GPE Kc

UNITS FOR 4-PIPE SYSTEMS WITH SCROLL COMPRESSORS

COOLING CAPACITY FROM 77 TO 426 kW - 2 COOLING CIRCUITS

GPE 802 Kc + CF + GP + MV + P1

Above picture is only indicative and is not binding.

The units of **GPE.Kc series** can be installed in all the applications where there is the need to produce at the same time cold and warm water. The peculiarity of this "Polyvalent Groups" is to suit all the needs of the system, independently from weather conditions. These units are 4-pipes heat pumps with separate and not interchangeable circuits, supplied with an additional water/refrigerant condenser/recovery on each cooling circuit, able to entirely replace the air/refrigerant condensing coil and to produce "free" warm water, when needed.

OPERATION MODES

MODE 1: Only Cooling Mode

When warm water production is not required, the unit runs as a water chiller and only produces chilled water. With such a running mode and in order to complete the cooling process, the exchangers in use are the evaporator and the finned air cooled condensing coil.

MODE 2: Cooling Mode with heat recovery

When warm water is required as well, the unit can operate as water chiller with heat recovery and produce warm water at the same time, without additional costs and exploiting the heating power of the condensing process. In this way, in order to complete the cooling process, the evaporator and the water cooled condenser/recovery, where the condensing process takes place, are the exchangers in use.

MODE 3: Heat Pump Mode

The unit runs as an heat pump and therefore produces warm water. With such a running mode and in order to complete the cooling process, the finned condensing coil (as evaporator) and the water cooled condenser/recovery, where the condensing process takes place, are the exchangers in use. Being 2-circuit unit, it is possible to have all the above mentioned running modes at the same time on different circuits (i.e. the circuit 1 can be on Mode 1 and the circuit 2 can be on Mode 2 or 3).

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

Structure made of a base and a chassis manufactured in high-thickness galvanised steel, assembled with stainless steel rivets. All galvanised steel surfaces are powder-coated with colour RAL 7035. 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 surface, so to the 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.

Dry expansion shell and tube evaporator with two refrigerant circuits, in carbon steel and copper tubes, insulated by close-cell polyurethane foam material. It is complete with electric heater and water flow switch.

Shell and tube **heat recovery / condenser** in carbon steel and copper tubes.

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. The fans speed control is standard provided.

Cooling circuit realized with copper or steel pipes, composed of thermostatic expansion valve, solenoid valves for automatic changeover of the different operation modes, dehydrating filter, sight glass, check valves on the liquid line, safety valves, shut off valves, high and low pressure switches and gauges.

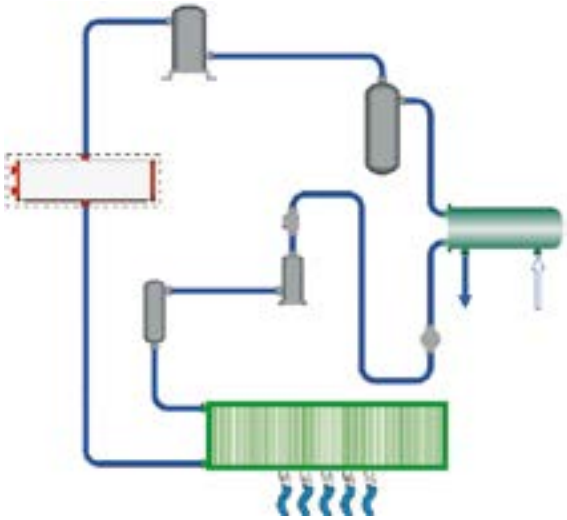
Electric board in compliance with CE norms, contained in a suitable partition protected by the internal safety panel, provided with a main switch and an external and hinged panel to be opened. It is complete with remote switches, overload protections, transformer for auxiliaries and terminal board. In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

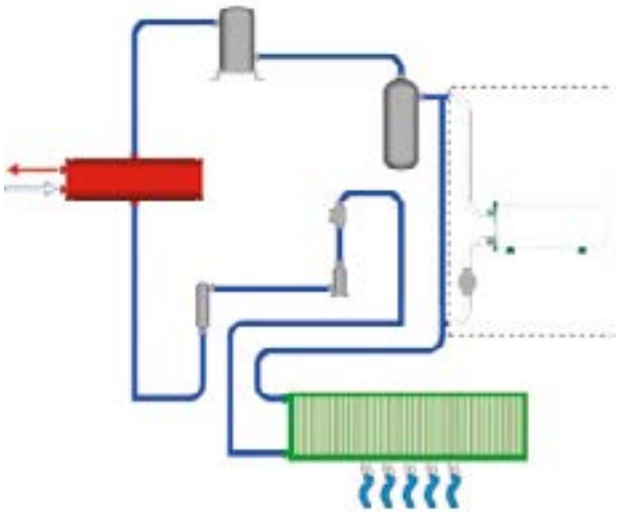
ACCESSORIES

- **AE** **Electrical power supply different from standard:** Mainly, 230V three-phase, 460V three-phase. Frequency 50/60 Hz.
- **CFU** **Soundproofed compressors cabinet with higher thickness material:** Compressor insulation with high-density sound and fireproofing materials of higher thickness.
- **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.
- **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.
- **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 pump group made of a single pump, expansion vessel, safety valve water gauge, water charge and discharge valves, air purging valves, electric control of the pump. The pump is of enbloc 2-pole 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.
- **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.
- **RR** **Copper/copper condensing coils:** Special execution of the condensing coils with copper pipe and fins.
- **VB** **Brine version:** Unit suitable for working with evaporator outlet water temperatures lower than 0°C. A 20 mm evaporator insulation will be provided.

