

Let's talk!

AC-DC Converter REC2400-230-48-K9

Modular Battery Charger / Inverter System

General description

Thanks to the variety of modules available, the REC2400 system offers the perfect solution for all areas of application requiring a power output of up to 2.4 kW.

Starting up from a minimum equipment for 800 Watt, the system can be expanded with additional modules to a higher-performance or even redundant system to grow with the requirements of your application. With the controller monitoring and remote control functions which can be easily integrated, the REC2400 system permits the design and set-up of system solutions appropriate – for example – for outdoor telecommunication systems.



Picture may differ from actual device

- 19", 3U basic module, also appropriate for installation in ETSI racks or cabinets
- Redundant rectifier modules, 800W each
- Inverter module for AC units
- Battery module for UPS function
- Short-term UPS based on Super-Cap capacitors
- Comprehensive Controller functions covering alarm contacts, LAN access, remote maintenance via optical fiber / G.SHDSL line
- DC distribution with hydro magnetic circuit breakers
- Electronic distribution with switch off function

Electrical data - Input

Mains voltage	$U_N = 230V_{AC}, 50/60Hz$
Voltage range	+/-20% (184 – 276V _{AC})
Frequency range	45-66Hz
Mains connection	1-phase
Commercial power line	TT and TN net acc. to EN60950

Electrical data - Output

Output voltage	-48V _{DC}
Output power	800W - 2400W, depending on expansion stage, without derating up to ambient temperature of 60°C

Other output voltages upon request
Positive pole tied to chassis / protective earth
Temperature-controlled battery charging characteristic

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Geschäftsführer:
Dipl.-Ing. Bernhard Böden

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Modular Battery Charger / Inverter System

Protection functions

AC Input	Overvoltage, acc. to EN61000-4-1 (VDE 0160): 750V _{AC} 0,1/1,3ms
DC Output	Overvoltage protection, repetitive trace function, tripping value $\leq 60V_{DC}$
Leakage current	Fixed protective earth (PE) connection is obligatory

Connector terminals

AC Input	Connecting cable 3m
DC Output	Battery connector: D-SUB 7W2, male (battery module)
DC Output, OUT 1-5	D-SUB 3W3, female
Alarms / Signals	D-SUB, 44-pole, female
LCT	RJ 45

Distribution panel

DC OUT 1	16A, 1-pole, circuit breaker
DC OUT 2	16A, 1-pole, circuit breaker
DC OUT 3	10A, 1-pole, circuit breaker
DC OUT 4	6A, 1-pole, circuit breaker
DC OUT 5	4A, 1-pole, circuit breaker

EMC, safety

Emission	EN55022, Class B, ETS 300 386 V1.3.1
Immunity to interference	EN55024, EN61000-6-2 (Industrial area)
Electrical safety	EN60950, UL94
Protection class	1
Pollution degree	2
Active PFC (Power Factor Correction)	Acc. to EN61000-3-2, >0,98 at 100% load; >0,95 at 60% load

Environmental conditions

Environmental conditions during operation	ETS300 019-1-3, Class 3.3, extended to +60°C ambient temperature
during transport	ETS300 019-1-2, Class 2.3
during stocking	ETS300 019-1-1, Class 1.2
Isolation group	Acc. To EN 60950
Ambient temperature during operation	-25°C to +60°C
Maximum ambient temperature	+70°C, beginning from +60°C, 2,5% derating per 1°C
Relative air humidity	0% to 100%
Protection	IP 20

Warranty 24 months

Order code MBGT2400-230-48-K9

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800 W Rectifier Module for the REC2400

General description

The MREC800-HE 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 the active load sharing between the single rectifier modules with the resulting module redundancy provide a system with a very high availability.

The module is optimized for a high life span and high efficiency.



Picture may differ from actual device

Electrical data - Output

Nominal voltage	40V _{DC} - 60V _{DC} , CAN bus controlled
Output power	Max. 800W
Constant power range	40V - 60V
Output current	Max. 16A
Efficiency	>94% at nominal load
Output characteristic	UI characteristic
Output ripple	<50mV _{pp}
Parallel operation	Redundant decoupling of 800W modules with di- ode function
Load sharing	Active, accuracy +/-10%

Signaling

LED green	AC o.k.
LED green	DC o.k.

