

RAS MC VB KP

R290 AIR COOLED CHILLERS FOR OUTDOOR INSTALLATION

Cooling capacities from 31 KW to 250 KW



The packaged air cooled chillers of RAS MC VB 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.

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 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. The evaporator 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 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. Fans are supplied with electronic frequency converter for the continuous modulating control of the condensing pressure through the variation of fan rotation speed.

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

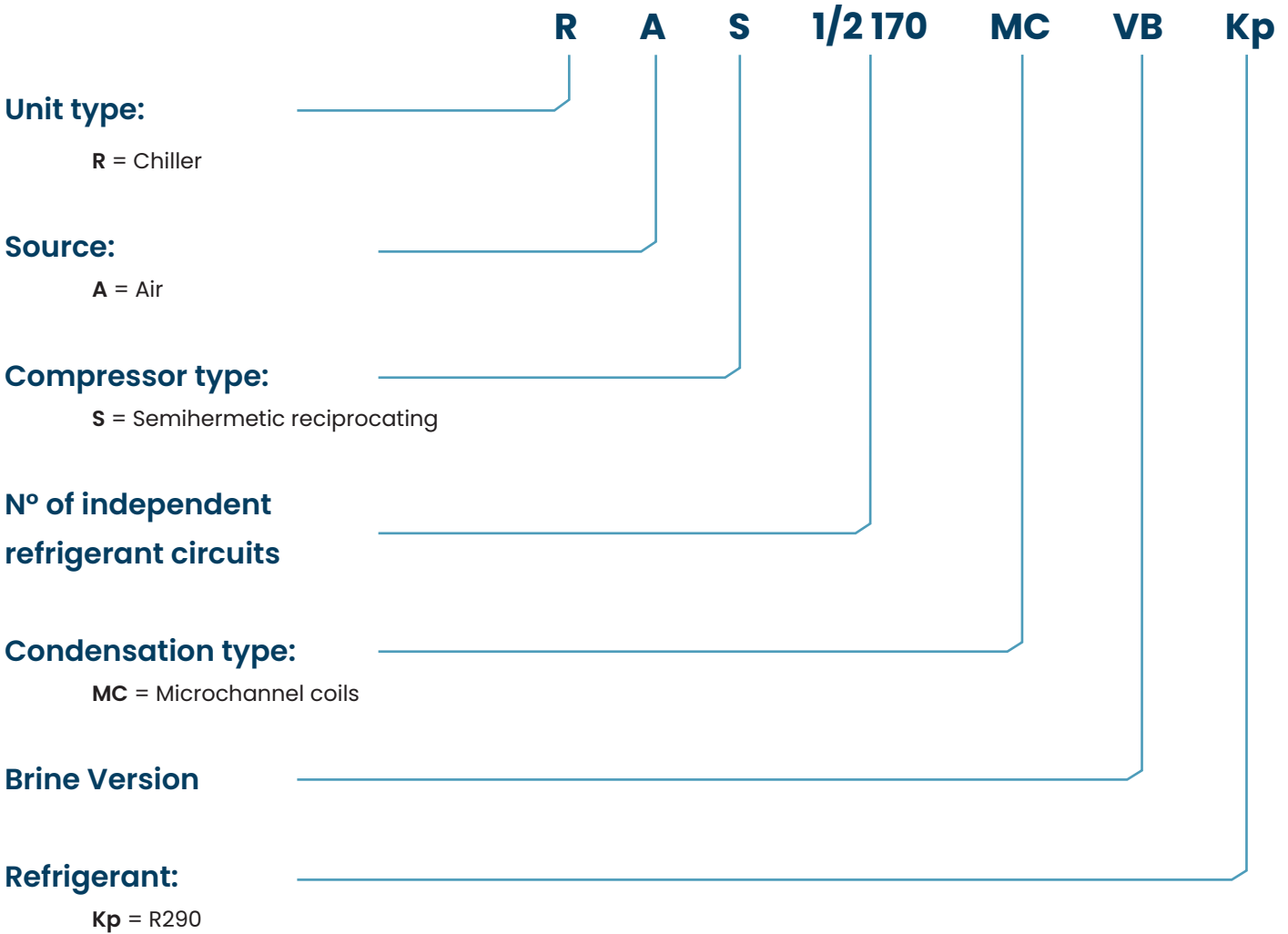
Independent cooling circuits, each provided with a shut-off valve for refrigerant charge, antifreeze probe, sight glass, dehydrating filter for R290 with wide filtering surface, high pressure side safety valve equipped with connector to the discharge refrigerant conveying piping, electronic thermostatic valve (for 1001,2402 and following bigger frames), 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

