

RWH VS Ke/Kh

**WATER COOLED CHILLERS WATER CONDENSED FOR INDOOR INSTALLATION
EQUIPPED WITH SCREW COMPRESSORS FULL INVERTER
AND SHELL AND TUBE EXCHANGER**

Cooling capacity from 269 kW to 2020 kW

R513A

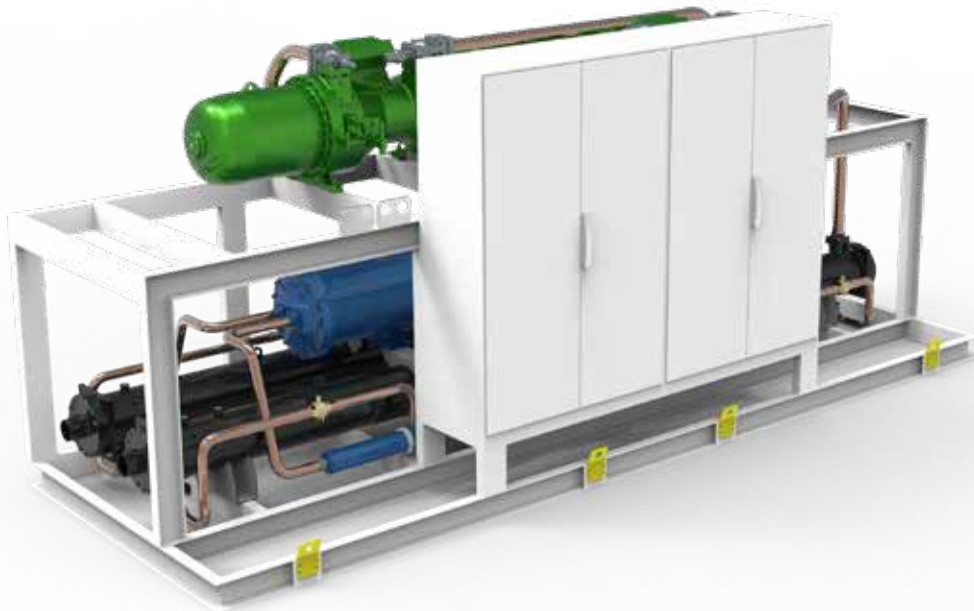
R1234
ze



H2O



ERP
2021



VERSIONS

RWH VS - standard version

The modular water cooled chillers of RWH...VS KE series are suitable for external installations and are particularly indicated to cool fluid solutions for industrial applications or air conditioning systems of commercial sector, where it is necessary to grant a very low environmental impact, class A efficiency and the compliance with the seasonal efficiency requirements specified on the EU Regulation 2016/2281.

The units of this series are equipped with two semi-hermetic screw compressors; each one provided with constant control of the cooling capacity through dedicated external inverter, each compressor operates on a single independent circuit thus ensuring the highest reliability.

All the units are totally factory assembled and tested, following specific quality procedures. Besides, they are hydraulic, cooling and electrical connected allowing a quick installation once on site. Before the test, the cool-

ing circuits of each unit are subjected to a pressure test and then charged with refrigerant and non-freezing oil. Therefore, once on site, the units must only be positioned and electrically and hydraulically connected.

Units CE certified in compliance with the European regulation 2016/2281 ERP 2021.

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 semi-hermetic screw type with INVERTER

Compressors of semi-hermetic screw type, controlled by integrated frequency inverter, allowing to adapt the power to the load variations ensuring at the same time the maximum efficiency at different operating conditions. The compressors are provided with motor thermal protection, rotation direction control, crankcase heater, oil filter, oil service valve, POE oil charge and vibration dumpers kit. Compressors lubrication is of forced type without pump, to avoid excessive oil migrations to the cooling circuit, compressors are equipped with an oil separator on discharge side. Both compressors are equipped with an oil flow safety switch, an optoelectronic device operating in case the oil flow inside the compressor falls below the minimum threshold.

