RAH MC VS Ka/Kh/Ke

AIR COOLED CHILLERS FOR OUTDOOR INSTALLATION

EQUIPPED WITH INVERTER SCREW COMPRESSORS, AXIAL FANS AND MICROCHANNEL CONDENSING COILS

Cooling capacity from 306 kW to 1555 kW

VERSIONS

RAH MC VS - standard version
RAH MC VS S - silenced version
RAH MC VS HE - high efficiency version
RAH MC VS HE S - high efficiency silenced version

The air-cooled chillers of this serie are suitable for outdoor installation and are particularly suitable for cooling liquid solutions, used for industrial applications or air conditioning systems, in which it is necessary to ensure excellent performance and low environmental impact.
The machines are designed as outdoor units in compliance with European standards EN378 and its updates and are able to meet the seasonal efficiency requirements established by Regulation (EU) 2016/2281-LOT21.
The units of this series are equipped with two screw compressors, each with a continuous control of the cooling capacity, realized thanks to an in-built inverter. Each compressor operates on a single totally independent circuit, thus ensuring the maximum reliability.

All the units are totally factory assembled and tested, following specific quality procedures. Besides, they are totally hydraulic, cooling and electrical connected, permitting a quick installation once on site. Before the test, the cooling circuits of each unit are subject to a pressure tightness test and then charged with Refrigerant and non-freezing oil. Therefore, once on site, the units must be only positioned and electrically and hydraulically connected.

The reduction of the sound level in the silenced version is reached thanks to refrigerant/air exchangers with wider surfaces and a compressor cabinet insulated with higher thickness soundproof material.

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

MAIN COMPONENTS

STRUCTURE
Structure made of a base and a chassis manufactured in high-thickness galvanised steel, assembled with stainless steel rivets. All galvanised steel surfaces are powder-coated with colour RAL 7035. The technical section contains compressors and the other cooling circuit elements.

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.

EXTERNAL CONDENSING COIL
Totally made up of aluminum alloy to grant a perfect and continuous contact among tubes and fins optimizing the thermal exchange and reducing dimensions.
The high passivation degree of the used alloy, besides the peculiar assembling way, avoids the possibility to have galvanic corrosion phenomena. On demand it is also possible to provide the units installed in particularly aggressive environments with surface treatments against exchangers environmental corrosion.
The cross "V" arrangement of the condensing coils makes the units of this series perfectly each other modular, granting at the same time the easiest access to the technical room both for checking operations required during the normal unit functioning and for maintenance.

STAINLESS STEEL PLATE EVAPORATOR (size 352÷552)
Of "single" or "dual" circuit type, with high thickness close cell insulation and UV ray-proof. The max operating pressure limits are 6 bar for water side and 45 bar for refrigerant side. The evaporator is also equipped with safety water flow switch switching off the unit in case of low water flow through the evaporator.

SHELL AND TUBE EVAPORATOR (sizes 652÷1502)
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.

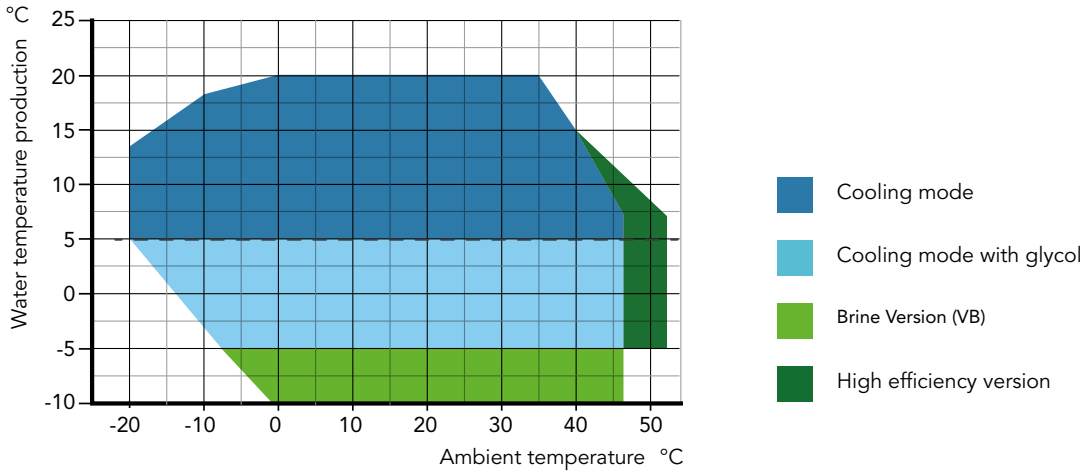
AXIAL FANS
With external rotor directly coupled to a three-phase electronically commutated motor (EC) they have the possibility of a continuous regulation of the speed by means of a 0-10V signal completely managed by the microprocessor. Aluminum blades with wings profile are suitably designed to avoid any turbulence in the air detachment zone, granting in this way the max efficiency with the minimum noise level. The fan is equipped with galvanized steel protection grid painted after the construction. These fans, thanks to a more accurate regulation of the airflow, allow the unit to operate with an external air temperature up to - 20 °C.

