



PROPANE

catalogue

THE EMICON **LABS**

CLIMATE **CHAMBERS** (for chillers and heat pumps test)

Very often, consultants and designers ask for chillers performance certifications not only at nominal conditions but also at different source temperatures and working conditions. Manufacturers must reliably and accurately declare the efficiency values of their products. All the projects focused on energy saving must be compliant with rigorous seasonal efficiency standards. Hence the need of a total reliability of the declared data, thanks to the test in climatic chambers able to exactly reproduce the working conditions of the installation site, especially using diversified load profiles in order to certify the partial load performance levels of the units. In order to achieve these goals, Emicon has built two climatic chambers inside its own facilities, able to test the units performances in simulated ambient conditions.

MAIN **FEATURES**

The climatic chambers are rooms where a controlled air-microclimate is reproduced thanks to auxiliary and recovery systems. Inside it is possible testing both air and water cooled chillers and heat pumps with cycle inversion.

The Galleon laboratory allows to check the performances of chillers, heat pumps and water cooled **6 pipes units till 1500 kW and air cooled chillers till 1200 kW. and till 1600 kW (heat).**

GALLEON

Galleon Climatic Chambers is provided with a double ring with chilled and hot water for testing air and water cooled chillers and heat pumps, with desuperheater or total heat recovery, 4 pipes and split units.

Air temperature: **min. -8°C / max 52°C**

Fluid temperature : **min -10°C / max 25°C**

On demand, it is possible testing units **till 55 °C.**

After the test, a test report is released with unit performances at nominal, seasonal conditions or the ones required by the customer, certifying unit consumptions and thus its energy index. The laboratory can test unit at 50 Hz and 60 Hz. The customer can directly attend the test in Emicon facilities or remotely, through Webcams.



EMICON
CLIMATE SOLUTIONS



ONE WORD, MA

RESEARCH AND QUALITY

In order to grant the end customer's satisfaction, keeping its leadership position on the market and at the same time carrying on a continuous improvement both of the company internal working conditions and of its own environmental performances, Emicon strongly internally promotes the culture of Quality and Environmental Protection, Pollution prevention and systematic compliance with environmental regulations.

Emicon is perfectly aware that the market and its requirements are the driving motor of the company activity and that a methodically managed organization of the company processes represents a topical factor for the customer satisfaction.

In order to achieve such results, the company considers the **Quality and Environmental Service development and management fundamental**, as basic tool for the company processes check. For this reason Emicon focuses its attention on all its staff's training, involvement and motivation, and let the people working in an healthy ambient and in infrastructures suitable to each different working activity.

PRO

The Propane could be used in many areas, pure and also basically mixed with other hydrocarbon gases. Mainly used as fuel or refrigerant gas (R290 code identified).

The mixture is used in industrial process for decades and thanks to the almost toxicity absence can be used also in medicine.

His use is destined to increase thanks to his low environment impact and its abundance.

“

CONSIDERING OUR PAST AND THE WIDE TECHNICAL EXPERIENCE,
OF CHILLERS DESIGNED FOR INDUSTRIAL, RESIDENTIAL, PROCESS

ANY FEATURES.

DAVE

SUSTAINABILITY AND EFFICIENCY

In this continuous innovation context and technological research aimed to obtain more efficiency thanks to the use of natural gases, Emicon has laid the groundwork to become leader in this market thanks to his continuous research and the development thinking always to the environmental issue.

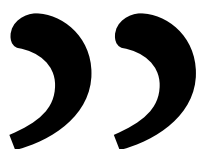
In this way Emicon his able to export his technical competence in all the Europe area maintaining a very high quality and efficiency standard.

The research of environmental quality represents for Emicon a basic choice for any technological application each time realized. In this context, environmental compatibility means efficiency optimization, mainly facing 2 very topical issues: ozone and sound problem.

Thanks to this deep interest to all the main environmental issues, Emicon, after an intensive research and certification activity, has included in its catalogue units able to work with new refrigerants having a very low environmental impact , such as **HFO and R290**, granting a t the same time a very high energy efficiency and extremely low GWP (respectively 6 and 3).

The "Innovation and Comfort" promise by Emicon is a binomial widely appreciated both in Italy and abroad from projects such as Great Works, Calculation Centers and Banks to air conditioning applications for Museum and Galleries, where the preservation of masterpieces of extreme value requires very sophisticated air-conditioning solutions. It is not a coincidence that since **1984**, Emicon has become well known as avant-garde reality in air conditioning field , and this leading position has been kept unaltered during the years thanks to the improving of skills, extension of product ranges able to cover the very different requirements of the market and a flexible and dynamic attitude towards all the customer's need.

WE ARE ONE OF THE MOST ADVANCED MANUFACTURER
AND DATACENTERS MARKETS





4th GEN





ERP 2021

The NEW Emicon Propane range has been designed in compliance with ERP 2021 European efficiency Standards. The 2016/2281 European regulation imposes a minimum seasonal efficiency value, which is SEER 5.2 for the water condensed units and SEER 4.1 for air cooled ones.

LOW SOUND EMISSIONS

The reduction of the sound level of the units can be obtained thanks to a sound proofed compressors cabinet and Axitop fans. The cabinet coating can be made up of standard sound proofed material (20mm thickness) or higher thickness sound proofed material (30 mm thickness), in accordance to the customer's request, allowing the installation of the units even where the legislation dictates very strict sound limits.

ENERGY SAVING

The investment and operating costs reduction, together with the compliancy with the norms in force for the power consumption reduction and for the environmental compatibility, are very important factors in the choice of technologically advanced units which are characterized by very high performance factors thanks to the electronic regulation of their components.

The use in no-stop working regimes confirms the very high saving in terms of operations costs, allowing effective energy saving strategies and the technological plant integration in any sector, especially the industrial one.

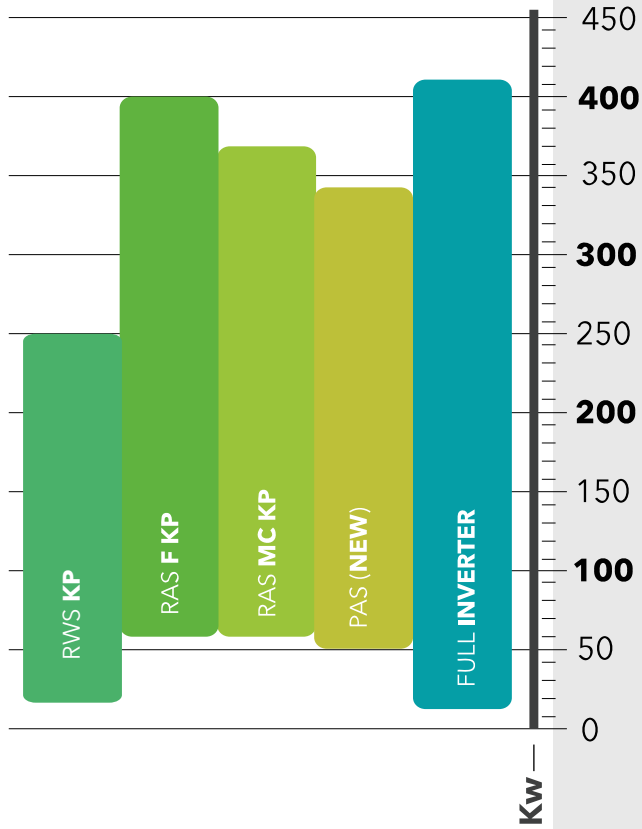
FUNCTIONING LOGIC

The electronic regulation by microprocessor controls and manages the actuators (in terms of timing, rotation and safety). Furthermore there is also the PID Overheating-Regulation though the electronic expansion valve which optimizes the unit operation allowing a consumption reduction.

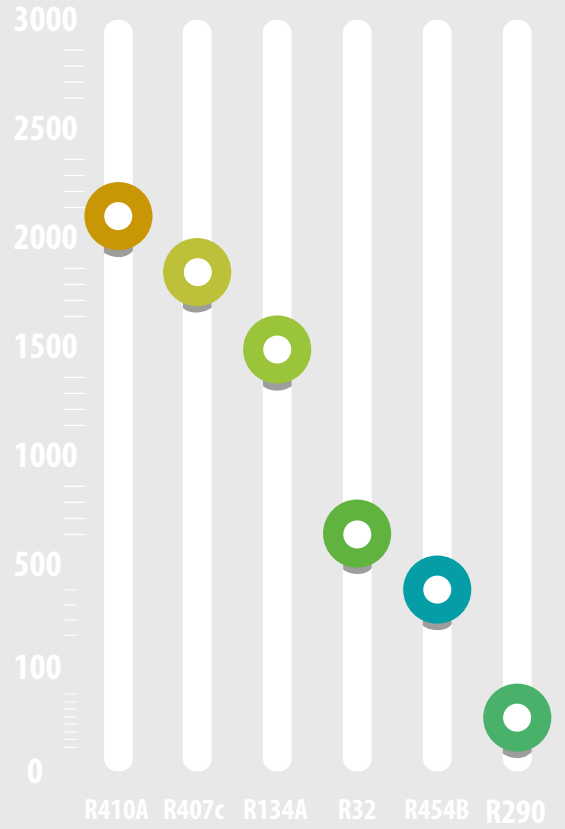
The microprocessor also controls the water temperature, makes the self-diagnosis of the anomalies and allows a remote management and supervision.

An internal memory records the working conditions when an alarm occurs, so that they can be shown on the display on board.

