

PAE C Kc

AIR COOLED HEAT PUMPS WITH SCROLL COMPRESSORS AND CENTRIFUGAL FANS

COOLING CAPACITY FROM 80,5 TO 242 kW 2 COOLING CIRCUITS

PAE 1402 C O Kc



Above picture is only indicative and is not binding.



The air cooled heat pumps of **PAE 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 industrial processes. They are all available with 2 refrigerant circuits. Thanks to their compact dimensions and to the several options available, these units are particularly easy to install in small spaces. The whole range is complete of a compressors section, allowing a quick and easy ordinary service to the units. 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

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

Horizontal air flow

- **PAE C.O Kc** standard version
- **PAE C.O U Kc** ultrasilenced version

Operation limits (standard units):

SUMMER OPERATION: air from 15 to 45°C - water (out from evaporator) from 5 to 15°C.
WINTER OPERATION: air from 20 to -4°C - water (out from evaporator) max 50°C.

MAIN COMPONENTS

Frame made of galvanized steel plate, suitably treated to resist to external agents and then painted in RAL 7035 colour. The compressor section is completely closed and suitably isolated from the air flow; inside of it, the compressor and the main components are installed. The external panels, easy to be dismantled with a quick $\frac{3}{4}$ key turn, allow the full access to all components in case of service. When required, the hydraulic kit (buffer tank and pump group) are installed inside the unit.

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. Being 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 aluminium 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).

Dry expansion shell and tube user exchanger with two refrigerant circuits, in carbon steel and copper tubes, insulated by close-cell polyurethane foam material. The exchanger is also equipped with safety water flow switch switching off the unit in case of low water flow through the exchanger.

Cooling circuit composed of 4-way valve for refrigerant cycle inversion, thermostatic expansion valve, dehydrating filter, sight glass, safety device, antifreeze thermostat, high and low pressure switches, shut-off valves on liquid line, shut-off valves 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 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, controlling the automatic defrost system based on a time/temperature logics, complete with compressors hour counter.

ACCESSORIES

1M-2M Higher available pressure for fan: Bigger electrical motor, so to have a higher available pressure to fans to be ducted.

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 (Only for summer operation).

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

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.

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 remotely. 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.

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.

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 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.

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: Epoxy coating of the condensing coils surface

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 consider option BF.

RV Personalized frame painting in RAL color.

SC Insulated compressors housing: With sound proofing material (Already 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.

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Technical data sheet - PAE 842-2602 C Kc

