

FOCS-NR

r HFC
R-134a

1062 - 3222
200 - 826 kW

Reversible unit, NRG line, total heat recovery, air source
for outdoor installation



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

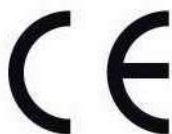
- Unique proposal
- Extensive range of operation
- Hot water supply
- Version 'XL-CA-E' available

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Company quality system
certified to UNI EN ISO 9001

Liability disclaimer

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

This bulletin refers to standard executions, in particular for dimension, weight, electric, hydraulic, aeraulic and refrigerant connections (whereas applicable). Contact Climaveneta Commercial Office for further drawings and schemes.

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1. PRODUCT PRESENTATION

FOCS-NR units are designed for two-pipe systems and are able to produce hot or cold water and even hot water on an auxiliary circuit when needed for domestic utilities or post heating for air conditioning units.

In summer mode, the unit is fully managed like a refrigerator with the possibility of recovery condensation heat through an auxiliary exchanger. In winter mode, the unit can manage heat production on two circuits: space heating and domestic hot water production according to each one's demand and priorities set by the user.

Unità reversibile linea NRG, recupero totale di calore, sorgente aria, installazione esterna

The FOCS-NR units are ideal for outdoor installation. For these products, the coil permits heat exchange with outdoor air, acting as an evaporator or condenser according to machine operating conditions.

The FOCS-NR units are suitable for the complete range of operating conditions, also attained thanks to efficient energy management for defrosting. This is based on special algorithms specifically developed by Climaveneta that ensure correct unit operations, reducing time and energy spent for defrosting to a minimum.



1.1 Unique proposal

Unique proposal: unit designed to satisfy, according to the mode of operation, requirements of cold water, hot water for heating or hot water for domestic use.

1.2 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.



1.3 Hot water supply

Hot water supply up to 55°C. In winter mode the unit manages hot water production in the plant-side heat exchanger and in the reclaim one, with priority settled by customer, eventually at two different set-points.

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 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 FOCS-NR 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

Reversible unit, NRG line, total heat recovery, air source for outdoor installation

Outdoor heat pump unit for the production of chilled/hot water with semi-hermetic screw compressors optimized for R134a, axial-flow fans, external coil with copper tubes and aluminium fins, shell and tubes heat exchangers designed by Climaveneta and thermostatic expansion valve. Base and supporting structure and panels are galvanized epoxy powder coated steel with increased thickness. These units are designed for two-pipes systems and are able to produce hot or cold water and even hot water on an auxiliary circuit when needed for domestic utilities or post heating for air conditioning units.

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 resistance 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
- externally equalised thermostatic 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
- reversing cycle valve

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 fit-

ted 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 heat exchanger

Shell and tube heat exchanger; it acts as an evaporator or as a condenser depending to the unit's commutation; refrigerant flows 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 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 anomalies and overheating. The heat exchanger is made in compliance with PED standard work pressure requisites.

Heat exchanger for heat reclaim

Shell and tube heat exchanger working as a condenser to provide, on request, hot water for secondary uses (domestic hot water, treatments on AHU, ...); refrigerant flows 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 comply with PED standards, concerning to operating pressure.

Source side heat exchanger

Air-refrigerant heat exchanger, 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 aerodynamic 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 Certifications

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 W3000SE Large controller offers advanced functions and algorithms. The keypad features an easy-to-use interface and a complete LCD display, allowing to consult and intervene on the unit by means of a multi-level menu, with selectable language setting. The regulation operates on both water circuits featuring the step-wise regulation referred to the return water temperature with proportional logic. This allows to satisfy simultaneously the different requests of both cooling and heating, according to the selected operation mode. The diagnostics includes a complete alarm management, with the "black-box" and alarm logging functions for enhanced analysis of the unit operation. For multiple units' systems, the regulation of the resources, via optional proprietary devices, can be implemented. Energy metering, for both consumption and capacity, can also be developed. Supervision can be easily developed via proprietary devices or the integration in third party systems by means of the most common protocols as ModBus, Bacnet, Bacnet-over-IP, Echelon LonWorks. Compatibility with the remote keyboard managing up to 10 units. Availability of an internal real time clock for operation scheduling (4-day profiles with 10 hour belts). The defrost adopts a proprietary self-adaptive logic, which features the

monitoring of numerous operational parameters. This 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 Accessories

- 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)

- Variable flow hydronic group (see dedicate section)

- kit HWT

Kit for increased hot primary heat exchanger leaving water temperature up to 62°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 load.

- 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 protocols.

- 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

- Griglia antintrusione

Avoid the intrusion of solid bodies into the unit's structure (only for size 2022-3222).

- Remote signal double SET POINT

Allows to activate the Energy Saving set-point.
Enforce Energy Saving policy.

- 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 standby to the other, it's possible to balance the operating hours between them.

- BACnet OVER IP connectivity

Interface module for BACnet OVER-IP protocols.
Allows to interconnect BACnet devices over Internet Protocol within wide-area networks.

- 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.

Altri accessori

- Flanged evaporator connection
- Evaporator flowswitch (water side)
- Container packing
- Rubber anti vibration device
- Spring anti vibration device
- Numbered cables on electrical board
- Power factor correction
- Double insulation on evaporator
- Double antifreeze heater
- Coil's protection grill and nylon coverage

2.7 Operating principle

The Energy line units, FOCS-NR, are reversible units, specifically designed for 2+2 pipes plants.

This kind of plants have one main circuit dedicated to the summer/winter air conditioning and one circuit for secondary uses, like sanitary hot water production or hot water production for air treatment in typical AHU applications.

The unit has 2 separate sections: one dedicated for the cold/hot water production for air conditioning, and the other one dedicated for heat reclaim for secondary uses.

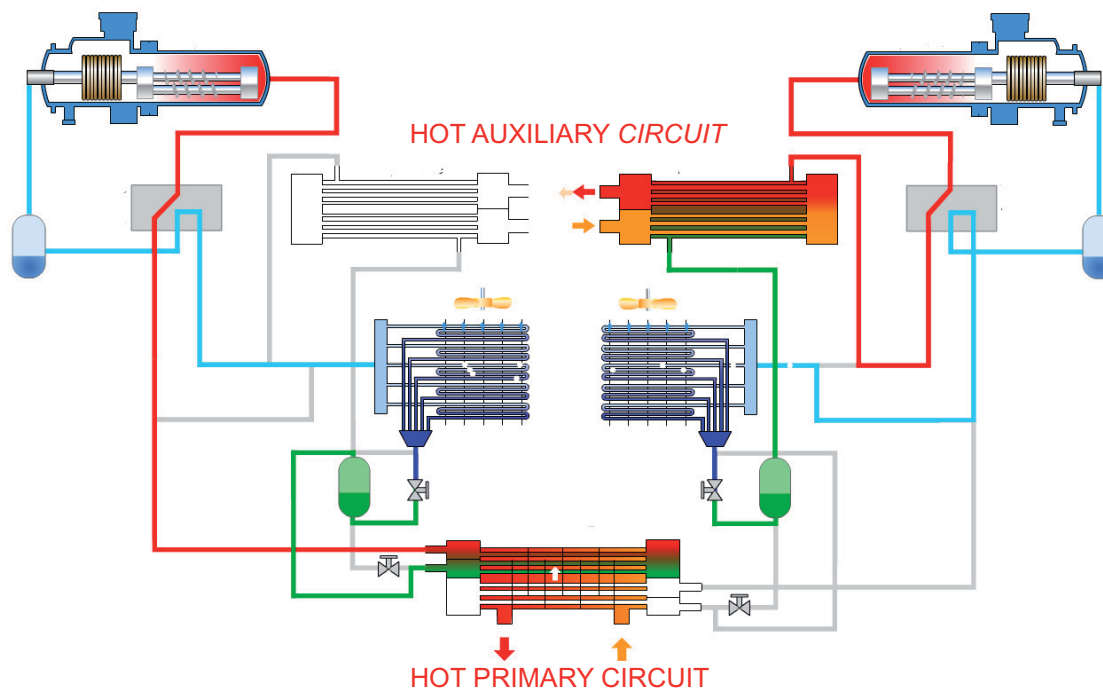
They can be distinguished the following working modes. for each of the two commutation ("summer" "mode") of a typical heat pump.

WINTER MODE

In the winter mode, hot water for the hydronic conditioning units is produced in the main water circuit which crosses the evaporator/condenser exchanger. (See figure below)

Hot water can be produced on request in the heat recovery exchanger for secondary users such as the domestic hot water system. It is not possible to produce hot water in the two exchangers belonging to the same cooling circuit at the same

time. As the units feature various independent cooling circuits, in the presence of partial loads, hot water can be produced both in the main and the recovery circuits at the same time. The unit's controller can be programmed to give priority either to the production of hot water through the main evaporator/condenser exchanger or to the production of hot water in the auxiliary circuit.



3.1 GENERAL TECHNICAL DATA

FOCS-NR CA

SIZE		1062	1162	1362	1562	1762	1962	2022
FOCS-NR /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
FOCS-NR /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
FOCS-NR /CA								
COOLING WITH TOTAL RECOVERY (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
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
FOCS-NR /CA								
TOTAL RECOVERY ONLY (4)								
Total heat recovery capacity	kW	218	258	308	339	396	434	492
Total power input (unit)	kW	59,8	73,5	85,0	91,7	112	119	137
Heat exchanger recovery water flow	m³/h	37,8	44,9	53,6	58,9	68,7	75,4	85,5
Heat exchanger recovery pressure drop	kPa	31,5	44,3	38,8	46,9	44,4	29,6	28,2
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	STEPS
Minimum capacity steps	%	25	25	25	25	25	25	25
Type of refrigerant	R134a	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 (5)								
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 (6)								
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
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 87% R.H.

3 Plant (side) cooling exchanger water (in/out) 12/7 °C
Heat exchanger air (in) 35 °C

4 Plant (side) heat exchanger recovery water (in/out) 40/45 °C
Plant (side) heat exchanger recovery water (in/out) 40/45 °C
Source (side) heat exchanger air (in) 7 °C

5 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

6 Standard configuration
- Not available

GENERAL TECHNICAL DATA

FOCS-NR
CA

SIZE		2222	2422	2622	2722	3222		
FOCS-NR /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		
FOCS-NR /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		
FOCS-NR /CA COOLING WITH TOTAL RECOVERY (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		
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		
FOCS-NR /CA TOTAL RECOVERY ONLY (4)								
Total heat recovery capacity	kW	541	571	615	711	826		
Total power input (unit)	kW	145	154	163	190	221		
Heat exchanger recovery water flow	m³/h	94,1	99,2	107	124	143		
Heat exchanger recovery pressure drop	kPa	31,4	34,9	22,8	31,9	31,5		
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	STEPS		
Minimum capacity steps	%	25	25	25	25	25		
Type of refrigerant	R134a	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 (5)								
Total sound power	dB(A)	101	101	101	101	102		
Total sound pressure	dB(A)	68	68	68	68	69		
DIMENSIONS AND WEIGHTS (6)								
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
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 87% R.H.

3 Plant (side) cooling exchanger water (in/out) 12/7 °C
Heat exchanger air (in) 35 °C

4 Plant (side) heat exchanger recovery water (in/out) 40/45 °C
Plant (side) heat exchanger recovery water (in/out) 40/45 °C
Source (side) heat exchanger air (in) 7 °C

5 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

6 Standard configuration
- Not available

GENERAL TECHNICAL DATA

FOCS-NR
LN-CA

SIZE		1062	1162	1362	1562	1762	1962	2022
FOCS-NR /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
FOCS-NR /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
FOCS-NR /LN-CA COOLING WITH TOTAL RECOVERY (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
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
FOCS-NR /LN-CA TOTAL RECOVERY ONLY (4)								
Total heat recovery capacity	kW	218	258	308	339	396	434	492
Total power input (unit)	kW	59,8	73,5	85,0	91,7	112	119	137
Heat exchanger recovery water flow	m³/h	37,8	44,9	53,6	58,9	68,7	75,4	85,5
Heat exchanger recovery pressure drop	kPa	31,5	44,3	38,8	46,9	44,4	29,6	28,2
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	STEPS
Minimum capacity steps	%	25	25	25	25	25	25	25
Type of refrigerant	R134a	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 (5)								
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 (6)								
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
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 87% R.H.

3 Plant (side) cooling exchanger water (in/out) 12/7 °C
Heat exchanger air (in) 35 °C

4 Plant (side) heat exchanger recovery water (in/out) 40/45 °C
Plant (side) heat exchanger recovery water (in/out) 40/45 °C
Source (side) heat exchanger air (in) 7 °C

5 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

6 Standard configuration
- Not available

GENERAL TECHNICAL DATA

FOCS-NR
LN-CA

SIZE		2222	2422	2622	2722	3222		
FOCS-NR /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		
FOCS-NR /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		
FOCS-NR /LN-CA COOLING WITH TOTAL RECOVERY (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		
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		
FOCS-NR /LN-CA TOTAL RECOVERY ONLY (4)								
Total heat recovery capacity	kW	541	571	615	711	826		
Total power input (unit)	kW	145	154	163	190	221		
Heat exchanger recovery water flow	m³/h	94,1	99,2	107	124	143		
Heat exchanger recovery pressure drop	kPa	31,4	34,9	22,8	31,9	31,5		
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	STEPS		
Minimum capacity steps	%	25	25	25	25	25		
Type of refrigerant	R134a	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 (5)								
Total sound power	dB(A)	95	95	95	95	96		
Total sound pressure	dB(A)	62	62	62	62	63		
DIMENSIONS AND WEIGHTS (6)								
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
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 87% R.H.

3 Plant (side) cooling exchanger water (in/out) 12/7 °C
Heat exchanger air (in) 35 °C

4 Plant (side) heat exchanger recovery water (in/out) 40/45 °C
Plant (side) heat exchanger recovery water (in/out) 40/45 °C
Source (side) heat exchanger air (in) 7 °C

5 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

6 Standard configuration
- Not available

GENERAL TECHNICAL DATA

FOCS-NR
SL-CA

SIZE		1062	1162	1362	1562	1762	1962	2022
FOCS-NR /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
FOCS-NR /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
FOCS-NR /SL-CA COOLING WITH TOTAL RECOVERY (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
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
FOCS-NR /SL-CA TOTAL RECOVERY ONLY (4)								
Total heat recovery capacity	kW	211	251	301	330	385	422	486
Total power input (unit)	kW	59,4	73,0	84,5	91,2	111	118	136
Heat exchanger recovery water flow	m³/h	36,7	43,6	52,3	57,4	66,9	73,3	84,4
Heat exchanger recovery pressure drop	kPa	29,6	41,9	36,9	44,4	42,1	27,9	27,5
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	STEPS
Minimum capacity steps	%	25	25	25	25	25	25	25
Type of refrigerant	R134a	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 (5)								
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 (6)								
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
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 87% R.H.

3 Plant (side) cooling exchanger water (in/out) 12/7 °C
Heat exchanger air (in) 35 °C

4 Plant (side) heat exchanger recovery water (in/out) 40/45 °C
Plant (side) heat exchanger recovery water (in/out) 40/45 °C
Source (side) heat exchanger air (in) 7 °C

5 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

6 Standard configuration
- Not available

GENERAL TECHNICAL DATA

FOCS-NR
SL-CA

SIZE		2222	2422	2622	2722	3222		
FOCS-NR /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		
FOCS-NR /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		
FOCS-NR /SL-CA COOLING WITH TOTAL RECOVERY (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		
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		
FOCS-NR /SL-CA TOTAL RECOVERY ONLY (4)								
Total heat recovery capacity	kW	536	564	607	703	815		
Total power input (unit)	kW	144	154	163	190	220		
Heat exchanger recovery water flow	m³/h	93,1	98,0	105	122	142		
Heat exchanger recovery pressure drop	kPa	30,8	34,1	22,2	31,2	30,7		
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	STEPS		
Minimum capacity steps	%	25	25	25	25	25		
Type of refrigerant	R134a	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 (5)								
Total sound power	dB(A)	91	91	91	91	92		
Total sound pressure	dB(A)	58	58	58	58	59		
DIMENSIONS AND WEIGHTS (6)								
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
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 87% R.H.