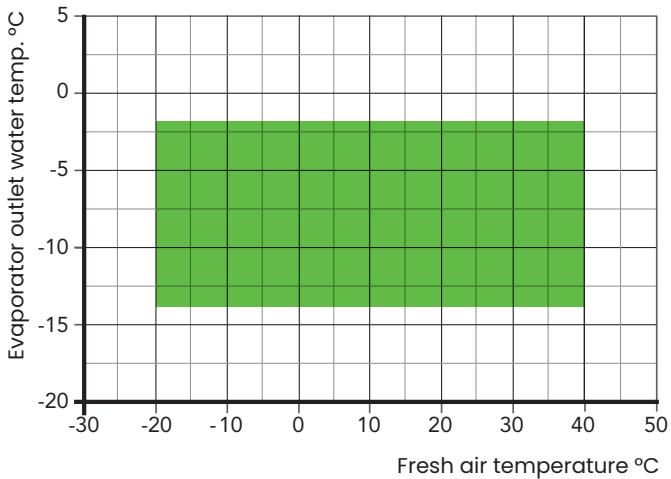
Built in compliance with 61439-1 standards, inside of which all the control system elements and the ones required for electrical motors starting and protection are located, all the components are factory connected and testes. The electrical cabinet has got a watertight structure, equipped with cable 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.


UNIT IDENTIFICATION & NOMENCLATURE

The simplest way to define in a clear way & in all details the RAS MC VB Kp units for your plant



OPERATING RANGE



 Cooling mode with glycol

TECHNICAL DATA

RAS MC VB Kp		521	591	721	871	1001	1402
Cooling capacity	kW	31,8	35,6	43,8	53,5	60,7	87,1
Total input power	kW	12,4	14,2	17,4	21,1	25,4	34,6
Nominal input current	A	31,0	32,4	35,5	44,6	53,7	71,0
EER	W/W	2,56	2,51	2,52	2,54	2,39	2,52
SEPR ⁽⁵⁾	W/W	3,58	3,51	3,38	3,70	3,42	3,35
Circuits	n°	1	1	1	1	1	2
Compressors	n°	1	1	1	1	1	2
Refrigerant R290							
Refrigerant charge	kg	4	4	7	7	8	14
Global warming potential (GWP)	-	3	3	3	3	3	3
Equivalent CO ₂ charge	kg	12	12	21	21	24	42
Axial fans ⁽¹⁾							
Quantity	n°	2	2	2	2	2	4
Total air flow	m ³ /h	16250	16650	18700	31200	32600	37400
Total power input	kW	1,2	1,2	1,2	3,9	3,9	2,4
Total input current	A	5,2	5,2	5,2	7,8	7,8	10,5
Evaporator ⁽²⁾							
Quantity	n°	1	1	1	1	1	1
Water flow	m ³ /h	6,2	6,9	8,5	10,4	11,8	17,0
Pressure drop	kPa	27	34	16	23	29	18
Weight							
Transport weight	kg	1052	1056	1164	1242	1252	1942
Operating weight	kg	1056	1060	1170	1248	1258	1956
Dimensions							
Length	mm	2590	2590	2590	2590	2590	4840
Width	mm	1370	1370	1370	1370	1370	1370
Height	mm	2570	2570	2570	2570	2570	2570
Sound data							
Total LWA ⁽³⁾	dB(A)	86,3	88,1	88,1	92,2	92,2	92,6
Total SPL 10m ⁽⁴⁾	dB(A)	54,3	56,1	56,1	60,2	60,2	60,4
Power supply							
Voltage/phase/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
General electrical data							
Maximum input power	[kW]	21,2	25	27,1	37,9	45,9	54,3
Maximum input current	[A]	42,3	49,4	52,4	68,8	82,4	105
Inrush current	[A]	208	230	245	281	329	297

(1) Ambient air temperature 35°C

(2) Fluid: Water + Ethylene glycol 35% - in/out: Temperature -3/-8°C

(3) Sound power level in accordance with ISO 3744.

