Flatpack2 48-60/2000 HE WOR & Flatpack2 48-60/15A HE

48, 48 NiCad & 60VDC Rectifier/Converter Modules

The most efficient rectifier in the industry!

The combination of innovative design, efficiency and reliability makes the Flatpack2 HE stand out. With an efficiency up to 96.2%, the losses have been reduced by 50% compared to the current industry standard.
In a global perspective, considering the high energy consumption in the telecom industry, this technology breakthrough is not only reducing operational cost for the operators, but it can also have a significant environmental impact.

FLATPACK2 48-60/2000 HE WOR & FLATPACK2 48-60/15A HE

Doc 241115.705.DS3 – v6

APPLICATIONS

Industry

High efficiency rectifier for DC power supply facilities with or without battery. The module also operates with DC input, making it a versatile DC/DC Converter for stepping down a DC supply or act as a buffer to isolate branches.
All in all this make the Flatpack2 HE modules Industrial Building Blocks (IBB) with superior flexibility. Combined with other IBBs systems can be created for:

- Low & High Voltage switchgear
- Transformer & SUB Stations
- Power Generation & Distribution
- Emergency lighting systems
- Rail applications; Telecom, signaling and power conversion
- Industrial control systems
- Process and Heavy industry

Small and large

Due to the high power density, cost competitive design and a highly flexible system communication interface, Flatpack2 HE rectifiers are used in system solutions from 2kW to 192kW.

KEY FEATURES

- FLEXIBILITY AND RELIABILITY
  The FP2 modular concept has a lot of benefits compared to traditional solutions in the industry:
  - High efficiency; less power consumption and heat dissipation
  - Overall Size and footprint of cabinet: 50% of Thyristor Controlled Size
  - Modular Hot Plug-in Construction allows
  - Redundancy, n+1, n+2... configurations
  - easy to do repairing: MTTR < 5 minutes
  - Very high MTBF > 350000 hours
  - Wide input AC Voltage and Frequency range
  - Possibility to build combined systems with rectifiers, DC/DC converters and inverters controlled by one controller
- GLOBAL COMPLIANCE
  Eltek is among the market leaders in all regions in the world, and designs the core products to be compliant to all relevant standards and customer requirements. All Flatpack2 rectifiers are CE marked and UL recognized.
- PATENTS
  Flatpack2 HE is a result of intensive research over many years. Several unique technical solutions, protected by patent applications, are introduced,

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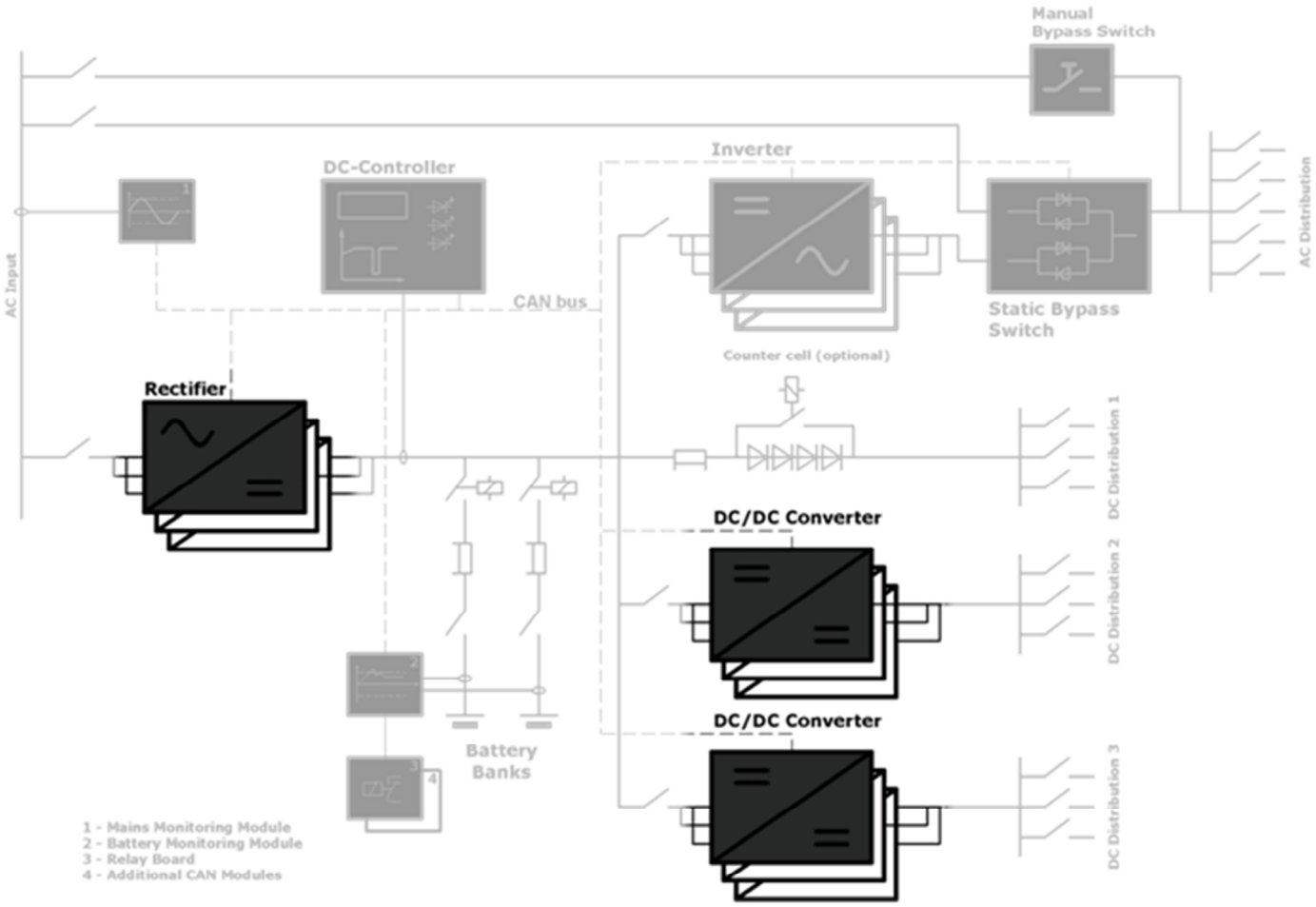
ADDITIONAL TECHNICAL SPECIFICATIONS



