,4	38,0	26,4	25,1
Heat recovery thermal capacity	**kW**	**266**	**316**	**386**	**416**	**486**	**542**	**609**
TER - Total Efficiency Ratio		7,83	7,81	7,94	8,06	7,80	7,96	8,17
Heat exchanger recovery water flow	m³/h	46,1	54,9	67,2	72,4	84,4	94,2	106
Plant side heat exchanger recovery pressure drop	kPa	46,8	66,3	60,9	70,7	67,0	46,1	43,3
COMPRESSORS								
Number	N°.	2	2	2	2	2	2	2
Number of capacity	N°.	6	6	6	6	6	6	6
Number of circuits	N°.	2	2	2	2	2	2	2
Type of regulation		STEPS	STEPS	STEPS	STEPS	STEPS	STEPS	STEPS
Minimum capacity steps	%	25	25	25	25	25	25	25
Type of refrigerant		R134a	R134a	R134a	R134a	R134a	R134a	R134a
Refrigerant charge	kg.	83	97	132	132	160	167	210
Oil charge	kg.	19	20	20	30	30	30	44
FANS								
Number	N°.	6	6	6	8	8	10	10
Air flow	m³/s	22,8	25,0	27,2	33,3	35,6	41,6	38,1
Singol power input	kW	1,2	1,2	1,2	1,2	1,2	1,2	1,2
NOISE LEVELS	(4)							
Total sound power	dB(A)	90	91	91	92	92	92	93
Total sound pressure	dB(A)	58	59	59	60	59	59	60
DIMENSIONS AND WEIGHTS	(5)							
Length	mm.	4610	4610	5610	5610	6610	6610	6300
Width	mm.	2220	2220	2220	2220	2220	2220	2260
Height	mm.	2150	2420	2430	2430	2430	2430	2350
Weight	kg.	3600	3870	4620	5040	5520	5670	7580

1 Plant (side) cooling exchanger water (in/out) 12/7 °C
Source (side) heat exchanger air (in) 35 °C

2 Plant (side) heating exchanger water (in/out) 40/45 °C
Source (side) heat exchanger air (in) 7 °C R.H. 87%

3 Plant (side) cooling exchanger water (in/out) 12/7 °C
Source (side) heat exchanger air (in) 35 °C
Plant (side) heating exchanger water (in/out) 40/45 °C
Source (side) heat exchanger air (in) 7 °C R.H. 87%

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
Average sound pressure level, at 10 (m.) distance, unit in a free field on a reflective surface; non-binding value obtained from the sound power level

5 Standard configuration

\- Not available

ERACS2-Q LN-CA

SIZE		2222	2422	2622	2722	3222		
ERACS2-Q /LN-CA								
COOLING	(1)							
Cooling capacity	**kW**	**513**	**541**	**604**	**684**	**799**		
Total power input (unit)	kW	168	177	206	225	274		
EER		3,06	3,05	2,93	3,03	2,91		
ESEER		-	-	-	-	-		
Heat exchanger water flow	m³/h	88,4	93,2	104	118	138		
Heat exchanger pressure drop	kPa	27,7	30,8	21,6	29,0	29,0		
ERACS2-Q /LN-CA								
HEATING	(2)							
Heating capacity	**kW**	**541**	**571**	**615**	**711**	**826**		
Total power input (unit)	kW	159	169	178	207	240		
COP		3,74	3,70	3,76	3,74	3,74		
Heat exchanger water flow	m³/h	94,1	99,2	107	124	143		
Heat exchanger pressure drop	kPa	31,4	34,9	22,8	31,9	31,5		
ERACS2-Q /LN-CA								
REFRIGERATION AND HEATING	(3)							
Cooling capacity	kW	522	550	631	701	826		
Total power input (unit)	kW	145	153	170	193	228		
Heat exchanger water flow	m³/h	88,4	93,2	104	118	138		
Heat exchanger pressure drop	kPa	27,7	30,8	21,6	29,0	29,0		
Heat recovery thermal capacity	**kW**	**658**	**694**	**791**	**883**	**1041**		
TER - Total Efficiency Ratio		8,14	8,12	8,35	8,19	8,17		
Heat exchanger recovery water flow	m³/h	114	121	138	153	181		
Plant side heat exchanger recovery pressure drop	kPa	46,4	51,7	37,8	49,2	50,1		
COMPRESSORS								
Number	N°.	2	2	2	2	2		
Number of capacity	N°.	6	6	6	6	6		
Number of circuits	N°.	2	2	2	2	2		
Type of regulation		STEPS	STEPS	STEPS	STEPS	STEPS		
Minimum capacity steps	%	25	25	25	25	25		
Type of refrigerant		R134a	R134a	R134a	R134a	R134a		
Refrigerant charge	kg.	240	250	254	312	360		
Oil charge	kg.	44	44	38	38	70		
FANS								
Number	N°.	12	12	12	14	16		
Air flow	m³/s	50,6	46,0	46,0	54,9	62,8		
Singol power input	kW	1,2	1,2	1,2	1,2	1,2		
NOISE LEVELS	(4)							
Total sound power	dB(A)	95	95	95	95	96		
Total sound pressure	dB(A)	62	62	62	62	63		
DIMENSIONS AND WEIGHTS	(5)							
Length	mm.	7200	7200	7200	8400	9700		
Width	mm.	2260	2260	2260	2260	2260		
Height	mm.	2350	2350	2350	2350	2350		
Weight	kg.	8060	8160	8600	9160	11380		

1 Plant (side) cooling exchanger water (in/out) 12/7 °C
Source (side) heat exchanger air (in) 35 °C

2 Plant (side) heating exchanger water (in/out) 40/45 °C
Source (side) heat exchanger air (in) 7 °C R.H. 87%

3 Plant (side) cooling exchanger water (in/out) 12/7 °C
Source (side) heat exchanger air (in) 35 °C
Plant (side) heating exchanger water (in/out) 40/45 °C
Source (side) heat exchanger air (in) 7 °C R.H. 87%

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
Average sound pressure level, at 10 (m.) distance, unit in a free field on a reflective surface; non-binding value obtained from the sound power level

5 Standard configuration

\- Not available

SIZE		1062	1162	1362	1562	1762	1962	2022
ERACS2-Q /SL-CA								
COOLING	(1)							
Cooling capacity	**kW**	**199**	**233**	**283**	**314**	**356**	**401**	**464**
Total power input (unit)	kW	72,7	87,6	109	113	137	149	166
EER		2,74	2,66	2,61	2,78	2,59	2,69	2,80
ESEER		-	-	-	-	-	-	-
Heat exchanger water flow	m³/h	34,3	40,1	48,8	54,0	61,3	69,1	79,9
Heat exchanger pressure drop	kPa	26,0	35,4	32,1	39,4	35,3	24,8	24,6
ERACS2-Q /SL-CA								
HEATING	(2)							
Heating capacity	**kW**	**211**	**251**	**301**	**330**	**385**	**422**	**486**
Total power input (unit)	kW	64,8	78,4	89,9	98,4	119	127	147
COP		3,56	3,44	3,56	3,62	3,46	3,58	3,56
Heat exchanger water flow	m³/h	36,7	43,6	52,3	57,4	66,9	73,3	84,4
Heat exchanger pressure drop	kPa	29,6	41,9	36,9	44,4	42,1	27,9	27,5
ERACS2-Q /SL-CA								
REFRIGERATION AND HEATING	(3)							
Cooling capacity	kW	209	248	305	329	381	428	484
Total power input (unit)	kW	60,6	72,2	87,1	92,5	111	122	134
Heat exchanger water flow	m³/h	34,3	40,1	48,8	54,0	61,3	69,1	79,9
Heat exchanger pressure drop	kPa	26,0	35,4	32,1	39,4	35,3	24,8	24,6
Heat recovery thermal capacity	**kW**	**266**	**316**	**386**	**416**	**486**	**542**	**609**
TER - Total Efficiency Ratio		7,83	7,81	7,94	8,06	7,80	7,96	8,17
Heat exchanger recovery water flow	m³/h	46,1	54,9	67,2	72,4	84,4	94,2	106
Plant side heat exchanger recovery pressure drop	kPa	46,8	66,3	60,9	70,7	67,0	46,1	43,3
COMPRESSORS								
Number	N°.	2	2	2	2	2	2	2
Number of capacity	N°.	6	6	6	6	6	6	6
Number of circuits	N°.	2	2	2	2	2	2	2
Type of regulation		STEPS	STEPS	STEPS	STEPS	STEPS	STEPS	STEPS
Minimum capacity steps	%	25	25	25	25	25	25	25
Type of refrigerant		R134a	R134a	R134a	R134a	R134a	R134a	R134a
Refrigerant charge	kg.	83	97	132	132	160	167	210
Oil charge	kg.	19	20	20	30	30	30	44
FANS								
Number	N°.	6	6	6	8	8	10	10
Air flow	m³/s	18,3	20,2	22,1	26,9	28,6	33,7	35,1
Singol power input	kW	0,9	0,9	0,9	0,9	0,9	0,9	1,1
NOISE LEVELS	(4)							
Total sound power	dB(A)	86	87	87	88	88	88	89
Total sound pressure	dB(A)	54	55	55	56	55	55	56
DIMENSIONS AND WEIGHTS	(5)							
Length	mm.	4610	4610	5610	5610	6610	6610	6300
Width	mm.	2220	2220	2220	2220	2220	2220	2260
Height	mm.	2150	2420	2430	2430	2430	2430	2350
Weight	kg.	3600	3870	4620	5040	5520	5670	7670

1 Plant (side) cooling exchanger water (in/out) 12/7 °C
Source (side) heat exchanger air (in) 35 °C

2 Plant (side) heating exchanger water (in/out) 40/45 °C
Source (side) heat exchanger air (in) 7 °C R.H. 87%

3 Plant (side) cooling exchanger water (in/out) 12/7 °C
Source (side) heat exchanger air (in) 35 °C
Plant (side) heating exchanger water (in/out) 40/45 °C
Source (side) heat exchanger air (in) 7 °C R.H. 87%

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
Average sound pressure level, at 10 (m.) distance, unit in a free field on a reflective surface; non-binding value obtained from the sound power level

5 Standard configuration

\- Not available

GENERAL TECHNICAL DATA

ERACS2-Q SL-CA

SIZE		2222	2422	2622	2722	3222		
ERACS2-Q /SL-CA								
COOLING	(1)							
Cooling capacity	**kW**	**509**	**537**	**597**	**678**	**790**		
Total power input (unit)	kW	170	180	210	229	281		
EER		2,99	2,98	2,85	2,96	2,81		
ESEER		-	-	-	-	-		
Heat exchanger water flow	m³/h	87,6	92,5	103	117	136		
Heat exchanger pressure drop	kPa	27,3	30,3	21,1	28,5	28,3		
ERACS2-Q /SL-CA								
HEATING	(2)							
Heating capacity	**kW**	**536**	**564**	**607**	**703**	**815**		
Total power input (unit)	kW	158	167	176	205	238		
COP		3,71	3,67	3,72	3,70	3,70		
Heat exchanger water flow	m³/h	93,1	98,0	105	122	142		
Heat exchanger pressure drop	kPa	30,8	34,1	22,2	31,2	30,7		
ERACS2-Q /SL-CA								
REFRIGERATION AND HEATING	(3)							
Cooling capacity	kW	522	550	631	701	826		
Total power input (unit)	kW	145	153	170	193	228		
Heat exchanger water flow	m³/h	87,6	92,5	103	117	136		
Heat exchanger pressure drop	kPa	27,3	30,3	21,1	28,5	28,3		
Heat recovery thermal capacity	**kW**	**658**	**694**	**791**	**883**	**1041**		
TER - Total Efficiency Ratio		8,14	8,12	8,35	8,19	8,17		
Heat exchanger recovery water flow	m³/h	114	121	138	153	181		
Plant side heat exchanger recovery pressure drop	kPa	46,4	51,7	37,8	49,2	50,1		
COMPRESSORS								
Number	N°.	2	2	2	2	2		
Number of capacity	N°.	6	6	6	6	6		
Number of circuits	N°.	2	2	2	2	2		
Type of regulation		STEPS	STEPS	STEPS	STEPS	STEPS		
Minimum capacity steps	%	25	25	25	25	25		
Type of refrigerant		R134a	R134a	R134a	R134a	R134a		
Refrigerant charge	kg.	240	250	254	312	360		
Oil charge	kg.	44	44	38	38	70		
FANS								
Number	N°.	12	12	12	14	16		
Air flow	m³/s	46,6	42,4	42,4	50,7	58,0		
Singol power input	kW	1,1	1,1	1,1	1,1	1,1		
NOISE LEVELS	(4)							
Total sound power	dB(A)	91	91	91	91	92		
Total sound pressure	dB(A)	58	58	58	58	59		
DIMENSIONS AND WEIGHTS	(5)							
Length	mm.	7200	7200	7200	8400	9700		
Width	mm.	2260	2260	2260	2260	2260		
Height	mm.	2350	2350	2350	2350	2350		
Weight	kg.	8150	8250	8690	9260	11480		

1 Plant (side) cooling exchanger water (in/out) 12/7 °C
Source (side) heat exchanger air (in) 35 °C

2 Plant (side) heating exchanger water (in/out) 40/45 °C
Source (side) heat exchanger air (in) 7 °C R.H. 87%

3 Plant (side) cooling exchanger water (in/out) 12/7 °C
Source (side) heat exchanger air (in) 35 °C
Plant (side) heating exchanger water (in/out) 40/45 °C
Source (side) heat exchanger air (in) 7 °C R.H. 87%

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
Average sound pressure level, at 10 (m.) distance, unit in a free field on a reflective surface; non-binding value obtained from the sound power level

5 Standard configuration

\- Not available

SIZE		2022	2222	2422	2622	2722	3222	
ERACS2-Q /XL-CA								
COOLING	(1)							
Cooling capacity	**kW**	**454**	**500**	**528**	**584**	**665**	**772**	
Total power input (unit)	kW	167	169	180	212	230	287	
EER		2,73	2,95	2,94	2,76	2,90	2,70	
ESEER		-	-	-	-	-	-	
Heat exchanger water flow	m³/h	78,2	86,2	91,0	101	115	133	
Heat exchanger pressure drop	kPa	23,6	26,4	29,4	20,2	27,4	27,1	
ERACS2-Q /XL-CA								
HEATING	(2)							
Heating capacity	**kW**	**486**	**536**	**564**	**607**	**703**	**815**	
Total power input (unit)	kW	143	152	161	170	199	230	
COP		3,56	3,71	3,67	3,72	3,70	3,70	
Heat exchanger water flow	m³/h	84,4	93,1	98,0	105	122	142	
Heat exchanger pressure drop	kPa	27,5	30,8	34,1	22,2	31,2	30,7	
ERACS2-Q /XL-CA								
REFRIGERATION AND HEATING	(3)							
Cooling capacity	kW	484	522	550	631	701	826	
Total power input (unit)	kW	134	145	153	170	193	228	
Heat exchanger water flow	m³/h	78,2	86,2	91,0	101	115	133	
Heat exchanger pressure drop	kPa	23,6	26,4	29,4	20,2	27,4	27,1	
Heat recovery thermal capacity	**kW**	**609**	**658**	**694**	**791**	**883**	**1041**	
TER - Total Efficiency Ratio		8,17	8,14	8,12	8,35	8,19	8,17	
Heat exchanger recovery water flow	m³/h	106	114	121	138	153	181	
Plant side heat exchanger recovery pressure drop	kPa	43,3	46,4	51,7	37,8	49,2	50,1	
COMPRESSORS								
Number	N°.	2	2	2	2	2	2	
Number of capacity	N°.	6	6	6	6	6	6	
Number of circuits	N°.	2	2	2	2	2	2	
Type of regulation		STEPS	STEPS	STEPS	STEPS	STEPS	STEPS	
Minimum capacity steps	%	25	25	25	25	25	25	
Type of refrigerant		R134a	R134a	R134a	R134a	R134a	R134a	
Refrigerant charge	kg.	210	240	250	254	312	360	
Oil charge	kg.	44	44	44	38	38	70	
FANS								
Number	N°.	10	12	12	12	14	16	
Air flow	m³/s	30,5	40,7	36,9	36,9	44,2	50,5	
Singol power input	kW	0,43	0,43	0,43	0,43	0,43	0,43	
NOISE LEVELS	(4)							
Total sound power	dB(A)	85	87	87	87	87	88	
Total sound pressure	dB(A)	52	54	54	54	54	55	
DIMENSIONS AND WEIGHTS	(5)							
Length	mm.	6300	7200	7200	7200	8400	9700	
Width	mm.	2260	2260	2260	2260	2260	2260	
Height	mm.	2350	2350	2350	2350	2350	2350	
Weight	kg.	7790	8260	8350	8790	9340	11580	

1 Plant (side) cooling exchanger water (in/out) 12/7 °C
Source (side) heat exchanger air (in) 35 °C

2 Plant (side) heating exchanger water (in/out) 40/45 °C
Source (side) heat exchanger air (in) 7 °C R.H. 87%

3 Plant (side) cooling exchanger water (in/out) 12/7 °C
Source (side) heat exchanger air (in) 35 °C
Plant (side) heating exchanger water (in/out) 40/45 °C
Source (side) heat exchanger air (in) 7 °C R.H. 87%

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
Average sound pressure level, at 10 (m.) distance, unit in a free field on a reflective surface; non-binding value obtained from the sound power level

5 Standard configuration

- Not available

GENERAL TECHNICAL DATA

ERACS2-Q XL-CA-E

SIZE		1062	1162	1362	1562	1762	2022	2222
ERACS2-Q /XL-CA-E								
COOLING	(1)							
Cooling capacity	**kW**	**204**	**247**	**293**	**319**	**366**	**473**	**510**
Total power input (unit)	kW	66,6	77,0	99,5	105	127	152	163
EER		3,07	3,21	2,95	3,06	2,88	3,11	3,14
ESEER		-	-	-	-	-	-	-
Heat exchanger water flow	m³/h	35,2	42,5	50,5	55,0	63,1	81,4	87,7
Heat exchanger pressure drop	kPa	27,2	39,8	34,4	40,8	37,4	25,5	27,3
ERACS2-Q /XL-CA-E								
HEATING	(2)							
Heating capacity	**kW**	**218**	**267**	**308**	**340**	**393**	**513**	**552**
Total power input (unit)	kW	62,4	77,6	88,4	95,2	116	145	154
COP		3,65	3,60	3,63	3,71	3,51	3,72	3,80
Heat exchanger water flow	m³/h	37,9	46,4	53,5	59,1	68,3	89,1	95,9
Heat exchanger pressure drop	kPa	31,6	47,5	38,7	47,2	43,8	30,6	32,6
ERACS2-Q /XL-CA-E								
REFRIGERATION AND HEATING	(3)							
Cooling capacity	kW	209	248	305	329	381	484	522
Total power input (unit)	kW	60,6	72,2	87,1	92,5	111	134	145
Heat exchanger water flow	m³/h	35,2	42,5	50,5	55,0	63,1	81,4	87,7
Heat exchanger pressure drop	kPa	27,2	39,8	34,4	40,8	37,4	25,5	27,3
Heat recovery thermal capacity	**kW**	**266**	**316**	**386**	**416**	**486**	**609**	**658**
TER - Total Efficiency Ratio		7,83	7,81	7,94	8,06	7,80	8,17	8,14
Heat exchanger recovery water flow	m³/h	46,1	54,9	67,2	72,4	84,4	106	114
Plant side heat exchanger recovery pressure drop	kPa	46,8	66,3	60,9	70,7	67,0	43,3	46,4
COMPRESSORS								
Number	N°.	2	2	2	2	2	2	2
Number of capacity	N°.	6	6	6	6	6	6	6
Number of circuits	N°.	2	2	2	2	2	2	2
Type of regulation		STEPS	STEPS	STEPS	STEPS	STEPS	STEPS	STEPS
Minimum capacity steps	%	25	25	25	25	25	25	25
Type of refrigerant		R134a	R134a	R134a	R134a	R134a	R134a	R134a
Refrigerant charge	kg.	97	116	132	132	167	248	254
Oil charge	kg.	19	20	20	30	30	44	44
FANS								
Number	N°.	6	8	8	8	10	12	14
Air flow	m³/s	20,2	26,9	26,9	28,6	33,7	42,0	52,3
Singol power input	kW	0,43	0,43	0,43	0,43	0,43	0,43	0,43
NOISE LEVELS	(4)							
Total sound power	dB(A)	85	86	86	87	87	86	88
Total sound pressure	dB(A)	53	54	54	54	54	53	55
DIMENSIONS AND WEIGHTS	(5)							
Length	mm.	4610	5610	5610	6610	6610	8400	9300
Width	mm.	2220	2220	2220	2220	2220	2260	2260
Height	mm.	2420	2430	2430	2430	2430	2350	2350
Weight	kg.	3900	4490	4830	5590	5730	8510	8720

