

> RMA² HE

AIR-WATER CHILLERS AND HEAT PUMPS
FOR OUTDOOR INSTALLATION



Available range

Unit type

| | |
|----|---|
| IR | Chiller |
| IP | Heat pump (reversible on the refrigerant side) |
| BR | Chiller Brine |
| BP | Heat pump Brine (reversible on the refrigerant side) |

Versions

| | |
|----|--------------|
| VB | Base Version |
| VP | Pump version |
| VA | Tank version |

Acoustic setting up

| | |
|----|----------------------|
| AB | Base setting up |
| AS | Low noise setting up |

Unit description

This series of air-water chillers and heat pumps satisfies the cooling and heating requirements of residential plants of small and medium size.

All the units are suitable for outdoor installation and can be applied to fan coil plants, radiant floor plants and high efficiency radiators plants.

The refrigerant circuit, contained in a compartment protected from the air flow to simplify the maintenance operations, is equipped with scroll compressor mounted on damper supports, brazed plate heat exchanger, thermostatic expansion valve, reverse cycle valve, axial fans with safety

protection grilles, finned coil made of copper pipes and aluminium louvered fins. The circuit is protected by high and low pressure switches and differential pressure switch on the plate heat exchanger.

The plate heat exchanger and all the hydraulic pipes are thermally insulated in order to avoid condensate generation and to reduce thermal losses.

All the units can be equipped with variable speed fans control that allows the units to operate with low outdoor temperatures in cooling and high outdoor temperature in heating and permits to reduce noise emissions in such operating conditions.

The low noise acoustic setting up (AS) is obtained, starting from the base setting up (AB), reducing the rotational speed of the fans and mounting sound jackets on the compressors.

All the units are provided with a phase presence and correct sequence controller device.

All the units are accurately built and individually tested in the factory. Only electric and hydraulic connections are required for installation.

Options

Storing and pumping module

- not present (VB - base version)
- standard, high head or modulating pump (VP - pump version)
- tank and standard, high head or modulating pump (VA - tank version)

Integrative electrical heaters

- not present
- standard in the tank

Compressor starting

- standard (contactors)
- soft starter

Fans control

- on-off control
- modulating control (condensation / evaporation control)

Electrical loads protection

- fuses
- thermal magnetic circuit breakers

Compressor power factor correction

Accessories

Rubber vibration dampers

Coil protection grille

Remote control

Modbus serial interface on RS485

Programmer clock

Phase sequence and voltage controller

Water flow switch

Manometer

Oil crankcase electrical heater (only for IR/BR unit, standard for IP/BP unit)

