RWC Ka

WATER COOLED CHILLERS
WITH BRUSHLESS OIL-FREE COMPRESSORS

1 AND 2 COOLING CIRCUITS CAPACITIES FROM 280 TO 2100 KW

RWC 562 Ka

Above picture is only indicative and is not binding.

The water cooled chillers of **RWC Ka series** are designed for indoor installation and are particularly suitable for air conditioning systems, water cooling for industrial processes and wherever high efficiency at partial loads and maximum quietness must be granted. These chillers have a compact frame, inside of which the compressors, shell & tube condensers and flooded evaporator are placed, with consequent reduced overall dimensions and compact footprint. Depending on the cooling capacity, they are available with 1 or 2 cooling circuits, from 1 to 4 compressors. The units are completely assembled and tested in the factory and supplied with refrigerant and non-freezing oil charge. Therefore, once on site, the units only need to be positioned and electrically and hydraulically connected.

On request (option), the heat pump version (PWC) with switchover on water side is also available; for further details, you are kindly invited to get in touch with Emicon sales staff.

Operation limits (standard units):
EVAPORATOR (OUT): Max inlet temperature 25°C
CONDENSER (OUT): Min./Max. inlet temperature 20°C/50°C

MAIN COMPONENTS
Strong and compact **frame**, mainly made of two front steel structural plates supporting the exchangers and carbon steel structurals, all painted with high thickness epoxy powders of RAL 5015 colour.

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 valve on suction side, 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 remarkably high seasonal efficiency values (ESEER).

Suitably designed **evaporator** so to guarantee high level of E.E.R., E.S.E.E.R. and I.P.L.V. The water-refrigerant exchanger is of flooded type, with a single refrigerant passage (shell side) and water multi-passage internal piping, able to operate with a small difference between the evaporating and the outlet fluid temperature, with very low pressure drops and overheating values.

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.

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 helicoidal turning so to have high exchange coefficient values and 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 with in-built microprocessor and display 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 discharge and suction 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, pressure measurement plugs, high and low pressure gauges for refrigerant, high and low pressure transducers, high and low pressure switches.

Electrical board: It is installed on the front side and is contained in a cabinet IP 54 protection, realized with a double door with outside sealing and mechanical lock-door main switch. The LCD display is frontally positioned 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 damages.
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.
Allowed temperature range from 0°C to +50°C.

Microprocessor: It is made of a IN/OUT electronic 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.

ACCESSORIES

- **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).
- **CF** **Soundproofed compressors cabinet with standard material:** realized by sandwich panels of remarkable thickness and filled with glass fiber insulating material so to reduce the sound level of the unit.
- **DR** **Refrigerant leakage detector:** this device immediately detects eventual refrigerant leakages in the unit.
- **FL** **Mechanical flow** switch on water side, made of a paddle device for monitoring the proper water flow rate through the evaporator.
- **GSM** **SMS Data transmission card** for unit supervision through a mobile telephone line. In this way, you can completely and remotely supervising the unit through a mobile phone, receiving SMS for diagnostics.
- **KWP** **Device for electrical power measurement**, for measuring and recording the active and reactive power.
- **IH** **RS 485 serial interface:** electronic card to be connected to microprocessor, to allow communication between the units and a Modbus 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.
- **PA** **Rubber-type vibration dampers:** Bell-shaped vibration dampers supports for insulating the unit (supplied in kit), made of base and bell in galvanized steel and natural rubber mixture.
- **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 microprocessor:** remote terminal, 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 within 2 minutes from the return of power supply after electrical black-out.
- **RA** **Anti-freeze heater on evaporator:** Electrical heater installed on the evaporator, in order to prevent freezing and provided with thermostat.
- **RF** **Power factor correction system cosfi >0,9:** Electrical device made of suitable condensers for compressors rephasing, ensuring a cosfi value ≥0,9, so to reduce the power absorption from the electrical network.
- **RL** **Compressors overload relays:** Electromechanical protection devices against compressor's overload.
- **RT** **Total condensing heat recovery** realized by double water circuit shell & tube condensers (one circuit for condensing heat waste and the other connected to heat recovery). In this case, the unit is provided with double temperature probes, reading the temperature differences both on cooling and heating circuit. The heat recovery is always bound to the simultaneous production of chilled water.
- **V** **Voltmeter:** Electrical device measuring the electrical tension in the power supply of the unit.
- **VP** **2-way pressostatic valve** well side for condensing control. It is normally provided with hydraulic socket placed at the condenser water inlet and still ready to use. The opening of the valve (or of the servo-controlled valve for the bigger diameters) is proportional to the increase of the condensing pressure. This valve is not suitable for seawater.

