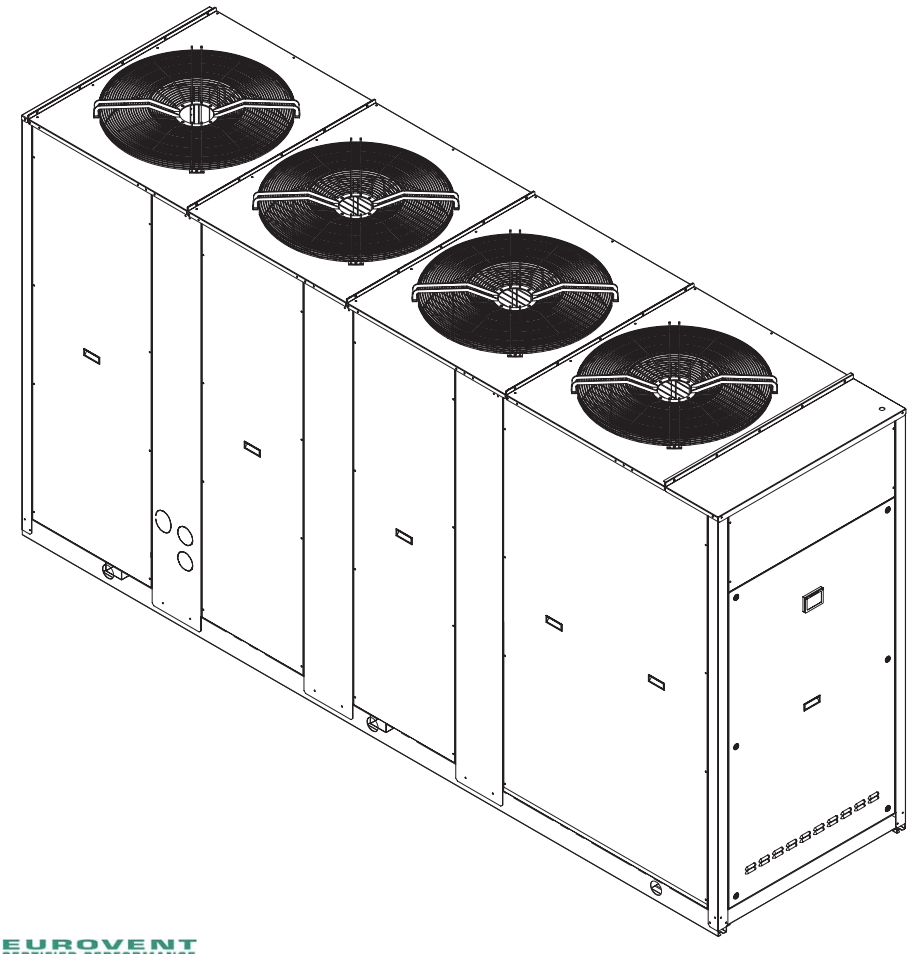
RGA

AIR COOLED WATER CHILLERS AND HEAT PUMPS
WITH AXIAL FANS

53.5 ÷ 200 kW IN COOLING MODE
53.2 ÷ 202 kW IN HEATING MODE



FERROLI adheres to the EUROVENT certification programme.
The products concerned appear in the products guide to www.eurovent-certification.com

OZONE SAVED R410A

INSTALLATION AND OPERATION MANUAL

Dear Customer,
Thank you for having purchased a **FERROLI** Idustrial coolers. It is the result of many years experience, particular research and has been made with top quality materials and higlly advanced technologies.The CE mark guaranteed thats the appliances meets European Machine Directive requirements regarding safety.
The qualitative level is kept under constant surveillance. **FERROLI** products therefore offer SAFETY, QUALITY and RELIABILITY.
Due to the continuous improvements in technologies and materials, the product specification as well as performances are subject to variations without prior notice.

Thank you once again for your preference.
FERROLI S.p.A

CE

GB **"CE" DECLARATION OF CONFORMITY**
We, the undersigned, hereby declare under our responsibility, that the machine in question complies with the provisions established by Directives :

DE **"EG" KONFORMITÄTSERKLÄRUNG**
Wir, die Unterzeichner dies er Erklärung, erklären unter unseren ausschlie ßlichen Verantworfung, daß die genannte Maschine den Bestimmungen der folgenden EG-Richtlinien entspricht :

FR **DECLARATION "CE" DE CONFORMITE**
Nous soussignés déclarons, sous notre entière responsabilité, que la machine en objet est conforme aux prescriptions des Directives :

IT **DICHIARAZIONE "CE" DI CONFORMITÀ**
Noi sottoscritti dichiariamo, sotto la nostra responsabilità, che la macchina in questione è conforme alle prescrizioni delle Direttive :

ES **DECLARACION "CE" DE CONFORMIDAD**
Quienes subscribimos la presente declaracion, declaramos, baio nuestra exclusiva responsabilidad, que la maquina en objeto respeta lo prescrito par las Directivas :

PT **DECLARAÇÃO "CE" DE CONFORMIDADE**
Nós, signatários da presente, declaramos sob a nassa exclusiva responsabilidade, que a má quina em questão está em conformidade com as prescrições das Directrizes :

NL **"EG" CONFORMITEITSVERKLARING**
Wij ondergetekenden verklaren hierbij op uitsluitend eigen verantwoording dat de bovengenoemde machine conform de voorschriften is van de Richtlijnen:

DK **"CE" OVERENSSTEMMELSESERKLERING**
Underfegnede forsikrer under eget ansvar al den ovennævnte maskine er i overensstemmelse med vilkårene i direktiveme :

SE **FÖRSÄKRAN OM "CE" ÖVERENSSTÄMMELSE**
Underfecknade försäkrar under eget ansvar alt ovannämnda maskinskinen er i overensstemmelse med vilkarene i direktivene :

NO **BEKREFTELSE OM ÆCEØ OVERENSSTEMMELSE**
Underfegnede forsikrer under eget ansvar al den ovennevnte maskinen er i overensstemmelse med vilkarene i direktivene :

FI **"CE" VAATIMUSTENMUKAISUUSVAKUUTUS**
Allekirjoittaneet vakuutamme omalla vastuullamme että yllämainittu kone noudattaa ehtoja direktiiveissä :

GR **ΔΗΛΩΣΗ ΣΥΜΒΑΤΟΤΗΤΑΣ "ΕΕ"**
Εμετς που υπογραφουμε την παρουσα, δηλωνουμε υπο την αποκλειστικη μας ευθυνη, οτι το μηχανημα συμμορφουται οτα οσ α ορτζουν οι Οδηγιες :

HR **IZJAVA O "CE" SUGLASNOSTI**
Mi niže potpisani izjavljujemo, pod našom odgovornošu, da ova Mašina odgovara zahtijevima iz Direktiva :

PL **DEKLARACJA ZGODNOŚCI "CE"**
My niżej podpisani oświadczamy z pełną odpowiedzialnością, że niżej wymienione urządzenie w pełni odpowiada postanowieniom przyjętym w następujących Dyrektywach:

2006/42/EC
97/23/EC
2004/108/EC
2006/95/EC

Il legale rappresentante
Dante Ferroli

3QE22170 rev.03

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GENERAL SPECIFICATIONS

General specifications

This manual and the wiring diagram supplied with the unit must be kept in a dry place for possible future consultation.
The manual provides information on installation and correct use and maintenance of the unit. **Before carrying out installation, please carefully read all the information contained in this manual, which describes the procedures necessary for correct installation and use of the unit.**

Carefully follow the instructions contained in this manual and comply with the current safety regulations. The unit must be installed in conformity with the laws in force in the country of use. Unauthorised tampering with the electrical and mechanical equipment **INVALIDATES THE WARRANTY**.
Check the electrical specifications given on the dataplate before making the electrical connections. Read the instructions given in the specific section on electrical connections.
Deactivate the equipment in case of a fault or poor operation.
If the unit requires repairs, only contact a specialised service centre recognised by the manufacturer and use original replacement parts.
The unit must be installed outside and connected to a hydronic cooling and/or heating system. Any use different from that permitted or outside the operating limits given in this manual is prohibited (unless previously agreed on with the firm).

The manufacturer declines any liability for damage or injury due to non-compliance with the information given in this manual.

European Directives

The company hereby declares that the machine in question complies with the matters prescribed by the following Directives:

- Machinery directive **2006/42/EC**
- Pressurised equipment directive (PED) **97/23/EC**
- Electromagnetic compatibility directive (EMC) **2004/108/EC**
- Low voltage directive (LVD) **2006/95/EC**

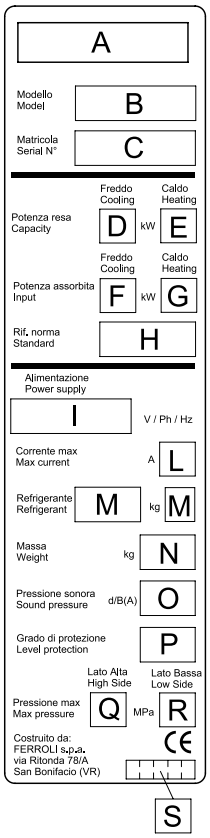
Unit identification plate

The figure on the left illustrates the identification plate of the unit:

Basic versions
A - Trademark
B - Model
C - Serial number
D - Cooling Capacity
E - Heating Capacity
F - Power input in COOLING mode
G - Power input in HEATING mode
H - Reference standard
I - Electric power supply
L - Maximum current absorption
M - Type of refrigerant and weight of charge
N - Shipping weight of the unit
O - Sound pressure
P - IP Level Protection
Q - Maximum pressure - High Side
R - Maximum pressure - Low Side
S - PED certification authority

Special versions
A - Trademark
B - Model
C - Serial number
D - Useful cooling output (same as Standard Version of the unit)
E - **Useful heating output**
for IR unit, VD version, same as the recovered Heat rating
for IP unit, VD version, same as the Heat rating / recovered Heat rating
F - Electric power draw in the COOLING mode (same as Standard version of the unit)
G- **Electric power draw in the HEATING mode**
H - Reference standard
I - Electric power supply
L - Maximum electric current requirement
M- Type of refrigerant and weight of charge
N - Shipping weight of the unit
O - Acoustic pressure
P - IP Protection degree
Q - Maximum pressure on top side
R - Maximum pressure on bottom side
S - PED certification authority

NOTE: The identification plate of the Brine Version (VI) is filled out as shown in the diagram for the Basic Version of the unit (VB).



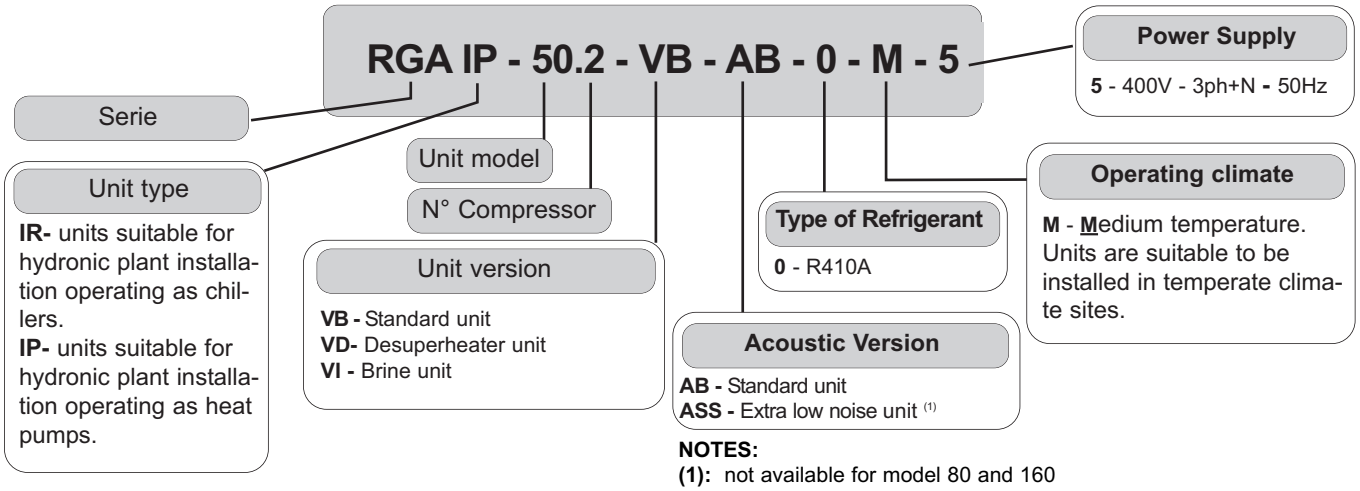
GENERAL SPECIFICATIONS

Unit description

This new series of industrial chillers and heat pumps has been designed to meet the demands of global markets in the small-medium power industrial and commercial plants. Units are compact and highly configurable, built to fit different types of plants so to meet the needs of highly qualified engineers.
Units are water chillers and heat pumps condensed in air with axial fans suitable for outdoor installation: the structure and panels are robust, made of galvanized and painted steel; all fasteners are made of stainless steel or galvanized steel, the frame containing the electrical equipment and all the components exposed to weather have a minimum IP54 degree of protection.
This series is composed of twelve models divided in four sizes with nominal cooling capacity from **53.5** to **200 kW** and thermal capacity from **53.2** to **202 kW.**
The units product cold water from 5 to 20°C (in summer) and hot water from 30 to 53°C (in winter) and **as standard** they are equipped with continuous adjustment of axial fans rotating speed in order to allow the units to operate both with low outdoor temperature in cooling mode and with high outdoor temperature in heating mode as well as to reduce noise emissions.
All the units are equipped with 2 scroll compressors arranged in pairs (tandem) on 1 circuit operating with **environmental friendly R410A gas**, brazed plate heat exchanger completely insulated and protected by water side with a differential pressure control and with an antifreeze electrical heater, coil heat exchanger made of louver aluminum fins and copper tubes, axial fans with profiled blades to contain noise and with thermal protection built-in, on-board electrical control panel equipped with control system to manage the main functions.
Hydronic group (MP) composed of fittings and connections is available as an accessory with 1 or 2 pumps and also with high available head pumps; the accessory Water Storage Tank (SAA) is completely insulated and available on delivery side or for primary-secondary hydraulic circuit (Victaulic connections already in place) depending on the kind of plants to serve.
A variety of other accessories are available to extend the capabilities of the units.
During the design of the units particular attention has been given to achieve high system efficiency, to reduce overall energy consumptions and sound levels in order to meet the increasingly restrictive laws in terms of noise. Upon request, you can choose for a Standard Unit (AB) or a Low Noise Kit (KS) which provides sound attenuation thanks to sound absorbing insulation in compressors area, sound jackets on compressors and reduced speed axial fans, or a Extra low noise unit (ASS), which provides in addition slower axial fans and more powerful finned coils.
All units are accurately build in compliance with the existing standards and are individually tested in factory. Only electrical and hydraulic connections are required for installation.

Identification code of the unit

The codes that identify the units are listed below and include the sequences of letters that determine the meanings for the various versions and set-ups.



NOTES:
(1): not available for model 80 and 160

The available special versions are described below:

VB: Basic version.

VD: Version with Desuperheater (available forboth IR units and IP units)
Produces cold water in the same way as the standard version plus hot water **from 40 to 70°C** at the same time. This is achieved by installing a water-refrigerant gas heat exchanger between the compressor and coils in order to recover 15 to 20% of the heating capacity that would otherwise be dispersed in the air.

VI: Version that produces water at a low temperature (BRINE) (available for IR units only)
The unit can produce cold water with brine at a temperature of **-8 to 5°C.**

GENERAL SPECIFICATIONS

Description of the components

The complete series of industrial chillers and heat pumps for use in hydronic systems includes **12 constructional sizes** rang **from 53.5 to 200 kW** in the cooling mode and **from 53.2 to 202 kW** in the heating mode.

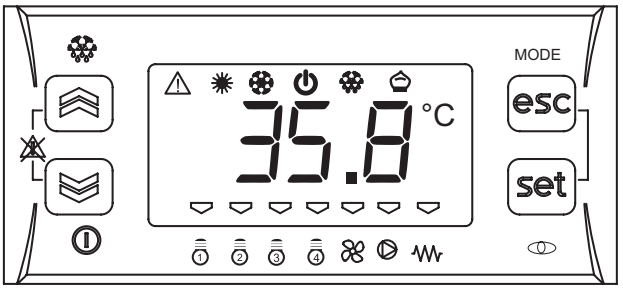
Main components:

1. **Fans.** These are the helical type with scythe-shaped blades to increase the efficiency and reduce the noise level. The fans are directly coupled to the single-phase motor by means of an external rotor. Thermal protection against operating faults is installed inside the winding. As standard they are equipped with continuous adjustment of axial fans rotating speed in order to allow the units to operate both with low outdoor temperature in cooling mode and with high outdoor temperature in heating mode
2. **Electric control and monitoring panel.** This is housed in a metal casing in which the various electrical components are positioned on one metal plate.

2a. The power section includes:
- Main door-locking circuit-breaker.
- Fuse-holder that can be isolated with protection fuse triad for each compressor.
- Fuse-holder that can be isolated with protection fuse for compressor oil heaters and antifreeze (if installed).
- Control contactor for each compressor.
- Protection fuse for the ventilation unit.
- Fan speed regulating board.
- Contactor and magnetothermic switch to protect the pump (if the Hydronic Kit accessory is installed).
- Pump contactor (if the Hydronic Kit accessory is installed).
- Phase presence and sequence monitoring device on power supply

2b. The auxiliary section includes:
- Fuses on the auxiliary transformer.
- Fuses for fans protection
- Electromagnetic noise filter
- Adjusting fan speed board
- Insulating and safety transformer to power the auxiliary circuit.

2c. The microprocessor monitoring section includes:
- User interfacing terminal with display.
- On-off key.
- Operating mode selector key.
- Compressor on-off display **LED**.
- Operational mode **LED**
- Antifreeze heaters activated indicator **LED**.
- Fans on-off dislay **LED**
- Pumps on-off display **LED**
- Check-control with fault code display
- Defrosting, alarm, economy, stand-by **LED.**
- **Remote ON/OFF functions** - Summer/Winter (E/I) remote selection (IP unit only).



Control system main functions: temperature control of the water produced by the unit, compressor and pump operating hour counter, timing and cycling of start-ups, input parameters by keyboard, alarms management, smart defrosting control and operating mode change (only IP unit), dynamic set-point (climatic control), scheduling and integrative heaters control.

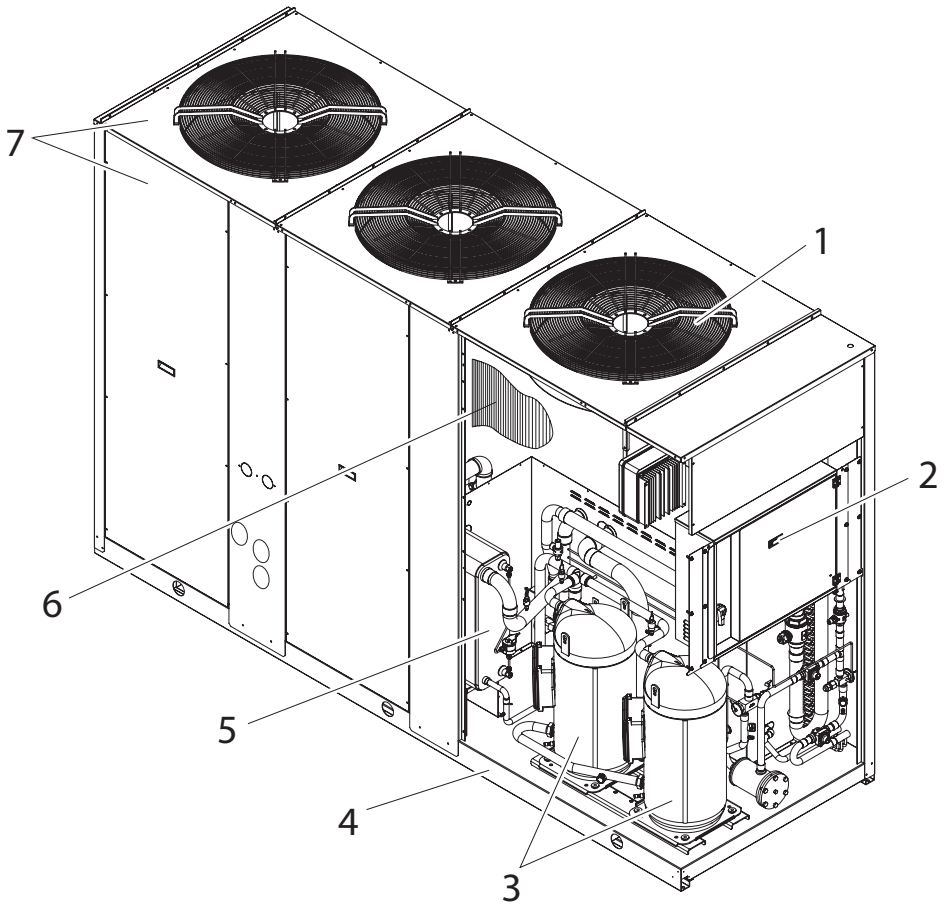
Digital input functions: low pressure, high pressure, high temperature on compressor supply, phase presence and sequence monitoring device on power supply, differential water pressure control, compressors thermal protection, fans thermal protection, pumps thermal protection (only if installed MP accessory), ON/OFF and remote operating mode change, demand limit and Economy function.

Digital output functions: compressor start-up, pump start-up (only with MP accessory), plate heat exchanger electrical heater, remote general alarm, 4-way valve (only IP unit), integrative heaters and clean contact on compressors start-up.

Analogic input functions: in and out water temperature, coil temperature probe, external air temperature probe (if present).

Analogic output functions: continuous adjustment of axial fans rotating speed.

GENERAL SPECIFICATIONS



3. Compressors. They are the **SCROLL** type with orbiting coil equipped with built-in thermal protection and oil heater. The version unit **AB+KS and ASS** includes: a soundproofing jacket for the compressors, acoustic cladding for the entire compressor compartment to reduce the noise level and continuous adjustment of axial fans rotating speed. All units are equipped with two compressors connected in parallel (1 single cooling circuit) which can operate at the same time (**100% cooling power**) or individually (**50% of the cooling power**), thus adapting to the different thermal loads of the system supplied.

4. Frame structure made of galvanized sheet metal panels coated with polyurethane powder paint to ensure maximun protection against adverse weather conditions.

5. Evaporator made of brazed stainless steel plates (**AISI 316**). It is installed in a shell of heat-insulating material to prevent the formation of condensation and heat exchanges towards the outside. Standard supply also includes antifreeze heater a differential pressure switch on the water circuit to avoid the risk of freezing if the water flow is shut off for some reason.

6. Condensing coils, the aluminium finned pack type with shaped profile to increase the heat exchange coefficient and with copper pipes arranged in staggered rows. A sub-cooling section is integrated into the lower part.

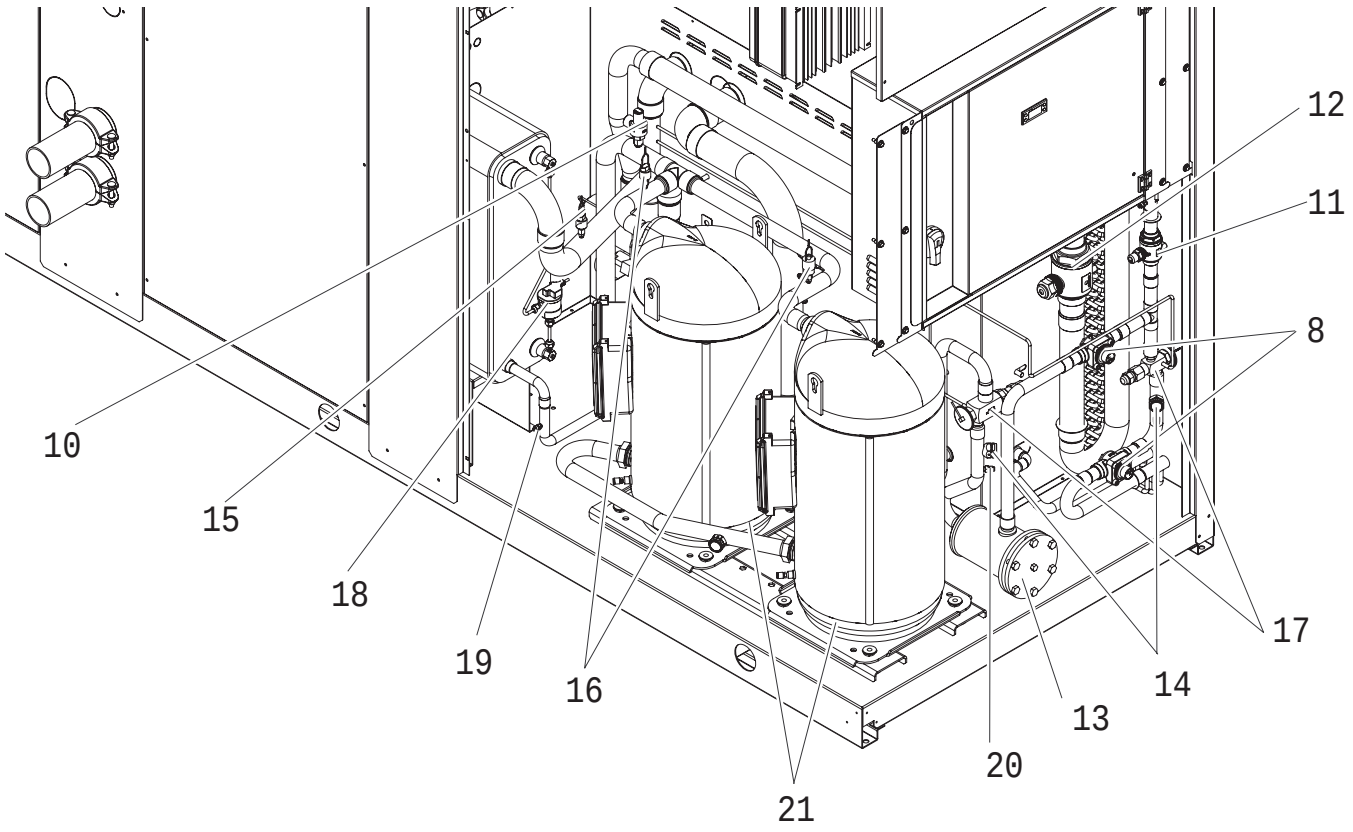
7. Covering panels, made of galvanized sheet metal coated with polyurethane powder paint to ensure maximun protection against adverse weather conditions

8.One-way valves (IP unit only), allowing the coolant to pass into the appropriate exchangers, depending on the operating cycle.

4-way cycle reversal valve (IP unit only), reverses the flow direction of the coolant as the summer/winter operating mode is changed.

Hydraulic and cooling circuit components

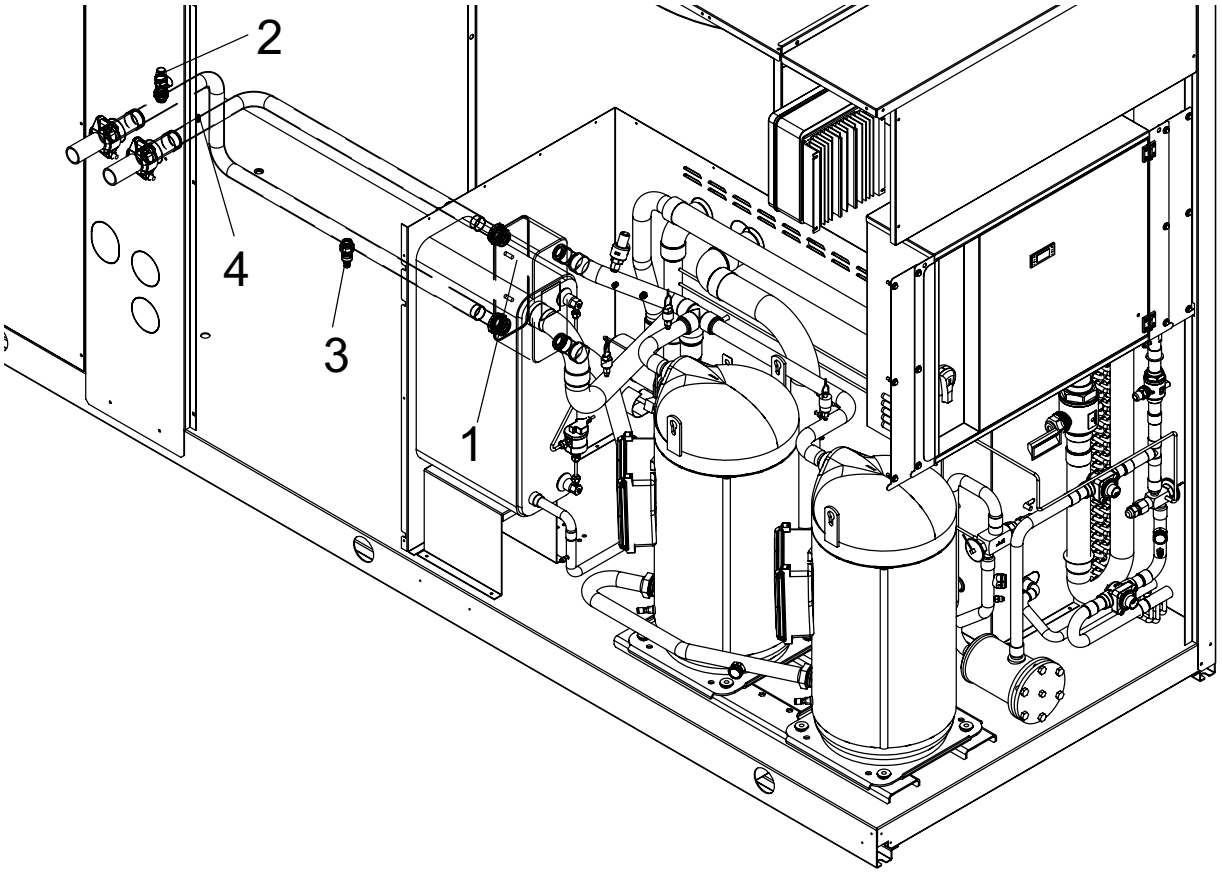
10. Safety valve. Installed on the delivery pipe of the compressors, this operates if extreme faults should occur in the plant.
11. Fluid cock. Ball type, this allows the gas flow on the fluid line to be turned on and off. Along with the cock on the compressor delivery, it allows the components of the fluid line to be subjected to extraordinary maintenance work and the compressors to be replaced if necessary (without discharging the coolant from the unit).
12. Compressor delivery cock. Ball type, allows the gas delivered to the compressors to be turned on and off.
13. Dehydrator filter. Mechanical type. Retains impurities and traces of moisture in the circuit. **Hermetic** type for models **50÷80**; **cartridge** type for models **90÷160**.
14. Fluid and humidity indicator. Signals when fluid passes through the circuit, indicating that the coolant charge is correct. The fluid indicator light also indicates the amount of moisture in the coolant by changing colour.
15. Low pressure switch (N°1 of series IR version, N°2 of series IP version). With fixed setting. It is installed on the suction pipe and blocks the compressors if the operating pressures drop below the tolerated values. Automatically resets as the pressure increases. If it activates frequently, the unit will block and can only be restarted by resetting via the user interface terminal.
16. High pressure switch (n°2). With fixed setting. Are is installed on the delivery pipe and blocks the compressors if the operating pressures exceed the tolerated values. If it activates, the unit will block and can only be restarted by resetting via the user interface terminal.
17. Thermostatic valve. With external equalizer, this supplies the evaporator correctly, keeping the selected overheating degree at a steady level.
18. Water differential pressure switch. This is standard supply and is installed on the connections between the water inlet and outlet of the exchanger. It stops the unit if it activates.
19. Pressure taps: 1/4 " SAE (7/16" UNF) type with flow regulator. Allow the operating pressure of the system to be measured: compressor delivery, lamination component inlet, compressor intake.
20. Pressure taps: 5/16 " SAE type with flow regulator. Allow the charge/discharge of the gas from the system, precisely from compressor outlet an expansion valve inlet.
21. Electrical heating elements to heat the compressor oil. "Belt" type. These activate when the compressor turns off and keep the temperature of the oil sufficiently high so as to prevent coolant from migrating during these pauses.
Fluid receiver (IP unit only), this is a plenum tank that accounts for variations to the coolant charge the machine must supply as the summer/winter operating mode varies.
Fluid separator (IP unit only), on the compressor intake to protect against possible fluid back-flows.



Version with Desuperheater VD (available for both IR units and IP units)

Hydraulic and chilling circuit components:

1. **Desuperheater.** Specially designed for the specific version. Plate type, made of stainless steel (AISI 316).
   It is installed within a shell of thermal barrier insulating material to prevent heat exchanges towards the outside. Standard supply also includes an electric antifreeze heater to prevent the parts from freezing during the winter, when the system remains at a stand-still (if not drained).
2. **Water safety valve.**On the heat recovery inlet pipe. It acts whenever faulty service leads to an operating pressure in the plumbing system that exceeds the valve opening value (Fig.1).
3. **Water drain cock** for emptying the exchangers and pipes of the machine dedicated to heat recovery (Fig. 1).
4. **Air vent.** Accessed by removing the front panels. It consists of a manually operated valve installed in the highest part of the water pipes. To use in conjunction with the water drain cocks situated in the rear part of the unit, for emptying the exchangers and pipes dedicated to heat recovery.



ACCESSORIES AND OPTIONAL EQUIPMENT

Mechanical options

AVG - Rubber vibration dampers. Consisting of 4/6 rubber vibration dampers to fit under the unit. Reduce the extent to which the mechanical vibrations created by the compressors and fans during normal operation are transmitted to the bearing surface of the machine. The insulating degree of the vibration dampers is about 85%.

GM - Pressure gauge unit. Consisting of 2 pressure gauges that display the pressure values of the refrigerating fluid on the compressor suction and delivery sides.

GP - Protective grilles. These are metal grilles installed to protect the finned banks.

SAA - Water storage tank. Made of adequately thick painted sheet metal, this reduces the number of compressor start-ups and fluctuations in the temperature of the water conveyed to the users. It is insulated with thermal barrier material to prevent the formation of condensation and heat exchanges towards the outside.

Water storage tank. It consists of:
Water draining. On-off action by means of a cock that can be accessed by removing the rear panel, positioned on the side of the unit opposite to the electric panel.
Air vent. Accessed by removing the rear panel positioned on the side of the unit opposite to the electric panel. It consists of a manually operated valve installed on the highest part of the wet pipes.
Water safety valve, on the rear part of the tank. It acts whenever faulty service leads to an operating pressure in the hydraulic circuit that exceeds the valve opening value.
Antifreeze heater connection. 1”1/4 female threaded connection pre-engineered for installation of the antifreeze heater (RAG accessory).

KS- Low noise kit (M). Provides sound attenuation thanks to sound absorbing insulation in compressors area, sound jackets on compressors and reduced speed axial fans

BCN- Drain Pan Kit (M). Provides a pan under the coil to drain the condensing water, fitted with 1/2" outlet connection positioned opposite to the electric control panel.

KT - the following kits are available (this accessory is mandatory if the Hydronic Kit is not installed).
- Basic pipe kit. This accessory consists of steel pipes insulated with thermal barrier material and allows the water inlet/outlet to be connected straight inside the unit.
- **Complete pipe kit.** This accessory consists of steel pipes insulated with thermal barrier material and allows the water inlet/outlet connection to be routed to the machine.
- **Water storage tank pipe kit.** This accessory consists of steel pipes insulated with thermal barrier material and allows the water inlet/outlet connection to be routed to the machine.

NB: YOU CAN CHOOSE ONLY ONE KIT.

• **MP. Hydronic Kit (M).** Consists of:

1 On-off ball valves. Turn components such as the water filter, surge chamber and pump on and off when they require routine or extraordinary maintenance.
2 Metal gauze water filter. Can be turned on and off and inspected. It is installed on the pump delivery side. Prevents machining residues (dust, swarf, etc.) in the water pipes from entering the plate-type heat exchanger.
3 Hydraulic pump. Circulates water around the system. The pumps have a low/high head and suit the majority of installation requirements. The pumps are safeguarded by a magnetothermics installed in the chiller’s electric panel.
4 Surge chamber. This is a closed, diaphragm type chamber. It absorbs the variations in the volumes of water in the system caused by temperature variations.
5 Water filling. Manual function with control positioned on the side of the unit opposite the electric panel and turned on and off by a cock that can be accessed by removing the rear panel.
6 Water pressure gauge. Connected to the water fill pipe. Displays the pressure of the water in the system.
7 Water safety valve.
8 Water outlet.
9 Air vent.
10 Antifreeze heater connection (RAG accessory)**.**

MP. Hydronic Kit.
MP : Hydronic Kit with 1 o 2 Pumps: Besides the pumps, this accessory is equipped with all the hydraulic components (water filter, expansion tank, on-off valves, water pressure gauge, air vent, water outlet) required for complete installation and easy maintenance.
Different water accumulation tank configurations are therefore available in combination with the Hydronic Kit accessory:

MP - AM: Accumulation on the Plant Delivery side (Standard)(A): The pump draws water from the system, sends it to the plate exchanger and from thence to the inertial accumulation tank. During normal operating conditions, the pump in this configuration is able to provide a residue head from 86 to 150 kPa (from 9 to 15 m.w.c.) for the circulating water.

MP - AM AP: Accumulation on the Plant Delivery side (High)(B).: The pump draws water from the system, sends it to the plate exchanger and from thence to the inertial accumulation tank. During normal operating conditions, the pump in this configuration is able to provide a residue head from 198 to 255 kPa (from 20 to 25 m.w.c.) for the circulating water.

MP - PS: Accumulation pre-engineered for the primary and secondary circuit : The sole function of the pump is to circulate the water around the primary circuit: this circuit includes the accumulation tank and plate exchanger (chiller water circuit). The installer must mount the pumping section relative to the secondary circuit formed by the accumulation tank (with the pre-engineered wet connections) and the system served. No high working head version available.

MP-SS: Hydronic Kit without Water Storage Tank (Standard) (A). The pump draws water from the system, sends it to the plate heat exchanger and returns it to the system. During normal operating conditions, the pump in this configurations can provide a residue head from 86 to 150 kPa (from 9 to 15 m w.c.).

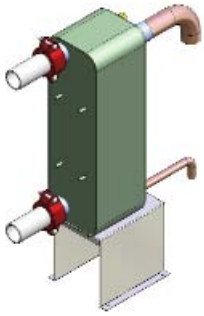
MP-SS AP: Hydronic Kit without Water Storage Tank (High Working Head) (B). The pump draws water from the system, sends it to the plate heat exchanger and returns it to the system. During normal operating conditions, the pump in this configurations can provide a residue head from 198 to 255 kPa (from 20 to 25 m w.c.).

(A): For the working head values depending on the water flow rate, consult the Standard Working Head MP-AM graph.
(B): For the working head values depending on the water flow rate, consult the High Working Head MP-AM graph.
NOTE: **(M):** Installed **(F):** To be installed by customers

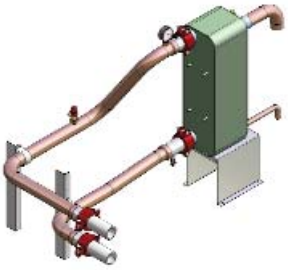
NOTE: It is essential to purchase the units with either the KT or MP accessory described previously.
The choice of one automatically excludes the other.

ACCESSORIES AND OPTIONAL EQUIPMENT

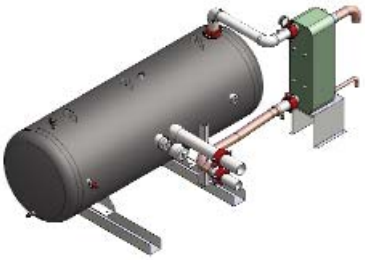
KT - BASIC PIPE KIT



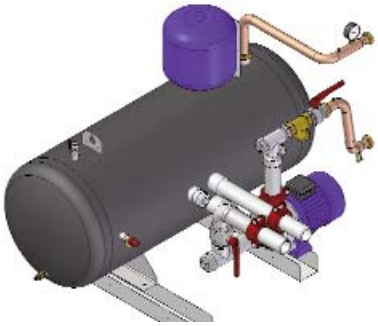
KT - COMPLETE PIPE KIT



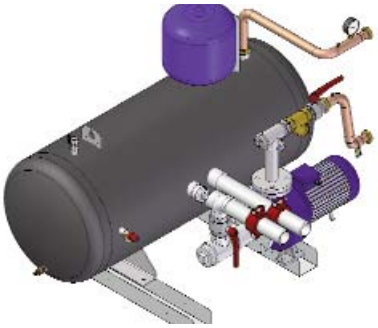
WATER STORAGE TANK PIPE KIT



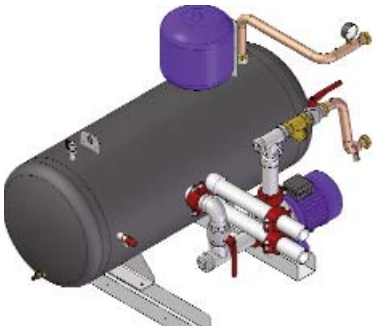
MP - 1P AM



MP - 1P AM AP

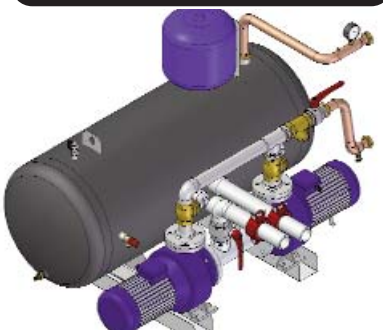


MP - 1P PS



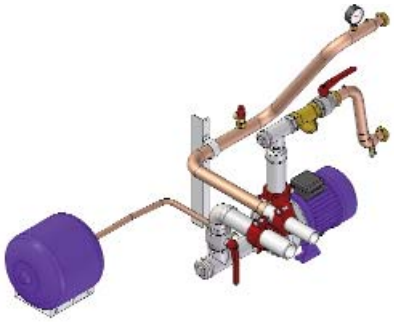
MP - 2P AM

MP - 2P AM AP

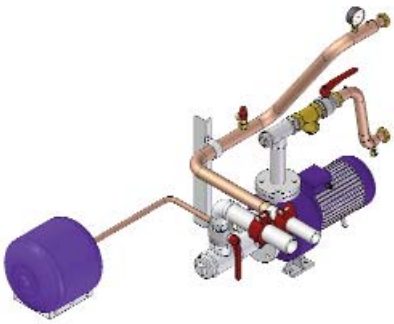


MP - 2P PS

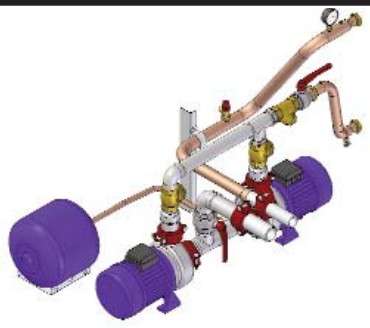
MP - 1P SS



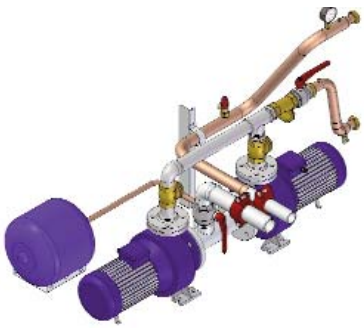
MP - 1P SS AP



MP - 2P SS



MP - 2P SS AP



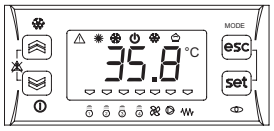
ACCESSORIES AND OPTIONAL EQUIPMENT

Electrical options

CF - Electric power supply phase presence and sequence monitoring device (F). This consists of a device installed in the electric panel that blocks the unit if one or more phases are absent or if the phase sequence is not correct: this protects the electric motor of the compressor and the hydraulic pump (if installed) against overheating and/or burnout.

CR - Remote control (F). This can be used to select all the monitoring and display functions of the control unit on the machine at a maximum distance of 100 meters away. It must be installed by using a cable with three strands or three wires in **PVC** of the **N07-VK** type with a 1mm^2 section. The transmission line must be installed in a race-way separate from any electric powering wires (**230/400 V**).

The control unit has the following buttons:



MODE key : used to select the operating mode
ON/OFF key : used to turn the unit ON/OFF and to reset the alarms
Mode + ON/OFF keys : used to access and quit the various menu levels
UP key: scrolls forwards through the menu items or increases the value of a parameter
Tasto DOWN: scrolls backwards through the menu items or decreases the value of a parameter.

KOP - Programmer clock (F). Allows the unit to be turned on and off depending on the programmed time setting (up to 14 switching actions can be programmed as required throughout the 7 days of the week).

RAG: Antifreeze heating element for the accumulation tank (M/F). Plug type. This activates in parallel with the evaporator's antifreeze heating element and keeps the water at a temperature able to prevent ice from forming when the unit remains idle during the winter.

TAT- High Temperature Thermostat (M). Two thermostats in series on compressors outlet pipes preserve operation not allowing temperature to rise up than a specified non adjustable value.

SND- External Air Probe (M). External air probe mounted near coil allows smart defrosting and climatic variation of setpoint

INT - Serial interface (F). Allows serial communication on RS485 by MODBUS protocol

NOTE: **(M):** Installed **(F):** To be installed by customers

Mechanical options

Special finned heat exchangers
- Coils with copper fins
- Coils with tin-coated copper fins
- Coils with aluminium fins with acrylic coating

Electrical options

Other power source voltage rating (contact our technical department).

ACCESSORIES AND OPTIONAL EQUIPMENT

Accessories - Model Combinations

MODEL / ACCESSORY CODE				M / F	50	60	70	80	90	100	115	130	145	160	180	200
Mechanical Accessories	Rubber vibration dampers	With Tank	AVG13	F	•	•	•	•								
			AVG15	F					•	•	•	•	•	•	•	•
		Without Tank	AVG12	F	•	•	•	•								
			AVG14	F					•	•	•	•	•	•		
			AVG16	F											•	•
	Gas pressure gauges		GM12	M	•	•	•	•	•	•	•	•	•	•	•	•
	Protective grilles		GP49	M	•	•	•	•								
			GP50	M					•	•						
			GP51	M							•	•	•	•		
			GP66	M											•	•
	Drain pan kit		BCN3	M	•	•	•	•								
			BCN4	M					•	•	•	•	•	•		
			BCN12	M											•	•
	Low noise kit		KS5	M	•	•	•	•								
			KS6	M					•							
			KS7	M						•						
			KS8	M							•					
			KS9	M								•	•	•		
			KS15	M											•	•
	Basic pipe kit		KT30	M	•	•	•	•								
			KT29	M					•	•	•	•	•	•	•	•
	Copmplete pipe kit		KT31	M	•	•	•	•								
			KT33	M					•	•	•	•	•	•		
			KT40	M											•	•
	Tank pipe kit		KT34	M	•	•	•	•								
			KT35	M					•	•	•	•	•	•		
			KT41	M											•	•
	Water storage tank		SAA29	M	•	•	•	•								
			SAA30	M					•	•	•	•	•	•		
			SAA39	M											•	•

NOTE:
(M): *factory mounted*
(F): *to be installed by customer*

Table Continued on next page.

ACCESSORIES AND OPTIONAL EQUIPMENT

MODEL / ACCESSORY CODE						M / F	50	60	70	80	90	100	115	130	145	160	180	200
Mechanical Accessories	Hydronic kit	With tank on delivery (Standard Head)	1 Pump	MP105		M	•	•	•	•								
				MP106		M					•	•	•	•				
				MP113		M									•	•		
				MP147		M											•	•
			2 Pumps	MP122		M	•	•	•	•								
				MP124		M					•	•	•	•				
				MP133		M									•	•		
				MP152		M											•	•
		With tank on delivery (High Head)	1 Pump	MP107		M	•	•	•	•								
				MP108		M					•	•						
				MP109		M							•	•	•	•		
				MP148		M											•	•
			2 Pumps	MP125		M	•	•	•	•								
				MP126		M					•	•						
				MP127		M							•	•	•	•		
				MP153		M											•	•
		With tank for primary - Secondary circuit	1 Pump	MP111		M	•	•	•	•								
				MP112		M					•	•	•	•				
				MP113		M									•	•		
				MP149		M											•	•
			2 Pumps	MP128		M	•	•	•	•								
				MP129		M					•	•	•	•				
				MP130		M									•	•		
				MP154		M											•	•
		Without tank (Standard Head)	1 Pump	MP117		M	•	•	•	•								
				MP118		M					•	•	•	•				
				MP131		M									•	•		
				MP150		M											•	•
			2 Pumps	MP134		M	•	•	•	•								
				MP135		M					•	•	•	•				
				MP136		M									•	•		
				MP155		M											•	•
		Without tank (High Head)	1 Pump1 Pump	MP119		M	•	•	•	•								
				MP120		M					•	•						
				MP121		M							•	•	•	•		
				MP151		M											•	•
			2 Pumps	MP137		M	•	•	•	•								
				MP138		M					•	•						
				MP139		M							•	•	•	•		
				MP156		M											•	•

MODEL / ACCESSORY CODE		M / F	50	60	70	80	90	100	115	130	145	160	180	200
Electrical Accessories	External air probe	SND3	M	•	•	•	•	•	•	•	•	•	•	•	•
	Programming clock kit	KOP1	F	•	•	•	•	•	•	•	•	•	•	•	•
	Storage tank electrical heater kit	RAG13	M	•	•	•	•	•	•	•	•	•	•	•	•
		RAG14	F	•	•	•	•	•	•	•	•	•	•	•	•
	High temperature thermostat kit (1)	TAT8	M	•	•	•	•	•	•	•	•	•	•	•	•
	Remote control kit	CR6	F	•	•	•	•	•	•	•	•	•	•	•	•
	Serial interface kit	INT2	M	•	•	•	•	•	•	•	•	•	•	•	•

NOTE:
(M): *factory mounted*
(F): *to be installed by customer*
(1): *standard for Brine Version VI*

TECHNICAL SPECIFICATIONS AND STANDARD PERFORMANCES - IR COOLING UNIT ONLY

Technical specifications of unit AB Standard Unit

Model	50	60	70	80	90	100	115	130	145	160	180	200	UM
Power supply	400V - 3ph+N - 50 Hz												V-f-Hz
Type of refrigerant	R410A												/
Circuits	1												n°
Cooling capacity (1) (E)	53,5	58,6	68,8	78,7	91,0	102	112	126	143	158	180	200	kW
Compressors power input (1)	16,3	18,5	20,9	25,6	28,2	31,6	35,5	40,5	46,0	51,0	56,0	62,8	kW
EER	3,28	3,17	3,29	3,07	3,23	3,22	3,15	3,11	3,11	3,10	3,21	3,18	-
Total power input (1) (E)	18,1	20,3	22,7	27,4	31,8	35,2	39,1	44,1	51,4	56,4	63,2	70,0	kW
Total EER	2,96	2,89	3,03	2,87	2,86	2,89	2,86	2,86	2,78	2,80	2,85	2,86	-
ESEER (E)	4,08	3,98	4,18	3,96	3,95	3,98	3,95	3,94	3,84	3,87	3,93	3,94	-
Water flow rate (1)	2,56	2,80	3,29	3,76	4,35	4,85	5,35	6,02	6,83	7,55	8,60	9,56	l/s
Water pressure drops (1) (E)	42	51	48	40	40	40	40	39	39	39	58	57	kPa
Available static head (1) (MP)	135	116	97	75	143	129	113	92	116	95	141	107	kPa

Compressor

Type	Scroll												/
Quantity	2												n°
Load steps	0-50-100												%
Oil charge CP1	3,25	3,25	3,25	3,25	3,25	4,7	4,7	6,8	6,8	6,3	6,3	6,3	l
Oil charge CP2	3,25	3,25	3,25	3,25	4,7	4,7	6,8	6,8	6,3	6,3	6,3	6,3	l

Heat Exchanger

Type	Brazed plates												/
Quantity	1												n°
Water volume	3,6	3,6	4,6	5,4	7,6	8,4	9,7	10,9	12,6	14,5	11,1	13,0	l

Fan

Type	Axial												-
Quantity	3				2				3		4		n°
Maximum rotational speed (AB)	900												rpm
Total air flow rate	29050	29050	28100	27680	41460	41460	47440	47440	62190	59820	82920	79760	m^3/h
Power input	1,8				3,6				5,4		7,2		kW

Coil

Type	Aluminum fins and copper tubes												/
Quantity	1												n°
Front area	3,38				4,72		5,90				7,41		m^2

Water Storage Tank (SAA accessory)

Water volume	200				400						460		l
Safety valve setting	600												kPa
Surge chamber volume	12				24								l
Surge chamber default pressure	150												kPa
Max. operating pressure	1000				800								kPa

Electrical Data

Units without pumping module

Total maximum power input [FLA]	48,2	50,9	58,3	68,6	76,0	81,5	89,9	98,3	117	131	150	165	A
Total maximum power input [FLI]	25,5	27,7	31,1	35,5	43,6	49,2	53,9	58,6	69,4	78,2	90,8	101	kW
Total maximum starting current [MIC]	146	147	173	211	265	270	317	325	368	382	470	485	A

Units with pumping module MP-AM and MP-PS (1 or 2 pumps)

Total maximum power input [FLA]	51,4	54,1	61,5	71,8	80,8	86,3	94,7	103	123	137	158	173	A
Total maximum power input [FLI]	27,2	29,4	32,8	37,2	46,5	52,1	56,8	61,5	72,7	81,5	95,6	106	kW
Total maximum starting current [MIC]	149	150	176	214	269	275	322	330	373	388	479	493	A

Units with pumping module MP-AM AP (1 or 2 pumps)

Total maximum power input [FLA]	54,4	57,1	64,6	74,9	82,2	87,8	98,1	106	125	140	161	176	A
Total maximum power input [FLI]	29,2	31,4	34,8	39,2	47,3	53,0	58,7	63,4	74,2	83,0	97,3	108	kW
Total maximum starting current [MIC]	152	153	179	217	271	276	325	334	376	390	481	496	A

Data referred to standard operating condition.
(1): water temperature: in 12°C - out 7°C air temperature: in 35°C d.b.
(2): water temperature: in 40°C - out 45°C air temperature: in 7°C d.b. 87% RH
(MP): with standard hydronic kit MP-AM and MP-SS
(SAA): with storage tank
(E): data declared according to **LCP EUROVENT** certification program

TECHNICAL SPECIFICATIONS AND STANDARD PERFORMANCES - IR COOLING UNIT ONLY

Standard performances AB Standard unit

Mod. 50-100

MOD.	Tw	OUTDOOR AIR TEMPERATURE (°C D.B.)													
		20		25		30		35		40		45		50	
		kWf	kWa	kWf	kWa	kWf	kWa	kWf	kWa	kWf	kWa	kWf	kWa	kWf	kWa
50	5	61,1	11,4	57,0	13,2	53,9	14,5	50,6	16,0	47,1	17,6	43,6	19,2	40,0	20,8
	6	62,8	11,5	58,6	13,3	55,4	14,6	52,0	16,1	48,4	17,8	44,8	19,4	41,1	21,0
	7	64,6	11,7	60,3	13,4	57,0	14,8	**53,5**	**16,3**	49,8	18,0	46,1	19,6	42,3	21,2
	8	66,4	11,8	62,0	13,6	58,6	14,9	55,0	16,5	51,2	18,2	47,4	19,8	-	-
	9	68,2	11,9	63,7	13,7	60,2	15,1	56,5	16,6	52,6	18,3	48,7	20,0	-	-
	10	70,1	12,0	65,4	13,8	61,8	15,2	58,0	16,8	54,0	18,5	50,0	20,2	-	-
	11	71,8	12,1	67,1	14,0	63,4	15,4	59,5	17,0	55,4	18,7	51,3	20,4	-	-
	12	73,8	12,3	68,9	14,1	65,1	15,5	61,1	17,1	56,9	18,9	52,7	20,6	-	-
60	5	66,9	13,0	62,4	14,9	59,0	16,5	55,4	18,1	51,5	20,0	47,7	21,8	43,9	23,6
	6	68,7	13,1	64,2	15,1	60,7	16,6	56,9	18,3	53,0	20,2	49,1	22,0	45,1	23,8
	7	70,7	13,2	66,0	15,2	62,4	16,8	**58,6**	**18,5**	54,5	20,4	50,5	22,2	46,4	24,0
	8	72,8	13,4	67,9	15,4	64,2	17,0	60,3	18,7	56,1	20,6	51,9	22,5	-	-
	9	74,8	13,5	69,8	15,6	66,0	17,1	61,9	18,9	57,6	20,8	53,4	22,7	-	-
	10	76,7	13,7	71,6	15,7	67,7	17,3	63,6	19,1	59,1	21,0	54,8	22,9	-	-
	11	78,7	13,8	73,5	15,9	69,5	17,5	65,2	19,3	60,7	21,2	56,2	23,2	-	-
	12	80,8	13,9	75,5	16,0	71,3	17,6	67,0	19,5	62,3	21,4	57,7	23,4	-	-
70	5	78,5	14,7	73,3	16,9	69,3	18,6	65,0	20,5	60,5	22,6	56,1	24,6	51,5	26,6
	6	80,7	14,8	75,3	17,0	71,2	18,8	66,9	20,7	62,2	22,8	57,6	24,9	52,9	26,9
	7	83,1	15,0	77,5	17,2	73,3	19,0	**68,8**	**20,9**	64,0	23,0	59,3	25,1	54,5	27,2
	8	85,4	15,1	79,7	17,4	75,4	19,2	70,7	21,1	65,8	23,3	61,0	25,4	-	-
	9	87,8	15,3	81,9	17,6	77,5	19,4	72,7	21,3	67,6	23,5	62,6	25,6	-	-
	10	90,1	15,4	84,1	17,7	79,5	19,5	74,6	21,6	69,4	23,8	64,3	25,9	-	-
	11	92,4	15,6	86,2	17,9	81,6	19,7	76,5	21,8	71,2	24,0	66,0	26,2	-	-
	12	94,9	15,7	88,6	18,1	83,8	19,9	78,6	22,0	73,1	24,2	67,7	26,4	-	-
80	5	89,8	18,0	83,9	20,7	79,3	22,8	74,4	25,1	69,2	27,7	64,1	30,2	58,9	32,6
	6	92,3	18,1	86,2	20,9	81,5	23,0	76,5	25,3	71,1	27,9	65,9	30,5	60,5	32,9
	7	95,0	18,3	88,7	21,1	83,9	23,2	**78,7**	**25,6**	73,2	28,2	67,8	30,8	62,3	33,3
	8	97,7	18,5	91,2	21,3	86,2	23,5	80,9	25,9	75,3	28,5	69,7	31,1	-	-
	9	100	18,7	93,7	21,5	88,6	23,7	83,2	26,1	77,4	28,8	71,7	31,4	-	-
	10	103	18,9	96,2	21,7	91,0	23,9	85,4	26,4	79,4	29,1	73,6	31,7	-	-
	11	106	19,1	98,7	21,9	93,3	24,2	87,5	26,7	81,5	29,4	75,4	32,0	-	-
	12	109	19,3	101	22,2	95,8	24,4	89,9	26,9	83,7	29,7	77,5	32,3	-	-
90	5	104	19,8	97,0	22,8	91,7	25,1	86,0	27,7	80,1	30,5	74,1	33,2	68,1	35,9
	6	107	20,0	100	23,0	94,2	25,3	88,4	27,9	82,3	30,8	76,2	33,5	70,0	36,3
	7	110	20,2	103	23,2	97,0	25,6	**91,0**	**28,2**	84,7	31,1	78,4	33,9	72,0	36,6
	8	113	20,4	105	23,5	100	25,9	93,6	28,5	87,1	31,4	80,6	34,3	-	-
	9	116	20,6	108	23,7	102	26,1	96,2	28,8	89,5	31,7	82,9	34,6	-	-
	10	119	20,8	111	23,9	105	26,4	98,7	29,1	91,8	32,1	85,1	34,9	-	-
	11	122	21,0	114	24,2	108	26,6	101	29,4	94,2	32,4	87,2	35,3	-	-
	12	126	21,2	117	24,4	111	26,9	104	29,7	96,7	32,7	89,6	35,6	-	-
100	5	116	22,2	109	25,5	103	28,1	96,4	31,0	89,7	34,2	83,1	37,2	76,3	40,3
	6	120	22,4	112	25,7	106	28,4	99,1	31,3	92,2	34,5	85,4	37,6	78,4	40,6
	7	123	22,6	115	26,0	109	28,7	**102**	**31,6**	94,9	34,8	87,9	38,0	80,7	41,1
	8	127	22,9	118	26,3	112	29,0	105	31,9	97,6	35,2	90,4	38,4	-	-
	9	130	23,1	121	26,6	115	29,3	108	32,3	100	35,6	92,9	38,8	-	-
	10	134	23,3	125	26,8	118	29,6	111	32,6	103	35,9	95,3	39,2	-	-
	11	137	23,5	128	27,1	121	29,8	113	32,9	106	36,3	97,8	39,5	-	-
	12	141	23,8	131	27,4	124	30,1	117	33,2	108	36,6	100	39,9	-	-

Tw= Outlet water temperature °C **kWf =** refrigerating power (kW). **kWa =** Power input of compressors (kW)

The standard performances refer to a 5°C temperature difference between the water entering and leaving the plate-type heat exchanger and to operation of the unit with all fans at top speed. A 0.44 x 10^{-4} m^2 K/W fouling factor has also been considered with the unit installed at zero meters above sea level (Pb = 1013mbar).

