RAH F Ke/Kh

AIR COOLED CHILLERS FOR OUTDOOR INSTALLATION WITH INTEGRATED FREE COOLING

EQUIPPED WITH SCREW COMPRESSORS AND AXIAL FANS

Cooling capacity from 338 kW to 1586 kW

R513A

R1234 ze

AIR

FC

AC

EC

ERP 2021

HIGHLY SUSTAINABLE

VERSIONS

RAH F - standard version
RAH F HE - high efficiency version
RAH F S e U - silenced and ultra-silenced version **on request**

Packaged air cooled chillers of RAH F eries with integrated free cooling section are suitable for outdoor installation and can be used to cool glycol fluid solutions for air conditioning or in industrial applications.

Semi-hermetic screw technology allows to reach great efficiency improvements at part load, if compared to the other traditional systems for cooling capacity control.

The integrated free cooling section allows to partially or totally recover 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.

The combination of high efficiency finned exchangers with the thermophysical purity of refrigerant used, almost glide-free during the changes of state, allows having nominal EER near 3 with ESEER above 4, 5 in mechanical operation. EER can exceed 25 in free-cooling mode.

These units have been designed considering limited space requirements and keeping, at the same time, high cooling performances. Such result has been attained with high-quality and up-to-date components.
All units are completely assembled and tested in the factory with specific quality procedures and are already equipped with all necessary hydraulic, refrigerant and electrical connections for a quick installation on site.

Before factory testing, cooling circuits are tested under pressure and then supplied with refrigerant and a non-freezing oil charge.

Units CE certified in compliance with the European regulation 2016/2281 ERP 2021.

COMPONENTS

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

COMPRESSORS semi-hermetic screw type with INVERTER
Compressors of semi-hermetic screw type, controlled by integrated frequency inverter, allowing to adapt the power to the load variations ensuring at the same time the maximum efficiency at different operating conditions. The compressors are provided with motor thermal protection, rotation direction control, crankcase heater, oil filter, oil service valve, POE oil charge and vibration dumpers kit. Compressors lubrication is of forced type without pump, to avoid excessive oil migrations to the cooling circuit, compressors are equipped with an oil separator on discharge side. Both compressors are equipped with an oil flow safety switch, an optoelectronic device operating in case the oil flow inside the compressor falls below the minimum threshold.

SHELL & TUBE EVAPORATOR
Tube bundle type with dry expansion and pure electrolytic copper tubes, shell and tube plate made up of carbon steel. The exchanger is provided with anti-condensation insulation made up of a nitrile rubber and polyethylene foam with a thickness of 8mm externally protected by an embossed scratchproof polyethylene film. The hydraulic connection are of elastic Victaulic type. Inside the shell, some plastic and corrosion-proof baffles, allowing a correct water distribution and making the tube bundle particularly strong and vibration free, even with high water flows. The evaporator is also provided with a safety water flow switch that does not allow the unit to operate in case of water flow rate lack to the evaporator.

EXTERNAL CONDENSING COIL
Multisection type, with micro-finned copper tubes, positioned in staggered rows and mechanically expanded into an aluminum finned pack. Fins are designed with such a shape providing the highest heat exchange efficiency (turbo-fin).The max operating pressure refrigerant side is 45 relative bar.

EXTERNAL FREE COOLING COILS
Made of copper tubes with optimized section so to reduce the pressure drops glycol side and aluminum finned pack. Fins are designed with such a shape providing the highest heat exchange efficiency (turbo-fin).The max operating pressure fluid side of free cooling coils is 10 relative bar. As soon as the temperature of the air entering the freecooling coil is lower than the temperature of the return flow, the free-cooling system is activated, allowing the ventilated system to obtain the maximum refrigerant recovery at those conditions. The benefit obtained by the free-cooling system is much bigger as much lower is the external temperature respect the 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 on places where the weather annual profile is characterized by medium and low external temperatures and where the cooling demand is significant and for long periods of time.. Is almost always indispensable that free-cooling coils are supplied with glycol mixtures to prevent the freezing of the fluid to be chilled and to avoid relevant breakages of exchangers. On applications where is not possible to use directly glycol mixture, is possible to added at unit a "GLYCOL LOOP" circuit (GYL option) with which an hydraulic separation is obtained between the free-cooling coils and the whole remaining part of the hydronic plant.
That circuit provides the separation thanks to an additional water/glycol heat exchanger and is complete of a water pump for the internal fluid circulation. That pump is switched on only during free cooling operation.

AXIAL FANS
Of directly coupled type, with wing-profile aluminium blades, are designed not to create air turbulence. This ensures the max efficiency with the lowest sound level. Each fan is provided with a galvanized steel protection grid, which is painted after construction. The IP54 fans motors are completely closed and provided with in-built overload protection thermostat, incorporated to the motor windings. These fans, thanks to a more accurate regulation of the airflow, allow the unit to operate with an external air temperature up to - 20 °C.

