

## High efficiency and reliable rectifier/converter

The most efficient power conversion module in the industry! Since the launch the Flatpack 2 family has expanded into a wide selection of power ratings and voltages.

The Flatpack2 48-60/2000 HE is a cost efficient rectifier for 48V and 60V lead acid battery systems as well as 48V NiCad.



# Flatpack2 Rectifier

## 48-60/2000 HE

Doc 241115.705.DS3 – v9

### APPLICATIONS

#### TELECOM

- Radio base stations / Cell sites
- LTE / 4G / WIMAX
- Distributed Antenna Systems
- Microwave / Broadband
- Central office

#### POWER UTILITIES

- Control & protection
- SCADA
- Communications equipment

#### RAIL & METRO

- Control & protection
- Signaling

#### MARINE & OFFSHORE

- Communications on ships



16kW Telecom system in outdoor cabinet



2U 8kW bulk feed power system

### KEY FEATURES

- HIGH EFFICIENCY – 96.2 %
- PROVEN RELIABILITY
- HIGH POWER DENSITY
- APPLICATION FLEXIBILITY, 2KW TO MULTICABINET INSTALLATIONS
- MODULAR DESIGN
- MTTR < 5MINS
- ACCEPTS DC INPUT (DC/DC CONVERTER)
- GLOBAL COMPLIANCE (CE, UL, NEBS)
- MARINE & OFFSHORE CERTIFICATIONS
- PATENTED TECHNOLOGY



1U 8kW power shelf

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Model	48-60/2000 HE
Part number	241115.705
<b>INPUT DATA</b>	
Voltage (nominal)	185 - 275 V <sub>AC</sub> / 185 - 275 V <sub>DC</sub>
Voltage (operating range)	85 - 300 V <sub>AC</sub> / 80 - 300 V <sub>DC</sub>
Current (maximum) @ nominal input, full load	11.6 A <sub>RMS</sub>
Frequency	45 - 66 Hz / 0 Hz
Power Factor	> 0.99 at 50% load or more
THD	< 5% at 100% load
Protection	Fuse in L & N, Varistor, Shutdown when input voltage is out of operating range
<b>OUTPUT DATA</b>	
Voltage (default) <sup>1)</sup>	53.5 V <sub>DC</sub> (67 V <sub>DC</sub> in 60V mode)
Voltage (adjustable range) <sup>1)</sup>	39.9 - 72 V <sub>DC</sub>
Power (maximum) @ nominal input	2000 W (@V <sub>OUT</sub> ≥ 48V <sub>DC</sub> )
Power @ 85 VAC	750 W
Current (maximum) @ nominal input	41.6 A (@V <sub>OUT</sub> < 48V <sub>DC</sub> )
Hold up time, 1500W output power	>20ms; output voltage > 53.5 V <sub>DC</sub> (60V mode)
Current sharing (10 - 100% load)	±5% of maximum current from 10 to 100% load
Static Voltage regulation (10 - 100% load)	±0.5%
Dynamic Voltage regulation	±5.0% for 10-80% or 80-10% load variation, regulation time < 50ms
Ripple & noise	< 150 mV <sub>PP</sub> , 30 MHz bandwidth / < 2 mV <sub>RMS</sub> psophometric
Protection	Fuse , Short circuit proof, High temperature protection, Over voltage Shutdown
<b>OTHER SPECIFICATIONS</b>	
Efficiency	96.2 %
Isolation	3.0 kV <sub>AC</sub> - input to output, 1.5 kV <sub>AC</sub> - input to earth, 500 V <sub>DC</sub> - output to earth
Alarms: Red LED	Low / high input voltage shutdown, High / low temperature shutdown, Rectifier Failure, Overvoltage shutdown on output, Fan failure, Low output voltage alarm, CAN bus failure
Warnings: Yellow LED	Rectifier in power de-rate mode, Remote output current limit activated, Input voltage out of range, flashing at overvoltage, Loss of CAN communication with controller
Normal operation: Green LED	
MTBF (Telcordia SR-332 Iss.I method III (a))	>350 000 (@ T <sub>ambient</sub> : 25 °C)
Operating temp. (5-95% RH n.cond. hum.)	-40 to + 75°C [-40 to +167°F]
Max output power de-rates above temp / to	45°C [113°F] / 1200W @ 75°C[167°F]
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 (4.25 x 1.69 x 13") / 1.950 kg (4.3lbs)
<b>DESIGN STANDARDS</b>	
Electrical safety	EN 60950-1:2006+A11:2009+A1:2010+A12:2011+A2:2013, IEC 60950-1:2013 UL 60950-1:2011
EMC	EN 61000-6-1:2007, -6-2:2005, -6-3:2007 + A1:2011, -6-4:2007 + A1:2011, IEC 61000-6-5: 2015, ETSI EN 300 386:2.1.1
Marine	DNVGL-CG-0339 <sup>2)</sup>
Environment	ETSI EN 300 019: 2-1 (Class 1.2) & 2-2 (Class 2.3) 2011/65/EU (RoHS) & 2012/19/EU (WEEE) Normal operating conditions as per IEC 62040-5-3:2016 clause 4.2. Other operating conditions as per IEC 62040-5-3:2016 clause 4.3, must be advised
<sup>1)</sup> OVS setting from controller select mode: OVS≤59.5V = 48V mode (42-58V), 59.5V<OVS<70.85 = 48V NiCad mode (39.9-66V) and OVS≥70.85V = 60V mode (52.5-72V). When de-energized module will return to 48V mode. <sup>2)</sup> Only valid for part number 241115.705M	

Specifications are subject to change without notice