

# ferroli

## CGA

CONDENSING UNIT FOR COOLING ONLY AND HEAT PUMP  
WITH AXIAL FANS

53.5 ÷ 200 kW IN COOLING MODE

57.5 ÷ 214 kW IN HEATING MODE



## TECHNICAL MANUAL

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# TABLE OF CONTENTS

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

<b>GENERAL SPECIFICATIONS</b> .....	<b>5</b>
PRESENTATION OF THE UNIT .....	5
IDENTIFICATION CODE OF THE UNIT .....	5
DESCRIPTION OF THE COMPONENTS .....	6
HYDRAULIC AND COOLING CIRCUIT COMPONENTS .....	8
VERSION WITH DESUPERHEATER VD (AVAILABLE FOR BOTH IR UNITS AND IP UNITS) .....	9
<b>ACCESSORIES AND OPTIONAL EQUIPMENT</b> .....	<b>10</b>
MECHANICAL ACCESSORIES .....	10
ELECTRICAL ACCESSORIES .....	10
MECHANICAL OPTIONS .....	10
ELECTRICAL OPTIONS .....	10
<b>TECHNICAL SPECIFICATIONS AND STANDARD PERFORMANCES - IR COOLING UNIT ONLY</b> .....	<b>11</b>
TECHNICAL SPECIFICATIONS OF AB UNIT STANDARD UNIT .....	11
STANDARD PERFORMANCES AB STANDARD UNIT .....	12
TECHNICAL SPECIFICATIONS OF UNIT AS LOW NOISE UNIT .....	14
STANDARD PERFORMANCES AS LOW NOISE UNIT .....	15
TECHNICAL SPECIFICATIONS OF UNIT AX EXTRA LOW NOISE UNIT .....	17
STANDARD PERFORMANCES AX EXTRA LOW NOISE UNIT .....	18
VERSION WITH DESUPERHEATER(VD) .....	20
RECOVERED HEATING CAPACITY IN VERSION WITH DESUPERHEATER(VD) .....	20
<b>TECHNICAL SPECIFICATIONS AND STANDARD PERFORMANCES - IP HEAT PUMP UNITS</b> .....	<b>21</b>
TECHNICAL SPECIFICATIONS OF UNIT AB STANDARD UNIT .....	21
STANDARD PERFORMANCES IN COOLING MODE AB STANDARD UNIT .....	22
STANDARD PERFORMANCES IN HEATING MODE AB STANDARD UNIT .....	24
TECHNICAL SPECIFICATIONS OF UNIT AS LOW NOISE UNIT .....	25
STANDARD PERFORMANCES IN COOLING MODE AS LOW NOISE UNIT .....	26
STANDARD PERFORMANCES IN HEATING MODE AS LOW NOISE UNIT .....	28
TECHNICAL SPECIFICATIONS OF UNIT AX EXTRA LOW NOISE UNIT .....	29
STANDARD PERFORMANCES IN COOLING MODE AX EXTRA LOW NOISE UNIT .....	30
STANDARD PERFORMANCES IN HEATING MODE AX EXTRA LOW NOISE UNIT .....	32
VERSION WITH DESUPERHEATER (VD) .....	33
RECOVERED HEATING CAPACITY IN VERSION WITH DESUPERHEATER (VD) .....	33
<b>NOISE LEVELS</b> .....	<b>34</b>
AB STANDARD UNIT .....	34
AS LOW NOISE UNIT .....	34
AX EXTRA LOW NOISE UNIT .....	34
<b>OPERATING RANG</b> .....	<b>35</b>
OPERATING RANGE .....	35
<b>WATER PRESSURE DROP DESUPERHEATER</b> .....	<b>36</b>
<b>DIMENSIONAL DATA</b> .....	<b>37</b>
OVERALL DIMENSIONS .....	37
DESCRIPTION OF THE COMPONENTS .....	38
MINIMUM SPACE REQUIRED FOR OPERATION .....	38
POSITION OF CONDENSATE DRAIN .....	38
<b>WEIGHT DURING OPERATION AND TRANSPORT</b> .....	<b>39</b>
VIBRATION-DAMPER INSTALLATION .....	39
WEIGHT DURING OPERATION AND TRANSPORT .....	39



## GENERAL SPECIFICATIONS

### Presentation of the unit

This new series of industrial condensing unit in cooling only 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 cooling only 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 heating capacity from **57.5 to 214 kW**.

**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**, 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.

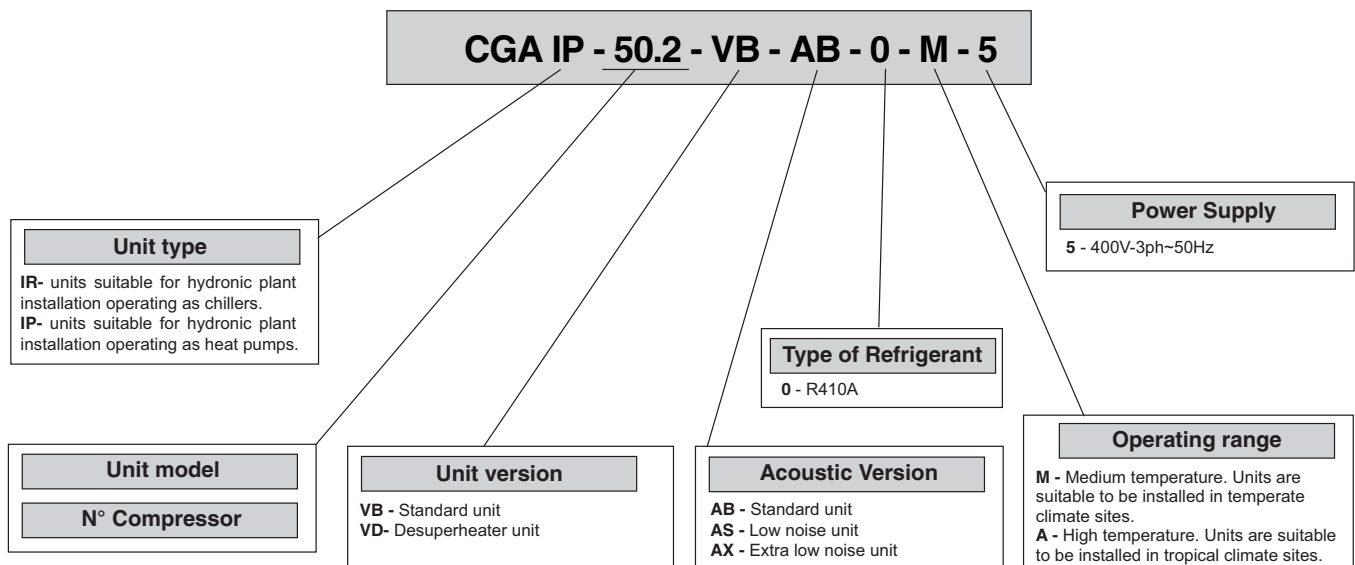
A variety of other accessories are available to extend the capabilities of the units.

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 Low noise unit (AS) 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 (AX), 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.



The available special versions are described below:

**VB: Standard unit.**

**VD: Desuperheater unit (available for both IR units and IP units)**

Produces cold water in the same way as the standard version plus hot water **from 30 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.

## GENERAL SPECIFICATIONS

### Description of the components

The complete series of industrial chillers and heat pumps for use in hydronic systems includes **12 constructional sizes** ranging from **53.5 to 200 kW** in the cooling mode and **from 57.5 to 214 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:

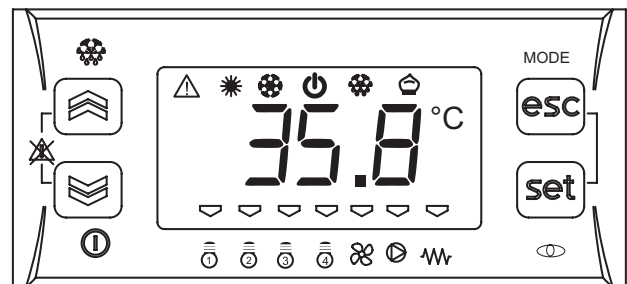
- Main door-locking circuit-breaker.
- Fuse-holder that can be isolated with protection fuse triad for each compressor.
- Fuse-holder that can be isolated with protection fuse for compressor oil heaters and antifreeze (if installed).
- Control contactor for each compressor.
- Protection fuse for the ventilation unit.
- Fan speed regulating board.
- 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 display **LED**
- Pumps on-off display **LED**
- Check-control with fault code display
- Defrosting, alarm, economy, stand-by **LED**.
- ON / Stand-by remote - Summer/Winter (E/I) remote selection (IP unit only).



**Control system main functions:** temperature control of the water/air 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.

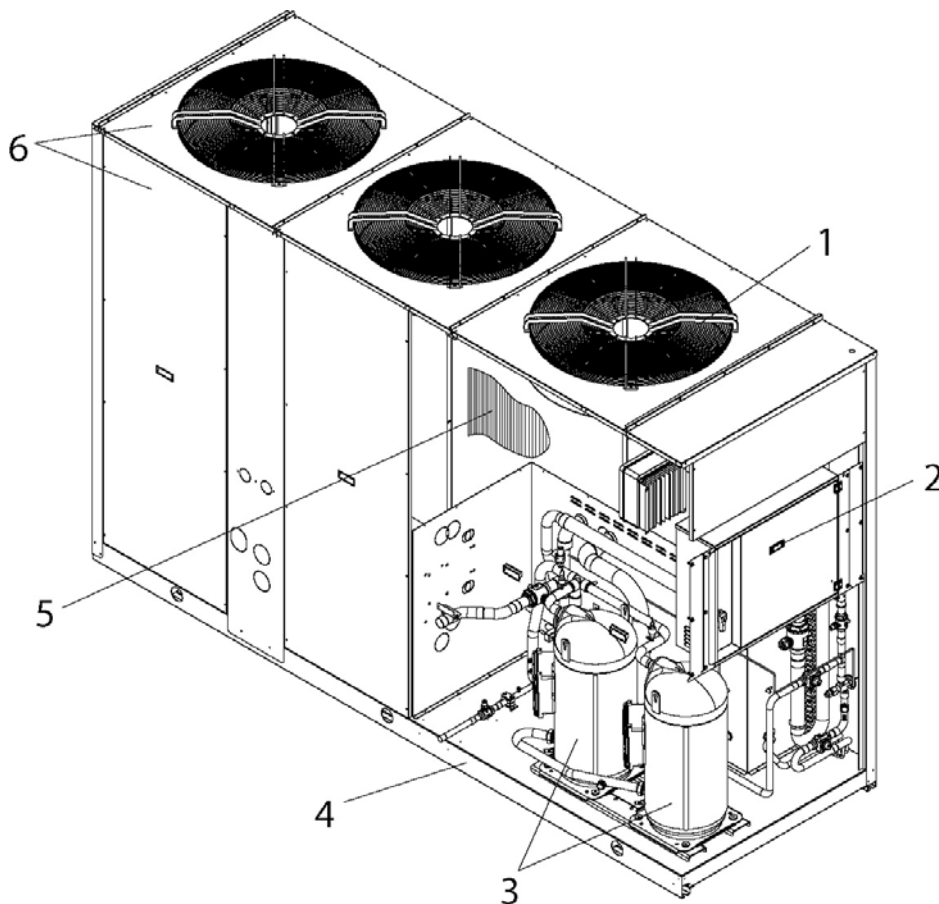
**Digital input functions:** low pressure, high pressure, high temperature on compressor supply, phase presence and sequence monitoring device on power supply, differential water/air pressure control, compressors thermal protection, fans thermal protection, ON/OFF and remote operating mode change, Demand Limit and Economy function.

**Digital output functions:** compressor start-up, pump/fan start-up, 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/air 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 AS unit includes: a soundproofing jacket for the compressors, an acoustic cladding around the compartment where they are housed, to reduce noise level, and reduced rotating speed of axial fans; AX unit integrates batteries with condensing surface increased and rotating speed of axial fans further reduced. 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 maximum protection against adverse weather conditions.

**5. 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.

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

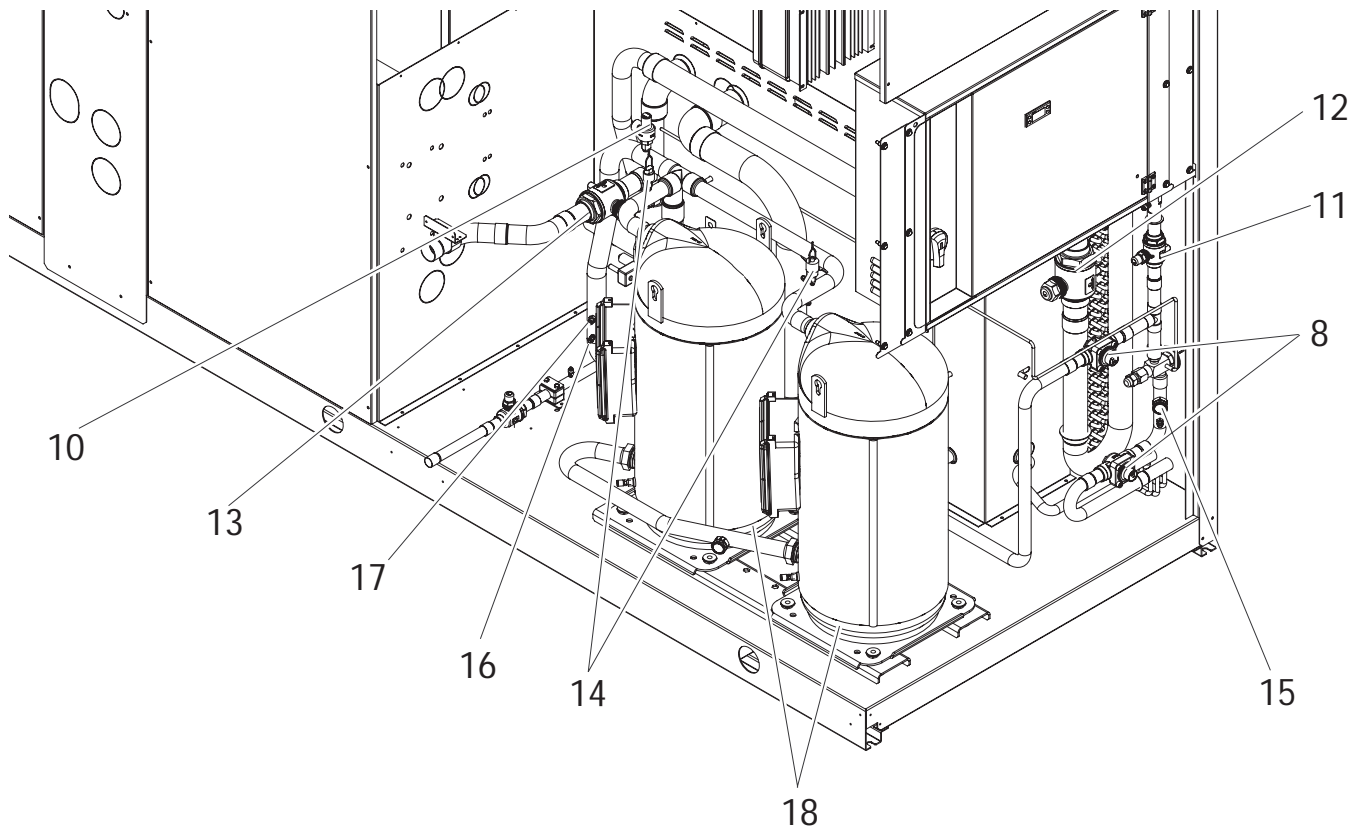
**7. One-way valves (IP unit only),** allowing the coolant to pass into the appropriate exchangers, depending on the operating cycle.

**8. 4-way cycle reversal valve (IP unit only),** reverses the flow direction of the coolant as the summer/winter operating mode is changed.

## GENERAL SPECIFICATIONS

### Hydraulic and cooling circuit components

- 9. Safety valve.** Installed on the delivery pipe of the compressors, this operates if extreme faults should occur in the plant.
- 10. 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).
- 11. Compressor delivery cock.** Ball type, allows the gas delivered to the compressors to be turned on and off.
- 12. 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.
- 13. High pressure switch (n°2).** With fixed setting. Are 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.
- 14. Thermostatic valve (only IP version).** With external equalizer, this supplies the evaporator correctly, keeping the selected overheating degree at a steady level.
- 15. 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.
- 16. 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.
- 17. 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.



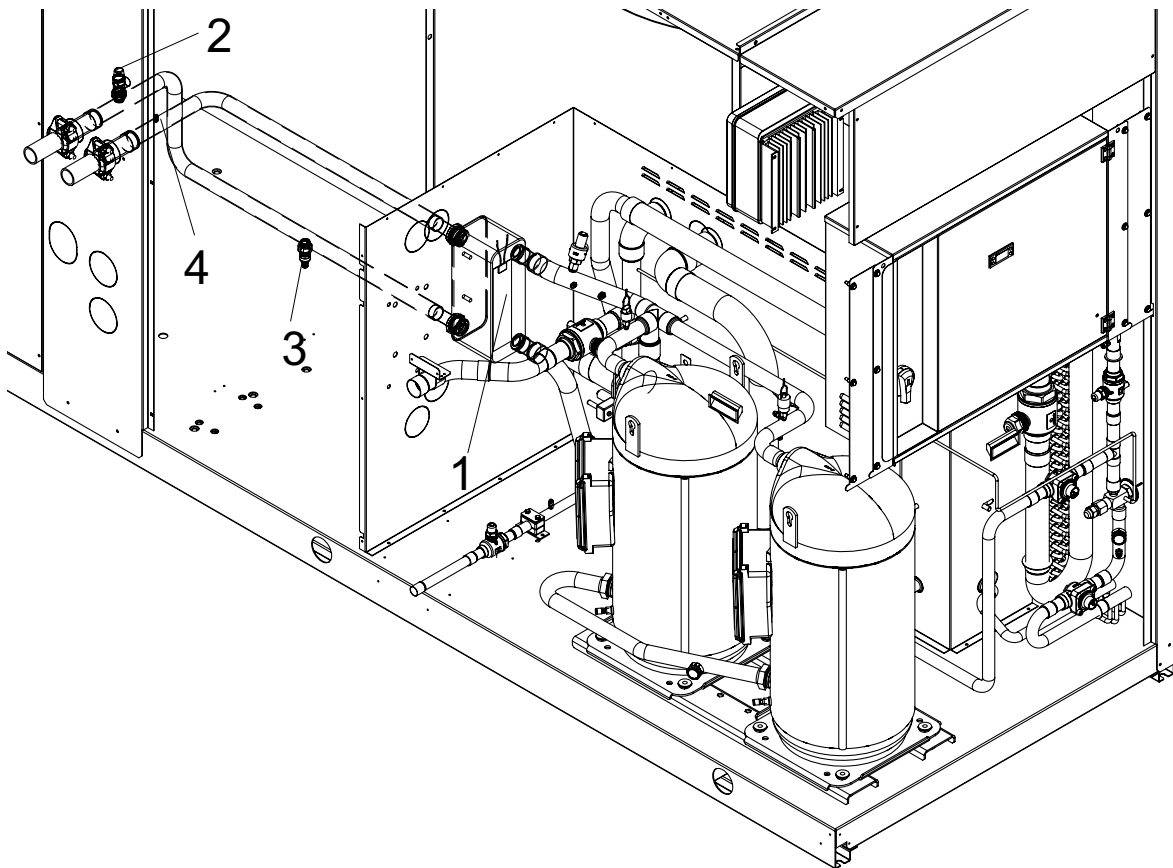


## GENERAL SPECIFICATIONS

### Version with Condensing 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 standstill (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.

**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.

**KSP - Plate heat exchanger kit (F).** It consists of a plate heat exchanger, differential pressure switch, probe well and antifreeze electrical heater.

**KLQ - Liquid line kit (F).** It consists of a solenoid valve with coil, dehydrator filter, Liquid and moisture indicator, thermostatic expansion valve, one-way valve (only IP version).

### 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<sup>2</sup> section. The transmission line must be installed in a raceway 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).