INDEPENDENT COOLING CIRCUITS
Independent cooling circuits, each provided with a shut-off valve for refrigerant charge, antifreeze sensor, shut-off valves on liquid lines, sight glass, dehydrating filter, high-pressure safety device on high pressure refrigerant side and electronic thermostatic expansion valve, as well as high and low pressure switches and gauges.

ELECTRICAL BOARD
Built in compliance with CE Norms, inside of which are placed the control system and the components for motors starting, wired and tested in the factory. It is made by a cabinet suitable for outdoor installation, containing 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, terminals for general alarm and remote ON/OFF, terminal board and possibility to interface to BMS systems.

STANDARD HYDRONIC CIRCUIT
Provided with three-way water valve ON/OFF to activate the free-cooling mode, automatic air vent valves on plate coils and exchangers, glycol solution charge and/or discharge valves, anti-freeze probe.

ACCESSORIES

RAH F Ke		302	352	402	482	542	602	722	822	952	1102	1202	1302
Amperometer	A	o	o	o	o	o	o	o	o	o	o	o	o
Electrical power supply different than standard	AE	□	□	□	□	□	□	□	□	□	□	□	□
Operation in cooling mode down to -20°C	BF	o	o	o	o	o	o	o	o	o	o	o	o
Operation in cooling mode down to -10°C	BT	•	•	•	•	•	•	•	•	•	•	•	•
Soundproofed compressors cabinet with standard material	CF	•	•	•	•	•	•	•	•	•	•	•	•
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
Star/Delta	DS	•	•	•	•	•	•	•	•	•	•	•	•
Axial fans with electronic commutated motor	EC	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
Anti-intrusion grid	GP3	o	o	o	o	o	o	o	o	o	o	o	o
Glycol loop	GYL	□	□	□	□	□	□	□	□	□	□	□	□
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
Watch card	IG	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
LON Protocol serial interface	IH-LON	o	o	o	o	o	o	o	o	o	o	o	o
Seawood packing	IM	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
Liquid injection	LI	o	o	o	o	o	o	o	o	o	o	o	o
Modulating capacity control	M12	o	o	o	o	o	o	o	o	o	o	o	o
Phase monitor	MF	•	•	•	•	•	•	•	•	•	•	•	•
Buffer tank module	MV	□	□	□	□	□	□	□	□	□	□	□	□
Oil flow safety switch	OS	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	P1H	o	o	o	o	o	o	o	o	o	o	o	o
Single pump variable flow	P1VS	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
Double pump variable flow	P2VS	o	o	o	o	o	o	o	o	o	o	o	o
Rubber-type vibration dampers	PA	o	o	o	o	o	o	o	o	o	o	o	o
Safety water flow switch	PF	•	•	•	•	•	•	•	•	•	•	•	•
Spring-type vibration dampers	PM	o	o	o	o	o	o	o	o	o	o	o	o
Remote display	PQ	o	o	o	o	o	o	o	o	o	o	o	o
In-line twin pump group (only one working)	PT	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 cosfi ≥0,9	RF	o	o	o	o	o	o	o	o	o	o	o	o
Shut-off valve on compressors suction side	RH	o	o	o	o	o	o	o	o	o	o	o	o
Compressor overload relays	RL	o	o	o	o	o	o	o	o	o	o	o	o
Condensing coil with pre-painted fins	RM	o	o	o	o	o	o	o	o	o	o	o	o
Partial heat recovery	RP	o	o	o	o	o	o	o	o	o	o	o	o
Copper/Copper coil	RR	o	o	o	o	o	o	o	o	o	o	o	o
Total heat recovery	RT	□	□	□	□	□	□	□	□	□	□	□	□
Personalized frame painting	RV	o	o	o	o	o	o	o	o	o	o	o	o
Coil with double layer treatment	TDS	o	o	o	o	o	o	o	o	o	o	o	o
Electronic thermostatic valve	TE	•	•	•	•	•	•	•	•	•	•	•	•
Voltmeter	V	o	o	o	o	o	o	o	o	o	o	o	o
Brine Version	VB	o	o	o	o	o	o	o	o	o	o	o	o
Solenoid valve	VS	o	o	o	o	o	o	o	o	o	o	o	o

