

MARK: Telecommunication packaged air conditioners
with free-cooling system for indoor or outdoor installation.
Cooling Capacity: 5,8 ÷ 9,1 kW



NEW!!!
RC Hi-Tech

UPS_{48VDC}
RC Hi-Tech

INVERTER
RC Hi-Tech

FREE COOLING
RC Hi-Tech

rcgroupairconditioning



MAIN FEATURES

- Telecommunication packaged air conditioners.
- Proportional automatic free-cooling system. Three working mode.
- 3 models available for a wide selection opportunity.
- Modulating cooling capacity control.
- Rotary or On/off or BLDC scroll compressor.
- EER up to 4,3.
- R410A refrigerant charge.
- EC plug-fans.
- Horizontal air flow.
- Double power supply (Network + 48VDC UPS)
- Suitable for indoor or outdoor installation.

MAIN BENEFITS

- The proprietary software foresees unit working with the lowest noise emission during the night.
- Working continuity even during black-out periods.
- Automatic restart of the unit.
- BLDC Inverter scroll compressor and EC plug-fans for a higher energy efficiency.
- Availability of electric heater.
- Choice between indoor and outdoor installation.
- Free-cooling operation with +45% of air flow compared to the mechanical cooling operation. This allows to transfer more cooling power to the air conditioned room, maximizing energy savings.
- Easily of maintenance.

SUITABLE FOR INDOOR OR OUTDOOR INSTALLATION

FREE-COOLING SYSTEM

- Proportional free-cooling system
- The free-cooling system does not require the installation of overpressure damper or air expulsion system, into the room. The layout of the unit allows the expulsion of air injected with the free-cooling system directly from the machine.

DOUBLE POWER SUPPLY

(Network + 48VDC UPC)

WORKING LIMITS

Room humidity from 20 up to 75% rH

Room temperature from 10 up to 42°C

Ambient temperature from -20 up to 42°C



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1 9 6 3 2 0 1 3
fiftycoolyears

MAIN COMPONENTS

FRAMEWORK

- Base and frame in galvanized steel sheet, painted with epoxy powders.
- Galvanized steel sheet panels painted with epoxy powders, internally insulated with noise absorption material and seals to ensure air tight with the panels.
- Panels fixed with safety screws.
- Total front access for routine maintenance.
- Brackets for unit wall mounting.
- Colour RAL 9002

ON / OFF COMPRESSOR

MARK 06

- Rotary compressor with rotary vane optimized for R410A refrigerant.
- Electric motor with direct on line starting.
- Rubber supports.

MARK 09

- Scroll compressor with spiral profile optimized for R410A refrigerant.
- Electric motor with direct on line starting.
- Rubber supports.

INVERTER DRIVEN COMPRESSOR

MARK 10 INV

- scroll compressor BLDC inverter with spiral profile optimized for R410A refrigerant.
- Synchronous brushless inverter driven motor.
- Inverter for modulating capacity control.
- Reactance for the reduction of electromagnetic noise and interference.
- Crankcase heater.
- Rubber supports.
- Soundproof cap.

FILTER SECTION

- Washable air filters with G4 efficiency, with cells in synthetic fibre and metallic frame (EN 779-2002).

EVAPORATING SECTION

- Heat exchanger coil with internally corrugated copper tubes and high efficiency aluminium fins, specifically developed to provide high heat transfer and lower pressure drops.
- Frame in galvanized steel.
- Condensate tray in peraluman with PVC flexible discharge pipe.

SUPPLY FANS SECTION

Power supply 48VDC from UPS

- Centrifugal fans with backward curved blade, single suction and without scroll housings (Plug-fan), directly coupled to external rotor electric motor.
 - Impeller in aluminium exempt from rust formation.
 - Brushless type synchronous EC motor with integrated electronic commutated system and continuous variation of the rotation speed.
 The motor rotation control is obtained with the EC system (Electronic Commutation) that manage the motor according to the signal coming from the microprocessor control.
- Temperature sensor on room air intake
- Temperature sensor on room air delivery.
- Grille on room air suction.
- Grille on room air delivery.
- System for air flow loss alarm

REFRIGERANT CIRCUIT

- Thermostatic expansion valve for models MARK 06 and MARK 09.
- Electronic expansion valve for model MARK 10 INV
- Sight glass.
- Filter dryer on liquid line.
- Pressure transducer with indication, control, protection and limit functions on high pressure.
- Pressure transducer with indication, control and protection functions on low pressure.
- Refrigerant circuit with copper tubing with anticondensate insulation of the suction line.
- R410A refrigerant charge and lubricant oil

CONDENSING COIL

- Heat exchanger coil with high efficiency aluminium fins, specifically developed to provide high heat transfer and lower pressure drops. The combination of two factors, special tubes and fins, allow to optimally combine the following aspects:
 - Maximum capacity relative to the size of the exchanger.
 - Minimum charge of refrigerant.
 - Reduction of the air flow required for the heat exchange.
- Frame in galvanized steel.
- Grille on air suction/discharge.