3 Plant (side) cooling exchanger water (in/out) 12/7 °C
Heat exchanger air (in) 35 °C

4 Plant (side) heat exchanger recovery water (in/out) 40/45 °C
Plant (side) heat exchanger recovery water (in/out) 40/45 °C
Source (side) heat exchanger air (in) 7 °C

5 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

6 Standard configuration
- Not available

GENERAL TECHNICAL DATA

FOCS-NR
XL-CA

SIZE		2022	2222	2422	2622	2722	3222	
FOCS-NR /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	
FOCS-NR /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	
FOCS-NR /XL-CA								
COOLING WITH TOTAL RECOVERY (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	
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	
FOCS-NR /XL-CA								
TOTAL RECOVERY ONLY (4)								
Total heat recovery capacity	kW	486	536	564	607	703	815	
Total power input (unit)	kW	136	144	154	163	190	220	
Heat exchanger recovery water flow	m³/h	84,4	93,1	98,0	105	122	142	
Heat exchanger recovery pressure drop	kPa	27,5	30,8	34,1	22,2	31,2	30,7	
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	STEPS	
Minimum capacity steps	%	25	25	25	25	25	25	
Type of refrigerant	R134a	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 (5)								
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 (6)								
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
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 87% R.H.

3 Plant (side) cooling exchanger water (in/out) 12/7 °C
Heat exchanger air (in) 35 °C

4 Plant (side) heat exchanger recovery water (in/out) 40/45 °C
Plant (side) heat exchanger recovery water (in/out) 40/45 °C
Source (side) heat exchanger air (in) 7 °C

5 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

6 Standard configuration
- Not available

GENERAL TECHNICAL DATA

FOCS-NR
XL-CA-E

SIZE		1062	1162	1362	1562	1762	2022	2222
FOCS-NR /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
FOCS-NR /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
FOCS-NR /XL-CA-E								
COOLING WITH TOTAL RECOVERY (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
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
FOCS-NR /XL-CA-E								
TOTAL RECOVERY ONLY (4)								
Total heat recovery capacity	kW	218	267	308	340	393	513	552
Total power input (unit)	kW	59,8	74,2	84,9	91,8	112	138	145
Heat exchanger recovery water flow	m³/h	37,9	46,4	53,5	59,1	68,3	89,1	95,9
Heat exchanger recovery pressure drop	kPa	31,6	47,5	38,7	47,2	43,8	30,6	32,6
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	STEPS
Minimum capacity steps	%	25	25	25	25	25	25	25
Type of refrigerant	R134a	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 (5)								
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 (6)								
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
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 87% R.H.

3 Plant (side) cooling exchanger water (in/out) 12/7 °C
Heat exchanger air (in) 35 °C

4 Plant (side) heat exchanger recovery water (in/out) 40/45 °C
Plant (side) heat exchanger recovery water (in/out) 40/45 °C
Source (side) heat exchanger air (in) 7 °C

5 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

6 Standard configuration
- Not available

GENERAL TECHNICAL DATA

FOCS-NR
XL-CA-E

SIZE		2422	2622					
FOCS-NR /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					
FOCS-NR /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					
FOCS-NR /XL-CA-E								
COOLING WITH TOTAL RECOVERY	(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					
Heat exchanger recovery water flow	m³/h	121	138					
Plant side heat exchanger recovery pressure drop	kPa	51,7	37,8					
FOCS-NR /XL-CA-E								
TOTAL RECOVERY ONLY	(4)							
Total heat recovery capacity	kW	588	644					
Total power input (unit)	kW	155	165					
Heat exchanger recovery water flow	m³/h	102	112					
Heat exchanger recovery pressure drop	kPa	37,1	25,0					
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								
Total sound power	(5) dB(A)	88	88					
Total sound pressure	dB(A)	55	55					
DIMENSIONS AND WEIGHTS								
Length	(6) 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
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 87% R.H.

3 Plant (side) cooling exchanger water (in/out) 12/7 °C
Heat exchanger air (in) 35 °C

4 Plant (side) heat exchanger recovery water (in/out) 40/45 °C
Plant (side) heat exchanger recovery water (in/out) 40/45 °C
Source (side) heat exchanger air (in) 7 °C

5 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

6 Standard configuration
- Not available

2722																		
Ta	25	30	32	35	40	42	25	30	32	35	40	42	25	30	32	35	40	42
Tev	6						7						8					
Pf	732	708	697	681	650	637	754	729	719	701	670	657	777	751	740	722	690	676
Pat	181	199	207	220	245	256	183	201	209	222	248	259	184	203	211	225	250	261
Qev	126	122	120	117	112	110	130	126	124	121	115	113	134	129	127	124	119	116
Dpev	33,2	31,0	30,1	28,7	26,2	25,2	35,3	33,0	32,0	30,5	27,8	26,7	37,4	35,0	33,9	32,3	29,5	28,4
Tev	9						10						11					
Pf	799	773	762	743	710	696	822	795	783	764	730	715	845	817	804	785	750	735
Pat	186	205	213	227	252	264	188	206	215	229	255	266	189	208	217	231	257	268
Qev	138	133	131	128	122	120	142	137	135	132	126	123	146	141	139	135	129	127
Dpev	39,6	37,1	36,0	34,3	31,3	30,0	41,9	39,2	38,0	36,2	33,1	31,7	44,3	41,4	40,2	38,2	34,9	33,5
3222																		
Ta	25	30	32	35	40	42	25	30	32	35	40	42	25	30	32	35	40	42
Tev	6						7						8					
Pf	868	837	823	801	759	741	894	863	849	826	783	764	921	889	874	850	806	787
Pat	204	229	241	261	298	315	206	232	244	264	302	319	208	234	247	267	306	324
Qev	149	144	142	138	131	128	154	149	146	142	135	132	159	153	151	146	139	135
Dpev	34,1	31,7	30,7	29,1	26,1	24,9	36,3	33,8	32,7	30,9	27,8	26,5	38,5	35,8	34,7	32,8	29,5	28,1
Tev	9						10						11					
Pf	948	915	900	875	830	810	975	940	925	900	853	832	1002	966	950	925	876	855
Pat	210	237	250	270	310	328	212	240	252	274	314	332	214	242	255	277	318	336
Qev	163	158	155	151	143	139	168	162	159	155	147	143	173	167	164	159	151	147
Dpev	40,8	38,0	36,7	34,8	31,2	29,8	43,1	40,2	38,8	36,8	33,0	31,5	45,6	42,4	41,0	38,8	34,9	33,2

Ta [°C] - Air temperature

Tev [°C] - Plant (side) cooling exchanger output water temperature

Pf [kW] - Cooling capacity

Pat [kW] - Total power input

Qev [m³/h] - Plant (side) heat exchanger water flow

Dpev [kPa] - Plant (side) cooling exchanger pressure drop

'-' Conditions outside the operating range

Waterflow and pressure drop on heat exchangers calculated with 5°C of delta T

NOTE: Data on grey background: unit switched to non-silenced operation

2722																		
Ta	25	30	32	35	40	42	25	30	32	35	40	42	25	30	32	35	40	42
Tev	6						7						8					
Pf	719	693	681	664	632	618	740	714	702	684	651	637	762	734	723	704	670	655
Pat	179	199	208	223	249	261	182	202	211	225	252	264	184	204	213	228	255	267
Qev	124	119	117	114	109	106	127	123	121	118	112	110	131	126	124	121	115	113
Dpev	32,0	29,7	28,8	27,3	24,7	23,7	33,9	31,5	30,5	29,0	26,2	25,1	36,0	33,4	32,4	30,7	27,8	26,6
Tev	9						10						11					
Pf	784	755	743	724	688	673	805	776	763	743	707	692	827	797	784	763	726	710
Pat	186	206	216	231	258	270	188	209	218	233	261	273	190	211	220	236	264	276
Qev	135	130	128	125	119	116	139	134	132	128	122	119	143	137	135	132	125	122
Dpev	38,1	35,4	34,2	32,5	29,4	28,1	40,2	37,4	36,2	34,3	31,0	29,7	42,5	39,4	38,1	36,1	32,7	31,3
3222																		
Ta	25	30	32	35	40	42	25	30	32	35	40	42	25	30	32	35	40	42
Tev	6						7						8					
Pf	850	816	801	776	731	711	875	840	825	799	753	732	901	865	849	823	775	754
Pat	206	235	248	270	312	330	208	238	252	274	317	335	211	242	256	279	322	341
Qev	146	140	138	134	126	122	151	145	142	138	130	126	155	149	146	142	133	130
Dpev	32,7	30,2	29,0	27,3	24,2	22,9	34,8	32,0	30,8	29,0	25,7	24,3	36,8	33,9	32,7	30,7	27,2	25,8
Tev	9						10						11					
Pf	927	890	873	846	796	775	953	914	897	869	818	795	978	939	921	892	839	816
Pat	214	245	259	283	327	347	217	249	263	287	332	352	219	252	267	291	337	358
Qev	160	153	150	146	137	133	164	157	155	150	141	137	169	162	159	154	145	141
Dpev	39,0	35,9	34,6	32,5	28,8	27,2	41,2	37,9	36,5	34,3	30,4	28,7	43,5	40,0	38,5	36,2	32,0	30,3

Ta [°C] - Air temperature

Tev [°C] - Plant (side) cooling exchanger output water temperature

Pf [kW] - Cooling capacity

Pat [kW] - Total power input

Qev [m³/h] - Plant (side) heat exchanger water flow

Dpev [kPa] - Plant (side) cooling exchanger pressure drop

'-' Conditions outside the operating range

Waterflow and pressure drop on heat exchangers calculated with 5°C of delta T

NOTE: Data on grey background: unit switched to non-silenced operation

2722																		
Ta	25	30	32	35	40	42	25	30	32	35	40	42	25	30	32	35	40	42
Tev	6						7						8					
Pf	714	688	676	658	626	612	736	708	696	678	644	630	757	729	717	697	662	648
Pat	181	202	211	226	253	265	184	204	214	229	257	269	186	207	216	232	260	272
Qev	123	118	116	113	108	105	127	122	120	117	111	108	130	125	123	120	114	112
Dpev	31,6	29,3	28,3	26,8	24,2	23,2	33,5	31,1	30,0	28,5	25,7	24,6	35,5	32,9	31,8	30,1	27,2	26,0
Tev	9						10						11					
Pf	778	749	737	717	681	665	800	770	757	736	699	683	821	790	777	756	717	701
Pat	188	209	219	234	263	275	190	212	222	237	266	278	192	214	224	240	269	282
Qev	134	129	127	123	117	115	138	133	130	127	120	118	142	136	134	130	124	121
Dpev	37,6	34,8	33,7	31,9	28,7	27,5	39,7	36,8	35,5	33,6	30,3	29,0	41,9	38,8	37,5	35,4	31,9	30,5
3222																		
Ta	25	30	32	35	40	42	25	30	32	35	40	42	25	30	32	35	40	42
Tev	6						7						8					
Pf	844	808	793	767	721	701	869	833	816	790	742	721	894	857	840	813	763	742
Pat	209	240	254	276	319	338	212	243	258	281	325	344	215	247	262	286	330	350
Qev	145	139	136	132	124	121	150	143	141	136	128	124	154	148	145	140	131	128
Dpev	32,3	29,6	28,5	26,7	23,6	22,3	34,2	31,4	30,2	28,3	25,0	23,6	36,3	33,3	32,0	30,0	26,4	25,0
Tev	9						10						11					
Pf	920	881	864	836	784	762	945	905	887	858	805	782	970	929	911	881	826	802
Pat	218	251	266	290	336	356	221	255	270	295	342	362	224	259	274	300	347	368
Qev	158	152	149	144	135	131	163	156	153	148	139	135	167	160	157	152	142	138
Dpev	38,4	35,2	33,9	31,7	27,9	26,4	40,5	37,2	35,7	33,5	29,5	27,8	42,8	39,2	37,7	35,3	31,0	29,3

Ta [°C] - Air temperature

Tev [°C] - Plant (side) cooling exchanger output water temperature

Pf [kW] - Cooling capacity

Pat [kW] - Total power input

Qev [m³/h] - Plant (side) heat exchanger water flow

Dpev [kPa] - Plant (side) cooling exchanger pressure drop

'-' Conditions outside the operating range

Waterflow and pressure drop on heat exchangers calculated with 5°C of delta T

NOTE: Data on grey background: unit switched to non-silenced operation

3222																		
Ta	25	30	32	35	40	42	25	30	32	35	40	42	25	30	32	35	40	42
Tev	6						7						8					
Pf	832	794	777	751	701	680	856	817	800	772	721	699	881	841	823	794	741	718
Pat	209	242	257	281	327	347	212	246	262	287	333	354	216	251	266	292	340	361
Qev	143	137	134	129	121	117	147	141	138	133	124	120	152	145	142	137	128	124
Dpev	31,4	28,6	27,4	25,5	22,3	21,0	33,3	30,3	29,0	27,1	23,6	22,2	35,2	32,1	30,7	28,6	24,9	23,4
Tev	9						10						11					
Pf	906	864	845	816	761	737	930	887	868	837	781	756	954	910	890	858	800	775
Pat	220	255	271	297	346	368	223	260	276	303	353	375	227	264	281	308	360	382
Qev	156	149	146	140	131	127	160	153	149	144	134	130	164	157	153	148	138	134
Dpev	37,2	33,9	32,4	30,2	26,3	24,7	39,3	35,7	34,2	31,8	27,7	26,0	41,4	37,6	36,0	33,5	29,1	27,3

Ta [°C] - Air temperature

Tev [°C] - Plant (side) cooling exchanger output water temperature

Pf [kW] - Cooling capacity

Pat [kW] - Total power input

Qev [m³/h] - Plant (side) heat exchanger water flow

Dpev [kPa] - Plant (side) cooling exchanger pressure drop

'-' Conditions outside the operating range

Waterflow and pressure drop on heat exchangers calculated with 5°C of delta T

NOTE: Data on grey background: unit switched to non-silenced operation

2722																		
Ta	-5	0	5	7	10	15	-5	0	5	7	10	15	-5	0	5	7	10	15
Tcd	30						35						40					
Pt	535	589	661	694	751	858	536	591	663	696	751	856	539	595	666	699	753	856
Qcd	92,5	102	114	120	130	148	92,9	102	115	121	130	148	93,5	103	116	121	131	148
Pcd	17,9	21,7	27,3	30,1	35,2	46,0	18,0	21,9	27,5	30,4	35,4	46,0	18,3	22,2	27,9	30,7	35,7	46,0
Pat	139	140	142	144	146	151	152	154	157	159	161	166	169	172	175	177	180	185
Ta	-5	0	5	7	10	15	-5	0	5	7	10	15	-5	0	5	7	10	15
Tcd	45						50						55					
Pt	544	600	671	703	756	856	550	607	677	708	760	857	558	615	684	715	765	859
Qcd	94,5	104	117	122	131	149	95,8	106	118	123	132	149	97,4	107	119	125	133	150
Pcd	18,7	22,7	28,4	31,2	36,1	46,2	19,2	23,3	29,0	31,8	36,6	46,5	19,8	24,1	29,8	32,5	37,2	46,9
Pat	189	192	197	199	202	208	212	217	221	224	227	233	239	244	249	252	255	262
3222																		
Ta	-5	0	5	7	10	15	-5	0	5	7	10	15	-5	0	5	7	10	15
Tcd	30						35						40					
Pt	620	682	765	804	869	994	618	683	767	806	870	994	620	686	771	810	874	995
Qcd	107	118	132	139	150	172	107	118	133	140	151	172	107	119	134	140	152	173
Pcd	17,6	21,3	26,8	29,6	34,6	45,2	17,5	21,4	27,0	29,8	34,8	45,3	17,7	21,7	27,3	30,2	35,1	45,6
Pat	158	158	159	160	162	165	174	175	177	178	180	184	194	197	200	201	204	209
Ta	-5	0	5	7	10	15	-5	0	5	7	10	15	-5	0	5	7	10	15
Tcd	45						50						55					
Pt	624	691	777	815	879	998	630	700	785	824	886	1004	639	710	796	834	896	1011
Qcd	108	120	135	142	153	174	110	122	137	143	154	175	112	124	139	145	156	176
Pcd	18,0	22,1	27,9	30,7	35,7	46,1	18,4	22,7	28,6	31,5	36,4	46,7	19,0	23,5	29,5	32,4	37,4	47,6
Pat	220	224	228	230	234	241	251	256	262	265	269	278	287	293	301	304	310	321

