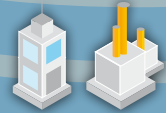


Air cooled chillers with screw compressors and axial fans

RAH...T Ka Series - 2 cooling circuits
Cooling capacities from 190 to 737 kW



- External installation
- Wide range of options
- Huge versatility and flexibility



Air cooled chillers



screw compressors



air cooled unit



only cooling units



Units available in low noise versions



units with free-cooling



EMIKON

AIR CONDITIONING AND INDUSTRIAL APPLICATION

The air cooled chillers of **RAH T Ka** series are designed for outdoor installation and are particularly suitable for industrial applications. They can also be used for medium and big air conditioning systems and to be matched to fancoils or terminal units. These units are standard provided by a technical housing, always protected by panels. Thanks to the several options available, these units are particularly flexible and can be easily adapted to all installation sites. These units are completely assembled and tested in the factory and supplied with refrigerant and non-freezing oil charge. Therefore, once on site, the units only need to be positioned and electrically and hydraulically connected.

Operation limits (standard unit)

- AIR : from 15 to 45°C
- WATER (out from evaporator): from 5 to 15°C

Main components

Strong and compact **frame** made of pressed and bended galvanized steel profiles, panels and base-frame of high thickness galvanized and painted steel and coated by rust-proof paint, suitable to resist to external agents. The technical housing, completely closed and suitably isolated from the air flow, is containing the compressors and the main components. The external panels, easily to be dismantled, allow the complete access in case of service, without compromising the operation of the unit itself. When required, the hydraulic kit (buffer tank and pump group) are installed inside the unit, with no change in overall dimensions.

Semi-hermetic **screw compressors** equipped with capacity steps, motor thermal protection, oil crankcase heater and phase monitor. The compressors lubrication is of forced type, with no pump and in order to prevent many oil migrations to the cooling circuit, the compressors are provided with an oil separator, in-built to the discharge side. The electrical motor is foreseen for lower inrush current and, in this case, the unit is equipped with an automatic partial load inrush device and mechanical interlock of the inrush control switches, to prevent accidental short circuits (options DS and PW).

Heat-exchange **external coil** with copper tube and turbo aluminium fins for a better efficiency. It is suitably sized with a wide exchange surface, so to allow the unit operation also at very high external air temperatures. On request, in case of installation in aggressive environments, several coil protection treatments are available.

For free-cooling version (F) only, **additional free-cooling water coil** with copper tube and aluminium fins, complete with mixing valve, for production of chilled water by means of the very low external air temperatures. This allows a remarkable reduction of the compressors working hours with a consequent energy saving, also considering that each circuit is completely independent.

Available versions

- Ka – standard version
- S.Ka - silenced version: oversized coil, reduced air flow, fans with a lower rotation speed, technical partition insulated by means of soundproofing material
- U.Ka - ultra-silenced version: oversized coil, reduced air flow, fans with a very low rotation speed, technical partition insulated by means of soundproofing material with bituminous rubber coating, vibration dampers on compressors suction and discharge pipes, mufflers on discharge pipes, compressors fixed on spring-type vibration dampers
- F.Ka - standard version with free-cooling coil
- FS.Ka - silenced version with free-cooling coil
- FU.Ka - ultra-silenced version with free-cooling coil

Low rpm **axial fans**, of directly coupled type, with 6-8 pole electrical motor complete with in-built overload protection, electronic balance, low sound level blades with wing profile and safety protection grid.

Dry expansion **shell & tube evaporator** with two refrigerant circuits and one water circuit, with very low pressure drops. Shell and tubes plate made in carbon steel and copper tubes. Some plastic and corrosion-proof baffles are suitably placed inside the shell, allowing a correct water distribution and making the tube bundle particularly strong and vibration-free, also in case of very high water flows.

Cooling circuit composed of thermostatic expansion valve, dehydrating filter, sight glass, high pressure safety device, antifreeze thermostat, high and low pressure switches, high and low pressure gauges, non-return valve on discharge side, shut-off valve on liquid line, shut-off valve on compressor discharge side.

