

RAE C Kc

AIR COOLED CHILLERS WITH SCROLL COMPRESSORS AND AXIAL FANS

COOLING CAPACITY FROM 20 TO 89 kW 1 AND 2 CIRCUITS

RAE 201 C Kc + P1



Above picture is only indicative and is not binding.



The air cooled chillers of **RAE C Kc series**, with centrifugal fans, are designed for indoor installation and are particularly suitable for small and medium sized air conditioning systems, in residential and commercial applications. They can also be matched to fancoils or terminal units or for water cooling in small industrial processes. They are all available with 1 or 2 refrigerant circuits. During their design, it has been given a particular care for dimensions and compactness, so to facilitate their handling and positioning in site. In order to further reduce weight and dimensions, in case of particular applications, when the units are provided with buffer tank and pump group, on request it is possible to separately supply the hydraulic kit, usually included in the frame of the unit itself. 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:

Vertical air flow

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

Horizontal air flow

- **RAE C.O Kc** standard version
- **RAE C.O 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. 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 at the bottom of the unit, in a suitable section.

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

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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.

Centrifugal fans of double suction type with electrical motor directly joined and balanced blades, suitably isolated with rubber vibration dampers and sealing on discharge. They are provided with short circuit and overload protections and external safety protection grid. The motor is of 4-pole triphase type, with belt transmission and variable pulleys, placed on slide so to speed up the pulley tension. As a standard, the unit has a vertical airflow or, on request, you can ask for an horizontal airflow (coil side).

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 three-phase, 460V three-phase. Frequency 50/60 Hz.

BF Low temperature operation (-20°C) with inverter fan speed regulation: Electronic device controlling the condensing pressure through an inverter, modulating the frequency of the fans electrical supply.

BFa-BFb Low temperature operation (-20°C) with inverter fan speed regulation (with option 1M and 2M): Electronic device controlling the condensing pressure through an inverter, modulating the frequency of the fans electrical supply.

CF Soundproofed compressors cabinet: Insulation of compressors by a cabinet coated with soundproofing material and vibration dampers under compressors.

CI Soundproofing jacket on compressors: Made of soundproofing material, wrapped all around compressors so to further reduce the overall sound level of the unit (Already included on ultrasilenced version).

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 Seawood 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.

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.

PQ Remote display: 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: Double-layer treatment of 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.

RV Personalized frame painting in RAL color.

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 cut off the liquid line at compressors switch-off.

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Technical data sheet - RAE 201-421 C Kc

RAE C		201 Kc	241 Kc	281 Kc	361 Kc	421 Kc
Cooling capacity						
Cooling capacity						
Absorbed power	kW	20,7	25,0	29,3	35,6	44,0
EER		3,51	3,47	3,57	3,52	3,64
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	11,9	13,6	15,6	18,2	22,2
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
Centrifugal fans						
Quantity	n	1	1	1	2*	2*
Total air flow	m ³ /h	8.800	8.650	9.000	11.200	13.000
Total air flow	l/s	2.444	2.403	2.500	3.111	3.611
STD Version						
Available pressure	Pa	80	80	80	80	80
Rotation speed	rpm	896	915	975	746	858
Motors power	kW	2,2	2,2	3,0	2,2	3,0
Nominal absorbed current	A	5,3	5,3	6,7	5,3	6,7
Sound pressure level 2)	dB(A)	66	66	67	64	65
1M Version						
Available pressure	Pa	120	120	120	120	120
Rotation speed	rpm	935	955	1.014	811	914
Motors power	kW	3,0	3,0	3,0	2,2	3,0
Nominal absorbed current	A	6,7	6,7	6,7	5,3	6,7
Sound pressure level 2)	dB(A)	67	67	68	65	66
2M Version						
Available pressure	Pa	200	200	200	200	200
Rotation speed	rpm	1.014	1.036	1.091	938	1.025
Motors power	kW	3,0	3,0	3,0	3,0	4,0
Nominal absorbed current	A	6,7	6,7	6,7	6,7	9,4
Sound pressure level 2)	dB(A)	68	68	69	66	67
Brazed plate evaporator						
Quantity	n	1	1	1	1	1
Water flow rate	m ³ /h	3,6	4,3	5,0	6,1	7,5
Water flow rate	l/s	1,0	1,2	1,4	1,7	2,1
Pressure drop	kPa	43	47	50	48	71
Pumps						
Available pressure with P1	kPa	179	152	148	155	132
Motor power with P1	kW	0,55	0,55	0,75	0,75	0,75
Available pressure with P1H	kPa	239	207	198	210	262
Motor power with P1H	kW	0,55	0,75	0,75	0,75	1,10
Buffer tank water volume	l	180	180	180	180	180
Electrical data						
Total absorbed power	kW	8,1	9,4	11,2	12,3	15,1
Dimensions						
Length	mm	1.320	1.320	1.320	1.665	1.665
Length with MV included	mm	1.665	1.665	1.665	1.665	1.665
Width	mm	750	750	750	750	750
Width with MV included	mm	750	750	750	750	750
Height	mm	1.250	1.250	1.250	1.460	1.460
Height with MV included	mm	1.675	1.675	1.675	1.885	1.885
Weight	kg	395	406	417	499	522
Weight with empty MV included	kg	575	586	597	679	702
Refrigerant charge	kg	4,6	6,0	7,4	9,3	12,0
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* = 1 tandem fans driven with 1 motor.

