

RAE Kc

AIR COOLED CHILLERS WITH SCROLL COMPRESSORS AND AXIAL FANS

COOLING CAPACITY FROM 19,5 TO 82 kW 1 AND 2 COOLING CIRCUITS

RAE 421 Kc + MV + P1



Above picture is only indicative and is not binding.



The air cooled chillers of **RAE Kc series** are designed for outdoor installation and are particularly suitable for small and medium sized air conditioning systems, in residential and commercial applications. Depending on the cooling capacity, they are available with 1 and 2 cooling circuits. Thanks to their compact dimensions and to the several options available, these units are particularly easy to install in small spaces, also when supplied with the hydraulic kit. All sizes are standard provided with an isolated compressors section and the external frame is completely closed. They 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.

The following versions are available:

- **RAE Kc** standard version
- **RAE U Kc** ultrasilenced version

Operation limits (standard units):

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

MAIN COMPONENTS

Frame made of galvanized steel plate, suitably treated to resist to external agents and then painted in RAL 7035 color. The compressor section is

completely closed and suitably isolated from the air flow; inside of it, the compressor and the main components are placed so to facilitate also the service operations. For ultrasilenced version, it is insulated with soundproofing material. The external panels, easy to be dismantled, allow the full access in case of service. When required, the hydraulic kit (buffer tank and pump group) are installed inside the unit, with no change in overall dimensions.

High-efficiency scroll compressor (EER 3,7 at ARI conditions), with low sound level, internal heat protection, installed on rubber vibration dampers, supplied with crankcase heater when necessary. In case of 2 circuit units, in case of problem on one of the circuit, the 50% operation of the unit is anyway granted.

Heat-exchange external coil with copper tube and specially corrugated aluminum 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.

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. On request, it is available

the modulating fans speed regulation (option BT).

Weld-brazed plate evaporator in AISI 316 stainless steel, with pipes and patented manifold so to reach a high heat exchange coefficient. Its design allows a uniform water distribution, compatibly with pressure drops. The exchanger is provided with close-cell insulating material. The evaporator is also equipped with safety water flow switch switching off the unit in case of low water flow through the evaporator.

Cooling circuit composed of thermostatic expansion valve, dehydrating filter, sight glass, safety device, antifreeze thermostat, high and low pressure switches.

Electric board in compliance with CE norms, contained in a suitable partition protected by the internal safety panel, provided with a main switch and an external and hinged panel to be opened. It is complete with remote switches, overload protections, transformer for auxiliaries and terminal board. In case of hydraulic kit on board, the electrical control of the pump group is provided.

Unit management microprocessor installed on the internal safety panel of the electrical board, complete with compressors hour counter.

ACCESSORIES

- AE Electrical power supply different from standard:** mainly, 230V triphase, 460V triphase. Frequency 50/60 Hz.
- BT Low temperature operation** (down to -8°C): Electronic device for the continuous modulating voltage control of the condensing pressure through the variation of the fan rotation speed (Alternative to BF).
- BF Low ambient temperature operation** (down to -20°C): Electronic device, frequency converter type, for the continuous modulating control of the condensing pressure through the variation of the fan rotation speed (Alternative to BT).
- CS Compressors inrush counter:** Electromechanical device positioned inside the electrical board, recording the total inrush starts of compressors.
- GP Condensing coil protection grid:** Metal protection grid against accidental impacts.
- HG Hot gas by-pass:** Mechanical device for modulating cooling capacity (only for 1-circuit sizes).
- 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 Sea-wood packing:** Fumigated sea-wood case and protection bag with hygroscopic salts, suitable for long sea transports.
- MF Phase monitor:** Electronic device controlling the correct sequence and/or the eventual lack of one of the 3 phases, switching off the unit if necessary.
- MT High and low pressure gauges:** For measuring circuit pressure.
- MV Buffer tank:** Of suitable capacity complete with expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves.
- 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.

- P1 H 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.
- 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. (Available from size 482).
- RA Anti-freeze heater on evaporator:** Electrical heater installed on the evaporator, in order to prevent freezing and provided with thermostat.
- RL Compressors overload relays:** Electromechanical protection devices against compressor's overload with displayed alarm.
- 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.
- RV Personalized frame painting in RAL color.**
- SC Insulated compressors housing** with sound proofing material (included on ultra-silenced version).
- 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.