**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, climatic variation of setpoint and enables heat pump stop reducing the external air temperature below a setpoint.**INT - Serial interface (F).** Allows serial communication on RS485 by MODBUS protocol

**CSF - Voltage monitor and sequence meter (M).** 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.

**RIF - Capacitors for power factor corrections (M).** Capacitors for power factor corrections increase power factor  $\cos \phi$  (>0.91) and reduce power input.**SS - Soft Starter (M).** Soft starter for compressor, reduce the maximum starting current up to 60% of nominal starting current.

**MTC - Magnetothermic switch (M).** Magnetothermic switch on all loads place of fuses.

**NOTE: (M):** Factory mounted.      **(F):** To be installed by customer

### Mechanical options

#### Special finned heat exchangers

- Coils with copper fins
- Coils with tin-coated copper fins
- Coils with aluminium fins with acrylic, epoxy or hydrophilic coating.

### Electrical options

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

## 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				400V - 3ph - 50 Hz									V-f-Hz
Type of refrigerant	R410A													/
Circuits	1													n°
Cooling capacity <sup>(1)</sup>	53.5	58.6	68.8	78.7	91.0	102	112	126	143	158	180	200	kW	
Compressors power input <sup>(1)</sup>	16.5	18.5	21.7	25.6	28.2	31.6	35.5	40.5	45.0	50.5	56.0	62.8	kW	
EER	3.24	3.17	3.17	3.07	3.23	3.23	3.15	3.11	3.18	3.13	3.21	3.18	-	
Total power input <sup>(1)</sup>	18.3	20.3	23.5	27.4	31.8	35.2	39.1	44.1	50.4	55.9	63.2	70.0	kW	
Total EER	2.92	2.89	2.93	2.87	2.86	2.90	2.86	2.86	2.84	2.83	2.85	2.86	-	
ESEER	4.03	3.98	4.04	3.96	3.95	4.00	3.95	3.94	3.92	3.90	3.93	3.94	-	

### 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	

### Fan

Type	Axial													-
Quantity	3			2				3			4			n°
Maximum rotational speed <sup>(AB)</sup>	900													rpm
Total air flow rate	29050	29050	28100	27680	41460	40100	47440	47440	62190	59820	82920	79760	m³/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		m²

### Electrical Data

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

### NOTES:

(1): Data referred to evaporation temperature : 3°C (Dew point), outdoor air temperature 35°C D.B. superheating and subcooling 5°K.

(2): Data referred to condensation temperature : 50°C (Dew point), outdoor air temperature 7°C D.B., relative humidifying 87% (6°C W.B.). Superheating and subcooling 5°K.

# 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	11.6	57.0	13.3	53.9	14.7	50.6	16.2	47.1	17.8	43.6	19.4	40.0	21.0
	6	62.8	11.7	58.6	13.4	55.4	14.8	52.0	16.3	48.4	18.0	44.8	19.6	41.1	21.2
	7	64.6	11.8	60.3	13.6	57.0	15.0	<b>53.5</b>	<b>16.5</b>	49.8	18.2	46.1	19.8	42.3	21.4
	8	66.4	11.9	62.0	13.7	58.6	15.1	55.0	16.7	51.2	18.4	47.4	20.0	-	-
	9	68.2	12.1	63.7	13.9	60.2	15.3	56.5	16.8	52.6	18.6	48.7	20.2	-	-
	10	70.1	12.2	65.4	14.0	61.8	15.4	58.0	17.0	54.0	18.8	50.0	20.4	-	-
	11	71.8	12.3	67.1	14.1	63.4	15.6	59.5	17.2	55.4	18.9	51.3	20.6	-	-
	12	73.8	12.4	68.9	14.3	65.1	15.7	61.1	17.4	56.9	19.1	52.7	20.8	-	-
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	<b>58.6</b>	<b>18.5</b>	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	15.2	73.3	17.5	69.3	19.3	65.0	21.3	60.5	23.5	56.1	25.6	51.5	27.6
	6	80.7	15.4	75.3	17.7	71.2	19.5	66.9	21.5	62.2	23.7	57.6	25.8	52.9	27.9
	7	83.1	15.5	77.5	17.9	73.3	19.7	<b>68.8</b>	<b>21.7</b>	64.0	23.9	59.3	26.1	54.5	28.2
	8	85.4	15.7	79.7	18.1	75.4	19.9	70.7	21.9	65.8	24.2	61.0	26.4	-	-
	9	87.8	15.9	81.9	18.2	77.5	20.1	72.7	22.2	67.6	24.4	62.6	26.6	-	-
	10	90.1	16.0	84.1	18.4	79.5	20.3	74.6	22.4	69.4	24.7	64.3	26.9	-	-
	11	92.4	16.2	86.2	18.6	81.6	20.5	76.5	22.6	71.2	24.9	66.0	27.2	-	-
	12	94.9	16.3	88.6	18.8	83.8	20.7	78.6	22.8	73.1	25.2	67.7	27.4	-	-
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	<b>78.7</b>	<b>25.6</b>	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	<b>91.0</b>	<b>28.2</b>	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	<b>102</b>	<b>31.6</b>	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	-	-

Te= evaporation temperature °C (Dew point)

kWf = refrigerating power (kW).

kWa = Power input of compressors (kW)

## TECHNICAL SPECIFICATIONS AND STANDARD PERFORMANCES - IR COOLING UNIT ONLY

### Mod. 115-200

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	<b>112</b>	<b>35.5</b>	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	<b>126</b>	<b>40.5</b>	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	31.6	152	36.3	144	40.0	135	44.1	126	48.6	117	53.0	107	57.3
	6	168	31.9	157	36.7	148	40.4	139	44.5	129	49.1	120	53.5	110	57.9
	7	173	32.2	161	37.0	152	40.8	<b>143</b>	<b>45.0</b>	133	49.6	123	54.1	113	58.5
	8	178	32.6	166	37.5	157	41.3	147	45.5	137	50.1	127	54.7	-	-
	9	182	32.9	170	37.8	161	41.7	151	46.0	141	50.6	130	55.2	-	-
	10	187	33.2	175	38.2	165	42.1	155	46.4	144	51.2	134	55.8	-	-
	11	192	33.5	179	38.6	170	42.5	159	46.9	148	51.7	137	56.3	-	-
	12	197	33.9	184	39.0	174	42.9	163	47.3	152	52.2	141	56.9	-	-
160	5	180	35.4	168	40.8	159	44.9	149	49.5	139	54.6	129	59.5	118	64.3
	6	185	35.8	173	41.2	164	45.3	154	50.0	143	55.1	132	60.1	122	64.9
	7	191	36.1	178	41.6	168	45.8	<b>158</b>	<b>50.5</b>	147	55.7	136	60.7	125	65.6
	8	196	36.5	183	42.0	173	46.3	162	51.1	151	56.3	140	61.4	-	-
	9	202	36.9	188	42.5	178	46.8	167	51.6	155	56.8	144	62.0	-	-
	10	207	37.3	193	42.9	183	47.2	171	52.1	159	57.4	148	62.6	-	-
	11	212	37.6	198	43.3	187	47.7	176	52.6	164	58.0	151	63.2	-	-
	12	218	38.0	203	43.7	192	48.2	181	53.1	168	58.5	156	63.8	-	-
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	<b>180</b>	<b>56.0</b>	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	<b>200</b>	<b>62.8</b>	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	-	-

Te= evaporation temperature °C (Dew point)

kWf = refrigerating power (kW).

kWa = Power input of compressors (kW)

## TECHNICAL SPECIFICATIONS AND STANDARD PERFORMANCES - IR COOLING UNIT ONLY

### Technical specifications of unit AS Low noise unit

Model	50	60	70	80	90	100	115	130	145	160	180	200	UM	
Power supply	400V - 3ph+N - 50 Hz				400V - 3ph - 50 Hz									V-f-Hz
Type of refrigerant	R410A													/
Circuits	1													n°
Cooling capacity <sup>(1)</sup>	51.9	56.8	66.7	76.3	88.2	98.5	109	122	139	153	174	194	kW	
Compressors power input <sup>(1)</sup>	17.2	19.3	22.6	26.8	29.5	33.0	37.1	42.3	47.0	52.7	58.5	65.6	kW	
EER	3.01	2.94	2.95	2.85	2.99	2.98	2.94	2.88	2.96	2.90	2.97	2.96	-	
Total power input <sup>(1)</sup>	19.0	21.1	24.4	28.6	33.1	36.6	40.7	45.9	52.4	58.1	65.7	72.8	kW	
Total EER	2.73	2.69	2.73	2.67	2.66	2.69	2.68	2.66	2.65	2.63	2.65	2.66	-	
ESEER	3.76	3.71	3.77	3.68	3.68	3.71	3.70	3.67	3.66	3.63	3.65	3.68	-	

#### 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	

#### Fan

Type	Axial													-
Quantity	3				2				3			4		n°
Maximum rotational speed	900													rpm
Total air flow rate	24208	24208	23417	23067	34550	33417	39533	39533	51825	49850	69100	66467	m <sup>3</sup> /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 <sup>2</sup>

#### Electrical Data

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

#### NOTES:

(1): Data referred to evaporation temperature : 3°C (Dew point), outdoor air temperature 35°C D.B. superheating and subcooling 5°K.

(2): Data referred to condensation temperature : 50°C (Dew point), outdoor air temperature 7°C D.B., relative humidifying 87% (6°C W.B.). Superheating and subcooling 5°K.

## TECHNICAL SPECIFICATIONS AND STANDARD PERFORMANCES - IR COOLING UNIT ONLY

### Standard performances AS Low noise 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	59.2	12.1	55.3	13.9	52.3	15.3	49.1	16.9	45.7	18.6	42.3	20.3	38.8	22.0
	6	60.9	12.2	56.8	14.0	53.7	15.5	50.4	17.1	46.9	18.8	43.5	20.5	39.9	22.2
	7	62.7	12.3	58.5	14.2	55.3	15.6	<b>51.9</b>	<b>17.2</b>	48.3	19.0	44.7	20.7	41.1	22.4
	8	64.4	12.5	60.1	14.3	56.9	15.8	53.4	17.4	49.7	19.2	46.0	20.9	-	-
	9	66.2	12.6	61.8	14.5	58.4	16.0	54.8	17.6	51.0	19.4	47.3	21.1	-	-
	10	68.0	12.7	63.4	14.6	60.0	16.1	56.3	17.8	52.4	19.6	48.5	21.4	-	-
	11	69.7	12.8	65.1	14.8	61.5	16.3	57.7	17.9	53.7	19.8	49.8	21.6	-	-
	12	71.6	13.0	66.8	14.9	63.2	16.4	59.3	18.1	55.2	20.0	51.1	21.8	-	-
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	<b>56.8</b>	<b>19.3</b>	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	15.9	71.1	18.3	67.2	20.1	63.1	22.2	58.7	24.5	54.3	26.7	49.9	28.8
	6	78.2	16.0	73.0	18.4	69.1	20.3	64.8	22.4	60.3	24.7	55.8	26.9	51.3	29.1
	7	80.5	16.2	75.2	18.6	71.1	20.5	<b>66.7</b>	<b>22.6</b>	62.1	25.0	57.5	27.2	52.8	29.4
	8	82.8	16.4	77.3	18.8	73.1	20.8	68.6	22.9	63.8	25.2	59.1	27.5	-	-
	9	85.1	16.5	79.4	19.0	75.1	21.0	70.5	23.1	65.6	25.5	60.7	27.8	-	-
	10	87.3	16.7	81.5	19.2	77.1	21.2	72.3	23.3	67.3	25.7	62.3	28.1	-	-
	11	89.6	16.9	83.6	19.4	79.1	21.4	74.2	23.6	69.0	26.0	63.9	28.3	-	-
	12	92.0	17.0	85.9	19.6	81.2	21.6	76.2	23.8	70.9	26.2	65.7	28.6	-	-
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	<b>76.3</b>	<b>26.8</b>	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	<b>88.2</b>	<b>29.5</b>	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	<b>98.5</b>	<b>33.0</b>	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	-	-

Te= evaporation temperature °C (Dew point)

kWf = refrigerating power (kW).

kWa = Power input of compressors (kW)

## TECHNICAL SPECIFICATIONS AND STANDARD PERFORMANCES - IR COOLING UNIT ONLY

Mod. 115-200

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
<b>115</b>	<b>5</b>	124	26.0	116	30.0	110	33.0	103	36.4	95.9	40.1	88.8	43.7	81.6	47.3
	<b>6</b>	128	26.3	119	30.2	113	33.3	106	36.7	98.5	40.5	91.3	44.1	83.8	47.7
	<b>7</b>	132	26.5	123	30.5	116	33.6	<b>109</b>	<b>37.1</b>	101	40.9	93.9	44.6	86.3	48.2
	<b>8</b>	135	26.8	126	30.9	119	34.0	112	37.5	104	41.3	96.6	45.1	-	-
	<b>9</b>	139	27.1	130	31.2	123	34.4	115	37.9	107	41.8	99.2	45.5	-	-
	<b>10</b>	143	27.4	133	31.5	126	34.7	118	38.3	110	42.2	102	46.0	-	-
	<b>11</b>	146	27.6	137	31.8	129	35.0	121	38.6	113	42.6	104	46.4	-	-
	<b>12</b>	150	27.9	140	32.1	133	35.4	125	39.0	116	43.0	107	46.9	-	-
<b>130</b>	<b>5</b>	139	29.7	130	34.1	123	37.6	115	41.5	107	45.7	99.4	49.8	91.3	53.9
	<b>6</b>	143	30.0	134	34.5	126	38.0	119	41.9	110	46.2	102	50.3	93.8	54.4
	<b>7</b>	147	30.3	137	34.8	130	38.4	<b>122</b>	<b>42.3</b>	114	46.6	105	50.8	96.6	55.0
	<b>8</b>	151	30.6	141	35.2	134	38.8	125	42.8	117	47.1	108	51.4	-	-
	<b>9</b>	156	30.9	145	35.6	137	39.2	129	43.2	120	47.6	111	51.9	-	-
	<b>10</b>	160	31.2	149	35.9	141	39.6	132	43.6	123	48.1	114	52.4	-	-
	<b>11</b>	164	31.5	153	36.3	145	40.0	136	44.1	126	48.6	117	52.9	-	-
	<b>12</b>	168	31.8	157	36.6	149	40.3	139	44.5	130	49.0	120	53.5	-	-
<b>145</b>	<b>5</b>	159	33.0	148	38.0	140	41.8	131	46.1	122	50.8	113	55.4	104	59.9
	<b>6</b>	163	33.3	152	38.3	144	42.2	135	46.5	126	51.3	116	55.9	107	60.5
	<b>7</b>	168	33.6	157	38.7	148	42.6	<b>139</b>	<b>47.0</b>	129	51.8	120	56.5	110	61.1
	<b>8</b>	173	34.0	161	39.1	152	43.1	143	47.5	133	52.4	123	57.1	-	-
	<b>9</b>	177	34.4	166	39.5	157	43.5	147	48.0	137	52.9	127	57.7	-	-
	<b>10</b>	182	34.7	170	39.9	161	44.0	151	48.5	140	53.4	130	58.3	-	-
	<b>11</b>	187	35.0	174	40.3	165	44.4	155	49.0	144	54.0	133	58.8	-	-
	<b>12</b>	192	35.4	179	40.7	169	44.8	159	49.4	148	54.5	137	59.4	-	-
<b>160</b>	<b>5</b>	175	37.0	163	42.6	154	46.9	145	51.7	135	57.0	125	62.1	114	67.2
	<b>6</b>	179	37.3	168	43.0	158	47.3	149	52.2	138	57.5	128	62.7	118	67.8
	<b>7</b>	185	37.7	172	43.4	163	47.8	<b>153</b>	<b>52.7</b>	142	58.1	132	63.4	121	68.5
	<b>8</b>	190	38.1	177	43.9	168	48.4	157	53.3	146	58.8	136	64.1	-	-
	<b>9</b>	195	38.5	182	44.3	172	48.8	162	53.9	150	59.4	139	64.7	-	-
	<b>10</b>	200	38.9	187	44.8	177	49.3	166	54.4	154	59.9	143	65.4	-	-
	<b>11</b>	205	39.3	192	45.2	181	49.8	170	54.9	158	60.5	147	66.0	-	-
	<b>12</b>	211	39.7	197	45.7	186	50.3	175	55.5	163	61.1	151	66.6	-	-
<b>180</b>	<b>5</b>	199	41.0	185	47.2	175	52.0	165	57.4	153	63.2	142	68.9	130	74.5
	<b>6</b>	204	41.4	191	47.7	180	52.5	169	57.9	157	63.8	146	69.6	134	75.2
	<b>7</b>	210	41.9	196	48.2	185	53.1	<b>174</b>	<b>58.5</b>	162	64.5	150	70.3	138	76.0
	<b>8</b>	216	42.3	202	48.7	191	53.6	179	59.1	166	65.2	154	71.1	-	-
	<b>9</b>	222	42.7	207	49.2	196	54.2	184	59.7	171	65.8	158	71.8	-	-
	<b>10</b>	228	43.2	213	49.7	201	54.7	189	60.3	176	66.5	163	72.5	-	-
	<b>11</b>	234	43.6	218	50.2	206	55.3	194	60.9	180	67.2	167	73.2	-	-
	<b>12</b>	240	44.0	224	50.6	212	55.8	199	61.5	185	67.8	171	73.9	-	-
<b>200</b>	<b>5</b>	221	46.0	207	53.0	195	58.3	183	64.3	171	70.9	158	77.3	145	83.6
	<b>6</b>	228	46.5	212	53.5	201	58.9	189	64.9	175	71.6	162	78.0	149	84.4
	<b>7</b>	234	46.9	219	54.0	207	59.5	<b>194</b>	<b>65.6</b>	180	72.3	167	78.8	154	85.2
	<b>8</b>	241	47.5	225	54.6	213	60.2	199	66.3	186	73.1	172	79.7	-	-
	<b>9</b>	247	47.9	231	55.1	218	60.8	205	67.0	191	73.8	177	80.5	-	-
	<b>10</b>	254	48.4	237	55.7	224	61.4	210	67.7	196	74.6	181	81.3	-	-
	<b>11</b>	261	48.9	243	56.2	230	62.0	216	68.3	201	75.3	186	82.1	-	-
	<b>12</b>	268	49.4	250	56.8	236	62.6	222	69.0	206	76.0	191	82.9	-	-

Te= evaporation temperature °C (Dew point)

kWf = refrigerating power (kW).

kWa = Power input of compressors (kW)



# TECHNICAL SPECIFICATIONS AND STANDARD PERFORMANCES - IR COOLING UNIT ONLY

## Technical specifications of unit AX Extra Low noise Unit

Model	50	60	70	80	90	100	115	130	145	160	180	200	UM	
Power supply	400V - 3ph+N - 50 Hz				400V - 3ph - 50 Hz									V-f-Hz
Type of refrigerant	R410A													/
Circuits	1													n°
Cooling capacity <sup>(1)</sup>	50.7	55.5	65.2	74.5	86.2	96.2	106	119	135	150	170	189	kW	
Compressors power input <sup>(1)</sup>	17.6	19.9	23.1	27.6	28.6	34.1	38.3	43.7	48.0	53.9	60.4	67.7	kW	
EER	2.88	2.79	2.82	2.70	3.01	2.82	2.77	2.72	2.81	2.79	2.81	2.79	-	
Total power input <sup>(1)</sup>	19.4	21.7	24.9	29.4	32.2	37.7	41.9	47.3	53.4	59.3	67.6	74.9	kW	
Total EER	2.61	2.56	2.62	2.53	2.68	2.55	2.53	2.52	2.53	2.53	2.51	2.52	-	
ESEER	3.61	3.53	3.61	3.50	3.69	3.52	3.49	3.47	3.49	3.49	3.47	3.48	-	

### 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	

### Fan

Type	Axial													-
Quantity	3				2				3			4		n°
Maximum rotational speed	900													rpm
Total air flow rate	19367	19367	18733	18453	27640	26733	31627	31627	41460	39880	55280	53173	m³/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		m²

### Electrical Data

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

### NOTES:

(1): Data referred to evaporation temperature : 3°C (Dew point), outdoor air temperature 35°C D.B. superheating and subcooling 5°K.

