# ERAH AM MC Ka



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

R134a



## VERSIONS

AM: Abroad market version

Units in compliance with the European regulation whose sales is reserved to countries out of the European Union.

The modular air cooled chillers of ERAH AM MC Ka 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.

Micro channel condensing coils are totally made up of mechanically expanded aluminum alloy. In comparison to the traditional Copper-Aluminum coils, the micro channel geometry provides less resistance to the air passing. This allows to optimize the performances of the fans section and consequently to reduce dimensions keeping performances unchanged.

Moreover the micro channel technology permits to reduce the weight of the condensing section as well as the refrigerant charge. 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.

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 R134a and non-freezing oil. So, once on site, the units must be only positioned and electrically and hydraulically connected.

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



## MAIN COMPONENTS

#### 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 type, provided with capacity steps, motor thermal protection, rotation direction control, crankcase heater, discharge side shut-off valve and anti-vibration kit. Compressors lubrication is of forced type, without pump and to avoid excessive oil migration to the cooling circuits, they are provided with an in-built oil separator. In the standard configuration it is also included a discharge junction flange, as well as steps capacity control system, non-return and safety valve, oil heater, lubrication management system, oil filter, oil service valve, POE oil charge, integral motor protection with protection module, discharge side temperature control device. The electrical motor of the compressors is provided with an inrush current reduction device obtained thanks to some interlocked contactors. Besides the capacity can be continuously modulated through option M25.

#### **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. Water side exchanger design pressure are 10 bar.

#### 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.

#### FANS

Of directly coupled type, with wing-profile aluminium blades, are designed not to create air turbulence. This ensures the max efficiency with the lowest sound level. Each fan is provided with a galvanized steel protection grid, which is painted after construction. The IP54 fans motors are completely closed and provided with in-built overload protection thermostat, incorporated to the motor windings.

#### **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

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.



## **OPERATING RANGE**



# ACCESSORIES

ERAH AM MC KA		4120	4520	5320	6120	7020	7320
Amperometer	Α	0	0	0	0	0	0
Anti-corrosive protection of the condensing coils	ACP	0	0	0	0	0	0
Electrical power supply different than standard	AE	0	0	0	0	0	0
Operation in cooling mode down to -20°C	BF	0	0	0	0	0	0
Operation in cooling mode down to -10°C	BT	0	0	0	0	0	0
Soundproofed compressors cabinet with standard material	CF	0	0	0	0	0	0
Compressors inrush counter	CS	0	0	0	0	0	0
Star/Delta	DS	-	-	-	-	0	0
Axial fans with electronic commutated motor	EC	0	0	0	0	0	0
Condensing coil protection grid	GP	0	0	0	0	0	0
Anti-intrusion grid	GP1	0	0	0	0	0	0
RS 485 Serial interface	IH	0	0	0	0	0	0
LON Protocol serial interface	IH-LON	0	0	0	0	0	0
Seawood packing	IM	0	0	0	0	0	0
TCP/IP Protocol serial interface	IWG	0	0	0	0	0	0
Modulating capacity control	M12	0	0	0	0	0	0
Buffer tank module	MV	-	-	-	-	-	-
Oil flow safety switch	OS	0	0	0	0	0	0
Pump group	P1	0	0	0	0	0	0
Higher available pressure pump group	P1H	0	0	0	0	0	0
Double pump group	P2	0	0	0	0	0	0
Higher available pressure double pump group	P2H	0	0	0	0	0	0
Rubber-type vibration dampers	PA	0	0	0	0	0	0
Anti-corrosive protection of the condensing coils	PCP	0	0	0	0	0	0
Safety water flow switch	PF	0	0	0	0	0	0
Spring-type vibration dampers	PM	0	0	0	0	0	0
Remote display	PQ	0	0	0	0	0	0
In-line twin pump group (only one working)	PT	0	0	0	0	0	0
Part-Winding	PW	•	•	•	٠	-	-
Anti-freeze heater on evaporator	RA	0	0	0	0	0	0
Power factor correction system cosfi ≥0,9	RF	0	0	0	0	0	0
Shut-off valve on compressors suction side	RH	0	0	0	0	0	0
Compressor overload relays	RL	0	0	0	0	0	0
Partial heat recovery	RP	0	0	0	0	0	0
Total heat recovery	RT	-	-	-	-	-	-
Electronic thermostatic valve	TE	•	•	•	•	•	•
Voltmeter	V	0	0	0	0	0	0
Brine Version	VB	0	0	0	0	0	0
Solenoid valve	VS	0	0	0	0	0	0

