

# 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

### 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                                                  | kW          | 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                                                    | m³/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                                                   | m³/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).                      |             |                           |        |        |        |        |

## Technical data sheet - RAE 482-822 Kc

| RAE                                                               |             | 482 Kc                     | 562 Kc | 702 Kc | 822 Kc |
|-------------------------------------------------------------------|-------------|----------------------------|--------|--------|--------|
| Cooling capacity                                                  |             |                            |        |        |        |
| Cooling capacity                                                  | kW          | 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                                                    | m³/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    |
| Braze plate evaporator                                            |             |                            |        |        |        |
| Quantity                                                          | n           | 2                          | 2      | 2      | 2      |
| Water flow rate                                                   | m³/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).                      |             |                            |        |        |        |