

RAH MC Kp

**AIR COOLED CHILLERS FOR OUTDOOR INSTALLATION
WITH SCREW COMPRESSORS AND AXIAL FANS**

Cooling capacity from 390 kW to 790 kW

R290



AIR



EC



ERP
2021



VERSIONS

RAH MC VS U Kp - standard version

The modular air cooled chillers of RAH VS MC U Kp are designed for external installation and are particularly suitable for cooling liquid solutions in industrial applications or for air conditioning in commercial field, where excellent seasonal performances must be granted keeping at the same time a low environmental impact, class A efficiency and meeting the seasonal efficiency requirements established by (EU) 2016/2281 Regulation.

The refrigerant used is Propane, a non-toxic hydrocarbon, even at high concentrations, with almost a null ozone depletion potential, negligible global warming potential and thermodynamic properties which allow to reach high efficiency values.

The units are designed for external installation, in compliance with the European standard EN 378 and his updates.

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 subjected to a pressure test and then charged with Refrigerant R290 and non-freezing oil. So, once on site, the units must be only positioned and electrically and hydraulically connected.

Reduced sound level in version U is realised by using condensers with larger surface areas as well as sound-proofed compressor cabinets.

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

MAIN COMPONENTS

FRAME

Structure realized with frame made up of hot galvanized steel sheet and RAL 7035 painted, suitable to resist to atmospheric agents. Compressors and main components are easily accessible and suitably placed in the technical room.

COMPRESSORS

Semi-hermetic screw compressors, optimized for operation with hydrocarbons and manufactured in accordance with current safety regulations. The compressors, one for each circuit, are with motor thermal protection, rotation direction control, crankcase heater, liquid injection, suction and discharge shut-off valves, compressor overload relays and vibration kit. Lubrication is of the forced type without a pump and to avoid excessive oil migration to the cooling circuit, there is an oil separator incorporated in the delivery. The electric motor is equipped with an automatic partial load starting system and mechanical interlock of the starting contactors, to avoid accidental short circuits.

EVAPORATOR

Stainless steel plates type mono or bi circuits, thermally insulated using a flexible closed cells mattress of high thickness. Is also provided with a safety differential pressure switch which does not allow the unit operation in case of water flow lack or reduction.

COILS

Micro channel condensing Coils 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.

FANS

With 6-poles electrical motor with external rotor directly coupled to the impeller and driven by a V/F inverter system which controls the condensation temperature. 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. The fan motors are of totally closed type and have got a protection factor IP54 and protection winding-flooded thermostat.

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, non return valve in-built on compressors discharge side, 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.

