

# AC-DC Converter REC8400-Series

## Rectifier System for Telecom-, Industry- and Railway Applications

### General description

REC8400 is a high performance battery charging system with particular flexibility. By paralleling the modules on the DC bus, an output range from 4kW up to 60kW can be carried out. The integrated controller which is operable via Ethernet provides monitoring and control signals. It facilitates a battery management with load control, capacity test, charging characteristic, short battery test and low-voltage-disconnect.



Figure may differ from actual device

### General information

Electrical safety	EN 60950, UL 94
Protection class	1
Pollution degree	2
Hot plug-in	Modules can be replaced during operation
Ventilation	Forced ventilation, electronically monitored fans

### Electrical data - Input

Input voltage	400V <sub>AC</sub> 3~ +/-20%
Frequency range	45-66 Hz
Mains connection	3-phase, without N

### Electrical data – Output

Output voltage	24V <sub>DC</sub> , 48V <sub>DC</sub> and 60V <sub>DC</sub> , potential free
Output voltage tolerance	Temperature controlled battery loading characteristic, adjustable
Output power	Depending on the configuration 4,2kW–67kW
Output characteristic	UPI characteristic, transition from P to I at <math>\leq 24V_{DC}</math>, 48V <sub>DC</sub> or 60V <sub>DC</sub>

Output ripple	<math>< 100\text{mVpp}</math>
Efficiency	24V <sub>DC</sub> = >92% at nominal rating 48V <sub>DC</sub> und 60V <sub>DC</sub> = >95% at nominal rating
Parallel operating	Redundant de-coupling of the 4,2kW modules with diode function
Load sharing	Active, accuracy +/-10%

### Environmental conditions

Isolation group	According to EN 60950, Pollution degree 2
Ambient temperature: During operation	-25°C to +70°C
Cold start	-40°C, Adherence of tolerance from -25°C
Max. ambient temperature	+70°C, from +60°C with derating = 2,5% per 1°K
Rel. humidity	0% - 100%, start-up after drying
Max. operation altitude	2000 meters
Protection class	IP 20

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### EMC

Emission	EN 55022, class A
Immunity	EN 55024, EN 6100-6-2 (Industrial area)

### Signale

Visual	
Controller:	LED red = Alarm LED green = ok
Rectifier:	LED green = DC ok LED green = DC ok
Alarm inputs (8)	For potential free alarm contacts
Alarm contacts	3 potential free alarm contacts max. 70V <sub>DC</sub> , 500mA
Temperature sensor	PT 1000 Sensor
LCT (TCP/IP)	PC-interface for data reading and parameter adjustment via monitoring software

### Protective functions

AC input	EN 61000-4-1 (VDE 0160): 750V <sub>AC</sub> 0,1/1,3ms		
DC output	24V <sup>DC</sup>	48V <sup>DC</sup>	60V <sup>DC</sup>
Overvoltage protection	≤33V	≤66V	≤82V
Short circuit current, pro module short-circuit proof	175A	88A	70A
Leakage current	A fixed protective earth connection must be running		

### Mechanical data (for mounting into 19"-racks)

Dimensions	84HP x 500mm x 4U (W x D x H)	
Weight	Module rack	ca. 5kg
	Single Rectifier	ca.15kg

### Connection terminals

AC Input	H15
DC Output	Screw M10 (+) Screw M12 (-)
Alarm contact	D-SUB, 44-pole, female (programmable)
Signal contact	D-SUB, 44-pole, female (programmable)
LCT	RJ 45

### Battery management (optional)

Symmetry control	4 monitoring inputs
LVD	Contact for ext. LVD
Battery test	Adjustable via LCT
Temperature monitoring	PT1000 sensor input

### Cooling

Rectifier Module	Horizontal forced ventilation, fan failure detection
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### Warranty

**24 months**

### Order code:

### System rack

**MBGT8400-K1**

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## Controller-Module for the REC8400

### General description

The Controller Module is used for controlling and monitoring the REC8400 system via the CAN bus. The Local Craft Terminal (LC) 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:

- 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

### Signals

- Interface RS232
- 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
- 3 outputs, freely programmable, floating

### 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

**MCON8400-400-24**  
**MCON8400-400-48**  
**MCON8400-400-60**

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## Power Rectifier Module for REC8400

### General description

The MREC4200 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.



### Electrical data - Output

Nominal voltage	20-30V <sub>DC</sub> 40-60V <sub>DC</sub> 50-75V <sub>DC</sub> CAN-bus controlled
Output power	Max. 4,2kW
Constant power range	24V <sub>DC</sub> – 24-30V 48V <sub>DC</sub> – 48-60V 60V <sub>DC</sub> – 60-75V
Output current	Max. 175 A – 24V <sub>DC</sub> Max. 88A – 48V <sub>DC</sub> Max. 70A – 60V <sub>DC</sub>
Efficiency	>92% (24V <sub>DC</sub> ), >95% (48,60V <sub>DC</sub> ) at nominal load
Output characteristic	UPI characteristic, transit from I to P at 24V <sub>DC</sub> , 48V <sub>DC</sub> und 60V <sub>DC</sub>

Output ripple	<100mVpp
Parallel operation	Redundant decoupling of the 4,2kW modules with diode function
Load sharing	active, accuracy +/-10%

### Signaling

LED green	DC ok
LED green	AC ok

<b>Order code</b>	<b>MREC4200-400-24-K1</b>
	<b>MREC4200-400-48-K1</b>
	<b>MREC4200-400-60-K1</b>