(4) Sound pressure level at 10m from the unit in free field conditions, in accordance with ISO 3744

(5) SEPR: Medium temperature process chiller.

RAS MC VB Kp		1702	2102	2402	2902	3402	3702
Cooling capacity	kW	106,1	124,1	149,2	172,0	207,6	235,3
Total input power	kW	41,9	51,3	57,4	71,7	85,5	103,2
Nominal input current	A	88,9	107,7	124,6	138,4	172,6	208,9
EER	W/W	2,53	2,42	2,60	2,40	2,43	2,28
SEPR ⁽⁵⁾	W/W	3,75	3,49	3,75	3,38	3,68	3,47
Circuits	n°	2	2	2	2	2	2
Compressors	n°	2	2	4	4	4	4
Refrigerant R290							
Refrigerant charge	kg	14	15	16	18	23	24
Global warming potential (GWP)	-	3	3	3	3	3	3
Equivalent CO ₂ charge	kg	42	45	48	54	69	72
Axial fans ⁽¹⁾							
Quantity	n°	4	4	4	4	6	6
Total air flow	m ³ /h	62000	63600	68200	73000	101400	101400
Total power input	kW	7,8	7,8	7,8	7,8	11,6	11,6
Total input current	A	15,6	15,6	15,6	15,6	23,4	23,4
Evaporator ⁽²⁾							
Quantity	n°	1	1	1	1	1	1
Water flow	m ³ /h	20,7	24,2	29,1	33,5	40,4	45,8
Pressure drop	kPa	26	24	31	24	35	35
Weight							
Transport weight	kg	2096	2162	2518	2600	3102	3120
Operating weight	kg	2110	2188	2540	2632	3134	3152
Dimensions							
Length	mm	4840	4840	4840	4840	4430	4430
Width	mm	1370	1370	1370	1370	2260	2260
Height	mm	2570	2570	2570	2570	2480	2480
Sound data							
Total LWA ⁽³⁾	dB(A)	95,7	95,7	96,0	96,0	99,2	99,7
Total SPL 10m ⁽⁴⁾	dB(A)	63,4	63,4	63,7	63,7	66,9	67,4
Power supply							
Voltage/phase/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
General electrical data							
Maximum input power	[kW]	75,8	91,8	104	112	148	180
Maximum input current	[A]	138	165	192	204	267	322
Inrush current	[A]	350	412	372	396	479	569

(1) Ambient air temperature 35°C

(2) Fluid: Water + Ethylene glycol 35% - in/out: Temperature -3/-8°C

(3) Sound power level in accordance with ISO 3744.

(4) Sound pressure level at 10m from the unit in free field conditions, in accordance with ISO 3744

