

# AC-DC Converter REC2400-230-110-K10

Rectifier System for Telecom-, Industrie- and Railapplications

## Specification

### General

Electrical safety	EN 60950, UL 94
Protection class	1
Pollution degree	2
Isolation	primary – secondary 3.75kV <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 Hz
Voltage range	+/-20% (184 – 276) V <sub>AC</sub>
Frequency range	45-66 Hz, sine wave
Mains connection	1+1 phase
Commercial power line	TT and TN-Net according to EN60950

#### Output

Output voltage	110V <sub>DC</sub> , potential free
Output voltage tolerance	temperature controlled battery loading characteristic
Output power	from 600 - 2400W, module size = 600W, without derating up to 60°C ambient temperature
Output characteristic	UI characteristic
Output ripple	<100 mV <sub>pp</sub>
Efficiency	>91% at nom. load
Parallel operation	redundant de-coupling of the 600W 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 +70°C, at 60°C derating 2,5% per 1°C non condensing
Cold start	-40°C, adherence of tolerances from -25°C
Rel. humidity	0% to 100%, start-up after drying up
Maximum operation altitude	3000 meters
Protection	IP 20
<b>EMC</b>	
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	4 programmable, potential free alarm contacts, max. 125V <sub>DC</sub> , 500 mA	
Temperature sensor	2x PT1000 sensor inputs via signal connector	
TCP/IP Ethernet	interface for data reading, parameter adjustment	

### Battery management (optional with battery module)

Symmetry control	2 monitoring inputs	
LVD	integrated low voltage disconnect relay	
Battery test	adjustable via ethernet interface in combination with a monitoring software	
Temperature monitoring	PT1000 sensor	

### Protection functions

AC input	overvoltage, according to EN 61000-4-1 (VDE 0160): 750V <sub>AC</sub> 0,1/1,3 ms	
DC output	overvoltage, repetitive trace function, tripping value $\leq 135V_{DC}$	
	short circuit current $I_c = 5,3A$ each rectifier module (without accumulator), short-circuit proof	
Leakage current	a fixed protective earth (PE) connection must be setup	

### Cooling

Rectifier modules	horizontal forced ventilation, with fan failure detection
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### Mechanical data

Construction	for mounting in ETSI- and 19"-racks (flange can be changed)
Dimension	19" x 240 mm x 3U (W x D x H)
Weight	
Module rack + controller + fuse panel	approx. 12 kg
Single rectifier	approx. 1,5 kg

### Connection terminals

AC input	5 x 0,75mm <sup>2</sup> connecting cable
DC input	OUT 1 : HDFKV 10 OUT 2 : HDFKV 10 OUT 3 : HDFKV 10
Alarm contact	D-SUB, 44-pole, female (programmable)
Signal contact	D-SUB, 44pole, female (programmable)
LCT	RJ45
Battery (optional with battery module)	HDFKV 10
Battery Signal (optional with battery module)	Phoenix MC 1,5/5-63,5

### Distribution / Fuse panel

DC OUT 1	10A, 1-pole, circuit breaker
DC OUT 2	10A, 1-pole, circuit breaker
DC OUT 3	10A, 1-pole, circuit breaker

### Warranty

24 months

**Order code for system rack with distribution: MBGT2400-230-K10**

# Power Rectifier Module for REC2400

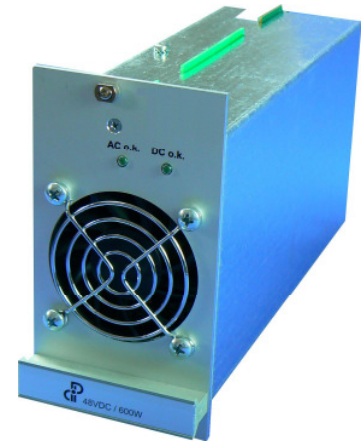
## General Description

### Power Rectifier Module 600W

MREC600 modules for installation in the REC2400 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.

