

## High efficiency and reliable rectifiers

The most efficient power conversion module in the industry! Since the launch the Flatpack2 family has expanded into a wide selection of power ratings and voltages.

Power systems up to the MW-range can be realized using the 10A model addressing small and larger modular data centers' power needs. 220V<sub>DC</sub> power systems provide an excellent alternative to traditional AC UPS providing significant efficiency and reliability improvements.

With 220V<sub>DC</sub>, standard components, cables and distribution can be used and most IT equipment designed for 208/230V<sub>AC</sub> can be connected directly to the 220V<sub>DC</sub> bus.



# FLATPACK2 220V RECTIFIERS

220V<sub>DC</sub>/2000W HE & 220V<sub>DC</sub>/10A HE

Doc 24111x.815.DS3 - v2

### APPLICATIONS

#### POWER UTILITIES

- SWITCH TRIPPING
- CONTROL & PROTECTION SYSTEMS
- EMERGENCY LIGHTING

#### RAILWAY INFRASTRUCTURE

- CONVERTER STATIONS
- POWER STATIONS

#### MARINE AND OFF-SHORE

- CENTRAL POWER SYSTEM

#### DATA CENTER

- CENTRAL POWER SYSTEM
- DC/DC - ISOLATE BRANCHES



FLATPACK2 POWER RACK FOR HVDC (PN: 268035)



SMARTPACK2 MASTER AND BASIC INDUSTRIAL

### KEY FEATURES

- PROVEN RELIABILITY
- HIGH POWER DENSITY
- HIGH EFFICIENCY
- APPLICATION FLEXIBILITY, 2KW - 2MW
- ACCEPTS DC INPUT (DC/DC CONVERTER)
- GLOBAL COMPLIANCE (CE, UL, NEBS)
- MARINE & OFFSHORE CERTIFICATIONS
- PATENTED TECHNOLOGY
- DIGITAL CONTROLLERS

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220V<sub>DC</sub>/2000W HE & 220V<sub>DC</sub>/10A HE

## APPLICABLE INDUSTRIAL SYSTEMS



IBB SYSTEM IN FPC CABINET

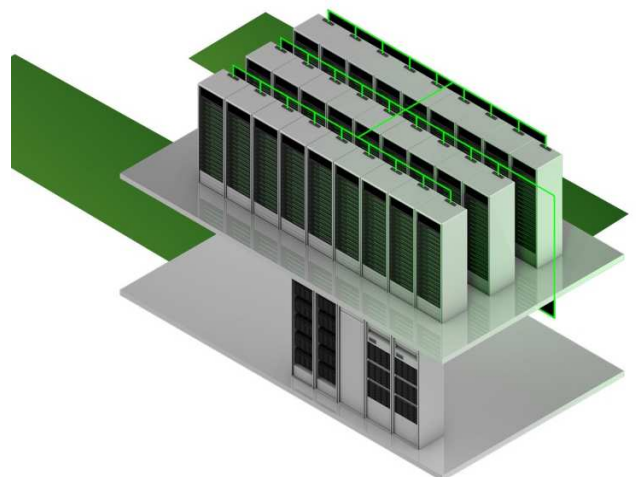
## APPLICATION EXAMPLES

### HV AND MV SWITCHGEAR



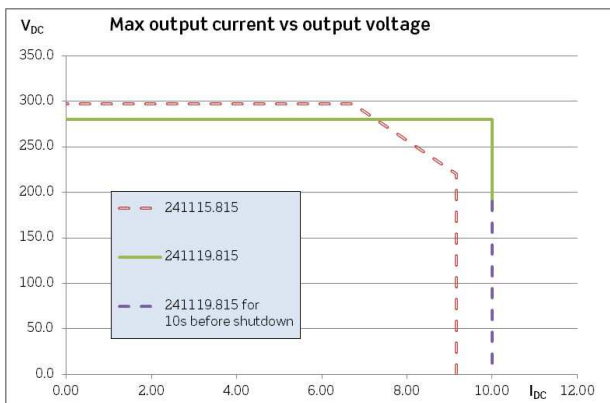
Modular and redundant solutions for safe and energy efficient powering of HV and MV switchgear

### RELIABLE POWER FOR DATA CENTERS



Uninterruptable power solutions based on 220VDC have many advantages and provide an extreme power reliability and power availability while opening new possibilities to further improve PUE.