Pressure transducer

Coil protection kit for shipment

Outdoor air sensor

NET NOMINAL performances - Standard plants - EUROVENT certified data

| IR | Base setting up (AB) | 19.1 | 22.1 | 26.1 | 30.1 | 35.1 | 40.1 | |
|-------|---------------------------|-------------|-------------|-------------|-------------|-------------|-------------|------------|
| A35W7 | Cooling capacity | 20,3 | 22,7 | 26,4 | 31,5 | 35,5 | 41,4 | kW |
| | Power input | 6,49 | 7,25 | 8,36 | 10,09 | 11,3 | 13,0 | kW |
| | EER | 3,12 | 3,13 | 3,16 | 3,12 | 3,14 | 3,17 | W/W |
| | ESEER | 3,50 | 3,51 | 3,54 | 3,49 | 3,52 | 3,55 | W/W |
| | Water flow rate | 3512 | 3929 | 4566 | 5442 | 6140 | 7150 | l/h |
| | Pressure drops | 27 | 25 | 24 | 28 | 29 | 27 | kPa |
| IR | Low noise setting up (AS) | 19.1 | 22.1 | 26.1 | 30.1 | 35.1 | 40.1 | |
| A35W7 | Cooling capacity | 19,5 | 21,8 | 25,4 | 30,3 | 34,2 | 39,9 | kW |
| | Power input | 6,98 | 7,80 | 9,00 | 10,85 | 12,1 | 13,9 | kW |
| | EER | 2,79 | 2,80 | 2,82 | 2,79 | 2,81 | 2,87 | W/W |
| | ESEER | 3,13 | 3,13 | 3,16 | 3,13 | 3,15 | 3,22 | W/W |
| | Water flow rate | 3372 | 3771 | 4391 | 5235 | 5905 | 6890 | l/h |
| | Pressure drops | 25 | 23 | 22 | 26 | 27 | 25 | kPa |
| IP | Base setting up (AB) | 19.1 | 22.1 | 26.1 | 30.1 | 35.1 | 40.1 | |
| A35W7 | Cooling capacity | 19,9 | 22,3 | 25,9 | 30,9 | 34,8 | 40,5 | kW |
| | Power input | 6,42 | 7,17 | 8,25 | 9,96 | 11,20 | 12,95 | kW |
| | EER | 3,10 | 3,11 | 3,14 | 3,10 | 3,11 | 3,13 | W/W |
| | ESEER | 3,47 | 3,49 | 3,51 | 3,47 | 3,48 | 3,51 | W/W |
| | Water flow rate | 3442 | 3859 | 4478 | 5337 | 6020 | 7008 | l/h |
| | Pressure drops | 26 | 24 | 23 | 27 | 28 | 26 | kPa |
| A7W45 | Heating capacity | 21,1 | 24,0 | 27,8 | 32,3 | 37,0 | 42,7 | kW |
| | Power input | 6,42 | 7,14 | 8,25 | 10,01 | 11,21 | 12,83 | kW |
| | COP | 3,29 | 3,36 | 3,37 | 3,22 | 3,29 | 3,33 | W/W |
| | Water flow rate | 3612 | 4096 | 4763 | 5517 | 6320 | 7310 | l/h |
| | Pressure drops | 29 | 27 | 26 | 29 | 31 | 28 | kPa |
| IP | Low noise setting up (AS) | 19.1 | 22.1 | 26.1 | 30.1 | 35.1 | 40.1 | |
| A35W7 | Cooling capacity | 19,1 | 21,4 | 24,9 | 29,7 | 33,5 | 39,0 | kW |
| | Power input | 6,91 | 7,74 | 8,91 | 10,75 | 12,06 | 13,74 | kW |
| | EER | 2,76 | 2,77 | 2,79 | 2,76 | 2,77 | 2,84 | W/W |
| | ESEER | 3,09 | 3,10 | 3,13 | 3,09 | 3,11 | 3,18 | W/W |
| | Water flow rate | 3302 | 3700 | 4303 | 5129 | 5785 | 6748 | l/h |
| | Pressure drops | 24 | 22 | 21 | 25 | 26 | 24 | kPa |
| A7W45 | Heating capacity | 20,1 | 22,9 | 26,6 | 31,0 | 35,2 | 40,8 | kW |
| | Power input | 6,23 | 6,90 | 8,00 | 9,70 | 10,87 | 12,42 | kW |
| | COP | 3,22 | 3,32 | 3,32 | 3,20 | 3,24 | 3,28 | W/W |
| | Water flow rate | 3422 | 3902 | 4533 | 5261 | 6016 | 6963 | l/h |
| | Pressure drops | 26 | 25 | 23 | 26 | 28 | 26 | kPa |

Data declared according to **EN 14511**. The values are referred to units without options and accessories.

EER (Energy Efficiency Ratio) = ratio of the total cooling capacity to the effective power input of the unit

COP (Coefficient Of Performance) = ratio of the total heating capacity to the effective power input of the unit

ESEER (European Seasonal Energy Efficiency Ratio) = Unit in **A CLASS**.