EVAPORATOR

Tube bundle type with dry expansion and pure electrolytic copper tubes, shell and tube plate made up of carbon steel. The exchanger is provided with anti-condensation insulation made up of a nitrile rubber and polyethylene foam with a thickness of 8mm externally protected by an embossed scratchproof polyethylene film. The hydraulic connection are of elastic Victaulic type. Inside the shell, some plastic and corrosion-proof baffles, allowing a correct water distribution and making the tube bundle particularly strong and vibration free, even with high water flows. The evaporator is also provided with a safety water flow switch that does not allow the unit to operate in case of water flow rate lack to the evaporator.

CONDENSER

The condenser, complete with victaulic couplings, of singlepass type with water flow on the tube side (finned externally and internally lined) and refrigerant flow on the shell side.

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 evapo-

erator 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.

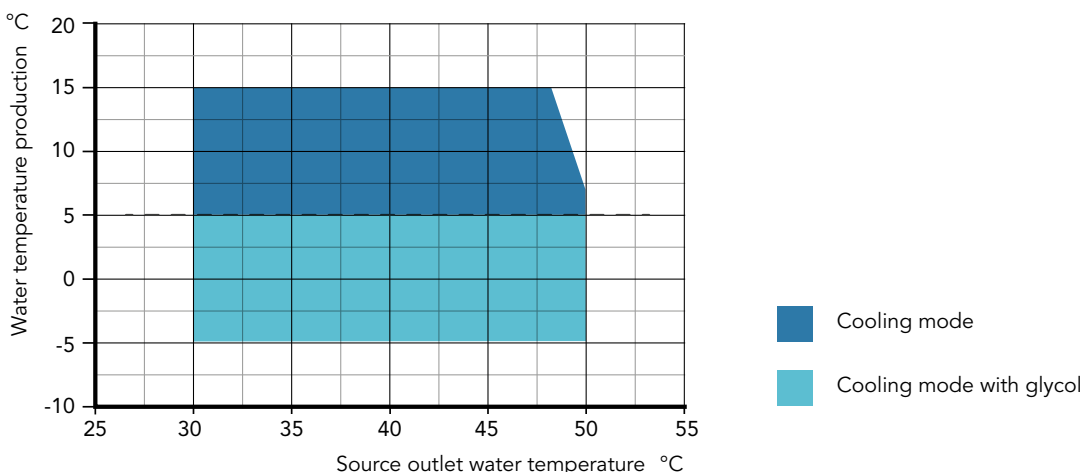
The main features are: three-phase power supply 400V/3ph/50Hz on all models (if not differently required); low voltage auxiliary circuit 24Vac with insulation transformer; lockable mechanical main switch; protection automatic switches; terminal box for signal and management free-comtacts.

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.

OPERATING RANGE



RWH VS Ke		271	331	431	521	302	432	562	702	762
Amperometer+Voltmeter	A+V	o	o	o	o	o	o	o	o	o
Compressors cabinet in rock wool.	CFR	o	o	o	o	o	o	o	o	o
RS 485 Serial interface	IH	o	o	o	o	o	o	o	o	o
BAC-NET Serial interface	IH BAC	o	o	o	o	o	o	o	o	o
Wooden platform packing	IR	o	o	o	o	o	o	o	o	o
Fumigated wooden crate packing.	IE	o	o	o	o	o	o	o	o	o
Seawood packing	IM	o	o	o	o	o	o	o	o	o
SNMP or TCP/IP Protocol serial interface	IWG	o	o	o	o	o	o	o	o	o
Rubber-type vibration dampers	PA	o	o	o	o	o	o	o	o	o
Spring-type vibration dampers	PM	o	o	o	o	o	o	o	o	o
Remote display	PQ	o	o	o	o	o	o	o	o	o
Anti-freeze heater on evaporator	RA	o	o	o	o	o	o	o	o	o
Shut-off valve on compressors discharge side	RD	o	o	o	o	o	o	o	o	o
Shut-off valve on compressors suction side	RH	o	o	o	o	o	o	o	o	o
Partial heat recovery	RP	o	o	o	o	o	o	o	o	o
Brine Version	VB	o	o	o	o	o	o	o	o	o
Mixing valve for condensing control	VCP	o	o	o	o	o	o	o	o	o
Pressostatic valve for condensing control	VP	--	--	--	--	--	o	o	o	o