## AVAILABLE CURRENT AT NOMINAL INPUT



# FLATPACK2 220V RECTIFIERS



220V<sub>DC</sub>/2000W HE & 220V<sub>DC</sub>/10A HE

Model	220 / 2000 HE WOR	220 / 10A HE
Part number	241115.815	241119.815
<b>INPUT DATA</b>		
Voltage range	85 - 300 V <sub>AC/DC</sub>	85 - 305 V <sub>AC</sub>
Voltage range (nominal)	185 - 275 V <sub>AC/DC</sub>	176 - 305 V <sub>AC</sub>
Frequency	0 - 66 Hz	45 - 66 Hz
Maximum current	11.9 A <sub>RMS</sub>	17 A <sub>RMS</sub>
Power Factor	0.99 (@ 50-100% load)	0.99 (@ 50-100% load)
THD (@ 230 V <sub>AC</sub> )	< 5 % (@ full load)	< 4% (@ full load)
Protection	Varistor for transient protection, fuse in both lines, shutdown above 300/305 V	
<b>OUTPUT DATA</b>		
Default voltage	245.3 V <sub>DC</sub>	
Voltage range	178.5 <sup>1)</sup> - 297 V <sub>DC</sub>	198 <sup>1)</sup> - 280 V <sub>DC</sub> <sup>2)</sup>
# Pb cell supported (1.8 - 2.4 V <sub>DC</sub> /cell)	108 - 122	108-110 (120 <sup>3)</sup> )
# NiCad cell supported (1.05 - 1.65 V <sub>DC</sub> /cell)	170 - 180	-
Max power, nominal input	2000 W	2800 W
Max power, 85V input	850 W	1304 W
Max current, @220V <sub>DC</sub>	9.16 A	10 A <sup>4)</sup>
Hold-up time, default voltage and 1500 W load	20 ms, V <sub>OUT</sub> > 178 V <sub>DC</sub>	20 ms, V <sub>OUT</sub> > 210 V <sub>DC</sub>
Ripple and noise, 30 MHz bandwidth	< 1000 mV <sub>PP</sub>	
Current sharing	±5% of maximum current from 10 to 100% load	
Static voltage regulation	±0.5% from 10% to 100% load and nominal input	
Dynamic voltage regulation	±5.0% for 10-90% or 90-10% load variation, regulation time < 50ms	
Protection	Overvoltage shutdown, short circuit proof, high temperature, hot plug-in inrush current limiting, ORing diode	
<b>OTHER SPECIFICATIONS</b>		
Efficiency	> 95%	> 95.5%
Isolation	3.0 kV <sub>AC</sub> - input to output, 1.5 kV <sub>AC</sub> - input to earth, 1.5 kV <sub>DC</sub> - output to earth 3 kV <sub>AC</sub> - CAN to input, 3 kV <sub>AC</sub> - CAN to output, 500 V <sub>AC</sub> - CAN to earth	
Alarms (Red LED)	Low mains shutdown, High and low temperature shutdown, Rectifier Failure, Overvoltage shutdown on output, Fan failure, Low voltage alarm, CAN bus failure	
Warnings (Yellow LED)	Rectifier in power derate mode, Remote battery current limit activated, Input voltage out of range, flashing at overvoltage	
Normal (Green LED)	Input and output ok	
MTBF (Telcordia SR-332 Issue I method III (a))	>391 000h (@T <sub>AMBIENT</sub> = 25°C)	>400 000h (@T <sub>AMBIENT</sub> = 25°C)
Operating temperature (5 - 95% RH non-cond.)	-40 to +75°C [-40 to +167°F]	
Output power de-rates above temp / to	+55°C / 1350W @ +75°C +50°C / 1750 W @ +75°C	
Storage temperature	-40 to +85°C (-40 to +185°F), humidity 0 - 99% RH non-condensing	
Dimensions[WxHxD] / Weight	109 x 41.5 x 327mm (WxHxD) [4.25 x 1.69 x 13"] / 1.950 kg [4.3lbs]	
<b>DESIGN STANDARDS</b>		
Electrical safety	UL 60950-1, EN 60950-1, CSA 22.2	
EMC	ETSI EN 300 386 V.1.3.2 EN 61000-6-1 / -2 / -3 / -4 / -5	
Mains Harmonics	EN 61000-3-2	
Environment	ETSI EN 300 019: 2-1 (Class 1.2), 2-2 (Class 2.3) & 2-3 (Class 3.2) ETSI EN 300 132-2 2011/65/EU (RoHS) & 2008/98/EC (WEEE)	
Marine compliance (EMC class B with AC filter)	DnV Rules for Classification of Ships, High Speed & Light Craft and DnV Offshore Standards	
<small>1) V<sub>OUT</sub> may increase at no and very light load (&lt; 1 A) for V<sub>OUT,SET</sub> &lt; 245 V<sub>DC</sub> set and V<sub>IN</sub> &gt; 250 V<sub>AC/DC</sub>                  2) Specification valid for HW version 2 and newer. For older revision see DS:24111x.815.DS3 ver1.                  3) VRLA batteries boost 2.33V/cell                  4) 8A when V<sub>IN</sub> &gt; 290V<sub>AC</sub> and T<sub>ambient</sub> &gt; 45°C and V<sub>OUT</sub> &lt; 220V<sub>DC</sub> </small>		