1 Plant (side) cooling exchanger water (in/out) 12/7 °C
Source (side) heat exchanger air (in) 35 °C
2 Plant (side) heating exchanger water (in/out) 40/45 °C
Source (side) heat exchanger air (in) 7 °C R.H. 87%
3 Plant (side) cooling exchanger water (in/out) 12/7 °C
Source (side) heat exchanger air (in) 35 °C
Plant (side) heating exchanger water (in/out) 40/45 °C
Source (side) heat exchanger air (in) 7 °C R.H. 87%
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
Average sound pressure level, at 10 (m.) distance, unit in a free field on a reflective surface; non-binding value obtained from the sound power level
5 Standard configuration
- Not available

SIZE		2422	2622					
ERACS2-Q /XL-CA-E								
COOLING	(1)							
Cooling capacity	**kW**	**541**	**611**					
Total power input (unit)	kW	169	193					
EER		3,20	3,17					
ESEER		-	-					
Heat exchanger water flow	m³/h	93,2	105					
Heat exchanger pressure drop	kPa	30,8	22,1					
ERACS2-Q /XL-CA-E								
HEATING	(2)							
Heating capacity	**kW**	**588**	**644**					
Total power input (unit)	kW	164	176					
COP		3,80	3,89					
Heat exchanger water flow	m³/h	102	112					
Heat exchanger pressure drop	kPa	37,1	25,0					
ERACS2-Q /XL-CA-E								
REFRIGERATION AND HEATING	(3)							
Cooling capacity	kW	550	631					
Total power input (unit)	kW	153	170					
Heat exchanger water flow	m³/h	93,2	105					
Heat exchanger pressure drop	kPa	30,8	22,1					
Heat recovery thermal capacity	**kW**	**694**	**791**					
TER - Total Efficiency Ratio		8,12	8,35					
Heat exchanger recovery water flow	m³/h	121	138					
Plant side heat exchanger recovery pressure drop	kPa	51,7	37,8					
COMPRESSORS								
Number	N°.	2	2					
Number of capacity	N°.	6	6					
Number of circuits	N°.	2	2					
Type of regulation		STEPS	STEPS					
Minimum capacity steps	%	25	25					
Type of refrigerant		R134a	R134a					
Refrigerant charge	kg.	282	286					
Oil charge	kg.	44	38					
FANS								
Number	N°.	14	16					
Air flow	m³/s	48,6	53,0					
Singol power input	kW	0,43	0,43					
NOISE LEVELS	(4)							
Total sound power	dB(A)	88	88					
Total sound pressure	dB(A)	55	55					
DIMENSIONS AND WEIGHTS	(5)							
Length	mm.	9300	9300					
Width	mm.	2260	2260					
Height	mm.	2350	2350					
Weight	kg.	8890	9400					

1 Plant (side) cooling exchanger water (in/out) 12/7 °C
Source (side) heat exchanger air (in) 35 °C
2 Plant (side) heating exchanger water (in/out) 40/45 °C
Source (side) heat exchanger air (in) 7 °C R.H. 87%
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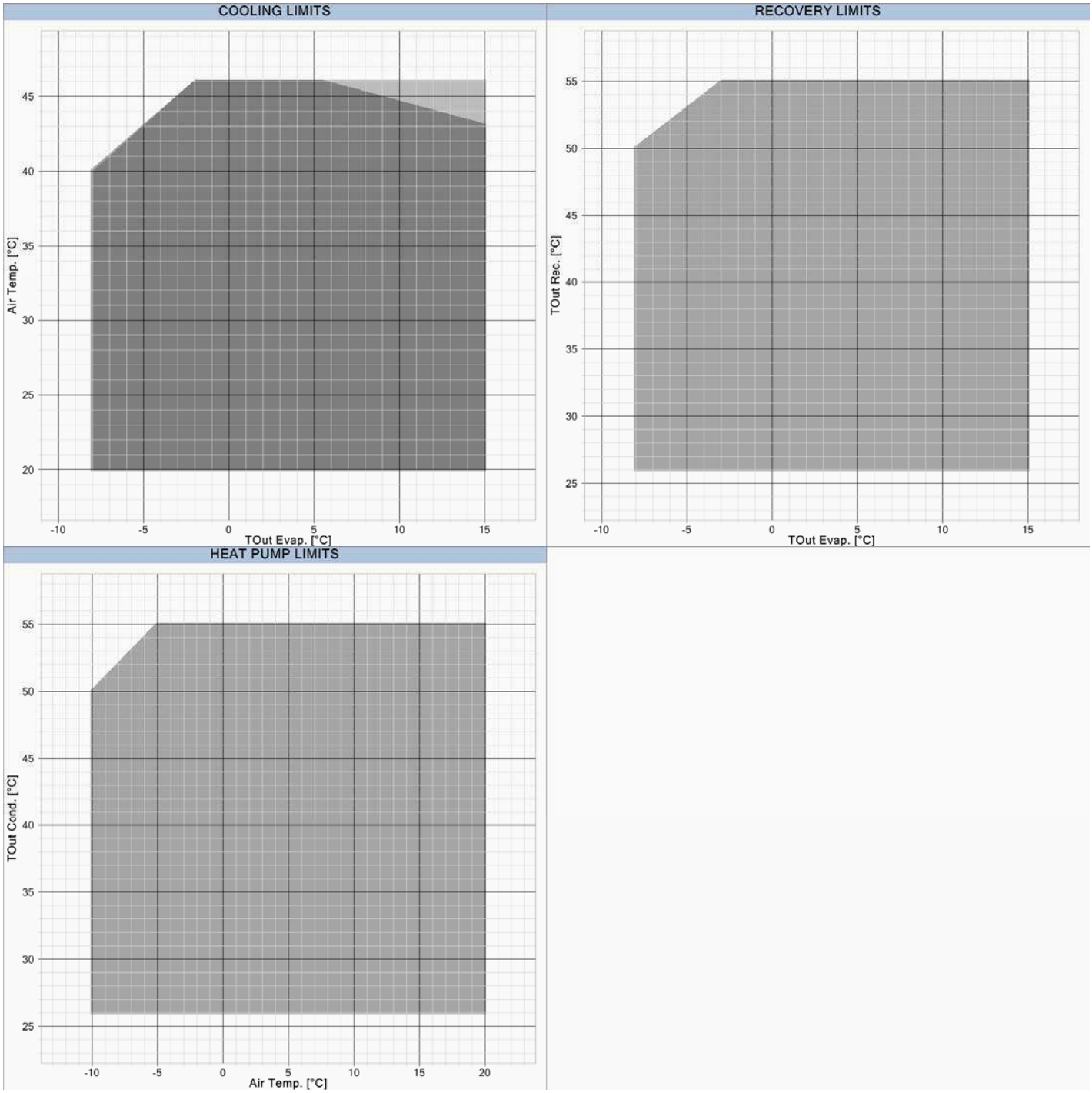
4 Sound power on the basis of measurements made in compliance with ISO 9614 and Eurovent 8/1 for Eurovent certified units;
in compliance with ISO 3744 for non-certified units
Average sound pressure level, at 10 (m.) distance, unit in a free field on a reflective surface; non-binding value obtained
from the sound power level
5 Standard configuration
- Not available

/CA - 1062 ÷ 1962



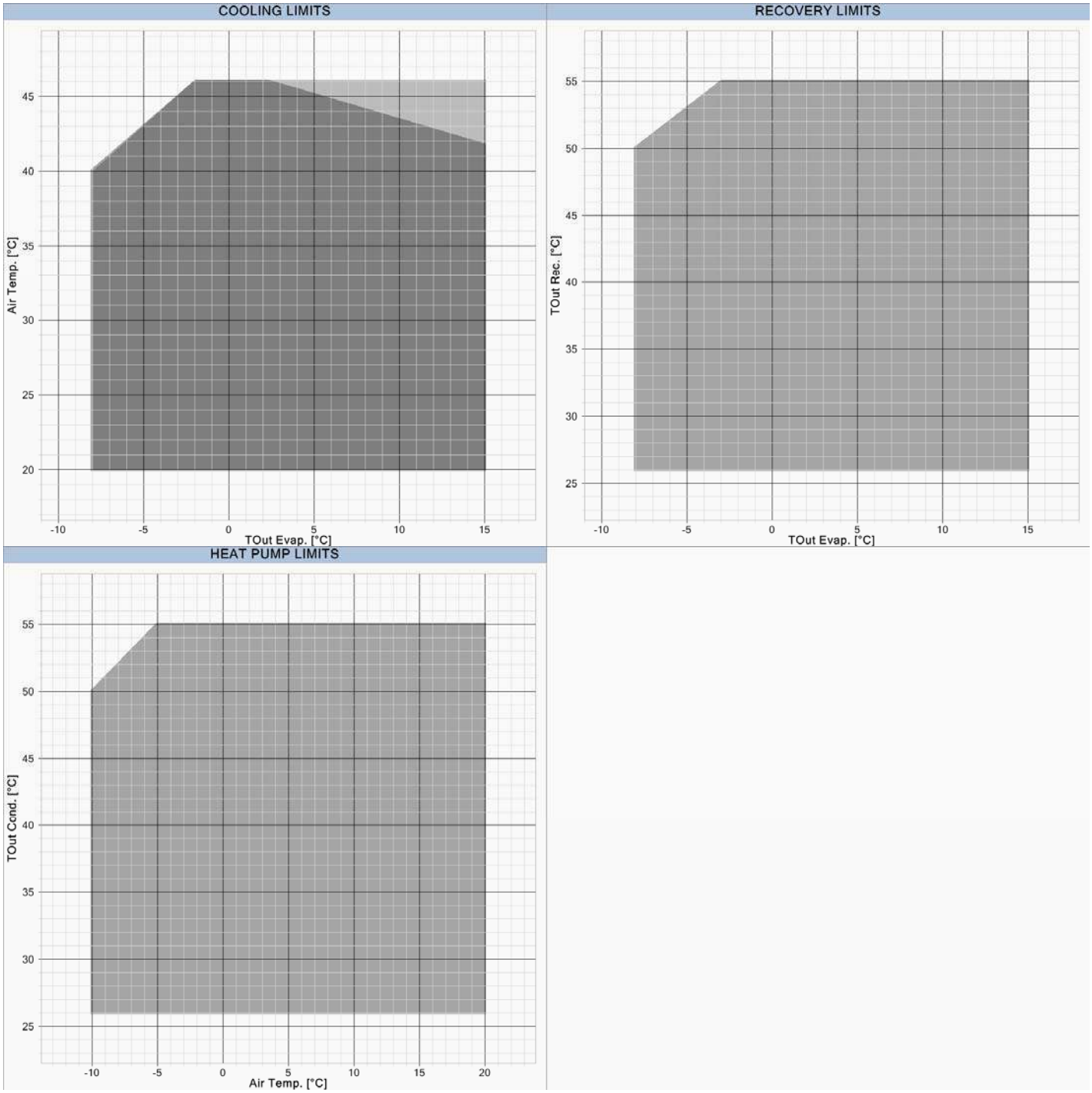
Selection limits

Selection limits

Economizers de-activated and unit in non silenced mode

NOTE:
The represented operating limit refers to the standard unit's operation. Thanks to the condensation and evaporation control device adopted in ERACS2-Q line, the units can work in each of the possible operating mode from -10°C up to 46°C outdoor air temperature.

/CA - 2022 ÷ 3222



Selection limits

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Economizers de-activated and unit in non silenced mode

NOTE:
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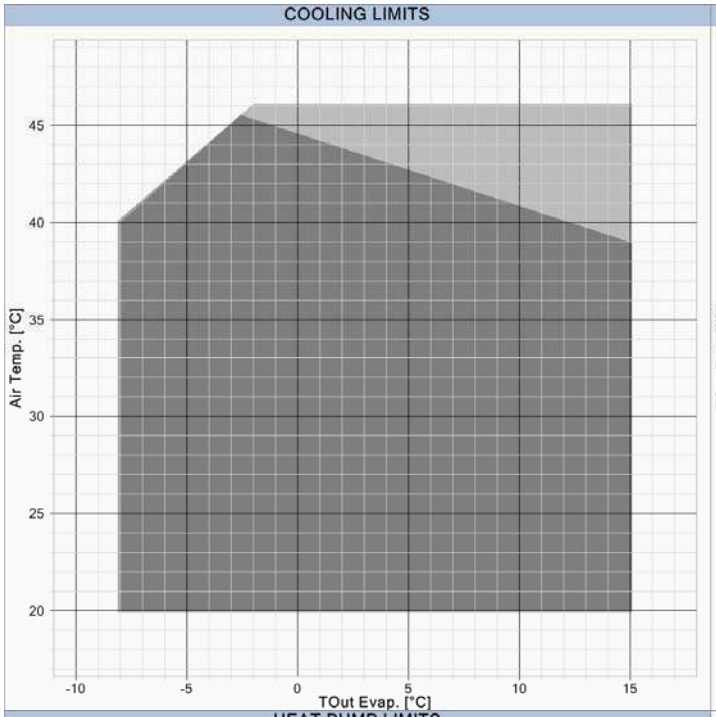
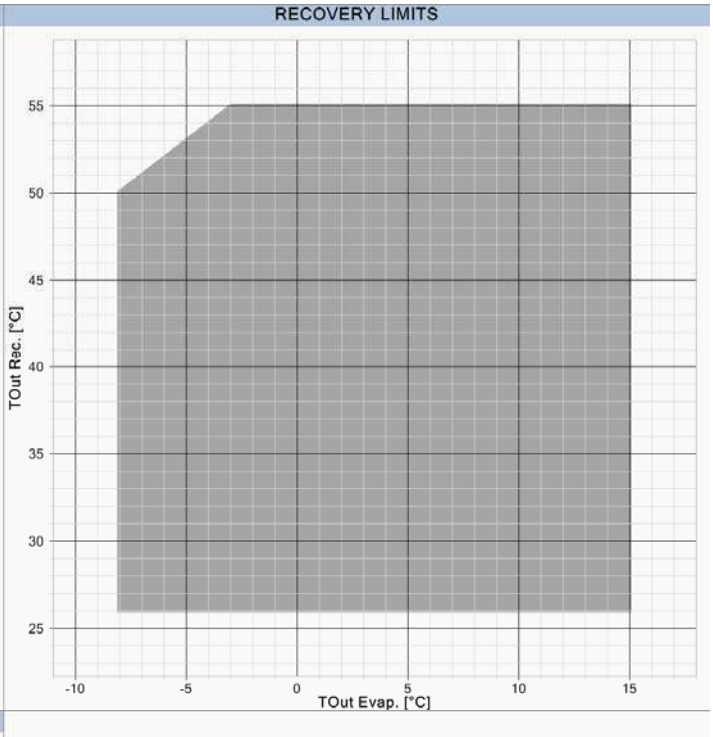
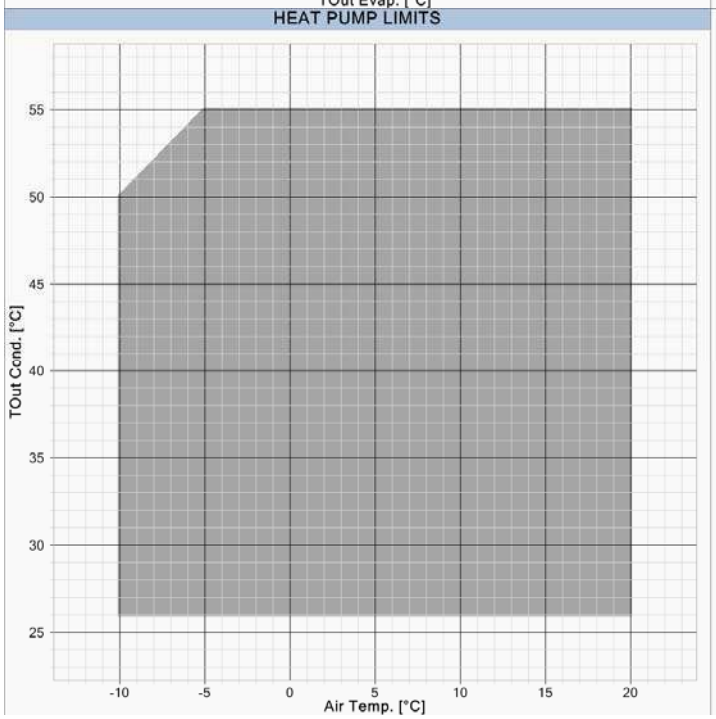
/LN-CA - 1062 ÷ 1962







Selection limits

Selection limits

Economizers de-activated and unit in non silenced mode

NOTE:
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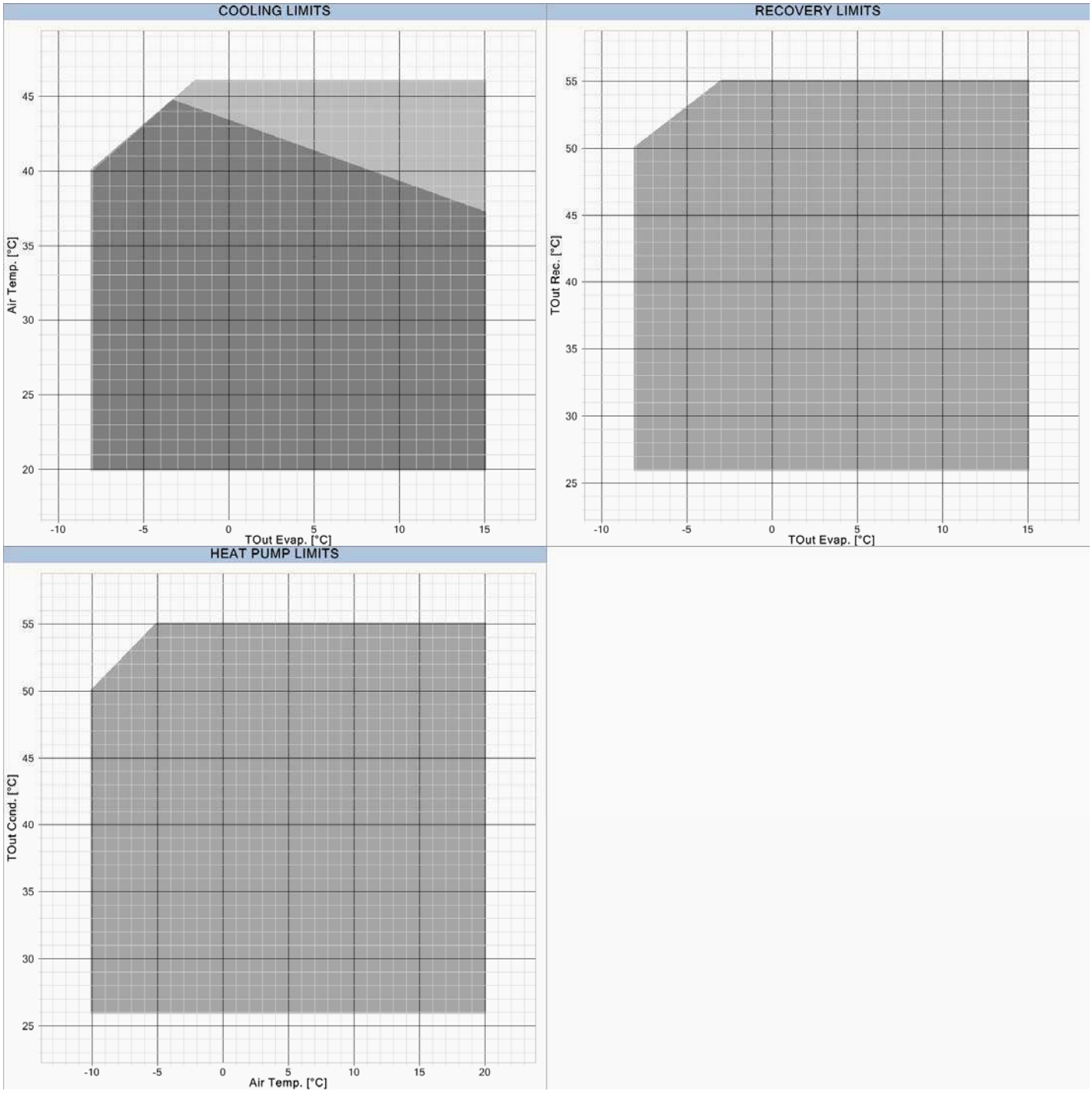
/LN-CA - 2022 ÷ 3222