TECHNICAL SPECIFICATIONS AND STANDARD PERFORMANCES - IR COOLING UNIT ONLY

Mod. 115-160

MOD.	Tw	OUTDOOR AIR TEMPERATURE (°C D.B.)													
		20		25		30		35		40		45		50	
		kWf	kWa	kWf	kWa	kWf	kWa	kWf	kWa	kWf	kWa	kWf	kWa	kWf	kWa
115	5	128	24,9	119	28,7	113	31,6	106	34,8	98,5	38,4	91,3	41,8	83,8	45,2
	6	131	25,1	123	28,9	116	31,9	109	35,1	101	38,7	93,8	42,2	86,1	45,7
	7	135	25,4	126	29,2	119	32,2	**112**	**35,5**	104	39,1	96,5	42,7	88,6	46,1
	8	139	25,7	130	29,5	123	32,6	115	35,9	107	39,6	99,2	43,1	-	-
	9	143	25,9	133	29,8	126	32,9	118	36,3	110	40,0	102	43,6	-	-
	10	147	26,2	137	30,1	129	33,2	121	36,6	113	40,4	105	44,0	-	-
	11	150	26,5	140	30,4	133	33,5	125	37,0	116	40,7	107	44,4	-	-
	12	154	26,7	144	30,7	136	33,9	128	37,3	119	41,1	110	44,9	-	-
130	5	144	28,4	134	32,7	127	36,0	119	39,7	111	43,8	103	47,7	94,3	51,6
	6	148	28,7	138	33,0	130	36,4	122	40,1	114	44,2	106	48,2	96,9	52,1
	7	152	29,0	142	33,3	134	36,7	**126**	**40,5**	117	44,6	109	48,7	100	52,6
	8	156	29,3	146	33,7	138	37,1	130	40,9	121	45,1	112	49,2	-	-
	9	161	29,6	150	34,0	142	37,5	133	41,4	124	45,6	115	49,7	-	-
	10	165	29,9	154	34,4	146	37,9	137	41,8	127	46,0	118	50,2	-	-
	11	169	30,2	158	34,7	149	38,3	140	42,2	130	46,5	121	50,7	-	-
	12	174	30,5	162	35,1	153	38,6	144	42,6	134	46,9	124	51,2	-	-
145	5	163	32,3	152	37,1	144	40,9	135	45,1	126	49,7	117	54,2	107	58,6
	6	168	32,6	157	37,5	148	41,3	139	45,5	129	50,2	120	54,7	110	59,2
	7	173	32,9	161	37,9	152	41,7	**143**	**46,0**	133	50,7	123	55,3	113	59,8
	8	178	33,3	166	38,3	157	42,2	147	46,5	137	51,3	127	55,9	-	-
	9	182	33,6	170	38,7	161	42,6	151	47,0	141	51,8	130	56,4	-	-
	10	187	33,9	175	39,1	165	43,0	155	47,4	144	52,3	134	57,0	-	-
	11	192	34,3	179	39,4	170	43,5	159	47,9	148	52,8	137	57,6	-	-
	12	197	34,6	184	39,8	174	43,9	163	48,4	152	53,3	141	58,1	-	-
160	5	180	35,8	168	41,2	159	45,4	149	50,0	139	55,1	129	60,1	118	65,0
	6	185	36,1	173	41,6	164	45,8	154	50,5	143	55,6	132	60,7	122	65,6
	7	191	36,5	178	42,0	168	46,3	**158**	**51,0**	147	56,2	136	61,3	125	66,3
	8	196	36,9	183	42,4	173	46,8	162	51,6	151	56,8	140	62,0	-	-
	9	202	37,3	188	42,9	178	47,2	167	52,1	155	57,4	144	62,6	-	-
	10	207	37,6	193	43,3	183	47,7	171	52,6	159	58,0	148	63,2	-	-
	11	212	38,0	198	43,7	187	48,2	176	53,1	164	58,5	151	63,8	-	-
	12	218	38,4	203	44,1	192	48,6	181	53,6	168	59,1	156	64,4	-	-
180	5	205	39,3	192	45,2	181	49,8	170	54,9	158	60,5	147	66,0	135	71,4
	6	211	39,7	197	45,6	186	50,3	175	55,4	163	61,1	151	66,6	138	72,0
	7	217	40,1	203	46,1	192	50,8	**180**	**56,0**	167	61,7	155	67,3	142	72,8
	8	223	40,5	209	46,6	197	51,4	185	56,6	172	62,4	160	68,0	-	-
	9	230	40,9	214	47,1	203	51,9	190	57,2	177	63,0	164	68,7	-	-
	10	236	41,3	220	47,5	208	52,4	195	57,8	182	63,7	168	69,4	-	-
	11	242	41,7	226	48,0	213	52,9	200	58,3	186	64,3	173	70,1	-	-
	12	248	42,1	232	48,5	219	53,4	206	58,9	191	64,9	177	70,8	-	-
200	5	228	44,1	213	50,7	202	55,9	189	61,6	176	67,9	163	74,0	150	80,0
	6	235	44,5	219	51,2	207	56,4	194	62,2	181	68,5	167	74,7	154	80,8
	7	241	44,9	225	51,7	213	57,0	**200**	**62,8**	186	69,2	172	75,5	158	81,6
	8	248	45,4	232	52,3	219	57,6	206	63,5	191	70,0	177	76,3	-	-
	9	255	45,9	238	52,8	225	58,2	211	64,1	197	70,7	182	77,1	-	-
	10	262	46,3	244	53,3	231	58,7	217	64,8	202	71,4	187	77,8	-	-
	11	269	46,8	251	53,8	237	59,3	222	65,4	207	72,1	192	78,6	-	-
	12	276	47,2	258	54,4	244	59,9	229	66,0	213	72,8	197	79,4	-	-

Tw= Outlet water temperature °C **kWf =** refrigerating power (kW). **kWa =** Power input of compressors (kW)

The standard performances refer to a 5°C temperature difference between the water entering and leaving the plate-type heat exchanger and to operation of the unit with all fans at top speed. A 0.44 x 10^{-4} m^2 K/W fouling factor has also been considered with the unit installed at zero meters above sea level (Pb = 1013mbar).

TECHNICAL SPECIFICATIONS AND STANDARD PERFORMANCES - IR COOLING UNIT ONLY

Technical specifications of unit AB Standard Unit + KS Silencer kit

Model	50	60	70	80	90	100	115	130	145	160	180	200	UM
Power supply	400V - 3ph+N - 50 Hz												V-f-Hz
Type of refrigerant	R410A												/
Circuits	1												n°
Cooling capacity (1) (E)	51,9	56,8	66,7	76,3	88,2	98,5	109	122	139	153	174	194	kW
Compressors power input (1)	17,0	19,3	21,8	26,8	29,5	33,0	37,1	42,3	48,1	53,3	58,5	65,6	kW
EER	3,04	2,94	3,05	2,85	2,99	2,98	2,93	2,89	2,88	2,87	2,98	2,95	-
Total power input (1) (E)	18,8	21,1	23,6	28,6	33,1	36,6	40,7	45,9	53,5	58,7	65,7	72,8	kW
Total EER	2,75	2,69	2,82	2,67	2,67	2,69	2,67	2,66	2,59	2,61	2,65	2,66	-
ESEER (E)	3,80	3,71	3,89	3,69	3,68	3,71	3,68	3,67	3,58	3,60	3,66	3,67	-
Water flow rate (1)	2,48	2,71	3,19	3,64	4,21	4,71	5,19	5,84	6,62	7,32	8,34	9,26	l/s
Water pressure drops (1) (E)	39	48	45	38	37	38	38	37	37	37	54	54	kPa
Available static head (1) (MP)	144	124	103	80	153	137	119	98	123	101	151	114	kPa

Compressor

Type	Scroll												/
Quantity	2												n°
Load steps	0-50-100												%
Oil charge CP1	3,25	3,25	3,25	3,25	3,25	4,7	4,7	6,8	6,8	6,3	6,3	6,3	l
Oil charge CP2	3,25	3,25	3,25	3,25	4,7	4,7	6,8	6,8	6,3	6,3	6,3	6,3	l

Heat Exchanger

Type	Brazed plates												/
Quantity	1												n°
Water volume	3,6	3,6	4,6	5,4	7,6	8,4	9,7	10,9	12,6	14,5	11,1	13,0	l

Fan

Type	Axial												-
Quantity	3				2				3		4		n°
Maximum rotational speed	900												rpm
Total air flow rate	24208	24208	23417	23067	34550	34550	39533	39533	51825	49850	69100	66467	m^3/h
Power input	1,8				3,6				5,4		7,2		kW

Coil

Type	Aluminum fins and copper tubes												/
Quantity	1												n°
Front area	3,38				4,72		5,90				7,41		m^2

Water Storage Tank (SAA accessory)

Water volume	200				400						460		l
Safety valve setting	600												kPa
Surge chamber volume	12				24								l
Surge chamber default pressure	150												kPa
Max. operating pressure	1000				800								kPa

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Units without pumping module

Total maximum power input [FLA]	48,2	50,9	58,3	68,6	76,0	81,5	89,9	98,3	117	131	150	165	A
Total maximum power input [FLI]	25,5	27,7	31,1	35,5	43,6	49,2	53,9	58,6	69,4	78,2	90,8	101	kW
Total maximum starting current [MIC]	146	147	173	211	265	270	317	325	368	382	470	485	A

Units with pumping module MP-AM and MP-PS (1 or 2 pumps)

Total maximum power input [FLA]	51,4	54,1	61,5	71,8	80,8	86,3	94,7	103	123	137	158	173	A
Total maximum power input [FLI]	27,2	29,4	32,8	37,2	46,5	52,1	56,8	61,5	72,7	81,5	95,6	106	kW
Total maximum starting current [MIC]	149	150	176	214	269	275	322	330	373	388	479	493	A

Units with pumping module MP-AM AP (1 or 2 pumps)

Total maximum power input [FLA]	54,4	57,1	64,6	74,9	82,2	87,8	98,1	106	125	140	161	176	A
Total maximum power input [FLI]	29,2	31,4	34,8	39,2	47,3	53,0	58,7	63,4	74,2	83,0	97,3	108	kW
Total maximum starting current [MIC]	152	153	179	217	271	276	325	334	376	390	481	496	A

Data referred to standard operating condition.
(1): water temperature: in 12°C - out 7°C air temperature: in 35°C d.b.
(2): water temperature: in 40°C - out 45°C air temperature: in 7°C d.b. 87% RH
(MP): with standard hydronic kit MP-AM and MP-SS
(SAA): with storage tank
(E): data declared according to LCP EUROVENT certification program

TECHNICAL SPECIFICATIONS AND STANDARD PERFORMANCES - IR COOLING UNIT ONLY

Standard performances AB Standard Unit + KS Silencer kit

Mod. 50-100

MOD.	Tw	OUTDOOR AIR TEMPERATURE (°C D.B.)													
		20		25		30		35		40		45		50	
		kWf	kWa	kWf	kWa	kWf	kWa	kWf	kWa	kWf	kWa	kWf	kWa	kWf	kWa
50	**5**	59,2	11,9	55,3	13,7	52,3	15,1	49,1	16,7	45,7	18,4	42,3	20,0	38,8	21,7
	6	60,9	12,0	56,8	13,9	53,7	15,3	50,4	16,8	46,9	18,5	43,5	20,2	39,9	21,9
	7	62,7	12,2	58,5	14,0	55,3	15,4	**51,9**	**17,0**	48,3	18,7	44,7	20,4	41,1	22,1
	8	64,4	12,3	60,1	14,1	56,9	15,6	53,4	17,2	49,7	18,9	46,0	20,7	-	-
	9	66,2	12,4	61,8	14,3	58,4	15,7	54,8	17,4	51,0	19,1	47,3	20,9	-	-
	10	68,0	12,5	63,4	14,4	60,0	15,9	56,3	17,5	52,4	19,3	48,5	21,1	-	-
	11	69,7	12,7	65,1	14,6	61,5	16,1	57,7	17,7	53,7	19,5	49,8	21,3	-	-
	12	71,6	12,8	66,8	14,7	63,2	16,2	59,3	17,9	55,2	19,7	51,1	21,5	-	-
60	**5**	64,8	13,5	60,5	15,6	57,2	17,2	53,7	18,9	50,0	20,9	46,3	22,7	42,5	24,6
	6	66,6	13,7	62,2	15,7	58,8	17,3	55,2	19,1	51,3	21,1	47,6	23,0	43,7	24,8
	7	68,6	13,8	64,0	15,9	60,5	17,5	**56,8**	**19,3**	52,8	21,3	48,9	23,2	45,0	25,1
	8	70,5	14,0	65,8	16,1	62,2	17,7	58,4	19,5	54,3	21,5	50,3	23,4	-	-
	9	72,5	14,1	67,6	16,2	64,0	17,9	60,0	19,7	55,8	21,7	51,7	23,7	-	-
	10	74,4	14,2	69,4	16,4	65,7	18,1	61,6	19,9	57,3	21,9	53,1	23,9	-	-
	11	76,3	14,4	71,2	16,5	67,3	18,2	63,2	20,1	58,8	22,2	54,4	24,2	-	-
	12	78,4	14,5	73,1	16,7	69,2	18,4	64,9	20,3	60,4	22,4	55,9	24,4	-	-
70	**5**	76,1	15,3	71,1	17,6	67,2	19,4	63,1	21,4	58,7	23,6	54,3	25,7	49,9	27,8
	6	78,2	15,4	73,0	17,8	69,1	19,6	64,8	21,6	60,3	23,8	55,8	25,9	51,3	28,0
	7	80,5	15,6	75,2	17,9	71,1	19,8	**66,7**	**21,8**	62,1	24,0	57,5	26,2	52,8	28,3
	8	82,8	15,8	77,3	18,1	73,1	20,0	68,6	22,0	63,8	24,3	59,1	26,5	-	-
	9	85,1	15,9	79,4	18,3	75,1	20,2	70,5	22,3	65,6	24,5	60,7	26,8	-	-
	10	87,3	16,1	81,5	18,5	77,1	20,4	72,3	22,5	67,3	24,8	62,3	27,0	-	-
	11	89,6	16,2	83,6	18,7	79,1	20,6	74,2	22,7	69,0	25,0	63,9	27,3	-	-
	12	92,0	16,4	85,9	18,9	81,2	20,8	76,2	22,9	70,9	25,3	65,7	27,5	-	-
80	**5**	87,1	18,8	81,3	21,6	76,9	23,8	72,1	26,3	67,1	29,0	62,2	31,6	57,1	34,1
	6	89,5	19,0	83,5	21,8	79,0	24,1	74,1	26,5	69,0	29,2	63,9	31,9	58,7	34,5
	7	92,1	19,2	86,0	22,1	81,3	24,3	**76,3**	**26,8**	71,0	29,5	65,7	32,2	60,4	34,8
	8	94,7	19,4	88,4	22,3	83,6	24,6	78,5	27,1	73,0	29,9	67,6	32,6	-	-
	9	97,3	19,6	90,9	22,5	85,9	24,8	80,6	27,4	75,0	30,2	69,5	32,9	-	-
	10	100	19,8	93,3	22,8	88,2	25,1	82,8	27,6	77,0	30,5	71,3	33,2	-	-
	11	102	20,0	95,6	23,0	90,4	25,3	84,9	27,9	79,0	30,8	73,1	33,5	-	-
	12	105	20,2	98,2	23,2	92,9	25,6	87,2	28,2	81,1	31,1	75,1	33,9	-	-
90	**5**	101	20,7	94,0	23,8	88,9	26,2	83,4	28,9	77,6	31,9	71,9	34,8	66,0	37,6
	6	103	20,9	96,6	24,0	91,3	26,5	85,7	29,2	79,7	32,2	73,9	35,1	67,8	37,9
	7	106	21,1	99,4	24,3	94,0	26,8	**88,2**	**29,5**	82,1	32,5	76,0	35,4	69,8	38,3
	8	109	21,3	102	24,6	96,6	27,1	90,7	29,8	84,4	32,9	78,2	35,8	-	-
	9	113	21,6	105	24,8	99,3	27,3	93,2	30,1	86,7	33,2	80,3	36,2	-	-
	10	115	21,8	108	25,0	102	27,6	95,7	30,4	89,0	33,5	82,4	36,6	-	-
	11	118	22,0	111	25,3	105	27,9	98,1	30,7	91,3	33,9	84,5	36,9	-	-
	12	122	22,2	114	25,5	107	28,1	101	31,0	93,8	34,2	86,8	37,3	-	-
100	**5**	112	23,2	105	26,6	99,2	29,4	93,1	32,4	86,6	35,7	80,3	38,9	73,7	42,0
	6	116	23,4	108	26,9	102	29,6	95,7	32,7	89,0	36,0	82,5	39,3	75,8	42,4
	7	119	23,6	111	27,2	105	29,9	**98,5**	**33,0**	91,6	36,4	84,9	39,7	78,0	42,9
	8	122	23,9	114	27,5	108	30,3	101	33,4	94,2	36,8	87,3	40,1	-	-
	9	126	24,1	117	27,7	111	30,6	104	33,7	96,8	37,1	89,7	40,5	-	-
	10	129	24,3	120	28,0	114	30,9	107	34,0	99,4	37,5	92,1	40,9	-	-
	11	132	24,6	123	28,3	117	31,2	110	34,4	102	37,9	94,4	41,3	-	-
	12	136	24,8	127	28,6	120	31,5	113	34,7	105	38,2	97,0	41,7	-	-

Tw= Temperatura acqua in uscita in °C **kWf =** Potenza frigorifera netta(kW). **kWa =** Potenza assorbita dai compressori (kW)

Le prestazioni standard si riferiscono ad un differenza di 5 °C di temperatura tra acqua entrante ed uscente dallo scambiatore a piastre, e al funzionamento dell'unità con tutti i ventilatori alla massima velocità. Si considera inoltre un fattore di sporcamento di 0.44 x 10^{-4} m^2 K/W e l'unità posta a zero metri sul livello del mare (Pb = 1013mbar).

TECHNICAL SPECIFICATIONS AND STANDARD PERFORMANCES - IR COOLING UNIT ONLY

Mod. 115-160

MOD.	Tw	OUTDOOR AIR TEMPERATURE (°C D.B.)													
		20		25		30		35		40		45		50	
		kWf	kWa	kWf	kWa	kWf	kWa	kWf	kWa	kWf	kWa	kWf	kWa	kWf	kWa
115	5	124	26,0	116	30,0	110	33,0	103	36,4	95,9	40,1	88,8	43,7	81,6	47,3
	6	128	26,3	119	30,2	113	33,3	106	36,7	98,5	40,5	91,3	44,1	83,8	47,7
	7	132	26,5	123	30,5	116	33,6	**109**	**37,1**	101	40,9	93,9	44,6	86,3	48,2
	8	135	26,8	126	30,9	119	34,0	112	37,5	104	41,3	96,6	45,1	-	-
	9	139	27,1	130	31,2	123	34,4	115	37,9	107	41,8	99,2	45,5	-	-
	10	143	27,4	133	31,5	126	34,7	118	38,3	110	42,2	102	46,0	-	-
	11	146	27,6	137	31,8	129	35,0	121	38,6	113	42,6	104	46,4	-	-
	12	150	27,9	140	32,1	133	35,4	125	39,0	116	43,0	107	46,9	-	-
130	5	139	29,7	130	34,1	123	37,6	115	41,5	107	45,7	99,4	49,8	91,3	53,9
	6	143	30,0	134	34,5	126	38,0	119	41,9	110	46,2	102	50,3	93,8	54,4
	7	147	30,3	137	34,8	130	38,4	**122**	**42,3**	114	46,6	105	50,8	96,6	55,0
	8	151	30,6	141	35,2	134	38,8	125	42,8	117	47,1	108	51,4	-	-
	9	156	30,9	145	35,6	137	39,2	129	43,2	120	47,6	111	51,9	-	-
	10	160	31,2	149	35,9	141	39,6	132	43,6	123	48,1	114	52,4	-	-
	11	164	31,5	153	36,3	145	40,0	136	44,1	126	48,6	117	52,9	-	-
	12	168	31,8	157	36,6	149	40,3	139	44,5	130	49,0	120	53,5	-	-
145	5	159	33,7	148	38,8	140	42,8	131	47,2	122	52,0	113	56,7	104	61,3
	6	163	34,1	152	39,2	144	43,2	135	47,6	126	52,5	116	57,2	107	61,9
	7	168	34,4	157	39,6	148	43,6	**139**	**48,1**	129	53,0	120	57,8	110	62,5
	8	173	34,8	161	40,0	152	44,1	143	48,6	133	53,6	123	58,4	-	-
	9	177	35,1	166	40,4	157	44,6	147	49,1	137	54,1	127	59,0	-	-
	10	182	35,5	170	40,8	161	45,0	151	49,6	140	54,7	130	59,6	-	-
	11	187	35,8	174	41,2	165	45,4	155	50,1	144	55,2	133	60,2	-	-
	12	192	36,2	179	41,6	169	45,9	159	50,6	148	55,8	137	60,8	-	-
160	5	175	37,4	163	43,0	154	47,4	145	52,3	135	57,6	125	62,8	114	67,9
	6	179	37,7	168	43,4	158	47,9	149	52,8	138	58,2	128	63,4	118	68,5
	7	185	38,1	172	43,9	163	48,3	**153**	**53,3**	142	58,7	132	64,0	121	69,3
	8	190	38,6	177	44,4	168	48,9	157	53,9	146	59,4	136	64,8	-	-
	9	195	38,9	182	44,8	172	49,4	162	54,4	150	60,0	139	65,4	-	-
	10	200	39,3	187	45,3	177	49,9	166	55,0	154	60,6	143	66,1	-	-
	11	205	39,7	192	45,7	181	50,3	170	55,5	158	61,2	147	66,7	-	-
	12	211	40,1	197	46,1	186	50,8	175	56,0	163	61,8	151	67,4	-	-
180	5	199	41,0	185	47,2	175	52,0	165	57,4	153	63,2	142	68,9	130	74,5
	6	204	41,4	191	47,7	180	52,5	169	57,9	157	63,8	146	69,6	134	75,2
	7	210	41,9	196	48,2	185	53,1	**174**	**58,5**	162	64,5	150	70,3	138	76,0
	8	216	42,3	202	48,7	191	53,6	179	59,1	166	65,2	154	71,1	-	-
	9	222	42,7	207	49,2	196	54,2	184	59,7	171	65,8	158	71,8	-	-
	10	228	43,2	213	49,7	201	54,7	189	60,3	176	66,5	163	72,5	-	-
	11	234	43,6	218	50,2	206	55,3	194	60,9	180	67,2	167	73,2	-	-
	12	240	44,0	224	50,6	212	55,8	199	61,5	185	67,8	171	73,9	-	-
200	5	221	46,0	207	53,0	195	58,3	183	64,3	171	70,9	158	77,3	145	83,6
	6	228	46,5	212	53,5	201	58,9	189	64,9	175	71,6	162	78,0	149	84,4
	7	234	46,9	219	54,0	207	59,5	**194**	**65,6**	180	72,3	167	78,8	154	85,2
	8	241	47,5	225	54,6	213	60,2	199	66,3	186	73,1	172	79,7	-	-
	9	247	47,9	231	55,1	218	60,8	205	67,0	191	73,8	177	80,5	-	-
	10	254	48,4	237	55,7	224	61,4	210	67,7	196	74,6	181	81,3	-	-
	11	261	48,9	243	56,2	230	62,0	216	68,3	201	75,3	186	82,1	-	-
	12	268	49,4	250	56,8	236	62,6	222	69,0	206	76,0	191	82,9	-	-

Tw= Temperatura acqua in uscita in °C **kWf =** Potenza frigorifera netta(kW). **kWa =** Potenza assorbita dai compressori (kW)

Le prestazioni standard si riferiscono ad un differenza di 5 °C di temperatura tra acqua entrante ed uscente dallo scambiatore a piastre, e al funzionamento dell'unità con tutti i ventilatori alla massima velocità. Si considera inoltre un fattore di sporcamento di 0.44 x 10^{-4} m^2 K/W e l'unità posta a zero metri sul livello del mare (Pb = 1013mbar).

TECHNICAL SPECIFICATIONS AND STANDARD PERFORMANCES - IR COOLING UNIT ONLY

Technical specifications of unit ASS Extra low noise version

Model	50	60	70	80	90	100	115	130	145	160	180	200	UM
Power supply	400V - 3ph+N - 50 Hz												V-f-Hz
Type of refrigerant	R410A												/
Circuits	1												n°
Cooling capacity (1) (E)	50,7	55,5	65,2	-	86,2	96,2	106	119	135	-	170	-	kW
Compressors power input (1)	17,6	19,9	22,5	-	30,4	34,1	38,3	43,7	49,6	-	60,4	-	kW
EER	2,88	2,78	2,89	-	2,83	2,82	2,77	2,73	2,73	-	2,82	-	-
Total power input (1) (E)	19,4	21,7	24,3	-	32,2	37,7	41,9	47,3	55,0	-	67,6	-	kW
Total EER	2,62	2,55	2,68	-	2,68	2,55	2,53	2,52	2,46	-	2,52	-	-
ESEER (E)	3,61	3,52	3,70	-	3,69	3,53	3,50	3,48	3,40	-	3,48		-
Water flow rate (1)	2,42	2,65	3,11	-	4,12	4,60	5,07	5,70	6,47	-	8,14	-	l/s
Water pressure drops (1) (E)	38	46	43	-	36	36	36	35	35	-	52	-	kPa
Available static head (1) (MP)	151	130	108	-	159	143	126	103	130	-	158	-	kPa

Compressor

Type	Scroll												/
Quantity	2												n°
Load steps	0-50-100												%
Oil charge CP1	3,25	3,25	3,25	-	3,25	4,7	4,7	6,8	6,8	-	6,3	-	l
Oil charge CP2	3,25	3,25	3,25	-	4,7	4,7	6,8	6,8	6,3	-	6,3	-	l

Heat Exchanger

Type	Brazed plates												/
Quantity	1												n°
Water volume	3,6	3,6	4,6	-	7,6	8,4	9,7	10,9	12,6	-	11,1	-	l

Fan

Type	Axial												-
Quantity	3				2				3		4		n°
Maximum rotational speed	900												rpm
Total air flow rate	19367	19367	18733	-	27640	27640	31627	31627	41460	-	55280	-	m^3/h
Power input	1,8				3,6				5,4		7,2		kW

Coil

Type	Aluminum fins and copper tubes												/
Quantity	1												n°
Front area	3,38				4,72		5,90				7,41		m^2

Water Storage Tank (SAA accessory)

Water volume	200				400						460		l
Safety valve setting	600												kPa
Surge chamber volume	12				24								l
Surge chamber default pressure	150												kPa
Max. operating pressure	1000				800								kPa

Electrical Data

Units without pumping module

Total maximum power input [FLA]	48,2	50,9	58,3	68,6	76,0	81,5	89,9	98,3	117	131	150	165	A
Total maximum power input [FLI]	25,5	27,7	31,1	35,5	43,6	49,2	53,9	58,6	69,4	78,2	90,8	101	kW
Total maximum starting current [MIC]	146	147	173	211	265	270	317	325	368	382	470	485	A

Units with pumping module MP-AM and MP-PS (1 or 2 pumps)

Total maximum power input [FLA]	51,4	54,1	61,5	71,8	80,8	86,3	94,7	103	123	137	158	173	A
Total maximum power input [FLI]	27,2	29,4	32,8	37,2	46,5	52,1	56,8	61,5	72,7	81,5	95,6	106	kW
Total maximum starting current [MIC]	149	150	176	214	269	275	322	330	373	388	479	493	A

Units with pumping module MP-AM AP (1 or 2 pumps)

Total maximum power input [FLA]	54,4	57,1	64,6	74,9	82,2	87,8	98,1	106	125	140	161	176	A
Total maximum power input [FLI]	29,2	31,4	34,8	39,2	47,3	53,0	58,7	63,4	74,2	83,0	97,3	108	kW
Total maximum starting current [MIC]	152	153	179	217	271	276	325	334	376	390	481	496	A

Data referred to standard operating condition.
(1): water temperature: in 12°C - out 7°C air temperature: in 35°C d.b.
(2): water temperature: in 40°C - out 45°C air temperature: in 7°C d.b. 87% RH
(MP): with standard hydronic kit MP-AM and MP-SS
(SAA): with storage tank
(E): data declared according to LCP EUROVENT certification program

TECHNICAL SPECIFICATIONS AND STANDARD PERFORMANCES - IR COOLING UNIT ONLY

Standard performances ASS Extra low noise version

Mod. 50-100

MOD.	Tw	OUTDOOR AIR TEMPERATURE (°C D.B.)													
		20		25		30		35		40		45		50	
		kWf	kWa	kWf	kWa	kWf	kWa	kWf	kWa	kWf	kWa	kWf	kWa	kWf	kWa
50	5	57,9	12,3	54,0	14,2	51,1	15,7	47,9	17,3	44,6	19,0	41,3	20,7	37,9	22,4
	6	59,5	12,5	55,5	14,3	52,5	15,8	49,3	17,4	45,8	19,2	42,5	20,9	39,0	22,6
	7	61,2	12,6	57,1	14,5	54,0	16,0	**50,7**	**17,6**	47,2	19,4	43,7	21,1	40,1	22,9
	8	62,9	12,7	58,8	14,6	55,6	16,1	52,1	17,8	48,5	19,6	44,9	21,4	-	-
	9	64,7	12,9	60,4	14,8	57,1	16,3	53,6	18,0	49,8	19,8	46,2	21,6	-	-
	10	66,4	13,0	62,0	14,9	58,6	16,5	55,0	18,2	51,2	20,0	47,4	21,8	-	-
	11	68,1	13,1	63,6	15,1	60,1	16,6	56,4	18,3	52,5	20,2	48,6	22,0	-	-
	12	69,9	13,2	65,3	15,2	61,7	16,8	57,9	18,5	53,9	20,4	49,9	22,2	-	-
60	5	63,4	14,0	59,1	16,1	55,9	17,7	52,5	19,5	48,8	21,5	45,2	23,5	41,5	25,4
	6	65,1	14,1	60,8	16,2	57,5	17,9	53,9	19,7	50,2	21,7	46,5	23,7	42,7	25,6
	7	67,0	14,2	62,5	16,4	59,1	18,0	**55,5**	**19,9**	51,6	21,9	47,8	23,9	43,9	25,9
	8	68,9	14,4	64,3	16,6	60,8	18,2	57,1	20,1	53,1	22,2	49,2	24,2	-	-
	9	70,8	14,5	66,1	16,7	62,5	18,4	58,6	20,3	54,6	22,4	50,5	24,4	-	-
	10	72,7	14,7	67,8	16,9	64,1	18,6	60,2	20,5	56,0	22,6	51,9	24,7	-	-
	11	74,5	14,8	69,6	17,1	65,8	18,8	61,7	20,7	57,4	22,8	53,2	24,9	-	-
	12	76,6	15,0	71,5	17,2	67,6	19,0	63,4	20,9	59,0	23,1	54,6	25,1	-	-
70	5	74,4	15,8	69,5	18,2	65,7	20,0	61,6	22,1	57,4	24,3	53,1	26,5	48,8	28,7
	6	76,5	15,9	71,4	18,3	67,5	20,2	63,4	22,3	58,9	24,5	54,6	26,8	50,1	28,9
	7	78,7	16,1	73,5	18,5	69,5	20,4	**65,2**	**22,5**	60,7	24,8	56,2	27,0	51,6	29,2
	8	80,9	16,3	75,6	18,7	71,4	20,6	67,0	22,7	62,4	25,1	57,8	27,3	-	-
	9	83,2	16,4	77,6	18,9	73,4	20,8	68,9	23,0	64,1	25,3	59,4	27,6	-	-
	10	85,4	16,6	79,7	19,1	75,4	21,0	70,7	23,2	65,8	25,6	60,9	27,9	-	-
	11	87,6	16,8	81,7	19,3	77,3	21,3	72,5	23,4	67,5	25,8	62,5	28,2	-	-
	12	89,9	16,9	83,9	19,5	79,4	21,5	74,5	23,7	69,3	26,1	64,2	28,4	-	-
80	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-
90	5	98,4	21,3	91,8	24,5	86,8	27,0	81,5	29,8	75,8	32,9	70,2	35,8	64,5	38,7
	6	101	21,5	94,4	24,8	89,3	27,3	83,8	30,1	77,9	33,2	72,2	36,2	66,3	39,1
	7	104	21,8	97,1	25,0	91,9	27,6	**86,2**	**30,4**	80,2	33,5	74,3	36,5	68,2	39,5
	8	107	22,0	100	25,3	94,5	27,9	88,6	30,7	82,5	33,9	76,4	36,9	-	-
	9	110	22,2	103	25,6	97,1	28,2	91,1	31,0	84,7	34,2	78,5	37,3	-	-
	10	113	22,4	105	25,8	100	28,4	93,5	31,4	87,0	34,6	80,6	37,7	-	-
	11	116	22,7	108	26,1	102	28,7	95,9	31,7	89,2	34,9	82,6	38,0	-	-
	12	119	22,9	111	26,3	105	29,0	98,5	32,0	91,6	35,2	84,9	38,4	-	-
100	5	110	23,9	102	27,5	96,9	30,3	91,0	33,4	84,6	36,9	78,4	40,2	72,0	43,4
	6	113	24,2	105	27,8	100	30,6	93,5	33,8	87,0	37,2	80,5	40,6	74,0	43,9
	7	116	24,4	108	28,1	103	30,9	**96,2**	**34,1**	89,5	37,6	82,9	41,0	76,1	44,3
	8	119	24,7	111	28,4	105	31,3	98,9	34,5	92,0	38,0	85,2	41,4	-	-
	9	123	24,9	115	28,7	108	31,6	102	34,8	94,6	38,4	87,6	41,8	-	-
	10	126	25,2	118	29,0	111	31,9	104	35,2	97,1	38,8	89,9	42,3	-	-
	11	129	25,4	121	29,2	114	32,2	107	35,5	100	39,1	92,2	42,7	-	-
	12	133	25,7	124	29,5	117	32,5	110	35,9	102	39,5	94,7	43,1	-	-

Tw= Temperatura acqua in uscita in °C **kWf =** Potenza frigorifera netta(kW). **kWa =** Potenza assorbita dai compressori (kW)

Le prestazioni standard si riferiscono ad un differenza di 5 °C di temperatura tra acqua entrante ed uscente dallo scambiatore a piastre, e al funzionamento dell'unità con tutti i ventilatori alla massima velocità. Si considera inoltre un fattore di sporcamento di 0.44 x 10^{-4} m^2 K/W e l'unità posta a zero metri sul livello del mare (Pb = 1013mbar).

TECHNICAL SPECIFICATIONS AND STANDARD PERFORMANCES - IR COOLING UNIT ONLY

Mod. 115-160

MOD.	Tw	OUTDOOR AIR TEMPERATURE (°C D.B.)													
		20		25		30		35		40		45		50	
		kWf	kWa	kWf	kWa	kWf	kWa	kWf	kWa	kWf	kWa	kWf	kWa	kWf	kWa
115	5	121	26,9	113	30,9	107	34,1	100	37,6	93,2	41,4	86,4	45,1	79,3	48,8
	6	124	27,1	116	31,2	110	34,4	103	37,9	95,8	41,8	88,8	45,6	81,5	49,3
	7	128	27,4	119	31,5	113	34,7	**106**	**38,3**	98,6	42,2	91,3	46,0	83,9	49,8
	8	132	27,7	123	31,9	116	35,1	109	38,7	101	42,7	93,9	46,5	-	-
	9	135	28,0	126	32,2	119	35,5	112	39,1	104	43,1	96,5	47,0	-	-
	10	139	28,3	130	32,5	123	35,8	115	39,5	107	43,5	99,1	47,5	-	-
	11	142	28,5	133	32,8	126	36,2	118	39,9	110	44,0	102	47,9	-	-
	12	146	28,8	136	33,2	129	36,5	121	40,3	113	44,4	104	48,4	-	-
130	5	136	30,7	127	35,3	120	38,9	113	42,9	105	47,2	97,0	51,5	89,1	55,7
	6	140	30,9	130	35,6	123	39,2	116	43,3	108	47,7	100	52,0	91,5	56,2
	7	144	31,3	134	36,0	127	39,6	**119**	**43,7**	111	48,2	103	52,5	94,2	56,8
	8	148	31,6	138	36,4	130	40,1	122	44,2	114	48,7	105	53,1	-	-
	9	152	31,9	142	36,7	134	40,5	126	44,6	117	49,2	108	53,6	-	-
	10	156	32,2	145	37,1	138	40,9	129	45,1	120	49,7	111	54,2	-	-
	11	160	32,6	149	37,5	141	41,3	132	45,5	123	50,2	114	54,7	-	-
	12	164	32,9	153	37,8	145	41,7	136	46,0	127	50,7	117	55,2	-	-
145	5	154	34,8	144	40,0	136	44,1	128	48,6	119	53,6	110	58,4	101	63,2
	6	158	35,1	148	40,4	140	44,5	131	49,1	122	54,1	113	59,0	104	63,8
	7	163	35,5	152	40,8	144	45,0	**135**	**49,6**	126	54,7	116	59,6	107	64,4
	8	168	35,9	156	41,3	148	45,5	139	50,1	129	55,3	120	60,3	-	-
	9	172	36,2	161	41,7	152	45,9	143	50,7	133	55,8	123	60,9	-	-
	10	177	36,6	165	42,1	156	46,4	146	51,2	136	56,4	126	61,5	-	-
	11	181	37,0	169	42,5	160	46,9	150	51,7	140	56,9	129	62,1	-	-
	12	186	37,3	174	42,9	164	47,3	154	52,2	144	57,5	133	62,7	-	-
160	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	7	-	-	-	-	-	-	**-**	**-**	-	-	-	-	-	-
	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-
180	5	194	42,4	181	48,8	171	53,7	161	59,2	150	65,3	139	71,2	127	77,0
	6	199	42,8	186	49,2	176	54,2	165	59,8	154	65,9	142	71,8	131	77,7
	7	205	43,2	192	49,7	181	54,8	**170**	**60,4**	158	66,6	146	72,6	135	78,5
	8	211	43,7	197	50,3	186	55,4	175	61,1	163	67,3	151	73,4	-	-
	9	217	44,1	202	50,8	191	55,9	180	61,7	167	68,0	155	74,1	-	-
	10	223	44,6	208	51,3	196	56,5	184	62,3	172	68,7	159	74,9	-	-
	11	228	45,0	213	51,8	202	57,1	189	62,9	176	69,3	163	75,6	-	-
	12	235	45,4	219	52,3	207	57,6	194	63,5	181	70,0	167	76,3	-	-
200	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	7	-	-	-	-	-	-	**-**	**-**	-	-	-	-	-	-
	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Tw= Temperatura acqua in uscita in °C **kWf =** Potenza frigorifera netta(kW). **kWa =** Potenza assorbita dai compressori (kW)

Le prestazioni standard si riferiscono ad un differenza di 5 °C di temperatura tra acqua entrante ed uscente dallo scambiatore a piastre, e al funzionamento dell'unità con tutti i ventilatori alla massima velocità. Si considera inoltre un fattore di sporcamento di 0.44 x 10^{-4} m^2 K/W e l'unità posta a zero metri sul livello del mare (Pb = 1013mbar).

TECHNICAL SPECIFICATIONS AND STANDARD PERFORMANCES - IR COOLING UNIT ONLY

Version with Desuperheater (VD)

Recovery heat exchanger specifications

Model	50	60	70	80	90	100	115	130	145	160	180	200	UM
Type of recovery exchanger	STAINLESS STEEL BRAZE PLATES												
Quantity	1												N°
Max. operating pressure on wet side	600												kPa
Total water content of recovery exchangers	0,6				0,8		1,3				1,8		l

Unit specification

Recovered heating capacity (1)	15,7	17,6	20,0	23,6	27,1	30,4	34,4	38,4	44,0	49,3	55,4	61,3	kW
Recovered water flow rate (1)	0,75	0,84	0,96	1,13	1,29	1,45	1,64	1,83	2,10	2,36	2,65	2,93	l/s
Recovered water pressure drop (1)	9	11	14	19	15	18	11	14	18	22	18	21	kPa

(1): The data refer to: Water temperature: evaporator inlet :**12°C** - evaporator outlet: **7°C**, Outdoor air temperature **35°C**.
The data refer to: Water temperature: recovery inlet :**40°C** - recovery outlet: **45°C.**

Recovered heating capacity in Version with Desuperheater (VD)

MOD.	TWR	OUTDOOR AIR TEMPERATURE (°C D.B.)				
		25	30	35	40	45
		kWt_r = RECOVERED HEATING CAPACITY [KW]				
50	30	12,8	14,7	16,9	19,3	22,0
	35	12,9	14,8	17,0	19,4	22,1
	40	12,6	14,4	16,6	18,9	21,6
	45	11,9	13,7	**15,7**	17,9	20,5
	50	10,9	12,5	14,3	16,4	18,7
	55	9,5	10,9	12,5	14,3	16,3
	60	7,7	8,8	10,1	11,6	13,2
	65	5,5	6,4	7,3	8,4	9,5
	70	3,0	3,5	4,0	4,6	5,2
55	30	14,6	16,8	19,0	21,7	24,6
	35	14,6	16,8	19,0	21,7	24,6
	40	14,2	16,3	18,6	21,2	24,0
	45	13,5	15,5	**17,6**	20,1	22,8
	50	12,4	14,2	17,0	18,5	20,9
	55	10,9	12,5	15,0	16,3	18,4
	60	9,0	10,4	12,5	13,5	15,3
	65	6,8	7,9	9,4	10,2	11,6
	70	4,3	4,9	5,9	6,4	7,2
60	30	16,6	19,0	21,6	24,7	28,0
	35	16,6	19,0	21,6	24,7	28,0
	40	16,1	18,6	21,1	24,1	27,3
	45	15,3	17,6	**20,0**	22,8	25,9
	50	14,0	16,2	18,4	21,0	23,8
	55	12,4	14,2	16,2	18,5	20,9
	60	10,3	11,8	13,4	15,4	17,4
	65	7,8	8,9	10,2	11,6	13,1
	70	4,8	5,6	6,3	7,2	8,2
70	30	19,4	22,2	25,4	29,2	33,4
	35	19,4	22,3	25,5	29,3	33,6
	40	19,0	21,7	24,9	28,6	32,8
	45	18,0	20,6	**23,6**	27,1	31,1
	50	16,4	18,8	21,6	24,8	28,4
	55	14,4	16,5	18,9	21,7	24,8
	60	11,8	13,5	15,5	17,8	20,4
	65	8,6	9,9	11,3	13,0	14,9
	70	5,0	5,7	6,5	7,5	8,6
90	30	22,5	25,6	29,2	33,3	37,8
	35	22,6	25,7	29,3	33,4	38,0
	40	22,1	25,1	28,6	32,6	37,1
	45	20,9	23,8	**27,1**	30,9	35,1
	50	19,1	21,8	24,8	28,3	32,1
	55	16,7	19,1	21,7	24,7	28,1
	60	13,7	15,6	17,8	20,3	23,1
	65	10,1	11,5	13,1	14,9	17,0
	70	5,9	6,7	7,6	8,7	9,9
100	30	25,5	29,0	33,0	37,5	42,5
	35	25,3	28,8	32,8	37,3	42,2
	40	24,7	28,1	32,0	36,3	41,1
	45	23,5	26,7	**30,4**	34,5	39,1
	50	21,7	24,7	28,2	32,0	36,2
	55	19,5	22,1	25,2	28,6	32,4
	60	16,7	19,0	21,6	24,5	27,8
	65	13,4	15,2	17,3	19,6	22,2
	70	9,5	10,8	12,3	14,0	15,8

MOD.	TWR	OUTDOOR AIR TEMPERATURE (°C D.B.)				
		25	30	35	40	45
		kWt_r = RECOVERED HEATING CAPACITY [KW]				
115	30	29,1	33,0	37,5	42,5	48,1
	35	28,9	32,8	37,3	42,3	47,8
	40	28,2	31,9	36,2	41,1	46,5
	45	26,7	30,3	**34,4**	39,0	44,1
	50	24,7	28,0	31,7	36,0	40,7
	55	21,9	24,9	28,3	32,0	36,2
	60	18,6	21,1	24,0	27,2	30,7
	65	14,6	16,6	18,8	21,4	24,2
	70	10,0	11,4	12,9	14,6	16,5
130	30	32,3	36,6	41,5	47,1	53,2
	35	32,3	36,6	41,5	47,1	53,2
	40	31,5	35,6	40,5	45,9	51,9
	45	29,8	33,8	**38,4**	43,5	49,2
	50	27,4	31,1	35,3	40,0	45,2
	55	24,2	27,4	31,1	35,2	39,9
	60	20,1	22,8	25,9	29,3	33,2
	65	15,2	17,3	19,6	22,2	25,1
	70	9,6	10,8	12,3	14,0	15,8
145	30	36,7	41,7	47,4	53,6	60,5
	35	36,8	41,8	47,5	53,8	60,6
	40	35,9	40,8	46,4	52,5	59,2
	45	34,1	38,7	**44,0**	49,8	56,2
	50	31,3	35,6	40,4	45,7	51,5
	55	27,5	31,3	35,5	40,2	45,4
	60	22,8	25,9	29,4	33,3	37,6
	65	17,1	19,5	22,1	25,0	28,2
	70	10,5	11,9	13,5	15,3	17,3
160	30	41,5	47,1	53,4	60,5	68,2
	35	41,4	47,1	53,3	60,4	68,1
	40	40,3	45,8	52,0	58,8	66,3
	45	38,3	43,5	**49,3**	55,8	62,9
	50	35,2	40,0	45,4	51,3	57,9
	55	31,2	35,4	40,1	45,4	51,2
	60	26,1	29,7	33,7	38,1	42,9
	65	20,1	22,8	25,9	29,3	33,0
	70	13,1	14,8	16,8	19,0	21,5
180	30	46,6	53,0	60,0	68,0	76,6
	35	46,5	52,9	59,9	67,8	76,5
	40	45,3	51,5	58,4	66,1	74,5
	45	43,0	48,9	**55,4**	62,7	70,7
	50	39,6	45,0	51,0	57,7	65,0
	55	35,0	39,8	45,1	51,1	57,6
	60	29,4	33,4	37,8	42,8	48,3
	65	22,6	25,7	29,1	32,9	37,1
	70	14,7	16,7	18,9	21,4	24,1
200	30	51,6	58,6	66,4	75,2	84,8
	35	51,5	58,5	66,3	75,1	84,6
	40	50,2	57,0	64,6	73,1	82,4
	45	47,6	54,1	**61,3**	69,4	78,2
	50	43,8	49,8	56,4	63,8	72,0
	55	38,8	44,0	49,9	56,5	63,7
	60	32,5	36,9	41,8	47,4	53,4
	65	25,0	28,4	32,2	36,4	41,1
	70	16,2	18,5	20,9	23,7	26,7

kWt_r = RECOVERED HEATING CAPACITY [KW]

Twr = Desuperheater outlet water temperature, Δtin-out= 5°C

Specific data fot Brine Version (VI)

Correction factors to apply to the basic version data

Brine pencentage	**20% Ethylene Glicol**						
freezing point [°C]	**-8**						
Produced water temperature	4	2	0	-2	-4	-6	-8
Cooling capacityr c.f.	0,912	0,855	0,798	0,738	0,683	-	-
Compressor power input c.f.	0,967	0,957	0,947	0,927	0,897	-	-
Water flow rate c.f.	0,984	0,899	0,821	0,750	0,685	0,620	0,561
Water pressure drop c.f.	1,289	1,071	0,890	0,740	0,615	0,490	0,390

Brine pencentage	**30% Ethylene Glicol**						
freezing point [°C]	**-14**						
Produced water temperature	4	2	0	-2	-4	-6	-8
Cooling capacityr c.f.	0,899	0,842	0,785	0,725	0,670	0,613	0,562
Compressor power input c.f.	0,960	0,950	0,940	0,920	0,890	0,870	0,840
Water flow rate c.f.	1,013	0,928	0,851	0,780	0,715	0,650	0,591
Water pressure drop c.f.	1,431	1,184	0,979	0,810	0,670	0,530	0,419

Brine pencentage	**40% Ethylene Glicol**						
freezing point [°C]	**-22**						
Produced water temperature	4	2	0	-2	-4	-6	-8
Cooling capacityr c.f.	0,884	0,827	0,770	0,710	0,655	0,598	0,547
Compressor power input c.f.	0,880	0,870	0,860	0,840	0,810	0,790	0,760
Water flow rate c.f.	1,062	0,970	0,887	0,810	0,740	0,670	0,607
Water pressure drop c.f.	1,542	1,279	1,061	0,880	0,730	0,580	0,461

A calculation example showing how the table is used is given below.
Consider unit **IR 160.2** in the Basic Version with:

- Cooling capacity of the Basic Version unit (VB): Pf_{VB} = 158 kW
- Power input of the Compressors in the Basic Version unit (VB): $Pass_{CP,VB}$= 53.2 kW
- Water Flow Rate of the Basic Version unit (VB): Q_{VB}= 7.55 l/s
- Water pressure drop of the Basic Version unit (VB): Δp_{VB}= 39 kPa
- with 30% brine and -2°C temperature of the water produced

The corresponding values for the Brine Version are:

- Cooling capacity $Pf_{VI} = Pf_{VB}$ x (**0.725**) = 115 kW
- Compressor power input $Pass_{CP,VI} = Pass_{CP,VB}$ x (**0.92**)= 48.9 kW
- Water flow rate $Q_{VI}= Q_{VB}$ x (**0.78**)= 5.89 l/s
- Water pressure drop $\Delta p_{VI} = \Delta p_{VB}$ x (**0.81**)= 32 kPa

If you need to calculate the performances of the unit with outdoor air temp. different than 35°C, you have to use the values for Pf_{VB} and $Pass_{CP,VB}$ reported on the tables standard performances for the requisited air temp. and with water leaving temp=7°C.
With Pf_{VB} calculate Q_{VB} and using the graph water pressure drop Basic Version you have $\Delta p_{VB.}$ Then apply the corrective coefficients indicated on the tables for VI.