COOLING CIRCUIT
Cooling circuit made up of electronic thermostatic expansion valve, sight glass, high pressure safety device, anti-freeze protection on evaporator, high and low pressure switches, dehydrating filter with replaceable cartridges, shut-off valve on liquid line.
Each compressor operates on an independent circuit granting in this way, a considerable reliability.

ELECTRICAL BOARD
In compliance with CE Norms, contained in a suitable section protected by internal safety panel, provided with a lock-door main switch. Inside all the control and protection components are suitably placed, together with terminal board and auxiliaries. The electrical board also includes the control device for power supply phases to prevent the compressor wrong side rotation. Microprocessor and relevant display are also placed inside the electrical cabinet.

MICROPROCESSOR
For unit management installed inside the electrical cabinet, with double evaporator in/out control of the chilled water temperature, as well as control of working parameters and equalization of compressors working hours, failures auto-detection system, alarm log, start and set point timeslot programming, possibility of remote management and supervision by enabling standard communication protocols management, complete with compressors hour counter.

OPERATING RANGE



ACCESSORIES

RAH MC VS / RAH MC VS S		352	402	452	552	652	752	852
Amperometer + Voltmeter	A+V	o	o	o	o	o	o	o
Compressors inrush counter	CS	o	o	o	o	o	o	o
Anti-corrosive protection of the condensing coils	ECP	o	o	o	o	o	o	o
Condensing coil protection grid	GP	o	o	o	o	o	o	o
Anti-intrusion grid	GP1	o	o	o	o	o	o	o
RS 485 Serial interface	IH	o	o	o	o	o	o	o
BACNET Protocol serial interface	IH-BAC	o	o	o	o	o	o	o
Buffer tank module	MV	o	o	o	o	o	o	o
Pump group	P1	o	o	o	o	o	o	o
Higher available pressure pump group	P1H	o	o	o	o	o	o	o
Double pump group	P2	o	o	o	o	o	o	o
Higher available pressure double pump group	P2H	o	o	o	o	o	o	o
Rubber-type vibration dampers	PA	o	o	o	o	o	o	o
Anti-corrosive protection of the condensing coils (Powder coating)	PCP	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
Anti-freeze heater on evaporator	RA	o	o	o	o	o	o	o
Shut-off valve on compressors discharge side	RD	o	o	o	o	o	o	o
Shut-off valve on compressors suction side	RH	o	o	o	o	o	o	o
Brine Version	VB	o	o	o	o	o	o	o
Partial heat recovery	RP	o	o	o	o	o	o	o
Total heat recovery	RT	o	o	o	o	o	o	o

RAH MC VS / RAH MC VS S		952	1052	1102	1252	1352	1452	1502
Amperometer + Voltmeter	A+V	o	o	o	o	o	o	o
Compressors inrush counter	CS	o	o	o	o	o	o	o
Anti-corrosive protection of the condensing coils	ECP	o	o	o	o	o	o	o
Condensing coil protection grid	GP	o	o	o	o	o	o	o
Anti-intrusion grid	GP1	o	o	o	o	o	o	o
RS 485 Serial interface	IH	o	o	o	o	o	o	o
BACNET Protocol serial interface	IH-BAC	o	o	o	o	o	o	o
Buffer tank module	MV	o	o	o	o	o	o	o
Pump group	P1	o	o	o	o	o	o	o
Higher available pressure pump group	P1H	o	o	o	o	o	o	o
Double pump group	P2	o	o	o	o	o	o	o
Higher available pressure double pump group	P2H	o	o	o	o	o	o	o
Rubber-type vibration dampers	PA	o	o	o	o	o	o	o
Anti-corrosive protection of the condensing coils (Powder coating)	PCP	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
Anti-freeze heater on evaporator	RA	o	o	o	o	o	o	o
Shut-off valve on compressors discharge side	RD	o	o	o	o	o	o	o
Shut-off valve on compressors suction side	RH	o	o	o	o	o	o	o
Brine Version	VB	o	o	o	o	o	o	o
Partial heat recovery	RP	o	o	o	o	o	o	o
Total heat recovery	RT	o	o	o	o	o	o	o