Ta [°C] - Air temperature

Tcd (°C) - Source (side) heat exchanger output water temperature

Pt (kW) - Heating capacity

Qcd (m³/h) - Source (side) heat exchanger water flow

Dpcd (kPa) - Source (side) heat exchanger pressure drop

Pat (kW) - Total power input

'-' - Conditions outside the operating range

Waterflow and pressure drop on heat exchangers calculated with 5°C of delta T

NOTE: Data on grey background: unit switched to non-silenced operation

2622																		
Ta	-5	0	5	7	10	15	-5	0	5	7	10	15	-5	0	5	7	10	15
Tcd	30						35						40					
Pt	484	542	613	646	698	797	482	541	612	644	697	794	479	540	612	644	695	791
Qcd	83,8	93,7	106	112	121	138	83,5	93,6	106	112	121	137	83,2	93,6	106	112	121	137
Pcd	14,0	17,6	22,5	24,9	29,2	38,0	13,9	17,5	22,5	24,9	29,1	37,8	13,8	17,5	22,5	24,9	29,1	37,6
Pat	124	124	126	127	130	135	135	136	139	140	143	149	149	151	155	156	160	166
Ta	-5	0	5	7	10	15	-5	0	5	7	10	15	-5	0	5	7	10	15
Tcd	45						50						55					
Pt	477	539	612	644	695	788	476	539	613	644	695	786	474	540	614	645	695	784
Qcd	83,0	93,7	106	112	121	137	82,8	93,9	107	112	121	137	82,7	94,2	107	113	121	137
Pcd	13,8	17,6	22,6	25,0	29,2	37,5	13,7	17,6	22,7	25,2	29,3	37,4	13,7	17,8	22,9	25,3	29,4	37,4
Pat	165	169	173	176	179	186	182	188	195	198	202	208	201	211	219	223	227	234

Ta [°C] - Air temperature

Tcd (°C) - Source (side) heat exchanger output water temperature

Pt (kW) - Heating capacity

Qcd (m³/h) - Source (side) heat exchanger water flow

Dpcd (kPa) - Source (side) heat exchanger pressure drop

Pat (kW) - Total power input

'-' - Conditions outside the operating range

Waterflow and pressure drop on heat exchangers calculated with 5°C of delta T

NOTE: Data on grey background: unit switched to non-silenced operation

2222																		
Tre	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45
Tev	6			7			8			9			10			11		
Pf	540	524	505	557	541	522	574	558	538	592	575	555	609	592	572	627	609	589
Qev	85,1	85,1	85,1	87,7	87,7	87,7	90,3	90,3	90,3	92,9	92,9	92,9	95,5	95,5	95,5	98,1	98,1	98,1
Dpev	25,7	25,7	25,7	27,3	27,3	27,3	29,0	29,0	29,0	30,6	30,6	30,6	32,4	32,4	32,4	34,2	34,2	34,2
Pat	113	128	144	114	128	145	114	129	145	115	129	146	115	129	146	116	130	147
Ptre	646	643	640	664	661	658	682	679	675	700	696	692	717	714	709	735	731	726
Qre	112	112	111	115	115	114	118	118	117	121	121	120	124	124	123	127	127	126
Dpre	44,5	44,2	44,0	46,9	46,7	46,4	49,5	49,2	48,8	52,1	51,8	51,3	54,8	54,4	53,9	57,5	57,1	56,6

2422																		
Tre	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45
Tev	6			7			8			9			10			11		
Pf	568	552	533	586	569	550	604	587	568	622	605	585	639	622	602	657	640	620
Qev	90,5	90,5	90,5	93,2	93,2	93,2	95,9	95,9	95,9	98,7	98,7	98,7	101	101	101	104	104	104
Dpev	29,0	29,0	29,0	30,8	30,8	30,8	32,7	32,7	32,7	34,6	34,6	34,6	36,5	36,5	36,5	38,5	38,5	38,5
Pat	120	135	153	120	136	153	121	136	154	121	137	154	122	137	155	122	137	155
Ptre	680	679	677	699	697	694	717	715	712	735	733	730	754	751	748	772	769	765
Qre	118	118	118	121	121	121	124	124	124	127	127	127	131	130	130	134	133	133
Dpre	49,3	49,2	49,1	52,0	51,9	51,7	54,8	54,6	54,4	57,6	57,4	57,1	60,5	60,3	59,9	63,5	63,2	62,8

2622																		
Tre	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45	35	40	45
Tev	6			7			8			9			10			11		
Pf	658	636	610	679	657	631	701	678	652	723	699	673	745	721	694	766	742	715
Qev	102	102	102	105	105	105	108	108	108	112	112	112	115	115	115	118	118	118
Dpev	20,8	20,8	20,8	22,1	22,1	22,1	23,5	23,5	23,5	24,9	24,9	24,9	26,4	26,4	26,4	27,8	27,8	27,8
Pat	134	150	169	136	152	170	137	153	172	138	154	173	139	155	174	141	156	175
Ptre	784	777	770	807	799	791	830	822	813	853	844	835	876	867	857	899	889	879
Qre	136	135	134	140	139	138	144	143	141	148	146	145	152	150	149	156	154	153
Dpre	36,9	36,3	35,8	39,1	38,5	37,8	41,3	40,6	39,9	43,6	42,9	42,1	46,0	45,2	44,4	48,4	47,6	46,7

Tre (°C) - Plant (side) heat exchanger recovery output water temperature

Tev (°C) - Plant (side) cooling exchanger output water temperature

Pf (kW) - Cooling capacity

Qev (m3/h) - Plant (side) heat exchanger water flow

Dpev (kPa) - Plant (side) cooling exchanger pressure drop

Ptre (kW) - Heat recovery thermal capacity

Pat (kW) - Total power input

Qre (m3/h) - Plant side heat exchanger recovery water flow

Dpre (kPa) - Plant side heating exchanger recovery pressure drop

'-' - Conditions outside the operating range

Waterflow and pressure drop on heat exchangers calculated with 5°C of delta T

2722																		
Ta	-5	0	5	7	10	15	-5	0	5	7	10	15	-5	0	5	7	10	15
Tre	30						35						40					
Ptre	536	594	669	704	761	869	538	597	671	705	761	867	541	600	674	708	762	865
Qre	92,7	103	116	122	132	150	93,2	103	116	122	132	150	93,9	104	117	123	132	150
Dpre	18,0	22,1	28,0	31,0	36,2	47,2	18,1	22,3	28,2	31,2	36,3	47,1	18,4	22,7	28,6	31,5	36,6	47,1
Pat	146	148	151	152	154	159	160	162	165	167	170	175	177	180	184	186	188	194
Tre	45						50						55					
Ptre	546	605	678	711	765	865	552	612	684	716	769	865	560	620	691	723	773	866
Qre	94,9	105	118	124	133	150	96,1	107	119	125	134	151	97,7	108	121	126	135	151
Dpre	18,8	23,1	29,0	31,9	36,9	47,2	19,3	23,7	29,6	32,5	37,4	47,4	19,9	24,4	30,4	33,2	38,0	47,7
Pat	197	201	205	207	210	216	220	225	230	232	235	242	247	252	258	260	264	270
3222																		
Ta	-5	0	5	7	10	15	-5	0	5	7	10	15	-5	0	5	7	10	15
Tre	30						35						40					
Ptre	622	689	775	815	881	1007	621	689	776	816	882	1006	622	692	780	820	885	1007
Qre	108	119	134	141	152	174	108	119	134	141	153	174	108	120	135	142	154	175
Dpre	17,7	21,7	27,5	30,4	35,5	46,4	17,7	21,8	27,7	30,6	35,7	46,5	17,8	22,1	28,0	31,0	36,1	46,7
Pat	167	167	168	169	171	175	183	184	186	187	190	194	203	206	209	211	214	219
Tre	45						50						55					
Ptre	626	698	786	826	890	1010	632	706	794	833	897	1014	642	716	804	843	906	1020
Qre	109	121	137	143	155	175	110	123	138	145	156	177	112	125	140	147	158	178
Dpre	18,1	22,5	28,5	31,5	36,6	47,1	18,5	23,1	29,2	32,2	37,3	47,7	19,2	23,9	30,1	33,1	38,2	48,4
Pat	229	233	238	240	244	250	260	265	272	274	279	288	297	303	311	314	320	331

Ta (°C) - Air temperature

Tre (°C) - Plant (side) heat exchanger recovery output water temperature

Ptre (kW) - Heat recovery thermal capacity

Qre (m3/h) - Plant side heat exchanger recovery water flow

Dpre (kPa) - Plant side heating exchanger recovery pressure drop

Pat (kW) - Total power input

'-' - Conditions outside the operating range

Waterflow and pressure drop on heat exchangers calculated with 5°C of delta T

2722																		
Ta	-5	0	5	7	10	15	-5	0	5	7	10	15	-5	0	5	7	10	15
Tre	30						35						40					
Ptre	536	594	669	704	761	869	538	597	671	705	761	867	541	600	674	708	762	865
Qre	92,7	103	116	122	132	150	93,2	103	116	122	132	150	93,9	104	117	123	132	150
Dpre	18,0	22,1	28,0	31,0	36,2	47,2	18,1	22,3	28,2	31,2	36,3	47,1	18,4	22,7	28,6	31,5	36,6	47,1
Pat	146	148	151	152	154	159	160	162	165	167	170	175	177	180	184	186	188	194
Tre	45						50						55					
Ptre	546	605	678	711	765	865	552	612	684	716	769	865	560	620	691	723	773	866
Qre	94,9	105	118	124	133	150	96,1	107	119	125	134	151	97,7	108	121	126	135	151
Dpre	18,8	23,1	29,0	31,9	36,9	47,2	19,3	23,7	29,6	32,5	37,4	47,4	19,9	24,4	30,4	33,2	38,0	47,7
Pat	197	201	205	207	210	216	220	225	230	232	235	242	247	252	258	260	264	270
3222																		
Ta	-5	0	5	7	10	15	-5	0	5	7	10	15	-5	0	5	7	10	15
Tre	30						35						40					
Ptre	622	689	775	815	881	1007	621	689	776	816	882	1006	622	692	780	820	885	1007
Qre	108	119	134	141	152	174	108	119	134	141	153	174	108	120	135	142	154	175
Dpre	17,7	21,7	27,5	30,4	35,5	46,4	17,7	21,8	27,7	30,6	35,7	46,5	17,8	22,1	28,0	31,0	36,1	46,7
Pat	167	167	168	169	171	175	183	184	186	187	190	194	203	206	209	211	214	219
Tre	45						50						55					
Ptre	626	698	786	826	890	1010	632	706	794	833	897	1014	642	716	804	843	906	1020
Qre	109	121	137	143	155	175	110	123	138	145	156	177	112	125	140	147	158	178
Dpre	18,1	22,5	28,5	31,5	36,6	47,1	18,5	23,1	29,2	32,2	37,3	47,7	19,2	23,9	30,1	33,1	38,2	48,4
Pat	229	233	238	240	244	250	260	265	272	274	279	288	297	303	311	314	320	331

Ta (°C) - Air temperature

Tre (°C) - Plant (side) heat exchanger recovery output water temperature

Ptre (kW) - Heat recovery thermal capacity

Qre (m3/h) - Plant side heat exchanger recovery water flow

Dpre (kPa) - Plant side heating exchanger recovery pressure drop

Pat (kW) - Total power input

'-' - Conditions outside the operating range

Waterflow and pressure drop on heat exchangers calculated with 5°C of delta T

2722																		
Ta	-5	0	5	7	10	15	-5	0	5	7	10	15	-5	0	5	7	10	15
Tre	30						35						40					
Ptre	535	589	661	694	751	858	536	591	663	696	751	856	539	595	666	699	753	856
Qre	92,5	102	114	120	130	148	92,9	102	115	121	130	148	93,5	103	116	121	131	148
Dpre	17,9	21,7	27,3	30,1	35,2	46,0	18,0	21,9	27,5	30,4	35,4	46,0	18,3	22,2	27,9	30,7	35,7	46,0
Pat	145	146	149	150	152	158	158	161	164	165	168	173	175	178	182	184	186	192
Tre	45						50						55					
Ptre	544	600	671	703	756	856	550	607	677	708	760	857	558	615	684	715	765	859
Qre	94,5	104	117	122	131	149	95,8	106	118	123	132	149	97,4	107	119	125	133	150
Dpre	18,7	22,7	28,4	31,2	36,1	46,2	19,2	23,3	29,0	31,8	36,6	46,5	19,8	24,1	29,8	32,5	37,2	46,9
Pat	195	199	203	205	208	214	219	223	228	230	234	240	246	251	256	258	262	269
3222																		
Ta	-5	0	5	7	10	15	-5	0	5	7	10	15	-5	0	5	7	10	15
Tre	30						35						40					
Ptre	620	682	765	804	869	994	618	683	767	806	870	994	620	686	771	810	874	995
Qre	107	118	132	139	150	172	107	118	133	140	151	172	107	119	134	140	152	173
Dpre	17,6	21,3	26,8	29,6	34,6	45,2	17,5	21,4	27,0	29,8	34,8	45,3	17,7	21,7	27,3	30,2	35,1	45,6
Pat	166	165	167	167	169	173	181	182	184	185	188	192	202	204	207	209	212	217
Tre	45						50						55					
Ptre	624	691	777	815	879	998	630	700	785	824	886	1004	639	710	796	834	896	1011
Qre	108	120	135	142	153	174	110	122	137	143	154	175	112	124	139	145	156	176
Dpre	18,0	22,1	27,9	30,7	35,7	46,1	18,4	22,7	28,6	31,5	36,4	46,7	19,0	23,5	29,5	32,4	37,4	47,6
Pat	228	231	236	238	241	248	259	263	269	272	277	285	295	301	308	312	317	328

Ta (°C) - Air temperature

Tre (°C) - Plant (side) heat exchanger recovery output water temperature

Ptre (kW) - Heat recovery thermal capacity

Qre (m3/h) - Plant side heat exchanger recovery water flow

Dpre (kPa) - Plant side heating exchanger recovery pressure drop

Pat (kW) - Total power input

'-' - Conditions outside the operating range

Waterflow and pressure drop on heat exchangers calculated with 5°C of delta T

3222																		
Ta	-5	0	5	7	10	15	-5	0	5	7	10	15	-5	0	5	7	10	15
Tre	30						35						40					
Ptre	620	682	765	804	869	994	618	683	767	806	870	994	620	686	771	810	874	995
Qre	107	118	132	139	150	172	107	118	133	140	151	172	107	119	134	140	152	173
Dpre	17,6	21,3	26,8	29,6	34,6	45,2	17,5	21,4	27,0	29,8	34,8	45,3	17,7	21,7	27,3	30,2	35,1	45,6
Pat	158	158	159	160	162	165	174	175	177	178	180	184	194	197	200	201	204	209
Tre	45						50						55					
Ptre	624	691	777	815	879	998	630	700	785	824	886	1004	639	710	796	834	896	1011
Qre	108	120	135	142	153	174	110	122	137	143	154	175	112	124	139	145	156	176
Dpre	18,0	22,1	27,9	30,7	35,7	46,1	18,4	22,7	28,6	31,5	36,4	46,7	19,0	23,5	29,5	32,4	37,4	47,6
Pat	220	224	228	230	234	241	251	256	262	265	269	278	287	293	301	304	310	321

