

# > RGC

## AIR-WATER CHILLERS AND HEAT PUMPS FOR INDOOR 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)

#### Version

VB	Base version
VD	Desuperheater version
VR	Total recovery version

#### Acoustic setting up

AB	Base setting up
AS	Low noise setting up

#### Source temperature level

M	Medium temperature level
A	High temperature level

### Unit description

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

All the units are suitable for indoor 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 compressors mounted on damper supports, brazed plate heat exchanger, thermostatic expansion valve (standard for IR) or electronic expansion valve (standard for IP / option

for IR), reverse cycle valve, dehydrator filter, double inlet centrifugal fans with forward curved blades, finned coil made of copper pipes and aluminium louvered fins with subcooling section. The circuit is protected by a safety gas valve, 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), mounting sound jackets on the compressors and the technical compartment is clad with soundproofing material of suitable thickness.

All the units are supplied with a management and control electrical panel containing general switch, phase presence and correct sequence controller, microprocessor controller with display and all the other electrical components with IP54 minimum protection degree.

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** available in the configurations :

- Storage tank arranged as buffer on the flow or as primary-secondary buffer
- 1 or 2 pumps
- standard or high head pump
- modulating pump

#### Expansion valve

- thermostatic
- electronic (standard for IP)

#### Compressor starting

- standard (contactors)
- soft starter

#### Fans control

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

#### Compressor power factor correction

#### Electrical load protection

- fuses
- thermal magnetic circuit breakers

#### Coil condensate tray

(standard for IP)

### Accessories

Rubber vibration dampers

Spring vibration dampers

Coil protection grilles

Tank antifreeze electrical heater

Remote control

Modbus serial interface on RS485

Programmer clock

Phase sequence and voltage controller

Low temperature kit (standard for IP)

