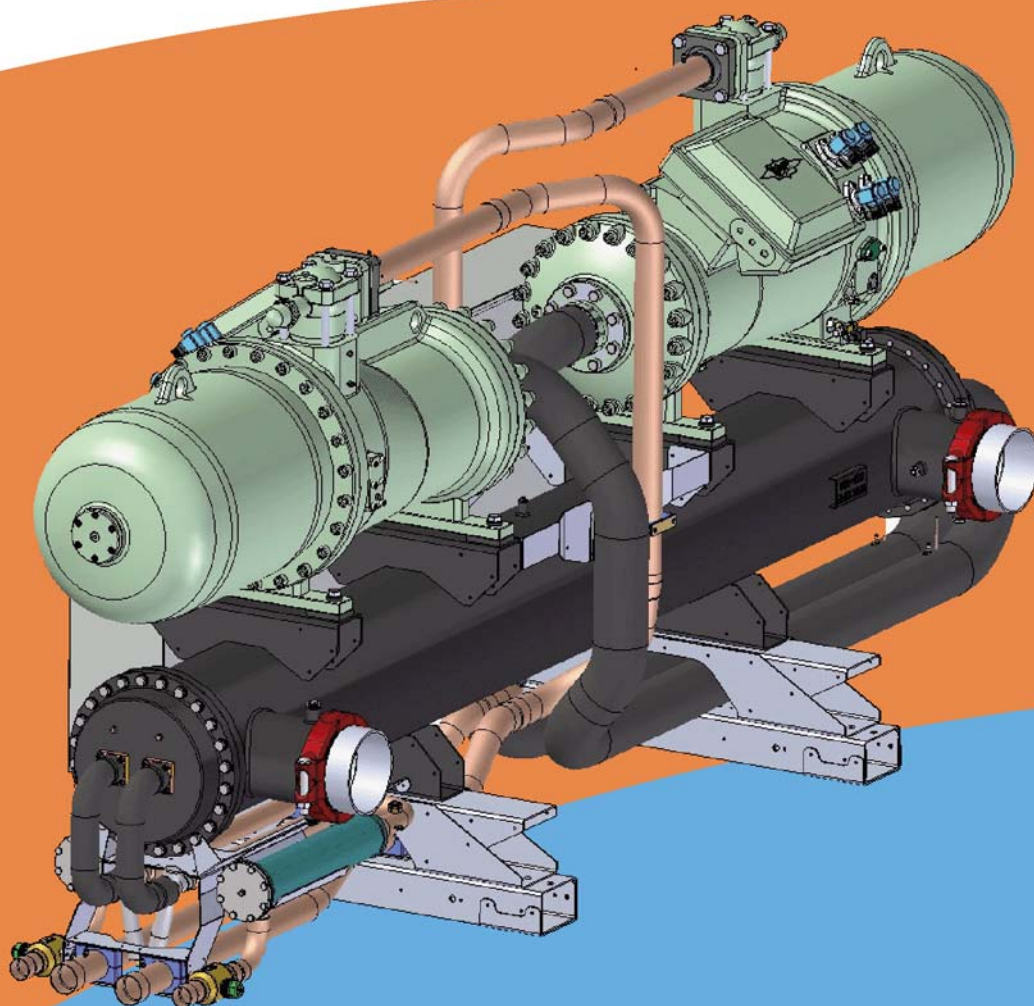


ferroli

i migliori gradi centigradi

EVW REMOTE AIR-COOLED CHILLERS

249 ÷ 1048 KW



TECHNICAL MANUAL

TABLE OF CONTENTS

THIS MANUAL IS DIVIDED INTO SECTIONS. THEIR NAMES APPEAR IN THE HEADING OF EACH PAGE.

| | |
|--|------------|
| GENERAL SPECIFICATIONS | .4 |
| PRESENTATION OF UNIT | .4 |
| GENERAL SPECIFICATIONS | .4 |
| EUROPEAN DIRECTIVES | .4 |
| IDENTIFICATION PLATE OF THE UNIT | .5 |
| IDENTIFICATION CODE OF THE UNIT | .5 |
| VERSIONS | .5 |
| DESCRIPTION OF THE COMPONENT | .6 |
| ACCESSORIES AND OPTIONAL EQUIPMENT | .8 |
| ACCESSORIES AND OPTIONS | .8 |
| ELECTRICAL OPTIONS | .8 |
| TECHNICAL SPECIFICATIONS FOR BASIC VERSION (VB) | .9 |
| GENERAL TECHNICAL SPECIFICATIONS | .9 |
| ACOUSTIC VERSION: AB (BASIC VERSION) | .9 |
| CORRECTION FACTOR FOR THE USE OF GLYCOL EVAPORATOR SIDE | .10 |
| STANDARD PERFORMANCES - BASIC VERSION AB | .11 |
| TECHNICAL SPECIFICATIONS FOR DESUPERHEATER VERSION (VD) | .14 |
| VERSION WITH DESUPERHEATER VD | .14 |
| RECOVERY HEAT EXCHANGER SPECIFICATIONS VERSION WITH DESUPERHEATER VD | .14 |
| NOISE LEVELS | .15 |
| BASIC VERSION VB | .15 |
| BASIC VERSION VB + COMPRESSOR SOUNDPROOFING BOX ACCESSORY (CC) | .15 |
| OPERATING RANGE | .16 |
| LIMITI OPERATIVI | .16 |
| WATER PRESSURE DROP | .17 |
| WATER PRESSURE DROP EVAPORATOR | .17 |
| WATER PRESSURE DROP DESUPERHEATER | .17 |
| DIMENSIONAL DATA | .18 |
| DIMENSION AND WEIGHT | .18 |
| MINIMUM SPACE REQUIRED FOR OPERATION | .18 |
| VICTAULIC CONNECTIONS AND WATER FLOW SWITCH | .18 |
| REMOTE AXIAL CONDENSER ACCESSORIES - RC | .19 |
| DESCRIPTION | .19 |
| AB BASIC VERSION | .20 |
| AS LOW NOISE VERSION | .21 |
| ASS EXTRA LOW NOISE VERSION | .22 |

GENERAL SPECIFICATIONS

Presentation of unit

This new series of water chillers (condenserless) is based on **12 models** with cooling capacity from **249 to 1048 kW** and has been designed to meet the demands of global markets in the medium-big 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. The units are suitable for indoor installation and, as standard, are equipped with bearing structure made of adequately thick coated and galvanized sheet metal where are fastened the the evaporator, the electrical panel and the compressors. This layout allows an uniform weight distribution and an easy maintenance. The basement of the unit is designed and made to allow an easy and quick handling of the unit in order to minimise the cost for installation.

All fastening components are made of stainless and/or galvanized steel.

When the units were designed, particular attention was also paid to sound emission in our endeavour

to comply with the increasingly more restrictive laws governing acoustic pollution. To reduce the noise emission the units can be equipped with an acoustic box for the compressors: this device allows a noise reduction of 4-5 dB.

The units can produce cold water from 5 to 15°C (up to 23°C with High power electrical motor). They can be equipped with 1 or 2 independent refrigerant circuits, each of which has a semi-hermetic **TWINSCREW** compressor featuring a 25 to 100% control capacity device. They are equipped with an asynchronous three-phase motor (400V-3-50Hz) with aluminium squirrel-cage rotor, pre-engineered for part-winding or star-delta starting (so as to reduce the current input during the starting phase to the minimum) and are protected by a chain of thermistors buried in the stator windings (controlled by an electronic module with the function to prevent the reverse rotation of the single compressors) and fuses housed in the electric panel. The standard outfit includes an efficient oil separator complete with electric heater (activated when the compressor stops). To widen the field of application to an even greater extent, some models are equipped with a liquid injection system controlled by the electronic controller so that use only occurs when effectively necessary.

As part of the standard supply, they are positioned on rubber vibration dampers to reduce the vibrations transmitted to the base of the unit.

As standard, the evaporator is insulated with 10mm flexible closed-cell foam that forms barrier to prevent the formation of condensation and heat exchanges towards the outside. Standard supply also includes a differential water pressure switch built into the water supply circuit to avoid the risk of freezing if the water flow is shut off for some reason and as standard is equipped with VICTAULIC water connections. The evaporator is fed by an electronic expansion valve that allows the exploitation of the evaporator

surface thus increasing the efficiency of the system in all working conditions (25 to 100% for single compressor units, 13 to 100% for double compressors units) so achieving the optimal seasonal energy efficiency.

As standard, the units are equipped with electric panel for setting and controls with a door-locking main circuit-breaker, controller with microprocessor plus LCD with 4 lines of 20 characters, refrigerant circuit made with copper pipes, complete with low and high pressure switch (automatic and manual reset), safety valves (according to PED), Dehydrator filter with replaceable core, discharge and liquid shutoff valves, low and high pressure transducers, compressor oil, charge of NITROGEN (in order to avoid entrance of air into the refrigerant circuit), Discharge and Liquid shut-off valves. Copper Pipe connections (discharge and liquid) lines.

All the units are accurately built and tested individually.

All units can be equipped with a large series of accessories or options described in the following pages.



General specifications

- This manual and the wiring diagram supplied with the unit must be kept in a dry place and ready to hand for future consultation when required.
- This manual has been compiled to ensure that the unit is installed in the correct way and to supply comprehensive information about how to correctly use and service the appliance. **Before proceeding with the installation phase, please carefully read all the information in this manual, which describes the procedures required to correctly install and use the unit.**
- Strictly comply with the instructions in this manual and conform to the current safety standards.
- The appliance must be installed in accordance with the laws in force in the country in which the unit is installed.
- Unauthorized tampering with the electrical and mechanical equipment will **VOID THE WARRANTY**.
- Check the electrical specifications on the identification plate before making the electrical connections. Read the instructions in the specific section where the electrical connections are described.
- If the unit must be repaired for any reason, this must only be done by a specialized service center recognized by the manufacturer and using genuine spare parts.
- The manufacturer also declines all liability for any damage to persons or property deriving from failure of the information in this manual to correspond to the actual machine in your possession.
- **Proper uses: this series of chillers is designed to produce cold or hot water for use in hydronic systems for conditioning/heating purposes. The units are not suitable for the production of domestic hot water. Any use differing from this proper use or beyond the operating limits indicated in this manual is forbidden unless previously agreed with the manufacturer.**
- **The prevention of the risk of fire at the installation site is the responsibility of the end user.**

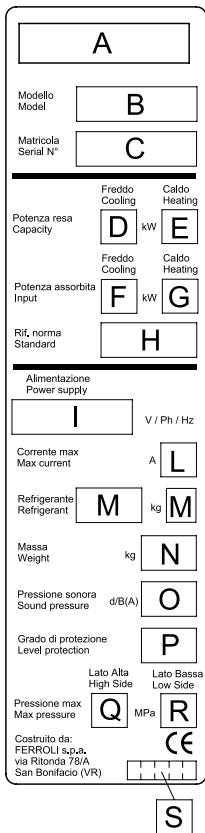
European Directives

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 |

GENERAL SPECIFICATIONS

Identification plate of the Unit



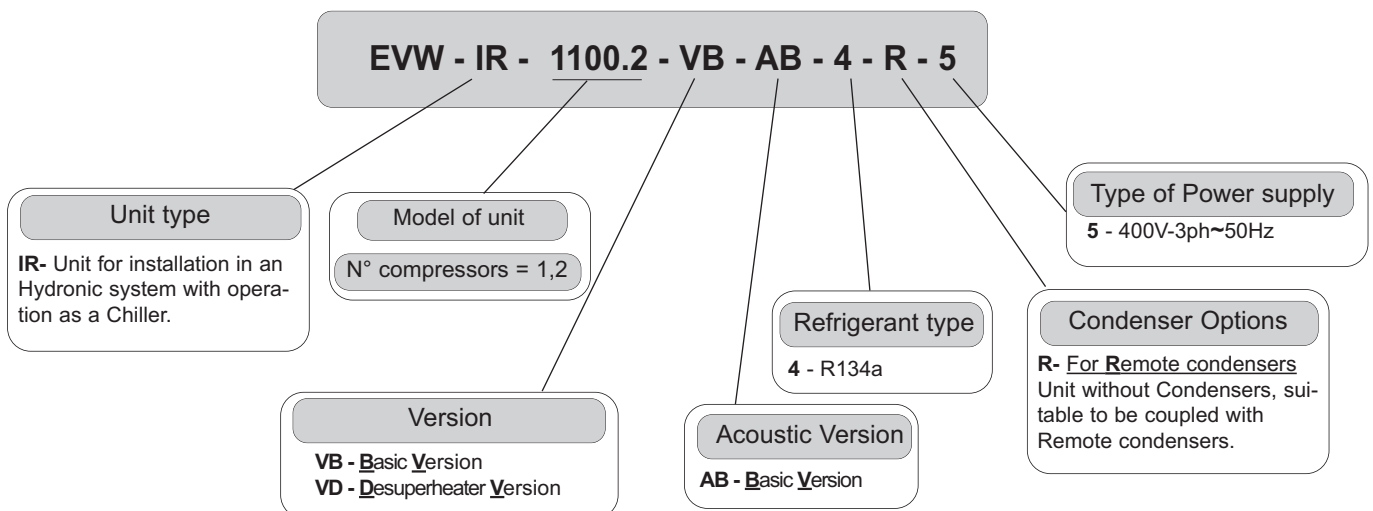
The figure on the left depicts the identification plate of the unit, affixed to the outer left-hand side of the Electric Panel.

A description of the data is given below:

- 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 level
- P** - IP Level Protection at 1 meters (ISO 3744)
- Q** - Maximum pressure - High Side
- R** - Maximum pressure - Low Side
- S** - PED certification authority

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.



Versions

The available unit versions are described below:

VD: Version with Desuperheater. Produces cold water as in the standard version plus hot water at a temperature from 40 to 50°C at the same time. This is achieved thanks to a water-refrigerant gas heat exchanger between the compressors and condenser that recovers part of the thermal power that would otherwise be dispersed in the cooling water and increases the unit cooling capacity from 3 to 5%.

GENERAL SPECIFICATIONS

Description of the component

1. Electric control and monitoring panel.

It is housed in a cabinet made of adequately thick painted sheet metal suitable for outdoor installation (protection degree IP 54). The panel comprises the following main components:

- Main door-locking circuit-breaker.
- Contactors to control and manage the part-winding or star-delta starting mechanism of each compressor.
- Fuse holders with protection fuses for each compressor.
- Fuse holders with protection fuses for the oil heaters of the compressors.
- Insulating and safety transformer to power the auxiliaries, protected with fuses.
- Basic monitoring board with microprocessor:
- Electronic expansion valve controller

The main functions of the monitoring system are:

Temperature regulation of the water produced by the unit, operating hour counting for compressors and pump/s, operating hour, balancing for compressors and pumps, start-up timing, parameter entry digitized via the keyboard, alarm diagnosis.