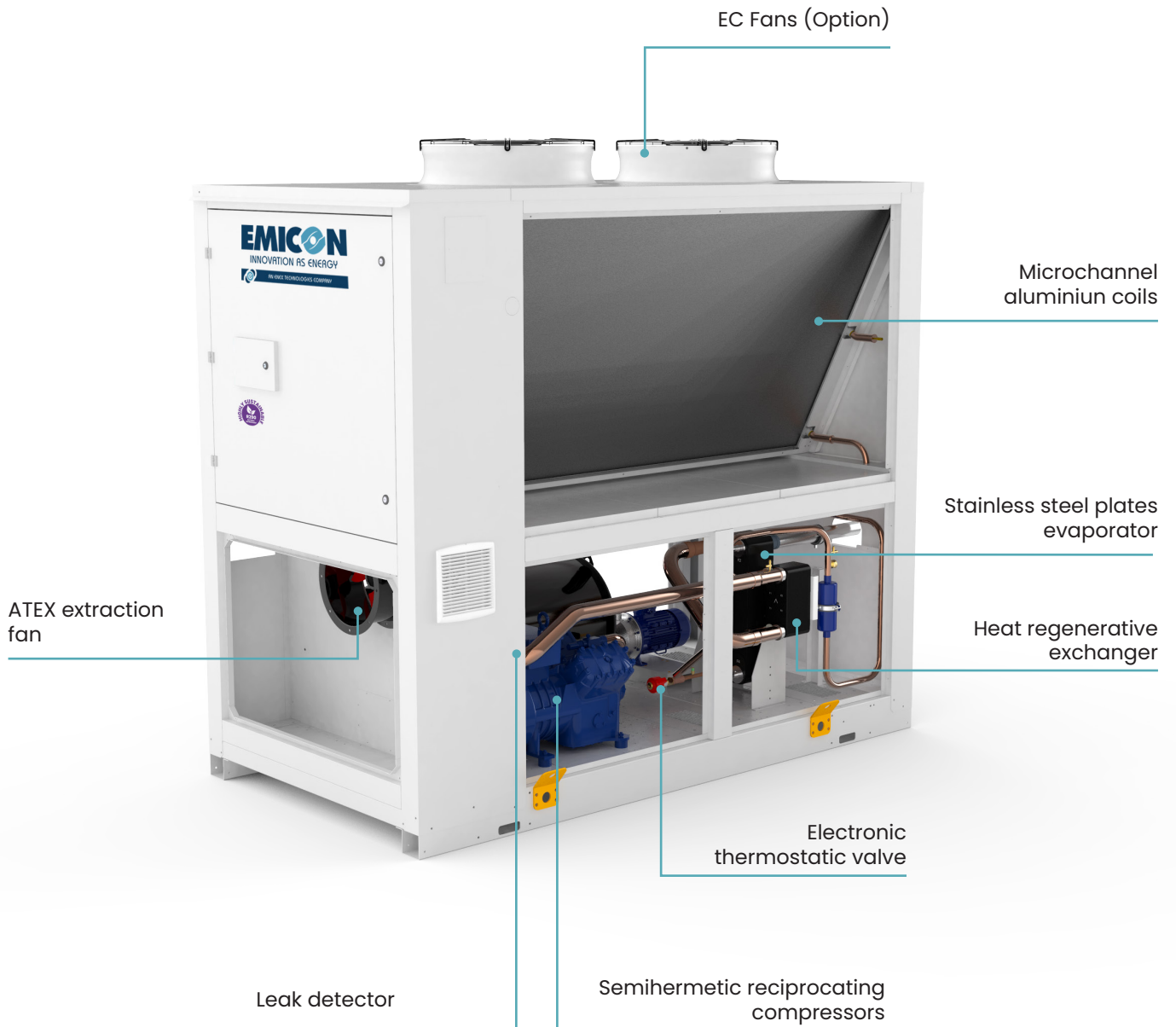
(5) SEPR: Medium temperature process chiller.

