

RWC Ke/Kh



CLIMATE DESIGN

WATER COOLED CHILLERS WATER CONDENSED FOR INDOOR INSTALLATION
EQUIPPED WITH BRUSHLESS OIL-FREE TURBOCOR COMPRESSORS

Cooling capacity from 210 kW to 1800 kW

R513A

R1234
ze



H2O



ERP
2021



The monoblock air-cooled chillers of RWC series are suitable for external installation and are particularly indicated for liquid cooling in air conditioning and industrial process plants, where high efficiency with partial loads, quietness and long lifetime must be granted.

Units are equipped with magnetic levitation centrifugal compressors and flooded shell and tube evaporator. The magnetic levitation technology means that there is no mechanical friction in the compressor, allowing oil-free refrigeration circuits.

All the units are totally factory assembled and tested following specific quality procedures. They are also totally hydraulically and electrically connected so, once

on site, they can be quickly installed. Before final test, cooling circuits are pressure tightness tested and charged with the refrigerant. Therefore, once on site, the units must only be positioned and hydraulically and electrically connected.

COMPONENTS

FRAME

Robust and compact supporting structure, built with folded and painted steel profiles that integrates the exchangers of the evaporator and tube bundle condenser unit and on which all components are mounted. On demand, the compressors can be acoustically insulated with a cabinet covered with a standard sound-proofed material or with a double thickness sound-proofing material to further reduce the unit sound level.

COMPRESSORS

Double-stage, magnetic-levitation centrifugal hermetic Compressors (without mechanical bearings). They are oil-free and provided with in-built electronic management system, pressure and temperature probes, direct-cooling system and inverter for speed regulation. Each compressor is equipped with rubber type anti-vibration dampers, suction side shut-off valve, discharge side shut-off valve with in-built check valve, suction filter, double stage hot gas by-pass system for start phases, liquid refrigerant line with sight-glass and valve for compressor direct and controlled cooling. Compressors are suitably weather protected, being installed inside a sealed and sound-proof cabinet, easy to be inspected thanks side panels provided with ¼ turn locks which can be opened through special keys. The electrical cabinet with interlocked double panels can be opened by an external main switch positioned on the unit front side.

EVAPORATOR

Shell & tube flooded (Falling Film) Evaporator. Refrigerant is outside the tubes and inside a carbon steel shell; the flooding level is controlled by an electronic sensor which grants the max efficiency at any load condition. Refrigerant side design pressure is 16,5 bar. Water side one is 10 bar. The exchange tube, the chilled solutions (water or glycol solutions) flows in, is made up of pure corrugated copper to optimize thermal exchange. The exchange shell is covered by 10 mm thickness, fire retardant, closed cell material and protected by scratch-resistant coating. Hydraulic connections are of Victaulic type.

CONDENSER

The units are equipped with shell and tube condenser with two water-side and one refrigerant-side passages. Made from copper tubing and built in such a way as to ensure high efficiency for the entire life of the exchanger: in fact, the tube is equipped with a special spiral which stops incrustation forming.

The discharge gas from all compressors enters the top of the vessel and surrounds the tube bundle. As the cooling tower water passes through the tube bundle, the refrigerant surrounding the tube bundle changes state from a high-temperature, high pressure superheated vapour to a high pressure, sub-cooled liquid.

COOLING CIRCUITS

Each cooling circuit is equipped with the following elements: filter drier, sight glass, electronic thermostatic valve, high and low pressure safety valves, shut-off valve on liquid line, non-return valve on compressor discharge, high and low pressure gauges, high and low pressure switches, temperature probes to evaporator inlet and outlet. The above-mentioned components are connected in a close circuit through copper pipes and connections. The permanent junctions among components are made by brazing or welding, following processes and made by qualified staff.

ELECTRIC BOARD

The electrical cabinet of the unit, is realized in compliance with current European Standards inside a metal compartment with protection degree IP54 suitable for external installation and separated from airflow.

The main features are: three-phase power supply 400V/3ph/50Hz on all models (if not differently required); low voltage auxiliary circuit 24Vac with insulation transformer; lockable mechanical main switch; protection automatic switches; terminal box for signal and management free-contacts.

The opening panel of the a.m electrical cabinet is equipped with main switch. Inside the compartment the following main components are also installed: contactors; automatic overload protection switches; transformers; numbered wires; low voltage auxiliary circuit; terminals; management and control electronic cards.

MICROPROCESSOR

All the units are subject to a safety cycle with continuity tests on the protection circuit, insulation resistance and tension test (dielectric strength). The unit management is realized by the management program uploaded in the electronic microprocessor. The microprocessor is made up of: an electronic control board with terminals for working parameters transmission and control devices activation, a user interface board with programming buttons and graphic display to show operation status and alarms. The electronic control board manages all the devices installed in the unit based on the values of the operation variables, with the following main functions: unit ON/OFF from board or from remote position, management and storage of alert and alarm status. The user interface display of the microprocessor allows also to see the following information: working parameters set values, functional variables values; analogue and digital inputs and outputs status, unit operation status, alert and alarm indications. Possibility to interface EMS/BMS management systems.