LIQUID CHILLERS - AIR COOLED

Technical data sheet - RAE 201-421 Kc

RAE		201 Kc	241 Kc	281 Kc	361 Kc	421 Kc
Cooling capacity						
Cooling capacity		19,5	23,3	27,4	34,7	41,5
Absorbed power	kW	6,1	7,3	8,2	9,7	11,9
EER		3,20	3,19	3,34	3,60	3,49
Scroll compressors						
Quantity	n	1	1	1	1	1
Standard steps capacity	n	1	1	1	1	1
Circuits	n	1	1	1	1	1
Nominal absorbed current	A	12,0	14,1	15,9	17,6	22,3
Maximum absorbed current	A	17,0	20,0	22,0	27,0	32,0
Inrush current	A	99,0	123,0	127,0	167,0	198,0
Axial fans						
Quantity	n	2	2	2	2	2
Rotation speed	rpm	900	900	900	860	860
Motors power	kW	0,74	0,74	0,74	1,26	1,26
Total air flow	m ³ /h	11.200	11.200	10.200	16.000	16.000
Total air flow	l/s	3.111	3.111	2.833	4.444	4.444
Nominal absorbed current	A	3,4	3,4	3,4	6,0	6,0
Brazed plate evaporator						
Quantity	n	1	1	1	1	1
Water flow rate	m ³ /h	3,3	4,0	4,7	6,0	7,1
Water flow rate	l/s	0,9	1,1	1,3	1,7	2,0
Pressure drop	kPa	38	41	44	46	64
Pumps						
Available pressure with P1	kPa	162	149	127	144	134
Motor power with P1	kW	0,55	0,55	0,55	0,55	0,55
Available pressure with P1H	kPa	207	194	167	184	169
Motor power with P1H	kW	0,55	0,55	0,55	0,75	0,75
Buffer tank water volume	l	80	80	80	180	180
Electrical data						
Total absorbed power	kW	6,8	8,0	8,9	10,9	13,2
Sound pressure level						
Sound pressure level 2)	dB(A)	62	62	62	67	67
Dimensions						
Length	mm	1.600	1.600	1.600	2.000	2.000
Width	mm	750	750	750	850	850
Height	mm	1.260	1.260	1.260	1.650	1.650
Weight	kg	250	255	295	400	415
Weight with empty MV included	kg	300	305	345	465	480
Refrigerant charge	kg	4,2	4,3	6,3	10,0	11,0
Power supply						
Power supply	V / ph / Hz	400 V/50 Hz / 3Ph + N + T				
NOTES						
Nominal condition referred to: air 35 °C - chilled water 7/12 °C.						
2) Measured at 1 m in open field (ISO 3746).						

LIQUID CHILLERS - AIR COOLED

Technical data sheet - RAE 201-421 U Kc

RAE U		201 Kc	241 Kc	281 Kc	361 Kc	421 Kc
Cooling capacity						
Cooling capacity		19,3	23,4	28,0	34,1	41,0
Absorbed power	kW	6,1	7,3	7,9	10,0	12,3
EER		3,19	3,21	3,54	3,41	3,33
Scroll compressors						
Quantity	n	1	1	1	1	1
Standard steps capacity	n	1	1	1	1	1
Circuits	n	1	1	1	1	1
Nominal absorbed current	A	12,3	14,9	15,2	18,3	23,0
Maximum absorbed current	A	17,0	20,0	22,0	27,0	32,0
Inrush current	A	99,0	123,0	127,0	167,0	198,0
Axial fans						
Quantity	n	2	2	2	2	3
Rotation speed	rpm	680	680	650	650	650
Motors power	kW	0,44	0,44	0,62	0,62	0,93
Total air flow	m ³ /h	8.000	7.000	11.200	11.200	17.400
Total air flow	l/s	2.222	1.944	3.111	3.111	4.833
Nominal absorbed current	A	2,2	2,2	3,1	3,1	4,7
Brazed plate evaporator						
Quantity	n	1	1	1	1	1
Water flow rate	m ³ /h	3,3	4,0	4,8	5,9	7,0
Water flow rate	l/s	0,9	1,1	1,3	1,6	1,9
Pressure drop	kPa	38	42	46	44	63
Pumps						
Available pressure with P1	kPa	162	149	127	144	134
Motor power with P1	kW	0,55	0,55	0,55	0,55	0,55
Available pressure with P1H	kPa	207	194	167	184	169
Motor power with P1H	kW	0,55	0,55	0,55	0,75	0,75
Buffer tank water volume	l	80	80	180	180	180
Electrical data						
Total absorbed power	kW	6,5	7,7	8,5	10,6	13,2
Sound pressure level						
Sound pressure level 2)	dB(A)	55	55	59	59	61
Dimensions						
Length	mm	1.600	1.600	2.000	2.000	2.130
Width	mm	750	750	850	850	1.100
Height	mm	1.260	1.260	1.650	1.650	1.760
Weight	kg	256	261	370	400	570
Weight with empty MV included	kg	305	310	435	465	635
Refrigerant charge	kg	4,2	6,2	10,0	10,0	9,4
Power supply						
Power supply	V / ph / Hz	400 V / 50Hz / 3Ph + N + T				
NOTES						
Nominal condition referred to: air 35 °C - chilled water 7/12 °C.						
2) Measured at 1 m in open field (ISO 3746).						