Functions associated with the digital inputs: low and high pressure, high discharge temperature, correct electric power phase presence and sequence, thermal protection for compressors, thermal protection for evaporator and condenser pump (or fans thermal switches of remote condenser), differential water pressure switch, remote controlled ON/OFF commands.

Functions associated with the digital outputs: compressor control, solenoid valves for compressor control capacity, liquid injection solenoid valve control, water pump/s control or remote condenser management (1 relé for each circuit), electric anti-freeze heater (accessory), general alarm (can be remote controlled).

Functions associated with the analog inputs: evaporator water inlet and outlet temperatures, condenser water outlet temperature (only for IW units) discharge temperature. Suction and discharge pressure, discharge temperature probe

Functions associated with the analog outputs: 4-20 mA for head pressure control; it can be used to manage 3 way valves on water cooled condenser(s) or fans speed control for air cooled remote condenser(s) (1 signal for each circuit)

Moreover the controller allows

- Alarm history (max 50m alarms managed with FIFO logic)
- Time scheduling (daily and weekly)
- Precise control of the water leaving temperature
- Prevention of the block of the unit: In case of critical conditions the machine does not stop but is able to regulate itself and provide the maximum power that can be generated in those conditions with the compressors working inside the admissible limits.
- Demand Limit by Digital Input and/or by Analog Input (4-20mA)
- Dynamic Setpoint by Analog Input (4-20mA): for instance by an outdoor temperature probe for the climate control
- Second Set Point by Digital Input
- Connection to BMS (supervision systems) through serial port RS 485 and MODBUS protocol

- User interfacing terminal with display.

The interface consists of:

- FUNCTION/ON-OFF multifunction key for quick access to the 4 main menus and for powering/switching off.
- MENU multifunction key to access all the menus for controlling and configuring the unit.
- **Power-on LED.**
- **RX-TX LED** to indicate that the user interface and monitoring module are communicating.
- **Alarm indicator LED.**
- Check-control with alarm display.
- Time band
- High pressure prevention

- **Bearing structure** made of galvanized sheet metal coated to ensure good protection against adverse weather conditions.

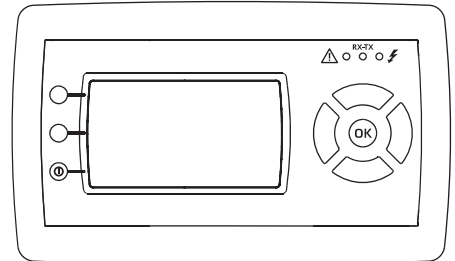
- **Compressors.** Suitable for outdoor installation. They are the **TWIN-SCREW type with 25 to 100% control capacity:** in conjunction with accurate assembly, this technical solution allows the refrigerant to compress and the axial thrusts on the bearings (amongst the most critical components of the compressor) to be perfectly balanced, thus guaranteeing long life.

They are equipped with an asynchronous three-phase motor (400V-3-50Hz) with aluminium squirrel-cage rotor, pre-engineered for part-winding or star-delta starting (so as to reduce the current input during the starting phase to the minimum) and are protected by a chain of thermostors buried in the stator windings (controlled by an electronic module) and fuses housed in the electric panel. The standard outfit includes an efficient oil separator complete with electric heater (activated when the compressor stops). To widen the field of application to an even greater extent, some models are equipped with a liquid injection system controlled by the electronic controller so that use only occurs when effectively necessary.

As part of the standard supply, they are positioned on rubber vibration dampers to reduce the vibrations transmitted to the base of the unit.

- **Evaporator** of the shell and tube heat exchanger type, made of carbon steel and optimized for operation with **R134a**. Features high-efficiency grooved pipes and also achieves low losses on the wet side.

As standard, the evaporator is insulated with 10mm flexible closed-cell foam that forms barrier to prevent the formation of condensation and heat exchanges towards the outside. Standard supply also includes a differential water pressure switch built into the water supply circuit to avoid the risk of freezing if the water flow is shut off for some reason. Also ensures that mechanical stress is absorbed to a good degree. As accessory it can be supplied with Water flow switch FA.



GENERAL SPECIFICATIONS

Hydraulic and refrigerant circuit components

- **Refrigerant safety valve.** (Conforms to the Directive governing pressurized equipments - PED). Installed on the delivery pipe of the compressors. It acts if critical service faults should occur.
- **Liquid cock - Gas cock.** Allow all the refrigerant in the coils to be pumped and then stored so as to carry out servicing work or to replace all the components of the chilling circuit without having to drain it.
- **Dehydrator filter.** Of the removable cartridge type. Retains impurities and traces of moisture in the circuit.
- **Electronic expansion valve.** It has the task of correctly feeding the evaporator insuring a steady superheat. The valve is managed by a dedicated electronic board. It has also the function to stop the liquid when the compressor is off, so avoiding the refrigerant migration from the coils to the evaporator and to the compressor.
- **Compressor delivery probe.** One per compressor, installed on the delivery pipe to protect the compressor if the end of compression temperature exceeds the established limits.
- **Liquid and moisture sight glass.** Signals when liquid passes through the circuit, indicating that the refrigerant charge is correct. The liquid indicator also changes colour to show the amount of moisture in the refrigerant.
- **Pressure taps:** 1/4 " SAE (7/16" UNF) (schraeder). Allow the operating pressure of both the circuits to be measured in 3 main points of each refrigerant circuit: compressor discharge, thermostatic valve inlet, compressor suction.
- **High pressure switch.** With fixed setting. It is installed on the delivery pipe and blocks the compressor of the circuit if the operating pressures exceed the tolerated values. If it activates, the circuit will block and can only be restarted by resetting via the user interface terminal.
- **Oil crankcase heater** to heat the compressor oil. One per compressor. Activated when the compressor switches off. Their task is to keep the temperature of the oil sufficiently high so as to prevent refrigerant from migrating during these pauses.
- **Low pressure switch.** 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.

ACCESSORIES AND OPTIONAL EQUIPMENT

Accessories and options

NOTE: The accessories can be of the following type:

(M): only installed in the factory.

(F): supplied for installation by the customer.

CC (F): Compressor Soundproofing Box It is made of hot galvanised steel sheet of adequate thickness, with internal acoustic insulation, and externally painted with polyester powders able to resist the atmospheric agents over time.

MAP (F) Storage and Pumping Module (Storage on the Delivery or Storage on Return). The purpose of the storage and pumping module is to lower the number of compressor surges, increasing the amount of water in the system and, thus, its thermal inertia. It consists of a base made of galvanized and painted sheet metal and aluminium sheet panelling suitable for outdoor installation.

Designed for connection alongside the chiller, the accessory comprises an insulated carbon steel tank, a single or double centrifugal pump with on-off valves, an electric power panel, expansion tank, safety valve, air vent, pressure gauge and filling and draining valves.

RAG (M) Antifreeze heating element for Pumping Module Water tank.

FLS (M) Evaporator Water paddle flow switch. factory installed is electrically wired to the electric panel.

FLS (F) Water paddle flow switch. The installation is in charge of the customer. It is suitable to be mounted on pipe with diameter from 1" to 8".

RAG (M) Antifreeze Electrical Heater element for Evaporator.

GM (M) Pressure gauge unit. This consists of low pressure gauges and high pressure gauges (one low and one high pressure gauge for each circuit).

AVG (F) Rubber vibration dampers. Consisting of 4 rubber vibration dampers, they reduce the mechanical vibrations generated by the compressor during their normal operation, that are then transmitted to the bearing surface of the machine. The insulation degree provided by the vibration dampers is about 90%.

RB(M) Compressor suction shut-off valve. in abbinamento al rubinetto di mandata consente la sostituzione del compressore senza dover scaricare il refrigerante.

IEM (M): High thickness evaporator insulation with 19mm flexible closed cell foam.

CR (F) Remote Control. Repeats the functions of the control system installed in the unit, thus allowing this latter to be controlled at a distance (up to 100 m) from the unit.

CSF (M) Voltage monitor and sequence meter. The device enables control of the correct sequence of power phases and the lack of any phases. It also ensures that the unit works within $\pm 10\%$ the rated voltage (MIN=360 V - RATED=400V - MAX=440V). It blocks the unit if the voltage is outside the limits provided for the condensation pressure inside the correct operating limits.

INT (M) RS485 Serial interface, for communication with the MODBUS protocol To connect to BMS (Building Management System). Via serial port it is possible to manage the ON/OFF of the unit, to modify the set point, to read and store the main parameters of the refrigerant and water circuits (analogue input) and to acquire the main alarms (digital input).

OP (F) Programmer Clock, applied to the remote ON/OFF function.

RC (F) Remote Condensers. It is possible to supply several types of air cooled remote condensers following different project specification as for instance different noise levels (standard, low noise, extra low noise), coils with coated or copper fins, ecc. The remote condensers can be equipped with specific accessories as for instance sheet metal support for horizontal installation, electrical wiring box, electrical panel (CE marked), fans speed control by cut of phase for head pressure control.

Electrical options

MM (M): High power electric motor, it allows to the unit to produce water up to 23°C (for special applications).

For power supply voltage different from 400V-3ph~50Hz contact our Sales Office.

TECHNICAL SPECIFICATIONS FOR BASIC VERSION (VB)

General technical specifications

Acoustic Version: AB (Basic Version)

The following data refer to an IR unit using **R134a** refrigerant

General specification

| Mod. | 280.1 | 320.1 | 360.1 | 420.1 | 480.1 | 540.1 | 600.1 | 710.2 | 820.2 | 950.2 | 1100.2 | 1200.2 | UM |
|----------------------|--------------------|-------|-------|-------|-------|-------|----------|-------|-------|-------|--------|--------|---------|
| Power supply | 400 ± 10% - 3 - 50 | | | | | | | | | | | | V-ph-Hz |
| Refrigerant | R134a | | | | | | | | | | | | Type |
| Refrigerant circuits | 1 | | | | | | 2 | | | | | | N° |
| Control capacity | 25 ÷ 100 | | | | | | 13 ÷ 100 | | | | | | % |

Unit specification

| COOLING MODE | | | | | | | | | | | | | |
|---|------|------|------|------|------|------|------|------|------|------|------|------|-----|
| Cooling capacity ⁽¹⁾ | 249 | 276 | 314 | 361 | 423 | 475 | 524 | 627 | 723 | 846 | 950 | 1048 | kW |
| Compressor power input ⁽¹⁾ | 72 | 79 | 90 | 103 | 121 | 137 | 151 | 181 | 207 | 243 | 274 | 301 | kW |
| EER | 3.46 | 3.49 | 3.49 | 3.50 | 3.48 | 3.47 | 3.48 | 3.46 | 3.50 | 3.48 | 3.47 | 3.48 | W/W |
| Evaporator Water flow rate ⁽¹⁾ | 11.9 | 13.2 | 15.0 | 17.3 | 20.2 | 22.7 | 25.0 | 30.0 | 34.5 | 40.4 | 45.4 | 50.1 | l/s |
| Evaporator Water pressure drop ⁽¹⁾ | 36 | 28 | 36 | 34 | 43 | 34 | 42 | 41 | 35 | 47 | 47 | 36 | kPa |

Compressor specifications

| | | | | | | | | | | | | | | |
|---------------|------------------------|--|--|------------|--|--|---|----|------------|--|--|--|----|---|
| Type | TWINSCREW / 25 - 100 % | | | | | | | | | | | | - | |
| Starting mode | PART WINDING | | | STAR-DELTA | | | | PW | STAR-DELTA | | | | | - |
| Quantity | 1 | | | | | | 2 | | | | | | N° | |

Evaporator specifications

| | | | | | | | | | | | | | |
|-----------------------------------|----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----------------|
| Type | Shell and tube | | | | | | | | | | | | Type |
| Quantity | 1 | | | | | | | | | | | | N° |
| Maximum pressure H ₂ O | 1000 | | | | | | | | | | | | kPa |
| Maximum operating pressure | 1650 | | | | | | | | | | | | kPa |
| Water capacity | 115 | 110 | 106 | 165 | 159 | 153 | 270 | 200 | 353 | 343 | 325 | 315 | dm ³ |

Electrical specifications

| Model | 280.1 | 320.1 | 360.1 | 420.1 | 480.1 | 540.1 | 600.1 | 710.2 | 820.2 | 950.2 | 1100.2 | 1200.2 | UM |
|---------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|--------|----|
| FLA Maximum power input | 162 | 181 | 211 | 232 | 270 | 309 | 340 | 422 | 464 | 540 | 618 | 680 | A |
| FLI Maximum Power Input | 99 | 110 | 129 | 144 | 169 | 190 | 209 | 257 | 287 | 339 | 380 | 418 | kW |
| MIC Maximum surge current | 520 | 612 | 665 | 436 | 465 | 586 | 650 | 876 | 668 | 735 | 895 | 990 | A |

Noise level⁽²⁾

| | | | | | | | | | | | | | |
|---------------------------------------|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-------|
| SWL Sound power level | 97 | 97 | 97 | 98 | 98 | 98 | 98 | 99 | 100 | 100 | 100 | 100 | dB(A) |
| SWL Sound power level with CC | 92 | 92 | 92 | 93 | 93 | 94 | 94 | 94 | 95 | 95 | 96 | 96 | dB(A) |
| SPL Sound pressure at 1 meter | 79 | 79 | 79 | 80 | 80 | 80 | 80 | 80 | 81 | 81 | 81 | 81 | dB(A) |
| SPL Sound pressure at 1 meter with CC | 74 | 74 | 74 | 75 | 75 | 76 | 76 | 75 | 76 | 76 | 77 | 77 | dB(A) |

(1): Cooling Mode The data refer to: Evaporator Water temperature: inlet: 12°C - outlet: 7°C, Condensing temperature= 50°C, Subcooling = 5K.

(2): The noise levels refer to units operating in cooling mode at the nominal condition in cooling mode.

CC: Compressor Soundproofing Box

PW: PART WINDING

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 according to the Eurovent certification program and 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.