Electric board in compliance with CE norms, contained in a suitable partition protected by the internal safety panel, provided with a lock-door main switch. Inside, it is complete with all control and protection switches, the terminal board and auxiliaries. The electrical board also includes the control device for power supply phases, to prevent the compressor to turn in the wrong sense. The microprocessor, complete with display, is also placed inside the electrical board.

Unit management **microprocessor** installed on the internal safety panel of the electrical board, controlling the chilled water temperature regulation, the working parameters, auto-detection failure system, remote management and supervision, complete with compressors hour counter.

References

- Rechenzentrum Mahisdorf – Berlino (Germany)
- Nuovi Uffici Giudiziari – Venezia (Italy)
- Sede INPS – Catania (Italy)
- Hotel Holiday Inn – Carros (France)
- Ospedale Fallagara – Bari (Italy)
- Ospedale di Rho (Italy)
- R.S.A. Limbiate (Italy)
- Centro Commerciale Area Ex-Mangelli – Forlì (Italy)
- Congress Center – Brdo (Slovenja)
- Ristorante Corte Bracco dei Germani – Corato (Italy)
- High Tech Campus – Vienna (Austria)

Available options

A - Amperometer: Electrical device for measuring the intensity of electrical current absorbed by the unit.

BT - Low temperature operation (-20°C): electronic device of for the continuous voltage control of the condensing pressure through the variation of the fan rotation speed (standard provided for F versions).

CE - UV protection on water insulation: particular coat of the evaporator and of water insulations with UV ray proof material.

CS - Compressors inrush counter: Electromechanical device positioned inside the electrical board, recording the total inrush starts of compressors.

DS - Star/delta: electric device of close transition type to reduce the inrush current, complete with short circuit safety by mechanical interlock.

FA - Condensing coil protection filters: washable metal filters with very low pressure drop, protecting the condensing coils from dirt, with aluminium mesh against dust and leaves.

GP - Condensing coil protection grid: metal protection grid against accidental impacts, made of 50x50 4-mesh wire.

I1 - Victaulic insulation on pump side: insulation of the joints by close-cell polyurethane material, to prevent condense, pump side.

I2 - Victaulic insulation on buffer tank side: insulation of the joints by close-cell polyurethane material, to prevent condense, buffer tank side.

I3 - Victaulic insulation for the free-cooling version: insulation of the joints by close-cell polyurethane material, to prevent condense, free-cooling side.

IG - Watch card: Electronic card to program the switch-over and rotation between to units, after a pre-set time.

IH - RS 485 serial interface: electronic card to be connected to microprocessor, to allow communication between the units and a CAREL supervision system. It is possible to fully control the unit from remote. For connection to other supervision systems, the protocol of the controlled parameters is available on request.

IM - Seawood packing: fumigated seawood case and protection bag with hygroscopic salts, suitable for long sea transports.

LI - Liquid injection: mechanical device allowing a better cooling of compressors at very high compression level.

M12 - Modulating capacity control for 2-circuit units: by means of some valves installed on compressors, the capacity is modulated from 12,5

to 100%.

MV - Buffer tank of suitable capacity complete with expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves.

OS - Oil flow safety switch: in-built in the compressor oil separator, it indicates the eventual decrease of the oil level.

P1 - Single pump group: chilled water pump group composed of single pump, expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves, electrical control of the pump. The pump is of 2 pole centrifugal packaged type.

P1H - Higher available pressure pump group: chilled water higher available pressure pump group composed of single pump, expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves, electrical control of the pump. The pump is of 2 pole centrifugal packaged type.

PA - Rubber-type vibration dampers: bell-shaped vibration dampers supports for insulating the unit (supplied in kit), made of base and bell in galvanized steel and natural rubber mixture (not available when option MV is required).

PF - Safety water flow switch: installed on evaporator, it switches off the unit in case of lack of water flow rate through the evaporator.

