

## Flatpack2 24/1800 HE

### 24VDC Rectifier/Converter Modules

The combination of innovative design, efficiency and reliability makes the Flatpack2 HE stand out. With efficiency up to 96.2%, the losses have been reduced by 50% compared to the current industry standard. Compared to older technologies with even poorer efficiency an investment in a Flatpack2 HE system is repaid in a few years by the reduced operating cost.

In a global perspective, considering the high energy consumption in the industry, this technology breakthrough can also have a significant environmental impact.



# FLATPACK2 24/1800 HE

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## 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 1,8kW to 192kW.

## PRODUCT FEATURES AND ADVANTAGES

### 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

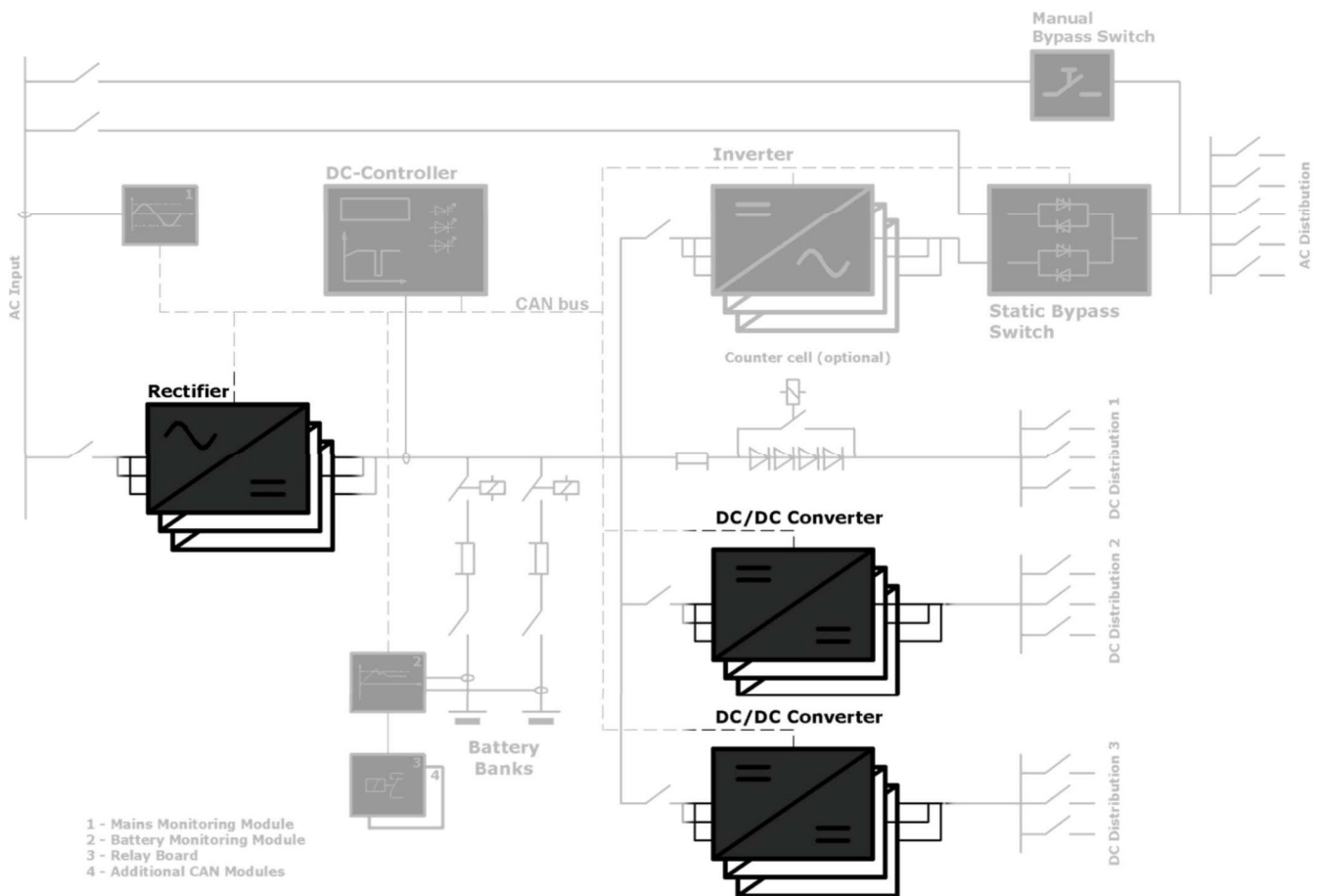
- Very high MTBF > 350000 hours
- Wide input AC Voltage and Frequency range
- Possibility to build combined systems with rectifiers, DC/DC converters and inverters controlled by one controller