FOULING FACTORS

The performances supplied with the tables are referred to a fouling factory = 0.44x10⁻⁴ m² K/W . For different values of the fouling factory, use the reduction coefficients reported in the following table.

| Fouling factory | Evaporator | |
|------------------------|------------|---------|
| | F.c. PF | F.c. PA |
| (m ² K / W) | 1 | 1 |
| (m ² K / W) | 0,98 | 0,99 |
| (m ² K / W) | 0,93 | 0,98 |

F.c. PF: Correction Factor for Cooling capacity

F.c. PA: Correction Factor for Power Input

TECHNICAL SPECIFICATIONS FOR BASIC VERSION (VB)

Correction factor for the use of GLYCOL EVAPORATOR side

Correction factor for the use of **ETHYLENE GLYCOL** with water produced between $5 \pm 20^\circ\text{C}$.

| percentage Of glycol in mass / volume | 0 / 0 | 10 / 8,9 | 20 / 18,1 | 30 / 27,7 | 40 / 37,5 |
|---------------------------------------|-------|----------|-----------|-----------|-----------|
| freezing point [$^\circ\text{C}$] | 0 | -3,2 | -8 | -14 | -22 |
| Cooling capacity CCPF | 1,000 | 0,990 | 0,980 | 0,970 | 0,950 |
| Power input CCPA | 1,000 | 1,000 | 0,990 | 0,990 | 0,980 |
| Water flow rate CCQA | 1,000 | 1,040 | 1,080 | 1,120 | 1,160 |
| Water pressure drop CCDP | 1,000 | 1,080 | 1,160 | 1,250 | 1,350 |

Correction factor for the use of **PROPYLENE GLYCOL** with water produced between $5 \pm 20^\circ\text{C}$.

| percentage Of glycol in mass / volume | 0 / 0 | 10 / 9,6 | 20 / 19,4 | 30 / 29,4 | 40 / 39,6 |
|---------------------------------------|-------|----------|-----------|-----------|-----------|
| freezing point [$^\circ\text{C}$] | 0 | -3,3 | -7 | -13 | -21 |
| Cooling capacity CCPF | 1,000 | 0,980 | 0,960 | 0,940 | 0,920 |
| Power input CCPA | 1,000 | 0,990 | 0,980 | 0,950 | 0,930 |
| Water flow rate CCQA | 1,000 | 1,010 | 1,030 | 1,060 | 1,090 |
| Water pressure drop CCDP | 1,000 | 1,050 | 1,110 | 1,220 | 1,380 |

TECHNICAL SPECIFICATIONS FOR BASIC VERSION (VB)

Standard performances - Basic Version AB

Mod. 280.1÷420.1

| MOD. | TWE | Tc Condensing temperature (°C) - Subcooling = 5K | | | | | | | | | | | | | | | | | | |
|-------|-------|--|-----|-----|-----|-----|-----|-----|-----|-----|------------|------------|------------|------------|-----|-----|-----|-----|-----|-----|
| | | 35 | | | 40 | | | 45 | | | 50 | | | 55 | | | 60 | | | |
| | | kWf | kWa | kWt | kWf | kWa | kWt | kWf | kWa | kWt | kWf | kWa | kWt | kWf | kWa | kWt | kWf | kWa | kWt | |
| 280.1 | 5 | 273 | 54 | 325 | 260 | 58 | 316 | 247 | 64 | 307 | 231 | 71 | 298 | 215 | 78 | 288 | 198 | 85 | 279 | |
| | 6 | 283 | 54 | 335 | 270 | 59 | 326 | 256 | 65 | 317 | 240 | 71 | 308 | 223 | 78 | 298 | 206 | 86 | 288 | |
| | 7 | 294 | 55 | 346 | 280 | 60 | 337 | 265 | 65 | 327 | 249 | 72 | 317 | 232 | 79 | 308 | 215 | 87 | 297 | |
| | 8 | 304 | 55 | 356 | 290 | 60 | 347 | 275 | 66 | 338 | 259 | 72 | 327 | 242 | 79 | 317 | 223 | 88 | 306 | |
| | 9 | 314 | 56 | 368 | 300 | 61 | 358 | 285 | 67 | 348 | 268 | 73 | 338 | 250 | 80 | 326 | 232 | 88 | 316 | |
| | 10 | 325 | 57 | 379 | 310 | 61 | 369 | 295 | 67 | 358 | 278 | 74 | 348 | 260 | 81 | 336 | 240 | 89 | 325 | |
| | 11 | 336 | 57 | 390 | 321 | 62 | 380 | 305 | 67 | 369 | 287 | 74 | 358 | 269 | 81 | 346 | 249 | 89 | 334 | |
| | 12 | 346 | 58 | 401 | 330 | 63 | 389 | 313 | 68 | 378 | 296 | 75 | 367 | 277 | 82 | 354 | 257 | 90 | 343 | |
| | 13 | 356 | 59 | 411 | 339 | 63 | 399 | 322 | 69 | 388 | 305 | 76 | 377 | 285 | 83 | 363 | 266 | 91 | 352 | |
| | 14 | 366 | 59 | 422 | 349 | 64 | 410 | 331 | 70 | 398 | 314 | 76 | 386 | 293 | 83 | 372 | 274 | 92 | 361 | |
| | 15 | 377 | 60 | 434 | 359 | 65 | 420 | 341 | 70 | 408 | 323 | 77 | 396 | 302 | 84 | 382 | 283 | 92 | 371 | |
| | 16 | 388 | 61 | 445 | 369 | 65 | 431 | 351 | 71 | 418 | 333 | 78 | 407 | 311 | 85 | 392 | 293 | 93 | 381 | |
| | 17 | 399 | 61 | 457 | 380 | 66 | 442 | 361 | 72 | 429 | 343 | 78 | 417 | 320 | 86 | 402 | 302 | 94 | 391 | |
| | 18 | 411 | 62 | 469 | 390 | 67 | 454 | 371 | 73 | 440 | 353 | 79 | 428 | 330 | 86 | 412 | 312 | 95 | 402 | |
| | 320.1 | 5 | 302 | 60 | 359 | 287 | 64 | 349 | 272 | 71 | 339 | 256 | 78 | 330 | 238 | 86 | 320 | 220 | 95 | 310 |
| | | 6 | 313 | 60 | 370 | 298 | 65 | 360 | 282 | 71 | 350 | 265 | 79 | 340 | 247 | 87 | 330 | 229 | 96 | 320 |
| | | 7 | 324 | 60 | 382 | 309 | 66 | 372 | 293 | 72 | 361 | 276 | 79 | 351 | 257 | 88 | 340 | 238 | 97 | 330 |
| | | 8 | 335 | 61 | 394 | 320 | 67 | 383 | 304 | 73 | 373 | 286 | 80 | 362 | 267 | 88 | 351 | 247 | 97 | 340 |
| 9 | | 347 | 62 | 406 | 331 | 67 | 395 | 314 | 73 | 384 | 296 | 81 | 373 | 277 | 89 | 361 | 257 | 98 | 350 | |
| 10 | | 359 | 62 | 418 | 342 | 68 | 407 | 325 | 74 | 395 | 307 | 82 | 384 | 287 | 89 | 372 | 266 | 99 | 360 | |
| 11 | | 371 | 63 | 431 | 354 | 68 | 419 | 336 | 75 | 407 | 317 | 82 | 395 | 297 | 90 | 383 | 276 | 99 | 371 | |
| 12 | | 381 | 64 | 442 | 364 | 69 | 429 | 346 | 75 | 417 | 327 | 83 | 405 | 305 | 91 | 392 | 285 | 100 | 380 | |
| 13 | | 392 | 64 | 454 | 374 | 70 | 440 | 356 | 76 | 428 | 336 | 84 | 416 | 314 | 92 | 402 | 294 | 101 | 390 | |
| 14 | | 404 | 65 | 466 | 384 | 71 | 451 | 366 | 77 | 439 | 346 | 84 | 426 | 323 | 93 | 411 | 303 | 102 | 400 | |
| 15 | | 415 | 66 | 478 | 395 | 71 | 463 | 376 | 78 | 451 | 356 | 85 | 437 | 333 | 93 | 422 | 313 | 103 | 410 | |
| 16 | | 427 | 67 | 490 | 406 | 72 | 475 | 387 | 79 | 462 | 367 | 86 | 448 | 342 | 94 | 432 | 323 | 104 | 421 | |
| 17 | | 439 | 67 | 503 | 418 | 73 | 487 | 398 | 80 | 474 | 377 | 87 | 460 | 352 | 95 | 443 | 333 | 105 | 432 | |
| 18 | | 452 | 68 | 517 | 429 | 74 | 499 | 410 | 81 | 486 | 389 | 87 | 471 | 363 | 96 | 454 | 343 | 105 | 443 | |
| 360.1 | | 5 | 344 | 67 | 407 | 326 | 73 | 396 | 310 | 80 | 386 | 291 | 90 | 377 | 273 | 98 | 366 | 253 | 109 | 357 |
| | | 6 | 356 | 68 | 420 | 338 | 74 | 409 | 321 | 81 | 398 | 303 | 90 | 388 | 283 | 99 | 377 | 263 | 110 | 368 |
| | | 7 | 368 | 69 | 434 | 351 | 75 | 422 | 333 | 82 | 411 | 314 | 90 | 400 | 294 | 100 | 389 | 273 | 111 | 379 |
| | | 8 | 381 | 70 | 447 | 364 | 76 | 436 | 345 | 83 | 424 | 326 | 91 | 412 | 305 | 101 | 402 | 284 | 113 | 391 |
| | 9 | 395 | 70 | 461 | 376 | 76 | 448 | 357 | 83 | 436 | 337 | 92 | 425 | 316 | 102 | 413 | 295 | 114 | 403 | |
| | 10 | 407 | 71 | 475 | 389 | 77 | 462 | 369 | 84 | 449 | 349 | 93 | 438 | 328 | 102 | 425 | 305 | 114 | 413 | |
| | 11 | 421 | 72 | 489 | 401 | 78 | 475 | 382 | 85 | 463 | 361 | 94 | 450 | 338 | 103 | 437 | 316 | 115 | 425 | |
| | 12 | 433 | 72 | 501 | 412 | 79 | 487 | 393 | 86 | 475 | 371 | 95 | 461 | 348 | 104 | 447 | 325 | 116 | 435 | |
| | 13 | 445 | 73 | 514 | 424 | 79 | 499 | 404 | 87 | 487 | 381 | 95 | 472 | 357 | 105 | 457 | 335 | 117 | 446 | |
| | 14 | 457 | 74 | 527 | 435 | 80 | 511 | 416 | 88 | 500 | 392 | 96 | 483 | 367 | 106 | 468 | 345 | 118 | 457 | |
| | 15 | 470 | 74 | 541 | 447 | 81 | 524 | 428 | 89 | 513 | 403 | 97 | 495 | 377 | 108 | 479 | 355 | 119 | 468 | |
| | 16 | 484 | 75 | 555 | 459 | 82 | 537 | 441 | 90 | 526 | 414 | 98 | 507 | 387 | 109 | 491 | 366 | 120 | 480 | |
| | 17 | 497 | 76 | 569 | 472 | 82 | 550 | 453 | 91 | 540 | 426 | 98 | 520 | 398 | 110 | 502 | 377 | 121 | 492 | |
| | 18 | 511 | 77 | 584 | 485 | 83 | 564 | 467 | 93 | 554 | 438 | 99 | 532 | 409 | 111 | 514 | 388 | 122 | 504 | |
| | 420.1 | 5 | 396 | 79 | 471 | 378 | 85 | 458 | 358 | 92 | 445 | 335 | 101 | 431 | 310 | 112 | 416 | 285 | 122 | 401 |
| | | 6 | 411 | 79 | 486 | 392 | 86 | 473 | 371 | 93 | 459 | 348 | 102 | 445 | 323 | 113 | 430 | 297 | 123 | 414 |
| | | 7 | 426 | 79 | 501 | 406 | 87 | 488 | 384 | 94 | 474 | 361 | 103 | 459 | 336 | 114 | 444 | 309 | 124 | 427 |
| | | 8 | 440 | 80 | 516 | 420 | 87 | 503 | 398 | 95 | 489 | 374 | 104 | 473 | 350 | 114 | 458 | 322 | 125 | 441 |
| 9 | | 456 | 81 | 532 | 436 | 87 | 519 | 413 | 96 | 504 | 389 | 105 | 488 | 362 | 115 | 471 | 334 | 126 | 454 | |
| 10 | | 471 | 82 | 549 | 450 | 88 | 534 | 427 | 96 | 518 | 402 | 106 | 503 | 375 | 116 | 485 | 347 | 127 | 468 | |
| 11 | | 487 | 83 | 566 | 465 | 89 | 550 | 441 | 97 | 534 | 417 | 107 | 518 | 389 | 117 | 500 | 360 | 128 | 482 | |
| 12 | | 502 | 84 | 581 | 479 | 90 | 565 | 454 | 98 | 547 | 429 | 108 | 532 | 401 | 118 | 512 | 372 | 129 | 495 | |
| 13 | | 516 | 85 | 597 | 493 | 91 | 579 | 467 | 99 | 561 | 442 | 109 | 546 | 413 | 119 | 526 | 385 | 130 | 508 | |
| 14 | | 532 | 86 | 613 | 507 | 92 | 595 | 480 | 100 | 575 | 456 | 110 | 560 | 425 | 120 | 539 | 397 | 131 | 522 | |
| 15 | | 547 | 87 | 630 | 521 | 93 | 610 | 494 | 101 | 590 | 470 | 111 | 575 | 438 | 121 | 553 | 411 | 132 | 536 | |
| 16 | | 563 | 88 | 647 | 537 | 94 | 626 | 508 | 102 | 605 | 484 | 112 | 590 | 452 | 122 | 567 | 424 | 133 | 551 | |
| 17 | | 580 | 89 | 664 | 552 | 95 | 643 | 522 | 103 | 620 | 499 | 113 | 606 | 466 | 123 | 582 | 439 | 134 | 566 | |
| 18 | | 597 | 90 | 682 | 568 | 97 | 660 | 537 | 104 | 636 | 514 | 114 | 622 | 480 | 124 | 597 | 453 | 135 | 582 | |

TWE= Evaporator outlet water temperature (°C)

Tc =Condensing temperature (°C) - Subcooling = 5K

TWD = Desuperheater water temperature outlet (°C)

kWf = Cooling capacity (kW).

kWa = Compressor power input (kW).

kWt = Heating capacity (kW).

The standard performances refer to a 5°C temperature difference between the water entering and leaving the heat exchanger. Has also been considered A 0.44 x 10⁻⁴ m² K/W fouling factor.