• Standard, o Optional, -- Not available

RWH VS Ke		862	1052	1192	1382	1562	1573	1793	2063
Amperometer+Voltmeter	A+V	0	0	0	0	0	0	0	0
Compressors cabinet in rock wool.	CFR	0	0	0	0	0	0	0	0
RS 485 Serial interface	IH	0	0	0	0	0	0	0	0
BAC-NET Serial interface	IH BAC	0	0	0	0	0	0	0	0
Wooden platform packing	IR	0	0	0	0	0	0	0	0
Fumigated wooden crate packing.	IE	0	0	0	0	0	0	0	0
Seawood packing	IM	0	0	0	0	0	0	0	0
SNMP or TCP/IP Protocol serial interface	IWG	0	0	0	0	0	0	0	0
Rubber-type vibration dampers	PA	0	0	0	0	0	0	0	0
Spring-type vibration dampers	PM	0	0	0	0	0	0	0	0
Remote display	PQ	0	0	0	0	0	0	0	0
Anti-freeze heater on evaporator	RA	0	0	0	0	0	0	0	0
Shut-off valve on compressors discharge side	RD	0	0	0	0	0	0	0	0
Shut-off valve on compressors suction side	RH	0	0	0	0	0	0	0	0
Partial heat recovery	RP	0	0	0	0	0	0	0	0
Brine Version	VB	0	0	0	0	0	0	0	0
Mixing valve for condensing control	VCP	0	0	0	0	0	0	0	0
Pressostatic valve for condensing control	VP	--	--	--	--	--	--	--	--

