PAS Kp

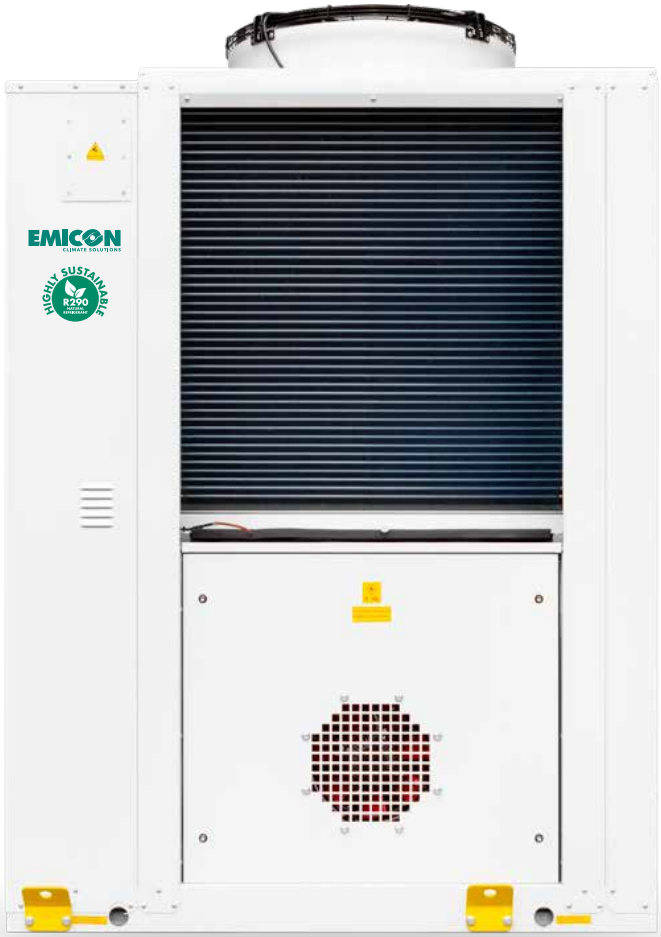
AIR COOLED HEATPUMPS WITH RECIPROCATING COMPRESSORS AND AXIAL FANS

The packaged air cooled heatpumps of PAS Kp series are suitable for outdoor installation and can be used to cool pure fluid solutions for industrial applications or in air conditioning systems of the service industry, where it is necessary to grant excellent performances and a very low environmental impact.
The refrigerant used is propane, a non-toxic hydrocarbon, even at high concentrations, with a null ozone depletion potential, negligible global warming potential and thermodynamic properties which allow to reach high efficiency values.
For this reason the units are designed, as groups for external installation, in compliance with the European standards EN 378-1 / EN 378 -2 and their updates.

Depending on the required heating capacity, the units are available in mono or multi compressor with 1 or 2 independent cooling circuits.
Thanks to the many available options, these heat pumps are particularly versatile and are easily adaptable to the different types of plant, where production of chilled water is required.

All the units are completely factory-assembled and tested
and supplied with refrigerant and non-freezing oil charge. So, once on site, they only need to be positioned and connected to the hydraulic line and power supply.

Units CE certified in compliance with the European regulation 813/2013 at working condition, on the use side 30/35°C.



Following versions are available:

PAS Kp - STANDARD VERSION

Operation limits at cooling mode (standard unit):
AIR: from +10°C to +40°C;
WATER (outlet from the evaporator): From -5 to 15°C.
Operation limits at heating mode (standard unit):
AIR: from -15°C to +15°C;
WATER (outlet from the condenser): From 25 to 55°C.

MAIN COMPONENTS:
Structure strong and compact, made of base and frame with high-thickness galvanised steel elements, assembled with stainless steel rivets. All galvanised steel surfaces externally positioned are superficially coated by an oven powder-painting with colour RAL 7035. The technical section which contains compressors and the other cooling circuits elements, except the condensing part, is hermetically closed from the rest of the ambient , equipped with a leakage sensor and a forced ventilation system . To reduce the sound level, it is possible to insulate the technical section with a sound and fire proof mattress.