(2): Data referred to condensation temperature : 50°C (Dew point), outdoor air temperature 7°C D.B., relative humidifying 87% (6°C W.B.). Superheating and subcooling 5°K.

## TECHNICAL SPECIFICATIONS AND STANDARD PERFORMANCES - IR COOLING UNIT ONLY

### Standard performances AX Extra Low noise 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	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	<b>50.7</b>	<b>17.6</b>	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	18.1	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	<b>55.5</b>	<b>19.9</b>	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	16.2	69.5	18.7	65.7	20.6	61.6	22.7	57.4	25.0	53.1	27.2	48.8	29.4
	6	76.5	16.4	71.4	18.8	67.5	20.7	63.4	22.9	58.9	25.2	54.6	27.5	50.1	29.7
	7	78.7	16.5	73.5	19.0	69.5	21.0	<b>65.2</b>	<b>23.1</b>	60.7	25.5	56.2	27.8	51.6	30.0
	8	80.9	16.7	75.6	19.2	71.4	21.2	67.0	23.4	62.4	25.8	57.8	28.1	-	-
	9	83.2	16.9	77.6	19.4	73.4	21.4	68.9	23.6	64.1	26.0	59.4	28.4	-	-
	10	85.4	17.1	79.7	19.6	75.4	21.6	70.7	23.8	65.8	26.3	60.9	28.6	-	-
	11	87.6	17.2	81.7	19.8	77.3	21.8	72.5	24.1	67.5	26.5	62.5	28.9	-	-
	12	89.9	17.4	83.9	20.0	79.4	22.0	74.5	24.3	69.3	26.8	64.2	29.2	-	-
80	5	85.0	19.4	79.4	22.3	75.1	24.5	70.4	27.1	65.5	29.8	60.7	32.5	55.8	35.2
	6	87.4	19.5	81.6	22.5	77.1	24.8	72.4	27.3	67.4	30.1	62.4	32.8	57.3	35.5
	7	89.9	19.7	84.0	22.7	79.4	25.0	<b>74.5</b>	<b>27.6</b>	69.3	30.4	64.2	33.2	59.0	35.9
	8	92.5	20.0	86.3	23.0	81.6	25.3	76.6	27.9	71.3	30.8	66.0	33.5	-	-
	9	95.0	20.2	88.7	23.2	83.9	25.6	78.7	28.2	73.2	31.1	67.8	33.9	-	-
	10	97.6	20.4	91.1	23.4	86.1	25.8	80.8	28.5	75.2	31.4	69.6	34.2	-	-
	11	100	20.6	93.4	23.7	88.3	26.1	82.9	28.7	77.1	31.7	71.4	34.5	-	-
	12	103	20.8	95.9	23.9	90.7	26.3	85.1	29.0	79.2	32.0	73.4	34.9	-	-
90	5	98.4	20.1	91.8	23.1	86.8	25.4	81.5	28.0	75.8	30.9	70.2	33.7	64.5	36.4
	6	101	20.3	94.4	23.3	89.3	25.7	83.8	28.3	77.9	31.2	72.2	34.0	66.3	36.8
	7	104	20.5	97.1	23.5	91.9	25.9	<b>86.2</b>	<b>28.6</b>	80.2	31.5	74.3	34.4	68.2	37.2
	8	107	20.7	100	23.8	94.5	26.2	88.6	28.9	82.5	31.9	76.4	34.7	-	-
	9	110	20.9	103	24.0	97.1	26.5	91.1	29.2	84.7	32.2	78.5	35.1	-	-
	10	113	21.1	105	24.3	100	26.8	93.5	29.5	87.0	32.5	80.6	35.4	-	-
	11	116	21.3	108	24.5	102	27.0	95.9	29.8	89.2	32.8	82.6	35.8	-	-
	12	119	21.5	111	24.8	105	27.3	98.5	30.1	91.6	33.1	84.9	36.1	-	-
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	<b>96.2</b>	<b>34.1</b>	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	-	-

Te= evaporation temperature °C (Dew point)

kWf = refrigerating power (kW).

kWa = Power input of compressors (kW)

# TECHNICAL SPECIFICATIONS AND STANDARD PERFORMANCES - IR COOLING UNIT ONLY

Mod. 115-200

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
<b>115</b>	<b>5</b>	121	26.9	113	30.9	107	34.1	100	37.6	93.2	41.4	86.4	45.1	79.3	48.8
	<b>6</b>	124	27.1	116	31.2	110	34.4	103	37.9	95.8	41.8	88.8	45.6	81.5	49.3
	<b>7</b>	128	27.4	119	31.5	113	34.7	<b>106</b>	<b>38.3</b>	98.6	42.2	91.3	46.0	83.9	49.8
	<b>8</b>	132	27.7	123	31.9	116	35.1	109	38.7	101	42.7	93.9	46.5	-	-
	<b>9</b>	135	28.0	126	32.2	119	35.5	112	39.1	104	43.1	96.5	47.0	-	-
	<b>10</b>	139	28.3	130	32.5	123	35.8	115	39.5	107	43.5	99.1	47.5	-	-
	<b>11</b>	142	28.5	133	32.8	126	36.2	118	39.9	110	44.0	102	47.9	-	-
	<b>12</b>	146	28.8	136	33.2	129	36.5	121	40.3	113	44.4	104	48.4	-	-
<b>130</b>	<b>5</b>	136	30.7	127	35.3	120	38.9	113	42.9	105	47.2	97.0	51.5	89.1	55.7
	<b>6</b>	140	30.9	130	35.6	123	39.2	116	43.3	108	47.7	100	52.0	91.5	56.2
	<b>7</b>	144	31.3	134	36.0	127	39.6	<b>119</b>	<b>43.7</b>	111	48.2	103	52.5	94.2	56.8
	<b>8</b>	148	31.6	138	36.4	130	40.1	122	44.2	114	48.7	105	53.1	-	-
	<b>9</b>	152	31.9	142	36.7	134	40.5	126	44.6	117	49.2	108	53.6	-	-
	<b>10</b>	156	32.2	145	37.1	138	40.9	129	45.1	120	49.7	111	54.2	-	-
	<b>11</b>	160	32.6	149	37.5	141	41.3	132	45.5	123	50.2	114	54.7	-	-
	<b>12</b>	164	32.9	153	37.8	145	41.7	136	46.0	127	50.7	117	55.2	-	-
<b>145</b>	<b>5</b>	154	33.7	144	38.8	136	42.7	128	47.1	119	51.9	110	56.6	101	61.2
	<b>6</b>	158	34.0	148	39.1	140	43.1	131	47.5	122	52.4	113	57.1	104	61.8
	<b>7</b>	163	34.4	152	39.5	144	43.6	<b>135</b>	<b>48.0</b>	126	52.9	116	57.7	107	62.4
	<b>8</b>	168	34.7	156	40.0	148	44.0	139	48.6	129	53.5	120	58.3	-	-
	<b>9</b>	172	35.1	161	40.4	152	44.5	143	49.0	133	54.1	123	58.9	-	-
	<b>10</b>	177	35.4	165	40.8	156	44.9	146	49.5	136	54.6	126	59.5	-	-
	<b>11</b>	181	35.8	169	41.2	160	45.4	150	50.0	140	55.1	129	60.1	-	-
	<b>12</b>	186	36.1	174	41.6	164	45.8	154	50.5	144	55.7	133	60.7	-	-
<b>160</b>	<b>5</b>	171	37.8	160	43.5	151	47.9	142	52.8	132	58.2	122	63.5	112	68.6
	<b>6</b>	176	38.1	164	43.9	155	48.4	146	53.3	136	58.8	126	64.1	115	69.3
	<b>7</b>	181	38.5	169	44.3	160	48.8	<b>150</b>	<b>53.9</b>	140	59.4	129	64.7	119	70.0
	<b>8</b>	186	39.0	174	44.8	164	49.4	154	54.4	144	60.0	133	65.4	-	-
	<b>9</b>	191	39.3	179	45.3	169	49.9	159	55.0	147	60.6	137	66.1	-	-
	<b>10</b>	196	39.7	183	45.7	173	50.4	163	55.5	151	61.2	140	66.7	-	-
	<b>11</b>	201	40.1	188	46.2	178	50.9	167	56.1	155	61.8	144	67.4	-	-
	<b>12</b>	207	40.5	193	46.6	183	51.4	171	56.6	159	62.4	148	68.1	-	-
<b>180</b>	<b>5</b>	194	42.4	181	48.8	171	53.7	161	59.2	150	65.3	139	71.2	127	77.0
	<b>6</b>	199	42.8	186	49.2	176	54.2	165	59.8	154	65.9	142	71.8	131	77.7
	<b>7</b>	205	43.2	192	49.7	181	54.8	<b>170</b>	<b>60.4</b>	158	66.6	146	72.6	135	78.5
	<b>8</b>	211	43.7	197	50.3	186	55.4	175	61.1	163	67.3	151	73.4	-	-
	<b>9</b>	217	44.1	202	50.8	191	55.9	180	61.7	167	68.0	155	74.1	-	-
	<b>10</b>	223	44.6	208	51.3	196	56.5	184	62.3	172	68.7	159	74.9	-	-
	<b>11</b>	228	45.0	213	51.8	202	57.1	189	62.9	176	69.3	163	75.6	-	-
	<b>12</b>	235	45.4	219	52.3	207	57.6	194	63.5	181	70.0	167	76.3	-	-
<b>200</b>	<b>5</b>	216	47.5	201	54.7	190	60.2	179	66.4	166	73.2	154	79.8	141	86.3
	<b>6</b>	222	47.9	207	55.2	196	60.8	184	67.0	171	73.9	158	80.5	145	87.1
	<b>7</b>	228	48.4	213	55.7	201	61.4	<b>189</b>	<b>67.7</b>	176	74.6	163	81.4	150	88.0
	<b>8</b>	235	49.0	219	56.3	207	62.1	194	68.4	181	75.4	167	82.3	-	-
	<b>9</b>	241	49.5	225	56.9	213	62.7	200	69.1	186	76.2	172	83.1	-	-
	<b>10</b>	247	50.0	231	57.5	218	63.3	205	69.8	191	77.0	177	83.9	-	-
	<b>11</b>	254	50.4	237	58.0	224	63.9	210	70.5	196	77.7	181	84.7	-	-
	<b>12</b>	261	50.9	243	58.6	230	64.6	216	71.2	201	78.5	186	85.5	-	-

Te= evaporation temperature °C (Dew point)

kWf = refrigerating power (kW).

kWa = Power input of compressors (kW)

# 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

#### NOTES:

(1): Data referred to evaporation temperature : 3°C (Dew point), outdoor air temperature 35°C D.B. superheating and subcooling 5°K.

### Recovered heating capacity in Version with Desuperheater (VD)

MOD.	TWR	OUTDOOR AIR TEMPERATURE (°C D.B.)					MOD.	TWR	OUTDOOR AIR TEMPERATURE (°C D.B.)				
		25	30	35	40	45			25	30	35	40	45
		kW <sub>t</sub> = RECOVERED HEATING CAPACITY [KW]							kW <sub>t</sub> = RECOVERED HEATING CAPACITY [KW]				
<b>50</b>	30	12.8	14.7	16.9	19.3	22.0	<b>115</b>	30	29.1	33.0	37.5	42.5	48.1
	35	12.9	14.8	17.0	19.4	22.1		35	28.9	32.8	37.3	42.3	47.8
	40	12.6	14.4	16.6	18.9	21.6		40	28.2	31.9	36.2	41.1	46.5
	45	11.9	13.7	15.7	17.9	20.5		45	26.7	30.3	34.4	39.0	44.1
	50	10.9	12.5	14.3	16.4	18.7		50	24.7	28.0	31.7	36.0	40.7
	55	9.5	10.9	12.5	14.3	16.3		55	21.9	24.9	28.3	32.0	36.2
	60	7.7	8.8	10.1	11.6	13.2		60	18.6	21.1	24.0	27.2	30.7
	65	5.5	6.4	7.3	8.4	9.5		65	14.6	16.6	18.8	21.4	24.2
70	3.0	3.5	4.0	4.6	5.2	70	10.0	11.4	12.9	14.6	16.5		
<b>55</b>	30	14.6	16.8	19.0	21.7	24.6	<b>130</b>	30	32.3	36.6	41.5	47.1	53.2
	35	14.6	16.8	19.0	21.7	24.6		35	32.3	36.6	41.5	47.1	53.2
	40	14.2	16.3	18.6	21.2	24.0		40	31.5	35.6	40.5	45.9	51.9
	45	13.5	15.5	17.6	20.1	22.8		45	29.8	33.8	38.4	43.5	49.2
	50	12.4	14.2	17.0	18.5	20.9		50	27.4	31.1	35.3	40.0	45.2
	55	10.9	12.5	15.0	16.3	18.4		55	24.2	27.4	31.1	35.2	39.9
	60	9.0	10.4	12.5	13.5	15.3		60	20.1	22.8	25.9	29.3	33.2
	65	6.8	7.9	9.4	10.2	11.6		65	15.2	17.3	19.6	22.2	25.1
70	4.3	4.9	5.9	6.4	7.2	70	9.6	10.8	12.3	14.0	15.8		
<b>60</b>	30	16.6	19.0	21.6	24.7	28.0	<b>145</b>	30	36.7	41.7	47.4	53.6	60.5
	35	16.6	19.0	21.6	24.7	28.0		35	36.8	41.8	47.5	53.8	60.6
	40	16.1	18.6	21.1	24.1	27.3		40	35.9	40.8	46.4	52.5	59.2
	45	15.3	17.6	20.0	22.8	25.9		45	34.1	38.7	44.0	49.8	56.2
	50	14.0	16.2	18.4	21.0	23.8		50	31.3	35.6	40.4	45.7	51.5
	55	12.4	14.2	16.2	18.5	20.9		55	27.5	31.3	35.5	40.2	45.4
	60	10.3	11.8	13.4	15.4	17.4		60	22.8	25.9	29.4	33.3	37.6
	65	7.8	8.9	10.2	11.6	13.1		65	17.1	19.5	22.1	25.0	28.2
70	4.8	5.6	6.3	7.2	8.2	70	10.5	11.9	13.5	15.3	17.3		
<b>70</b>	30	19.4	22.2	25.4	29.2	33.4	<b>160</b>	30	41.5	47.1	53.4	60.5	68.2
	35	19.4	22.3	25.5	29.3	33.6		35	41.4	47.1	53.3	60.4	68.1
	40	19.0	21.7	24.9	28.6	32.8		40	40.3	45.8	52.0	58.8	66.3
	45	18.0	20.6	23.6	27.1	31.1		45	38.3	43.5	49.3	55.8	62.9
	50	16.4	18.8	21.6	24.8	28.4		50	35.2	40.0	45.4	51.3	57.9
	55	14.4	16.5	18.9	21.7	24.8		55	31.2	35.4	40.1	45.4	51.2
	60	11.8	13.5	15.5	17.8	20.4		60	26.1	29.7	33.7	38.1	42.9
	65	8.6	9.9	11.3	13.0	14.9		65	20.1	22.8	25.9	29.3	33.0
70	5.0	5.7	6.5	7.5	8.6	70	13.1	14.8	16.8	19.0	21.5		
<b>90</b>	30	22.5	25.6	29.2	33.3	37.8	<b>180</b>	30	46.6	53.0	60.0	68.0	76.6
	35	22.6	25.7	29.3	33.4	38.0		35	46.5	52.9	59.9	67.8	76.5
	40	22.1	25.1	28.6	32.6	37.1		40	45.3	51.5	58.4	66.1	74.5
	45	20.9	23.8	27.1	30.9	35.1		45	43.0	48.9	55.4	62.7	70.7
	50	19.1	21.8	24.8	28.3	32.1		50	39.6	45.0	51.0	57.7	65.0
	55	16.7	19.1	21.7	24.7	28.1		55	35.0	39.8	45.1	51.1	57.6
	60	13.7	15.6	17.8	20.3	23.1		60	29.4	33.4	37.8	42.8	48.3
	65	10.1	11.5	13.1	14.9	17.0		65	22.6	25.7	29.1	32.9	37.1
70	5.9	6.7	7.6	8.7	9.9	70	14.7	16.7	18.9	21.4	24.1		
<b>100</b>	30	25.5	29.0	33.0	37.5	42.5	<b>200</b>	30	51.6	58.6	66.4	75.2	84.8
	35	25.3	28.8	32.8	37.3	42.2		35	51.5	58.5	66.3	75.1	84.6
	40	24.7	28.1	32.0	36.3	41.1		40	50.2	57.0	64.6	73.1	82.4
	45	23.5	26.7	30.4	34.5	39.1		45	47.6	54.1	61.3	69.4	78.2
	50	21.7	24.7	28.2	32.0	36.2		50	43.8	49.8	56.4	63.8	72.0
	55	19.5	22.1	25.2	28.6	32.4		55	38.8	44.0	49.9	56.5	63.7
	60	16.7	19.0	21.6	24.5	27.8		60	32.5	36.9	41.8	47.4	53.4
	65	13.4	15.2	17.3	19.6	22.2		65	25.0	28.4	32.2	36.4	41.1
70	9.5	10.8	12.3	14.0	15.8	70	16.2	18.5	20.9	23.7	26.7		

kW<sub>t</sub> = RECOVERED HEATING CAPACITY [KW]

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

## 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				400V - 3ph - 50 Hz									V-f-Hz
Type of refrigerant	R410A												/	
Circuits	1												n°	
Cooling capacity <sup>(1)</sup>	52.9	57.5	67.2	74.1	89.2	99.0	110	122	138	154	178	198	kW	
Compressors power input <sup>(1)</sup>	16.7	18.4	21.8	24.7	28.0	31.4	35.4	40.0	43.9	49.8	55.0	62.5	kW	
EER	3.17	3.13	3.08	3.00	3.19	3.15	3.11	3.05	3.14	3.09	3.24	3.17	-	
Total power input <sup>(1)</sup>	18.5	20.2	23.6	26.5	31.6	35.0	39.0	43.6	49.3	55.2	62.2	69.7	kW	
Total EER	2.86	2.85	2.85	2.80	2.82	2.83	2.82	2.80	2.80	2.79	2.86	2.84	-	
ESEER	3.95	3.93	3.93	3.86	3.90	3.90	3.89	3.86	3.86	3.85	3.95	3.92	-	
Heating capacity <sup>(2)</sup>	57.5	62.6	73.8	82.3	98.7	109	124	135	153	171	195	214	kW	
Compressors power input <sup>(2)</sup>	16.7	18.5	21.9	25.1	29.0	31.4	36.4	40.1	45.1	50.0	56.2	62.6	kW	
COP	3.44	3.39	3.37	3.28	3.40	3.48	3.41	3.37	3.39	3.42	3.47	3.42	-	
Total power input <sup>(2)</sup>	18.5	20.3	23.7	26.9	32.6	35.0	40.0	43.7	50.5	55.4	63.4	69.8	kW	
Total COP	3.11	3.09	3.11	3.06	3.03	3.12	3.10	3.09	3.03	3.09	3.08	3.07	-	

### 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

### Fan

Type	Assiali												-
Quantity	3			2			3			4			n°
Maximum rotational speed	900												rpm
Total air flow rate	29050	29050	28100	27680	41460	40100	47440	47440	62190	59820	82920	79760	m³/h
Power input	1.8			3.6			5.4			7.2			kW

### Coil

Type	Alette in alluminio e tubi in rame												/
Quantity	1												n°
Front area	3.38			4.72			5.90			7.41			m²

### Electrical Data

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

### NOTES:

(1): Data referred to evaporation temperature : 3°C (Dew point), outdoor air temperature 35°C D.B. superheating and subcooling 5°K.

(2): Data referred to condensation temperature : 50°C (Dew point), outdoor air temperature 7°C D.B., relative humidifying 87% (6°C W.B.). Superheating and subcooling 5°K.