ACCESSORIES

RWC		211	311	371	591	422	622	742	1182
Insulated condensers	CC	o	o	o	o	o	o	o	o
Insulation of compressors by a cabinet with soundproofing material	CF	o	o	o	o	o	o	o	o
Mechanical flow switch	FL	o	o	o	o	o	o	o	o
RS 485 Serial interface	IH	o	o	o	o	o	o	o	o
BAC-NET Serial interface	IH-BAC	o	o	o	o	o	o	o	o
Rubber-type vibration dampers	PA	o	o	o	o	o	o	o	o
Safety water flow switch	PF	o	o	o	o	o	o	o	o
Spring-type vibration dampers	PM	o	o	o	o	o	o	o	o
Remote display	PQ	o	o	o	o	o	o	o	o
Pressostatic valve for condensing control	VP	o	o	o	o	o	o	o	o
RWC		633	933	1113	1773	844	1244	1484	
Insulated condensers	CC	o	o	o	o	o	o	o	
Insulation of compressors by a cabinet with soundproofing material	CF	o	o	o	o	o	o	o	
Mechanical flow switch	FL	o	o	o	o	o	o	o	
RS 485 Serial interface	IH	o	o	o	o	o	o	o	
BAC-NET Serial interface	IH-BAC	o	o	o	o	o	o	o	
Rubber-type vibration dampers	PA	o	o	o	o	o	o	o	
Safety water flow switch	PF	o	o	o	o	o	o	o	
Spring-type vibration dampers	PM	o	o	o	o	o	o	o	
Remote display	PQ	o	o	o	o	o	o	o	
Pressostatic valve for condensing control	VP	o	o	o	o	o	o	o	

• Standard, o Optional, -- Not available

TECHNICAL DATA

RWC Kh		221	311	442	622	663	933	884	1244
Cooling capacity	kW	220,0	310,0	442,0	623,0	667,0	933,0	884,0	1247,0
Total input power	kW	37,6	49,4	76,1	99,8	113,7	149,2	151,2	198,6
Nominal input current	A	63,2	83,2	128,1	168,0	191,3	251,2	254,5	334,3
EER Gross	W/W	5,86	6,28	5,81	6,24	5,87	6,25	5,85	6,28
EER Net	W/W	5,86	6,28	5,81	6,24	5,87	6,25	5,85	6,28
Circuits	n°	1	1	1	1	1	1	1	1
Compressors	n°	1	1	2	2	3	3	4	4
Compressor input power		37,6	49,4	76,1	99,8	113,7	149,2	151,2	198,6
Refrigerant data R1234ze									
Refrigerant charge	kg	191	300	332	446	446	690	517	863
Global warming potential (GWP)		6	6	6	6	6	6	6	6
Equivalent CO ₂ charge	t	1,1	1,8	2,0	2,7	2,7	4,1	3,1	5,2
Condenser ⁽¹⁾									
Quantity	n°	1	1	1	1	1	1	1	1
Flow rate	m ³ /h	44,4	61,9	89,2	124,5	134,4	186,4	178,3	248,9
Total input current	kW	56	52	57	52	54	34	32	47
Evaporator ⁽²⁾									
Quantity	n°	1	1	1	1	1	1	1	1
Flow rate	m ³ /h	37,9	53,4	76,1	107,3	114,9	160,7	152,2	214,7
Pressure drop	kPa	30	34	36	23	24	30	25	47
Weight									
Transport weight	kg	1400	1929	1821	2993	3050	4057	3708	5496
Operating weight	kg	1514	2096	1999	3297	3354	4480	4090	6018
Dimensions									
Length	mm	2750	2750	3550	3550	3550	3550	4400	4400
Width	mm	1500	1500	1500	1500	1870	1870	1950	1950
Height	mm	2270	2270	2270	2270	2350	2350	2500	2500
Sound data									
Total LWA ⁽³⁾	dB(A)	90,5	91,3	93,8	94,6	96,1	96,3	99,0	99,0
Total SPL 10m ⁽⁴⁾	dB(A)	58,5	59,3	61,7	62,5	62,5	64,2	66,7	66,7
Power supply									
Voltage/phase/frequency	V/ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
General electrical data									
Maximum input power	[kW]	165	228	330	456	495	684	660	912
Maximum input current	[A]	**	**	**	**	**	**	**	**

(1) Fluid: Water - In/out Temperature: 30/35°C

(2) Fluid: Water - In/out Temperature: 12/7°C

(3) Sound power level in accordance with ISO 3744.