SEMI-HERMETIC ALTERNATIVE COMPRESSORS
optimized to operate with the hydrocarbons and realized in compliance with the regulations on safety in force. The compressors and all the relevant components of the cooling circuit are closed inside a technical compartment which is hermetically closed and kept in constant forced ventilation to avoid air stagnation and refrigerant pockets which can comes out from possible leaks. The electrical motor, arranged for starting with low inrush current (option PW), is equipped with thermal protection module (installed inside the electrical cabinet). The lubricating system, of forced type, is equipped with oil filters and check valves to survey the lubricating pressure and is made through a high pressure pump. Each compressor, which works on a single independent circuit, is installed on rubber isolation dampers and provided with anti-vibration dampers and valves on suction and discharge side, ATEX version of electronic differential pressure switch to control the oil level, ATEX crankcase heater and temperature probe on discharge side to control the compressor discharge temperature.

STAINLESS STEEL PLATE HEAT EXCHANGER
One or two circuits version, thermally insulated with high thickness close cell flexible insulation. The evaporator is also equipped with safety water flow switch switching off the unit in case of low water flow through the evaporator.

HEAT-EXCHANGE EXTERNAL COILS
With micro-finned copper tubes and a hydrophilic treatment , positioned in staggered rows and mechanically expanded into an aluminium finned pack. Fins are designed with such a shape providing the highest heat exchange efficiency. The coil is placed directly on a condensate drip tray . The frontal section of the coil can have, as an option, the safety protection grid (Option GP).

6-POLES AXIAL FANS WITH ELECTRICAL MOTOR
With external rotor directly coupled to the impeller Aluminum blades with wings profile are suitably designed to avoid any turbulence in the air detachment zone, granting in this way the max efficiency with the minimum noise level. The fan is equipped with galvanized steel protection grid painted after the construction. The fan motors are of totally closed type and have got a protection factor IP54 and protection winding-flooded thermostat.

PLATE REGENERATIVE GAS/FLUID HEATING EXCHANGER
Installed on each circuit to grant a suitable overheating value to the compressor sucked gas and a right oil temperature and at the same time to increase the cooling circuit efficiency through the sub-cooling of condensing section leaving fluid.

INDEPENDENT COOLING CIRCUITS
Each provided with a shut-off valve for refrigerant charge, antifreeze sensor, 4 way valve for circle inversion liquid separator, shut-off valves on liquid line, sight glass, dehydrating filter for R290 with wide filtering surface, high-pressure safety valve on high pressure refrigerant side equipped with a connector to the discharged refrigerant conveying piping, solenoid valve on liquid line with coil, mechanical thermostatic expansion valve, calibrated high and low pressure switches and gauges for R290 specifically. All units are equipped with a special sensor that turning off the compressors in the event of a gas leak.

ELECTRIC BOARD
Built in compliance with 61439-1 standards, inside of which all the control system elements and the ones required for electrical motors starting and protection are located. All factory-connected and tested. The electrical cabinet has got a watertight structure, equipped with cable glands with protection factor IP65/66. Beside the electrical cabinet also contains all the power and control devices, microprocessor electronic board complete with keypad and display, for visualizing the several functions available, main switch of lock-door type, isolation transformer for auxiliary circuits, automatic switches, fuses and protection switches for compressors and fans motors, terminals for general alarm and remote ON/OFF, spring type terminal board, possibility to interface to BMS systems.
T
he unit is pre-arranged to activate the electrical power supply stop when there is a ventilation lack in the compressor section. The lack of ventilation is managed through differential pressure switches which works as air flow switches.

