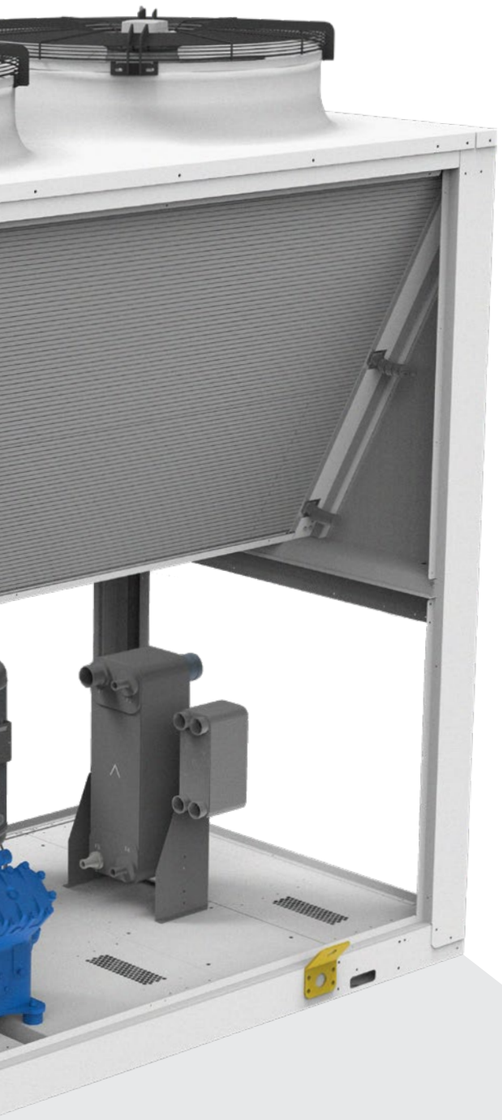
RAS MC Kp

AIR COOLED CHILLERS WITH RECIPROCATING COMPRESSORS AND AXIAL FANS



AIR COOLED CHILLERS WITH RECIPROCATING COMPRESSORS AND AXIAL FANS - REFRIGERANT **R290**

The packaged air cooled chillers of RAS MC Kp series are suitable for outdoor installation and are particularly indicated 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 almost 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 for external installation, in compliance with the European standard EN 378 and his updates.

Depending on the capacity required the units are available with 1 or 2 independents cooling circuits equipped with 1 or 2 compressors for each circuit.
Thanks to the many available options, these chillers are particularly versatile and are easily adaptable to the different types of plants, where production of chilled water is required.

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

EC certified units in compliance with the European regulation 2016/2281 at nominal working condition 12/7°C user side.

Operation Limits:
Air: from +10 to +40°C.
Water: (evaporator outlet):
from -2 to +15°C (**Standard version**)
from -14 to -2°C (**VB version**)
from -5 to +15°C (**F version**)

RAS MC Kp: Standard version
RAS MC VB Kp: Version suitable to produce low temperature water/glycol mixture, equipped with electronic thermostatic valve, inverter fans, evaporator higher insulation (20mm thickness)

MAIN COMPONENTS:

FRAME
Strong and compact structure, made of base and frame with high-thickness galvanized steel elements assembled with stainless steel rivets. All galvanized steel surfaces externally positioned are superficially coated by an oven powder-painting with colour RAL7035. The technical section which contains compressors and the other cooling circuit elements, exept the condensing part, is closed in a cabinet; if a refrigerant leak occurs the technical vane is automatically airy using an external axial fan which is able to clean all the air inside the cabinet 4 time/minute.
To reduce the sound level it is possible to insulate the technical section with a sound and fire proof standard thickness material or higher thickness material (CFU option).

COMPRESSORS
Semi hermetic alternative type optimized to operate with the hydrocarbons and realized in compliance with the safety regulation in force. The electrical motor, arranged for starts with low inrush current (PW option), is equipped with thermal protection module (installed in 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 is installed on rubber type vibration dampers and is provided with switch-off valve on suction and discharge side, electronic differential pressure switch for the oil level control, crankcase heater and temperature probe on discharge side to control the compressor's discharge temperature. If the compressors are installed in "tandem" version each one is equipped with oil level sensor and oil recuperator; this device activates automatically when in one compressor the lubricant level goes down then minimum value.

