

# AC-DC Converter REC500-230-48-K9

## Rectifier System for Telecom-, Industrie- and Railapplications

### Specification

#### General

Electrical safety	EN 60950, UL 94
Protection class	1
Pollution degree	2
Isolation	primary – secondary 3.75 kV <sub>DC</sub>
PFC	according to EN 61000-3-2, >0,98
at	100% load; >0,95 at 60% load
Ventilation	forced ventilation, electronically monitored fans
MTBF	140 000 h



Picture may differ from actual device

#### Electrical data

##### Input

Mains input voltage nom.	$U_N = 230V_{AC}, 50/60 \text{ Hz}$
Voltage range	+/- 20% (184 – 276) V <sub>AC</sub>
Frequency range	45-66 Hz, sine wave
Mains connection	1-phase

##### Output

Output voltage	52V <sub>DC</sub> , positive mass associated with housing / protective earth
Output voltage tolerance	+/- 2%
Output power	from 250 - 500W, without derating up to 60°C ambient temperature
Output characteristic	UI characteristic
Output ripple	<100 mVpp
Efficiency	>91%
Parallel operation	redundant de-coupling of the 250W modules with diode function
Load sharing	active, accuracy +/-10%

#### Environmental conditions

Conditions during operation	ETS 300 019-1-3 class 3.3, extended to +60°C ambient temperature
during transport	ETS 300 019-1-2 class 2.3
during stocking	ETS 300 019-1-1 class 1.2
Isolation group	according to EN 60950, pollution degree 2
Ambient temperature during operation	-25°C to +60°C
Cold start	-40°C, adherence of tolerances from -25°C
Maximum ambient temperature	+70°C, from +60°C with derating = 2,5% per 1°C
Rel. humidity	0% to 100%, start-up after drying up
Maximum operation altitude	2000 meters
Protection	IP 20

#### EMC

Emission	EN 55022, class B, ETS 300 386 V1.3.1
Immunity	EN 55024, EN 61000-6-2 (Industrial areas)

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### Specification

#### Signals

Visual	Controller:	LED red = Alarm LED green = o.k.
	Rectifier:	LED green = DC o.k. LED green = AC o.k.
Alarm inputs	8 x for potential free alarm contacts	
Alarm contacts	2 x programmable, potential free alarm contacts, max. 125 V <sub>DC</sub> , 500 mA	
Temperature sensor	2x PT1000 sensor inputs via signal connector	
TCP/IP Ethernet	interface for data reading at the controller, parameter adjustment via monitoring software	



#### Mechanical data

Construction	for mounting in ETSI- and 19"-racks (flange can be supplemented)
Dimension	19" x 240 mm x 1U (W x D x H)
Weight	Module rack + controller + fuse panel approx. 5,5 kg
Single rectifier	approx. 0,7 kg

#### Battery management (optional with battery module and controller)

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 contacts	D-SUB, 44-pole, female (programmable)
Signal contacts	D-SUB, 44pole, female (programmable)
LCT	RJ45

#### Protection functions

AC input	overvoltage, according to EN 61000-4-1 (VDE 0160): 750 V <sub>AC</sub> 0,1/1,3 ms
DC output	overvoltage, repetitive trace function, tripping value ≤ 60 V <sub>DC</sub>  short circuit current I <sub>c</sub> = 5,3A each rectifier module (without accumulator), short-circuit proof
Leakage current	a fixed protective earth (PE) connection must be setup

#### Batterymodule:

Battery	Type D-SUB 7W2
Distribution	OUT 1 MCV1,5/3-GF-3,81 OUT 2 MCV1,5/3-GF-3,81 OUT 3 MCV1,5/3-GF-3,81

#### Cooling

Rectifier modules	horizontal forced ventilation, with fan failure detection
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**Warranty** 24 months

**Order code** MBGT500-K9

# Power Rectifier Module for REC500

## General Description

### Power Rectifier Module 250W

MREC250-modules for installation in the REC500 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.



## General Technical Specifications

Output		Signaling	
Nominal voltage	52V <sub>DC</sub> ,	LED green	DC ok
Output power	max. 250W	LED green	AC ok
Output current	max. 5A		
Efficiency	>92% at nominal load		
Output characteristic	UI characteristic		
Output ripple	< 100 mVpp		
Parallel operation	redundant decoupling of 250W modules with diode function		
Load sharing	active, accuracy +/-10%		

**Order code:**

**MREC250-230-48-K9**

# Controller Module for REC500

## General Description

### Controller Module

The Controller Module is used for controlling and monitoring the REC500 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 facilitates control, programming and linkage of all Controller parameters depending on user requirements.

- Hot plug-in capability
- No AC/DC power supply interruption in case of Controller exchange or failure
- Output voltage control via temperature-dependent charging characteristic
- External alarm inputs
- RS232 for external modules
- Freely programmable alarm relays
- PCBs protected against humidity
- **Optional:**  
**Expandable with Management System**



## General Technical Specifications

### Multifunctional-port

- RS232 Interface:  
for external sensors (12V auxiliary voltage)  
e.g. RFID card reader  
e.g. smoke or gas sensors
- Temperature measurements with PT1000 (2x)
- Switching outputs for external components
- 8 alarm inputs
  - e.g. door contacts
  - e.g. temperature alarms
- PWM output to external fan control
- Alarm outputs (2x),
  - Freely programmable
  - Floating (potential-free)

### Connector

D-SUB HD 44

### Signaling

LED green      ok.  
LED red        Alarm (general alarm)

### Local Craft Terminal (LCT)

Connector	RJ45
Protocol	TCP/IP

### Order code:

**MCON500-230-48-K9**

# Electronic Connection Panel for REC500

## General Description

### Connection Module for the REC500 System

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 – for example – 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 power available at the outputs can be measured.

- CAN bus controlled
- All six outputs are electronically protected
- Programmable tripping current
- Power measurement at each output
- Outputs separately switchable
- Manual reset
- Function display via LED



The device has 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 parameterized via the operating software.

## General Technical Specifications

### Connecting:

Battery connect 250W at 12V batteries  
(only possible with controller) 500W at 24V batteries

Battery current limit 20A

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

### Signaling

LED green Operation  
LED red Failure, shutdown

**Reset** Manually via Reset button (protected against unintentional actuation)

**Order code:** MBATT500-24-K9