TECHNICAL SPECIFICATIONS FOR BASIC VERSION (VB)

Mod. 480.1÷710.2

| MOD. | TWE | Tc Condensing temperature (°C) - Subcooling = 5K | | | | | | | | | | | | | | | | | | |
|-------|-------|--|-----|------|-----|-----|------|-----|-----|------|------------|------------|------------|------------|-----|------|-----|-----|------|-----|
| | | 35 | | | 40 | | | 45 | | | 50 | | | 55 | | | 60 | | | |
| | | kWf | kWa | kWt | kWf | kWa | kWt | kWf | kWa | kWt | kWf | kWa | kWt | kWf | kWa | kWt | kWf | kWa | kWt | |
| 480.1 | 5 | 459 | 88 | 543 | 438 | 97 | 530 | 416 | 108 | 519 | 392 | 119 | 505 | 367 | 133 | 494 | 341 | 148 | 481 | |
| | 6 | 476 | 89 | 561 | 454 | 98 | 547 | 432 | 109 | 535 | 407 | 120 | 521 | 382 | 134 | 509 | 354 | 149 | 495 | |
| | 7 | 494 | 90 | 579 | 471 | 99 | 565 | 447 | 110 | 552 | 423 | 121 | 538 | 396 | 135 | 524 | 368 | 149 | 510 | |
| | 8 | 510 | 90 | 596 | 488 | 100 | 583 | 463 | 111 | 568 | 438 | 122 | 554 | 411 | 136 | 540 | 382 | 150 | 524 | |
| | 9 | 527 | 91 | 614 | 504 | 101 | 600 | 480 | 112 | 586 | 453 | 123 | 570 | 426 | 137 | 556 | 396 | 151 | 540 | |
| | 10 | 545 | 92 | 632 | 521 | 101 | 617 | 496 | 112 | 602 | 469 | 124 | 587 | 441 | 137 | 571 | 410 | 151 | 554 | |
| | 11 | 561 | 93 | 650 | 538 | 102 | 635 | 512 | 113 | 619 | 485 | 125 | 604 | 456 | 138 | 587 | 425 | 152 | 570 | |
| | 12 | 576 | 94 | 665 | 552 | 103 | 650 | 527 | 114 | 635 | 499 | 126 | 619 | 470 | 139 | 602 | 438 | 153 | 584 | |
| | 13 | 591 | 95 | 681 | 567 | 104 | 666 | 542 | 115 | 651 | 513 | 128 | 634 | 485 | 140 | 617 | 451 | 154 | 598 | |
| | 14 | 606 | 96 | 697 | 582 | 105 | 682 | 557 | 116 | 667 | 527 | 129 | 649 | 499 | 141 | 633 | 465 | 155 | 613 | |
| | 15 | 621 | 98 | 714 | 598 | 106 | 699 | 573 | 117 | 684 | 542 | 130 | 666 | 515 | 142 | 649 | 480 | 156 | 628 | |
| | 16 | 637 | 99 | 731 | 614 | 107 | 716 | 590 | 118 | 701 | 558 | 131 | 682 | 530 | 143 | 666 | 494 | 157 | 644 | |
| | 17 | 653 | 100 | 748 | 631 | 108 | 733 | 607 | 119 | 719 | 573 | 132 | 699 | 546 | 144 | 683 | 510 | 158 | 660 | |
| | 18 | 670 | 101 | 766 | 648 | 109 | 751 | 624 | 120 | 738 | 590 | 133 | 716 | 563 | 145 | 701 | 525 | 159 | 677 | |
| | 540.1 | 5 | 520 | 104 | 619 | 496 | 112 | 602 | 469 | 122 | 584 | 441 | 134 | 568 | 410 | 148 | 551 | 378 | 162 | 532 |
| | | 6 | 539 | 105 | 639 | 514 | 114 | 622 | 487 | 123 | 604 | 458 | 135 | 586 | 427 | 149 | 568 | 394 | 163 | 549 |
| | | 7 | 559 | 106 | 660 | 533 | 115 | 642 | 505 | 125 | 624 | 475 | 137 | 605 | 444 | 150 | 586 | 410 | 165 | 567 |
| | | 8 | 579 | 108 | 681 | 552 | 116 | 662 | 524 | 126 | 644 | 493 | 138 | 624 | 461 | 151 | 605 | 427 | 166 | 585 |
| 9 | | 599 | 109 | 702 | 571 | 117 | 683 | 542 | 127 | 663 | 511 | 139 | 644 | 478 | 153 | 623 | 443 | 167 | 602 | |
| 10 | | 618 | 111 | 723 | 591 | 119 | 704 | 561 | 129 | 683 | 530 | 141 | 663 | 496 | 154 | 642 | 461 | 169 | 621 | |
| 11 | | 638 | 112 | 745 | 610 | 120 | 725 | 580 | 130 | 704 | 548 | 142 | 683 | 514 | 155 | 661 | 478 | 170 | 639 | |
| 12 | | 656 | 114 | 764 | 627 | 122 | 743 | 597 | 132 | 722 | 565 | 143 | 700 | 530 | 156 | 678 | 493 | 172 | 656 | |
| 13 | | 674 | 115 | 783 | 645 | 123 | 762 | 614 | 133 | 741 | 581 | 144 | 718 | 547 | 157 | 696 | 509 | 173 | 673 | |
| 14 | | 692 | 117 | 803 | 663 | 125 | 782 | 632 | 135 | 760 | 599 | 145 | 736 | 564 | 158 | 714 | 525 | 175 | 691 | |
| 15 | | 711 | 118 | 823 | 682 | 127 | 802 | 650 | 136 | 779 | 617 | 146 | 755 | 581 | 159 | 732 | 542 | 176 | 709 | |
| 16 | | 730 | 120 | 844 | 701 | 128 | 822 | 669 | 138 | 800 | 635 | 147 | 775 | 600 | 160 | 752 | 559 | 178 | 728 | |
| 17 | | 750 | 121 | 865 | 720 | 130 | 843 | 688 | 140 | 821 | 654 | 148 | 795 | 618 | 161 | 771 | 577 | 179 | 748 | |
| 18 | | 771 | 123 | 887 | 740 | 131 | 865 | 708 | 141 | 842 | 674 | 149 | 815 | 638 | 162 | 792 | 596 | 181 | 768 | |
| 600.1 | | 5 | 572 | 113 | 679 | 545 | 123 | 662 | 516 | 134 | 644 | 486 | 149 | 628 | 456 | 165 | 612 | 423 | 183 | 597 |
| | | 6 | 592 | 114 | 701 | 565 | 124 | 683 | 535 | 136 | 665 | 505 | 150 | 648 | 473 | 166 | 631 | 439 | 185 | 615 |
| | | 7 | 613 | 115 | 723 | 585 | 125 | 704 | 555 | 137 | 686 | 524 | 151 | 668 | 491 | 168 | 650 | 457 | 186 | 633 |
| | | 8 | 635 | 117 | 746 | 606 | 126 | 726 | 575 | 138 | 706 | 543 | 153 | 688 | 509 | 169 | 670 | 474 | 188 | 652 |
| | 9 | 656 | 118 | 768 | 626 | 127 | 747 | 595 | 139 | 728 | 562 | 154 | 708 | 527 | 170 | 689 | 491 | 189 | 671 | |
| | 10 | 678 | 119 | 790 | 648 | 128 | 770 | 615 | 140 | 749 | 582 | 155 | 729 | 546 | 171 | 709 | 509 | 190 | 690 | |
| | 11 | 700 | 120 | 814 | 669 | 129 | 792 | 636 | 141 | 770 | 601 | 156 | 749 | 565 | 173 | 729 | 527 | 192 | 709 | |
| | 12 | 719 | 121 | 834 | 687 | 130 | 811 | 653 | 142 | 788 | 618 | 157 | 767 | 581 | 174 | 747 | 542 | 193 | 726 | |
| | 13 | 739 | 122 | 854 | 706 | 131 | 831 | 671 | 143 | 807 | 635 | 158 | 785 | 598 | 176 | 765 | 559 | 195 | 744 | |
| | 14 | 759 | 123 | 876 | 725 | 133 | 851 | 690 | 144 | 827 | 653 | 159 | 804 | 616 | 177 | 784 | 575 | 196 | 762 | |
| | 15 | 780 | 124 | 898 | 745 | 134 | 872 | 709 | 145 | 847 | 671 | 160 | 823 | 634 | 179 | 804 | 592 | 198 | 780 | |
| | 16 | 802 | 125 | 920 | 766 | 135 | 894 | 728 | 147 | 868 | 690 | 161 | 842 | 652 | 180 | 824 | 610 | 199 | 800 | |
| | 17 | 824 | 126 | 943 | 787 | 136 | 916 | 749 | 148 | 889 | 709 | 162 | 863 | 671 | 182 | 844 | 628 | 201 | 819 | |
| | 18 | 846 | 127 | 967 | 809 | 137 | 939 | 769 | 149 | 911 | 729 | 163 | 883 | 691 | 184 | 865 | 647 | 203 | 839 | |
| | 710.2 | 5 | 686 | 135 | 814 | 653 | 148 | 794 | 619 | 161 | 772 | 582 | 179 | 753 | 546 | 198 | 733 | 505 | 221 | 714 |
| | | 6 | 711 | 137 | 841 | 677 | 149 | 819 | 642 | 163 | 797 | 604 | 180 | 776 | 566 | 200 | 756 | 525 | 222 | 736 |
| | | 7 | 736 | 139 | 868 | 702 | 150 | 845 | 666 | 165 | 823 | 627 | 181 | 800 | 587 | 202 | 779 | 546 | 223 | 758 |
| | | 8 | 762 | 140 | 895 | 727 | 152 | 871 | 690 | 166 | 847 | 650 | 183 | 825 | 609 | 203 | 802 | 567 | 225 | 781 |
| 9 | | 789 | 141 | 923 | 753 | 153 | 898 | 714 | 167 | 873 | 674 | 184 | 849 | 632 | 205 | 827 | 588 | 227 | 804 | |
| 10 | | 815 | 143 | 951 | 778 | 154 | 924 | 738 | 169 | 899 | 697 | 185 | 873 | 654 | 206 | 850 | 609 | 228 | 826 | |
| 11 | | 842 | 144 | 979 | 804 | 155 | 951 | 763 | 170 | 925 | 721 | 187 | 899 | 677 | 207 | 874 | 631 | 229 | 849 | |
| 12 | | 865 | 145 | 1003 | 826 | 156 | 974 | 785 | 171 | 948 | 742 | 188 | 921 | 697 | 208 | 895 | 651 | 231 | 870 | |
| 13 | | 889 | 146 | 1028 | 849 | 157 | 999 | 808 | 172 | 971 | 764 | 190 | 944 | 718 | 209 | 917 | 671 | 232 | 891 | |
| 14 | | 914 | 147 | 1054 | 873 | 158 | 1023 | 831 | 173 | 995 | 786 | 191 | 968 | 740 | 210 | 939 | 692 | 233 | 913 | |
| 15 | | 939 | 148 | 1080 | 898 | 159 | 1049 | 854 | 174 | 1020 | 809 | 193 | 992 | 762 | 211 | 962 | 713 | 235 | 936 | |
| 16 | | 965 | 150 | 1107 | 923 | 160 | 1075 | 879 | 175 | 1045 | 833 | 194 | 1017 | 785 | 212 | 986 | 735 | 236 | 959 | |
| 17 | | 992 | 151 | 1135 | 949 | 161 | 1102 | 904 | 176 | 1071 | 857 | 196 | 1043 | 808 | 213 | 1011 | 758 | 237 | 983 | |
| 18 | | 1020 | 152 | 1164 | 975 | 162 | 1130 | 930 | 178 | 1098 | 882 | 197 | 1069 | 833 | 214 | 1036 | 781 | 239 | 1008 | |

TWE= Evaporator outlet water temperature (°C)
Tc =Condensing temperature (°C) - Subcooling = 5K
TWb = Desuperheater water temperature outlet (°C)
kWf = Cooling capacity (kW).
kWa = Compressor power input (kW).
kWt = Heating capacity (kW).

The standard performances refer to a 5°C temperature difference between the water entering and leaving the heat exchanger. Has also been considered a 0.44 x 10⁻⁴ m² K/W fouling factor.

TECHNICAL SPECIFICATIONS FOR BASIC VERSION (VB)