EVAPORATOR
Stainless steel plates type mono or bi circuits, thermally insulated using a flexible closed cells mattress of high thickness. Is also provided with a safety differential pressure switch which does not allows the unit operation in case of water flow lack or reduction.

COILS
The external exchanger coils are made of microchannel aluminium extruded pipes and brazed aluminium fins.
Thanks to the reduced whole volume and the high external surfaces, the microchannel coils allow a great reduction of refrigerant charge and an high heat exchange capacity.

FANS
6 poles axial fans with electrical motor and external rotor directly coupled to the impeller; aluminium blades with wings profile are suitably designed to avoid any turbulence in the iar detachment zone, granting in this way the maximum efficiency with the minimum noise level. The fan is equipped with a galvanized steel protection grid painted after the construction; the fan motors are of totally closed type and have got a protection factor IP54 and winding-flooded protection thermostat.

REGENERATIVE EXCHANGER
Heat regenerative exchanger gas/fluid of plates type, installed on each circuit to grant a suitable overheating value to the compressor sucked gas and at the same time to increase the cooling circuit efficiency thanks to higher sub-cooling of condensing coil leaving fluid.
Insulated thermally using a close cells mattress of great thickness.

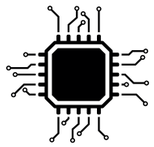
COOLING CIRCUIT
Indipendent cooling circuits, each provided with a shut-off valve for refrigerant charge, antifreeze probe, sight glass, dehydrating filter for **R290** with wide filtering surface, high pressure side safety valve equipped with connector to the discharge refrigerant conveying piping, electronic thermostatic valve (for 1001,2402 and folowing bigger frames), settable pressure switches and high/low pressure gauges for R290 specifically.
All the units are equipped with a leak sensor which is able to turn off the compressors and turn on the extraction fan in case of a refrigerant leak occurs.

ELECTRICAL 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 the components are factory connected and testes.
The electrical cabinet has got a watertight structure, equipped with cable glands with protection factor of **IP65/66**.
Besides the electrical cabinet contains all the power and control devices, microprocessor electronic board complete with keyboard and display for visualizing several function 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 unit remote ON/OFF, spring type terminal board and the possibility to interface to BMS system.

STANDARD

RAS MC VB Kp
RAS MC Kp
RAH MC Kp

[equipment]



ELECTRICAL

Built in compliance with EN60204 separated from compressor's cabinet, is made in order to avoid entry of refrigerant gas in case of leak occurs; the inverter (if present) has a dedicate ventilated provided vain separated from electrical board.

COMPRESSOR

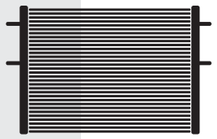
The unit is equipped with high efficency semi hermetic alternative compressors suitable for use in a explosion hazard zone (Zone 2) due to the presence of flammable gases following the ATEX 2014/34/UE European norm.

LEAK **SENSOR**

Gas presence sensor composed by an electronic detector combined with catalytic sensor able to reveal a propane gas presence in the air.

COOLING **CIRCUIT**

All the RAS Kp cooling circuits are provided with antivibration dampers both on suction and discharge; the compressors also are installed on rubber dampers in order to reduce the vibrations transmitted to the frame.



MICROCHANNEL **COIL**

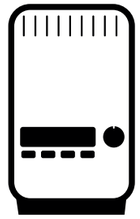
The microchannel condensing coil are completely made of aluminium alloy; compared to the standard copper- aluminium ones the microchannel geometry, at the same heat exchange capacity, has less resistance to air flow. This allows to optimize the fan section work reducing consequently both the dimensions (at the same performance) and the electrical consumption. Moreover, this technology allows a great reduction of condensing section weights and also the refrigerant charge.

EXTRACTION **FAN**

The refrigerant extraction fans starts when the gas sensor reveals a gas presence inside of the compressor's cabinet. The fresh air is pushed inside the cabinet allowing the elimination of the mixture air/gas potentially explosive; the fans flow is able to clean completely the air in less then 15 seconds.

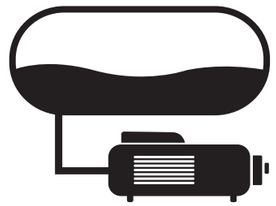
ELECTRONIC THERMOSTATIC **VALVE**

Electronic expansion valve for a perfect overheating regulation in cooling circuits. The design allows a double-flow operation and a perfect hold when the valve is closed.