• Standard, o Optional, -- Not available

RAH F HE Ke		302	352	402	482	542	602	722	822	952	1102	1202	1302
Amperometer	A	o	o	o	o	o	o	o	o	o	o	o	o
Electrical power supply different than standard	AE	□	□	□	□	□	□	□	□	□	□	□	□
Soundproofed compressors cabinet with standard material	CF	•	•	•	•	•	•	•	•	•	•	•	•
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
Star/Delta	DS	•	•	•	•	•	•	•	•	•	•	•	•
Axial fans with electronic commutated motor	EC	•	•	•	•	•	•	•	•	•	•	•	•
Condensing coil protection grid	GP	o	o	o	o	o	o	o	o	o	o	o	o
Anti-intrusion grid	GP3	o	o	o	o	o	o	o	o	o	o	o	o
Glycol loop	GYL	□	□	□	□	□	□	□	□	□	□	□	□
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
Watch card	IG	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
LON Protocol serial interface	IH-LON	o	o	o	o	o	o	o	o	o	o	o	o
Seawood packing	IM	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
Liquid injection	LI	o	o	o	o	o	o	o	o	o	o	o	o
Modulating capacity control	M12	o	o	o	o	o	o	o	o	o	o	o	o
Phase monitor	MF	•	•	•	•	•	•	•	•	•	•	•	•
Buffer tank module	MV	□	□	□	□	□	□	□	□	□	□	□	□
Oil flow safety switch	OS	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	P1H	o	o	o	o	o	o	o	o	o	o	o	o
Single pump variable flow	P1VS	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
Double pump variable flow	P2VS	o	o	o	o	o	o	o	o	o	o	o	o
Rubber-type vibration dampers	PA	o	o	o	o	o	o	o	o	o	o	o	o
Safety water flow switch	PF	•	•	•	•	•	•	•	•	•	•	•	•
Spring-type vibration dampers	PM	o	o	o	o	o	o	o	o	o	o	o	o
Remote display	PQ	o	o	o	o	o	o	o	o	o	o	o	o
In-line twin pump group (only one working)	PT	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 cosfi ≥0,9	RF	o	o	o	o	o	o	o	o	o	o	o	o
Shut-off valve on compressors suction side	RH	o	o	o	o	o	o	o	o	o	o	o	o
Compressor overload relays	RL	o	o	o	o	o	o	o	o	o	o	o	o
Condensing coil with pre-painted fins	RM	o	o	o	o	o	o	o	o	o	o	o	o
Partial heat recovery	RP	o	o	o	o	o	o	o	o	o	o	o	o
Copper/Copper coil	RR	o	o	o	o	o	o	o	o	o	o	o	o
Total heat recovery	RT	□	□	□	□	□	□	□	□	□	□	□	□
Personalized frame painting	RV	o	o	o	o	o	o	o	o	o	o	o	o
Coil with double layer treatment	TDS	o	o	o	o	o	o	o	o	o	o	o	o
Electronic thermostatic valve	TE	•	•	•	•	•	•	•	•	•	•	•	•
Voltmeter	V	o	o	o	o	o	o	o	o	o	o	o	o
Brine Version	VB	o	o	o	o	o	o	o	o	o	o	o	o
Solenoid valve	VS	o	o	o	o	o	o	o	o	o	o	o	o

• Standard, o Optional, -- Not available

RAH F Kh		302	352	402	482	542	602	722	822	902	1002
Amperometer	A	o	o	o	o	o	o	o	o	o	o
Electrical power supply different than standard	AE	□	□	□	□	□	□	□	□	□	□
Operation in cooling mode down to -20°C	BF	o	o	o	o	o	o	o	o	o	o
Operation in cooling mode down to -10°C	BT	•	•	•	•	•	•	•	•	•	•
Soundproofed compressors cabinet with standard material	CF	•	•	•	•	•	•	•	•	•	•
Soundproofed compressors cabinet with higher thickness material	CFU	o	o	o	o	o	o	o	o	o	o
Compressors inrush counter	CS	o	o	o	o	o	o	o	o	o	o
Star/Delta	DS	•	•	•	•	•	•	•	•	•	•
Axial fans with electronic commutated motor	EC	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
Anti-intrusion grid	GP3	o	o	o	o	o	o	o	o	o	o
Glycol loop	GYL	□	□	□	□	□	□	□	□	□	□
Victaulic insulation on pump side	I1	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
Watch card	IG	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
LON Protocol serial interface	IH-LON	o	o	o	o	o	o	o	o	o	o
Seawood packing	IM	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
Liquid injection	LI	o	o	o	o	o	o	o	o	o	o
Modulating capacity control	M12	o	o	o	o	o	o	o	o	o	o
Phase monitor	MF	•	•	•	•	•	•	•	•	•	•
Buffer tank module	MV	□	□	□	□	□	□	□	□	□	□
Oil flow safety switch	OS	o	o	o	o	o	o	o	o	o	o
Pump group	P1	o	o	o	o	o	o	o	o	o	o
Higher available pressure pump group	P1H	o	o	o	o	o	o	o	o	o	o
Single pump variable flow	P1VS	o	o	o	o	o	o	o	o	o	o
Double pump group	P2	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
Double pump variable flow	P2VS	o	o	o	o	o	o	o	o	o	o
Rubber-type vibration dampers	PA	o	o	o	o	o	o	o	o	o	o
Safety water flow switch	PF	•	•	•	•	•	•	•	•	•	•
Spring-type vibration dampers	PM	o	o	o	o	o	o	o	o	o	o
Remote display	PQ	o	o	o	o	o	o	o	o	o	o
In-line twin pump group (only one working)	PT	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
Shut-off valve on compressors discharge side	RD	•	•	•	•	•	•	•	•	•	•
Power factor correction system cosfi ≥0,9	RF	o	o	o	o	o	o	o	o	o	o
Shut-off valve on compressors suction side	RH	o	o	o	o	o	o	o	o	o	o
Compressor overload relays	RL	o	o	o	o	o	o	o	o	o	o
Condensing coil with pre-painted fins	RM	o	o	o	o	o	o	o	o	o	o
Partial heat recovery	RP	o	o	o	o	o	o	o	o	o	o
Copper/Copper coil	RR	o	o	o	o	o	o	o	o	o	o
Total heat recovery	RT	□	□	□	□	□	□	□	□	□	□
Personalized frame painting	RV	o	o	o	o	o	o	o	o	o	o
Coil with double layer treatment	TDS	o	o	o	o	o	o	o	o	o	o
Electronic thermostatic valve	TE	•	•	•	•	•	•	•	•	•	•
Voltmeter	V	o	o	o	o	o	o	o	o	o	o
Brine Version	VB	o	o	o	o	o	o	o	o	o	o
Solenoid valve	VS	o	o	o	o	o	o	o	o	o	o