• Standard, 0 Optional, -- Not available

RWH VS Ke		271	331	431	521	302	432	562	702	762
Cooling capacity	kW	269	337	421	510	302	414	543	678	738
Total input power	kW	59,4	72,5	89,9	109	63,8	89,2	118	145	158
Nominal input current	A	94,9	109,7	144,7	168,1	107,6	149,7	190,0	219,5	252,5
EER	W/W	4,53	4,65	4,68	4,68	4,73	4,64	4,60	4,68	4,67
SEER (EN14825)	W/W	7,04	7,12	7,10	7,13	7,21	7,24	7,28	7,30	7,35
Circuits	n°	1	1	1	1	2	2	2	2	2
Compressors	n°	1	1	1	1	2	2	2	2	2
Refrigerant data R513A										
Refrigerant charge	kg	42	94	88	82	70	62	80	186	178
Global warming potential (GWP)		573	573	573	573	573	573	573	573	573
Equivalent CO ₂ charge	t	24,1	53,9	50,4	47,0	40,1	35,5	45,8	106,6	102,0
Condenser ⁽¹⁾										
Quantity	n°	1	1	1	1	2	2	2	2	2
Flow rate	m ³ /h	56,5	70,4	87,9	106,5	62,9	86,6	113,7	141,6	154,1
Total input current	kW	29,0	27,0	31,1	25,2	27,0	27,0	29,2	37,6	27,1
Evaporator ⁽²⁾										
Quantity	n°	1	1	1	1	1	1	1	1	1
Water flow	m ³ /h	46,3	58,0	72,4	87,7	51,9	71,2	93,4	116,6	126,9
Pressure drop	kPa	51,0	39,0	43,9	42,8	48,0	42,0	41,8	40,7	47,6
Weight										
Transport weight	kg	1476	1974	2172	2790	2046	2506	2910	3952	4062
Operating weight	kg	1648	2148	2422	3182	2220	2752	3304	4352	4470
Dimensions										
Length	mm	4700	4700	4700	4700	4700	4700	4700	4700	4700
Width	mm	1550	1550	1550	1550	1850	1850	1850	1850	1850
Height	mm	1750	1750	1750	1750	2200	2200	2200	2200	2200
Sound data										
Total LWA ⁽³⁾	dB(A)	94,8	95,1	96,2	96,5	96,9	97,3	97,8	98,1	98,8
Total SPL 10m ⁽⁴⁾	dB(A)	62,7	63,0	64,1	64,4	64,6	65,0	65,6	65,9	66,5
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	400/3/50
General electrical data										
Maximum input power	[kW]	59,4	72,5	89,9	109,0	63,8	89,2	118,0	145,0	158,0
Maximum input current	[A]	128,0	156,0	203,0	233,0	148,0	196,0	256,0	312,0	354,0
Inrush current	[A]	**	**	**	**	**	**	**	**	**
RWH VS Ke		862	1052	1192	1382	1562	1573	1793	2063	
Cooling capacity	kW	841	1020,0	1170,0	1340	1430	1530	1750	2020	
Total input power	kW	180	217,0	245,0	278	287	325	369	415	
Nominal input current	A	289,5	336,1	380,1	418,5	460,2	504,2	570,2	627,9	
EER	W/W	4,67	4,70	4,78	4,82	4,98	4,71	4,74	4,87	
SEER (EN14825)	W/W	7,26	7,32	7,42	7,49	7,61	7,43	7,41	7,58	
Circuits	n°	2	2	2	2	2	3	3	3	
Compressors	n°	2	2	2	2	2	3	3	3	
Refrigerant data R513A										
Refrigerant charge	kg	174	160	152	238	228	238	226	358	
Global warming potential (GWP)		573	573	573	573	573	573	573	573	
Equivalent CO ₂ charge	t	99,7	91,7	87,1	136,4	130,6	136,4	129,5	205,1	
Condenser ⁽¹⁾										
Quantity	n°	2	2	2	2	2	3	3	3	
Flow rate	m ³ /h	175,6	212,8	243,4	278,3	295,3	319,1	364,5	418,8	
Total input current	kW	31,1	25,3	28,1	32,1	23,4	25,3	28,2	32,1	
Evaporator ⁽²⁾										
Quantity	n°	1	1	1	1	1	1	1	1	
Water flow	m ³ /h	144,7	175,4	201,2	230,5	246,0	263,2	301,0	347,4	
Pressure drop	kPa	53,5	46,7	30,2	54,6	33,1	38,0	48,7	44,9	
Weight										
Transport weight	kg	4450	5888	6070	7096	7388	8864	9088	10214	
Operating weight	kg	5074	6526	6790	8092	8394	9880	10104	11428	
Dimensions										
Length	mm	4700	5000	5000	5000	5000	5600	5600	5600	
Width	mm	1850	2150	2150	2150	2150	2300	2300	2300	
Height	mm	2300	2450	2450	2550	2550	2550	2550	2550	
Sound data										
Total LWA ⁽³⁾	dB(A)	99,7	100,0	100,2	101,6	101,9	102,3	102,5	104,4	
Total SPL 10m ⁽⁴⁾	dB(A)	67,5	67,6	67,8	69,2	69,5	69,8	70,0	71,9	
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]	180	217	245	278	287	325	369	415	
Maximum input current	[A]	406	466	532	612	690	699	798	918	
Inrush current	[A]	**	**	**	**	**	**	**	**	

(1) Ambient air temperature 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