PM - Spring-type vibration dampers: spring-type vibration dampers support, for insulating the unit (supplied in kit), mainly indicated for installation in difficult and aggressive environments. Made of two steel plates containing a suitable quantity of harmonic steel springs.

PQ - Remote microprocessor: remote terminal, allowing to display the temperature and humidity values detected by probes, the alarm digital inputs, the outputs and the remote ON/OFF of the unit, to change and program of the parameters, the sound signal and the display of the present alarms.

PT - Twin pump group: chilled water pump group composed of twin pump, expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves, electrical control of the pump, automatic switch in case of failure of the working pump. The pump is of 2 pole centrifugal packaged type.

PW - Part-winding: equipment for step compressors starting, reducing of about 35% the inrush current of each compressor.

RA - Anti-freeze heater on evaporator: electrical heater installed on the evaporator, in order to prevent freezing and provided with thermostat.

RF - Power factor correction system cosfi >

0,9: Electrical device made of suitable condensers for compressors rephasing, ensuring a cosfi value $\geq 0,9$, so to reduce the power absorption from the electrical network.

RH - Shut-off valve on suction side: they are use to isolate compressors during service operations.

RL - Compressors overload relays: electromechanical protection devices against compressors overload.

RM - Condensing coil with pre-painted fins: superficial treatment of the condensing coils with epoxy coating.

RP - Partial heat recovery (about 20%) of the condensing heat, by means of a refrigerant/water plate exchanger (desuperheater), always in series to the compressors. It is requested when you need to produce sanitary water, by recovering condensing heat capacity.

RR - Copper/copper condensing coils: special execution of the condensing coils with copper pipe and fins.

RT - Total heat recovery (100%) of the condensing heat, by means of a refrigerant/water plate exchanger, always in series to the compressors. It is requested when you need to produce sanitary water, by recovering condensing heat capacity, and /or for dehumidification. It is necessary to order option BT and it is not available on free-cooling version.

RV - Personalized frame painting in RAL colour.

SC - Insulated compressors housing with sound proofing material (included on silenced version)

SU - Insulated compressors housing with bituminous rubber sound proofing material, muffler on discharge pipe and vibration dampers for compressors (included on ultra-silenced version)

TE - Electronic thermostatic valve: it is requested to make a very accurate regulation of the refrigerant flow and to limit variations of cooling capacity and evaporator leaving temperature water during operation in transitions and for a better performance with fixed superheating.

V - Voltmeter: Electrical device measuring the electrical tension in the power supply of the unit.

VB - Brine version: unit suitable for working with evaporator outlet water temperatures lower than 0°C. A 20 mm evaporator insulation will be provided.

VS - Solenoid valve: electromagnetic solenoid valve on each cooling circuit to prevent refrigerant migrations and consequent flooding of compressors.

RAH T Ka - Standard Version

MODEL		2502 Ka	2802 Ka	3202 Ka	3602 Ka	4602 Ka	5202 Ka	6002 Ka	6802 Ka	8002 Ka
Cooling capacity	kW	260	290	320	348	432	465	568	608	737
Absorbed power	kW	73	88	103	126	166	188	198	244	282
EER		3,56	3,30	3,11	2,76	2,60	2,47	2,87	2,49	2,61
Screw compressors	n.	2								
Standard steps capacity	n.	6	6	6	6	6	6	6	6	6
Axial fans										
Quantity	n.	6	6	6	6	6	6	8	8	10
Sound pressure level	dB(A)	78	78	78	78	79	79	80	80	82
Shell & Tube evaporator	n.	1								
Water flow rate	m ³ /h	44,7	49,9	55,0	59,9	74,3	80,0	97,7	104,6	126,8
Pressure drop	kPa	55	59	72	43	52	28	42	40	38
Electrical data										
Total absorbed power	kW	85	100	115	138	178	200	214	260	302
Total nominal absorbed current	A	149	172	198	230	299	338	364	430	491
Maximum absorbed current	A	220	272	312	348	388	454	494	592	660
Total inrush current	A	571	633	753	872	1.007	1.182	1.286	1.676	1.792
Total inrush current with opt. PW/DS	A	389	438	518	609	726	851	927	1267	1359
Dimensions										
Length	mm	5.082	5.082	5.082	5.082	5.082	5.082	6.120	6.960	7.997
Width	mm	2.244	2.244	2.244	2.244	2.244	2.244	2.244	2.244	2.244
Height	mm	2.370	2.370	2.370	2.370	2.370	2.370	2.370	2.370	2.370
Transport weight	kg	3.535	3.554	3.576	3.648	4.492	4.689	5.140	6.109	6.713
Power supply		400 V / 50 Hz / 3 Ph + T								