Ta (°C) - Air temperature

Tre (°C) - Plant (side) heat exchanger recovery output water temperature

Ptre (kW) - Heat recovery thermal capacity

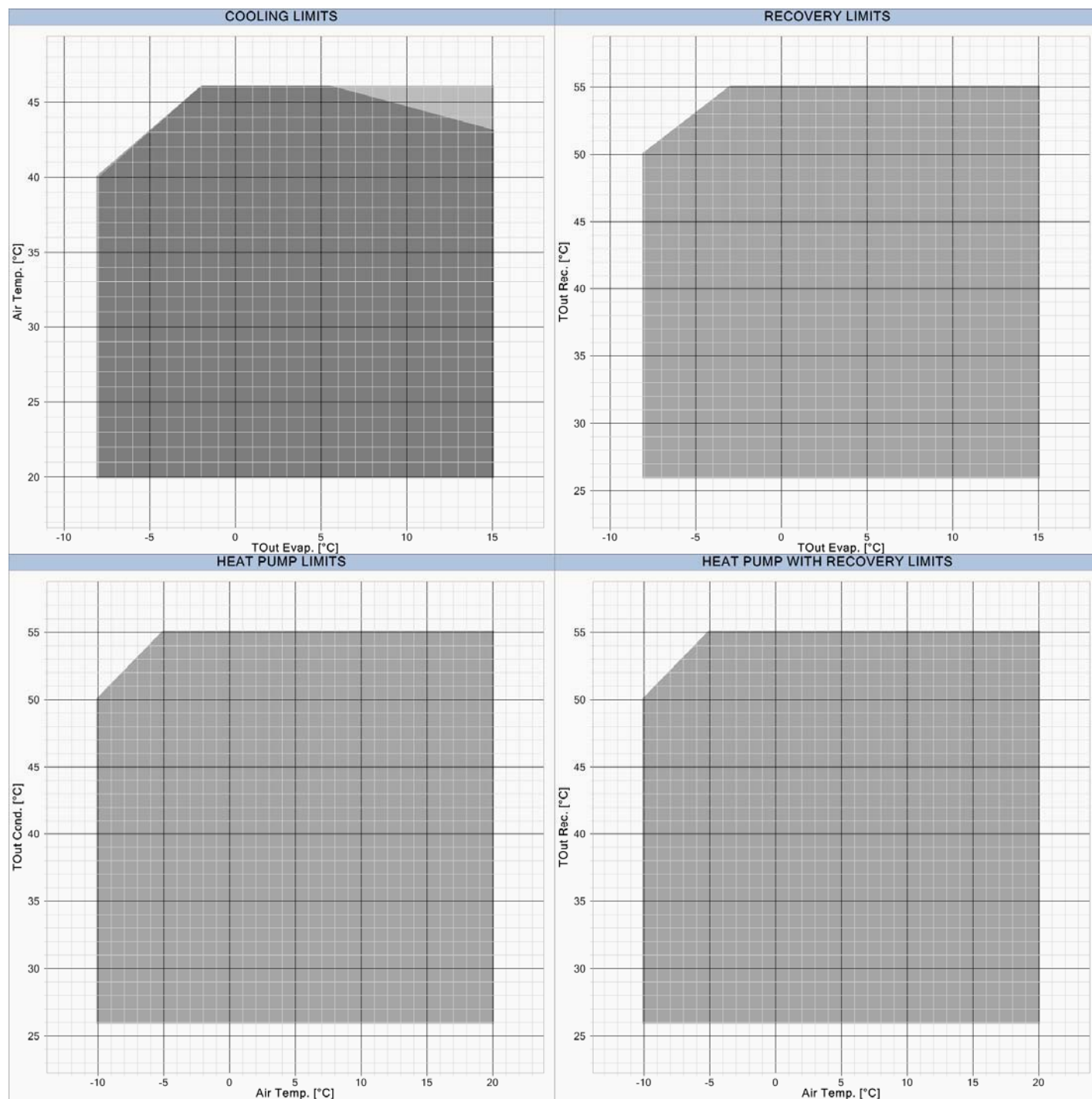
Qre (m3/h) - Plant side heat exchanger recovery water flow

Dpre (kPa) - Plant side heating exchanger recovery pressure drop

Pat (kW) - Total power input

'-' - Conditions outside the operating range

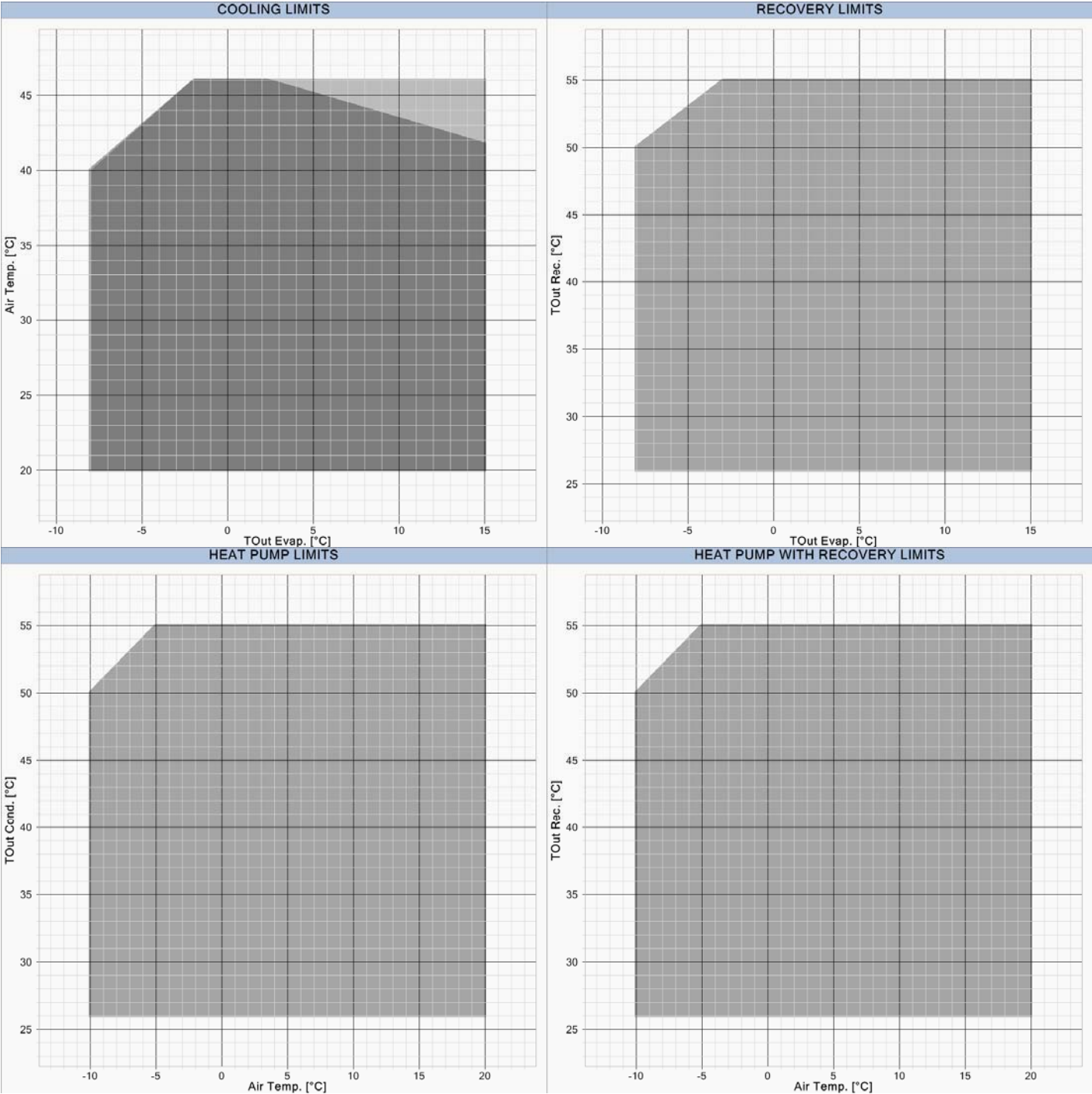
Waterflow and pressure drop on heat exchangers calculated with 5°C of delta T



- Selection limits
- Selection limits
- Economizers de-activated and unit in non silenced mode

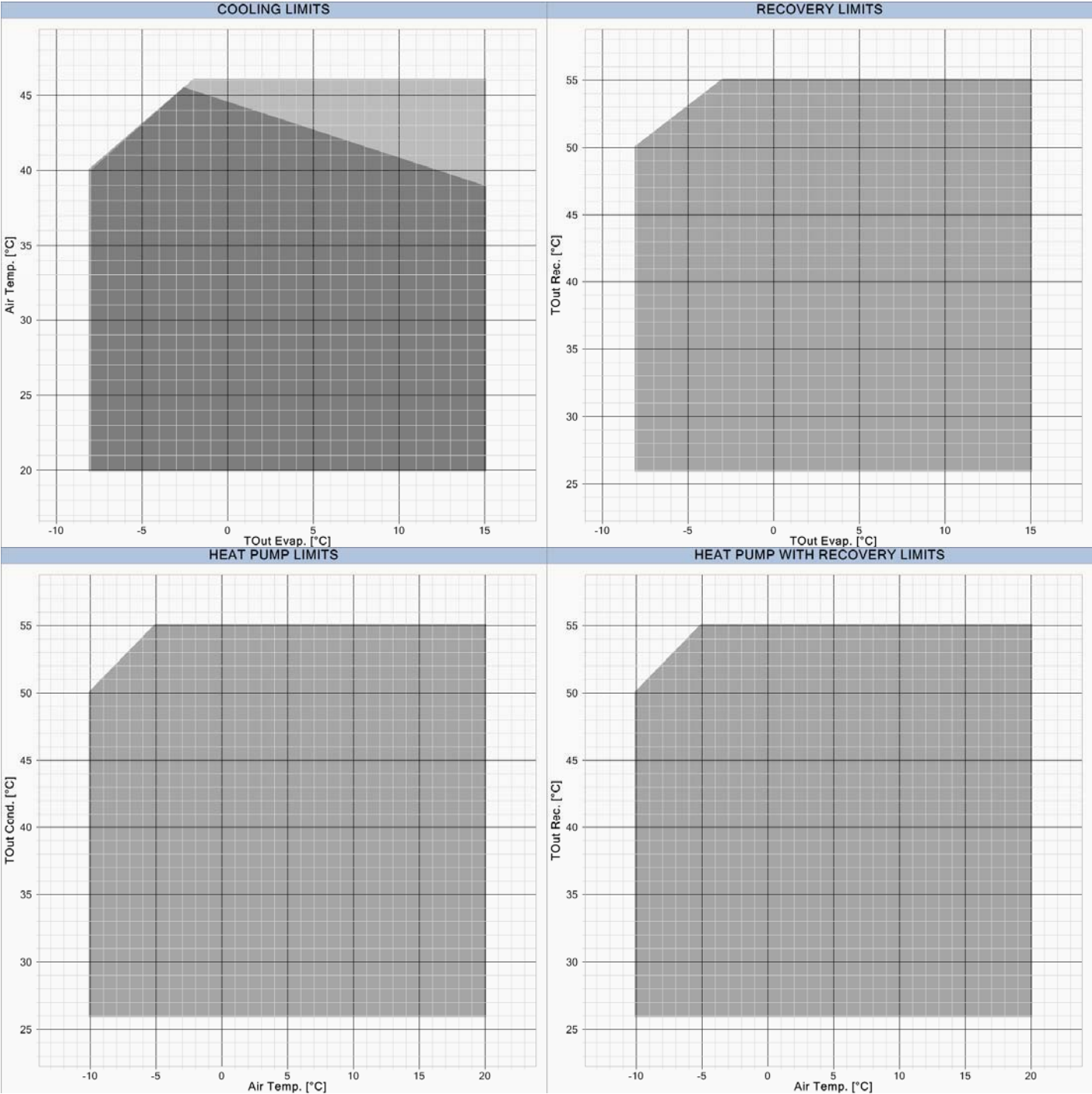
NOTE:

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



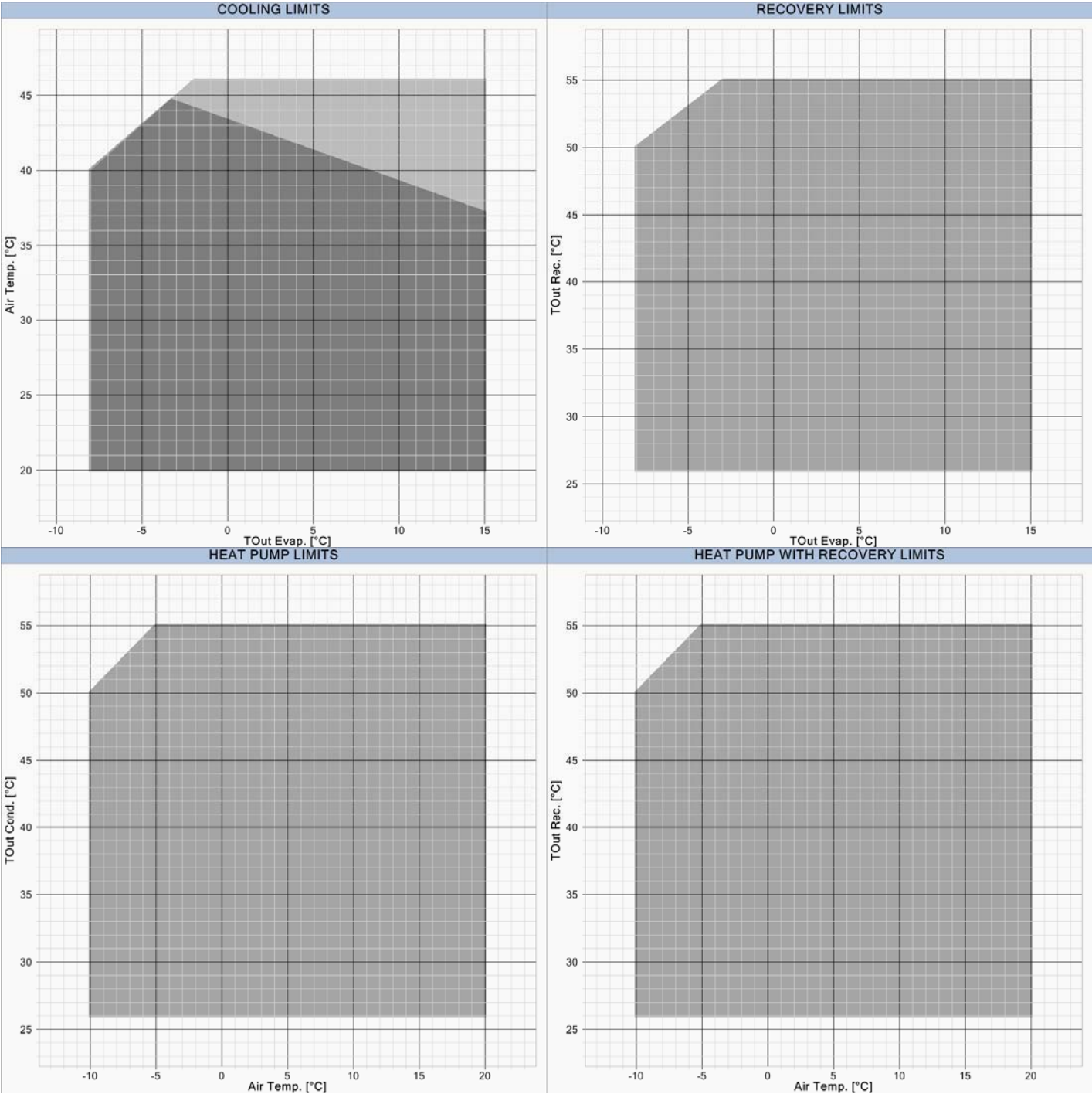
- Selection limits
- Selection limits
- Economizers de-activated and unit in non silenced mode