ACCESSORIES

RAS MC VB Kp		521	591	721	871	1001	1402	1702	2102	2402	2902	3402	3702
Amperometer + Voltmeter	A+V	o	o	o	o	o	o	o	o	o	o	o	o
Electrical power supply different than standard	AE	□	□	□	□	□	□	□	□	□	□	□	□
Axial fan diffuser	AXT	o	o	o	o	o	o	o	o	o	o	o	o
Operation in cooling mode down to -20°C	BF	●	●	●	●	●	●	●	●	●	●	●	●
Operation in cooling mode down to -10°C	BT	--	--	--	--	--	--	--	--	--	--	--	--
Soundproofed compressors cabinet with higher thickness material	CFU	o	o	o	o	o	o	o	o	o	o	o	o
Compressors inrush counter	CS	o	o	o	o	o	o	o	o	o	o	o	o
Refrigerant leakage detector	DR	●	●	●	●	●	●	●	●	●	●	●	●
Axial fans with electronic commutated motor	EC	o	o	o	o	o	o	o	o	o	o	o	o
Anticorrosive electro coating protection of condensing coils	ECP	o	o	o	o	o	o	o	o	o	o	o	o
Condensing coil protection grid	GP	o	o	o	o	o	o	o	o	o	o	o	o
High pressure double safety valve	HRV2	o	o	o	o	o	o	o	o	o	o	o	o
Victaulic insulation on pump side	I1	o	o	o	o	o	o	o	o	o	o	o	o
Victaulic insulation buffer tank side	I2	o	o	o	o	o	o	o	o	o	o	o	o
RS 485 Serial interface	IH	o	o	o	o	o	o	o	o	o	o	o	o
BACNET Protocol serial interface	IH-BAC	o	o	o	o	o	o	o	o	o	o	o	o
TCP/IP Protocol serial interface	IWG	o	o	o	o	o	o	o	o	o	o	o	o
Phase monitor	MF	o	o	o	o	o	o	o	o	o	o	o	o
MP advanced control for MSC - up to n.2 units	MP ADV	o	o	o	o	o	o	o	o	o	o	o	o
Up to two units	MS	o	o	o	o	o	o	o	o	o	o	o	o
Advanced Cascade system - up to n.6 units	MSC	o	o	o	o	o	o	o	o	o	o	o	o
Remote monitoring for units in cascade	MSHWEV	o	o	o	o	o	o	o	o	o	o	o	o
Pressure gauges	MT	●	●	●	●	●	●	●	●	●	●	●	●
Buffer tank module	MV	o	o	o	o	o	o	o	o	o	o	o	o
Pump group	P1	o	o	o	o	o	o	o	o	o	o	o	o
Higher available pressure pump group	PIH	o	o	o	o	o	o	o	o	o	o	o	o
Double pump group	P2	o	o	o	o	o	o	o	o	o	o	o	o
Higher available pressure double pump group	P2H	o	o	o	o	o	o	o	o	o	o	o	o
Rubber-type vibration dampers	PA	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇
Anti-corrosive protection of the condensing coils	PCP	o	o	o	o	o	o	o	o	o	o	o	o
Spring-type vibration dampers	PM	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇
Remote display	PQ	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇
Part-Winding	PW	o	o	o	o	o	o	o	o	o	o	o	o
Nordic option for electric panel (in/out covers for grilles + 15W/m electric heater)	QN	o	o	o	o	o	o	o	o	o	o	o	o
Anti-freeze heater on evaporator	RA	o	o	o	o	o	o	o	o	o	o	o	o
Shut-off valve on compressors discharge side	RD	●	●	●	●	●	●	●	●	●	●	●	●
Power factor correction system cosφ ≥ 0,9	RF	o	o	o	o	o	o	o	o	o	o	o	o
Shut-off valve on compressors suction side	RH	●	●	●	●	●	●	●	●	●	●	●	●
Compressor overload relays	RL	o	o	o	o	o	o	o	o	o	o	o	o
Condensing coil with pre-painted fins	RM	--	--	--	--	--	--	--	--	--	--	--	--
Partial heat recovery	RP	o	o	o	o	o	o	o	o	o	o	o	o
Copper/Copper coil	RR	--	--	--	--	--	--	--	--	--	--	--	--
Metal door for display	SPX	o	o	o	o	o	o	o	o	o	o	o	o
Personalized frame painting	RV	□	□	□	□	□	□	□	□	□	□	□	□
Double layer treatment of the coil	TDS	--	--	--	--	--	--	--	--	--	--	--	--
Electronic thermostatic valve	TE	●	●	●	●	●	●	●	●	●	●	●	●
Brine Version	VB	●	●	●	●	●	●	●	●	●	●	●	●
Periodic fans running during stand-by (1min/h)	VMA	o	o	o	o	o	o	o	o	o	o	o	o
Inverter on compressor	VSC	o	o	o	o	o	o	o	o	o	o	o	o
Inverter for pump	VSP1	o	o	o	o	o	o	o	o	o	o	o	o
High pressure inverter for pump	VSP1H	o	o	o	o	o	o	o	o	o	o	o	o
Inverter for parallel pumps (only one running)	VSP2	o	o	o	o	o	o	o	o	o	o	o	o
High pressure inverter for parallel pumps (only one running)	VSP2H	o	o	o	o	o	o	o	o	o	o	o	o
Hiweb	XW	o	o	o	o	o	o	o	o	o	o	o	o

● Standard, o Optional, ◇ Optional (external kit), -- Not available, □ Contact sales department

DISTINCTIVE TECHNOLOGICAL CHOICES OF THE RANGE



Publication: Commercial Brochure RAS MC VB Kp Series | Version December 2023 | ENG

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