

RWH Ka

WATER COOLED CHILLERS WITH SCREW COMPRESSORS

RWH Ka SERIES REFRIGERANT R134a



Above picture is only indicative and is not binding.



The well or cooling tower water cooled chillers of **RWH Ka series** are designed for indoor installation and are particularly suitable for industrial processes or air conditioning systems, where it is necessary to ensure excellent seasonal performance and low environmental impact. Depending on the cooling capacity, they are available with 1 or 2 independent cooling circuits. Thanks to the several options available, these units are particularly flexible and can be easily adapted to all installation sites, where it is necessary to produce chilled water. They 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.

The following is available with refrigerant R134a (Ka):

RWH...Ka – standard version

Water operation limits (standard units):
 EVAPORATOR (outlet water) : from 5 to 15°C
 CONDENSER (outlet water) : from 30 to 58°C

Main components:

Strong and compact frame, made of bended and coloured steel profiles (colour RAL 9004-black), supporting the exchangers of the evapo-condensers group and on which all the main components are installed at sight. On request, the compressors can be isolated by a soundproofing cabinet with standard material (option CF) or with double thickness material and mufflers on compressors discharge (option CFU), so to further reduce the overall sound level of the unit itself.

Semi-hermetic screw compressors equipped with capacity steps, motor thermal protection, control of the rotation sense, oil crankcase heater, shut-off valve on discharge side and anti-vibration mountings. The compressors lubrication is of forced type, with no pump and in order to prevent many oil migrations to the cooling circuit, the compressors are provided with an oil separator, in-built to the discharge side, an optical electronic pressure switch for checking the oil level. The electrical motor is provided with an automatic system for partial load start and for mechanical lock of the inrush remote control switches, so to avoid accidental short-circuits (standard provided for size 281 Ka – 321 Ka – 361 Ka – 452 Ka – 562 Ka – 642 Ka and 732 Ka. Option DS for other sizes).

LIQUID CHILLERS - WATER COOLED

The cooling capacity could be regulated by steps (standard) or modulated (option M12÷25).

Dry expansion shell and tube evaporator with one or two refrigerant circuits and one water circuit. Realized with pure electrolytic copper tubes, tubes plate made in carbon steel, it is insulated by close-cell polyurethane foam material and external UV ray-proof scratch jacket. Some plastic and corrosion-proof baffles are suitably placed inside the shell, allowing a correct water distribution and making the tube bundle particularly strong and vibration-free, also in case of very high water flows. The evaporator is also equipped with safety water flow switch switching off the unit in case of low water flow through the evaporator and with Victaulic joints. Exchanger design pressure water side: 10 bar.

Shell and tube condenser with one cooling and one water circuit. Realized with high performance special copper pipes, externally finned and internally grooved to increase the heating exchange coefficient, keeping a low fouling factor. It is equipped with Victaulic joints and it could be hydraulically connected to well or cooling tower water systems.

Cooling circuit made of copper or carbon steel tube, it is composed of electronic thermostatic expansion valve, dehydrating filter with interchangeable cartridges, sight glass, high and low pressure safety device, high and low pressure switches, high and low pressure gauges, shut-off valve on liquid line, in-built non-return valve on discharge side. Each compressor works on an independent cooling circuit, assuring a remarkable liability to two-circuit units.

Electric board in compliance with CE standards, contained in a suitable partition protected by the internal safety panel, provided with a lock-door main switch. Inside, it is complete with all control and protection switches, the terminal board and auxiliaries. The electrical board also includes the control device for power supply phases, to prevent the compressor to turn in the wrong sense. The microprocessor, complete with display, is also placed inside the electrical board.

Unit management microprocessor installed inside the electrical board, controlling the chilled water temperature regulation, the working parameters, auto-detection failure system, alarm history, rotation between units, after a pre-set time, remote management and supervision, complete with compressors hour counter.