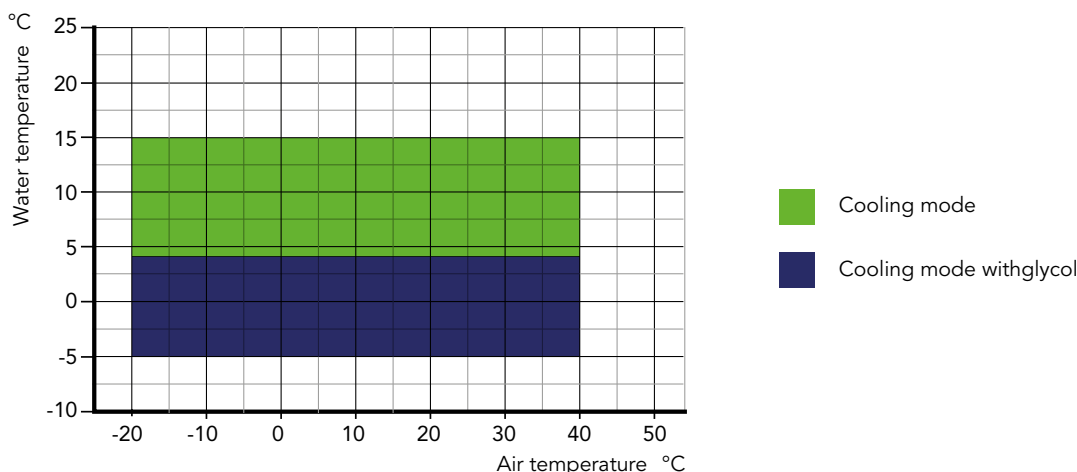
ELECTRICAL BOARD

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

Electronic 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 Kp

RAH MC Kp		402	502	602	652	752
Amperometer + Voltmeter	A+V	o	o	o	o	o
Low ambient temperature operation (down to -20°C)	BF	•	•	•	•	•
Soundproofed compressors cabinet	CFU	•	•	•	•	•
Compressors inrush counter	CS	o	o	o	o	o
Refrigerant leakage detector	DR	•	•	•	•	•
Axial fans with electronic commutated motor	EC	o	o	o	o	o
Anticorrosive electro coating protection of condensing coils	ECP	o	o	o	o	o
Condensing coil protection grid	GP	o	o	o	o	o
Anti-intrusion grid	GP1	o	o	o	o	o
RS 485 Serial interface	IH	o	o	o	o	o
BACNET Protocol serial interface	IH-BAC	o	o	o	o	o
Phase monitor	MF	•	•	•	•	•
Enhanced microprocessor board	MP ADV	o	o	o	o	o
Advanced Cascade system	MSC	o	o	o	o	o
Pressure gauges	MT	•	•	•	•	•
Buffer tank module	MV	o	o	o	o	o
Pump group	P1	o	o	o	o	o
Higher available pressure pump group	P1H	o	o	o	o	o
Double pump group	P2	o	o	o	o	o
Higher available pressure double pump group	P2H	o	o	o	o	o
Rubber-type vibration dampers	PA	◊	◊	◊	◊	◊
Spring-type vibration dampers	PM	◊	◊	◊	◊	◊
Remote display	PQ	◊	◊	◊	◊	◊
Anti-freeze heater on evaporator	RA	o	o	o	o	o
Shut-off valve on compressors discharge side	RD	•	•	•	•	•
Shut-off valve on compressors suction side	RH	•	•	•	•	•
Compressor overload relays	RL	o	o	o	o	o
Electronic thermostatic valve	TE	•	•	•	•	•
Inverter for pump	VSP1	o	o	o	o	o
High pressure inverter for pump	VSP1H	o	o	o	o	o
Inverter for parallel pumps (only one running)	VSP2	o	o	o	o	o
High pressure inverter for parallel pumps (only one running)	VSP2H	o	o	o	o	o

• Standard, o Optional, ◊ Optional (external kit), -- Not available

TECHNICAL DATA

RAH MC Kp		402	502	602	652	752
Cooling capacity	kW	397,2	524,8	631,3	693,2	788,7
Total input power	kW	137,9	182,0	216,4	231,3	263,2
Nominal input current	A	239,0	308,7	369,0	395,5	453,2
EER	W/W	2,88	2,88	2,92	3,00	3,00
SEPR ⁽⁵⁾	W/W	5,10	5,53	5,55	5,52	5,55
Circuits	n°	2	2	2	2	2
Compressors	n°	2	2	2	2	2
Refrigerant R290						
Refrigerant charge	kg	27	30	36	42	44
Global warming potential (GWP)	-	0,02	0,02	0,02	0,02	0,02
Equivalent CO ₂ charge	kg	0,54	0,60	0,72	0,84	0,88
Axial fans ⁽¹⁾						
Quantity	n°	8	8	10	12	12
Total air flow	m ³ /h	165600	165600	207000	248400	248400
Total power input	kW	15,5	15,5	19,4	23,3	23,3
Evaporator ⁽²⁾						
Quantity	n°	1	2	2	2	2
Water flow	m ³ /h	68,3	90,3	108,6	119,2	135,6
Pressure drop	kPa	32	32	30	35	37
Weight						
Transport weight	kg	3602	3832	5002	5380	5532
Operating weight	kg	3648	3898	5078	5456	5626
Dimensions						
Length	mm	5860	5860	7200	8540	8540
Width	mm	2260	2260	2260	2260	2260
Height	mm	2470	2470	2470	2470	2470
Sound data						
Total LWA ⁽³⁾	dB(A)	92,4	92,8	94,2	95,5	96,0
Total SPL 10m ⁽⁴⁾	dB(A)	60,0	60,4	61,5	62,7	63,2
Power supply						
Voltage/phase/frequency	V/ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
General electrical data						
Maximum input power	[kW]	176	216	254	273	283
Maximum input current	[A]	351	421	502	537	611
Inrush current	[A]	596	731	814	879	1060

(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

(5) SEPR: High temperature process chillers.