COMPRESSORS **INVERTER**

To solve the cooling capacity adaptation the unit can be provided with an external inverter; it guarantees an higher energetic efficiency to the partial loads allowing to reduce the number of starts/stops as well as decrease the sound power.



HYDRONIC **KIT**

Pump + buffer tank integrated module composed by: different capacity storage tank (dipending on the unit capacity), a circulating centrifugal water pump directly managed by microprocessor which controls the starts and the operation.

INVERTER **PUMP**

Cooled water pump, available as single or double;
It cans be coupled with an inverter to increase the efficiency and the existing system adaptation.

AXITOP **FANS**

Axial diffuser to combined to condensing section provides a great efficiency and sound pressure improvement.
Thanks to his aerodynamic effect minimizes output losses increasing the air flow till 9% to the same electrical consumption or a consumption decrease till 27% to the same air flow; similarly the sound power reduction to the same air flow decrease till

RAS MC VB Kp **RAS** MC Kp

OPTIONAL

[equipment]

RAS MC Kp

[technical spec]

		521 MC VS Kp	591 MC VS Kp	721 MC VS Kp	871 MC VS Kp	1001 MC VS Kp	1402 MC Kp	1702 MC Kp	2102 MC Kp	2402 MC Kp	2902 MC Kp	3402 MC Kp
Nominal cooling capacity	Kw	54,2	61,0	74,8	92,9	107,1	155,5	182,8	215,7	252,1	289,7	352,9
Nominal absorbed capacity	Kw	16,4	19,2	23,3	29,2	34,1	47,5	56,4	68,2	77,0	96,5	114,1
Nominal absorbed current	A	35,1	38,2	42,5	52,1	63,2	85,5	103,7	126,6	145,5	166,3	205,7
EER	-	3,30	3,19	3,21	3,18	3,15	3,27	3,24	3,16	3,28	3,00	3,09
SEER	-	4,17	4,12	4,24	4,17	4,14	4,15	4,14	4,12	4,26	4,13	4,24
cooling circuit	q.tà	1	1	1	1	1	2	2	2	2	2	2
Number of compressors	q.tà	1	1	1	1	1	2	2	2	4	4	4
Freon charge	Kg	4,0	4,0	8	8	8	15	15	17	17	16	21
EVAPORATOR - Fluid: water - Temperature IN/OUT: 12 / 7°C												
Water Flow	mc/h	9,3	10,5	12,9	16,0	18,4	26,7	31,4	37,1	43,4	49,8	60,7
Prtessure Drop	kPa	29	35	17	24	31	21	28	26	33	26	36
FANS- Axial- External air temperature: 35°C												
Quantity	q.ty	2	2	2	2	2	4	4	4	4	4	6
Air flow	mc/h	17760	17690	20020	40220	40070	80770	80470	80110	79850	79400	119920
Absorbed power	Kw	1,2	1,2	1,2	3,9	3,9	7,8	7,8	7,8	7,8	7,8	11,6
Absorbed current	A	5,2	5,2	5,2	7,8	7,8	15,6	15,6	15,6	15,6	15,6	23,4
WEIGHT												
Transport	Kg	1094	1096	1206	1304	1310	2002	2098	2156	2522	2598	3100
Operation	Kg	1098	1100	1212	1310	1316	2016	2112	2178	2544	2630	3132
DIMENSIONS												
Lenght	mm	2590	2590	2590	2590	2590	4840	4840	4840	4840	4840	4430
Widht	mm	1370	1370	1370	1370	1370	1370	1370	1370	1370	1370	2260
Height	mm	2570	2570	2570	2570	2570	2570	2570	2570	2570	2570	2480
NOISE												
Unit total LWA	dB(A)	86,3	88,1	88,1	92,2	92,2	92,6	95,7	95,7	96,0	96,0	99,2
Unit total SPL at 1mt free field	dB(A)	67,8	69,6	69,6	73,7	73,7	73,0	76,0	76,0	76,3	76,3	79,3
POWER SUPPLY												
Tension/Phases/Frequence	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

*The values shown are indicative and may vary according to the machine configuration. Emicon reserves the right to report specific values on the commercial proposal.