Order code

MREC800-230-48-K9-HE

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Controller Module for the REC2400

General description

The controller module is used for controlling and monitoring the REC2400 system via the 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 the 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
- **Optionally: Expandable with management system**



Picture may differ from actual device

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

2 Alarm outputs

- Freely programmable
- Floating (potential-free)

Signal connector

D-Sub HD 44

Signaling

LED green	o.k.
LED red	Alarm (general alarm)

Local Craft Terminal (LCT)

Connector	RJ45
Protocol	TCP/IP

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Battery Connection Module for the REC2400

General description

The battery connection module is required for connecting a battery to the REC2400 system. It includes the battery connector, battery fuse and LVD relay 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
- Programmable charging characteristic
- Programmable LVD relay
- Battery temperature detection
- Automatic battery test



Picture may differ from actual device

Battery connection

Nominal voltage	48V _{DC}
Temperature sensor	PT1000
Fuse	2-pole, magneto-hydraulic
Max. output current	40A
Symmetry measurement	Via battery connecting cable, with 10kOhm in the line
Deep-discharge protection	Via LVD relay (low voltage disconnect)
Battery connection	D-Sub 7W2
Recommended power reserve for battery charging	500W

Signale

Alarms	Adjustable and evaluable by means of the controller operating software
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MBATT2400-48-K9

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Electronic Connection Panel for the REC2400

General description

The connection module permits an electronically controlled distribution via six 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 shut-down can take place immediately or with a certain delay. The power available at the outputs can be measured.



Picture may differ from actual device

Further features:

- 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

Outputs

DC OUT, 1-3	adjustable from 0-8A, electronically
DC OUT, 4-6	adjustable from 0-6A, electronically
Max. sum current	30A
Plug connector	Type 3W3

Signaling

LED green	Operation
LED red	Failure, shutdown

Reset

Manually via Reset button (protected against unintentional actuation)
or remote via monitoring software

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MSICH-K9

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Inverter Module for the REC2400

General description

Inverter module for a secure and uninterrupted supply of AC units. The MINV500 plug-in module provides a 230V_{AC}, 50Hz sine-wave output signal supplied by the DC bus system. The load connection is carried out via the module's front panel.

Further features:

- CAN bus controlled
- Hot plug-in capability
- Temperature range -25°C to +70°C
- Controlled and monitored fan
- PCBs protected against humidity
- Real SINE output
- Short-circuit protected



Picture may differ from actual device

Electrical data - Output

Output voltage	230V _{AC}
Frequency	50Hz, sine-wave processor controlled
Output power	500VA / 400W
Power factor	0,8
Crest factor	>2,5%
Harmonic distortion	<2,5%
Load range	1% - 100%
Overload range	101% - 150%, tolerated for 30 s to 3 s
Efficiency	>90% at nominal load

Connector terminals

Output	Phoenix MC1,5/3-GF-5,08
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Signals

LED green	Output ok
LED yellow	Over-temperature warning
LED red	Output switched off (Overload or over-temperature)

Order code

MINV500-48-230-K1

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Short-Term UPS Module for the REC2400

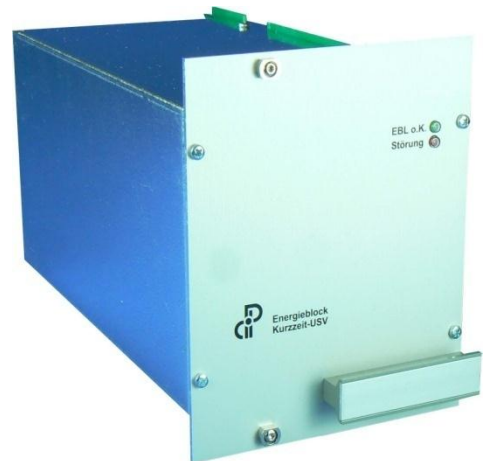
General description

Super-Cap based UPS module (1000 W).

This module provides a UPS protecting your system against short-term interruptions in the public utility network even without the need of batteries. The consequent use of the most recent technologies offers you the possibility to set up an uninterrupted power supply for your application without having to worry about maintenance intervals or handling chemical substances.

Further features:

- 1000 W max. output power
- CAN bus controlled
- Hot plug-in capability
- Temperature range -25°C to +70°C
- PCBs protected against humidity
- UPS function through capacitors
- Maintenance-free
- Long life utility



Picture may differ from actual device

Electrical data - Input

Nominal voltage	48V _{DC}
Charging at	52V _{DC} – 60V _{DC}
Max. charging current	<5A

Electrical data - Output

Nominal voltage	48V _{DC}
Voltage stability	+/- 5%
Max. output power	1000 W

Bypass data

Bypass time	6 s at 1000 W load
Max. charging time	6 minutes
Response time	interruption-free

Signals

LED green on	UPS module o.k.
LED green flashing	UPS module charging
LED red	Failure
Alarms	Adjustable and evaluable by means of the controller operating software

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MKUSV1000-48-48-K9

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