High and low pressure gauges

High temperature thermostat

Coil shut off valves

Outdoor air sensor

Water flow switch

Victaulic hydraulic fittings

**NET NOMINAL performances - Standard plants - EUROVENT certified data**

IR	Base setting up (AB)	40.2	50.2	60.2	70.2	80.2	90.2	100.2	115.2	130.2	145.2	160.2	180.2	200.2	
A35W7	Cooling capacity	45,0	53,0	58,1	68,2	78,1	90,3	101	111	125	142	157	179	198	kW
	Power input	15,7	18,8	20,8	24,1	28,0	32,5	35,9	39,9	45,1	51,5	57,1	64,6	71,6	kW
	EER	2,87	2,82	2,79	2,83	2,79	2,78	2,81	2,78	2,77	2,76	2,75	2,77	2,77	W/W
	ESEER	3,93	3,90	3,85	3,91	3,84	3,93	3,86	3,93	3,82	3,89	3,77	3,80	3,82	W/W
	Water flow rate	2,16	2,56	2,80	3,29	3,76	4,35	4,87	5,35	6,02	6,83	7,55	8,60	9,56	l/s
	Pressure drops	40	56	55	51	50	48	46	44	48	47	48	48	50	kPa
IR	Low noise setting up (AS)	40.2	50.2	60.2	70.2	80.2	90.2	100.2	115.2	130.2	145.2	160.2	180.2	200.2	
A35W7	Cooling capacity	45,0	53,0	58,1	68,2	78,1	90,3	101	111	125	142	157	179	198	kW
	Power input	15,7	18,8	20,8	24,1	28,0	32,5	35,9	39,9	45,1	51,5	57,1	64,6	71,6	kW
	EER	2,87	2,82	2,79	2,83	2,79	2,78	2,81	2,78	2,77	2,76	2,75	2,77	2,77	W/W
	ESEER	3,93	3,90	3,85	3,91	3,84	3,93	3,86	3,93	3,82	3,89	3,77	3,80	3,82	W/W
	Water flow rate	2,16	2,56	2,80	3,29	3,76	4,35	4,87	5,35	6,02	6,83	7,55	8,60	9,56	l/s
	Pressure drops	40	56	55	51	50	48	46	44	48	47	48	48	50	kPa
IP	Base setting up (AB)	40.2	50.2	60.2	70.2	80.2	90.2	100.2	115.2	130.2	145.2	160.2	180.2	200.2	
A35W7	Cooling capacity	43,5	52,4	57,0	66,7	73,6	88,5	98	109	121	137	153	177	196	kW
	Power input	15,5	19,0	20,7	24,1	27,0	32,3	35,7	39,8	44,5	50,3	56,3	63,5	71,2	kW
	EER	2,81	2,76	2,75	2,77	2,73	2,74	2,75	2,74	2,72	2,72	2,72	2,79	2,75	W/W
	ESEER	3,84	3,82	3,80	3,80	3,73	3,87	3,78	3,87	3,73	3,84	3,72	3,82	3,79	W/W
	Water flow rate	2,09	2,53	2,75	3,21	3,54	4,26	4,73	5,26	5,83	6,59	7,36	8,50	9,46	l/s
	Pressure drops	37	55	53	49	44	46	43	43	45	44	46	47	49	kPa
IP	Low noise setting up (AS)	40.2	50.2	60.2	70.2	80.2	90.2	100.2	115.2	130.2	145.2	160.2	180.2	200.2	
A35W7	Cooling capacity	43,5	52,4	57,0	66,7	73,6	88,5	98	109	121	137	153	177	196	kW
	Power input	15,5	19,0	20,7	24,1	27,0	32,3	35,7	39,8	44,5	50,3	56,3	63,5	71,2	kW
	EER	2,81	2,76	2,75	2,77	2,73	2,74	2,75	2,74	2,72	2,72	2,72	2,79	2,75	W/W
	ESEER	3,84	3,82	3,80	3,80	3,73	3,87	3,78	3,87	3,73	3,84	3,72	3,82	3,79	W/W
	Water flow rate	2,09	2,53	2,75	3,21	3,54	4,26	4,73	5,26	5,83	6,59	7,36	8,50	9,46	l/s
	Pressure drops	37	55	53	49	44	46	43	43	45	44	46	47	49	kPa
IP	Base setting up (AB)	40.2	50.2	60.2	70.2	80.2	90.2	100.2	115.2	130.2	145.2	160.2	180.2	200.2	
A7W45	Heating capacity	48,1	58,1	63,2	74,5	83,0	99,6	110	125	136	154	173	197	216	kW
	Power input	15,6	19,1	20,9	24,4	27,6	33,5	35,9	41,1	44,9	51,8	56,9	65,1	71,7	kW
	COP	3,08	3,04	3,02	3,05	3,01	2,97	3,06	3,04	3,03	2,97	3,04	3,03	3,01	W/W
	Water flow rate	2,28	2,75	2,99	3,53	3,93	4,72	5,21	5,92	6,45	7,31	8,17	9,32	10,2	l/s
	Pressure drops	45	65	63	59	55	57	53	54	55	54	56	56	57	kPa
	Heating capacity	48,1	58,1	63,2	74,5	83,0	99,6	110	125	136	154	173	197	216	kW
A7W45	Power input	15,6	19,1	20,9	24,4	27,6	33,5	35,9	41,1	44,9	51,8	56,9	65,1	71,7	kW
	COP	3,08	3,04	3,02	3,05	3,01	2,97	3,06	3,04	3,03	2,97	3,04	3,03	3,01	W/W
	Water flow rate	2,28	2,75	2,99	3,53	3,93	4,72	5,21	5,92	6,45	7,31	8,17	9,32	10,2	l/s
	Pressure drops	45	65	63	59	55	57	53	54	55	54	56	56	57	kPa

