



# Flatpack2 48/2000 HE

## 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 96.5%, 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.

### Applications

#### Wireless, fiber and fixed line communication

Today's communications demand state of the art, cost effective and compact DC power systems. Flatpack2 HE delivers an industry leading power density and superb reliability at lowest lifetime cost.

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

#### Broadband and network access

Increasing network speed demands flexible and expandable DC power solutions. The Flatpack2 HE rectifiers are your key building blocks for future needs.

#### 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 and NEBS compliant.

#### Patents pending

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

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## Additional Technical Specifications

### AC Input

Voltage	85-300 VAC (Nominal 185 – 275 VAC)
Frequency	45 to 66Hz
Maximum Current	11.6 A <sub>rms</sub> maximum at nominal input and full load
Power Factor	> 0.99 at 50% load or more
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 VAC</li> </ul>

### DC Output

Voltage	53.5 VDC (adj. range: 43.5-57.6 VDC)
Output Power	2000 W at nominal input (derates to 750W at 85V <sub>DC</sub> input)
Maximum Current	41.7 Amps at 48 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 10-90% or 90-10% load variation, regulation time < 50ms
Hold up time	> 20ms; output voltage > 43.5 VDC at 1500W load
Ripple and Noise	<ul style="list-style-type: none"> <li>&lt; 100 mV peak to peak, 30 MHz bandwidth</li> <li>&lt; 2 mV rms psophometric</li> </ul>
Output Protection	<ul style="list-style-type: none"> <li>Overvoltage shutdown</li> <li>Hot plug-in - Inrush current limiting</li> <li>Short circuit proof</li> <li>High temperature protection</li> </ul>

### Applicable Standards

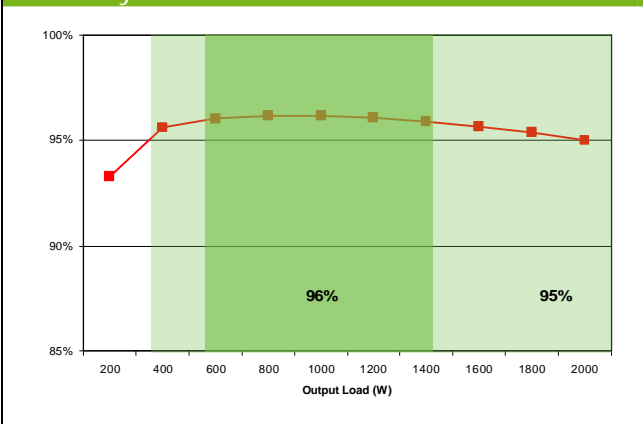
Electrical safety	IEC 60950-1 UL 60950-1 CSA 22.2
EMC	ETSI EN 300 386 V.1.3.2 EN 61000-6-1 (immunity, light industry) EN 61000-6-2 (immunity, industry) EN 61000-6-3 (emission, light industry) EN 61000-6-4 (emission, industry) Telcordia NEBS GR1089 CORE
Mains Harmonics	EN 61000-3-2
Environment	ETSI EN 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

Specifications are subject to change without notice

### 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:	<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> <li>Fan failure</li> <li>Low voltage alarm at 43.5V</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> <li>Input voltage out of range, flashing at overvoltage</li> <li>Loss of CAN communication with control unit, stand alone mode</li> </ul>
Visual indications	<ul style="list-style-type: none"> <li>Green LED: ON, no faults</li> <li>Red LED: rectifier failure</li> <li>Yellow LED : rectifier warning</li> </ul>
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 <sub>ambient</sub> : 25°C)
Acoustic Noise	<ul style="list-style-type: none"> <li>&lt; 20dBA at nominal input and full load (T<sub>ambient</sub> ≤ 25°C)</li> <li>&lt; 56dBA at nominal input and full load (T<sub>ambient</sub> &gt; 40°C)</li> </ul>
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



241115.105.DS3 – v11

### Ordering Information

Part no.	Description
241115.105	Flatpack2 48/2000 HE