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



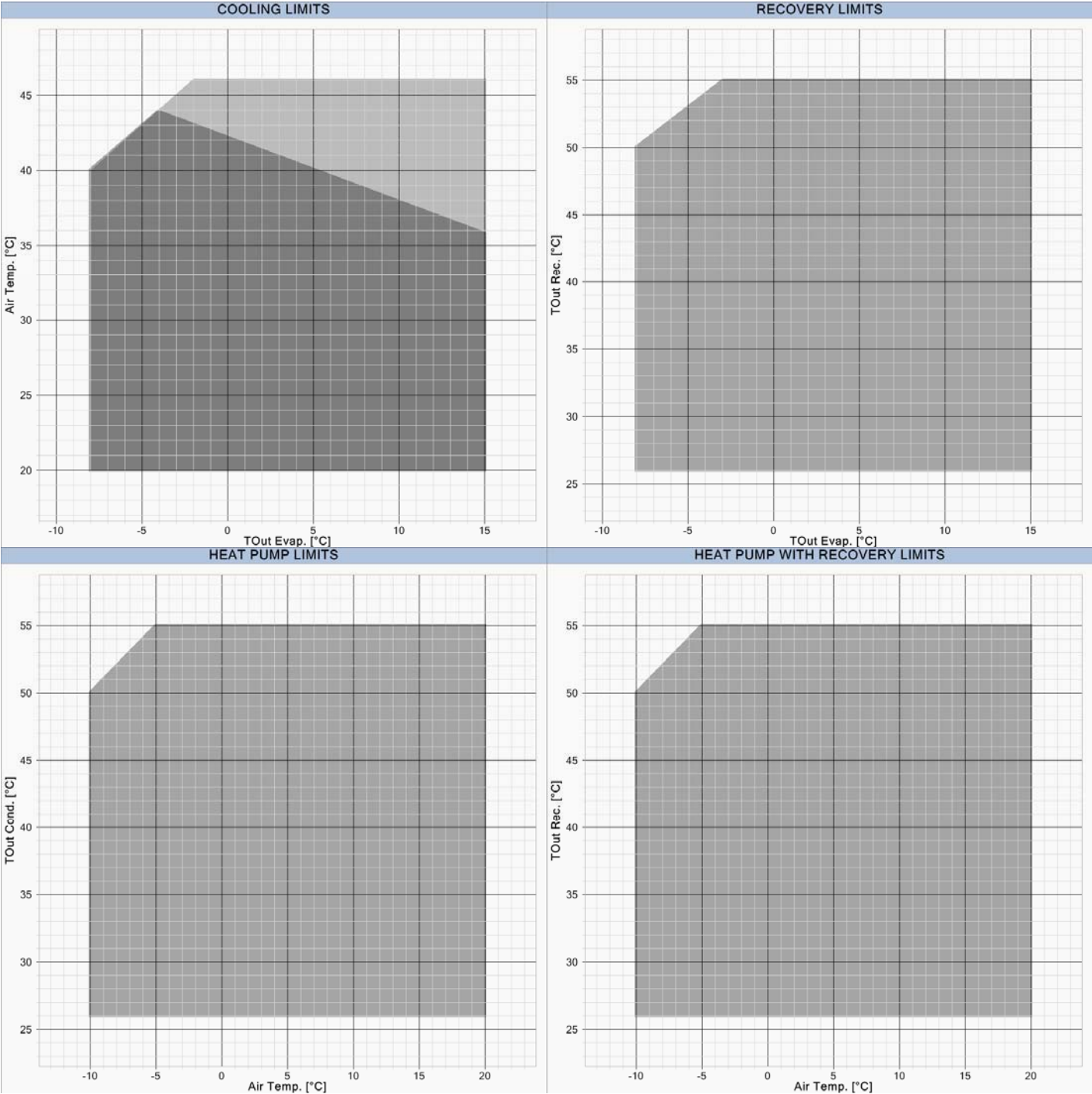
- Selection limits
- Selection limits
- Economizers de-activated and unit in non silenced mode

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



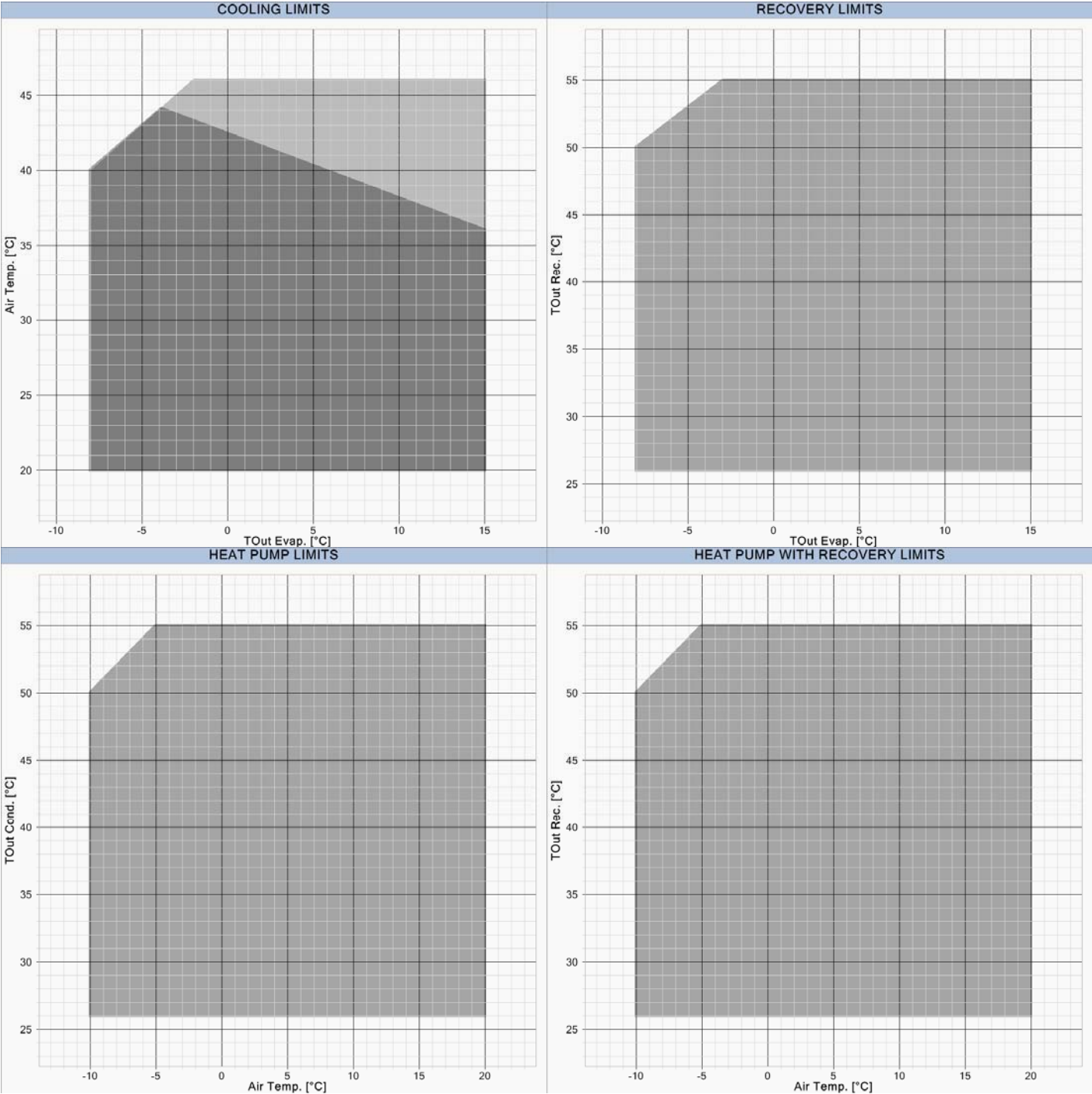
- Selection limits
- Selection limits
- Economizers de-activated and unit in non silenced mode

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



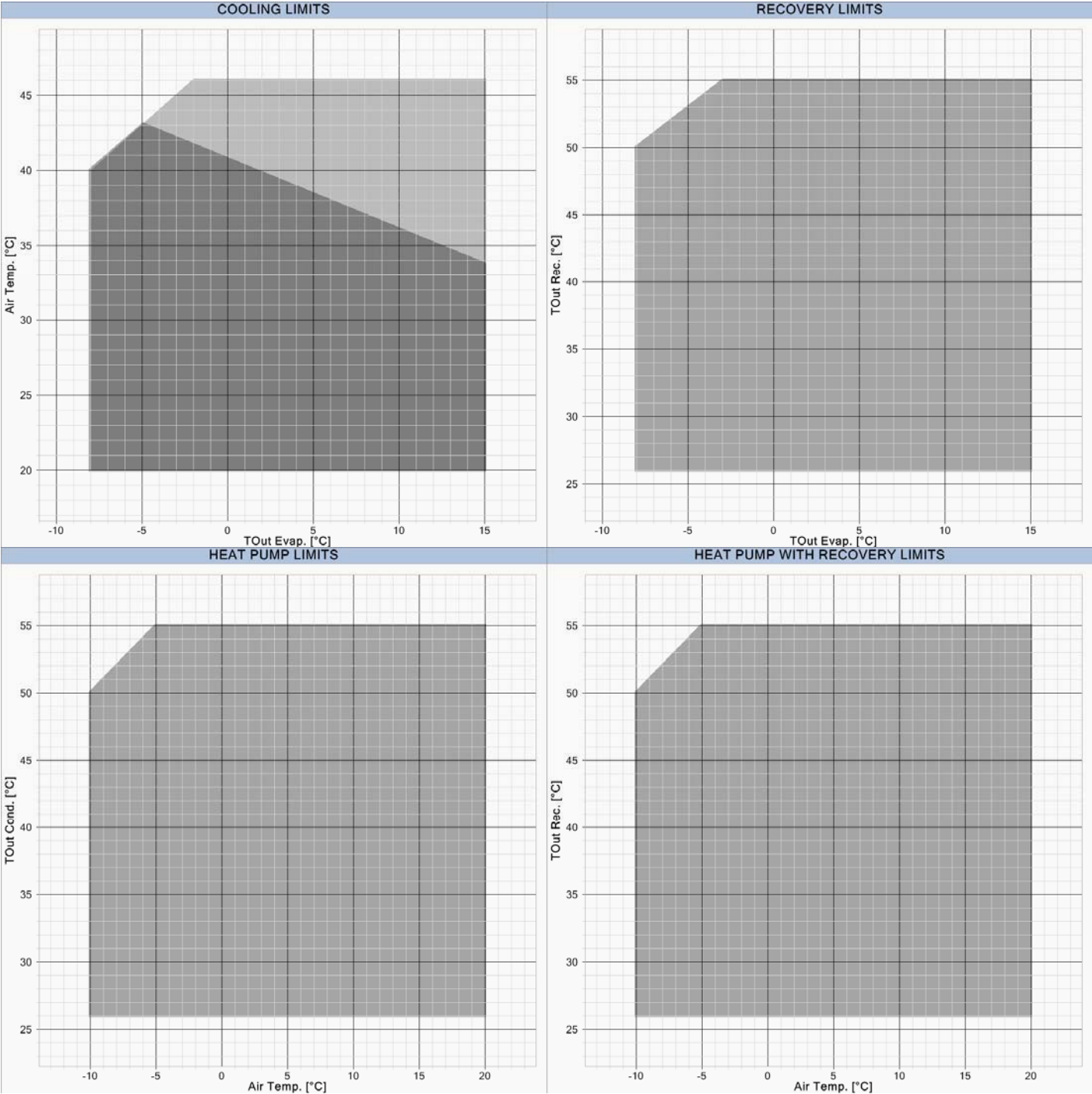
- Selection limits
- Selection limits
- Economizers de-activated and unit in non silenced mode

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



- Selection limits
- Selection limits
- Economizers de-activated and unit in non silenced mode

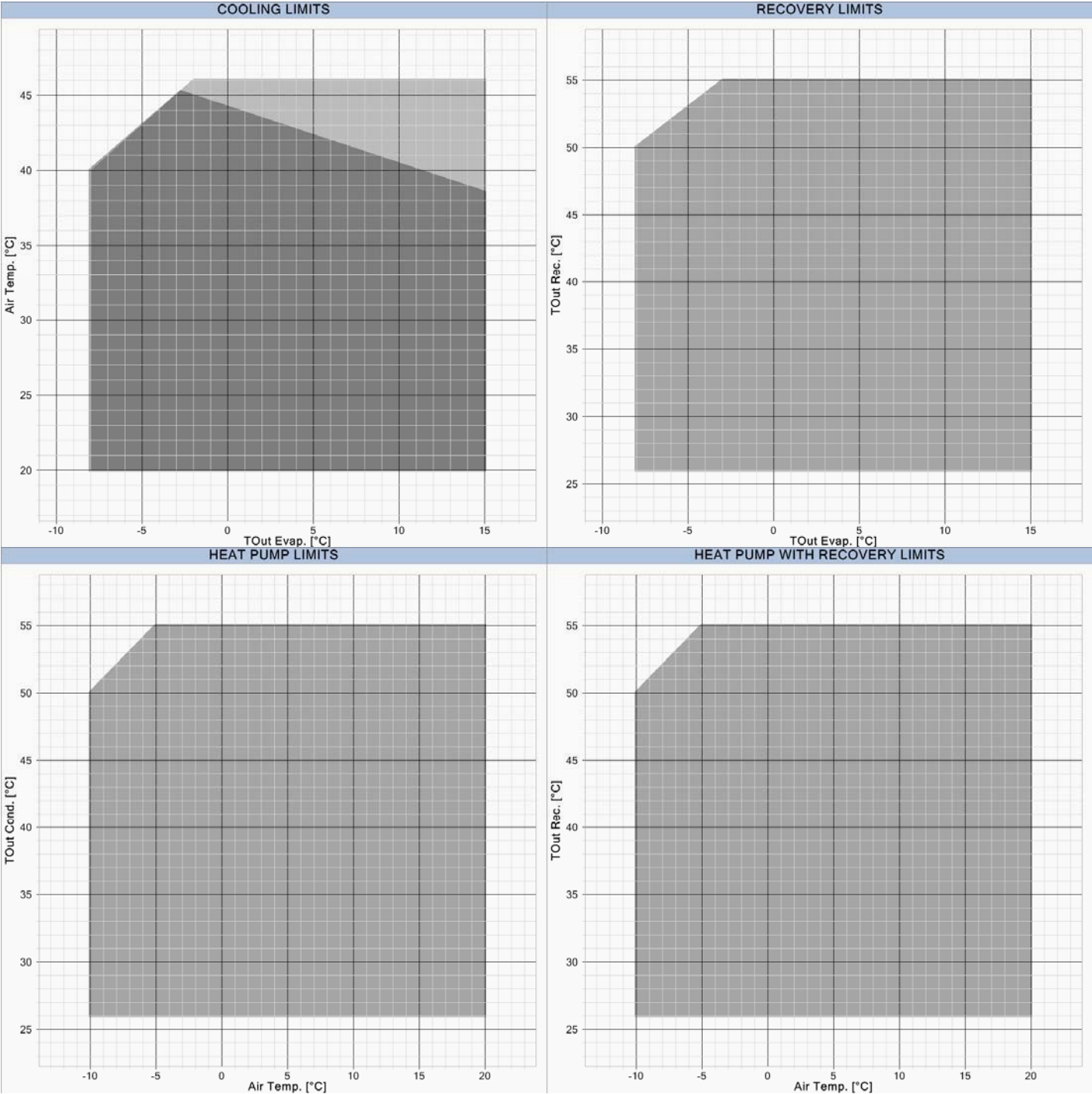
NOTE:
The represented operating limit refers to the standard unit's operation. Thanks to the condensation and evaporation control device adopted in FOCS-NR line, the units can work in each of the possible operating mode from -10°C up to 46°C outdoor air temperature.