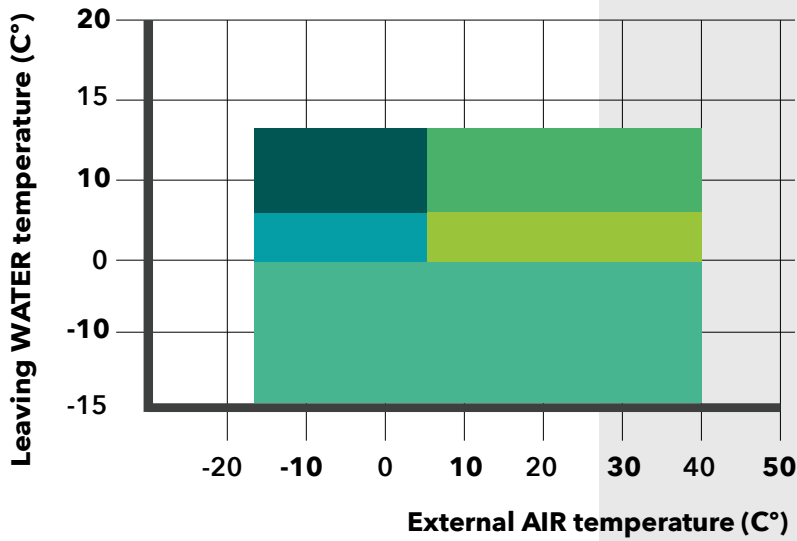
[AVAILABLE RANGES]



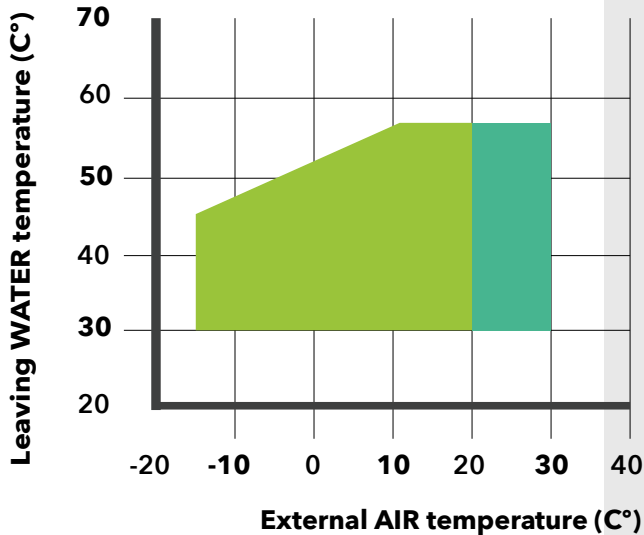
GWP (100 years based)



[OPERATION LIMITS]



- Unit cooling BRINE version
- Standard cooling with Glycol
- Standard unit with glycol and fan speed regulation
- Standard unit cooling with fan speed regulation
- Standard unit cooling



- Heating
- Heating with fan speed regulation





[**HOLD YOUR COLOUR**]





MORE THAN
COLORED

Keep the style of your brand or the hue perfectly fitted into your environment. The colour is not just "a colour".

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 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, except the condensing part, is closed in a cabinet; if a refrigerant leak occurs the technical vane is automatically airy using an external centrifugal 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

Independent 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 following 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.

The air extraction fan with forward blades are positioned in a separated technical department

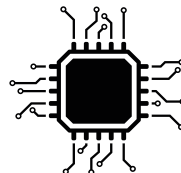
STANDARD

RAS MC VB Kp

RAS MC Kp

RAH MC Kp

[equipment]



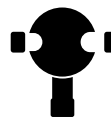
ELECTRICAL

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 efficiency 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.



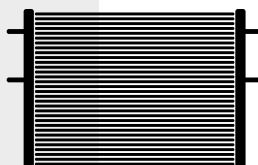
LEAK SENSOR

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 micro-channel 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.



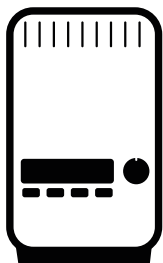
EXTRACTION FAN

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.



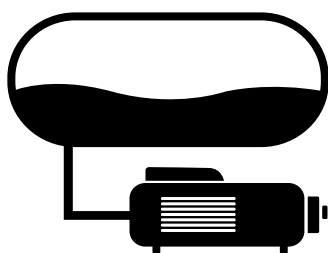
ELECTRONIC THERMOSTATIC **VALVE**

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 (depending 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 can 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

		521 MC VS Kp	591 MC VS Kp	721 MC VS Kp	871 MC VS Kp
Nominal cooling capacity	Kw	54,2	61,0	74,8	92,9
Nominal absorbed capacity	Kw	16,4	19,2	23,3	29,2
Nominal absorbed current	A	35,1	38,2	42,5	52,1
EER	-	3,30	3,19	3,21	3,18
SEER	-	4,17	4,12	4,24	4,17
cooling circuit	q.tà	1	1	1	1
Number of compressors	q.tà	1	1	1	1
Freon charge	Kg	4,0	4,0	8	8

EVAPORATOR - Fluid: water - Temperature IN/OUT: 12 / 7°C

Water Flow	mc/h	9,3	10,5	12,9	16,0
Prtessure Drop	kPa	29	35	17	24

FANS- Axial- External air temperature: 35°C

Quantity	q.ty	2	2	2	2
Air flow	mc/h	17760	17690	20020	40220
Absorbed power	Kw	1,2	1,2	1,2	3,9
Absorbed current	A	5,2	5,2	5,2	7,8

WEIGHT

Transport	Kg	1094	1096	1206	1304
Operation	Kg	1098	1100	1212	1310

DIMENSIONS

Lenght	mm	2590	2590	2590	2590
Widht	mm	1370	1370	1370	1370
Height	mm	2570	2570	2570	2570

NOISE

Unit total LWA	dB(A)	86,3	88,1	88,1	92,2
Unit total SPL at 1mt free field	dB(A)	67,8	69,6	69,6	73,7

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
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RAS MC VB Kp

		521 MC VB Kp	591 MC VB Kp	721 MC VB Kp	871 MC VB Kp	1001 MC VB Kp
Nominal cooling capacity	Kw	31,8	35,6	43,6	53,5	60,7
Nominal absorbed power	Kw	12,4	14,2	14,2	21,1	25,4
Nominal absorbed current	A	30,2	31,6	31,6	43,3	52,2
EER	-	2,56	2,52	2,52	2,54	2,39
SEPR	-	3,58	3,51	3,38	3,70	3,42
Cooling circuit	q.ty	1	1	1	1	1
Number of compressors	q.ty	1	1	1	1	1
Freon charge	Kg	4,0	4,0	7,0	7,0	7,0

EVAPORATOR - Fluid: Water +35% ethylene glycol - Temperature IN/OUT: -3 °C / -8 °C

		521 MC VB Kp	591 MC VB Kp	721 MC VB Kp	871 MC VB Kp	1001 MC VB Kp
Water flow	mc/h	6,2	7,07	8,6	10,5	11,9
Pressure Drop	kPa	20,4	25,3	12,0	16,9	21,0

FANS- Axial - Air Temperature : 35 °C

		521 MC VB Kp	591 MC VB Kp	721 MC VB Kp	871 MC VB Kp	1001 MC VB Kp
Quantity	q.ty	2	2	2	2	2
Air flow	mc/h	14420	15780	16750	29580	31030
Absorbed power	Kw	1,2	1,2	1,2	3,9	3,9
Absorbed current	A	5,2	5,2	5,2	7,8	7,8

Weight

		521 MC VB Kp	591 MC VB Kp	721 MC VB Kp	871 MC VB Kp	1001 MC VB Kp
Transport	Kg	1052	1056	1164	1242	1246
Operation	Kg	1056	1060	1170	1248	1252

DIMENSIONS

		521 MC VB Kp	591 MC VB Kp	721 MC VB Kp	871 MC VB Kp	1001 MC VB Kp
Length	mm	2590	2590	2590	2590	2590
Width	mm	1370	1370	1370	1370	1370
Height	mm	2570	2570	2570	2570	2570

NOISE

		521 MC VB Kp	591 MC VB Kp	721 MC VB Kp	871 MC VB Kp	1001 MC VB Kp
Unit total LWA	dB(A)	86,3	88,1	88,1	92,2	92,2
Unit total SPL 1mt free range	dB(A)	67,8	69,6	69,6	73,7	73,7

ALIMENTAZIONE

		521 MC VB Kp	591 MC VB Kp	721 MC VB Kp	871 MC VB Kp	1001 MC VB Kp
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

[equipment]

