

# NetSure™ 12V DC Power System

## Key Features

- High power density – up to 24 kW (12V DC at 2000 A) per shelf in three rack units (5.25")
- Interchangeable 3000 watt rectifiers and battery backup units, each slot accommodates either unit
- Battery backup units that deliver battery backup for 90 seconds or operate in power boost mode to supplement power output of the rectifiers
- Hot swappable – allows for system expansion without disruption
- Expandable – parallel up to three shelves per system for up to 72 kW (12V DC at 6000 A) per system
- Operates over a wide AC input voltage range with multiple input configurations
- Safety compliance – UL 60950, CAN/CSA-C22.2 No. 60950-1-03, GR-3160, CE mark, RoHS, REACH

## Standard Features

- Ethernet interface to rack management system via SNMP
- System alarming
- Current and power limiting
- Over-voltage protection
- Load sharing
- Over-temperature protection
- Emergency shutdown



12V Rectifier (left)  
Battery Backup Unit (right)

*Compact, modular design provides a total DC power solution, complete with battery backup, for a wide range of data rack applications.*

## Description

The modular NetSure 12V DC power system provides up to 6000 amps at 12 volts DC via high efficiency switch mode rectifiers rated at 3000 watts (250 amps) each and battery backup units (BBUs) rated at 3000 watts (250 amps) each. It can be configured with up to three shelves rated at 2000 amps each. The system also accommodates a System Control Card (SCC) that controls and monitors the rectifiers and BBUs while communicating to the rack management system.

BBUs, which can be installed in any rectifier slot, can be operated in two modes. In the classic backup power mode – during the loss of AC input – each BBU can deliver 3000 watts for 90 seconds. The BBUs also provide a power boost feature that delivers additional power to the system when the peak power requirement of the load temporarily exceeds the output capacity of the installed rectifies or a settable power limit value.

The modular design allows the power system's capacity to expand as your system needs grow. Each 12V DC power shelf can accept a combination of nine individual, plug-in rectifiers or battery backup units that can be easily installed live without system interruption. Each shelf provides 24000 watts (2000 A max) at 12V DC in three rack units (5.25") of height. The SCC can manage up to three shelves for a maximum system capacity of 72000 watts (6000 A max) at 12V DC.

A rectifier is also available at 3300 watts (275 amps) maximum output for applications requiring even higher power density.

## Application

The NetSure 12V DC power system is ideal for data center racks and cabinets, either custom or standard (such as Open Compute Project).

## Ordering Information

Model Number	Part Number	Description
PSS12/2000-19BC	588706000xx*	12V DC power main shelf
PSS12/2000-19B	588706000xx*	12V DC power expansion shelf
M520H	1M520HNA	12V DC System Control Card (SCC)
R12-3000	1R123000	12V rectifier, 3000 watts
B12-3000	1B123000	12V battery backup unit, 3000 watts
R12-3300	1R123300	12V rectifier, 3300 watts

\* Several options are available.



12V DC Power System Shown with  
Six 12V Rectifiers, Three BBUs and One SCC



## Technical Specifications

Input	
Voltage, Shelf	208 VAC / 240 VAC nominal single-phase with range of 176 VAC to 264 VAC 200 VAC / 208 VAC / 240 VAC nominal three-phase with range of 176 VAC to 264 VAC 380 VAC / 415 VAC / 480 VAC nominal three-phase (4-wire + PE) with range of 323 VAC to 528 VAC
Voltage, Rectifier and BBU	200 VAC / 208 VAC / 220 VAC / 240 VAC / 277 VAC nominal single-phase with range of 176 VAC to 305 VAC
Current, Rectifier	18.3 amps maximum at full power and 176 VAC
Current, BBU	0.55 amps maximum at 176 VAC
Circuit Protection	Fuses located in each line input of rectifiers and BBUs
Efficiency	94% typical

Output	
Voltage	12.3 VDC nominal, adjustable from 12.0 VDC to 13.2 VDC
Current, Shelf	2000 amps maximum
Current, Rectifier	250 amps maximum at 12.0 VDC (3000 watts maximum)
Current, BBU	250 amps maximum at 12.0 VDC (3000 watts maximum) for 90 seconds
Capacity, BBU	75 Watt-Hours, 1500 cycles
Regulation	Steady state output voltage remains within $\pm 1\%$ of the pre-adjusted voltage for any load current from no load to full load and over the specified input voltage range
Dynamic Response	For a step load change within the range of 10 % to 90 % of full rated current, the maximum voltage transient will not exceed 5 % of the initial steady state voltage
Filtering	Wide band noise does not exceed 120 mV peak to peak

Protection	
Over-Voltage	Each rectifier and BBU will automatically shut down and lock out should its output voltage exceed a value set by the controller, maximum set point is 13.2 VDC. Unit will automatically attempt to restart once. A second (backup) over-voltage protection circuit will shut down and latch off the unit if the voltage exceeds 14.0 VDC.
Over-Current	Adjustable from 25 amps to 250 amps per rectifier and BBU
Power Limit	Non-adjustable limit of 3000 watts maximum per rectifier and BBU
Over-Temperature	Each rectifier and BBU will automatically shut down if the internal temperature of the module exceeds a predetermined value. Operation will automatically resume after the over-temperature condition is removed.
Internal Fault On Output	Each rectifier and BBU contains an output blocking (ORing) circuit which prevents an internal fault in the unit from affecting the bus voltage.

Physical Characteristics – Weight and Dimensions (H x W x D)	
Shelf	17.5 kg (38.5 lb) without AC cords, 132 mm x 483 mm x 656 mm (5.2" x 19" x 25.8")
Rectifier	3.0 kg (6.6 lb), 124 mm x 41.4 mm x 453 mm (4.9" x 1.6" x 17.8")
BBU	4.1 kg (9.1 lb), 124 mm x 41.4 mm x 453 mm (4.9" x 1.6" x 17.8")

Environmental	
Operating Temperature	-10 °C to +45 °C (+14 °F to +113 °F) without BBUs, 0 °C to +45 °C (+32 °F to +113 °F) with BBUs
Storage Temperature	-40 °C to +85 °C (-40 °F to +185 °F) without BBUs, consult manual for BBU storage temperature specifications
Humidity	0 % to 95 % relative humidity, non-condensing
Altitude	-200 feet to 10000 feet, maximum operating ambient temperature should be derated linearly (3 °C per 1000 ft.) at elevation above 6000 ft
EMC	This unit conforms to the requirements of FCC Part 15, Subpart B, Class A and EN 300 386, Class A for radiated and conducted noise
Safety Compliance	UL 60950, CAN/CSA-C22.2 No. 60950-1-03, GR-3160, CE mark, RoHS, REACH

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