**NET NOMINAL performances - Radiant plants**

IR	Base setting up (AB)	40.2	50.2	60.2	70.2	80.2	90.2	100.2	115.2	130.2	145.2	160.2	180.2	200.2	
A35W18	Cooling capacity	58,3	68,5	75,1	88,2	100,6	116	131	144	162	184	202	231	257	kW
	Power input	17,1	20,8	22,9	26,4	30,8	35,6	39,4	43,6	49,4	56,4	62,5	70,7	78,5	kW
	EER	3,41	3,29	3,28	3,34	3,27	3,26	3,32	3,30	3,28	3,26	3,23	3,27	3,27	W/W
	Water flow rate	2,81	3,33	3,64	4,27	4,87	5,64	6,35	6,98	7,84	8,89	9,8	11,2	12,4	l/s
	Pressure drops	68	95	93	86	84	81	78	75	81	80	81	81	84	kPa
	Heating capacity	56,3	67,8	73,7	86,3	95,2	115	127	141	157	177	198	228	254	kW
IP	Base setting up (AB)	40.2	50.2	60.2	70.2	80.2	90.2	100.2	115.2	130.2	145.2	160.2	180.2	200.2	
A35W18	Cooling capacity	56,3	67,8	73,7	86,3	95,2	115	127	141	157	177	198	228	254	kW
	Power input	16,9	20,9	22,8	26,4	29,7	35,2	39,0	43,4	48,8	54,9	61,7	69,5	78,1	kW
	EER	3,33	3,24	3,23	3,27	3,21	3,26	3,32	3,25	3,22	3,22	3,21	3,28	3,25	W/W
	Water flow rate	2,72	3,29	3,57	4,18	4,60	5,54	6,16	6,83	7,60	8,55	9,56	11,0	12,3	l/s
	Pressure drops	63	92	89	82	75	78	74	72	77	74	77	79	83	kPa
	Heating capacity	51,1	61,7	67,1	79,0	88,0	106	117	132	144	164	183	209	229	kW
A7W35	Power input	12,9	15,7	17,3	20,1	22,7	27,9	29,8	34,0	37,1	43,0	47,2	54,3	59,6	kW
	COP	3,96	3,93	3,88	3,93	3,88	3,80	3,93	3,88	3,88	3,81	3,88	3,85	3,84	W/W
	Water flow rate	2,42	2,91	3,17	3,74	4,17	5,02	5,54	6,26	6,83	7,74	8,65	9,89	10,8	l/s
	Pressure drops	50	72	70	66	61	64	60	60	62	60	63	63	64	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

<b>Base setting up (AB)</b>	<b>40.2</b>	<b>50.2</b>	<b>60.2</b>	<b>70.2</b>	<b>80.2</b>	<b>90.2</b>	<b>100.2</b>	<b>115.2</b>	<b>130.2</b>	<b>145.2</b>	<b>160.2</b>	<b>180.2</b>	<b>200.2</b>
Sound power level (E)	88	88	89	89	89	91	91	91	96	97	97	98	98
Sound pressure level at 1 meter	70	70	71	71	71	73	73	73	78	79	79	80	80
Sound pressure level at 5 meters	61	61	62	62	62	65	65	65	69	70	70	71	71
Sound pressure level at 10 meters	56	56	57	57	57	59	59	59	64	65	65	66	66
<b>Low noise setting up (AS)</b>	<b>40.2</b>	<b>50.2</b>	<b>60.2</b>	<b>70.2</b>	<b>80.2</b>	<b>90.2</b>	<b>100.2</b>	<b>115.2</b>	<b>130.2</b>	<b>145.2</b>	<b>160.2</b>	<b>180.2</b>	<b>200.2</b>
Sound power level (E)	85	85	86	86	86	88	88	88	93	94	94	95	95
Sound pressure level at 1 meter	67	67	68	68	68	70	70	70	75	76	76	77	77
Sound pressure level at 5 meters	58	58	59	59	59	62	62	62	66	67	67	68	68
Sound pressure level at 10 meters	53	53	54	54	54	56	56	56	61	62	62	63	63

(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	40.2	50.2	60.2	70.2	80.2	90.2	100.2	115.2	130.2	145.2	160.2	180.2	200.2	
Power supply							400 - 3 - 50							V-ph-Hz
Compressor type							scroll							-
N° compressors / N° refrigerant circuits							2 / 1							n°
Plant side heat exchanger type							stainless steel brazed plates							-
Source side heat exchanger type							finned coil							-
Fans type							centrifugal							-
N° fans		1					2		3		4			n°
Tank volume		200					400				460			l
Hydraulic fittings		2" VICTAULIC					2" 1/2 VICTAULIC							-