RAS MC KP	521	591	721	871	1001	1402	1702	2102	2402	2902	3402
A+V Amperometer+ Voltmeter	○	○	○	○	○	○	○	○	○	○	○
AE Electrical power supply different from standard	★	★	★	★	★	★	★	★	★	★	★
CFU Soundproofed compressors cabinet	○	○	○	○	○	○	○	○	○	○	○
CS Compressors inrush counter	○	○	○	○	○	○	○	○	○	○	○
GP Condensing coil protection grid	○	○	○	○	○	○	○	○	○	○	○
I1 Vistaic insulation on pump side	○	○	○	○	○	○	○	○	○	○	○
I2 Vistaic insulation on buffer tank side	○	○	○	○	○	○	○	○	○	○	○
IH RS485 Serial interface	○	○	○	○	○	○	○	○	○	○	○
IH BAC BACNET Serial interface	○	○	○	○	○	○	○	○	○	○	○
IWG SNMP or TCP/IP Serial interface	○	○	○	○	○	○	○	○	○	○	○
MF Phase monitor	○	○	○	○	○	○	○	○	○	○	○
MV Buffer tank module	○	○	○	○	○	○	○	○	○	○	○
P1 Single pump module	○	○	○	○	○	○	○	○	○	○	○
PIH Higher available pressure single pump	○	○	○	○	○	○	○	○	○	○	○
P2 Double pump group	○	○	○	○	○	○	○	○	○	○	○
P2H Higher available pressure double pump module <small>(only one working)</small>	○	○	○	○	○	○	○	○	○	○	○
PA Rubber-type vibration dampers	○	○	○	○	○	○	○	○	○	○	○
PM Spring-type vibration dampers	○	○	○	○	○	○	○	○	○	○	○
PQ Remote display	○	○	○	○	○	○	○	○	○	○	○
PW Part-Winding compressors start up system	○	○	○	○	○	○	○	○	○	○	○
RA Anti-freeze heater on evaporator	○	○	○	○	○	○	○	○	○	○	○
RF Power factor correction system Cosφ ≥0.9	○	○	○	○	○	○	○	○	○	○	○
RL Compressors overload relays	○	○	○	○	○	○	○	○	○	○	○
PCP Anticorrosive treatment on coils	○	○	○	○	○	○	○	○	○	○	○
ECP Microchannel coil with anticorrosive treatment	○	○	○	○	○	○	○	○	○	○	○
RV Personalized frame painting in alternative colour	★	★	★	★	★	★	★	★	★	★	★
BT External Air low temperature operation (-10°C)	○	○	○	○	○	○	○	○	○	○	○
BF External air low temperature operation (-20°C)	○	○	○	○	○	○	○	○	▲	▲	▲
RP Partial heat recovery	○	○	○	○	○	○	○	○	○	○	○
EC Axial fans with electronic commutated motor	○	○	○	○	○	○	○	○	○	○	○
HRV2 High pressure double safety valve	○	○	○	○	○	○	○	○	○	○	○
AXT Axial fan diffusor	○	○	○	○	○	○	○	○	○	○	○
VSC Inverter for compressors	▲	▲	▲	▲	▲	○	○	○	○	○	○
VSP Inverter for pump	○	○	○	○	○	○	○	○	○	○	○
TE Electronic Thermostatic Valve	○	○	○	○	▲	○	○	○	▲	▲	▲

○ OPTIONAL
 ▲ STANDARD
 ■ NOT AVAILABLE
 ★ CONTACT MANUFACTURER

[equipment]

RAS MC VB	521	591	721	871	1001	1402	1702	2102	2402	2902	3402	3702
A+V Amperometer+ Voltmeter	○	○	○	○	○	○	○	○	○	○	○	○
AE Electrical power supply different from standard	★	★	★	★	★	★	★	★	★	★	★	★
CFU Soundproofed compressors cabinet with higher thickness material	○	○	○	○	○	○	○	○	○	○	○	○
CS Compressor inrush counter	○	○	○	○	○	○	○	○	○	○	○	○
GP Condensing coil protection grid	○	○	○	○	○	○	○	○	○	○	○	○
II Viciaulic insulation on pump side	○	○	○	○	○	○	○	○	○	○	○	○
I2 Viciaulic insulation on buffer tank side	○	○	○	○	○	○	○	○	○	○	○	○
IH RS485 Serial interface	○	○	○	○	○	○	○	○	○	○	○	○
IH BAC BACNET Serial interface	○	○	○	○	○	○	○	○	○	○	○	○
IWG SNMP or TCP/IP Serial interface	○	○	○	○	○	○	○	○	○	○	○	○
MF Phase monitor	○	○	○	○	○	○	○	○	○	○	○	○
MV Buffer tank module	○	○	○	○	○	○	○	○	○	○	○	○
P1 Single pump module	○	○	○	○	○	○	○	○	○	○	○	○
PIH Higher available pressure single pump	○	○	○	○	○	○	○	○	○	○	○	○
P2 Double pump module (only one working)	○	○	○	○	○	○	○	○	○	○	○	○
P2H Higher available pressure double pump module (only one working)	○	○	○	○	○	○	○	○	○	○	○	○
PA Rubber-type vibration dampers	○	○	○	○	○	○	○	○	○	○	○	○
PM Spring-type vibration dampers	○	○	○	○	○	○	○	○	○	○	○	○
PQ Remote display	○	○	○	○	○	○	○	○	○	○	○	○
PW Part-Winding compressors start up system	○	○	○	○	○	○	○	○	○	○	○	○
RA Anti-freeze heater on evaporator	○	○	○	○	○	○	○	○	○	○	○	○
RF Power factor correction system Cosφ ≥0.9	○	○	○	○	○	○	○	○	○	○	○	○
RL Compressors overload relays	○	○	○	○	○	○	○	○	○	○	○	○
PCP Microchannel coils with anticorrosive soft treatment	○	○	○	○	○	○	○	○	○	○	○	○
ECP Microchannel coils with anticorrosive strong treatment	○	○	○	○	○	○	○	○	○	○	○	○
RP Partial heat recovery	○	○	○	○	○	○	○	○	○	○	○	○
RV Personalized frame painting in alternative RAL color	★	★	★	★	★	★	★	★	★	★	★	★
TE Electronic thermostatic valve	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
BT External air low temperature operation (-10°C)	○	○	○	○	○	○	○	○	○	○	○	○
BF External air low temperature operation (-20°C)	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
EC Axial fans with electronic commutated motor	○	○	○	○	○	○	○	○	○	○	○	○
HRV2 High pressure double safety valve	○	○	○	○	○	○	○	○	○	○	○	○
ATX Axial fan diffuser	○	○	○	○	○	○	○	○	○	○	○	○
VSC Inverter for compressors	○	○	○	○	○	○	○	○	○	○	○	○
VSP Inverter for pump	○	○	○	○	○	○	○	○	○	○	○	○

○ OPTIONAL

□ NOT AVAILABLE

▲ STANDARD

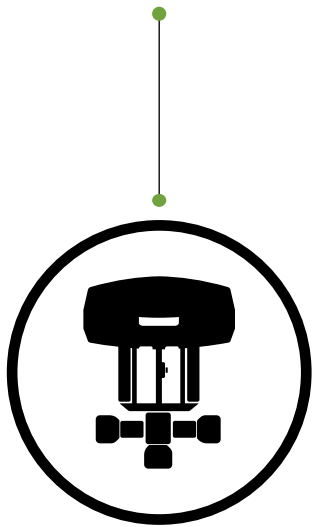
★ CONTACT MANUFACTURER

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 than 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 independent 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



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, except the condensing part, is closed in a cabinet; if a refrigerant leak occurs the technical vane is automatically airy using an external centrifugal 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 allow 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 provided 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

Independent 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 following 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.

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 tested.

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.

The air extraction fan are positioned in a separated technical department.

RAS F Kp

		RAS 521 F Kp	RAS 591 F Kp	RAS 721 F Kp	RAS 871 F Kp
Nominal cooling capacity	Kw	50,9	60,1	73,8	89,1
Nominal Absorbed power	Kw	18,2	20,2	23,9	30,8
Nominal absorbed current	A	35,1	37,2	41,8	55,2
EER	-	2,80	2,98	3,08	2,89
SEPR	-	5,32	5,33	5,34	5,49
Cooling circuit	q.ty	1	1	1	1
Number of compressors	q.ty	1	1	1	1
Freon charge	Kg	4,0	6,0	7,0	7,0

EVAPORATOR - Fluid: water +30% ethylene glycol- water Temperature IN/OUT: 12 / 7°C

Flow	mc/h	9,7	11,4	14,0	16,9
Pressure drop	kPa	35,3	47,2	22,4	31,1

FREE COOLING SECTION

F.C. cooling capacity	Kw	31,5	32,8	26,3	63,6
Fluid Flow	mc/h	9,7	11,4	14,0	16,9
Pressure Drop	kPa	20,5	27,2	25,0	41,8

FANS- Axial - Air Temperature: 35°C

Quantity	q.ty	1	1	1	2
Air flow	mc/h	24120	22870	22910	46960
Absorbed power	Kw	2,5	2,5	2,5	5,0
Absorbed current	A	5,2	5,2	5,2	10,3

WEIGHT

Transport	Kg	1066	1102	1131	1451
Operation	Kg	1088	1124	1150	1492

DIMENSIONS

Length	mm	1730	1730	1730	2770
Width	mm	1370	1370	1370	1370
Height	mm	2420	2420	2420	2420

NOISE

Unit total LWA	dB(A)	88,9	90,1	91,8	94,5
Unit total SPL at 1mt free range	dB(A)	71,0	72,2	73,3	75,9

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
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[equipment]