OPTIONS

- A Amperometer:** Electrical device for measuring the intensity of electrical current absorbed by the unit.
- AE Electrical power supply** different from standard: mainly, 230V triphase, 460V triphase. Frequency 50/60 Hz.
- CA Condenser suitable for seawater:** made in cupro-nichel or titanium, to be selected on request, suitable for working with seawater.
- CF Soundproofed compressors cabinet with standard material:** Insulation of compressors by a cabinet made of extruded anodized aluminum profiles, with panels in aluminum alloy, coated with soundproofing material.
- CFU Soundproofed compressors cabinet with bituminous rubber coated material:** Insulation of compressors by a cabinet made of

- extruded anodized aluminum profiles, with panels in aluminum alloy, coated with double thickness soundproofing material.
- CS Compressors inrush counter:** Electromechanical device positioned inside the electrical board, recording the total inrush starts of compressors.
- DS Star/delta:** electric device of close transition type to reduce the inrush current, complete with short circuit safety by mechanical interlock.
- FL Mechanical paddle flow switch:** on water side, for monitoring the correct water flow through the evaporator.
- 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 supervision system. It is possible to fully control the unit from remote. (Alternative to IH LON or IWG)
- IH LON Protocol serial interface:** Electronic card to be connected to the microprocessor to allow connection of the units to supervision systems with LON protocol, for a remote control and monitoring of the unit. (Alternative to IH or IWG).
- IM Seawood packing:** Fumigated seawood case and film envelope together added with slowly vaporizing corrosion inhibitors completely nitrates and heavy metals (VCI) free suitable for long sea transports.
- IWG SNMP or TCP/IP Protocol serial interface:** Electronic card to be connected to the microprocessor to allow connection of the units to supervision systems with SNMP or TCP/IP protocol, for a remote control and monitoring of the unit. (Alternative to IH or IH LON).
- LR Liquid receiver** suitably sized to contain the exceeding quantity of liquid refrigerant.
- M12÷M25 Modulating capacity control:** made by means of some valves installed on compressors, depending on their quantity.
- 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.
- 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 cosφ >0,9:** Electrical device made of suitable condensers for compressors rephasing, ensuring a cosφ value =0,9, so to reduce the power absorption from the electrical network.
- RH Shut-off valve on suction side:** they are used to isolate compressors during service operations.
- RL Compressors overload relays:** electromechanical protection devices against compressor's overload.
- RP Partial heat recovery** 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.

LIQUID CHILLERS - WATER COOLED

- RT Total heat recovery** (100%) of the condensing heat, by means of a double condenser, in parallel to the water cooled condenser. It is requested when you need to produce sanitary water or heating by recovering condensing heat capacity. Exchangers are isolated by material of 10 mm thickness.
- V Voltmeter:** Electrical device measuring the electrical tension in the power supply of the unit.
- VB Brine version:** unit suitable for working with evaporator outlet water temperatures lower than 0°C. A 20 mm evaporator insulation will be provided.
- VCP Regulation valve** of condensation pressure through the mixing on condenser water side. (Supplied loose - Alternative to VP)
- VP Pressostatic valve:** it is placed on condenser water side and controls the water flow rate according to the unit condensing pressure. (Supplied loose - Alternative to VCP)
- VS Solenoid valve:** electromagnetic solenoid valve on each cooling circuit to prevent refrigerant migrations and consequent flooding of compressors.