## Electrical data

<b>Standard unit</b>	<b>40.2</b>	<b>50.2</b>	<b>60.2</b>	<b>70.2</b>	<b>80.2</b>	<b>90.2</b>	<b>100.2</b>	<b>115.2</b>	<b>130.2</b>	<b>145.2</b>	<b>160.2</b>	<b>180.2</b>	<b>200.2</b>	
<b>FLA</b> - Full load current at maximum tolerated conditions	43,2	48,8	56,7	62,1	73,0	80,5	95,0	103	117	145	158	188	199	A
<b>FLI</b> - Full load power input at maximum tolerated conditions	25,2	28,0	33,0	35,6	40,8	47,3	58,3	63,8	72,8	88,7	96,3	113	120	kW
<b>MIC</b> - Maximum instantaneous current of the unit	137	147	152	177	216	269	264	272	278	370	383	384	420	A
<b>MIC SS</b> - Maximum instantaneous current of the unit with soft starter options	92,4	99,4	105	121	147	179	180	188	194	222	268	277	301	A
<b>Unit with high head modulating pump</b>	<b>40.2</b>	<b>50.2</b>	<b>60.2</b>	<b>70.2</b>	<b>80.2</b>	<b>90.2</b>	<b>100.2</b>	<b>115.2</b>	<b>130.2</b>	<b>145.2</b>	<b>160.2</b>	<b>180.2</b>	<b>200.2</b>	
<b>FLA</b> - Full load current at maximum tolerated conditions	49,3	54,9	62,8	68,2	79,1	86,6	101	112	126	153	166	198	209	A
<b>FLI</b> - Full load power input at maximum tolerated conditions	28,7	31,5	36,5	39,1	44,3	50,8	61,8	68,4	77,3	93,2	101	119	126	kW
<b>MIC</b> - Maximum instantaneous current of the unit	143	153	158	183	222	275	270	281	287	378	392	394	430	A
<b>MIC SS</b> - Maximum instantaneous current of the unit with soft starter options	98,5	105	111	127	153	185	186	197	203	231	277	287	311	A

### Operative range

Temperature	Unit type	Cooling		Heating		Unit
		min	max	min	max	
Outdoor air inlet temperature	IR, BR, IP, BP	-10*	50	-10	40*	(°C)
Water outlet temperature	IR, IP	5	25	30	55	(°C)
Water outlet temperature	BR, BP	-12	25	30	55	(°C)
Water outlet temperature (VD)	IR, BR, IP, BP	30	70	30	70	(°C)
Water outlet temperature (VR)	IR, BR	30	55	-	-	(°C)

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

#### Aeraulic performance

## VD and VR versions

These units allow to recover the heating power, otherwise wasted on air, through an additional heat exchanger.

The **Desuperheater Version (VD)** allow the hot water production at temperatures between 30 and 70°C through the partial heat recovery of the condensation heat.

The **Total Recovery Version (VR)** allows the cold water production and, at the same time, the hot water production at temperatures between 30 and 55°C through the total recovery of the condensation heat.