Plug and play

Plug a new rectifier into the system, and it automatically logs on, gets an assigned ID, downloads the system set parameters from the control system and starts up with a minimum of installation time, and without interrupting the system or attached equipment.

The Flatpack2 HE family covers application with output voltages from 22 to 290VDC. It is capable of taking both AC and DC input voltages of from 85 to 300V. This makes the Flatpack2 family the perfect choice to build a platform suitable to a wide range of applications.

Wide Output Range (WOR)

Wide DC output range to support battery banks of both NiCd and lead acid. For NiCd battery banks any number cells from 38 to 40 are fully supported.

Application example - Power up the riser

In areas with regular earthquakes it is regarded less likely that the batteries would fall over in the basement than in the upper floors. Distributing 24V or 48V from the basement and up requires large copper cables, and hence a solution is to distribute battery backed up 220VDC. As can be seen in the illustration next page, the Flatpack2 HE family is ideal for this application, because of its high efficiency, operates with both AC and DC input and also its wide output voltage range. (12VDC could also be provided with the use of Eltek Micropack 12/120 WOR.)

Flexibility and reliability

Use of digital controllers in the Flatpack2 provides intelligent self-protective features like reduced output power at high temperatures and low mains. Flatpack2 rectifiers are also designed to have the highest possible immunity level and fulfill the IEC61000-6-5 (immunity, power station and substation) which is unique in the Industry.