In case of other type of antifreezing fluid please contact our sales office.

TECHNICAL SPECIFICATIONS AND STANDARD PERFORMANCES - IP HEAT PUMP UNITS

Technical specifications of unit AB Standard unit

Model	50	60	70	80	90	100	115	130	145	160	180	200	UM
Power supply	400V - 3ph+N - 50 Hz												V-f-Hz
Type of refrigerant	R410A												/
Circuits	1												n°
Cooling capacity (1) (E)	52,9	57,5	67,2	74,1	89,2	99,0	110	122	138	154	178	198	kW
Compressors power input (1)	16,2	18,4	20,7	24,7	28,0	31,4	35,4	40,0	45,8	50,5	55,0	62,5	kW
EER	3,27	3,13	3,25	3,00	3,19	3,15	3,11	3,05	3,01	3,05	3,24	3,17	-
Total power input (1) (E)	18,0	20,2	22,5	26,5	31,6	35,0	39,0	43,6	51,2	55,9	62,2	69,7	kW
Total EER	2,94	2,85	2,99	2,80	2,82	2,83	2,82	2,80	2,70	2,75	2,86	2,84	-
ESEER (E)	4,06	3,93	4,12	3,86	3,90	3,90	3,89	3,86	3,72	3,80	3,95	3,92	-
Water flow rate (1)	2,53	2,75	3,21	3,54	4,26	4,73	5,26	5,83	6,59	7,36	8,50	9,46	l/s
Water pressure drops (1) (E)	41	49	46	35	38	38	39	37	36	37	57	56	kPa
Available static head (1) (MP)	138	120	102	85	149	136	117	98	125	100	144	109	kPa
Heating capacity (2) (E)	53,2	58,0	67,7	76,2	91,4	103	113	125	143	156	184	202	kW
Compressors power input (2)	16,2	18,0	20,3	23,1	28,2	31,4	34,8	39,0	45,1	49,8	54,0	61,0	kW
COP	3,28	3,22	3,34	3,30	3,24	3,28	3,25	3,21	3,17	3,13	3,41	3,31	-
Total power input (2) (E)	18,0	19,8	22,1	24,9	31,8	35,0	38,4	42,6	50,5	55,2	61,2	68,2	kW
Total COP	2,96	2,93	3,07	3,06	2,87	2,94	2,94	2,93	2,83	2,83	3,01	2,96	-
Water flow rate (2)	2,54	2,77	3,23	3,64	4,37	4,92	5,40	5,97	6,83	7,45	8,79	9,65	l/s
Water pressure drops (2) (E)	41	50	46	37	40	41	41	38	39	38	61	58	kPa
Available static head (2) (MP)	137	119	101	80	142	125	111	94	116	98	135	105	kPa

Compressor

Type	Scroll												/
Quantity	2												n°
Load steps	0-50-100												%
Oil charge CP1	3,25	3,25	3,25	3,25	3,25	4,7	4,7	6,8	6,8	6,3	6,3	6,3	l
Oil charge CP2	3,25	3,25	3,25	3,25	4,7	4,7	6,8	6,8	6,3	6,3	6,3	6,3	l

Heat Exchanger

Tipo	Brazed plates												/
Quantità	1												n°
Contenuto acqua	3,6	3,6	4,6	5,4	7,6	8,4	9,7	10,9	12,6	14,5	11,1	13,0	l

Fan

Type	Axial												-
Quantity	3				2				3		4		n°
Maximum rotational speed	900												rpm
Total air flow rate	29050	29050	28100	27680	41460	41460	47440	47440	62190	59820	82920	79760	m^3/h
Power input	1,8				3,6				5,4		7,2		kW

Coil

Type	Aluminum fins and copper tubes												/
Quantity	1												n°
Front area	3,38				4,72		5,90				7,41		m^2

Water Storage Tank (SAA accessory)

Water volume	200				400						460		l
Safety valve setting	600												kPa
Surge chamber volume	12				24								l
Surge chamber default pressure	150												kPa
Max. operating pressure	1000				800								kPa

Electrical Data

Units without pumping module

Total maximum power input [FLA]	48,2	50,9	58,3	68,6	76,0	81,5	89,9	98,3	117	131	150	165	A
Total maximum power input [FLI]	25,5	27,7	31,1	35,5	43,6	49,2	53,9	58,6	69,4	78,2	90,8	101	kW
Total maximum starting current [MIC]	146	147	173	211	265	270	317	325	368	382	470	485	A

Units with pumping module MP-AM and MP-PS (1 or 2 pumps)

Total maximum power input [FLA]	51,4	54,1	61,5	71,8	80,8	86,3	94,7	103	123	137	158	173	A
Total maximum power input [FLI]	27,2	29,4	32,8	37,2	46,5	52,1	56,8	61,5	72,7	81,5	95,6	106	kW
Total maximum starting current [MIC]	149	150	176	214	269	275	322	330	373	388	479	493	A

Units with pumping module MP-AM AP (1 or 2 pumps)

Total maximum power input [FLA]	54,4	57,1	64,6	74,9	82,2	87,8	98,1	106	125	140	161	176	A
Total maximum power input [FLI]	29,2	31,4	34,8	39,2	47,3	53,0	58,7	63,4	74,2	83,0	97,3	108	kW
Total maximum starting current [MIC]	152	153	179	217	271	276	325	334	376	390	481	496	A

Data referred to standard operating condition.
(1): water temperature: in 12°C - out 7°C air temperature: in 35°C d.b.
(2): water temperature: in 40°C - out 45°C air temperature: in 7°C d.b. 87% RH
(MP): with standard hydronic kit MP-AM and MP-SS
(SAA): with storage tank
(E): data declared according to LCP EUROVENT certification program

TECHNICAL SPECIFICATIONS AND STANDARD PERFORMANCES - IP HEAT PUMP UNITS

Standard performances in cooling mode AB Standard Unit

Mod. 50-100

MOD.	Tw	OUTDOOR AIR TEMPERATURE (°C D.B.)													
		20		25		30		35		40		45		50	
		kWf	kWa	kWf	kWa	kWf	kWa	kWf	kWa	kWf	kWa	kWf	kWa	kWf	kWa
50	**5**	60,4	11,4	56,4	13,1	53,3	14,4	50,0	15,9	46,5	17,5	43,1	19,1	39,6	20,6
	6	62,1	11,5	57,9	13,2	54,8	14,5	51,4	16,0	47,8	17,7	44,3	19,3	40,7	20,8
	7	63,9	11,6	59,6	13,3	56,4	14,7	**52,9**	**16,2**	49,2	17,9	45,6	19,5	41,9	21,0
	8	65,7	11,7	61,3	13,5	58,0	14,9	54,4	16,4	50,6	18,1	46,9	19,7	-	-
	9	67,5	11,8	63,0	13,6	59,6	15,0	55,9	16,5	52,0	18,2	48,2	19,9	-	-
	10	69,3	12,0	64,7	13,8	61,1	15,2	57,4	16,7	53,4	18,4	49,4	20,1	-	-
	11	71,0	12,1	66,3	13,9	62,7	15,3	58,8	16,9	54,8	18,6	50,7	20,3	-	-
	12	73,0	12,2	68,1	14,0	64,4	15,5	60,4	17,0	56,2	18,8	52,1	20,5	-	-
60	**5**	65,6	12,9	61,3	14,9	57,9	16,4	54,4	18,0	50,6	19,9	46,8	21,7	43,0	23,4
	6	67,5	13,0	63,0	15,0	59,5	16,5	55,9	18,2	52,0	20,1	48,1	21,9	44,2	23,7
	7	69,4	13,2	64,8	15,1	61,3	16,7	**57,5**	**18,4**	53,5	20,3	49,5	22,1	45,5	23,9
	8	71,4	13,3	66,6	15,3	63,0	16,9	59,1	18,6	55,0	20,5	51,0	22,4	-	-
	9	73,4	13,4	68,5	15,5	64,7	17,0	60,8	18,8	56,5	20,7	52,4	22,6	-	-
	10	75,3	13,6	70,3	15,6	66,5	17,2	62,4	19,0	58,0	20,9	53,7	22,8	-	-
	11	77,2	13,7	72,1	15,8	68,2	17,4	64,0	19,2	59,5	21,1	55,1	23,0	-	-
	12	79,3	13,8	74,0	15,9	70,0	17,5	65,7	19,3	61,1	21,3	56,6	23,3	-	-
70	**5**	76,7	14,5	71,6	16,7	67,7	18,4	63,5	20,3	59,1	22,4	54,8	24,4	50,3	26,4
	6	78,8	14,7	73,6	16,9	69,6	18,6	65,3	20,5	60,8	22,6	56,3	24,6	51,7	26,6
	7	81,1	14,8	75,7	17,0	71,6	18,8	**67,2**	**20,7**	62,5	22,8	57,9	24,9	53,2	26,9
	8	83,4	15,0	77,9	17,2	73,6	19,0	69,1	20,9	64,3	23,1	59,5	25,1	-	-
	9	85,7	15,1	80,0	17,4	75,7	19,2	71,0	21,1	66,1	23,3	61,2	25,4	-	-
	10	88,0	15,3	82,1	17,6	77,7	19,4	72,9	21,3	67,8	23,5	62,8	25,7	-	-
	11	90,2	15,4	84,2	17,7	79,7	19,6	74,8	21,6	69,6	23,8	64,4	25,9	-	-
	12	92,7	15,6	86,5	17,9	81,8	19,7	76,8	21,8	71,4	24,0	66,2	26,2	-	-
80	**5**	84,6	17,3	79,0	19,9	74,7	22,0	70,1	24,2	65,2	26,7	60,4	29,1	55,5	31,5
	6	86,9	17,5	81,1	20,1	76,7	22,2	72,0	24,4	67,0	26,9	62,0	29,4	57,0	31,8
	7	89,5	17,7	83,5	20,3	79,0	22,4	**74,1**	**24,7**	68,9	27,2	63,9	29,7	58,7	32,1
	8	92,0	17,9	85,9	20,6	81,2	22,7	76,2	25,0	70,9	27,5	65,7	30,0	-	-
	9	94,5	18,0	88,2	20,8	83,4	22,9	78,3	25,2	72,8	27,8	67,5	30,3	-	-
	10	97,0	18,2	90,6	21,0	85,6	23,1	80,4	25,5	74,8	28,1	69,3	30,6	-	-
	11	100	18,4	92,9	21,2	87,8	23,3	82,4	25,7	76,7	28,4	71,0	30,9	-	-
	12	102	18,6	95,4	21,4	90,2	23,6	84,7	26,0	78,8	28,6	73,0	31,2	-	-
90	**5**	102	19,6	95,0	22,6	89,9	24,9	84,3	27,5	78,5	30,3	72,7	33,0	66,8	35,7
	6	105	19,8	97,7	22,8	92,4	25,1	86,7	27,7	80,6	30,5	74,7	33,3	68,6	36,0
	7	108	20,0	101	23,0	95,1	25,4	**89,2**	**28,0**	83,0	30,9	76,9	33,6	70,6	36,4
	8	111	20,3	103	23,3	97,7	25,7	91,7	28,3	85,3	31,2	79,0	34,0	-	-
	9	114	20,5	106	23,5	100	25,9	94,3	28,6	87,7	31,5	81,2	34,4	-	-
	10	117	20,7	109	23,8	103	26,2	96,8	28,9	90,0	31,8	83,4	34,7	-	-
	11	120	20,9	112	24,0	106	26,4	99,2	29,2	92,3	32,1	85,5	35,0	-	-
	12	123	21,1	115	24,2	109	26,7	102	29,4	94,8	32,5	87,8	35,4	-	-
100	**5**	113	22,0	105	25,3	100	27,9	93,6	30,8	87,1	33,9	80,7	37,0	74,1	40,0
	6	116	22,2	108	25,6	103	28,2	96,2	31,1	89,5	34,3	82,9	37,3	76,1	40,4
	7	120	22,5	112	25,8	105	28,5	**99,0**	**31,4**	92,1	34,6	85,3	37,7	78,4	40,8
	8	123	22,7	115	26,1	108	28,8	102	31,7	94,7	35,0	87,7	38,1	-	-
	9	126	22,9	118	26,4	111	29,1	105	32,1	97,3	35,3	90,1	38,5	-	-
	10	130	23,2	121	26,7	114	29,4	107	32,4	100	35,7	92,5	38,9	-	-
	11	133	23,4	124	26,9	117	29,7	110	32,7	102	36,0	94,9	39,3	-	-
	12	137	23,6	127	27,2	121	29,9	113	33,0	105	36,4	97,5	39,7	-	-

Tw= Outlet water temperature in °C **kWf =** refrigerating power (kW). **kWa =** Power input of compressors (kW)

The standard performances refer to a 5°C temperature difference between the water entering and leaving the plate-type heat exchanger and to operation of the unit with all the fans to top speed. A 0.44 x 10^{-4} m^2 K/W fouling factor has also been considered with the unit installed at zero meters above sea level (Pb = 1013mbar).

TECHNICAL SPECIFICATIONS AND STANDARD PERFORMANCES - IP HEAT PUMP UNITS

Mod. 115-160

MOD.	Tw	OUTDOOR AIR TEMPERATURE (°C D.B.)													
		20		25		30		35		40		45		50	
		kWf	kWa	kWf	kWa	kWf	kWa	kWf	kWa	kWf	kWa	kWf	kWa	kWf	kWa
115	5	126	24,8	117	28,6	111	31,5	104	34,7	96,8	38,3	89,6	41,7	82,3	45,1
	6	129	25,1	120	28,8	114	31,8	107	35,0	99,4	38,6	92,1	42,1	84,6	45,5
	7	133	25,3	124	29,1	117	32,1	**110**	**35,4**	102	39,0	94,8	42,5	87,1	46,0
	8	137	25,6	127	29,5	121	32,5	113	35,8	105	39,4	97,5	43,0	-	-
	9	140	25,9	131	29,8	124	32,8	116	36,1	108	39,8	100	43,4	-	-
	10	144	26,1	134	30,1	127	33,1	119	36,5	111	40,2	103	43,9	-	-
	11	148	26,4	138	30,3	130	33,4	122	36,9	114	40,6	105	44,3	-	-
	12	152	26,6	142	30,6	134	33,8	126	37,2	117	41,0	108	44,7	-	-
130	5	139	28,1	130	32,3	123	35,6	115	39,2	107	43,2	99,4	47,1	91,3	51,0
	6	143	28,3	134	32,6	126	35,9	119	39,6	110	43,6	102	47,6	93,8	51,4
	7	147	28,6	137	32,9	130	36,3	**122**	**40,0**	114	44,1	105	48,1	96,6	52,0
	8	151	28,9	141	33,3	134	36,7	125	40,4	117	44,6	108	48,6	-	-
	9	156	29,2	145	33,6	137	37,0	129	40,8	120	45,0	111	49,1	-	-
	10	160	29,5	149	34,0	141	37,4	132	41,3	123	45,5	114	49,6	-	-
	11	164	29,8	153	34,3	145	37,8	136	41,7	126	45,9	117	50,1	-	-
	12	168	30,1	157	34,6	149	38,2	139	42,1	130	46,4	120	50,5	-	-
145	5	158	32,1	147	37,0	139	40,7	130	44,9	121	49,5	112	54,0	103	58,4
	6	162	32,4	151	37,3	143	41,1	134	45,3	125	50,0	116	54,5	106	58,9
	7	167	32,8	156	37,7	147	41,5	**138**	**45,8**	128	50,5	119	55,0	109	59,5
	8	171	33,1	160	38,1	151	42,0	142	46,3	132	51,0	122	55,6	-	-
	9	176	33,5	164	38,5	155	42,4	146	46,8	136	51,6	126	56,2	-	-
	10	181	33,8	169	38,9	160	42,8	150	47,2	139	52,1	129	56,8	-	-
	11	185	34,1	173	39,3	164	43,3	154	47,7	143	52,6	132	57,3	-	-
	12	190	34,5	178	39,6	168	43,7	158	48,2	147	53,1	136	57,9	-	-
160	5	176	35,4	164	40,8	155	44,9	146	49,5	135	54,6	125	59,5	115	64,3
	6	181	35,8	169	41,2	159	45,3	150	50,0	139	55,1	129	60,1	118	64,9
	7	186	36,1	174	41,6	164	45,8	**154**	**50,5**	143	55,7	133	60,7	122	65,6
	8	191	36,5	178	42,0	169	46,3	158	51,1	147	56,3	136	61,4	-	-
	9	196	36,9	183	42,5	173	46,8	163	51,6	151	56,8	140	62,0	-	-
	10	202	37,3	188	42,9	178	47,2	167	52,1	155	57,4	144	62,6	-	-
	11	207	37,6	193	43,3	183	47,7	171	52,6	159	58,0	148	63,2	-	-
	12	212	38,0	198	43,7	188	48,2	176	53,1	164	58,5	152	63,8	-	-
180	5	203	38,6	190	44,4	179	48,9	168	53,9	157	59,4	145	64,8	133	70,1
	6	209	39,0	195	44,8	184	49,4	173	54,4	161	60,0	149	65,4	137	70,7
	7	215	39,4	201	45,3	190	49,9	**178**	**55,0**	166	60,6	153	66,1	141	71,5
	8	221	39,8	206	45,8	195	50,4	183	55,6	170	61,3	158	66,8	-	-
	9	227	40,2	212	46,2	200	50,9	188	56,2	175	61,9	162	67,5	-	-
	10	233	40,6	218	46,7	206	51,4	193	56,7	180	62,5	166	68,2	-	-
	11	239	41,0	223	47,2	211	52,0	198	57,3	184	63,1	171	68,8	-	-
	12	246	41,4	229	47,6	217	52,5	203	57,8	189	63,7	175	69,5	-	-
200	5	226	43,9	211	50,5	199	55,6	187	61,3	174	67,6	161	73,7	148	79,6
	6	232	44,3	217	50,9	205	56,1	192	61,9	179	68,2	166	74,3	152	80,4
	7	239	44,7	223	51,5	211	56,7	**198**	**62,5**	184	68,9	171	75,1	157	81,2
	8	246	45,2	229	52,0	217	57,3	204	63,2	189	69,6	175	75,9	-	-
	9	253	45,7	236	52,5	223	57,9	209	63,8	195	70,3	180	76,7	-	-
	10	259	46,1	242	53,1	229	58,5	215	64,5	200	71,0	185	77,5	-	-
	11	266	46,6	248	53,6	235	59,0	220	65,1	205	71,7	190	78,2	-	-
	12	273	47,0	255	54,1	241	59,6	226	65,7	210	72,4	195	79,0	-	-

Tw= Outlet water temperature in °C **kWf =** refrigerating power (kW). **kWa =** Power input of compressors (kW)

The standard performances refer to a 5°C temperature difference between the water entering and leaving the plate-type heat exchanger and to operation of the unit with all the fans to top speed. A 0.44 x 10^{-4} m^2 K/W fouling factor has also been considered with the unit installed at zero meters above sea level (Pb = 1013mbar).

TECHNICAL SPECIFICATIONS AND STANDARD PERFORMANCES - IP HEAT PUMP UNITS

Standard performances in heating mode AB Standard Unit

MOD.	Tw	OUTDOOR AIR TEMPERATURE (°C D.B.)													
		-6		-2		2		6		9		12		15	
		kWt	kWa	kWt	kWa	kWt	kWa	kWt	kWa	kWt	kWa	kWt	kWa	kWt	kWa
50	30	40,6	11,5	46,6	11,6	50,9	11,8	54,2	11,8	58,1	12,0	62,1	12,1	66,4	12,2
	35	40,4	12,8	46,3	12,9	50,7	13,0	53,9	13,1	57,8	13,3	61,8	13,4	66,1	13,6
	40	40,2	14,2	46,1	14,3	50,4	14,5	53,6	14,6	57,5	14,7	61,4	14,9	65,7	15,1
	45	39,9	15,8	45,7	15,9	50,0	16,1	**53,2**	**16,2**	57,1	16,4	61,0	16,6	65,3	16,8
	50	39,6	17,6	45,4	17,7	49,7	17,9	52,8	18,0	56,7	18,2	60,6	18,4	64,8	18,6
60	30	44,3	12,8	50,8	12,9	55,5	13,1	59,0	13,1	63,3	13,3	67,7	13,4	72,4	13,6
	35	44,1	14,2	50,5	14,3	55,2	14,5	58,7	14,6	63,0	14,7	67,4	14,9	72,1	15,1
	40	43,8	15,8	50,2	15,9	54,9	16,1	58,4	16,2	62,6	16,4	67,0	16,6	71,6	16,8
	45	43,5	17,5	49,9	17,7	54,5	17,9	**58,0**	**18,0**	62,2	18,2	66,5	18,4	71,1	18,6
	50	43,2	19,5	49,5	19,6	54,2	19,9	58,0	20,0	61,8	20,2	66,0	20,5	70,7	20,7
70	30	51,7	14,5	59,2	14,5	64,8	14,7	68,9	14,8	73,9	15,0	79,0	15,2	84,5	15,3
	35	51,4	16,0	58,9	16,1	64,5	16,3	68,6	16,4	73,5	16,6	78,6	16,8	84,1	17,0
	40	51,1	17,8	58,6	17,9	64,1	18,2	68,2	18,3	73,1	18,5	78,2	18,7	83,6	18,9
	45	50,8	19,8	58,2	19,9	63,7	20,2	**67,7**	**20,3**	72,6	20,5	77,6	20,8	83,0	21,0
	50	50,4	22,0	57,8	22,1	63,2	22,4	67,2	22,6	72,1	22,8	77,1	23,1	82,5	23,4
80	30	58,2	16,4	66,7	16,5	72,9	16,8	77,6	16,9	83,2	17,1	88,9	17,3	95,2	17,5
	35	57,9	18,2	66,3	18,3	72,6	18,6	77,2	18,7	82,8	18,9	88,5	19,1	94,7	19,3
	40	57,6	20,3	66,0	20,4	72,1	20,7	76,7	20,8	82,3	21,0	88,0	21,3	94,1	21,5
	45	57,2	22,5	65,5	22,7	71,7	23,0	**76,2**	**23,1**	81,7	23,4	87,4	23,6	93,5	23,9
	50	56,8	25,0	65,1	25,2	71,2	25,5	75,7	25,7	81,2	26,0	86,8	26,3	92,8	26,6
90	30	69,8	20,1	80,0	20,2	87,5	20,5	93,0	20,6	99,8	20,8	107	21,1	114	21,3
	35	69,4	22,2	79,6	22,4	87,0	22,7	92,6	22,8	99,3	23,1	106	23,3	114	23,6
	40	69,0	24,7	79,1	24,9	86,5	25,2	92,0	25,4	98,7	25,7	106	26,0	113	26,3
	45	68,6	27,5	78,6	27,7	85,9	28,0	**91,4**	**28,2**	98,0	28,5	105	28,9	112	29,2
	50	68,1	30,6	78,0	30,7	85,3	31,2	90,8	31,4	97,3	31,7	104	32,1	111	32,4
100	30	78,7	22,4	90,1	22,5	98,6	22,8	105	22,9	112	23,2	120	23,5	129	23,7
	35	78,3	24,8	89,7	24,9	98,1	25,3	104	25,4	112	25,7	120	26,0	128	26,3
	40	77,8	27,5	89,2	27,7	97,5	28,1	104	28,3	111	28,6	119	28,9	127	29,2
	45	77,3	30,6	88,6	30,8	96,8	31,2	**103**	**31,4**	110	31,8	118	32,1	126	32,5
	50	76,7	34,0	87,9	34,2	96,2	34,7	102	34,9	110	35,3	117	35,7	125	36,1
115	30	86,3	24,8	98,9	24,9	108	25,3	115	25,4	123	25,7	132	26,0	141	26,3
	35	85,8	27,5	98,4	27,6	108	28,0	114	28,2	123	28,5	131	28,8	140	29,1
	40	85,4	30,5	97,8	30,7	107	31,1	114	31,3	122	31,7	130	32,0	140	32,4
	45	84,8	33,9	97,1	34,1	106	34,6	**113**	**34,8**	121	35,2	130	35,6	139	36,0
	50	84,2	37,7	96,5	37,9	106	38,5	112	38,7	120	39,1	129	39,6	138	40,0
130	30	95,5	27,8	109	27,9	120	28,3	127	28,5	136	28,8	146	29,1	156	29,5
	35	95,0	30,8	109	31,0	119	31,4	127	31,6	136	31,9	145	32,3	155	32,7
	40	94,4	34,2	108	34,4	118	34,9	126	35,1	135	35,5	144	35,9	154	36,3
	45	93,8	38,0	107	38,2	118	38,8	**125**	**39,0**	134	39,5	143	39,9	153	40,4
	50	93,1	42,3	107	42,5	117	43,1	124	43,4	133	43,9	142	44,4	152	44,9
145	30	109	32,1	125	32,3	137	32,7	146	32,9	156	33,3	167	33,7	179	34,1
	35	109	35,6	125	35,8	136	36,3	145	36,5	155	36,9	166	37,3	178	37,8
	40	108	39,6	124	39,8	135	40,3	144	40,6	154	41,1	165	41,5	177	42,0
	45	107	44,0	123	44,2	134	44,8	**143**	**45,1**	153	45,6	164	46,1	175	46,7
	50	107	48,9	122	49,2	134	49,9	142	50,1	152	50,7	163	51,3	174	51,9
160	30	119	35,5	137	35,7	149	36,2	159	36,4	170	36,8	182	37,2	195	37,6
	35	119	39,3	136	39,5	149	40,1	158	40,3	169	40,8	181	41,2	194	41,7
	40	118	43,7	135	43,9	148	44,6	157	44,8	168	45,3	180	45,8	193	46,4
	45	117	48,6	134	48,8	147	49,5	**156**	**49,8**	167	50,4	179	51,0	191	51,5
	50	116	54,0	133	54,3	146	55,0	155	55,4	166	56,0	178	56,6	190	57,3
180	30	141	38,4	161	38,7	176	39,2	187	39,4	201	39,9	215	40,3	230	40,8
	35	140	42,6	160	42,9	175	43,4	186	43,7	200	44,2	214	44,7	229	45,2
	40	139	47,4	159	47,7	174	48,3	185	48,6	199	49,2	212	49,7	227	50,3
	45	138	52,6	158	53,0	173	53,7	**184**	**54,0**	197	54,6	211	55,2	226	55,9
	50	137	58,5	157	58,9	172	59,7	183	60,0	196	60,7	210	61,4	224	62,1
200	30	154	43,4	177	43,7	193	44,3	206	44,5	221	45,1	236	45,6	252	46,1
	35	153	48,1	176	48,4	192	49,1	205	49,4	219	49,9	235	50,5	251	51,1
	40	153	53,5	175	53,8	191	54,6	203	54,9	218	55,5	233	56,2	250	56,8
	45	152	59,5	174	59,8	190	60,6	**202**	**61,0**	217	61,7	232	62,4	248	63,1
	50	150	66,1	172	66,5	189	67,4	201	67,8	215	68,6	230	69,4	246	70,2

Tw= Outlet water temperature in °C **kWt =** heating output (kW). **kWa =** Power input of compressors (kW)

The standard performances refer to a 5°C temperature difference between the water entering and leaving the plate-type heat exchanger, outdoor air with 87% relative humidity and to operation of the unit with all the fans to top speed. A 0.44 x 10-4 m2 K/W fouling factor has also been considered with the unit installed at zero meters above sea level (Pb = 1013mbar).

NOTE

For air temperatures of less than 7°C, the heating capacity is declared without considering the effect of the thawing cycles, strictly correlated with the humidity in the outdoor air.

TECHNICAL SPECIFICATIONS AND STANDARD PERFORMANCES - IP HEAT PUMP UNITS

Technical specifications of unit AB Standard Unit + KS Silencer kit

Model	50	60	70	80	90	100	115	130	145	160	180	200	UM
Power supply	400V - 3ph+N - 50 Hz												V-f-Hz
Type of refrigerant	R410A												/
Circuits	1												n°
Cooling capacity (1) (E)	51,3	55,7	65,1	71,8	86,5	96,0	107	118	134	149	173	192	kW
Compressors power input (1)	16,9	19,2	21,6	25,8	29,3	32,8	37,0	41,8	47,9	52,8	57,5	65,3	kW
EER	3,03	2,90	3,01	2,78	2,95	2,92	2,88	2,83	2,79	2,83	3,00	2,94	-
Total power input (1) (E)	18,7	21,0	23,4	27,6	32,9	36,4	40,6	45,4	53,3	58,2	64,7	72,5	kW
Total EER	2,74	2,65	2,78	2,60	2,63	2,63	2,63	2,60	2,51	2,57	2,67	2,65	-
ESEER (E)	3,78	3,66	3,84	3,59	3,63	3,64	3,62	3,59	3,47	3,54	3,68	3,65	-
Water flow rate (1)	2,45	2,66	3,11	3,43	4,13	4,58	5,09	5,65	6,39	7,13	8,24	9,17	l/s
Water pressure drops (1) (E)	38	46	43	33	36	36	36	34	34	35	54	52	kPa
Available static head (1) (MP)	147	129	109	90	159	144	124	105	132	107	152	116	kPa
Heating capacity (2) (E)	51,6	56,2	65,6	73,9	88,6	99,8	110	121	139	151	178	196	kW
Compressors power input (2)	16,9	18,8	21,2	24,1	29,5	32,8	36,4	40,8	47,1	52,1	56,4	63,8	kW
COP	3,05	2,99	3,10	3,06	3,01	3,04	3,01	2,97	2,94	2,91	3,16	3,07	-
Total power input (2) (E)	18,7	20,6	23,0	25,9	33,1	36,4	40,0	44,4	52,5	57,5	63,6	71,0	kW
Total COP	2,75	2,73	2,85	2,85	2,68	2,74	2,74	2,73	2,64	2,63	2,80	2,76	-
Water flow rate (2)	2,46	2,69	3,14	3,53	4,23	4,77	5,23	5,79	6,62	7,22	8,52	9,35	l/s
Water pressure drops (2) (E)	39	47	43	35	38	39	39	36	37	36	57	55	kPa
Available static head (2) (MP)	145	126	107	85	151	133	117	100	123	104	144	112	kPa

Compressor

Type	Scroll												/
Quantity	2												n°
Load steps	0-50-100												%
Oil charge CP1	3,25	3,25	3,25	3,25	3,25	4,7	4,7	6,8	6,8	6,3	6,3	6,3	l
Oil charge CP2	3,25	3,25	3,25	3,25	4,7	4,7	6,8	6,8	6,3	6,3	6,3	6,3	l

Heat Exchanger

Type	Brazed plates												/
Quantity	1												n°
Water volume	3,6	3,6	4,6	5,4	7,6	8,4	9,7	10,9	12,6	14,5	11,1	13,0	l

Fan

Type	Axial												-
Quantity	3				2				3		4		n°
Maximum rotational speed	900												rpm
Total air flow rate	24208	24208	23417	23067	34550	34550	39533	39533	51825	49850	69100	66467	m^3/h
Power input	1,8				3,6				5,4		7,2		kW

Coil

Type	Aluminum fins and copper tubes												/
Quantity	1												n°
Front area	3,38				4,72		5,90				7,41		m^2

Water Storage Tank (SAA accessory)

Water volume	200				400						460		l
Safety valve setting	600												kPa
Surge chamber volume	12				24								l
Surge chamber default pressure	150												kPa
Max. operating pressure	1000				800								kPa

Electrical Data

Units without pumping module

Total maximum power input [FLA]	48,2	50,9	58,3	68,6	76,0	81,5	89,9	98,3	117	131	150	165	A
Total maximum power input [FLI]	25,5	27,7	31,1	35,5	43,6	49,2	53,9	58,6	69,4	78,2	90,8	101	kW
Total maximum starting current [MIC]	146	147	173	211	265	270	317	325	368	382	470	485	A

Units with pumping module MP-AM and MP-PS (1 or 2 pumps)

Total maximum power input [FLA]	51,4	54,1	61,5	71,8	80,8	86,3	94,7	103	123	137	158	173	A
Total maximum power input [FLI]	27,2	29,4	32,8	37,2	46,5	52,1	56,8	61,5	72,7	81,5	95,6	106	kW
Total maximum starting current [MIC]	149	150	176	214	269	275	322	330	373	388	479	493	A

Units with pumping module MP-AM AP (1 or 2 pumps)

Total maximum power input [FLA]	54,4	57,1	64,6	74,9	82,2	87,8	98,1	106	125	140	161	176	A
Total maximum power input [FLI]	29,2	31,4	34,8	39,2	47,3	53,0	58,7	63,4	74,2	83,0	97,3	108	kW
Total maximum starting current [MIC]	152	153	179	217	271	276	325	334	376	390	481	496	A

Data referred to standard operating condition.
(1): water temperature: in 12°C - out 7°C air temperature: in 35°C d.b.
(2): water temperature: in 40°C - out 45°C air temperature: in 7°C d.b. 87% RH
(MP): with standard hydronic kit MP-AM and MP-SS
(SAA): with storage tank
(E): data declared according to LCP EUROVENT certification program

Standard performances in cooling mode AB Standard Unit + KS Silencer kit

Mod. 50-100

MOD.	Tw	OUTDOOR AIR TEMPERATURE (°C D.B.)													
		20		25		30		35		40		45		50	
		kWf	kWa	kWf	kWa	kWf	kWa	kWf	kWa	kWf	kWa	kWf	kWa	kWf	kWa
50	5	58,6	11,9	54,7	13,6	51,7	15,0	48,5	16,6	45,1	18,3	41,8	19,9	38,4	21,5
	6	60,2	12,0	56,2	13,8	53,1	15,2	49,8	16,7	46,4	18,4	43,0	20,1	39,5	21,7
	7	61,9	12,1	57,8	13,9	54,7	15,3	**51,3**	**16,9**	47,7	18,6	44,2	20,3	40,6	22,0
	8	63,7	12,2	59,4	14,1	56,2	15,5	52,8	17,1	49,1	18,8	45,5	20,5	-	-
	9	65,4	12,3	61,1	14,2	57,8	15,7	54,2	17,3	50,4	19,0	46,7	20,7	-	-
	10	67,2	12,5	62,7	14,3	59,3	15,8	55,6	17,4	51,8	19,2	48,0	20,9	-	-
	11	68,9	12,6	64,3	14,5	60,8	16,0	57,1	17,6	53,1	19,4	49,2	21,1	-	-
	12	70,8	12,7	66,1	14,6	62,5	16,1	58,6	17,8	54,5	19,6	50,5	21,4	-	-
60	5	63,6	13,5	59,3	15,5	56,1	17,1	52,7	18,8	49,0	20,8	45,4	22,6	41,7	24,5
	6	65,3	13,6	61,0	15,6	57,7	17,2	54,1	19,0	50,4	20,9	46,6	22,8	42,8	24,7
	7	67,2	13,7	62,8	15,8	59,4	17,4	**55,7**	**19,2**	51,8	21,2	48,0	23,1	44,1	24,9
	8	69,2	13,9	64,5	16,0	61,0	17,6	57,3	19,4	53,3	21,4	49,4	23,3	-	-
	9	71,1	14,0	66,3	16,1	62,7	17,8	58,9	19,6	54,8	21,6	50,7	23,6	-	-
	10	72,9	14,2	68,1	16,3	64,4	18,0	60,4	19,8	56,2	21,8	52,1	23,8	-	-
	11	74,8	14,3	69,8	16,5	66,0	18,1	62,0	20,0	57,6	22,0	53,4	24,0	-	-
	12	76,8	14,4	71,7	16,6	67,8	18,3	63,6	20,2	59,2	22,3	54,8	24,3	-	-
70	5	74,3	15,2	69,4	17,4	65,6	19,2	61,6	21,2	57,3	23,3	53,0	25,5	48,7	27,5
	6	76,4	15,3	71,3	17,6	67,4	19,4	63,3	21,4	58,9	23,6	54,5	25,7	50,1	27,8
	7	78,6	15,5	73,4	17,8	69,4	19,6	**65,1**	**21,6**	60,6	23,8	56,1	26,0	51,5	28,1
	8	80,8	15,6	75,4	18,0	71,3	19,8	66,9	21,8	62,3	24,1	57,7	26,2	-	-
	9	83,0	15,8	77,5	18,2	73,3	20,0	68,8	22,1	64,0	24,3	59,3	26,5	-	-
	10	85,2	15,9	79,6	18,3	75,2	20,2	70,6	22,3	65,7	24,6	60,8	26,8	-	-
	11	87,4	16,1	81,6	18,5	77,2	20,4	72,4	22,5	67,4	24,8	62,4	27,0	-	-
	12	89,8	16,3	83,8	18,7	79,3	20,6	74,4	22,7	69,2	25,0	64,1	27,3	-	-
80	5	82,0	18,1	76,5	20,8	72,3	22,9	67,9	25,3	63,2	27,9	58,5	30,4	53,7	32,9
	6	84,2	18,3	78,6	21,0	74,3	23,2	69,8	25,5	64,9	28,1	60,1	30,7	55,2	33,2
	7	86,7	18,5	80,9	21,2	76,5	23,4	**71,8**	**25,8**	66,8	28,4	61,9	31,0	56,8	33,5
	8	89,1	18,7	83,2	21,5	78,7	23,7	73,8	26,1	68,7	28,8	63,6	31,3	-	-
	9	91,6	18,9	85,5	21,7	80,8	23,9	75,9	26,3	70,6	29,0	65,4	31,7	-	-
	10	94,0	19,0	87,8	21,9	83,0	24,1	77,9	26,6	72,5	29,3	67,1	32,0	-	-
	11	96,4	19,2	90,0	22,1	85,1	24,4	79,9	26,9	74,3	29,6	68,8	32,3	-	-
	12	99,0	19,4	92,4	22,3	87,4	24,6	82,0	27,1	76,3	29,9	70,7	32,6	-	-
90	5	98,7	20,6	92,2	23,7	87,1	26,1	81,8	28,7	76,1	31,7	70,5	34,5	64,7	37,3
	6	101	20,8	94,7	23,9	89,6	26,3	84,0	29,0	78,2	32,0	72,4	34,9	66,5	37,7
	7	104	21,0	97,5	24,1	92,2	26,6	**86,5**	**29,3**	80,5	32,3	74,5	35,2	68,5	38,1
	8	107	21,2	100	24,4	94,8	26,9	89,0	29,6	82,8	32,7	76,7	35,6	-	-
	9	110	21,4	103	24,6	97,4	27,1	91,4	29,9	85,0	33,0	78,8	36,0	-	-
	10	113	21,6	106	24,9	100	27,4	93,8	30,2	87,3	33,3	80,9	36,3	-	-
	11	116	21,8	108	25,1	103	27,7	96,2	30,5	89,5	33,6	82,9	36,7	-	-
	12	119	22,0	111	25,4	105	27,9	98,8	30,8	92,0	34,0	85,2	37,0	-	-
100	5	110	23,0	102	26,5	96,7	29,2	90,8	32,2	84,4	35,5	78,2	38,7	71,8	41,8
	6	113	23,2	105	26,7	99,4	29,4	93,3	32,5	86,8	35,8	80,4	39,0	73,8	42,2
	7	116	23,5	108	27,0	102	29,7	**96,0**	**32,8**	89,3	36,2	82,7	39,4	76,0	42,6
	8	119	23,7	111	27,3	105	30,1	98,7	33,2	91,8	36,6	85,1	39,8	-	-
	9	122	24,0	114	27,6	108	30,4	101	33,5	94,4	36,9	87,4	40,2	-	-
	10	126	24,2	117	27,8	111	30,7	104	33,8	96,9	37,3	89,7	40,6	-	-
	11	129	24,4	120	28,1	114	31,0	107	34,2	99,4	37,7	92,0	41,0	-	-
	12	132	24,7	124	28,4	117	31,3	110	34,5	102	38,0	94,5	41,4	-	-

Tw= Outlet water temperature in °C **kWf =** refrigerating power (kW). **kWa =** Power input of compressors (kW)

The standard performances refer to a 5°C temperature difference between the water entering and leaving the plate-type heat exchanger and to operation of the unit with all the fans to top speed. A 0.44 x 10^{-4} m^2 K/W fouling factor has also been considered with the unit installed at zero meters above sea level (Pb = 1013mbar).

Mod. 115-160

MOD.	Tw	OUTDOOR AIR TEMPERATURE (°C D.B.)													
		20		25		30		35		40		45		50	
		kWf	kWa	kWf	kWa	kWf	kWa	kWf	kWa	kWf	kWa	kWf	kWa	kWf	kWa
115	5	122	26,0	114	29,9	108	32,9	101	36,3	94,1	40,0	87,2	43,6	80,1	47,1
	6	126	26,2	117	30,2	111	33,2	104	36,6	96,7	40,4	89,6	44,0	82,3	47,6
	7	129	26,5	121	30,5	114	33,6	**107**	**37,0**	100	40,8	92,2	44,5	84,7	48,1
	8	133	26,8	124	30,8	117	33,9	110	37,4	102	41,2	94,8	45,0	-	-
	9	136	27,0	127	31,1	120	34,3	113	37,8	105	41,6	97,4	45,4	-	-
	10	140	27,3	131	31,4	124	34,6	116	38,2	108	42,1	100	45,9	-	-
	11	144	27,6	134	31,7	127	34,9	119	38,5	111	42,5	103	46,3	-	-
	12	148	27,8	138	32,0	130	35,3	122	38,9	114	42,9	105	46,8	-	-
130	5	135	29,3	126	33,7	119	37,2	112	41,0	104	45,2	96,1	49,3	88,3	53,3
	6	138	29,6	129	34,1	122	37,5	115	41,4	107	45,6	98,8	49,7	90,8	53,8
	7	142	29,9	133	34,4	126	37,9	**118**	**41,8**	110	46,1	102	50,2	93,4	54,3
	8	146	30,2	137	34,8	129	38,3	121	42,3	113	46,6	105	50,8	-	-
	9	151	30,5	141	35,1	133	38,7	125	42,7	116	47,0	107	51,3	-	-
	10	155	30,8	144	35,5	136	39,1	128	43,1	119	47,5	110	51,8	-	-
	11	158	31,1	148	35,8	140	39,5	131	43,5	122	48,0	113	52,3	-	-
	12	163	31,4	152	36,2	144	39,9	135	44,0	125	48,4	116	52,8	-	-
145	5	153	33,6	143	38,7	135	42,6	127	47,0	118	51,8	109	56,4	100	61,0
	6	157	33,9	147	39,0	139	43,0	130	47,4	121	52,3	112	57,0	103	61,6
	7	162	34,3	151	39,4	143	43,4	**134**	**47,9**	125	52,8	115	57,6	106	62,2
	8	166	34,6	155	39,9	147	43,9	138	48,4	128	53,4	119	58,2	-	-
	9	171	35,0	160	40,3	151	44,4	142	48,9	132	53,9	122	58,8	-	-
	10	175	35,3	164	40,7	155	44,8	145	49,4	135	54,4	125	59,4	-	-
	11	180	35,7	168	41,1	159	45,2	149	49,9	139	55,0	128	59,9	-	-
	12	185	36,0	173	41,5	163	45,7	153	50,4	142	55,5	132	60,5	-	-
160	5	170	37,0	159	42,6	150	47,0	141	51,8	131	57,1	121	62,2	112	67,3
	6	175	37,4	163	43,0	154	47,4	145	52,3	135	57,6	125	62,8	115	67,9
	7	180	37,8	168	43,5	159	47,9	**149**	**52,8**	139	58,2	128	63,4	118	68,6
	8	185	38,2	173	43,9	163	48,4	153	53,4	143	58,8	132	64,1	-	-
	9	190	38,6	177	44,4	168	48,9	157	53,9	146	59,4	136	64,8	-	-
	10	195	39,0	182	44,8	172	49,4	162	54,5	150	60,0	139	65,4	-	-
	11	200	39,3	187	45,3	177	49,9	166	55,0	154	60,6	143	66,1	-	-
	12	206	39,7	192	45,7	181	50,4	170	55,5	158	61,2	147	66,7	-	-
180	5	197	40,3	184	46,4	174	51,1	164	56,4	152	62,2	141	67,8	129	73,3
	6	203	40,7	189	46,9	179	51,6	168	56,9	156	62,7	145	68,4	133	74,0
	7	209	41,1	195	47,3	184	52,2	**173**	**57,5**	161	63,4	149	69,1	137	74,7
	8	215	41,6	200	47,9	190	52,7	178	58,1	166	64,1	153	69,9	-	-
	9	221	42,0	206	48,3	195	53,3	183	58,7	170	64,7	158	70,6	-	-
	10	227	42,4	211	48,8	200	53,8	188	59,3	175	65,4	162	71,3	-	-
	11	232	42,8	217	49,3	205	54,3	192	59,9	179	66,0	166	72,0	-	-
	12	239	43,3	223	49,8	211	54,8	198	60,5	184	66,6	170	72,7	-	-
200	5	219	45,8	205	52,7	193	58,1	182	64,0	169	70,6	156	77,0	144	83,2
	6	225	46,2	210	53,2	199	58,6	187	64,6	174	71,2	161	77,7	148	84,0
	7	232	46,7	216	53,8	205	59,2	**192**	**65,3**	179	72,0	165	78,5	152	84,8
	8	238	47,2	222	54,3	210	59,9	197	66,0	184	72,8	170	79,3	-	-
	9	245	47,7	229	54,9	216	60,5	203	66,7	189	73,5	175	80,1	-	-
	10	251	48,2	235	55,4	222	61,1	208	67,3	194	74,2	179	80,9	-	-
	11	258	48,7	241	56,0	228	61,7	214	68,0	199	75,0	184	81,7	-	-
	12	265	49,1	247	56,5	234	62,3	219	68,7	204	75,7	189	82,5	-	-

Tw= Outlet water temperature in °C **kWf =** refrigerating power (kW). **kWa =** Power input of compressors (kW)

The standard performances refer to a 5°C temperature difference between the water entering and leaving the plate-type heat exchanger and to operation of the unit with all the fans to top speed. A 0.44 x 10^{-4} m^2 K/W fouling factor has also been considered with the unit installed at zero meters above sea level (Pb = 1013mbar).

TECHNICAL SPECIFICATIONS AND STANDARD PERFORMANCES - IP HEAT PUMP UNITS

Standard performances in heating mode AB Standard Unit + KS Silencer kit

MOD.	Tw	OUTDOOR AIR TEMPERATURE (°C D.B.)													
		-6		-2		2		6		9		12		15	
		kWt	kWa	kWt	kWa	kWt	kWa	kWt	kWa	kWt	kWa	kWt	kWa	kWt	kWa
50	30	39,4	12,0	45,2	12,1	49,4	12,3	52,5	12,3	56,3	12,5	60,2	12,6	64,4	12,8
	35	39,2	13,3	44,9	13,4	49,1	13,6	52,3	13,7	56,0	13,8	59,9	14,0	64,1	14,2
	40	39,0	14,8	44,7	14,9	48,9	15,1	52,0	15,2	55,7	15,4	59,6	15,6	63,7	15,7
	45	38,7	16,5	44,4	16,6	48,5	16,8	**51,6**	**16,9**	55,3	17,1	59,2	17,3	63,3	17,5
	50	38,4	18,3	44,1	18,4	48,2	18,7	51,2	18,8	55,0	19,0	58,8	19,2	62,9	19,4
60	30	42,9	13,4	49,2	13,5	53,8	13,6	57,2	13,7	61,4	13,9	65,6	14,0	70,2	14,2
	35	42,7	14,8	48,9	14,9	53,5	15,1	56,9	15,2	61,0	15,4	65,3	15,6	69,8	15,7
	40	42,5	16,5	48,7	16,6	53,2	16,8	56,6	16,9	60,7	17,1	64,9	17,3	69,4	17,5
	45	42,2	18,3	48,3	18,4	52,8	18,7	**56,2**	**18,8**	60,3	19,0	64,4	19,2	68,9	19,5
	50	41,9	20,4	48,0	20,5	52,5	20,8	56,2	20,9	59,9	21,1	64,0	21,4	68,5	21,6
70	30	50,1	15,1	57,4	15,2	62,8	15,4	66,8	15,5	71,6	15,7	76,6	15,8	81,9	16,0
	35	49,8	16,7	57,1	16,8	62,5	17,1	66,4	17,2	71,3	17,4	76,2	17,6	81,5	17,8
	40	49,6	18,6	56,8	18,7	62,1	19,0	66,1	19,1	70,8	19,3	75,7	19,5	81,0	19,7
	45	49,2	20,7	56,4	20,8	61,7	21,1	**65,6**	**21,2**	70,4	21,4	75,2	21,7	80,5	21,9
	50	48,9	23,0	56,0	23,1	61,3	23,4	65,1	23,6	69,9	23,8	74,7	24,1	79,9	24,4
80	30	56,4	17,2	64,7	17,3	70,7	17,5	75,2	17,6	80,7	17,8	86,3	18,0	92,3	18,2
	35	56,1	19,0	64,3	19,1	70,4	19,4	74,8	19,5	80,3	19,7	85,8	20,0	91,8	20,2
	40	55,8	21,1	64,0	21,3	70,0	21,6	74,4	21,7	79,8	21,9	85,3	22,2	91,3	22,4
	45	55,4	23,5	63,5	23,6	69,5	24,0	**73,9**	**24,1**	79,3	24,4	84,7	24,7	90,7	24,9
	50	55,1	26,1	63,1	26,3	69,0	26,6	73,4	26,8	78,7	27,1	84,1	27,4	90,0	27,7
90	30	67,7	21,0	77,5	21,1	84,8	21,4	90,2	21,5	96,7	21,8	103	22,0	111	22,3
	35	67,3	23,3	77,1	23,4	84,4	23,7	89,7	23,9	96,2	24,1	103	24,4	110	24,7
	40	66,9	25,9	76,7	26,0	83,9	26,4	89,2	26,5	95,7	26,9	102	27,2	109	27,5
	45	66,5	28,8	76,2	28,9	83,3	29,3	**88,6**	**29,5**	95,0	29,8	102	30,2	109	30,5
	50	66,0	32,0	75,6	32,2	82,7	32,6	88,0	32,8	94,4	33,2	101	33,6	108	33,9
100	30	76,2	23,4	87,3	23,5	95,5	23,8	102	24,0	109	24,2	116	24,5	125	24,8
	35	75,8	25,9	86,9	26,0	95,0	26,4	101	26,5	108	26,9	116	27,2	124	27,5
	40	75,4	28,8	86,4	28,9	94,5	29,3	100	29,5	108	29,9	115	30,2	123	30,5
	45	74,9	32,0	85,8	32,2	93,8	32,6	**99,8**	**32,8**	107	33,2	114	33,6	122	33,9
	50	74,3	35,6	85,2	35,8	93,2	36,3	99,1	36,5	106	36,9	114	37,3	122	37,7
115	30	84,0	25,9	96,3	26,1	105	26,4	112	26,6	120	26,9	128	27,2	137	27,5
	35	83,6	28,7	95,8	28,9	105	29,3	111	29,5	119	29,8	128	30,1	137	30,5
	40	83,1	31,9	95,2	32,1	104	32,6	111	32,8	119	33,1	127	33,5	136	33,9
	45	82,5	35,5	94,6	35,7	103	36,2	**110**	**36,4**	118	36,8	126	37,2	135	37,7
	50	81,9	39,5	93,9	39,7	103	40,2	109	40,5	117	40,9	125	41,4	134	41,9
130	30	92,4	29,0	106	29,2	116	29,6	123	29,8	132	30,1	141	30,5	151	30,8
	35	91,9	32,2	105	32,4	115	32,8	123	33,0	131	33,4	141	33,8	150	34,2
	40	91,4	35,8	105	36,0	115	36,5	122	36,7	131	37,1	140	37,6	149	38,0
	45	90,8	39,8	104	40,0	114	40,6	**121**	**40,8**	130	41,3	139	41,7	148	42,2
	50	90,1	44,2	103	44,5	113	45,1	120	45,4	129	45,9	138	46,4	147	46,9
145	30	106	33,5	122	33,7	133	34,2	141	34,4	152	34,8	162	35,2	174	35,6
	35	106	37,2	121	37,4	132	37,9	141	38,1	151	38,6	161	39,0	173	39,4
	40	105	41,3	120	41,6	132	42,1	140	42,4	150	42,9	160	43,4	172	43,9
	45	104	45,9	119	46,2	131	46,8	**139**	**47,1**	149	47,6	159	48,2	171	48,7
	50	104	51,1	119	51,4	130	52,1	138	52,4	148	53,0	158	53,6	169	54,2
160	30	115	37,1	132	37,3	145	37,8	154	38,0	165	38,5	176	38,9	189	39,4
	35	115	41,1	131	41,3	144	41,9	153	42,2	164	42,6	175	43,1	188	43,6
	40	114	45,7	131	46,0	143	46,6	152	46,9	163	47,4	174	48,0	187	48,5
	45	113	50,8	130	51,1	142	51,8	**151**	**52,1**	162	52,7	173	53,3	185	53,9
	50	112	56,5	129	56,8	141	57,6	150	57,9	161	58,6	172	59,3	184	59,9
180	30	136	40,2	156	40,4	170	40,9	181	41,2	194	41,7	208	42,1	222	42,6
	35	135	44,5	155	44,8	170	45,4	180	45,6	193	46,2	207	46,7	221	47,2
	40	134	49,5	154	49,8	169	50,5	179	50,7	192	51,3	206	51,9	220	52,5
	45	134	55,0	153	55,3	167	56,1	**178**	**56,4**	191	57,1	204	57,7	218	58,4
	50	133	61,1	152	61,5	166	62,3	177	62,7	190	63,4	203	64,2	217	64,9
200	30	150	45,4	172	45,7	188	46,3	200	46,6	214	47,1	229	47,7	245	48,2
	35	149	50,3	171	50,6	187	51,3	198	51,6	213	52,2	228	52,8	243	53,4
	40	148	56,0	170	56,3	186	57,1	197	57,4	212	58,1	226	58,7	242	59,4
	45	147	62,2	169	62,6	184	63,4	**196**	**63,8**	210	64,5	225	65,3	240	66,0
	50	146	69,2	167	69,6	183	70,5	195	70,9	209	71,7	223	72,6	239	73,4

Tw= Outlet water temperature in °C **kWt =** heating output (kW). **kWa =** Power input of compressors (kW)

The standard performances refer to a 5°C temperature difference between the water entering and leaving the plate-type heat exchanger, outdoor air with 87% relative humidity and to operation of the unit with all the fans to top speed. A 0.44 x 10-4 m2 K/W fouling factor has also been considered with the unit installed at zero meters above sea level (Pb = 1013mbar).