• Standard, o Optional, -- Not available

RAH F HE Kh		302	352	402	482	542	602	722	822	902	1002
Amperometer	A	o	o	o	o	o	o	o	o	o	o
Electrical power supply different than standard	AE	□	□	□	□	□	□	□	□	□	□
Soundproofed compressors cabinet with standard material	CF	●	●	●	●	●	●	●	●	●	●
Soundproofed compressors cabinet with higher thickness material	CFU	o	o	o	o	o	o	o	o	o	o
Compressors inrush counter	CS	o	o	o	o	o	o	o	o	o	o
Star/Delta	DS	●	●	●	●	●	●	●	●	●	●
Axial fans with electronic commutated motor	EC	●	●	●	●	●	●	●	●	●	●
Condensing coil protection grid	GP	o	o	o	o	o	o	o	o	o	o
Anti-intrusion grid	GP3	o	o	o	o	o	o	o	o	o	o
Glycol loop	GYL	□	□	□	□	□	□	□	□	□	□
Victaulic insulation on pump side	I1	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
Watch card	IG	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
LON Protocol serial interface	IH-LON	o	o	o	o	o	o	o	o	o	o
Seawood packing	IM	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
Liquid injection	LI	o	o	o	o	o	o	o	o	o	o
Modulating capacity control	M12	o	o	o	o	o	o	o	o	o	o
Phase monitor	MF	●	●	●	●	●	●	●	●	●	●
Buffer tank module	MV	□	□	□	□	□	□	□	□	□	□
Oil flow safety switch	OS	o	o	o	o	o	o	o	o	o	o
Pump group	P1	o	o	o	o	o	o	o	o	o	o
Higher available pressure pump group	P1H	o	o	o	o	o	o	o	o	o	o
Single pump variable flow	P1VS	o	o	o	o	o	o	o	o	o	o
Double pump group	P2	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
Double pump variable flow	P2VS	o	o	o	o	o	o	o	o	o	o
Rubber-type vibration dampers	PA	o	o	o	o	o	o	o	o	o	o
Safety water flow switch	PF	●	●	●	●	●	●	●	●	●	●
Spring-type vibration dampers	PM	o	o	o	o	o	o	o	o	o	o
Remote display	PQ	o	o	o	o	o	o	o	o	o	o
In-line twin pump group (only one working)	PT	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
Shut-off valve on compressors discharge side	RD	●	●	●	●	●	●	●	●	●	●
Power factor correction system cosfi ≥0,9	RF	o	o	o	o	o	o	o	o	o	o
Shut-off valve on compressors suction side	RH	o	o	o	o	o	o	o	o	o	o
Compressor overload relays	RL	o	o	o	o	o	o	o	o	o	o
Condensing coil with pre-painted fins	RM	o	o	o	o	o	o	o	o	o	o
Partial heat recovery	RP	o	o	o	o	o	o	o	o	o	o
Copper/Copper coil	RR	o	o	o	o	o	o	o	o	o	o
Total heat recovery	RT	□	□	□	□	□	□	□	□	□	□
Personalized frame painting	RV	o	o	o	o	o	o	o	o	o	o
Coil with double layer treatment	TDS	o	o	o	o	o	o	o	o	o	o
Electronic thermostatic valve	TE	●	●	●	●	●	●	●	●	●	●
Voltmeter	V	o	o	o	o	o	o	o	o	o	o
Brine Version	VB	o	o	o	o	o	o	o	o	o	o
Solenoid valve	VS	o	o	o	o	o	o	o	o	o	o