LIQUID CHILLERS - AIR COOLED

Technical data sheet - RAE 482-822 Kc

RAE		482 Kc	562 Kc	702 Kc	822 Kc
Cooling capacity					
Cooling capacity		47,3	53,8	68,3	81,9
Absorbed power	kW	14,3	16,9	19,9	24,8
EER		3,31	3,18	3,43	3,30
Scroll compressors					
Quantity	n	2	2	2	2
Standard steps capacity	n	2	2	2	2
Circuits	n	2	2	2	2
Optional steps capacity	n	-	-	-	-
Nominal absorbed current	A	27,7	32,7	36,7	46,8
Maximum absorbed current	A	40,0	44,0	54,0	64,0
Inrush current	A	143,0	149,0	194,0	230,0
Axial fans					
Quantity	n	3	3	3	3
Rotation speed	rpm	860	860	860	860
Motors power	kW	1,9	1,9	1,9	1,9
Total air flow	m ³ /h	25.200	25.200	21.300	21.300
Total air flow	l/s	7.000	7.000	5.917	5.917
Nominal absorbed current	A	9,0	9,0	9,0	9,0
Brazed plate evaporator					
Quantity	n	2	2	2	2
Water flow rate	m ³ /h	8,1	9,2	11,7	14,0
Water flow rate	l/s	2,3	2,6	3,3	3,9
Pressure drop	kPa	42	43	44	63
Pumps					
Available pressure with P1	kPa	137	130	122	108
Motor power with P1	kW	0,75	0,75	2,2	2,2
Available pressure with P1H	kPa	187	185	172	158
Motor power with P1H	kW	1,1	1,1	2,2	2,2
Available pressure with PT	kPa	137	140	137	120
Motor power with PT	kW	1,5	1,5	1,5	1,5
Buffer tank water volume	l	180	180	180	180
Electrical data					
Total absorbed power	kW	16,2	18,8	21,8	26,7
Sound pressure level					
Sound pressure level 2)	dB(A)	69	69	69	69
Dimensions					
Length	mm	2.130	2.130	2.130	2.130
Length with MV included	mm	2.130	2.130	2.130	2.130
Width	mm	1.100	1.100	1.100	1.100
Width with MV included	mm	1.100	1.100	1.100	1.100
Height	mm	1.760	1.760	1.760	1.760
Height with MV included	mm	1.760	1.760	1.760	1.760
Weight	kg	607	611	682	693
Weight with empty MV included	kg	672	676	747	758
Refrigerant charge for each circuit	kg	4,8	4,9	9,2	9,4
Power supply					
Power supply	V / ph / Hz	400V / 50Hz / 3 Ph + T + N			
NOTES					
- = not available.					
Nominal condition referred to: air 35 °C - chilled water 7/12 °C.					
2) Measured at 1 m in open field (ISO 3746).					

LIQUID CHILLERS - AIR COOLED

Technical data sheet - RAE 482-702 U Kc

RAE U		482 Kc	562 Kc	702 Kc
Cooling capacity				
Cooling capacity		46,2	54,8	66,2
Absorbed power	kW	14,8	16,3	21,0
EER		3,12	3,36	3,15
Scroll compressors				
Quantity	n	2	2	2
Standard steps capacity	n	2	2	2
Circuits	n	2	2	2
Optional steps capacity	n	-	-	-
Nominal absorbed current	A	28,6	31,8	38,8
Maximum absorbed current	A	40,0	44,0	54,0
Inrush current	A	143,0	149,0	194,0
Axial fans				
Quantity	n	3	3	3
Rotation speed	rpm	650	650	650
Motors power	kW	0,93	0,93	0,93
Total air flow	m ³ /h	17.700	14.200	14.200
Total air flow	l/s	4.917	3.944	3.944
Nominal absorbed current	A	4,7	4,7	4,7
Brazed plate evaporator				
Quantity	n	2	2	2
Water flow rate	m ³ /h	7,9	9,4	11,4
Water flow rate	l/s	2,2	2,6	3,2
Pressure drop	kPa	41	44	42
Pumps				
Available pressure with P1	kPa	140	127	127
Motor power with P1	kW	0,75	0,75	2,2
Available pressure with P1H	kPa	190	177	172
Motor power with P1H	kW	1,1	1,1	2,2
Available pressure with PT	kPa	140	137	142
Motor power with PT	kW	1,5	1,5	1,5
Buffer tank water volume	l	180	180	180
Electrical data				
Total absorbed power	kW	15,7	17,2	21,9
Sound pressure level				
Sound pressure level 2)	dB(A)	61	61	61
Dimensions				
Length	mm	2.130	2.130	2.130
Length with MV included	mm	2.130	2.130	2.130
Width	mm	1.100	1.100	1.100
Width with MV included	mm	1.100	1.100	1.100
Height	mm	1.760	1.760	1.760
Height with MV included	mm	1.760	1.760	1.760
Weight	kg	614	618	689
Weight with empty MV included	kg	680	684	754
Refrigerant charge for each circuit	kg	4,8	9,0	9,2
Power supply				
Power supply	V / ph / Hz	400V / 50Hz / 3 Ph + T + N		
NOTES				
- = not available.				
Nominal condition referred to: air 35 °C - chilled water 7/12 °C.				
2) Measured at 1 m in open field (ISO 3746).				