• Standard, o Optional, -- Not available



ERAH AM MC KA		8020	9020	10120	10520	11520
Amperometer	Α	0	0	0	0	0
Anti-corrosive protection of the condensing coils	ACP	0	0	0	0	0
Electrical power supply different than standard	AE	0	0	0	0	0
Operation in cooling mode down to -20°C	BF	0	0	0	0	0
Operation in cooling mode down to -10°C	BT	0	0	0	0	0
Soundproofed compressors cabinet with standard material	CF	0	0	0	0	0
Compressors inrush counter	CS	0	0	0	0	0
Star/Delta	DS	0	0	0	0	0
Axial fans with electronic commutated motor	EC	0	0	0	0	0
Condensing coil protection grid	GP	0	0	0	0	0
Anti-intrusion grid	GP1	0	0	0	0	0
RS 485 Serial interface	IH	0	0	0	0	0
LON Protocol serial interface	IH-LON	0	0	0	0	0
Seawood packing	IM	0	0	0	0	0
TCP/IP Protocol serial interface	IWG	0	0	0	0	0
Modulating capacity control	M12	0	0	0	0	0
Buffer tank module	MV	0	0	0	0	0
Oil flow safety switch	OS	0	0	0	0	0
Pump group	P1	0	0	0	0	0
Higher available pressure pump group	P1H	0	0	0	0	0
Double pump group	P2	0	0	0	0	0
Higher available pressure double pump group	P2H	0	0	0	0	0
Rubber-type vibration dampers	PA	0	0	0	0	0
Anti-corrosive protection of the condensing coils	PCP	0	0	0	0	0
Safety water flow switch	PF	0	0	0	0	0
Spring-type vibration dampers	PM	0	0	0	0	0
Remote display	PQ	0	0	0	0	0
In-line twin pump group (only one working)	PT	0	0	0	0	0
Part-Winding	PW	0	0	0	0	0
Anti-freeze heater on evaporator	RA	0	0	0	0	0
Power factor correction system $cosfi \ge 0,9$	RF	0	0	0	0	0
Shut-off valve on compressors suction side	RH	0	0	0	0	0
Compressor overload relays	RL	0	0	0	0	0
Partial heat recovery	RP	0	0	0	0	0
Total heat recovery	RT	-	-	-	-	-
Electronic thermostatic valve	TE	•	•	٠	٠	٠
Voltmeter	V	0	0	0	0	0
Brine Version	VB	0	0	0	0	0
Solenoid valve	VS	0	0	0	0	0

• Standard, o Optional, -- Not available



## **TECHNICAL DATA**

ERAH AM MC Ka		4120	4520	5320	6120	7020	7320
Cooling capacity	kW	401	449	527	610	701	734
Total input power	kW	151	168	188	224	276	289
EER	W/W	2,66	2,67	2,80	2,72	2,54	2,54
SEER (EN14825)	W/W	3,27	3,38	3,34	3,34	3,39	3,49
ηs,c <sup>(1)</sup>		128	132	131	131	133	137
Circuits	n°	2	2	2	2	2	2
Compressors	n°	2	2	2	2	2	2
Refrigerant data R134A							
Refrigerant charge	kg	62	66	84	90	96	51
Global warming potential (GWP)	-	1430	1430	1430	1430	1430	1430
Equivalent CO₂ charge	t	88,70	94,38	120,12	128,70	137,28	72,93
Axial fans (1)							
Quantity	n°	6	6	8	8	8	10
Total air flow	m³/h	104564	126578	169899	168907	167337	173377
Total power input	kW	9,42	13,2	17,4	17,7	18,5	16,0
Total input current	А	19,5	27,7	37,1	36,9	36,7	32,3
Evaporator <sup>(2)</sup>							
Quantity	n°	1	1	1	1	1	1
Water flow	m³/h	68,9	77,2	90,7	105,0	120,6	126,2
Pressure drop	kPa	51,1	45,7	58,4	48,7	38,5	42,3
Weight							
Transport weight	kg	3072	3772	4238	4418	5638	5986
Operating weight	kg	3230	3924	4386	4672	5884	6232
Dimensions							
Length	mm	4020	4020	5360	5360	5360	6700
Width	mm	2260	2260	2260	2260	2260	2260
Height	mm	2470	2470	2470	2470	2470	2470
Sound data							
Total LWA (3)	dB(A)	95	98	99	99	99	99
Total SPL 10m <sup>(4)</sup>	dB(A)	62	66	66	67	66	66
Power supply							
Voltage/phase/frequency	V/ph/Hz	3/400/50	3/400/50	3/400/50	3/400/50	3/400/50	3/400/50
General electrical data							
Maximum input power	[kW]	143	215	191	214	242	258
Maximum input current	[A]	361	391	437	483	607	637
Inrush current	[A]	959	931	2270	1180	1690	1760



(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

ERAH AM MC Ka		8020	9020	10120	10520	11520
Cooling capacity	kW	792	900	1020	1050	1140
Total input power	kW	299	329	358	400	416
EER	W/W	2,65	2,74	2,85	2,62	2,74
SEER (EN14825)	W/W	3,49	3,27	3,32	3,35	3,36
ηs,c <sup>(1)</sup>		137	128	130	131	131
Circuits	n°	2	2	2	2	2
Compressors	n°	2	2	2	2	2
Refrigerant data R134A						
Refrigerant charge	kg	108	130	138	144	166
Global warming potential (GWP)	-	1430	1430	1430	1430	1430
Equivalent CO <sub>2</sub> charge	t	154	186	197	206	237
Axial fans (1)						
Quantity	n°	10	12	14	14	16
Total air flow	m³/h	210121	253359	296323	295483	338697
Total power input	kW	22,2	26,1	30,6	31,0	35,3
Total input current	А	46,1	55,4	64,8	64,6	74,0
Evaporator <sup>(2)</sup>						
Quantity	n°	1	1	1	1	1
Water flow	m³/h	136,3	154,8	175,5	180,3	195,9
Pressure drop	kPa	49,1	67,2	118,4	42,3	47,3
Weight						
Transport weight	kg	6042	6454	7112	7140	7556
Operating weight	kg	6282	6688	7524	7536	7940
Dimensions						
Length	mm	6700	8040	9380	9380	10720
Width	mm	2260	2260	2260	2260	2260
Height	mm	2470	2470	2470	2470	2470
Sound data						
Total LWA <sup>(3)</sup>	dB(A)	99	100	101	103	103
Total SPL 10m <sup>(4)</sup>	dB(A)	67	67	68	70	70
Power supply						
Voltage/phase/frequency	V/ph/Hz	3/400/50	3/400/50	3/400/50	3/400/50	3/400/50
General electrical data						
Maximum input power	[kW]	280	321	350	383	407
Maximum input current	[A]	682	774	926	468	1060
Inrush current	[A]	1810	2270	2530	2790	3090

(1) Ambient air temperature 35°C / H.R 50%
(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