• Standard, o Optional, -- Not available

TECHNICAL DATA

RAH F Ke		302	352	402	482	542	602	722	822	952	1102	1202	1302
Cooling mode (R513A) (1)													
Cooling capacity	kW	341,7	399,4	453,7	551,8	617,6	690,3	818,5	944,3	1085,1	1244,4	1372,6	1496,1
Compressor input power	kW	91,9	104,6	119,4	147,5	163,0	182,8	214,1	248,3	283,6	326,6	359,3	393,2
Total input power	kW	111,1	125,7	143,4	173,9	191,8	214,5	247,7	285,2	322,0	368,9	407,3	446,0
Nominal input current	A	195,7	221,5	252,7	306,4	338,0	377,8	436,3	502,5	567,3	649,9	717,6	785,7
EER Gross	W/W	3,72	3,82	3,80	3,74	3,79	3,78	3,82	3,80	3,83	3,81	3,82	3,81
EER Net	W/W	3,08	3,18	3,16	3,17	3,22	3,22	3,30	3,31	3,37	3,37	3,37	3,35
Flow rate (4)	m^3/h	63,5	74,3	84,4	102,6	114,9	128,4	152,2	175,6	201,8	231,4	255,3	278,2
Pressure drop	kPa	54,9	54,4	55,0	56,1	57,0	53,6	51,3	52,7	54,1	55,2	56,4	56,4
Circuits	n°	2	2	2	2	2	2	2	2	2	2	2	2
Compressors	n°	2	2	2	2	2	2	2	2	2	2	2	2
Free Cooling (2)													
Cooling capacity	kW	521,2	532,2	650,9	660,1	784,2	799,0	917,0	924,4	1042,3	1064,3	1301,8	1320,3
Input power	kW	19,2	21,12	24	26,4	28,8	31,68	33,6	36,96	38,4	42,24	48	52,8
Input current	A	36,8	40,5	46,0	50,6	55,2	60,8	64,4	70,9	73,6	81,0	92,1	101,3
EER	W/W	27,1	25,2	27,1	25,0	27,2	25,2	27,3	25,0	27,1	25,2	27,1	25,0
Flow rate (4)	m^3/h	98,7	100,8	123,3	125,0	148,5	151,3	173,7	175,1	197,4	201,6	246,6	250,1
Pressure drop	kPa	313,7	281,4	298,8	264,6	276,6	255,7	248,1	233,6	233,0	223,1	233,9	226,8
Free Cooling (3)													
Cooling capacity	kW	264,28	269,86	330,07	334,76	397,66	405,17	465,03	468,76	528,55	539,72	660,14	669,52
Input power	kW	19,2	21,1	24,0	26,4	28,8	31,7	33,6	37,0	38,4	42,2	48,0	52,8
Input current	A	36,8	40,5	46,0	50,6	55,2	60,8	64,4	70,9	73,6	81,0	92,1	101,3
EER	W/W	13,8	12,8	13,8	12,7	13,8	12,8	13,8	12,7	13,8	12,8	13,8	12,7
Flow rate (4)	m^3/h	50,1	51,1	62,5	63,4	75,3	76,7	88,1	88,8	100,1	102,2	125,0	126,8
Pressure drop	kPa	80,7	72,4	76,8	68,0	71,1	65,8	63,8	60,1	59,9	57,4	60,1	58,3
Axial fans													
Quantity	n°	8	8	10	10	12	12	14	14	16	16	20	20
Total air flow	m^3/h	156800	164640	196000	205800	235200	246960	274400	288120	313600	329280	392000	411600
Total power input	kW	19,2	21,1	24,0	26,4	28,8	31,7	33,6	37,0	38,4	42,2	48,0	52,8
Total input current	A	36,8	40,5	46,0	50,6	55,2	60,8	64,4	70,9	73,6	81,0	92,1	101,3
Weight													
Transport weight	kg	4690	4837	5936	6088	7783	7932	8442	8598	9565	9729	10620	10793
Operating weight	kg	4874	5024	6166	6320	8059	8212	8765	8923	9933	10103	11079	11257
Dimensions													
Length	mm	4750	4750	5720	5720	6700	6700	7670	7670	9800	9800	10770	10770
Width	mm	2300	2300	2300	2300	2300	2300	2300	2300	2300	2300	2300	2300
Height	mm	2560	2560	2560	2560	2560	2560	2560	2560	2560	2560	2560	2560
Sound data													
Total LWA (5)	dB(A)	101,9	102,4	102,9	103,4	103,9	104,4	104,9	105,4	105,9	106,4	106,9	107,4
Total SPL 1m (6)	dB(A)	81,3	81,8	82,3	82,8	83,3	83,8	84,3	84,8	85,3	85,8	86,3	86,8
Power supply													
Voltage/phase/frequency	V/ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
General electrical data													
Maximum input power	[A]	283	321	366	441	497	569	646	737	840	801	1004	1121
Maximum input current	[A]	341	393	458	538	618	686	824	904	1079	1132	1399	1579

(1) Water in/out: 15/10°C - Ambient air temperature 30°C
(2) Water in/out: 15/10°C - Ambient air temperature 0°C
(3) Water in/out: 15/10°C - Ambient air temperature 5°C
(4) Hydraulic data referred to fluid Glycol 30%
(5) Sound power level in accordance with ISO 3744.
(6) Sound pressure level at 1m from the unit in free field conditions, in accordance with ISO 3744