RAH T.S Ka - Silencend Version

MODEL		2202 Ka	2502 Ka	2802 Ka	3202 Ka	3602 Ka	4602 Ka	5202 Ka	6002 Ka	6802 Ka	8002 Ka
Cooling capacity	kW	218	252	279	306	329	431	464	534	633	747
Absorbed power	kW	63	77	92	110	134	166	188	212	234	277
EER		3,46	3,27	3,03	2,78	2,46	2,60	2,47	2,52	2,71	2,70
Screw compressors	n.	2									
Standard steps capacity	n.	6	6	6	6	6	6	6	6	6	
Axial fans											
Quantity	n.	6	6	6	6	6	8	8	8	10	12
Sound pressure level	dB(A)	73	73	73	74	75	76	77	77	78	79
Shell & Tube evaporator	n.	1									
Water flow rate	m ³ /h	37,5	43,3	48,0	52,6	56,6	74,1	79,8	91,8	108,9	128,5
Pressure drop	kPa	39	52	55	65	39	52	28	37	44	39
Electrical data											
Total absorbed power	kW	71	85	100	118	142	176	198	222	247	292
Total nominal absorbed current	A	122	145	170	198	232	294	333	371	405	473
Maximum absorbed current	A	172	210	262	302	338	382	448	480	583	648
Total inrush current	A	448	561	623	743	861	1.001	1.176	1.272	1.667	1.780
Total inrush current with opt. PW/DS	A	299	379	428	508	598	720	845	913	1258	1347
Dimensions											
Length	mm	5.082	5.082	5.082	5.082	5.082	6.120	6.120	6.120	7.997	9.035
Width	mm	2.244	2.244	2.244	2.244	2.244	2.244	2.244	2.244	2.244	2.244
Height	mm	2.370	2.370	2.370	2.370	2.370	2.370	2.370	2.370	2.370	2.370
Transport weight	kg	3.513	3.535	3.554	3.576	3.648	4.800	4.997	5.140	6.534	7.139

RAH T.U - Ultra-Silencend Version

MODEL		1802 Ka	2202 Ka	2502 Ka	2802 Ka	3202 Ka	3602 Ka	4602 Ka	5202 Ka	6002 Ka	
Cooling capacity	kW	199	211	242	267	289	326	427	483	633	
Absorbed power	kW	53	66	81	98	117	136	168	180	234	
EER		3,75	3,20	2,99	2,72	2,47	2,40	2,54	2,68	2,71	
Screw compressors	n.	2									
Standard steps capacity	n.	6	6	6	6	6	6	6	6	6	
Axial fans											
Quantity	n.	6	6	6	6	6	6	8	10	12	
Sound pressure level	dB(A)	70	70	70	70	71	72	73	74	75	
Shell & Tube evaporator	n.	1									
Water flow rate	m ³ /h	34,2	36,3	41,6	45,9	49,7	56,1	73,4	83,1	108,9	
Pressure drop	kPa	32	36	48	50	58	38	51	30	39	
Electrical data											
Total absorbed power	kW	58	71	86	103	122	141	174	188	243	
Total nominal absorbed current	A	100	122	147	174	204	229	290	317	400	
Maximum absorbed current	A	121	167	205	257	297	333	376	445	578	
Total inrush current	A	370	443	556	618	738	857	995	1173	1.662	
Total inrush current with opt. PW/DS	A	218	294	374	423	503	594	714	842	1253	
Dimensions											
Length	mm	5.082	5.082	5.082	5.082	5.082	5.082	6.120	7.158	7.158	9.035
Width	mm	2.244	2.244	2.244	2.244	2.244	2.244	2.244	2.244	2.244	2.244
Height	mm	2.370	2.370	2.370	2.370	2.370	2.370	2.370	2.370	2.370	2.370
Transport weight	kg	3.085	3.488	3.509	3.529	3.550	3.714	4.888	5.350	5.522	7.524
Power supply		400 V / 50 Hz / 3 Ph + T									