Mod. 820.2÷1200.2

| MOD. | TWE | Tc Condensing temperature (°C) - Subcooling = 5K | | | | | | | | | | | | | | | | | | |
|--------|--------|--|------|------|------|------|------|------|------|------|------------|-------------|------------|-------------|------|------|------|-----|------|------|
| | | 35 | | | 40 | | | 45 | | | 50 | | | 55 | | | 60 | | | |
| | | kWf | kWa | kWt | kWf | kWa | kWt | kWf | kWa | kWt | kWf | kWa | kWt | kWf | kWa | kWt | kWf | kWa | kWt | |
| 820.2 | 5 | 792 | 155 | 940 | 755 | 171 | 918 | 715 | 186 | 891 | 671 | 205 | 866 | 623 | 224 | 836 | 574 | 247 | 809 | |
| | 6 | 821 | 157 | 970 | 783 | 172 | 946 | 741 | 188 | 920 | 696 | 206 | 892 | 648 | 226 | 863 | 597 | 249 | 833 | |
| | 7 | 850 | 159 | 1002 | 811 | 173 | 975 | 769 | 190 | 949 | 723 | 207 | 920 | 674 | 228 | 890 | 621 | 251 | 859 | |
| | 8 | 880 | 160 | 1032 | 840 | 175 | 1007 | 796 | 191 | 977 | 749 | 209 | 948 | 699 | 230 | 918 | 645 | 253 | 885 | |
| | 9 | 910 | 162 | 1064 | 869 | 176 | 1036 | 825 | 193 | 1008 | 777 | 211 | 977 | 726 | 232 | 946 | 671 | 255 | 912 | |
| | 10 | 941 | 163 | 1096 | 898 | 178 | 1067 | 853 | 195 | 1038 | 804 | 212 | 1006 | 751 | 233 | 972 | 695 | 257 | 939 | |
| | 11 | 971 | 165 | 1128 | 928 | 179 | 1098 | 882 | 196 | 1068 | 832 | 214 | 1035 | 778 | 235 | 1001 | 721 | 258 | 966 | |
| | 12 | 997 | 167 | 1156 | 953 | 181 | 1125 | 907 | 198 | 1095 | 856 | 216 | 1061 | 801 | 237 | 1026 | 743 | 260 | 990 | |
| | 13 | 1025 | 169 | 1185 | 980 | 182 | 1153 | 932 | 200 | 1122 | 881 | 218 | 1088 | 825 | 239 | 1052 | 767 | 261 | 1015 | |
| | 14 | 1052 | 171 | 1215 | 1007 | 184 | 1182 | 958 | 202 | 1150 | 906 | 220 | 1115 | 850 | 241 | 1079 | 791 | 263 | 1041 | |
| | 15 | 1081 | 173 | 1246 | 1035 | 185 | 1211 | 985 | 203 | 1179 | 932 | 222 | 1144 | 876 | 243 | 1106 | 816 | 264 | 1067 | |
| | 16 | 1110 | 175 | 1277 | 1063 | 187 | 1241 | 1013 | 205 | 1208 | 959 | 224 | 1173 | 902 | 245 | 1135 | 842 | 266 | 1094 | |
| | 17 | 1141 | 177 | 1309 | 1093 | 189 | 1272 | 1042 | 207 | 1239 | 987 | 226 | 1202 | 929 | 247 | 1164 | 868 | 268 | 1123 | |
| | 18 | 1172 | 180 | 1342 | 1123 | 190 | 1303 | 1071 | 209 | 1270 | 1016 | 229 | 1233 | 957 | 249 | 1194 | 896 | 269 | 1152 | |
| | 950.2 | 5 | 922 | 176 | 1089 | 879 | 196 | 1065 | 833 | 215 | 1038 | 786 | 241 | 1014 | 736 | 267 | 990 | 683 | 294 | 962 |
| | | 6 | 954 | 178 | 1123 | 910 | 197 | 1098 | 864 | 217 | 1070 | 815 | 242 | 1045 | 764 | 268 | 1018 | 709 | 296 | 991 |
| | | 7 | 987 | 180 | 1157 | 943 | 198 | 1131 | 896 | 219 | 1104 | 846 | 243 | 1077 | 793 | 269 | 1048 | 737 | 298 | 1020 |
| | | 8 | 1020 | 181 | 1192 | 976 | 200 | 1166 | 928 | 220 | 1137 | 877 | 245 | 1109 | 822 | 271 | 1080 | 765 | 300 | 1050 |
| 9 | | 1055 | 182 | 1228 | 1009 | 201 | 1200 | 960 | 222 | 1171 | 907 | 246 | 1141 | 852 | 273 | 1111 | 794 | 302 | 1080 | |
| 10 | | 1088 | 183 | 1263 | 1042 | 202 | 1234 | 992 | 223 | 1205 | 939 | 248 | 1174 | 882 | 274 | 1142 | 822 | 304 | 1111 | |
| 11 | | 1123 | 185 | 1299 | 1076 | 204 | 1269 | 1025 | 225 | 1239 | 971 | 249 | 1207 | 912 | 276 | 1174 | 851 | 305 | 1141 | |
| 12 | | 1153 | 186 | 1330 | 1105 | 205 | 1300 | 1054 | 226 | 1268 | 998 | 251 | 1237 | 939 | 278 | 1203 | 876 | 307 | 1168 | |
| 13 | | 1184 | 187 | 1362 | 1135 | 207 | 1331 | 1083 | 228 | 1299 | 1027 | 252 | 1267 | 967 | 280 | 1233 | 902 | 308 | 1195 | |
| 14 | | 1215 | 189 | 1395 | 1166 | 209 | 1364 | 1113 | 229 | 1331 | 1056 | 254 | 1297 | 996 | 282 | 1264 | 929 | 310 | 1224 | |
| 15 | | 1248 | 190 | 1428 | 1197 | 210 | 1397 | 1144 | 231 | 1363 | 1086 | 256 | 1329 | 1025 | 284 | 1295 | 957 | 311 | 1253 | |
| 16 | | 1281 | 191 | 1463 | 1230 | 212 | 1431 | 1175 | 232 | 1396 | 1117 | 257 | 1362 | 1056 | 287 | 1328 | 985 | 313 | 1283 | |
| 17 | | 1315 | 193 | 1498 | 1263 | 214 | 1466 | 1208 | 234 | 1430 | 1149 | 259 | 1395 | 1087 | 289 | 1361 | 1014 | 315 | 1313 | |
| 18 | | 1350 | 194 | 1535 | 1297 | 216 | 1502 | 1242 | 235 | 1465 | 1182 | 260 | 1430 | 1119 | 291 | 1396 | 1045 | 316 | 1345 | |
| 1100.2 | | 5 | 1041 | 209 | 1239 | 991 | 225 | 1204 | 937 | 244 | 1169 | 881 | 268 | 1136 | 820 | 296 | 1101 | 757 | 325 | 1065 |
| | | 6 | 1078 | 211 | 1279 | 1028 | 228 | 1244 | 973 | 247 | 1208 | 915 | 271 | 1173 | 853 | 298 | 1136 | 788 | 327 | 1099 |
| | | 7 | 1118 | 213 | 1320 | 1066 | 231 | 1285 | 1010 | 250 | 1248 | 950 | 274 | 1211 | 888 | 300 | 1172 | 820 | 330 | 1134 |
| | | 8 | 1157 | 216 | 1362 | 1104 | 232 | 1325 | 1047 | 253 | 1288 | 986 | 276 | 1249 | 922 | 303 | 1209 | 853 | 333 | 1170 |
| | 9 | 1197 | 219 | 1405 | 1142 | 235 | 1366 | 1084 | 255 | 1327 | 1023 | 279 | 1288 | 956 | 306 | 1247 | 887 | 335 | 1205 | |
| | 10 | 1236 | 222 | 1447 | 1181 | 238 | 1408 | 1122 | 258 | 1367 | 1059 | 282 | 1327 | 991 | 309 | 1285 | 921 | 338 | 1242 | |
| | 11 | 1276 | 225 | 1489 | 1220 | 241 | 1450 | 1160 | 261 | 1408 | 1096 | 284 | 1366 | 1028 | 311 | 1323 | 955 | 341 | 1279 | |
| | 12 | 1311 | 228 | 1527 | 1254 | 244 | 1487 | 1193 | 264 | 1444 | 1129 | 286 | 1400 | 1060 | 313 | 1357 | 986 | 344 | 1313 | |
| | 13 | 1347 | 231 | 1566 | 1290 | 247 | 1525 | 1228 | 267 | 1481 | 1163 | 288 | 1436 | 1093 | 315 | 1392 | 1017 | 347 | 1347 | |
| | 14 | 1384 | 234 | 1606 | 1326 | 251 | 1564 | 1263 | 270 | 1520 | 1197 | 290 | 1473 | 1127 | 317 | 1428 | 1050 | 350 | 1383 | |
| | 15 | 1421 | 237 | 1646 | 1363 | 254 | 1604 | 1299 | 273 | 1559 | 1233 | 292 | 1511 | 1163 | 319 | 1465 | 1083 | 353 | 1419 | |
| | 16 | 1460 | 240 | 1688 | 1401 | 257 | 1645 | 1337 | 277 | 1600 | 1270 | 294 | 1550 | 1199 | 321 | 1504 | 1118 | 357 | 1457 | |
| | 17 | 1500 | 243 | 1731 | 1440 | 260 | 1687 | 1376 | 280 | 1641 | 1308 | 296 | 1590 | 1237 | 323 | 1543 | 1154 | 360 | 1496 | |
| | 18 | 1541 | 246 | 1775 | 1480 | 263 | 1730 | 1415 | 283 | 1684 | 1348 | 298 | 1631 | 1275 | 325 | 1584 | 1191 | 363 | 1535 | |
| | 1200.2 | 5 | 1144 | 225 | 1357 | 1091 | 245 | 1323 | 1033 | 267 | 1287 | 972 | 297 | 1254 | 912 | 328 | 1223 | 845 | 364 | 1191 |
| | | 6 | 1184 | 227 | 1400 | 1130 | 247 | 1364 | 1071 | 270 | 1328 | 1009 | 299 | 1293 | 946 | 331 | 1260 | 878 | 367 | 1227 |
| | | 7 | 1227 | 229 | 1444 | 1170 | 249 | 1406 | 1110 | 273 | 1370 | 1048 | 301 | 1334 | 981 | 334 | 1298 | 913 | 370 | 1265 |
| | | 8 | 1270 | 232 | 1490 | 1211 | 251 | 1450 | 1150 | 275 | 1411 | 1085 | 304 | 1374 | 1018 | 337 | 1338 | 948 | 373 | 1302 |
| 9 | | 1312 | 234 | 1534 | 1253 | 253 | 1494 | 1190 | 277 | 1454 | 1124 | 306 | 1414 | 1055 | 339 | 1376 | 982 | 376 | 1340 | |
| 10 | | 1356 | 236 | 1580 | 1295 | 255 | 1538 | 1231 | 279 | 1496 | 1163 | 308 | 1456 | 1092 | 341 | 1416 | 1018 | 378 | 1377 | |
| 11 | | 1400 | 238 | 1626 | 1337 | 257 | 1582 | 1271 | 281 | 1538 | 1202 | 310 | 1496 | 1130 | 344 | 1456 | 1054 | 381 | 1416 | |
| 12 | | 1438 | 240 | 1666 | 1374 | 259 | 1621 | 1306 | 283 | 1575 | 1235 | 312 | 1532 | 1163 | 347 | 1492 | 1085 | 384 | 1450 | |
| 13 | | 1478 | 242 | 1708 | 1412 | 261 | 1660 | 1342 | 285 | 1613 | 1270 | 314 | 1568 | 1196 | 350 | 1529 | 1117 | 387 | 1485 | |
| 14 | | 1519 | 244 | 1750 | 1451 | 263 | 1701 | 1379 | 287 | 1652 | 1305 | 316 | 1605 | 1231 | 353 | 1566 | 1151 | 390 | 1521 | |
| 15 | | 1560 | 246 | 1794 | 1491 | 265 | 1743 | 1418 | 289 | 1692 | 1342 | 318 | 1644 | 1267 | 356 | 1605 | 1185 | 393 | 1558 | |
| 16 | | 1603 | 248 | 1839 | 1532 | 268 | 1786 | 1457 | 291 | 1734 | 1379 | 320 | 1683 | 1304 | 359 | 1645 | 1220 | 396 | 1597 | |
| 17 | | 1647 | 250 | 1885 | 1574 | 270 | 1830 | 1497 | 293 | 1776 | 1418 | 322 | 1724 | 1342 | 362 | 1686 | 1257 | 399 | 1636 | |
| 18 | | 1693 | 252 | 1932 | 1617 | 272 | 1876 | 1539 | 295 | 1819 | 1457 | 324 | 1765 | 1382 | 365 | 1728 | 1294 | 403 | 1676 | |

TWE= Evaporator outlet water temperature (°C)
Tc =Condensing temperature (°C) - Subcooling = 5K
TWb = Desuperheater water temperature outlet (°C)
kWf = Cooling capacity (kW).
kWa = Compressor power input (kW).
kWt = Heating capacity (kW).

The standard performances refer to a 5°C temperature difference between the water entering and leaving the heat exchanger. Has also been considered A 0.44 x 10⁻⁴ m² K/W fouling factor.

TECHNICAL SPECIFICATIONS FOR DESUPERHEATER VERSION (VD)

Version with Desuperheater VD

| Model | 280.1 | 320.1 | 360.1 | 420.1 | 480.1 | 540.1 | 600.1 | 710.2 | 820.2 | 950.2 | 1100.2 | 1200.2 | UM |
|--|------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|--------|-----|
| Recovered heating capacity | 66 | 73 | 83 | 95 | 112 | 126 | 139 | 167 | 190 | 224 | 252 | 277 | kW |
| Recovered water flow rate | 3,2 | 3,5 | 4,0 | 4,5 | 5,3 | 6,0 | 6,6 | 8,0 | 9,1 | 10,7 | 12,1 | 13,2 | l/s |
| Recovered water pressure drop | 9 | 11 | 11 | 14 | 13 | 10 | 13 | 11 | 14 | 13 | 10 | 13 | kPa |
| Type of recovery exchanger | STAINLESS STEEL BRAZE PLATES | | | | | | | | | | | | - |
| Quantity | 1 | | | | | | 2 | | | | | | N° |
| Max. operating pressure on wet side | 1000 | | | | | | | | | | | | kPa |
| Total water content of recovery exchangers | 5 | 5 | 7 | 7 | 9 | 10 | 14 | 13 | 13 | 18 | 20 | 28 | l |

Notes:

The data refer to: Water temperature: evaporator inlet :**12°C** - evaporator outlet: **7°C**.
 Water temperature: recovery inlet :**40°C** - recovery outlet: **45°C**.
 Condenser temperature: **50°C** - subcooling: **5K**.

Recovery heat exchanger specifications Version with Desuperheater VD

| MOD. | TW _D | CONDENSER WATER TEMPERATURE (°C TW _C) | | | | | |
|---------------|-----------------|---|-----|-----|------------|-----|-----|
| | | 35 | 40 | 45 | 50 | 55 | 60 |
| | | kW _t = RECOVERED HEATING CAPACITY [Kw] | | | | | |
| 280.1 | 40 | 47 | 56 | 63 | 69 | 76 | 83 |
| | 45 | 45 | 54 | 60 | 66 | 73 | 80 |
| | 50 | 44 | 52 | 58 | 64 | 71 | 77 |
| 320.1 | 40 | 52 | 61 | 69 | 75 | 83 | 91 |
| | 45 | 50 | 59 | 66 | 73 | 80 | 87 |
| | 50 | 48 | 57 | 63 | 70 | 77 | 84 |
| 360.1 | 40 | 59 | 70 | 79 | 86 | 95 | 104 |
| | 45 | 57 | 68 | 76 | 83 | 92 | 100 |
| | 50 | 54 | 65 | 73 | 80 | 88 | 96 |
| 420.1 | 40 | 67 | 80 | 90 | 98 | 109 | 119 |
| | 45 | 65 | 77 | 86 | 95 | 105 | 114 |
| | 50 | 62 | 74 | 83 | 91 | 101 | 109 |
| 480.1 | 40 | 79 | 95 | 106 | 116 | 129 | 140 |
| | 45 | 76 | 91 | 102 | 112 | 124 | 135 |
| | 50 | 73 | 87 | 98 | 107 | 119 | 129 |
| 540.1 | 40 | 90 | 107 | 119 | 131 | 145 | 158 |
| | 45 | 86 | 103 | 115 | 126 | 139 | 152 |
| | 50 | 83 | 98 | 110 | 121 | 134 | 146 |
| 600.1 | 40 | 99 | 118 | 132 | 145 | 160 | 174 |
| | 45 | 95 | 113 | 127 | 139 | 154 | 167 |
| | 50 | 91 | 108 | 121 | 133 | 148 | 161 |
| 710.1 | 40 | 119 | 141 | 158 | 174 | 192 | 209 |
| | 45 | 114 | 136 | 152 | 167 | 185 | 201 |
| | 50 | 110 | 131 | 146 | 161 | 178 | 193 |
| 820.2 | 40 | 135 | 161 | 180 | 198 | 219 | 238 |
| | 45 | 130 | 155 | 173 | 190 | 210 | 229 |
| | 50 | 125 | 148 | 166 | 182 | 202 | 220 |
| 950.2 | 40 | 159 | 189 | 212 | 233 | 257 | 280 |
| | 45 | 153 | 182 | 204 | 224 | 248 | 269 |
| | 50 | 147 | 175 | 196 | 215 | 238 | 259 |
| 1100.2 | 40 | 179 | 213 | 239 | 262 | 290 | 316 |
| | 45 | 172 | 205 | 230 | 252 | 279 | 303 |
| | 50 | 165 | 197 | 220 | 242 | 268 | 291 |
| 1200.2 | 40 | 197 | 234 | 262 | 288 | 318 | 346 |
| | 45 | 189 | 225 | 252 | 277 | 306 | 333 |
| | 50 | 181 | 216 | 242 | 266 | 294 | 320 |

TW_D = Desuperheater water temperature outlet (°C)

TW_C = Condenser water temperature outlet (°C)

The standard performances refer to a 5°C temperature difference between the water entering and leaving the heat exchanger. Has also been considered A 0.44 x 10⁻⁴ m² K/W fouling factor.