NOTE

For air temperatures of less than 7°C, the heating capacity is declared without considering the effect of the thawing cycles, strictly correlated with the humidity in the outdoor air.

TECHNICAL SPECIFICATIONS AND STANDARD PERFORMANCES - IP HEAT PUMP UNITS

Technical specifications of unit ASS Extra low noise version

Model	50	60	70	80	90	100	115	130	145	160	180	200	UM
Power supply	400V - 3ph+N - 50 Hz												V-f-Hz
Type of refrigerant	R410A												/
Circuits	1												n°
Cooling capacity (1) (E)	50,1	54,5	63,6	-	84,5	93,8	104	116	131	-	169	-	kW
Compressors power input (1)	17,5	19,8	22,3	-	30,2	33,8	38,2	43,1	49,4	-	59,3	-	kW
EER	2,87	2,75	2,85	-	2,80	2,77	2,73	2,68	2,65	-	2,84	-	-
Total power input (1) (E)	19,3	21,6	24,1	-	33,8	37,4	41,8	46,7	54,8	-	66,5	-	kW
Total EER	2,60	2,52	2,64	-	2,50	2,50	2,49	2,47	2,39	-	2,54	-	-
ESEER (E)	3,59	3,47	3,64	-	3,45	3,45	3,44	3,41	3,29	-	3,50	-	-
Water flow rate (1)	2,39	2,60	3,04	-	4,04	4,48	4,98	5,52	6,24	-	8,05	-	l/s
Water pressure drops (1) (E)	37	44	41	-	35	34	35	33	33	-	51	-	kPa
Available static head (1) (MP)	155	135	114	-	166	151	131	109	138	-	160	-	kPa
Heating capacity (2) (E)	50,5	55,1	64,3	-	86,8	97,9	107	119	136	-	175	-	kW
Compressors power input (2)	17,0	18,9	21,3	-	29,6	33,0	36,5	41,0	47,4	-	56,7	-	kW
COP	2,97	2,92	3,02	-	2,93	2,97	2,94	2,90	2,87	-	3,08	-	-
Total power input (2) (E)	18,8	20,7	23,1	-	31,4	36,6	40,1	44,6	52,8	-	63,9	-	kW
Total COP	2,69	2,66	2,78	-	2,76	2,68	2,67	2,67	2,58	-	2,74	-	-
Water flow rate (2)	2,41	2,63	3,07	-	4,15	4,68	5,13	5,67	6,49	-	8,35	-	l/s
Water pressure drops (2) (E)	37	45	42	-	36	37	36	35	35	-	55	-	kPa
Available static head (2) (MP)	152	131	111	-	157	139	124	103	128	-	149	-	kPa

Compressor

Type	Scroll												/
Quantity	2												n°
Load steps	0-50-100												%
Oil charge CP1	3,25	3,25	3,25	-	3,25	4,7	4,7	6,8	6,8	-	6,3	-	l
Oil charge CP2	3,25	3,25	3,25	-	4,7	4,7	6,8	6,8	6,3	-	6,3	-	l

Heat Exchanger

Type	Brazed plates												/
Quantity	1												n°
Water volume	3,6	3,6	4,6	-	7,6	8,4	9,7	10,9	12,6	-	11,1	-	l

Fan

Type	Axial												-
Quantity	3				2				3		4		n°
Maximum rotational speed	900												rpm
Total air flow rate	19367	19367	18733	-	27640	27640	31627	31627	41460	-	55280	-	m^3/h
Power input	1,8				3,6				5,4		7,2		kW

Coil

Type	Aluminum fins and copper tubes												/
Quantity	1												n°
Front area	3,38				4,72		5,90				7,41		m^2

Water Storage Tank (SAA accessory)

Water volume	200				400						460		l
Safety valve setting	600												kPa
Surge chamber volume	12				24								l
Surge chamber default pressure	150												kPa
Max. operating pressure	1000				800								kPa

Electrical Data

Units without pumping module

Total maximum power input [FLA]	48,2	50,9	58,3	-	76,0	81,5	89,9	98,3	117	-	150	-	A
Total maximum power input [FLI]	25,5	27,7	31,1	-	43,6	49,2	53,9	58,6	69,4	-	90,8	-	kW
Total maximum starting current [MIC]	146	147	173	-	265	270	317	325	368	-	470	-	A

Units with pumping module MP-AM and MP-PS (1 or 2 pumps)

Total maximum power input [FLA]	51,4	54,1	61,5	-	80,8	86,3	94,7	103	123	-	158	-	A
Total maximum power input [FLI]	27,2	29,4	32,8	-	46,5	52,1	56,8	61,5	72,7	-	95,6	-	kW
Total maximum starting current [MIC]	149	150	176	-	269	275	322	330	373	-	479	-	A

Units with pumping module MP-AM AP (1 or 2 pumps)

Total maximum power input [FLA]	54,4	57,1	64,6	-	82,2	87,8	98,1	106	125	-	161	-	A
Total maximum power input [FLI]	29,2	31,4	34,8	-	47,3	53,0	58,7	63,4	74,2	-	97,3	-	kW
Total maximum starting current [MIC]	152	153	179	-	271	276	325	334	376	-	481	-	A

Data referred to standard operating condition.
(1): water temperature: in 12°C - out 7°C air temperature: in 35°C d.b.
(2): water temperature: in 40°C - out 45°C air temperature: in 7°C d.b. 87% RH
(MP): with standard hydronic kit MP-AM and MP-SS
(SAA): with storage tank
(E): data declared according to **LCP EUROVENT** certification program

Standard performances in cooling mode ASS Extra low noise version

Mod. 50-100

MOD.	Tw	OUTDOOR AIR TEMPERATURE (°C D.B.)													
		20		25		30		35		40		45		50	
		kWf	kWa	kWf	kWa	kWf	kWa	kWf	kWa	kWf	kWa	kWf	kWa	kWf	kWa
50	5	57,2	12,3	53,4	14,1	50,5	15,6	47,4	17,2	44,1	18,9	40,8	20,6	37,5	22,3
	6	58,8	12,4	54,9	14,3	51,9	15,7	48,7	17,3	45,3	19,1	41,9	20,8	38,5	22,5
	7	60,5	12,5	56,5	14,4	53,4	15,9	**50,1**	**17,5**	46,6	19,3	43,2	21,0	39,7	22,7
	8	62,2	12,7	58,1	14,6	54,9	16,0	51,5	17,7	47,9	19,5	44,4	21,3	-	-
	9	63,9	12,8	59,7	14,7	56,4	16,2	52,9	17,9	49,3	19,7	45,6	21,5	-	-
	10	65,6	12,9	61,2	14,9	57,9	16,4	54,3	18,0	50,6	19,9	46,8	21,7	-	-
	11	67,3	13,0	62,8	15,0	59,4	16,5	55,7	18,2	51,9	20,1	48,0	21,9	-	-
	12	69,1	13,2	64,5	15,1	61,0	16,7	57,2	18,4	53,3	20,3	49,3	22,1	-	-
60	5	62,2	13,9	58,1	16,0	54,9	17,6	51,5	19,4	47,9	21,4	44,4	23,3	40,8	25,2
	6	63,9	14,0	59,7	16,1	56,4	17,8	53,0	19,6	49,3	21,6	45,6	23,6	41,9	25,5
	7	65,8	14,2	61,4	16,3	58,1	18,0	**54,5**	**19,8**	50,7	21,8	47,0	23,8	43,1	25,7
	8	67,7	14,3	63,2	16,5	59,7	18,2	56,0	20,0	52,1	22,1	48,3	24,1	-	-
	9	69,5	14,5	64,9	16,6	61,4	18,3	57,6	20,2	53,6	22,3	49,6	24,3	-	-
	10	71,4	14,6	66,6	16,8	63,0	18,5	59,1	20,4	55,0	22,5	50,9	24,5	-	-
	11	73,2	14,8	68,3	17,0	64,6	18,7	60,6	20,6	56,4	22,7	52,2	24,8	-	-
	12	75,2	14,9	70,2	17,1	66,4	18,9	62,3	20,8	57,9	22,9	53,7	25,0	-	-
70	5	72,6	15,6	67,8	18,0	64,1	19,8	60,1	21,9	55,9	24,1	51,8	26,3	47,6	28,4
	6	74,6	15,8	69,6	18,2	65,9	20,0	61,8	22,1	57,5	24,3	53,3	26,5	48,9	28,7
	7	76,8	16,0	71,7	18,4	67,8	20,2	**63,6**	**22,3**	59,2	24,6	54,8	26,8	50,3	29,0
	8	79,0	16,1	73,7	18,6	69,7	20,4	65,4	22,5	60,8	24,9	56,4	27,1	-	-
	9	81,1	16,3	75,7	18,7	71,6	20,7	67,2	22,8	62,5	25,1	57,9	27,4	-	-
	10	83,3	16,5	77,7	18,9	73,5	20,9	69,0	23,0	64,2	25,3	59,4	27,6	-	-
	11	85,4	16,6	79,7	19,1	75,4	21,1	70,7	23,2	65,8	25,6	61,0	27,9	-	-
	12	87,7	16,8	81,9	19,3	77,4	21,3	72,7	23,4	67,6	25,8	62,6	28,2	-	-
80	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	7	-	-	-	-	-	-	**-**	**-**	-	-	-	-	-	-
	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-
90	5	96,5	21,2	90,0	24,4	85,1	26,9	79,9	29,6	74,3	32,6	68,8	35,6	63,2	38,5
	6	99,1	21,4	92,5	24,6	87,5	27,1	82,1	29,9	76,4	32,9	70,8	35,9	65,0	38,8
	7	102	21,6	95,2	24,9	90,0	27,4	**84,5**	**30,2**	78,6	33,3	72,8	36,3	66,9	39,2
	8	105	21,8	97,9	25,1	92,6	27,7	86,9	30,5	80,8	33,7	74,9	36,7	-	-
	9	108	22,1	101	25,4	95,1	28,0	89,3	30,8	83,1	34,0	76,9	37,1	-	-
	10	111	22,3	103	25,6	97,7	28,2	91,7	31,1	85,3	34,3	79,0	37,4	-	-
	11	113	22,5	106	25,9	100	28,5	94,0	31,5	87,5	34,7	81,0	37,8	-	-
	12	117	22,7	109	26,1	103	28,8	96,5	31,8	89,8	35,0	83,2	38,2	-	-
100	5	107	23,7	100	27,3	94,5	30,1	88,7	33,1	82,5	36,5	76,4	39,8	70,2	43,1
	6	110	23,9	103	27,5	97,1	30,3	91,1	33,5	84,8	36,9	78,5	40,2	72,1	43,5
	7	113	24,2	106	27,8	100	30,7	**93,8**	**33,8**	87,3	37,3	80,8	40,6	74,2	43,9
	8	116	24,5	109	28,1	103	31,0	96,5	34,2	89,7	37,7	83,1	41,1	-	-
	9	120	24,7	112	28,4	106	31,3	99,1	34,5	92,2	38,0	85,4	41,5	-	-
	10	123	24,9	115	28,7	108	31,6	102	34,9	94,7	38,4	87,7	41,9	-	-
	11	126	25,2	118	29,0	111	31,9	104	35,2	97,1	38,8	89,9	42,3	-	-
	12	129	25,4	121	29,3	114	32,2	107	35,5	100	39,2	92,4	42,7	-	-

Tw= Outlet water temperature in °C **kWf =** refrigerating power (kW). **kWa =** Power input of compressors (kW)

The standard performances refer to a 5°C temperature difference between the water entering and leaving the plate-type heat exchanger and to operation of the unit with all the fans to top speed. A 0.44 x 10^{-4} m^2 K/W fouling factor has also been considered with the unit installed at zero meters above sea level (Pb = 1013mbar).

Mod. 115-160

MOD.	Tw	OUTDOOR AIR TEMPERATURE (°C D.B.)													
		20		25		30		35		40		45		50	
		kWf	kWa	kWf	kWa	kWf	kWa	kWf	kWa	kWf	kWa	kWf	kWa	kWf	kWa
115	5	119	26,8	111	30,8	105	34,0	98,3	37,5	91,5	41,3	84,7	45,0	77,8	48,7
	6	122	27,1	114	31,1	108	34,3	101	37,8	94,0	41,7	87,1	45,4	80,0	49,1
	7	126	27,3	117	31,4	111	34,6	**104**	**38,2**	96,8	42,1	89,6	45,9	82,3	49,6
	8	129	27,6	121	31,8	114	35,0	107	38,6	100	42,6	92,2	46,4	-	-
	9	133	27,9	124	32,1	117	35,4	110	39,0	102	43,0	94,7	46,9	-	-
	10	136	28,2	127	32,4	120	35,7	113	39,4	105	43,4	97,2	47,3	-	-
	11	140	28,5	130	32,7	123	36,1	116	39,8	108	43,8	100	47,8	-	-
	12	143	28,7	134	33,1	127	36,4	119	40,2	111	44,3	102	48,3	-	-
130	5	132	30,2	124	34,8	117	38,3	110	42,3	102	46,6	94,5	50,8	86,8	54,9
	6	136	30,5	127	35,1	120	38,7	113	42,7	105	47,0	97,1	51,3	89,2	55,4
	7	140	30,8	131	35,5	124	39,1	**116**	**43,1**	108	47,5	100	51,8	91,8	56,0
	8	144	31,2	134	35,9	127	39,5	119	43,6	111	48,0	103	52,4	-	-
	9	148	31,5	138	36,2	131	39,9	123	44,0	114	48,5	106	52,9	-	-
	10	152	31,8	142	36,6	134	40,3	126	44,4	117	49,0	108	53,4	-	-
	11	156	32,1	145	37,0	138	40,7	129	44,9	120	49,5	111	53,9	-	-
	12	160	32,4	149	37,3	141	41,1	133	45,3	123	50,0	114	54,5	-	-
145	5	150	34,7	140	39,9	132	43,9	124	48,4	115	53,4	107	58,2	98,0	62,9
	6	154	35,0	143	40,3	136	44,4	127	48,9	118	53,9	110	58,8	101	63,5
	7	158	35,3	148	40,7	140	44,8	**131**	**49,4**	122	54,4	113	59,4	104	64,2
	8	163	35,7	152	41,1	144	45,3	135	49,9	125	55,1	116	60,0	-	-
	9	167	36,1	156	41,5	148	45,8	138	50,4	129	55,6	119	60,6	-	-
	10	172	36,5	160	41,9	151	46,2	142	50,9	132	56,2	122	61,2	-	-
	11	176	36,8	164	42,4	155	46,7	146	51,4	136	56,7	126	61,8	-	-
	12	181	37,2	169	42,8	159	47,1	150	51,9	139	57,3	129	62,4	-	-
160	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	7	-	-	-	-	-	-	**-**	**-**	-	-	-	-	-	-
	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-
180	5	193	41,6	180	47,9	170	52,7	160	58,2	149	64,1	138	69,9	126	75,6
	6	198	42,0	185	48,3	175	53,2	164	58,7	153	64,7	142	70,5	130	76,3
	7	204	42,4	190	48,8	180	53,8	**169**	**59,3**	157	65,4	146	71,3	134	77,0
	8	210	42,9	196	49,4	185	54,4	174	60,0	162	66,1	150	72,0	-	-
	9	216	43,3	201	49,8	190	54,9	179	60,6	166	66,7	154	72,8	-	-
	10	221	43,8	207	50,3	195	55,5	183	61,2	171	67,4	158	73,5	-	-
	11	227	44,2	212	50,8	200	56,0	188	61,8	175	68,1	162	74,2	-	-
	12	233	44,6	218	51,3	206	56,6	193	62,4	180	68,7	166	74,9	-	-
200	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	7	-	-	-	-	-	-	**-**	**-**	-	-	-	-	-	-
	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Tw= Outlet water temperature in °C **kWf =** refrigerating power (kW). **kWa =** Power input of compressors (kW)

The standard performances refer to a 5°C temperature difference between the water entering and leaving the plate-type heat exchanger and to operation of the unit with all the fans to top speed. A 0.44 x 10^{-4} m^2 K/W fouling factor has also been considered with the unit installed at zero meters above sea level (Pb = 1013mbar).

TECHNICAL SPECIFICATIONS AND STANDARD PERFORMANCES - IP HEAT PUMP UNITS

Standard performances in heating mode ASS Extra low noise version

MOD.	Tw	OUTDOOR AIR TEMPERATURE (°C D.B.)													
		-6		-2		2		6		9		12		15	
		kWt	kWa	kWt	kWa	kWt	kWa	kWt	kWa	kWt	kWa	kWt	kWa	kWt	kWa
50	30	38,6	12,1	44,2	12,2	48,3	12,3	51,4	12,4	55,1	12,6	58,9	12,7	63,1	12,8
	35	38,4	13,4	44,0	13,5	48,1	13,7	51,1	13,8	54,9	13,9	58,6	14,1	62,7	14,2
	40	38,1	14,9	43,7	15,0	47,8	15,2	50,9	15,3	54,5	15,5	58,3	15,7	62,4	15,8
	45	37,9	16,6	43,4	16,7	47,5	16,9	**50,5**	**17,0**	54,2	17,2	57,9	17,4	61,9	17,6
	50	37,6	18,4	43,1	18,5	47,2	18,8	50,1	18,9	53,8	19,1	57,5	19,3	61,5	19,6
60	30	42,1	13,5	48,2	13,5	52,7	13,7	56,1	13,8	60,2	14,0	64,3	14,1	68,8	14,3
	35	41,9	14,9	48,0	15,0	52,5	15,2	55,8	15,3	59,8	15,5	64,0	15,6	68,5	15,8
	40	41,6	16,6	47,7	16,7	52,2	16,9	55,5	17,0	59,5	17,2	63,6	17,4	68,1	17,6
	45	41,3	18,4	47,4	18,5	51,8	18,8	**55,1**	**18,9**	59,1	19,1	63,2	19,3	67,6	19,6
	50	41,0	20,5	47,0	20,6	51,4	20,9	55,1	21,0	58,7	21,3	62,7	21,5	67,1	21,7
70	30	49,1	15,2	56,3	15,3	61,5	15,5	65,5	15,6	70,2	15,7	75,1	15,9	80,3	16,1
	35	48,8	16,8	56,0	16,9	61,2	17,1	65,1	17,2	69,8	17,4	74,7	17,6	79,9	17,8
	40	48,6	18,7	55,7	18,8	60,9	19,1	64,7	19,2	69,4	19,4	74,2	19,6	79,4	19,8
	45	48,2	20,8	55,3	20,9	60,5	21,2	**64,3**	**21,3**	69,0	21,5	73,7	21,8	78,9	22,0
	50	47,9	23,1	54,9	23,2	60,0	23,5	63,9	23,7	68,5	24,0	73,2	24,2	78,3	24,5
80	30	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	45	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-
90	30	66,3	21,1	76,0	21,2	83,1	21,5	88,4	21,6	94,8	21,9	101	22,1	108	22,4
	35	65,9	23,4	75,6	23,5	82,7	23,8	87,9	24,0	94,3	24,2	101	24,5	108	24,8
	40	65,6	26,0	75,1	26,1	82,2	26,5	87,4	26,6	93,7	26,9	100	27,3	107	27,6
	45	65,1	28,9	74,6	29,0	81,6	29,4	**86,8**	**29,6**	93,1	29,9	99,5	30,3	106	30,6
	50	64,7	32,1	74,1	32,3	81,0	32,7	86,2	32,9	92,4	33,3	98,8	33,7	106	34,0
100	30	74,8	23,5	85,7	23,6	93,7	24,0	99,7	24,1	107	24,4	114	24,7	122	24,9
	35	74,4	26,0	85,2	26,2	93,2	26,6	99,1	26,7	106	27,0	114	27,3	122	27,6
	40	74,0	28,9	84,8	29,1	92,7	29,5	98,6	29,7	106	30,0	113	30,4	121	30,7
	45	73,4	32,2	84,2	32,4	92,1	32,8	**97,9**	**33,0**	105	33,4	112	33,8	120	34,1
	50	72,9	35,8	83,6	36,0	91,4	36,5	97,2	36,7	104	37,1	111	37,5	119	38,0
115	30	81,7	26,0	93,6	26,1	102	26,5	109	26,7	117	27,0	125	27,3	134	27,6
	35	81,3	28,8	93,2	29,0	102	29,4	108	29,5	116	29,9	124	30,2	133	30,6
	40	80,8	32,0	92,6	32,2	101	32,7	108	32,8	116	33,2	124	33,6	132	34,0
	45	80,3	35,6	92,0	35,8	101	36,3	**107**	**36,5**	115	36,9	123	37,3	131	37,8
	50	79,7	39,6	91,3	39,8	99,9	40,3	106	40,6	114	41,0	122	41,5	130	42,0
130	30	90,9	29,2	104	29,4	114	29,8	121	29,9	130	30,3	139	30,6	149	31,0
	35	90,4	32,3	104	32,5	113	33,0	121	33,2	129	33,6	138	33,9	148	34,3
	40	89,9	36,0	103	36,2	113	36,7	120	36,9	129	37,3	137	37,7	147	38,2
	45	89,3	40,0	102	40,2	112	40,8	**119**	**41,0**	128	41,5	136	41,9	146	42,4
	50	88,6	44,4	102	44,7	111	45,3	118	45,6	127	46,1	136	46,6	145	47,2
145	30	104	33,7	119	33,9	130	34,4	138	34,6	148	35,0	159	35,4	170	35,8
	35	103	37,4	118	37,6	130	38,1	138	38,4	148	38,8	158	39,2	169	39,7
	40	103	41,6	118	41,8	129	42,4	137	42,7	147	43,1	157	43,6	168	44,1
	45	102	46,2	117	46,5	128	47,1	**136**	**47,4**	146	47,9	156	48,5	167	49,0
	50	101	51,4	116	51,7	127	52,4	135	52,7	145	53,3	155	53,9	166	54,5
160	30	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	45	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-
180	30	134	40,4	153	40,6	168	41,2	178	41,4	191	41,9	204	42,4	219	42,8
	35	133	44,7	152	45,0	167	45,6	177	45,9	190	46,4	203	46,9	217	47,5
	40	132	49,7	151	50,0	166	50,7	176	51,0	189	51,6	202	52,2	216	52,8
	45	131	55,3	150	55,6	165	56,4	**175**	**56,7**	188	57,4	201	58,0	215	58,7
	50	130	61,5	149	61,8	163	62,7	174	63,0	186	63,8	199	64,5	213	65,2
200	30	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	45	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Tw= Outlet water temperature in °C **kWt =** heating output (kW). **kWa =** Power input of compressors (kW)

The standard performances refer to a 5°C temperature difference between the water entering and leaving the plate-type heat exchanger, outdoor air with 87% relative humidity and to operation of the unit with all the fans to top speed. A 0.44 x 10-4 m2 K/W fouling factor has also been considered with the unit installed at zero meters above sea level (Pb = 1013mbar).

NOTE

For air temperatures of less than 7°C, the heating capacity is declared without considering the effect of the thawing cycles, strictly correlated with the humidity in the outdoor air.

TECHNICAL SPECIFICATIONS AND STANDARD PERFORMANCES - IP HEAT PUMP UNITS

Version with Desuperheater (VD)

Recovery heat exchanger specifications

Model	50	60	70	80	90	100	115	130	145	160	180	200	UM
Type of recovery exchanger	STAINLESS STEEL BRAZE PLATES												
Quantity	1												N°
Max. operating pressure on wet side	600												kPa
Total water content of recovery exchangers	0,6				0,8		1,3				1,8		l

Unit specification

Recovered heating capacity (1)	15,2	17,0	19,4	22,9	26,2	29,2	33,2	37,1	42,4	47,5	52,4	58,1	kW
Recovered water flow rate (1)	0,73	0,81	0,93	1,10	1,25	1,39	1,58	1,77	2,03	2,27	2,50	2,78	l/s
Recovered water pressure drop (1)	8	10	13	18	14	17	10	13	17	20	16	19	kPa

(1): The data refer to: Water temperature: evaporator inlet :**12°C** - evaporator outlet: **7°C**, Outdoor air temperature **35°C**.
The data refer to: Water temperature: recovery inlet :**40°C** - recovery outlet: **45°C.**

NOTE : THE HEATING CAPACITY RECOVERED BY THE DESUPERHEATER EXCLUSIVELY REFERS TO UNITS OPERATING IN THE COOLING MODE.

Recovered heating capacity in Version with Desuperheater (VD)

MOD.	TWR	OUTDOOR AIR TEMPERATURE (°C D.B.)				
		25	30	35	40	45
		kWt_r= RECOVERED HEATING CAPACITY [KW]				
50	30	12,4	14,2	16,3	18,6	21,2
	35	12,4	14,2	16,4	18,7	21,3
	40	12,2	13,9	16,0	18,3	20,8
	45	11,5	13,2	**15,2**	17,4	19,8
	50	10,6	12,1	13,9	15,9	18,1
	55	9,3	10,6	12,2	14,0	15,9
	60	7,6	8,8	10,1	11,5	13,1
	65	5,7	6,5	7,5	8,5	9,7
	70	3,3	3,8	4,4	5,0	5,7
55	30	13,9	15,9	18,2	20,8	23,6
	35	14,0	16,0	18,3	20,9	23,8
	40	13,7	15,7	17,9	20,4	23,2
	45	13,0	14,9	**17,0**	19,4	22,1
	50	11,9	13,7	16,4	17,8	20,2
	55	10,4	12,0	14,4	15,6	17,7
	60	8,6	9,9	11,9	12,9	14,6
	65	6,4	7,3	8,8	9,5	10,8
	70	3,8	4,3	5,2	5,6	6,4
60	30	15,9	18,2	20,8	23,7	27,0
	35	15,9	18,3	20,9	23,9	27,1
	40	15,6	17,9	20,4	23,3	26,5
	45	14,8	17,0	**19,4**	22,2	25,2
	50	13,6	15,6	17,8	20,3	23,1
	55	11,9	13,7	15,6	17,8	20,3
	60	9,8	11,3	12,9	14,7	16,7
	65	7,3	8,3	9,5	10,9	12,4
	70	4,3	4,9	5,6	6,4	7,3
70	30	18,7	21,5	24,6	28,2	32,0
	35	18,8	21,6	24,7	28,3	32,2
	40	18,3	21,1	24,2	27,6	31,4
	45	17,4	20,0	**22,9**	26,2	29,8
	50	15,9	18,3	21,0	24,0	27,3
	55	13,9	16,0	18,4	21,0	23,9
	60	11,4	13,2	15,1	17,2	19,6
	65	8,4	9,7	11,1	12,7	14,5
	70	4,9	5,7	6,5	7,4	8,4
90	30	21,7	24,8	28,2	32,3	36,7
	35	21,8	24,9	28,3	32,4	36,8
	40	21,2	24,3	27,6	31,6	36,0
	45	20,1	23,0	**26,2**	30,0	34,1
	50	18,4	21,1	24,0	27,4	31,2
	55	16,1	18,5	21,0	24,0	27,3
	60	13,2	15,2	17,2	19,7	22,4
	65	9,8	11,2	12,7	14,5	16,5
	70	5,7	6,5	7,4	8,5	9,6
100	30	24,4	27,8	31,5	35,8	40,5
	35	24,5	27,9	31,6	35,9	40,6
	40	23,9	27,2	30,8	35,0	39,6
	45	22,6	25,7	**29,2**	33,2	37,5
	50	20,7	23,5	26,7	30,3	34,3
	55	18,1	20,6	23,3	26,5	30,0
	60	14,8	16,8	19,1	21,7	24,5
	65	10,8	12,3	14,0	15,9	18,0
	70	6,2	7,0	8,0	9,1	10,3

MOD.	TWR	OUTDOOR AIR TEMPERATURE (°C D.B.)				
		25	30	35	40	45
		kWt_r= RECOVERED HEATING CAPACITY [KW]				
115	30	27,8	31,6	35,9	40,6	45,8
	35	27,8	31,6	35,9	40,6	45,8
	40	27,1	30,8	35,0	39,6	44,7
	45	25,7	29,3	**33,2**	37,6	42,5
	50	23,7	26,9	30,5	34,6	39,1
	55	20,9	23,8	27,0	30,6	34,5
	60	17,5	19,9	22,6	25,6	28,9
	65	13,4	15,2	17,3	19,6	22,1
	70	8,6	9,8	11,1	12,6	14,2
130	30	31,2	35,3	40,1	45,4	51,4
	35	31,2	35,3	40,1	45,4	51,4
	40	30,4	34,5	39,1	44,3	50,1
	45	28,9	32,7	**37,1**	42,0	47,5
	50	26,5	30,0	34,1	38,6	43,7
	55	23,4	26,5	30,1	34,1	38,5
	60	19,5	22,1	25,1	28,4	32,1
	65	14,8	16,8	19,1	21,6	24,4
	70	9,4	10,6	12,0	13,6	15,4
145	30	35,7	40,6	46,0	52,1	58,8
	35	35,7	40,5	45,9	52,0	58,7
	40	34,7	39,5	44,7	50,6	57,2
	45	33,0	37,4	**42,4**	48,1	54,3
	50	30,3	34,5	39,0	44,2	49,9
	55	26,9	30,5	34,6	39,2	44,2
	60	22,5	25,6	29,0	32,9	37,1
	65	17,4	19,7	22,3	25,3	28,6
	70	11,3	12,9	14,6	16,5	18,7
160	30	39,8	45,2	51,2	58,0	65,5
	35	39,9	45,3	51,4	58,2	65,7
	40	39,0	44,3	50,1	56,8	64,2
	45	36,9	41,9	**47,5**	53,8	60,8
	50	33,8	38,3	43,4	49,2	55,6
	55	29,5	33,5	38,0	43,0	48,6
	60	24,2	27,4	31,1	35,2	39,7
	65	17,7	20,1	22,8	25,8	29,1
	70	10,1	11,5	13,0	14,8	16,7
180	30	43,9	49,8	56,5	64,0	72,2
	35	44,1	50,0	56,7	64,2	72,5
	40	43,0	48,8	55,3	62,7	70,8
	45	40,7	46,3	**52,4**	59,4	67,0
	50	37,3	42,3	47,9	54,3	61,3
	55	32,6	37,0	41,9	47,5	53,6
	60	26,6	30,3	34,3	38,8	43,8
	65	19,5	22,2	25,1	28,5	32,1
	70	11,2	12,7	14,4	16,3	18,4
200	30	48,7	55,3	62,6	70,9	80,1
	35	48,8	55,5	62,8	71,2	80,4
	40	47,7	54,1	61,3	69,5	78,5
	45	45,2	51,3	**58,1**	65,8	74,3
	50	41,3	46,9	53,1	60,2	68,0
	55	36,1	41,0	46,4	52,6	59,4
	60	29,5	33,5	38,0	43,1	48,6
	65	21,6	24,6	27,8	31,5	35,6
	70	12,4	14,1	15,9	18,1	20,4

kWt_r = RECOVERED HEATING CAPACITY [KW]

Twr = Desuperheater outlet water temperature, Δtin-out= 5°C

NOISE LEVELS

The noise levels refer to units operating in the nominal conditions (water temperature: inlet: 12°C - outlet: 7°C, Outdoor air temperature 35°C), due to a change of external air temperature noise levels may change to ensure proper functioning of the unit within operating range.
The acoustic pressure levels are measured 1/ 5 / 10 meters away from the outer surface of the unit operating in the free field and resting on a reflecting surface (directional factor of 2).

SWL = Sound power levels, with reference to $2x10^{-12}$ W.
The **Total** sound power level in **dB(A)** measured in compliance with **ISO 9614** standards, is certified according to the **Eurovent** certification program.
Eurovent certification **(E)** exclusively refers to the **Total** Sound Power in **db(A)**, which is therefore the only binding acoustic specification (the values of the Octave bands in the table are indicative).
SPL = Sound pressure levels, with reference to $2x10^{-5}$ Pa.
The sound pressure levels are values calculated by applying the **ISO-3744 relation (Eurovent 8/1)** and refer to a distance of 1 meter away from the external surface of units operating in the open field with directivity factor 2 and the units operating in nominal conditions in the cooling mode.

AB Standard version

Mod.	SWL (dB) (E)										SPL (dBA)		
	Octave bands (Hz)								Total				
	63	125	250	500	1000	2000	4000	8000	dB	dB(A)	1m	5m	10m
50	94,2	91,9	89,4	85,3	81,0	74,6	67,0	58,6	97	87	69	60	55
60	94,2	91,9	89,4	85,3	81,0	74,6	67,0	58,6	97	87	69	60	55
70	94,2	91,9	89,4	85,3	81,0	74,6	67,0	58,6	97	87	69	60	55
80	94,2	91,9	89,4	85,3	81,0	74,6	67,0	58,6	97	87	69	60	55
90	92,4	90,1	88,6	86,0	83,2	77,8	71,2	62,8	96	88	70	61	56
100	92,4	90,1	88,6	86,0	83,2	77,8	71,2	62,8	96	88	70	61	56
115	92,4	90,1	88,6	86,0	83,2	77,8	71,2	62,8	96	88	70	61	56
130	92,4	90,1	88,6	86,0	83,2	77,8	71,2	62,8	96	88	70	61	56
145	96,1	92,2	91,3	89,2	86,1	81,0	74,4	66,9	99	91	72	64	59
160	96,1	92,2	91,3	89,2	86,1	81,0	74,4	66,9	99	91	72	64	59
180	96,4	94,1	92,6	90,0	87,2	81,8	75,2	66,8	100	92	73	65	60
200	96,4	94,1	92,6	90,0	87,2	81,8	75,2	66,8	100	92	73	65	60

AB Standard version + Low noise Kit KS

Mod.	SWL (dB) (E)										SPL (dBA)		
	Octave bands (Hz)								Total				
	63	125	250	500	1000	2000	4000	8000	dB	dB(A)	1m	5m	10m
50	91,2	88,9	86,4	82,3	78,0	71,6	64,0	55,6	94	84	66	57	52
60	91,2	88,9	86,4	82,3	78,0	71,6	64,0	55,6	94	84	66	57	52
70	91,2	88,9	86,4	82,3	78,0	71,6	64,0	55,6	94	84	66	57	52
80	91,2	88,9	86,4	82,3	78,0	71,6	64,0	55,6	94	84	66	57	52
90	92,2	89,9	87,4	83,3	79,0	72,6	65,0	56,6	95	85	67	58	53
100	92,2	89,9	87,4	83,3	79,0	72,6	65,0	56,6	95	85	67	58	53
115	92,2	89,9	87,4	83,3	79,0	72,6	65,0	56,6	95	85	67	58	53
130	92,2	89,9	87,4	83,3	79,0	72,6	65,0	56,6	95	85	67	58	53
145	92,4	90,1	88,6	86,0	83,2	77,8	71,2	62,8	96	88	69	61	56
160	92,4	90,1	88,6	86,0	83,2	77,8	71,2	62,8	96	88	69	61	56
180	95,4	93,0	90,8	86,3	83,4	79,8	71,3	62,0	99	89	70	62	57
200	95,4	93,0	90,8	86,3	83,4	79,8	71,3	62,0	99	89	70	62	57

AB Standard version + Low noise Kit KS

Mod.	SWL (dB) (E)										SPL (dBA)		
	Octave bands (Hz)								Total				
	63	125	250	500	1000	2000	4000	8000	dB	dB(A)	1m	5m	10m
50	84,4	87,3	83,6	78,8	75,3	68,8	60,2	51,3	91	81	63	54	49
60	84,4	87,3	83,6	78,8	75,3	68,8	60,2	51,3	91	81	63	54	49
70	84,4	87,3	83,6	78,8	75,3	68,8	60,2	51,3	91	81	63	54	49
80	-	-	-	-	-	-	-	-	-	-	-	-	-
90	85,4	88,3	84,6	79,8	76,3	69,8	61,2	52,3	92	82	64	55	50
100	85,4	88,3	84,6	79,8	76,3	69,8	61,2	52,3	92	82	64	55	50
115	85,4	88,3	84,6	79,8	76,3	69,8	61,2	52,3	92	82	64	55	50
130	85,4	88,3	84,6	79,8	76,3	69,8	61,2	52,3	92	82	64	55	50
145	92,2	89,9	87,4	83,3	79,0	72,6	65,0	56,6	95	85	66	58	53
160	-	-	-	-	-	-	-	-	-	-	-	-	-
180	92,4	90,0	87,8	83,3	80,4	76,8	68,3	59,0	96	86	67	59	54
200	-	-	-	-	-	-	-	-	-	-	-	-	-

OPERATING RANGE

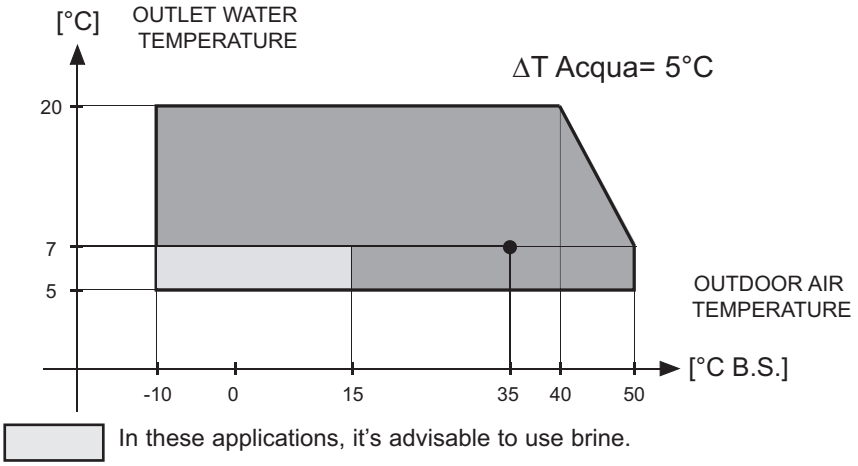
Operating range

The graphs below give the operating ranges within which correct operation of the units is guaranteed.
The use of the units in conditions differing from those indicated will void the warranty with which the product is supplied.
In the following table, there are the thermal water head limit values of the unit.

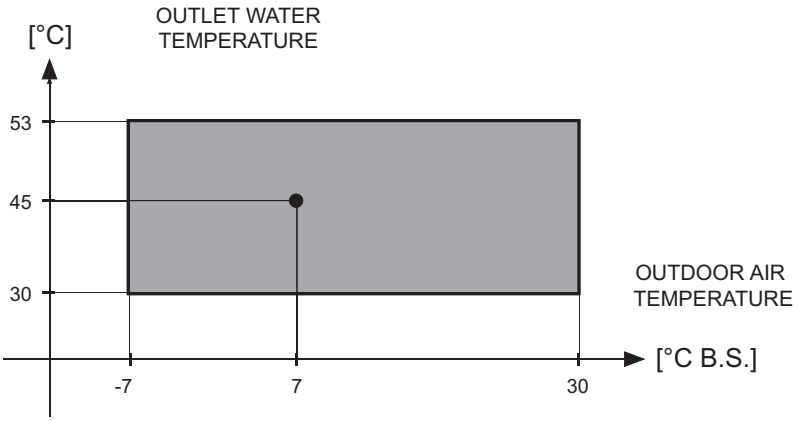
Thermal Water Head		Limit value
Minimum	°C	3
Maximum	°C	8

Note: Make sure the water flow is within the minimum and maximum pressure drop as reported "water pressure drop plate heat exchanger ".

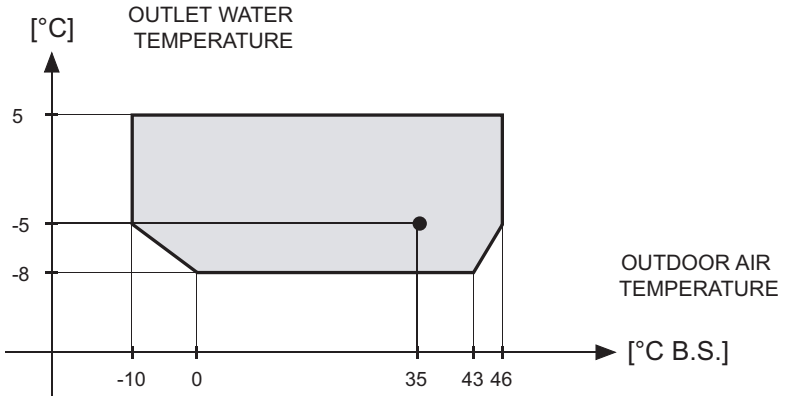
COOLING MODE



HEATING MODE



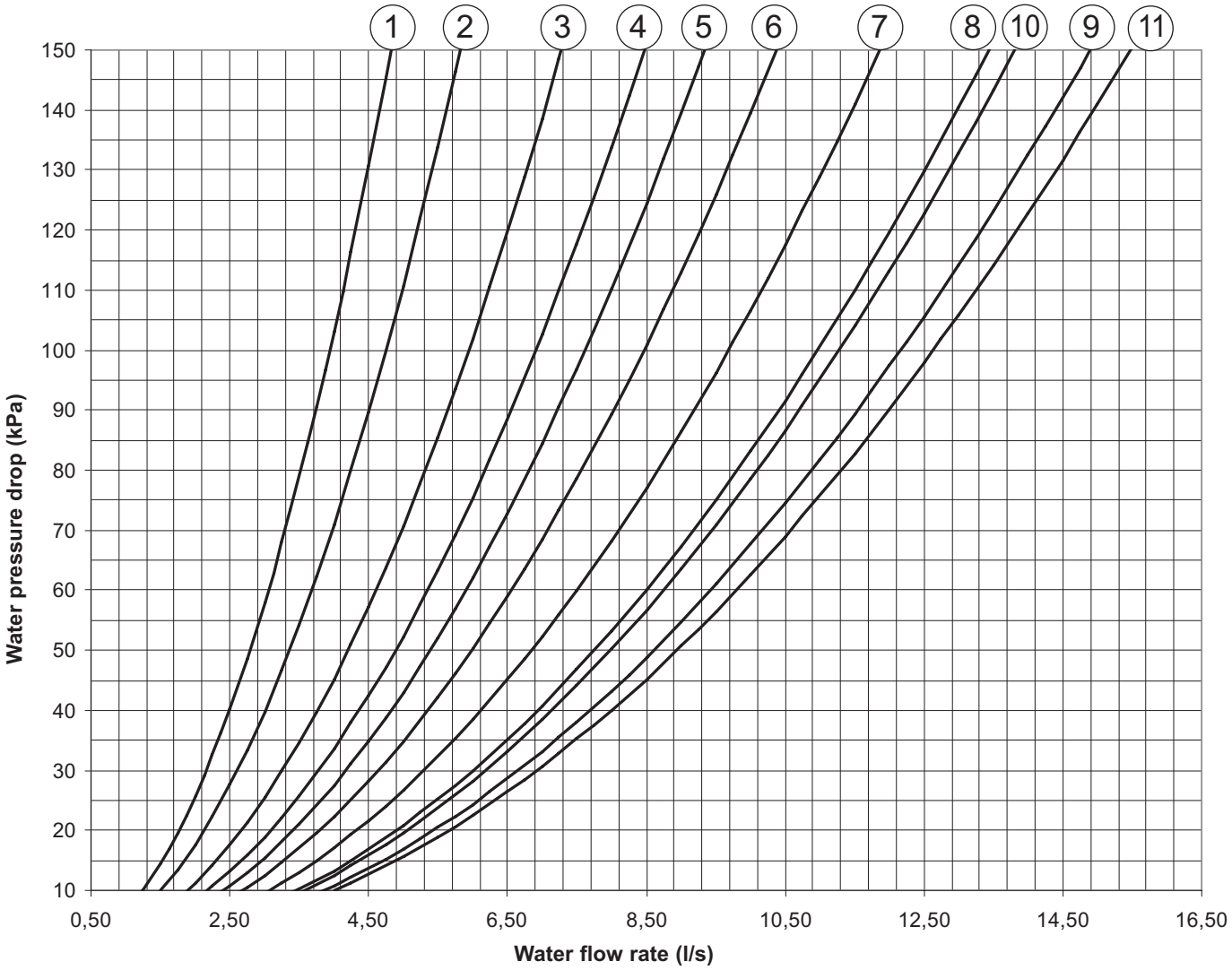
COOLING MODE BRINE VERSION (VI)



Use water glicol as specified in the paragraph "Specification data for Brine Version (VI)".

WATER PRESSURE DROP PLATE HEAT EXCHANGER

The graph below illustrates the water pressure drop values in **kPa** depending on the flow rate in **liters/second**. The operating range is delimited by the minimum and maximum values given in the next table.

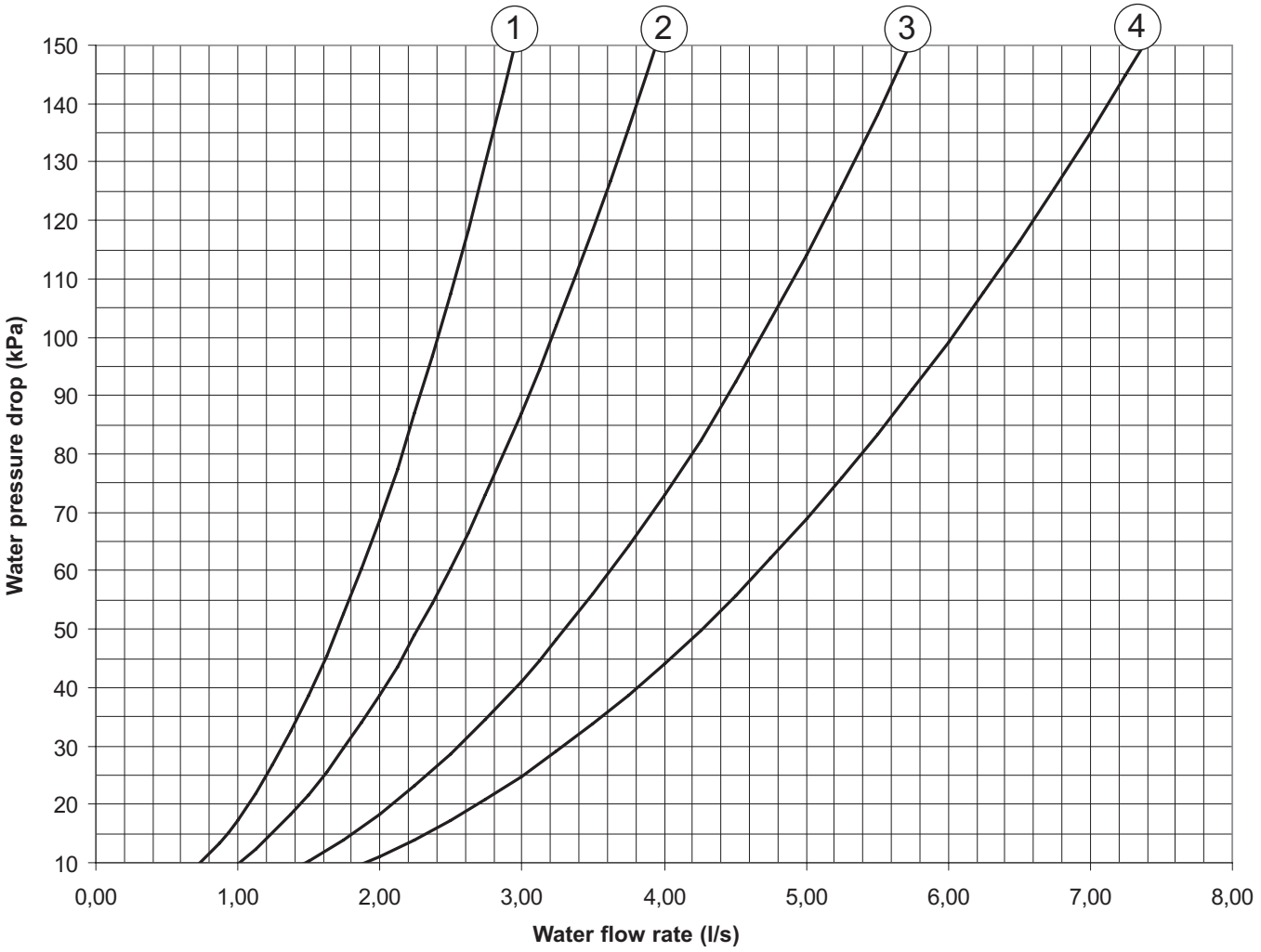


Operation limit

Unit Size		50	60	70	80	90	100	115	130	145	160	180	200	UM	NOTES
Graph reference		**1**		**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**		**Q=**Water flow rate
Lower limit value	**Q**	1,2		1,5	1,9	2,2	2,4	2,7	3,1	3,5	3,8	3,6	4,0	l\s	
	Δp	10												kPa	**Δp=**Water pressure drop
Upper limit value	**Q**	4,8		5,8	7,3	8,5	9,3	10,4	11,9	13,4	14,9	13,8	15,5	l\s	
	Δp	150												kPa	
Max. operating pressure on wet side		600												kPa	

WATER PRESSURE DROP OF THE DESUPERHEATER

The graph below illustrates the water pressure drop values in **kPa** depending on the flow rate in **liters/second**, for the Special Versions with Desuperheater (VD) in both the units that operate in the Cooling mode only (IR) and in Heat Pump units (IP). The operating range is delimited by the minimum and maximum values given in the next table.

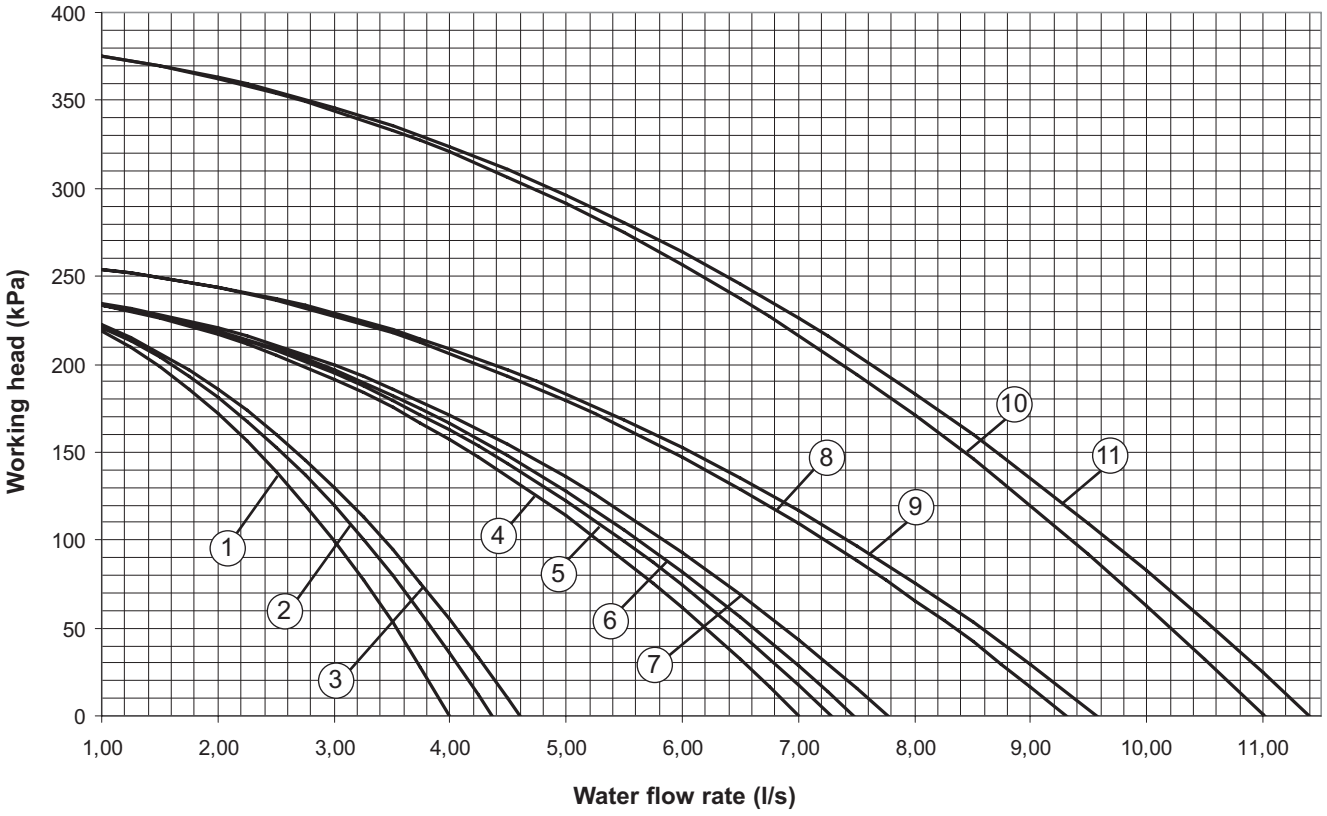


Limits to operation

Unit Size		50	60	70	80	90	100	115	130	145	160	180	200	UM	NOTES
Graph reference		1				2		3				4			**Q=**Water flow rate **Δp=**Water pressure drop
Lower limit value	**Q**	0,8				1,0		1,5				1,9		l\s	
	Δp	10												kPa	
Upper limit value	**Q**	3,0				3,9		5,7				7,4		l\s	
	Δp	150												kPa	

WORKING HEAD OF THE PUMPING MODULE MP-AM AND MP-SS

The following graph gives the head values (**kPa**) depending on the water flow rate (**liters/second**). The operating range is delimited by the minimum and maximum values given in the next table.
Working head is the one on the wet module outlet minus all the load losses of the unit.