Nominal condition referred to: air 35 °C - chilled water 7/12 °C - Sound pressure level referred to 1 m in open field (ISO 3744)

RAHT F Ka - Standard Free-Cooling Version

MODEL		2202 Ka	2502 Ka	2802 Ka	3202 Ka	3602 Ka	4602 Ka	5202 Ka	6002 Ka	6802 Ka	8002 Ka
Cooling capacity	kW	215	248	275	301	324	423	492	529	628	738
Absorbed power	kW	62,7	76,4	91,9	108,9	133,6	165,8	172,6	209,2	230,2	273,9
EER		3,43	3,25	2,99	2,76	2,43	2,55	2,85	2,53	2,73	2,69
Cooling capacity in free cooling	kW	216	216	216	216	216	282	270	270	344	416
Screw compressors	n.	2									
Standard steps capacity	n.	6	6	6	6	6	6	6	6	6	6
Axial fans											
Quantity	n.	6	6	6	6	6	8	8	8	10	12
Sound pressure level	dB(A)	78	78	78	78	79	79	80	80	82	82
Shell & Tube evaporator	n.	1									
Water flow rate	m ³ /h	39,6	45,6	50,6	55,4	59,6	77,8	90,5	97,4	115,6	135,8
Pressure drop	kPa	48	63	67	80	47	63	40	46	54	56
Free cooling pressure drop	kPa	150	181	158	178	145	125	110	92	123	145
Electrical data											
Total absorbed power	kW	75	88	104	121	146	182	189	225	250	298
Total nominal absorbed current	A	132	154	179	207	241	307	323	380	417	488
Maximum absorbed current	A	182	220	272	312	348	396	462	494	600	668
Total inrush current	A	458	571	633	753	872	1.015	1.190	1.286	1.684	1.800
Total inrush current with opt. PW/DS	A	309	389	438	518	609	734	859	927	1275	1367
Dimensions											
Length	mm	5.082	5.082	5.082	5.082	5.082	6.120	6.120	6.120	7.158	9.035
Width	mm	2.244	2.244	2.244	2.244	2.244	2.244	2.244	2.244	2.244	2.244
Height	mm	2.370	2.370	2.370	2.370	2.370	2.370	2.370	2.370	2.370	2.370
Transport weight	kg	3.826	3.847	3.867	3.888	3.960	5.258	5.577	5.598	7.103	7.817
Power supply		400 V / 50 Hz / 3 Ph + T									