### Desupeheater Version (VD) - NET NOMINAL performances

IR	Base setting up (AB)	40.2	50.2	60.2	70.2	80.2	90.2	100.2	115.2	130.2	145.2	160.2	180.2	200.2
A35W7 - W45	Cooling capacity	46,8	55,1	60,3	71	81,1	93,8	105	115	130	148	163	185	206
	Total power input	15,3	18,3	20,3	23,4	27,3	31,8	35,1	38,9	44	50,3	55,8	63	69,9
	EER	3,05	3	2,98	3,03	2,97	2,95	2,99	2,96	2,95	2,94	2,92	2,94	2,95
	HRE	3,93	3,86	3,84	3,88	3,83	3,8	3,86	3,85	3,83	3,81	3,8	3,82	3,83
	Water flow rate	2,25	2,66	2,91	3,42	3,91	4,52	5,06	5,54	6,26	7,12	7,84	8,93	9,94
	Water pressure drop	43	60	59	55	54	52	50	47	52	51	52	52	54
	Heating recovery capacity	13,5	15,7	17,6	20	23,6	27,1	30,4	34,4	38,4	44	49,3	55,4	61,3
A35W7 - W45	Water flow rate recovery	0,65	0,75	0,84	0,96	1,13	1,29	1,45	1,64	1,83	2,1	2,36	2,65	2,93
	Water pressure drop recovery	6	9	11	14	19	15	18	11	14	18	22	18	21
	Water pressure drop													
IP	Base setting up (AB)	40.2	50.2	60.2	70.2	80.2	90.2	100.2	115.2	130.2	145.2	160.2	180.2	200.2
A35W7 - W45	Cooling capacity	45,3	54,5	59,3	69,3	76,5	92,1	102	113	126	143	159	183	204
	Total power input	15,1	18,5	20,1	23,5	26,4	31,5	34,9	38,7	43,4	49,1	54,9	62,1	69,5
	EER	3	2,94	2,94	2,95	2,9	2,92	2,93	2,92	2,9	2,91	2,89	2,95	2,94
	HRE	3,86	3,76	3,79	3,78	3,77	3,75	3,78	3,76	3,77	3,75	3,75	3,8	3,77
	Water flow rate	2,18	2,63	2,86	3,34	3,68	4,43	4,92	5,45	6,07	6,88	7,64	8,84	9,84
	Water pressure drop	41	59	57	53	48	50	47	46	49	48	49	51	53
	Heating recovery capacity	13	15,2	17	19,4	22,9	26,2	29,2	33,2	37,1	42,4	47,5	52,4	58,1
A35W7 - W45	Water flow rate recovery	0,62	0,73	0,81	0,93	1,09	1,25	1,4	1,59	1,77	2,03	2,27	2,5	2,78
	Water pressure drop recovery	6	8	10	13	18	14	17	10	13	17	21	16	19
IR	Base setting up (AB)	40.2	50.2	60.2	70.2	80.2	90.2	100.2	115.2	130.2	145.2	160.2	180.2	200.2
A35W7 - W45	Cooling capacity	46,8	55,1	60,3	71	81,1	93,8	105	115	130	148	163	185	206
	Total power input	13,9	16,9	18,4	21,4	25,3	27,9	31,1	35	40	44,4	49,9	55,3	62,1
	EER	3,36	3,25	3,28	3,31	3,2	3,36	3,38	3,29	3,25	3,33	3,26	3,35	3,32
	HRE	7,67	7,46	7,52	7,58	7,35	7,67	7,71	7,52	7,45	7,61	7,47	7,65	7,59
	Water flow rate	2,25	2,66	2,91	3,42	3,91	4,52	5,06	5,54	6,26	7,12	7,84	8,93	9,94
	Water pressure drop	43	60	59	55	54	52	50	47	52	51	52	52	54
	Heating recovery capacity	60	71,2	77,8	91,4	105	120	135	148	168	190	210	238	265
A35W7 - W45	Water flow rate recovery	2,87	3,4	3,72	4,37	5,02	5,73	6,45	7,07	8,03	9,08	10	11,4	12,7
	Water pressure drop recovery	35	49	41	45	50	48	52	47	52	51	52	55	55

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

HRE (Heat Recovery Efficiency) = ratio of the total capacity of the system (heating plus cooling capacity) to the effective power input

A35W7 - W45 = source : air in 35°C d.b. / plant : water in 12°C out 7°C / Recovery : water in 40°C out 45°C

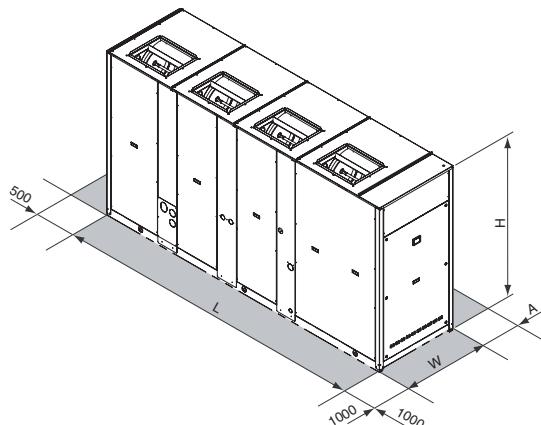
## CONTROL SYSTEM

The units are equipped with a controller designed to ensure energy saving and unit efficiency. Available functions :

- Adaptive function
- Dynamic defrost
- Sound management
- Climatic control in heating and in cooling mode
- Economy function
- Demand limit
- Integrative heating
- Remote stand by
- Remote cooling-heatingg



## DIMENSIONS - MINIMUM OPERATING AREA - WEIGHT



	40.2	50.2	60.2	70.2	80.2	90.2	100.2	115.2	130.2	145.2	160.2	180.2	200.2	
L				2501								4097		mm
W				954				1104				1104		mm
H				1760				1760				2160		mm
A					1600						2000			mm
Operating maximum weight*	1078	1082	1102	1143	1168	1684	1765	1825	2000	2042	2094	2423	2467	kg

\* Weight refers to the unit IP with tank and pumping module 2 pumps.