# 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	11.7	56.4	13.5	53.3	14.9	50.0	16.4	46.5	18.1	43.1	19.7	39.6	21.3
	6	62.1	11.8	57.9	13.6	54.8	15.0	51.4	16.5	47.8	18.2	44.3	19.9	40.7	21.5
	7	63.9	11.9	59.6	13.7	56.4	15.1	<b>52.9</b>	<b>16.7</b>	49.2	18.4	45.6	20.1	41.9	21.7
	8	65.7	12.1	61.3	13.9	58.0	15.3	54.4	16.9	50.6	18.6	46.9	20.3	-	-
	9	67.5	12.2	63.0	14.0	59.6	15.5	55.9	17.1	52.0	18.8	48.2	20.5	-	-
	10	69.3	12.3	64.7	14.2	61.1	15.6	57.4	17.2	53.4	19.0	49.4	20.7	-	-
	11	71.0	12.4	66.3	14.3	62.7	15.8	58.8	17.4	54.8	19.2	50.7	20.9	-	-
	12	73.0	12.6	68.1	14.5	64.4	15.9	60.4	17.6	56.2	19.4	52.1	21.1	-	-
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	<b>57.5</b>	<b>18.4</b>	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	15.3	71.6	17.6	67.7	19.4	63.5	21.4	59.1	23.6	54.8	25.7	50.3	27.8
	6	78.8	15.4	73.6	17.8	69.6	19.6	65.3	21.6	60.8	23.8	56.3	25.9	51.7	28.0
	7	81.1	15.6	75.7	17.9	71.6	19.8	<b>67.2</b>	<b>21.8</b>	62.5	24.0	57.9	26.2	53.2	28.3
	8	83.4	15.8	77.9	18.1	73.6	20.0	69.1	22.0	64.3	24.3	59.5	26.5	-	-
	9	85.7	15.9	80.0	18.3	75.7	20.2	71.0	22.3	66.1	24.5	61.2	26.8	-	-
	10	88.0	16.1	82.1	18.5	77.7	20.4	72.9	22.5	67.8	24.8	62.8	27.0	-	-
	11	90.2	16.2	84.2	18.7	79.7	20.6	74.8	22.7	69.6	25.0	64.4	27.3	-	-
	12	92.7	16.4	86.5	18.9	81.8	20.8	76.8	22.9	71.4	25.3	66.2	27.5	-	-
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	<b>74.1</b>	<b>24.7</b>	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	<b>89.2</b>	<b>28.0</b>	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	<b>99.0</b>	<b>31.4</b>	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	-	-

Te= evaporation temperature °C (Dew point)

kWf = refrigerating power (kW).

kWa = Power input of compressors (kW)

# TECHNICAL SPECIFICATIONS AND STANDARD PERFORMANCES - IP HEAT PUMP UNITS

## Mod. 115-200

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
<b>115</b>	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	<b>110</b>	<b>35.4</b>	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	-	-
<b>130</b>	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	<b>122</b>	<b>40.0</b>	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	-	-
<b>145</b>	5	158	30.8	147	35.4	139	39.0	130	43.1	121	47.5	112	51.7	103	55.9
	6	162	31.1	151	35.8	143	39.4	134	43.5	125	47.9	116	52.2	106	56.5
	7	167	31.4	156	36.1	147	39.8	<b>138</b>	<b>43.9</b>	128	48.4	119	52.8	109	57.0
	8	171	31.8	160	36.5	151	40.3	142	44.4	132	48.9	122	53.3	-	-
	9	176	32.1	164	36.9	155	40.7	146	44.8	136	49.4	126	53.9	-	-
	10	181	32.4	169	37.3	160	41.1	150	45.3	139	49.9	129	54.4	-	-
	11	185	32.7	173	37.6	164	41.5	154	45.7	143	50.4	132	54.9	-	-
	12	190	33.0	178	38.0	168	41.9	158	46.2	147	50.9	136	55.5	-	-
<b>160</b>	5	176	34.9	164	40.2	155	44.3	146	48.8	135	53.8	125	58.7	115	63.5
	6	181	35.3	169	40.6	159	44.7	150	49.3	139	54.3	129	59.2	118	64.0
	7	186	35.6	174	41.0	164	45.2	<b>154</b>	<b>49.8</b>	143	54.9	133	59.8	122	64.7
	8	191	36.0	178	41.4	169	45.7	158	50.4	147	55.5	136	60.5	-	-
	9	196	36.4	183	41.9	173	46.1	163	50.9	151	56.1	140	61.1	-	-
	10	202	36.7	188	42.3	178	46.6	167	51.4	155	56.6	144	61.7	-	-
	11	207	37.1	193	42.7	183	47.0	171	51.9	159	57.2	148	62.3	-	-
	12	212	37.5	198	43.1	188	47.5	176	52.4	164	57.7	152	62.9	-	-
<b>180</b>	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	<b>178</b>	<b>55.0</b>	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	-	-
<b>200</b>	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	<b>198</b>	<b>62.5</b>	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	-	-

Te= evaporation temperature °C (Dew point)

kWf = refrigerating power (kW).

kWa = Power input of compressors (kW)

# 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	43.9	11.9	50.3	12.0	55.0	12.1	58.5	12.2	62.7	12.3	67.1	12.5	71.7	12.6
	35	43.7	13.2	50.0	13.3	54.7	13.4	58.2	13.5	62.4	13.7	66.7	13.8	71.4	14.0
	40	43.4	14.7	49.7	14.7	54.4	14.9	57.9	15.0	62.0	15.2	66.3	15.4	71.0	15.5
	45	43.1	16.3	49.4	16.4	54.0	16.6	57.5	16.7	61.6	16.9	65.9	17.1	70.5	17.3
	50	42.8	18.1	49.1	18.2	53.6	18.5	57.1	18.6	61.2	18.8	65.4	19.0	70.0	19.2
60	30	47.8	13.2	54.8	13.2	60.0	13.4	63.8	13.5	68.4	13.7	73.1	13.8	78.2	14.0
	35	47.6	14.6	54.5	14.7	59.7	14.9	63.4	15.0	68.0	15.1	72.7	15.3	77.8	15.5
	40	47.3	16.2	54.2	16.3	59.3	16.6	63.1	16.6	67.6	16.8	72.3	17.0	77.4	17.2
	45	47.0	18.0	53.9	18.1	58.9	18.4	62.6	18.5	67.2	18.7	71.8	18.9	76.8	19.1
	50	46.7	20.1	53.5	20.2	58.5	20.4	62.6	20.6	66.7	20.8	71.3	21.0	76.3	21.3
70	30	56.4	15.6	64.6	15.7	70.6	15.9	75.1	16.0	80.6	16.2	86.1	16.4	92.1	16.5
	35	56.1	17.3	64.2	17.4	70.3	17.6	74.7	17.7	80.1	17.9	85.7	18.1	91.7	18.3
	40	55.7	19.2	63.9	19.3	69.9	19.6	74.3	19.7	79.7	19.9	85.2	20.2	91.1	20.4
	45	55.4	21.4	63.4	21.5	69.4	21.8	73.8	21.9	79.1	22.2	84.6	22.4	90.5	22.7
	50	55.0	23.7	63.0	23.9	68.9	24.2	73.3	24.3	78.6	24.6	84.0	24.9	89.9	25.2
80	30	62.8	17.9	72.0	18.0	78.8	18.2	83.8	18.3	89.8	18.5	96.1	18.8	103	19.0
	35	62.5	19.8	71.7	19.9	78.4	20.2	83.3	20.3	89.4	20.5	95.6	20.8	102	21.0
	40	62.2	22.0	71.2	22.1	77.9	22.5	82.9	22.6	88.9	22.8	95.0	23.1	102	23.4
	45	61.7	24.5	70.8	24.6	77.4	25.0	82.3	25.1	88.3	25.4	94.4	25.7	101	26.0
	50	61.3	27.2	70.3	27.4	76.8	27.7	81.7	27.9	87.6	28.2	93.7	28.6	100	28.9
90	30	75.4	20.6	86.4	20.8	94.5	21.1	100	21.2	108	21.4	115	21.7	123	21.9
	35	75.0	22.9	85.9	23.0	94.0	23.3	100	23.5	107	23.7	115	24.0	123	24.3
	40	74.6	25.4	85.5	25.6	93.5	25.9	99.4	26.1	107	26.4	114	26.7	122	27.0
	45	74.0	28.3	84.9	28.4	92.8	28.8	98.7	29.0	106	29.3	113	29.7	121	30.0
	50	73.5	31.4	84.3	31.6	92.2	32.1	98.0	32.2	105	32.6	112	33.0	120	33.4
100	30	83.4	22.4	95.5	22.5	105	22.8	111	22.9	119	23.2	127	23.5	136	23.7
	35	82.9	24.8	95.1	24.9	104	25.3	111	25.4	119	25.7	127	26.0	136	26.3
	40	82.5	27.5	94.5	27.7	103	28.1	110	28.3	118	28.6	126	28.9	135	29.2
	45	81.9	30.6	93.9	30.8	103	31.2	109	31.4	117	31.8	125	32.1	134	32.5
	50	81.3	34.0	93.2	34.2	102	34.7	108	34.9	116	35.3	124	35.7	133	36.1
115	30	94.7	25.9	109	26.1	119	26.4	126	26.6	135	26.9	145	27.2	155	27.5
	35	94.2	28.7	108	28.9	118	29.3	126	29.5	135	29.8	144	30.1	154	30.5
	40	93.7	31.9	107	32.1	117	32.6	125	32.8	134	33.1	143	33.5	153	33.9
	45	93.0	35.5	107	35.7	117	36.2	124	36.4	133	36.8	142	37.2	152	37.7
	50	92.4	39.5	106	39.7	116	40.2	123	40.5	132	40.9	141	41.4	151	41.9
130	30	103	28.5	118	28.7	129	29.1	137	29.3	147	29.6	158	30.0	169	30.3
	35	103	31.6	118	31.8	129	32.3	137	32.5	147	32.8	157	33.2	168	33.6
	40	102	35.2	117	35.4	128	35.9	136	36.1	146	36.5	156	36.9	167	37.3
	45	101	39.1	116	39.3	127	39.9	135	40.1	145	40.6	155	41.0	166	41.5
	50	101	43.5	115	43.7	126	44.3	134	44.6	144	45.1	154	45.6	164	46.1
145	30	117	32.1	134	32.3	146	32.7	156	32.9	167	33.3	179	33.7	191	34.1
	35	116	35.6	133	35.8	146	36.3	155	36.5	166	36.9	178	37.3	190	37.8
	40	116	39.6	132	39.8	145	40.3	154	40.6	165	41.1	177	41.5	189	42.0
	45	115	44.0	132	44.2	144	44.8	153	45.1	164	45.6	175	46.1	188	46.7
	50	114	48.9	131	49.2	143	49.9	152	50.1	163	50.7	174	51.3	186	51.9
160	30	131	35.6	150	35.8	164	36.3	174	36.5	187	36.9	200	37.4	214	37.8
	35	130	39.4	149	39.7	163	40.2	173	40.5	186	40.9	199	41.4	212	41.9
	40	129	43.9	148	44.1	162	44.7	172	45.0	185	45.5	197	46.0	211	46.6
	45	128	48.7	147	49.0	161	49.7	171	50.0	183	50.6	196	51.2	210	51.7
	50	127	54.2	146	54.5	160	55.3	170	55.6	182	56.2	195	56.9	208	57.5
180	30	149	40.0	171	40.2	187	40.8	199	41.0	213	41.5	228	42.0	244	42.5
	35	148	44.3	170	44.6	186	45.2	198	45.5	212	46.0	226	46.5	242	47.1
	40	147	49.3	169	49.6	185	50.3	196	50.6	211	51.2	225	51.7	241	52.3
	45	146	54.8	168	55.1	183	55.9	195	56.2	209	56.8	224	57.5	239	58.1
	50	145	60.9	167	61.3	182	62.1	194	62.5	208	63.2	222	63.9	238	64.6
200	30	164	44.6	187	44.8	205	45.4	218	45.7	234	46.2	250	46.8	267	47.3
	35	163	49.4	186	49.7	204	50.4	217	50.7	233	51.2	249	51.8	266	52.4
	40	162	54.9	185	55.2	203	56.0	216	56.3	231	57.0	247	57.6	264	58.3
	45	161	61.0	184	61.4	201	62.2	214	62.6	230	63.3	246	64.0	263	64.8
	50	160	67.9	183	68.3	200	69.2	213	69.6	228	70.4	244	71.2	261	72.0

Tc= Condensation temperature in °C (Dew point)

kWt = heating output (kW).

kWa = Power input of compressors (kW)

**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 AS Low noise Unit

Model	50	60	70	80	90	100	115	130	145	160	180	200	UM	
Power supply	400V - 3ph+N - 50 Hz				400V - 3ph - 50 Hz									V-f-Hz
Type of refrigerant	R410A													/
Circuits	1													n°
Cooling capacity <sup>(1)</sup>	50.8	55.2	64.5	71.1	85.6	95.0	106	117	132	148	171	190	kW	
Compressors power input <sup>(1)</sup>	17.8	19.6	23.2	26.3	29.9	33.5	37.7	42.6	46.9	53.1	58.7	66.7	kW	
EER	2.85	2.82	2.78	2.70	2.86	2.84	2.81	2.75	2.81	2.79	2.91	2.85	-	
Total power input <sup>(1)</sup>	19.6	21.4	25.0	28.1	33.5	37.1	41.3	46.2	52.3	58.5	65.9	73.9	kW	
Total EER	2.59	2.58	2.58	2.53	2.56	2.56	2.57	2.53	2.52	2.53	2.59	2.57	-	
ESEER	3.58	3.56	3.56	3.49	3.53	3.53	3.54	3.49	3.48	3.49	3.58	3.55	-	
Heating capacity <sup>(2)</sup>	56.0	61.1	71.9	80.2	96.2	106	121	132	149	167	190	209	kW	
Compressors power input <sup>(2)</sup>	15.9	17.6	20.8	23.9	27.5	29.8	34.6	38.1	42.8	47.5	53.3	59.5	kW	
COP	3.52	3.47	3.46	3.36	3.50	3.56	3.50	3.46	3.48	3.52	3.56	3.51	-	
Total power input <sup>(2)</sup>	17.7	19.4	22.6	25.7	31.1	33.4	38.2	41.7	48.2	52.9	60.5	66.7	kW	
Total COP	3.16	3.15	3.18	3.12	3.09	3.17	3.17	3.17	3.09	3.16	3.14	3.13	-	

### 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	

### Fan

Type	Assiali													-
Quantity	3			2				3			4			n°
Maximum rotational speed	900													rpm
Total air flow rate	24208	24208	23417	23067	34550	33417	39533	39533	51825	49850	69100	66467	m³/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			m²

### Electrical Data

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

### NOTES:

(1): Data referred to evaporation temperature : 3°C (Dew point), outdoor air temperature 35°C D.B. superheating and subcooling 5°K.

(2): Data referred to condensation temperature : 50°C (Dew point), outdoor air temperature 7°C D.B., relative humidifying 87% (6°C W.B.). Superheating and subcooling 5°K.

## TECHNICAL SPECIFICATIONS AND STANDARD PERFORMANCES - IP HEAT PUMP UNITS

### Standard performances in cooling mode AS Low noise 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	58.0	12.5	54.1	14.4	51.2	15.8	48.0	17.5	44.7	19.2	41.4	21.0	38.0	22.7
	6	59.6	12.6	55.6	14.5	52.6	16.0	49.4	17.6	45.9	19.4	42.5	21.2	39.1	22.9
	7	61.3	12.7	57.2	14.7	54.1	16.1	<b>50.8</b>	<b>17.8</b>	47.3	19.6	43.8	21.4	40.2	23.1
	8	63.1	12.9	58.9	14.8	55.7	16.3	52.2	18.0	48.6	19.8	45.0	21.6	-	-
	9	64.8	13.0	60.5	15.0	57.2	16.5	53.7	18.2	49.9	20.0	46.3	21.8	-	-
	10	66.5	13.1	62.1	15.1	58.7	16.7	55.1	18.4	51.3	20.2	47.5	22.1	-	-
	11	68.2	13.3	63.7	15.3	60.2	16.8	56.5	18.5	52.6	20.4	48.7	22.3	-	-
60	5	63.0	13.8	58.8	15.8	55.6	17.4	52.2	19.2	48.6	21.2	45.0	23.1	41.3	25.0
	6	64.8	13.9	60.4	16.0	57.2	17.6	53.6	19.4	49.9	21.4	46.2	23.3	42.5	25.2
	7	66.6	14.0	62.2	16.1	58.8	17.8	<b>55.2</b>	<b>19.6</b>	51.4	21.6	47.6	23.6	43.7	25.5
	8	68.5	14.2	64.0	16.3	60.5	18.0	56.8	19.8	52.8	21.8	48.9	23.8	-	-
	9	70.4	14.3	65.7	16.5	62.2	18.2	58.3	20.0	54.3	22.1	50.3	24.1	-	-
	10	72.3	14.5	67.5	16.6	63.8	18.3	59.9	20.2	55.7	22.3	51.6	24.3	-	-
	11	74.1	14.6	69.2	16.8	65.4	18.5	61.4	20.4	57.1	22.5	52.9	24.5	-	-
70	5	73.6	16.3	68.7	18.7	65.0	20.6	61.0	22.8	56.7	25.1	52.6	27.3	48.3	29.6
	6	75.7	16.4	70.6	18.9	66.8	20.8	62.7	23.0	58.3	25.3	54.0	27.6	49.6	29.8
	7	77.9	16.6	72.7	19.1	68.7	21.0	<b>64.5</b>	<b>23.2</b>	60.0	25.6	55.6	27.9	51.1	30.1
	8	80.1	16.8	74.7	19.3	70.7	21.3	66.3	23.5	61.7	25.9	57.2	28.2	-	-
	9	82.3	17.0	76.8	19.5	72.6	21.5	68.2	23.7	63.4	26.1	58.7	28.5	-	-
	10	84.5	17.1	78.8	19.7	74.6	21.7	70.0	23.9	65.1	26.4	60.3	28.8	-	-
	11	86.6	17.3	80.9	19.9	76.5	21.9	71.8	24.2	66.8	26.6	61.8	29.0	-	-
80	5	81.2	18.5	75.8	21.2	71.6	23.4	67.2	25.8	62.5	28.4	57.9	31.0	53.2	33.5
	6	83.4	18.6	77.9	21.4	73.6	23.6	69.1	26.0	64.3	28.7	59.5	31.3	54.7	33.8
	7	85.8	18.8	80.1	21.7	75.8	23.9	<b>71.1</b>	<b>26.3</b>	66.2	29.0	61.3	31.6	56.3	34.2
	8	88.3	19.0	82.4	21.9	77.9	24.1	73.1	26.6	68.0	29.3	63.0	32.0	-	-
	9	90.7	19.2	84.7	22.1	80.1	24.4	75.1	26.9	69.9	29.6	64.7	32.3	-	-
	10	93.1	19.4	86.9	22.3	82.2	24.6	77.1	27.1	71.8	29.9	66.5	32.6	-	-
	11	95.5	19.6	89.1	22.5	84.3	24.8	79.1	27.4	73.6	30.2	68.2	32.9	-	-
90	5	97.7	21.0	91.2	24.1	86.2	26.6	80.9	29.3	75.3	32.3	69.7	35.2	64.1	38.1
	6	100	21.2	93.7	24.4	88.6	26.8	83.2	29.6	77.4	32.6	71.7	35.6	65.8	38.5
	7	103	21.4	96.5	24.6	91.2	27.1	<b>85.6</b>	<b>29.9</b>	79.6	33.0	73.8	35.9	67.8	38.8
	8	106	21.6	99	24.9	93.8	27.4	88.0	30.2	81.9	33.3	75.9	36.3	-	-
	9	109	21.8	102	25.1	96.4	27.7	90.5	30.5	84.2	33.7	77.9	36.7	-	-
	10	112	22.1	105	25.4	99	28.0	92.8	30.8	86.4	34.0	80.0	37.1	-	-
	11	115	22.3	107	25.6	101	28.2	95.2	31.1	88.6	34.3	82.1	37.4	-	-
100	5	108	23.5	101	27.0	95.7	29.8	89.8	32.9	83.6	36.2	77.4	39.5	71.1	42.7
	6	111	23.7	104	27.3	98.4	30.1	92.3	33.2	85.9	36.6	79.5	39.8	73.1	43.1
	7	115	24.0	107	27.6	101	30.4	<b>95.0</b>	<b>33.5</b>	88.4	36.9	81.9	40.3	75.2	43.5
	8	118	24.2	110	27.9	104	30.7	97.7	33.9	90.9	37.3	84.2	40.7	-	-
	9	121	24.5	113	28.2	107	31.0	100	34.2	93.4	37.7	86.5	41.1	-	-
	10	124	24.7	116	28.4	110	31.3	103	34.5	95.9	38.1	88.8	41.5	-	-
	11	128	25.0	119	28.7	113	31.6	106	34.9	98.3	38.5	91.1	41.9	-	-
	12	131	25.2	122	29.0	116	32.0	109	35.2	101	38.8	93.5	42.3	-	-