Selection limits

Selection limits

Economizers de-activated and unit in non silenced mode

NOTE:
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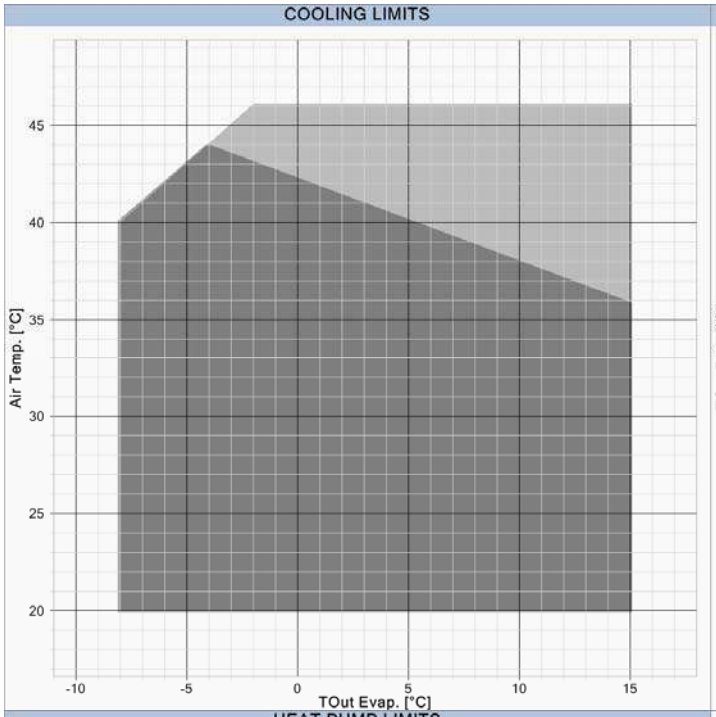
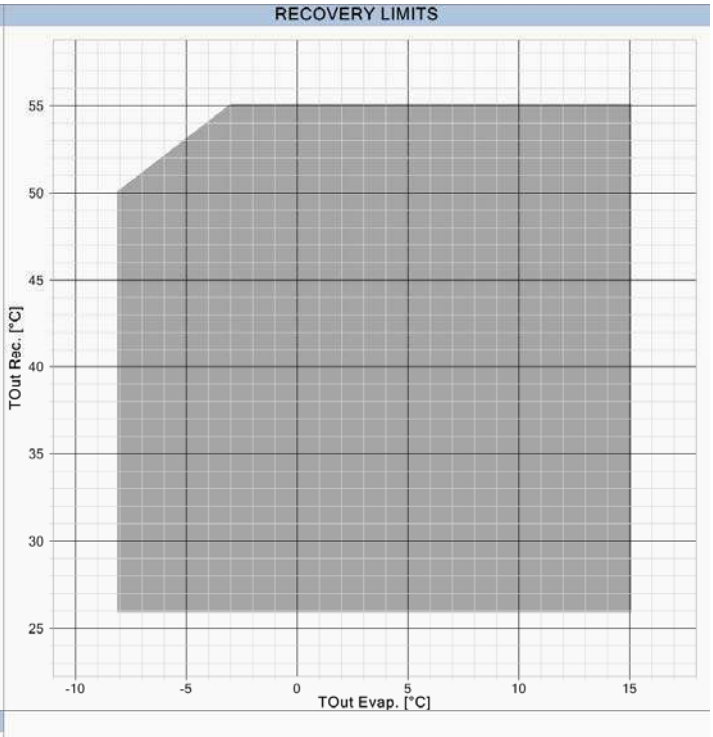
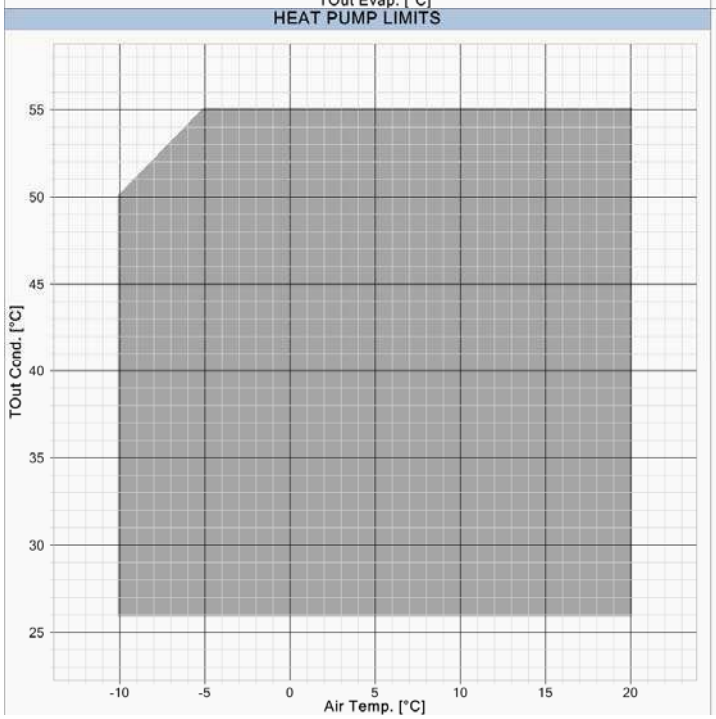
/SL-CA - 1062 ÷ 1962







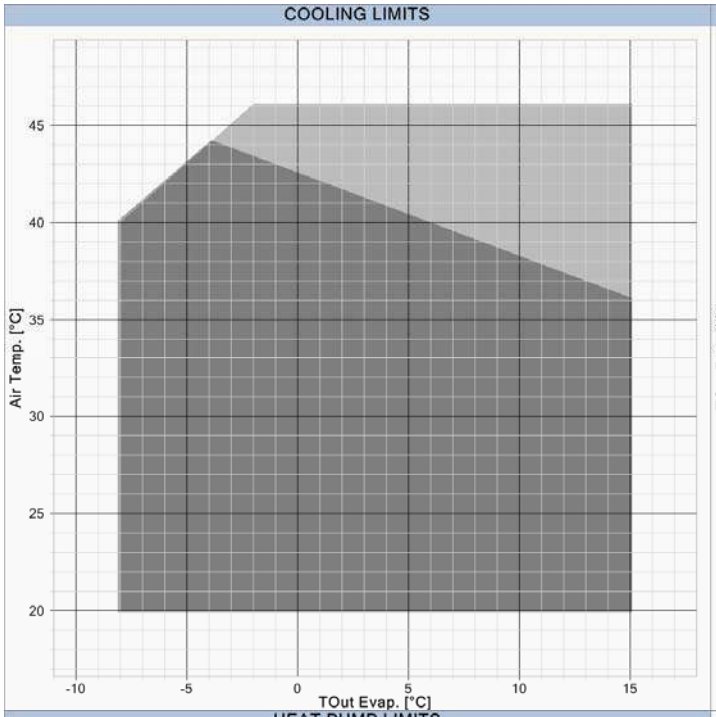
Selection limits

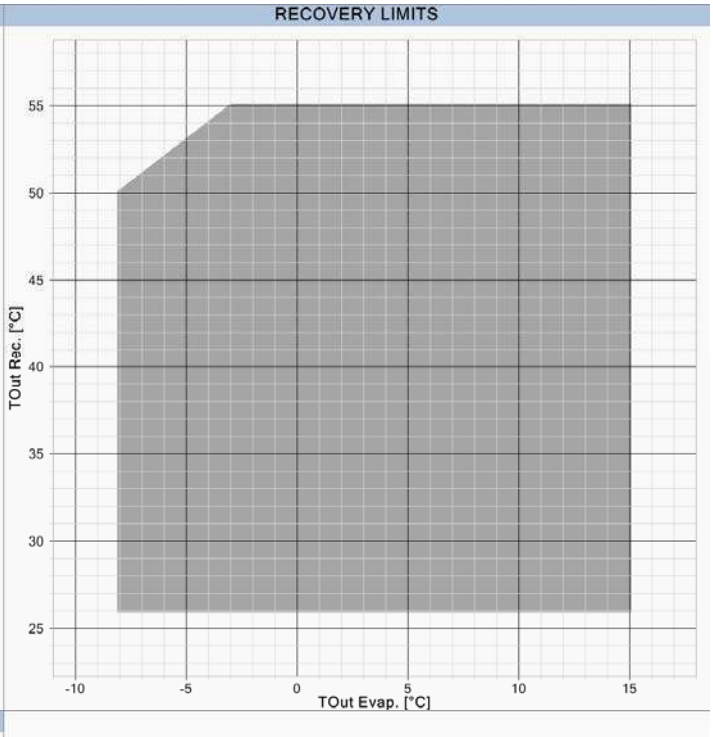
Selection limits

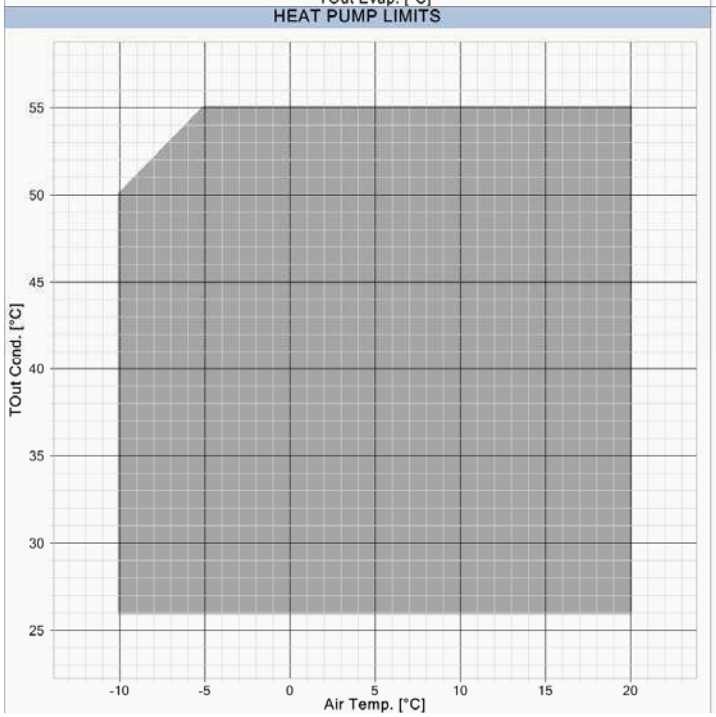
Economizers de-activated and unit in non silenced mode

NOTE:
The represented operating limit refers to the standard unit's operation. Thanks to the condensation and evaporation control device adopted in ERACS2-Q line, the units can work in each of the possible operating mode from -10°C up to 46°C outdoor air temperature.

/SL-CA - 2022 ÷ 3222







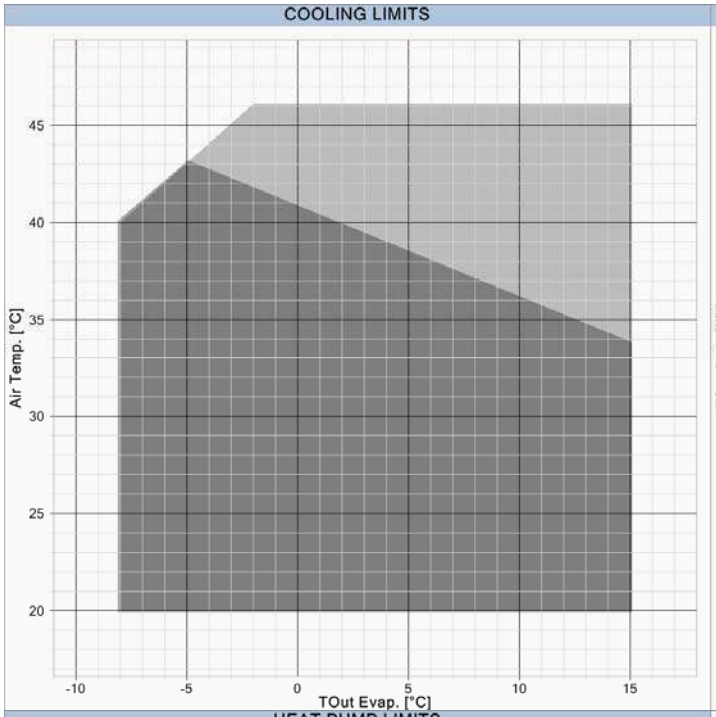
Selection limits

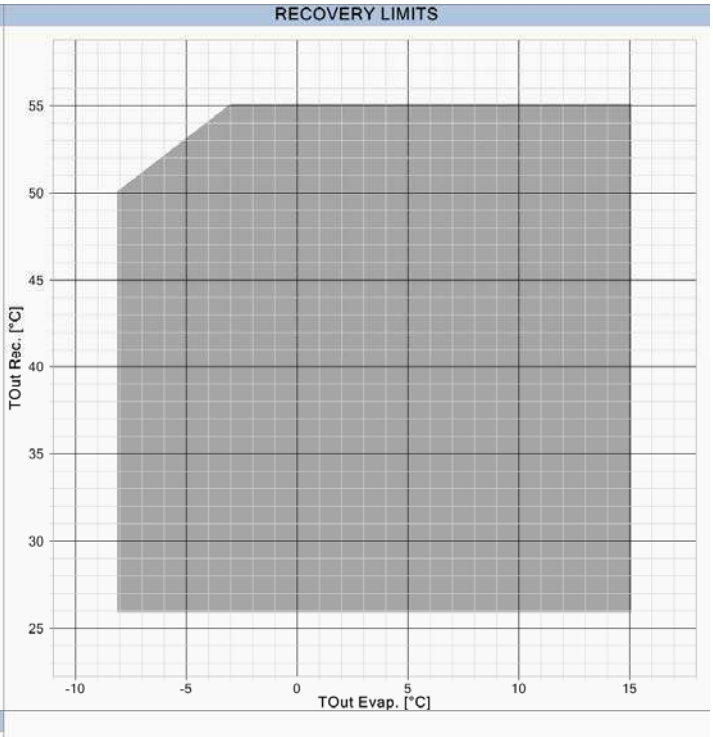
Selection limits

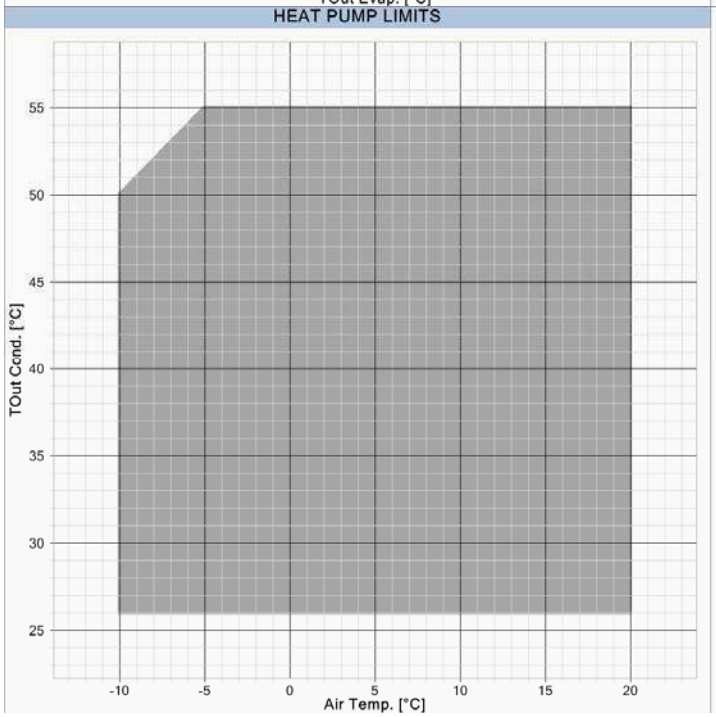
Economizers de-activated and unit in non silenced mode

NOTE:
The represented operating limit refers to the standard unit's operation. Thanks to the condensation and evaporation control device adopted in ERACS2-Q line, the units can work in each of the possible operating mode from -10°C up to 46°C outdoor air temperature.

/XL-CA - 2022 ÷ 3222







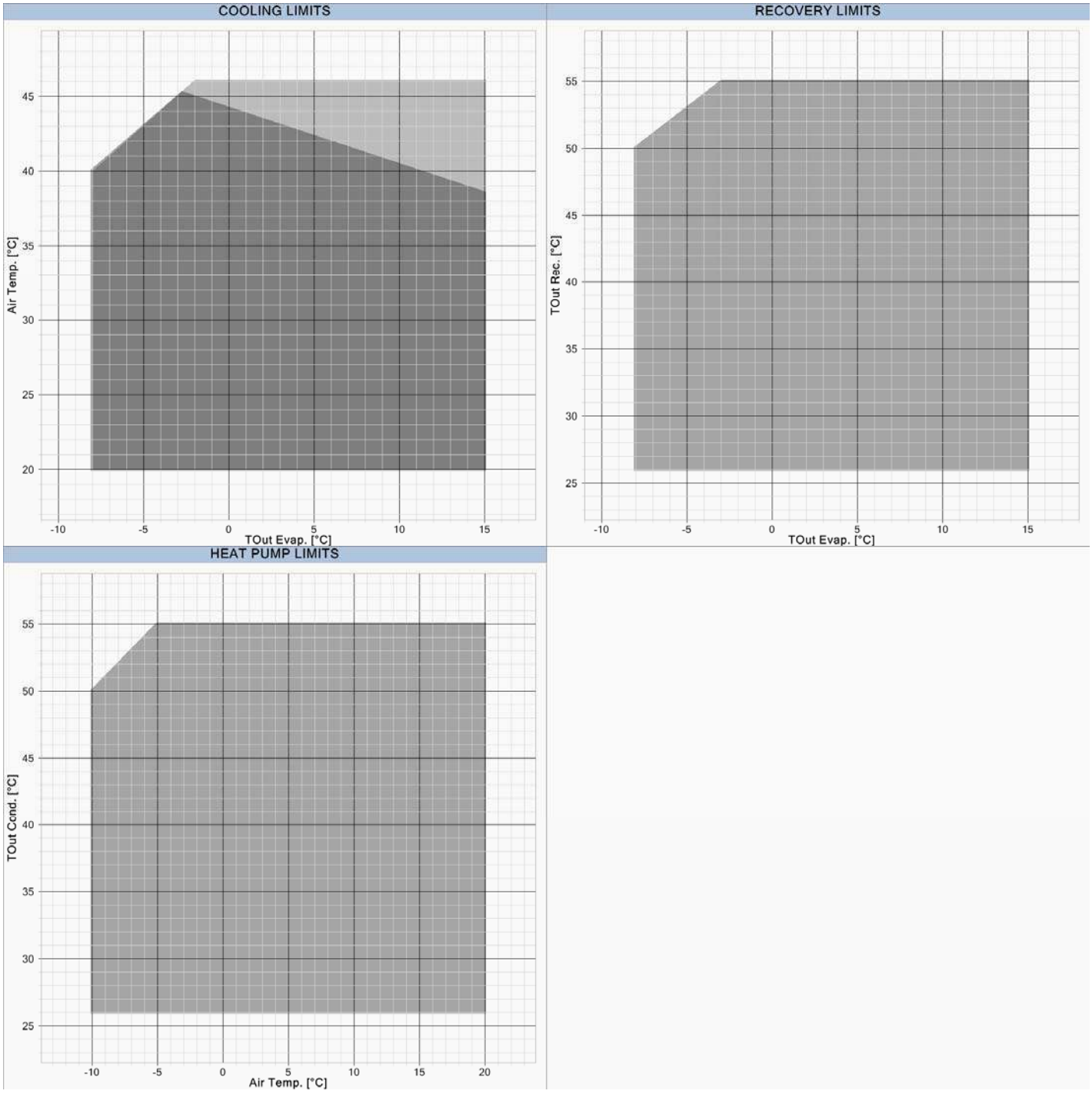
Selection limits

Selection limits

Economizers de-activated and unit in non silenced mode

NOTE:
The represented operating limit refers to the standard unit's operation. Thanks to the condensation and evaporation control device adopted in ERACS2-Q line, the units can work in each of the possible operating mode from -10°C up to 46°C outdoor air temperature.