PAS Kp

[technical spec]

		PAS 451 Kp	PAS 521 Kp	PAS 651 Kp	PAS 731 Kp	RWS 881 Kp	PAS 1001 Kp	PAS 1201 Kp	PAS 1502 Kp	PAS 1702 Kp	PAS 2102 Kp	PAS 2502 Kp	PAS 2902 Kp	PAS 3402 Kp
Nominal cooling capacity	Kw	36,6	44,9	53,9	61,0	76,4	90,9	104,3	129,7	148,4	180,6	209,5	248,2	296,8
Nominal absorbed power	Kw	12,5	14,4	16,4	19,1	24,0	29,3	35,4	40,0	47,5	58,7	70,9	78,4	96,0
Nominal absorbed current	A	25,9	27,8	34,0	37,0	42,8	52,0	63,8	74,8	83,6	104,0	128,2	145,5	169,8
EER	-	2,94	3,12	3,28	3,19	3,18	3,10	2,94	3,24	3,13	3,08	2,96	3,17	3,09
Cooling circuit	q.ty	1	1	1	1	1	1	1	2	2	2	2	2	2
Number of compressors	q.ty	1	1	1	1	1	1	1	2	2	2	2	4	4
Freon charge	Kg	6	7	10	10	10	13	13	15	20	37	37	46	57
EVAPORATOR - Fluid : WATER														
Flow	mc/h	6,3	7,7	9,3	10,5	13,1	15,6	17,9	22,3	25,5	31,1	36,0	42,7	51,1
Pressure drop	kPa	35	47	28	35	17	23	29	15	19	27	24	32	26
AXIAL FANS														
Quantity	q.ty	1	1	2	2	2	2	2	3	3	4	4	5	5
Air flow	mc/h	21620	20920	20920	20920	43120	41700	41700	64710	62580	83400	83400	104250	125250
Absorbed power	Kw	1,9	1,9	1,2	1,2	3,9	3,9	3,9	5,8	5,8	7,8	7,8	9,7	12,4
Absorbed current	A	3,9	3,9	2,4	2,4	7,8	7,8	7,8	11,7	11,7	15,6	15,6	19,5	25,8
HEATPUMP WORKING (AIR TEMP. 7°C - 87%U.R. - WATER 40/45°C														
Nominal thermical power	Kw	43,0	50,7	61,1	69,4	84,8	103,3	119,5	142,2	168,0	209,3	239,8	280,1	333,8
Nominal absorbed power	Kw	13,1	15,0	16,6	19,1	24,0	29,3	34,4	38,7	46,2	58,8	68,0	76,7	94,2
Nominal absorbed current	A	26,9	28,9	34,7	37,5	43,0	52,3	62,5	73,6	82,2	104,5	123,9	144,1	168,4
SCOP	-	3,28	3,27	3,56	3,47	3,37	3,45	3,35	3,30	3,25	3,29	3,29	3,38	3,27
COP	-	3,28	3,38	3,69	3,63	3,54	3,53	3,48	3,68	3,63	3,56	3,53	3,65	3,54
WEIGHT														
Transport	Kg	882	946	1258	1280	1350	1416	1466	1798	1876	2246	2366	2918	3106
Operation	Kg	884	948	1262	1284	1356	1422	1472	1812	1890	2260	2388	2949	3138
DIMENSIONS														
Lenght	mm	1620	1620	2660	2660	2660	2660	2660	3700	3700	4850	4850	5890	5890
Width	mm	1370	1370	1370	1370	1370	1370	1370	1370	1370	1370	1370	1370	1370
Height	mm	2420	2420	2420	2420	2420	2420	2420	2420	2420	2420	2420	2420	2420
NOISE														
Unit total LWA	dB(A)	84,3	84,6	84,8	88,6	91,0	93,2	93,2	93,7	93,7	95,2	95,2	95,2	95,5
Unit total SPL at 1mt free field	dB(A)	66,5	66,8	66,3	70,1	72,5	74,7	74,7	74,6	74,6	75,6	75,6	75,1	75,4
POWER SUPPLY														
Tension/Phases/Frequency	V/ph/Hz	400/3/50+N+PE	400/3/50+N+PE	400/3/50+N+PE	400/3/50+N+PE	400/3/50+N+PE	400/3/50+N+PE	400/3/50+N+PE	400/3/50+N+PE	400/3/50+N+PE	400/3/50+N+PE	400/3/50+N+PE	400/3/50+N+PE	400/3/50+N+PE