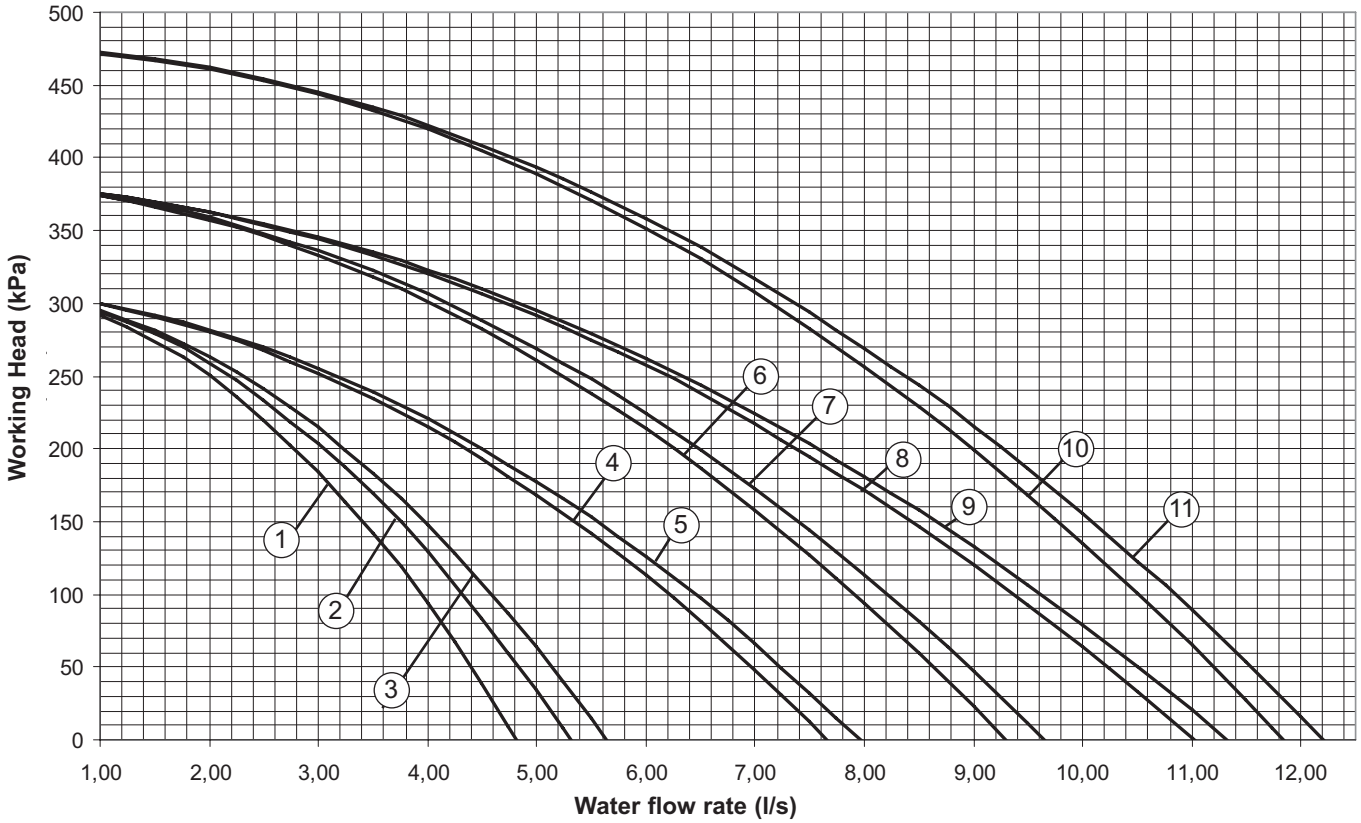


Operation limit

Unit Size		50	60	70	80	90	100	115	130	145	160	180	200	UM	NOTES
Graph reference		1		2	3	4	5	6	7	8	9	10	11		**Q=**Water flow rate
Lower limit value	Q	1,25		1,50	1,88	2,19	2,41	2,68	3,06	3,47	3,85	3,57	4,00	l\s	
Upper limit value		4,00		4,36	4,61	6,71	7,00	7,29	7,48	9,32	9,58	11,00	11,40	l\s	
Max. operating pressure on wet side		600												kPa	

HIGH WORKING HEAD OF THE PUMPING MODULE MP-AM AP AND MP-SS AP

The following graph gives the head values (**kPa**) depending on the water flow rate (**liters/second**). The operating range is delimited by the minimum and maximum values given in the next table.
Working head is the one on the wet module outlet minus all the load losses of the unit.



Operation limit

Unit Size		50	60	70	80	90	100	115	130	145	160	180	200	UM	NOTES
Graph reference		**1**		**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**		**Q=**Water flow rate
Lower limit value	**Q**	1,25		1,50	1,88	2,19	2,41	2,68	3,06	3,47	3,85	3,57	4,00	l\s	
Upper limit value		4,82		5,31	5,65	7,67	7,96	9,29	9,65	11,03	11,32	11,85	12,21	l\s	
Max. operating pressure on wet side		600												kPa	

MAXIMUM VOLUME OF WATER

Maximum volume of water in the system with wet module

Before filling the water system, it is advisable to consider the type of installation in question, i.e. check the difference in level between the wet module and user. The following table gives the maximum water content of the water supply system in liters, depending on the capacity of the standard surge chamber supplied and the pressure at which it should be charged. The surge chamber setting must be regulated to suit the maximum positive difference in level of the user.
Maximum setting value **600 kPa**.
With a positive H of more than 12.25 meters, calculate the surge chamber's service charge value in kPa using the formula below:

Surge chamber service charge= [H/10.2+0.3]x100 = [kPa]

NOTE: In case **A**, make sure that the user's lowest point is able to withstand the global pressure.

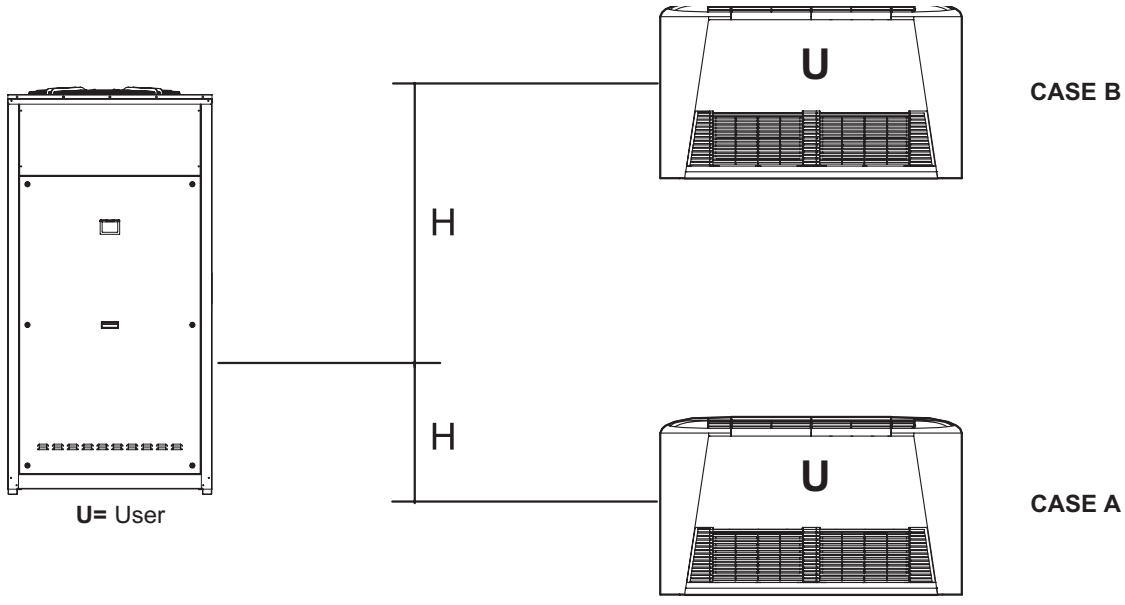
Tab.1

Model			50-60-70-80		90-100-110-115-130-145-160-180-200	
Surge chamber volume (liters)			12		24	
Thermal expansion of water (10-40°C)			0.0074			
Thermal expansion of water (10-60°C)			0.0167			
H (meters)		Surge chamber pressure (kPa)	Maximum total volume of water supply system (liters)			
			IR	IP	IR	IP
Case A	H <0	150 (standard)	1043	461	2085	921
Case B	0 < H < 12.25	150 (standard)	1043	461	2085	921
	15	177	980	435	1960	870
	20	226	866	384	1732	768
	25	275	753	334	1505	667
	30	324	640	283	1279	566

NOTE: If the unit operates with brine, calculate the real volume of the system by taking into account the corrective factors for the volume of the system given in the table below.

Corrective factors per total maximum volume of the system with brine

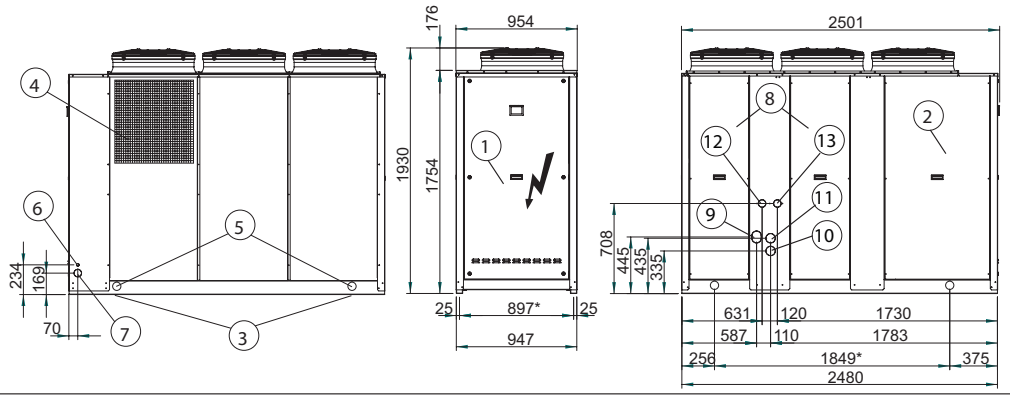
% of brine	0%	10%	20%	30%	40%
Cooling Mode	1.000	0.738	0.693	0.652	0.615
Heating Mode	1.000	0.855	0.811	0.769	0.731



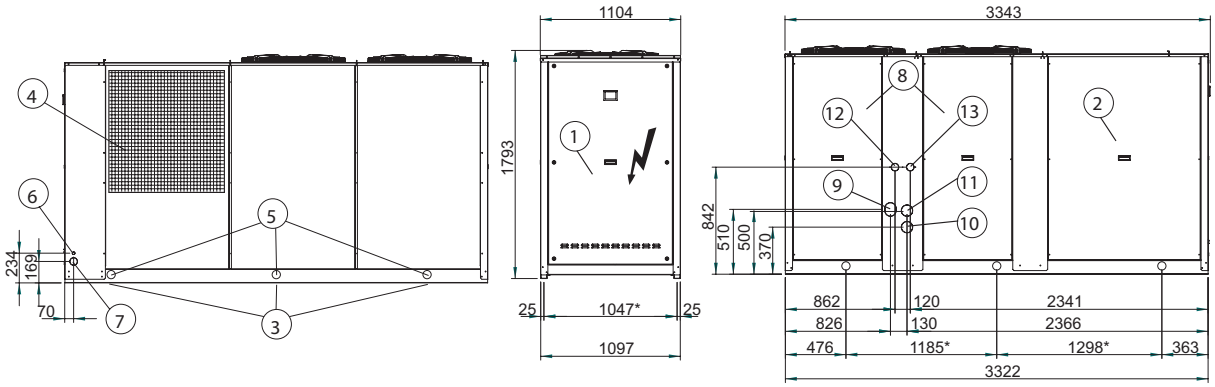
DIMENSIONAL DATA

Overall dimensions

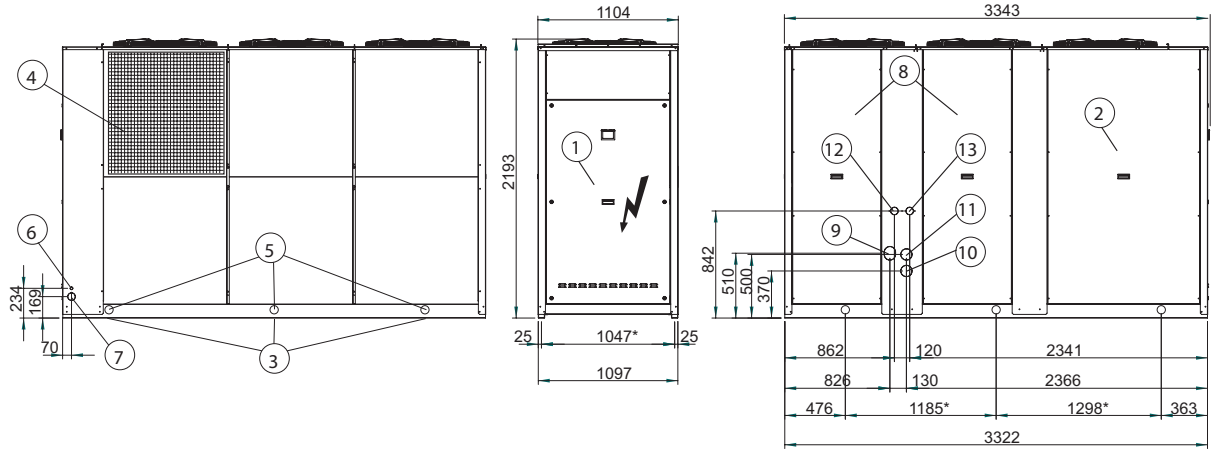
Mod. 50-60-70-80



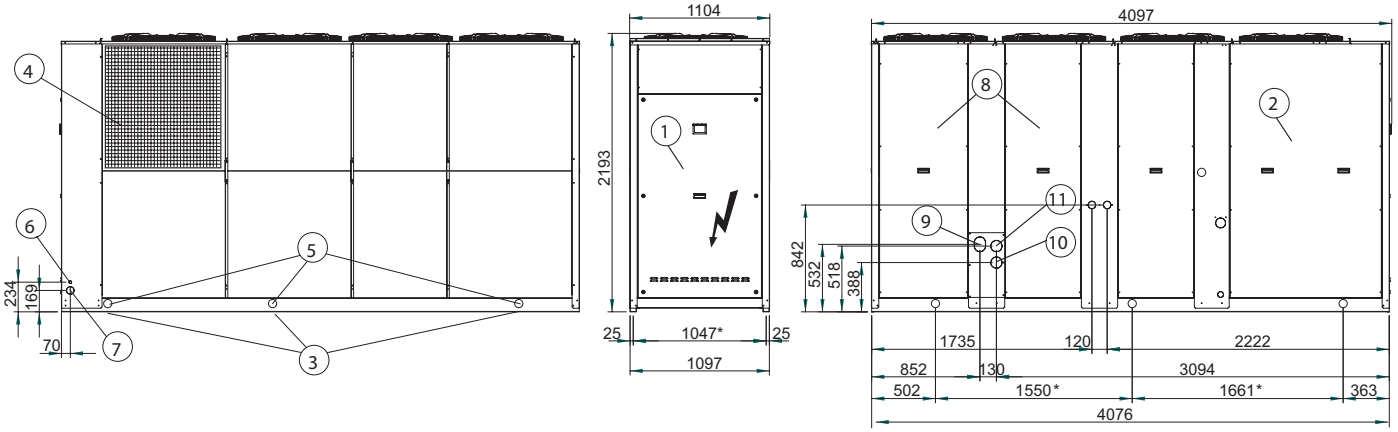
Mod. 90-100



Mod. 115-130-145-160



Mod. 180-200



DIMENSIONAL DATA

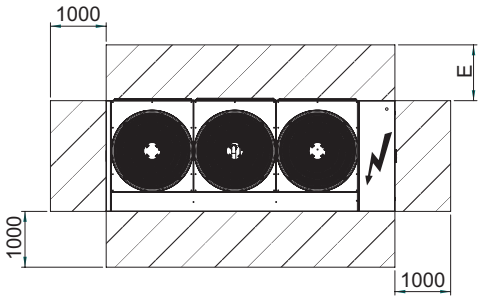
Description of the components

1 - Access panel to electric panel's power section
2 - Access panel to compressor compartment
3 - Vibration damper fixing holes (4 pcs)
4 - Coil protection grilles (accessory)
5 - ø 65 mm lifting holes
6 - ø 22 mm input hole for accessory cables
7- ø 60 mm hole for electric power supply input
8 - Access panel to pump compartment
9 - Water inlet for MP-AM and MP-SS
10 - Water inlet for KT and MP-PS
11 - Water outlet
12 - Water inlet for Desuperheater (only VD version)
13 - Water outlet for Desuperheater (only VD version)
*: Center distance of vibration damper holes
Note (1): Basic pipe kit do not allow external connections.

	KT BASIC		KT COMPLETE		KT WATER STORAGE TANK		MP-AM		MP-AM AP		MP-SS		MP-SS AP		MP-PS		VD	
	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
Rif.	(1)	(1)	10	11	10	11	9	11	9	11	9	11	9	11	10	11	12	13
50	2"M		1 1/2"		1 1/2"	2"	2"		2"		2"	1 1/2"	2"	1 1/2"	2"		1 1/4"	
60																		
70																		
80																		
90	2 1/2"M		2"		2"	2 1/2"	2 1/2"		2 1/2"		2 1/2"	2"	2 1/2"	2"	2 1/2"		1 1/4"	
100																		
115																		
130																		
145																		
160																		
180																		
200																		

Minimum space required for operation

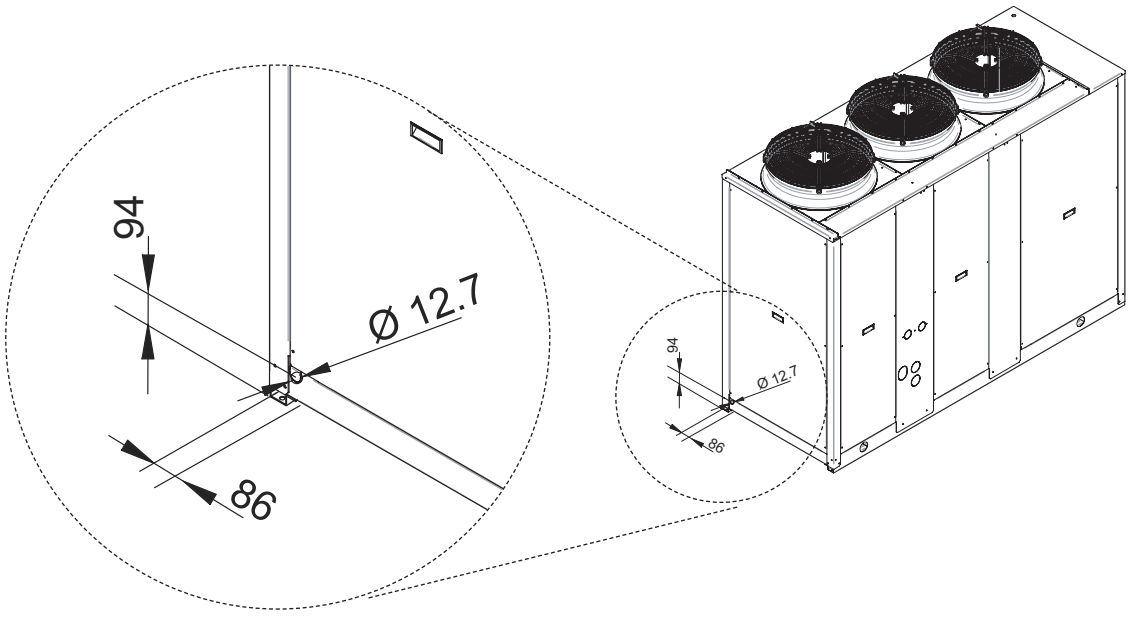
To correctly install the unit, comply with the measurements for the free area that must be left around the machine, as shown in the figure.
This will ensure good air circulation, allow the unit to operate correctly and facilitate future maintenance work.
The distances must be doubled if the unit is to be installed in a pit.
NOTE. Allow for an uncluttered area of not less than 2.5 meters above the unit.



Modello	50-80	90-100	115-200
E [mm]	1600		2000

Position of condensate drain

The condensate tray (if present) must have a suitable drain trap to prevent spilling of water during operation.



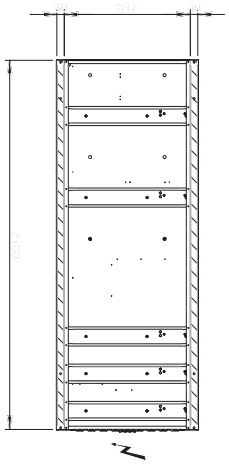
WEIGHT DURING OPERATION AND TRANSPORT

Vibration-damper installation

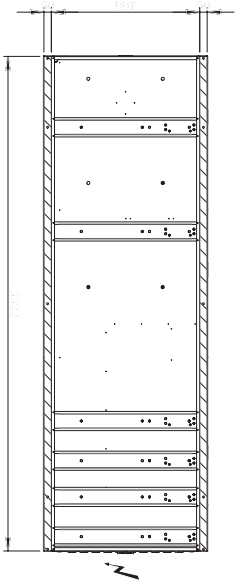
To prevent the operating unit from transmitting vibrations to the bearing structure, vibration dampening materials should be inserted under the bearing points.
The unit can be supplied with the rubber or spring vibration dampening accessory. This must be mounted by the installer.

Area of support

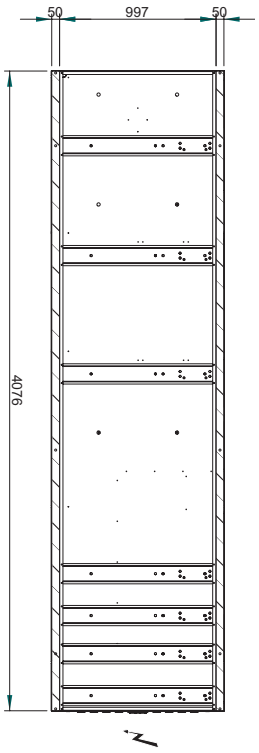
Mod. 50-60-70-80



Mod. 90-100-115-130-145-160



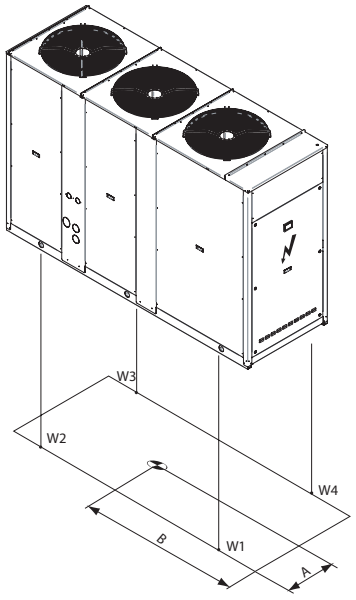
Mod. 180-200



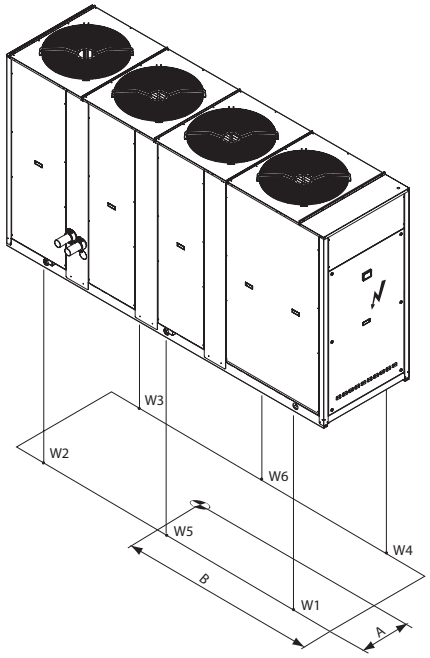
Weight during operation and transport

To correctly install the unit, comply with the measurements for the free area that must be left around the machine, as shown in the drawing.

Mod. 50-60-70-80-90-100-115-130-145-160



Mod. 180-200



WEIGHT DURING OPERATION AND TRANSPORT - MOD. 50

AB - Standard unit / AB - Standard unit + KS Low Noise Kit

	Unit type	IP - Heating mode																			
	Version	VB (Standard unit) - VI (Brine unit)										VD (Desuperheater unit)									
		Operation							Transport			Operation							Transport		
		A	B	W1	W2	W3	W4	TOT.	A	B	TOT.	A	B	W1	W2	W3	W4	TOT.	A	B	TOT.
AB - Standard Unit	CHILLER	414	861	261	93	72	200	627	416	861	623	411	873	266	98	74	201	639	413	871	635
WITHOUT WATER STORAGE TANK	CHILLER + KIT TB COMPLETO	409	875	266	98	74	199	638	412	872	633	406	885	271	103	76	200	650	408	883	644
	CHILLER + KIT TB BASE	411	864	265	96	72	200	633	413	863	629	407	875	270	100	74	201	645	410	874	640
	CHILLER + KIT MDP 2P SS	391	965	283	132	91	194	701	395	953	687	387	973	287	137	93	195	713	392	961	699
	CHILLER + KIT MDP 2P SS AP	372	1034	299	166	105	189	759	378	1015	738	370	1040	304	171	107	190	771	376	1022	750
	CHILLER + KIT MDP 1P SS	396	920	280	117	82	197	676	400	913	666	392	930	285	122	85	197	688	396	922	678
	CHILLER + KIT MDP 1P SS AP	389	951	289	131	89	197	706	393	940	692	386	959	294	136	91	198	718	390	948	704
WITH WATER STORAGE TANK	CHILLER + KIT TB CON SERB.	443	1160	279	206	180	244	909	422	961	697	440	1164	284	211	182	245	921	419	969	709
	CHILLER + KIT 2P AM	428	1201	296	239	195	241	972	406	1022	752	425	1204	301	244	197	242	984	403	1029	763
	CHILLER + KIT 2P AM AP	412	1238	312	273	208	237	1030	390	1075	802	410	1240	316	278	209	238	1042	388	1080	814
	CHILLER + KIT 1P AM	435	1178	291	224	188	245	947	413	991	731	432	1181	296	229	190	245	960	410	998	742
	CHILLER + KIT 1P AM AP	426	1189	302	238	192	245	977	404	1010	757	423	1192	307	243	194	245	990	401	1016	768
	CHILLER + KIT 2P P/S	427	1202	297	240	195	241	974	406	1023	753	425	1205	301	245	197	242	986	403	1030	765
	CHILLER + KIT 1P P/S	434	1179	292	224	188	245	949	413	992	732	431	1182	296	230	190	245	961	410	999	744
	Unit type	IR - Cooling mode																			
	CHILLER	402	879	251	94	68	182	595	404	878	591	398	890	256	99	70	182	607	400	889	603
WITHOUT WATER STORAGE TANK	CHILLER + KIT TB COMPLETO	397	893	255	99	70	181	606	399	890	601	393	904	260	104	72	181	618	396	901	612
	CHILLER + KIT TB BASE	398	882	255	96	69	182	601	400	881	597	394	893	260	101	71	182	613	397	891	608
	CHILLER + KIT MDP 2P SS	378	986	272	134	87	176	669	382	973	655	375	994	276	139	89	177	681	379	981	667
	CHILLER + KIT MDP 2P SS AP	360	1056	288	168	100	172	727	366	1037	706	358	1062	292	173	102	172	739	364	1043	718
	CHILLER + KIT MDP 1P SS	383	939	269	118	78	179	644	387	932	634	380	949	274	123	81	179	656	384	941	646
	CHILLER + KIT MDP 1P SS AP	376	970	278	132	85	179	674	381	960	660	373	979	283	137	87	179	686	378	968	672
WITH WATER STORAGE TANK	CHILLER + KIT TB CON SERB.	436	1183	268	208	175	226	877	411	982	665	433	1186	272	213	177	227	889	408	990	677
	CHILLER + KIT 2P AM	420	1224	285	241	190	224	940	395	1044	720	417	1227	289	247	192	225	952	392	1050	731
	CHILLER + KIT 2P AM AP	405	1261	300	276	202	220	998	379	1097	770	402	1263	304	281	204	221	1010	377	1102	782
	CHILLER + KIT 1P AM	427	1200	280	225	183	227	915	402	1012	699	424	1203	284	231	185	228	928	399	1019	710
	CHILLER + KIT 1P AM AP	418	1211	291	240	188	227	945	393	1031	725	416	1214	295	245	189	228	958	390	1037	736
	CHILLER + KIT 2P P/S	420	1225	285	242	190	224	942	395	1045	721	417	1227	289	247	192	225	954	392	1051	733
	CHILLER + KIT 1P P/S	427	1201	280	226	184	227	917	402	1013	700	424	1204	285	232	185	228	929	399	1020	712

ASS - Extra Low noise Version

	Unit type	IP - Heating mode																			
	Version	VB (Standard unit) - VI (Brine unit)										VD (Desuperheater unit)									
		Operation							Transport			Operation							Transport		
		A	B	W1	W2	W3	W4	TOT.	A	B	TOT.	A	B	W1	W2	W3	W4	TOT.	A	B	TOT.
ASS - Extra Low noise Version	CHILLER	430	877	259	97	80	214	649	432	877	646	426	888	264	101	82	214	662	429	887	657
WITHOUT WATER STORAGE TANK	CHILLER + KIT TB COMPLETO	425	890	264	102	82	213	660	428	888	655	422	900	269	107	84	213	672	424	898	667
	CHILLER + KIT TB BASE	427	880	263	99	80	214	656	429	879	652	423	890	268	104	83	214	668	426	889	663
	CHILLER + KIT MDP 2P SS	406	976	281	135	100	207	723	410	964	710	403	984	286	140	102	208	735	407	972	721
	CHILLER + KIT MDP 2P SS AP	387	1042	298	168	114	202	782	393	1024	761	384	1048	303	173	116	202	794	391	1030	772
	CHILLER + KIT MDP 1P SS	411	933	278	120	91	210	699	415	926	689	408	942	283	125	93	210	711	412	935	700
	CHILLER + KIT MDP 1P SS AP	404	962	287	134	98	210	729	408	952	715	401	970	292	139	100	210	741	405	960	726
WITH WATER STORAGE TANK	CHILLER + KIT TB CON SERB.	454	1164	279	207	190	255	932	436	973	720	451	1167	283	212	192	256	944	433	980	731
	CHILLER + KIT 2P AM	438	1204	296	241	205	253	994	420	1031	774	435	1207	301	246	207	253	1006	417	1037	786
	CHILLER + KIT 2P AM AP	422	1240	312	274	218	248	1053	403	1082	825	420	1242	317	280	220	249	1065	401	1087	837
	CHILLER + KIT 1P AM	445	1181	291	225	198	256	970	427	1001	753	442	1184	295	230	200	257	982	424	1007	765
	CHILLER + KIT 1P AM AP	436	1192	302	239	203	256	1000	418	1019	779	434	1195	307	244	204	257	1012	415	1025	791
	CHILLER + KIT 2P P/S	438	1205	297	241	206	253	996	419	1032	776	435	1207	301	247	207	253	1008	416	1038	787
	CHILLER + KIT 1P P/S	445	1182	292	226	198	256	972	427	1002	755	442	1185	296	231	200	257	984	423	1009	766
	Unit type	IR - Cooling mode																			
	CHILLER	419	895	249	97	76	195	617	421	895	614	415	906	254	102	79	195	630	417	905	625
WITHOUT WATER STORAGE TANK	CHILLER + KIT TB COMPLETO	414	908	253	103	79	194	628	417	906	623	410	918	258	107	81	194	640	413	916	635
	CHILLER + KIT TB BASE	415	898	253	100	77	195	624	418	897	620	412	908	258	104	79	195	636	414	907	631
	CHILLER + KIT MDP 2P SS	394	997	270	137	96	189	691	399	985	678	391	1004	274	142	98	189	703	396	992	689
	CHILLER + KIT MDP 2P SS AP	376	1064	286	170	109	184	750	382	1045	729	373	1070	291	175	111	184	762	379	1052	740
	CHILLER + KIT MDP 1P SS	400	952	267	121	87	192	667	404	945	657	396	961	272	126	89	192	679	400	954	668
	CHILLER + KIT MDP 1P SS AP	392	982	276	135	94	192	697	397	972	683	389	990	281	140	96	192	709	394	979	694
WITH WATER STORAGE TANK	CHILLER + KIT TB CON SERB.	447	1186	267	209	186	237	900	426	993	688	444	1190	272	214	187	238	912	423	1000	699
	CHILLER + KIT 2P AM	431	1226	284	243	200	235	962	410	1052	742	428	1229	289	248	202	236	974	407	1058	754
	CHILLER + KIT 2P AM AP	415	1262	300	277	213	231	1021	393	1104	793	413	1264	304	282	215	232	1033	391	1108	805
	CHILLER + KIT 1P AM	438	1203	280	227	193	238	938	417	1021	721	435	1206	284	232	195	239	950	414	1028	733
	CHILLER + KIT 1P AM AP	429	1214	291	241	198	238	968	408	1040	747	426	1217	295	246	200	239	980	405	1046	759
	CHILLER + KIT 2P P/S	430	1227	285	243	201	235	964	409	1053	744	428	1230	289	249	203	236	976	406	1059	755
	CHILLER + KIT 1P P/S	437	1204	280	228	194	238	940	417	1023	723	435	1207	284	233	196	239	952	413	1029	734

WEIGHT DURING OPERATION AND TRANSPORT - MOD. 60

AB - Standard unit / AB - Standard unit + KS Low Noise Kit

	Unit type	IP - Heating mode																			
	Version	VB (Standard unit) - VI (Brine unit)										VD (Desuperheater unit)									
		Operation							Transport			Operation							Transport		
		A	B	W1	W2	W3	W4	TOT.	A	B	TOT.	A	B	W1	W2	W3	W4	TOT.	A	B	TOT.
AB - Standard Unit	CHILLER	414	861	262	93	71	201	627	416	860	624	410	872	267	98	74	201	639	412	871	635
WITHOUT WATER STORAGE TANK	CHILLER + KIT TB COMPLETO	409	874	266	98	74	199	638	412	872	633	405	885	271	103	76	200	650	408	882	645
	CHILLER + KIT TB BASE	411	864	266	96	72	200	634	413	863	629	407	875	271	100	74	201	646	409	873	641
	CHILLER + KIT MDP 2P SS	390	964	283	132	91	194	701	395	952	688	387	973	288	137	93	195	713	392	960	699
	CHILLER + KIT MDP 2P SS AP	372	1033	300	166	105	189	759	378	1014	739	370	1040	304	171	107	190	772	376	1021	750
	CHILLER + KIT MDP 1P SS	395	920	280	117	82	197	677	399	912	667	392	929	285	122	84	197	689	396	921	678
	CHILLER + KIT MDP 1P SS AP	388	950	290	131	89	197	707	393	939	693	385	958	294	136	91	198	719	390	948	704
WITH WATER STORAGE TANK	CHILLER + KIT TB CON SERB.	443	1159	280	206	180	244	909	422	961	698	440	1163	284	211	182	245	922	418	969	709
	CHILLER + KIT 2P AM	427	1200	297	239	195	241	972	406	1021	752	425	1203	301	244	197	242	984	403	1028	764
	CHILLER + KIT 2P AM AP	412	1237	313	273	207	237	1031	390	1074	803	410	1240	317	279	209	238	1043	387	1079	814
	CHILLER + KIT 1P AM	434	1177	292	224	188	245	948	413	990	731	432	1181	296	229	190	246	960	410	997	743
	CHILLER + KIT 1P AM AP	426	1188	303	238	192	245	978	404	1009	757	423	1192	307	243	194	245	990	401	1016	769
	CHILLER + KIT 2P P/S	427	1201	297	240	195	242	974	405	1023	754	424	1204	302	245	197	242	986	402	1029	765
	CHILLER + KIT 1P P/S	434	1178	292	224	188	245	950	412	992	733	431	1181	297	230	190	246	962	409	999	744
	Unit type	IR - Cooling mode																			
AB - Standard Unit	CHILLER	401	878	252	94	68	182	595	403	878	592	397	890	256	99	70	182	607	400	888	603
WITHOUT WATER STORAGE TANK	CHILLER + KIT TB COMPLETO	396	892	256	99	70	181	606	399	890	601	393	903	261	104	72	181	618	395	900	613
	CHILLER + KIT TB BASE	398	881	255	96	68	182	602	400	880	597	394	892	260	101	71	182	614	397	891	609
	CHILLER + KIT MDP 2P SS	378	985	272	134	87	176	669	382	972	656	375	993	277	139	89	177	681	379	980	667
	CHILLER + KIT MDP 2P SS AP	360	1055	288	168	100	172	727	366	1036	707	357	1061	293	173	102	172	740	363	1042	718
	CHILLER + KIT MDP 1P SS	383	939	270	118	78	179	645	387	931	635	379	948	274	123	80	179	657	383	940	646
	CHILLER + KIT MDP 1P SS AP	376	970	279	132	85	179	675	380	959	661	373	978	283	137	87	179	687	377	967	672
WITH WATER STORAGE TANK	CHILLER + KIT TB CON SERB.	436	1182	268	208	175	226	877	411	981	666	432	1185	273	213	177	227	890	407	989	677
	CHILLER + KIT 2P AM	420	1223	285	241	190	224	940	395	1043	720	417	1226	289	247	192	225	952	392	1049	732
	CHILLER + KIT 2P AM AP	404	1260	300	276	202	220	999	379	1096	771	402	1262	305	281	204	221	1011	377	1102	782
	CHILLER + KIT 1P AM	427	1200	280	226	183	227	916	402	1011	699	424	1203	285	231	185	228	928	399	1018	711
	CHILLER + KIT 1P AM AP	418	1211	291	240	187	227	946	393	1030	725	416	1214	296	245	189	228	958	390	1037	737
	CHILLER + KIT 2P P/S	419	1224	285	242	190	224	942	394	1044	722	417	1227	290	248	192	225	954	391	1051	733
	CHILLER + KIT 1P P/S	426	1201	281	226	183	227	918	401	1012	701	424	1204	285	232	185	228	930	398	1019	712

ASS - Extra Low noise Version

	Unit type	IP - Heating mode																			
	Version	VB (Standard unit) - VI (Brine unit)										VD (Desuperheater unit)									
		Operation							Transport			Operation							Transport		
		A	B	W1	W2	W3	W4	TOT.	A	B	TOT.	A	B	W1	W2	W3	W4	TOT.	A	B	TOT.
ASS - Extra Low noise Version	CHILLER	430	877	260	97	80	214	650	432	876	646	426	887	265	101	82	214	662	428	886	658
WITHOUT WATER STORAGE TANK	CHILLER + KIT TB COMPLETO	425	889	264	102	82	213	661	428	887	656	421	899	269	107	84	213	673	424	897	667
	CHILLER + KIT TB BASE	427	879	264	99	80	214	656	429	878	652	423	890	269	104	83	214	669	425	888	664
	CHILLER + KIT MDP 2P SS	405	976	281	135	100	207	724	410	964	710	402	983	286	140	102	208	736	407	971	722
	CHILLER + KIT MDP 2P SS AP	387	1041	298	168	114	202	782	393	1023	761	384	1048	303	173	116	202	794	390	1030	773
	CHILLER + KIT MDP 1P SS	411	933	278	120	91	210	699	415	926	689	407	941	283	125	93	210	711	412	934	701
	CHILLER + KIT MDP 1P SS AP	403	962	288	134	98	210	729	408	951	715	400	970	293	139	100	210	741	405	959	727
WITH WATER STORAGE TANK	CHILLER + KIT TB CON SERB.	454	1163	279	207	190	256	932	436	972	720	451	1167	284	212	192	256	944	432	979	732
	CHILLER + KIT 2P AM	438	1203	297	241	205	253	995	419	1030	775	435	1206	301	246	207	253	1007	416	1036	786
	CHILLER + KIT 2P AM AP	422	1239	313	274	218	248	1053	403	1081	826	420	1242	317	280	220	249	1065	401	1086	837
	CHILLER + KIT 1P AM	445	1181	291	225	198	256	971	427	1000	754	442	1184	296	230	200	257	983	423	1007	765
	CHILLER + KIT 1P AM AP	436	1191	303	239	202	256	1001	418	1018	780	433	1194	307	244	204	257	1013	415	1024	791
	CHILLER + KIT 2P P/S	437	1204	297	241	205	253	997	419	1031	776	435	1207	302	247	207	253	1009	416	1038	788
	CHILLER + KIT 1P P/S	444	1181	292	226	198	256	972	426	1001	755	441	1185	296	231	200	257	985	423	1008	767
	Unit type	IR - Cooling mode																			
ASS - Extra Low noise Version	CHILLER	419	894	249	97	76	195	618	421	894	614	415	905	254	102	78	195	630	417	904	626
WITHOUT WATER STORAGE TANK	CHILLER + KIT TB COMPLETO	414	907	254	103	78	194	629	416	905	624	410	918	259	107	81	194	641	412	915	635
	CHILLER + KIT TB BASE	415	897	253	100	77	195	624	418	896	620	411	907	258	104	79	195	637	414	906	632
	CHILLER + KIT MDP 2P SS	394	996	270	137	96	189	692	399	984	678	391	1004	275	142	98	189	704	396	992	690
	CHILLER + KIT MDP 2P SS AP	375	1063	287	170	109	184	750	382	1045	729	373	1069	291	175	111	185	762	379	1051	741
	CHILLER + KIT MDP 1P SS	399	952	268	121	87	192	667	403	944	657	396	961	272	126	89	192	679	400	953	669
	CHILLER + KIT MDP 1P SS AP	392	981	277	135	94	192	697	397	971	683	389	989	282	140	96	192	709	394	979	695
WITH WATER STORAGE TANK	CHILLER + KIT TB CON SERB.	447	1185	268	209	185	238	900	426	992	688	443	1189	272	214	187	238	912	422	1000	700
	CHILLER + KIT 2P AM	431	1225	285	243	200	235	963	409	1052	743	428	1228	289	248	202	236	975	406	1058	754
	CHILLER + KIT 2P AM AP	415	1261	301	277	213	231	1021	393	1103	794	412	1263	305	282	215	232	1033	391	1108	805
	CHILLER + KIT 1P AM	438	1203	280	227	193	239	939	417	1021	722	435	1206	284	232	195	239	951	414	1027	733
	CHILLER + KIT 1P AM AP	429	1213	291	241	198	238	969	408	1039	748	426	1216	295	247	200	239	981	405	1045	759
	CHILLER + KIT 2P P/S	430	1226	285	243	201	235	965	409	1053	744	427	1229	290	249	202	236	977	406	1059	756
	CHILLER + KIT 1P P/S	437	1203	281	228	194	239	940	416	1022	723	434	1207	285	233	195	239	953	413	1029	735

WEIGHT DURING OPERATION AND TRANSPORT - MOD. 70

AB - Standard unit / AB - Standard unit + KS Low Noise Kit

	Unit type	IP - Heating mode																			
	Version	VB (Standard unit) - VI (Brine unit)										VD (Desuperheater unit)									
		Operation							Transport			Operation							Transport		
		A	B	W1	W2	W3	W4	TOT.	A	B	TOT.	A	B	W1	W2	W3	W4	TOT.	A	B	TOT.
AB - Standard Unit	CHILLER	422	866	273	99	78	217	668	424	865	663	418	876	278	103	81	217	680	421	875	675
WITHOUT WATER STORAGE TANK	CHILLER + KIT TB COMPLETO	417	878	278	104	81	216	679	420	876	673	414	888	283	109	83	216	691	417	886	684
	CHILLER + KIT TB BASE	419	868	277	101	79	217	674	422	867	669	415	879	282	106	81	217	687	418	877	681
	CHILLER + KIT MDP 2P SS	399	963	295	138	98	211	742	404	951	727	396	971	300	143	100	211	754	401	959	739
	CHILLER + KIT MDP 2P SS AP	381	1029	312	171	112	205	800	387	1011	778	378	1035	317	176	114	206	812	385	1017	790
	CHILLER + KIT MDP 1P SS	404	921	292	122	89	214	717	408	914	706	401	930	297	127	92	214	729	405	922	718
	CHILLER + KIT MDP 1P SS AP	397	950	302	136	96	214	747	402	940	732	394	958	306	141	98	214	759	399	947	744
WITH WATER STORAGE TANK	CHILLER + KIT TB CON SERB.	448	1150	292	211	188	260	950	429	960	737	445	1154	296	216	190	261	962	426	967	749
	CHILLER + KIT 2P AM	432	1190	309	244	203	257	1013	413	1018	792	430	1193	314	249	205	258	1025	410	1024	803
	CHILLER + KIT 2P AM AP	417	1226	325	278	216	253	1071	398	1068	843	415	1229	330	283	217	253	1083	395	1073	854
	CHILLER + KIT 1P AM	439	1168	304	228	196	261	989	420	988	771	436	1171	309	233	197	261	1001	417	994	782
	CHILLER + KIT 1P AM AP	431	1179	315	242	200	260	1018	412	1006	797	428	1182	320	248	202	261	1031	409	1012	808
	CHILLER + KIT 2P P/S	432	1191	310	245	203	257	1015	413	1019	793	429	1194	314	250	205	258	1027	410	1025	805
	CHILLER + KIT 1P P/S	439	1168	305	229	196	261	990	420	989	772	436	1172	309	234	198	261	1002	417	996	784
	Unit type	IR - Cooling mode																			
	CHILLER	411	884	262	99	75	198	635	414	883	630	407	894	267	104	77	198	647	410	893	642
WITHOUT WATER STORAGE TANK	CHILLER + KIT TB COMPLETO	406	897	266	105	77	197	646	409	894	640	403	907	271	109	80	197	658	406	904	651
	CHILLER + KIT TB BASE	408	886	266	102	76	198	641	411	885	636	404	897	271	106	78	198	654	407	895	648
	CHILLER + KIT MDP 2P SS	388	984	283	139	94	192	709	393	972	694	385	992	288	144	96	193	721	390	980	706
	CHILLER + KIT MDP 2P SS AP	370	1050	299	172	108	187	767	377	1032	745	368	1057	304	177	110	188	779	374	1039	757
	CHILLER + KIT MDP 1P SS	393	940	280	123	86	195	684	397	933	673	390	949	285	128	88	195	696	394	942	685
	CHILLER + KIT MDP 1P SS AP	386	970	290	137	92	195	714	391	959	699	383	978	294	142	94	195	726	388	967	711
WITH WATER STORAGE TANK	CHILLER + KIT TB CON SERB.	441	1173	280	212	183	242	917	420	980	704	438	1176	284	217	185	242	929	416	988	716
	CHILLER + KIT 2P AM	426	1213	297	246	198	239	980	404	1039	759	423	1216	301	251	200	240	992	401	1045	770
	CHILLER + KIT 2P AM AP	410	1249	312	280	211	235	1038	388	1090	810	408	1251	317	285	213	236	1050	386	1095	821
	CHILLER + KIT 1P AM	432	1190	292	230	191	243	956	411	1009	738	430	1193	296	235	193	243	968	408	1015	749
	CHILLER + KIT 1P AM AP	424	1201	303	244	196	243	985	402	1027	764	421	1204	307	250	198	243	998	399	1033	775
	CHILLER + KIT 2P P/S	425	1213	297	247	199	239	982	403	1040	760	423	1216	302	252	200	240	994	401	1047	772
	CHILLER + KIT 1P P/S	432	1191	292	231	192	243	957	410	1010	739	429	1194	297	236	194	243	969	407	1017	751

ASS - Extra Low noise Version

	Unit type	IP - Heating mode																			
	Version	VB (Standard unit) - VI (Brine unit)										VD (Desuperheater unit)									
		Operation							Transport			Operation							Transport		
		A	B	W1	W2	W3	W4	TOT.	A	B	TOT.	A	B	W1	W2	W3	W4	TOT.	A	B	TOT.
ASS - Extra Low noise Version	CHILLER	432	876	272	101	84	226	684	434	875	679	428	886	277	106	86	226	696	431	885	691
WITHOUT WATER STORAGE TANK	CHILLER + KIT TB COMPLETO	427	888	277	106	86	225	694	430	886	688	424	898	282	111	89	225	707	427	895	700
	CHILLER + KIT TB BASE	429	879	276	103	85	226	690	431	878	685	425	888	281	108	87	226	702	428	887	696
	CHILLER + KIT MDP 2P SS	408	971	294	140	104	219	757	413	959	743	405	978	299	145	106	220	769	410	967	755
	CHILLER + KIT MDP 2P SS AP	390	1034	311	172	118	214	816	397	1017	794	387	1040	316	177	120	214	828	394	1023	806
	CHILLER + KIT MDP 1P SS	414	930	291	125	95	222	733	418	923	722	410	938	296	129	97	223	745	415	931	734
	CHILLER + KIT MDP 1P SS AP	406	957	301	138	102	222	763	411	947	748	403	965	305	143	104	223	775	408	955	760
WITH WATER STORAGE TANK	CHILLER + KIT TB CON SERB.	454	1153	292	212	194	268	966	438	967	753	451	1156	296	217	196	268	978	434	974	764
	CHILLER + KIT 2P AM	439	1192	309	245	210	265	1029	422	1023	808	436	1195	314	250	211	265	1041	419	1029	819
	CHILLER + KIT 2P AM AP	424	1228	326	279	223	260	1087	406	1073	858	421	1230	330	284	224	261	1099	404	1077	870
	CHILLER + KIT 1P AM	445	1170	304	229	202	268	1004	429	994	786	443	1173	309	234	204	269	1016	426	1001	798
	CHILLER + KIT 1P AM AP	437	1181	315	244	207	268	1034	420	1012	812	434	1184	320	249	209	269	1046	417	1018	824
	CHILLER + KIT 2P P/S	438	1193	310	246	210	265	1030	421	1025	809	436	1196	314	251	212	265	1042	419	1030	821
	CHILLER + KIT 1P P/S	445	1171	305	230	203	268	1006	429	996	788	442	1174	309	235	205	269	1018	425	1002	800
	Unit type	IR - Cooling mode																			
	CHILLER	422	894	261	102	81	207	651	424	894	646	418	904	266	107	83	207	663	421	903	658
WITHOUT WATER STORAGE TANK	CHILLER + KIT TB COMPLETO	417	907	265	107	83	206	661	420	904	655	413	916	270	112	85	206	674	416	914	667
	CHILLER + KIT TB BASE	418	897	265	104	81	207	657	421	896	652	415	907	270	109	84	207	669	418	905	663
	CHILLER + KIT MDP 2P SS	398	991	282	141	100	201	724	403	980	710	395	999	287	146	102	201	736	400	987	722
	CHILLER + KIT MDP 2P SS AP	380	1056	299	174	114	196	783	386	1038	761	377	1062	303	179	116	196	795	384	1044	773
	CHILLER + KIT MDP 1P SS	403	949	279	126	92	204	700	408	942	689	400	957	284	131	94	204	712	404	950	701
	CHILLER + KIT MDP 1P SS AP	396	977	289	139	98	204	730	401	967	715	393	985	293	144	100	204	742	398	975	727
WITH WATER STORAGE TANK	CHILLER + KIT TB CON SERB.	448	1175	280	213	190	249	933	429	988	720	445	1179	284	218	192	250	945	426	995	731
	CHILLER + KIT 2P AM	432	1214	297	247	205	247	996	413	1045	775	430	1217	301	252	207	248	1008	410	1051	786
	CHILLER + KIT 2P AM AP	417	1250	313	281	218	243	1054	397	1095	825	415	1252	317	286	220	243	1066	395	1099	837
	CHILLER + KIT 1P AM	439	1192	292	231	198	250	971	420	1015	753	436	1195	296	236	200	251	983	417	1022	765
	CHILLER + KIT 1P AM AP	431	1203	303	245	203	250	1001	411	1033	779	428	1205	307	251	205	251	1013	408	1039	791
	CHILLER + KIT 2P P/S	432	1215	297	248	206	247	997	413	1046	776	429	1218	302	253	207	248	1009	410	1052	788
	CHILLER + KIT 1P P/S	439	1193	292	232	199	250	973	420	1016	755	436	1196	297	237	200	251	985	417	1023	767

WEIGHT DURING OPERATION AND TRANSPORT - MOD. 80

AB - Standard unit / AB - Standard unit + KS Low Noise Kit

		Unit type	IP - Heating mode																		
		Version	**VB** (Standard unit) **- VI** (Brine unit)									**VD** (Desuperheater unit)									
			Operation							Transport			Operation							Transport		
			A	*B*	*W1*	*W2*	*W3*	*W4*	*TOT.*	*A*	*B*	*TOT.*	*A*	*B*	*W1*	*W2*	*W3*	*W4*	*TOT.*	*A*	*B*	*TOT.*
AB - Standard Unit		*CHILLER*	427	871	280	103	83	227	693	430	871	688	424	881	284	107	86	228	705	427	880	699
	WITHOUT WATER STORAGE TANK	*CHILLER + KIT TB COMPLETO*	423	883	284	108	86	226	704	426	881	697	419	893	289	112	88	227	716	423	890	709
		CHILLER + KIT TB BASE	424	874	284	105	84	227	700	427	873	693	421	884	288	109	86	228	712	424	882	705
		CHILLER + KIT MDP 2P SS	404	965	301	141	104	221	767	409	954	752	401	973	306	146	106	221	779	406	961	763
		CHILLER + KIT MDP 2P SS AP	387	1028	318	174	118	215	825	393	1011	803	384	1034	323	179	120	216	837	391	1017	814
		CHILLER + KIT MDP 1P SS	409	924	298	126	95	224	743	414	918	731	406	933	303	131	97	224	755	411	926	742
		CHILLER + KIT MDP 1P SS AP	402	952	308	140	101	224	773	408	942	757	399	960	313	145	104	224	785	405	950	768
	WITH WATER STORAGE TANK	*CHILLER + KIT TB CON SERB.*	451	1147	299	214	193	270	975	434	962	761	448	1150	303	219	195	270	987	431	969	773
		CHILLER + KIT 2P AM	436	1186	316	247	208	267	1038	418	1018	816	433	1189	320	252	210	267	1050	416	1024	828
		CHILLER + KIT 2P AM AP	421	1222	332	281	221	262	1096	403	1067	867	418	1224	337	286	223	263	1109	401	1072	878
		CHILLER + KIT 1P AM	442	1164	311	231	201	270	1014	425	989	795	439	1167	315	236	203	271	1026	422	995	806
		CHILLER + KIT 1P AM AP	434	1175	322	246	206	270	1044	417	1006	821	431	1178	327	251	208	271	1056	414	1013	833
		CHILLER + KIT 2P P/S	435	1187	317	248	209	267	1040	418	1019	818	433	1190	321	253	211	267	1052	415	1025	829
		CHILLER + KIT 1P P/S	442	1165	311	232	202	270	1016	425	990	797	439	1168	316	237	204	271	1028	422	997	808
		Unit type	**IR - Cooling mode**																		
		CHILLER	417	888	269	103	80	209	661	419	887	656	413	898	274	108	82	209	673	416	897	667
	WITHOUT WATER STORAGE TANK	*CHILLER + KIT TB COMPLETO*	412	900	274	108	82	207	672	415	898	665	408	910	278	113	84	208	684	412	907	676
		CHILLER + KIT TB BASE	413	890	273	105	80	208	668	416	889	661	410	900	278	110	83	209	680	413	899	673
		CHILLER + KIT MDP 2P SS	394	984	290	143	99	202	735	399	973	720	391	991	295	147	101	203	747	396	980	731
		CHILLER + KIT MDP 2P SS AP	376	1048	307	176	113	197	793	383	1031	770	373	1054	312	181	115	198	805	380	1037	782
		CHILLER + KIT MDP 1P SS	399	942	287	127	91	205	710	403	935	699	395	950	292	132	93	205	723	400	943	710
		CHILLER + KIT MDP 1P SS AP	392	970	297	141	97	205	740	397	960	725	389	978	302	146	99	206	753	394	968	736
	WITH WATER STORAGE TANK	*CHILLER + KIT TB CON SERB.*	444	1167	287	215	189	252	943	424	981	729	441	1171	292	221	191	252	955	421	988	741
		CHILLER + KIT 2P AM	429	1207	304	249	204	249	1006	409	1037	784	426	1210	309	254	205	250	1018	406	1043	795
		CHILLER + KIT 2P AM AP	414	1242	320	283	216	245	1064	393	1087	835	411	1245	325	288	218	246	1076	391	1092	846
		CHILLER + KIT 1P AM	435	1184	299	233	197	252	982	416	1008	763	433	1188	304	238	198	253	994	413	1014	774
		CHILLER + KIT 1P AM AP	427	1195	311	248	201	252	1012	407	1026	789	425	1198	315	253	203	253	1024	404	1032	800
		CHILLER + KIT 2P P/S	428	1208	305	250	204	249	1008	408	1039	785	426	1210	309	255	206	250	1020	406	1045	797
		CHILLER + KIT 1P P/S	435	1185	300	234	197	253	983	415	1009	764	432	1189	304	239	199	253	996	412	1016	776