RWVH VS Kh		271	301	401	501	302	402	522	622	762
Cooling capacity	kW	277	315	429	504	314	407	553	630	765
Total input power	kW	56,4	64,3	86,6	98,1	65,1	84,7	112,9	128,5	156,6
Nominal input current	A	97,2	110,7	149,1	168,8	112,1	145,8	194,4	221,3	269,6
EER	W/W	4,90	4,90	4,96	5,13	4,82	4,81	4,90	4,90	4,89
SEER (EN14825)	W/W	7,07	7,16	7,14	7,16	7,24	7,28	7,32	7,34	7,39
Circuits	n°	1	1	1	1	2	2	2	2	2
Compressors	n°	1	1	1	1	2	2	2	2	2
Refrigerant data R1234ze										
Refrigerant charge	kg	45	101	94	88	75	67	86	200	191
Global warming potential (GWP)		6	6	6	6	6	6	6	6	6
Equivalent CO ₂ charge	t	0,27	0,61	0,57	0,53	0,45	0,40	0,52	1,20	1,15
Condenser ⁽¹⁾										
Quantity	n°	1	1	1	1	2	2	2	2	2
Flow rate	m ³ /h	57,4	65,3	88,8	103,6	65,2	84,7	114,7	130,6	158,7
Total input current	kW	28,6	26,6	30,7	24,8	26,6	26,6	28,8	37,1	26,7
Evaporator ⁽²⁾										
Quantity	n°	1	1	1	1	1	1	1	1	1
Water flow	m ³ /h	47,6	54,1	73,8	86,6	54,0	70,0	95,2	108,3	131,6
Pressure drop	kPa	48,8	37,3	42,0	41,0	45,9	40,2	40,0	38,9	45,5
Weight										
Transport weight	kg	1514	2012	2210	2828	2126	2586	2990	4032	4142
Operating weight	kg	1686	2186	2460	3220	2300	2832	3384	4432	4550
Dimensions										
Length	mm	4700	4700	4700	4700	4700	4700	4700	4700	4700
Width	mm	1550	1550	1550	1550	1850	1850	1850	1850	1850
Height	mm	1750	1750	1750	1750	2200	2200	2200	2200	2200
Sound data										
Total LWA ⁽³⁾	dB(A)	94,0	94,3	95,4	95,7	96,1	96,5	97,0	97,3	98,0
Total SPL 10m ⁽⁴⁾	dB(A)	62,2	62,5	63,6	63,9	64,1	64,5	65,0	65,3	66,0
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	400/3/50
General electrical data										
Maximum input power	[kW]	115,9	131,6	177,4	201,6	132,8	174	231,8	263	318,6
Maximum input current	[A]	268	257	322	373	238,6	324	448	514	564
Inrush current	[A]	*	*	*	*	*	*	*	*	*
RWVH VS Kh		852	1002	1142	1202	1352	1603	1853	2003	
Cooling capacity	kW	859	1007	1145	1234	1370	1660	1889	2015	
Total input power	kW	173,9	196,1	221,9	250,3	276,0	339	386	398,5	
Nominal input current	A	299,4	337,7	382,0	430,9	475,3	583,1	664,0	686,1	
EER	W/W	4,94	5,13	5,16	4,93	4,96	4,90	4,90	5,06	
SEER (EN14825)	W/W	7,29	7,36	7,46	7,52	7,65	7,46	7,45	7,62	
Circuits	n°	2	2	2	2	2	3	3	3	
Compressors	n°	2	2	2	2	2	3	3	3	
Refrigerant data R1234ze										
Refrigerant charge	kg	187	172	163	256	245	256	243	384	
Global warming potential (GWP)		6	6	6	6	6	6	6	6	
Equivalent CO ₂ charge	t	1,12	1,03	0,98	1,53	1,47	1,53	1,46	2,31	
Condenser ⁽¹⁾										
Quantity	n°	2	2	2	2	2	3	3	3	
Flow rate	m ³ /h	177,8	207,2	235,3	255,6	283,4	344,2	391,7	415,6	
Total input current	kW	30,7	24,9	27,7	31,6	23,1	24,9	27,8	31,6	
Evaporator ⁽²⁾										
Quantity	n°	1	1	1	1	1	1	1	1	
Water flow	m ³ /h	147,7	173,2	196,9	212,2	235,6	285,5	324,9	346,6	
Pressure drop	kPa	51,2	44,7	28,9	52,2	31,7	36,4	46,6	43,0	
Weight										
Transport weight	kg	4530	6008	6190	7216	7508	9054	9278	10404	
Operating weight	kg	5154	6646	6910	8212	8514	10070	10294	11618	
Dimensions										
Length	mm	4700	5000	5000	5000	5000	5600	5600	5600	
Width	mm	1850	2150	2150	2150	2150	2300	2300	2300	
Height	mm	2300	2450	2450	2550	2550	2550	2550	2550	
Sound data										
Total LWA ⁽³⁾	dB(A)	98,9	99,2	99,4	100,8	101,1	101,4	101,6	103,5	
Total SPL 10m ⁽⁴⁾	dB(A)	66,9	67,1	67,3	68,7	69,0	69,2	69,4	71,3	
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]	354,8	403,2	449	531	579,4	604,8	673,5	796,5	
Maximum input current	[A]	644	746	840	1140	1192	1119	1260	1710	
Inrush current	[A]	*	*	*	*	*	*	*	*	