/XL-CA-E - 1062 ÷ 1762



Selection limits

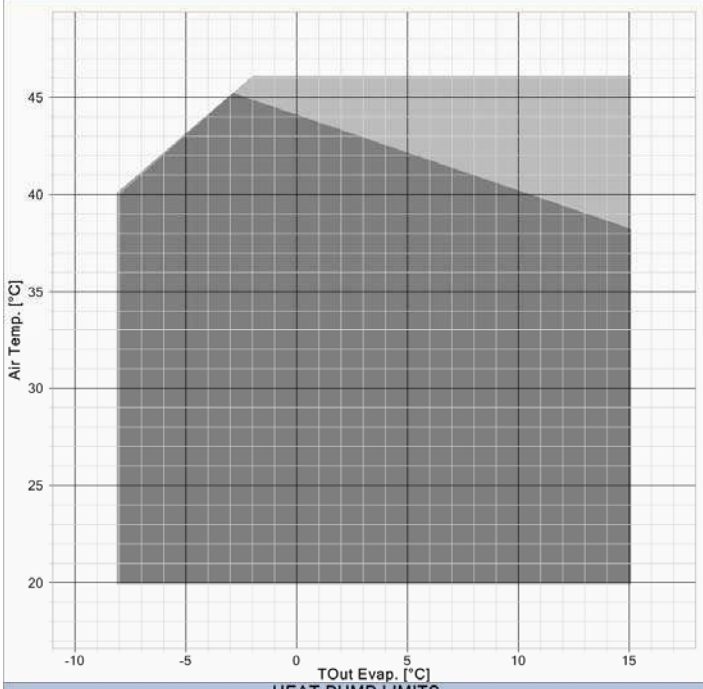
Selection limits

Economizers de-activated and unit in non silenced mode

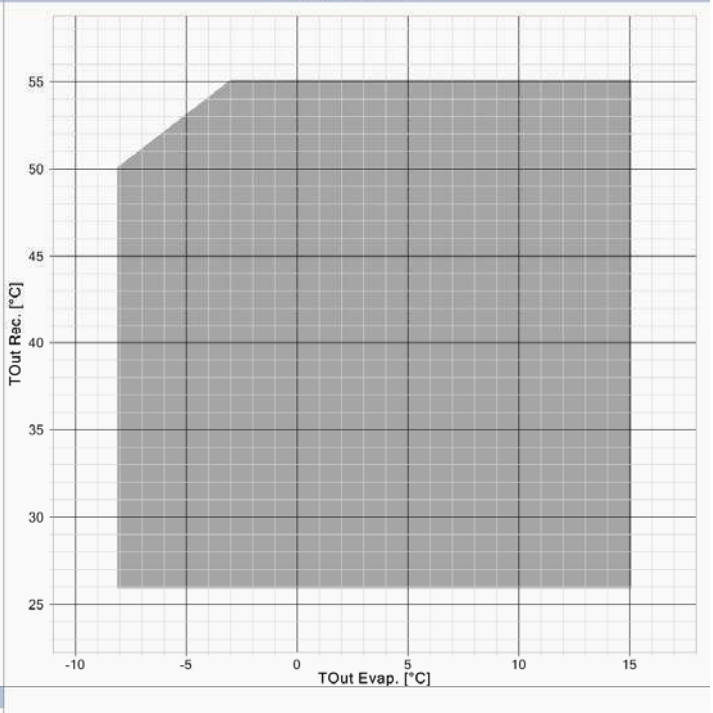
NOTE:
The represented operating limit refers to the standard unit's operation. Thanks to the condensation and evaporation control device adopted in ERACS2-Q line, the units can work in each of the possible operating mode from -10°C up to 46°C outdoor air temperature.

/XL-CA-E - 2022 ÷ 2622

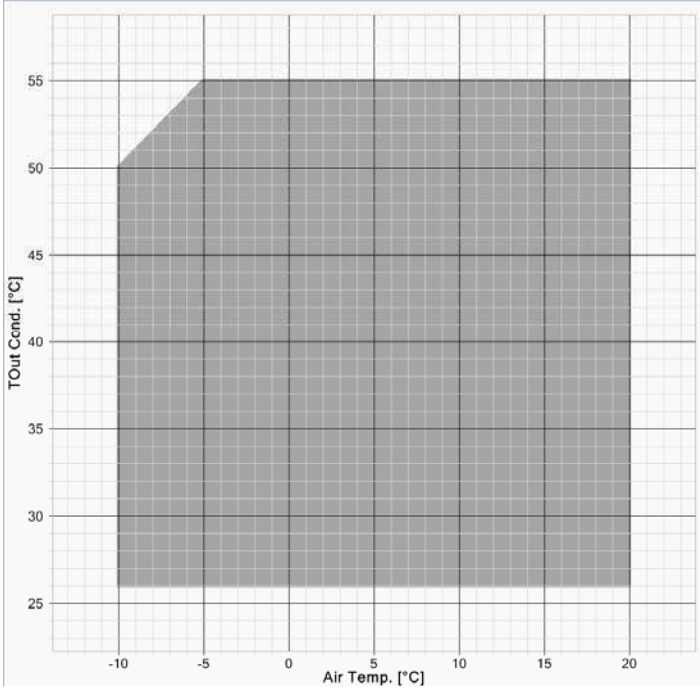
COOLING LIMITS



RECOVERY LIMITS



HEAT PUMP LIMITS



Selection limits

Selection limits

Economizers de-activated and unit in non silenced mode

NOTE:
The represented operating limit refers to the standard unit's operation. Thanks to the condensation and evaporation control device adopted in ERACS2-Q line, the units can work in each of the possible operating mode from -10°C up to 46°C outdoor air temperature.

4.2 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.

4.3 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	PLANT SIDE COLD HEAT EXCHANGER			SOURCE SIDE HEAT EXCHANGER			PLANT SIDE HOT HEAT EXCHANGER
ff (m^2 °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 x 10^{-5}	1,000	1,000	0,0	1,000	1,000	0,0	1,000
4,40 x 10^{-5}	1,000	1,000	0,0	0,990	1,030	1,0	0,990
8,80 x 10^{-5}	0,960	0,990	0,7	0,980	1,040	1,5	0,980
13,20 x 10^{-5}	0,944	0,985	1,0	0,964	1,050	2,3	0,964
17,20 x 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

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)

SIZE	PLANT SIDE COLD HEAT EXCHANGER				PLANT SIDE HOT HEAT EXCHANGER		
	K	Q min m^3/h	Q max m^3/h	C.a. min m^3	K	Q min m^3/h	Q max m^3/h
ERACS2-Q /CA 1062	22	22,5	60,4	1,5	22	23,4	58
ERACS2-Q /CA 1162	22	26,6	71,3	1,8	22	27,7	69
ERACS2-Q /CA 1362	13,5	32,4	86,9	2,2	13,5	33,2	84,5
ERACS2-Q /CA 1562	13,5	35,3	94,6	2,4	13,5	36,4	91
ERACS2-Q /CA 1762	9,4	40,8	109,3	2,7	9,4	42,5	106,3
ERACS2-Q /CA 1962	5,2	45,6	122,2	3	5,2	46,6	118,3
ERACS2-Q /CA 2022	3,86	48,8	138,4	4,4	3,86	52,1	131,7
ERACS2-Q /CA 2222	3,55	53,7	150,6	4,7	3,55	57,5	141,5
ERACS2-Q /CA 2422	3,55	56,7	158,9	5	3,55	60,5	149,4
ERACS2-Q /CA 2622	2	62,7	178,9	5,7	2	65,1	170,1
ERACS2-Q /CA 2722	2,09	71,6	201,8	6,3	2,09	75,4	190,4
ERACS2-Q /CA 3222	1,53	82,9	236,8	7,5	1,53	87,6	224,2
ERACS2-Q /LN-CA 1062	22	22,5	60,4	1,5	22	23,4	58
ERACS2-Q /LN-CA 1162	22	26,6	71,3	1,8	22	27,7	69
ERACS2-Q /LN-CA 1362	13,5	32,4	86,9	2,2	13,5	33,2	84,5
ERACS2-Q /LN-CA 1562	13,5	35,3	94,6	2,4	13,5	36,4	91
ERACS2-Q /LN-CA 1762	9,4	40,8	109,3	2,7	9,4	42,5	106,3
ERACS2-Q /LN-CA 1962	5,2	45,6	122,2	3	5,2	46,6	118,3
ERACS2-Q /LN-CA 2022	3,86	48,8	138	4,4	3,86	52,1	131,7
ERACS2-Q /LN-CA 2222	3,55	53,7	151	4,7	3,55	57,5	141,5
ERACS2-Q /LN-CA 2422	3,55	56,7	159	5	3,55	60,5	149,4
ERACS2-Q /LN-CA 2622	2	62,7	179	5,7	2	65,1	170,1
ERACS2-Q /LN-CA 2722	2,09	71,6	202	6,3	2,09	75,4	190,4
ERACS2-Q /LN-CA 3222	1,53	82,9	237	7,5	1,53	87,6	224,2
ERACS2-Q /SL-CA 1062	22	22,5	60,4	1,5	22	23,4	58
ERACS2-Q /SL-CA 1162	22	26,6	71,3	1,8	22	27,7	69
ERACS2-Q /SL-CA 1362	13,5	32,4	86,9	2,2	13,5	33,2	84,5
ERACS2-Q /SL-CA 1562	13,5	35,3	94,6	2,4	13,5	36,4	91
ERACS2-Q /SL-CA 1762	9,4	40,8	109,3	2,7	9,4	42,5	106,3
ERACS2-Q /SL-CA 1962	5,2	45,6	122,2	3	5,2	46,6	118,3
ERACS2-Q /SL-CA 2022	3,86	48,8	138	4,4	3,86	52,1	131,7
ERACS2-Q /SL-CA 2222	3,55	53,7	151	4,7	3,55	57,5	141,5
ERACS2-Q /SL-CA 2422	3,55	56,7	159	5	3,55	60,5	149,4
ERACS2-Q /SL-CA 2622	2	62,7	179	5,7	2	65,1	170,1
ERACS2-Q /SL-CA 2722	2,09	71,6	202	6,3	2,09	75,4	190,4
ERACS2-Q /SL-CA 3222	1,53	82,9	237	7,5	1,53	87,6	224,2
ERACS2-Q /XL-CA 2022	3,86	48,8	138	4,4	3,86	52,1	131,7
ERACS2-Q /XL-CA 2222	3,55	53,7	151	4,7	3,55	57,5	141,5
ERACS2-Q /XL-CA 2422	3,55	56,7	159	5	3,55	60,5	149,4
ERACS2-Q /XL-CA 2622	2	62,7	179	5,7	2	65,1	170,1
ERACS2-Q /XL-CA 2722	2,09	71,6	202	6,3	2,09	75,4	190,4
ERACS2-Q /XL-CA 3222	1,53	82,9	237	7,5	1,53	87,6	224,2
ERACS2-Q /XL-CA-E 1062	22	22,5	60,4	1,5	22	23,4	58
ERACS2-Q /XL-CA-E 1162	22	26,6	71,3	1,8	22	27,7	69
ERACS2-Q /XL-CA-E 1362	13,5	32,4	86,9	2,2	13,5	33,2	84,5

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, using traditional control logic

SIZE	PLANT SIDE COLD HEAT EXCHANGER				PLANT SIDE HOT HEAT EXCHANGER		
	K	Q min m^3/h	Q max m^3/h	C.a. min m^3	K	Q min m^3/h	Q max m^3/h
ERACS2-Q /XL-CA-E 1562	13,5	35,3	94,6	2,4	13,5	36,4	91
ERACS2-Q /XL-CA-E 1762	9,4	40,8	109,3	2,7	9,4	42,5	106,3
ERACS2-Q /XL-CA-E 2022	3,86	48,8	138	4,4	3,86	52,1	131,7
ERACS2-Q /XL-CA-E 2222	3,55	53,7	151	4,7	3,55	57,5	141,5
ERACS2-Q /XL-CA-E 2422	3,55	56,7	159	5	3,55	60,5	149,4
ERACS2-Q /XL-CA-E 2622	2	62,7	179	5,7	2	65,1	170,1

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, using traditional control logic

5.2 HYDRONIC GROUP (Optional)

Hydraulic group consisting of:
- 2 pumps for tube exchanger
- differential pressure switch
- discharge valves
- pump inlet / oulet valves
- check valve
- purge valve
- drain valve

Each of the components of the hydraulic group has been designed to optimise hydraulic and electrical installation space, time and costs.
The second pump operates in stand-by to the first. The relative operating hours of the two pumps are balanced. In case the operating pump breaks down, the reserve pump is automatically enabled.
The electrical panel of the unit is protected with fuses and contactor with thermal cut-out.

IN-LINE PUMPS SPECIFICATION
2-pole low head pumps
Centrifugal pumps with in-line suction and delivery flanges, in single and twin versions. Pump body in cast iron and impeller in AISI 316L stainless steel or cast-iron, entirely laser technology welded. Mechanical seal with components in ceramics, carbon and EPDM elastomers. Three-phase electric motor protected to IP55, insulation class F, suitable for continuous service.

2-pole high-head pumps
All versions of the hydronic unit can be supplied with a high head pump. In these cases, the pump features a two-pole motor even in the silent-running versions.

SINGLE PUMPS SPECIFICATION
Low or high head pump
Horizontal one-piece centrifuge pump, normalised to EN 733, axial suction and radial delivery, cast iron body and AISI 316L stainless steel impeller. The section of the shaft in contact with the liquid is made from stainless steel. Mechanical seal with components in various materials depending on the size: ceramic/carbon/NBR or carbon/carburundum/silicon/EPDM. Three-phase electric motor protected to IP55, insulation class F, suitable for continuous service.
N.B.: for the version /SL-CA, /XL-CA e /XL-CA-E, the addition of the hydraulic group with 2 pumps, increase noise output by about 1 dB(A).

SPECIAL PUMPS
For pumps with different configurations, please contact our sales department.

The supply does not include the following accessories though these are recommended to ensure correct system operation:
- Flow switch
- Pressure gauges upline and downline from the unit
- Flexible joints on piping
- On-off valves
- Outlet control thermometer
- Mains filter

Available configurations:

VERSION	HYDRONIC GROUP		
	2 Poli - BP	2 Poli - AP	4 Poli - BP
CA	X	X	
LN-CA	X	X	
SL-CA		X	X
XL-CA		X	X
XL-CA-E		X	X

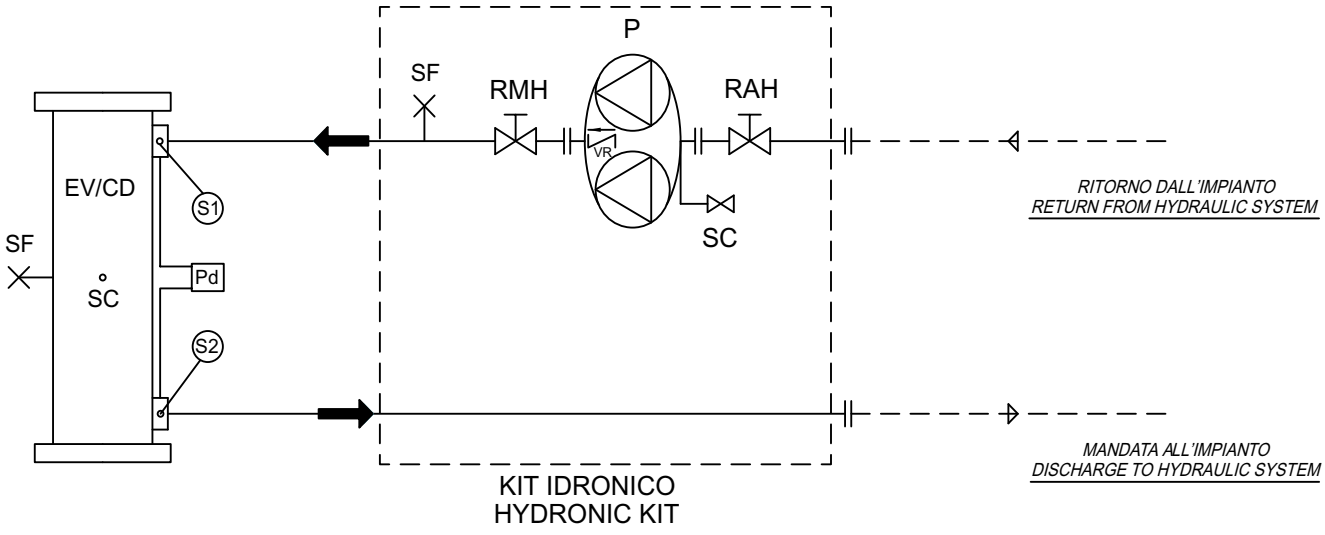
Hydronic group extra weight

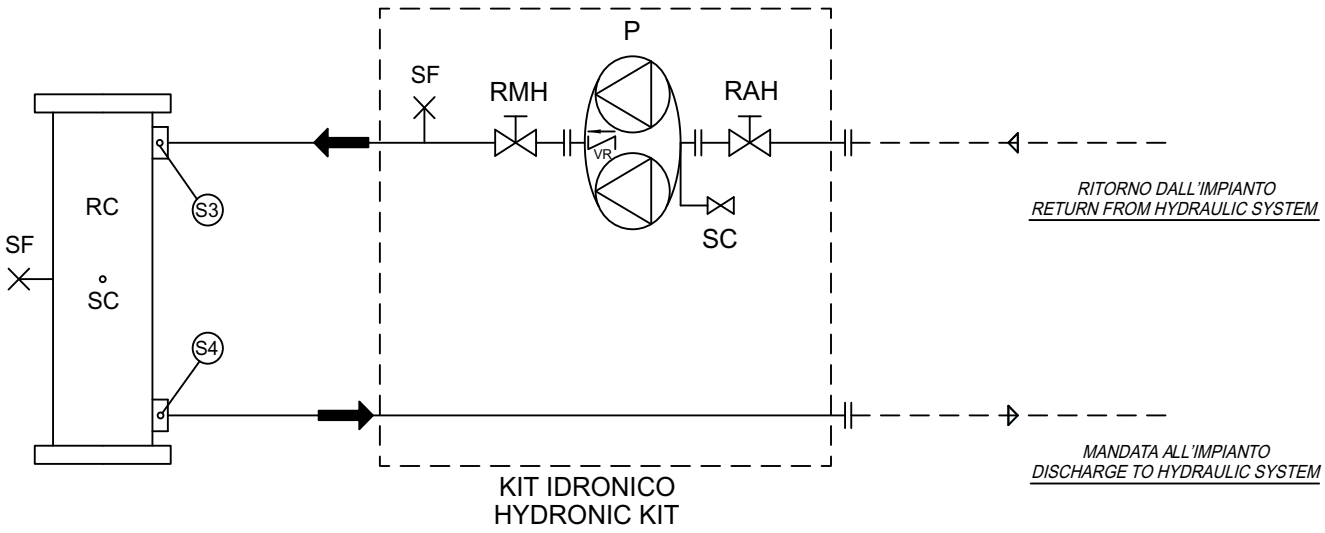
SIZE	VERSION	2 Poli - BP	2 Poli - AP	4 Poli - BP
		extra kg	extra kg	extra kg
1062	CA	246	282	-
1162		270	386	-
1362		279	395	-
1562		303	395	-
1762		612	756	-
1962		628	756	-
2022		1070	1190	-
2222		1170	1290	-
2422		1170	1290	-
2622		1170	1290	-
2722		1150	1090	-
3222		1100	1600	-
1062	LN-CA	246	282	-
1162		270	386	-
1362		279	395	-
1562		303	395	-
1762		612	756	-
1962		628	756	-
2022		1070	1190	-
2222		1170	1290	-
2422		1170	1290	-
2622		1170	1290	-
2722		1150	1090	-
3222		1100	1600	-
1062	SL-CA	-	282	354
1162		-	386	534
1362		-	395	543
1562		-	395	567
1762		-	756	562
1962		-	756	562
2022		-	1190	1190
2222		-	1290	1290
2422		-	1290	1330
2622		-	1290	1330
2722		-	1090	1150
3222		-	1600	1540
2022	XL-CA	-	1190	1190
2222		-	1290	1290
2422		-	1290	1330
2622		-	1290	1330
2722		-	1090	1150
3222		-	1600	1540
1062	XL-CA-E	-	282	354
1162		-	419	567
1362		-	395	543
1562		-	628	530
1762		-	756	562
2022		-	1350	1350
2222		-	1370	1370
2422		-	1370	1410
2622		-	1370	1410

extra kg extra weight (hydronic group + hydraulic connection)
BP Low head pumps
AP High head pumps