RAS F	521	591	721	871	1001	1402	1702	2102	2402	2902	3402
A+V Amperometer+ Voltmeter	○	○	○	○	○	○	○	○	○	○	○
AE Electrical power supply different from standard	★	★	★	★	★	★	★	★	★	★	★
CFU Soundproofed compressors cabinet	○	○	○	○	○	○	○	○	○	○	○
CS Compressors inrush counter	○	○	○	○	○	○	○	○	○	○	○
GP Condensing coil protection grid	○	○	○	○	○	○	○	○	○	○	○
i1 Victaulic insulation on pump side	○	○	○	○	○	○	○	○	○	○	○
i2 Victaulic insulation on buffer tank side	○	○	○	○	○	○	○	○	○	○	○
IH RS485 Serial interface	○	○	○	○	○	○	○	○	○	○	○
IH BAC BACNET Serial interface	○	○	○	○	○	○	○	○	○	○	○
IWG SNMP or TCP/IP Serial interface	○	○	○	○	○	○	○	○	○	○	○
MF Phase monitor	○	○	○	○	○	○	○	○	○	○	○
MV Buffer tank module	○	○	○	○	○	○	○	○	○	○	○
P1 Single pump module	○	○	○	○	○	○	○	○	○	○	○
PIH Higher available pressure single pump	○	○	○	○	○	○	○	○	○	○	○
P2 Double pump group	○	○	○	○	○	○	○	○	○	○	○
P2H Higher available pressure double pump module <small>(only one working)</small>	○	○	○	○	○	○	○	○	○	○	○
PA Rubber-type vibration dampers	○	○	○	○	○	○	○	○	○	○	○
PM Spring-type vibration dampers	○	○	○	○	○	○	○	○	○	○	○
PQ Remote display	○	○	○	○	○	○	○	○	○	○	○
PW Part-Winding compressors start up system	○	○	○	○	○	○	○	○	○	○	○
RA Anti-freeze heater on evaporator	○	○	○	○	○	○	○	○	○	○	○
RF Power factor correction system Cosφ ≥0,9	○	○	○	○	○	○	○	○	○	○	○
RL Compressors overload relays	○	○	○	○	○	○	○	○	○	○	○
RP Partial heat recovery	○	○	○	○	○	○	○	○	○	○	○
RR Copper/copper coil	○	○	○	○	○	○	○	○	○	○	○
RV Personalized frame painting in alternative colour	★	★	★	★	★	★	★	★	★	★	★
TE Electronic Thermostatic Valve	○	○	○	○	▲	○	○	○	▲	▲	▲
TDS Double layer treatment coil	○	○	○	○	▲	○	○	○	○	○	○
BF External air low temperature operation (-20°C)	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
EC Axial fans with electronic commutated motor	○	○	○	○	○	○	○	○	○	○	○
HRV2 High pressure double safety valve	○	○	○	○	○	○	○	○	○	○	○
AXT Axial fan diffuser	■	■	■	■	■	■	■	■	■	■	■
VSC Inverter for compressors	○	○	○	○	○	○	○	○	○	○	○
VSP Inverter for pump	○	○	○	○	○	○	○	○	○	○	○

○ OPTIONAL
 ▲ STANDARD
 ■ NOT AVAILABLE
 ★ CONTACT MANUFACTURER



EMICON
CLIMATE & ENERGY TECH



RWS Kp

WATER COOLED CHILLERS WITH RECIPROCATING COMPRESSORS



WATER COOLED CHILLERS WITH RECIPROCATING COMPRESSORS - R290

The packaged water cooled chillers of RWS Kp series are suitable for internal or external 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 internal installation, in compliance with the European standard EN378 and updates; Unit to install inside of engine rooms responding to safety regulations.

Depending on the capacity required the units are available with 1, 2 or 4 independent cooling circuits equipped with 1 compressor for every 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 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

Operation Limits:

Water (condenser inlet): from +25 to +50°C (Standard version)

Water (evaporator outlet): from -5 to +15°C (Standard version)



FOLLOWING VERSIONS ARE AVAILABLE:

RWS Kp: Standard version

MAIN COMPONENTS:

FRAME

Strong and compact structure, made of base and frame with high-thickness galvanized and painted steel elements, aluminium tubular elements and galvanized steel panels.

All galvanized steel surfaces externally positioned are superficially coated by an oven powder-painting with color RAL7035. The technical section which contains compressors and all the cooling circuit elements is closed in a cabinet; if a refrigerant leak occurs the technician 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 the compressors cabinet is insulated with a sound and fire proof mattress.

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 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.

EVAPORATOR/CONDENSER

Plates AISI 316 stainless steel type evaporator and condenser mono or bi-circuit.

The evaporator is thermally insulated using a closed cells flexible mattress of a great thickness and is provided a safety differential pressure switch on the water side which does not allows the unit operation in case of water flow lack or reduction.

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, thermally insulated 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, high and 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 EN 60204 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.

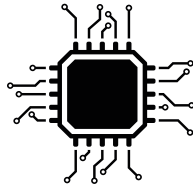
The electrical cabinet has got a watertight structure, equipped with cable glands with protection factor of IP65/66.

Besides the electrical cabinet contains all the power and control devices, microprocessor electronic board complete with keyboard and display for visualizing several 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.

The extraction fan on the cooling circuit vain of high flow axial type, ATEX certified.

RWS Kp

SAFETY DEVICES



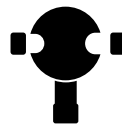
ELECTRICAL

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 efficiency 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.



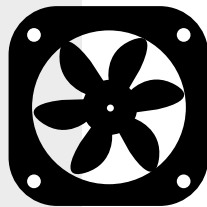
LEAK SENSOR

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



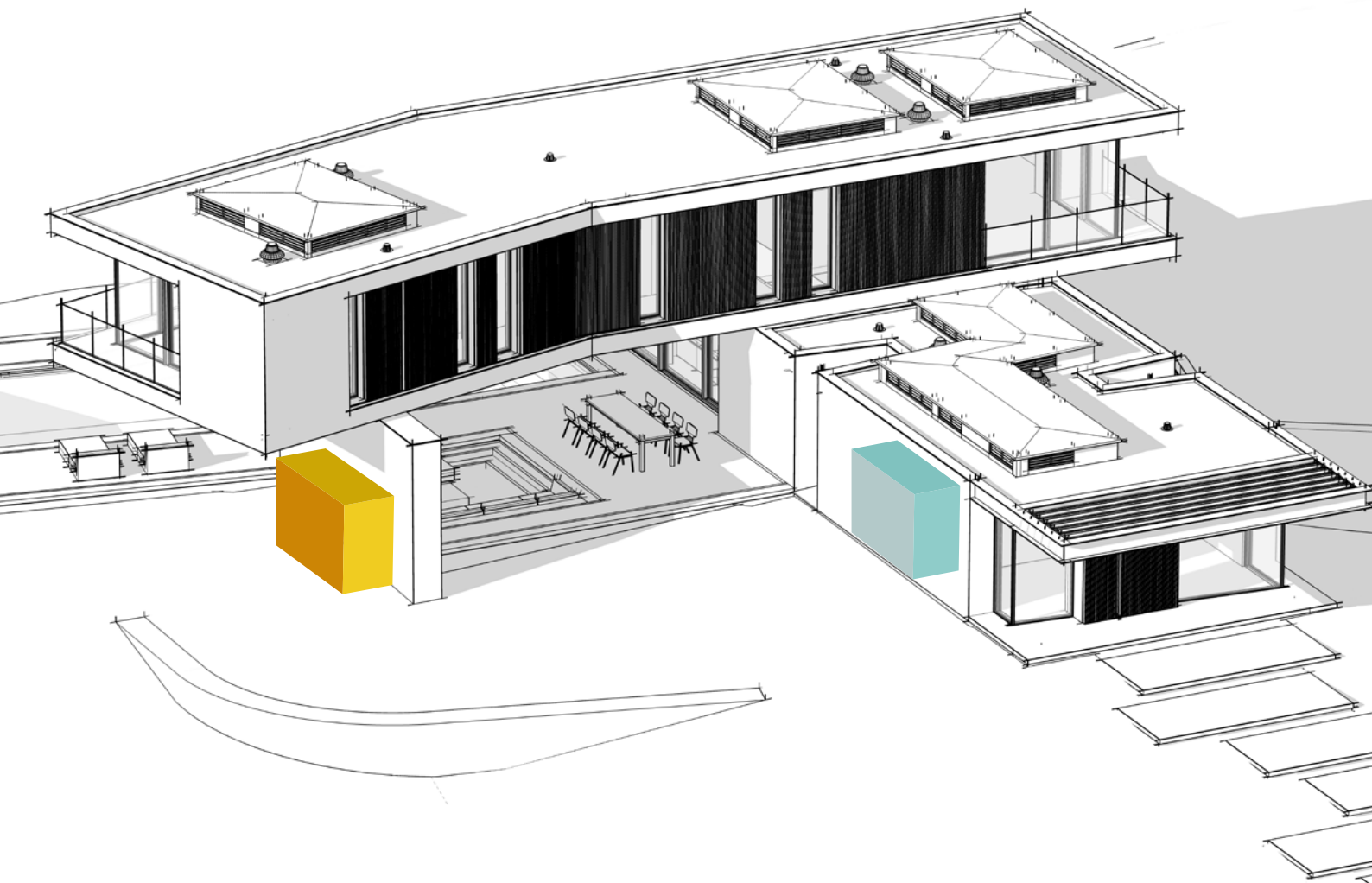
COOLING CIRCUIT

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.



CERTIFIED FAN

Refrigerant extraction fan starts when the gas leaks sensor reveal a refrigerant's leak inside the compressor cabinet. Entering in cabinet the fresh air eliminates all the potentially explosive air/ refrigerant mixture; The fan flow allow the total air replacement in 15seconds.



Following the **EN 378 norm** and the local regulation in force, the units are suitable to internal installation with the available amendments.