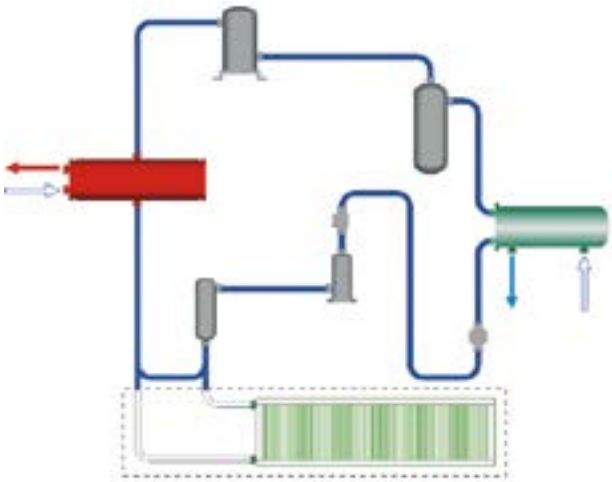
MODE 1: Only Cooling Mode



MODE 2: Cooling Mode with heat recovery



MODE 3: Heat Pump Mode



Technical data sheet - GPE 802-2302 Kc

GPE		802 Kc	1002 Kc	1302 Kc	1502 Kc	1702 Kc	2002 Kc	2302 Kc
Cooling capacity								
Cooling capacity	kW	77,6	110,2	135,6	158,1	179,0	216,3	241,3
Absorbed power	kW	27,1	34,5	42,3	47,3	51,2	72,3	85,2
EER Gross		2,86	3,19	3,20	3,34	3,50	2,99	2,83
EER NET		2,42	2,79	2,87	2,76	2,93	2,63	2,54
ESEER		3,59	3,55	3,77	3,77	3,71	3,87	3,98
Heating capacity								
Heating capacity	kW	101,5	136,0	166,2	192,2	218,1	269,0	300,4
Absorbed power in heating	kW	25,9	37,5	45,4	49,9	54,6	71,1	78,6
COP Gross		3,92	3,63	3,66	3,85	3,99	3,78	3,82
COP Net		3,29	3,20	3,30	3,21	3,38	3,32	3,39
Scroll compressors								
Quantity	n	2	2	2	2	2	4	4
Standard steps capacity	n	2	2	2	2	2	4	4
Circuits	n	2	2	2	2	2	2	2
Nominal absorbed current	A	44,4	57,0	68,8	77,5	84,6	118,8	131,0
Maximum absorbed current	A	60,9	88,0	106,0	108,7	121,7	170,9	188,9
Inrush current	A	170,7	239,7	245,7	321,4	325,4	294,4	300,4
Axial fans								
Quantity	n	2	2	2	4	4	4	4
Rotation speed	rpm	885	885	885	885	885	885	885
Motors power	kW	4,96	4,96	4,96	9,92	9,92	9,92	9,92
Total air flow	m^3/h	55.400	55.180	53.150	110.800	110.800	108.800	104.200
Total air flow	l/s	15.389	15.328	14.764	30.778	30.778	30.222	28.944
Nominal absorbed current	A	10,3	10,3	10,3	20,6	20,6	20,6	20,6
Brazed plate evaporator								
Quantity	n	2	2	2	2	2	2	2
Water flow rate	m^3/h	13,3	19,0	23,3	27,2	30,8	37,2	41,5
Water flow rate	l/s	3,7	5,3	6,5	7,6	8,6	10,3	11,5
Pressure drop	kPa	49	61	66	67	73	69	74
Brazed plate condenser								
Quantity	n	2	2	2	2	2	2	2
Water flow rate	m^3/h	17,5	23,4	28,6	33,1	37,5	46,3	51,7
Water flow rate	l/s	4,8	6,5	7,9	9,2	10,4	12,9	14,4
Pressure drop	kPa	83	87	93	95	108	102	110
Pump group P1								
Available pressure with P1	kPa	91	93	102	91	104	114	86
Motor power with P1	kW	1,5	1,9	3,0	3,0	4,0	4,0	4,0
Nominal absorbed current	A	3,9	5,0	6,2	6,2	7,4	7,4	7,4
Hydraulic kit								
Buffer tank water volume	l	100	300	300	300	300	300	300
Weight with empty MV included	Kg	40	80	80	80	80	80	80
Electrical data								
Total absorbed power	kW	32,1	39,5	47,3	57,2	61,1	82,2	95,1
Total nominal absorbed current	A	54,7	67,3	79,1	98,1	105,2	139,4	151,6
Total maximum absorbed current	A	71,2	98,3	116,3	129,3	142,3	191,5	209,5
Total inrush current	A	181,0	250,0	256,0	342,0	346,0	315,0	321,0
Sound pressure level								
Sound pressure level 2)	dB(A)	75,2	75,2	77,4	78,2	78,1	78,5	78,9
Dimensions								
Length	mm	2.980	2.980	2.980	5.780	5.780	5.780	5.780
Width	mm	1.370	1.370	1.370	1.370	1.370	1.370	1.370
Height	mm	2.420	2.420	2.420	2.420	2.420	2.420	2.420
Weight	kg	1.230	1.265	1.310	1.895	1.980	1.915	2.030
Refrigerant charge	kg	21	32	42	42	62	62	62
Power supply								
Power supply	V / ph / Hz	400 V/ 50Hz / 3Ph + N + T						
NOTES								