RAH F HE Ke		302	352	402	482	542	602	722	822	952	1102	1202	1302
Cooling mode (R513A) (1)													
Cooling capacity	kW	365,6	427,4	485,9	589,9	654,7	731,8	867,6	1001,0	1150,2	1319,1	1454,9	1585,9
Compressor input power	kW	86,0	98,8	112,8	140,5	155,3	174,1	203,9	236,4	270,1	311,1	342,2	374,5
Total input power	kW	102,4	119,3	135,3	165,1	182,3	202,8	235,4	269,2	306,2	352,1	391,4	428,6
Nominal input current	A	180,4	210,3	238,4	290,9	321,2	357,2	414,8	474,3	539,4	620,3	689,5	755,1
EER Gross	W/W	4,25	4,32	4,31	4,20	4,22	4,20	4,26	4,23	4,26	4,24	4,25	4,24
EER Net	W/W	3,57	3,58	3,59	3,57	3,59	3,61	3,68	3,72	3,76	3,75	3,72	3,70
Flow rate (4)	m^3/h	68,0	79,5	90,4	109,7	121,8	136,1	161,3	186,2	213,9	245,3	270,6	294,9
Pressure drop	kPa	52,2	51,7	52,3	53,3	54,2	50,9	48,7	50,1	51,4	52,4	53,6	53,6
Circuits	n°	2	2	2	2	2	2	2	2	2	2	2	2
Compressors	n°	2	2	2	2	2	2	2	2	2	2	2	2
Free Cooling (2)													
Cooling capacity	kW	389,7	482,4	494,6	585,3	591,4	674,2	681,1	779,4	786,5	964,8	1170,6	1182,8
Input power	kW	16,4	20,5	22,6	24,6	27,1	28,7	31,6	32,8	36,1	41,0	49,2	54,1
Input current	A	31,5	39,3	43,2	47,2	51,9	55,0	60,5	62,9	69,2	78,6	94,4	103,8
EER	W/W	23,8	23,5	21,9	23,8	21,9	23,5	21,6	23,8	21,8	23,5	23,8	21,9
Flow rate (4)	m^3/h	73,8	91,4	93,7	110,9	112,0	127,7	129,0	147,6	149,0	182,8	221,7	224,0
Pressure drop	kPa	159,5	166,3	154,2	152,4	143,9	142,8	129,2	129,5	122,9	127,1	134,0	128,9
Free Cooling (3)													
Cooling capacity	kW	268,76	332,69	341,10	403,66	407,86	464,97	469,72	537,52	542,41	665,38	807,31	815,72
Input power	kW	16,4	20,5	22,6	24,6	27,1	28,7	31,6	32,8	36,1	41,0	49,2	54,1
Input current	A	31,5	39,3	43,2	47,2	51,9	55,0	60,5	62,9	69,2	78,6	94,4	103,8
EER	W/W	16,4	16,2	15,1	16,4	15,1	16,2	14,9	16,4	15,0	16,2	16,4	15,1
Flow rate (4)	m^3/h	50,9	63,0	64,6	76,5	77,3	88,1	89,0	101,8	102,7	126,0	152,9	154,5
Pressure drop	kPa	75,8	79,1	73,3	72,5	68,4	67,9	61,4	61,6	58,5	60,4	63,7	61,3
Axial fans													
Quantity	n°	8	10	10	12	12	14	14	16	16	20	24	24
Total air flow	m^3/h	163200	204000	214200	244800	257040	285600	299880	326400	342720	408000	489600	514080
Total power input	kW	16,4	20,5	22,6	24,6	27,1	28,7	31,6	32,8	36,1	41,0	49,2	54,1
Total input current	A	31,5	39,3	43,2	47,2	51,9	55,0	60,5	62,9	69,2	78,6	94,4	103,8
Weight													
Transport weight	kg	4825	5931	6079	7778	7924	8435	8576	9552	9695	10587	11722	11895
Operating weight	kg	5017	6170	6322	8067	8215	8768	8912	9937	10082	11064	12299	12477
Dimensions													
Length	mm	4750	5720	5720	6700	6700	7670	7670	9800	9800	10770	13200	13200
Width	mm	2300	2300	2300	2300	2300	2300	2300	2300	2300	2300	2300	2300
Height	mm	2560	2560	2560	2560	2560	2560	2560	2560	2560	2560	2560	2560
Sound data													
Total LWA (5)	dB(A)	101,3	101,9	102,4	103,0	103,6	104,1	104,7	105,3	105,9	106,5	107,1	107,7
Total SPL 1m (6)	dB(A)	80,7	81,3	81,8	82,4	83,0	83,5	84,1	84,7	85,3	85,9	86,5	87,1
Power supply													
Voltage/phase/frequency	V/ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
General electrical data													
Maximum input power	[A]	283	321	366	441	497	569	646	737	840	801	1004	1121
Maximum input current	[A]	341	393	458	538	618	686	824	904	1079	1132	1399	1579

