

# Flatpack2 220/2000 HE WOR Rectifier Module



## 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 95.3%, the losses have been reduced by 50% compared to the current industry standard.

In a global perspective, considering the high energy consumption in the industry, this technology breakthrough is not only reducing operational cost, but it can also have a significant environmental impact.

## Applications

### Industry

High efficiency rectifier for DC power supply facilities with or without battery in all areas of industry, power generation and power distribution.

The HE rectifier also has an extremely high efficiency at low load, which historically has been a drawback with most modern soft switching technologies.

### Wide Output Range (WOR)

Wide DC output range to support battery banks of both NiCd and lead acid. For NiCd battery banks the any number cells from 170 to 180 are fully supported.

### 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.

## Product Features and Advantages

### Flexibility and reliability

Extensive use of digital controllers has enabled advanced functionality to meet most customers' requirements. It also provides intelligent self-protective features like reduced output power at high temperatures or low mains.

### 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 HE rectifier is made fully compliant with the standard Flatpack2 rectifier which means it can be used in any FP2 system solutions, whether it is in new installations, site expansions or replacement programs.

### Global compliance

Eltek Valere 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, UL recognized.

### Patents pending

Flatpack2 HE is a result of intensive research over many years. Several unique technical solutions are introduced, protected by patent applications.

See reverse side for specifications

# Flatpack2 220/2000 HE WOR

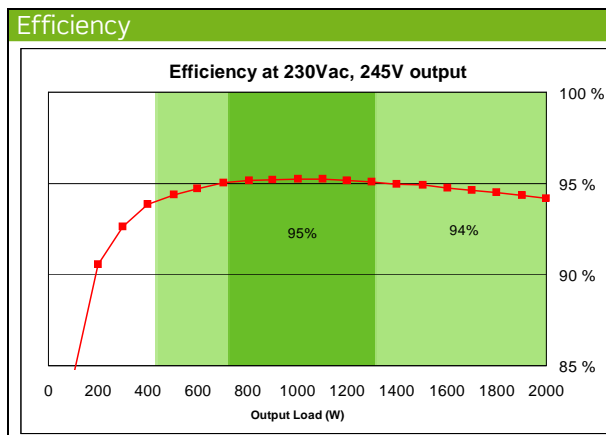
## Additional Technical Specifications

AC Input	
Voltage	85-300 VAC (Nominal 185 – 275 VAC)
Frequency	45 to 66Hz
Maximum Current	11.9 A <sub>rms</sub> maximum at nominal input and full load
Power Factor	> 0.99 at 50% load or more
THD	< 5 % at nominal input and full load
Input Protection	<ul style="list-style-type: none"> <li>o Varistors for transient protection</li> <li>o Mains fuse in both lines</li> <li>o Disconnect above 300 VAC</li> </ul>

DC Output (floating)	
Voltage	Default: 245.3 VDC (without controller)
Adjustable	Range: 178.5-297 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  No of cells configurable in controller Min: 170 / Max: 180
Output Power	2000 W at nominal input, derating linear below 185VAC to 850W at 85VAC  Constant Power > 220V > Constant Current
Maximum Current	9.16 Amps at 220 VDC and nominal input
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 > 178 VDC at 1500W load
Ripple and Noise	< 1000 mV peak to peak, 30 MHz bandwidth
Output Protection	<ul style="list-style-type: none"> <li>o Overvoltage shutdown</li> <li>o Hot plug-in</li> <li>o OR-ing diode</li> <li>o Short circuit proof</li> <li>o High temperature protection</li> </ul>

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
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

Other Specifications	
Efficiency	>95% at 35-65% load
Isolation	3.0 KVAC – input to output 1.5 KVAC – input to earth 1.5 KVDC – output to earth 3.0 KVAC – CAN to primary 3.0 KVAC – CAN to secondary
Alarms:	<ul style="list-style-type: none"> <li>o Low mains shutdown</li> <li>o High temperature shutdown</li> <li>o Rectifier Failure</li> <li>o Overvoltage shutdown on output</li> <li>o Fan failure</li> <li>o Low voltage alarm</li> <li>o CAN bus failure</li> </ul>
Warnings:	<ul style="list-style-type: none"> <li>o Low temperature shutdown</li> <li>o Rectifier in power derate mode</li> <li>o Remote battery current limit activated</li> <li>o Input voltage out of range, flashing at overvoltage</li> <li>o Loss of CAN communication with control unit, stand alone mode</li> </ul>
Visual indications	<ul style="list-style-type: none"> <li>o Green LED: ON, no faults</li> <li>o Red LED: rectifier failure</li> <li>o Yellow LED : rectifier warning</li> </ul>
Operating temp	-40 to +75°C (-40 to +167°F), derating above +55°C (+131°F) to 1350W 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	> 459, 000 hours Telcordia SR-332 Issue I, method III (a) (T <sub>ambient</sub> : 25°C)
Acoustic Noise	< 40dBA at nominal input and full load (T <sub>ambient</sub> <= 25°C) < 58dBA at nominal input and full load (T <sub>ambient</sub> > 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)



241115.815.DS3 – v2

Specifications are subject to change without notice

Part no.	Description
241115.815	Flatpack2 220/2000 HE WOR