• Standard, o Optional, -- Not available

RAH MC VS HE		482	552	592	652	702	812	902	1042	1162	1252
Amperometer + Voltmeter	A+V	o	o	o	o	o	o	o	o	o	o
Compressors inrush counter	CS	o	o	o	o	o	o	o	o	o	o
Anti-corrosive protection of the condensing coils	ECP	o	o	o	o	o	o	o	o	o	o
Condensing coil protection grid	GP	o	o	o	o	o	o	o	o	o	o
Anti-intrusion grid	GP1	o	o	o	o	o	o	o	o	o	o
RS 485 Serial interface	IH	o	o	o	o	o	o	o	o	o	o
BACNET Protocol serial interface	IH-BAC	o	o	o	o	o	o	o	o	o	o
Buffer tank module	MV	o	o	o	o	o	o	o	o	o	o
Pump group	P1	o	o	o	o	o	o	o	o	o	o
Higher available pressure pump group	P1H	o	o	o	o	o	o	o	o	o	o
Double pump group	P2	o	o	o	o	o	o	o	o	o	o
Higher available pressure double pump group	P2H	o	o	o	o	o	o	o	o	o	o
Rubber-type vibration dampers	PA	o	o	o	o	o	o	o	o	o	o
Anti-corrosive protection of the condensing coils (Powder coating)	PCP	o	o	o	o	o	o	o	o	o	o
Spring-type vibration dampers	PM	o	o	o	o	o	o	o	o	o	o
Remote display	PQ	o	o	o	o	o	o	o	o	o	o
Anti-freeze heater on evaporator	RA	o	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	o
Shut-off valve on compressors suction side	RH	o	o	o	o	o	o	o	o	o	o
Brine Version	VB	o	o	o	o	o	o	o	o	o	o
Partial heat recovery	RP	o	o	o	o	o	o	o	o	o	o
Total heat recovery	RT	o	o	o	o	o	o	o	o	o	o

RAH MC VS HE S		432	492	532	602	742	862	982	1062	1172
Amperometer + Voltmeter	A+V	o	o	o	o	o	o	o	o	o
Compressors inrush counter	CS	o	o	o	o	o	o	o	o	o
Anti-corrosive protection of the condensing coils	ECP	o	o	o	o	o	o	o	o	o
Condensing coil protection grid	GP	o	o	o	o	o	o	o	o	o
Anti-intrusion grid	GP1	o	o	o	o	o	o	o	o	o
RS 485 Serial interface	IH	o	o	o	o	o	o	o	o	o
BACNET Protocol serial interface	IH-BAC	o	o	o	o	o	o	o	o	o
Buffer tank module	MV	o	o	o	o	o	o	o	o	o
Pump group	P1	o	o	o	o	o	o	o	o	o
Higher available pressure pump group	P1H	o	o	o	o	o	o	o	o	o
Double pump group	P2	o	o	o	o	o	o	o	o	o
Higher available pressure double pump group	P2H	o	o	o	o	o	o	o	o	o
Rubber-type vibration dampers	PA	o	o	o	o	o	o	o	o	o
Anti-corrosive protection of the coils (Powder coating)	PCP	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
Brine Version	VB	o	o	o	o	o	o	o	o	o
Partial heat recovery	RP	o	o	o	o	o	o	o	o	o
Total heat recovery	RT	o	o	o	o	o	o	o	o	o

• Standard, o Optional, -- Not available

TECHNICAL DATA

RAH MC VS Ke		352	402	452	552	652	752	852
Cooling capacity	kW	368,7	417,2	490,3	592,3	666,4	761,2	873,4
Total input power	kW	123,0	142,0	158,0	199,0	222,0	251,0	298,0
Nominal input current	A	199,6	228,5	248,2	318,8	357,3	401,7	462,3
EER	W/W	3,0	2,9	3,1	3,0	3,0	3,0	2,9
SEER (EN14825)	W/W	5,01	4,92	5,18	5,13	4,92	4,91	4,83
Circuits	n°	2	2	2	2	2	2	2
Compressors	n°	2	2	2	2	2	2	2
Refrigerant data R513A								
Refrigerant charge	kg	52	54	68	82	90	104	112
Global warming potential (GWP)	-	573	573	573	573	573	573	573
Equivalent CO_2 charge	t	29,8	30,9	39,0	47,0	51,6	59,6	64,2
Fans (1)								
Quantity	n°	6	6	8	10	10	12	12
Total air flow	m^3/h	147600	147000	196880	245600	245400	294960	293520
Total power input	kW	18	18	24	30	30	36	36
Total input current	A	27,6	27,6	36,8	46,0	46,0	55,2	55,2
Evaporator (2)								
Quantity	n°	1	1	1	1	1	1	1
Water flow	m^3/h	63,4	71,7	84,3	101,9	114,6	130,9	150,2
Pressure drop	kPa	18	16	17	18	26	32	45
Weight								
Transport weight	kg	3158	3204	3718	4736	4820	5462	6478
Operating weight	kg	3216	3270	3796	4826	4930	5672	6760
Dimensions								
Length	mm	3920	3920	5060	6200	6200	7340	7340
Width	mm	2260	2260	2260	2260	2260	2260	2260
Height	mm	2650	2650	2650	2650	2650	2650	2650
Sound data								
Total LWA (3)	dB(A)	97	98	99	102	102	102	103
Total SPL 10m (4)	dB(A)	65,0	65,4	66,2	69,4	69,5	69,8	70,0
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
General electrical data								
Maximum input power	[kW]	120,0	139,0	154,0	194,0	217,0	245,0	292,0
Maximum input current	[A]	274	308	357	436	488	563	637
Inrush current	[A]	**	**	**	**	**	**	**