(1) Water in/out: 15/10°C - Ambient air temperature 30°C
(2) Water in/out: 15/10°C - Ambient air temperature 0°C
(3) Water in/out: 15/10°C - Ambient air temperature 5°C
(4) Hydraulic data referred to fluid Glycol 30%
(5) Sound power level in accordance with ISO 3744.
(6) Sound pressure level at 1m from the unit in free field conditions, in accordance with ISO 3744

RAH F Kh		302	352	402	482	542	602	722	822	902	1002
Cooling mode (R1234Ze) (1)											
Cooling capacity	kW	338,2	408,7	459,5	529,9	610,7	690,3	816,2	927,0	1020,5	1147,5
Compressor input power	kW	87,8	106,3	120,9	137,5	156,3	176,7	208,2	235,0	257,4	290,0
Total input power	kW	107,0	127,4	144,9	163,9	185,1	208,4	241,8	271,9	295,8	332,3
Nominal input current	A	188,6	224,5	255,4	288,8	326,1	367,1	426,0	479,1	521,1	585,4
EER Gross	W/W	3,85	3,84	3,80	3,85	3,91	3,91	3,92	3,95	3,96	3,96
EER Net	W/W	3,16	3,21	3,17	3,23	3,30	3,31	3,38	3,41	3,45	3,45
Flow rate (4)	m^3/h	62,9	76,0	85,4	98,5	113,6	128,4	151,8	172,4	189,8	213,4
Pressure drop	kPa	55,8	55,2	55,9	57,0	57,9	54,4	52,1	53,5	54,9	56,0
Circuits	n°	2	2	2	2	2	2	2	2	2	2
Compressors	n°	2	2	2	2	2	2	2	2	2	2
Free Cooling (2)											
Cooling capacity	kW	383,2	391,3	478,6	485,4	576,6	587,5	674,3	679,7	766,4	782,6
Input power	kW	19,2	21,1	24,0	26,4	28,8	31,7	33,6	37,0	38,4	42,2
Input current	A	36,8	40,5	46,0	50,6	55,2	60,8	64,4	70,9	73,6	81,0
EER	W/W	20,0	18,5	19,9	18,4	20,0	18,5	20,1	18,4	20,0	18,5
Flow rate (4)	m^3/h	72,6	74,1	90,7	91,9	109,2	111,3	127,7	128,7	145,2	148,2
Pressure drop	kPa	172,2	150,5	160,9	147,6	151,5	138,9	134,9	127,8	130,2	125,0
Free Cooling (3)											
Cooling capacity	kW	264,28	269,86	330,07	334,76	397,66	405,17	465,03	468,76	528,55	539,72
Input power	kW	19,2	21,1	24,0	26,4	28,8	31,7	33,6	37,0	38,4	42,2
Input current	A	36,8	40,5	46,0	50,6	55,2	60,8	64,4	70,9	73,6	81,0
EER	W/W	13,8	12,8	13,8	12,7	13,8	12,8	13,8	12,7	13,8	12,8
Flow rate (4)	m^3/h	50,1	51,1	62,5	63,4	75,3	76,7	88,1	88,8	100,1	102,2
Pressure drop	kPa	81,9	71,6	76,5	70,2	72,1	66,1	64,2	60,8	61,9	59,5
Axial fans											
Quantity	n°	8	8	10	10	12	12	14	14	16	16
Total air flow	m^3/h	156800	164640	196000	205800	235200	246960	274400	288120	313600	329280
Total power input	kW	19,2	21,1	24,0	26,4	28,8	31,7	33,6	37,0	38,4	42,2
Total input current	A	36,8	40,5	46,0	50,6	55,2	60,8	64,4	70,9	73,6	81,0
Weight											
Transport weight	kg	4810	4980	6528	6695	7920	8093	8635	8821	9810	10165
Operating weight	kg	4994	5167	6758	6927	8196	8373	8958	9146	10178	10539
Dimensions											
Length	mm	4750	4750	5720	5720	6700	6700	7670	7670	9800	9800
Width	mm	2300	2300	2300	2300	2300	2300	2300	2300	2300	2300
Height	mm	2560	2560	2560	2560	2560	2560	2560	2560	2560	2560
Sound data											
Total LWA (5)	dB(A)	103,6	104,0	104,5	105,0	105,5	106,0	106,5	107,0	107,5	108,0
Total SPL 1m (6)	dB(A)	83,0	83,4	83,9	84,4	84,9	85,4	85,9	86,4	86,9	87,4
Power supply											
Voltage/phase/frequency	V/ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
General electrical data											
Maximum input power	[A]	357	431	488	559	637	727	830	791	986	1101
Maximum input current	[A]	426	503	581	646	782	859	1033	1081	1335	1508