### 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,



## Plug and play

Plug a new rectifier into the system, and it automatically logs on, gets an assigned ID, downloads the system set parameter 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.

## 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.

## AC INPUT

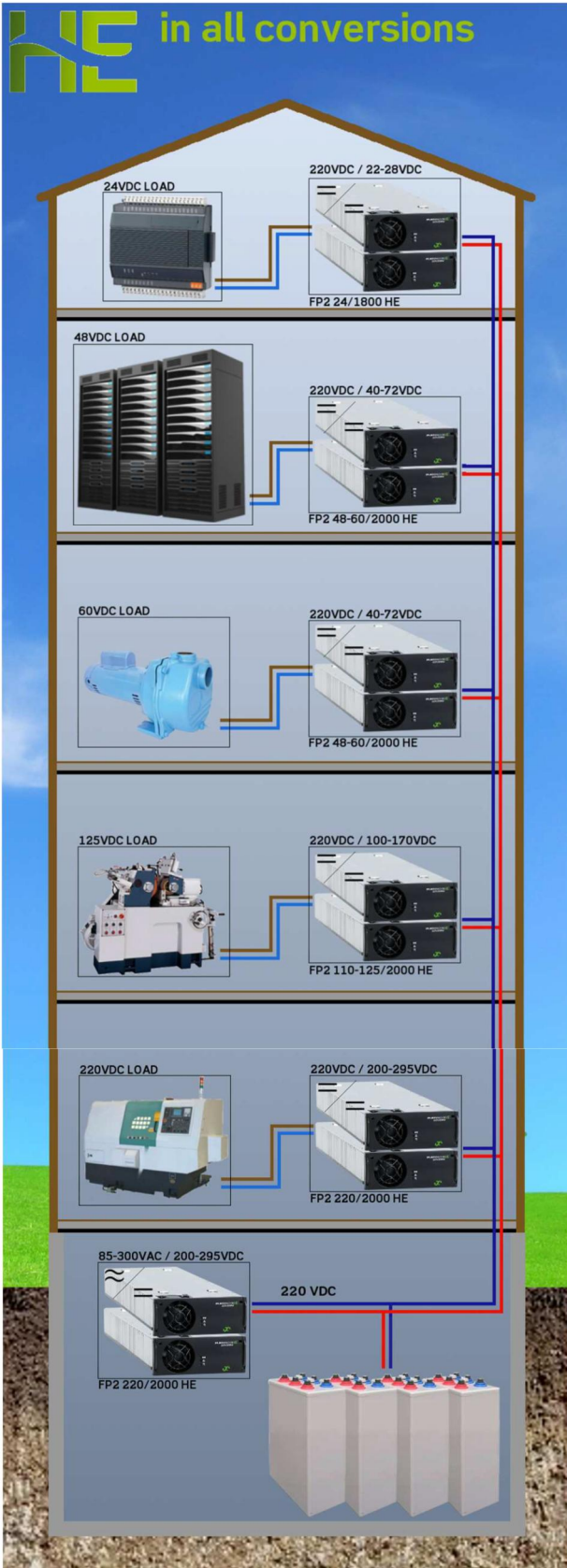
Voltage	85-300 VAC/DC (Nominal 185 – 275 V)
Frequency	0 to 66Hz- See previous page for frequency response
Maximum Current	11.25 Arms maximum at nominal input and full load
Power Factor	> 0.99 at 1000W load or more
THD	< 4 % at nominal input and 1800W load < 5 % at nominal input and 1000W load
Input Protection	<ul style="list-style-type: none"> <li>○ Varistors for transient protection</li> <li>○ Mains fuse in both lines</li> <li>○ Disconnect above 300 V</li> </ul>