WEIGHT DURING OPERATION AND TRANSPORT - MOD. 90

AB - Standard unit / AB - Standard unit + KS Low Noise Kit

	Unit type	IP - Heating mode																			
	Version	VB (Standard unit) - VI (Brine unit)										VD (Desuperheater unit)									
		Operation							Transport			Operation							Transport		
		A	B	W1	W2	W3	W4	TOT.	A	B	TOT.	A	B	W1	W2	W3	W4	TOT.	A	B	TOT.
AB - Standard Unit	CHILLER	476	1182	358	176	133	271	939	478	1180	932	472	1193	364	183	136	271	953	475	1190	945
WITHOUT WATER STORAGE TANK	CHILLER + KIT TB COMPLETO	470	1199	364	185	137	270	956	474	1195	946	467	1209	370	191	140	270	970	470	1205	959
	CHILLER + KIT TB BASE	475	1183	359	177	134	271	941	478	1181	933	471	1194	365	183	136	271	955	474	1191	947
	CHILLER + KIT MDP 2P SS	447	1325	387	245	165	261	1058	453	1307	1035	444	1333	392	251	168	262	1072	450	1315	1049
	CHILLER + KIT MDP 2P SS AP	436	1374	398	273	177	257	1105	443	1352	1076	433	1381	403	280	179	258	1119	440	1359	1089
	CHILLER + KIT MDP 1P SS	457	1270	380	219	154	267	1019	462	1258	1001	454	1279	385	225	156	267	1034	459	1267	1015
	CHILLER + KIT MDP 1P SS AP	451	1289	388	231	158	266	1043	456	1275	1022	448	1298	393	237	161	266	1058	453	1284	1036
WITH WATER STORAGE TANK	CHILLER + KIT TB CON SERB.	516	1599	378	375	331	334	1417	485	1301	1036	513	1602	383	381	333	334	1431	482	1309	1049
	CHILLER + KIT 2P AM	497	1655	400	434	357	329	1520	465	1390	1126	495	1657	405	441	359	330	1534	463	1396	1139
	CHILLER + KIT 2P AM AP	488	1679	410	463	367	326	1566	456	1428	1165	486	1682	415	470	369	326	1580	453	1433	1179
	CHILLER + KIT 1P AM	506	1625	394	407	346	334	1480	474	1347	1091	503	1628	398	414	348	335	1495	471	1354	1105
	CHILLER + KIT 1P AM AP	501	1633	401	420	350	334	1505	469	1361	1112	498	1636	406	427	352	335	1519	466	1368	1126
	CHILLER + KIT 2P P/S	497	1655	401	435	357	329	1522	465	1391	1127	495	1658	405	442	359	330	1536	463	1397	1140
	CHILLER + KIT 1P P/S	505	1626	394	408	346	334	1483	474	1348	1093	503	1629	399	415	348	335	1497	471	1355	1106
	Unit type	IR - Cooling mode																			
	CHILLER	465	1201	346	176	128	250	900	467	1199	893	461	1212	351	183	130	251	915	464	1210	906
WITHOUT WATER STORAGE TANK	CHILLER + KIT TB COMPLETO	459	1218	352	185	131	249	917	463	1214	907	456	1229	357	191	134	250	931	459	1224	921
	CHILLER + KIT TB BASE	464	1202	347	177	128	250	902	467	1200	894	460	1213	352	183	131	251	916	463	1211	908
	CHILLER + KIT MDP 2P SS	436	1348	373	245	159	242	1019	442	1330	996	434	1355	378	252	161	242	1034	439	1337	1010
	CHILLER + KIT MDP 2P SS AP	425	1397	384	274	170	238	1066	432	1375	1037	423	1404	389	281	172	238	1080	429	1382	1050
	CHILLER + KIT MDP 1P SS	446	1291	367	219	147	247	980	451	1279	962	443	1300	372	225	150	247	995	448	1288	976
	CHILLER + KIT MDP 1P SS AP	440	1311	375	231	152	246	1004	445	1297	983	437	1319	380	238	154	247	1019	442	1305	997
WITH WATER STORAGE TANK	CHILLER + KIT TB CON SERB.	510	1624	364	376	324	314	1378	475	1323	997	507	1626	369	382	326	315	1393	472	1331	1011
	CHILLER + KIT 2P AM	491	1679	386	435	350	310	1481	456	1414	1087	489	1681	391	442	352	311	1496	453	1420	1100
	CHILLER + KIT 2P AM AP	482	1704	396	465	360	307	1527	446	1452	1127	480	1705	401	471	362	308	1541	444	1457	1140
	CHILLER + KIT 1P AM	500	1649	380	408	339	315	1442	465	1370	1052	497	1652	384	415	341	316	1456	462	1376	1066
	CHILLER + KIT 1P AM AP	495	1657	387	421	343	315	1466	459	1384	1073	492	1659	392	428	345	315	1480	457	1391	1087
	CHILLER + KIT 2P P/S	491	1680	386	436	350	310	1483	456	1414	1088	489	1682	391	443	352	311	1497	453	1421	1101
	CHILLER + KIT 1P P/S	499	1650	380	409	339	315	1444	465	1371	1054	497	1653	385	416	341	316	1458	462	1378	1067

ASS - Extra Low noise Version

	Unit type	IP - Heating mode																			
	Version	VB (Standard unit) - VI (Brine unit)										VD (Desuperheater unit)									
		Operation							Transport			Operation							Transport		
		A	B	W1	W2	W3	W4	TOT.	A	B	TOT.	A	B	W1	W2	W3	W4	TOT.	A	B	TOT.
ASS - Extra Low noise Version	CHILLER	491	1196	354	179	143	284	960	494	1194	952	487	1206	359	185	146	284	974	490	1204	966
WITHOUT WATER STORAGE TANK	CHILLER + KIT TB COMPLETO	485	1211	360	187	147	283	976	489	1208	966	482	1222	365	193	149	283	990	485	1217	980
	CHILLER + KIT TB BASE	490	1196	355	179	143	284	962	493	1194	954	486	1207	360	185	146	284	976	489	1204	967
	CHILLER + KIT MDP 2P SS	461	1334	383	246	176	274	1079	467	1317	1056	458	1342	388	253	178	274	1093	464	1325	1069
	CHILLER + KIT MDP 2P SS AP	450	1382	394	275	187	269	1125	456	1361	1096	447	1389	399	281	190	270	1140	454	1367	1110
	CHILLER + KIT MDP 1P SS	471	1281	376	220	164	280	1040	476	1269	1022	468	1289	381	227	166	280	1054	473	1278	1035
	CHILLER + KIT MDP 1P SS AP	465	1299	384	233	169	278	1064	470	1286	1043	462	1308	389	239	171	279	1078	467	1294	1056
WITH WATER STORAGE TANK	CHILLER + KIT TB CON SERB.	526	1602	376	374	343	344	1438	499	1311	1056	523	1605	381	381	345	345	1452	495	1318	1070
	CHILLER + KIT 2P AM	507	1657	398	434	369	339	1541	478	1398	1146	504	1659	403	440	371	340	1555	475	1404	1160
	CHILLER + KIT 2P AM AP	497	1681	409	462	380	336	1587	468	1435	1186	495	1683	413	469	382	336	1601	466	1440	1199
	CHILLER + KIT 1P AM	515	1628	392	407	358	345	1501	488	1356	1112	512	1631	396	413	360	345	1515	484	1362	1125
	CHILLER + KIT 1P AM AP	510	1636	399	420	362	344	1525	482	1370	1133	507	1638	404	426	364	345	1539	479	1376	1146
	CHILLER + KIT 2P P/S	506	1658	399	434	370	339	1542	478	1399	1147	504	1660	403	441	372	340	1556	475	1404	1161
	CHILLER + KIT 1P P/S	515	1629	392	408	358	345	1503	487	1357	1113	512	1631	397	415	361	345	1517	484	1364	1127
	Unit type	IR - Cooling mode																			
	CHILLER	481	1215	342	178	138	263	921	484	1213	913	477	1226	347	185	140	263	935	480	1223	927
WITHOUT WATER STORAGE TANK	CHILLER + KIT TB COMPLETO	475	1231	347	187	141	262	937	479	1228	928	472	1241	353	193	144	262	952	475	1237	941
	CHILLER + KIT TB BASE	480	1216	342	179	138	263	923	483	1214	915	476	1227	348	185	140	263	937	479	1224	928
	CHILLER + KIT MDP 2P SS	451	1357	370	247	169	254	1040	457	1339	1017	448	1364	375	253	172	254	1054	454	1347	1030
	CHILLER + KIT MDP 2P SS AP	440	1405	381	275	181	250	1086	446	1384	1057	437	1412	386	282	183	250	1101	444	1390	1071
	CHILLER + KIT MDP 1P SS	461	1302	363	221	158	259	1001	466	1290	983	458	1311	368	227	160	260	1015	463	1299	996
	CHILLER + KIT MDP 1P SS AP	455	1321	371	233	162	259	1025	460	1307	1004	452	1329	376	239	165	259	1039	457	1315	1017
WITH WATER STORAGE TANK	CHILLER + KIT TB CON SERB.	520	1626	362	375	336	325	1399	490	1333	1018	517	1629	367	382	339	325	1413	486	1340	1031
	CHILLER + KIT 2P AM	501	1681	384	435	362	320	1502	470	1421	1107	498	1683	389	442	364	321	1516	467	1427	1121
	CHILLER + KIT 2P AM AP	491	1705	394	464	373	317	1548	460	1458	1147	489	1707	399	471	375	318	1562	457	1464	1161
	CHILLER + KIT 1P AM	509	1652	378	408	351	325	1462	479	1378	1073	507	1654	383	415	353	326	1476	476	1385	1086
	CHILLER + KIT 1P AM AP	504	1659	385	421	355	325	1486	473	1392	1094	502	1662	390	428	357	326	1501	470	1398	1107
	CHILLER + KIT 2P P/S	501	1681	385	436	363	320	1503	469	1422	1108	498	1684	389	442	365	321	1517	467	1428	1122
	CHILLER + KIT 1P P/S	509	1653	378	409	352	325	1464	478	1380	1074	506	1655	383	416	354	326	1478	475	1386	1088

WEIGHT DURING OPERATION AND TRANSPORT - MOD. 100

AB - Standard unit / AB - Standard unit + KS Low Noise Kit

	Unit type	IP - Heating mode																			
	Version	VB (Standard unit) - VI (Brine unit)										VD (Desuperheater unit)									
		Operation							Transport			Operation							Transport		
		A	B	W1	W2	W3	W4	TOT.	A	B	TOT.	A	B	W1	W2	W3	W4	TOT.	A	B	TOT.
AB - Standard Unit	CHILLER	457	1133	413	186	131	291	1020	460	1130	1012	454	1143	418	192	133	291	1034	457	1140	1025
WITHOUT WATER STORAGE TANK	CHILLER + KIT TB COMPLETO	453	1149	419	194	134	290	1036	456	1144	1026	450	1159	424	200	137	290	1051	453	1154	1039
WITHOUT WATER STORAGE TANK	CHILLER + KIT TB BASE	457	1134	414	186	131	291	1022	460	1131	1013	454	1144	419	192	134	291	1036	457	1141	1027
WITHOUT WATER STORAGE TANK	CHILLER + KIT MDP 2P SS	433	1271	441	254	162	282	1139	438	1253	1115	430	1279	446	261	165	282	1153	436	1261	1129
WITHOUT WATER STORAGE TANK	CHILLER + KIT MDP 2P SS AP	423	1319	452	283	173	277	1186	429	1296	1156	421	1326	457	289	176	278	1200	427	1303	1169
WITHOUT WATER STORAGE TANK	CHILLER + KIT MDP 1P SS	442	1218	434	228	151	287	1100	446	1206	1081	439	1227	439	234	153	287	1114	443	1214	1095
WITHOUT WATER STORAGE TANK	CHILLER + KIT MDP 1P SS AP	436	1237	442	240	155	286	1124	441	1223	1102	434	1245	447	247	158	286	1138	438	1231	1116
WITH WATER STORAGE TANK	CHILLER + KIT TB CON SERB.	502	1543	428	388	324	358	1498	468	1247	1116	499	1547	433	394	326	358	1512	465	1255	1129
WITH WATER STORAGE TANK	CHILLER + KIT 2P AM	485	1600	451	447	350	353	1601	451	1334	1206	483	1602	455	454	352	353	1615	449	1341	1219
WITH WATER STORAGE TANK	CHILLER + KIT 2P AM AP	476	1625	461	476	361	349	1647	442	1372	1245	474	1627	466	483	363	350	1661	440	1377	1259
WITH WATER STORAGE TANK	CHILLER + KIT 1P AM	492	1570	444	420	339	358	1561	459	1293	1171	490	1573	449	427	341	359	1576	456	1300	1185
WITH WATER STORAGE TANK	CHILLER + KIT 1P AM AP	488	1578	452	433	343	358	1585	454	1307	1192	485	1581	456	440	345	358	1600	452	1314	1206
WITH WATER STORAGE TANK	CHILLER + KIT 2P P/S	485	1600	451	448	350	353	1602	451	1335	1207	482	1603	456	455	353	354	1617	448	1342	1220
WITH WATER STORAGE TANK	CHILLER + KIT 1P P/S	492	1571	445	421	339	358	1563	459	1294	1173	490	1574	449	428	342	359	1578	456	1301	1186
	Unit type	IR - Cooling mode																			
AB - Standard Unit	CHILLER	457	1133	413	186	131	291	1020	460	1130	1012	454	1143	418	192	133	291	1034	457	1140	1025
WITHOUT WATER STORAGE TANK	CHILLER + KIT TB COMPLETO	453	1149	419	194	134	290	1036	456	1144	1026	450	1159	424	200	137	290	1051	453	1154	1039
WITHOUT WATER STORAGE TANK	CHILLER + KIT TB BASE	457	1134	414	186	131	291	1022	460	1131	1013	454	1144	419	192	134	291	1036	457	1141	1027
WITHOUT WATER STORAGE TANK	CHILLER + KIT MDP 2P SS	433	1271	441	254	162	282	1139	438	1253	1115	430	1279	446	261	165	282	1153	436	1261	1129
WITHOUT WATER STORAGE TANK	CHILLER + KIT MDP 2P SS AP	423	1319	452	283	173	277	1186	429	1296	1156	421	1326	457	289	176	278	1200	427	1303	1169
WITHOUT WATER STORAGE TANK	CHILLER + KIT MDP 1P SS	442	1218	434	228	151	287	1100	446	1206	1081	439	1227	439	234	153	287	1114	443	1214	1095
WITHOUT WATER STORAGE TANK	CHILLER + KIT MDP 1P SS AP	436	1237	442	240	155	286	1124	441	1223	1102	434	1245	447	247	158	286	1138	438	1231	1116
WITH WATER STORAGE TANK	CHILLER + KIT TB CON SERB.	502	1543	428	388	324	358	1498	468	1247	1116	499	1547	433	394	326	358	1512	465	1255	1129
WITH WATER STORAGE TANK	CHILLER + KIT 2P AM	485	1600	451	447	350	353	1601	451	1334	1206	483	1602	455	454	352	353	1615	449	1341	1219
WITH WATER STORAGE TANK	CHILLER + KIT 2P AM AP	476	1625	461	476	361	349	1647	442	1372	1245	474	1627	466	483	363	350	1661	440	1377	1259
WITH WATER STORAGE TANK	CHILLER + KIT 1P AM	492	1570	444	420	339	358	1561	459	1293	1171	490	1573	449	427	341	359	1576	456	1300	1185
WITH WATER STORAGE TANK	CHILLER + KIT 1P AM AP	488	1578	452	433	343	358	1585	454	1307	1192	485	1581	456	440	345	358	1600	452	1314	1206
WITH WATER STORAGE TANK	CHILLER + KIT 2P P/S	485	1600	451	448	350	353	1602	451	1335	1207	482	1603	456	455	353	354	1617	448	1342	1220
WITH WATER STORAGE TANK	CHILLER + KIT 1P P/S	492	1571	445	421	339	358	1563	459	1294	1173	490	1574	449	428	342	359	1578	456	1301	1186

ASS - Extra Low noise Version

	Unit type	IP - Heating mode																			
	Version	VB (Standard unit) - VI (Brine unit)										VD (Desuperheater unit)									
		Operation							Transport			Operation							Transport		
		A	B	W1	W2	W3	W4	TOT.	A	B	TOT.	A	B	W1	W2	W3	W4	TOT.	A	B	TOT.
ASS - Extra Low noise Version	CHILLER	472	1146	408	188	140	304	1040	475	1144	1032	469	1156	414	194	143	304	1055	471	1154	1046
WITHOUT WATER STORAGE TANK	CHILLER + KIT TB COMPLETO	467	1162	414	196	144	303	1057	470	1157	1046	464	1172	419	203	146	303	1071	467	1167	1060
WITHOUT WATER STORAGE TANK	CHILLER + KIT TB BASE	471	1147	409	189	140	304	1042	474	1145	1034	468	1157	415	195	143	304	1057	471	1155	1047
WITHOUT WATER STORAGE TANK	CHILLER + KIT MDP 2P SS	446	1280	437	256	172	294	1159	452	1263	1136	444	1288	442	262	175	294	1174	449	1271	1149
WITHOUT WATER STORAGE TANK	CHILLER + KIT MDP 2P SS AP	436	1327	448	284	184	290	1206	442	1305	1176	434	1334	453	291	186	290	1220	440	1312	1190
WITHOUT WATER STORAGE TANK	CHILLER + KIT MDP 1P SS	455	1229	430	230	161	300	1121	460	1217	1102	452	1237	435	236	163	300	1135	457	1225	1115
WITHOUT WATER STORAGE TANK	CHILLER + KIT MDP 1P SS AP	450	1247	438	242	165	299	1145	455	1234	1123	447	1255	443	249	168	299	1159	452	1242	1136
WITH WATER STORAGE TANK	CHILLER + KIT TB CON SERB.	511	1547	426	388	336	369	1518	481	1257	1136	508	1550	431	395	338	369	1533	478	1265	1150
WITH WATER STORAGE TANK	CHILLER + KIT 2P AM	494	1602	449	447	362	363	1621	463	1343	1226	491	1605	453	454	364	364	1636	461	1349	1240
WITH WATER STORAGE TANK	CHILLER + KIT 2P AM AP	485	1627	459	476	373	360	1667	454	1379	1266	483	1629	464	483	375	360	1682	452	1384	1279
WITH WATER STORAGE TANK	CHILLER + KIT 1P AM	501	1573	442	420	351	369	1582	471	1302	1192	499	1576	447	427	353	369	1596	469	1308	1205
WITH WATER STORAGE TANK	CHILLER + KIT 1P AM AP	497	1581	449	433	355	368	1606	466	1316	1213	494	1584	454	440	357	369	1620	464	1322	1226
WITH WATER STORAGE TANK	CHILLER + KIT 2P P/S	493	1603	449	448	363	364	1623	463	1343	1227	491	1606	454	454	365	364	1637	461	1349	1241
WITH WATER STORAGE TANK	CHILLER + KIT 1P P/S	501	1574	442	421	351	369	1584	471	1303	1193	499	1577	447	428	354	369	1598	468	1310	1207
	Unit type	IR - Cooling mode																			
ASS - Extra Low noise Version	CHILLER	462	1162	396	188	134	283	1002	465	1160	993	459	1173	401	194	137	284	1016	461	1170	1007
WITHOUT WATER STORAGE TANK	CHILLER + KIT TB COMPLETO	457	1178	402	196	138	282	1018	460	1174	1008	454	1188	407	202	141	282	1032	457	1184	1021
WITHOUT WATER STORAGE TANK	CHILLER + KIT TB BASE	461	1163	397	189	135	283	1003	464	1161	995	458	1174	402	195	137	284	1018	461	1171	1008
WITHOUT WATER STORAGE TANK	CHILLER + KIT MDP 2P SS	436	1299	424	257	166	274	1121	442	1282	1097	434	1307	429	263	168	275	1135	439	1290	1110
WITHOUT WATER STORAGE TANK	CHILLER + KIT MDP 2P SS AP	426	1347	435	285	177	270	1167	432	1325	1137	424	1354	440	292	180	271	1182	430	1332	1151
WITHOUT WATER STORAGE TANK	CHILLER + KIT MDP 1P SS	445	1247	417	230	155	280	1082	450	1235	1063	443	1255	422	237	157	280	1096	447	1243	1076
WITHOUT WATER STORAGE TANK	CHILLER + KIT MDP 1P SS AP	440	1265	425	243	159	279	1106	445	1252	1084	437	1274	430	249	162	279	1120	442	1260	1097
WITH WATER STORAGE TANK	CHILLER + KIT TB CON SERB.	505	1568	412	389	329	349	1480	472	1276	1098	502	1571	417	395	332	350	1494	469	1284	1111
WITH WATER STORAGE TANK	CHILLER + KIT 2P AM	488	1624	435	448	355	344	1583	455	1362	1187	486	1626	439	455	357	345	1597	452	1369	1201
WITH WATER STORAGE TANK	CHILLER + KIT 2P AM AP	479	1648	445	477	366	341	1628	446	1399	1227	477	1650	449	484	368	342	1643	443	1405	1241
WITH WATER STORAGE TANK	CHILLER + KIT 1P AM	496	1595	428	421	344	350	1543	463	1321	1153	493	1597	433	428	346	350	1557	460	1328	1166
WITH WATER STORAGE TANK	CHILLER + KIT 1P AM AP	491	1603	436	434	348	349	1567	458	1335	1174	488	1605	440	441	350	350	1581	455	1341	1187
WITH WATER STORAGE TANK	CHILLER + KIT 2P P/S	488	1624	435	449	355	344	1584	454	1363	1188	485	1627	440	456	358	345	1598	452	1369	1202
WITH WATER STORAGE TANK	CHILLER + KIT 1P P/S	495	1595	429	422	344	350	1545	462	1322	1154	493	1598	433	429	347	350	1559	460	1329	1168

WEIGHT DURING OPERATION AND TRANSPORT - MOD. 115

AB - Standard unit / AB - Standard unit + KS Low Noise Kit

		Unit type	IP - Heating mode																			
		Version	VB (Standard unit) - VI (Brine unit)										VD (Desuperheater unit)									
			Operation							Transport			Operation							Transport		
			A	B	W1	W2	W3	W4	TOT.	A	B	TOT.	A	B	W1	W2	W3	W4	TOT.	A	B	TOT.
AB - Standard Unit		CHILLER	471	1151	445	207	154	331	1136	474	1149	1126	468	1161	451	214	157	331	1153	471	1158	1142
	WITHOUT WATER STORAGE TANK	CHILLER + KIT TB COMPLETO	467	1165	451	215	157	330	1153	470	1161	1141	464	1175	457	222	160	330	1170	467	1170	1157
		CHILLER + KIT TB BASE	471	1151	446	207	154	331	1138	474	1149	1128	468	1162	452	214	157	331	1155	471	1159	1144
		CHILLER + KIT MDP 2P SS	448	1274	474	275	186	321	1255	453	1258	1230	445	1282	480	282	189	322	1272	450	1266	1246
		CHILLER + KIT MDP 2P SS AP	436	1330	488	311	201	315	1315	442	1309	1282	433	1336	494	319	204	316	1332	440	1315	1298
		CHILLER + KIT MDP 1P SS	456	1226	467	249	174	327	1216	461	1216	1196	453	1235	473	256	177	327	1233	458	1224	1212
		CHILLER + KIT MDP 1P SS AP	449	1248	477	264	180	325	1247	454	1235	1223	447	1256	484	271	183	326	1264	452	1243	1239
	WITH WATER STORAGE TANK	CHILLER + KIT TB CON SERB.	508	1526	462	407	349	396	1614	480	1253	1231	505	1529	468	415	352	397	1631	477	1260	1247
		CHILLER + KIT 2P AM	492	1580	485	466	375	391	1717	464	1332	1320	490	1582	491	474	378	392	1734	461	1338	1336
		CHILLER + KIT 2P AM AP	482	1610	498	503	389	386	1777	453	1376	1372	480	1613	504	511	392	387	1794	451	1381	1388
		CHILLER + KIT 1P AM	499	1552	478	439	364	396	1677	471	1294	1286	497	1555	484	447	367	397	1695	469	1301	1302
		CHILLER + KIT 1P AM AP	494	1562	488	456	369	395	1708	465	1310	1313	491	1564	494	463	372	397	1725	463	1317	1329
		CHILLER + KIT 2P P/S	492	1580	485	467	376	391	1718	464	1333	1322	490	1583	491	474	378	392	1736	461	1339	1337
		CHILLER + KIT 1P P/S	499	1553	479	440	364	396	1679	471	1296	1288	497	1556	485	448	367	397	1697	468	1302	1304
		Unit type	IR - Cooling mode																			
		CHILLER	461	1166	432	206	147	308	1093	463	1164	1083	457	1176	438	213	150	308	1110	460	1173	1099
	WITHOUT WATER STORAGE TANK	CHILLER + KIT TB COMPLETO	456	1180	438	215	150	307	1109	460	1176	1097	453	1190	444	222	153	307	1126	457	1186	1113
		CHILLER + KIT TB BASE	460	1166	433	207	147	308	1095	463	1164	1085	457	1177	439	214	150	308	1112	460	1174	1101
		CHILLER + KIT MDP 2P SS	437	1292	460	275	178	299	1212	442	1276	1186	435	1300	466	282	181	299	1229	440	1284	1202
		CHILLER + KIT MDP 2P SS AP	425	1349	474	312	193	293	1272	431	1327	1239	423	1355	480	319	196	294	1289	429	1334	1255
		CHILLER + KIT MDP 1P SS	446	1243	453	249	167	304	1173	450	1232	1153	443	1252	459	256	170	305	1190	447	1241	1169
		CHILLER + KIT MDP 1P SS AP	439	1265	464	264	173	303	1204	444	1252	1179	436	1273	470	272	176	304	1221	441	1260	1195
	WITH WATER STORAGE TANK	CHILLER + KIT TB CON SERB.	502	1547	448	408	341	374	1571	470	1271	1187	499	1550	454	415	344	375	1588	468	1278	1203
		CHILLER + KIT 2P AM	486	1601	470	467	367	369	1674	454	1351	1277	483	1603	476	475	370	370	1691	452	1357	1293
		CHILLER + KIT 2P AM AP	475	1631	483	505	381	365	1733	444	1396	1329	473	1633	489	512	383	366	1750	442	1401	1345
		CHILLER + KIT 1P AM	493	1573	463	440	356	374	1634	462	1312	1242	490	1575	469	448	358	376	1651	459	1319	1258
		CHILLER + KIT 1P AM AP	487	1582	473	457	361	374	1665	456	1329	1269	485	1585	479	464	363	375	1682	453	1335	1285
		CHILLER + KIT 2P P/S	485	1601	470	468	367	369	1675	454	1352	1278	483	1604	476	476	370	370	1692	452	1358	1294
		CHILLER + KIT 1P P/S	493	1574	464	441	356	374	1636	462	1314	1244	490	1576	470	449	359	376	1653	459	1320	1260

ASS - Extra Low noise Version

		Unit type	IP - Heating mode																			
		Version	VB (Standard unit) - VI (Brine unit)										VD (Desuperheater unit)									
			Operation							Transport			Operation							Transport		
			A	B	W1	W2	W3	W4	TOT.	A	B	TOT.	A	B	W1	W2	W3	W4	TOT.	A	B	TOT.
ASS - Extra Low noise Version		CHILLER	489	1166	439	210	167	349	1165	492	1165	1155	485	1176	445	217	170	349	1182	488	1174	1171
	WITHOUT WATER STORAGE TANK	CHILLER + KIT TB COMPLETO	484	1180	445	218	171	348	1181	488	1176	1169	481	1189	451	225	174	348	1198	485	1185	1185
		CHILLER + KIT TB BASE	488	1167	440	211	167	349	1167	491	1165	1157	485	1177	446	218	170	350	1184	488	1174	1173
		CHILLER + KIT MDP 2P SS	464	1286	468	277	200	338	1284	470	1271	1258	461	1293	475	284	203	339	1301	467	1278	1274
		CHILLER + KIT MDP 2P SS AP	452	1340	483	313	215	332	1344	458	1319	1311	449	1346	489	321	218	333	1361	456	1325	1327
		CHILLER + KIT MDP 1P SS	473	1239	461	251	188	344	1245	477	1229	1225	470	1247	467	259	191	345	1262	475	1237	1241
		CHILLER + KIT MDP 1P SS AP	466	1260	472	267	194	343	1276	471	1248	1251	463	1267	478	274	197	344	1293	468	1255	1267
	WITH WATER STORAGE TANK	CHILLER + KIT TB CON SERB.	520	1531	459	407	365	411	1643	496	1265	1259	517	1534	465	415	368	412	1660	493	1272	1275
		CHILLER + KIT 2P AM	503	1583	482	466	392	406	1746	479	1342	1349	501	1586	488	474	395	407	1763	476	1348	1365
		CHILLER + KIT 2P AM AP	493	1613	496	503	406	400	1805	468	1385	1401	491	1615	502	510	409	402	1822	466	1390	1417
		CHILLER + KIT 1P AM	511	1556	475	439	380	411	1706	487	1305	1314	508	1559	481	447	383	412	1723	484	1311	1330
		CHILLER + KIT 1P AM AP	505	1565	485	455	386	411	1737	481	1321	1341	503	1568	491	463	388	412	1754	478	1327	1357
		CHILLER + KIT 2P P/S	503	1584	482	467	392	406	1747	479	1343	1350	501	1586	488	474	395	407	1764	476	1349	1366
		CHILLER + KIT 1P P/S	511	1557	476	440	381	411	1708	487	1306	1316	508	1560	482	448	384	412	1725	484	1313	1332
		Unit type	IR - Cooling mode																			
		CHILLER	479	1181	426	209	160	326	1121	482	1180	1112	476	1191	432	216	163	326	1138	479	1189	1127
	WITHOUT WATER STORAGE TANK	CHILLER + KIT TB COMPLETO	475	1195	432	218	164	325	1138	478	1192	1126	471	1205	438	225	167	325	1155	475	1201	1142
		CHILLER + KIT TB BASE	479	1182	427	210	161	326	1123	482	1180	1113	475	1192	433	217	164	327	1140	478	1190	1129
		CHILLER + KIT MDP 2P SS	454	1303	455	277	193	316	1240	460	1288	1215	452	1311	461	284	196	317	1257	457	1295	1231
		CHILLER + KIT MDP 2P SS AP	442	1358	469	314	208	310	1301	448	1338	1267	439	1365	475	321	210	311	1318	446	1344	1283
		CHILLER + KIT MDP 1P SS	463	1256	447	251	181	322	1201	468	1246	1181	460	1264	454	259	184	323	1219	465	1254	1197
		CHILLER + KIT MDP 1P SS AP	456	1277	458	267	187	321	1232	461	1265	1208	453	1284	464	274	190	321	1249	459	1272	1224
	WITH WATER STORAGE TANK	CHILLER + KIT TB CON SERB.	514	1551	445	408	357	389	1599	487	1283	1216	511	1554	451	415	360	390	1616	484	1290	1232
		CHILLER + KIT 2P AM	497	1604	467	467	384	384	1702	470	1361	1306	495	1606	473	475	386	385	1719	468	1367	1321
		CHILLER + KIT 2P AM AP	487	1634	481	504	398	379	1762	459	1404	1357	484	1636	487	512	400	380	1779	457	1409	1373
		CHILLER + KIT 1P AM	505	1576	461	440	372	390	1663	478	1323	1271	502	1579	466	448	375	391	1680	475	1329	1287
		CHILLER + KIT 1P AM AP	499	1586	470	456	377	389	1693	472	1339	1298	496	1588	476	464	380	390	1711	469	1345	1314
		CHILLER + KIT 2P P/S	497	1604	468	468	384	384	1704	470	1362	1307	495	1607	474	475	387	385	1721	468	1367	1323
		CHILLER + KIT 1P P/S	504	1577	461	441	373	390	1665	478	1324	1273	502	1580	467	449	375	391	1682	475	1331	1289

WEIGHT DURING OPERATION AND TRANSPORT - MOD. 130

AB - Standard unit / AB - Standard unit + KS Low Noise Kit

	Unit type	IP - Heating mode																			
	Version	VB (Standard unit) - VI (Brine unit)										VD (Desuperheater unit)									
		Operation							Transport			Operation							Transport		
		A	B	W1	W2	W3	W4	TOT.	A	B	TOT.	A	B	W1	W2	W3	W4	TOT.	A	B	TOT.
AB - Standard Unit	CHILLER	466	1140	463	211	153	337	1164	469	1138	1153	463	1150	470	218	156	337	1181	466	1147	1169
WITHOUT WATER STORAGE TANK	CHILLER + KIT TB COMPLETO	462	1154	469	219	157	336	1181	465	1150	1168	459	1164	475	226	160	336	1198	462	1159	1183
WITHOUT WATER STORAGE TANK	CHILLER + KIT TB BASE	465	1141	464	212	154	337	1166	468	1138	1155	462	1151	471	219	157	337	1183	465	1148	1171
WITHOUT WATER STORAGE TANK	CHILLER + KIT MDP 2P SS	443	1262	492	279	185	327	1283	448	1246	1257	441	1269	498	286	188	328	1300	446	1253	1273
WITHOUT WATER STORAGE TANK	CHILLER + KIT MDP 2P SS AP	431	1317	506	316	200	321	1343	438	1296	1309	429	1323	512	323	203	322	1360	436	1302	1325
WITHOUT WATER STORAGE TANK	CHILLER + KIT MDP 1P SS	451	1215	485	253	174	333	1244	456	1204	1223	448	1223	491	260	177	333	1261	453	1212	1239
WITHOUT WATER STORAGE TANK	CHILLER + KIT MDP 1P SS AP	445	1236	495	268	180	331	1275	450	1223	1250	442	1244	502	276	183	332	1292	447	1231	1266
WITH WATER STORAGE TANK	CHILLER + KIT TB CON SERB.	503	1512	479	413	347	403	1642	475	1241	1258	501	1515	485	420	350	404	1659	472	1248	1273
WITH WATER STORAGE TANK	CHILLER + KIT 2P AM	488	1566	502	472	374	398	1745	459	1319	1347	486	1569	508	479	376	399	1762	457	1325	1363
WITH WATER STORAGE TANK	CHILLER + KIT 2P AM AP	478	1596	515	509	388	393	1805	449	1363	1399	476	1599	521	516	390	394	1822	447	1368	1415
WITH WATER STORAGE TANK	CHILLER + KIT 1P AM	495	1538	495	445	362	403	1705	467	1282	1313	493	1541	501	452	365	404	1723	464	1288	1329
WITH WATER STORAGE TANK	CHILLER + KIT 1P AM AP	489	1548	505	461	368	403	1736	461	1298	1339	487	1551	511	468	370	404	1753	458	1304	1355
WITH WATER STORAGE TANK	CHILLER + KIT 2P P/S	488	1566	502	472	374	398	1746	459	1320	1348	485	1569	508	480	377	399	1764	457	1326	1364
WITH WATER STORAGE TANK	CHILLER + KIT 1P P/S	495	1539	496	446	363	403	1707	466	1283	1314	492	1542	501	453	365	404	1725	464	1289	1330
	Unit type	IR - Cooling mode																			
AB - Standard Unit	CHILLER	455	1154	450	210	147	314	1121	458	1152	1110	452	1164	456	217	150	314	1138	455	1162	1126
WITHOUT WATER STORAGE TANK	CHILLER + KIT TB COMPLETO	451	1168	456	219	150	313	1137	454	1164	1124	448	1178	462	226	153	313	1154	452	1174	1140
WITHOUT WATER STORAGE TANK	CHILLER + KIT TB BASE	455	1155	451	211	147	314	1123	458	1153	1111	451	1165	457	218	150	314	1140	455	1162	1127
WITHOUT WATER STORAGE TANK	CHILLER + KIT MDP 2P SS	433	1279	478	279	178	305	1240	438	1263	1213	430	1286	484	287	181	305	1257	436	1270	1229
WITHOUT WATER STORAGE TANK	CHILLER + KIT MDP 2P SS AP	421	1335	492	316	192	299	1300	427	1314	1266	419	1341	498	324	195	300	1317	425	1320	1282
WITHOUT WATER STORAGE TANK	CHILLER + KIT MDP 1P SS	441	1231	471	253	167	310	1201	445	1220	1179	438	1239	477	260	169	311	1218	443	1228	1195
WITHOUT WATER STORAGE TANK	CHILLER + KIT MDP 1P SS AP	434	1252	482	269	172	309	1232	439	1239	1206	432	1260	488	276	175	310	1249	437	1247	1222
WITH WATER STORAGE TANK	CHILLER + KIT TB CON SERB.	497	1532	465	413	339	381	1599	465	1257	1214	494	1535	471	421	342	382	1616	463	1265	1230
WITH WATER STORAGE TANK	CHILLER + KIT 2P AM	481	1586	487	473	365	376	1702	450	1337	1304	479	1589	493	480	368	378	1719	448	1343	1320
WITH WATER STORAGE TANK	CHILLER + KIT 2P AM AP	471	1617	500	510	379	372	1761	440	1381	1355	469	1619	506	518	382	373	1778	438	1387	1371
WITH WATER STORAGE TANK	CHILLER + KIT 1P AM	489	1558	480	446	354	382	1662	457	1299	1269	486	1561	486	453	357	383	1679	455	1306	1285
WITH WATER STORAGE TANK	CHILLER + KIT 1P AM AP	483	1568	490	462	359	381	1693	452	1315	1296	481	1570	496	470	362	382	1710	449	1321	1312
WITH WATER STORAGE TANK	CHILLER + KIT 2P P/S	481	1586	487	473	366	377	1703	450	1338	1305	479	1589	493	481	368	378	1720	447	1344	1321
WITH WATER STORAGE TANK	CHILLER + KIT 1P P/S	488	1559	481	447	355	382	1664	457	1300	1271	486	1562	487	454	357	383	1681	454	1307	1287

ASS - Extra Low noise Version

	Unit type	IP - Heating mode																			
	Version	VB (Standard unit) - VI (Brine unit)										VD (Desuperheater unit)									
		Operation							Transport			Operation							Transport		
		A	B	W1	W2	W3	W4	TOT.	A	B	TOT.	A	B	W1	W2	W3	W4	TOT.	A	B	TOT.
ASS - Extra Low noise Version	CHILLER	483	1155	457	214	166	355	1193	486	1153	1182	480	1165	463	221	170	356	1210	483	1162	1198
WITHOUT WATER STORAGE TANK	CHILLER + KIT TB COMPLETO	479	1169	463	222	170	354	1209	482	1165	1196	475	1178	469	229	173	354	1226	479	1174	1212
WITHOUT WATER STORAGE TANK	CHILLER + KIT TB BASE	482	1156	458	215	167	355	1195	486	1154	1183	479	1166	464	222	170	356	1212	482	1163	1199
WITHOUT WATER STORAGE TANK	CHILLER + KIT MDP 2P SS	459	1273	486	281	199	345	1312	465	1258	1285	457	1280	493	289	202	345	1329	462	1265	1301
WITHOUT WATER STORAGE TANK	CHILLER + KIT MDP 2P SS AP	447	1327	501	318	215	338	1372	454	1306	1338	445	1333	507	325	217	339	1389	451	1313	1354
WITHOUT WATER STORAGE TANK	CHILLER + KIT MDP 1P SS	468	1228	479	256	187	351	1273	472	1217	1251	465	1236	485	263	190	351	1290	470	1225	1267
WITHOUT WATER STORAGE TANK	CHILLER + KIT MDP 1P SS AP	461	1248	490	271	193	349	1304	466	1236	1278	458	1255	496	278	196	350	1321	464	1243	1294
WITH WATER STORAGE TANK	CHILLER + KIT TB CON SERB.	515	1517	476	413	363	419	1671	491	1253	1286	512	1520	482	420	366	420	1688	488	1260	1302
WITH WATER STORAGE TANK	CHILLER + KIT 2P AM	499	1569	499	472	390	413	1774	474	1329	1376	497	1572	505	479	393	414	1791	472	1335	1392
WITH WATER STORAGE TANK	CHILLER + KIT 2P AM AP	489	1599	513	508	404	408	1833	464	1371	1427	487	1602	518	516	407	409	1850	462	1376	1443
WITH WATER STORAGE TANK	CHILLER + KIT 1P AM	506	1542	492	445	379	419	1734	482	1292	1341	504	1545	498	452	381	420	1751	479	1299	1357
WITH WATER STORAGE TANK	CHILLER + KIT 1P AM AP	501	1552	502	461	384	418	1765	476	1308	1368	498	1554	508	469	387	419	1782	473	1314	1384
WITH WATER STORAGE TANK	CHILLER + KIT 2P P/S	499	1570	499	472	391	413	1775	474	1330	1377	497	1572	505	480	393	414	1792	472	1336	1393
WITH WATER STORAGE TANK	CHILLER + KIT 1P P/S	506	1543	492	446	379	419	1736	482	1294	1343	504	1546	498	453	382	420	1753	479	1300	1359
	Unit type	IR - Cooling mode																			
ASS - Extra Low noise Version	CHILLER	473	1170	444	214	160	332	1149	476	1168	1138	470	1180	450	221	163	333	1166	473	1177	1154
WITHOUT WATER STORAGE TANK	CHILLER + KIT TB COMPLETO	469	1183	450	222	163	331	1166	473	1180	1153	466	1193	456	229	166	332	1183	470	1189	1169
WITHOUT WATER STORAGE TANK	CHILLER + KIT TB BASE	473	1171	445	214	160	332	1151	476	1169	1140	469	1180	451	221	163	333	1168	473	1178	1156
WITHOUT WATER STORAGE TANK	CHILLER + KIT MDP 2P SS	450	1290	472	282	192	322	1268	455	1275	1242	447	1297	479	289	195	323	1285	453	1282	1258
WITHOUT WATER STORAGE TANK	CHILLER + KIT MDP 2P SS AP	437	1345	487	318	207	316	1329	444	1324	1294	435	1351	493	326	210	317	1346	442	1330	1310
WITHOUT WATER STORAGE TANK	CHILLER + KIT MDP 1P SS	458	1244	465	256	180	328	1229	463	1233	1208	455	1252	472	263	183	329	1247	460	1241	1224
WITHOUT WATER STORAGE TANK	CHILLER + KIT MDP 1P SS AP	451	1264	476	271	186	327	1260	457	1252	1235	449	1272	482	278	189	328	1277	454	1259	1251
WITH WATER STORAGE TANK	CHILLER + KIT TB CON SERB.	509	1537	461	414	356	397	1627	482	1270	1243	506	1540	467	421	358	398	1644	479	1277	1259
WITH WATER STORAGE TANK	CHILLER + KIT 2P AM	493	1589	484	473	382	391	1730	466	1347	1332	491	1592	490	480	385	393	1747	463	1353	1348
WITH WATER STORAGE TANK	CHILLER + KIT 2P AM AP	483	1619	498	510	396	387	1790	455	1390	1384	481	1621	503	517	398	388	1807	453	1395	1400
WITH WATER STORAGE TANK	CHILLER + KIT 1P AM	500	1562	477	446	371	397	1691	473	1310	1298	498	1565	483	453	373	398	1708	471	1316	1314
WITH WATER STORAGE TANK	CHILLER + KIT 1P AM AP	495	1571	487	462	376	396	1721	467	1325	1325	492	1574	493	470	378	397	1739	465	1331	1341
WITH WATER STORAGE TANK	CHILLER + KIT 2P P/S	493	1590	485	473	382	392	1732	466	1348	1334	491	1592	490	481	385	393	1749	463	1354	1349
WITH WATER STORAGE TANK	CHILLER + KIT 1P P/S	500	1563	478	447	371	397	1693	473	1311	1300	498	1566	484	454	374	398	1710	470	1317	1316

WEIGHT DURING OPERATION AND TRANSPORT - MOD. 145

AB - Standard unit / AB - Standard unit + KS Low Noise Kit

		Unit type	IP - Heating mode																			
		Version	VB (Standard unit) - VI (Brine unit)									VD (Desuperheater unit)										
			Operation							Transport			Operation							Transport		
			A	B	W1	W2	W3	W4	TOT.	A	B	TOT.	A	B	W1	W2	W3	W4	TOT.	A	B	TOT.
AB - Standard Unit		CHILLER	465	1130	490	219	159	355	1222	468	1128	1210	462	1140	496	226	162	355	1240	465	1137	1226
	WITHOUT WATER STORAGE TANK	CHILLER + KIT TB COMPLETO	461	1144	496	227	162	354	1239	465	1140	1224	458	1153	502	234	165	354	1256	462	1149	1240
		CHILLER + KIT TB BASE	464	1131	491	220	159	355	1224	468	1129	1212	461	1141	497	227	162	355	1242	465	1138	1227
		CHILLER + KIT MDP 2P SS	443	1248	519	287	191	345	1341	449	1232	1313	441	1255	525	294	194	346	1359	446	1240	1329
		CHILLER + KIT MDP 2P SS AP	432	1301	533	324	206	339	1402	439	1281	1366	430	1308	539	331	209	340	1419	436	1287	1382
		CHILLER + KIT MDP 1P SS	451	1202	511	261	179	351	1303	456	1192	1280	448	1211	518	268	182	351	1320	453	1200	1295
		CHILLER + KIT MDP 1P SS AP	445	1223	522	277	185	349	1333	450	1210	1306	442	1231	528	284	188	350	1351	448	1218	1322
	WITH WATER STORAGE TANK	CHILLER + KIT TB CON SERB.	501	1493	505	422	352	422	1700	474	1227	1314	499	1496	511	429	355	423	1718	471	1235	1330
		CHILLER + KIT 2P AM	487	1546	528	480	379	416	1803	459	1304	1404	484	1548	534	488	381	417	1821	457	1310	1420
		CHILLER + KIT 2P AM AP	477	1576	542	517	393	411	1863	449	1346	1456	475	1578	547	525	395	412	1880	447	1351	1471
		CHILLER + KIT 1P AM	493	1518	521	454	367	422	1764	466	1267	1369	491	1522	527	461	370	423	1781	464	1274	1385
		CHILLER + KIT 1P AM AP	488	1528	531	470	372	421	1795	461	1283	1396	486	1531	537	477	375	422	1812	458	1289	1412
		CHILLER + KIT 2P P/S	486	1546	528	481	379	416	1805	459	1304	1405	484	1549	534	489	382	417	1822	457	1310	1421
		CHILLER + KIT 1P P/S	493	1519	522	455	368	422	1766	466	1268	1371	491	1522	528	462	370	423	1783	463	1275	1387
		Unit type	IR - Cooling mode																			
		CHILLER	453	1143	477	219	151	330	1177	457	1141	1163	451	1153	483	226	154	331	1194	455	1150	1178
	WITHOUT WATER STORAGE TANK	CHILLER + KIT TB COMPLETO	450	1157	483	227	155	329	1194	454	1153	1177	447	1167	489	234	158	330	1211	451	1162	1193
		CHILLER + KIT TB BASE	453	1144	478	219	152	330	1179	457	1141	1164	450	1154	484	226	155	331	1196	454	1151	1180
		CHILLER + KIT MDP 2P SS	432	1264	505	287	183	321	1296	438	1248	1266	430	1271	511	295	186	322	1313	436	1255	1282
		CHILLER + KIT MDP 2P SS AP	421	1318	519	324	197	316	1356	428	1297	1318	419	1325	525	332	200	317	1373	426	1304	1334
		CHILLER + KIT MDP 1P SS	440	1217	498	261	171	327	1257	445	1206	1232	437	1226	504	268	174	328	1274	443	1214	1248
		CHILLER + KIT MDP 1P SS AP	434	1238	508	277	177	326	1288	440	1225	1259	431	1246	515	284	180	326	1305	437	1232	1275
	WITH WATER STORAGE TANK	CHILLER + KIT TB CON SERB.	495	1512	491	422	343	399	1655	464	1243	1267	492	1515	497	430	346	400	1672	462	1250	1283
		CHILLER + KIT 2P AM	480	1565	513	482	370	394	1758	450	1321	1357	477	1568	519	489	372	395	1775	447	1327	1372
		CHILLER + KIT 2P AM AP	470	1595	526	519	383	389	1818	440	1364	1408	468	1598	532	526	386	390	1835	438	1369	1424
		CHILLER + KIT 1P AM	486	1538	506	455	358	399	1718	457	1283	1322	484	1541	512	462	361	400	1736	454	1290	1338
		CHILLER + KIT 1P AM AP	481	1547	516	471	363	399	1749	451	1299	1349	479	1550	522	478	366	400	1766	449	1305	1365
		CHILLER + KIT 2P P/S	479	1566	513	482	370	394	1759	450	1321	1358	477	1568	519	490	372	395	1777	447	1327	1374
		CHILLER + KIT 1P P/S	486	1538	507	456	359	399	1720	456	1284	1324	484	1541	513	463	361	400	1738	454	1291	1340

ASS - Extra Low noise Version

		Unit type	IP - Heating mode																			
		Version	VB (Standard unit) - VI (Brine unit)									VD (Desuperheater unit)										
			Operation							Transport			Operation							Transport		
			A	B	W1	W2	W3	W4	TOT.	A	B	TOT.	A	B	W1	W2	W3	W4	TOT.	A	B	TOT.
ASS - Extra Low noise Version		CHILLER	481	1145	484	222	172	373	1251	485	1143	1238	478	1155	490	229	175	374	1268	482	1152	1254
	WITHOUT WATER STORAGE TANK	CHILLER + KIT TB COMPLETO	477	1158	489	231	175	372	1268	481	1155	1253	474	1167	496	238	179	373	1285	478	1163	1269
		CHILLER + KIT TB BASE	481	1146	484	223	172	373	1253	484	1144	1240	478	1156	491	230	175	374	1270	481	1153	1256
		CHILLER + KIT MDP 2P SS	459	1259	513	290	205	363	1370	464	1244	1342	456	1266	519	297	208	363	1387	462	1251	1358
		CHILLER + KIT MDP 2P SS AP	447	1311	528	326	220	356	1430	454	1291	1394	445	1317	534	333	223	357	1447	452	1297	1410
		CHILLER + KIT MDP 1P SS	467	1215	506	264	193	369	1331	472	1205	1308	464	1223	512	271	196	369	1348	469	1212	1324
		CHILLER + KIT MDP 1P SS AP	460	1235	516	279	199	367	1362	466	1223	1335	458	1242	523	287	202	368	1379	463	1230	1351
	WITH WATER STORAGE TANK	CHILLER + KIT TB CON SERB.	513	1497	502	422	368	437	1729	489	1239	1343	510	1501	508	429	371	438	1746	486	1246	1359
		CHILLER + KIT 2P AM	497	1550	525	480	395	432	1832	474	1313	1432	495	1552	531	488	398	433	1849	471	1319	1448
		CHILLER + KIT 2P AM AP	488	1579	539	517	409	426	1892	464	1354	1484	485	1581	545	525	412	428	1909	461	1359	1500
		CHILLER + KIT 1P AM	504	1523	518	454	383	437	1792	481	1278	1398	502	1526	524	461	386	438	1810	478	1284	1414
		CHILLER + KIT 1P AM AP	499	1532	528	470	389	437	1823	475	1293	1425	497	1535	534	477	391	438	1840	473	1299	1441
		CHILLER + KIT 2P P/S	497	1550	525	481	395	432	1833	473	1314	1434	495	1553	531	489	398	433	1851	471	1320	1450
		CHILLER + KIT 1P P/S	504	1524	518	455	384	437	1794	480	1279	1400	502	1527	524	462	387	438	1812	478	1285	1416
		Unit type	IR - Cooling mode																			
		CHILLER	471	1159	470	222	164	349	1206	475	1156	1191	468	1168	477	229	168	349	1223	472	1165	1207
	WITHOUT WATER STORAGE TANK	CHILLER + KIT TB COMPLETO	467	1172	476	230	168	348	1222	471	1168	1206	464	1181	483	237	171	348	1239	468	1176	1221
		CHILLER + KIT TB BASE	470	1159	471	223	165	349	1208	474	1157	1193	467	1169	478	230	168	349	1225	471	1166	1209
		CHILLER + KIT MDP 2P SS	448	1275	499	290	197	339	1325	455	1260	1295	446	1282	505	297	200	340	1342	452	1267	1311
		CHILLER + KIT MDP 2P SS AP	437	1328	514	326	212	333	1385	444	1308	1347	435	1334	520	334	215	334	1402	442	1314	1363
		CHILLER + KIT MDP 1P SS	456	1230	492	264	185	345	1286	462	1219	1261	454	1238	498	271	188	346	1303	459	1227	1277
		CHILLER + KIT MDP 1P SS AP	450	1250	503	279	191	344	1317	456	1237	1288	447	1257	509	287	194	344	1334	454	1245	1304
	WITH WATER STORAGE TANK	CHILLER + KIT TB CON SERB.	506	1516	487	423	359	414	1684	480	1255	1296	504	1520	493	430	362	415	1701	478	1262	1311
		CHILLER + KIT 2P AM	491	1569	510	482	386	409	1787	465	1330	1385	489	1571	516	489	389	410	1804	462	1336	1401
		CHILLER + KIT 2P AM AP	481	1598	524	518	400	404	1846	455	1372	1437	479	1601	529	526	403	405	1863	452	1377	1453
		CHILLER + KIT 1P AM	498	1542	503	455	375	414	1747	472	1294	1351	495	1545	509	462	377	415	1764	469	1300	1367
		CHILLER + KIT 1P AM AP	492	1551	513	471	380	414	1778	466	1309	1377	490	1554	519	478	382	415	1795	464	1315	1393
		CHILLER + KIT 2P P/S	491	1569	510	482	386	409	1788	465	1331	1386	488	1572	516	490	389	410	1805	462	1337	1402
		CHILLER + KIT 1P P/S	498	1543	504	456	375	414	1749	472	1295	1352	495	1545	510	463	378	415	1766	469	1301	1368