NOISE LEVELS

Basic version VB

| Mod. | SWL (dB) | | | | | | | | | | SPL (dBA) | | |
|--------|-------------------|-----|-----|-----|------|------|------|------|-------|-------|-----------|----|-----|
| | Octave bands (Hz) | | | | | | | | Total | | 1m | 5m | 10m |
| | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | Tot | dB(A) | | | |
| 280.1 | 94 | 93 | 91 | 92 | 92 | 91 | 86 | 79 | 100 | 97 | 79 | 70 | 65 |
| 320.1 | 94 | 93 | 91 | 92 | 92 | 91 | 86 | 79 | 100 | 97 | 79 | 70 | 65 |
| 360.1 | 94 | 93 | 91 | 92 | 92 | 91 | 86 | 79 | 100 | 97 | 79 | 70 | 65 |
| 420.1 | 96 | 95 | 94 | 93 | 94 | 92 | 88 | 82 | 102 | 98 | 80 | 72 | 67 |
| 480.1 | 96 | 95 | 94 | 93 | 94 | 92 | 88 | 82 | 102 | 98 | 80 | 72 | 67 |
| 540.1 | 96 | 95 | 94 | 93 | 94 | 92 | 88 | 82 | 102 | 98 | 80 | 72 | 67 |
| 600.1 | 96 | 95 | 94 | 93 | 94 | 92 | 88 | 82 | 102 | 98 | 80 | 71 | 66 |
| 710.2 | 98 | 97 | 95 | 93 | 94 | 94 | 88 | 82 | 103 | 99 | 80 | 72 | 67 |
| 820.2 | 100 | 98 | 97 | 95 | 96 | 94 | 90 | 84 | 105 | 100 | 81 | 73 | 68 |
| 950.2 | 100 | 98 | 97 | 95 | 96 | 94 | 90 | 84 | 105 | 100 | 81 | 73 | 68 |
| 1100.2 | 100 | 98 | 97 | 95 | 96 | 94 | 90 | 84 | 105 | 100 | 81 | 73 | 68 |
| 1200.2 | 100 | 98 | 97 | 95 | 96 | 94 | 90 | 84 | 105 | 100 | 81 | 73 | 68 |

The noise levels refer to units operating in the nominal conditions (water temperature: inlet: 12°C - outlet: 7°C, Condenser water temperature: inlet: 30°C - outlet: 8°C).

SWL = Sound power levels, with reference to 1×10^{-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 2×10^{-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.

Basic version VB + Compressor Soundproofing Box accessory (CC)

| Mod. | SWL (dB) | | | | | | | | | | SPL (dBA) | | |
|--------|-------------------|-----|-----|-----|------|------|------|------|-------|-------|-----------|----|-----|
| | Octave bands (Hz) | | | | | | | | Total | | 1m | 5m | 10m |
| | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | Tot | dB(A) | | | |
| 280.1 | 93 | 90 | 88 | 87 | 86 | 88 | 80 | 76 | 97 | 92 | 74 | 65 | 60 |
| 320.1 | 93 | 90 | 88 | 87 | 86 | 88 | 80 | 76 | 97 | 93 | 75 | 66 | 61 |
| 360.1 | 93 | 90 | 88 | 87 | 86 | 88 | 80 | 76 | 97 | 92 | 74 | 65 | 60 |
| 420.1 | 94 | 91 | 89 | 87 | 86 | 89 | 82 | 78 | 98 | 93 | 75 | 66 | 61 |
| 480.1 | 94 | 91 | 89 | 87 | 86 | 89 | 82 | 78 | 98 | 93 | 75 | 66 | 61 |
| 540.1 | 95 | 92 | 90 | 89 | 87 | 90 | 83 | 80 | 99 | 94 | 76 | 67 | 62 |
| 600.1 | 95 | 92 | 90 | 89 | 87 | 90 | 83 | 80 | 99 | 94 | 76 | 67 | 62 |
| 710.2 | 96 | 94 | 91 | 89 | 89 | 88 | 84 | 80 | 100 | 94 | 75 | 67 | 62 |
| 820.2 | 97 | 93 | 92 | 89 | 88 | 91 | 86 | 80 | 101 | 95 | 76 | 68 | 63 |
| 950.2 | 97 | 93 | 92 | 89 | 88 | 91 | 86 | 80 | 101 | 95 | 76 | 68 | 63 |
| 1100.2 | 97 | 95 | 94 | 90 | 89 | 92 | 86 | 80 | 102 | 96 | 77 | 69 | 64 |
| 1200.2 | 97 | 95 | 94 | 90 | 89 | 92 | 86 | 80 | 102 | 96 | 77 | 69 | 64 |

The noise levels refer to units operating in the nominal conditions (water temperature: inlet: 12°C - outlet: 7°C, Condenser water temperature: inlet: 30°C - outlet: 8°C).

SWL = Sound power levels, with reference to 1×10^{-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 2×10^{-5} Pa.

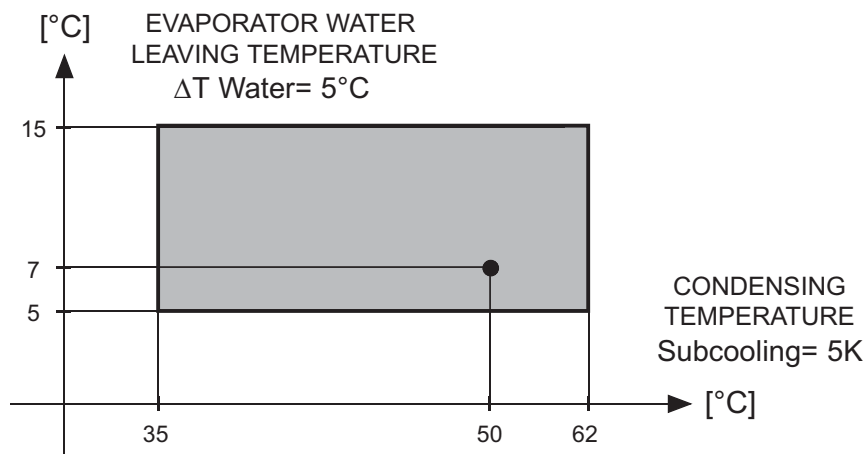
The sound pressure levels are values calculated by applying the **ISO-3744 relation (Eurovent 8/1)** and refer to a distance of 1 meter away from the external surface of units operating in the open field with directivity factor 2 and the units operating in nominal conditions in the cooling mode.

OPERATING RANGE

Limiti operativi

The graph indicates the admissible working envelope of the unit.
 The use of the unit in conditions outside the envelope will avoid the warranty.
 Here under are reported the limits of water differential temperature for the heat exchangers of the unit.

| Water thermal gradient* | | EVAPORATOR |
|-------------------------|----|------------|
| Minimum | °C | 4 |
| Maximum | °C | 8 |

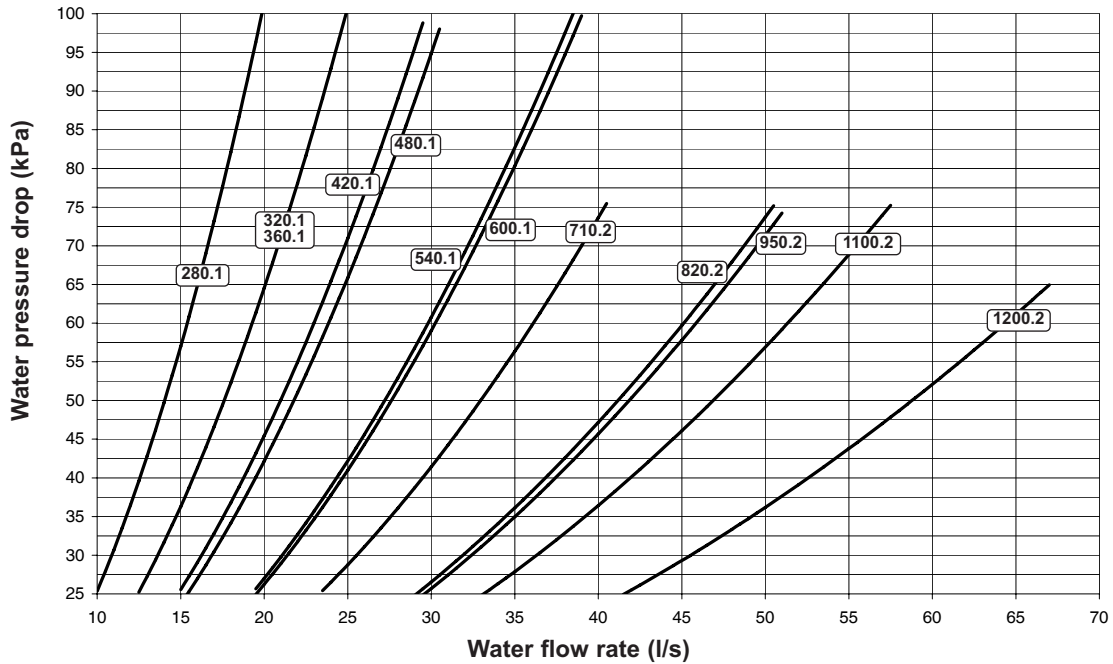


* : Verify that water flow rate is inside the admissible limits.

WATER PRESSURE DROP

Water pressure drop Evaporator

The graph below illustrates for the evaporator 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.

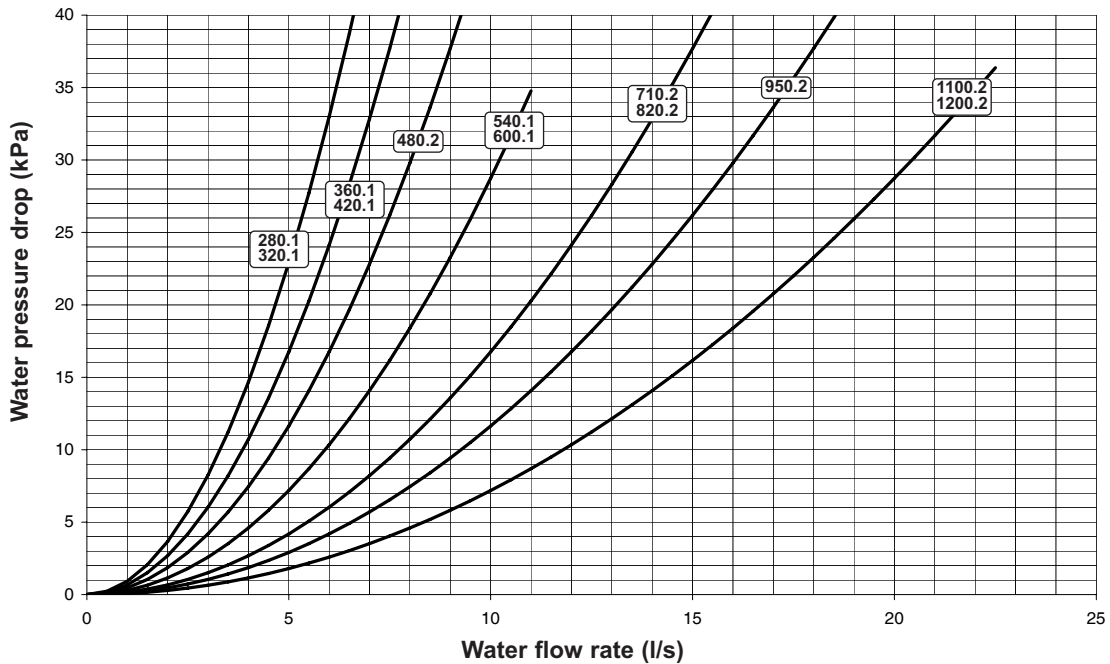


Operating range

| Mod. | | 280.1 | 320.1 | 360.1 | 420.1 | 480.1 | 540.1 | 600.1 | 710.2 | 820.2 | 950.2 | 1100.2 | 1200.2 | UM | NOTES |
|-------------------|----|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|--------|-----|---|
| Lower limit value | Q | 10 | 12.5 | | 15 | 15.5 | 19.5 | 19.5 | 23.5 | 29 | 29.5 | 33 | 41.5 | l/s | Q=Water flow rate Δp=Water pressure drop |
| | Δp | 25 | | | | | | | | | | | | kPa | |
| Upper limit value | Q | 20 | 25 | | 29.5 | 30.5 | 39 | 39 | 40.5 | 50.5 | 51 | 57.5 | 67 | l/s | |
| | Δp | 100 | 100 | | 99 | 98 | 100 | 100 | 75 | 75 | 74 | 75 | 65 | kPa | |

Water pressure drop Desuperheater

The graph below illustrates for the evaporator 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.