[equipment]

PAS KP		521	591	721	871	1001	1402	1702	2102	2402	2902	3402
Amperometer+Voltmeter	A+V	○	○	○	○	○	○	○	○	○	○	○
Electrical power supply different from standard	AE	★	★	★	★	★	★	★	★	★	★	★
Soundproofed compressors cabinet	CFU	○	○	○	○	○	○	○	○	○	○	○
Compressors inrush counter	CS	○	○	○	○	○	○	○	○	○	○	○
Condensing coil protection grid	GP	○	○	○	○	○	○	○	○	○	○	○
Victaulic insulation on pump side	L1	○	○	○	○	○	○	○	○	○	○	○
Victaulic insulation on buffer tank side	L2	○	○	○	○	○	○	○	○	○	○	○
RS485 Serial interface	IH	○	○	○	○	○	○	○	○	○	○	○
BACNET Serial interface	IH BAC	○	○	○	○	○	○	○	○	○	○	○
SNMP or TCP/IP Serial interface	IWG	○	○	○	○	○	○	○	○	○	○	○
Phase monitor	MF	○	○	○	○	○	○	○	○	○	○	○
Buffer tank module	MV	■	■	■	■	■	■	■	■	■	■	■
Single pump module	P1	○	○	○	○	○	○	○	○	○	○	○
Higher available pressure single pump	P1H	○	○	○	○	○	○	○	○	○	○	○
Twin pump module (only one working)	P2	○	○	○	○	○	○	○	○	○	○	○
Higher available pressure double pump module (only one working)	P2H	○	○	○	○	○	○	○	○	○	○	○
Rubber-type vibration dampers	PA	○	○	○	○	○	○	○	○	○	○	○
Spring-type vibration dampers	PM	○	○	○	○	○	○	○	○	○	○	○
Remote display	PQ	○	○	○	○	○	○	○	○	○	○	○
Part-Winding compressors start up system	PW	○	○	○	○	○	○	○	○	○	○	○
Anti-freeze heater on evaporator	RA	○	○	○	○	○	○	○	○	○	○	○
Power factor correction system Cosfi ≥0,9	RF	○	○	○	○	○	○	○	○	○	○	○
Compressors overload relays	RL	○	○	○	○	○	○	○	○	○	○	○
Microchannel coils	PCP	■	■	■	■	■	■	■	■	■	■	■
Microchannel coils with anticorrosive	ECP	■	■	■	■	■	■	■	■	■	■	■
Partial heat recovery	RP	○	○	○	○	○	○	○	○	○	○	○
Personalized frame painting in alternative RAL color	RV	★	★	★	★	★	★	★	★	★	★	★
Electronic thermostatic valve	TE	○	○	○	○	○	○	○	○	▲	▲	▲
External air low temperature operation (-10°C)	BT	○	○	○	○	○	○	○	○	○	○	○
External air low temperature operation (-20°C)	BF	○	○	○	○	○	○	○	○	○	○	○
Axial fans with electronic commutated motor	EC	○	○	○	○	○	○	○	○	○	○	○
High pressure double safety valve	HRV2	○	○	○	○	○	○	○	○	○	○	○
Axial fan diffusor	ATX	○	○	○	○	○	○	○	○	○	○	○
Inverter for compressors	VSC	○	○	○	○	○	○	○	○	○	○	○
Inverter for pump	VSP	○	○	○	○	○	○	○	○	○	○	○

○ OPTIONAL ■ NOT AVAILABLE
▲ STANDARD ★ CONTACT MANIFACTURER