- Selection limits
- Selection limits
- Economizers de-activated and unit in non silenced mode

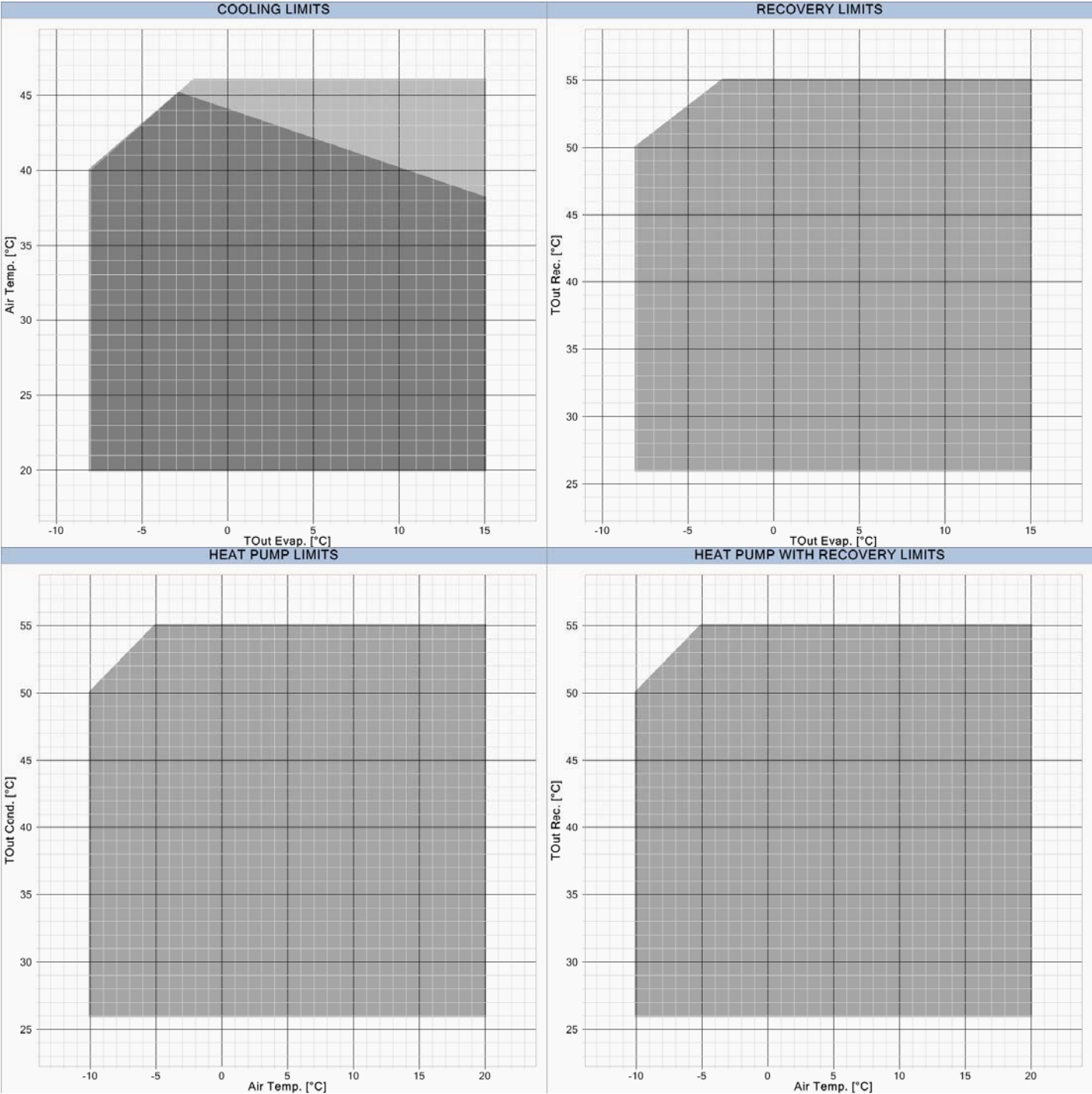
NOTE:
The represented operating limit refers to the standard unit's operation. Thanks to the condensation and evaporation control device adopted in FOCS-NR line, the units can work in each of the possible operating mode from -10°C up to 46°C outdoor air temperature.

/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 FOCS-NR line, the units can work in each of the possible operating mode from -10°C up to 46°C outdoor air temperature.



- 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 FOCS-NR 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			PLANT SIDE HOT HEAT EXCHANGER		
ff (m ² °CW)	F1	FK1	KE [°C]	F2	FK2	KC [°C]
0	1,000	1,000	0,0	1,000	1,000	0,0
1,80 x 10 ⁻⁵	1,000	1,000	0,0	1,000	1,000	0,0
4,40 x 10 ⁻⁵	1,000	1,000	0,0	0,990	1,030	1,0
8,80 x 10 ⁻⁵	0,960	0,990	0,7	0,980	1,040	1,5
13,20 x 10 ⁻⁵	0,944	0,985	1,0	0,964	1,050	2,3
17,20 x 10 ⁻⁵	0,930	0,980	1,5	0,950	1,060	3,0

ff: fouling factors

f1 - f2: potential correction factors

fk1 - fk2: compressor power input 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: $Q = P \times 0,86 / Dt$

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

GRUPPO IDRONICO (Optional)

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	354
1162		270	386	534
1362		279	395	543
1562		303	395	567
1762		612	756	562
1962		628	756	562
2022		1070	1190	1190
2222		1170	1290	1290
2422		1170	1290	1330
2622		1170	1290	1330
2722		1150	1090	1150
3222		1100	1600	1540
1062	LN-CA	246	282	354
1162		270	386	534
1362		279	395	543
1562		303	395	567
1762		612	756	562
1962		628	756	562
2022		1070	1190	1190
2222		1170	1290	1290
2422		1170	1290	1330
2622		1170	1290	1330
2722		1150	1090	1150
3222		1100	1600	1540
1062	SL-CA	246	282	354
1162		270	386	534
1362		279	395	543
1562		303	395	567
1762		612	756	562
1962		628	756	562
2022		1070	1190	1190
2222		1170	1290	1290
2422		1170	1290	1330
2622		1170	1290	1330
2722		1150	1090	1150
3222		1100	1600	1540
2022	XL-CA	1070	1190	1190
2222		1170	1290	1290
2422		1170	1290	1330
2622		1170	1290	1330
2722		1150	1090	1150
3222		1100	1600	1540
1062	XL-CA-E	246	282	354
1162		303	419	567
1362		279	395	543
1562		612	628	530
1762		612	756	562
2022		1230	1350	1350
2222		1250	1370	1370
2422		1250	1370	1410
2622		1250	1370	1410

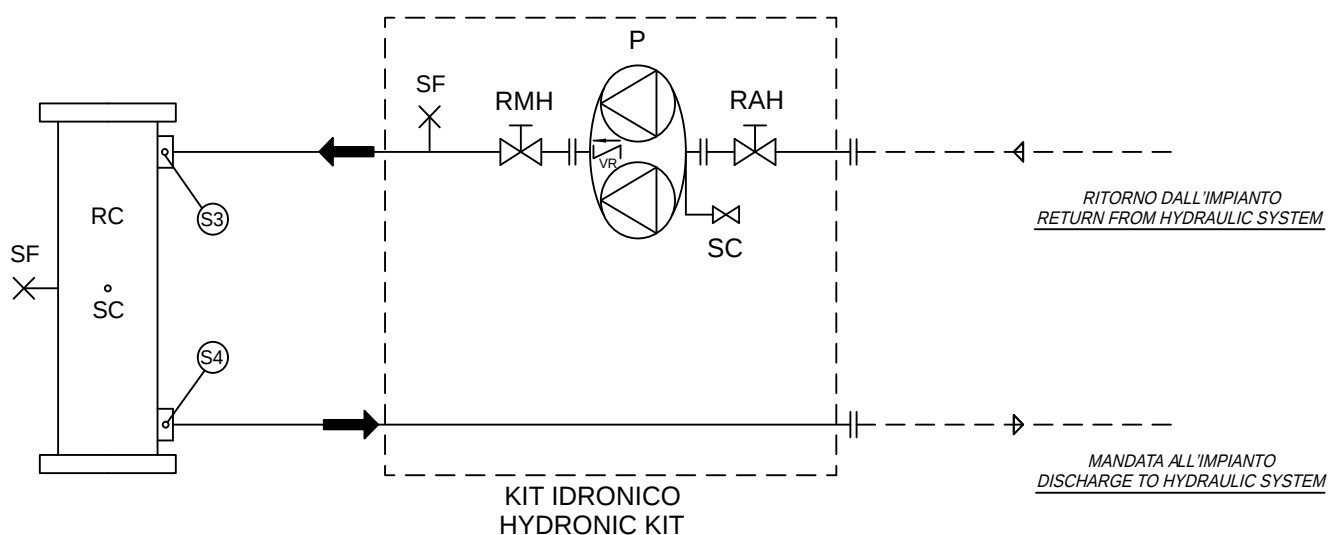
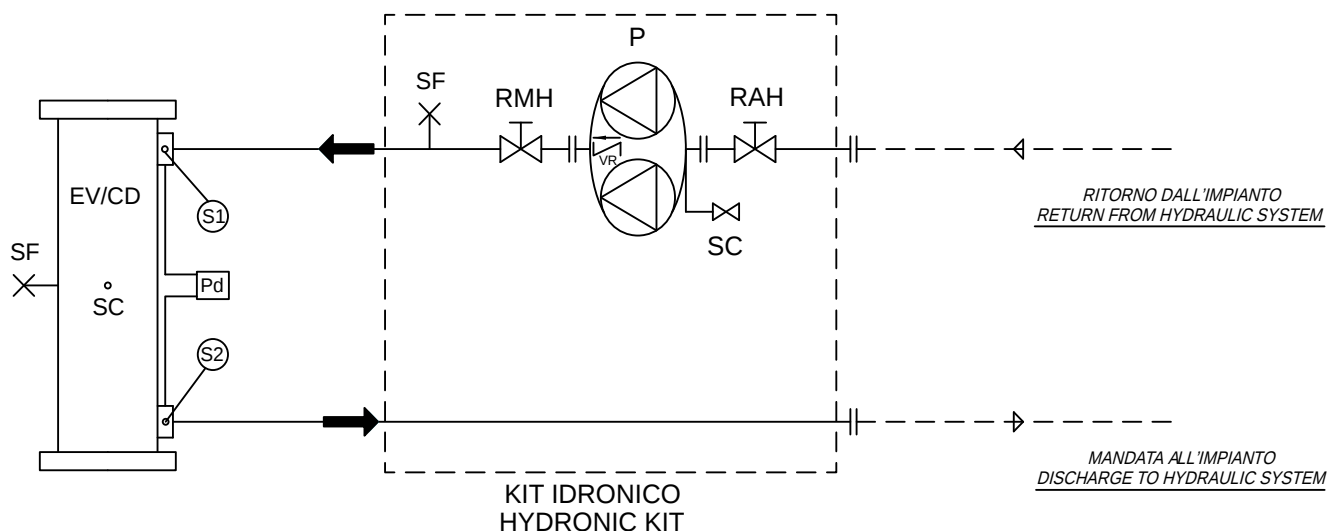
extra kg extra weight (hydronic group + hydraulic connection)

BP Low head pumps

AP High head pumps

HYDRONIC GROUP (Optional)

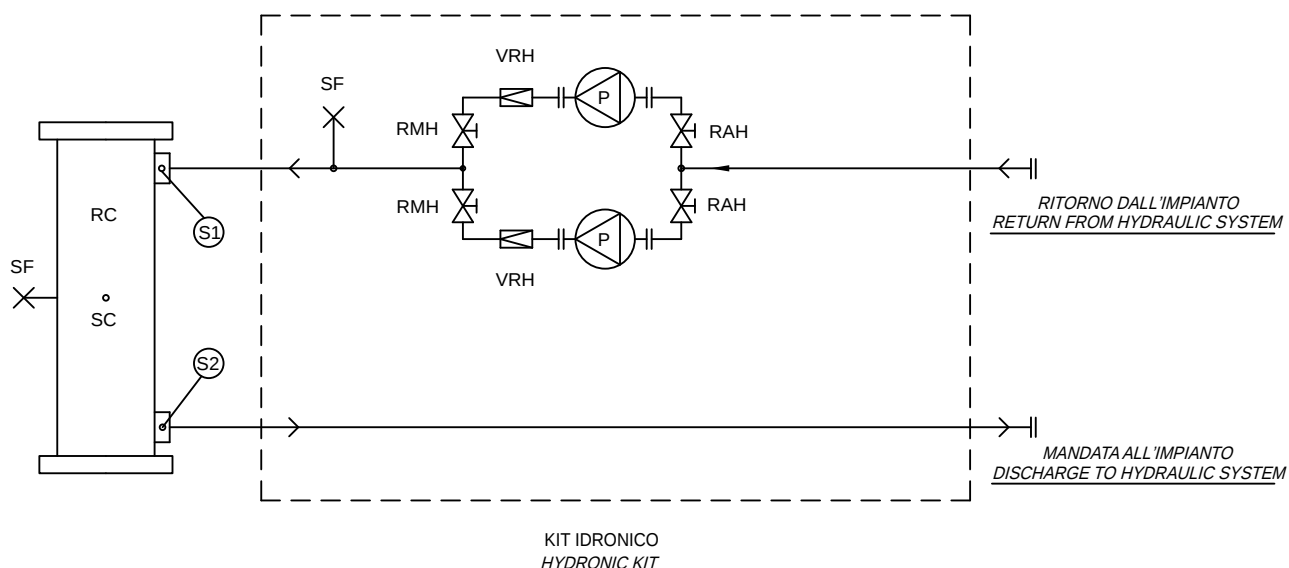
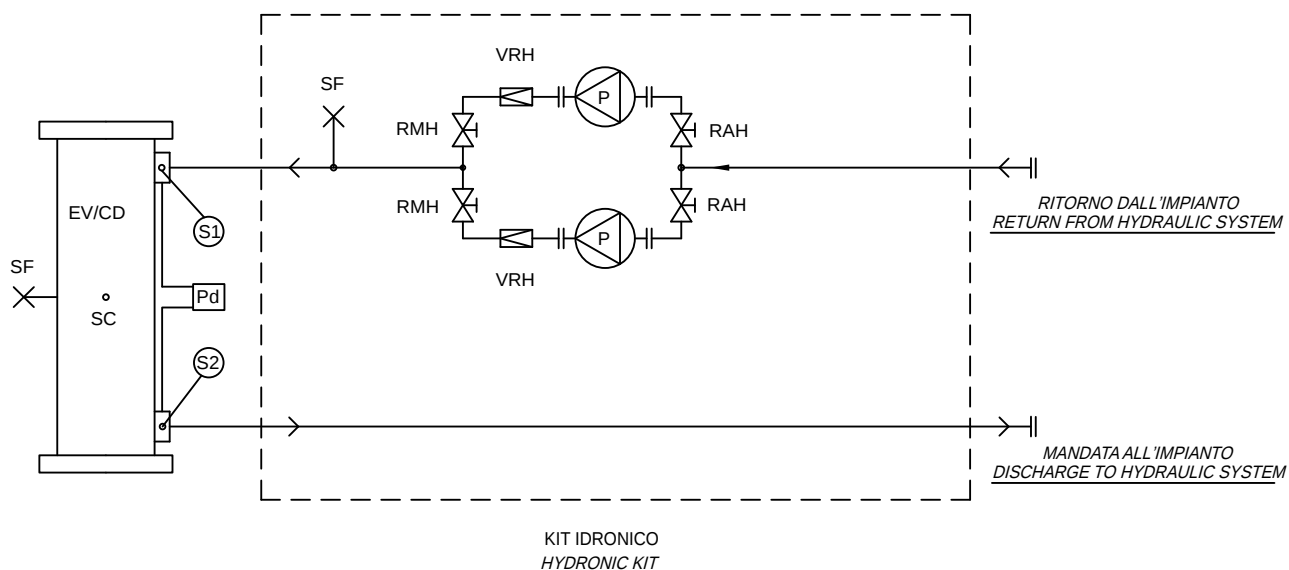
Hydraulic diagram IN-LINE water pump