2) Measured at 1 m in open field (ISO 3746) with air suction and air discharge in ducts.

In case an even higher available pressure is required, different from what stated above but anyway not higher than 2M, the option 1M &/or 2M must be ordered, stating clearly on the order the pressure value effectively requested on site. The factory will adjust the motor's pulley according.

Technical data sheet - RAE 201-421 CU Kc

RAE CU		201 Kc	241 Kc	281 Kc	361 Kc	421 Kc
Cooling capacity						
Cooling capacity						
Absorbed power	kW	20,7	25,2	29,0	35,6	44,0
EER		3,51	3,55	3,49	3,52	3,70
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	11,9	13,5	15,6	18,1	22,1
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
Centrifugal fans						
Quantity	n	1	1	2*	2*	2
Total air flow	m ³ /h	6.300	7.200	6.950	9.600	13.900
Total air flow	l/s	1.750	2.000	1.931	2.667	3.861
STD Version						
Available pressure	Pa	80	80	50	80	80
Rotation speed	rpm	720	818	637	711	696
Motors power	kW	1,5	1,5	1,5	1,5	3,0
Nominal absorbed current	A	3,7	3,7	3,7	3,7	7,4
Sound pressure level 2)	dB(A)	62	64	61	64	64
1M Version						
Available pressure	Pa	120	120	120	120	120
Rotation speed	rpm	776	866	728	785	752
Motors power	kW	1,5	2,2	1,5	1,5	3,0
Nominal absorbed current	A	3,7	5,3	3,7	3,7	7,4
Sound pressure level 2)	dB(A)	62	64	61	64	64
2M Version						
Available pressure	Pa	200	200	200	200	200
Rotation speed	rpm	886	963	891	925	858
Motors power	kW	1,5	2,2	1,5	2,2	4,4
Nominal absorbed current	A	3,7	5,3	3,7	5,3	10,6
Sound pressure level 2)	dB(A)	63	65	62	64	64
Brazed plate evaporator						
Quantity	n	1	1	1	1	1
Water flow rate	m ³ /h	3,6	4,3	5,0	6,1	7,5
Water flow rate	l/s	1,0	1,2	1,4	1,7	2,1
Pressure drop	kPa	43	47	49	48	71
Pumps						
Available pressure with P1	kPa	178	154	148	155	133
Motor power with P1	kW	0,55	0,55	0,75	0,75	0,75
Available pressure with P1H	kPa	238	209	198	210	263
Motor power with P1H	kW	0,55	0,75	0,75	0,75	1,1
Buffer tank water volume	l	180	180	180	180	240
Electrical data						
Total absorbed power	kW	7,4	8,6	9,8	11,6	14,9
Dimensions						
Length	mm	1.320	1.320	1.665	1.665	2.120
Length with MV included	mm	1.665	1.665	1.665	1.665	2.280
Width	mm	750	750	750	750	778
Width with MV included	mm	750	750	750	750	996
Height	mm	1.250	1.250	1.460	1.460	1.570
Height with MV included	mm	1.675	1.675	1.885	1.885	1.995
Weight	kg	396	407	501	511	642
Weight with empty MV included	kg	576	587	681	691	872
Refrigerant charge	kg	6	7	11	11	12
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* = 1 tandem fans driven with 1 motor.