RAH MC VS Ke		952	1052	1102	1252	1352	1452	1502
Cooling capacity	kW	990,9	1060,9	1143,3	1308,1	1421,4	1493,5	1555,3
Total input power	kW	334,0	365,0	388,0	439,0	484,0	507,0	532,0
Nominal input current	A	510,0	564,8	608,3	682,9	753,4	795,2	835,3
EER	W/W	3,0	2,9	2,9	3,0	2,9	2,9	2,9
SEER (EN14825)	W/W	4,86	4,74	4,87	4,92	4,83	4,82	4,76
Circuits	n°	2	2	2	2	2	2	2
Compressors	n°	2	2	2	2	2	2	2
Refrigerant data R513A								
Refrigerant charge	kg	130	134	144	168	182	190	194
Global warming potential (GWP)	-	573	573	573	573	573	573	573
Equivalent CO_2 charge	t	74,5	76,8	82,5	96,3	104,3	108,9	111,2
Fans (1)								
Quantity	n°	14	14	16	18	20	20	20
Total air flow	m^3/h	342580	341880	391520	440460	489600	488800	488200
Total power input	kW	42	42	48	54	60	60	60
Total input current	A	64,4	64,4	73,6	82,8	92,0	92,0	92,0
Evaporator (2)								
Quantity	n°	1	1	1	1	1	1	1
Water flow	m^3/h	170,4	182,5	196,6	225,0	244,5	256,9	267,5
Pressure drop	kPa	52	41	47	44	59	43	50
Weight								
Transport weight	kg	7084	7232	7650	8280	8896	9212	9232
Operating weight	kg	7382	7520	7938	8652	9258	9678	9686
Dimensions								
Length	mm	8480	8480	9620	10760	11900	11900	11900
Width	mm	2260	2260	2260	2260	2260	2260	2260
Height	mm	2650	2650	2650	2650	2650	2650	2650
Sound data								
Total LWA (3)	dB(A)	103	105	105	105	106	106	106
Total SPL 10m (4)	dB(A)	70,4	71,7	71,9	72,1	72,4	72,8	72,8
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	[kW]	327,0	358,0	380,0	430,0	474,0	497,0	522,0
Maximum input current	[A]	730	780	840	851	1004	1058	1112
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

RAH MC VS S Ke		352	402	452	552	652	752	852
Cooling capacity	kW	306,9	348,1	412,0	477,9	554,1	605,6	728,2
Total input power	kW	96,8	111,8	124,4	160,4	174,0	194,0	235,6
Nominal input current	A	166,3	190,9	206,5	270,0	297,6	329,3	386,3
EER	W/W	3,2	3,1	3,3	3,0	3,2	3,1	3,1
SEER (EN14825)	W/W	5,03	4,89	5,21	4,80	4,92	4,78	4,81
Circuits	n°	2	2	2	2	2	2	2
Compressors	n°	2	2	2	2	2	2	2
Refrigerant data R513A								
Refrigerant charge	kg	48	52	64	68	82	90	104
Global warming potential (GWP)	-	573	573	573	573	573	573	573
Equivalent CO_2 charge	t	27,5	29,8	36,7	39,0	47,0	51,6	59,6
Fans (1)								
Quantity	n°	6	6	8	8	10	10	12
Total air flow	m^3/h	123120	122880	163680	163600	205100	204500	245280
Total power input	kW	11	11	14	14	18	18	22
Total input current	A	18,0	18,0	24,0	24,0	30,0	30,0	36,0
Evaporator (2)								
Quantity	n°	1	1	1	1	1	1	1
Water flow	m^3/h	52,8	59,9	70,9	82,2	95,3	104,2	125,3
Pressure drop	kPa	16	16	16	16	16	22	29
Weight								
Transport weight	kg	3194	3238	3742	4432	4816	4920	6322
Operating weight	kg	3244	3296	3808	4510	4906	5030	6532
Dimensions								
Length	mm	3920	3920	5060	5060	6200	6200	7340
Width	mm	2260	2260	2260	2260	2260	2260	2260
Height	mm	2650	2650	2650	2650	2650	2650	2650
Sound data								
Total LWA (3)	dB(A)	91	91	92	94	94	95	95
Total SPL 10m (4)	dB(A)	58,7	59,0	60,0	61,6	61,8	62,0	62,6
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	[kW]	95,0	110,0	122,0	158,0	171,0	191,0	232,0
Maximum input current	[A]	275	309	358	428	490	556	640
Inrush current	[A]	**	**	**	**	**	**	**