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).

Technical data sheet - GPE 2802-4102 Kc

GPE		2802 Kc	3102 Kc	3202 Kc	3402 Kc	3602 Kc	3802 Kc	4102 Kc
Cooling capacity								
Cooling capacity	kW	268,4	314,2	344,9	368,2	386,7	407,0	426,0
Absorbed power	kW	85,1	97,4	113,3	116,2	120,7	129,0	140,0
EER Gross		3,15	3,23	3,04	3,17	3,20	3,16	3,04
EER NET		2,83	2,93	2,74	2,86	2,91	2,88	2,80
ESEER		3,76	3,89	3,89	3,75	3,83	3,84	3,89
Heating capacity								
Heating capacity	kW	335,7	381,5	420,1	443,5	473,1	496,7	515,2
Absorbed power in heating	kW	85,2	96,4	107,2	113,4	119,6	125,2	126,0
COP Gross		3,94	3,96	3,92	3,91	3,96	3,97	4,09
COP Net		3,53	3,59	3,51	3,53	3,58	3,61	3,72
Scroll compressors								
Quantity	n	4	4	4	4	4	4	4
Standard steps capacity	n	4	4	4	4	4	4	4
Circuits	n	2	2	2	2	2	2	2
Nominal absorbed current	A	138,0	159,0	186,5	195,5	207,7	218,3	229,3
Maximum absorbed current	A	212,0	238,0	258,9	284,0	304,0	314,0	324,0
Inrush current	A	313,4	401,4	421,3	430,3	442,3	460,3	469,3
Axial fans								
Quantity	n	4	4	5	5	5	5	5
Rotation speed	rpm	885	885	885	885	885	885	885
Motors power	kW	9,92	9,92	12,4	12,4	12,4	12,4	12,4
Total air flow	m^3/h	101.200	99.160	124.500	121.830	120.470	120.470	120.470
Total air flow	l/s	28.111	27.544	34.583	33.842	33.464	33.464	33.464
Nominal absorbed current	A	20,6	20,6	25,8	25,8	25,8	25,8	25,8
Brazed plate evaporator								
Quantity	n	2	2	2	2	2	2	2
Water flow rate	m^3/h	46,2	54,0	59,3	63,3	66,5	70,0	73,3
Water flow rate	l/s	12,8	15,0	16,5	17,6	18,5	19,4	20,4
Pressure drop	kPa	56	73	68	72	70	72	70
Brazed plate condenser								
Quantity	n	2	2	2	2	2	2	2
Water flow rate	m^3/h	57,7	65,6	72,3	76,3	81,4	85,4	88,6
Water flow rate	l/s	16,0	18,2	20,1	21,2	22,6	23,7	24,6
Pressure drop	kPa	97	104	98	101	97	100	70
Pump group P1								
Available pressure with P1	kPa	89	107	98	115	109	106	110
Motor power with P1	kW	4,0	5,5	5,5	7,5	7,5	7,5	7,5
Nominal absorbed current	A	7,4	11,0	11,0	14,0	14,0	14,0	14,0
Hydraulic kit								
Buffer tank water volume	l	820	820	820	1100	1100	1100	1100
Weight with empty MV included	Kg	145	145	145	220	220	220	220
Electrical data								
Total absorbed power	kW	95,0	107,3	125,7	128,6	133,1	141,4	152,4
Total nominal absorbed current	A	158,6	179,6	212,2	221,2	233,4	244,0	255,0
Total maximum absorbed current	A	232,6	258,6	284,6	309,8	329,8	339,8	349,8
Total inrush current	A	334,0	422,0	447,0	456,0	468,0	486,0	495,0
Sound pressure level								
Sound pressure level 2)	dB(A)	78,9	79,2	80,6	80,9	80,3	81,7	87,4
Dimensions								
Length	mm	5.780	5.780	6.680	6.680	6.680	6.680	6.680
Width	mm	1.370	1.370	1.370	1.370	1.370	1.370	1.370
Height	mm	2.420	2.420	2.420	2.420	2.420	2.420	2.420
Weight	kg	2.980	3.020	3.420	3.610	3.740	3.795	4.050
Refrigerant charge	kg	62	80	80	80	96	96	96
Power supply								
Power supply	V / ph / Hz	400 V/ 50Hz / 3Ph + N + T						
NOTES								

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).