2) Measured at 1 m in open field (ISO 3746) with air suction and air discharge in ducts.

In case an even higher available pressure is required, different from what stated above but anyway not higher than 2M, the option 1M &/or 2M must be ordered, stating clearly on the order the pressure value effectively requested on site. The factory will adjust the motor's pulley according.

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Technical data sheet - RAE 482-822 C Kc

RAE C		482 Kc	562 Kc	702 Kc	822 Kc
Cooling capacity					
Cooling capacity		50,8	58,7	71,2	89,0
Absorbed power	kW	14,1	16,1	20,2	23,6
EER		3,60	3,65	3,52	3,77
Scroll compressors					
Quantity	n	2	2	2	2
Standard steps capacity	n	2	2	2	2
Circuits	n	2	2	2	2
Nominal absorbed current	A	27,1	31,3	36,6	44,6
Maximum absorbed current	A	40,0	44,0	54,0	64,0
Inrush current	A	143,0	149,0	194,0	230,0
Centrifugal fans					
Quantity	n	2	2	2	2
Total air flow	m ³ /h	16.700	20.900	24.600	28.400
Total air flow	l/s	4.639	5.806	6.833	7.889
STD Version					
Available pressure	Pa	80	80	80	80
Rotation speed	rpm	782	919	640	745
Motors power	kW	4,4	8,0	6,0	11,0
Nominal absorbed current	A	10,6	18,8	13,4	24
Sound pressure level 2)	dB(A)	65	66	68	68
1M Version					
Available pressure	Pa	120	120	120	120
Rotation speed	rpm	830	959	669	769
Motors power	kW	4,4	8	8	11
Nominal absorbed current	A	10,6	18,8	18,8	24
Sound pressure level 2)	dB(A)	66	68	71	72
2M Version					
Available pressure	Pa	200	200	200	200
Rotation speed	rpm	923	1.037	725	819
Motors power	kW	6,0	8,0	8,0	11,0
Nominal absorbed current	A	13,4	18,8	18,8	24,0
Sound pressure level 2)	dB(A)	67	67	71	74
Brazed plate evaporator					
Quantity	n	2	2	2	2
Water flow rate	m ³ /h	8,7	10,1	12,2	15,3
Water flow rate	l/s	2,4	2,8	2,4	4,3
Pressure drop	kPa	48	50	48	73
Pumps					
Available pressure with P1	kPa	132	113	180	107
Motor power with P1	kW	0,75	0,75	2,2	2,2
Available pressure with P1H	kPa	237	223	250	157
Motor power with P1H	kW	1,1	1,1	2,2	2,2
Available pressure with PT	kPa	132	133	135	127
Motor power with PT	kW	1,5	1,5	1,5	1,5
Buffer tank water volume	l	240	240	240	240
Electrical data					
Total absorbed power	kW	18,5	24,1	26,2	34,6
Total nominal absorbed current	A	37,7	50,1	50,0	68,6
Total maximum absorbed current	A	50,6	62,8	67,4	88,0
Total inrush current	A	153,6	167,8	207,4	254,0
Dimensions					
Length	mm	2.120	2.120	2.280	2.280
Length with MV included	mm	2.280	2.280	2.280	2.280
Width	mm	778	778	990	990
Width with MV included	mm	990	990	990	990
Height	mm	1.570	1.570	1.845	1.845
Height with MV included	mm	1.995	1.995	2.270	2.270
Weight	kg	752	782	856	929
Weight with empty MV included	kg	982	1.012	1.086	1.159
Refrigerant charge for each circuit	kg	5,8	5,9	7,8	9,7
Refrigerant charge for each circuit with 0 option	kg	-	-	-	-
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) with air suction and air discharge in ducts.