LIQUID CHILLERS - WATER COOLED

Technical data - RWH 281-551 Ka

RWH		281	321	361	421	452	491	562	551
Cooling capacity									
Cooling capacity 1)	kW	279,9	321,1	365,5	424,4	448,6	489	558,3	551,4
Absorbed power	kW	56,4	64,7	74,2	86,2	94,4	97,4	111,9	113,3
EER		4,96	4,96	4,93	4,92	4,75	5,02	4,99	4,87
Compressors									
Quantity	n	1	1	1	1	2	1	2	1
Standard steps capacity	n	3	3	3	3	6	3	6	3
Circuits	n	1	1	1	1	2	1	2	1
Nominal absorbed current	A	94,6	51,5	64,0	68,8	92,3	107,8	139,7	166,6
Maximum absorbed current	A	180	198	221	283	320	315	360	356
Inrush current	A	434	530	587	436	486	465	528	586
Evaporator									
Quantity	n	1	1	1	1	1	1	1	1
Circuits	n	1	1	1	1	2	1	2	1
Water flow rate	m ³ /h	48	55,1	62,7	72,8	77	83,9	95,8	94,6
Water flow rate	l/s	13,3	15,3	17,4	20,2	21,3	23,3	26,6	26,3
Pressure drop	kPa	43	47	43	50	41	48	32	36
Condenser									
Quantity	n	1	1	1	1	2	1	2	1
Water flow rate	m ³ /h	58,3	66,8	76,1	88,4	94,1	101,5	116,1	115
Water flow rate	l/s	16,2	18,6	21,1	24,6	26,1	28,2	32,3	31,9
Pressure drop	kPa	15,6	18	22,3	29,9	22,7	19,9	32,1	23,9
Sound pressure level									
Sound pressure level 2)	dB(A)	75,5	75,7	75,6	75,7	75,4	75,4	78	75,7
Dimensions									
Length	mm	3600	3600	3600	3600	4100	3600	4100	3800
Width	mm	1320	1320	1320	1320	1350	1500	1350	1500
Height	mm	1500	1500	1500	1500	1700	1950	1700	1950
Transport weight 3)	kg	1953	2024	2061	2713	2541	2957	3327	3026
Weight in operation	kg	2120	2197	2234	2882	2781	3205	3569	3275
Refrigerant charge for each circuit	kg	79	77	76	78	53,5	102	53,4	103,8
Power supply									
Power supply	V / ph / Hz	400 V / 50 Hz / 3 Ph + T + N							
NOTES									
1) Nominal conditions referred to: chilled water 7/12 °C - condensing water 30/35 °C									
2) Measured at 1 m in open field (ISO 3746).									
3) Oil and refrigerant charge included.									

LIQUID CHILLERS - WATER COOLED

Technical data - RWH 601-1202 Ka

RWH		601	642	732	852	992	1102	1202
Cooling capacity								
Cooling capacity 1)	kW	601,5	645,8	731,4	848,3	994,3	1111,3	1227,6
Absorbed power	kW	124,1	129,9	148,1	170,3	192,8	226,2	245,8
EER		4,85	4,97	4,94	4,98	5,16	4,91	4,99
Compressors								
Quantity	n	1	2	2	2	2	2	2
Standard steps capacity	n	3	6	6	6	6	6	6
Circuits	n	1	2	2	2	2	2	2
Nominal absorbed current	A	212,9	221,1	248,8	297,3	317,8	391,7	422,3
Maximum absorbed current	A	427	396	442	566	630	712	854
Inrush current	A	650	641	714	583	626	777	875
Evaporator								
Quantity	n	1	1	1	1	1	1	1
Circuits	n	1	2	2	2	2	2	2
Water flow rate	m ³ /h	103,2	110,8	125,5	145,6	170,7	190,7	210,7
Water flow rate	l/s	28,7	30,8	34,9	40,4	47,4	53,0	58,2
Pressure drop	kPa	44	32	38	48	57	69	77
Condenser								
Quantity	n	1	2	2	2	2	2	2
Water flow rate	m ³ /h	125,6	134,2	152,2	176,2	205,4	231,5	254,9
Water flow rate	l/s	34,9	37,3	42,3	48,9	57,1	64,3	70,8
Pressure drop	kPa	28,8	38,7	30,8	36,5	43,3	50,1	36,3
Sound pressure level								
Sound pressure level 2)	dB(A)	77,8	77,6	77,8	77,8	77,7	78,1	78,8
Dimensions								
Length	mm	3800	4150	4200	4200	4200	4200	4200
Width	mm	1500	1650	1650	1650	1650	1650	1650
Height	mm	1950	2000	2000	2000	2250	2250	2250
Transport weight 3)	kg	3057	3846	4049	5407	5637	5716	5867
Weight in operation	kg	3293	4208	4448	5814	6091	6161	6351
Refrigerant charge for each circuit	kg	106	56	106	104,5	103	105,5	108
Power supply								
Power supply	V / ph / Hz	400 V / 50 Hz / 3 Ph + T + N						

NOTES

- 1) Nominal conditions referred to: chilled water 7/12 °C - condensing water 30/35 °C
- 2) Measured at 1 m in open field (ISO 3746).
- 3) Oil and refrigerant charge included.