DESIGNED TO BE
MULTIPURPOSE

		RWS 521 VS Kp	RWS 591 VS Kp	RWS 721 VS Kp	RWS 871VS Kp
Nominal cooling capacity	Kw	60,3	67,8	81,6	97,5
Nominal absorbed power	Kw	13,3	15,3	18,4	22,3
Nominal absorbed current	A	27,0	28,7	32,2	39,5
EER	-	4,53	4,45	4,45	4,36
SEER	-	5,38	5,25	5,48	5,35
Cooling circuit	q,tà	1	1	1	1
Number of compressors	q,tà	1	1	1	1
Freon charge	Kg	3,0	3,0	4,5	4,5

EVAPORATOR - Fluid: WATER - Temperature IN/OUT: 12 / 7°C

Quantity	q.ty	1	1	1	1
Flow	mc/h	10,4	11,7	14,0	16,8
Pressure drop	kPa	33,8	41,6	18,9	25,8

CONDENSER - Fluid: WATER - Temperature IN/OUT: 30 / 35°C

Quantity	q.ty	1	1	1	1
Flow	mc/h	12,7	14,3	17,2	20,6
Pressure drop	kPa	26,7	33,0	17,2	23,6

WEIGHT

Transport	Kg	716	718	798	876
Operation	Kg	720	722	804	882

DIMENSIONS

Lenght	mm	1930	1930	1930	1930
Widtht	mm	1050	1050	1050	1050
Height	mm	1650	1650	1650	1650

NOISE

Unit LWA total	dB(A)	79	81	81	86
Unit total SPL at 1mt free field	dB(A)	62	64	64	69

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
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[equipment]



RWS KP	521	591	721	871	1001	1402	1702	2102	2404	2904	3404
A+V Amperometer+Voltmeter	○	○	○	○	○	○	○	○	○	○	○
AE Electrical power supply different from standard	★	★	★	★	★	★	★	★	★	★	★
CS Compressors inrush counter	○	○	○	○	○	○	○	○	○	○	○
IH RS485 Serial interface	○	○	○	○	○	○	○	○	○	○	○
IH BAC BACNET Serial interface	○	○	○	○	○	○	○	○	○	○	○
IWG SNMP or TCP/IP Serial interface	○	○	○	○	○	○	○	○	○	○	○
MF Phase monitor	○	○	○	○	○	○	○	○	○	○	○
PA Rubber-type vibration dampers	○	○	○	○	○	○	○	○	○	○	○
PM Spring-type vibration dampers	○	○	○	○	○	○	○	○	○	○	○
PQ Remote display	○	○	○	○	○	○	○	○	○	○	○
PW Part Winding compressors start up system	○	○	○	■	■	○	○	○	○	○	○
RA Anti-freeze heater on evaporator	○	○	○	○	○	○	○	○	○	○	○
RF Power factor correction system Cosφi ≥0.9	○	○	○	○	○	○	○	○	○	○	○
RL Compressors overload relays	○	○	○	○	○	○	○	○	○	○	○
RP Partial heat recovery	○	○	○	○	○	○	○	○	○	○	○
TE Electronic thermostatic valve	○	○	○	▲	▲	○	○	▲	○	○	○
HRV2 High pressure side double safety valve	○	○	○	○	○	○	○	○	○	○	○
VSC Inverter for compressors	▲	▲	▲	▲	▲	○	○	○	○	○	○
VP Condensing control pressostatic valve	○	○	○	○	○	○	○	○	○	○	○

○ OPTIONAL
 ▲ STANDARD
 ■ NOT AVAILABLE
 ★ CONTACT MANUFACTURER

PAS Kp

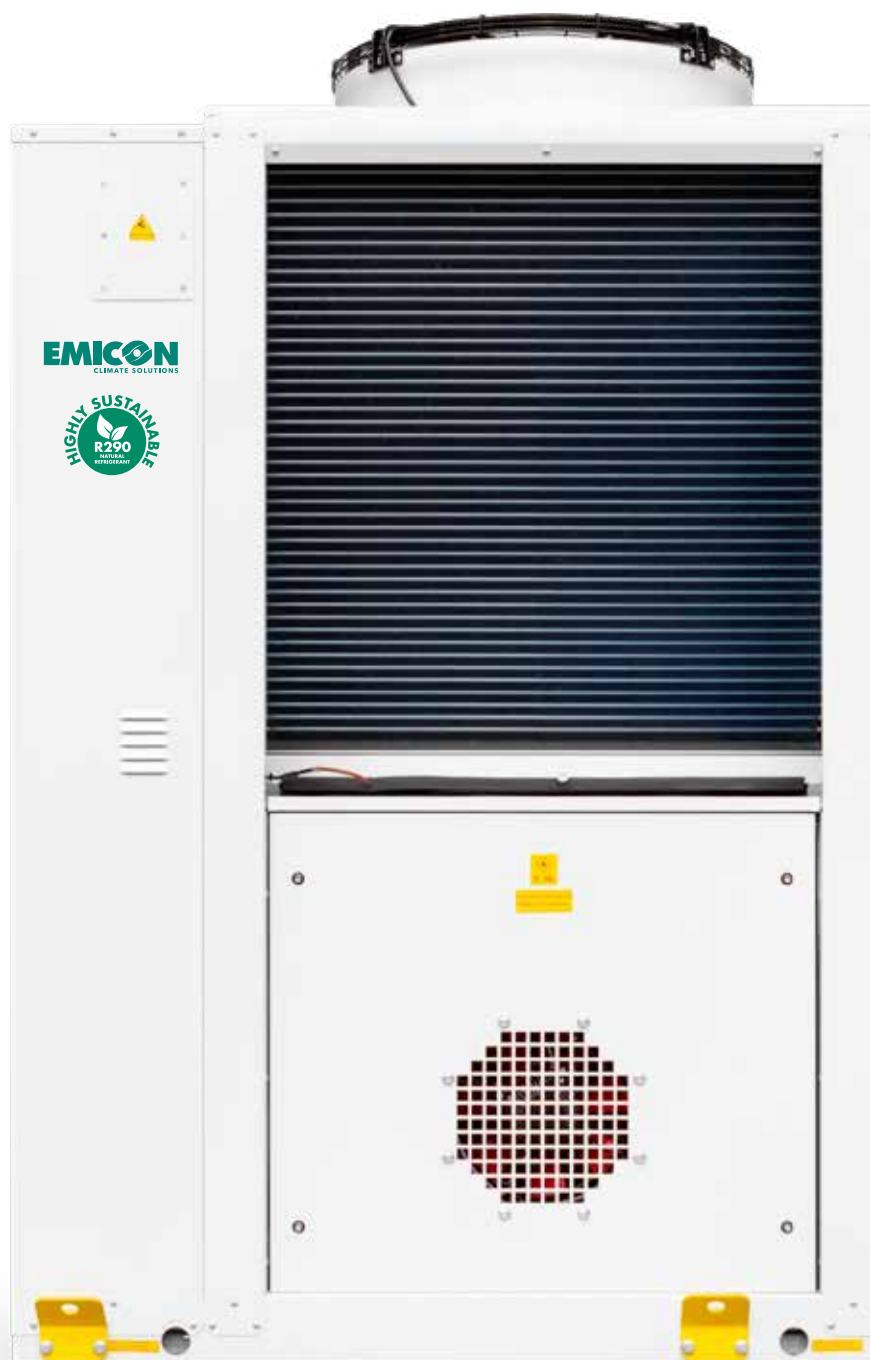
AIR COOLED HEATPUMPS WITH RECIPROCATING COMPRESSORS AND AXIAL FANS

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 come 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, 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, 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

		PAS 451 Kp	PAS 521 Kp	PAS 651 Kp	PAS 731 Kp	RWS 881 Kp
Nominal cooling capacity	Kw	36,6	44,9	53,9	61,0	76,4
Nominal absorbed power	Kw	12,5	14,4	16,4	19,1	24,0
Nominal absorbed current	A	25,9	27,8	34,0	37,0	42,8
EER	-	2,94	3,12	3,28	3,19	3,18
Cooling circuit	q.ty	1	1	1	1	1
Number of compressors	q.ty	1	1	1	1	1
Freon charge	Kg	6	7	10	10	10

EVAPORATOR - Fluid : WATER

Flow	mc/h	6,3	7,7	9,3	10,5	13,1
Pressure drop	kPa	35	47	28	35	17

AXIAL FANS

Quantity	q.ty	1	1	2	2	2
Air flow	mc/h	21620	20920	20920	20920	43120
Absorbed power	Kw	1,9	1,9	1,2	1,2	3,9
Absorbed current	A	3,9	3,9	2,4	2,4	7,8

HEATPUMP WORKING (AIR TEMP. 7°C - 87%U.R. - WATER 40/45°C)

Nominal thermal power	Kw	43,0	50,7	61,1	69,4	84,8
Nominal absorbed power	Kw	13,1	15,0	16,6	19,1	24,0
Nominal absorbed current	A	26,9	28,9	34,7	37,5	43,0
SCOP	-	3,28	3,27	3,56	3,47	3,37
COP	-	3,28	3,38	3,69	3,63	3,54

WEIGHT

Transport	Kg	882	946	1258	1280	1350
Operation	Kg	884	948	1262	1284	1356

DIMENSIONS

Lenght	mm	1620	1620	2660	2660	2660
Width	mm	1370	1370	1370	1370	1370
Height	mm	2420	2420	2420	2420	2420

NOISE

Unit total LWA	dB(A)	84,3	84,6	84,8	88,6	91,0
Unit total SPL at 1mt free field	dB(A)	66,5	66,8	66,3	70,1	72,5

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
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[equipment]