Te= evaporation temperature °C (Dew point)

kWf = refrigerating power (kW).

kWa = Power input of compressors (kW)

# TECHNICAL SPECIFICATIONS AND STANDARD PERFORMANCES - IP HEAT PUMP UNITS

Mod. 115-200

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
<b>115</b>	<b>5</b>	121	26.5	113	30.4	107	33.5	100	37.0	93.2	40.7	86.4	44.4	79.3	48.0
	<b>6</b>	124	26.7	116	30.7	110	33.8	103	37.3	95.8	41.1	88.8	44.8	81.5	48.5
	<b>7</b>	128	27.0	119	31.0	113	34.2	<b>106</b>	<b>37.7</b>	99	41.6	91.3	45.3	83.9	49.0
	<b>8</b>	132	27.3	123	31.4	116	34.6	109	38.1	101	42.0	93.9	45.8	-	-
	<b>9</b>	135	27.5	126	31.7	119	34.9	112	38.5	104	42.4	96.5	46.3	-	-
	<b>10</b>	139	27.8	130	32.0	123	35.3	115	38.9	107	42.9	99	46.7	-	-
	<b>11</b>	142	28.1	133	32.3	126	35.6	118	39.3	110	43.3	102	47.2	-	-
	<b>12</b>	146	28.4	136	32.6	129	36.0	121	39.6	113	43.7	104	47.6	-	-
<b>130</b>	<b>5</b>	134	29.9	125	34.4	118	37.9	111	41.8	103	46.0	95.3	50.2	87.6	54.3
	<b>6</b>	137	30.2	128	34.7	121	38.2	114	42.2	106	46.5	98.0	50.7	90.0	54.8
	<b>7</b>	141	30.5	132	35.1	125	38.6	<b>117</b>	<b>42.6</b>	109	47.0	101	51.2	92.6	55.3
	<b>8</b>	145	30.8	136	35.5	128	39.1	120	43.1	112	47.5	104	51.8	-	-
	<b>9</b>	149	31.1	139	35.8	132	39.5	124	43.5	115	47.9	107	52.3	-	-
	<b>10</b>	153	31.4	143	36.2	135	39.8	127	43.9	118	48.4	109	52.8	-	-
	<b>11</b>	157	31.7	147	36.5	139	40.2	130	44.4	121	48.9	112	53.3	-	-
	<b>12</b>	161	32.1	151	36.9	142	40.6	134	44.8	124	49.4	115	53.8	-	-
<b>145</b>	<b>5</b>	151	32.9	141	37.9	133	41.7	125	46.0	116	50.7	108	55.3	99	59.8
	<b>6</b>	155	33.2	145	38.2	137	42.1	128	46.4	119	51.2	111	55.8	102	60.3
	<b>7</b>	159	33.6	149	38.6	141	42.5	<b>132</b>	<b>46.9</b>	123	51.7	114	56.4	104	60.9
	<b>8</b>	164	33.9	153	39.0	145	43.0	136	47.4	126	52.3	117	57.0	-	-
	<b>9</b>	168	34.3	157	39.4	149	43.4	139	47.9	130	52.8	120	57.6	-	-
	<b>10</b>	173	34.6	161	39.8	153	43.9	143	48.4	133	53.3	123	58.1	-	-
	<b>11</b>	177	34.9	165	40.2	156	44.3	147	48.8	137	53.8	127	58.7	-	-
	<b>12</b>	182	35.3	170	40.6	161	44.7	151	49.3	140	54.4	130	59.3	-	-
<b>160</b>	<b>5</b>	169	37.3	158	42.9	149	47.2	140	52.1	130	57.4	121	62.6	111	67.7
	<b>6</b>	174	37.6	162	43.3	153	47.7	144	52.6	134	57.9	124	63.2	114	68.3
	<b>7</b>	179	38.0	167	43.7	158	48.2	<b>148</b>	<b>53.1</b>	138	58.5	128	63.8	117	69.0
	<b>8</b>	184	38.4	172	44.2	162	48.7	152	53.7	142	59.2	131	64.5	-	-
	<b>9</b>	189	38.8	176	44.6	167	49.2	156	54.2	146	59.8	135	65.2	-	-
	<b>10</b>	194	39.2	181	45.1	171	49.7	161	54.8	149	60.4	138	65.8	-	-
	<b>11</b>	199	39.6	186	45.5	175	50.2	165	55.3	153	61.0	142	66.5	-	-
	<b>12</b>	204	40.0	191	46.0	180	50.6	169	55.8	157	61.5	146	67.1	-	-
<b>180</b>	<b>5</b>	195	41.2	182	47.4	172	52.2	162	57.6	150	63.4	139	69.2	128	74.8
	<b>6</b>	201	41.6	187	47.8	177	52.7	166	58.1	155	64.0	143	69.8	132	75.5
	<b>7</b>	206	42.0	193	48.3	182	53.2	<b>171</b>	<b>58.7</b>	159	64.7	147	70.5	135	76.3
	<b>8</b>	212	42.5	198	48.9	187	53.8	176	59.3	164	65.4	152	71.3	-	-
	<b>9</b>	218	42.9	204	49.3	193	54.4	181	59.9	168	66.1	156	72.0	-	-
	<b>10</b>	224	43.3	209	49.8	198	54.9	185	60.5	173	66.7	160	72.7	-	-
	<b>11</b>	230	43.7	214	50.3	203	55.4	190	61.1	177	67.4	164	73.5	-	-
	<b>12</b>	236	44.2	220	50.8	208	56.0	195	61.7	182	68.0	168	74.2	-	-
<b>200</b>	<b>5</b>	217	46.8	202	53.8	191	59.3	180	65.4	167	72.1	155	78.6	142	85.0
	<b>6</b>	223	47.2	208	54.4	197	59.9	185	66.0	172	72.8	159	79.3	146	85.8
	<b>7</b>	229	47.7	214	54.9	202	60.5	<b>190</b>	<b>66.7</b>	177	73.5	164	80.2	150	86.7
	<b>8</b>	236	48.2	220	55.5	208	61.2	195	67.4	182	74.3	168	81.0	-	-
	<b>9</b>	242	48.7	226	56.1	214	61.8	201	68.1	187	75.1	173	81.8	-	-
	<b>10</b>	249	49.2	232	56.6	220	62.4	206	68.8	192	75.8	178	82.7	-	-
	<b>11</b>	255	49.7	238	57.2	225	63.0	211	69.5	197	76.6	182	83.5	-	-
	<b>12</b>	262	50.2	245	57.7	231	63.6	217	70.1	202	77.3	187	84.3	-	-

Te= evaporation temperature °C (Dew point)

kWf = refrigerating power (kW).

kWa = Power input of compressors (kW)

# TECHNICAL SPECIFICATIONS AND STANDARD PERFORMANCES - IP HEAT PUMP UNITS

Standard performances in heating mode AS Low noise 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	42.8	11.3	49.0	11.4	53.6	11.5	57.0	11.6	61.1	11.7	65.4	11.9	69.9	12.0
	35	42.5	12.5	48.8	12.6	53.3	12.8	56.7	12.9	60.8	13.0	65.0	13.2	69.6	13.3
	40	42.3	13.9	48.5	14.0	53.0	14.2	56.4	14.3	60.5	14.5	64.7	14.6	69.2	14.8
	45	42.0	15.5	48.1	15.6	52.7	15.8	56.0	15.9	60.1	16.1	64.2	16.3	68.7	16.5
	50	41.7	17.2	47.8	17.3	52.3	17.6	55.6	17.7	59.6	17.9	63.8	18.1	68.2	18.3
60	30	46.7	12.5	53.5	12.6	58.5	12.8	62.2	12.9	66.7	13.0	71.3	13.1	76.3	13.3
	35	46.4	13.9	53.2	14.0	58.2	14.2	61.9	14.2	66.4	14.4	71.0	14.6	75.9	14.7
	40	46.2	15.4	52.9	15.5	57.9	15.7	61.5	15.8	66.0	16.0	70.5	16.2	75.5	16.4
	45	45.8	17.2	52.5	17.3	57.5	17.5	61.1	17.6	65.5	17.8	70.1	18.0	74.9	18.2
	50	45.5	19.1	52.2	19.2	57.1	19.5	61.1	19.6	65.1	19.8	69.6	20.0	74.4	20.2
70	30	54.9	14.8	62.9	14.9	68.8	15.1	73.2	15.2	78.5	15.4	83.9	15.5	89.8	15.7
	35	54.6	16.4	62.6	16.5	68.5	16.7	72.8	16.8	78.1	17.0	83.5	17.2	89.3	17.4
	40	54.3	18.2	62.2	18.4	68.1	18.6	72.4	18.7	77.6	18.9	83.0	19.1	88.8	19.4
	45	53.9	20.3	61.8	20.4	67.6	20.7	71.9	20.8	77.1	21.0	82.4	21.3	88.2	21.5
	50	53.6	22.5	61.4	22.7	67.1	23.0	71.4	23.1	76.6	23.4	81.9	23.7	87.6	23.9
80	30	61.2	17.0	70.2	17.1	76.8	17.4	81.6	17.5	87.6	17.7	93.6	17.9	100.1	18.1
	35	60.9	18.9	69.8	19.0	76.4	19.2	81.2	19.3	87.1	19.6	93.1	19.8	99.6	20.0
	40	60.6	21.0	69.4	21.1	75.9	21.4	80.8	21.5	86.6	21.8	92.6	22.0	99.1	22.3
	45	60.2	23.3	68.9	23.4	75.4	23.8	80.2	23.9	86.0	24.2	92.0	24.5	98.4	24.7
	50	59.7	25.9	68.5	26.1	74.9	26.4	79.6	26.6	85.4	26.9	91.3	27.2	97.7	27.5
90	30	73.5	19.6	84.2	19.7	92.1	20.0	97.9	20.1	105	20.3	112	20.5	120	20.8
	35	73.1	21.7	83.8	21.8	91.6	22.1	97.4	22.3	104	22.5	112	22.8	120	23.0
	40	72.7	24.1	83.3	24.3	91.1	24.6	96.9	24.7	104	25.0	111	25.3	119	25.6
	45	72.2	26.8	82.7	27.0	90.5	27.3	96.2	27.5	103	27.8	110	28.1	118	28.5
	50	71.7	29.8	82.1	30.0	89.8	30.4	95.5	30.6	102	30.9	110	31.3	117	31.6
100	30	80.9	21.2	92.8	21.3	101	21.6	108	21.8	116	22.0	124	22.3	132	22.5
	35	80.5	23.5	92.3	23.7	101	24.0	107	24.1	115	24.4	123	24.7	132	25.0
	40	80.1	26.1	91.8	26.3	100	26.7	107	26.8	114	27.1	122	27.4	131	27.7
	45	79.5	29.1	91.1	29.2	99.7	29.6	106	29.8	114	30.1	122	30.5	130	30.8
	50	79.0	32.3	90.5	32.5	99.0	32.9	105	33.1	113	33.5	121	33.9	129	34.3
115	30	92.4	24.6	106	24.8	116	25.1	123	25.3	132	25.6	141	25.9	151	26.1
	35	91.9	27.3	105	27.5	115	27.8	123	28.0	131	28.3	141	28.6	150	29.0
	40	91.4	30.4	105	30.5	115	31.0	122	31.1	131	31.5	140	31.9	149	32.2
	45	90.8	33.7	104	33.9	114	34.4	121	34.6	130	35.0	139	35.4	148	35.8
	50	90.1	37.5	103	37.7	113	38.2	120	38.5	129	38.9	138	39.4	147	39.8
130	30	101	27.1	116	27.3	126	27.7	134	27.8	144	28.1	154	28.5	165	28.8
	35	100	30.1	115	30.2	126	30.7	134	30.8	143	31.2	153	31.5	164	31.9
	40	99.7	33.4	114	33.6	125	34.1	133	34.3	143	34.7	152	35.1	163	35.5
	45	99.0	37.1	113	37.4	124	37.9	132	38.1	142	38.5	151	39.0	162	39.4
	50	98.3	41.3	113	41.5	123	42.1	131	42.4	141	42.8	150	43.3	161	43.8
145	30	114	30.5	130	30.7	143	31.1	152	31.3	163	31.6	174	32.0	186	32.3
	35	113	33.8	130	34.0	142	34.4	151	34.6	162	35.0	173	35.4	185	35.8
	40	113	37.5	129	37.8	141	38.3	150	38.5	161	39.0	172	39.4	184	39.8
	45	112	41.7	128	42.0	140	42.6	149	42.8	160	43.3	171	43.8	183	44.3
	50	111	46.4	127	46.7	139	47.3	148	47.6	159	48.1	170	48.7	182	49.2
160	30	128	33.8	146	34.0	160	34.5	170	34.7	182	35.1	195	35.5	209	35.9
	35	127	37.5	145	37.7	159	38.2	169	38.4	181	38.9	194	39.3	207	39.8
	40	126	41.7	145	41.9	158	42.5	168	42.7	180	43.2	193	43.7	206	44.2
	45	125	46.3	144	46.6	157	47.2	167	47.5	179	48.0	191	48.6	205	49.1
	50	124	51.5	143	51.8	156	52.5	166	52.8	178	53.4	190	54.0	203	54.6
180	30	145	37.9	166	38.2	182	38.7	193	38.9	207	39.4	222	39.8	237	40.3
	35	144	42.1	165	42.3	181	42.9	192	43.1	206	43.6	221	44.1	236	44.6
	40	144	46.8	164	47.0	180	47.7	191	48.0	205	48.5	219	49.1	235	49.6
	45	143	52.0	163	52.3	179	53.0	190	53.3	204	53.9	218	54.5	233	55.1
	50	142	57.8	162	58.1	177	58.9	189	59.3	202	59.9	216	60.6	231	61.3
200	30	160	42.4	183	42.6	200	43.2	213	43.4	228	44.0	244	44.5	261	45.0
	35	159	46.9	182	47.2	199	47.9	212	48.2	227	48.7	243	49.3	260	49.8
	40	158	52.2	181	52.5	198	53.2	210	53.5	226	54.2	241	54.8	258	55.4
	45	157	58.0	180	58.4	197	59.2	209	59.5	224	60.2	240	60.9	256	61.6
	50	156	64.5	178	64.9	195	65.8	208	66.1	223	66.9	238	67.7	255	68.4

Tc= Condensation temperature in °C (Dew point)

kWt = heating output (kW).

kWa = Power input of compressors (kW)

**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 AX Extra Low noise Unit

Model	50	60	70	80	90	100	115	130	145	160	180	200	UM	
Power supply	400V - 3ph+N - 50 Hz				400V - 3ph - 50 Hz									V-f-Hz
Type of refrigerant	R410A												/	
Circuits	1												n°	
Cooling capacity <sup>(1)</sup>	49.7	54.1	63.2	69.7	83.8	93.1	103	115	130	145	167	186	kW	
Compressors power input <sup>(1)</sup>	18.9	20.8	24.6	27.9	31.8	35.6	40.1	45.2	49.8	56.4	62.5	70.9	kW	
EER	2.63	2.60	2.57	2.50	2.64	2.62	2.57	2.54	2.61	2.57	2.67	2.62	-	
Total power input <sup>(1)</sup>	20.7	22.6	26.4	29.7	35.4	39.2	43.7	48.8	55.2	61.8	69.7	78.1	kW	
Total EER	2.40	2.39	2.39	2.35	2.37	2.38	2.36	2.36	2.36	2.35	2.40	2.38	-	
ESEER	3.31	3.30	3.30	3.24	3.27	3.28	3.25	3.25	3.25	3.24	3.31	3.29	-	
Heating capacity <sup>(2)</sup>	54.0	58.9	69.4	77.4	92.8	103	117	127	144	161	183	201	kW	
Compressors power input <sup>(2)</sup>	15.0	16.7	19.8	22.7	26.1	28.3	32.8	36.2	40.6	45.0	50.5	56.3	kW	
COP	3.60	3.53	3.51	3.41	3.56	3.64	3.57	3.51	3.55	3.58	3.62	3.57	-	
Total power input <sup>(2)</sup>	16.8	18.5	21.6	24.5	29.7	31.9	36.4	39.8	46.0	50.4	57.7	63.5	kW	
Total COP	3.21	3.18	3.21	3.16	3.12	3.23	3.21	3.19	3.13	3.19	3.17	3.17	-	

### 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

### Fan

Type	Axial												-
Quantity	3			2			3			4			n°
Maximum rotational speed	900												rpm
Total air flow rate	19367	19367	18733	18453	27640	26733	31627	31627	41460	39880	55280	53173	m <sup>3</sup> /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 <sup>2</sup>

### Electrical Data

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

### NOTES:

(1): Data referred to evaporation temperature : 3°C (Dew point), outdoor air temperature 35°C D.B. superheating and subcooling 5°K.

(2): Data referred to condensation temperature : 50°C (Dew point), outdoor air temperature 7°C D.B., relative humidifying 87% (6°C W.B.). Superheating and subcooling 5°K.