WEIGHT DURING OPERATION AND TRANSPORT - MOD. 160

AB - Standard unit / AB - Standard unit + KS Low Noise Kit

	Unit type		IP - Heating mode																		
	Version		VB (Standard unit) - VI (Brine unit)									VD (Desuperheater unit)									
			Operation							Transport			Operation							Transport		
			A	B	W1	W2	W3	W4	TOT.	A	B	TOT.	A	B	W1	W2	W3	W4	TOT.	A	B	TOT.
AB - Standard Unit		CHILLER	476	1139	499	227	172	377	1275	480	1137	1260	473	1148	505	234	175	378	1292	477	1145	1276
	WITHOUT WATER STORAGE TANK	CHILLER + KIT TB COMPLETO	472	1152	505	235	175	376	1291	476	1148	1274	469	1161	511	242	178	377	1308	474	1156	1290
		CHILLER + KIT TB BASE	476	1140	500	228	172	377	1276	479	1137	1262	473	1149	506	234	175	378	1294	477	1146	1278
		CHILLER + KIT MDP 2P SS	454	1251	528	294	204	367	1394	460	1236	1364	452	1259	534	301	208	368	1411	458	1243	1379
		CHILLER + KIT MDP 2P SS AP	443	1303	543	330	220	361	1454	450	1283	1416	441	1309	549	338	223	362	1471	448	1289	1432
		CHILLER + KIT MDP 1P SS	462	1208	521	269	192	373	1355	467	1198	1330	460	1216	527	276	196	374	1372	465	1205	1346
		CHILLER + KIT MDP 1P SS AP	456	1227	531	284	199	372	1385	462	1215	1357	454	1235	538	291	202	373	1403	459	1222	1372
	WITH WATER STORAGE TANK	CHILLER + KIT TB CON SERB.	509	1488	516	427	367	443	1753	485	1232	1364	506	1492	522	435	370	444	1770	482	1239	1380
		CHILLER + KIT 2P AM	494	1540	539	486	394	437	1856	470	1305	1454	492	1543	545	493	397	438	1873	467	1311	1470
		CHILLER + KIT 2P AM AP	484	1570	553	523	408	432	1915	460	1346	1506	482	1572	559	530	411	433	1932	458	1351	1522
		CHILLER + KIT 1P AM	501	1513	532	459	382	443	1816	477	1270	1420	498	1516	538	467	385	444	1833	474	1276	1435
		CHILLER + KIT 1P AM AP	495	1523	542	475	387	442	1847	471	1285	1446	493	1526	548	483	390	443	1864	469	1291	1462
		CHILLER + KIT 2P P/S	494	1540	539	486	394	437	1857	470	1306	1455	492	1543	545	494	397	438	1874	467	1311	1471
		CHILLER + KIT 1P P/S	500	1514	532	460	383	443	1818	476	1271	1421	498	1517	538	468	385	444	1835	474	1277	1437
	Unit type		IR - Cooling mode																		
		CHILLER	466	1152	484	225	164	352	1225	470	1150	1211	463	1162	490	233	167	353	1242	467	1159	1227
	WITHOUT WATER STORAGE TANK	CHILLER + KIT TB COMPLETO	462	1165	490	234	168	351	1242	466	1161	1225	459	1175	496	241	171	351	1259	464	1170	1241
		CHILLER + KIT TB BASE	465	1153	485	226	164	352	1227	469	1150	1213	463	1163	491	233	167	353	1244	467	1159	1228
		CHILLER + KIT MDP 2P SS	444	1267	512	294	196	342	1344	450	1252	1314	442	1275	519	301	199	343	1361	448	1259	1330
		CHILLER + KIT MDP 2P SS AP	433	1320	527	330	211	337	1405	440	1300	1367	431	1326	533	338	214	337	1422	438	1306	1383
		CHILLER + KIT MDP 1P SS	452	1223	505	268	184	348	1305	457	1212	1281	449	1231	512	275	187	349	1323	455	1220	1296
		CHILLER + KIT MDP 1P SS AP	446	1243	516	283	190	347	1336	452	1230	1307	443	1250	522	290	193	348	1353	449	1238	1323
	WITH WATER STORAGE TANK	CHILLER + KIT TB CON SERB.	502	1508	500	427	358	419	1703	476	1247	1315	500	1511	506	435	361	420	1721	473	1254	1331
		CHILLER + KIT 2P AM	487	1560	522	486	385	413	1806	461	1322	1405	485	1563	528	494	387	414	1824	458	1328	1421
		CHILLER + KIT 2P AM AP	478	1590	536	523	399	408	1866	451	1364	1457	476	1592	542	531	401	409	1883	449	1369	1472
		CHILLER + KIT 1P AM	494	1533	516	459	373	419	1767	468	1286	1370	492	1536	522	467	376	420	1784	465	1292	1386
		CHILLER + KIT 1P AM AP	489	1542	526	476	378	418	1797	462	1301	1397	487	1545	532	483	381	419	1815	460	1307	1413
		CHILLER + KIT 2P P/S	487	1560	523	487	385	413	1808	461	1323	1406	485	1563	529	494	387	414	1825	458	1329	1422
		CHILLER + KIT 1P P/S	494	1534	516	460	374	419	1769	467	1287	1372	492	1537	522	468	376	420	1786	465	1294	1388

WEIGHT DURING OPERATION AND TRANSPORT - MOD. 180

AB - Standard unit / AB - Standard unit + KS Low Noise Kit

	Unit type	IP - Heating mode																			
	Version	VB (Standard unit) - VI (Brine unit)										VD (Desuperheater unit)									
		Operation							Transport			Operation							Transport		
		A	B	W1	W2	W3	W4	TOT.	A	B	TOT.	A	B	W1	W2	W3	W4	TOT.	A	B	TOT.
AB - Standard Unit	CHILLER	471	1368	484	329	245	360	1418	474	1368	1407	469	1374	490	337	248	361	1435	471	1373	1422
WITHOUT WATER STORAGE TANK	CHILLER + KIT TB COMPLETO	467	1387	489	343	251	358	1441	470	1384	1427	465	1392	495	351	254	359	1458	468	1389	1442
WITHOUT WATER STORAGE TANK	CHILLER + KIT TB BASE	471	1369	485	330	245	360	1420	474	1368	1408	468	1374	491	338	248	361	1437	471	1374	1424
WITHOUT WATER STORAGE TANK	CHILLER + KIT MDP 2P SS	440	1584	495	479	314	325	1613	445	1559	1577	438	1586	501	487	317	326	1631	443	1562	1592
WITHOUT WATER STORAGE TANK	CHILLER + KIT MDP 2P SS AP	435	1617	496	506	325	319	1646	441	1589	1606	433	1619	502	514	328	320	1664	439	1592	1621
WITHOUT WATER STORAGE TANK	CHILLER + KIT MDP 1P SS	452	1490	498	414	285	343	1541	456	1476	1514	450	1494	504	422	288	344	1558	454	1480	1529
WITHOUT WATER STORAGE TANK	CHILLER + KIT MDP 1P SS AP	449	1502	501	425	289	341	1557	454	1487	1528	447	1506	507	433	292	342	1574	452	1490	1543
WITH WATER STORAGE TANK	CHILLER + KIT TB CON SERB.	518	1796	452	617	549	403	2022	484	1496	1548	516	1796	458	625	552	404	2039	481	1499	1563
WITH WATER STORAGE TANK	CHILLER + KIT 2P AM	495	1907	457	752	612	372	2193	460	1647	1697	493	1906	463	760	614	374	2211	458	1649	1712
WITH WATER STORAGE TANK	CHILLER + KIT 2P AM AP	490	1927	458	779	623	366	2226	456	1673	1726	488	1926	464	788	625	368	2244	454	1675	1741
WITH WATER STORAGE TANK	CHILLER + KIT 1P AM	505	1850	460	688	583	390	2121	471	1573	1634	503	1850	466	696	585	392	2138	469	1575	1649
WITH WATER STORAGE TANK	CHILLER + KIT 1P AM AP	503	1858	463	700	587	388	2139	468	1584	1650	500	1857	469	709	589	390	2157	466	1586	1665
WITH WATER STORAGE TANK	CHILLER + KIT 2P P/S	494	1909	458	755	613	372	2197	460	1649	1700	492	1908	463	763	615	373	2214	458	1651	1715
WITH WATER STORAGE TANK	CHILLER + KIT 1P P/S	505	1852	461	690	584	390	2124	471	1575	1637	503	1852	466	698	586	391	2142	469	1578	1652
	Unit type	IR - Cooling mode																			
	CHILLER	463	1389	467	329	236	335	1367	465	1389	1356	460	1395	473	337	239	336	1385	463	1394	1372
WITHOUT WATER STORAGE TANK	CHILLER + KIT TB COMPLETO	458	1408	472	343	242	333	1390	461	1406	1376	456	1414	478	351	245	334	1408	459	1411	1392
WITHOUT WATER STORAGE TANK	CHILLER + KIT TB BASE	462	1390	468	330	236	335	1369	465	1389	1358	460	1395	474	337	239	336	1387	462	1395	1374
WITHOUT WATER STORAGE TANK	CHILLER + KIT MDP 2P SS	431	1609	477	480	304	302	1563	437	1585	1526	429	1611	483	488	307	303	1581	435	1587	1542
WITHOUT WATER STORAGE TANK	CHILLER + KIT MDP 2P SS AP	426	1642	478	508	315	296	1596	432	1615	1555	424	1644	483	516	317	298	1614	430	1617	1571
WITHOUT WATER STORAGE TANK	CHILLER + KIT MDP 1P SS	443	1514	480	415	276	319	1490	448	1499	1463	441	1517	486	423	278	320	1508	445	1503	1479
WITHOUT WATER STORAGE TANK	CHILLER + KIT MDP 1P SS AP	440	1526	483	426	280	318	1507	445	1510	1477	438	1530	489	434	283	319	1524	443	1514	1493
WITH WATER STORAGE TANK	CHILLER + KIT TB CON SERB.	513	1821	434	618	540	379	1972	476	1519	1497	511	1822	440	626	542	381	1989	474	1523	1513
WITH WATER STORAGE TANK	CHILLER + KIT 2P AM	489	1933	438	754	601	350	2143	453	1673	1646	488	1932	444	762	603	351	2161	451	1674	1662
WITH WATER STORAGE TANK	CHILLER + KIT 2P AM AP	485	1953	439	781	612	344	2176	448	1700	1675	483	1952	445	790	614	346	2194	446	1701	1691
WITH WATER STORAGE TANK	CHILLER + KIT 1P AM	500	1876	442	689	573	367	2070	463	1598	1583	498	1876	447	697	575	369	2088	461	1600	1599
WITH WATER STORAGE TANK	CHILLER + KIT 1P AM AP	497	1883	444	702	577	366	2089	461	1609	1599	495	1883	450	710	579	367	2107	459	1611	1615
WITH WATER STORAGE TANK	CHILLER + KIT 2P P/S	489	1935	439	756	602	349	2146	452	1675	1649	487	1934	444	765	604	351	2164	450	1677	1665
WITH WATER STORAGE TANK	CHILLER + KIT 1P P/S	500	1878	442	691	574	367	2074	463	1600	1586	498	1877	448	700	576	368	2092	461	1602	1602

ASS - Extra Low noise Version

	Unit type	IP - Heating mode																			
	Version	VB (Standard unit) - VI (Brine unit)										VD (Desuperheater unit)									
		Operation							Transport			Operation							Transport		
		A	B	W1	W2	W3	W4	TOT.	A	B	TOT.	A	B	W1	W2	W3	W4	TOT.	A	B	TOT.
ASS - Extra Low noise Version	CHILLER	485	1386	478	335	263	375	1451	488	1386	1440	483	1391	484	342	266	376	1468	485	1391	1455
WITHOUT WATER STORAGE TANK	CHILLER + KIT TB COMPLETO	481	1404	483	349	269	373	1474	484	1401	1460	478	1409	489	356	272	374	1491	482	1406	1475
WITHOUT WATER STORAGE TANK	CHILLER + KIT TB BASE	485	1386	479	336	263	375	1453	488	1386	1441	482	1392	485	343	266	376	1470	485	1391	1457
WITHOUT WATER STORAGE TANK	CHILLER + KIT MDP 2P SS	453	1595	491	483	334	339	1646	459	1571	1610	451	1597	497	491	336	340	1664	457	1574	1625
WITHOUT WATER STORAGE TANK	CHILLER + KIT MDP 2P SS AP	447	1627	492	510	345	333	1679	454	1601	1639	445	1629	498	518	347	334	1697	452	1603	1654
WITHOUT WATER STORAGE TANK	CHILLER + KIT MDP 1P SS	465	1504	493	419	304	358	1574	470	1490	1547	463	1508	499	427	307	359	1591	468	1494	1562
WITHOUT WATER STORAGE TANK	CHILLER + KIT MDP 1P SS AP	462	1516	496	430	308	356	1590	467	1501	1561	460	1519	502	438	311	357	1607	465	1504	1576
WITH WATER STORAGE TANK	CHILLER + KIT TB CON SERB.	527	1802	450	620	571	415	2055	496	1509	1581	525	1802	456	628	573	416	2072	494	1512	1596
WITH WATER STORAGE TANK	CHILLER + KIT 2P AM	503	1910	456	754	634	383	2226	472	1656	1730	501	1910	461	762	636	385	2244	470	1658	1745
WITH WATER STORAGE TANK	CHILLER + KIT 2P AM AP	499	1930	457	781	645	377	2259	468	1682	1759	497	1929	462	789	647	379	2277	466	1683	1774
WITH WATER STORAGE TANK	CHILLER + KIT 1P AM	514	1855	458	689	604	402	2154	483	1584	1667	512	1855	464	698	607	403	2171	481	1587	1682
WITH WATER STORAGE TANK	CHILLER + KIT 1P AM AP	511	1862	461	702	609	400	2172	480	1595	1683	509	1862	467	710	611	402	2190	478	1597	1698
WITH WATER STORAGE TANK	CHILLER + KIT 2P P/S	503	1912	456	756	635	383	2230	472	1659	1733	501	1912	461	764	637	384	2247	470	1660	1748
WITH WATER STORAGE TANK	CHILLER + KIT 1P P/S	514	1857	458	692	606	401	2157	483	1587	1670	512	1856	464	700	608	403	2175	481	1589	1685
	Unit type	IR - Cooling mode																			
	CHILLER	477	1407	461	335	254	351	1400	480	1407	1389	474	1412	467	342	257	351	1418	477	1412	1405
WITHOUT WATER STORAGE TANK	CHILLER + KIT TB COMPLETO	473	1425	466	348	261	348	1423	476	1423	1409	470	1430	472	356	263	349	1441	473	1428	1425
WITHOUT WATER STORAGE TANK	CHILLER + KIT TB BASE	477	1407	462	335	255	351	1402	479	1407	1391	474	1413	468	343	257	352	1420	477	1412	1407
WITHOUT WATER STORAGE TANK	CHILLER + KIT MDP 2P SS	445	1620	472	484	324	316	1596	450	1596	1559	442	1622	478	492	326	317	1614	448	1599	1575
WITHOUT WATER STORAGE TANK	CHILLER + KIT MDP 2P SS AP	439	1653	473	511	335	310	1629	445	1626	1588	437	1654	479	519	337	311	1647	444	1628	1604
WITHOUT WATER STORAGE TANK	CHILLER + KIT MDP 1P SS	457	1527	475	420	295	334	1523	462	1513	1496	455	1531	481	427	297	335	1541	459	1517	1512
WITHOUT WATER STORAGE TANK	CHILLER + KIT MDP 1P SS AP	454	1539	478	430	299	332	1540	459	1524	1510	452	1543	484	438	302	333	1557	457	1527	1526
WITH WATER STORAGE TANK	CHILLER + KIT TB CON SERB.	522	1827	432	620	561	391	2005	489	1533	1530	520	1827	438	628	564	393	2022	487	1536	1546
WITH WATER STORAGE TANK	CHILLER + KIT 2P AM	499	1936	437	755	623	361	2176	465	1682	1679	497	1935	442	764	626	362	2194	463	1683	1695
WITH WATER STORAGE TANK	CHILLER + KIT 2P AM AP	494	1955	438	783	634	355	2209	460	1708	1708	492	1955	443	791	636	356	2227	458	1709	1724
WITH WATER STORAGE TANK	CHILLER + KIT 1P AM	509	1880	440	691	595	379	2103	476	1609	1616	507	1880	445	699	597	380	2121	474	1611	1632
WITH WATER STORAGE TANK	CHILLER + KIT 1P AM AP	507	1887	442	703	599	377	2122	473	1619	1632	505	1887	448	712	601	379	2140	471	1621	1648
WITH WATER STORAGE TANK	CHILLER + KIT 2P P/S	498	1938	437	758	625	360	2179	465	1684	1682	496	1937	442	766	627	362	2197	463	1686	1698
WITH WATER STORAGE TANK	CHILLER + KIT 1P P/S	509	1882	440	693	596	378	2107	476	1611	1619	507	1881	446	701	598	380	2125	474	1613	1635

WEIGHT DURING OPERATION AND TRANSPORT - MOD. 200

AB - Standard unit / AB - Standard unit + KS Low Noise Kit

		Unit type	IP - Heating mode																			
		Version	VB (Standard unit) - VI (Brine unit)										VD (Desuperheater unit)									
			Operation							Transport			Operation							Transport		
			A	B	W1	W2	W3	W4	TOT.	A	B	TOT.	A	B	W1	W2	W3	W4	TOT.	A	B	TOT.
AB - Standard Unit		CHILLER	483	1378	487	337	262	378	1464	486	1378	1451	480	1384	493	344	265	379	1481	483	1383	1466
	WITHOUT WATER STORAGE TANK	CHILLER + KIT TB COMPLETO	479	1396	492	351	268	376	1487	482	1394	1471	476	1401	498	358	271	377	1504	479	1398	1486
		CHILLER + KIT TB BASE	482	1379	488	338	262	378	1465	485	1378	1452	480	1384	494	345	265	379	1483	483	1383	1468
		CHILLER + KIT MDP 2P SS	451	1586	500	485	332	342	1659	457	1563	1621	448	1589	506	493	335	343	1677	455	1566	1636
		CHILLER + KIT MDP 2P SS AP	445	1618	501	512	343	336	1692	452	1592	1650	443	1621	507	520	346	337	1710	450	1594	1665
		CHILLER + KIT MDP 1P SS	463	1496	502	421	303	361	1587	468	1482	1558	460	1499	508	429	305	362	1604	466	1486	1573
		CHILLER + KIT MDP 1P SS AP	460	1508	505	432	307	359	1603	465	1493	1572	458	1511	511	440	310	360	1620	463	1496	1587
	WITH WATER STORAGE TANK	CHILLER + KIT TB CON SERB.	525	1793	458	622	569	419	2068	494	1501	1592	523	1794	464	631	571	420	2085	492	1504	1607
		CHILLER + KIT 2P AM	501	1902	464	756	632	387	2239	470	1648	1741	500	1902	469	765	634	389	2257	468	1650	1756
		CHILLER + KIT 2P AM AP	497	1922	465	784	643	381	2272	466	1674	1770	495	1921	470	792	645	383	2290	464	1675	1785
		CHILLER + KIT 1P AM	512	1847	466	692	602	406	2167	481	1576	1678	510	1847	472	701	605	407	2184	479	1578	1693
		CHILLER + KIT 1P AM AP	509	1854	469	705	607	404	2185	479	1587	1694	507	1854	475	713	609	406	2203	476	1589	1709
		CHILLER + KIT 2P P/S	501	1904	464	759	633	387	2242	470	1650	1744	499	1904	469	767	635	389	2260	468	1652	1759
		CHILLER + KIT 1P P/S	512	1848	466	695	604	405	2170	481	1579	1681	510	1848	472	703	606	407	2188	479	1581	1696
		Unit type	IR - Cooling mode																			
		CHILLER	475	1399	470	336	253	354	1413	477	1399	1400	472	1404	476	344	256	355	1431	475	1404	1416
	WITHOUT WATER STORAGE TANK	CHILLER + KIT TB COMPLETO	470	1417	475	350	259	352	1436	474	1415	1420	468	1422	481	358	262	353	1454	471	1419	1436
		CHILLER + KIT TB BASE	474	1399	471	337	253	354	1415	477	1399	1402	471	1405	477	345	256	355	1433	475	1404	1418
		CHILLER + KIT MDP 2P SS	442	1611	481	486	322	319	1609	448	1588	1570	440	1613	487	494	325	320	1626	446	1590	1586
		CHILLER + KIT MDP 2P SS AP	437	1643	482	514	333	313	1642	444	1617	1599	435	1646	488	521	336	314	1660	442	1619	1615
		CHILLER + KIT MDP 1P SS	455	1519	484	422	293	337	1536	460	1505	1507	452	1522	490	429	296	338	1554	457	1508	1523
		CHILLER + KIT MDP 1P SS AP	452	1531	487	432	298	335	1552	457	1516	1521	450	1534	493	440	300	336	1570	455	1519	1537
	WITH WATER STORAGE TANK	CHILLER + KIT TB CON SERB.	520	1818	440	623	559	395	2017	487	1524	1541	518	1818	446	631	562	397	2035	485	1527	1557
		CHILLER + KIT 2P AM	497	1928	445	758	621	365	2189	463	1673	1690	495	1927	450	766	623	366	2206	461	1675	1706
		CHILLER + KIT 2P AM AP	492	1947	446	785	632	359	2222	459	1699	1719	490	1946	451	794	634	361	2240	457	1701	1735
		CHILLER + KIT 1P AM	507	1872	448	693	592	383	2116	474	1600	1627	505	1871	453	702	595	384	2134	472	1602	1643
		CHILLER + KIT 1P AM AP	505	1879	451	706	597	381	2135	471	1611	1643	503	1878	456	714	599	383	2152	469	1613	1659
		CHILLER + KIT 2P P/S	496	1929	445	760	623	364	2192	463	1676	1693	494	1929	450	769	625	366	2210	461	1677	1709
		CHILLER + KIT 1P P/S	507	1873	448	696	594	382	2120	474	1603	1630	505	1873	454	704	596	384	2137	472	1605	1646

RECEPTION AND POSITIONING

Inspections on arrival

As soon as the unit is consigned, it is essential to make sure that all the ordered items have been received and that the dispatch is complete. Carefully check that the load has not been damaged. If visible damage is discovered, immediately inform the haulage contractor and write "**Collected with reserves owing to evident damage**" on the consignment note. Delivery at the plant means that any damages will be reimbursed by the insurance company as established by law.

Safety prescriptions

Comply with the current safety provisions in relation to the equipment used to handle the unit and the ways in which these operations are carried out.

Handling

Before moving the unit, check its weight on the data plate with the general specifications of the appliance and consult the **Main Features** section of this manual. Make sure that the unit is handled with care, that it is not jolted in any way and that none of its functional parts is damaged.
Comply with the following instructions when lifting and positioning the unit:

• Handling with a lift truck or similar

The unit has four wooden bases so that it can be transported in a longitudinal direction (**not sideways**).
Place something suitable in between to separate the truck from the unit in order to prevent the surfaces of the bank or electric panel from being damaged if the unit has to be moved sideways (**Fig.1**). Do not allow the unit or any of its parts to drop on to the ground. Remember that the heaviest part is the one where the compressor is installed (**electric panel side Fig.1**).

Refer to the data plates (**Part.3 Fig.1**) that identify the center of gravity position, applied to the **4 sides** of the base.

Fig.1

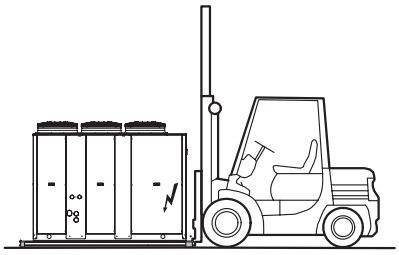


Fig.2

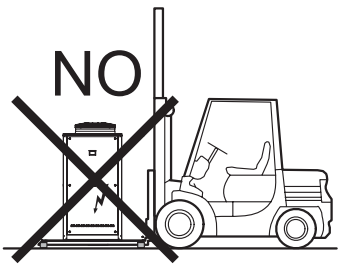
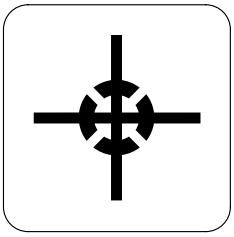
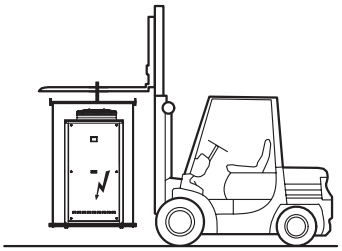


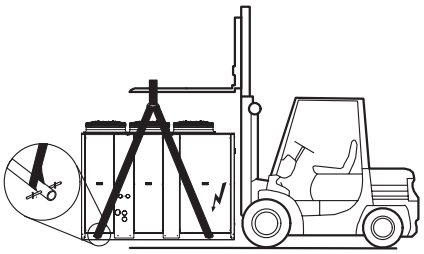
Fig.3



• Lifting and handling with a crane or similar

• Position metal tubes of an adequate thickness in the holes on the base of the unit in order to lift it.
• The ends of the tubes must project to an adequate extent to allow safety components to be inserted and the lifting belts to be fitted.
• Consult the tables in the **When the appliance arrives** section for the venter of gravity position.
• Use spacer bars in the top part of the unit to prevent the banks and plastic parts covering the unit from being crushed and damaged.





WARNING:
Before proceeding with the handling operations, read the information on the wrapping to ensure the safety of persons and property. Also be sure to:
• Handle the load with care
• Avoid stacking other objects on top of the unit

Storage

The units must be stored in a dry place sheltered from the run, rain, sand and wind.
The storage conditions are:
• Do not stack the units
• Maximum temperature = **60°C**
• Minimum temperature = **-10°C**
• Humidity = **90%**

ELECTRICAL CONNECTIONS

General rules

The appliance must be wired in compliance with the laws in force in the country in which it is installed. The units are supplied fully wired in the factory and pre-engineered for connection to the electricity main. The electric panel is made in compliance with the technical standards in force in the European Union.

Structure of the electric panel

All the electrical components are housed in an enclosed casing protected against adverse weather conditions. They can be inspected through the screen-printed front door. The door is locked by the door locking mechanism of the main circuit-breaker. The powering flex and ground wire (**PE**) access the panel through the opening on the left-hand side in the lower part of the side of the unit and enter the actual panel through the lower part of the junction box.

Composition of the system

The system consists of an electromechanical part formed by the power circuit (which includes the circuit-breaker, the contactors, fuse protections and transformer) and a second part formed by the microprocessor monitoring system.

NOTE: REFER TO THE WIRING DIAGRAM SUPPLIED WITH THE UNIT FOR THE LAYOUT OF THE ELECTRIC PANEL.

Electrical connections

All electrical connections must be carried out by qualified personnel in the absence of electric power. The table below gives the electrical specifications of the different constructional configurations of the units.

Compressor specifications

MOD.		50	60	70	80	90	100	115	130	145	160	180	200
Power supply	V-ph-Hz	400 - 3 - 50											
FLA [A]	CP1	20,4	22,6	25,6	31,0	31,0	37,0	37,0	45,0	45,0	60,0	60,0	82,0
	CP2	20,4	22,6	25,6	31,0	37,0	37,0	45,0	45,0	60,0	60,0	82,0	82,0
LRA [A]	CP1	118	118	140	173	173	225	225	272	272	310	310	394
	CP2	118	118	140	173	225	225	272	272	310	310	394	394
FLI [kW]	CP1	11,8	13,2	14,7	17,0	17,0	22,6	22,6	27,3	27,3	36,1	36,1	46,7
	CP2	11,8	13,2	14,7	17,0	22,6	22,6	27,3	27,3	36,1	36,1	46,7	46,7

Single Fan specifications

MOD.	50	60	70	80	90	100	115	130	145	160	180	200
Power supply [V-ph-Hz]	230 - 1 - 50				400 - 3 - 50							
FLA [A]	2,3				4,3							
LRA [A]	4,4				15,0							
FLI [kW]	0,5				2,0							

Summary specifications Fans

MOD.	50	60	70	80	90	100	115	130	145	160	180	200
Power supply [V-ph-Hz]	230 - 1 - 50				400 - 3 - 50							
FLA [A]	6,8				8,6				12,9		18,2	
LRA [A]	13,2				30,0				45,0		60,0	
FLI [kW]	1,6				4,0				6,0		8,0	

Specifications of pumping module accessory MP-AM, MP-PS and MP-SS

MOD.	50	60	70	80	90	100	115	130	145	160	180	200
Power supply [V-ph-Hz]	400 - 3 - 50											
FLA [A]	3,2	3,2	3,2	3,2	4,8	4,8	4,8	4,8	5,6	5,6	8,1	8,1
LRA [A]	20,6	20,6	20,6	20,6	37,3	37,3	37,3	37,3	57,6	57,6	63,9	63,9
FLI [kW]	1,8	1,8	1,8	1,8	2,9	2,9	2,9	2,9	3,3	3,3	4,8	4,8

ELECTRICAL CONNECTIONS

Specifications of pumping module accessory High working head MP-AM AP and MP-SS AP

MOD.	50	60	70	80	90	100	115	130	145	160	180	200
Power supply [V-ph-Hz]	400 - 3 - 50											
FLA [A]	6,2	6,2	6,2	6,2	6,2	6,2	8,1	8,1	8,1	8,1	11,0	11,0
LRA [A]	42,3	42,3	42,3	42,3	42,3	42,3	63,9	63,9	63,9	63,9	84,8	84,8
FLI [kW]	3,8	3,8	3,8	3,8	3,8	3,8	4,8	4,8	4,8	4,8	6,5	6,5

NOTES:
Values valid for **IP** and **IR** units, **BASIC** and **SILENCED** versions, **WITH** or **WITHOUT** water tank
FLA= Full load current at maximum tolerated conditions
LRA= Locked rotor current
FLI= Full load power input at maximum tolerated conditions
MIC= Maximum instantaneous current of the unit
Values relative to a **400V~3+N~50Hz** power supply voltage rating

Summary tables (total values):

Version without Pumping Module

MOD.	50	60	70	80	90	100	115	130	145	160	180	200
Power supply [V-ph-Hz]	400 - 3 +N - 50											
FLA TOTALE [A]	48,2	50,9	58,3	68,6	76,0	81,5	89,9	98,3	117	131	150	165
FLI TOTALE [kW]	25,5	27,7	31,1	35,5	43,6	49,2	53,9	58,6	69,4	78,2	90,8	101
MIC TOTALE [A]	146	147	173	211	265	270	317	325	368	382	470	485

Version with Pumping Module MP-AM and MP-PS

MOD.	50	60	70	80	90	100	115	130	145	160	180	200
Power supply [V-ph-Hz]	400 - 3 +N - 50											
FLA TOTALE [A]	51,4	54,1	61,5	71,8	80,8	86,3	94,7	103	123	137	158	173
FLI TOTALE [kW]	27,2	29,4	32,8	37,2	46,5	52,1	56,8	61,5	72,7	81,5	95,6	106
MIC TOTALE [A]	149	150	176	214	269	275	322	330	373	388	479	493

Version with Pumping Module MP-AM High

MOD.	50	60	70	80	90	100	115	130	145	160	180	200
Power supply [V-ph-Hz]	400 - 3 +N - 50											
FLA TOTALE [A]	54,4	57,1	64,6	74,9	82,2	87,8	98,1	106	125	140	161	176
FLI TOTALE [kW]	29,2	31,4	34,8	39,2	47,3	53,0	58,7	63,4	74,2	83,0	97,3	108
MIC TOTALE [A]	152	153	179	217	271	276	325	334	376	390	481	496

ELECTRICAL CONNECTIONS

1) Connection to the electricity main

• Feeder line;
The feeder line of the machine must follow a well defined route without interruptions. Run the line through the precut hole at the bottom of the right panel on the machine. It is advisable to use a cable gland, to secure the line to the machine structure. Now route the line inside the compressor compartment until it reaches the hole in the bottom of the electric panel. Here again, make sure you use an adequately sized cable clamp, **use a high temperature cable or sheath, not place the cable or sheath on the compressors.**
Connect the conductors straight to the input terminals of the main circuit-breaker of the machine.
• Powering system;
The power cables of the feeder line of the machine must come from a symmetric threephase voltage system complete with neutral conductor and separate protection conductor.

V= 400V ± 10%
f= 50 Hz

• Protection on supply side;
An automatic switch must be installed on the supply side of the side in order to protect against any overcurrents and indirect contacts that could occur when the machine is operating.
It is advisable to install an automatic current limiter switch in order to limit the effective short-circuit current in the connecting point of the machine. This allows a protection device with a lower breaking capacity than that required in the connection point to be sized like the main circuit-breaker of the machine.
The line and switch must be coordinated in compliance with the current laws governing electrical safety matters, regarding the type of installation and environmental conditions in which the machine must operate.
• Protection conductor (ground wire);
The protection conductor from the feeder line must be connected straight to the ground screw identified by code "**PE**", which ensures the equipotential connection of all metal grounding points and structural parts of the machine.
• Neutral conductor:
The neutral conductor in the feeder line must be connected to the neutral conductor identified by the letter "**N**" corresponding to the fourth pole of the main panel circuit-breaker.

2) Electric panel

• Protection degree:
The electric panel casing is made of galvanised sheet metal and has an IP54 protection degree in corre spondence to the door, which can be directly accessed from outside. The other parts of the casing guarantee a protection degree that is at least equivalent to **IP22**, as established by the current laws in force: this has been achieved since the panel has further protection against the penetration of solid foreign bodies and atmospheric agents thanks to the machine structure in which it is housed.
• Starting and stopping function:
The red handle on the panel door directly acts on the main circuit-breaker. The handle also acts as a door lock since it ensures that the machine is only powered when the door is shut. The stopping function carried out by the main circuit-breaker is classified as type "0" since the machine is stopped by immediately cutting off the power supply.
• Emergency function:
The handle also acts as an emergency stop since it can be directly accessed from outside and is also evident owing to its red colour.

3) Reference standards
• The provisions established by the following Directives have been complied with to ensure the safety of the electrical products placed on the European Union market:
- Low Voltage Directive **2006/95 EEC** which also includes the following harmonized standards:
CEI EN 60335-1 and **60335-2-40**.
Classification:**CEI EN 60204-1**. Safety of machinery. Electrical equipment of machines. Part 1:
General rules.
- Directive **2004/108/EEC** concerning "**Electromagnetic compatibility**".

WET CONNECTIONS

General rules

A mesh filter (hole Ø £ 500 µm) must be installed on the unit's water inlet otherwise warranty is immediately forfeited for units with either the standard or the complete pipe kit and MP-PS. The filter performs the function of blocking any foreign matter in the system's plumbing circuit (shavings, machining debris, etc.). This prevents the plate exchanger water pipes from clogging then possibly freezing (and therefore bursting). This filter is included in the unit equipped with the pumping module accessory.

Comply with the local laws governing safety matters in order to correctly design the hydraulic circuit. The following information gives suggestions on how to correctly install the unit.

1) Standard supply.

• Standard supply includes a differential pressure switch situated between the water inlet and outlet of the plate exchanger to avoid freezing if the water flow stops for any reason.
Activation is calibrated for a **105 mbar ±5 Δp**, while resetting occurs with a **Δp** of **80 mbar ±5**.

2) With pumping module accessory.

• Besides the standard accessories, the unit is equipped with all the hydraulic components, as specified in the "**Options and accessories**" section.

Hydraulic layout of the system

General suggestions

• The pipes must have the least possible number of bends to minimize load losses and must be adequately supported in order to prevent the connections of the unit from being excessively stressed.
• Install on-off valves near components that need to be serviced to isolate them when maintenance work needs to be done and to allow them to be replaced without having to discharge the system.
• Before isolating the pipes and charging the system, carry out preliminary inspections to make sure that there are no leaks.
• Isolate all the chilled water pipes to prevent condensation from forming along the pipes themselves. Make sure that the material used is the steam barrier type, failing this, cover the insulation with an appropriate protection. Also make sure that the air venting valves can be accessed through the insulation.
• Do not forget to install or at least allow for the installation of pressure and temperature reading instruments on the inlet and outlet parts of the hydraulic circuit. These instruments will allow you to monitor the operation of the system.
• The circuit can be kept under pressure by means of an expansion tank (with which the unit is equipped if the pumping module accessory is installed) and a pressure reducer. A plant filling unit can also be used in order to automatically charge the system and keep it at the desired pressure if it drops below a certain pressure value. Install manual or automatic values in the highest point of the system to eliminate air from the circuit.

Fit manual or automatic valves at the highest point in the circuit in order to vent air from the circuit.

• Depending on the chosen accessory, there may be male threaded connections or Victaulic-type joints for hooking up to the unit. The joints allow the pipes to expand due to changes in temperature and in addition the elastomer gasket and the specified play help insulate and absorb noise and vibration.
• If anti-vibration mounts are installed under the unit, it is recommended to use flexible couplings before and after the water circulation pump and near the unit.
• Install a cock on the outlet of the unit in order to regulate the water flow.

Precautions for the Winter

The water could freeze and damage the exchanger of the unit and other parts of the system during the winter period, if the system was to remain at a standstill. This problem can be obviated in 3 different ways:

1. Drain the system completely, taking care to drain the plate exchanger (in order to drain the unit's plumbing system completely, open the water drain ball valves and the air vent valves).

2. Operate with glycol water taking account, depending on the % of glycol, of the factor of correction of the refrigerating capacity, power input, water flow rate and losses of head (see table on following page)

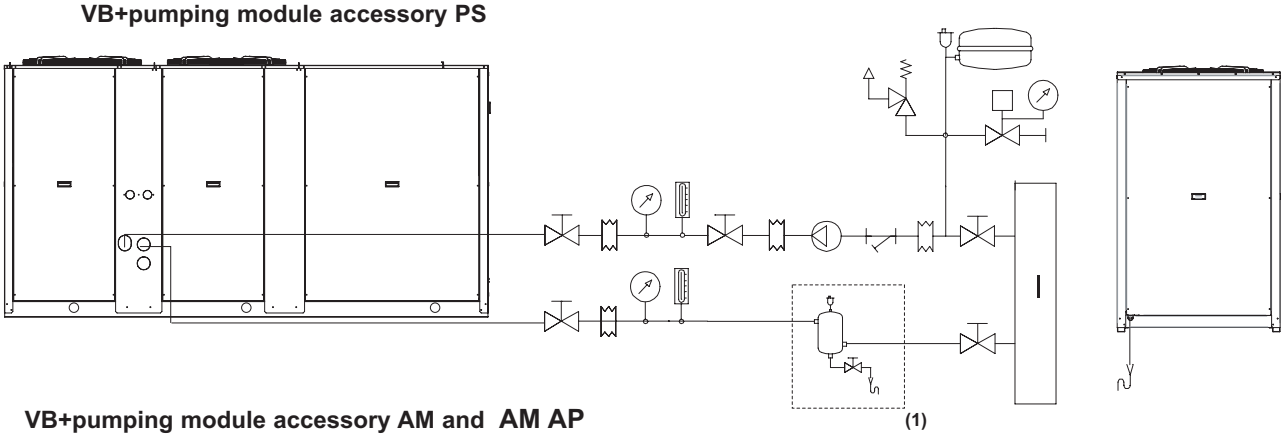
3. If it is certain that the unit will always be powered throughout the winter, the unit is able to protect itself from freezing, down to a temperature of -20°C: this is possible thanks to an antifreeze electric heating element installed on the plate exchanger and intelligent control of the water pump that must be governed by the microprocessor board (see the “Electric Connections” section). If the unit is fitted with a Storage tank, solution no. 3 requires installing the tank antifreeze heating element accessor

WET CONNECTIONS

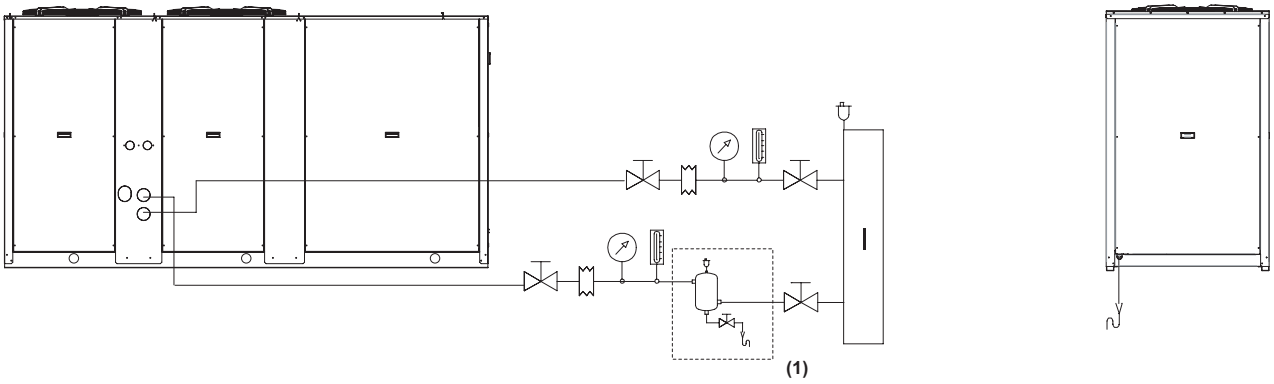
Basic diagram Standard Unit VB [COLD WATER CIRCUIT]

The following figures represent connections to the evaporator circuit.
IMPORTANT: There must be a constant flow of water to the exchanger. With accessory primary-secondary pumping module MP-PS is mandatory to install a water filter in the secondary circuit immediately before of the water tank.

VB+pumping module accessory PS



VB+pumping module accessory AM and AM AP



(1): Component not required if the unit is equipped with the “Water storage tank” accessory. Installation of this accessory is recommended if the unit is without it.

I = User system

- Pressure gauge
- Pump
- Breather valve
- Coupling
- Thermometer
- Filter
- Safety valve
- Water filling unit
- On-off and/or water flow rate regulating valve
- Tank(1)
- Siphon

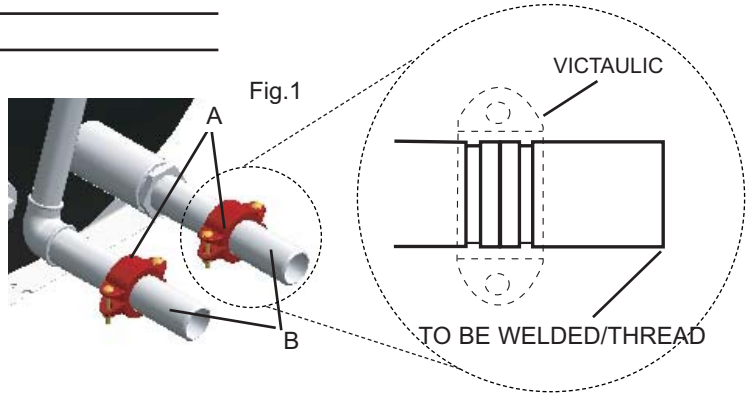
Air vent and water drain

On the plumbing circuit feeding the unit, especially when equipped with the standard pipe kit, the installer must fit an appropriate number of valves (manual or automatic) at the top of the circuit in order to vent any air in the plumbing system. In the same way, he must install a water drain valve in order, when necessary, to drain the unit's plate exchanger completely (especially during the winter in order to prevent freezing that would seriously jeopardize the operation of the unit). For units with the complete pipe kit there is an air vent valve on the top pipe (water inlet) and a water drain valve on the bottom pipe (water outlet). See “Accessories and options” section.

Plumbing connection with Victaulic couplings

It is composed of two Victaulic type quick couplers (Fig. 1-A) comprehensive of union (Fig. 1-B) and seal not installed (supplied with the unit). The unions are supplied to be welded on the end. Here we give the instructions to follow for installing the quick couplers.

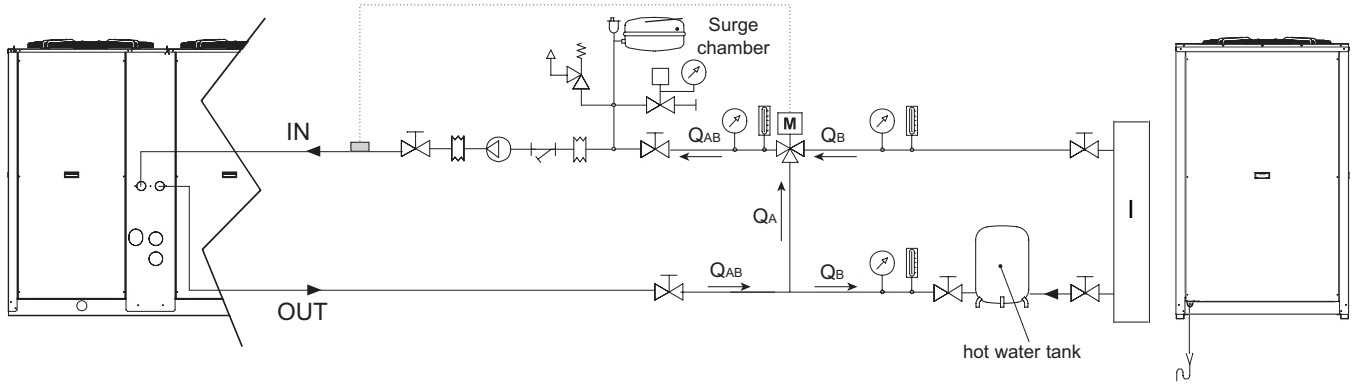
Fig.1



WET CONNECTIONS

Basic diagram for units with Desuperheater [HOT WATER CIRCUIT]

The basic diagram given is valid for VD version
The figure below shows the basic diagram of the portion of the system with the heat exchanger used for recovering partially heating power that would otherwise be disposed of in the air.

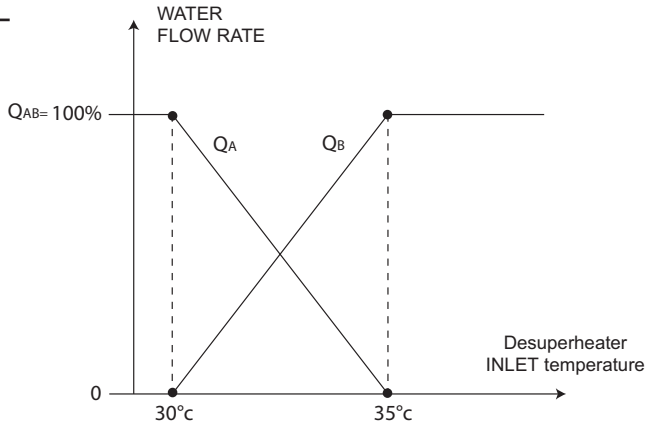


I = User system

- Pressure gauge
- Pump
- Coupling
- Venting valve
- Thermometer
- Filter
- Water filling unit
- Safety valve
- On-off and/or water flow regulating valve
- Three-way driven valve
- Desuperheater water flow inlet probe
- Monitoring electronics (governor)

Valve regulating diagram valve

To prevent problems from occurring when the machine is started with very cold water, you are strongly advised to install a mixer valve as shown in the diagram.
The valve must be regulated to suit the temperature at which the water flows into the desuperheater (see diagram): the graph on the right shows the type of adjustment to use.



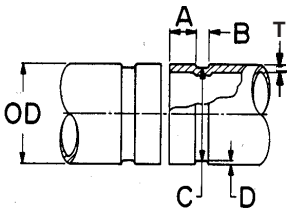
WET CONNECTIONS

ISO-G	DN(mm)	EXTERNAL DIAMETER OD(mm)	A	B	O	D	T
1”	25	33.7	15.875	7.137	30.226	1.600	1.651
1 1/4”	32	42.4	15.875	7.137	38.989	1.600	1.651
1 1/2”	40	48.3	15.875	7.137	45.085	1.600	1.651
2”	**50**	**60.3**	**15.875**	**8.738**	**57.150**	**1.600**	**1.651**
2 1/2”	**65**	**76.1**	**15.875**	**8.738**	**72.260**	**1.981**	**2.108**
3”	80	88.9	15.875	8.738	84.938	1.981	2.108
4”	100	114.3	15.875	8.738	110.084	2.108	2.108
5”	125	139.7	15.875	8.738	135.500	2.134	2.769
6”	150	168.3	15.875	8.738	163.957	2.159	2.769
8”	200	219.1	19.050	11.913	214.401	2.337	2.769

1) Pipe groove inspections

Check the depth and diameter of the grooves and their distance from the pipe ends. Make sure that the work has been carried out with care and that the end surface of the pipes is smooth and not ovalized.

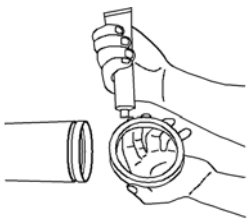
Make sure that there are no notches, burrs or other imperfections that could impair the tightness. Groove dimensions in mm **A**=16-**B**=8-**C**=57.2-**D**=1.6



2) Checking the seal and relative lubrication

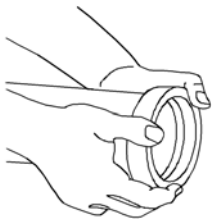
Make sure that the type of seal used is compatible with the nature and temperature of the fluid. Signal green **EPDM** seals are used.

Apply a film of grease to the seal: on the back, on the side flanks and on the inner lips that contact the pipe. Work in conditions of the utmost cleanliness as particles of dirt could damage the seal. Always and only use synthetic grease. Greasing makes it easier to fit the seal on the pipe and improves the tightness. It also allows the seal to slide within the connection, avoiding tensions and projections near the bolts.



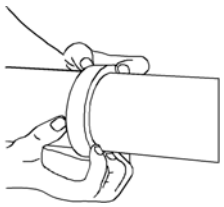
3) How to fit the seal

Fully insert the seal into the end of a pipe. Make sure that the seal lips adhere to the pipe itself.



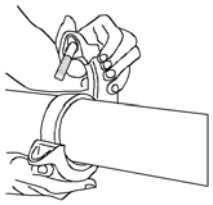
4) Alignment

Align the pipes and move their ends near to each other. Now push the seal, centering it on the two pipe ends. The seal must remain inside the grooves.



5) Joint assembly

Remove one bolt and loosen (without removing) the other one. Seat part of the body of the joint at the bottom, between the pipe ends, inserting and edges of the grooves. Now seat the other part of the body at the top, on the two ends, and close the joint. Make sure that the parts of the body of the joint touch each other.

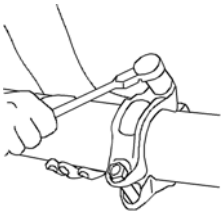


6) Nut torquing

Fit the previously removed bolt back in place and tighten both nuts by hand. Now torque them with the relative wrench, tightening them alternately a few turns.

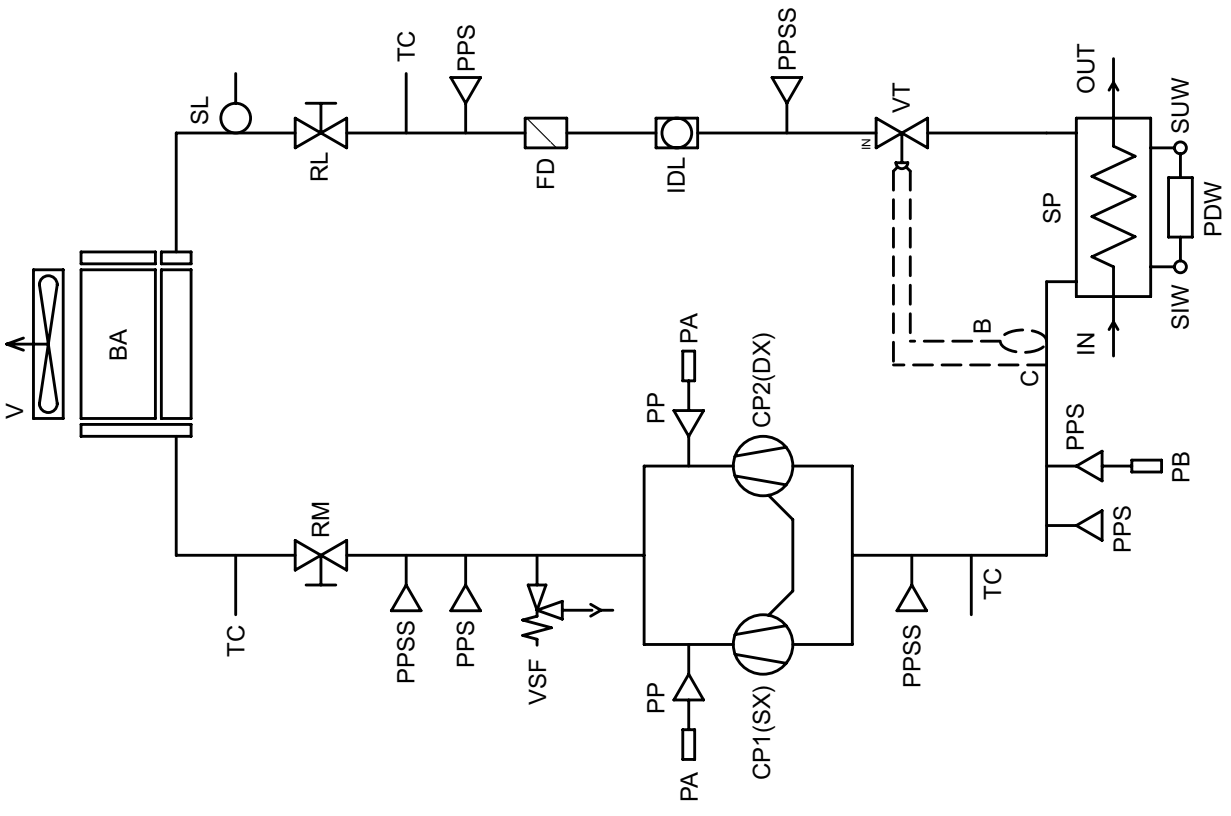
WARNING:

If one nut is fully tightened at a time, the seal could slip between the jaws of the opposite side of the joint.