(4) Sound pressure level at 10m from the unit in free field conditions, in accordance with ISO 3744

RWC Ke		211	311	371	591	422	622	742	1182
Cooling capacity	kW	210,0	310,0	370,0	590,0	420,0	620,0	740,0	1180,0
Total input power	kW	37,1	54,5	65,6	102,7	74,2	109,1	131,2	205,4
Nominal input current	A	62,5	91,8	110,4	172,9	124,9	183,6	220,9	345,8
EER Gross	W/W	5,66	5,68	5,64	5,74	5,66	5,68	5,64	5,74
EER Net	W/W	5,66	5,68	5,64	5,74	5,66	5,68	5,64	5,74
Circuits	n°	1	1	1	1	1	1	1	1
Compressors	n°	1	1	1	1	2	2	2	2
Compressor input power	kW	37,1	54,5	65,6	102,7	74,2	109,1	131,2	205,4
Refrigerant data R513A									
Refrigerant charge	kg	191	300	298	476	332	446	509	679
Global warming potential (GWP)		573	573	573	573	573	573	573	573
Equivalent CO ₂ charge	t	109,4	171,9	170,8	272,7	190,2	255,6	291,7	389,1
Condenser ⁽¹⁾									
Quantity	n°	1	1	1	1	1	1	1	1
Flow rate	m ³ /h	42,6	62,8	75,0	119,3	85,1	125,5	150,0	238,6
Total input current	kW	56	52	40	50	57	52	64	42
Evaporator ⁽²⁾									
Quantity	n°	1	1	1	1	1	1	1	1
Flow rate	m ³ /h	36,2	53,4	63,7	101,6	72,3	106,8	127,4	203,2
Pressure drop	kPa	30	34	36	36	36	23	25	35
Weight									
Transport weight	kg	1388	1929	2197	3323	1797	2993	3565	4826
Operating weight	kg	1502	2096	2414	3651	1975	3297	3904	5358
Dimensions									
Length	mm	2750	2750	2750	2750	3550	3550	3550	3550
Width	mm	1500	1500	1500	1500	1500	1500	1500	1500
Height	mm	2270	2270	2270	2270	2270	2270	2270	2270
Sound data									
Total LWA ⁽³⁾	dB(A)	90,5	91,3	96,5	98,6	93,8	94,6	98,6	98,9
Total SPL 10m ⁽⁴⁾	dB(A)	58,5	59,3	64,5	66,6	61,7	62,5	66,5	66,7
Power supply									
Voltage/phase/frequency	V/ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
General electrical data									
Maximum input power	[A]	160	231	187	216	160	231	374	432
Maximum input current	[A]	**	**	**	**	**	**	**	**

RWC Ke		633	933	1113	1773	844	1244	1484
Cooling capacity	kW	630,0	930,0	1110,0	1770,0	840,0	1240,0	1480,0
Total input power	kW	111,3	163,6	196,8	320,4	148,4	218,1	265,6
Nominal input current	A	187,4	275,4	331,3	539,4	249,8	367,2	447,2
EER Gross	W/W	5,66	5,68	5,64	5,52	5,66	5,68	5,57
EER Net	W/W	5,66	5,68	5,64	5,52	5,66	5,68	5,57
Circuits	n°	1	1	1	1	1	1	1
Compressors	n°	3	3	3	3	4	4	4
Compressor input power	kW	111,3	163,6	196,8	320,4	148,4	218,1	265,6
Refrigerant data R513A								
Refrigerant charge	kg	446	690	676	796	517	863	796
Global warming potential (GWP)		573	573	573	573	573	573	573
Equivalent CO ₂ charge	t	255,6	395,4	387,3	456,1	296,2	494,5	456,1
Condenser ⁽¹⁾								
Quantity	n°	1	1	1	1	1	1	1
Flow rate	m ³ /h	127,7	188,3	225,0	360,0	170,2	251,1	300,6
Total input current	kW	54	34	40	95	32	47	70
Evaporator ⁽²⁾								
Quantity	n°	1	1	1	1	1	1	1
Flow rate	m ³ /h	108,5	160,1	191,1	304,8	144,6	213,5	254,9
Pressure drop	kPa	24	30	26	66	25	47	47
Weight								
Transport weight	kg	3014	4057	5024	5836	3660	5496	5932
Operating weight	kg	3318	4480	5547	6440	4042	6018	6536
Dimensions								
Length	mm	3550	3550	3550	4400	4400	4400	4400
Width	mm	1870	1870	1870	1950	1950	1950	1950
Height	mm	2350	2350	2350	2500	2500	2500	2500
Sound data								
Total LWA ⁽³⁾	dB(A)	96,1	96,3	97,5	99,6	99,0	99,0	102,0
Total SPL 10m ⁽⁴⁾	dB(A)	62,5	64,2	65,4	67,3	66,7	66,7	69,7
Power supply								
Voltage/phase/frequency	V/ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
General electrical data								
Maximum input power	[A]	160	231	561	648	640	924	748
Maximum input current	[A]	**	**	**	**	**	**	**

