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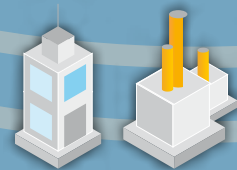


Water cooled chillers  
With oil-free compressors

**RWC .... Ka Series - 1 and 2 cooling circuits  
capacities from 346 a 1800 kW**



- Indoor installation with very low sound level
- Cooling circuit with no lubricating oil entrainment
- High capacities and compact design
- Frequency controlled capacity regulation with a remarkable precision on the adjustment of the discharge temperature
- Slight inrush current
- Maximum efficiency with remarkable ESEER values



Water cooled chillers



brushless  
oil-free  
compressors



water cooled  
unit



only cooling  
units



units available  
in low noise  
versions



**EMICON**

AIR CONDITIONING AND INDUSTRIAL APPLICATION

## Available options

**A - Amperometer:** Electrical device for measuring the intensity of electrical current absorbed by the unit.

**CA - Condensers suitable for seawater:** made in cupro-nichel or titanium, to be selected on request, suitable for working with seawater.

**CC - Insulated condensers:** insulation on condensers heads and side (10 mm thickness).

**IE - Fumigated wooden crate packing:** available on request for critical transports, so to assure a suitable protection to the unit.

**IH - RS 485 serial interface:** electronic card to be connected to microprocessor, to allow communication between the units and a Carel supervision system. It is possible to fully control the unit from remote. For connection to other supervision systems, the protocol of the controlled parameters is available on request.

**IM - Seawood packing:** fumigated seawood case and protection bag with hygroscopic salts, suitable for long sea transports.

**IR - Packing with fumigated wooden pallet and transparent film:** minimal packing made of wooden pallet and transparent film wrapped all around the unit.

**PM - Spring-type vibration dampers:** spring-type vibration dampers support, for insulating the unit (supplied in kit), mainly indicated for installation in difficult and aggressive environments. Made of two steel plates containing a suitable quantity of harmonic steel springs.

**PQ - Remote display:** allowing to display the temperature and humidity values detected by probes, the alarm digital inputs, the outputs and the remote ON/OFF of the unit, to change and program of the parameters, the sound signal and the display of the present alarms.

**PV - Quick start after electrical black-out:** this device allows the compressors re-start after 2 minutes from the return of power supply after electrical black-out.

**RP - Partial heat recovery (about 20%)** of the condensing heat, by means of a refrigerant/water plate exchanger (desuperheater), always in series to the compressors. It is requested when you need to produce sanitary water, by recovering condensing heat capacity.

**V - Voltmeter:** Electrical device measuring the electrical tension in the power supply of the unit.

## Water cooled chillers with oil-free compressors

The units of **RWC Ka series** are particularly indicated for cooling water in the industrial process and for air conditioning. These chillers have a compact frame, inside of which the compressors, shell & tube condensers and flooded evaporator are installed. They are completely assembled and tested in the factory and supplied with re-frigerant charge. Therefore, once on site, the units only need to be positioned and electrically and hydraulically connected

### Water operation limits (standard units):

- EVAPORATOR (OUT): from 5 to 20°C
- CONDENSER (OUT): from 25 to 50°C

For all those applications requiring innovative plant proposals, the **RWC Ka series** represents the ideal solution in terms of:



#### Energy saving

The reduction in investments and operating costs, together with the respect of the regulations in force about consumption cutback and environmental compatibility, correspond to more and more essential factors in the choice of technologically advanced units, with ESEER values higher than 5. Their use in continuous and yearly working application has confirmed a reduction on operating costs higher than 50%, allowing remarkable strategies of energy saving.



#### Low inrush current

Thanks to their technology and to the in-built soft-start system, the oil-free compressors have inrush current values very close to the nominal ones, with a consequent higher stability of the electrical power supply. Therefore, the use of these units also in buildings of non-recent construction allows their energy requalification in compliance with the regulations in force.



#### Compact design

The compact frame of this range, which is an essential element for handling and installation also in complicated architectonic facilities, represents the logistically ideal solution.



#### Low sound emissions

The compressors oil-free technology and the limited vibrations, together with the low speed fans, give this range very low sound levels, allowing the installation also in residential areas.

## RWC Ka - STANDARD VERSION

Model	RWC	351	411	451	502	562	602	642	692	752	812
Cooling capacity	kW	346	405	445	502	558	602	644	690	758	806
Compressors absorbed power	kW	56,3	68,0	78,5	88,4	100,4	107,6	106,0	114,2	127,6	138,2
EER NET		6,15	5,96	5,67	5,68	5,56	5,59	6,08	6,04	5,94	5,83
ESEER (ARI ST 555/590-98)		8,14	7,90	7,51	7,57	7,41	7,45	7,87	7,82	7,67	7,55
Heating capacity	kW	402	473	524	590	658	710	750	804	886	944
Cooling circuits	nr.	1									
Oil-free compressors	nr.	1					2				
Compressors input current	A	97	115	131	144	162	176	182	195	216	232
Shell & tube flooded evaporator	nr.	1									
Water flow	m <sup>3</sup> /h	59,4	69,5	76,4	86,2	95,8	103,3	110,6	118,5	130,1	138,4
Pressure drop	kPa	54	42	48	46	55	48	52	38	48	54
Water cooled condenser	nr.	1									
Water flow	m <sup>3</sup> /h	69,1	81,2	89,9	101,4	113,0	121,8	128,8	138,1	152,0	162,1
Pressure drop	kPa	61	82	82	84	62	72	79	63	76	86
Sound power level	dB(A)	82	83	83	85	85	85	85	85	85	85
Dimensions											
Length	mm	2.420					2.750				
Width	mm	1.420					1.500				
Height	mm	2.070									
Weight	kg	1.780	1.810	1.930	2.665	2.730	2.840	2.895	2.950	3.065	3.065
Power supply		400 V / 3 ph / 50 Hz + T									