In case an even higher available pressure is required, different from what stated above but anyway not higher than 2M, the option 1M &/or 2M must be ordered, stating clearly on the order the pressure value effectively requested on site. The factory will adjust the motor's pulley according.

LIQUID CHILLERS - AIR COOLED

Technical data sheet - RAE 482-702 CU Kc

RAE CU		482 Kc	562 Kc	702 Kc
Cooling capacity				
Cooling capacity		50,3	58,3	71,2
Absorbed power	kW	14,2	16,3	20,2
EER		3,54	3,58	3,52
Scroll compressors				
Quantity	n	2	2	2
Standard steps capacity	n	2	2	2
Circuits	n	2	2	2
Nominal absorbed current	A	27,1	31,3	36,3
Maximum absorbed current	A	40,0	44,0	54,0
Inrush current	A	143,0	149,0	194,0
Centrifugal fans				
Quantity	n	2	2	2
Total air flow	m ³ /h	14.700	18.000	20.700
Total air flow	l/s	4.083	5.000	5.750
STD Version				
Available pressure	Pa	80	80	80
Rotation speed	rpm	460	509	582
Motors power	kW	3,0	3,0	4,4
Nominal absorbed current	A	7,4	7,4	10,6
Sound pressure level 2)	dB(A)	60	58	58
1M Version				
Available pressure	Pa	120	120	120
Rotation speed	rpm	508	548	616
Motors power	kW	3,0	3,0	4,4
Nominal absorbed current	A	7,4	7,4	10,6
Sound pressure level 2)	dB(A)	61	63	66
2M Version				
Available pressure	Pa	200	200	200
Rotation speed	rpm	599	626	684
Motors power	kW	3,0	4,4	6,0
Nominal absorbed current	A	7,4	10,6	13,4
Sound pressure level 2)	dB(A)	62	64	66
Brazed plate evaporator				
Quantity	n	2	2	2
Water flow rate	m ³ /h	8,6	10,0	12,2
Water flow rate	l/s	2,4	2,8	3,4
Pressure drop	kPa	47	50	48
Pumps				
Available pressure with P1	kPa	132	114	180
Motor power with P1	kW	0,75	0,75	2,2
Available pressure with P1H	kPa	237	224	250
Motor power with P1H	kW	1,1	1,1	2,2
Available pressure with PT	kPa	132	134	135
Motor power with PT	kW	1,5	1,5	1,5
Buffer tank water volume	l	240	240	240
Electrical data				
Total absorbed power	kW	17,2	19,3	24,6
Total nominal absorbed current	A	34,5	38,7	46,9
Total maximum absorbed current	A	47,4	51,4	64,6
Total inrush current	A	150,4	156,4	204,6
Dimensions				
Length	mm	2.280	2.280	2.280
Length with MV included	mm	2.280	2.280	2.280
Width	mm	990	990	990
Width with MV included	mm	990	990	990
Height	mm	1.845	1.845	1.845
Height with MV included	mm	2.270	2.270	2.270
Weight	kg	825	825	869
Weight with empty MV included	kg	1.055	1.055	1.099
Refrigerant charge for each circuit	kg	7,5	7,6	9,5
Refrigerant charge for each circuit with O option	kg	-	-	-
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) with air suction and air discharge in ducts.

In case an even higher available pressure is required, different from what stated above but anyway not higher than 2M, the option 1M &/or 2M must be ordered, stating clearly on the order the pressure value effectively requested on site. The factory will adjust the motor's pulley according.