HYDRONIC GROUP (Optional)

Hydraulic diagram IN-LINE water pump

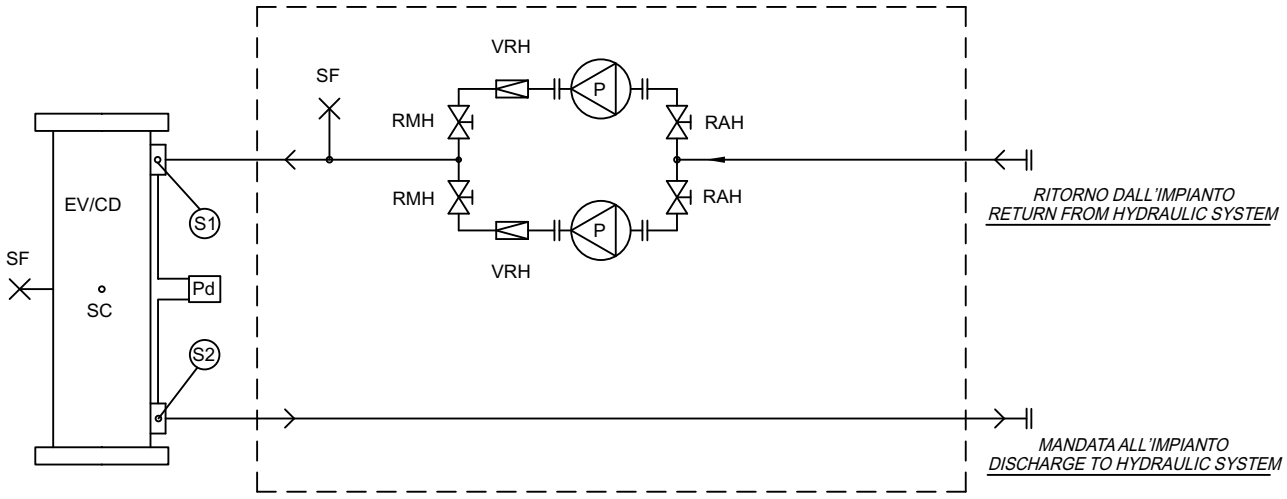




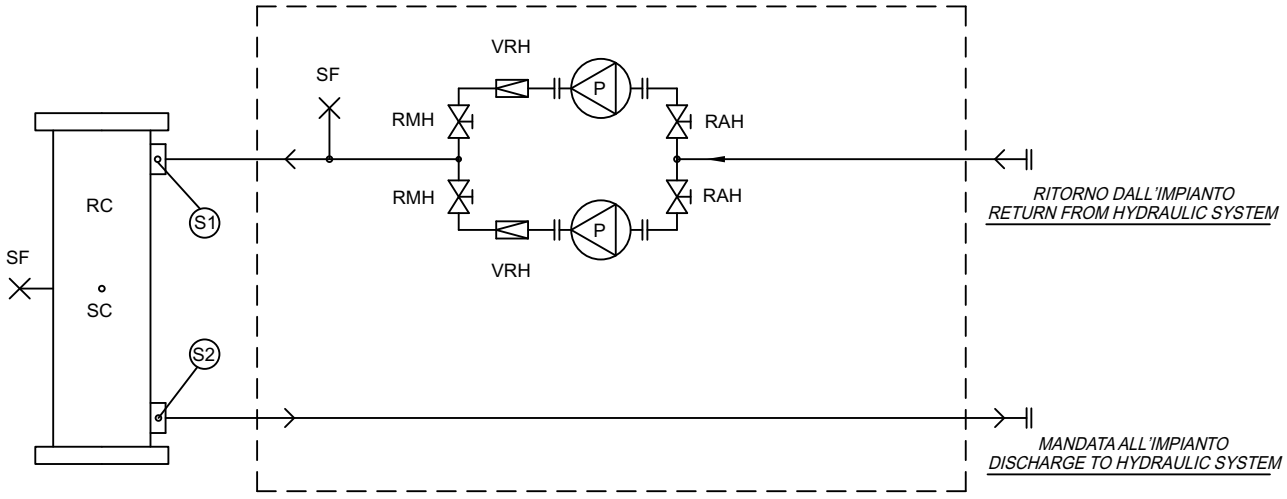
LEGENDA - LEGEND	
CONPONENTI DEL KIT IDRONICO *COMPONENTS OF THE HYDRONIC KIT*	
EV/CD	Scambiatore freddo lato utenza (scambiatore a fascio tubiero) Plant side cold heat exchanger (tube exchanger)
P	Pompa gemellare Twin rotor pump
Pd	Pressostato differenziale lato acqua Water Differential pressure switch
RC	Scambiatore caldo lato utenza (scambiatore a fascio tubiero) Plant side cold heat exchanger (tube exchanger)
RAH	Rubinetto aspirazione Pump suction valve
RMH	Rubinetto mandata Pump discharge valve
SC	Valvola di scarico Drain valve
SF	Valvola di sfiato Purge valve
S1/S3	Sonda ingresso acqua scambiatore Exchanger water inlet probe
S2/S4	Sonda uscita acqua scambiatore Exchanger water outlet probe
VR	Valvola di ritegno (interna alla pompa) Cheek valve (pump inside)

HYDRONIC GROUP (Optional)

Hydraulic diagram single water pump



KIT IDRONICO
HYDRONIC KIT



KIT IDRONICO
HYDRONIC KIT

LEGENDA - LEGEND	
CONPONENTI DEL KIT IDRONICO *COMPONENTS OF THE HYDRONIC KIT*	
EV/CD	Scambiatore freddo lato utenza (scambiatore a fascio tubiero) Plant side cold heat exchanger (tube exchanger)
P	Pompa Water pump
Pd	Pressostato differenziale lato acqua Water Differential pressure switch
RC	Scambiatore caldo lato utenza (scambiatore a fascio tubiero) Plant side cold heat exchanger (tube exchanger)
RAH	Rubinetto aspirazione Pump suction valve
RMH	Rubinetto mandata Pump discharge valve
SC	Valvola di scarico Drain valve
SF	Valvola di sfiato Purge valve
S1/S3	Sonda ingresso acqua scambiatore Exchanger water inlet probe
S2/S4	Sonda uscita acqua scambiatore Exchanger water outlet probe
VRH	Valvola di non ritorno One way valve

HYDRONIC GROUP (Optional)

COLD CIRCUIT - 2 PUMPS - LOW HEAD PUMP

SIZE	Pf (1)(2) [kW]	Q (1)(2) [m3/h]	Rif. Pump	Pump		N. Poli	F.L.I. [kW]	F.L.A. [A]	Ks	Dps (2) kPa	Hu (2) kPa
1062	210	36,1	P1	FHE 40-125/22	SINGLE	2	2,2	5,0	33,9	44,2	115
1162	248	42,7	P2	FHE 50-125/30	SINGLE	2	3,0	6,3	33,9	61,7	115
1362	302	51,9	P2	FHE 50-125/30	SINGLE	2	3,0	6,3	25,4	68,5	91
1562	329	56,6	P3	FHE 50-125/40	SINGLE	2	4,0	7,7	25,4	81,3	115
1562 XL-CA-E	319	54,9	P4	FCTE 80-125/40	IN - LINE	2	4,0	7,7	17,5	52,7	103
1762	380	65,4	P4	FCTE 80-125/40	IN - LINE	2	4,0	7,7	12,7	54,3	88
1962	425	73,1	P5	FCTE 80-125/55	IN - LINE	2	5,5	10,4	8,5	45,4	134
2022	469	80,7	P6	FHE 65-125/55	SINGLE	2	5,5	10,4	7,7	49,9	127
2222	513	88,2	P6	FHE 65-125/55	SINGLE	2	5,5	10,4	7,3	56,6	110
2422	541	93,1	P6	FHE 65-125/55	SINGLE	2	5,5	10,4	7,3	62,9	97
2622	604	103,9	P7	FHE 65-125/75	SINGLE	2	7,5	13,9	5,6	60,3	142
2722	684	117,6	P8	FCTE4 100-250/75	IN - LINE	4	7,5	15,4	2,9	39,7	103
3222	800	137,6	P9	FCTE 100-160/110	IN - LINE	2	11,0	20,2	2,5	46,8	136

HOT CIRCUIT - 2 PUMPS - LOW HEAD PUMP

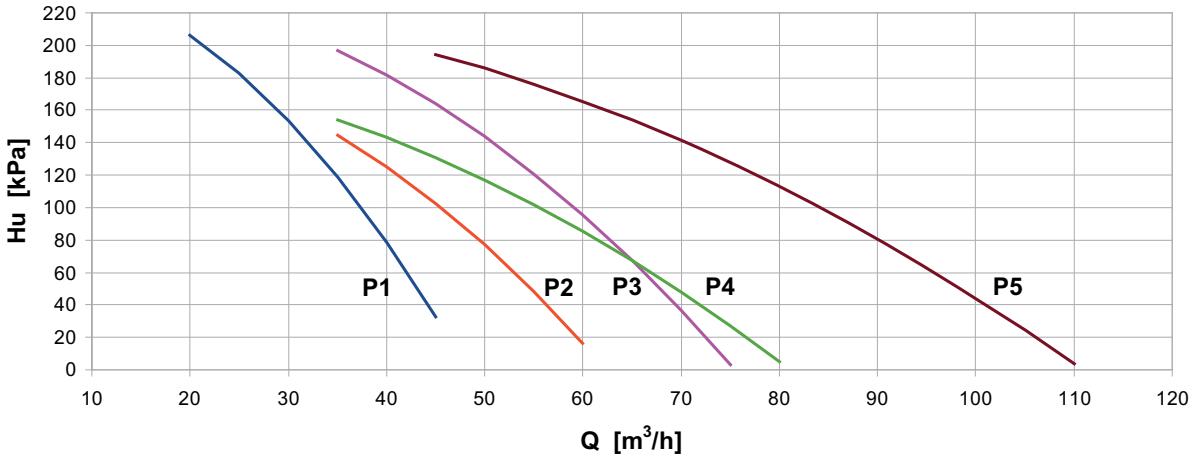
SIZE	Pt (1)(2) [kW]	Q (1)(2) [m3/h]	Rif. Pump	Pump		N. Poli	F.L.I. [kW]	F.L.A. [A]	Ks	Dps (2) kPa	Hu (2) kPa
1062	218	37,5	P1	FHE 40-125/22	SINGLE	2	2,2	5,0	33,9	47,7	104
1162	258	44,4	P2	FHE 50-125/30	SINGLE	2	3,0	6,3	33,9	66,8	100
1362	308	53,0	P2	FHE 50-125/30	SINGLE	2	3,0	6,3	25,4	71,3	83
1562	339	58,3	P3	FHE 50-125/40	SINGLE	2	4,0	7,7	25,4	86,4	104
1562 XL-CA-E	340	58,5	P4	FCTE 80-125/40	IN - LINE	2	4,0	7,7	17,5	59,8	91
1762	396	68,1	P4	FCTE 80-125/40	IN - LINE	2	4,0	7,7	12,7	58,9	78
1962	434	74,6	P5	FCTE 80-125/55	IN - LINE	2	5,5	10,4	8,5	47,4	125
2022	492	84,6	P6	FHE 65-125/55	SINGLE	2	5,5	10,4	7,7	54,9	117
2222	541	93,1	P6	FHE 65-125/55	SINGLE	2	5,5	10,4	7,3	62,9	97
2422	571	98,2	P6	FHE 65-125/55	SINGLE	2	5,5	10,4	7,3	70,1	82
2622	615	105,8	P7	FHE 65-125/75	SINGLE	2	7,5	13,9	5,6	62,5	137
2722	711	122,3	P8	FCTE4 100-250/75	IN - LINE	4	7,5	15,4	2,9	42,9	95
3222	826	142,1	P9	FCTE 100-160/110	IN - LINE	2	11,0	20,2	2,5	49,9	126

(1) Values refer to rated operating conditions
(2) Values referred to sizes 1062-1962, CA version
Values referred to sizes 2022-3222, LN-CA version
Pf Cooling capacity of unit
Q Flow of water to evaporator
F.L.I. Power absorbed by pump
F.L.A. Current absorbed by pump
Ks Total coefficient for the calculation of loss of power with double pump (one on stand-by)
Dps Total pressure drop in water circuit (evaporator and pipes)
Hu Working head

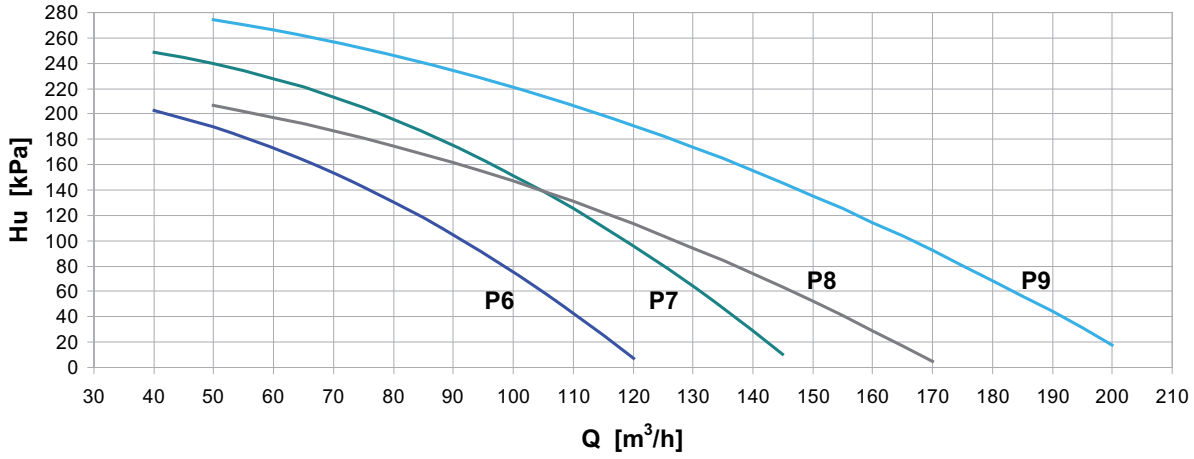
HYDRONIC GROUP (Optional)

PUMP CHARACTERISTICS

ERACS2-Q 1062 - 1962



ERACS2-Q 2022 - 3222



HYDRONIC GROUP (Optional)

COLD CIRCUIT - 2 PUMPS - HIGH HEAD PUMP

SIZE	Pf (1) [kW]	Q (1) [m3/h]	Rif. Pump	Pump		N. Poli	F.L.I. [kW]	F.L.A. [A]	Ks	Dps (2) kPa	Hu (2) kPa
1062	210	36,1	P1	FHE 40-160/40	SINGLE	2	4,0	7,7	33,9	44,2	232
1162	248	42,7	P2	FHE 50-160/55	SINGLE	2	5,5	10,4	33,9	61,7	227
1362	302	51,9	P2	FHE 50-160/55	SINGLE	2	5,5	10,4	25,4	68,5	200
1562	329	56,6	P2	FHE 50-160/55	SINGLE	2	5,5	10,4	25,4	81,3	174
1562 XL-CA-E	319	54,9	P3	FCTE 60-160/55	IN - LINE	2	5,5	10,4	17,5	52,7	192
1762	380	65,4	P4	FCTE 80-160/75	IN - LINE	2	7,5	13,9	12,7	54,3	185
1962	425	73,1	P4	FCTE 80-160/75	IN - LINE	2	7,5	13,9	8,5	45,4	185
2022	469	80,7	P5	FHE 65-160/92	SINGLE	2	9,2	16,7	7,7	49,9	231
2222	513	88,2	P5	FHE 65-160/92	SINGLE	2	9,2	16,7	7,3	56,6	213
2422	541	93,1	P5	FHE 65-160/92	SINGLE	2	9,2	16,7	7,3	62,9	199
2622	604	103,9	P6	FHE 65-160/110	SINGLE	2	11,0	20,2	5,6	60,3	221
2722	684	117,6	P7	FCTE 100-160/110	IN - LINE	2	11,0	20,2	2,9	39,7	173
3222	800	137,6	P8	FCTS4 150-250/185	IN - LINE	4	18,5	37,0	2,4	45,1	177

HOT CIRCUIT - 2 PUMPS - HIGH HEAD PUMP

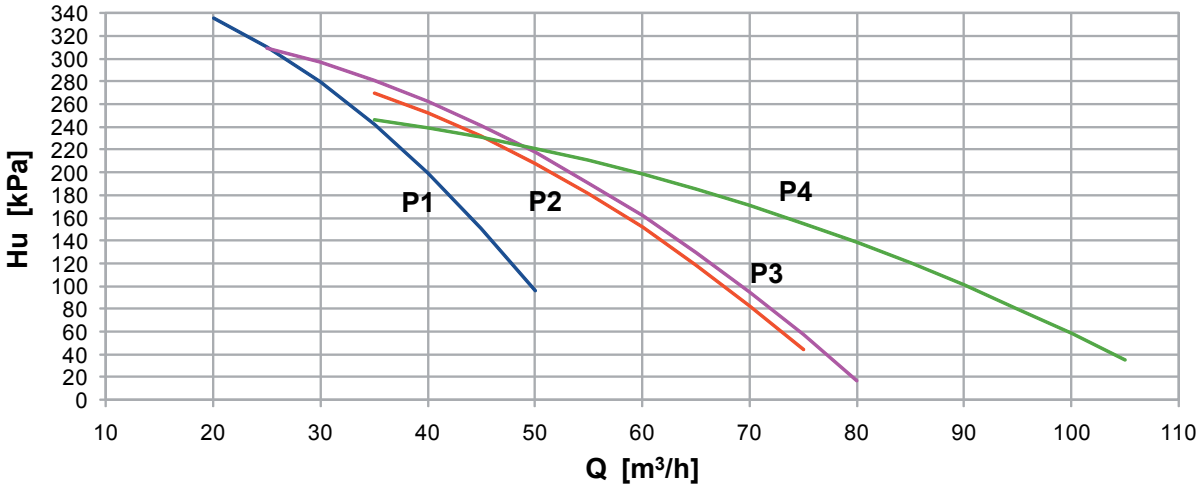
SIZE	Pt (1)(2) [kW]	Q (1)(2) [m3/h]	Rif. Pump	Pump		N. Poli	F.L.I. [kW]	F.L.A. [A]	Ks	Dps (2) kPa	Hu (2) kPa
1062	218	37,5	P1	FHE 40-160/40	SINGLE	2	4,0	7,7	33,9	47,7	221
1162	258	44,4	P2	FHE 50-160/55	SINGLE	2	5,5	10,4	33,9	66,8	212
1362	308	53,0	P2	FHE 50-160/55	SINGLE	2	5,5	10,4	25,4	71,3	191
1562	339	58,3	P2	FHE 50-160/55	SINGLE	2	5,5	10,4	25,4	86,4	161
1562 XL-CA-E	340	58,5	P3	FCTE 60-160/55	IN - LINE	2	5,5	10,4	17,5	59,8	171
1762	396	68,1	P4	FCTE 80-160/75	IN - LINE	2	7,5	13,9	12,7	58,9	176
1962	434	74,6	P4	FCTE 80-160/75	IN - LINE	2	7,5	13,9	8,5	47,4	180
2022	492	84,6	P5	FHE 65-160/92	SINGLE	2	9,2	16,7	7,7	54,9	220
2222	541	93,1	P5	FHE 65-160/92	SINGLE	2	9,2	16,7	7,3	62,9	199
2422	571	98,2	P5	FHE 65-160/92	SINGLE	2	9,2	16,7	7,3	70,1	183
2622	615	105,8	P6	FHE 65-160/110	SINGLE	2	11,0	20,2	5,6	62,5	214
2722	711	122,3	P7	FCTE 100-160/110	IN - LINE	2	11,0	20,2	2,9	42,9	165
3222	826	142,1	P8	FCTS4 150-250/185	IN - LINE	4	18,5	37,0	2,4	48,0	175

(1) Values refer to rated operating conditions
(2) Values referred to sizes 1062-1962, CA version
Values referred to sizes 2022-3222, LN-CA version
Pf Cooling capacity of unit
Q Flow of water to evaporator
F.L.I. Power absorbed by pump
F.L.A. Current absorbed by pump
Ks Total coefficient for the calculation of loss of power with double pump (one on stand-by)
Dps Total pressure drop in water circuit (evaporator and pipes)
Hu Working head