**LEGENDA - LEGEND****COMPONENTI DEL KIT IDRONICO
COMPONENTS OF THE HYDRONIC KIT**

EV/CD	Scambiatore lato utenza (scambiatore a fascio tubiero) Plant side heat exchanger (tube exchanger)
P	Pompa gemellare Twin rotor pump
Pd	Pressostato differenziale lato acqua Water Differential pressure switch
RC	Scambiatore di recupero (scambiatore a fascio tubiero) Heat exchanger for heat reclaim (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



LEGENDA - LEGEND	
COMPONENTI DEL KIT IDRONICO COMPONENTS OF THE HYDRONIC KIT	
EV/CD	Scambiatore lato utenza (scambiatore a fascio tubiero) Plant side heat exchanger (tube exchanger)
P	Pompa Water pump
Pd	Pressostato differenziale lato acqua Water Differential pressure switch
RC	Scambiatore di recupero (scambiatore a fascio tubiero) Heat exchanger for heat reclaim (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)

PRIMARY 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 AUXILIARY 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

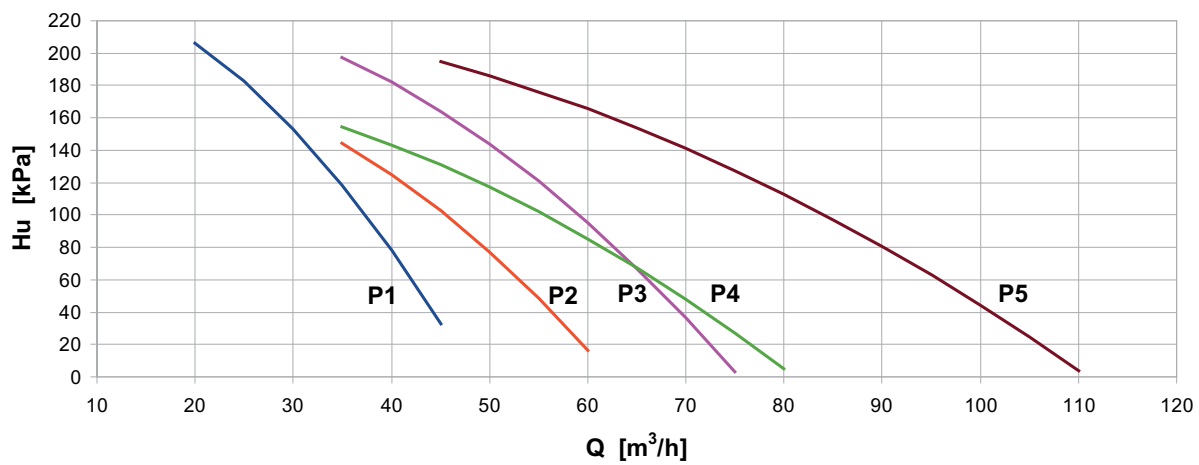
- (1) Values refer to rated operating conditions
 (2) Values referred to sizes 1062-1962, CA version
 Values referred to sizes 2022-3222, LN-CA version
 Pf Cooling capacity of unit
 Q Flow of water to evaporator
 F.L.I. Power absorbed by pump

- 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

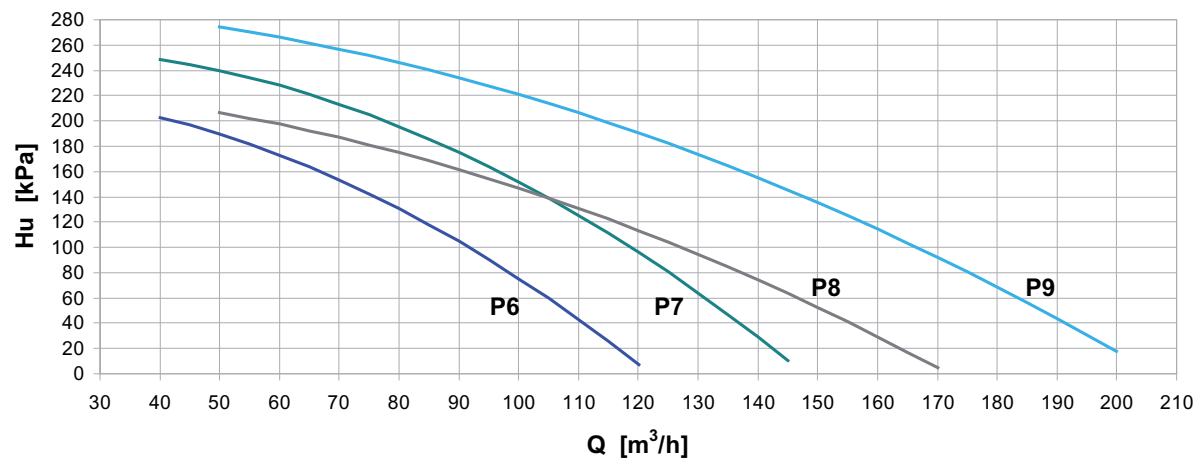
HYDRONIC GROUP (Optional)

PUMP CHARACTERISTICS

FOCS_NR 1062 - 1962



FOCS_NR 2022 - 3222



HYDRONIC GROUP (Optional)

PRIMARY 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	FC TE 60-160/55	IN - LINE	2	5,5	10,4	17,5	52,7	192
1762	380	65,4	P4	FC TE 80-160/75	IN - LINE	2	7,5	13,9	12,7	54,3	185
1962	425	73,1	P4	FC TE 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	FC TE 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

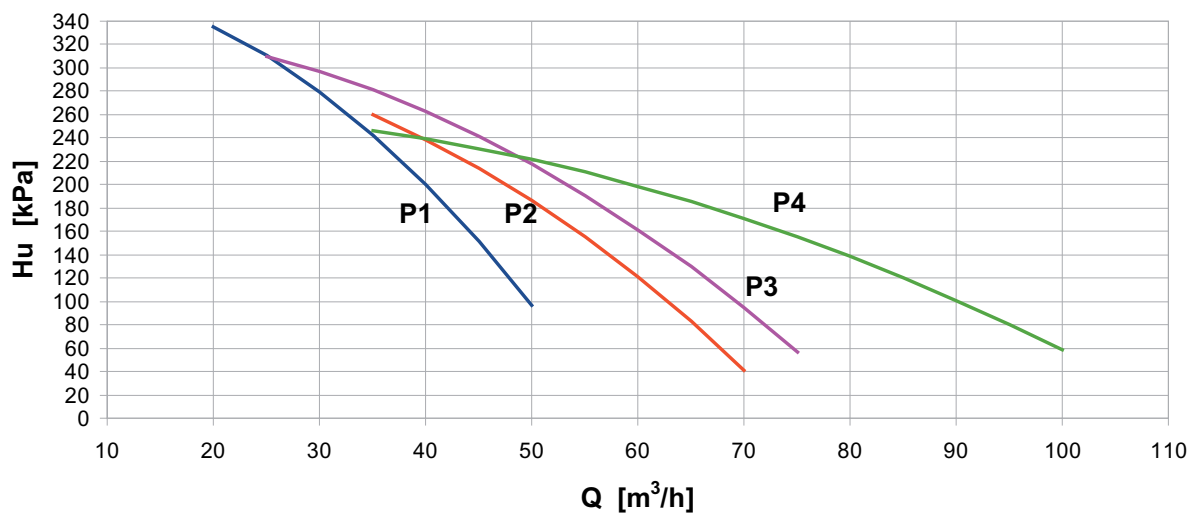
HOT AUXILIARY CIRCUIT - 2 PUMPS - HIGH HEAD PUMP

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	FC TE 60-160/55	IN - LINE	2	5,5	10,4	17,5	59,8	171
1762	396	68,1	P4	FC TE 80-160/75	IN - LINE	2	7,5	13,9	12,7	58,9	176
1962	434	74,6	P4	FC TE 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	FC TE 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

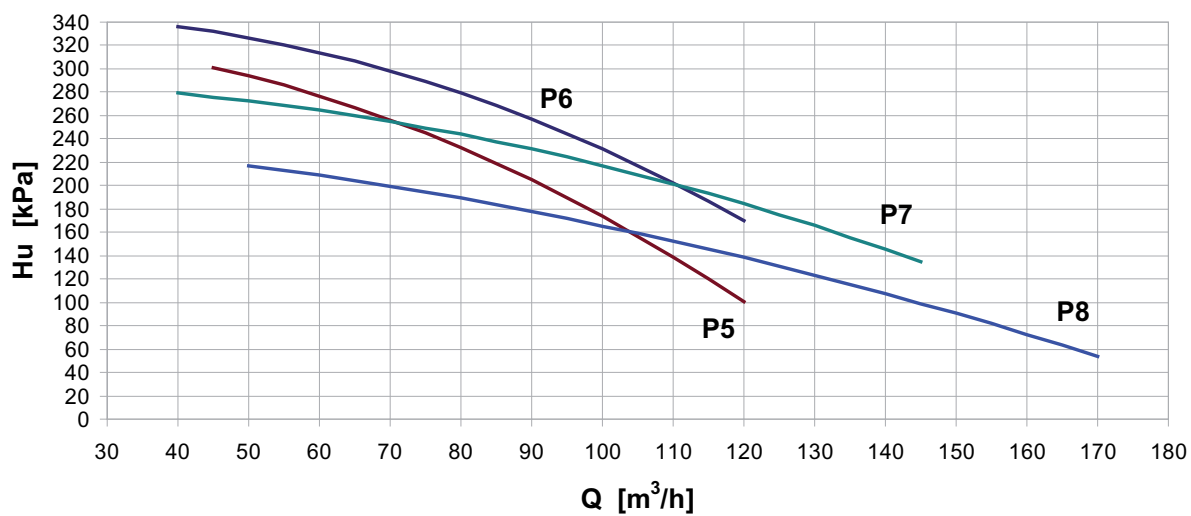
- (1) Values refer to rated operating conditions
 (2) Values referred to sizes 1062-1962, CA version
 Values referred to sizes 2022-3222, LN-CA version
 Pf Cooling capacity of unit
 Q Flow of water to evaporator
 F.L.I. Power absorbed by pump

- 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

FOCS_NR 1062 - 1962



FOCS_NR 2022 - 3222



HYDRONIC GROUP (Optional)

PRIMARY 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 AUXILIARY CIRCUIT - 2 PUMPS - 4 POLI - LOW HEAD PUMP

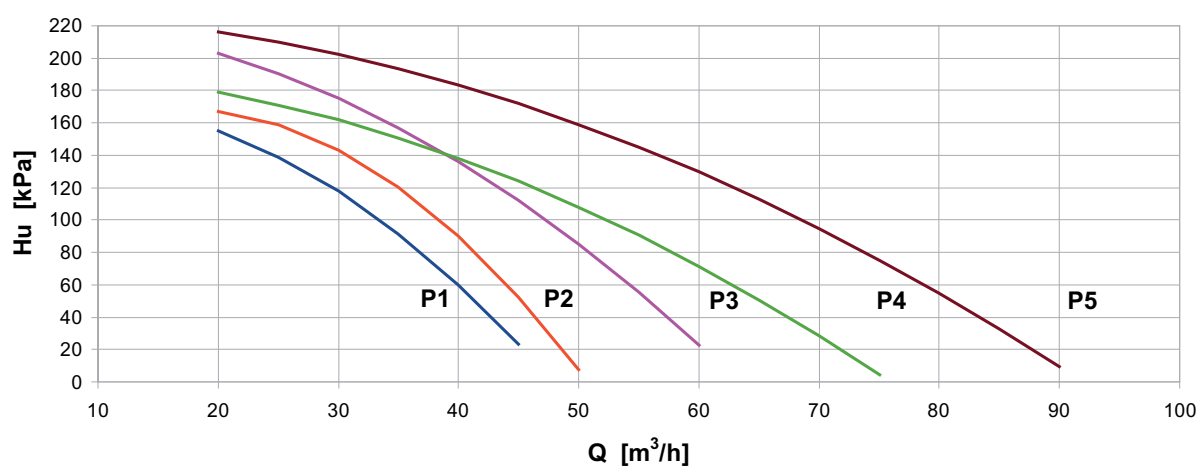
SIZE	Pt (1)(2) [kW]	Q (1)(2) [m3/h]	Rif. Pump	Pump		N. Poli	F.L.I. [kW]	F.L.A. [A]	Ks	Dps kPa	Hu (2) kPa
1062	218	37,5	P1	FHE4 50-250/22	SINGLE	4	2,2	4,7	33,9	47,7	79
1162	258	44,4	P2	FHE4 65-250/40	SINGLE	4	4,0	8,8	33,9	66,8	94
1362	308	53,0	P2	FHE4 65-250/40	SINGLE	4	4,0	8,8	25,4	71,3	82
1562	339	58,3	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

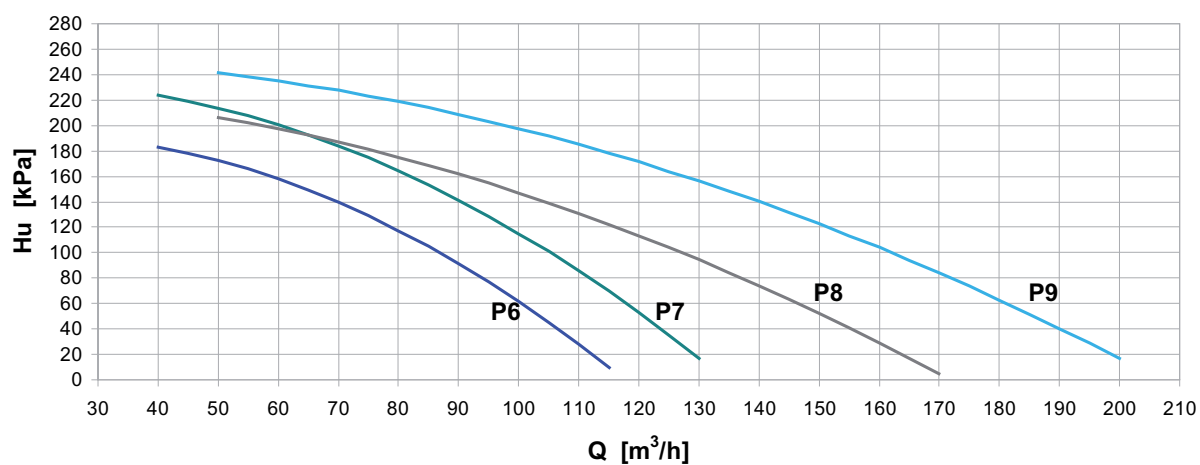
- F.L.A. Current absorbed by pump
 Ks Total coefficient for the calculation of loss of power with double pump (one on stand-by)
 Dps Total pressure drop in water circuit (evaporator and pipes)
 Hu Working head

PUMP CHARACTERISTICS

FOCS_NR 1062 - 1962



FOCS_NR 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]	L.R.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]	L.R.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]	L.R.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]	L.R.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]	L.R.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

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

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

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

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

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

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

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

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

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.