# TECHNICAL SPECIFICATIONS AND STANDARD PERFORMANCES - IP HEAT PUMP UNITS

## Standard performances in cooling mode AX Extra Low noise 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
<b>50</b>	5	56.7	13.3	53.0	15.3	50.1	16.8	47.0	18.5	43.7	20.4	40.5	22.3	37.2	24.1
	6	58.3	13.4	54.4	15.4	51.5	17.0	48.3	18.7	44.9	20.6	41.6	22.5	38.2	24.3
	7	60.0	13.5	56.0	15.6	53.0	17.1	<b>49.7</b>	<b>18.9</b>	46.2	20.8	42.8	22.7	39.3	24.6
	8	61.7	13.7	57.6	15.7	54.5	17.3	51.1	19.1	47.6	21.1	44.0	23.0	-	-
	9	63.4	13.8	59.2	15.9	56.0	17.5	52.5	19.3	48.9	21.3	45.3	23.2	-	-
	10	65.1	13.9	60.7	16.0	57.4	17.7	53.9	19.5	50.2	21.5	46.5	23.4	-	-
	11	66.7	14.1	62.3	16.2	58.9	17.9	55.3	19.7	51.4	21.7	47.6	23.7	-	-
	12	68.6	14.2	64.0	16.4	60.5	18.0	56.8	19.9	52.8	21.9	48.9	23.9	-	-
<b>60</b>	5	61.8	14.6	57.6	16.8	54.5	18.5	51.2	20.4	47.6	22.5	44.1	24.5	40.5	26.5
	6	63.5	14.7	59.2	16.9	56.0	18.7	52.6	20.6	48.9	22.7	45.3	24.7	41.6	26.8
	7	65.3	14.9	61.0	17.1	57.6	18.9	<b>54.1</b>	<b>20.8</b>	50.3	22.9	46.6	25.0	42.8	27.0
	8	67.2	15.0	62.7	17.3	59.3	19.1	55.6	21.0	51.8	23.2	47.9	25.3	-	-
	9	69.0	15.2	64.4	17.5	60.9	19.3	57.2	21.2	53.2	23.4	49.3	25.5	-	-
	10	70.8	15.3	66.1	17.7	62.5	19.5	58.7	21.5	54.6	23.6	50.6	25.8	-	-
	11	72.7	15.5	67.8	17.8	64.1	19.6	60.2	21.7	56.0	23.9	51.9	26.0	-	-
	12	74.6	15.6	69.7	18.0	65.9	19.8	61.8	21.9	57.5	24.1	53.3	26.3	-	-
<b>70</b>	5	72.1	17.3	67.3	19.9	63.7	21.9	59.8	24.1	55.6	26.6	51.5	29.0	47.3	31.3
	6	74.1	17.4	69.2	20.0	65.4	22.1	61.4	24.4	57.1	26.8	52.9	29.3	48.6	31.6
	7	76.3	17.6	71.2	20.3	67.3	22.3	<b>63.2</b>	<b>24.6</b>	58.8	27.1	54.5	29.6	50.0	32.0
	8	78.5	17.8	73.2	20.5	69.3	22.6	65.0	24.9	60.5	27.4	56.0	29.9	-	-
	9	80.6	18.0	75.3	20.7	71.2	22.8	66.8	25.1	62.1	27.7	57.5	30.2	-	-
	10	82.8	18.2	77.3	20.9	73.0	23.0	68.6	25.4	63.8	28.0	59.1	30.5	-	-
	11	84.9	18.3	79.2	21.1	74.9	23.2	70.3	25.6	65.4	28.2	60.6	30.8	-	-
	12	87.2	18.5	81.4	21.3	76.9	23.5	72.2	25.9	67.2	28.5	62.2	31.1	-	-
<b>80</b>	5	79.6	19.6	74.3	22.5	70.2	24.8	65.9	27.4	61.3	30.2	56.8	32.9	52.2	35.5
	6	81.8	19.8	76.3	22.7	72.2	25.0	67.7	27.6	63.0	30.4	58.4	33.2	53.6	35.9
	7	84.1	20.0	78.5	23.0	74.3	25.3	<b>69.7</b>	<b>27.9</b>	64.8	30.8	60.1	33.5	55.2	36.2
	8	86.5	20.2	80.8	23.2	76.4	25.6	71.7	28.2	66.7	31.1	61.8	33.9	-	-
	9	88.9	20.4	83.0	23.5	78.5	25.8	73.6	28.5	68.5	31.4	63.5	34.2	-	-
	10	91.3	20.6	85.2	23.7	80.6	26.1	75.6	28.8	70.3	31.7	65.1	34.6	-	-
	11	93.6	20.8	87.4	23.9	82.6	26.4	77.5	29.1	72.1	32.0	66.8	34.9	-	-
	12	96.1	21.0	89.7	24.2	84.9	26.6	79.6	29.3	74.1	32.3	68.6	35.3	-	-
<b>90</b>	5	95.7	22.3	89.3	25.7	84.4	28.3	79.2	31.2	73.7	34.4	68.3	37.5	62.7	40.5
	6	98.3	22.5	91.8	25.9	86.8	28.6	81.4	31.5	75.8	34.7	70.2	37.8	64.4	40.9
	7	101	22.8	94.4	26.2	89.3	28.8	<b>83.8</b>	<b>31.8</b>	78.0	35.1	72.2	38.2	66.3	41.3
	8	104	23.0	97.1	26.5	91.8	29.2	86.2	32.2	80.2	35.4	74.3	38.6	-	-
	9	107	23.2	100	26.7	94.4	29.5	88.5	32.5	82.4	35.8	76.3	39.0	-	-
	10	110	23.5	102	27.0	96.9	29.7	90.9	32.8	84.6	36.1	78.3	39.4	-	-
	11	113	23.7	105	27.3	99.3	30.0	93.2	33.1	86.7	36.5	80.3	39.8	-	-
	12	116	23.9	108	27.5	102	30.3	95.7	33.4	89.1	36.9	82.5	40.2	-	-
<b>100</b>	5	106	25.0	99.2	28.7	93.8	31.7	88.0	34.9	81.9	38.5	75.9	42.0	69.7	45.4
	6	109	25.2	102	29.0	96.4	32.0	90.5	35.2	84.2	38.8	78.0	42.3	71.6	45.8
	7	112	25.5	105	29.3	99.2	32.3	<b>93.1</b>	<b>35.6</b>	86.6	39.2	80.2	42.8	73.7	46.3
	8	116	25.8	108	29.6	102	32.6	95.7	36.0	89.1	39.7	82.5	43.3	-	-
	9	119	26.0	111	29.9	105	33.0	98.4	36.4	91.5	40.1	84.8	43.7	-	-
	10	122	26.3	114	30.2	108	33.3	101	36.7	94.0	40.5	87.0	44.1	-	-
	11	125	26.5	117	30.5	110	33.6	104	37.1	96.4	40.9	89.2	44.6	-	-
	12	128	26.8	120	30.8	113	34.0	106	37.4	99.0	41.3	91.7	45.0	-	-

Te= evaporation temperature °C (Dew point)

kWf = refrigerating power (kW).

kWa = Power input of compressors (kW)

# TECHNICAL SPECIFICATIONS AND STANDARD PERFORMANCES - IP HEAT PUMP UNITS

## Mod. 115-200

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
<b>115</b>	<b>5</b>	118	28.1	110	32.4	104	35.7	97.4	39.3	90.6	43.3	83.9	47.3	77.1	51.1
	<b>6</b>	121	28.4	113	32.7	107	36.0	100	39.7	93.1	43.8	86.2	47.7	79.2	51.6
	<b>7</b>	124	28.7	116	33.0	110	36.4	<b>103</b>	<b>40.1</b>	95.8	44.2	88.8	48.2	81.5	52.1
	<b>8</b>	128	29.0	119	33.4	113	36.8	106	40.5	98.5	44.7	91.3	48.7	-	-
	<b>9</b>	131	29.3	123	33.7	116	37.1	109	40.9	101	45.1	93.8	49.2	-	-
	<b>10</b>	135	29.6	126	34.0	119	37.5	112	41.4	104	45.6	96.3	49.7	-	-
	<b>11</b>	138	29.9	129	34.4	122	37.9	115	41.8	107	46.0	98.7	50.2	-	-
	<b>12</b>	142	30.2	133	34.7	125	38.2	118	42.2	109	46.5	101	50.7	-	-
<b>130</b>	<b>5</b>	131	31.7	123	36.5	116	40.2	109	44.3	101	48.9	93.7	53.3	86.1	57.6
	<b>6</b>	135	32.0	126	36.8	119	40.6	112	44.7	104	49.3	96.3	53.8	88.4	58.1
	<b>7</b>	139	32.3	130	37.2	123	41.0	<b>115</b>	<b>45.2</b>	107	49.8	99.1	54.3	91.0	58.7
	<b>8</b>	143	32.7	133	37.6	126	41.4	118	45.7	110	50.4	102	54.9	-	-
	<b>9</b>	147	33.0	137	38.0	129	41.9	122	46.2	113	50.9	105	55.5	-	-
	<b>10</b>	151	33.4	141	38.4	133	42.3	125	46.6	116	51.4	107	56.0	-	-
	<b>11</b>	154	33.7	144	38.8	136	42.7	128	47.1	119	51.9	110	56.6	-	-
	<b>12</b>	159	34.0	148	39.1	140	43.1	131	47.5	122	52.4	113	57.1	-	-
<b>145</b>	<b>5</b>	148	34.9	139	40.2	131	44.3	123	48.8	114	53.8	106	58.7	97.3	63.5
	<b>6</b>	152	35.3	142	40.6	135	44.7	126	49.3	118	54.3	109	59.2	100	64.0
	<b>7</b>	157	35.6	146	41.0	139	45.2	<b>130</b>	<b>49.8</b>	121	54.9	112	59.8	103	64.7
	<b>8</b>	161	36.0	151	41.4	142	45.7	134	50.4	124	55.5	115	60.5	-	-
	<b>9</b>	166	36.4	155	41.9	146	46.1	137	50.9	128	56.1	118	61.1	-	-
	<b>10</b>	170	36.7	159	42.3	150	46.6	141	51.4	131	56.6	122	61.7	-	-
	<b>11</b>	175	37.1	163	42.7	154	47.0	145	51.9	135	57.2	125	62.3	-	-
	<b>12</b>	179	37.5	167	43.1	158	47.5	149	52.4	138	57.7	128	62.9	-	-
<b>160</b>	<b>5</b>	166	39.6	154	45.5	146	50.2	137	55.3	128	61.0	118	66.5	109	71.9
	<b>6</b>	170	39.9	159	46.0	150	50.6	141	55.8	131	61.5	121	67.1	112	72.5
	<b>7</b>	175	40.4	163	46.4	155	51.2	<b>145</b>	<b>56.4</b>	135	62.2	125	67.8	115	73.3
	<b>8</b>	180	40.8	168	46.9	159	51.7	149	57.0	139	62.9	128	68.5	-	-
	<b>9</b>	185	41.2	173	47.4	163	52.2	153	57.6	143	63.5	132	69.2	-	-
	<b>10</b>	190	41.6	177	47.9	168	52.8	157	58.2	146	64.1	136	69.9	-	-
	<b>11</b>	195	42.0	182	48.4	172	53.3	161	58.7	150	64.7	139	70.6	-	-
	<b>12</b>	200	42.4	187	48.8	177	53.8	166	59.3	154	65.4	143	71.3	-	-
<b>180</b>	<b>5</b>	191	43.9	178	50.5	168	55.6	158	61.3	147	67.6	136	73.7	125	79.6
	<b>6</b>	196	44.3	183	50.9	173	56.1	162	61.9	151	68.2	140	74.3	128	80.4
	<b>7</b>	202	44.7	188	51.5	178	56.7	<b>167</b>	<b>62.5</b>	155	68.9	144	75.1	132	81.2
	<b>8</b>	207	45.2	194	52.0	183	57.3	172	63.2	160	69.6	148	75.9	-	-
	<b>9</b>	213	45.7	199	52.5	188	57.9	176	63.8	164	70.3	152	76.7	-	-
	<b>10</b>	219	46.1	204	53.1	193	58.5	181	64.5	169	71.0	156	77.5	-	-
	<b>11</b>	224	46.6	209	53.6	198	59.0	186	65.1	173	71.7	160	78.2	-	-
	<b>12</b>	230	47.0	215	54.1	203	59.6	191	65.7	178	72.4	164	79.0	-	-
<b>200</b>	<b>5</b>	212	49.7	198	57.2	187	63.1	176	69.5	164	76.6	152	83.6	139	90.3
	<b>6</b>	218	50.2	204	57.8	193	63.7	181	70.2	168	77.4	156	84.3	143	91.2
	<b>7</b>	225	50.7	210	58.4	198	64.3	<b>186</b>	<b>70.9</b>	173	78.1	160	85.2	147	92.1
	<b>8</b>	231	51.3	216	59.0	204	65.0	191	71.7	178	79.0	165	86.1	-	-
	<b>9</b>	237	51.8	221	59.6	209	65.7	197	72.4	183	79.8	169	87.0	-	-
	<b>10</b>	244	52.3	227	60.2	215	66.3	202	73.1	188	80.6	174	87.9	-	-
	<b>11</b>	250	52.8	233	60.8	220	67.0	207	73.8	193	81.4	178	88.7	-	-
	<b>12</b>	257	53.3	239	61.4	226	67.6	213	74.6	198	82.2	183	89.6	-	-

Te= evaporation temperature °C (Dew point)

kWf = refrigerating power (kW).

kWa = Power input of compressors (kW)

# TECHNICAL SPECIFICATIONS AND STANDARD PERFORMANCES - IP HEAT PUMP UNITS

Standard performances in heating mode AX Extra Low noise 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	41.2	10.7	47.3	10.7	51.7	10.9	55.0	11.0	59.0	11.1	63.0	11.2	67.4	11.3
	35	41.0	11.8	47.0	11.9	51.4	12.1	54.7	12.1	58.7	12.3	62.7	12.4	67.1	12.6
	40	40.8	13.2	46.7	13.2	51.1	13.4	54.4	13.5	58.3	13.7	62.4	13.8	66.7	14.0
	45	40.5	14.6	46.4	14.7	50.8	14.9	54.0	15.0	57.9	15.2	61.9	15.3	66.2	15.5
	50	40.2	16.3	46.1	16.4	50.4	16.6	53.6	16.7	57.5	16.9	61.5	17.1	65.8	17.3
60	30	45.0	11.9	51.5	12.0	56.4	12.1	60.0	12.2	64.3	12.3	68.8	12.5	73.5	12.6
	35	44.7	13.2	51.3	13.3	56.1	13.4	59.7	13.5	64.0	13.7	68.4	13.8	73.2	14.0
	40	44.5	14.7	51.0	14.7	55.8	14.9	59.3	15.0	63.6	15.2	68.0	15.4	72.8	15.5
	45	44.2	16.3	50.6	16.4	55.4	16.6	58.9	16.7	63.2	16.9	67.5	17.1	72.3	17.3
	50	43.9	18.1	50.3	18.2	55.0	18.5	58.9	18.6	62.7	18.8	67.1	19.0	71.7	19.2
70	30	53.0	14.1	60.7	14.2	66.4	14.4	70.6	14.5	75.8	14.6	81.0	14.8	86.7	15.0
	35	52.7	15.6	60.4	15.7	66.1	15.9	70.3	16.0	75.4	16.2	80.6	16.4	86.2	16.6
	40	52.4	17.4	60.1	17.5	65.7	17.7	69.9	17.8	74.9	18.0	80.1	18.2	85.7	18.4
	45	52.1	19.3	59.7	19.4	65.3	19.7	69.4	19.8	74.4	20.0	79.6	20.3	85.1	20.5
	50	51.7	21.5	59.2	21.6	64.8	21.9	68.9	22.0	73.9	22.3	79.0	22.5	84.5	22.8
80	30	59.1	16.2	67.7	16.3	74.1	16.5	78.8	16.6	84.5	16.8	90.3	17.0	96.7	17.2
	35	58.8	17.9	67.4	18.0	73.7	18.3	78.4	18.4	84.1	18.6	89.9	18.8	96.2	19.0
	40	58.5	19.9	67.0	20.0	73.3	20.3	77.9	20.4	83.6	20.7	89.4	20.9	95.6	21.1
	45	58.1	22.1	66.5	22.3	72.8	22.6	77.4	22.7	83.0	23.0	88.8	23.2	94.9	23.5
	50	57.7	24.6	66.1	24.8	72.3	25.1	76.9	25.2	82.4	25.5	88.1	25.8	94.3	26.1
90	30	70.9	18.6	81.2	18.7	88.8	18.9	94.5	19.1	101	19.3	108	19.5	116	19.7
	35	70.5	20.6	80.8	20.7	88.4	21.0	94.0	21.1	101	21.4	108	21.6	115	21.9
	40	70.1	22.9	80.3	23.0	87.9	23.3	93.4	23.5	100	23.8	107	24.0	115	24.3
	45	69.6	25.4	79.8	25.6	87.3	25.9	92.8	26.1	99.5	26.4	106	26.7	114	27.0
	50	69.1	28.3	79.2	28.5	86.7	28.8	92.2	29.0	98.8	29.4	106	29.7	113	30.0
100	30	78.7	20.1	90.1	20.3	98.6	20.5	105	20.7	112	20.9	120	21.1	129	21.4
	35	78.3	22.3	89.7	22.5	98.1	22.8	104	22.9	112	23.2	120	23.4	128	23.7
	40	77.8	24.8	89.2	25.0	97.5	25.3	104	25.5	111	25.8	119	26.1	127	26.3
	45	77.3	27.6	88.6	27.8	96.8	28.1	103	28.3	110	28.6	118	29.0	126	29.3
	50	76.7	30.7	87.9	30.9	96.2	31.3	102	31.5	110	31.8	117	32.2	125	32.6
115	30	89.3	23.4	102.4	23.5	112	23.8	119	24.0	128	24.2	137	24.5	146	24.8
	35	88.9	25.9	101.9	26.0	111	26.4	118	26.5	127	26.9	136	27.2	145	27.5
	40	88.4	28.8	101.3	28.9	111	29.3	118	29.5	126	29.9	135	30.2	145	30.5
	45	87.8	32.0	100.6	32.2	110	32.6	117	32.8	125	33.2	134	33.6	144	33.9
	50	87.2	35.6	99.9	35.8	109	36.3	116	36.5	125	36.9	133	37.3	143	37.7
130	30	97.0	25.8	111	25.9	122	26.3	129	26.4	139	26.7	148	27.0	159	27.4
	35	96.5	28.6	111	28.7	121	29.1	129	29.3	138	29.6	147	30.0	158	30.3
	40	95.9	31.8	110	31.9	120	32.4	128	32.6	137	32.9	147	33.3	157	33.7
	45	95.3	35.3	109	35.5	119	36.0	127	36.2	136	36.6	146	37.0	156	37.5
	50	94.6	39.2	108	39.5	119	40.0	126	40.2	135	40.7	145	41.2	155	41.6
145	30	110	28.9	126	29.1	138	29.5	147	29.6	157	30.0	168	30.3	180	30.7
	35	109	32.0	125	32.2	137	32.7	146	32.9	156	33.2	167	33.6	179	34.0
	40	109	35.6	125	35.8	136	36.3	145	36.5	156	37.0	166	37.4	178	37.8
	45	108	39.6	124	39.8	135	40.4	144	40.6	154	41.1	165	41.5	177	42.0
	50	107	44.0	123	44.3	134	44.9	143	45.1	153	45.7	164	46.2	175	46.7
160	30	123	32.0	141	32.2	154	32.7	164	32.9	176	33.2	188	33.6	201	34.0
	35	122	35.5	140	35.7	153	36.2	163	36.4	175	36.8	187	37.3	200	37.7
	40	122	39.5	139	39.7	152	40.3	162	40.5	174	41.0	186	41.4	199	41.9
	45	121	43.9	138	44.1	151	44.7	161	45.0	173	45.5	185	46.0	197	46.6
	50	120	48.8	137	49.1	150	49.7	160	50.0	171	50.6	183	51.2	196	51.8
180	30	140	36.0	160	36.2	175	36.7	186	36.9	200	37.3	214	37.7	229	38.2
	35	139	39.8	159	40.1	174	40.6	185	40.9	199	41.3	213	41.8	227	42.3
	40	138	44.3	158	44.6	173	45.2	184	45.4	198	46.0	211	46.5	226	47.0
	45	137	49.2	157	49.5	172	50.2	183	50.5	196	51.1	210	51.7	224	52.3
	50	136	54.7	156	55.1	171	55.8	182	56.1	195	56.8	208	57.4	223	58.1
200	30	153	40.1	176	40.3	192	40.9	205	41.1	219	41.6	235	42.1	251	42.5
	35	153	44.4	175	44.7	191	45.3	204	45.6	218	46.1	233	46.6	250	47.1
	40	152	49.4	174	49.7	190	50.4	202	50.7	217	51.2	232	51.8	248	52.4
	45	151	54.9	173	55.2	189	56.0	201	56.3	216	57.0	230	57.6	247	58.3
	50	150	61.0	172	61.4	188	62.2	200	62.6	214	63.3	229	64.0	245	64.8

Tc= Condensation temperature in °C (Dew point)

kWt = heating output (kW).

kWa = Power input of compressors (kW)

**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

#### NOTES:

(1): Data referred to evaporation temperature : 3°C (Dew point), outdoor air temperature 35°C D.B. superheating and subcooling 5°K.