RAH MC VS S Ke		952	1052	1102	1252	1352	1452	1502
Cooling capacity	kW	836,4	883,7	953,8	1050,6	1133,0	1236,0	1297,8
Total input power	kW	266,2	290,2	307,8	331,4	366,0	403,0	425,0
Nominal input current	A	428,3	472,4	508,5	549,8	607,0	666,3	702,6
EER	W/W	3,1	3,0	3,1	3,2	3,1	3,1	3,1
SEER (EN14825)	W/W	4,85	4,69	4,85	4,88	4,74	4,73	4,73
Circuits	n°	2	2	2	2	2	2	2
Compressors	n°	2	2	2	2	2	2	2
Refrigerant data R513A								
Refrigerant charge	kg	120	120	134	154	162	176	182
Global warming potential (GWP)	-	573	573	573	573	573	573	573
Equivalent CO_2 charge	t	68,8	68,8	76,8	88,2	92,8	100,8	104,3
Fans (1)								
Quantity	n°	14	14	16	18	20	20	20
Total air flow	m^3/h	286580	285740	327360	368640	419400	411000	410200
Total power input	kW	25	25	29	32	36	36	36
Total input current	A	42,0	42,0	48,0	54,0	60,0	60,0	60,0
Evaporator (2)								
Quantity	n°	1	1	1	1	1	1	1
Water flow	m^3/h	143,9	152,0	164,1	180,7	194,9	212,6	223,2
Pressure drop	kPa	42	46	49	41	47	40	51
Weight								
Transport weight	kg	7080	7200	7676	8088	8684	8996	9016
Operating weight	kg	7362	7482	7984	8376	8972	9368	9378
Dimensions								
Length	mm	8480	8480	9620	10760	11900	11900	11900
Width	mm	2260	2260	2260	2260	2260	2260	2260
Height	mm	2650	2650	2650	2650	2650	2650	2650
Sound data								
Total LWA (3)	dB(A)	96	97	97	97	98	98	98
Total SPL 10m (4)	dB(A)	63,1	63,9	64,2	64,4	64,8	65,0	65,3
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
General electrical data								
Maximum input power	[kW]	262,0	286,0	303,0	326,0	360,0	397,0	419,0
Maximum input current	[A]	733	783	843	854	1008	1062	1116
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

RAH MC VS HE Ke		482	552	592	652	702	812	902	1042	1162	1252
Cooling capacity	kW	483,0	538,0	603,0	649,0	703,0	783,0	874,0	1040,0	1130,0	1250,0
Total input power	kW	166,7	189,1	212,4	222,6	239,7	265,1	304,2	360,9	393,4	437,0
Nominal input current	A	275,8	309,6	345,0	360,4	385,4	424,6	484,4	581,6	630,8	704,8
EER	W/W	2,90	2,85	2,84	2,91	2,93	2,95	2,87	2,88	2,87	2,86
SEER (EN14825)	W/W	5,51	5,42	5,32	5,51	5,38	5,55	5,43	5,31	5,42	5,40
Circuits	n°	2	2	2	2	2	2	2	2	2	2
Compressors	n°	2	2	2	2	2	2	2	2	2	2
Refrigerant data R513A											
Refrigerant charge	kg	72,0	80,0	90,0	102,0	116,0	134,0	148,0	158,0	180,0	186,0
Global warming potential (GWP)	-	573	573	573	573	573	573	573	573	573	573
Equivalent CO_2 charge	t	41,3	45,8	51,6	58,4	66,5	76,8	84,8	90,5	103,1	106,6
Fans (1)											
Quantity	n°	8	8	10	12	12	14	14	16	18	18
Total air flow	m^3/h	196800	196080	245900	289440	294720	339920	343980	392640	442080	440460
Total power input	kW	24,0	24,0	30,0	36,0	36,0	42,0	42,0	48,0	54,0	54,0
Total input current	A	36,8	36,8	46,0	55,2	55,2	64,4	64,4	73,6	82,8	82,8
Evaporator (2)											
Quantity	n°	1	1	1	1	1	1	1	1	1	1
Water flow	m^3/h	83,1	92,5	103,7	111,6	121,1	134,7	150,3	178,9	194,4	215,0
Pressure drop	kPa	12,4	17,5	21,4	20,0	32,9	22,2	20,5	27,7	33,6	32,6
Weight											
Transport weight	kg	4124	4188	4536	4878	5368	5902	6174	7292	7746	7946
Operating weight	kg	4214	4298	4646	4998	5642	6190	6546	7664	8142	8400
Dimensions											
Length	mm	5060	5060	6200	7340	7340	8480	8480	9620	10760	10760
Width	mm	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260
Height	mm	2650	2650	2650	2650	2650	2650	2650	2650	2650	2650
Sound data											
Total LWA (3)	dB(A)	102,8	102,8	103,2	103,3	104,3	104,3	106,3	106,4	106,5	108,0
Total SPL 10m (4)	dB(A)	70,4	70,4	70,7	70,6	71,6	71,5	73,5	73,5	73,5	75,0
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	400/3/50
General electrical data											
Maximum input power	[kW]	161	182	205	213	231	249	289	351	383	426
Maximum input current	[A]	478	478	568	578	578	587	747	743	752	1066
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