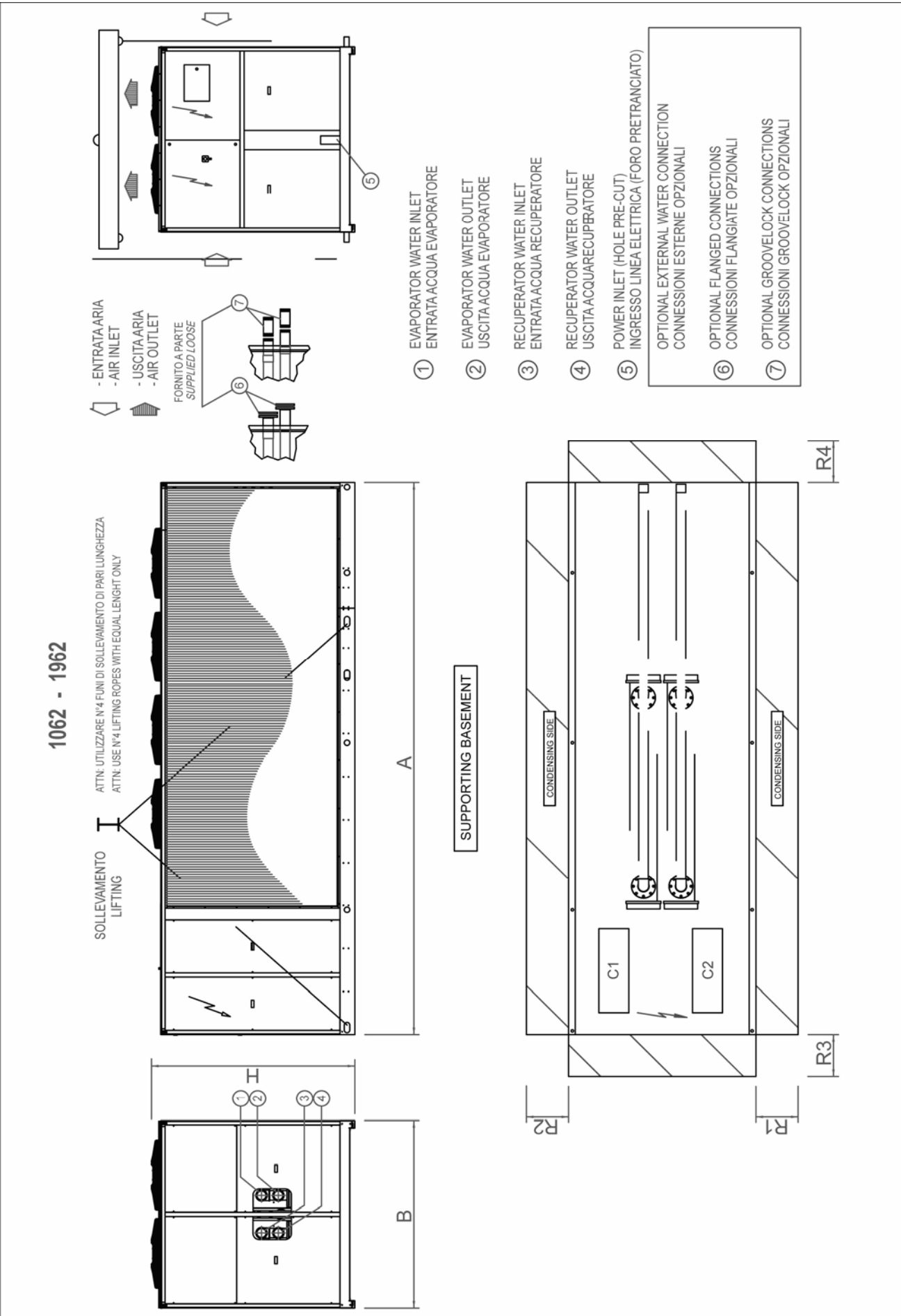
SOUND PRESSURE LEVEL									
SIZE	Octave band [Hz] at 10 m								Total sound level
	63	125	250	500	1000	2000	4000	8000	
	Sound pressure level dB(A)								
1062	56	47	50	52	50	42	36	31	53
1162	56	48	52	53	51	43	36	31	54
1362	56	50	53	52	51	43	36	31	54
1562	56	50	53	52	51	43	36	31	54
1762	56	50	53	52	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

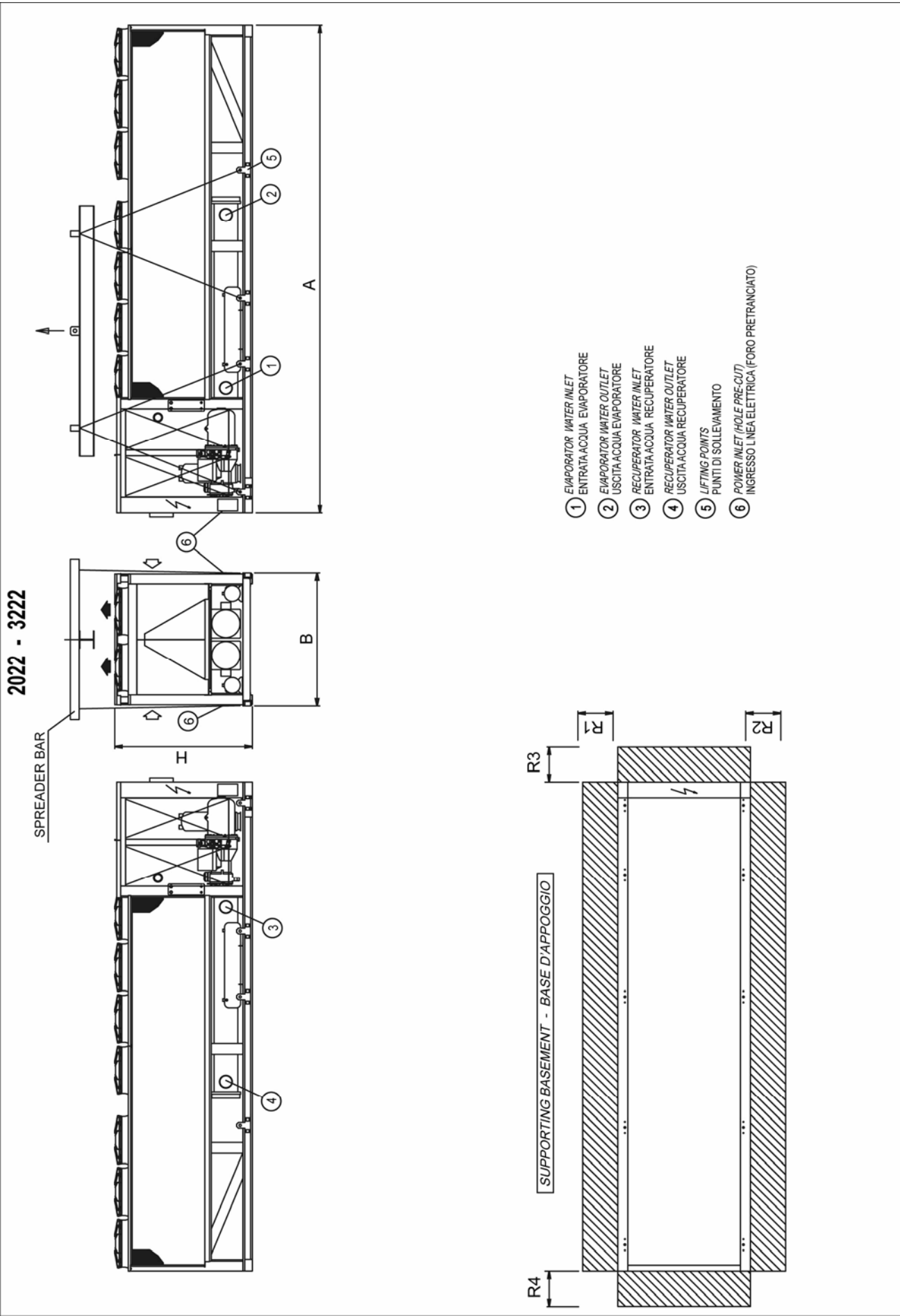
Heat exchanger air (in) 35 °C

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



"REMARKS:
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SIZE	DIMENSIONS AND				FREE SPACES				PLANT SIDE COLD HEAT EXCHANGER		PLANT SIDE HOT HEAT EXCHANGER		AUXILIARY SIDE 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
FOCS-NR /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"
FOCS-NR /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"
FOCS-NR /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"
FOCS-NR /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"
FOCS-NR /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"
FOCS-NR /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"
FOCS-NR /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"
FOCS-NR /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"
FOCS-NR /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"
FOCS-NR /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"
FOCS-NR /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"
FOCS-NR /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"
FOCS-NR /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"
FOCS-NR /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"
FOCS-NR /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"
FOCS-NR /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"
FOCS-NR /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"
FOCS-NR /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"
FOCS-NR /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"
FOCS-NR /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"
FOCS-NR /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"
FOCS-NR /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"
FOCS-NR /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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SIZE	DIMENSIONS AND				FREE SPACES				PLANT SIDE COLD HEAT EXCHANGER		PLANT SIDE HOT HEAT EXCHANGER		AUXILIARY SIDE 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
FOCS-NR /CA 2022	6300	2260	2350	7580	2000	2000	1800	1500	FLEXIBLE JOINT	6"	FLEXIBLE JOINT	6"	FLEXIBLE JOINT	6"
FOCS-NR /CA 2222	7200	2260	2350	8060	2000	2000	1800	1500	FLEXIBLE JOINT	6"	FLEXIBLE JOINT	6"	FLEXIBLE JOINT	6"
FOCS-NR /CA 2422	7200	2260	2350	8160	2000	2000	1800	1500	FLEXIBLE JOINT	6"	FLEXIBLE JOINT	6"	FLEXIBLE JOINT	6"
FOCS-NR /CA 2622	7200	2260	2350	8600	2000	2000	1800	1500	FLEXIBLE JOINT	8"	FLEXIBLE JOINT	8"	FLEXIBLE JOINT	8"
FOCS-NR /CA 2722	8400	2260	2350	9160	2000	2000	1800	1500	FLEXIBLE JOINT	8"	FLEXIBLE JOINT	8"	FLEXIBLE JOINT	8"
FOCS-NR /CA 3222	9700	2260	2350	11380	2000	2000	1800	1500	FLEXIBLE JOINT	8"	FLEXIBLE JOINT	8"	FLEXIBLE JOINT	8"
FOCS-NR /LN-CA 2022	6300	2260	2350	7580	2000	2000	1800	1500	FLEXIBLE JOINT	6"	FLEXIBLE JOINT	6"	FLEXIBLE JOINT	6"
FOCS-NR /LN-CA 2222	7200	2260	2350	8060	2000	2000	1800	1500	FLEXIBLE JOINT	6"	FLEXIBLE JOINT	6"	FLEXIBLE JOINT	6"
FOCS-NR /LN-CA 2422	7200	2260	2350	8160	2000	2000	1800	1500	FLEXIBLE JOINT	6"	FLEXIBLE JOINT	6"	FLEXIBLE JOINT	6"
FOCS-NR /LN-CA 2622	7200	2260	2350	8600	2000	2000	1800	1500	FLEXIBLE JOINT	8"	FLEXIBLE JOINT	8"	FLEXIBLE JOINT	8"
FOCS-NR /LN-CA 2722	8400	2260	2350	9160	2000	2000	1800	1500	FLEXIBLE JOINT	8"	FLEXIBLE JOINT	8"	FLEXIBLE JOINT	8"
FOCS-NR /LN-CA 3222	9700	2260	2350	11380	2000	2000	1800	1500	FLEXIBLE JOINT	8"	FLEXIBLE JOINT	8"	FLEXIBLE JOINT	8"
FOCS-NR /SL-CA 2022	6300	2260	2350	7670	2000	2000	1800	1500	FLEXIBLE JOINT	6"	FLEXIBLE JOINT	6"	FLEXIBLE JOINT	6"
FOCS-NR /SL-CA 2222	7200	2260	2350	8150	2000	2000	1800	1500	FLEXIBLE JOINT	6"	FLEXIBLE JOINT	6"	FLEXIBLE JOINT	6"
FOCS-NR /SL-CA 2422	7200	2260	2350	8250	2000	2000	1800	1500	FLEXIBLE JOINT	6"	FLEXIBLE JOINT	6"	FLEXIBLE JOINT	6"
FOCS-NR /SL-CA 2622	7200	2260	2350	8690	2000	2000	1800	1500	FLEXIBLE JOINT	8"	FLEXIBLE JOINT	8"	FLEXIBLE JOINT	8"
FOCS-NR /SL-CA 2722	8400	2260	2350	9260	2000	2000	1800	1500	FLEXIBLE JOINT	8"	FLEXIBLE JOINT	8"	FLEXIBLE JOINT	8"
FOCS-NR /SL-CA 3222	9700	2260	2350	11480	2000	2000	1800	1500	FLEXIBLE JOINT	8"	FLEXIBLE JOINT	8"	FLEXIBLE JOINT	8"
FOCS-NR /XL-CA 2022	6300	2260	2350	7790	2000	2000	1800	1500	FLEXIBLE JOINT	6"	FLEXIBLE JOINT	6"	FLEXIBLE JOINT	6"
FOCS-NR /XL-CA 2222	7200	2260	2350	8260	2000	2000	1800	1500	FLEXIBLE JOINT	6"	FLEXIBLE JOINT	6"	FLEXIBLE JOINT	6"
FOCS-NR /XL-CA 2422	7200	2260	2350	8350	2000	2000	1800	1500	FLEXIBLE JOINT	6"	FLEXIBLE JOINT	6"	FLEXIBLE JOINT	6"
FOCS-NR /XL-CA 2622	7200	2260	2350	8790	2000	2000	1800	1500	FLEXIBLE JOINT	8"	FLEXIBLE JOINT	8"	FLEXIBLE JOINT	8"
FOCS-NR /XL-CA 2722	8400	2260	2350	9340	2000	2000	1800	1500	FLEXIBLE JOINT	8"	FLEXIBLE JOINT	8"	FLEXIBLE JOINT	8"
FOCS-NR /XL-CA 3222	9700	2260	2350	11580	2000	2000	1800	1500	FLEXIBLE JOINT	8"	FLEXIBLE JOINT	8"	FLEXIBLE JOINT	8"
FOCS-NR /XL-CA-E 2022	8400	2260	2350	8510	2000	2000	1800	1500	FLEXIBLE JOINT	6"	FLEXIBLE JOINT	6"	FLEXIBLE JOINT	6"
FOCS-NR /XL-CA-E 2222	9300	2260	2350	8720	2000	2000	1800	1500	FLEXIBLE JOINT	6"	FLEXIBLE JOINT	6"	FLEXIBLE JOINT	6"
FOCS-NR /XL-CA-E 2422	9300	2260	2350	8890	2000	2000	1800	1500	FLEXIBLE JOINT	6"	FLEXIBLE JOINT	6"	FLEXIBLE JOINT	6"
FOCS-NR /XL-CA-E 2622	9300	2260	2350	9400	2000	2000	1800	1500	FLEXIBLE JOINT	8"	FLEXIBLE JOINT	8"	FLEXIBLE JOINT	8"

LEGEND OF PIPE CONNECTIONS

UNI ISO 228/1

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

Used terminology:

G: Pipe threads where pressure-tight joints are not made on the threads

A: Close tolerance class for external pipe threads where pressure-tight joints are not made on the threads

B: Wider tolerance class for external pipe threads where pressure-tight joints are not made on the threads

Internal threads: G letter followed by thread mark (only tolerance class)

External threads: G letter followed by thread mark and by A letter for A class external threads or by B letter for B class external threads.

UNI ISO 7/1

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

Used terminology:

Rp: Internal cylindrical threads where pressure-tight joints are made on the threads

Rc: Internal conical threads where pressure-tight joints are made on the threads

R: External conical threads where pressure-tight joints are made on the threads

Internal cylindrical threads: R letter followed by p letter

Internal conical threads: R letter followed by c letter

External conical threads: R letter

Designation	Description
UNI ISO 7/1 - Rp 1 1/2	Internal cylindrical threads where pressure-tight joints are made on the threads, defined by standard UNI ISO 7/1 Conventional $\varnothing$ 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 $\varnothing$ 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 $\varnothing$ 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 $\varnothing$ 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 $\varnothing$ 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 $\varnothing$	1"	1"
Pitch	2.309 mm	2.309 mm
External $\varnothing$	33.249 mm	33.249 mm
Core $\varnothing$	30.291 mm	30.291 mm
Thread height	1.479 mm	1.479 mm