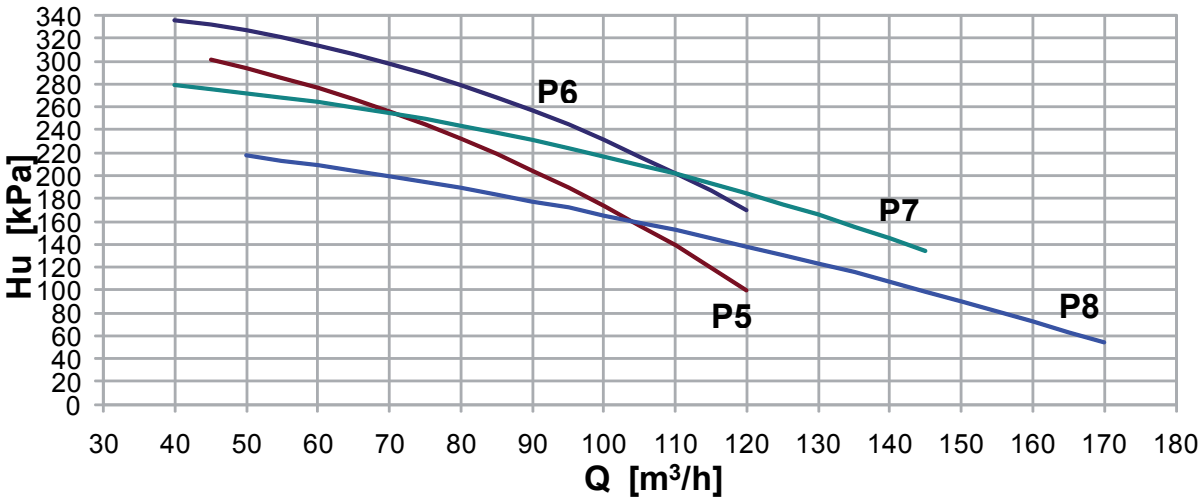
HYDRONIC GROUP (Optional)

PUMP CHARACTERISTICS

ERACS2-Q 1062 - 1962



ERACS2-Q 2022 - 3222



HYDRONIC GROUP (Optional)

COLD CIRCUIT - 2 PUMPS - 4 POLI - LOW HEAD PUMP

SIZE	Pf (1)(2) [kW]	Q (1)(2) [m3/h]	Rif. Pump	Pump		N. Poli	F.L.I. [kW]	F.L.A. [A]	Ks	Dps kPa	Hu (2) kPa
1062	210	36,1	P1	FHE4 50-250/22	SINGLE	4	2,2	4,7	33,9	44,2	88
1162	248	42,7	P2	FHE4 65-250/40	SINGLE	4	4,0	8,8	33,9	61,7	108
1362	302	51,9	P2	FHE4 65-250/40	SINGLE	4	4,0	8,8	25,4	68,5	89
1562	329	56,6	P3	FHE4 65-250/55	SINGLE	4	5,5	11,3	25,4	81,3	99
1562 XL-CA-E	319	54,9	P4	FCTE4 80-250/40	IN - LINE	4	4,0	8,8	17,5	52,7	91
1762	380	65,4	P5	FCTE4 80-250/55	IN - LINE	4	5,5	11,3	12,7	54,3	113
1962	425	73,1	P5	FCTE4 80-250/55	IN - LINE	4	5,5	11,3	8,5	45,4	107
2022	469	80,7	P6	FHE4 80-250/55	SINGLE	4	5,5	11,3	6,4	41,3	117
2222	513	88,2	P6	FHE4 80-250/55	SINGLE	4	5,5	11,3	6,0	46,3	100
2422	541	93,1	P7	FHE4 80-250/75	SINGLE	4	7,5	15,4	6,0	51,5	131
2622	604	103,9	P7	FHE4 80-250/75	SINGLE	4	7,5	15,4	4,3	46,1	120
2722	684	117,6	P8	FCTE4 100-250/75	IN - LINE	4	7,5	15,4	2,9	39,7	104
3222	800	137,6	P9	FCTS4 125-250/110	IN - LINE	4	11,0	21,1	2,3	44,1	147

HOT CIRCUIT - 2 PUMPS - 4 POLI - LOW HEAD PUMP

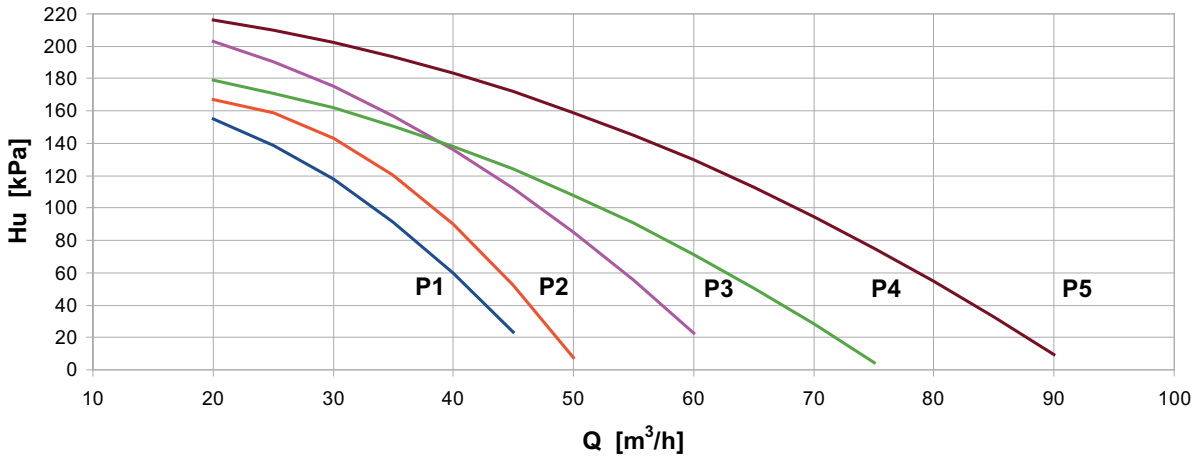
SIZE	Pt (1)(2) [kW]	Q (1)(2) [m3/h]	Rif. Pump	Pump		N. Poli	F.L.I. [kW]	F.L.A. [A]	Ks	Dps kPa	Hu (2) kPa
1062	218	37,5	P1	FHE4 50-250/22	SINGLE	4	2,2	4,7	33,9	47,7	79
1162	258	44,4	P2	FHE4 65-250/40	SINGLE	4	4,0	8,8	33,9	66,8	94
1362	308	53,0	P2	FHE4 65-250/40	SINGLE	4	4,0	8,8	25,4	71,3	82
1562	339	58,3	P3	FHE4 65-250/55	SINGLE	4	5,5	11,3	25,4	86,4	89
1562 XL-CA-E	340	58,5	P4	FCTE4 80-250/40	IN - LINE	4	4,0	8,8	17,5	59,8	77
1762	396	68,1	P5	FCTE4 80-250/55	IN - LINE	4	5,5	11,3	12,7	58,9	102
1962	434	74,6	P5	FCTE4 80-250/55	IN - LINE	4	5,5	11,3	8,5	47,4	101
2022	492	84,6	P6	FHE4 80-250/55	SINGLE	4	5,5	11,3	6,4	45,5	107
2222	541	93,1	P6	FHE4 80-250/55	SINGLE	4	5,5	11,3	6,0	51,5	87
2422	571	98,2	P7	FHE4 80-250/75	SINGLE	4	7,5	15,4	6,0	57,4	118
2622	615	105,8	P7	FHE4 80-250/75	SINGLE	4	7,5	15,4	4,3	47,8	114
2722	711	122,3	P8	FCTE4 100-250/75	IN - LINE	4	7,5	15,4	2,9	42,9	96
3222	826	142,1	P9	FCTS4 125-250/110	IN - LINE	4	11,0	21,1	2,3	47,0	140

(1) Values refer to rated operating conditions
(2) Values referred to sizes 1062-1962, CA version
Values referred to sizes 2022-3222, LN-CA version
Pf Cooling capacity of unit
Q Flow of water to evaporator
F.L.I. Power absorbed by pump
F.L.A. Current absorbed by pump
Ks Total coefficient for the calculation of loss of power with double pump (one on stand-by)
Dps Total pressure drop in water circuit (evaporator and pipes)
Hu Working head

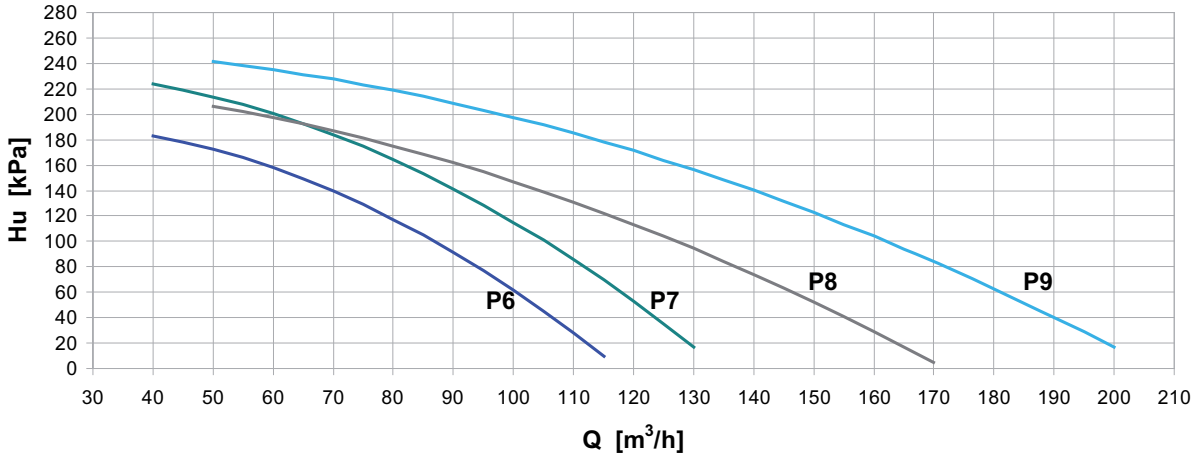
HYDRONIC GROUP (Optional)

PUMP CHARACTERISTICS

ERACS2-Q 1062 - 1962



ERACS2-Q 2022 - 3222



SIZE	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]
1062	2	2x40,5	2x67,1	2x169	2	3.8	93.0	157	235
1162	2	2x48,7	2x80,4	2x206	2	3.8	109	184	289
1362	2	2x51,7	2x91,7	2x267	2	3.8	115	206	355
1562	2	2x64,3	2x104,7	2x290	2	3.8	145	240	388
1762	2	2x70,2	2x114,9	2x350	2	3.8	156	260	461
1962	2	2x82,1	2x131,7	2x423	2	3.8	184	301	543
2022	2	2x85,4	2x137	2x246	2	3.8	191	312	377
2222	2	1x85,4+1x101	1x137+1x165	1x246+1x300	2	3.8	210	348	439
2422	2	2x101	2x165	2x300	2	3.8	226	376	449
2622	2	2x112	2x184	2x360	2	3.8	248	414	534
2722	2	2x127	2x208	2x404	2	3.8	282	469	588
3222	2	2x145	2x235	2x436	2	3.8	318	531	658

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

Power supply: 400/3/50
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	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]
1062	2	2x40,5	2x67,1	2x169	2	3.8	93.0	157	235
1162	2	2x48,7	2x80,4	2x206	2	3.8	109	184	289
1362	2	2x51,7	2x91,7	2x267	2	3.8	115	206	355
1562	2	2x64,3	2x104,7	2x290	2	3.8	145	240	388
1762	2	2x70,2	2x114,9	2x350	2	3.8	156	260	461
1962	2	2x82,1	2x131,7	2x423	2	3.8	184	301	543
2022	2	2x85,4	2x137	2x246	2	3.8	191	312	377
2222	2	1x85,4+1x101	1x137+1x165	1x246+1x300	2	3.8	210	348	439
2422	2	2x101	2x165	2x300	2	3.8	226	376	449
2622	2	2x112	2x184	2x360	2	3.8	248	414	534
2722	2	2x127	2x208	2x404	2	3.8	282	469	588
3222	2	2x145	2x235	2x436	2	3.8	318	531	658

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

Power supply: 400/3/50
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	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]
1062	2	2x40,5	2x67,1	2x169	2	3.8	93.0	157	235
1162	2	2x48,7	2x80,4	2x206	2	3.8	109	184	289
1362	2	2x51,7	2x91,7	2x267	2	3.8	115	206	355
1562	2	2x64,3	2x104,7	2x290	2	3.8	145	240	388
1762	2	2x70,2	2x114,9	2x350	2	3.8	156	260	461
1962	2	2x82,1	2x131,7	2x423	2	3.8	184	301	543
2022	2	2x85,4	2x137	2x246	2	3.8	191	312	377
2222	2	1x85,4+1x101	1x137+1x165	1x246+1x300	2	3.8	210	348	439
2422	2	2x101	2x165	2x300	2	3.8	226	376	449
2622	2	2x112	2x184	2x360	2	3.8	248	414	534
2722	2	2x127	2x208	2x404	2	3.8	282	469	588
3222	2	2x145	2x235	2x436	2	3.8	318	531	658

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

Power supply: 400/3/50
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	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]
2022	2	2x85,4	2x137	2x246	2	3.1	191	305	370
2222	2	1x85,4+1x101	1x137+1x165	1x246+1x300	2	3.1	210	339	431
2422	2	2x101	2x165	2x300	2	3.1	226	367	440
2622	2	2x112	2x184	2x360	2	3.1	248	405	525
2722	2	2x127	2x208	2x404	2	3.1	282	459	578
3222	2	2x145	2x235	2x436	2	3.1	318	520	647

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

Power supply: 400/3/50
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	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]
1062	2	2x40,5	2x67,1	2x169	2	3.1	93.0	153	231
1162	2	2x48,7	2x80,4	2x206	2	3.1	113	186	291
1362	2	2x51,7	2x91,7	2x267	2	3.1	119	208	357
1562	2	2x64,3	2x104,7	2x290	2	3.1	145	234	382
1762	2	2x70,2	2x114,9	2x350	2	3.1	160	261	462
2022	2	2x85,4	2x137	2x246	2	3.1	195	311	376
2222	2	1x85,4+1x101	1x137+1x165	1x246+1x300	2	3.1	214	345	437
2422	2	2x101	2x165	2x300	2	3.1	230	373	447
2622	2	2x112	2x184	2x360	2	3.1	256	418	538

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

Power supply: 400/3/50
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
	63	125	250	500	1000	2000	4000	8000	
	Sound power level dB(A)								
1062	93	96	97	94	94	86	83	74	**97**
1162	93	96	97	94	94	86	83	74	**97**
1362	93	96	97	94	94	86	83	74	**97**
1562	94	98	97	95	95	88	84	74	**98**
1762	95	99	98	96	96	89	85	75	**99**
1962	95	99	98	96	96	89	85	75	**99**
2022	90	96	99	95	95	90	82	74	**99**
2222	91	99	102	98	97	91	83	75	**101**
2422	91	99	102	98	97	91	83	75	**101**
2622	91	99	102	98	97	91	83	75	**101**
2722	91	99	102	98	97	91	83	75	**101**
3222	92	100	103	99	98	92	84	76	**102**

Working conditions
Plant (side) cooling exchanger water (in/out) 12/7 °C
Source (side) heat exchanger air (in) 35 °C
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
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] at 10 m								Total sound level
	63	125	250	500	1000	2000	4000	8000	
	Sound pressure level dB(A)								
1062	61	64	65	62	62	54	51	42	**65**
1162	61	64	65	62	62	54	51	42	**65**
1362	61	64	65	62	62	54	51	42	**65**
1562	62	66	65	63	63	56	52	42	**66**
1762	62	66	65	63	63	56	52	42	**66**
1962	62	66	65	63	63	56	52	42	**66**
2022	57	63	66	62	62	57	49	41	**66**
2222	58	66	69	65	64	58	50	42	**68**
2422	58	66	69	65	64	58	50	42	**68**
2622	58	66	69	65	64	58	50	42	**68**
2722	58	66	69	65	64	58	50	42	**68**
3222	59	67	70	66	65	59	51	43	**69**

Working conditions
Plant (side) cooling exchanger water (in/out) 12/7 °C
Source (side) heat exchanger air (in) 35 °C
Average sound pressure level, at 10 (m.) 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
	63	125	250	500	1000	2000	4000	8000	
	Sound power level dB(A)								
1062	90	87	86	88	87	80	75	65	**90**
1162	90	88	88	90	88	80	75	65	**91**
1362	90	87	88	90	88	80	75	65	**91**
1562	91	88	89	91	89	81	76	66	**92**
1762	91	88	89	91	89	81	76	66	**92**
1962	91	88	89	91	89	81	76	66	**92**
2022	90	92	95	92	88	83	77	68	**93**
2222	92	94	97	94	90	85	79	70	**95**
2422	92	94	97	94	90	85	79	70	**95**
2622	92	94	97	94	90	85	79	70	**95**
2722	92	94	97	94	90	85	79	70	**95**
3222	93	95	98	95	91	86	80	71	**96**

Working conditions
Plant (side) cooling exchanger water (in/out) 12/7 °C
Source (side) heat exchanger air (in) 35 °C
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
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] at 10 m								Total sound level
	63	125	250	500	1000	2000	4000	8000	
	Sound pressure level dB(A)								
1062	58	55	54	56	55	48	43	33	**58**
1162	58	56	56	58	56	48	43	33	**59**
1362	58	55	56	58	56	48	43	33	**59**
1562	59	56	57	59	57	49	44	34	**60**
1762	58	55	56	58	56	48	43	33	**59**
1962	58	55	56	58	56	48	43	33	**59**
2022	57	59	62	59	55	50	44	35	**60**
2222	59	61	64	61	57	52	46	37	**62**
2422	59	61	64	61	57	52	46	37	**62**
2622	59	61	64	61	57	52	46	37	**62**
2722	59	61	64	61	57	52	46	37	**62**
3222	60	62	65	62	58	53	47	38	**63**

Working conditions
Plant (side) cooling exchanger water (in/out) 12/7 °C
Source (side) heat exchanger air (in) 35 °C
Average sound pressure level, at 10 (m.) 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
	63	125	250	500	1000	2000	4000	8000	
	Sound power level dB(A)								
1062	89	80	83	85	83	75	69	64	**86**
1162	89	83	86	85	84	76	69	64	**87**
1362	89	83	86	85	84	76	69	64	**87**
1562	90	84	87	86	85	77	70	65	**88**
1762	90	84	87	86	85	77	70	65	**88**
1962	90	84	87	86	85	77	70	65	**88**
2022	92	90	92	88	84	78	71	63	**89**
2222	94	92	94	90	86	80	72	64	**91**
2422	94	92	94	90	86	80	72	64	**91**
2622	94	92	94	90	86	80	72	64	**91**
2722	94	92	94	90	86	80	72	64	**91**
3222	95	93	95	91	87	81	73	65	**92**

Working conditions
Plant (side) cooling exchanger water (in/out) 12/7 °C
Source (side) heat exchanger air (in) 35 °C
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
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] at 10 m								Total sound level
	63	125	250	500	1000	2000	4000	8000	
	Sound pressure level dB(A)								
1062	57	48	51	53	51	43	37	32	**54**
1162	57	51	54	53	52	44	37	32	**55**
1362	57	51	54	53	52	44	37	32	**55**
1562	58	52	55	54	53	45	38	33	**56**
1762	57	51	54	53	52	44	37	32	**55**
1962	57	51	54	53	52	44	37	32	**55**
2022	59	57	59	55	51	45	38	30	**56**
2222	61	59	61	57	53	47	39	31	**58**
2422	61	59	61	57	53	47	39	31	**58**
2622	61	59	61	57	53	47	39	31	**58**
2722	61	59	61	57	53	47	39	31	**58**
3222	62	60	62	58	54	48	40	32	**59**

Working conditions
Plant (side) cooling exchanger water (in/out) 12/7 °C
Source (side) heat exchanger air (in) 35 °C
Average sound pressure level, at 10 (m.) 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
	63	125	250	500	1000	2000	4000	8000	
	Sound power level dB(A)								
2022	88	86	88	83	80	74	67	59	**85**
2222	90	88	90	85	82	76	69	61	**87**
2422	90	88	90	85	82	76	69	61	**87**
2622	90	88	90	85	82	76	69	61	**87**
2722	90	88	90	85	82	76	69	61	**87**
3222	91	89	91	86	83	77	70	62	**88**