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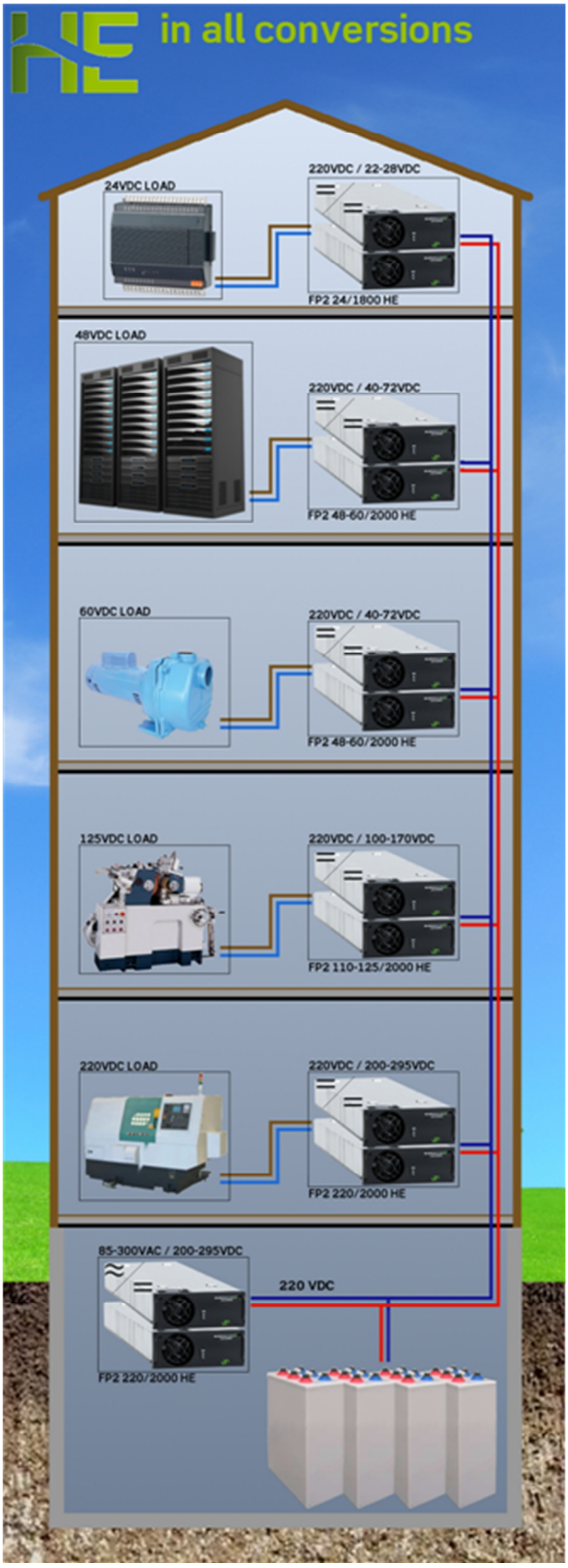
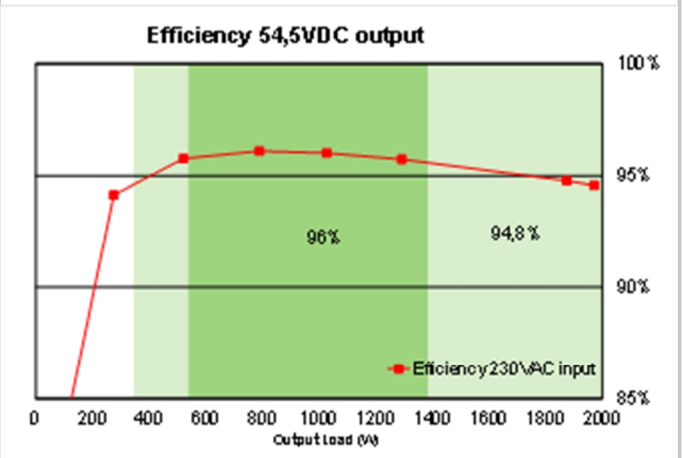
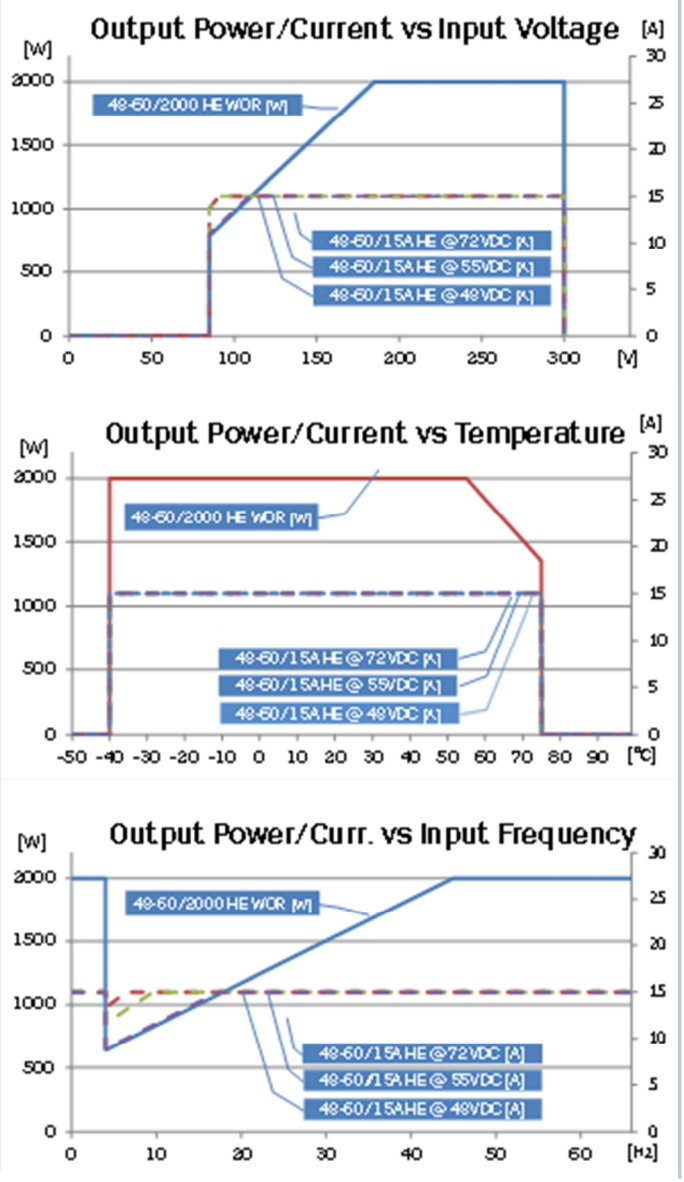