- Hot plug-in
- Module redundancy
- CAN bus controlled
- Temperature range -25° to 70° C
- Controlled and monitored fan
- PCBs protected against humidity



## General Technical Specifications

Output		Signaling	
Nominal voltage	100-130V <sub>DC</sub> , CAN bus controlled	LED green	DC ok
Output power	max. 600W	LED green	AC ok
Constant power range	100-130 V		
Efficiency	>92% at nominal load		
Output characteristic	UI characteristic		
Output ripple	<100 mVpp		
Parallel operation	redundant decoupling of 600W modules with diode function		
Load sharing	active, accuracy +/-10%		

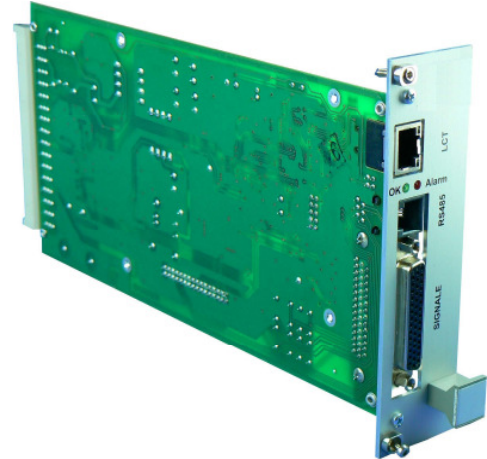
**Order code:**  
**MREC600-230-110-K10**

# Controller Module for REC2400

## General Description

### Controller Module

The Controller Module is used for controlling and monitoring the REC2400 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.



Further features:

- Hot plug-in capability
- No AC/DC power supply interruption in case of a Controller 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

- 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)

### Local Craft Terminal (LCT)

Connector	RJ45
Protocol	TCP/IP

### Connector

D-SUB HD 44

### Signaling

LED green	ok.
LED red	Alarm (general alarm)

### Order code:

**MCON 2400-230-110-K10**

# Battery Connection Module for REC2400

## General Description

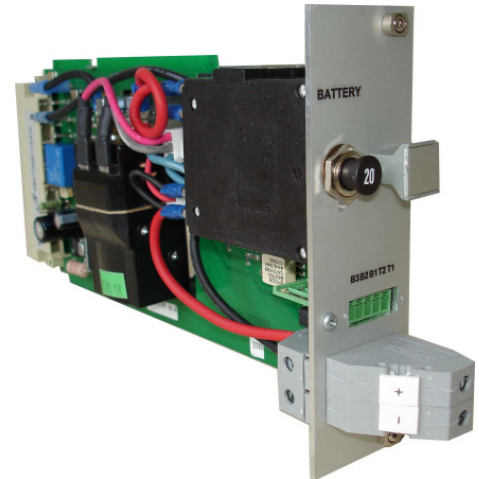
### Battery Connection Module for the REC2400 System

The battery connection module is required for connecting a battery to the REC2400 system. It includes the battery connector, battery fuse and LVD as well as the control logic for the battery management.

Functions such as symmetry monitoring, current measurement and temperature characteristic are integrated.

Further features:

- CAN bus controlled
- Easy use to retrofit system
- Programmable charging characteristic
- Programmable LVD relay
- Battery temperature detection
- Automatic battery test



## General Technical Specifications

Battery connection		Signale	
Nominal voltage	110V <sub>DC</sub>	Alarms	adjustable and analyzable by means of the Controller operating software
Temperature sensor	PT1000		
Fuse	2-pole, magneto-hydraulic		
Max.output current	20A		
Symmetry measurement	via battery connecting cable, with 10k Ohm in the line		
Deep-discharge protection	via LVD (low voltage disconnect)		
Battery connector	Phoenix HDFK10		
Recommended power reserve for battery charging	500W		

**Order code:**  
**MBATT2400-48-48-K10**