**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.)					MOD.	TWR	OUTDOOR AIR TEMPERATURE (°C D.B.)				
		25	30	35	40	45			25	30	35	40	45
		kW <sub>t</sub> = RECOVERED HEATING CAPACITY [KW]							kW <sub>t</sub> = RECOVERED HEATING CAPACITY [KW]				
<b>50</b>	30	12.4	14.2	16.3	18.6	21.2	<b>115</b>	30	27.8	31.6	35.9	40.6	45.8
	35	12.4	14.2	16.4	18.7	21.3		35	27.8	31.6	35.9	40.6	45.8
	40	12.2	13.9	16.0	18.3	20.8		40	27.1	30.8	35.0	39.6	44.7
	45	11.5	13.2	15.2	17.4	19.8		45	25.7	29.3	33.2	37.6	42.5
	50	10.6	12.1	13.9	15.9	18.1		50	23.7	26.9	30.5	34.6	39.1
	55	9.3	10.6	12.2	14.0	15.9		55	20.9	23.8	27.0	30.6	34.5
	60	7.6	8.8	10.1	11.5	13.1		60	17.5	19.9	22.6	25.6	28.9
	65	5.7	6.5	7.5	8.5	9.7		65	13.4	15.2	17.3	19.6	22.1
<b>55</b>	70	3.3	3.8	4.4	5.0	5.7	<b>130</b>	30	31.2	35.3	40.1	45.4	51.4
	30	13.9	15.9	18.2	20.8	23.6		35	31.2	35.3	40.1	45.4	51.4
	35	14.0	16.0	18.3	20.9	23.8		40	30.4	34.5	39.1	44.3	50.1
	40	13.7	15.7	17.9	20.4	23.2		45	28.9	32.7	37.1	42.0	47.5
	45	13.0	14.9	17.0	19.4	22.1		50	26.5	30.0	34.1	38.6	43.7
	50	11.9	13.7	16.4	17.8	20.2		55	23.4	26.5	30.1	34.1	38.5
	55	10.4	12.0	14.4	15.6	17.7		60	19.5	22.1	25.1	28.4	32.1
	60	8.6	9.9	11.9	12.9	14.6		65	14.8	16.8	19.1	21.6	24.4
<b>60</b>	65	6.4	7.3	8.8	9.5	10.8	<b>145</b>	70	9.4	10.6	12.0	13.6	15.4
	70	3.8	4.3	5.2	5.6	6.4		30	35.7	40.6	46.0	52.1	58.8
	30	15.9	18.2	20.8	23.7	27.0		35	35.7	40.5	45.9	52.0	58.7
	35	15.9	18.3	20.9	23.9	27.1		40	34.7	39.5	44.7	50.6	57.2
	40	15.6	17.9	20.4	23.3	26.5		45	33.0	37.4	42.4	48.1	54.3
	45	14.8	17.0	19.4	22.2	25.2		50	30.3	34.5	39.0	44.2	49.9
	50	13.6	15.6	17.8	20.3	23.1		55	26.9	30.5	34.6	39.2	44.2
	55	11.9	13.7	15.6	17.8	20.3		60	22.5	25.6	29.0	32.9	37.1
<b>70</b>	65	7.3	8.3	9.5	10.9	12.4	<b>160</b>	65	17.4	19.7	22.3	25.3	28.6
	70	4.3	4.9	5.6	6.4	7.3		30	39.8	45.2	51.2	58.0	65.5
	30	18.7	21.5	24.6	28.2	32.0		35	39.9	45.3	51.4	58.2	65.7
	35	18.8	21.6	24.7	28.3	32.2		40	39.0	44.3	50.1	56.8	64.2
	40	18.3	21.1	24.2	27.6	31.4		45	36.9	41.9	47.5	53.8	60.8
	45	17.4	20.0	22.9	26.2	29.8		50	33.8	38.3	43.4	49.2	55.6
	50	15.9	18.3	21.0	24.0	27.3		55	29.5	33.5	38.0	43.0	48.6
	55	13.9	16.0	18.4	21.0	23.9		60	24.2	27.4	31.1	35.2	39.7
<b>90</b>	65	8.4	9.7	11.1	12.7	14.5	<b>180</b>	65	17.7	20.1	22.8	25.8	29.1
	70	4.9	5.7	6.5	7.4	8.4		30	43.9	49.8	56.5	64.0	72.2
	30	21.7	24.8	28.2	32.3	36.7		35	44.1	50.0	56.7	64.2	72.5
	35	21.8	24.9	28.3	32.4	36.8		40	43.0	48.8	55.3	62.7	70.8
	40	21.2	24.3	27.6	31.6	36.0		45	40.7	46.3	52.4	59.4	67.0
	45	20.1	23.0	26.2	30.0	34.1		50	37.3	42.3	47.9	54.3	61.3
	50	18.4	21.1	24.0	27.4	31.2		55	32.6	37.0	41.9	47.5	53.6
	55	16.1	18.5	21.0	24.0	27.3		60	26.6	30.3	34.3	38.8	43.8
<b>100</b>	65	9.8	11.2	12.7	14.5	16.5	<b>200</b>	65	19.5	22.2	25.1	28.5	32.1
	70	5.7	6.5	7.4	8.5	9.6		30	48.7	55.3	62.6	70.9	80.1
	30	24.4	27.8	31.5	35.8	40.5		35	48.8	55.5	62.8	71.2	80.4
	35	24.5	27.9	31.6	35.9	40.6		40	47.7	54.1	61.3	69.5	78.5
	40	23.9	27.2	30.8	35.0	39.6		45	45.2	51.3	58.1	65.8	74.3
	45	22.6	25.7	29.2	33.2	37.5		50	41.3	46.9	53.1	60.2	68.0
	50	20.7	23.5	26.7	30.3	34.3		55	36.1	41.0	46.4	52.6	59.4
	55	18.1	20.6	23.3	26.5	30.0		60	29.5	33.5	38.0	43.1	48.6

kW<sub>t</sub> = 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 calculated 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  $1 \times 10^{-12}$  W.

The **Total** sound power level in **dB(A)** measured in compliance with **ISO 9614** standards, is certified according to the **Eurovent** certification program and it is the only mandatory value (the values of octave band in the table are indicative).

**SPL** = Sound pressure levels, with reference to  $2 \times 10^{-5}$  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.

### AB Standard unit

Mod.	SWL (dB)								Total		SPL (dBA)		
	Octave bands (Hz)										1m	5m	10m
	63	125	250	500	1000	2000	4000	8000	dB	dB(A)			
50	89.4	87.0	84.8	80.3	77.4	73.8	65.3	56.0	93	83	65	56	51
60	89.4	87.0	84.8	80.3	77.4	73.8	65.3	56.0	93	83	65	56	51
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	66	58	53
130	92.4	90.0	87.8	83.3	80.4	76.8	68.3	59.0	96	86	67	59	54
145	94.2	91.9	89.4	85.3	81.0	74.6	67.0	58.6	97	87	68	60	55
160	94.2	91.9	89.4	85.3	81.0	74.6	67.0	58.6	97	87	68	60	55
180	92.4	90.1	88.6	86.0	83.2	77.8	71.2	62.8	96	88	69	61	56
200	92.4	90.1	88.6	86.0	83.2	77.8	71.2	62.8	96	88	69	61	56

### AS Low noise unit

Mod.	SWL (dB)								Total		SPL (dBA)		
	Octave bands (Hz)										1m	5m	10m
	63	125	250	500	1000	2000	4000	8000	dB	dB(A)			
50	83.4	86.3	82.6	77.8	74.3	67.8	59.2	50.3	90	80	62	53	48
60	83.4	86.3	82.6	77.8	74.3	67.8	59.2	50.3	90	80	62	53	48
70	84.4	87.3	83.6	78.8	75.3	68.8	60.2	51.3	91	81	63	54	49
80	84.4	87.3	83.6	78.8	75.3	68.8	60.2	51.3	91	81	63	54	49
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	63	55	50
130	89.4	87.0	84.8	80.3	77.4	73.8	65.3	56.0	93	83	64	56	51
145	91.2	88.9	86.4	82.3	78.0	71.6	64.0	55.6	94	84	65	57	52
160	91.2	88.9	86.4	82.3	78.0	71.6	64.0	55.6	94	84	65	57	52
180	92.2	89.9	87.4	83.3	79.0	72.6	65.0	56.6	95	85	66	58	53
200	92.2	89.9	87.4	83.3	79.0	72.6	65.0	56.6	95	85	66	58	53

### AX Extra low noise unit

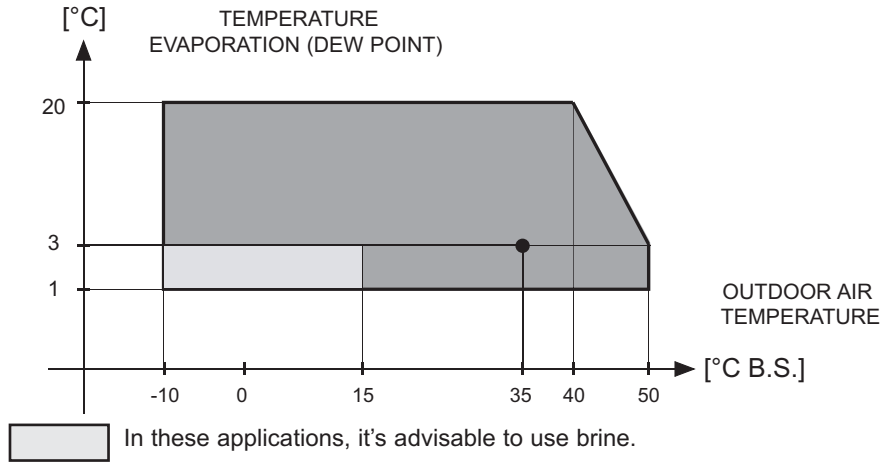
Mod.	SWL (dB)								Total		SPL (dBA)		
	Octave bands (Hz)										1m	5m	10m
	63	125	250	500	1000	2000	4000	8000	dB	dB(A)			
50	89.0	81.0	80.0	76.0	72.0	67.0	62.0	52.0	90	78	60	51	46
60	89.0	81.0	80.0	76.0	72.0	67.0	62.0	52.0	90	78	60	51	46
70	90.0	82.0	81.0	77.0	73.5	67.0	64.0	52.0	91	79	61	52	47
80	90.0	82.0	81.0	77.0	73.5	67.0	64.0	52.0	91	79	61	52	47
90	83.4	86.3	82.6	77.8	74.3	67.8	59.2	50.3	90	80	62	53	48
100	83.4	86.3	82.6	77.8	74.3	67.8	59.2	50.3	90	80	62	53	48
115	83.4	86.3	82.6	77.8	74.3	67.8	59.2	50.3	90	80	61	53	48
130	84.4	87.3	83.6	78.8	75.3	68.8	60.2	51.3	91	81	62	54	49
145	85.4	88.3	84.6	79.8	76.3	69.8	61.2	52.3	92	82	63	55	50
160	85.4	88.3	84.6	79.8	76.3	69.8	61.2	52.3	92	82	63	55	50
180	89.4	87.0	84.8	80.3	77.4	73.8	65.3	56.0	93	83	64	56	51
200	89.4	87.0	84.8	80.3	77.4	73.8	65.3	56.0	93	83	64	56	51

# OPERATING RANGE

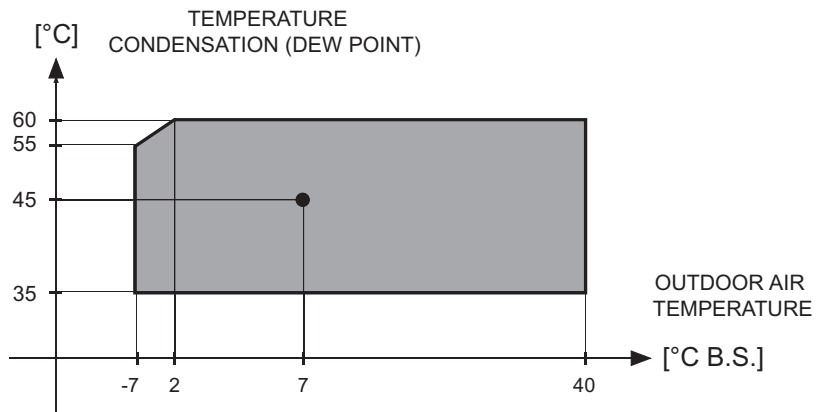
## Operating range

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.

### COOLING MODE

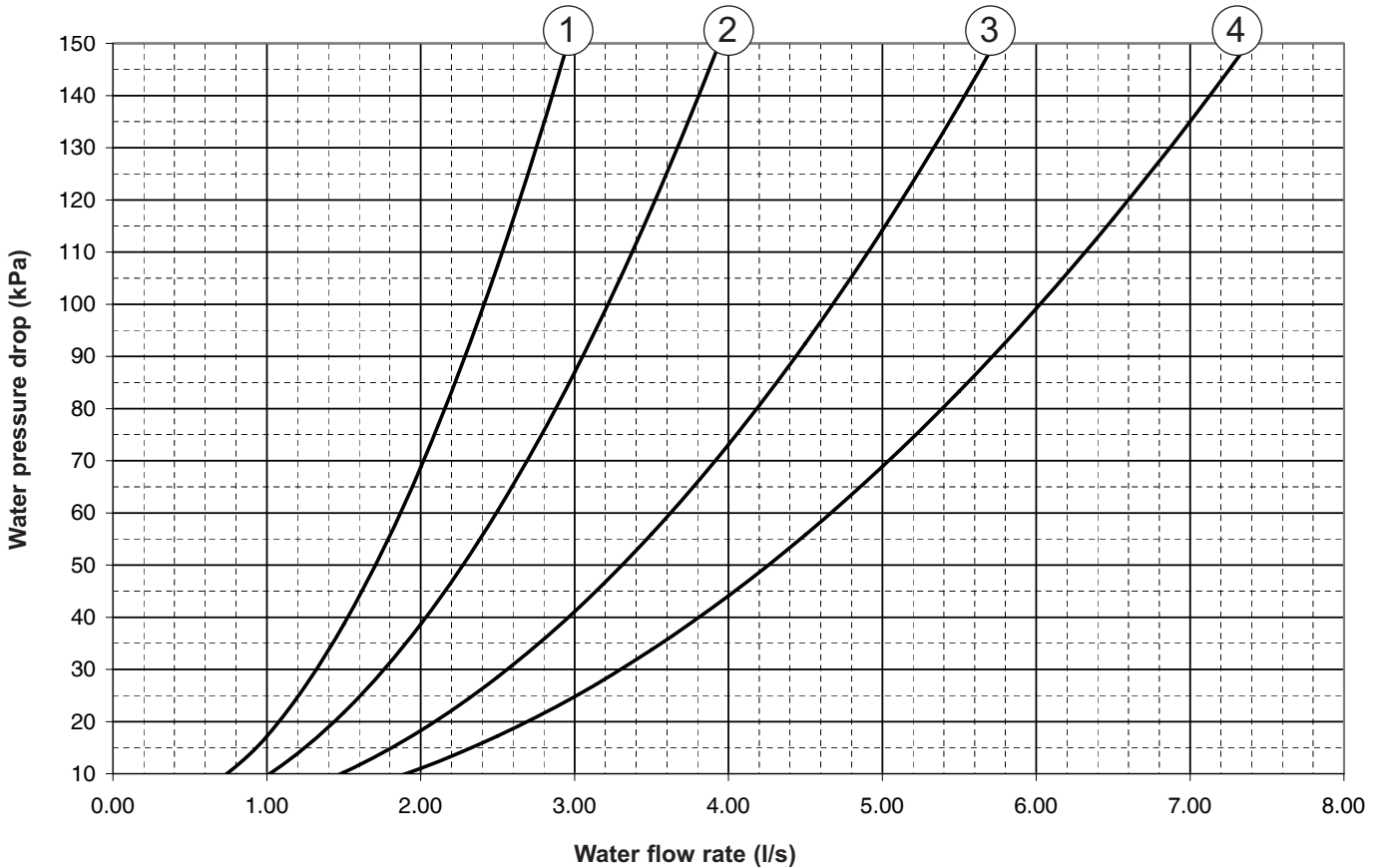


### HEATING MODE



## 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.



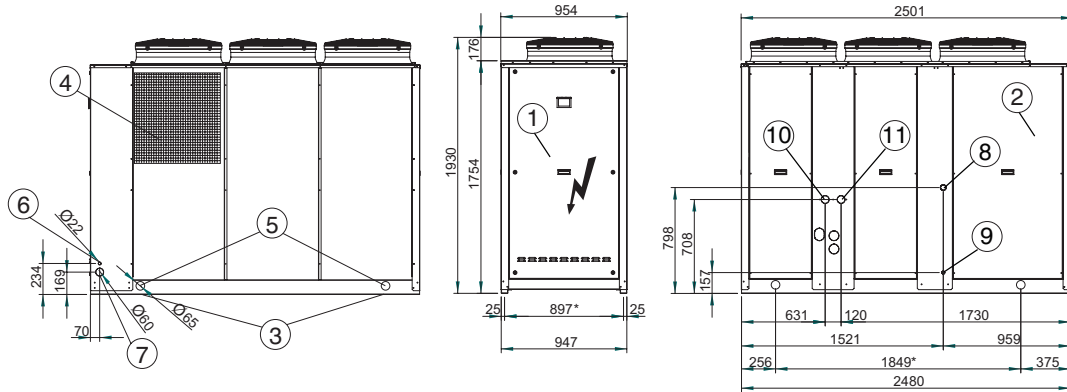
### Operation range

Unit Size		50	60	70	80	90	100	115	130	145	160	180	200	UM	NOTES
Graph reference		1				2		3			4				<b>Q</b> =Water flow rate  <b>Δp</b> =Water pressure drop
Lower limit value	<b>Q</b>	0.8				1.0		1.5			1.9		l/s		
	<b>Δp</b>	10											kPa		
Upper limit value	<b>Q</b>	3.0				3.9		5.7			7.4		l/s		
	<b>Δp</b>	150											kPa		