(1) Water in/out: 15/10°C - Ambient air temperature 30°C
(2) Water in/out: 15/10°C - Ambient air temperature 0°C
(3) Water in/out: 15/10°C - Ambient air temperature 5°C
(4) Hydraulic data referred to fluid Glycol 30%
(5) Sound power level in accordance with ISO 3744.
(6) Sound pressure level at 1m from the unit in free field conditions, in accordance with ISO 3744

RAH F HE Kh		302	352	402	482	542	602	722	822	902	1002
Cooling mode (R1234Ze) (1)											
Cooling capacity	kW	357,8	438,4	499,4	561,9	655,5	749,2	866,8	982,1	1075,7	1203,0
Compressor input power	kW	82,7	101,7	117,1	127,3	146,5	166,8	194,4	219,1	242,0	267,7
Total input power	kW	99,1	122,2	139,6	151,9	173,5	195,5	226,0	251,9	278,1	308,7
Nominal input current	A	174,6	215,4	246,0	267,7	305,7	344,4	398,2	443,8	490,0	543,8
EER Gross	W/W	4,33	4,31	4,27	4,41	4,48	4,49	4,46	4,48	4,44	4,49
EER Net	W/W	3,61	3,59	3,58	3,70	3,78	3,83	3,84	3,90	3,87	3,90
Flow rate (4)	m^3/h	66,5	81,5	92,9	104,5	121,9	139,3	161,2	182,6	200,1	223,7
Pressure drop	kPa	52,2	51,7	52,3	53,3	54,2	50,9	48,7	50,1	51,4	52,4
Circuits	n°	2	2	2	2	2	2	2	2	2	2
Compressors	n°	2	2	2	2	2	2	2	2	2	2
Free Cooling (2)											
Cooling capacity	kW	389,7	482,4	494,6	585,3	591,4	674,2	681,1	779,4	786,5	964,8
Input power	kW	16,4	20,5	22,6	24,6	27,1	28,7	31,6	32,8	36,1	41,0
Input current	A	31,5	39,3	43,2	47,2	51,9	55,0	60,5	62,9	69,2	78,6
EER	W/W	23,8	23,5	21,9	23,8	21,9	23,5	21,6	23,8	21,8	23,5
Flow rate (4)	m^3/h	73,8	91,4	93,7	110,9	112,0	127,7	129,0	147,6	149,0	182,8
Pressure drop	kPa	162,2	162,9	151,2	158,0	143,7	140,8	129,2	130,7	126,5	133,0
Free Cooling (3)											
Cooling capacity	kW	268,76	332,69	341,10	403,66	407,86	464,97	469,72	537,52	542,41	665,38
Input power	kW	16,4	20,5	22,6	24,6	27,1	28,7	31,6	32,8	36,1	41,0
Input current	A	31,5	39,3	43,2	47,2	51,9	55,0	60,5	62,9	69,2	78,6
EER	W/W	16,4	16,2	15,1	16,4	15,1	16,2	14,9	16,4	15,0	16,2
Flow rate (4)	m^3/h	50,9	63,0	64,6	76,5	77,3	88,1	89,0	101,8	102,7	126,0
Pressure drop	kPa	77,1	77,5	71,9	75,1	68,4	66,9	61,5	62,2	60,2	63,2
Axial fans											
Quantity	n°	8	10	10	12	12	14	14	16	16	20
Total air flow	m^3/h	163200	204000	214200	244800	257040	285600	299880	326400	342720	408000
Total power input	kW	16,4	20,5	22,6	24,6	27,1	28,7	31,6	32,8	36,1	41,0
Total input current	A	31,5	39,3	43,2	47,2	51,9	55,0	60,5	62,9	69,2	78,6
Weight											
Transport weight	kg	4945	6074	6671	8385	8061	8596	8769	9775	9940	11023
Operating weight	kg	5137	6313	6914	8674	8352	8929	9105	10160	10327	11500
Dimensions											
Length	mm	4750	5720	5720	6700	6700	7670	7670	9800	9800	10770
Width	mm	2300	2300	2300	2300	2300	2300	2300	2300	2300	2300
Height	mm	2560	2560	2560	2560	2560	2560	2560	2560	2560	2560
Sound data											
Total LWA (5)	dB(A)	102,6	103,2	103,7	104,3	104,9	105,4	106,0	106,6	107,2	107,8
Total SPL 1m (6)	dB(A)	82,0	82,6	83,1	83,7	84,3	84,8	85,4	86,0	86,6	87,2
Power supply											
Voltage/phase/frequency	V/ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
General electrical data											
Maximum input power	[A]	357	431	488	559	637	727	830	791	986	1101
Maximum input current	[A]	426	503	581	646	782	859	1033	1081	1335	1508

(1) Water in/out: 15/10°C - Ambient air temperature 30°C
(2) Water in/out: 15/10°C - Ambient air temperature 0°C
(3) Water in/out: 15/10°C - Ambient air temperature 5°C
(4) Hydraulic data referred to fluid Glycol 30%
(5) Sound power level in accordance with ISO 3744.
(6) Sound pressure level at 1m from the unit in free field conditions, in accordance with ISO 3744