

> RMA²

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 cop-

per 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)

Tank electrical heater

- not present
- antifreeze
- integrative

Compressor starting

- standard (contactors)
- soft starter

Fans control

- on-off control
- modulating control (condensation / evaporation control) standard for AS unit

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	19,7	22,2	25,7	30,2	34,6	40,4	kW
	Power input	6,84	7,67	8,80	10,80	12,1	14,0	kW
	EER	2,88	2,89	2,92	2,80	2,86	2,88	W/W
	ESEER	3,23	3,24	3,28	3,13	3,20	3,23	W/W
	Water flow rate	3412	3848	4459	5233	5998	6988	l/h
	Pressure drops	32	41	37	40	39	37	kPa
IR	Low noise setting up (AS)	19.1	22.1	26.1	30.1	35.1	40.1	
A35W7	Cooling capacity	18,9	21,3	24,7	29,0	33,3	38,8	kW
	Power input	7,34	8,25	9,43	11,57	13,1	15,1	kW
	EER	2,58	2,58	2,62	2,51	2,55	2,57	W/W
	ESEER	2,89	2,89	2,94	2,81	2,85	2,88	W/W
	Water flow rate	3275	3691	4286	5030	5763	6710	l/h
	Pressure drops	30	38	34	37	36	34	kPa
IP	Base setting up (AB)	19.1	22.1	26.1	30.1	35.1	40.1	
A35W7	Cooling capacity	19,3	21,8	25,2	29,6	34,0	39,6	kW
	Power input	6,76	7,58	8,68	10,66	12,00	13,90	kW
	EER	2,85	2,87	2,91	2,78	2,83	2,85	W/W
	ESEER	3,20	3,22	3,26	3,11	3,17	3,19	W/W
	Water flow rate	3344	3778	4373	5132	5881	6850	l/h
	Pressure drops	31	40	35	38	38	36	kPa
A7W45	Heating capacity	20,8	23,4	27,2	32,2	37,0	41,8	kW
	Power input	6,53	7,35	8,52	10,54	11,82	13,28	kW
	COP	3,18	3,18	3,19	3,06	3,13	3,15	W/W
	Water flow rate	3543	3990	4648	5504	6312	7138	l/h
	Pressure drops	35	44	40	44	43	39	kPa
IP	Low noise setting up (AS)	19.1	22.1	26.1	30.1	35.1	40.1	
A35W7	Cooling capacity	18,5	20,9	24,3	28,5	32,6	38,0	kW
	Power input	7,26	8,18	9,34	11,46	13,00	14,92	kW
	EER	2,55	2,55	2,60	2,48	2,51	2,55	W/W
	ESEER	2,86	2,86	2,91	2,78	2,81	2,85	W/W
	Water flow rate	3207	3622	4200	4928	5645	6572	l/h
	Pressure drops	28	36	32	35	35	33	kPa
A7W45	Heating capacity	19,7	22,3	25,9	30,8	35,2	39,8	kW
	Power input	6,32	7,05	8,21	10,16	11,40	12,80	kW
	COP	3,12	3,16	3,16	3,03	3,09	3,11	W/W
	Water flow rate	3357	3801	4424	5248	6009	6799	l/h
	Pressure drops	31	40	36	40	39	35	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)
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

Unit	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*	48	-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.

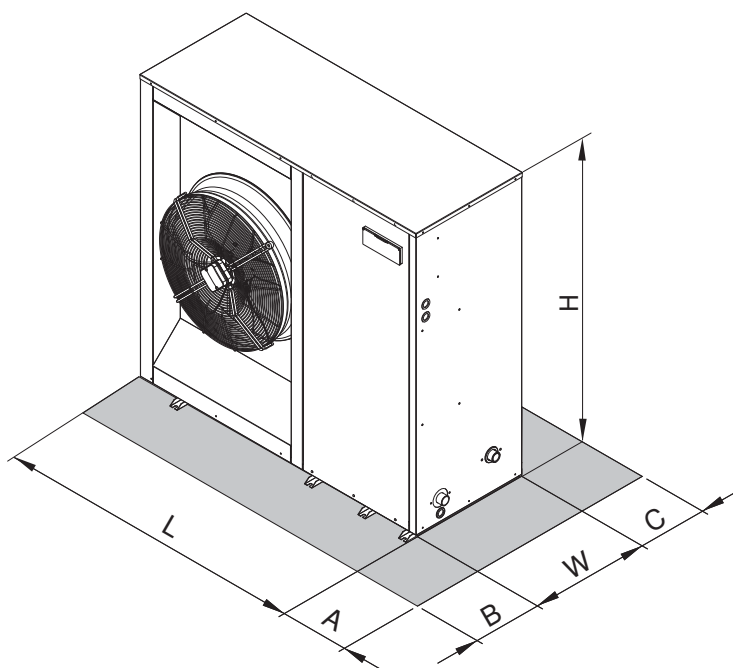
The main functions available are :

- 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)	349	352	371	385	410	412	kg

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FOR OUTDOOR INSTALLATION



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Acoustic setting up

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Unit description

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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.

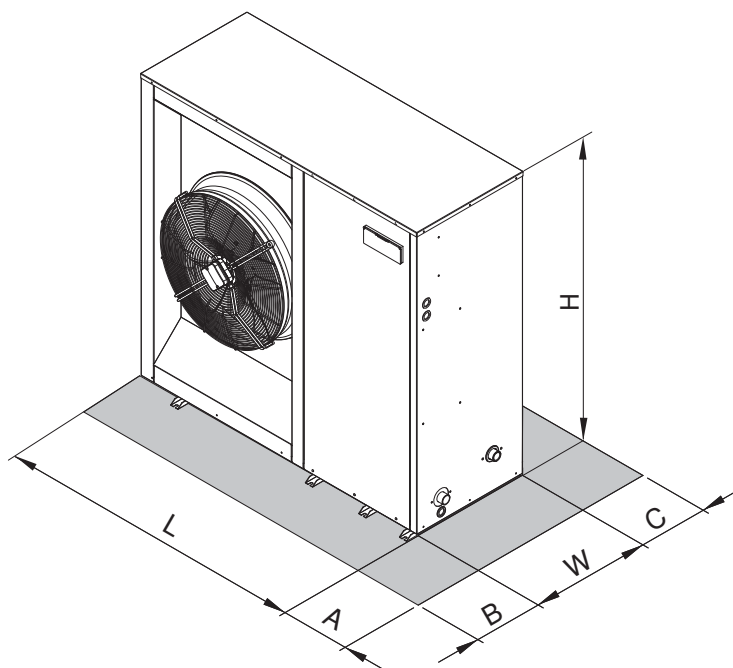
The main functions available are :

- 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