Refrigerant flow diagram basic version in cooling mode IR

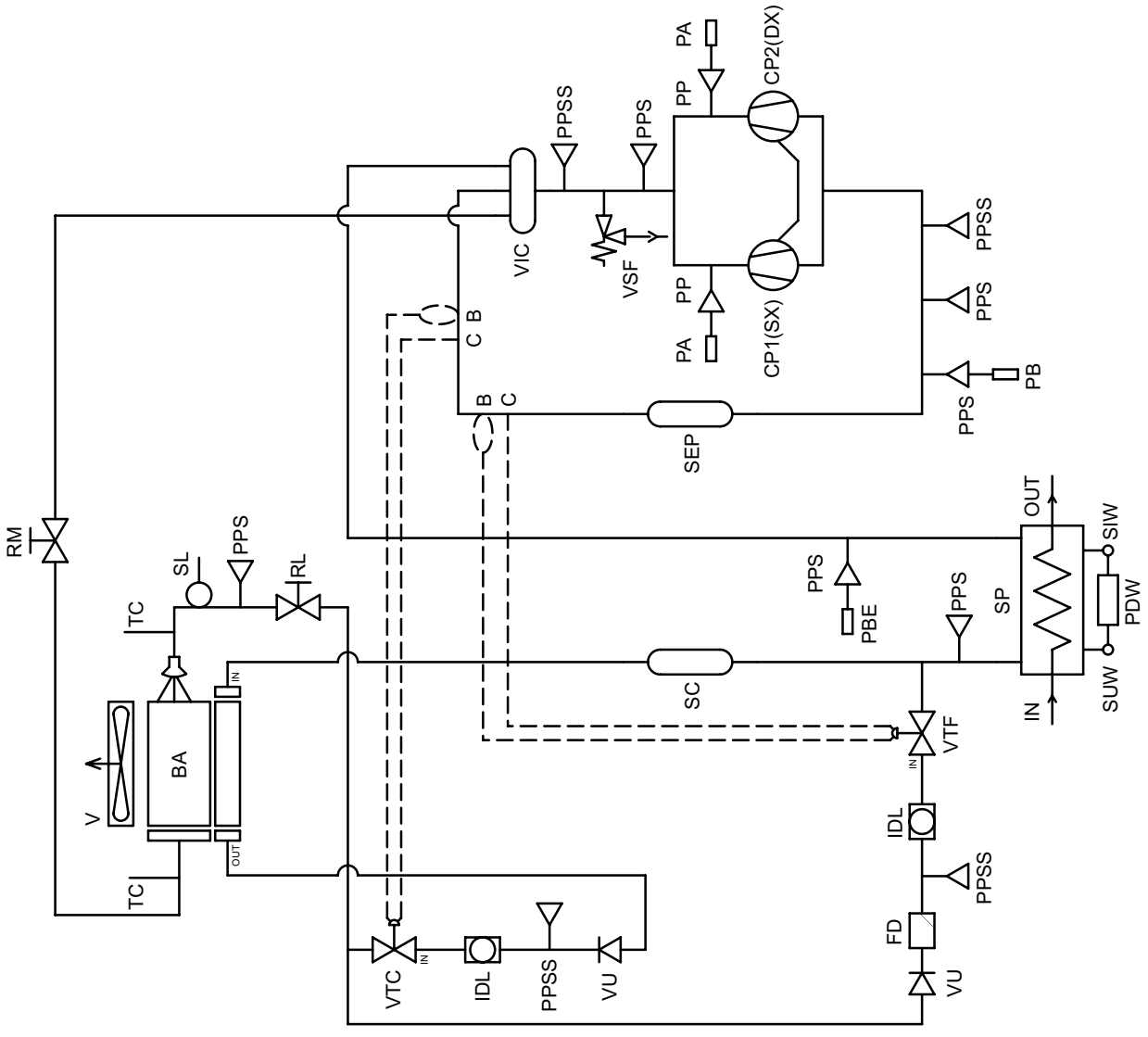
	Descrizione	Description
BA	BATTERIA ALETTATA	FIN AND TUBE COIL
CP	COMPRESSORE	COMPRESSOR
FD	FILTRO DEIDRATORE	FILTER DRIER
IDL	INDICATORE LIQUIDO E UMIDITA'	LIQUID AND MOISTURE INDICATOR
PA	PRESSOSTATO DI ALTA	HIGH PRESSURE SWITCH
PB	PRESSOSTATO DI BASSA	LOW PRESSURE SWITCH
PDW	PRESSOSTATO DIFFERENZIALE ACQUA	WATER PRESSURE SWITCH
PP	PRESA DI PRESSIONE ½" SAE SENZA SPILLO	PRESSURE SOCKET 1/4" SAE WITOUT CORE
PPS	PRESA DI PRESSIONE 1/4" SAE CON SPILLO	PRESSURE SOCKET 1/4" SAE WITH CORE
PPSS	PRESA DI PRESSIONE 5/16" SAE CON SPILLO	PRESSURE SOCKET 5/16" SAE WITH CORE
RL	RUBINETTO DEL LIQUIDO	LIQUID BALL VALVE
RM	RUBINETTO DI MANDATA	COMPRESSOR OUTLET BALL VALVE
SIW	SONDA INGRESSO ACQUA	WATER INLET PROBE
SL	SONDA DEL LIQUIDO	LIQUID PROBE
SP	SCAMBIATORE A PIASTRE	PLATE HEAT EXCHANGER
SUW	SONDA USCITA ACQUA	WATER OUTLET PROBE
TC	TRONCHETTO DI CARICA	CHARGING TUBE
V	VENTILATORE	FAN
VSF	VALVOLA DI SICUREZZA CIRCUITO FRIGO	SAFETY VALVE
VT	VALVOLA TERMOSTATICA	EXPANSION VALVE



WET CONNECTIONS

Refrigerant flow diagram basic version in heating mode IP

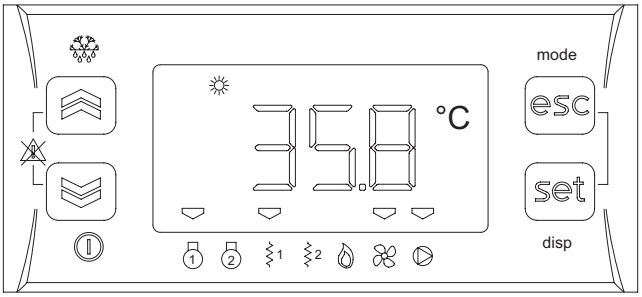
	Descrizione	Description
BA	BATTERIA ALETTATA	FIN AND TUBE COIL
CP	COMPRESSORE	COMPRESSOR
FD	FILTRO DEIDRATORE	FILTER DRIER
IDL	INDICATORE LIQUIDO E UMIDITA'	LIQUID AND MOISTURE INDICATOR
PA	PRESSOSTATO DI ALTA	HIGH PRESSURE SWITCH
PB	PRESSOSTATO DI BASSA	LOW PRESSURE SWITCH
PBE	PRESSOSTATO DI BASSA EVAPORATORE	EVAPORATOR LOW PRESSURE SWITCH
PDW	PRESSOSTATO DIFFERENZIALE ACQUA	WATER PRESSURE SWITCH
PP	PRESA DI PRESSIONE 1/4" SAE SENZA SPILLO	PRESSURE SOCKET 1/4" SAE WITHOUT CORE
PPS	PRESA DI PRESSIONE 1/4" SAE CON SPILLO	PRESSURE SOCKET 1/4" SAE WITH CORE
PPSS	PRESA DI PRESSIONE 5/16" SAE CON SPILLO	PRESSURE SOCKET 5/16" SAE WITH CORE
RL	RUBINETTO DEL LIQUIDO	LIQUID BALL VALVE
RM	RUBINETTO DI MANDATA	COMPRESSOR OUTLET BALL VALVE
SC	RICEVITORE DI LIQUIDO	LIQUID RECEIVER
SEP	SEPARATORE DI LIQUIDO	LIQUID SEPARATOR
SIW	SONDA INGRESSO ACQUA	WATER INLET PROBE
SL	SONDA DEL LIQUIDO	LIQUID PROBE
SP	SCAMBIATORE A PIASTRE	PLATE HEAT EXCHANGER
SUW	SONDA USCITA ACQUA	WATER OUTLET PROBE
TC	TRONCHETTO DI CARICA	CHARGING TUBE
V	VENTILATORE	FAN
VIC	VALVOLA INVERSIONE CICLO	REVERSING CYCLE VALVE
VSF	VALVOLA DI SICUREZZA	SAFETY VALVE
VTC	VALVOLA TERMOSTATICA "RAMO" CALDO	HEAT PUMP EXPANSION VALVE
VTF	VALVOLA TERMOSTATICA "RAMO" FREDDO	COOLING EXPANSION VALVE
VU	VALVOLA UNIDIREZIONALE	CHECK VALVE



ADJUSTMENT AND CONTROL

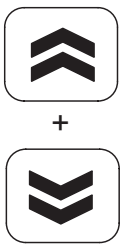
Control system

The unit is managed by a **microprocessor controller** to which all the loads and control devices are connected by means of a terminal block. The user interface comprises a display and four buttons with which it is possible to show and possibly modify all the unit's operation parameters. The interface, located in the front part of the unit and accessible from the outside, is protected by a transparent plastic door. A remote control having all the same functions as the interface fitted on the unit is available as an accessory.



Every button provides for :
- a **direct function** : indicated on the button itself and obtained by pressing the button
- an **associated function** : indicated on the front of the instrument at the corresponding button and obtained by prolonged pressing (3 seconds) of the button
- a **combined function** : obtained by pressing 2 buttons at the same time

Button		Direct function	Associated function	
	UP	Increase value of selected parameter Scroll menu up		Manual defrost
	DOWN	Decrease value of selected parameter Scroll menu down	-	-
esc	ESC	Go to menu higher level without saving the modification	mode	Access the "Operation mode" menu
set	SET	Go to menu higher level and save the modification Go to menu lower level Access the "Status" menu	disp	Changing the display value
	ALL	Alarm deactivation	-	-

Button		Combined function	
	UP + DOWN		Manual reset
esc + set	ESC + SET		Access the "Programming" menu

ADJUSTMENT AND CONTROL

Display
The following are shown in normal display :

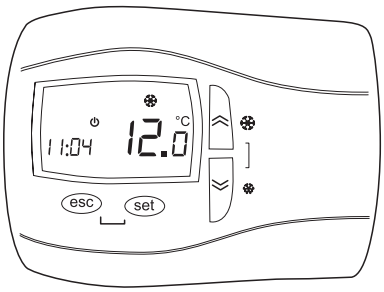
• adjustment temperature, or unit outlet water temperature (in degrees Celsius with decimal point)

• alarm code, if at least one is activated (in case of several alarms the code of the first according to the Table of Alarms is displayed)

In menu mode the display depends on its position (see menu structure).

	Icon	Description	Colour	On fixed	On flashing
Operation status and modes	⚠	Alarm	Red	Alarm in progress	Alarm deactivated
	☀	Heating	Green	Heating mode from keyboard	Heating mode from remote
	❄	Cooling	Green	Cooling mode from keyboard	Cooling mode from remote
	⏻	Standby	Green	Standby from keyboard	Standby from remote
	❄	Defrost	Green	Defrost in progress	-
		Economy	Green	not used	-
Unit of measure		Clock	Red	Time display format 24.00	Time setting format 24.00
	°C	Centigrade degrees	Red	Unit of measure of selected parameter	-
	Bar	Bar	Red	not used	-
	%R.H.	Relative humidity	Red	not used	-
	ABC	Menu	Red	Menu browsing	-
Users	①	Compressor 1	Amber	User activated	Safety timing
	②	Compressor 2	Amber	User activated	Safety timing
	③	not used	-	-	-
	④	not used	-	-	-
		Antifreeze heater Supplementary heating element 1st step	Amber	User activated	Safety timing
		Fans	Amber	User activated	Safety timing
		Pumps	Amber	User activated	Safety timing

Remote control



Suitable for wall mounting, it has all the functions of the standard interface fitted on the unit.
The buttons, functions associated with the buttons and the display indications are the same as those provided for the standard interface.
All configuration and control operations are further facilitated by the double display which allows the name and value of the selected parameter to be shown at the same time.

Refer to the enclosed manual for the installation and connection procedures and operating instructions.

ADJUSTMENT AND CONTROL

Menu structure

The control system provides for three menus with tree structure.

Menu	Access procedure	Submenu	Parameters	Available functions
Operation mode	Press (prolonged)  (ESC button associated function)	StbY	-	Change operation mode
		HEAt		
		COOL		
UP button	Press  (UP button direct function)	-	-	Value increases, the next label
DOWN button	Press  (DOWN button direct function)	-	-	Value decreases, the next label
Main view (disp)	Press (prolonged)  (SET button direct function)	AI.	AIL1	Display input AI1
			AIL2	Display input AI2
			AIL3	Display input AI3
			AIL4	Display input AI4 (se abilitato)
			AIL5	Display input AI5 (se abilitato)
		rtC	-	Visualizzazione orologio
		SEtP	-	Visualizzazione set-point impostato
		SEtr	-	Visualizzazione set-point reale
Status	Pres  (SET button direct function)	AI.	AIL1	Display input AI1
			AIL2	Display input AI2
			AIL3	Display input AI3
			AIL4	Display input AI4
			AIL5	Display input AI5
		di.	diL1	Display input DI1
			diL2	Display input DI2
			diL3	Display input DI3
			diL4	Display input DI4
			diL5	Display input DI5
			diL6	Display input DI6
		AO	tCL1	-
			AOL1	Display output AO1
			AOL2	Display output AO2
			AOL3	Display output AO3
			AOL4	Display output AO4
			AOL5	Display output AO5
		dO	dOL1	Display output DO1
			dOL2	Display output DO2
			dOL3	Display output DO3
			dOL4	Display output DO4
			dOL5	Display output DO5
			dOL6	Display output DO6
		CL	HOUr	Adjusting clock : hour
			dAtE	Adjusting clock : data
			YEAr	Adjusting clock : year
			HEAt	Viewing and setting set-point: heating
			COOL	Viewing and setting set-point: cooling
			HEAt	Display set-point real: heating
			COOL	Display set-point real: cooling
			CPO1	Viewing compressor 1 operating hours
			CPO2	Viewing compressor 2 operating hours
			PUO1	Viewing hours operating pump 1
			PUO2	Viewing hours operating pump 2

ADJUSTMENT AND CONTROL

Menu	Access procedure	Submenu		Parameters	Available functions
Programming	Press **ESC + SET at the same time**  (combined function buttons ESC + SET)	PAr	CL	CL20	Offset probe SIW (ST1) - input AI1
				CL21	Offset probe SIW (ST2) - input AI2
				CL22	Offset probe SIW (ST3) - input AI3
				CL23	STAE offset probe (S1) - input AI4
				CL24	Input Offset AI5 (S2)
			CF	CF01	Selection Protocol COM1 (TTL)
				CF20	Protocol controller address Eliwell
				CF21	Family Controller Protocol Eliwell
				CF30	Address Controller Modbus Protocol
				CF31	Baud rate serial output
				CF32	Protocol Modbus Parity
			Ui	Ui10	Selecting main view
			Ui	Ui11	Selecting main display remote terminal
			tr	tr10	Set point in cooling
				tr11	Minimum set point in cooling
				tr12	Maximum set point in cooling
				tr13	Hysteresis in cooling
				tr15	Differential set point in cooling
				tr20	Set point in heating
				tr21	Minimum set point in heating
				tr22	Maximum set point in heating
				tr23	Hysteresis in heating
				tr25	Differential set point in heating
			Pi	Pi01	Interval of inactivity pump anti-lock
				Pi03	Minimum time to pump up anti-lock
				Pi50	Approval with antifreeze pump
				Pi51	Set-point with antifreeze pump
				Pi52	With hysteresis antifreeze pump
			Hi	Hi20	Enabling integrative resistance
				Hi10	Set-point electrical resistance with antifreeze
				Hi15	Hysteresis antifreeze with electrical resistance
				Hi22	Differential resistance integrative
				Hi25	Hysteresis resistance integrative
				Hi26	2nd step differential resistance integrative
			dF	dF11	Set-point start counting defrost
				dF13	Cumulative counting time defrost
				dF30	Enabling dynamic defrost
			dS	dS00	Enabling climate
				dS01	Proportional band (cooling)

ADJUSTMENT AND CONTROL

Menu	Access procedure	Submenu		Parameters	Available functions
				d502	Proportional band (heating)
				d503	Differential maximum (cooling)
				d504	Differential maximum (heating)
				d505	Set start-point adjustment (cooling)
				d506	Set-point adjustment starting (heating)
			AL	AL51	Set-point alarm antifreeze
			AL	AL52	Antifreeze alarm hysteresis
		FnC		dEF	Manual defrost
		FnC		tA	Silence alarms
		FnC	St	OFF	Change in OFF state
		FnC	St	On	Change in status ON
		FnC	CC	UL	Upload program parameters
		FnC	CC	dL	Download the program parameters
		FnC	CC	Fr	Format Multi Function Key
		FnC		EUr	Reset historical alarms, long press button 
		PASS		-	Enter password (111)
		EU		-	Viewing historical alarms
Alarm silence	Pressure contemporary buttons  (combined function UP+DOWN button)	-	-	-	Manual
Manual defrost	Long press button  (UP button function associated)	-	-	-	Enable manual defrost

Press SET to go from one level to that below. Press ESC to go to higher level.
Press the UP and DOWN buttons respectively to scroll the menu up and down inside the same level.

Press the UP and DOWN buttons to modify the value of the selected parameter. Press SET to confirm the modification. Press ESC to not confirm the modification.

Inputs and outputs

To monitor the unit, the controller has the following inputs and outputs :
- Analogue inputs : 4
- Digital inputs : 5
- Analogue outputs : 1
- Digital outputs : 6

DESCRIPTION			CHARACTERISTICS
Analogue inputs			
AI1	SIW	water inlet probe	NTC temperature sensor (-30°C ÷ 90°C)
AI2	SUW	water outlet probe	NTC temperature sensor (-30°C ÷ 90°C)
AI3	SL	liquid probe	NTC temperature sensor (-30°C ÷ 90°C)
AI4	STAE / IN CF1	outside air probe / remote ON/OFF - S/W.-demand limit-economy	NTC temperature sensor (-30°C ÷ 90°C) / DIG IN
AI5	IN CF2	see AI5 on "digital inputs"	configured as digital input
- Input AI4 is factory-set as not enabled. Its configuration for specific use must be carried out at the time of installation according to the needs of the moment, modifying the configuration by parameter. - Input AI5 is factory-set as neutral and its configuration for specific use must be carried out at the time of installation according to the needs of the moment, modifying theconfiguration by parameter. **Modification and parameter configuration operations must only be carried out by an authorised service centre or by competent personnel.**			
Digital inputs			
DI1	TC1*	Thermal switch compressor 1 – thermo-statted delivery 1 –high pressure switch	Digital input with voltage-free contact
DI2	TC2*	Thermal switch compressor 2 –thermo-statted delivery 2 – high pressure switch	Digital input with voltage-free contact
DI3	PB +SEQ + TV	Low pressure switch + sequence meter + fan thermal switch	Digital input with voltage-free contact
DI4	TP1	Thermal switch pump 1	Digital input with voltage-free contact
DI5	TP2	Thermal switch pump 2	Digital input with voltage-free contact
DI6	P.diff.	Differential pressure switch	Digital input with voltage-free contact
AI5-IN DIG	Multiconf.	remote ON/OFF - S/W.-demand limit-economy	Analogue input configured as digital
*refer to section alarms. ER10-ER11 for more details Note for input ID5 thermal switch pump 2. If only one pump is used and only one thermal switch is required, ID5 can be used as an additional multiconf. input for Remote ON/OFF - S/W.-demand limit-economy. In this way it is possible to have both the - remote ON/OFF, and - S/W - demand limit – economy - External probe ID5 is factory-configured as pump 2 thermal switch. To modify the configuration, refer to the section “configurable inputs setting”.			

DESCRIPTION			CHARACTERISTICS
ANALOGUE OUTPUTS			
AO1	VE	Fans	pwm signal for control of single-phase fans in phase cut
AO4	VE	Fans	signal 0-10V for control of three-phase fans in phase cut
DIGITAL OUTPUTS			
DO1	CP1	Compressor 1	2A resistive relays
DO2	CP2	Compressor 2	2A resistive relays
DO3	VIC	Reverse cycle valve	2A resistive relays
DO4	RSC-RAG-RE1	Antifreeze resistance – support 1st step	2A resistive relays
DO5	ALL	Alarm relay	Open collector - 12Vdc max 35mA
DO6	RE2	Resistance support 2nd step	2A resistive relays
AO2	P1	Relay pump 1 (using 12Vdc external relay)	Open collector - 10Vdc max 20mA
AO3	P2	Relay pump 2 (using 12Vdc external relay)	Open collector - 10Vdc max 20mA
Note: AO2 is analogue output configured as digital			

Controller technical data

Description	Typical	Minimum	Maximum
Power supply voltage	12.0 V~	10.8 V~	13.2 V~
Power supply frequency	50 Hz / 60 Hz	-	-
Power	6 VA	-	-
Insulation class	2	-	-
Protection rating	Frontal IP0	-	-
Ambient operating temperature	25 °C	-10 °C	60 °C
Ambient operating humidity (non-condensing)	30 %	10 %	90 %
Ambient storage temperature	25 °C	-20 °C	85 °C
Ambient storage humidity (non-condensing)	30 %	10 %	90 %

Alarms

Alarm activation and reset
The controller can perform a complete diagnosis of the unit, detecting all operation faults and signalling a number of alarms.
Activation of an alarm involves :
• blocking of users concerned
• signalling of alarm code on the display (in case of simultaneous alarms the one with the lowest index is displayed whereas the complete list of active alarms can be shown by accessing the “Status \ AL”) menu
• recording of event in the alarms history

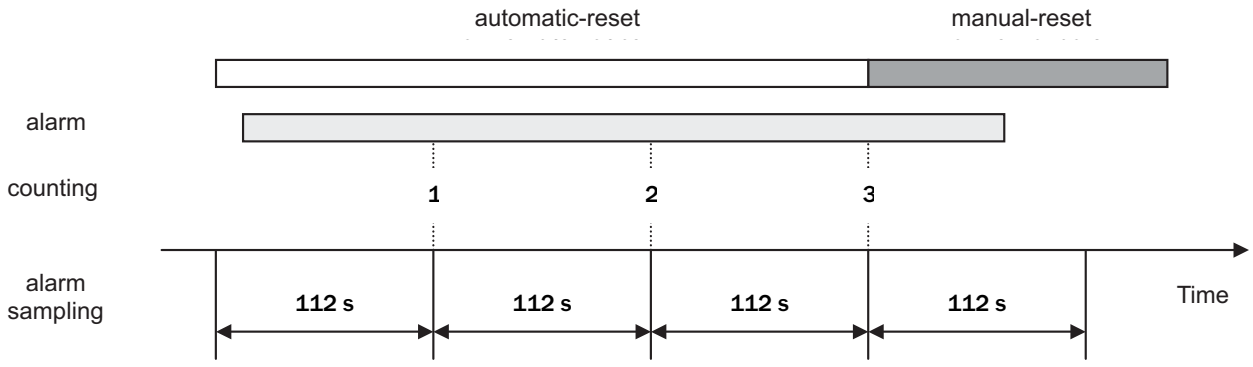
Alarms that can damage the unit or system require **manual resetting** or an action by the operator to reset the controller (pressing the UP and DOWN buttons at the same time). It is advisable to carefully check the cause of the alarm and make sure the problem is eliminated before restarting the unit. In any case the unit restarts only if the cause of the alarm has ended.

Less critical alarms are **automatic reset.** As soon as the cause is eliminated the unit starts working again and the alarm code disappears from the display. Some of these alarms become manual reset if the number events per hour exceeds a fixed limit.

Press any button to **deactivate the alarm** : alarm signalling disappears from the display, the alarm LED starts flashing and the Alarm digital output is disabled. This operation does not affect the alarm in progress.

Number of events per hour
The counting of events per hour is provided for some alarms : if the number of events reaches a fixed limit in the last hour, the alarm goes from automatic to manual reset.
Sampling of alarms occurs every 112 seconds. If an alarm is activated several times in a sampling period (112 seconds) it is counted only once.

Example. If an number of events per hour equal to 3 is set, it must have a duration of between 2*112 seconds and 3*112 seconds so that the alarm goes from automatic to manual reset.



Alarms history
The controller enables the recording of alarms occurring during unit operation (up to a max. of 99 events). The following are memorised for each event :
- alarm code
- input time
- input date
- output time
- output date
- type of alarm (automatic or manual reset)

This information can be shown by accessing the “Programming \ EU” menu.
When the number of events memorised is more than 99, alarm Er90 is generated and the subsequent events are memorised overwriting the oldest alarms.
The alarms history can be cancelled by means of the Eur function available inside the “Programming \ FnC” menu.

Table of alarms

Code	Alarm		Type of alarm	input	COMPRESSORS	EXCHANGER FANS (WITH LOSS)	PRIMARY CIRCUIT PUMPS	EXCHANGER RESISTANCES PRIMARY	AUXILIARY OUTPUT
Er05	Low pressure -sequence meter + fans thermal switch		A/M (2)	ID3	OFF	OFF			
Er 10*	Compressor 1 thermal protection	High pressure	M	ID1	OFF comp.1				
Er 11*	Compressor 2 thermal protection		M	ID2	OFF comp.2				
Er20	Primary circuit water differential pressure switch		A/M	ID6	OFF		OFF if manual-reset	OFF	
Er21	Primary circuit pump 1 thermal protection		M	ID4	OFF	OFF	OFF p.1	OFF	
Er22	Primary circuit pump 2 thermal protection		M	ID5	OFF	OFF	OFF p.2	OFF	
Er30	Primary circuit antifreeze		M	AI2	OFF				
Er45	Clock fault error		A						
Er46	Clock to be set error		A						
Er47	Remote keyboard communication error		A						
Er60	Primary exchanger inlet water temperature probe fault		A	AI1	OFF	OFF	OFF	OFF	OFF
Er61	Primary exchanger outlet water temperature probe fault		A	AI2	OFF	OFF	OFF	OFF	OFF
Er62	Liquid temperature probe		A	AI3					
Er68	External air temperature probe fault		A	AI4					
Er80	Configuration error		A		OFF	OFF	OFF	OFF	OFF
Er90	Recordings for alarms history exceeded signalling		M						

Notes:
(1) A = automatic reset, M = manual reset
(2) Only when the alarm becomes manual reset

Er05 Low pressure – Sequence meter
The alarm becomes manual reset when the number of events per hour is more than 3.
The alarm is bypassed for 120 seconds from activation of the compressor or the reverse cycle valve.

Er20 Differential pressure switch
The alarm is activated if the associated digital input remains activated for at least 5 seconds and automatically resets if the digital input remains not activated for at least 3 seconds. The alarm becomes manual reset if the digital input remains activated for more than 10 seconds.
The alarm is bypassed for 30 seconds from pump activation.

Er30 Antifreeze
The alarm is bypassed for 3 minutes from switching on of the unit (in heating mode only).

Er62 Liquid probe fault
When the alarm is activated the fans work with on-off logic by compressor request. The defrost input and output are managed according to compressor operation time.

Er68 Outside air probe fault
When the alarm is activated, climate adjustment in heating and dynamic defrost are unavailable.

Er90 Maximum number of recordings in alarms history exceeded
Indicates that the alarms history buffer is full. Every new alarm will be memorised, cancelling the oldest alarm.

ADJUSTMENT AND CONTROL

Functions available for the user

Unit lighting : ON-OFF
When the unit is powered it may be in STAND BY status (the display shows the message StbY) or ON status. It is possible to switch between ON and STAND BY by pressing (prolonged) the DOWN button.
When the unit is STAND BY all the users are disabled and the antifreeze function is not activated.
Operation mode selection
When the unit is ON, one of the operation modes can be selected by accessing the “Operation mode” menu.
- Cooling COOL
- Heating HEAt
- STANDBY StdbY

Remote ON/OFF
This function allows remote selection of the STANDBY mode. If the input is activated (contact open) the controller is in STANDBY mode and the operation mode cannot be modified from keyboard.
The function is available if one of the configurable inputs is configured for this, contact closed = unit ON (display SIW), contact open = OFF (display StdbY).
Remote Cooling-Heating
This function allows remote selection of Cooling or Heating mode. If the input is activated (contact open) the unit is in heating mode. If the input is not activated (contact closed) the unit is in cooling mode. The operation mode cannot be modified from the keyboard (but STANDBY mode can be selected).
To enable this function, follow the indications in the section “configurable inputs setting”.
Set point
The set point value in cooling (COOL) and heating (HEAt) can be set by accessing the “Status \ SP” menu. The purpose of the controller is to keep the water temperature at the unit inlet as close as possible to the set value, by activating the compressor according to an on-off logic.
Operation in heat pump mode
For all units in heat pump version the parameter tr01 enables operation in heat pump mode when it assumes value 1. It is possible set an outside air temperature value (parameter HP01) below which operation in heat pump mode is blocked (the supplementary electrical heating elements remain activated in any case, if present).
Antifreeze
The plate-type exchanger is protected by activation of an electrical heating element and activation of the antifreeze alarm, occurring in sequence when the exchanger outlet water temperature reaches dangerous values. The storage tank is protected by the antifreeze heater (accessory) activated in parallel with the plate-type exchanger heating element.
When the outside air temperature approaches 0°C, if the unit is not working, the pump is activated in any case to prevent excessive cooling of the water in the pipes.
Supplementary electrical heating elements
The parameter H102 enables operation of the electrical elements supplementing the heat pump when it assumes value 1. The heating elements are activated according to a two-step logic depending on the unit inlet water temperature. When present, the heating elements also carry out a storage tank antifreeze function.
Climate adjustment
In heating, the parameter dS00 allows enabling of climate adjustment when it assumes value 1. The heating set point is adjusted according to the outside air temperature (if the external probe is installed).
To configure this function, follow the indications in the section “configurable inputs setting”.

Dynamic defrost
The activation limit is modified in a dynamic way according to the outside air temperature (if the external probe is installed).
Power limitation.
With this function, the unit can be forced to operate at 50% maximum power, from a digital output, thus reducing energy consumption.
To enable this function, proceed as indicated in the section “configurable inputs setting”.
Economy function
This function allows the set point to be varied by a certain value from a digital input.
In cooling mode the set point is increased by the value set on tr15 (e.g. going from 9.5°C to 14.5 °C).
In heating mode the set point is decreased by the value set on tr25 (e.g. going from 42°C to 36°C)
To enable this function, proceed as indicated in the section “configurable inputs setting”.
Serial communication
The device is configured for communicating on a serial line using the MODBUS protocol. When connecting the device it must be assigned an address univocally identifying it among all the devices connected to the same serial line (“*Modbus individual address*”). This address must be between 1 and 247 and is configurable by means of the parameter CF30 (see section on serial communication).
Recording hours of operation
The controller can record the hours of compressor and pump operation. Access the “Status \ Hr” menu to show the values. The hours are reset by pressing (prolonged) the SET button, while the hours of operation are displayed.
Power failure
In case of a power failure, when the power is restored the controller will go to the status prior to the power failure. The procedure is cancelled if a defrost is in progress. All timing in progress is cancelled and reinitialised.
Clock
The controller has an internal clock for memorising the date and time of each alarm occurring during unit operation (see “Alarms history”). The clock can be set by accessing the “Status \ CL” menu.

ADJUSTMENT AND CONTROL

Configurable inputs setting
The configurable inputs are AI4, AI5 and ID5.
For configuration, access the parameters CL and select the required function according to the following tables.

I/O	Sigla	digital/analogic input	Configuration	Polarity	Offset (range) / Status
AI4	S1	Not configured	CL03 = 0 CL33 = 0 CL53 = 0	----	----
		External probe sensor (provided with accessory SND3)	CL03 = 2 CL33 = 9 CL53 = 0	NTC probe	CL23 (-12,0... +12,0 [°C]) CL I3 = Start value scale AiL4 [°C] CL I2 = Full scale value AiL4 [°C]
		External probe air as analog input 4-20 mA	CL03 = 3 CL33 = 9 CL53 = 0	----	CL23 (-12,0... +12,0 [°C]) CL I3 = Start value scale AiL4 [°C] CL I2 = Full scale value AiL4 [°C]
		External probe air as analog input 0-10 V	CL03 = 4 CL33 = 9 CL53 = 0	----	CL23 (-12,0... +12,0 [°C]) CL I3 = Start value scale AiL4 [°C] CL I2 = Full scale value AiL4 [°C]
		External probe air as analog input 0-5 V	CL03 = 5 CL33 = 9 CL53 = 0	----	CL23 (-12,0... +12,0 [°C]) CL I3 = Start value scale AiL4 [°C] CL I2 = Full scale value AiL4 [°C]
		External probe air as analog input 0-1 V	CL03 = 6 CL33 = 9 CL53 = 0	----	CL23 (-12,0... +12,0 [°C]) CL I3 = Start value scale AiL4 [°C] CL I2 = Full scale value AiL4 [°C]
		ON/STBY remote (digital input)	CL03 = 1 CL33 = 0 CL53 = -1	input active open contact	open contact = STAND-BY
		Summer / Winter remote (digital input)	CL03 = 1 CL33 = 0 CL53 = +3	input active close contact	close contact = HEAT (Winter)
		Demand Limit 50% (digital input)	CL03 = 1 CL33 = 0 CL53 = +21	input active close contact	close contact = Demand Limit 50%
		Economy (digital input)	CL03 = 1 CL33 = 0 CL53 = +22	input active close contact	close contact = economy
AI5	S2	Not configured	CL04 = 0 CL34 = 0 CL54 = 0	----	----
		External probe sensor (analogic input)	CL04 = 2 CL34 = 9 CL54 = 0	NTC probe	CL24 (-12,0... +12,0 [°C])
		ON/STBY remoto (digital input)	CL04 = 1 CL34 = 0 CL54 = -1	input active open contact	open contact = STAND-BY
		Summer / Winter remote (digital input)	CL04 = 1 CL34 = 0 CL54 = +3	input active close contact	close contact = HEAT (Winter)
		Demand Limit 50% (digital input)	CL04 = 1 CL34 = 0 CL54 = +21	input active close contact	close contact = Demand Limit 50%
		Economy (analogic input)	CL04 = 1 CL34 = 0 CL54 = +22	input active close contact	close contact = economy
DI5		Not configured	CL44 = 0	----	----
	QF2.2	thermal pump 2	CL44 = -48	input active open contact	open contact = thermal pump 2
		ON/STBY remote	CL44 = -1	input active open contact	open contact = STAND-BY
		Summer / Winter remote	CL44 = +3	input active close contact	close contact = HEAT (Winter)
		Demand Limit 50%	CL44 = +21	input active close contact	close contact = Demand Limit 50%
		Economy	CL44 = +22	input active close contact	close contact = economy
If present the module of pumping two pumps can not get that DI5 must be configured CL44 = -48					
The outdoor air sensor (optional SND3) is factory installed on input AI4; if it were necessary to can install it on input AI4 or AI5, as specified above. The input AI4 can also accept an input signal current (4-20mA) or voltage (0-10V ,0-5V ,0-1V) from a probe external air by the user.					

Probe characteristics

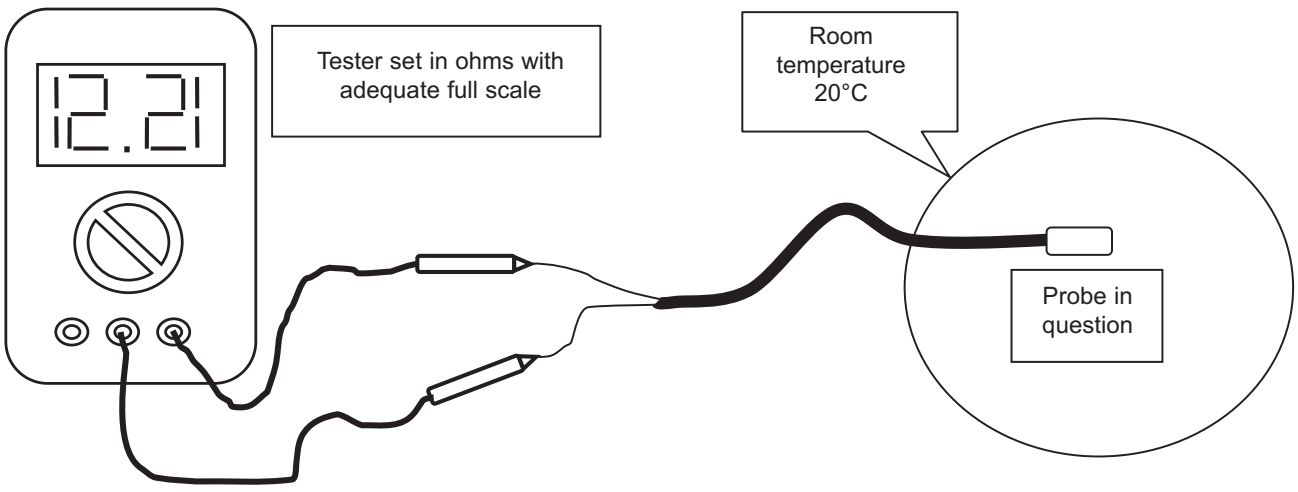
NTC10K-25°C type temperature probes are used.
When the probe bulb is at a temperature of 25°C the electrical resistance measurable at the probe ends with a multimeter is approx. 10 kΩ. The thermistor of these probes has a negative temperature coefficient: the electrical resistance value decreases as the temperature increases.

To find out if a temperature probe is faulty or disconnected, check the correspondence between the resistance value in kΩ and the bulb temperature in °C according to the following table.

Temperature [°C]	Resistance [kΩ]	Temperature [°C]	Resistance [kΩ]	Temperature [°C]	Resistance [kΩ]
0	25.7950	20	12.2110	40	5.7805
1	24.8483	21	11.7628	41	5.5683
2	23.9363	22	11.3311	42	5.3640
3	23.0578	23	10.9152	43	5.1671
4	22.2115	24	10.5146	44	4.9774
5	21.3963	25	10.1287	45	4.7948
6	20.6110	26	9.7569	46	4.6188
7	19.8546	27	9.3988	47	4.4493
8	19.1259	28	9.0539	48	4.2860
9	18.4239	29	8.7216	49	4.1287
10	17.7477	30	8.4015	50	3.9771
11	17.0963	31	8.0931	51	3.8312
12	16.4689	32	7.7961	52	3.6906
13	15.8644	33	7.5100	53	3.5551
14	15.2822	34	7.2343	54	3.4246
15	14.7213	35	6.9688	55	3.2989
16	14.1810	36	6.7131	56	3.1779
17	13.6605	37	6.4667	57	3.0612
18	13.1592	38	6.2293	58	2.9489
19	12.6762	39	6.0007	59	2.8406

For a reliable check it is not necessary to control each single value, but just several sample values. If the instrument gives an infinite resistance, this means the probe is disconnected.

Example. With a temperature of 20°C on the probe, the ohmmeter display will indicate approx. 12.21 kΩ



Serial communication

The unit can communicate on serial line using the **Modbus** communication protocol with **RTU** coding.
The unit can be connected to an RS485 network by means of the serial interface supplied as an accessory, and respond to requests from any master device connected to the network.

Serial line settings

The serial line must be set as follows :

- baud rate : **9600**
- data bits : **8**
- stop bits : **1**
- parity : **even**

All the devices connected to the same serial line MUST use the same settings.

Device address

To communicate correctly, each device connected to the serial network must have an univocal address ("*Modbus individual address*") of between 1 and 247. This address can be set by modifying the parameter CFG3.

Modbus commands

The Modbus commands implemented by the controller are :

- parameter reading **3** *(Hex 03 : Read Holding Registers)*
- parameter writing **16** *(Hex 10 : Write Multiple Registers)*

Table of addresses

All the available resources are stored in the controller as WORD (2 byte) and therefore require the reading or writing of an entire Modbus register. According to the Modbus protocol, to identify a register of address X the address X-1 must appear in the message.
Some registers contain more than one piece of information : in this case the bits representing the resource value are identified by means of the number of bits used ("Bit number") and by the least significant bit ("Lsb"). In the writing operation for these registers it is necessary to read the current register value, modify the bits representing the resource concerned and rewrite the entire register.

Example.

Bit number = 4
Lsb = 7
Resource value = 3

15	14	13	12	11	**10**	**9**	**8**	**7**	6	5	4	3	2	1	0
0	1	1	0	1	**0**	**0**	**1**	**1**	1	0	1	1	0	1	0

The resources can be read only (R), write only (W) or read and write (RW).

To interpret the value written in the register it is necessary to consider the value of CPL, EXP and UM :

CPL : if the register represents a number with sign (CPL = Y) carry out the following conversion :

0 = register value < 32767 : resource value = register value
32768 = register value < 65535 : resource value = register value – 65536

EXP : indicates the exponent of the power of 10 to be multiplied by the register value to obtain the resource value.

EXP	Multiplier	
-2	10^{-2}	0.01
-1	10^{-1}	0.1
0	10^{0}	1
1	10^{1}	10
2	10^{2}	100

MU : indicates the unit of measure of the resource

IMPORTANT. DO NOT modify any parameter not indicated in the tables provided or indicated as a read only parameter (R), otherwise the warranty will be cancelled.

Label	Description	RW	Register address		Bit number	Lsb	CPL	EXP	UM
			Dec	Hex					
TR10	Set point temperature controller in Cool	RW	17062	H12A6	16	0	Y	-1	°C
TR20	Set point temperature controller in Heat	RW	17074	H12B2	16	0	Y	-1	°C
-	Hours of operation compressor 1	R	857	H0359	16	0	N	0	hours
-	Hours of operation compressor 2	R	859	H035B	16	0	N	0	hours
-	Hours of operation pump 1	R	865	H0361	16	0	N	0	hours
-	Hours of operation pump 2	R	867	H0363	16	0	N	0	hours
-	Analogue input AIL1	R	412	H019C	16	0	Y	-1	°C
-	Analogue input AIL2	R	414	H019E	16	0	Y	-1	°C
-	Analogue input AIL3	R	416	H01A0	16	0	Y	-1	°C/Bar
-	Analogue/digital input AIL4	R	418	H01A2	16	0	Y	-1	°C/Bar
-	Analogue/digital input AIL5	R	420	H01A4	16	0	Y	-1	°C
-	Device in COOL	R	33028,4	H0104	1	4	N	0	num
-	Device in COOL (from digital input)	R	33028,5	H0104	1	5	N	0	num
-	Device in HEAT	R	33028,6	H0104	1	6	N	0	num
-	Device in HEAT (from digital input)	R	33028,7	H0104	1	7	N	0	num
-	Device in STAND BY	R	33028	H0104	1	2	N	0	-
-	Device in STAND BY (from digital input)	R	33028	H0104	1	3	N	0	-
COOL	Select COOL Mode	W	33450,3	H02AA	1	3	N	0	num
HEAT	Select HEAT Mode	W	33450,4	H02AA	1	4	N	0	num
STBY	Select STAND BY Mode	W	33450,5	H02AA	1	5	N	0	num
Er00	General alarm	R	33104	H0150	1	0	N	0	flag
Er05	Alarm: low pressure - sequence meter - fan thermal switch	R	33104,5	H0150	1	5	N	0	flag
Er10	Alarm: compressor 1 thermal protection – thermostatted delivery 1 – High pressure	R	33105,2	H0151	1	2	N	0	flag
Er11	Alarm: compressor 2 thermal protection – thermostatted delivery 2 - High pressure	R	33105,3	H0151	1	3	N	0	flag
Er20	Alarm: primary circuit flow switch	R	33106,4	H0152	1	4	N	0	flag
Er21	Alarm: primary circuit pump 1 thermal protection	R	33106,5	H0152	1	5	N	0	flag
Er22	Alarm: primary circuit pump 2 thermal protection	R	33106,6	H0152	1	6	N	0	flag
Er30	Alarm: primary circuit antifreeze	R	33107,6	H0153	1	6	N	0	flag
Er45	Alarm: clock fault	R	33109,5	H0155	1	5	N	0	flag
Er46	Alarm: time loss	R	33109,6	H0155	1	6	N	0	flag
Er47	Alarm: no communication with remote keyboard	R	33109,7	H0155	1	7	N	0	flag
Er60	Alarm: water temperature probe or inlet air primary exchanger fault	R	33111,4	H0157	1	4	N	0	flag
Er61	Alarm: water temperature probe or outlet air primary exchanger fault	R	33111,5	H0157	1	5	N	0	flag
Er62	Alarm: temperature probe exchanger (with loss) fault	R	33111,6	H0157	1	6	N	0	flag
Er68	Alarm: external temperature probe fault	R	33112,4	H0158	1	4	N	0	flag
Er90	Signalling alarms history full	R	33115,2	H015B	1	2	N	0	flag

** If several operation modes are enabled by mistake:*

- *OFF has priority over STAND BY, HEATING, COOLING*
- *STAND?BY has priority over HEATING, COOLING*
- *HEATING has priority over COOLING*

SETTING AT WORK

General Rules

To validate the **contractual warranty**, the machine must only be set at work by technicians from **an authorized assistance center**. Before they are called, check to make sure that all parts of the installation have been completed, the unit levelled, the plumbing connections made with the relative air vent and the electrical connections made. **Power on the unit at least 12 hours before the start.**

MAINTENANCE

Maintenance

IMPORTANT. MAKE SURE THE POWER TO UNIT IS DISCONNECTED BEFORE CARRYING OUT ANY CLEANING OR MAINTENANCE OPERATION. ALL ROUTINE AND EXTRAORDINARY MAINTENANCE OPERATIONS MUST BE CARRIED OUT BY SPECIALISED AND AUTHORISED PERSONNEL, IN ORDER TO ENSURE COMPLIANCE WITH THE CURRENT SAFETY REGULATIONS.

This section is extremely important for efficient operation of the unit over time. A few operations carried out periodically can avoid the need to call specialised personnel. The operations to be carried out do not require particular technical knowledge and consist of simple checks of the unit's components.
Contact an authorised service centre if maintenance is required.

Structure
To prevent the creation of anomalous vibrations and noise, make sure the various steel parts are secured together and that the inspection panels are properly fixed to the unit.
In case of oxidation, treat with paints suitable for eliminating or reducing the phenomenon in the parts of the unit affected.

Fans
Before every seasonal start-up, check the fixing of the fans and respective grilles to the unit's structure. Check any unbalance in the axial fan, indicated by anomalous vibrations and noise.

Finned coils
Accidental contact with the exchanger fins can cause small cuts. Use special gloves to carry out the operations described below. The exchangers must be able to ensure maximum heat exchange, therefore their surfaces must always be free of any dirt and dust deposited on them due to the action of the fans. Using a brush, remove all the impurities deposited on the surface of the coil. Clean the aluminium surface of the coil with a compressed air jet, making sure to aim the jet with the direction of fins so as to avoid damage. If the aluminium fins are damaged, "comb" the coil with a special tool until the damage is completely eliminated.

Finned coil condensate drain
In winter operation, the finned coil defrost stage occurs periodically through reversal of the refrigeration cycle. During this stage make sure the dripping of water from the finned pack has regular downflow and that the drain union on the base of the unit is not clogged. If the downflow is not correct, with particularly rigid temperatures a layer of ice could form over the base, compromising the unit's operation.

Plumbing system
Visually check that there are no leaks in the plumbing circuit and that it is pressurised. Make sure there is no air in the circuit (by operating the air vents). Make sure the filters in the unit (VP and VA versions) and in the system are clean.

Electrical system
Make sure there are no cuts, cracks or alterations able to comprise the insulation of the power cable connecting the unit to the distribution board. Contact an authorised service centre if maintenance is required. Carefully check the fixing of all the electrical connects after an initial period of operation following first start-up, and at every seasonal start-up or stop.

SAFETY AND POLLUTION

General considerations

The machine has been designed to reduce risks to persons and to the environment in which it is installed, to the minimum. To eliminate residue hazards, it is therefore advisable to become as familiar as possible with the machine in order to avoid accidents that could cause injuries to persons and/or damage to the property.

a. Access to the unit

Only qualified persons who are familiar with this type of machine and who are equipped with the necessary safety protections (footwear, gloves, helmet, etc.) may be allowed to access the machine. Moreover, in order to operate, these persons must have been authorized by the owner of the machine and be recognized by the Manufacturer itself.

b. Elements of risk

The machine has been designed and built so as not to create any condition of risk. However, residue hazards are impossible to eliminate during the planning phase are are therefore listed in the following table along with the instructions on how to neutralize them.

Part in question	Residue hazard	Mode	Precautions
Compressor and delivery pipe	Burns	Contact with the pipes and/or the compressor	Avoid contact by wearing protective gloves
Delivery pipes and bank	Explosion	Excessive pressure	Turn off the machine, check the high pressure switch and safety valve, the fans and condenser
Pipes in general	Ice burns	Leaking coolant	Do not exercise tension on the pipes
Electrical cables, metal parts	Electrocution, serious burns	Defective cable insulation, live metal parts	Adequate electrical protection; correctly ground the unit
Heat exchange bank	Cuts	Contact	Wear protective gloves
Electric fans	Cuts	Contact with the skin	Do not push the hands or objects through the fan grille

c. Pollution

The machine contains **r410a** coolant and lubricating oil. Thus, if the unit is scrapped, these fluids must be recovered and disposed of in accordance with the laws in force in the country where the machine is installed. **The machine must not be abandoned when scrapped.**

SAFETY AND POLLUTION

Refrigerant safety card

1 SUPPLIER COMPANY AND PRODUCT IDENTIFICATION

Card No.	FRIG 8
Product	R-410A
Supplier company identification	RIVOIRA SpA

2 COMPOSITION / INFORMATION ON INGREDIENTS

Substance / Preparation	Preparation
Components / Impurities	Contains the following components : Difluoromethane (R32) 50 % in weight Pentafluoroethane (R125) 50 % in weight
EEC No.	Non-applicable for mixtures
Trade-name	/

3 IDENTIFICATION OF HAZARDS

Identification of hazards	Liquefied gas. The vapours are heavier than air and can cause suffocation, reducing the oxygen available for breathing. Rapid evaporation of the fluid can cause freezing. Can cause cardiac arrhythmia.

4 FIRST-AID MEASURES

Inhalation	Do not administer anything if the person has fainted. Take the person outdoors. Use oxygen or artificial respiration if necessary. Do not administer adrenaline or similar substances.
Contact with eyes	Rinse thoroughly with plenty of water for at least 15 minutes and see a doctor.
Contact with skin	Wash immediately with plenty of water. Immediately remove all contaminated garments.
Swallowing	Risk unlikely.

5 FIRE-PREVENTION MEASURES

Specific hazards	Increase in pressure.
Dangerous fumes	Halogen acids, traces of carbonyl halides.
Fire-extinguishing means usable	All the known fire-extinguishing means can be used.
Specific methods	Cool the containers/tanks with water sprays.
Special protection equipment	Use self-contained breathing apparatus in confined spaces.

6 MEASURES AGAINST ACCIDENTAL SPILLING OF THE PRODUCT

Personal protection	Evacuate personnel to safe areas. Provide for adequate ventilation. Use personal protection equipment
Protection for the environment	It evaporates.
Product removal methods	It evaporates.

7 HANDLING AND STORAGE

Handling and storage	Ensure an adequate air change and/or extraction in the workplaces. Only use well-ventilated rooms. Do not breathe vapours or aerosols. Carefully close the containers and keep them in a cool, dry and well-ventilated place. Keep in the original containers.
Incompatible products	Explosives, flammable materials, organic peroxides.

8 CONTROL OF EXPOSURE / PERSONAL PROTECTION

Personal protection	Ensure adequate ventilation, especially in closed areas.
Control parameters	Difluoromethane (R32): Recommended exposure limits: AEL (8h and 12h TWA) = 1000 ml/m3 Pentafluoroethane (R125): Recommended exposure limits: AEL (8h and 12h TWA) = 1000 ml/m3
Respiratory tract protection	For rescue and for maintenance works in tanks, use self-contained breathing apparatus. The vapours are heavier than air and can cause suffocation, reducing the oxygen available for breathing.
Eye protection	Total protection glasses.
Hand protection	Rubber gloves.
Hygiene measures	Do not smoke.

9 CHEMICAL-PHYSICAL PROPERTIES

Relative density, gas (air=1)	Heavier than air.
Solubility in water (mg/l)	Not known, but deemed very low.
Appearance	Colourless liquefied gas.
Odour	Similar to ether.
Fire point	Does not ignite.

10 STABILITY AND REACTIVITY

Stability and reactivity	No decomposition if used according to the special instructions.
Materials to be avoided	Alkali metals, alkali-earth metals, granulated metal salts, Al, Zn, Be, etc. in powder.
Hazardous products of decomposition	Halogen acids, traces of carbonyl halides.

11 TOXICOLOGICAL INFORMATION

Local effects	Concentrations substantially above the value TLV (1000 ppm) can cause narcotic effects. Inhalation of highly concentrated products of decomposition can cause respiratory insufficiency (pulmonary oedema).
Long-term toxicity	No carcinogenic, teratogenic or mutagenic effects have been recorded in experiments on animals.
Specific effects	Rapid evaporation of the fluid can cause freezing. Can cause cardiac arrhythmia.

12 ECOLOGICAL INFORMATION

Effects linked to ecotoxicity	Pentafluoroethane (R125) Potential global warming with halocarbides; HGWP (R-11 = 1) = 0.84 Potential impoverishment of the ozone; ODP (R-11 = 1) = 0

SAFETY AND POLLUTION

13 CONSIDERATIONS ON DISPOSAL

General	Do not dispose of where accumulation can be hazardous. Usable with reconditioning. The depressurised containers must be returned to the supplier. Contact the supplier if instructions for use are deemed necessary.

14 INFORMATION FOR TRANSPORT

Designation for transport	LIQUEFIED GAS N.A.S. (DIFLUOROMETHANE, PENTAFLUOROETHANE)
UN No.	3163
Class/Div	2.2
ADR /RID No.	2, 2nd A
ADR/RID hazard no.	20
ADR label	Label 2 : non-toxic non-flammable gas.
CEFIC Groupcard	20g39 - A
Other information for transport	Avoid transport on vehicles where the loading zone is not separate from the cab. Make sure the driver is informed about the potential risk of the load and knows what to do in case of accident or emergency. Before starting transport, make sure the load is properly secured and : make sure the valve of the container is closed and does not leak; make sure the blind cap of the valve (when provided) is correctly fitted; make sure the cap (when provided) is correctly fitted and that there is an adequate ventilation passage; ensure compliance with the current provisions.

15 INFORMATION ON REGULATIONS

The product must not be labelled according to Directive 1999/45/EC.
Comply with the regulations given below, and the relevant applicable updates and amendments.
Circulars no. 46/79 and 61/81 of the Ministry of Labour : Risks related to the use of products containing aromatic amines
Leg. Decree no. 133/92 : Regulations on the discharge of hazardous substances in waters
Leg. Decree no. 277/91 : Protection of workers against noise, lead and asbestos
Law 256/74, Decree 28/1/92, Leg. Decree no. 52 dated 3/2/97, Decree dated 28/4/97 as amended : Classification, packing and labelling of hazardous substances and preparations
Decree no. 175/88, as amended : Activities with significant accident risks (Seveso Law)
Decree no. 203/88 : Emissions into the atmosphere
Decree no. 303/56 : Work hygiene
Decree no. 547/55 : Regulations on accident prevention
Leg. Decree no.152 dated 11/5/99 : Protection of waters

16 OTHER INFORMATION

Recommended uses: Refrigerant
Can cause suffocation in high concentration.
Keep in a well-ventilated place.
Do not breathe the gas.
The risk of suffocation is often underestimated and must be clearly explained during the training of operators.
Ensure compliance with all the national and regional regulations.
Before using this product in any new process or trial, an in-depth study on safety and compatibility of the product with the materials must be carried out.
The above information is based on our current know-how and describes the product according to the safety requirements. It does not however represent a guarantee and assurance of the qualities in a legal sense. Each person responds personally for compliance with such regulations.

The information contained in this document is to be deemed valid at the time of printing. The company declines any liability for damage caused by use of the product in incorrect applications and/or conditions different from those provided for.

First aid

- Move the victim away from the toxic source, keep him warm and allow him to rest.
- Administer oxygen if necessary.
- Proceed with artificial respiration if necessary.
- Give heart massage in the case of heart failure.
- Immediately seek medical help.

Contact with the skin:
- Immediately thaw the affected parts under running lukewarm water.
- Remove contaminated clothing (garments may stick to the skin in the case of ice burns) if they have not adhered to the skin.
- Seek medical assistance if necessary.

Contact with the eyes:
- Immediately rinse the eyes with physiologic eyewash or clean water for at least 10 minutes with the eyelids pulled open.
- Seek medical assistance if necessary.

Swallowing:
- Do not make the victim vomit. If the victim is conscious, have him rinse his mouth out with clean water and then drink 200-300 ml of water.
- Immediately seek medical help.
- Do not administer adrenaline or sympathomimetic drugs after exposure owing to the risk of cardiac arrhythmia.

Consult the technical safety briefs available from coolant manufacturers for further information about the characteristics of the cooling fluid.

Ferroli

Cod. 3QE25061

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