PAS KP	451	521	651	731	881	1001	1201	1502	1702	2102	2502	2902	3402
A+V Amperometer+ Voltmeter	○	○	○	○	○	○	○	○	○	○	○	○	○
AE Electrical power supply different from standard	★	★	★	★	★	★	★	★	★	★	★	★	★
CFU Soundproofed compressors cabinet	○	○	○	○	○	○	○	○	○	○	○	○	○
CS Compressors inrush counter	○	○	○	○	○	○	○	○	○	○	○	○	○
GP Condensing coil protection grid	○	○	○	○	○	○	○	○	○	○	○	○	○
i1 Victaulic insulation on pump side	○	○	○	○	○	○	○	○	○	○	○	○	○
i2 Victaulic insulation on buffer tank side	○	○	○	○	○	○	○	○	○	○	○	○	○
IH RS485 Serial interface	○	○	○	○	○	○	○	○	○	○	○	○	○
IH BAC BACNET Serial interface	○	○	○	○	○	○	○	○	○	○	○	○	○
IWG SNMP or TCP/IP Serial interface	○	○	○	○	○	○	○	○	○	○	○	○	○
MF Phase monitor	○	○	○	○	○	○	○	○	○	○	○	○	○
MV Buffer tank module	■	■	■	■	■	■	■	■	■	■	■	■	■
P1 Single pump module	○	○	○	○	○	○	○	○	○	○	○	○	○
PIH Higher available pressure single pump	○	○	○	○	○	○	○	○	○	○	○	○	○
P2 Double pump module (only one working)	○	○	○	○	○	○	○	○	○	○	○	○	○
P2H Higher available pressure double pump module <small>(only one working)</small>	○	○	○	○	○	○	○	○	○	○	○	○	○
PA Rubber-type vibration dampers	○	○	○	○	○	○	○	○	○	○	○	○	○
PIM Spring-type vibration dampers	○	○	○	○	○	○	○	○	○	○	○	○	○
PQ Remote display	○	○	○	○	○	○	○	○	○	○	○	○	○
PW Part-Winding compressors start up system	○	○	○	○	○	○	○	○	○	○	○	○	○
RA Anti-freeze heater on evaporator	○	○	○	○	○	○	○	○	○	○	○	○	○
RF Power factor correction system Cosφ ≥0.9	○	○	○	○	○	○	○	○	○	○	○	○	○
RL Compressors overload relays	○	○	○	○	○	○	○	○	○	○	○	○	○
PCP Microchannel coils with soft anticorrosive treatment	■	■	■	■	■	■	■	■	■	■	■	■	■
ECP Microchannel coils with strong anticorrosive treatment	■	■	■	■	■	■	■	■	■	■	■	■	■
RP Partial heat recovery	○	○	○	○	○	○	○	○	○	○	○	○	○
RV Personalized frame painting in alternative RAL color	★	★	★	★	★	★	★	★	★	★	★	★	★
TE Electronic thermostatic valve	○	○	○	○	○	○	○	○	○	○	○	○	○
BT External air low temperature operation (-10°C)	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
BF External air low temperature operation (-20°C)	○	○	○	○	○	○	○	○	○	○	○	○	○
EC Axial fans with electronic commutated motor	○	○	○	○	○	○	○	○	○	○	○	○	○
HRV2 High pressure double safety valve	○	○	○	○	○	○	○	○	○	○	○	○	○
ATX Axial fan diffusor	○	○	○	○	○	○	○	○	○	○	○	○	○
VSC Inverter for compressors	○	○	○	○	○	○	○	○	○	○	○	○	○
VSP Inverter for pump	○	○	○	○	○	○	○	○	○	○	○	○	○

○ OPTIONAL
 ▲ STANDARD
 ■ NOT AVAILABLE
 ★ CONTACT MANUFACTURER

RAH MC Kp

AIR COOLED CHILLERS EQUIPPED WITH INVERTER DRIVEN SCREW COMPRESSORS, AXIAL FANS AND MICROCHANNEL CONDENSING COILS

The modular air cooled chillers of RAH VS MC U Kp are designed for external installation and are particularly suitable for cooling liquid solutions in industrial applications or for air conditioning in commercial field, where excellent seasonal performances must be granted keeping at the same time a low environmental impact, class A efficiency and meeting the seasonal efficiency requirements established by (EU) 2016/2281 Regulation.

Micro channel condensing coils are totally made up of aluminum alloy. In comparison to the traditional Copper-Aluminum coils, the micro channel geometry provides less resistance to the air passing. This allows to optimize the performances of the fans section and consequently to reduce dimensions keeping performances unchanged. Moreover the micro channel technology permits to reduce the weight of the condensing section as well as the refrigerant charge.

The cross "V" arrangement of the condensing coils makes the units of this series perfectly each other modular, granting at the same time the easiest access to the technical room both for checking operations required during the normal unit functioning and for maintenance.

All the units are totally factory assembled and tested, following specific quality procedures. Besides they are totally hydraulic, cooling and electrical connected permitting a quick installation once on site. Before the test the cooling circuits of each unit are subjected to a pressure test and then charged with Refrigerant R290 and non-freezing oil. So, once on site, the units must be only positioned and electrically and hydraulically connected.

Reduced sound level in version U is realised by using condensers with larger surface areas as well as soundproofed compressor cabinets.

Temperature Operation Limits:

Air: from -20 to +42°C - Water: from 5 to 15°C (evaporator leaving water).



MAIN COMPONENTS:

Structure realized with frame made up of hot galvanized steel sheet and RAL 7035 painted, suitable to resist to atmospheric agents. Compressors and main components are easily accessible and suitably placed in the technical room.

COMPRESSORS Semi-hermetic type, one of them with inverter regulation and one provided with capacity steps, motor thermal protection, rotation direction control, crankcase heater, discharge side shut-off valve and anti-vibration kit.

Compressors lubrication is of forced type, without pump and to avoid excessive oil migration to the cooling circuits, they are provided with an in-built oil separator. In the standard configuration it is also included a discharge junction flange, as well as steps capacity control system, non-return and safety valve, oil heater, lubrication management system, oil filter, oil service valve, POE oil charge, integral motor protection with protection module, discharge side temperature control device.

STAINLESS STEEL PLATE EVAPORATOR of dual circuit type, with high thickness close cell insulation and UV ray-proof. The max operating pressure limits are 6 bar for water side and 45 bar for refrigerant side. The evaporator is also equipped with safety water flow switch switching off the unit in case of low water flow through the evaporator.

MICRO CHANNEL CONDENSING COILS

totally made up of aluminum alloy to grant a perfect and continuous contact among tubes and fins optimizing the thermal exchange and reducing dimensions.

The high passivation degree of the used alloy, besides the peculiar assembling way, avoids the possibility to have galvanic corrosion phenomena. On demand it is also possible to provide the units installed in particularly aggressive environments with surface treatments against exchangers environmental corrosion. (Option ACP and PCP)

AXIAL FANS, with external rotor directly coupled to a three-phase electronically commutated motor (EC) they have the possibility of a continuous regulation of the speed by means of a 0-10V signal completely managed by the microprocessor. 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. Thanks to a more accurate adjustment of air flow, they allow operation of the unit with external temperature down to -20 °C.

COOLING CIRCUIT made up of electronic thermostatic expansion valve, sight glass, high pressure safety device, anti-freeze protection on evaporator, high and low pressure switches, non return valve in-built on compressors discharge side, dehydrating filter with replaceable cartridges, shut-off valve on liquid line. Each compressor operates on an independent circuit granting in this way, a considerable reliability.

ELECTRICAL BOARD in compliance with CE Norms, contained in a suitable section protected by internal safety panel, provided with a lock-door main switch. Inside all the control and protection components are suitably placed, together with terminal board and auxiliaries. The electrical board also includes the control device for power supply phases to prevent the compressor wrong side rotation. Microprocessor and relevant display are also placed inside the electrical cabinet.

ELECTRONIC MICROPROCESSOR for unit management installed inside the electrical cabinet, with double evaporator in/out control of the chilled water temperature, as well as control of working parameters and equalization of compressors working hours, failures auto-detection system, alarm log, start and set point timeslot programming, possibility of remote management and supervision by enabling standard communication protocols management, complete with compressors hour counter.



RAH MC Kp		402	502	602	652
Nominal Cooling Capacity	Kw	385,6	499,8	601,2	660,2
Total absorbed power	Kw	131,3	173,3	206,1	220,3
EER	-	2,94	2,88	2,92	3,00
SEPR	-	5,10	5,53	5,55	5,52

AXIAL FANS

Quantity	q.ty	8	8	10	12
Air Flow	mc/h	165600	155600	207000	248400
Absorbed power	Kw	15,5	15,5	19,4	23,3

EVAPORATOR

Quantity	q.ty	1	2	2	2
Fluid	-	Acqua	Acqua	Acqua	Acqua
Temperature IN/OUT	°C	12/7	12/7	12/7	12/7
Flow	m3/h	66,3	86,0	103,4	113,6
Pressure Drop	kPa	32	32	30	36

DIMENSIONS

Lenght	mm	5860	5860	7200	8540
Width	mm	2260	2260	2260	2260
Height	mm	2470	2470	2470	2470

WEIGHT

Transport	Kg	3602	3832	5002	5380
Operation	Kg	3648	3898	5078	5456

NOISE

Total LWA	dB(A)	92	93	94	96
SPL (1mt free field)	dB(A)	71,7	72,1	72,9	73,8

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
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FREON

Freon Charge	Kg	27	30	36	42
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spec]

