

# REC-500-230-48-K9

## AC-DC CONVERTER



POSITIVE PROBLEM SOLVING **+ =**

This compact rectifier system is aimed at the  $\sim 48\text{VDC}$  telecom battery sector. The output is provided by three independent connectors.

The maximum current of the connectors can be adjusted between 0 to 5A. Each of the outputs can be switched off so that non critical loads can be removed to enable the battery to support the critical loads. The rectifier and controller modules can be hot swapped without supply AC or DC supply interruptions. Control and monitoring of the system can be achieved via an integrated Ethernet interface.

- + Operation  $-40$  to  $+70^{\circ}\text{C}$  ( $-25$  to  $+60^{\circ}\text{C}$  Without Derating)
- + Eight Alarm Inputs (eg Door Contacts, Temp Alarms etc)
- + System Expansion with Optional Management Systems
- + All PCB's Protected Against Humidity
- + ETSI or 19" Mount Options

# REC-500-230-48-K9

## AC-DC CONVERTER



### SELECTION TABLE

Part Number	Max. Power	Output Voltage	Max System Current	Dimensions [W × H × D]
REC-250-230-48-K9	250W	52VDC	4.8A	19" × 1U × 240mm
REC-500-230-48-K9	500W	52VDC	9.6A	19" × 1U × 240mm

Different output ranges and application/user specific options are possible. Please contact ETPS Ltd to discuss your requirements.

### OPTIONS

CODE	DESCRIPTION
/MCON500	Controller module
/MBATT500	Electronic connection module
/MREC250	250W rectifier module
/EKA50 797-H	Battery measurement test lead, monitors power and temperature
/VX-ZDC13	Set power connector
/VX-ZDC14	Phoenix DC-out set multi-function port connector



## OPTION INFORMATION

### RECTIFIER MODULE

MREC250 modules for installation in the REC-500 sub rack are hot pluggable, i.e. they can be mounted in the sub rack or extracted during operation. The decoupling of the DC bus system and active load sharing of individual modules with the resulting module redundancy provides a system with a very high availability.

Nominal Output Voltage	52VDC
Output Power	Maximum 250W
Output Current	Maximum 5A
Efficiency	>92% nominal load
Output Characteristic	VI characteristic
Output Ripple	<100mVpp
Parallel Operation	Redundant decoupling of 250W modules with diode function
Load Sharing	Active, accuracy $\pm 10\%$
Signalling LED Green	DC ok
Signalling LED Red	AC ok
Weight	0.7kgs

### CONTROLLER MODULE

The controller module is used for controlling and monitoring the REC500-230-48-K9 system via the internal CAN bus. The Local Craft Terminal (LCT) LAN interface permits the connection of a local PC or network. A clear and easy-to-operate user interface facilities control, programming and linkage of all controller parameters depending on user requirement.

Connector	D-SUB HD 44	<ul style="list-style-type: none"> <li>+ RS-232 interface: for external sensors (12V auxiliary voltage)</li> <li>+ Temperature measurements with PT1000 (2x)</li> <li>+ Switching outputs for external components</li> <li>+ 8 alarm inputs</li> <li>+ PVM output to external fan control</li> <li>+ Alarm outputs (2x):                             <ul style="list-style-type: none"> <li>- Free programmable</li> <li>- Floating (potential-free)</li> </ul> </li> </ul>
LCT Protocol	TCP/IP	
LCT Connector	RJ45	
Signalling: LED Green	Ok	
Signalling: LED Red	Alarm (general alarm)	

### CONNECTION MODULE

The connection module permits an electronically controlled distribution via three DC outputs. Each output is electronically overcurrent protected. The tripping current is adjusted via the software. After tripping, the output can be reset manually by means of a push button. Alternatively, a reset is also possible via the management system. All outputs can be switched individually. To save battery capacity, certain outputs can be switched off, such as by means of a time-control command or triggered by a power supply failure. In this case, the shutdown can take place immediately or with a certain delay. The device has an integrated impedance bridging for the connection of 12V or 24V batteries. The battery connection is made possible by the controller item PI-CRT2004 and can be parameterised via the operating software.