## DC OUTPUT (FLOATING)

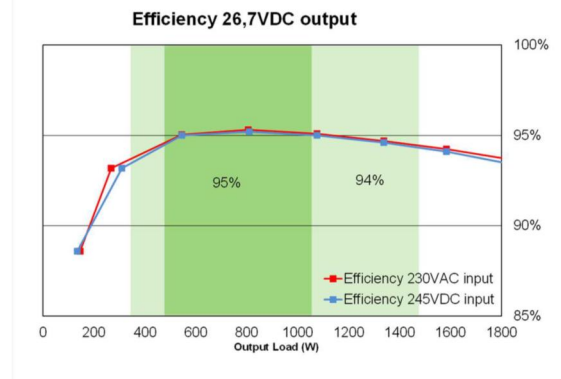
Part No.	241115.205	
Output Power	1800 W at nominal input Constant Power > 24V > Constant Current	
Maximum Current	75 Amps at 24 VDC and nominal input	
<b>Both models</b>		
Voltage	Default: 26.7	
Adjustable	Range: 21.7 – 28.8 VDC	
Current Sharing	±5% of maximum current from 10 to 100% load	
Static voltage regulation	±0.5% from 10% to 100% load	
Dynamic voltage regulation	±5.0% for 10-80% or 80-10% load variation, regulation time < 50ms	
Hold up time	> 20ms; output voltage > 21 VDC at 1000W load	
Ripple and Noise	< 250 mV peak to peak, 30 MHz bandwidth < 2 mVrms psophometric	
Output Protection	<ul style="list-style-type: none"> <li>• Overvoltage shutdown</li> <li>• Hot plug-in</li> </ul>	<ul style="list-style-type: none"> <li>• Short circuit proof</li> <li>• High temperature protection</li> </ul>