A35W7 = source : air in 35°C d.b. / plant : water in 12°C out 7°C

A35W18 = source : air in 35°C d.b. / plant : water in 23°C out 18°C

A7W45 = source : air in 7°C d.b. 6°C w.b. / plant : water in 40°C out 45°C

A7W35 = source : air in 7°C d.b. 6°C w.b. / plant : water in 30°C out 35°C

Acoustic performances

| Base setting up (AB) | 19.1 | 22.1 | 26.1 | 30.1 | 35.1 | 40.1 | |
|-----------------------------------|------|------|------|------|------|------|-------|
| Sound power level ^(E) | 77 | 77 | 78 | 81 | 82 | 82 | dB(A) |
| Sound pressure level at 1 meter | 61 | 62 | 62 | 65 | 66 | 66 | dB(A) |
| Sound pressure level at 5 meters | 51 | 51 | 52 | 55 | 55 | 56 | dB(A) |
| Sound pressure level at 10 meters | 46 | 46 | 47 | 50 | 50 | 50 | dB(A) |
| Low noise setting up (AS) | 19.1 | 22.1 | 26.1 | 30.1 | 35.1 | 40.1 | |
| Sound power level ^(E) | 74 | 74 | 75 | 78 | 79 | 79 | dB(A) |
| Sound pressure level at 1 meter | 58 | 59 | 59 | 62 | 63 | 63 | dB(A) |
| Sound pressure level at 5 meters | 48 | 48 | 49 | 52 | 53 | 53 | dB(A) |
| Sound pressure level at 10 meters | 43 | 43 | 44 | 47 | 48 | 48 | dB(A) |

(E): EUROVENT certified data

The acoustic performances are referred to units operating in cooling mode at nominal conditions A35W7.

Unit placed in free field on reflecting surface (directional factor equal to 2).

The sound power level is measured according to ISO 9614 standard.

The sound pressure level is calculated according to ISO 3744 and is referred to a distance of 1/5/10 metres from the external surface of the unit.

Technical data

| Unità | 19.1 | 22.1 | 26.1 | 30.1 | 35.1 | 40.1 | |
|--|-------------------------------|------|------|------|------|------|---------|
| Power supply | 400 - 3+N - 50 | | | | | | V-ph-Hz |
| Compressor type | scroll | | | | | | - |
| N° compressors / N° refrigerant circuits | 1 / 1 | | | | | | n° |
| Plant side heat exchanger type | stainless steel brazed plates | | | | | | - |
| Source side heat exchanger type | finned coil | | | | | | - |
| Fans type | axial | | | | | | - |
| N° fans | 1 | | | | | | n° |
| Tank volume | 85 | | | | | | l |
| Hydraulic fittings | 1"1/4 GAS | | | | | | - |

Electrical data

| Standard unit | 19.1 | 22.1 | 26.1 | 30.1 | 35.1 | 40.1 | |
|---|------|------|------|------|------|------|----|
| FLA - Full load current at maximum tolerated conditions | 15,8 | 17,6 | 19,1 | 24,4 | 26,8 | 30,8 | A |
| FLI - Full load power input at maximum tolerated conditions | 9,2 | 10,7 | 12,0 | 14,6 | 16,1 | 18,4 | kW |
| MIC - Maximum instantaneous current of the unit | 106 | 116 | 129 | 156 | 160 | 191 | A |
| MIC SS - Maximum instantaneous current of the unit with soft starter options | 61 | 67 | 74 | 85 | 87 | 106 | A |
| Unit with standard modulating pump | 19.1 | 22.1 | 26.1 | 30.1 | 35.1 | 40.1 | |
| FLA - Full load current at maximum tolerated conditions | 17,3 | 19,1 | 20,6 | 26,0 | 28,4 | 32,4 | A |
| FLI - Full load power input at maximum tolerated conditions | 9,8 | 11,3 | 12,6 | 15,4 | 16,9 | 19,2 | kW |
| MIC - Maximum instantaneous current of the unit | 107 | 117 | 130 | 158 | 162 | 193 | A |
| MIC SS - Maximum instantaneous current of the unit with soft starter options | 62 | 68 | 76 | 86 | 89 | 107 | A |
| Unit with high head modulating pump | 19.1 | 22.1 | 26.1 | 30.1 | 35.1 | 40.1 | |
| FLA - Full load current at maximum tolerated conditions | 17,5 | 19,3 | 20,8 | 27,4 | 29,8 | 33,8 | A |
| FLI - Full load power input at maximum tolerated conditions | 10,1 | 11,5 | 12,9 | 16,2 | 17,7 | 20,0 | kW |
| MIC - Maximum instantaneous current of the unit | 108 | 118 | 131 | 159 | 163 | 194 | A |
| MIC SS - Maximum instantaneous current of the unit with soft starter options | 62 | 68 | 76 | 88 | 90 | 109 | A |