Battery Current Limit	20A	<ul style="list-style-type: none"> <li>+ CAN bus controlled</li> <li>+ All three outputs are electronically protected</li> <li>+ Power measurement at each output</li> <li>+ Programmable tripping current</li> <li>+ Outputs separately switchable</li> <li>+ Function display via LED</li> <li>+ Manual reset</li> <li>+ Battery connect (only possible with controller):                             <ul style="list-style-type: none"> <li>- 250W at 24V batteries</li> <li>- 500W at 48V batteries</li> </ul> </li> </ul>
Connectors	Type D-SUB 7W2	
DC Out, 1-3	Adjustable via controller 0-5A, is given 5A	
Max. Sum Current	10A	
Plug Connector	Type Phoenix MCV1.5/3-GF-3.81	
Reset	Manually via reset button (protected against unintentional actuation)	
Signalling: LED Green	Operation	
Signalling: LED Red	Failure, shutdown	

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# REC-500-230-48-K9

## AC-DC CONVERTER



### TECHNICAL DATA

#### GENERAL

Electrical Safety	EN 60950, UL 94
Protection Class	1 to EN 60950
Pollution Degree	2 to EN 60950
Isolation	Primary - secondary 3.75kVDC
PFC	According to EN 61000-3-2, >0.98 at 100% load, >0.95 at 60% load
Ventilation	Forced ventilation, electronically controlled fans
MTBF	140.000h

#### PROTECTION FUNCTIONS

AC Input	Overvoltage, according to EN 61000-4-1 (VDE 0160): 750 VAC 0.1/1.3ms
DC Output	Overvoltage, repetitive trace function, tripping value $\leq 60$ VDC
DC Output	Short circuit current IC = 5.3A each rectifier module (without battery), short circuit proof
Leakage Current	A fixed protective earth (PE) connection must be setup

#### MECHANICAL DATA

Construction	For mounting in ETSI and 19" racks (flange can be supplemented)
Weight : Module Rack	Approximately 5.5kg (including controller + fuse panel)
Weight: Single Rectifier	Approximately 0.7kg

#### INPUT

Mains Input Voltage	230VAC, 50/60Hz
Voltage Range	$\pm 20\%$ (184 - 276VAC)
Frequency Range	45 - 66Hz, sine wave
Mains Connection	Single Phase

#### OUTPUT

DC Voltage	52DC, positive connected to housing/protective earth
Output Voltage Tolerance	$\pm 2\%$
Output Power	From 250-500W, without derating up to 60°C ambient temperature
Output Characteristic	VI characteristic
Output Ripple	<100ms mVpp
Efficiency	>92%
Parallel Operation	Redundant de-coupling of the 250W modules with diode function included
Load Sharing	Active, accuracy $\pm 10\%$



## TECHNICAL DATA

### ENVIRONMENTAL CONDITIONS

Operation	ETS 300 019-1-3 class 3.3, extended to +60°C ambient temperature
Transport	ETS 300 019-1-2 class 2.3
Storage	ETS 300 019-1-1 class 1.2
Isolation Group	EN 60950, pollution degree 2
Ambient Temperature During Operation	-25°C to +60°C
Cold Start	-40°C, adherence to tolerances from -25°C
Maximum Ambient Temperature	+70°C, from 60°C with derating = 2.5% /°C
Relative Humidity	0% to 100%, start-up after drying
Maximum Operation Altitude	2000 metres
Protection	IP20

### SIGNALS

Visual: Controller	LED red = alarm, LED green = OK
Visual: Rectifier	LED green = DC OK, LED green = AC OK
Alarm Inputs	8 x for potential free alarm contacts
Alarm Contacts	2 x programmable, potential free alarm contacts, maximum 125VDC, 500mA
Temperature Sensor	2 x PT1000 sensors inputs via signal connector
TCP / IP Ethernet	Interface for data reading at the controller, parameter adjustment via monitoring software

### BATTERY MANAGEMENT

LVD	Integrated low voltage disconnect relay
Battery Test	Adjustable via Ethernet interface in combination with a monitoring software
Temperature Monitoring	PT1000 sensor
Connecting Of	12V battery = 250W, 24V battery = 500W

### CONNECTION TERMINALS

AC Input	3 x 1mm <sup>2</sup> connecting cable
DC Output at the Module	MCV1.5/3-GF-3.81
Alarm/Signal Contacts	D-SUB, 44-pole, female (programmable)
LCT	RJ45

### BATTERY MODULE (OPTIONAL)

Battery	Type D-SUB 7W2
Distribution	OUT 1-3: MCV1.5/3-GF-3.81

### OTHER

Cooling: Rectifier Modules	Horizontal forced ventilation, with fan failure detection
Warranty	24 months
EMC: Emission	EN 55022, class B, ETS 300 386 V1.3.1
EMC: Immunity	EN 55024, EN61000-6-2 (industrial areas)

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