RAH MC VS HE S Ke		432	492	532	602	742	862	982	1062	1172
Cooling capacity	kW	438,8	496,5	542,8	609,8	727,2	888,9	1003,2	1081,5	1205,1
Total input power	kW	143,4	169,5	182,2	210,6	246,9	295,7	320,8	348,9	383,0
Nominal input current	A	242,2	282,0	301,4	344,4	399,0	484,0	524,0	572,0	626,0
EER	W/W	3,1	2,9	3,0	2,9	2,9	3,0	3,1	3,1	3,1
SEER (EN14825)	W/W	5,14	5,53	4,91	5,32	5,47	4,92	5,56	5,68	5,65
Circuits	n°	2	2	2	2	2	2	2	2	2
Compressors	n°	2	2	2	2	2	2	2	2	2
Refrigerant data R513A										
Refrigerant charge	kg	68	72	82	90	116	134	158	168	186
Global warming potential (GWP)	-	573	573	573	573	573	573	573	573	573
Equivalent CO_2 charge	t	39,0	41,3	47,0	51,6	66,5	76,8	90,5	96,3	106,6
Fans (1)										
Quantity	n°	8	8	10	10	12	14	16	18	18
Total air flow	m^3/h	164080	163360	205300	204400	245400	285740	326720	368280	367020
Total power input	kW	14	14	18	18	22	25	29	32	32
Total input current	A	24,0	24,0	30,0	30,0	36,0	42,0	48,0	54,0	54,0
Evaporator (2)										
Quantity	n°	1	1	1	1	1	1	1	1	1
Water flow	m^3/h	75,5	85,4	93,4	104,9	125,1	152,9	172,6	186,0	207,3
Pressure drop	kPa	14	13	15	22	35	28	26	30	31
Weight										
Transport weight	kg	4188	4248	4572	4676	5538	6722	7452	7750	8116
Operating weight	kg	4266	4338	4662	4786	5812	7010	7824	8122	8570
Dimensions										
Length	mm	5060	5060	6200	6200	7340	8480	9620	10760	10760
Width	mm	2260	2260	2260	2260	2260	2260	2260	2260	2260
Height	mm	2650	2650	2650	2650	2650	2650	2650	2650	2650
Sound data										
Total LWA (3)	dB(A)	92	93	94	94	95	96	97	98	99
Total SPL 10m (4)	dB(A)	60,0	61,0	61,5	61,5	62,4	63,3	63,8	65,3	66,3
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	400/3/50
General electrical data										
Maximum input power	[kW]	139,0	162,0	177,0	202,0	245,0	290,0	311,0	342,0	372,0
Maximum input current	[A]	478	478	568	568	738	907	917	1066	1066
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

RAH MC VS Kh		352	402	502	552	652	752	852	952	1052	1202
Cooling capacity	kW	312,1	442,9	504,7	570,6	663,3	758,1	877,6	995,0	1087,7	1217,5
Total input power	kW	102,5	149,8	169,2	188,2	212,3	243,4	280,0	314,3	342,3	380,5
Nominal input current	A	172,5	252,3	284,9	316,8	357,4	409,8	471,4	529,2	576,3	640,5
EER	W/W	3,70	3,36	3,48	3,61	3,64	3,65	3,60	3,65	3,62	3,66
SEER (EN14825)	W/W	3,05	2,96	2,98	3,03	3,12	3,11	3,13	3,17	3,18	3,20
Circuits	n°	2	2	2	2	2	2	2	2	2	2
Compressors	n°	2	2	2	2	2	2	2	2	2	2
Refrigerant data R1234Ze											
Refrigerant charge	kg	54	61	85	89	94	111	116	135	139	162
Global warming potential (GWP)	-	6	6	6	6	6	6	6	6	6	6
Equivalent CO_2 charge	t	0,32	0,37	0,51	0,53	0,56	0,67	0,70	0,81	0,83	0,97
Fans (1)											
Quantity	n°	6	6	8	10	10	12	12	14	14	16
Total air flow	m^3/h	145800	145800	194400	239000	239000	286800	286800	333900	333900	381600
Total power input	kW	18,0	18,0	24,0	30,0	30,0	36,0	36,0	42,0	42,0	48,0
Total input current	A	27,8	27,8	37,1	46,4	46,4	55,7	55,7	64,9	64,9	74,2
Evaporator (2)											
Quantity	n°	1	1	1	1	1	1	1	1	1	1
Water flow	m^3/h	53,7	76,3	86,9	98,3	114,2	130,5	151,1	171,3	187,3	209,6
Pressure drop	kPa	17,1	16,5	37,9	40,2	39,4	39,8	41,9	42,1	37,5	42,6
Weight											
Transport weight	kg	3248	3294	4138	5066	5140	5582	6598	7224	7372	7810
Operating weight	kg	3306	3360	4406	5336	5492	5792	6880	7522	7660	8098
Dimensions											
Length	mm	3920	3920	5060	6200	6200	7340	7340	8480	8480	9620
Width	mm	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260
Height	mm	2650	2650	2650	2650	2650	2650	2650	2650	2650	2650
Sound data											
Total LWA (3)	dB(A)	98,2	98,4	99,0	101,5	101,8	102,8	102,9	103,4	104,8	104,9
Total SPL 10m (4)	dB(A)	77,6	77,8	78,4	80,9	81,2	81,4	81,5	82,0	82,9	83,0
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	400/3/50
General electrical data											
Maximum input power	[kW]	206,8	248,2	284,5	329,1	373,0	428,8	488,2	466,2	580,3	649,9
Maximum input current	[A]	348	418	479	554	628	722	822	785	977	1094
Inrush current	[A]	**	**	**	**	**	**	**	**	**	**