RAS MC VB Kp

[technical spec]

		521 MC VB Kp	591 MC VB Kp	721 MC VB Kp	871 MC VB Kp	1001 MC VB Kp	1402 MC VB Kp	1702 MC VB Kp	2102 MC VB Kp	2402 MC VB Kp	2902 MC VB Kp	3402 MC VB Kp	3702 MC VB Kp
Nominal cooling capacity	Kw	31,8	35,6	43,6	53,5	60,7	87,1	106,1	123,9	149.2	172,0	207,5	235,3
Nominal absorbed power	Kw	12,4	14,2	14,2	21,1	25,4	34,6	41,9	51,2	57,4	71,7	85,5	103,2
Nominal absorbed current	A	30,2	31,6	31,6	43,3	52,2	58,3	86,3	105,0	122,1	135,5	168,3	204,7
EER	-	2,56	2,52	2,52	2,54	2,39	2,52	2,53	2,42	2,60	2,40	2,43	2,28
SEPR	-	3,58	3,51	3,38	3,70	3,42	3,35	3,75	3,49	3,75	3,38	3,68	3,47
Cooling circuit	q.ty	1	1	1	1	1	2	2	2	2	2	2	2
Number of compressors	q.ty	1	1	1	1	1	2	2	2	4	4	4	4
Freon charge	Kg	4,0	4,0	7,0	7,0	7,0	14,0	14,0	15,0	16,0	18,0	23,0	24,0
EVAPORATOR - Fluid: Water +35% ethynele glycol - Temperature IN/OUT: -3 °C / -8°C													
Water flow	mc/h	6,2	7,07	8,6	10,5	11,9	17,1	20,8	24,3	29,3	33,7	40,7	46,1
Pressure Drop	kPa	20,4	25,3	12,0	16,9	21,0	13,9	19,4	17,7	24,3	18,6	25,6	31,7
FANS- Axial - Air Temperature : 35°C													
Quantity	q.ty	2	2	2	2	2	4	4	4	4	4	6	6
Air flow	mc/h	14420	15780	16750	29580	31030	33440	58990	65520	65600	70780	97550	102310
Absorbed power	Kw	1,2	1,2	1,2	3,9	3,9	2,4	7,8	7,8	7,8	7,8	11,6	11,6
Absorbed current	A	5.2	5.2	5,2	7,8	7,8	10,5	15,6	15,6	15,6	15,6	23,4	23,4
Weight													
Transport	Kg	1052	1056	1164	1242	1246	1942	2096	2162	2518	2600	3102	3120
Operation	Kg	1056	1060	1170	1248	1252	1956	2110	2188	2540	2632	3134	3152
DIMENSIONS													
Lenght	mm	2590	2590	2590	2590	2590	4840	4840	4840	4840	4840	4430	4430
Widht	mm	1370	1370	1370	1370	1370	1370	1370	1370	1370	1370	2260	2260
Height	mm	2570	2570	2570	2570	2570	2570	2570	2570	2570	2570	2480	2480
NOISE													
Unit total LWA	dB(A)	86,3	88,1	88,1	92,2	92,2	92,6	95,7	95,7	96,0	96,0	99,2	99,7
Unit total SPL 1mt free range	dB(A)	67,8	69,6	69,6	73,7	73,7	73,0	76,0	76,0	76,3	76,3	79,3	79,8
ALIMENTAZIONE													
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

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[equipment]

RAS MC 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	I1	○	○	○	○	○	○	○	○	○	○	○
Victaulic insulation on buffer tank side	I2	○	○	○	○	○	○	○	○	○	○	○
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	○	○	○	○	○	○	○	○	○	○	○
Double pump group	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	○	○	○	○	○	○	○	○	○	○	○
Anticorrosive treatment on coils	PCP	○	○	○	○	○	○	○	○	○	○	○
Microchannel coil with anticorrosive treatment	ECP	○	○	○	○	○	○	○	○	○	○	○
Personalized frame painting in alternative colour	RV	★	★	★	★	★	★	★	★	★	★	★
External Air low temperature operation (-10°C)	BT	○	○	○	○	○	○	○	○	○	○	○
External air low temperature operation (-20°C)	BF	○	○	○	○	○	○	○	○	○	○	○
Partial heat recovery	RP	○	○	○	○	○	○	○	○	○	○	○
Axial fans with electronic commutated motor	EC	○	○	○	○	○	○	○	○	○	○	○
High pressure double safety valve	HRV2	○	○	○	○	○	○	○	○	○	○	○
Axial fan diffusor	AXT	○	○	○	○	○	○	○	○	○	○	○
Inverter for compressors	VSC	▲	▲	▲	▲	▲	○	○	○	○	○	○
Inverter for pump	VSP	○	○	○	○	○	○	○	○	○	○	○
Electronic Thermostatic Valve	TE	○	○	○	○	▲	○	○	○	▲	▲	▲

