ETPS
ELECTRONIC TEST & POWER SYSTEMS

REC-2400-230-110-K10
RECTIFIER SYSTEM

POSITIVE PROBLEM SOLVING

The flexible REC-2400-230-110-K10 system is aimed at the telecoms and rail industry. The subrack can be populated with up to four 600W modules.

Power outputs of up to 2400W can be achieved. Modules are hot swappable and can be configured to provide a redundant DC output. With full load efficiencies of >92% the full system weighs less than 18kgs. Operating temperatures range from -25°C to 60°C without derating. An optional battery module allows users to connect the system to batteries and carry out automatic tests at regular intervals to check the battery status and capacity.

- All PCBs Protected Against Humidity
- Efficiency >92% at Nominal Load
- Output Ripple <100 mVpp
- Redundant DC Output
- Redundant AC Input
- Hot Swap Modules

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SELECTION TABLE

Part Number	Max. Power	Voltage (per Module)	Max System Current	Number of Modules	Dimensions (W × H × D)
REC-2400-600-230-110-1	600W	100 - 130VDC	6A	1	19" × 3U × 240mm
REC-2400-600-230-110-2	1200W	100 - 130VDC	12A	2	19" × 3U × 240mm
REC-2400-600-230-110-3	1800W	100 - 130VDC	18A	3	19" × 3U × 240mm
REC-2400-600-230-110-4	2400W	100 - 130VDC	24A	4	19" × 3U × 240mm

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

OPTIONS

CODE	DESCRIPTION
/MCON	Controller module
/VX-ZME10	Mounting kit for ETSI
/VX-ZME13	Dummy plate to cover unpopulated subrack modules
/MBATT	Battery connection module
/MREC600-230-110	Individual rectifier module

OPTION INFORMATION

RECTIFIER MODULE

MREC600 modules for installation in the REC-2400 sub rack are hot pluggable, i.e. they can be mounted in the sub rack or extracted during operation. The modules can be retrospectively fitted to meet growing user power requirements. 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. The internal PCB is protected against damage by humidity.

Operating Temperature Range	From -25C to 70C
Weight	1.5kgs
Nominal Output Voltage	100-130VDC, CAN bus controlled
Output Power	Maximum 600W
Constant Power Range	100-130V
Efficiency	>92% nominal load
Output Characteristic	VI characteristic
Output Ripple	<100mVpp
Parallel Operation	Redundant decoupling of 600W modules with diode function
Load Sharing	Active, accuracy 10%
Signalling LED Green	DC ok
Signalling LED Green	AC ok

CONTROLLER MODULE

The controller module is used for controlling and monitoring the REC-2400-230-110-K10 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. Output voltage is controlled via the temperature dependent charging characteristic.

Connector	D-SUB HD 44
LCT Protocol	TCP/IP
LCT Connector	RJ45
Signalling: LED Green	Ok
Signalling: LED Red	Alarm (general alarm)

+ 2 x alarm outputs: free programmable, floating (potential-free)
+ RS232 interface: for external sensors (12V auxiliary voltage)
+ Temperature measurements with PT1000 (2x)
+ Switching outputs for external components
+ PVM output to external fan control
+ 8 external alarm inputs

BATTERY CONNECTION MODULE

The battery connection module is required for connecting a battery to the REC-2400-230-110-K10 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. Signal alarms can be adjusted and analysed by the controller operating software.

Nominal Voltage	110VDC
Temperature Sensor	PT1000
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

+ Programmable charging characteristic
+ Battery temperature detection
+ 2-pole Magneto-hydraulic fuse
+ Easy to use retrofit system
+ Programmable LVD relay
+ Automatic battery test
+ CAN bus controlled

Every effort is made to ensure that the information provided within this technical summary is accurate. However, ETPS Ltd must reserve the right to make changes to the published specifications without prior notice. Where certain operating parameters are critical for your application we advise that they be confirmed at the time of order. ETPS Ltd specialises in modifying its proven platforms to suit your needs. Please contact our office if your requirement is non-standard. Please note that your actual unit may differ from those shown.

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TECHNICAL DATA

GENERAL	
Electrical Safety	EN 60950, UL 94
Protection Class	1
Pollution Degree	2
Isolation	Primary - secondary 3.75kVDC
PFC	According to EN 61000-3-2, >0.98 at 100% load, >0.95 at 60% load
MTBF	140.000h
Cooling (Rectifier Modules)	Horizontal forced ventilation, fan failure detection
Emission	EN 55022, class B, ETS 300 386 V1.3.1
Immunity	EN 55024, EN 61000-6-2 (industrial areas)

MECHANICAL DATA	
Construction	For mounting in ETSI and 19" racks (flange can be changed)
Weight	Approx. 12kg (Including module rack, controller & distribution panel)
Single Rectifier	Approx. 1.5kg

INPUT	
Mains Voltage	230VAC, 50/60Hz
Voltage Range	±20% (184 - 276VAC)
Frequency Range	45 - 66Hz, sine wave
Mains Connection	1+1 Phase
Commercial Power Line	TT & TN-Net according to EN60950

OUTPUT	
Output Voltage	110VDC, 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	VI Characteristic
Output Ripple	<100ms mVpp
Efficiency	>92% at nominal load
Parallel Operation	Redundant de-coupling of the 600W modules with diode function
Load Sharing	Active, accuracy ±10%

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 monitoring software
Temperature Monitoring	PT1000 sensor

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	According to EN60950
Ambient Temp. During Operation	-25°C to 60°C
Maximum Ambient Temperature	+70°C, from +60°C to derating = 2.5% /°C non condensing
Cold Start	-40°C adherence of tolerances from -25°C
Rel. Humidity	0% to 100%, start-up after drying
Maximum Operation Altitude	3000m
Protection	IP20

PROTECTION FUNCTIONS	
AC Input	Overvoltage according to EN61000-4-1 (VDE 0160): 750VAC 0.1/1.3ms
DC Output	Overvoltage, repetitive trace function, trpping value ≤135VDC
DC Output	Short circuit current Ic = 5.3A each rectifier module (without accumulator), short-circuit proof
Leakage Current	A fixed protective earth (PE) connection must be setup

CONNECTION TERMINALS	
AC Input	5 x 0.75mm^2 connecting cable
DC Input	OUT 1-3: HDFKV 10
Alarms / Signals	D-SUB, 44-pole, female (programmable)
LCT	RJ45
Battery (option /MBATT)	HDFKV 10
Battery Signal (option /MBATT)	Phoenix MC 1.5/5-63.5

DISTRIBUTION / FUSE PANEL	
DC Output 1	10A, 1-pole, circuit breaker
DC Output 2	10A, 1-pole, circuit breaker
DC Output 3	10A, 1-pole, circuit breaker

SIGNALS	
Alarm Contacts	4 programmable, potential free alarm contacts, max. 125VDC, 500mA
Alarm Inputs	8 × for potential free alarm contacts
Temperature Sensor	2 × PT1000 sensor inputs via signal connector
Visual: Controller	LED red = alarm, LED green = ok
Visual: Rectifier	LED green = DC ok, LED green = AC ok
TCP/IP Ethernet	Interface for data reading, parameter adjustment

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“WE ARE POSITIVE PEOPLE”

ETPS engineer electronic power supply and testing systems. Our problem solving skills provide the spark of innovation to some of the world’s leading technology brands.

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