752

751,1

250,7

3,00

5,55

12

248400

23,3

2

Acqua

12/7

129,2

37

8540

2260

2470

5532

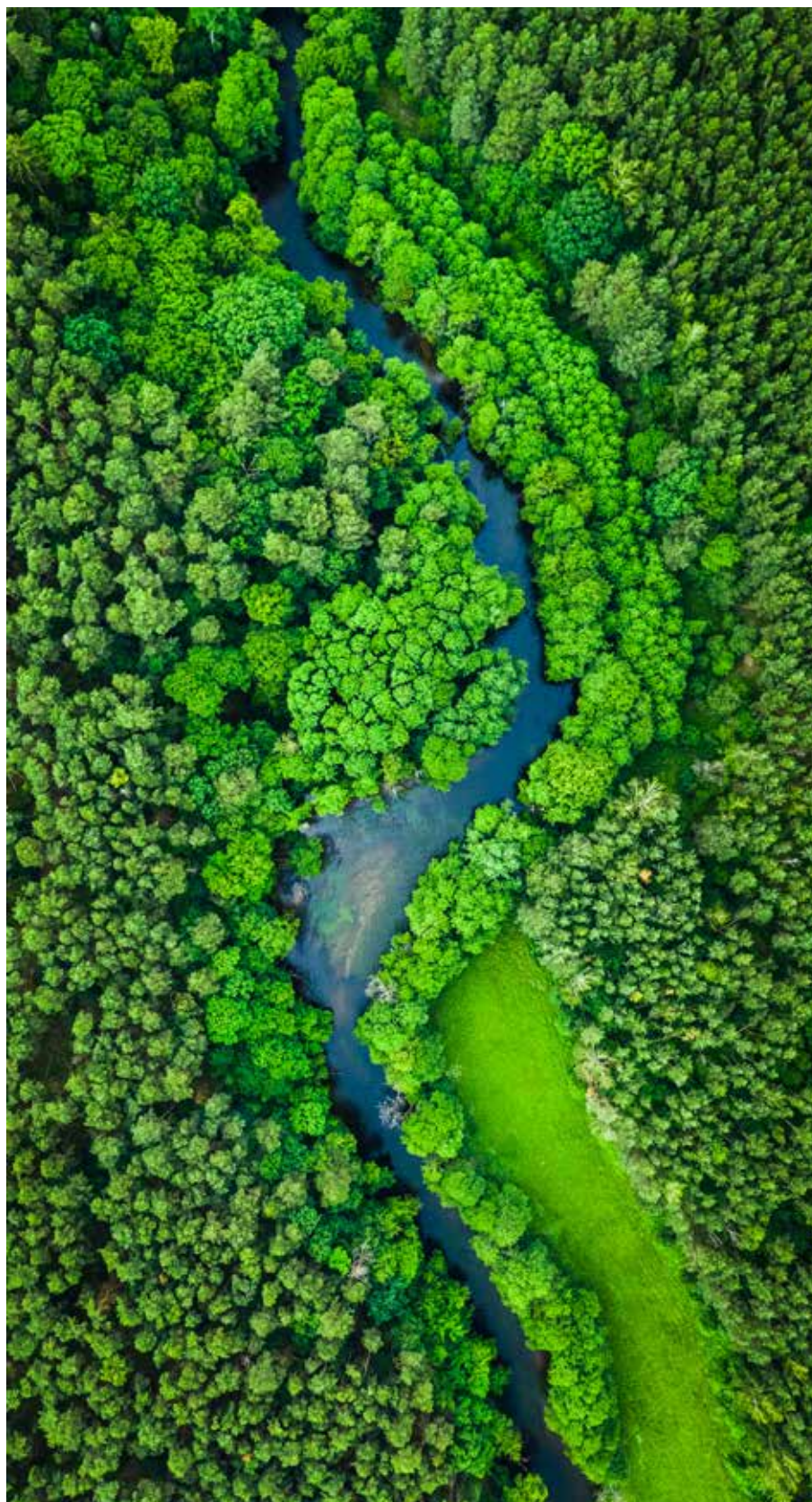
5626

96

74,3

400/3/50+N+PE

44



[OPTIONS LEGEND]

A+V - Amperometer+Voltmeter: Electronic devices to measure the electrical current absorbed and the power supply tension by the unit.

AE - Electrical power supply different than standard: In particular 230V/3phases, 460/3Phases with 50/60Hz of frequency.

CFU - Soundproofed compressors cabinet with higher thickness material: Insulation of compressors by a cabinet coated with 30mm thick sound and fire proof material.

CS - Compressors inrush counter: Electromechanical device positioned inside the electrical board which records the total inrush starts of compressors.

GP - Condensing coil protection grid: Painted metal grid against accidental impacts.

I1 - Victaulic insulation on pump side: Insulation of the joints by close-cells polyurethane material to prevent condensation on pump side.

I2 - Victaulic insulation on buffer tank side: Insulation of the joints by close-cells polyurethane material to prevent condensation on buffer tank side.

IH - RS485 Serial interface: Electronic card to be connected to the microprocessor which allows connection of the units to supervision system, for a remote control and unit teleservice. (Alternative to IH-BAC and IWG)

IH-BAC - BACNET Serial interface: Electronic card to be connected to the microprocessor which allows connection on the units to supervision system with BACNET protocol, for a remote control and unit teleservice. (Alternative to IH and IWG)

IWG - SNMP or TCP/IP Serial interface: Electronic card to be connected to the microprocessor which allows connection of the units to supervision system with LON protocol, for a remote control and unit teleservice. (Alternative to IH and IH-BAC)

MF - Phase monitor: Electronic device that checks the correct sequence and/or the lack of one of 3phases, switching off the unit if necessary.

MV - Buffer tank module: Of suitable capacity complete of expansion vessel, safety valve, hydrometer, switch-off valve for water charge and discharge, air purging valves, check valves for filter maintenance operations.

P1 - Single pump module: Chilled water single pump module with expansion vessel, safety valve, hydrometer, water shut-off valves for charge and discharge, air purging valves and pump electronic control; the pump is a centrifugal monoblock 2poles type.

P1H - Higher available pressure pump module: Chilled water single high prevalence pump with expansion vessel, safety valve, hydrometer, water shut-off valve for charge and discharge, air purging valves and pump electronic control; the pump is a centrifugal monoblock 2poles type.

P2 - Parallel double pumps module (only one working): Chilled water double pump module with expansion vessel, safety valve, hydrometer, water shut-off valve for charge and discharge, air purging valves, water shut-off valve on suction and check valve on discharge for each pump, electronic control; the pumps are centrifugal monoblock 2poles type.

P2H - Higher available pressure double pumps module (only one working): Chilled water double high prevalence pumps with expansion vessel, safety valve, hydrometer, water shut-off valve for charge and discharge, air purging valves, water shut-off valve on suction end check valve on discharge for each pump, electronic control; the pumps are centrifugal monoblock 2poles type.

PA - Rubber type vibration dampers: Bell shaped vibration dampers supports for unit isolation (supplied in kit), made of a bell base in galvanized steel and natural rubber mixture.

PM - Spring type vibration dampers: Spring type supports for unit isolation (supplied in kit), particularly indicated for installation in aggressive and difficult environments; made of two steel plates containing a suitable quantity of harmonic steel springs.

PQ - Remote display: Remote terminal which allows to display the temperature values detected by unit probes, the alarm digital inputs, the outputs, the unit remote ON/OFF, to change and program the different parameters and the signaling/display of the present alarms.

PW - Part Winding: Device able to start compressors reducing of about 35% the inrush current of each one.

RA - Anti freeze heater on evaporator: Electrical heater installed inside of the evaporator equipped with thermostat to avoid ice formation.

RF - Power factor correction system Cosfi $\geq 0,9$: Electrical device made by suitable condensers for compressor rephrasing that ensure a Cosfi value $\geq 0,9$ in order to reduce absorption from electrical network.

RL - Compressors overload relays: Electromechanical protection devices against compressor's overload.

PCP - Microchannel coil with prepainted fins: Superficial painting treatment of the aluminium fins, suitable for aggressive environmental with a high corrosive agents concentration.

ECP - Microchannel coil with prepainted fins: Superficial electroplating treatment of the aluminium fins by means of a protective layer of epoxy paint, suitable for aggressive environmental with a high corrosive agents concentration. (Available for Standard and VB versions)

RP - Partial heat recovery: of condensing hot through refrigerant/water plates exchangers (desuperheater) always in series to the compressors. It is used when a heat recovery is needed for sanitary water production.

RR - Copper/copper coil: Special condensing coils with copper pipes and fins. (Available for F version)

RV - Personalized frame painting in alternative RAL color.

TE - Electronic thermostatic valve: Suitable to reduce the response time of the unit; useful in case of frequent changes of cooling capacity to increase the unit efficiency.

TDS - Double layer treatment of the coil: Finned pack epoxy treatment and its frame, suitable for industrial very corrosive environmental or where there is an high concentration of chlorides.

BT - Low ambient temperature operation (-10°C): Electronic device for the continuous modulating voltage control of the condensing pressure through the variation of the fan rotation speed, allowing the unit operation down to -10°C ambient temperature. (Alternative to BF or EC)

BF - Low ambient temperature operation (-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 or EC)

EC - Axial fans with electronic commutated motor: Made of high-performance composite material, with external rotor directly coupled to a three-phase electronically commutated motor (EC); they have the possibility of a continuous regulation of the speed by means of a 0-10V signal, completely managed by the microprocessor. Thanks to a more accurate air flow regulation they allow unit operation until -20°C of external temperature. (Alternative to BF or BT)

HRV2 - High pressure double safety valve: Equipped with exchange shut-off valve to allow maintenance operations or his replacement without having to stop the unit.

AJT - Axial fan diffuser: It allow a reduction of energetic consumption and of noise pressure thanks to the optimization of the air flow; at maximum speed rotation increases the air flow until 9%.

VSC - Inverter for compressors: This option provides the installation of an inverter on one compressor per circuit.

VSP - Inverter for pump: This option provides the installation of an inverter combined to user side pump.



[ICONS LEGEND]

COMPLIANT WITH **ERP 2021**



MICROCHANNEL CONDENSING COIL



CHILLER OPERATION ONLY



ECOLOGICAL REFRIGERANT R290



PISTONS



AIR CONDENSATION



WATER CONDENSED UNIT



[MAKE THE DIFFERENCE]

In addition to a broad media debate, environmental impact is a focal point at the centre of every company. Operating for over 30 years in air conditioning, efficiency and sustainability are the main principles behind every design Emicon branded.