● OPTIONAL ■ NOT AVAILABLE
▲ STANDARD ★ CONTACT MANIFACTURER

[equipment]

RAS MC VB		521	591	721	871	1001	1402	1702	2102	2402	2902	3402	3702
Amperometer+Voltmeter	A+V	○	○	○	○	○	○	○	○	○	○	○	○
Electrical power supply different from standard	AE	★	★	★	★	★	★	★	★	★	★	★	★
Soundproofed compressors cabinet with higher thickness material	CFU	○	○	○	○	○	○	○	○	○	○	○	○
Compressor inrush counter	CS	○	○	○	○	○	○	○	○	○	○	○	○
Condensing coil protection grid	GP	○	○	○	○	○	○	○	○	○	○	○	○
Victaulic insulation on pump side	I1	○	○	○	○	○	○	○	○	○	○	○	○
Victaulic insulation on buffer tank side	I2	○	○	○	○	○	○	○	○	○	○	○	○
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	○	○	○	○	○	○	○	○	○	○	○	○
Double 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 with anticorrosive soft treatment	PCP	○	○	○	○	○	○	○	○	○	○	○	○
Microchannel coils with anticorrosive strong treatment	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	○	○	○	○	○	○	○	○	○	○	○	○

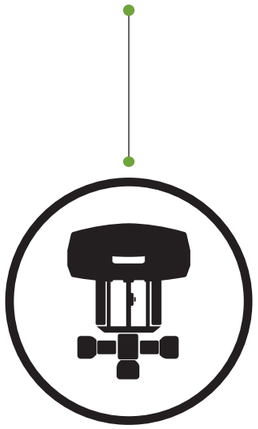
○ OPTIONAL □ NOT AVAILABLE ▲ STANDARD ★ CONTACT MANIFACTURER

RAS F Kp

AIR COOLED CHILLERS WITH **INTEGRATED FREE COOLING SYSTEM**,
RECIPROCATING COMPRESSORS AND AXIAL FANS

[MODULAR **3 WAY VALVE**]

Modular 3-way valve with 0-10V signal that allows a unit mixed use; Free-cooling system starts when the external temperature will be 3°C lower then inlet water temperature. It allows an extreme efficiency of Free-cooling system and of the unit.



[FREE-COOLING **SYSTEM**]

The Free-cooling system is combined in one solution with the condensing coil. The Free-cooling use allows a great energetic saving and is particularly indicated in the industrial processes. The mixed use enhances its efficiency

The packaged air cooled chillers of **RAS F Kp series** are suitable for outdoor installation and are particularly indicated to cool fluid solutions for industrial applications or air conditioning systems of the service industry, where it is necessary to grant excellent performances at very low environmental impact.
The refrigerant used is propane, a non-toxic hydrocarbon, even at high concentrations, with an almost 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 group for external installation, in compliance with the European standard EN378 and updates.

The integrated Free-cooling section allows to partially or totally recovering of cooling capacity from external air without big consumption of energy. Units are equipped with an additional coil crossed by the liquid to be chilled and invested by the complete air flow generated by the condenser fans.
As soon as the inlet Free-cooling air temperature is lower than inlet water returning from the plant, Free-cooling operation starts .
The benefit obtained by the Free-cooling system is much bigger as much lower is the external air temperature than the temperature value of fluid to be chilled. That's why such kind of units are suitable to be installed on air conditioning and refrigeration plants located where the weather annual profile is characterized by medium-low external temperatures and where the cooling demand is significant and for long periods of time.

Depending on the capacity required the units are available with 1 or 2 independents cooling circuits equipped with 1 or 2 compressors for every circuit ("tandem" configuration).
Thanks to the many available options, these chillers are particularly versatile and are easily adaptable to the different types of plants, where production of chilled water is required.