Working conditions
Plant (side) cooling exchanger water (in/out) 12/7 °C
Source (side) heat exchanger air (in) 35 °C
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
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] at 10 m								Total sound level
	63	125	250	500	1000	2000	4000	8000	
	Sound pressure level dB(A)								
2022	55	53	55	50	47	41	34	26	**52**
2222	57	55	57	52	49	43	36	28	**54**
2422	57	55	57	52	49	43	36	28	**54**
2622	57	55	57	52	49	43	36	28	**54**
2722	57	55	57	52	49	43	36	28	**54**
3222	58	56	58	53	50	44	37	29	**55**

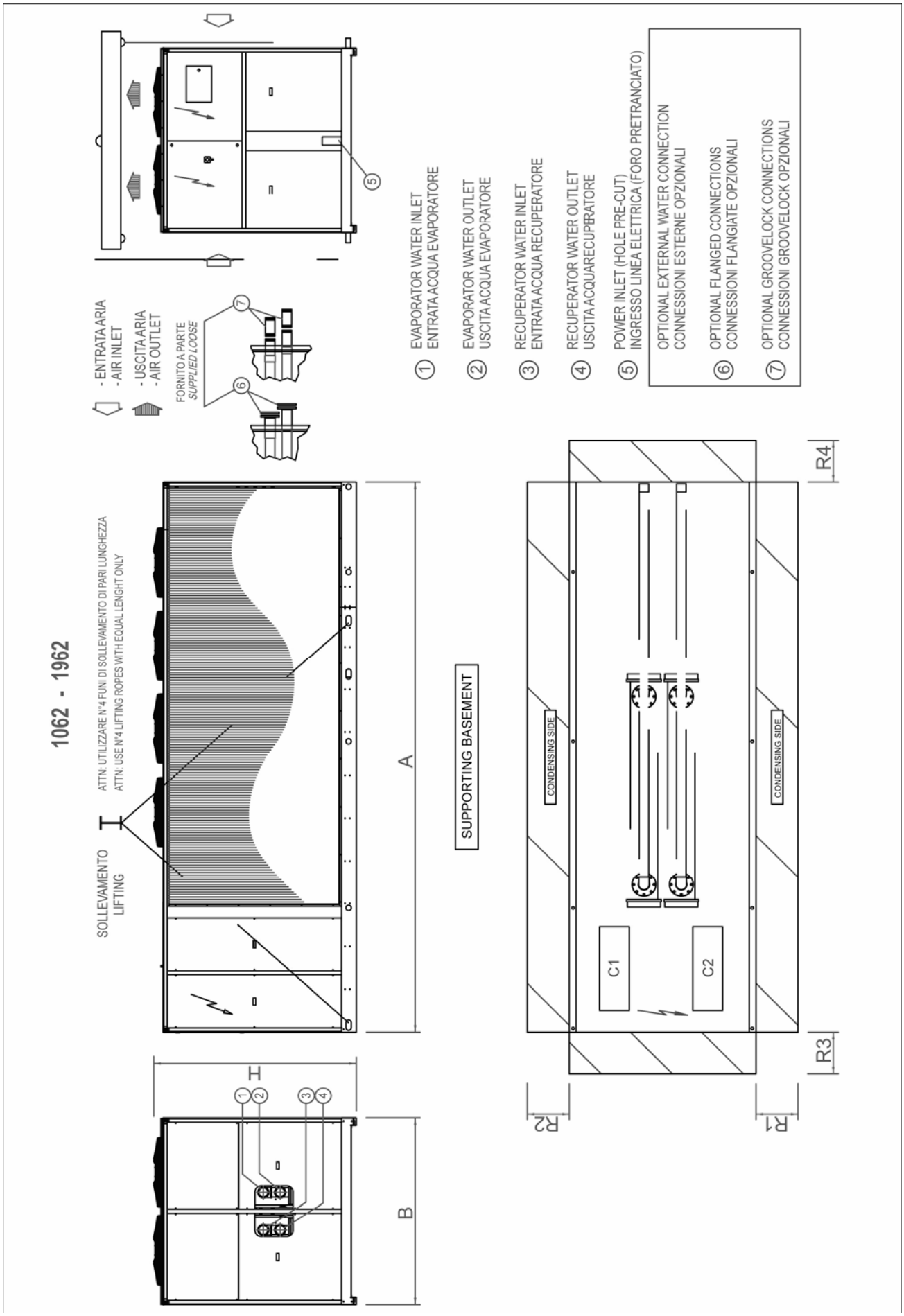
Working conditions
Plant (side) cooling exchanger water (in/out) 12/7 °C
Source (side) heat exchanger air (in) 35 °C
Average sound pressure level, at 10 (m.) distance, unit in a free field on a reflective surface; non-binding value obtained
from the sound power level

SOUND POWER									
SIZE	Octave band [Hz]								Total sound level
	63	125	250	500	1000	2000	4000	8000	
	Sound power level dB(A)								
1062	88	79	82	84	82	74	68	63	**85**
1162	88	80	84	85	83	75	68	63	**86**
1362	88	82	85	84	83	75	68	63	**86**
1562	89	83	86	85	84	76	69	64	**87**
1762	89	83	86	85	84	76	69	64	**87**
2022	89	87	89	84	81	75	68	60	**86**
2222	91	89	91	86	83	77	70	62	**88**
2422	91	89	91	86	83	77	70	62	**88**
2622	91	89	91	86	83	77	70	62	**88**

Working conditions
Plant (side) cooling exchanger water (in/out) 12/7 °C
Source (side) heat exchanger air (in) 35 °C
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
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] at 10 m								Total sound level
	63	125	250	500	1000	2000	4000	8000	
	Sound pressure level dB(A)								
1062	56	47	50	52	50	42	36	31	**53**
1162	56	48	52	53	51	43	36	31	**54**
1362	56	50	53	52	51	43	36	31	**54**
1562	56	50	53	52	51	43	36	31	**54**
1762	56	50	53	52	51	43	36	31	**54**
2022	56	54	56	51	48	42	35	27	**53**
2222	58	56	58	53	50	44	37	29	**55**
2422	58	56	58	53	50	44	37	29	**55**
2622	58	56	58	53	50	44	37	29	**55**

Working conditions
Plant (side) cooling exchanger water (in/out) 12/7 °C
Source (side) heat exchanger air (in) 35 °C
Average sound pressure level, at 10 (m.) distance, unit in a free field on a reflective surface; non-binding value obtained from the sound power level



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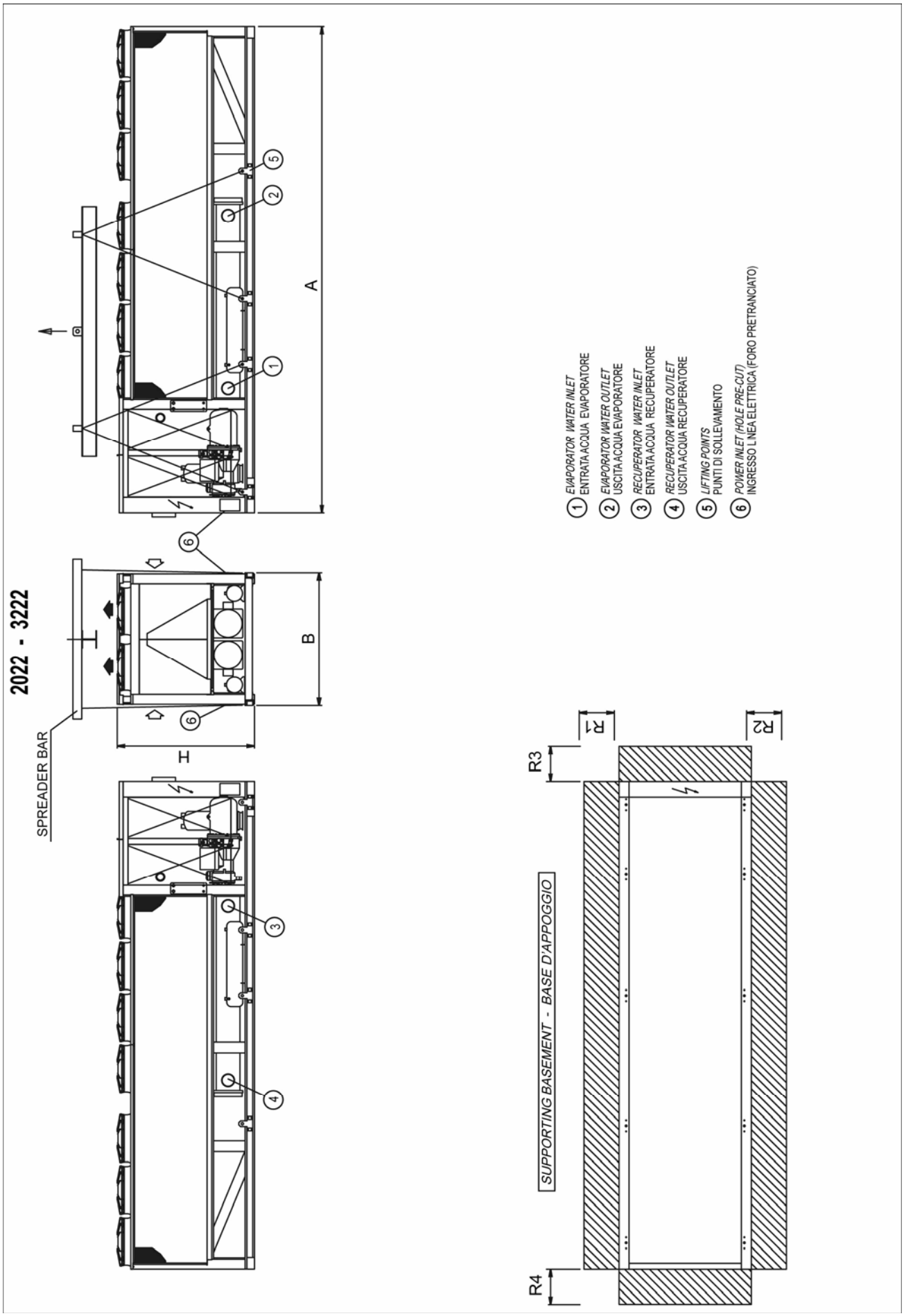
DIMENSIONAL DRAWINGS

SIZE	DIMENSIONS AND				FREE SPACES				PLANT SIDE COLD HEAT EXCHANGER		SOURCE SIDE HEAT EXCHANGER		PLANT SIDE HOT HEAT EXCHANGER	
	A	B	H	PESO	R1	R2	R3	R4	IN/OUT		IN/OUT		IN/OUT	
	[mm]	[mm]	[mm]	[kg]	[mm]	[mm]	[mm]	[mm]	TYPE	Ø	TYPE	Ø	TYPE	Ø
ERACS2-Q /CA 1062	4610	2220	2150	3600	2000	2000	1100	1100	UNI ISO 7/1-R4	4"	UNI ISO 7/1-R4	4"	UNI ISO 7/1-R4	4"
ERACS2-Q /CA 1162	4610	2220	2420	3870	2000	2000	1100	1100	UNI ISO 7/1-R4	4"	UNI ISO 7/1-R4	4"	UNI ISO 7/1-R4	4"
ERACS2-Q /CA 1362	5610	2220	2430	4620	2000	2000	1100	1100	UNI ISO 7/1-R4	4"	UNI ISO 7/1-R4	4"	UNI ISO 7/1-R4	4"
ERACS2-Q /CA 1562	5610	2220	2430	5040	2000	2000	1100	1100	UNI ISO 7/1-R4	4"	UNI ISO 7/1-R4	4"	UNI ISO 7/1-R4	4"
ERACS2-Q /CA 1762	6610	2220	2430	5520	2000	2000	1100	1100	UNI ISO 7/1-R4	4"	UNI ISO 7/1-R4	4"	UNI ISO 7/1-R4	4"
ERACS2-Q /CA 1962	6610	2220	2430	5670	2000	2000	1100	1100	UNI ISO 7/1-R4	4"	UNI ISO 7/1-R4	4"	UNI ISO 7/1-R4	4"
ERACS2-Q /LN-CA 1062	4610	2220	2150	3600	2000	2000	1100	1100	UNI ISO 7/1-R4	4"	UNI ISO 7/1-R4	4"	UNI ISO 7/1-R4	4"
ERACS2-Q /LN-CA 1162	4610	2220	2420	3870	2000	2000	1100	1100	UNI ISO 7/1-R4	4"	UNI ISO 7/1-R4	4"	UNI ISO 7/1-R4	4"
ERACS2-Q /LN-CA 1362	5610	2220	2430	4620	2000	2000	1100	1100	UNI ISO 7/1-R4	4"	UNI ISO 7/1-R4	4"	UNI ISO 7/1-R4	4"
ERACS2-Q /LN-CA 1562	5610	2220	2430	5040	2000	2000	1100	1100	UNI ISO 7/1-R4	4"	UNI ISO 7/1-R4	4"	UNI ISO 7/1-R4	4"
ERACS2-Q /LN-CA 1762	6610	2220	2430	5520	2000	2000	1100	1100	UNI ISO 7/1-R4	4"	UNI ISO 7/1-R4	4"	UNI ISO 7/1-R4	4"
ERACS2-Q /LN-CA 1962	6610	2220	2430	5670	2000	2000	1100	1100	UNI ISO 7/1-R4	4"	UNI ISO 7/1-R4	4"	UNI ISO 7/1-R4	4"
ERACS2-Q /SL-CA 1062	4610	2220	2150	3600	2000	2000	1100	1100	UNI ISO 7/1-R4	4"	UNI ISO 7/1-R4	4"	UNI ISO 7/1-R4	4"
ERACS2-Q /SL-CA 1162	4610	2220	2420	3870	2000	2000	1100	1100	UNI ISO 7/1-R4	4"	UNI ISO 7/1-R4	4"	UNI ISO 7/1-R4	4"
ERACS2-Q /SL-CA 1362	5610	2220	2430	4620	2000	2000	1100	1100	UNI ISO 7/1-R4	4"	UNI ISO 7/1-R4	4"	UNI ISO 7/1-R4	4"
ERACS2-Q /SL-CA 1562	5610	2220	2430	5040	2000	2000	1100	1100	UNI ISO 7/1-R4	4"	UNI ISO 7/1-R4	4"	UNI ISO 7/1-R4	4"
ERACS2-Q /SL-CA 1762	6610	2220	2430	5520	2000	2000	1100	1100	UNI ISO 7/1-R4	4"	UNI ISO 7/1-R4	4"	UNI ISO 7/1-R4	4"
ERACS2-Q /SL-CA 1962	6610	2220	2430	5670	2000	2000	1100	1100	UNI ISO 7/1-R4	4"	UNI ISO 7/1-R4	4"	UNI ISO 7/1-R4	4"
ERACS2-Q /XL-CA-E 1062	4610	2220	2420	3900	2000	2000	1100	1100	UNI ISO 7/1-R4	4"	UNI ISO 7/1-R4	4"	UNI ISO 7/1-R4	4"
ERACS2-Q /XL-CA-E 1162	5610	2220	2430	4490	2000	2000	1100	1100	UNI ISO 7/1-R4	4"	UNI ISO 7/1-R4	4"	UNI ISO 7/1-R4	4"
ERACS2-Q /XL-CA-E 1362	5610	2220	2430	4830	2000	2000	1100	1100	UNI ISO 7/1-R4	4"	UNI ISO 7/1-R4	4"	UNI ISO 7/1-R4	4"
ERACS2-Q /XL-CA-E 1562	6610	2220	2430	5590	2000	2000	1100	1100	UNI ISO 7/1-R4	4"	UNI ISO 7/1-R4	4"	UNI ISO 7/1-R4	4"
ERACS2-Q /XL-CA-E 1762	6610	2220	2430	5730	2000	2000	1100	1100	UNI ISO 7/1-R4	4"	UNI ISO 7/1-R4	4"	UNI ISO 7/1-R4	4"



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DIMENSIONAL DRAWINGS

SIZE	DIMENSIONS AND				FREE SPACES				PLANT SIDE COLD HEAT EXCHANGER		SOURCE SIDE HEAT EXCHANGER		PLANT SIDE HOT HEAT EXCHANGER	
	A	B	H	PESO	R1	R2	R3	R4	IN/OUT		IN/OUT		IN/OUT	
	[mm]	[mm]	[mm]	[kg]	[mm]	[mm]	[mm]	[mm]	TYPE	Ø	TYPE	Ø	TYPE	Ø
ERACS2-Q /CA 2022	6300	2260	2350	7580	2000	2000	1800	1500	FLEXIBLE JOINT	6"	FLEXIBLE JOINT	6"	FLEXIBLE JOINT	6"
ERACS2-Q /CA 2222	7200	2260	2350	8060	2000	2000	1800	1500	FLEXIBLE JOINT	6"	FLEXIBLE JOINT	6"	FLEXIBLE JOINT	6"
ERACS2-Q /CA 2422	7200	2260	2350	8160	2000	2000	1800	1500	FLEXIBLE JOINT	6"	FLEXIBLE JOINT	6"	FLEXIBLE JOINT	6"
ERACS2-Q /CA 2622	7200	2260	2350	8600	2000	2000	1800	1500	FLEXIBLE JOINT	8"	FLEXIBLE JOINT	8"	FLEXIBLE JOINT	8"
ERACS2-Q /CA 2722	8400	2260	2350	9160	2000	2000	1800	1500	FLEXIBLE JOINT	8"	FLEXIBLE JOINT	8"	FLEXIBLE JOINT	8"
ERACS2-Q /CA 3222	9700	2260	2350	11380	2000	2000	1800	1500	FLEXIBLE JOINT	8"	FLEXIBLE JOINT	8"	FLEXIBLE JOINT	8"
ERACS2-Q /LN-CA 2022	6300	2260	2350	7580	2000	2000	1800	1500	FLEXIBLE JOINT	6"	FLEXIBLE JOINT	6"	FLEXIBLE JOINT	6"
ERACS2-Q /LN-CA 2222	7200	2260	2350	8060	2000	2000	1800	1500	FLEXIBLE JOINT	6"	FLEXIBLE JOINT	6"	FLEXIBLE JOINT	6"
ERACS2-Q /LN-CA 2422	7200	2260	2350	8160	2000	2000	1800	1500	FLEXIBLE JOINT	6"	FLEXIBLE JOINT	6"	FLEXIBLE JOINT	6"
ERACS2-Q /LN-CA 2622	7200	2260	2350	8600	2000	2000	1800	1500	FLEXIBLE JOINT	8"	FLEXIBLE JOINT	8"	FLEXIBLE JOINT	8"
ERACS2-Q /LN-CA 2722	8400	2260	2350	9160	2000	2000	1800	1500	FLEXIBLE JOINT	8"	FLEXIBLE JOINT	8"	FLEXIBLE JOINT	8"
ERACS2-Q /LN-CA 3222	9700	2260	2350	11380	2000	2000	1800	1500	FLEXIBLE JOINT	8"	FLEXIBLE JOINT	8"	FLEXIBLE JOINT	8"
ERACS2-Q /SL-CA 2022	6300	2260	2350	7670	2000	2000	1800	1500	FLEXIBLE JOINT	6"	FLEXIBLE JOINT	6"	FLEXIBLE JOINT	6"
ERACS2-Q /SL-CA 2222	7200	2260	2350	8150	2000	2000	1800	1500	FLEXIBLE JOINT	6"	FLEXIBLE JOINT	6"	FLEXIBLE JOINT	6"
ERACS2-Q /SL-CA 2422	7200	2260	2350	8250	2000	2000	1800	1500	FLEXIBLE JOINT	6"	FLEXIBLE JOINT	6"	FLEXIBLE JOINT	6"
ERACS2-Q /SL-CA 2622	7200	2260	2350	8690	2000	2000	1800	1500	FLEXIBLE JOINT	8"	FLEXIBLE JOINT	8"	FLEXIBLE JOINT	8"
ERACS2-Q /SL-CA 2722	8400	2260	2350	9260	2000	2000	1800	1500	FLEXIBLE JOINT	8"	FLEXIBLE JOINT	8"	FLEXIBLE JOINT	8"
ERACS2-Q /SL-CA 3222	9700	2260	2350	11480	2000	2000	1800	1500	FLEXIBLE JOINT	8"	FLEXIBLE JOINT	8"	FLEXIBLE JOINT	8"
ERACS2-Q /XL-CA 2022	6300	2260	2350	7790	2000	2000	1800	1500	FLEXIBLE JOINT	6"	FLEXIBLE JOINT	6"	FLEXIBLE JOINT	6"
ERACS2-Q /XL-CA 2222	7200	2260	2350	8260	2000	2000	1800	1500	FLEXIBLE JOINT	6"	FLEXIBLE JOINT	6"	FLEXIBLE JOINT	6"
ERACS2-Q /XL-CA 2422	7200	2260	2350	8350	2000	2000	1800	1500	FLEXIBLE JOINT	6"	FLEXIBLE JOINT	6"	FLEXIBLE JOINT	6"
ERACS2-Q /XL-CA 2622	7200	2260	2350	8790	2000	2000	1800	1500	FLEXIBLE JOINT	8"	FLEXIBLE JOINT	8"	FLEXIBLE JOINT	8"
ERACS2-Q /XL-CA 2722	8400	2260	2350	9340	2000	2000	1800	1500	FLEXIBLE JOINT	8"	FLEXIBLE JOINT	8"	FLEXIBLE JOINT	8"
ERACS2-Q /XL-CA 3222	9700	2260	2350	11580	2000	2000	1800	1500	FLEXIBLE JOINT	8"	FLEXIBLE JOINT	8"	FLEXIBLE JOINT	8"
ERACS2-Q /XL-CA-E 2022	8400	2260	2350	8510	2000	2000	1800	1500	FLEXIBLE JOINT	6"	FLEXIBLE JOINT	6"	FLEXIBLE JOINT	6"
ERACS2-Q /XL-CA-E 2222	9300	2260	2350	8720	2000	2000	1800	1500	FLEXIBLE JOINT	6"	FLEXIBLE JOINT	6"	FLEXIBLE JOINT	6"
ERACS2-Q /XL-CA-E 2422	9300	2260	2350	8890	2000	2000	1800	1500	FLEXIBLE JOINT	6"	FLEXIBLE JOINT	6"	FLEXIBLE JOINT	6"
ERACS2-Q /XL-CA-E 2622	9300	2260	2350	9400	2000	2000	1800	1500	FLEXIBLE JOINT	8"	FLEXIBLE JOINT	8"	FLEXIBLE JOINT	8"