Since 2010, the company has produced ecological machines using Propane (R290) refrigerant. Since then, using environmentally sustainable refrigerants has been a corporate prerogative; R1234ze, R513A and R454B are today present in 85% of our Chillers and heat pumps.

We, therefore, think that bringing this attention back to even small actions makes a further difference. We have chosen quality and highly sustainable printing system, not using lamination for our catalogues and printing with **UV LED Direct Drive technology** that does not use ammonia-based inks or dry powders. The printing process thus requires **70% less energy** than the common off-set printing and significantly lowers the production of ozone and PM-10 powders. Each paper in our catalogues is **FSC®** certified, which guarantees that the products come from responsibly managed forests, thus guaranteeing high environmental protection standards.

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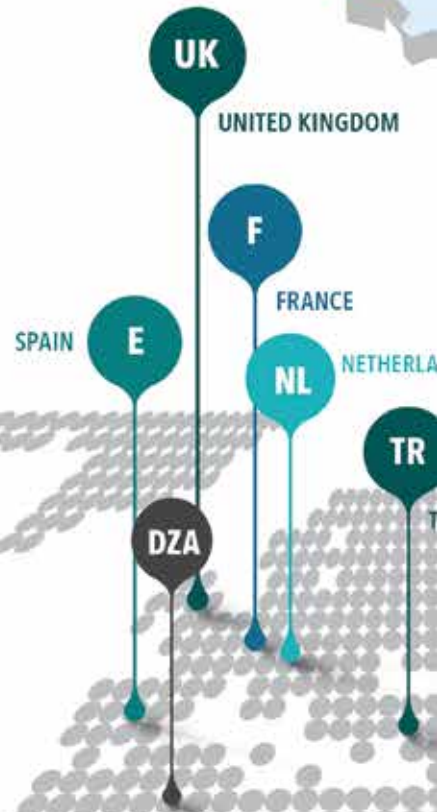
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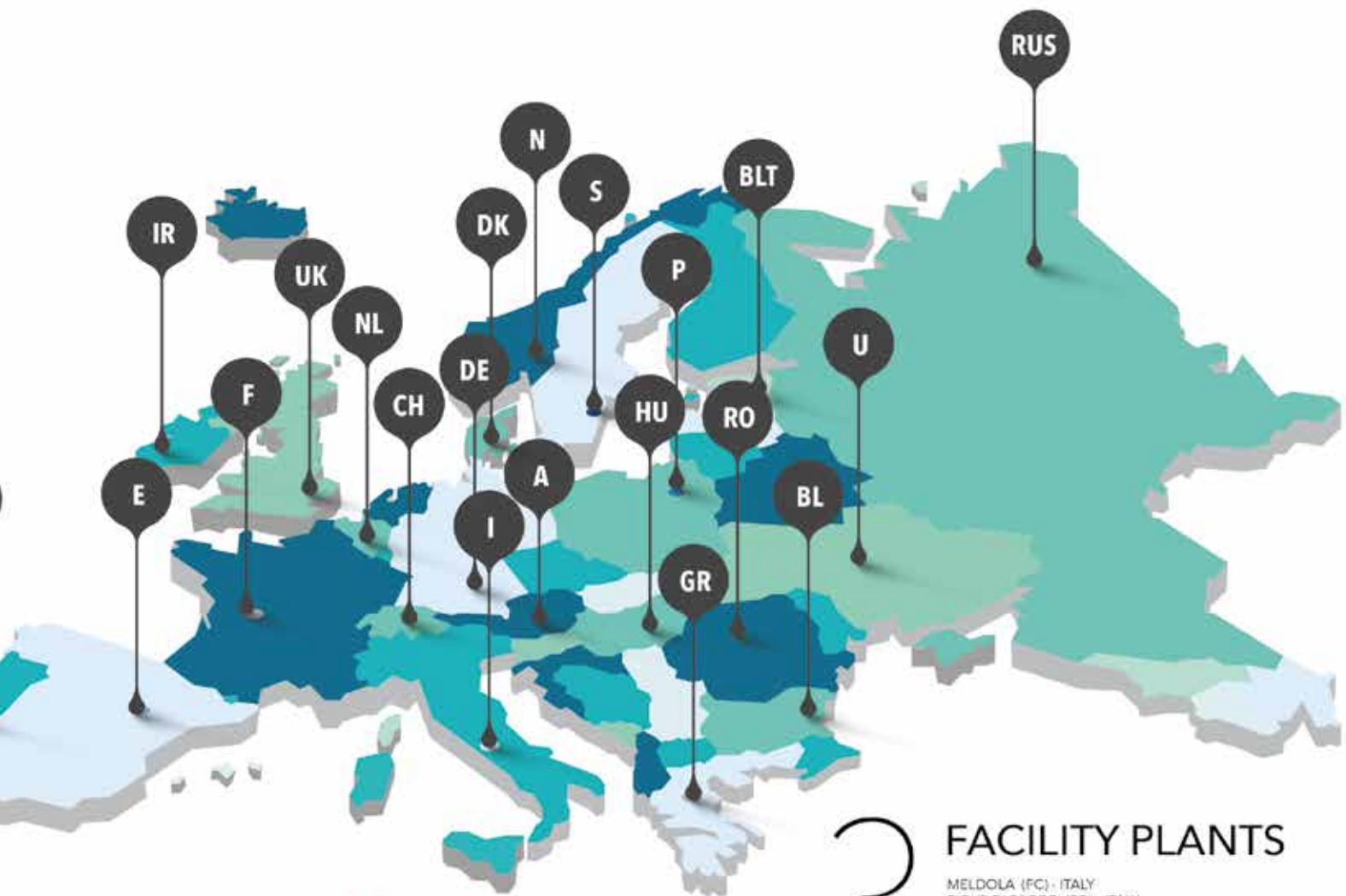
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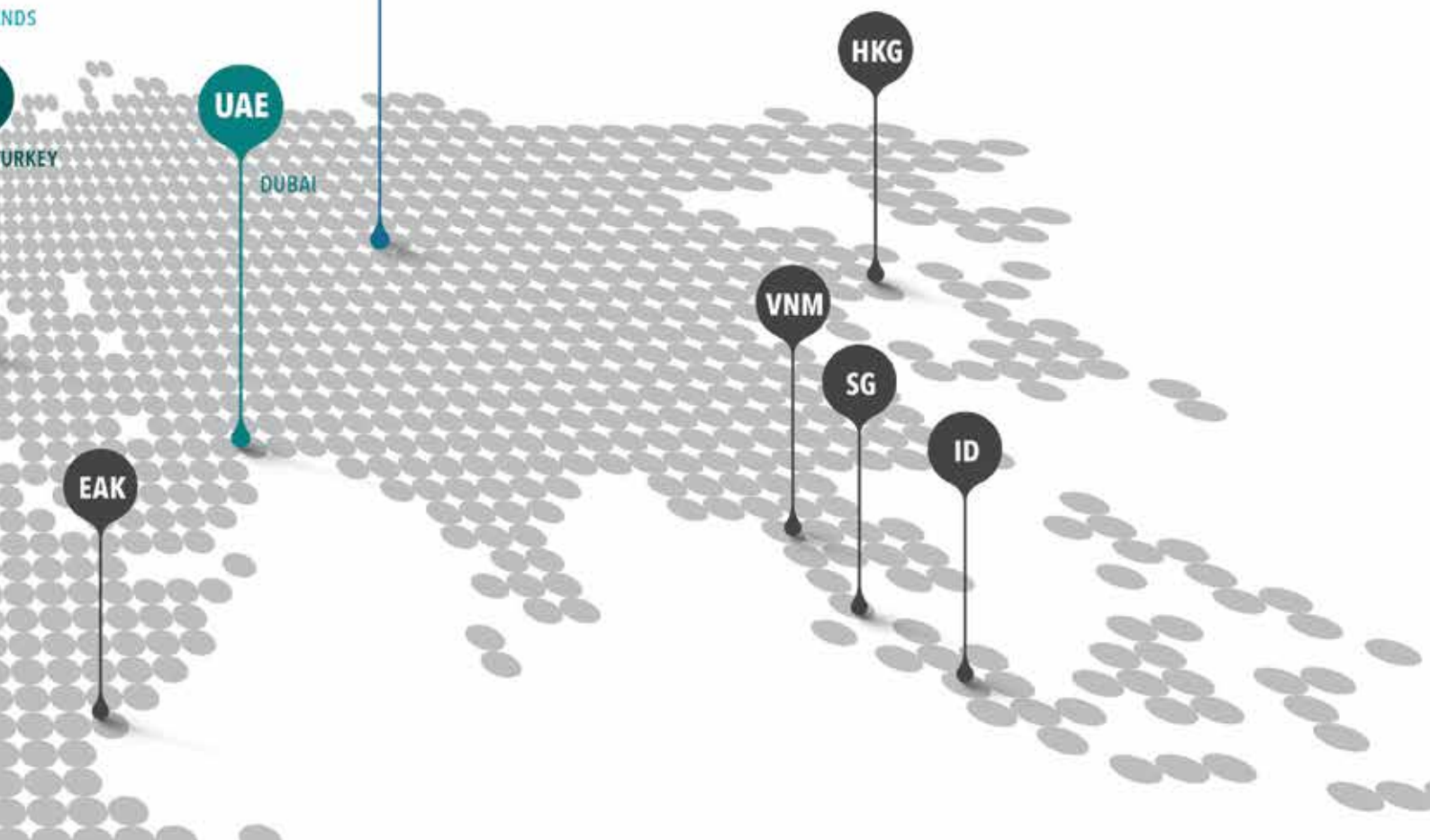
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