CONDENSER FANS SECTION

Power supply 48VDC from UPS

- Centrifugal fans with backward curved blades, single suction and without scroll housings (Plug-fan), directly coupled to external rotor electric motor.
 - Impeller in aluminium exempt from rust formation.
 - Brushless type synchronous EC motor with integrated electronic commutated system and continuous variation of the rotation speed.
 The motor rotation control is obtained with the EC system (Electronic Commutation) that manage the motor according to the signal coming from the microprocessor control.

DIRECT FREE-COOLING SECTION

Power supply 48VDC from UPS

- Deviating damper on ambient air.
 - Proportional servomotor directly driven by microprocessor control.
 - Grille on ambient air suction.
 - Temperature sensor on ambient air.
- The free-cooling system does not require the installation of overpressure damper or air expulsion system, into the room.

ELECTRICAL PANEL

In accordance with EN60204-1 norms, suitable for outdoor installation, complete with:

- Double power supply, from network and from UPS 48VDC
- MARK 06 – MARK 10 INV:
 - 230/1/50 power supply for compressor and eventual electric heater.
- MARK 09:
 - 400/3/50 power supply for compressor and eventual electric heater.
- For all units:
 - 48 VDC power supply from UPS for supply fan, condenser fan, free-cooling damper servomotor, auxiliary circuit and microprocessor control.
- Magnetothermic switch for 230/1/50 or 400/3/50 power supply line (from network)
- Magnetothermic switch for 48VDC power supply line (from UPS)
- Contactor on compressor (models MARK 06 and MARK 09)
- Phases monitoring relay (model MARK 09)
- Auxiliary circuit 48VDC (from UPS).
- Terminals for General Alarm

CONTROL SYSTEM

Power supply 48VDC from UPS

- Microprocessor system for control and monitor of operating and alarms status. The system includes:
 - 8-line remote display with keyboard. The display is supplied with a cable for connection to the controller and integrated magnetic plate. IP65 class protection.
 - Real time clock.
 - Main components hour-meter.
 - Menu with protection password.
 - Integrated RS485 serial line port.
 - Integrated Ethernet port
 - LAN connection.
 - Automatic restart of the unit in case of power failure
 - LN function to obtain a low noise unit running. The system works proportionally to the load on the fan rotation speed either of the

condenser fan or the supply fan. The system allows a low noise unit running during night time anyway according to the programmed sets.

- AIO (All In One) function of the Free-Cooling system. During free-cooling operation are used at the same time the supply fan and the condenser fan at higher speeds (+45% of air flow) compared to the mechanical cooling operation. This allows to transfer more cooling power to the air conditioned room, maximizing energy savings.
- The layout of the unit allows the expulsion of air injected with the free-cooling system directly from the machine avoiding the installation of overpressure damper.
- NBC (No Break Cooling) function to ensure continuity of cooling in alarm condition. The free-cooling system automatically activates the case of alarm / lock of the compressor or black-out of the electricity grid.

OPTIONAL ACCESSORIES - MARK

MARK MODEL	06	09	10 INV
311 - Electric heater	•	•	•
909 - Clogged filters alarm	•	•	•
911 - Water presence alarm	•	•	•

• available accessory; - not available accessory

TECHNICAL DATA

Model		06	09	10 INV	10 INV	10 INV
Cooling capacity(1)				min	nom	max
Total	kW	5,8	9,0	4,3	7,1	9,1
Sensible	kW	5,8	9,0	4,3	7,1	9,1
SHR	kW/kW	1,0	1,0	1,0	1,0	1,0
Unit power input	kW	1,9	3,2	1,0	1,9	3,4
Treatment fans	n.	1	1	1	1	1
Air flow	m³/h	1200	2000	2000	2000	2000
Compressors	rotary	scroll	scroll inverter	scroll inverter	scroll inverter	scroll inverter
Quantity	n.	1	1	1	1	1
Capacity steps	n.	1	1	MOD	MOD	MOD
Condenser fans	n.	1	1	1	1	1
Air flow	m³/h	2000	3200	3200	3200	3200
Refrigerant	R410A	R410A	R410A	R410A	R410A	R410A
Total refrigerant charge	Kg	1,7	1,7	1,7	1,7	1,7
Gas circuits	n.	1	1	1	1	1
Power supply	V/Ph/Hz	230-1-50 + 48 VDC	400-3-50 + 48 VDC	230-1-50 + 48 VDC	230-1-50 + 48 VDC	230-1-50 + 48 VDC
Max operating current (FLA)		26,8	28,2	43,2	43,2	43,2
Starting current (LRA)		74,0	67,2	24,2	24,2	24,2
EER (1)	kW/kW	3,06	2,79	4,3	3,65	2,64
Sound pressure - ISO 3744 (2)						
In-room side	dB(A)	42,8	52,6	52,6	52,6	52,6
Ambient side	dB(A)	53,7	62,3	62,3	62,3	62,3
Net weight	Kg	196	200	187	187	187

THE COOLING CAPACITY DOES NOT CONSIDER THE SUPPLY FANS MOTOR THERMAL LOAD

(1) Referred to entering air at 30°C with 35% RH and outdoor air temperature 35°C

(2) Sound pressure 1m far in free field according to ISO3744 norm.

DIMENSIONS (mm)

SIZE

	a	b	c
MARK	750	660	1995