EFFICIENCY



TEMPERATURE, INPUT VOLTAGE AND FREQUENCY DERATING



Curves shows power derating for Flatpack2 48-60/2000 HE and current derating for the Flatpack2 48-60/15A HE

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ADDITIONAL TECHNICAL SPECIFICATIONS

AC INPUT

Voltage	85-300 VAC (Nominal 185 – 275 VAC)	
Frequency	0 to 66Hz*)	
Maximum Current	11.9 Arms maximum at nominal input and full load	
Power Factor	> 0.99 at 1000W load or more	
THD	< 5 % at nominal input and 2000W load < 9 % at nominal input and 1000W load	
Input Protection	o Varistors for transient protection o Mains fuse in both lines	o Disconnect above 300 VAC

*)(see previous page for frequency response)

DC OUTPUT (FLOATING)

Model	241115.705	241115.705B
Output Power	2000 W at nominal input Constant Power > 48V > Constant Current	720-1080W at 48 - 72 VDC and nominal input Constant current 0 –72 VDC
Maximum Current	41.6 Amps at 48 VDC and nominal input	15 A at 0-72 VDC and nominal input
Hold up time	> 20ms; output voltage > 53.5 VDC at 1500W load	> 20ms; output voltage > 53.5 VDC at 1100W load (60V mode)
Voltage	Default: 53.5 VDC (48V mode (default)) Default: 67 VDC (60V mode)	
Adjustable	Range: 39.9 - 72 VDC	
NiCd batteries	Float charge: 1,40 – 1.45 VDC/cell Boost charge: 1.45 – 1.70 VDC/cell Standby/Test: 1.05 – 1.2 VDC/cell	
Current Sharing	±5% of maximum current from 10 to 100% load	
Static voltage regulation	±0.5% from 10% to 100% load	
Dynamic voltage regulation	±5.0% for 10-80% or 80-10% load variation, regulation time < 50ms	
Ripple and Noise	< 150 mV peak to peak, 30 MHz bandwidth < 2 mVrms psophometric	
Output Protection	o Overvoltage shutdown o Hot plug-in o Short circuit proof o High temperature protection	

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Specifications are subject to change without notice

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ADDITIONAL TECHNICAL SPECIFICATIONS

OTHER SPECIFICATIONS

Efficiency	>96% at 30-70% load	
Isolation	3.0 KVAC – input and output 1.5 KVAC – input earth	0.5 KVDC – output earth
Alarms:	o Low mains shutdown o High temperature shutdown o Rectifier Failure o Overvoltage shutdown on output	o Fan failure o Low voltage alarm at 43.5V o CAN bus failure
Warnings:	o Low temperature shutdown o Rectifier in power derate mode o Remote battery current limit activated	o Input voltage out of range, flashing at overvoltage o o Loss of CAN communication with control unit, stand alone mode
Visual indications	o Green LED: ON, no faults o Red LED: rectifier failure	o Yellow LED : rectifier warning
Operating temp	-40 to +75°C (-40 to +167°F), output power derates linear to 1200 W at +75°C (derating starts at +45°C (+ 113°F))	
Storage temp	-40 to +85°C (-40 to +185°F)	
Cooling	Fan (front to back airflow)	
Fan Speed	Temperature and current regulated	
MTBF	> 350, 000 hours Telcordia SR-332 Issue I, method III (a) ($T_{ambient}$: 25°C)	
Acoustic Noise	< 20dBA at nominal input and full load ($T_{ambient}$ <= 25°C) < 56dBA at nominal input and full load ($T_{ambient}$ > 40°C)	
Humidity	Operating: 5% to 95% RH non-condensing Storage: 0% to 99% RH non-condensing	
Dimensions	109 x 41.5 x 327mm (wxhxd) (4.25 x 1.69 x 13”)	
Weight	1.950 kg (4.3lbs)	

APPLICABLE STANDARDS

Electrical safety	o IEC 60950-1 o UL 60950-1	o CSA 22.2
EMC	o ETSI EN 300 386 V.1.3.2 o EN 61000-6-1 (immunity, light industry) o EN 61000-6-2 (immunity, industry)	o EN 61000-6-3 (emission, light industry) o EN 61000-6-4 (emission, industry) o Telcordia NEBS GR1089 CORE
Mains Harmonics	EN 61000-3-2	
Environment	ETSI EN 300 019-2-1 Class 1.2 ETSI EN 300 019-2-2 Class 2.3 ETSI EN 300 019-2-3 Class 3.2	ETSI EN 300 132-2 Telcordia NEBS GR63 CORE Zone 4 RoHS compliant

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ADDITIONAL TECHNICAL SPECIFICATIONS