Operating range

| Temperatura | Unit type | Cooling | | Heating | | |
|-------------------------------|----------------|---------|-----|---------|-----|------|
| | | min | max | min | max | |
| Outdoor air inlet temperature | IR, BR, IP, BP | -10* | 50 | -15 | 42 | (°C) |
| Water outlet temperature | IR, IP | 5 | 25 | 30 | 55 | (°C) |
| Water outlet temperature | BR, BP | -12 | 5 | 30 | 55 | (°C) |

* with fans modulating control option (condensation / evaporation control)

CONTROL SYSTEM

The unit is managed by a microprocessor controller to which, through a wiring board, all the electrical loads and the control devices are connected. The user interface is realized by a display and four buttons that allow to view and, if necessary, modify all the operating parameters of the unit. It's available, as an accessory, a remote control that reports all the functionalities of the user interface placed on the unit.

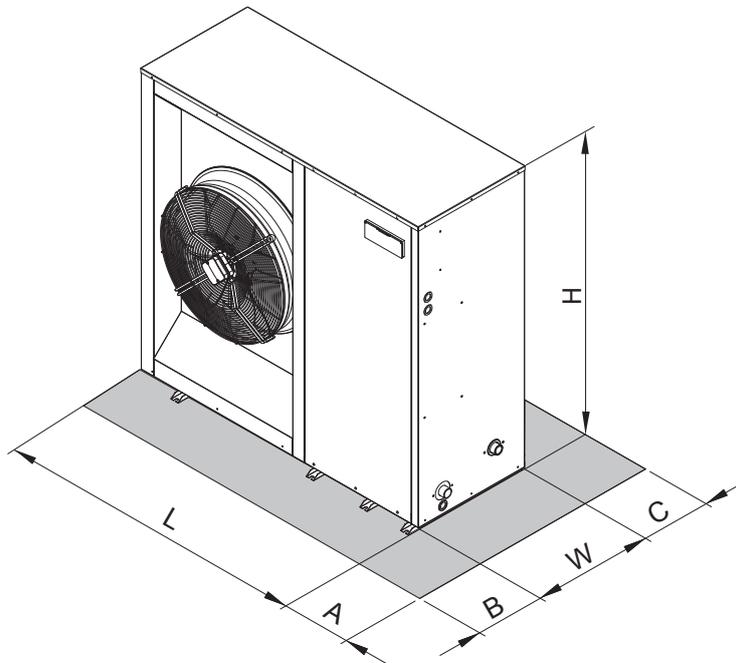
The main functions available are :

- water temperature management (through set point adjustment)
- adaptive function
- climatic control in heating and in cooling mode, automatic set point adjustment according to outdoor air temperature (if present "outdoor air sensor" accessory)
- dynamic defrost cycle management according to outdoor air temperature (if present "outdoor air sensor" accessory)
- alarm memory management and diagnostic

- fans management by means of continuous rotational speed control
- pump management
- integrative electrical heaters management in heating mode
- compressor and pump operating hours recording
- serial communication through Modbus protocol
- remote stand by
- remote cooling-heating
- general alarm digital output



DIMENSIONS AND MINIMUM OPERATING AREA



| | 19.1 | 22.1 | 26.1 | 30.1 | 35.1 | 40.1 | |
|---|------|------|------|------|------|------|----|
| L | | 1494 | | | 1704 | | mm |
| W | | 576 | | | 576 | | mm |
| H | | 1453 | | | 1453 | | mm |
| A | | 400 | | | 400 | | mm |
| B | | 600 | | | 600 | | mm |
| C | | 200 | | | 200 | | mm |
| Maximum weight operation (VA Tank version) | 364 | 367 | 391 | 412 | 438 | 440 | kg |