PAE C		842 Kc	962 Kc	1102 Kc	1402 Kc	1502 Kc	1602 Kc	2302 Kc	2402 Kc	2602 Kc
Cooling capacity										
Cooling capacity	kW	80,5	90,6	103,0	134,0	145,0	158,0	220,0	226,0	242,0
Absorbed power	kW	25,3	28,8	34,1	41,2	46,2	49,8	61,0	70,0	76,7
EER		3,18	3,15	3,02	3,25	3,14	3,17	3,61	3,23	3,16
Heating capacity										
Heating capacity	kW	98,7	113,4	128,1	163,8	176,4	196,4	275,0	276,1	296,1
Absorbed power in heating	kW	26,6	30,2	35,8	43,3	48,5	52,3	63,4	73,5	80,5
COP		3,71	3,75	3,58	3,78	3,64	3,76	4,34	3,76	3,68
Scroll compressors										
Quantity	n	2	4	4	4	4	4	4	4	4
Standard steps capacity	n	2	4	4	4	4	4	4	4	4
Optional steps capacity	n	-	-	-	-	-	-	-	-	-
Circuits	n	2	2	2	2	2	2	2	2	2
Nominal absorbed current	A	46,5	55,0	65,0	72,0	81,6	92,0	109,9	128,2	147,0
Maximum absorbed current	A	64,0	80,0	88,0	108,0	128,0	128,0	164,0	208,0	208,0
Inrush current	A	230,0	183,0	193,0	248,0	284,0	294,0	348,0	406,0	428,0
Centrifugal fans										
Quantity	n	3	3	3	4	4	4	6	6	6
Total air flow	m ³ /h	40.000	37.500	37.500	50.000	50.000	48.000	73.200	73.200	73.200
Total air flow	l/s	11.111	10.417	10.417	13.889	13.889	13.333	20.333	20.333	20.333
STD Version										
Available pressure	Pa	50	70	70	70	70	100	80	80	80
Rotation speed	rpm	920	900	900	915	915	935	920	920	920
Motors power	kW	12,0	12,0	12,0	16,0	16,0	16,0	24,0	24,0	24,0
Nominal absorbed current	A	30,3	30,3	30,3	41,6	41,6	41,6	60,6	60,6	60,6
Sound pressure level 2)	dB(A)	70	70	70	72	72	73	74	74	74
1M Version										
Available pressure	Pa	100	180	180	190	190	240	220	220	220
Rotation speed	rpm	970	1030	1030	1030	1030	1065	1050	1050	1050
Motors power	kW	12,0	12,0	12,0	16,0	16,0	16,0	24,0	24,0	24,0
Nominal absorbed current	A	30,3	30,3	30,3	41,6	41,6	41,6	60,6	60,6	60,6
Sound pressure level 2)	dB(A)	72	71	72	74	74	75	78	78	78
2M Version										
Available pressure	Pa	260	270	270	350	350	355	350	350	350
Rotation speed	rpm	1110	1100	1100	1170	1170	1170	1170	1170	1170
Motors power	kW	15,5	15,5	15,5	22,0	22,0	22,0	33,0	33,0	33,0
Nominal absorbed current	A	37,2	37,2	37,2	49,6	49,6	49,6	74,0	74,0	74,0
Sound pressure level 2)	dB(A)	75	75	75	76	76	76	77	77	78
Shall and tube evaporator										
Quantity	n	1	1	1	1	1	1	1	1	1
Water flow rate	m ³ /h	13,8	15,6	17,7	23,0	24,9	27,1	37,8	38,8	41,5
Water flow rate	l/s	3,8	4,3	4,9	6,4	6,9	7,5	10,5	10,8	11,5
Pressure drop	kPa	35	44	55	45	52	61	39	38	31
Pumps										
Available pressure with P1	kPa	124	118	110	116	100	76	133	101	86
Motor power with P1	kW	1,1	1,1	1,1	1,5	1,5	1,5	3,0	3,0	3,0
Available pressure with P1H	kPa	159	153	145	161	145	121	183	151	136
Motor power with P1H	kW	1,5	1,5	1,5	2,2	2,2	2,2	4,0	4,0	4,0
Available pressure with PT	kPa	149	138	130	131	110	86	123	86	71
Motor power with PT	kW	1,5	1,5	1,5	2,2	2,2	2,2	3,0	3,0	3,0
Buffer tank water volume	l	720	720	720	720	720	720	720	720	720
Electrical data										
Total absorbed power	kW	37,3	40,8	46,1	57,2	62,2	65,8	85,0	94,0	100,7
Total nominal absorbed current	A	76,8	85,3	95,3	113,6	123,2	133,6	170,5	188,8	207,6
Total maximum absorbed current	A	94,3	110,3	118,3	149,6	169,6	169,6	224,6	268,6	268,6
Total inrush current	A	260,3	213,3	223,3	289,6	325,6	335,6	408,6	466,6	488,6
Dimensions										
Length	mm	2.610	2.610	2.610	3.460	3.460	3.460	5.150	5.150	5.150
Length with MV included	mm	3.460	3.460	3.460	4.305	4.305	4.305	5.995	5.995	5.995
Width	mm	1.245	1.245	1.245	1.245	1.245	1.245	1.245	1.245	1.245
Width with MV included	mm	1.245	1.245	1.245	1.245	1.245	1.245	1.245	1.245	1.245
Height	mm	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995
Height with MV included	mm	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995
Weight	kg	1.334	1.449	1.456	1.800	1.840	1.840	2.360	2.450	2.540
Weight with empty MV included	kg	1.564	1.679	1.686	2.030	2.070	2.070	2.590	2.680	2.770
Refrigerant charge for each circuit	kg	14	17	17	26	31	31	35	35	35
Refrigerant charge for each circuit - opt. 0	kg	14	14	14	29	29	29	40	40	40
Power supply										
Power supply	V / ph / Hz	400V/50Hz/3 Ph+T+N								
NOTES										
- = not available										
Nominal conditions referred to:										
Summer work mode: air 35 °C - chilled water 7/12 °C.										
Winter work mode: air 10 °C - warmed water 40/45 °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.										
Notes: Option BT allows summer operation of units (therefore with chilled water production) with external temperature lower than 15 °C.										

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Technical data sheet - PAE 842-2602 CU Kc