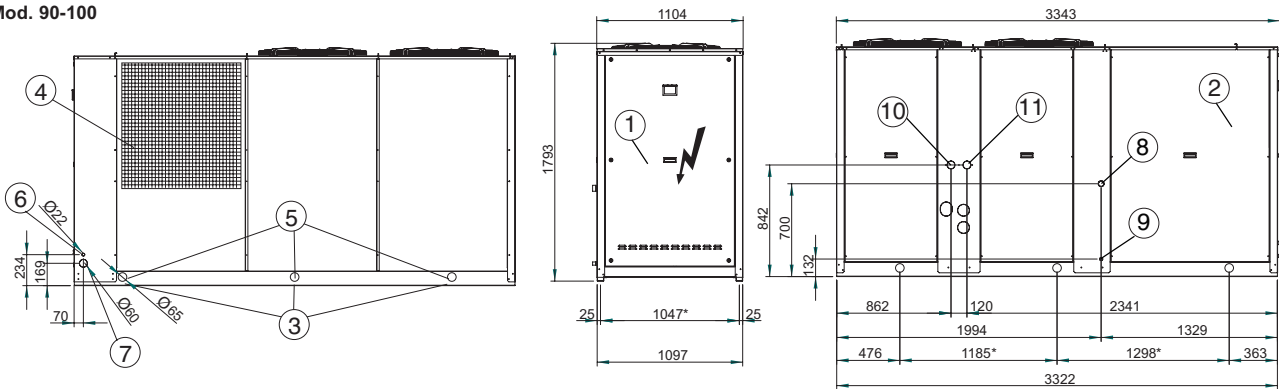
# DIMENSIONAL DATA

## Overall dimensions

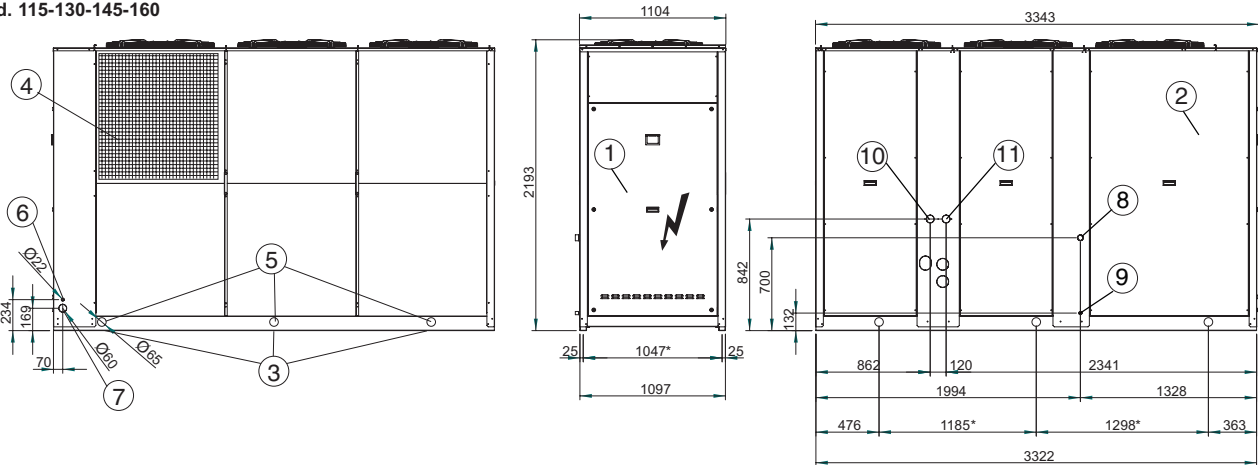
Mod. 50-60-70-80



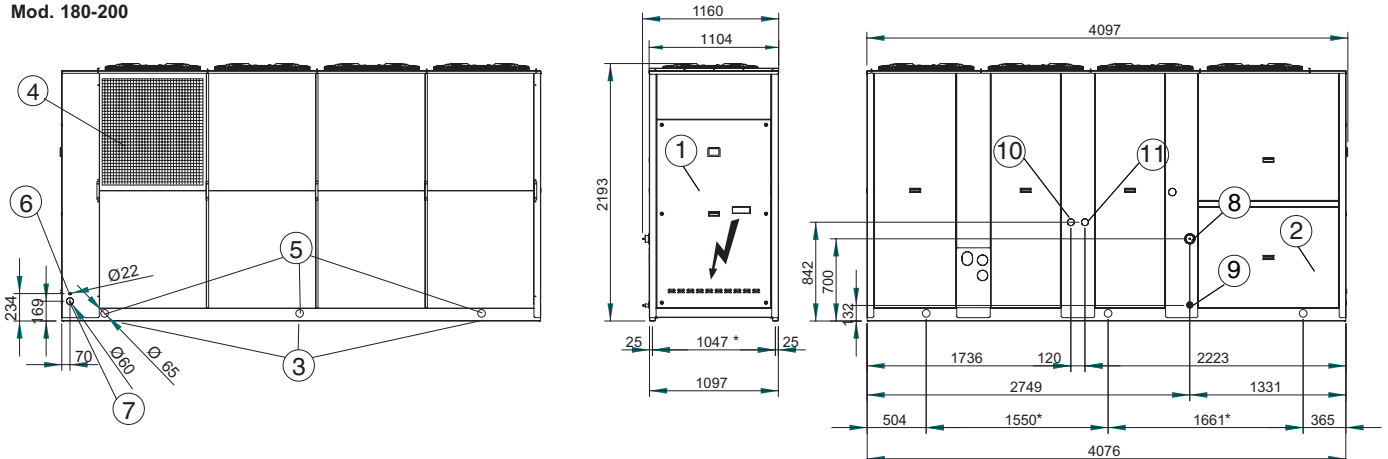
Mod. 90-100



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 -  $\varnothing$  65 mm lifting holes
  - 6 -  $\varnothing$  22 mm input hole for accessory cables
  - 7 -  $\varnothing$  60 mm hole for electric power supply input
  - 8 - GAS inlet pipe
  - 9 - LIQUID outlet pipe
  - 10 - Water inlet for Condensing Desuperheater (only VD version)
  - 11 - Water outlet for Condensing Desuperheater (only VD version)
- \*: Center distance of vibration damper holes

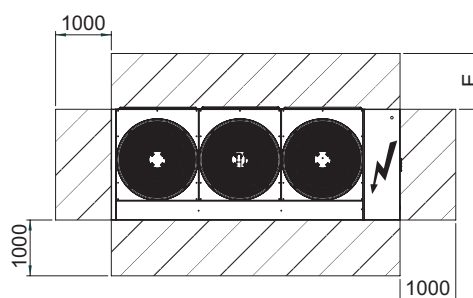
### Minimum space required for operation

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.

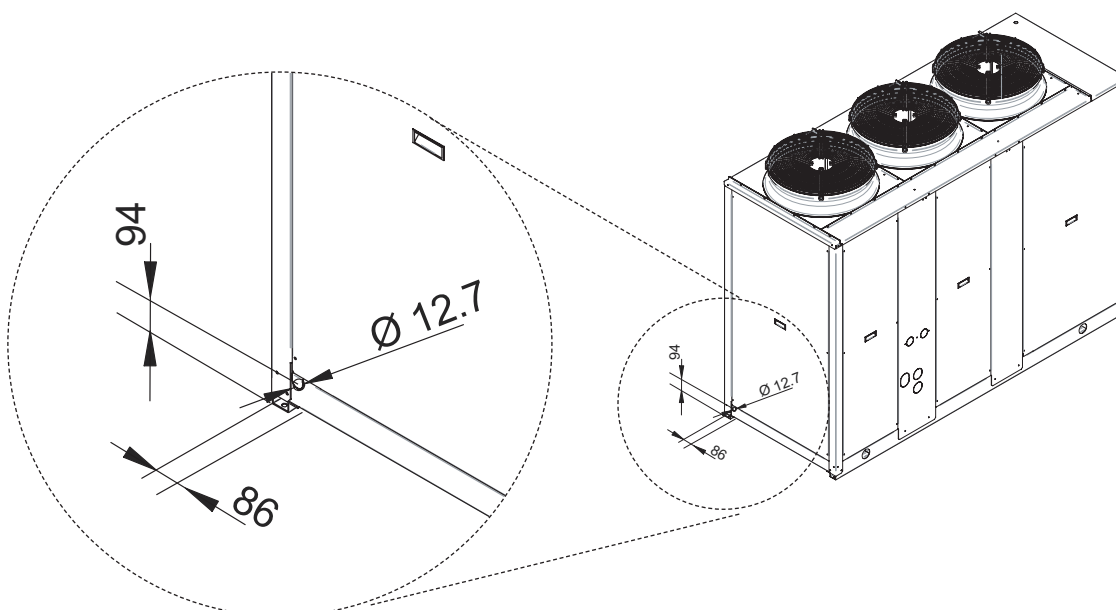
**NOTE. Allow for an uncluttered area of not less than 2.5 meters above the unit.**



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

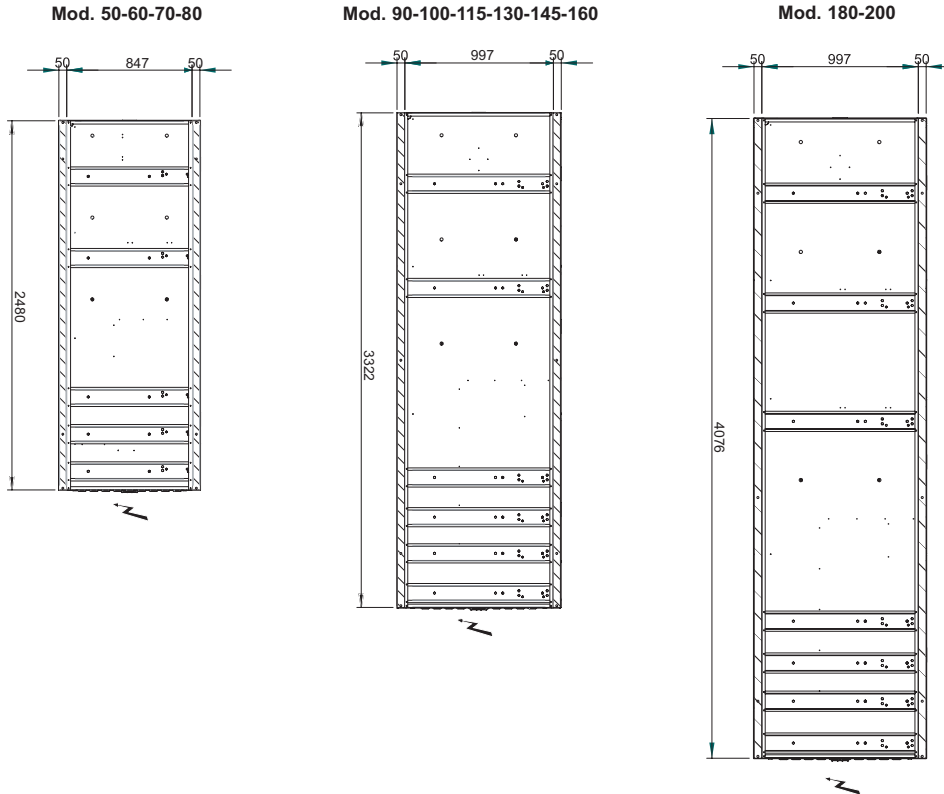
To prevent the operating unit from transmitting vibrations to the bearing structure, vibration dampening materials should be inserted under the bearing points.

The unit can be supplied with the rubber or spring vibration dampening accessory. This must be mounted by the installer.

## Weight during operation and transport

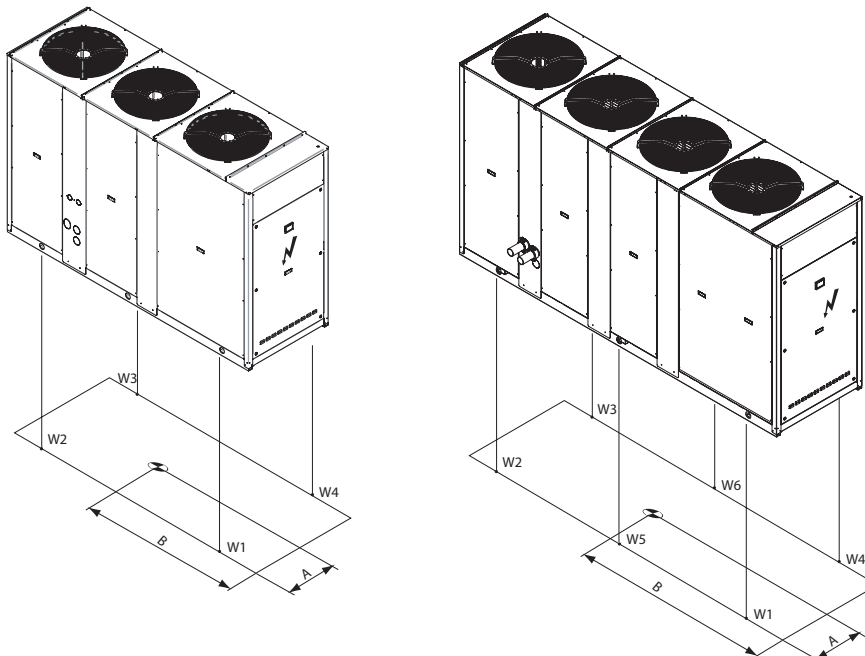
To correctly install the unit, comply with the measurements for the free area that must be left around the machine, as shown in the drawing.

### AREA OF SUPPORT



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

Mod. 180-200



## WEIGHT DURING OPERATION AND TRANSPORT

### AB - Standard unit / AS - Low Noise Unit

Version Mod.		IP - Heating mode																				
		VB (Standard 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.			
50	414	861	261	93	72	200	627	416	861	623	411	873	266	98	74	201	639	413	871	635		
60	414	861	262	93	71	201	627	416	860	624	410	872	267	98	74	201	639	412	871	635		
70	422	866	273	99	78	217	668	424	865	663	418	876	278	103	81	217	680	421	875	675		
80	427	871	280	103	83	227	693	430	871	688	424	881	284	107	86	228	705	427	880	699		
90	476	1182	358	176	133	271	939	478	1180	932	472	1193	364	183	136	271	953	475	1190	945		
100	457	1133	413	186	131	291	1020	460	1130	1012	454	1143	418	192	133	291	1034	457	1140	1025		
115	471	1151	445	207	154	331	1136	474	1149	1126	468	1161	451	214	157	331	1153	471	1158	1142		
130	466	1140	463	211	153	337	1164	469	1138	1153	463	1150	470	218	156	337	1181	466	1147	1169		
145	465	1130	490	219	159	355	1222	468	1128	1210	462	1140	496	226	162	355	1240	465	1137	1226		
160	476	1139	499	227	172	377	1275	480	1137	1260	473	1148	505	234	175	378	1292	477	1145	1276		
180	471	1368	484	329	245	360	1418	474	1368	1407	469	1374	490	337	248	361	1435	471	1373	1422		
200	483	1378	487	337	262	378	1464	486	1378	1451	480	1384	493	344	265	379	1481	483	1383	1466		
Version Mod.		IR - Cooling mode																				
		VB (Standard 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.			
50	402	879	251	94	68	182	595	404	878	591	398	890	256	99	70	182	607	400	889	603		
60	401	878	252	94	68	182	595	403	878	592	397	890	256	99	70	182	607	400	888	603		
70	411	884	262	99	75	198	635	414	883	630	407	894	267	104	77	198	647	410	893	642		
80	417	888	269	103	80	209	661	419	887	656	413	898	274	108	82	209	673	416	897	667		
90	465	1201	346	176	128	250	900	467	1199	893	461	1212	351	183	130	251	915	464	1210	906		
100	447	1148	401	185	125	270	981	449	1146	973	444	1159	406	192	128	270	995	446	1157	986		
115	461	1166	432	206	147	308	1093	463	1164	1083	457	1176	438	213	150	308	1110	460	1173	1099		
130	455	1154	450	210	147	314	1121	458	1152	1110	452	1164	456	217	150	314	1138	455	1162	1126		
145	453	1143	477	219	151	330	1177	457	1141	1163	451	1153	483	226	154	331	1194	455	1150	1178		
160	466	1152	484	225	164	352	1225	470	1150	1211	463	1162	490	233	167	353	1242	467	1159	1227		
180	463	1389	467	329	236	335	1367	465	1389	1356	460	1395	473	337	239	336	1385	463	1394	1372		
200	475	1399	470	336	253	354	1413	477	1399	1400	472	1404	476	344	256	355	1431	475	1404	1416		

### AX - eXtra Low noise Unit

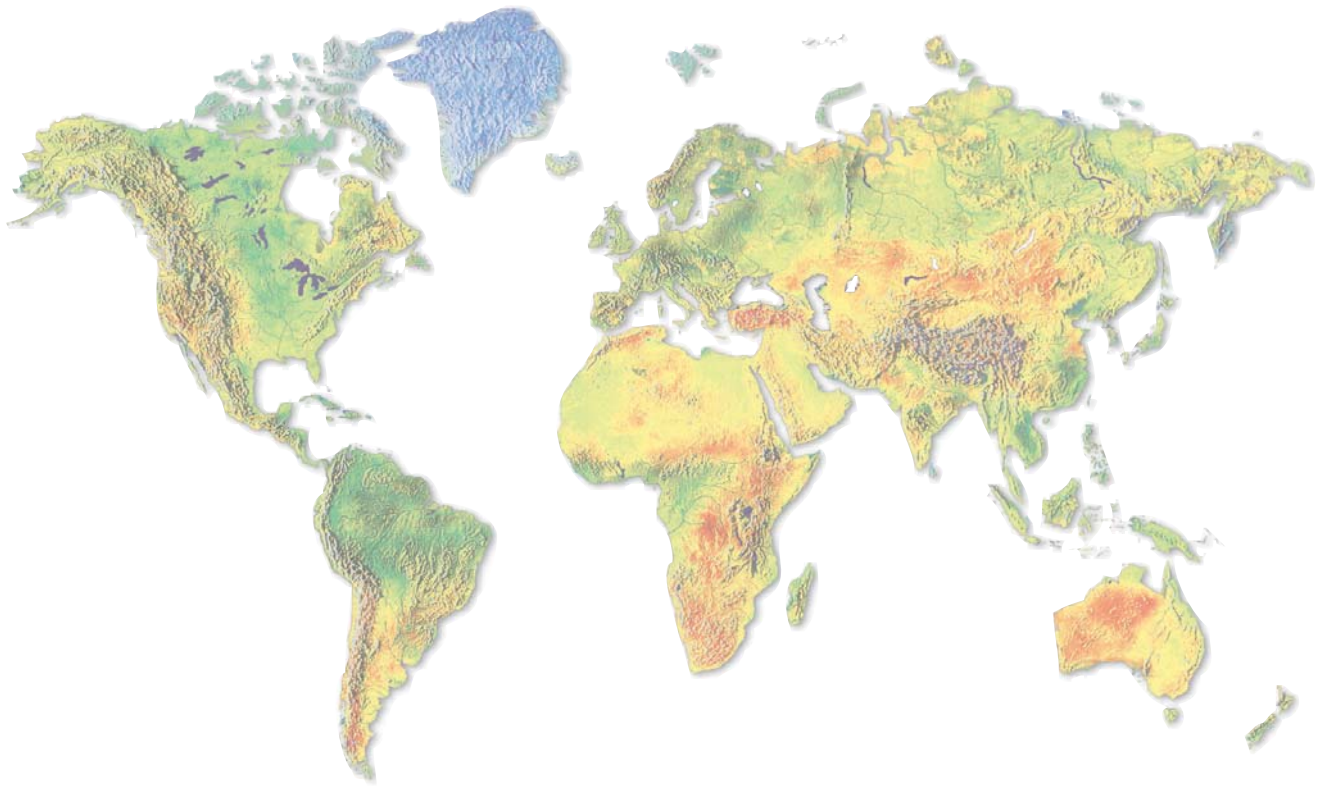
Version Mod.		IP - Heating mode																				
		VB (Standard unit)									VD (Desuperheater unit)											
		Operation						Transport			Operation						Transport					
A	B	W1	W2	W3	W4	TOT.	A	B	TOT.	A	B	W1	W2	W3	W4	TOT.	A	B	TOT.			
50	430	877	259	97	80	214	649	432	877	646	426	888	264	101	82	214	662	429	887	657		
60	430	877	260	97	80	214	650	432	876	646	426	887	265	101	82	214	662	428	886	658		
70	432	876	272	101	84	226	684	434	875	679	428	886	277	106	86	226	696	431	885	691		
80	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
90	491	1196	354	179	143	284	960	494	1194	952	487	1206	359	185	146	284	974	490	1204	966		
100	472	1146	408	188	140	304	1040	475	1144	1032	469	1156	414	194	143	304	1055	471	1154	1046		
115	489	1166	439	210	167	349	1165	492	1165	1155	485	1176	445	217	170	349	1182	488	1174	1171		
130	483	1155	457	214	166	355	1193	486	1153	1182	480	1165	463	221	170	356	1210	483	1162	1198		
145	481	1145	484	222	172	373	1251	485	1143	1238	478	1155	490	229	175	374	1268	482	1152	1254		
160	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
180	485	1386	478	335	263	375	1451	488	1386	1440	483	1391	484	342	266	376	1468	485	1391	1455		
200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Version Mod.		IR - Cooling mode																				
		VB (Standard 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.			
50	419	895	249	97	76	195	617	421	895	614	415	906	254	102	79	195	630	417	905	625		
60	419	894	249	97	76	195	618	421	894	614	415	905	254	102	78	195	630	417	904	626		
70	422	894	261	102	81	207	651	424	894	646	418	904	266	107	83	207	663	421	903	658		
80	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
90	481	1215	342	178	138	263	921	484	1213	913	477	1226	347	185	140	263	935	480	1223	927		
100	462	1162	396	188	134	283	1002	465	1160	993	459	1173	401	194	137	284	1016	461	1170	1007		
115	479	1181	426	209	160	326	1121	482	1180	1112	476	1191	432	216	163	326	1138	479	1189	1127		
130	473	1170	444	214	160	332	1149	476	1168	1138	470	1180	450	221	163	333	1166	473	1177	1154		
145	471	1159	470	222	164	349	1206	475	1156	1191	468	1168	477	229	168	349	1223	472	1165	1207		
160	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
180	477	1407	461	335	254	351	1400	480	1407	1389	474	1412	467	342	257	351	1418	477	1412	1405		
200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		



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Ferroli spa ☛ 37047 San Bonifacio (Verona) Italy ☛ Via Ritonda 78/A  
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