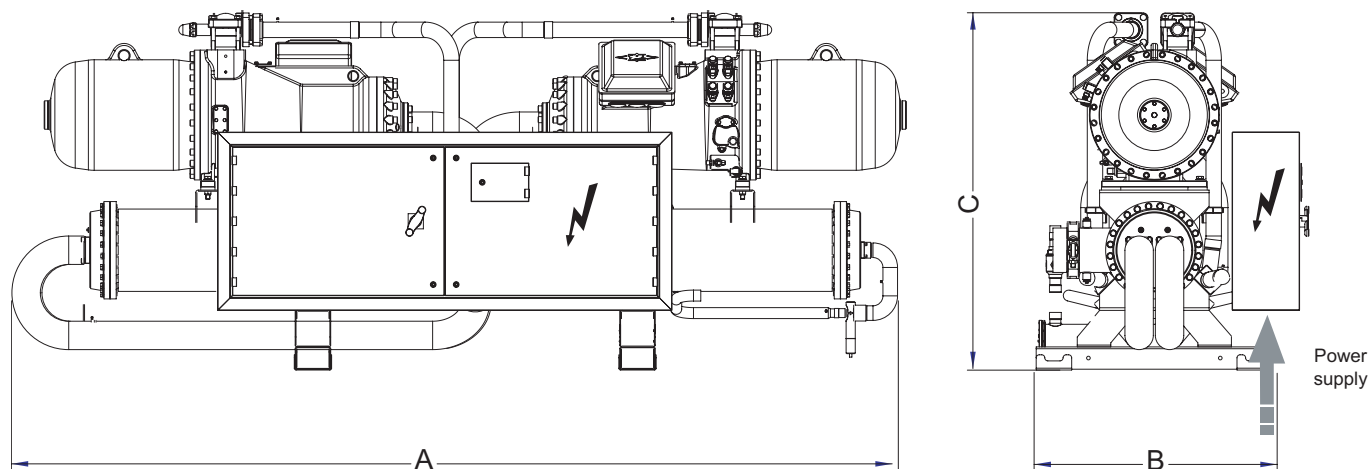


Operating range

| Mod. | | 280.1 | 320.1 | 360.1 | 420.1 | 480.1 | 540.1 | 600.1 | 710.2 | 820.2 | 950.2 | 1100.2 | 1200.2 | UM | NOTES |
|-------------------|----|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|--------|---|-------|
| Upper limit value | Q | 6.5 | | 7.8 | | 9.2 | 11 | | 15.5 | | 22.5 | | l/s | Q = Water flow rate Δp = Water pressure drop | |
| | Δp | 40 | | | | | 35 | | 40 | | 36 | | kPa | | |

DIMENSIONAL DATA

Dimension and weight

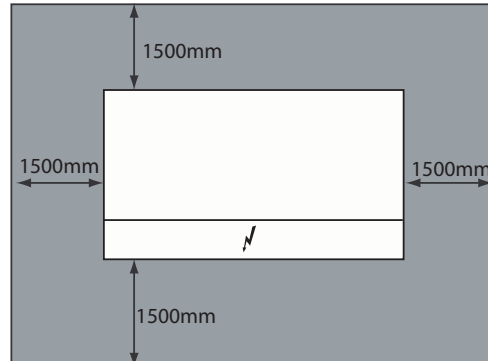


| Model | 280.1 | 320.1 | 360.1 | 420.1 | 480.1 | 540.1 | 600.1 | 710.2 | 820.2 | 950.2 | 1100.2 | 1200.2 | UM |
|------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|--------|-----------|
| Shipping weight | 1386 | 1404 | 1421 | 1938 | 1977 | 2032 | 2213 | 2657 | 3745 | 3762 | 3952 | 4011 | kg |
| Operating weight | 1501 | 1514 | 1527 | 2103 | 2136 | 2185 | 2483 | 2857 | 4098 | 4105 | 4257 | 4326 | kg |
| A | 3900 | 3900 | 3900 | 3900 | 3900 | 3900 | 3900 | 4320 | 4400 | 4400 | 4400 | 4400 | mm |
| B | 1100 | 1100 | 1100 | 1100 | 1100 | 1100 | 1100 | 1190 | 1190 | 1190 | 1230 | 1230 | mm |
| C | 1845 | 1845 | 1845 | 1880 | 1880 | 2045 | 2045 | 1845 | 1880 | 1880 | 2045 | 2045 | mm |
| IN - OUT EVAP. | DN125 | DN125 | DN125 | DN150 | DN150 | DN150 | DN200 | DN150 | DN200 | DN200 | DN200 | DN200 | VICTAULIC |

Minimum space required for operation

Refer to the figure alongside for the dimensions of the unit.
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. The distances must be doubled if the unit is to be installed in a pit.

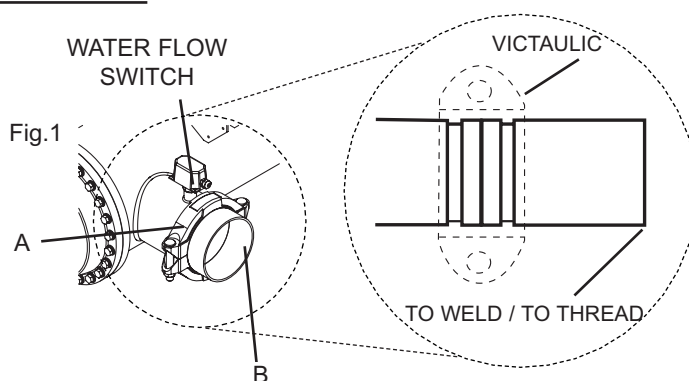
NOTE: Allow for a clear area of not less than 1.5 meters above unit.
The functional areas must be doubled if multiple units are installed.



Victaulic connections and water flow switch

These comprise two wet connections of the Victaulic type (Fig. 1-A) composed by steel joint (Fig. 1-B) and rubber packing not installed (supplied with the unit). The steel joints are suitable to be welded or threaded.

Nota:
Supplied as accessory (see "Accessory and optional equipment")



REMOTE AXIAL CONDENSER ACCESSORIES - RC

Description

This new series of Remote Axial Condensers uses copper pipes with special internal riffling and a high efficiency fin,

The fin has been specially designed to guarantee a high thermal exchange coefficient with low air pressure drops. By combining both special tubes and fins the following features can be achieved:

- Maximum capacity related to the heat exchanger's dimensions.
- Minimum refrigerant charge.
- The most strict environment standards for sound pollution can be met.

This new series of axial condensers is equipped with fans with scythe-shaped blades to reduce the sound emission. From the noise level point of view, all models can be supplied as basic version (AB), low noise version (AS) or extra low noise version (ASS).

To guarantee solidity, strength and the maximum resistance to atmospheric agents the bearing and the casing are manufactured with galvanized steel and oven painted with a polyurethane resin (the standard colour is RAL 7035).

All models can be equipped with several accessories as:

- **Condensing Control** using a cut of phase regulator (AB e AS), by step (ASS)
- **Electrical Wiring Box**, allows a fast and safe electrical installation of the unit since all wires and thermal protections of the fans are connected inside a waterproof box (IP54) to a terminal block where the installer connect the electrical supply (400V-3+PE-50Hz) and the fans thermal switches signal.
- **Electrical Panel CE** this accessory (like the electrical wiring box) allows a fast and safe electrical installation and moreover simplify the standard and non standard maintenance of the unit.
The accessory is in fact composed by main electrical switch, fuses and contactors of the fans, transformer to supply an alarm auxiliary relè, terminal block for remote ON-OFF (i.e. sent by the condenserless unit)
- **Rubber Vibrations Dampers**
- **Support Brackets**

As special options it is possible supply:

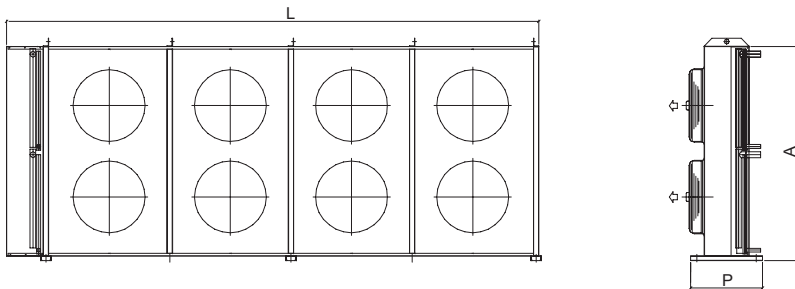
- Special fins (Copper, Painted Aluminium, ecc.).
- Special motors

REMOTE AXIAL CONDENSER ACCESSORIES - RC

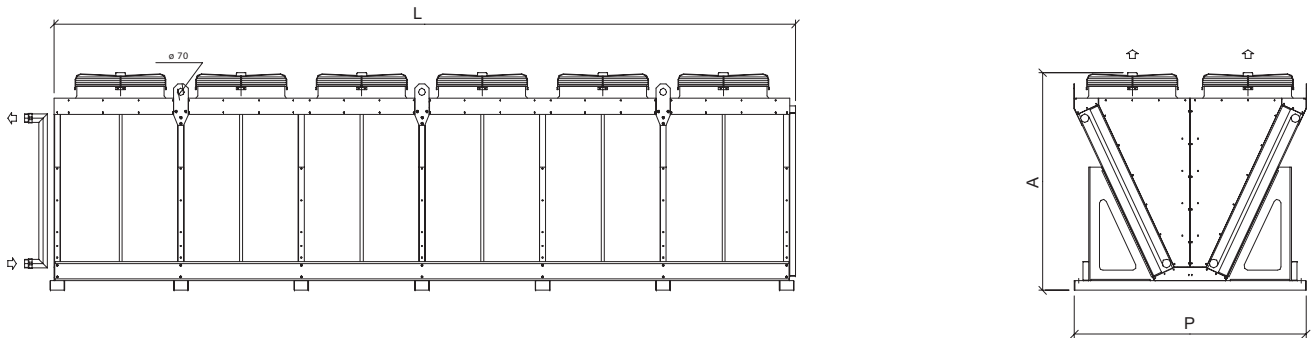
AB Basic Version

| Mod. | 280.1 | 320.1 | 360.1 | 420.1 | 480.1 | 540.1 | 600.1 | 710.2 | 820.2 | 950.2 | 1100.2 | 1200.2 | UM |
|---|----------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|--------|--------|
| Coils type | Alette in alluminio Tubo in Rame | | | | | | | | | | | | |
| Gas connections | 2x42 | 2x54 | 2x54 | 2x54 | 2x54 | 2x54 | 2x64 | 2x64 | 2x76 | 2x76 | 2x76 | 2x76 | n° x Ø |
| Liquid connections | 2x35 | 2x42 | 2x42 | 2x42 | 2x35 | 2x42 | 2x42 | 2x42 | 2x42 | 2x54 | 2x54 | 2x54 | n° x Ø |
| Fan specification | | | | | | | | | | | | | |
| Fan | 4 | 6 | 6 | 6 | 8 | 8 | 10 | 10 | 12 | 14 | 16 | 12 | n° |
| Diameter | 800 | 800 | 800 | 800 | 800 | 800 | 800 | 800 | 800 | 800 | 800 | 900 | mm |
| Air flow rate | 19667 | 31667 | 31667 | 29500 | 42222 | 39333 | 52778 | 49167 | 59000 | 68833 | 78667 | 100667 | l/s |
| Power input | 8 | 12 | 12 | 12 | 16 | 16 | 20 | 20 | 24 | 28 | 32 | 43,2 | kw |
| Current input | 17,2 | 25,8 | 25,8 | 25,8 | 34,4 | 34,4 | 43 | 43 | 51,6 | 60,2 | 68,8 | 86,4 | A |
| Standard configuration Dimension | | | | | | | | | | | | | |
| Type | 1 | | | | | | | | | | | 2 | - |
| Length [L] | 3230 | 4580 | 4580 | 4580 | 5930 | 5930 | 7280 | 7280 | 8630 | 9980 | 11330 | 7990 | mm |
| height [A] | 2390 | 2390 | 2390 | 2390 | 2390 | 2390 | 2390 | 2390 | 2390 | 2390 | 2390 | 2262 | mm |
| depth [P] | 800 | 800 | 800 | 800 | 800 | 800 | 800 | 800 | 800 | 800 | 800 | 2400 | mm |
| Dimension with Configuration with Support Brackets accessories | | | | | | | | | | | | | |
| Type | 3 | | | | | | | | | | | - | - |
| Length [L] | 3230 | 4580 | 4580 | 4580 | 5930 | 5930 | 7280 | 7280 | 8630 | 9980 | 11330 | - | mm |
| height [A] | 1565 | 1565 | 1565 | 1565 | 1565 | 1565 | 1565 | 1565 | 1565 | 1565 | 1565 | - | mm |
| depth [P] | 2400 | 2400 | 2400 | 2400 | 2400 | 2400 | 2400 | 2400 | 2400 | 2400 | 2400 | - | mm |
| weight | 543 | 742 | 742 | 804 | 982 | 1065 | 1222 | 1325 | 1585 | 1845 | 2106 | 2879 | kg |
| Volume interno | 64 | 74 | 74 | 96 | 95 | 125 | 119 | 156 | 292 | 340 | 387 | 222 | dm3 |
| Noise level | | | | | | | | | | | | | |
| Sound Power Level | 86 | 88 | 88 | 88 | 89 | 89 | 90 | 90 | 91 | 91 | 93 | 99 | dB(A) |
| Sound pressure level at 1mt | 70 | 72 | 72 | 72 | 73 | 73 | 74 | 74 | 74 | 74 | 76 | 82 | dB(A) |
| Sound pressure level at 5mt | 59 | 61 | 61 | 61 | 62 | 62 | 63 | 63 | 63 | 63 | 65 | 71 | dB(A) |
| Sound pressure level at 10mt | 54 | 56 | 56 | 56 | 57 | 57 | 58 | 58 | 58 | 58 | 60 | 66 | dB(A) |

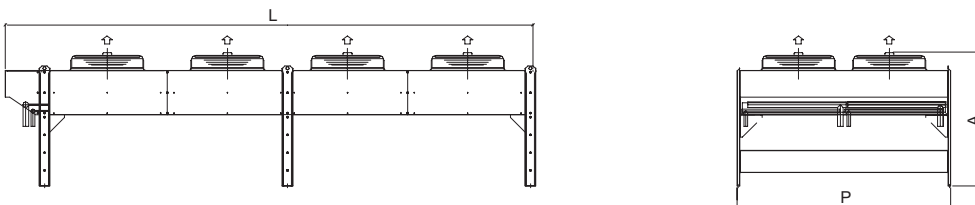
Standard configuration type 1 (horizontal air flow)



Standard configuration type 2



Configuration with Support Brackets accessories Type 3 (vertical air flow)