RAH MC VS S Kh		352	402	502	552	652	752	852	952	1052	1202
Cooling capacity	kW	304,3	372,9	424,4	480,0	558,3	638,6	737,5	836,4	914,6	1021,8
Total input power	kW	95,9	117,1	134,8	149,2	169,4	193,8	221,9	251,1	274,6	304,8
Nominal input current	A	161,4	197,1	227,0	251,3	285,2	326,3	373,6	422,7	462,3	513,2
EER	W/W	3,58	3,51	3,52	3,66	3,69	3,71	3,68	3,70	3,67	3,70
SEER (EN14825)	W/W	3,17	3,18	3,15	3,22	3,30	3,29	3,32	3,33	3,33	3,35
Circuits	n°	2	2	2	2	2	2	2	2	2	2
Compressors	n°	2	2	2	2	2	2	2	2	2	2
Refrigerant data R1234Ze											
Refrigerant charge	kg	52	57	70	85	89	105	111	128	132	151
Global warming potential (GWP)	-	6	6	6	6	6	6	6	6	6	6
Equivalent CO_2 charge	t	0,31	0,34	0,42	0,51	0,53	0,63	0,67	0,77	0,79	0,91
Fans (1)											
Quantity	n°	6	6	8	10	10	12	12	14	14	16
Total air flow	m^3/h	119700	119700	159600	199500	199500	239400	239400	279300	279300	319200
Total power input	kW	10,8	10,8	14,4	18,0	18,0	21,6	21,6	25,2	25,2	28,8
Total input current	A	16,7	16,7	22,3	27,8	27,8	33,4	33,4	39,0	39,0	44,5
Evaporator (2)											
Quantity	n°	1	1	1	1	1	1	1	1	1	1
Water flow	m^3/h	52,4	64,2	73,1	82,7	96,1	110,0	127,0	144,0	157,5	175,9
Pressure drop	kPa	16,2	15,7	41,1	40,6	41,2	38,7	39,8	40,0	35,6	40,5
Weight											
Transport weight	kg	3330	3375	4570	4820	5411	6471	6532	7321	7493	7946
Operating weight	kg	3381	3433	4649	5066	5657	6684	6745	7607	7779	8258
Dimensions											
Length	mm	3920	3920	5060	6200	6200	7340	7340	8480	8480	9620
Width	mm	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260
Height	mm	2650	2650	2650	2650	2650	2650	2650	2650	2650	2650
Sound data											
Total LWA (3)	dB(A)	91,4	91,6	94,1	94,2	94,4	95,3	95,5	95,6	96,6	97,2
Total SPL 10m (4)	dB(A)	71,1	71,3	73,5	73,6	73,8	73,9	74,1	74,2	74,7	75,3
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	400/3/50	400/3/50
General electrical data											
Maximum input power	[kW]	200,2	241,8	275,5	318,2	362,3	415,2	474,6	450,9	564,9	632,5
Maximum input current	[A]	337	407	464	536	610	699	799	759	951	1065
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