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

Units certified in compliance with the European regulation 2016/2281 at nominal working condition 12/7°C user side

R290 AIR

OPERATION LIMITS:
Air: from +10 to +40°C.
Water (evaporator output): from -5 to +15°C (F version)

Following versions are available:
RAS F Kp: Free-cooling integrated system version equipped with an additional air-water coil, 3-way valve, condensation control.
MAIN COMPONENTS

FRAME
Strong and compact structure, made of base and frame with high-thickness galvanized steel elements assembled with stainless steel rivets. All galvanized steel surfaces externally positioned are superficially coated by an oven powder-paint with colour RAL7035. The technical section which contains compressors and the other cooling circuit elements, exept the condensing part, is closed in a cabinet; if a refrigerant leak occurs the technical vane is automatically airy using an external axial fan which is able to clean all the air inside the cabinet 4 time/minute.
To reduce the sound level it is possible to insulate the technical section with a sound and fire proof standard thickness material (CF option) or higher thickness material (CFU option).

COMPRESSORS
Semi hermetic alternative type optimized to operate with the hydrocarbons and realized in compliance with the regulation on safety in force. The electrical motor, arranged for starting with low inrush current (PW option), is equipped with thermal protection module (installed in 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 is installed on rubber type vibration dampers and is provided with switch-off valve on suction and discharge side, electronic differential pressure switch for the oil level control, crankcase heater and temperature probe on discharge side to control the compressor's discharge temperature. If the compressors are installed in "tandem" version each one is equipped with oil level sensor and oil recuperator; this device activates automatically when in one compressor the lubricant level goes down than minimum value.

EVAPORATOR
Stainless steel plates type mono or bi circuits, thermally insulated using a flexible closed cells mattress of high thickness. It Is also provided with a safety differential pressure switch which does not allows the unit operation in case of water flow lack or reduction.

COILS
In RAS F Kp series the external exchanger coils are made of micro-finned copper pipes arranged in staggered ranks mechanically expanded inside of an aluminium finned pack. The fin is designed to maximize the thermal exchange efficiency.
Free-cooling external coil made of optimized section copper pipes able to reduce the glycol side pressure drops with aluminium finned pack.
The fluid side Free-cooling coils maximum pressure corresponds to 10 relative bar.
The coil frontal section can be provide with a protection grid (GP option).

FANS
6 poles axial fans with electrical motor and external rotor directly coupled to the impeller; aluminium blades with wings profile are suitably designed to avoid any turbulence in the air detachment zone, granting in this way the maximum efficiency with the minimum noise level. The fan is equipped with a galvanized steel protection grid painted after the construction; the fan motors are of totally closed type and have got a protection factor IP54 and winding-flooded protection thermostat.

REGENERATIVE EXCHANGER
Heat regenerative exchanger gas/fluid of plates type, installed on each circuit to grant a suitable overheating value to the compressor sucked gas and at the same time to increase the cooling circuit efficiency thanks to higher sub-cooling of condensing coil leaving fluid.
Insulated thermally using a close cells mattress of great thickness.

COOLING CIRCUITS
Indipendent cooling circuits, each provided with a shut-off valve for refrigerant charge, antifreeze probe, sight glass, dehydrating filter for R290 with wide filtering surface, high pressure side safety valve equipped with connector to the discharge refrigerant conveying piping, electronic thermostatic valve (for 1001,2402 and folowing bigger frames), settable pressure switches and and high/low pressure gauges for R290 specifically.
All the units are equipped with a leak sensor which is able to turn off the compressors and turn on the extraction fan in case of a refrigerant leak.

ELECTRICAL BOARD
Built in compliance with 61439-1 standards, where all the control system elements and the ones required for electrical motors starting and protection are located, all the components are factory connected and testes.
The electrical cabinet has got a watertight structure, equipped with cable glands with protection factor of IP65/66.
Besides the electrical cabinet contains all the power and control devices, microprocessor electronic board complete with keyboard and display for visualizing several available function, 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 unit remote ON/OFF, spring type terminal board and the possibility to interface to BMS system.

RAS F Kp

[technical spec]