Technical data sheet - RWC 281-812 Ka

RWC		281 Ka	351 Ka	401 Ka	451 Ka	502 Ka	562 Ka	602 Ka	652 Ka	702 Ka	752 Ka	812 Ka
Cooling capacity												
Cooling capacity	kW	282,2	349,3	405,8	451,6	502,7	558,1	604,9	651,8	705,0	754	812
Absorbed power	kW	52,5	62,9	75,2	87,9	91,4	103,8	116,6	117,6	127	136,8	149,8
EER		5,38	5,55	5,40	5,14	5,50	5,38	5,19	5,54	5,55	5,51	5,42
ESEER		8,37	8,44	8,65	8,66	8,54	8,70	8,71	8,52	8,54	8,54	8,65
Centrifugal compressors two stage oil free												
Quantity	n	1	1	1	1	2	2	2	2	2	2	2
Circuits	n	1	1	1	1	1	1	1	1	1	1	1
Nominal absorbed current	A	84,4	105,4	124,1	143,5	148,4	167,0	186,0	198,6	212,6	227,4	247,2
Maximum absorbed current	A	135,0	210,0	210,0	210,0	270,0	270,0	270,0	420,0	420,0	420,0	420,0
Evaporator												
Quantity	n	1	1	1	1	1	1	1	1	1	1	1
Water flow rate	m^3/h	48,5	60,0	69,7	77,5	86,3	95,8	103,8	111,9	121,0	129,4	139,3
Water flow rate	l/s	13,5	16,7	19,3	21,5	24,0	26,6	28,8	31,1	33,6	36,0	38,7
Pressure drop	kPa	28	42	36	34	46	74	86	75	87	79	91
Water volume	l	65	65	79	95	127	127	127	127	127	148	148
Water cooled condenser												
Quantity	n	1	1	1	1	1	1	1	1	1	1	1
Water flow rate	m^3/h	57,5	70,8	82,6	92,6	102,0	113,6	123,8	132,1	142,8	152,9	165,0
Water flow rate	l/s	16,0	19,7	22,9	25,7	28,3	31,6	34,4	36,7	39,7	42,5	45,8
Pressure drop	kPa	24	31	34	27	36	42	54	57	66	46	47
Water volume	l	40	45	57	61	62	66	68	72	72	94	104
Sound power level ISO 3744												
Sound power level	dB(A)	83	83	83	85	85	85	85	85	85	85	85
Dimensions												
Lenght	mm	2.420	2.420	2.420	2.750	2.750	2.750	2.750	2.750	2.750	2.750	2.750
Width	mm	1.500	1.500	1.500	1.500	1.500	1.500	1.500	1.500	1.500	1.500	1.500
Height	mm	2.070	2.070	2.070	2.070	2.070	2.070	2.070	2.070	2.070	2.070	2.070
Transport weight 3)	kg	1.810	1.885	1.930	2.665	2.730	2.840	2.895	2.950	2.950	3.065	3.065
Power supply												
Power supply	V / ph / Hz	400 V / 50 Hz / 3 Ph + T										
NOTES												
1) Nominal conditions referred to: chilled water 7/12 °C - condensing water 30/35 °C.												
3) Refrigerant charge included.												

Technical data sheet - RWC 863-2104 Ka

RWC		863 Ka	923 Ka	983 Ka	1083 Ka	1183Ka	1374 Ka	1504 Ka	1704 Ka	1804 Ka	2004 Ka	2104 Ka
Cooling capacity												
Cooling capacity	kW	863	920	984	1080	1182	1372	1500	1700	1802	2011	2104
Absorbed power	kW	161,7	177,9	177,0	194,7	216,3	246,8	272,0	320,8	354,4	372,4	400,4
EER		5,33	5,17	5,56	5,55	5,47	5,56	5,51	5,30	5,08	5,40	5,26
ESEER		8,55	8,78	8,58	8,47	8,32	8,45	8,54	8,52	8,44	8,64	8,52
Centrifugal compressors two stage oil free												
Quantity	n	3	3	3	3	3	4	4	4	4	4	4
Circuits	n	1	1	1	1	1	1	1	1	1	1	1
Nominal absorbed current	A	259,2	283,5	298,5	325,5	358,2	414,4	452,4	526,4	578,4	588,8	632,4
Maximum absorbed current	A	405	405	630,0	630,0	630,0	840,0	840,0	840,0	840,0	680,0	680,0
Evaporator												
Quantity	n	1	1	1	1	1	1	1	1	1	1	1
Water flow rate	m^3/h	148,1	158,0	168,9	185,4	202,9	235,5	257,4	291,8	309,4	345,2	361,3
Water flow rate	l/s	41,1	43,9	46,9	51,5	56,4	65,4	71,5	81,1	85,9	95,9	100,4
Pressure drop	kPa	97	110	75	89	106	31	37	44	50	87	95
Water volume	l	205	205	256	256	256	308	308	324	324	343	343
Water cooled condenser												
Quantity	n	1	1	1	1	1	2	2	2	2	2	2
Water flow rate	m^3/h	175,8	188,5	199,3	218,8	240,0	277,8	304,1	346,8	370,1	409,0	429,9
Water flow rate	l/s	48,8	52,4	55,4	60,8	66,7	77,2	84,5	96,3	102,8	113,6	119,4
Pressure drop	kPa	53	41	45	54	70	46	46	51	39	87	83
Water volume	l	104	117	117	117	146	84	94	104	117	119	130
Sound power level ISO 3744												
Sound power level	dB(A)	87	87	87	87	87	89	89	89	89	92	92
Dimensions												
Lenght	mm	3.550	3.550	3.550	3.550	3.550	4.420	4.420	4.420	4.420	4.420	4.420
Width	mm	1.600	1.600	1.600	1.600	1.600	1.600	1.600	1.600	1.600	1.600	1.600
Height	mm	2.070	2.070	2.070	2.070	2.070	2.070	2.070	2.070	2.070	2.070	2.070
Transport weight 3)	kg	4.250	4.250	4.415	4.465	4.540	5.120	5.230	5.230	5.395	5.230	5.395
Power supply												
Power supply	V / ph / Hz	400 V / 50 Hz / 3 Ph + T										
NOTE												
1) Nominal conditions referred to: chilled water 7/12 °C - condensing water 30/35 °C.												
3) Refrigerant charge included.												