RAH MC VS HE Kh		352	402	502	552	652	752	852	952	1052	1102
Cooling capacity	kW	388,3	430,5	487,2	514,5	592,2	747,6	795,9	844,2	961,8	1073,1
Total input power	kW	126,8	138,5	160,5	168,0	202,0	233,6	252,7	272,4	301,3	343,3
Nominal input current	A	213,5	233,2	270,2	282,8	340,1	393,2	425,4	458,6	507,3	577,9
EER	W/W	3,78	3,76	3,73	3,73	3,57	3,78	3,78	3,76	3,80	3,71
SEER (EN14825)	W/W	3,06	3,11	3,04	3,06	2,93	3,20	3,15	3,10	3,19	3,13
Circuits	n°	2	2	2	2	2	2	2	2	2	2
Compressors	n°	2	2	2	2	2	2	2	2	2	2
Refrigerant data R1234Ze											
Refrigerant charge	kg	75	77	94	96	112	120	139	160	162	185
Global warming potential (GWP)	-	6	6	6	6	6	6	6	6	6	6
Equivalent CO_2 charge	t	0,45	0,46	0,56	0,58	0,67	0,72	0,83	0,96	0,97	1,11
Fans (1)											
Quantity	n°	8	8	10	10	12	12	14	16	16	18
Total air flow	m^3/h	194208	194208	242760	242760	291312	291312	339864	388416	388416	436968
Total power input	kW	24,0	24,0	30,0	30,0	36,0	36,0	42,0	48,0	48,0	54,0
Total input current	A	37,1	37,1	46,4	46,4	55,7	55,7	64,9	74,2	74,2	83,5
Evaporator (2)											
Quantity	n°	1	1	1	1	1	1	1	1	1	1
Water flow	m^3/h	66,9	74,1	83,9	88,6	102,0	128,7	137,1	145,4	165,6	184,8
Pressure drop	kPa	39,6	40,1	39,3	39,6	41,1	40,4	42,6	42,8	38,1	43,3
Weight											
Transport weight	kg	4754	4818	5166	4799	5374	5469	6178	7290	7385	7946
Operating weight	kg	4959	5038	5401	5039	5642	5737	6546	7662	7757	8390
Dimensions											
Length	mm	5060	5060	6200	6200	7340	7340	8480	9620	9620	10760
Width	mm	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260
Height	mm	2650	2650	2650	2650	2650	2650	2650	2650	2650	2650
Sound data											
Total LWA (3)	dB(A)	100,5	100,7	101,4	103,9	104,2	105,2	105,3	105,9	107,3	107,4
Total SPL 10m (4)	dB(A)	79,9	80,1	80,8	83,3	83,6	83,8	83,9	84,5	85,4	85,5
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	400/3/50
General electrical data											
Maximum input power	[kW]	283,3	283,3	336,2	336,2	437,1	532,3	537,6	542,9	626,0	631,5
Maximum input current	[A]	477	477	566	566	736	896	905	914	1054	1063
Inrush current	[A]	**	**	**	**	**	**	**	**	**	**

RAH MC VS HE S Kh		352	402	502	552	652	752	852	952	1052	1102
Cooling capacity	kW	384,6	426,4	482,6	509,6	586,6	740,5	788,3	836,2	952,6	1062,9
Total input power	kW	119,3	131,2	151,1	162,3	190,9	226,7	243,7	257,7	290,7	327,4
Nominal input current	A	200,8	220,9	254,3	273,2	321,4	381,6	410,2	433,8	489,4	551,2
EER	W/W	3,67	3,65	3,63	3,62	3,46	3,68	3,67	3,65	3,69	3,60
SEER (EN14825)	W/W	3,22	3,25	3,19	3,14	3,07	3,27	3,24	3,25	3,28	3,25
Circuits	n°	2	2	2	2	2	2	2	2	2	2
Compressors	n°	2	2	2	2	2	2	2	2	2	2
Refrigerant data R1234Ze											
Refrigerant charge	kg	73	75	91	105	110	132	147	151	169	175
Global warming potential (GWP)	-	6	6	6	6	6	6	6	6	6	6
Equivalent CO_2 charge	t	0,44	0,45	0,55	0,63	0,66	0,79	0,88	0,91	1,01	1,05
Fans (1)											
Quantity	n°	8	8	10	12	12	14	16	16	18	18
Total air flow	m^3/h	194208	194208	242760	291312	291312	339864	388416	388416	436968	436968
Total power input	kW	14,4	14,4	18,0	21,6	21,6	25,2	28,8	28,8	32,4	32,4
Total input current	A	22,3	22,3	27,8	33,4	33,4	39,0	44,5	44,5	50,1	50,1
Evaporator (2)											
Quantity	n°	1	1	1	1	1	1	1	1	1	1
Water flow	m^3/h	66,2	73,4	83,1	87,8	101,0	127,5	135,7	144,0	164,0	183,0
Pressure drop	kPa	39,6	40,1	39,3	37,8	38,6	40,4	42,5	42,7	38,1	43,2
Weight											
Transport weight	kg	4754	4818	5166	5374	5474	6179	7290	7443	7946	8224
Operating weight	kg	4959	5038	5401	5642	5747	6415	7662	7823	8390	8684
Dimensions											
Length	mm	5060	5060	6200	7340	7340	8480	9620	9620	10760	10760
Width	mm	2260	2260	2260	2260	2260	2260	2260	2260	2260	2260
Height	mm	2650	2650	2650	2650	2650	2650	2650	2650	2650	2650
Sound data											
Total LWA (3)	dB(A)	92,6	93,6	93,6	94,4	94,8	95,9	96,6	97,2	98,0	98,9
Total SPL 10m (4)	dB(A)	72,0	73,0	73,0	73,8	74,2	74,5	75,2	75,8	76,1	77,0
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	400/3/50
General electrical data											
Maximum input power	[kW]	274,5	274,4	325,6	328,5	423,5	522,2	525,8	525,7	611,8	611,8
Maximum input current	[A]	462	462	548	553	713	879	885	885	1030	1030
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