Model	RWC	863	923	983	1083	1183	1324	1494	1644	1804	
Cooling capacity	kW	870	920	985	1.080	1.180	1.326	1.496	1.640	1.800	
Compressors absorbed power	kW	157,8	169,8	162,3	179,7	199,8	218,8	250,8	283,6	319,2	
EER NET		5,51	5,42	6,07	6,01	5,91	6,06	5,96	5,78	5,64	
ESEER (ARI ST 555/590-98)		7,56	7,44	8,11	8,02	7,89	7,82	7,70	7,46	7,28	
Heating capacity	kW	1.028	1.090	1.147	1.260	1.380	1.545	1.747	1.924	2.119	
Cooling circuits	nr.	1					2				
Oil-free compressors	nr.	3					4				
Compressors input current	A	254	272	278	305	336	375	424	475	537	
Shell & tube flooded evaporator	nr.	1									
Water flow	m <sup>3</sup> /h	149,4	157,9	169,1	185,4	202,6	227,6	256,8	281,5	309,0	
Pressure drop	kPa	32	32	38	42	48	34	42	49	51	
Water cooled condenser	nr.	1					2				
Water flow	m <sup>3</sup> /h	176,4	187,1	197,0	216,3	236,9	265,2	299,9	330,2	363,8	
Pressure drop	kPa	86	96	28	34	34	34	61	73	87	
Sound power level	dB(A)	87	87	87	87	87	89	89	89	89	
Dimensions											
Length	mm	3.550					4.420				
Width	mm	1.600									
Height	mm	2.070									
Weight	kg	4.250	4.250	4.415	4.465	4.540	5.120	5.230	5.230	5.395	
Power supply		400 V / 3 ph / 50 Hz + T									

- Operating conditions: evaporator water temperature 7/12°C; condenser water temperature 30/35°C.
- Sound pressure level at 1 m in open field (ISO 3744).
- Unit weight including oil.
- Above data are not binding and subject to variation without prior notice.

## Main components

### FRAME

Strong and compact frame, made of painted steel profiles, supporting the exchangers of the evapo-condensers group and on which all the main components are installed at sight.

### COMPRESSORS

The two-stage oil-free centrifugal compressor (with no mechanical bearings) is provided with in-built electronic control, pressure and temperature sensors, direct cooling system and inverter for capacity regulation.

Each compressor is complete with rubber anti-vibration dampers, shut-off valves on discharge side with in-built non return valve, filter on suction side, two-stage hot gas by-pass for inrush phases, sight glass on liquid refrigerant line and shut-off valve for the controlled and direct cooling of compressor. Its peculiarity allows the continuous regulation of the cooling capacity, changing the speed of the two-stage compression device, with all the advantages of a direct current brushless motor, in which the electrical absorption reduces in a more proportional way than the loading decrease. The result is seasonal efficiency values (ESEER) remarkably high.

### EVAPORATOR

Suitably designed evaporator so to guarantee high level of EER, ESEER and IPLV. The water refrigerant exchanger is of flooded type (pool boiling evaporation), with a single refrigerant passage (shell side) and water multi-passage internal piping, able to operate with a small difference between the evaporating temperature and the outlet fluid (outlet 1 or 2°C), with very low pressure drops and overheating of 1-2°C. The exchanger is completely insulated with close cell and fire-retardant material of 10 mm thickness, protected with anti-scratch coating. The evaporator is provided with level switch and sight glass for flooding control.

### WATER COOLED CONDENSER

The water cooled condenser is of shell & tube type with two passages water side within the tubes and a single passage refrigerant side in the shell. The pipes are made in high efficiency copper and with a particular internal turning so to avoid fouling. On request, special condensers in Cu/Ni suitable for sea water could be supplied.

### COOLING CIRCUIT

Each circuit, realized with copper pipes, is mainly composed of: electronic thermostatic valve for regulation of the refrigerant flow, also when the compressor is working at partial loads, and acting as solenoid valve when completely closed, shut-off valves on compressor's suction and discharge side, non return valve on discharge side, shut-off valve on liquid line, dehydrating filter with replaceable cartridge, sight glass, hot gas by-pass line with tandem or trio compressors, liquid bleeding line for internal cooling of compressors, high and low pressure safety valve, high and low pressure gauges, high and low pressure transducers, high and low pressure switches.

### ELECTRICAL BOARD

It is included in a cabinet (IP 55), on which the LCD display is positioned. The main switch is of lock-door type and the control, safety and protection devices, the terminal board and the 24V auxiliaries are internally installed. It is also complete of a phase monitor to prevent the compressor to turn in the wrong sense, so to avoid considerable damage. On request, a double electrical supply is available, separating the three-phase supply from the low tension single-phase supply of the control circuits. This option is useful in case of UPS emergency supply.

### MICROPROCESSOR

It is made of a IN/OUT electrical board, a LCD display, key board and LED signals. This microprocessor allows the PID regulation of the evaporator outlet water temperature, the set of the operation parameters, the alarm management, the reading of the measured values (temperatures, working hours, etc) and the possibility to control them through a supervision system. It is also possible to read and to set inputs and outputs, all the operating parameters of the unit and to display all the existing alarms. The user terminal can be positioned up to 100 m far, simply removing it from the unit and using a 6-pole telephone cable, for an easier setting the unit.

## References

- Hotel Schlossallée – Vienna (Austria)
- Masdar Project – Abu Dhabi (Arab Emirates)
- H3G Headquarters– Milan (Italy)
- Kreissparkasse – Linz (Austria)



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