RAHT F.S Ka - Silencend Free-Cooling Version

MODEL		1802 Ka	2202 Ka	2502 Ka	2802 Ka	3202 Ka	3602 Ka	4602 Ka	5202 Ka	6002 Ka	6802 Ka
Cooling capacity	kW	197	208	237	261	282	326	428	462	549	633
Absorbed power	kW	53	66,2	81,3	98,2	117	132,7	163,5	185,3	201,2	228
EER		3,72	3,14	2,92	2,66	2,41	2,46	2,62	2,49	2,73	2,78
Cooling capacity in free cooling	kW	176	176	176	176	176	171	223	223	283	342
Screw compressors	n.	2									
Standard steps capacity	n.	6	6	6	6	6	6	6	6	6	6
Axial fans											
Quantity	n.	6	6	6	6	6	6	8	8	10	12
Sound pressure level	dB(A)	73	73	73	74	75	75	76	76	78	78
Shell & Tube evaporator	n.	1									
Water flow rate	m ³ /h	36,3	38,3	43,6	48,0	51,9	60,0	78,8	85,0	101,0	116,5
Pressure drop	kPa	40	45	58	60	70	48	64	35	49	55
Free cooling pressure drop	kPa	115	125	151	129	144	126	121	93	101	127
Electrical data											
Total absorbed power	kW	61	74	89	106	125	141	174	195	214	243
Total nominal absorbed current	A	105	127	152	179	210	230	290	329	359	401
Maximum absorbed current	A	144	172	210	262	302	338	382	448	485	588
Total inrush current	A	417	448	561	623	743	862	1.001	1.176	1.277	1.672
Total inrush current with opt. PW/DS	A	248	299	379	428	508	599	720	845	918	1263
Dimensions											
Length	mm	5.082	5.082	5.082	5.082	5.082	5.082	6.120	6.120	7.158	9.035
Width	mm	2.244	2.244	2.244	2.244	2.244	2.244	2.244	2.244	2.244	2.244
Height	mm	2.370	2.370	2.370	2.370	2.370	2.370	2.370	2.370	2.370	2.370
Transport weight	kg	3.423	3.826	3.847	3.867	3.888	4.052	5.381	5.577	6.134	7.638
Power supply		400 V / 50 Hz / 3 Ph + T									

RAHT F.U Ka - Ultra-Silencend Free-Cooling Version

MODEL		1502 Ka	1802 Ka	2202 Ka	2502 Ka	2802 Ka	3202 Ka	3602 Ka	4602 Ka	5202 Ka	6002 Ka
Cooling capacity	kW	155	191	201	227	248	281	324	414	472	547
Absorbed power	kW	41,4	55,6	69,7	86	104,5	117,6	133,4	169,4	181,2	201,7
EER		3,74	3,44	2,88	2,64	2,37	2,39	2,43	2,44	2,60	2,71
Cooling capacity in free cooling	kW	149	149	149	149	149	141	194	247	234	283
Screw compressors	n.										
Standard steps capacity	n.	6	6	6	6	6	6	6	6	6	6
Axial fans											
Quantity	n.	6	6	6	6	6	6	8	10	10	12
Sound pressure level	dB(A)	69	70	70	70	71	72	72	73	73	74
Shell & Tube evaporator	n.										
Water flow rate	m ³ /h	28,5	35,2	37,0	41,8	45,6	51,7	59,6	76,2	86,9	100,7
Pressure drop	kPa	71	37	42	53	54	69	47	60	36	49
Free cooling pressure drop	kPa	128	100	109	131	109	130	98	118	99	102
Electrical data											
Total absorbed power	kW	46	61	75	91	110	123	139	177	189	211
Total nominal absorbed current	A	83	104	128	154	184	206	229	296	319	355
Maximum absorbed current	A	121	139	167	205	257	297	336	379	445	480
Total inrush current	A	370	412	443	556	618	738	860	998	1173	1272
Total inrush current with opt. PW/DS	A	218	243	294	374	423	503	597	717	842	913
Dimensions											
Length	mm	5.082	5.082	5.082	5.082	5.082	5.082	6.120	7.158	7.158	8.196
Width	mm	2.244	2.244	2.244	2.244	2.244	2.244	2.244	2.244	2.244	2.244
Height	mm	2.370	2.370	2.370	2.370	2.370	2.370	2.370	2.370	2.370	2.370
Transport weight	kg	3.251	3.398	3.800	3.821	3.841	3.954	4.471	5.723	6.070	6.618
Power supply		400 V / 50 Hz / 3 Ph + T									

Nominal condition referred to: air 35 °C - chilled water 7/12 °C; Free-cooling operation: air 5 °C - unit's inlet water 15 °C - glycol 20%
 Sound pressure level referred to 1 m in open field (ISO 3744)



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