		RAS 521 F Kp	RAS 591 F Kp	RAS 721 F Kp	RAS 871 F Kp	RAS 1001 F Kp	RAS1402 F Kp	RAS 1702 F Kp	RAS 2102 F Kp	RAS 2402 F Kp	RAS 2902 F Kp	RAS 3402 F Kp
Nominal cooling capacity	Kw	50,9	60,1	73,8	89,1	103,8	146,6	174,9	208,5	222,0	283,3	332,6
Nominal Absorbed power	Kw	18,2	20,2	23,9	30,8	35,3	47,5	59,5	70,2	83,6	96,5	118,5
Nominal absorbed current	A	35,1	37,2	41,8	55,2	65,0	83,4	105,7	127,1	153,5	168,6	206,5
EER	-	2,80	2,98	3,08	2,89	2,94	3,08	2,94	2,97	2,65	2,94	2,81
SEPR	-	5,32	5,33	5,34	5,49	5,47	4,51	5,41	5,34	5,23	5,28	5,24
Cooling circuit	q.ty	1	1	1	1	1	2	2	2	2	2	2
Number of compressors	q.ty	1	1	1	1	1	2	2	2	4	4	4
Freon charge	Kg	4,0	6,0	7,0	7,0	11,0	13,0	15,0	19,0	14,0	19,0	24,0
EVAPORATOR - Fluid: water +30% ethylene glycol- water Temperature IN/OUT: 12 / 7°C												
Flow	mc/h	9,7	11,4	14,0	16,9	19,7	27,8	33,2	39,5	42,1	53,7	63,1
Pressure drop	kPa	35,3	47,2	22,4	31,1	40,5	26,1	35,5	33,4	40,5	33,7	44,6
FREE COOLING SECTION												
F.C. cooling capacity	Kw	31,5	32,8	26,3	63,6	66,2	52,1	103,2	82,6	103,1	112,4	119,2
Fluid Flow	mc/h	9,7	11,4	14,0	16,9	19,7	27,8	33,2	39,5	42,1	53,7	63,1
Pressure Drop	kPa	20,5	27,2	25,0	41,8	54,1	22,6	68,7	61,0	46,2	64,3	58,0
FANS- Axial - Air Temperature: 35°C												
Quantity	q.ty	1	1	1	2	2	2	3	3	4	4	4
Air flow	mc/h	24120	22870	22910	46960	43780	45350	67380	67670	100610	95900	89990
Absorbed power	Kw	2,5	2,5	2,5	5,0	5,0	5,0	7,4	7,4	9,9	9,9	9,9
Absorbed current	A	5,2	5,2	5,2	10,3	10,3	10,3	15,5	15,5	20,6	20,6	20,6
WEIGHT												
Transport	Kg	1066	1102	1131	1451	1517	1739	2180	2220	2703	2874	3100
Operation	Kg	1088	1124	1150	1492	1558	1776	2246	2280	2794	2974	3178
DIMENSIONS												
Lenght	mm	1730	1730	1730	2770	2770	2770	3810	3810	4850	4850	4850
Widht	mm	1370	1370	1370	1370	1370	1370	1370	1370	1370	1370	1370
Height	mm	2420	2420	2420	2420	2420	2429	2420	2420	2420	2420	2420
NOISE												
Unit total LWA	dB(A)	88,9	90,1	91,8	94,5	94,5	94,7	94,7	96,7	96,5	97,1	99,2
Unit total SPL at 1mt free range	dB(A)	71,0	72,2	73,3	75,9	75,9	76,1	75,6	77,6	76,8	77,4	79,5
POWER SUPLY												
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

The values shown are indicative and may vary according to the machine configuration. Emicon reserves the right to report specific values on the commercial proposal.

[equipment]

RAS F		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	i1	○	○	○	○	○	○	○	○	○	○	○
Victaulic insulation on buffer tank side	i2	○	○	○	○	○	○	○	○	○	○	○
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	○	○	○	○	○	○	○	○	○	○	○
Double pump group	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	○	○	○	○	○	○	○	○	○	○	○
Partial heat recovery	RP	○	○	○	○	○	○	○	○	○	○	○
Copper/copper coil	RR	○	○	○	○	○	○	○	○	○	○	○
Personalized frame painting in alternative colour	RV	★	★	★	★	★	★	★	★	★	★	★
Electronic Thermostatic Valve	TE	○	○	○	○	▲	○	○	○	▲	▲	▲
Double layer treatment coil	TDS	○	○	○	○	○	○	○	○	○	○	○
External air low temperature operation (-20°C)	BF	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Axial fans with electronic commutated motor	EC	○	○	○	○	○	○	○	○	○	○	○
High pressure double safety valve	HRV2	○	○	○	○	○	○	○	○	○	○	○
Axial fan diffusor	AXT	■	■	■	■	■	■	■	■	■	■	■
Inverter for compressors	VSC	○	○	○	○	○	○	○	○	○	○	○
Inverter for pump	VSP	○	○	○	○	○	○	○	○	○	○	○

○ OPTIONAL ■ NOT AVAILABLE
▲ STANDARD ★ CONTACT MANIFACTURER