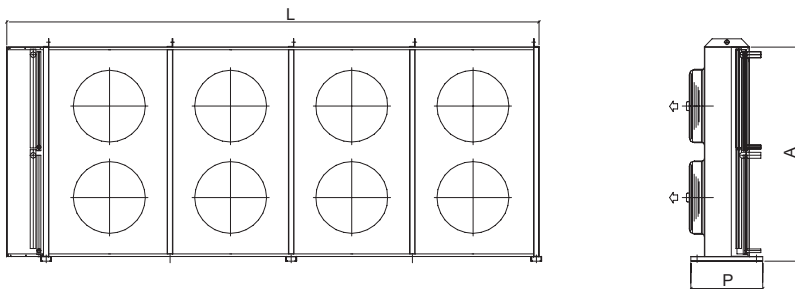


REMOTE AXIAL CONDENSER ACCESSORIES - RC

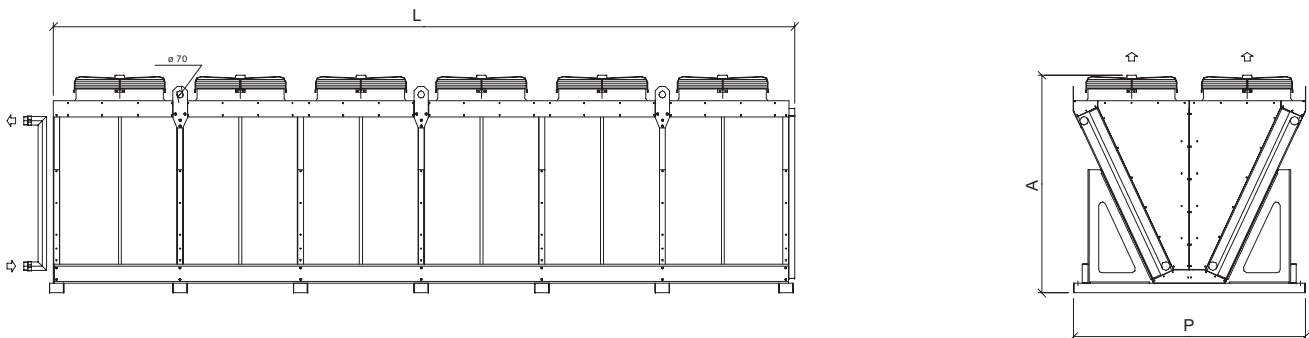
AS Low Noise Version

| Mod. | 280.1 | 320.1 | 360.1 | 420.1 | 480.1 | 540.1 | 600.1 | 710.2 | 820.2 | 950.2 | 1100.2 | 1200.2 | UM | |
|---|----------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|--------|--------|---|
| Coils type | Alette in alluminio Tubo in Rame | | | | | | | | | | | | | |
| Gas connections | 2x54 | 2x54 | 2x54 | 2x54 | 2x54 | 2x64 | 2x64 | 2x76 | 2x76 | 2x76 | 2x76 | 2x76 | n° x Ø | |
| Liquid connections | 2x42 | 2x42 | 2x42 | 2x35 | 2x42 | 2x42 | 2x42 | 2x42 | 2x54 | 2x54 | 2x54 | 2x54 | n° x Ø | |
| Fan specification | | | | | | | | | | | | | | |
| Fan | 6 | 6 | 6 | 8 | 8 | 10 | 10 | 12 | 14 | 16 | 12 | 12 | n° | |
| Diameter | 800 | 800 | 800 | 800 | 800 | 800 | 800 | 800 | 800 | 800 | 900 | 900 | mm | |
| Air flow rate | 24667 | 24667 | 22500 | 32889 | 30000 | 41111 | 37500 | 45000 | 52500 | 60000 | 87000 | 82333 | l/s | |
| Power input | 12 | 12 | 7,62 | 10,16 | 10,16 | 12,7 | 12,7 | 15,24 | 17,78 | 20,32 | 29,4 | 29,4 | kw | |
| Current input | 25,8 | 25,8 | 15 | 20 | 20 | 25 | 25 | 30 | 35 | 40 | 62,4 | 62,4 | A | |
| Standard configuration Dimension | | | | | | | | | | | | | | |
| Type | 1 | | | | | | | | | | | 2 | - | |
| Length [L] | 4580 | 4580 | 4580 | 5930 | 5930 | 7280 | 7280 | 8630 | 9980 | 11330 | 7990 | 7990 | mm | |
| height [A] | 2390 | 2390 | 2390 | 2390 | 2390 | 2390 | 2390 | 2390 | 2390 | 2390 | 2262 | 2262 | mm | |
| depth [P] | 800 | 800 | 800 | 800 | 800 | 800 | 800 | 800 | 800 | 800 | 2400 | 2400 | mm | |
| Dimension with Configuration with Support Brackets accessories | | | | | | | | | | | | | | |
| Type | 3 | | | | | | | | | | | - | - | - |
| Length [L] | 4580 | 4580 | 4580 | 5930 | 5930 | 7280 | 7280 | 8630 | 9980 | 11330 | - | - | mm | |
| height [A] | 1565 | 1565 | 1565 | 1565 | 1565 | 1565 | 1565 | 1565 | 1565 | 1565 | - | - | mm | |
| depth [P] | 2400 | 2400 | 2400 | 2400 | 2400 | 2400 | 2400 | 2400 | 2400 | 2400 | - | - | mm | |
| weight | 742 | 742 | 804 | 982 | 1065 | 1222 | 1325 | 1585 | 1845 | 2106 | 2879 | 3056 | kg | |
| Volume interno | 74 | 74 | 96 | 95 | 125 | 119 | 156 | 292 | 340 | 387 | 222 | 292 | dm3 | |
| Noise level | | | | | | | | | | | | | | |
| Sound Power Level | 81 | 81 | 81 | 82 | 82 | 83 | 83 | 84 | 84 | 86 | 90 | 90 | dB(A) | |
| Sound pressure level at 1mt | 65 | 65 | 65 | 66 | 66 | 67 | 67 | 67 | 67 | 69 | 73 | 73 | dB(A) | |
| Sound pressure level at 5mt | 54 | 54 | 54 | 55 | 55 | 56 | 56 | 56 | 56 | 58 | 62 | 62 | dB(A) | |
| Sound pressure level at 10mt | 49 | 49 | 49 | 50 | 50 | 51 | 51 | 51 | 51 | 53 | 57 | 57 | dB(A) | |

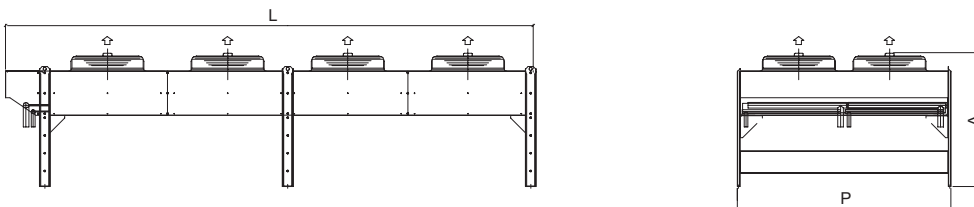
Standard configuration type 1 (horizontal air flow)



Standard configuration type 2



Configuration with Support Brackets accessories Type 3 (vertical air flow)

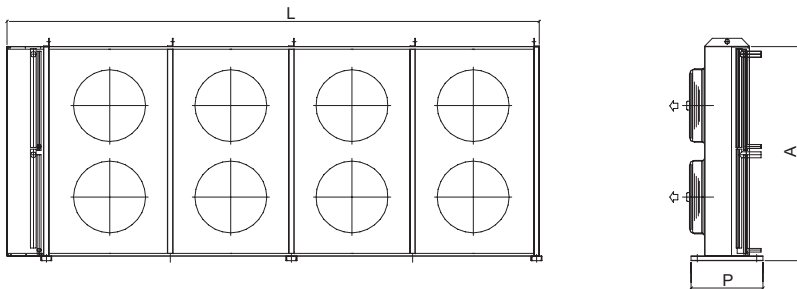


REMOTE AXIAL CONDENSER ACCESSORIES - RC

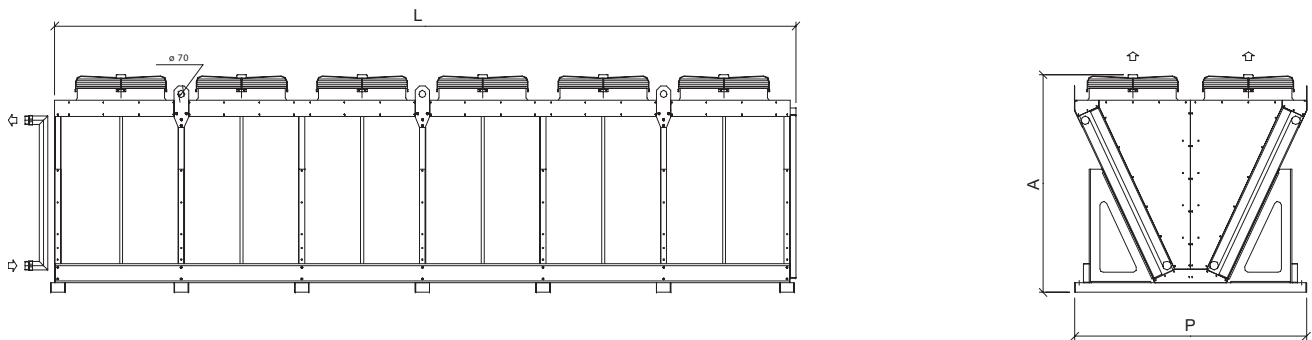
ASS Extra Low Noise Version

| Mod. | 280.1 | 320.1 | 360.1 | 420.1 | 480.1 | 540.1 | 600.1 | 710.2 | 820.2 | 950.2 | 1100.2 | 1200.2 | UM | |
|---|----------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|--------|--------|---|
| Coils type | Alette in alluminio Tubo in Rame | | | | | | | | | | | | | |
| Gas connections | 2x42 | 2x54 | 2x54 | 2x64 | 2x64 | 2x76 | 2x76 | 2x76 | 2x76 | 2x76 | 2x76 | 2x76 | n° x Ø | |
| Liquid connections | 2x35 | 2x35 | 2x42 | 2x42 | 2x42 | 2x42 | 2x54 | 2x54 | 2x64 | 2x64 | 2x64 | 2x64 | n° x Ø | |
| Fan specification | | | | | | | | | | | | | | |
| Fan | 8 | 8 | 8 | 10 | 10 | 12 | 14 | 16 | 14 | 14 | 14 | 14 | n° | |
| Diameter | 800 | 800 | 800 | 800 | 800 | 800 | 800 | 800 | 800 | 900 | 900 | 900 | mm | |
| Air flow rate | 25778 | 23111 | 21333 | 28889 | 26667 | 32000 | 40444 | 46222 | 56389 | 52500 | 70000 | 70000 | l/s | |
| Power input | 4,7 | 4,7 | 4,7 | 5,9 | 5,9 | 7,1 | 8,3 | 9,4 | 9,5 | 9,5 | 15,5 | 15,5 | kw | |
| Current input | 10,0 | 10,0 | 10,0 | 12,5 | 12,5 | 15,0 | 17,5 | 20,0 | 19,0 | 19,0 | 37,8 | 37,8 | A | |
| Standard configuration Dimension | | | | | | | | | | | | | | |
| Type | 1 | | | | | | | | | | | 2 | | - |
| Length [L] | 5930 | 5930 | 5930 | 7280 | 7280 | 8630 | 9980 | 11380 | 9240 | 9240 | 9240 | 9240 | mm | |
| height [A] | 2390 | 2390 | 2390 | 2390 | 2390 | 2390 | 2390 | 2390 | 2262 | 2262 | 2262 | 2262 | mm | |
| depth [P] | 800 | 800 | 800 | 800 | 800 | 800 | 800 | 800 | 800 | 2400 | 2400 | 2400 | mm | |
| Dimension with Configuration with Support Brackets accessories | | | | | | | | | | | | | | |
| Type | 3 | | | | | | | | | | | - | - | - |
| Length [L] | 5930 | 5930 | 5930 | 7280 | 7280 | 8630 | 9980 | 11380 | 9240 | 9240 | - | - | mm | |
| height [A] | 1565 | 1565 | 1565 | 1565 | 1565 | 1565 | 1565 | 1565 | 1565 | 1565 | - | - | mm | |
| depth [P] | 2400 | 2400 | 2400 | 2400 | 2400 | 2400 | 2400 | 2400 | 2400 | 2400 | - | - | mm | |
| weight | 900 | 982 | 1065 | 1222 | 1325 | 1585 | 1702 | 1942 | 3309 | 3515 | 3515 | 3515 | kg | |
| Volume interno | 59 | 95 | 125 | 119 | 156 | 292 | 252 | 293 | 259 | 336 | 336 | 336 | dm3 | |
| Noise level | | | | | | | | | | | | | | |
| Sound Power Level | 74 | 74 | 74 | 75 | 75 | 76 | 76 | 77 | 76 | 76 | 83 | 83 | dB(A) | |
| Sound pressure level at 1mt | 58 | 58 | 58 | 59 | 59 | 59 | 59 | 60 | 59 | 59 | 66 | 66 | dB(A) | |
| Sound pressure level at 5mt | 47 | 47 | 47 | 48 | 48 | 48 | 48 | 49 | 48 | 48 | 55 | 55 | dB(A) | |
| Sound pressure level at 10mt | 42 | 42 | 42 | 43 | 43 | 43 | 43 | 44 | 43 | 43 | 50 | 50 | dB(A) | |

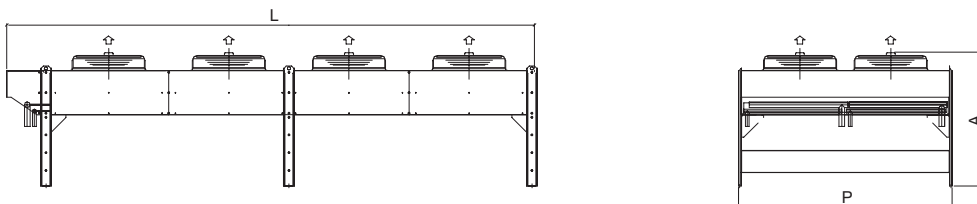
Standard configuration type 1 (horizontal air flow)



Standard configuration type 2



Configuration with Support Brackets accessories Type 3 (vertical air flow)



The manufacturer declines all responsibility for any inaccuracies in this manual due to printing or typing errors.
The reserves the right to modify the products contents in this catalogue without previous notice.

ferroli

Cod. 3QE26840



Ferrol spa - 37047 San Bonifacio (Verona) Italy - Via Ritonda 78/A
tel. +39.045.6139411 - fax +39.045.6100933 - www.ferrol.it