## OTHER SPECIFICATIONS

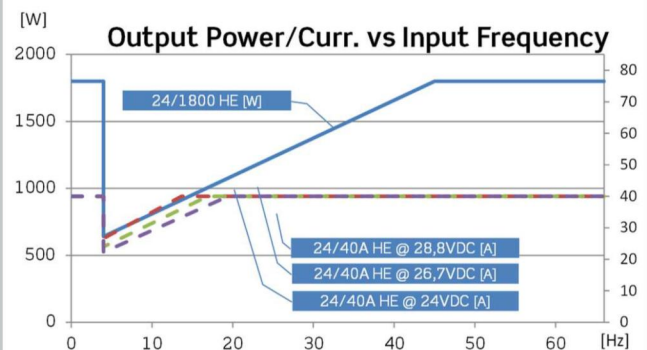
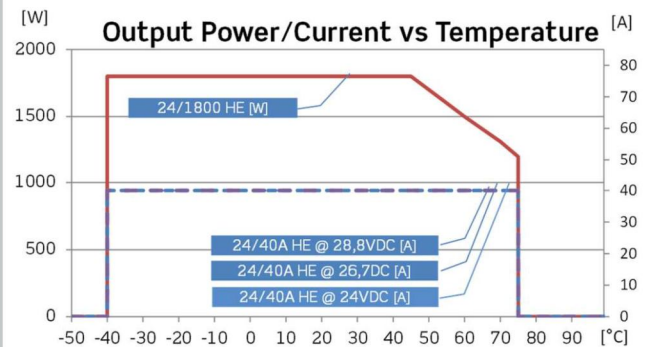
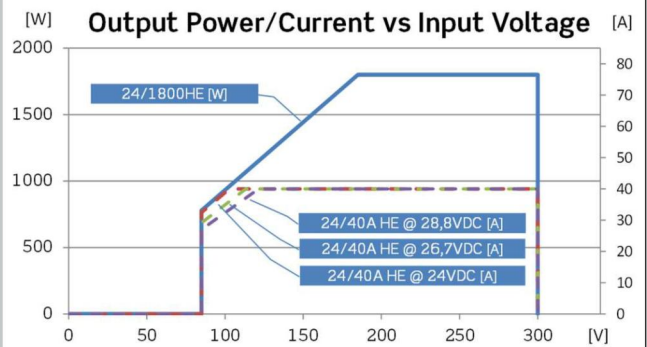
Efficiency	>95% at 30-70% load (241115.205) >95% at 37-100% load (241115.205B)	
Isolation	3.0 KVAC – input to output 1.5 KVAC – input to earth	0.5 KVDC – output to earth
Alarms	<ul style="list-style-type: none"> <li>○ Low mains shutdown</li> <li>○ High temperature shutdown</li> <li>○ Rectifier Failure</li> <li>○ Overvoltage shutdown on output</li> </ul>	<ul style="list-style-type: none"> <li>○ Fan failure</li> <li>○ Low voltage alarm</li> <li>○ CAN bus failure</li> </ul>
Warnings	<ul style="list-style-type: none"> <li>○ Low temperature shutdown</li> <li>○ Rectifier in power derate mode</li> <li>○ Remote battery current limit activated</li> </ul>	<ul style="list-style-type: none"> <li>○ Input voltage out of range, flashing at overvoltage</li> <li>○ Loss of CAN communication with control unit, standalone mode</li> </ul>
Visual indications	Green LED: ON, no faults Red LED: rectifier failure Yellow LED : rectifier warning	
Operating temp.	-40 to +75°C (-40 to +167°F), derating above +45°C (+131°F) to 1200W at +75°C (+167°F)	
Storage temp.	-40 to +85°C (-40 to +185°F)	
Cooling	Fan (front to back airflow)	
Fan Speed	Temperature and load regulated	
MTBF	> 300, 000 hours Telcordia SR-332 Issue I, method III (a) (Tambient : 25°C)	
Acoustic Noise	< 40dBA at nominal input and full load (Tambient <= 25°C) < 58dBA at nominal input and full load (Tambient > 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)	



## EFFICIENCY



## TEMPERATURE, INPUT VOLTAGE AND FREQUENCY DERATING



Curves shows power derating for Flatpack2 24/1800 HE

## APPLICABLE STANDARDS

Electrical safety	IEC 60950-1 /UL 60950-1 / CSA 22.2
EMC	ETSI EN 300 386 V.1.4.1 EN 61000-6-1 (immunity, light industry) EN 61000-6-2 (immunity, industry) EN 61000-6-3 (emission, light industry) EN 61000-6-4 (emission, industry) EN 61000-6-5 (immunity, power station and substation)
Mains Harmonics	EN 61000-3-2
Marine	DNV-OS-D202, Ch.2 Sec. 4 (DNV 2.4) <ul style="list-style-type: none"> <li>o Temperature Cl. B</li> <li>o Humidity Cl. B</li> <li>o Vibration Cl. A</li> <li>o EMC Cl. B *)</li> </ul> - Requires PR with filter: Fp2 PS 4 rect 4xAC HC Marine, pn: 233070
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 RoHS compliant

## ORDERING INFORMATION

Part No.	Description
241115.205	Flatpack2 24/1800 HE WOR

1) Allow for minimum 1U below and above to ensure airflow

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Specifications are subject to change without notice