DIMENSIONAL DRAWINGS

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

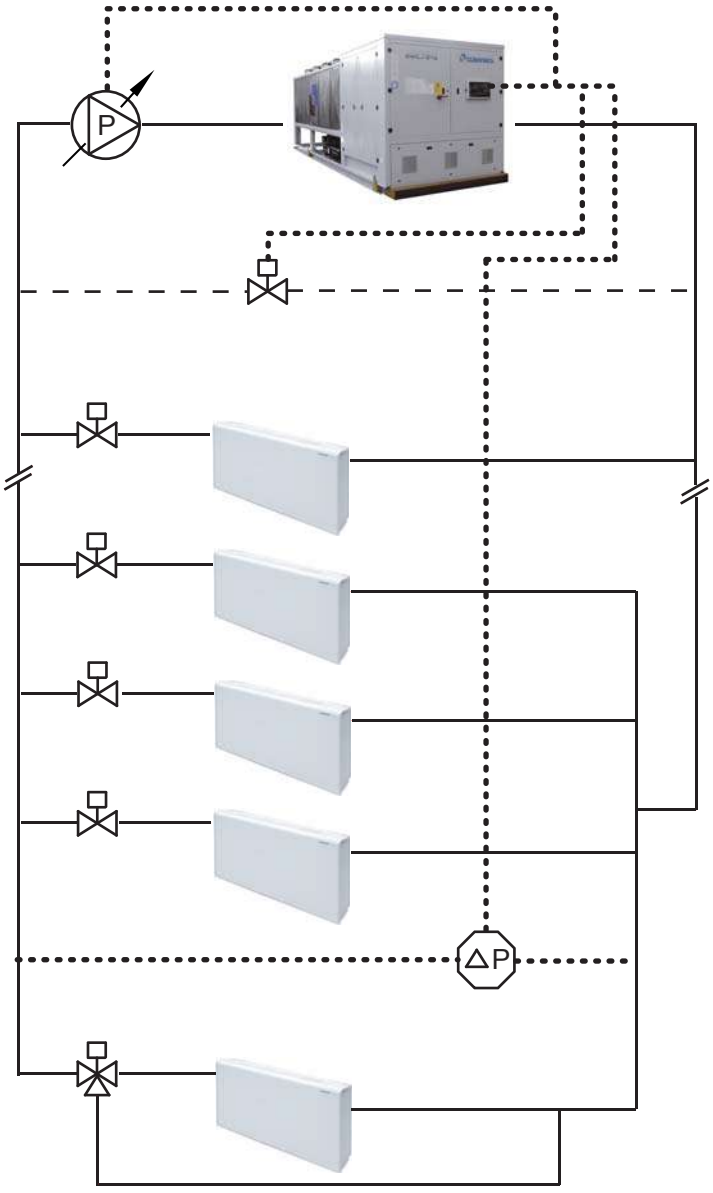
Notes:

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

9. VARIABLE FLOW HYDRONIC GROUP (optional)

The energy consumption associated with fluid circulation weighs heavily on the total operating costs of a large installation, especially when the units work at part load, and even more, when they are in stand-by. Under these conditions, although the power absorbed by the compressors and fans is reduced, the power consumed for water circulation remains high.
The ERACS2 units permit reduction in system power consumption using inverter driven pumps. Energy savings are considerable and immediately evident, since a Δx reduction on the waterflow means an energy saving up to an amount of $(\Delta x)^3$.
High head or low head inverter driven pumps are available as an option.
In the most advanced systems (see the simplified model shown in the diagram below), these become the pumps for the entire hydraulic circuit, and this eliminates the need to detach a primary circuit (constant flow) on the units and a secondary circuit (variable flow) on the plant.
This hydraulic separation was forced in the past, since the units weren't designed to properly work with variable flow. Now, thanks to the ERACS2 units, plant designers need no longer worry about this limitation. The units have been designed to work with maximum efficiency even with variable flow on the main heat exchangers; all the resources independently adjusts themselves in order to keep the outlet water temperature constant.
This important feature simplifies the systems' design and offers advantages in terms of both reductions in consumption and hydraulic circuit sizing. The integration of pumps + inverters in the unit permits significant savings in space, circuit components, and system start-up times. To conclude, this innovative solution gives, beyond energy saving and running cost reduction, even advantages in the initial capital cost of the plant. The plant itself infact, is simplified.



Example of a 2-pipe plant with a single hydraulic variable flow circuit
(pressure transducer and by-pass valve at costumer care)

VARIABLE FLOW HYDRONIC GROUP (optional)

9.1 VPF systems: plants designed with a single variable f ow hydraulic circuit

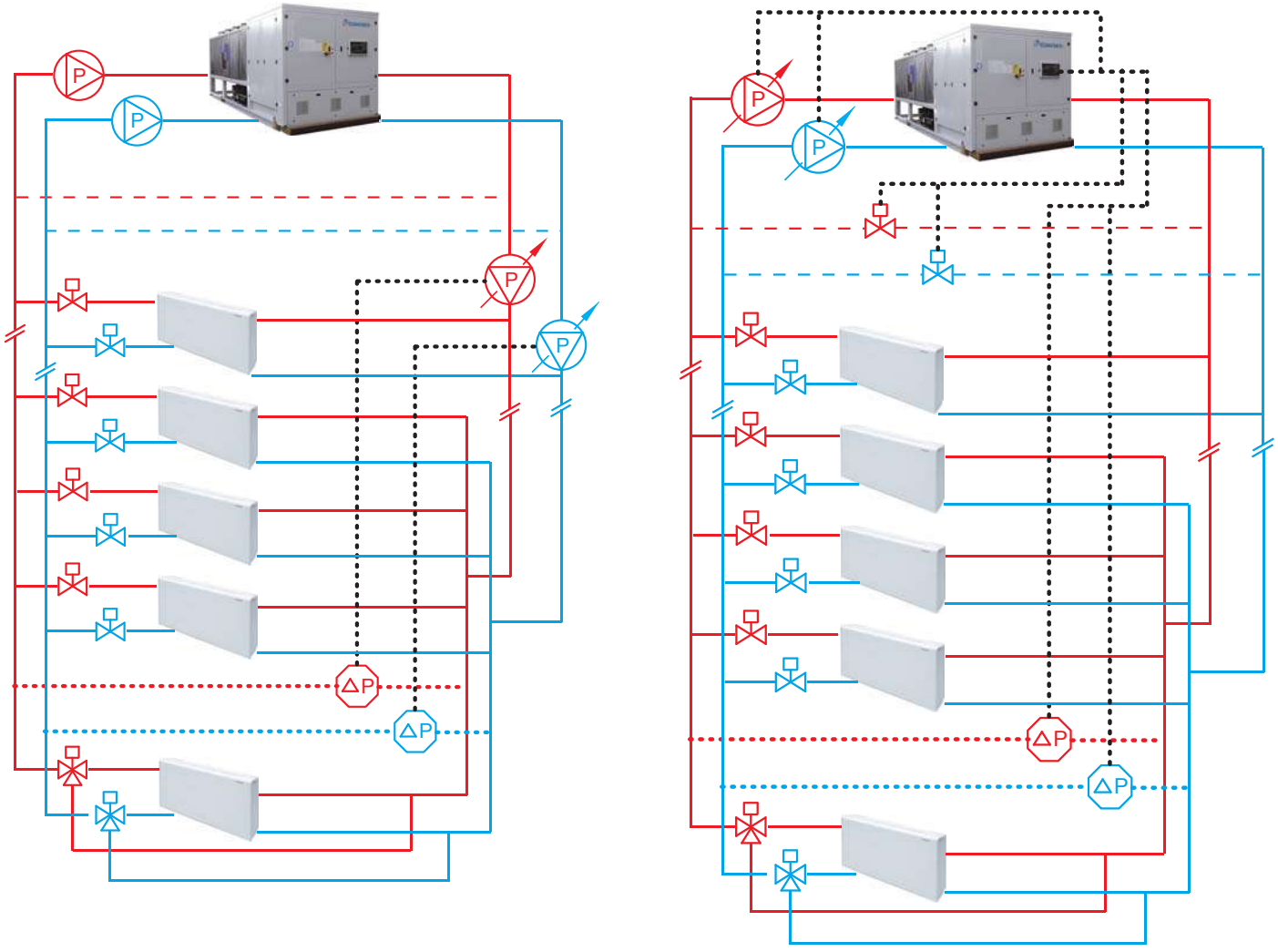
Traditional plant

The two hydraulic circuits of the plant can be recognized: the hot and the cold one.
In the traditional solution, both of them are hydraulically splitted in a primary constant flow circuit (insisting on the units) and a secondary variable flow circuit dedicated to the plant's final utilities.
An element of the plant works to decouple the two circuits: when pumps user-side partialize according to the building's requestes, it balances the all system by-passing the exceding flow to the unit.

The unit manages its own pumps as a function of its state (on/off) balancing the operating hours between them.
On the other side, the plant's inverter-pumps are managed through a differential pressure transducer: it reads the pressure drops variation on the circuit and traduce them in a power signal; this signal reports the percentage of load on the building and determines the pumps' modulation.

"Smart" plant

In this advanced solution for plant's design, both the cold and hot circuits are variable flow circuits.
The inverter-pumps insist on the cold and hot heat exchangers and are controlled directly by the unit's W3000 controller.
The sophisticated algorithms developed by Climaveneta allow the direct power signals coming from the plant's pressure transducer to be elaborated; this elaboration's result is the pumps and by-pass valves control through voltage signals.
The complete control of all resources (compressors, fans, pumps and by-pass valves) ensures the maximum system's efficiency together with the highest reliability on the units.



Example of a 4-pipe plant with two single hydraulic variable flow circuits (pressure transducers and by-pass valves at costumer care)

VARIABLE FLOW HYDRONIC GROUP (optional)

Differential pressure transducer on the farest pipe of the plant and by-pass valve are at customer charge.
Climaveneta provides only some indications for the plants design, as a function of the minimum waterflow on the primary heat exchanger.

Minimum waterf ow to technical bulletin [m3/h]	Kvs	Recommended valve	∅ Valve	Valve motor	∅ ByPass
19 to 30	40	VVG41.50	DN50	SKB60	DN50 (2”)
up to 37	49	VVF31.65	DN65	SKB60	DN65 (2"½)
up to 60	78	VVF31.80	DN80	SKB60	DN80 (3“)
up to 95	124	VVF31.90	DN100	SKC60	DN100 (4“)
up to 150	200	VVF31.91	DN125	SKC60	DN125 (5“)
up to 230	300	VVF31.92	DN150	SKC60	DN150 (6”)

2-way valve and minimum recommended bypass pipe diameter as a function of the minimum waterflow.

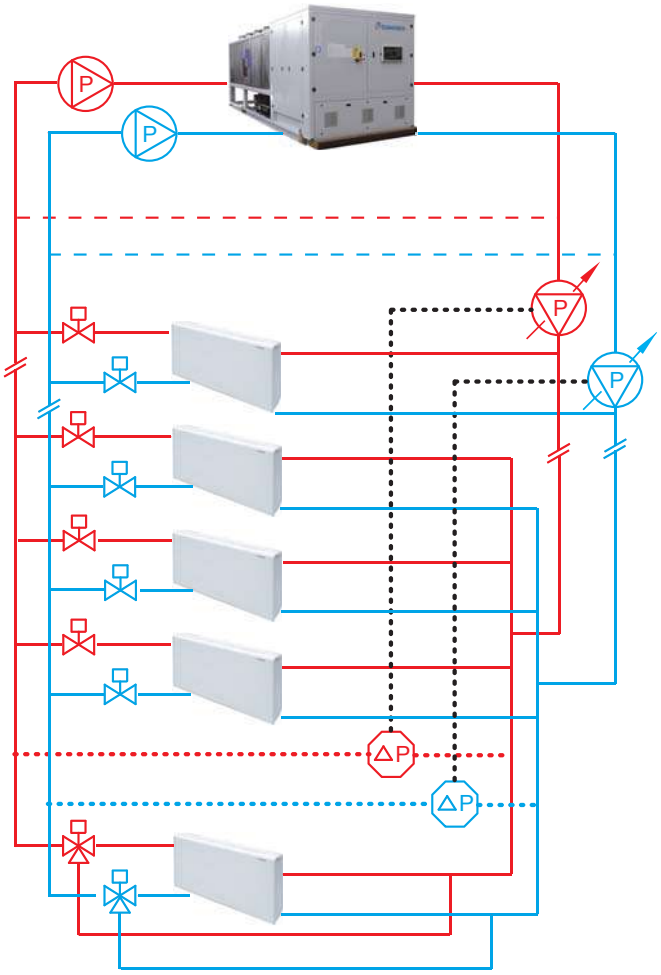
VARIABLE FLOW HYDRONIC GROUP (optional)

9.2 VPF.D systems: plants designed for variable f ow, decoupled, primary and secondary circuits

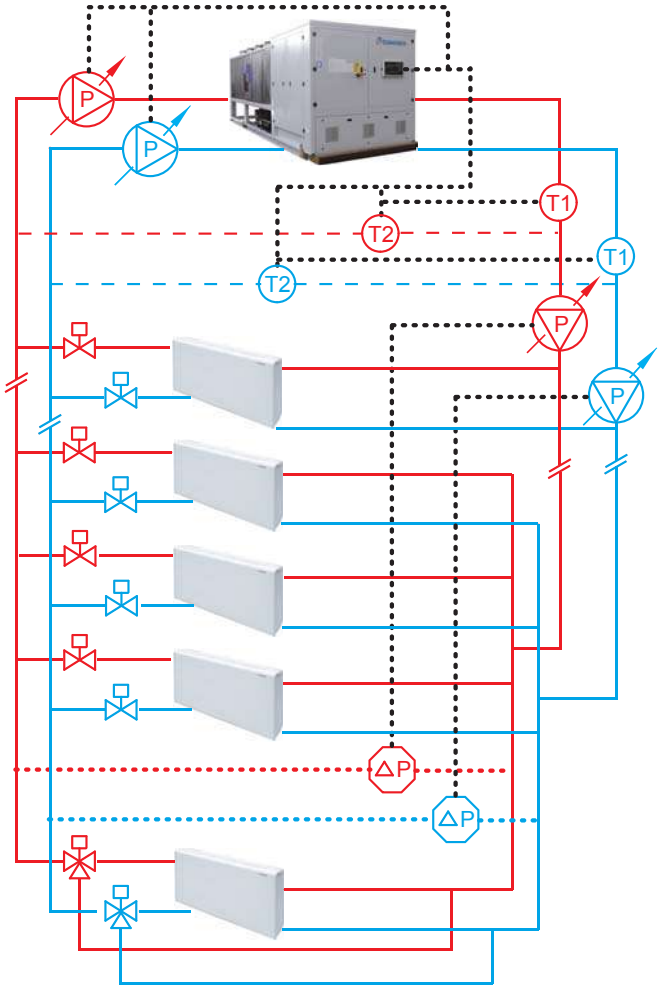
Even in that cases in which is not possible to work with a single variable primary flow circuits, or in that situations in which is preferible to mantain decoupled the primary circuits (to the units) and the secondary circuit (to the plants), it's possible the primary flow on pumps controlled by the unit.
The energy savings are lower than the solution with a unique VPF system, but still important expecially when the units are in stand-by and it's possible to reduce the waterflow through the unit up to 50%.
The VPF.D systems can be easily adopted in retrofitt application, where the chiller is supposed to be replaced but not the plant.

The regulation is up to the unit's controller, detecting the delta temperature at the primary heat exchanger: when the building's load decreases, waterflow is reduced in order to mantain a fixed delta T between the exchangers' inlet and outlet.
The VPF.D system by Climaveneta assures even the waterflow balancing between primary and secondary circuit, in order to avoid the flow inversion in the decoupling pipe.

Traditional plant



"Smart" plant



Example of a 4-pipe plant with cold and hot circuits hydraulically separated in a primary and a secondary ones, both of them featuring variable flow

Climaveneta provides in the table below some indications for the plants design, as a function of the nominal waterflow on the primary heat exchanger.
NOTE: temperature probes are separately supplied

Minimum waterf ow to technical bulletin [m3/h]	∅ Decoupling pipe
25 to 40	2"½
up to 60	3"
up to 100	4"
up to 150	5"
up to 225	6"
up to 375	8"

Minimum decoupling pipe diameter as a function of the minimum waterflow

VARIABLE FLOW HYDRONIC GROUP (optional)

Variable f ow hydraulic group consisting of:
- 2 inverter-pumps per each hydraulic circuit
- discharge valves
- pump inlet / outlet valves
- check valve
- air vent
- inverter with 25-50 Hz frequency modulation capability
- extensions on the W3000 controller for the complete management of variable flow pumps
- additional pressure transducer for increased safety controlling the minimum flow of water to the evaporator.

WARNING:
In VPF configuration both the differential pressure transducers and the by-pass valves are at costumer care.
The only must for the Climaveneta control to work properly is that:
- differential pressure transducers must give a electrical power signal 4-20 mA
- by-pass valves must be engined by a 0-10 V signal.

Each of the components of the hydraulic group has been designed to optimise hydraulic and electrical installation space, time and costs.The following solutions are available on request:

Low or high head pump
Horizontal one-piece centrifuge pump, normalised to EN 733, axial suction and radial delivery, cast iron body and AISI 316L stainless steel impeller. The section of the shaft in contact with the liquid is made of stainless steel. Mechanical seal with components in various materials depending on the size: ceramic/carbon/NBR or carbon/carburundum/silicon/EPDM.Three-phase electric motor protected to IP55, insulation class F, suitable for continuous service.
The pump is combined with a frequency converter with 25-50 Hz modulation capability. The inverter is a feeding device, which when connected to the pump motor permits intelligent management as required by system conditions and the loads required. Pump motor-inverter assembly and connection are performed by Climaveneta.
The second pump operates in stand-by to the first. The relative operating hours of the two pumps are balanced. In case the operating pump breaks down, the reserve pump is automatically enabled.

Special pumps
For pumps with different con gurations, please contact oursales department.

Integration of pumps in each size
For the integration of the pumps and the circuit's hydraulic diagram, see Enclosure B to this bulletin.

Pump characteristics
For the technical speci cations of the pumps installed and the respective curve characteristics, see Enclosure B to this bulletin.

CLIMAVENETA®

eco Changes for a greener tomorrow

Eco Changes is the Mitsubishi Electric Group's environmental statement, and expresses the Group's stance on environmental management. Through a wide range of businesses, we are helping contribute to the realization of a sustainable society.

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