PAE CU		842 Kc	962 Kc	1102 Kc	1402 Kc	1502 Kc	1602 Kc	2302 Kc	2402 Kc	2602 Kc
Cooling capacity										
Cooling capacity	kW	79,4	92,4	103,0	140,0	145,0	157,0	219,0	225,0	240,0
Absorbed power	kW	25,5	29,6	34,3	40,6	45,4	50,4	61,8	71,0	77,9
EER		3,11	3,12	3,00	3,45	3,19	3,12	3,54	3,17	3,08
Heating capacity										
Heating capacity	kW	98,7	112,4	127,0	161,7	177,5	196,4	274,0	275,1	352,8
Absorbed power in heating	kW	26,8	31,0	36,0	42,6	47,7	52,9	64,3	74,6	81,8
COP		3,68	3,63	3,53	3,80	3,72	3,71	4,26	3,69	4,31
Scroll compressors										
Quantity	n	2	4	4	4	4	4	4	4	4
Circuits	n	2	2	2	2	2	2	2	2	2
Standard steps capacity	n	2	4	4	4	4	4	4	4	4
Optional steps capacity	n	-	-	-	-	-	-	-	-	-
Nominal absorbed current	A	46,9	56,4	65,2	72,6	82,4	92,4	111,3	130,2	149,5
Maximum absorbed current	A	64,0	80,0	88,0	108,0	128,0	128,0	164,0	208,0	208,0
Inrush current	A	230,0	183,0	193,0	248,0	294,0	294,0	348,0	428,0	428,0
Centrifugal fans										
Quantity	n	3	3	4	6	6	6	8	8	8
Total air flow	m ³ /h	21.300	28.800	28.800	43.800	43.800	43.800	54.400	54.400	54.400
Total air flow	l/s	5.917	8.000	8.000	12.167	12.167	12.167	15.111	15.111	15.111
STD Version										
Available pressure	Pa	60	70	70	70	70	70	100	100	100
Rotation speed	rpm	590	760	590	610	610	610	650	650	650
Motors power	kW	3,3	6,6	4,4	6,6	6,6	6,6	8,8	8,8	8,8
Nominal absorbed current	A	9,6	16,5	12,8	19,2	19,2	19,2	25,6	25,6	25,6
Sound pressure level 2)	dB(A)	60	64	60	61	61	61	64	64	64
1M Version										
Available pressure	Pa	160	190	160	250	250	250	250	250	250
Rotation speed	rpm	750	890	720	880	880	880	870	870	870
Motors power	kW	3,3	6,6	4,4	9,0	9,0	9,0	12,0	12,0	12,0
Nominal absorbed current	A	9,6	16,5	12,8	25,2	25,2	25,2	33,6	33,6	33,6
Sound pressure level 2)	dB(A)	65	65	66	68	68	69	74	74	74
2M Version										
Available pressure	Pa	250	270	270	360	360	360	370	370	370
Rotation speed	rpm	870	975	870	1015	1015	1015	1015	1015	1015
Motors power	kW	4,5	9,0	6,0	13,2	13,2	13,2	17,6	17,6	17,6
Nominal absorbed current	A	12,6	22,5	16,8	33,0	33,0	33,0	44,0	44,0	44,0
Sound pressure level 2)	dB(A)	67	68	68	69	69	69	74	74	75
Shall and tube evaporator										
Quantity	n	1	1	1	1	1	1	1	1	1
Water flow rate	m ³ /h	13,6	15,8	17,7	24,0	24,9	26,9	37,6	38,6	41,2
Water flow rate	l/s	3,8	4,4	4,9	6,7	6,9	7,5	10,4	10,7	11,4
Pressure drop	kPa	34	45	55	49	52	60	39	38	31
Pumps										
Available pressure with P1	kPa	124	118	110	120	97	83	133	101	86
Motor power with P1	kW	1,1	1,1	1,1	1,5	1,5	1,5	3,0	3,0	3,0
Available pressure with P1H	kPa	159	153	145	175	142	133	183	151	136
Motor power with P1H	kW	1,5	1,5	1,5	2,2	2,2	2,2	4,0	4,0	4,0
Available pressure with PT	kPa	149	138	130	135	107	93	123	86	71
Motor power with PT	kW	1,5	1,5	1,5	2,2	2,2	2,2	3,0	3,0	3,0
Buffer tank water volume	l	720	720	720	720	720	720	720	720	720
Electrical data										
Total absorbed power	kW	28,8	36,2	38,7	47,2	52,0	57,0	70,6	79,8	86,7
Total nominal absorbed current	A	56,5	72,9	78,0	91,8	101,6	111,6	136,9	155,8	175,1
Total maximum absorbed current	A	73,6	96,5	100,8	127,2	147,2	147,2	189,6	233,6	233,6
Total inrush current	A	239,6	199,5	205,8	267,2	313,2	313,2	373,6	453,6	453,6
Dimensions										
Length	mm	2.610	2.610	3.460	5.150	5.150	5.150	6.840	6.840	6.840
Length with MV included	mm	3.460	3.460	4.305	5.995	5.995	5.995	6.840	6.840	6.840
Width	mm	1.245	1.245	1.245	1.245	1.245	1.245	1.245	1.245	1.245
Width with MV included	mm	1.245	1.245	1.245	1.245	1.245	1.245	1.245	1.245	1.245
Height	mm	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995
Height with MV included	mm	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995	1.995
Weight	kg	1.352	1.467	1.757	2.485	2.525	2.535	2.980	3.000	3.020
Weight with empty MV included	kg	1.582	1.697	1.987	2.715	2.755	2.765	3.210	3.230	3.250
Refrigerant charge for each circuit	kg	17	17	26	44	44	44	45	45	45
Refrigerant charge for each circuit - opt. 0	kg	14	14	29	48	48	48	45	45	45
Power supply										
Power supply	V / ph / Hz	400V/50Hz/3 Ph+T+N								
NOTES										
- = not available										
Nominal conditions referred to:										
Summer work mode: air 35 °C - chilled water 7/12 °C.										
Winter work mode: air 10 °C - warmed water 40/45 °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.										
Notes: Option BT allows summer operation of units (therefore with chilled water production) with external temperature lower than 15 °C.										