

■ DC Power for  
Business-Critical Continuity

*NetSure™ 701NVBB*  
DC Power System





### Key Features

- **Modular Design** — simple to install and operate; allows incremental cost-effective system growth
- **Single Point Adjustment** — no tools required to change settings and make adjustments; MCA controls up to 72 PCUs
- **Remote Access** — options allow users to view, control and interact with the system using an Ethernet, modem, RS 232 or LMS1000 interface
- **Plug'n'Play** — add PCUs without changing the settings and making adjustments; no system interruption
- **Front Accessible** — allows for easy installation, additions and maintenance
- **High Density** — compact design takes up less floor space; houses six 3200 watt PCUs per rectifier shelf (3RU), system can be configured with up to two bays
- **Constant Power** — delivers more current at lower voltages to meet load or recharge demand
- **Safety Compliance** — Designed to NEBS Level 3 compliance; UL Listed to UL subject 1801

New 3,200 watt constant power conversion units provide 55 to 67 amps (59 amps at 54.0VDC and 62 amps at 52.0VDC) with a current limit of 67 amps. With six units per shelf, these rectifiers provide 330 to 402 amps in three rack units (5.25-in.) of space.

The modular NetSure™ 701NVBB power system with 3,200 watt power conversion units (PCUs) provides up to 4,000 amps of power for -48 volt systems.

The basic components of the power system include the meter-control alarm unit (MCA), rectifier shelves which house the PCUs, and up to two modular distribution cabinets with rear copper bus inter-bay power connections, allowing the system to be expanded to either side of the main bay.

The NetSure™ 701 power system contains a powerful, microprocessor-based meter-control alarm system capable of monitoring and controlling up to 72 PCUs. The MCA provides a 16-character alphanumeric display, which can be activated at the touch of a keypad.

Each rectifier shelf can accommodate up to six plug'n'play PCUs, which are controlled by the MCA. Additional shelves can be added as load requirements increase.



NetSure™ 701NVBB

The NetSure™ 701 distribution cabinet is modular by row and position. Four distinct distribution cabinet sizes are available to accommodate from one to four distribution panels. This allows the system to be configured in relay racks of various heights for installation in low-profile sites or atop batteries or other equipment to make more effective use of floor space. Several distribution panels are available offering different combinations of distribution positions, low voltage disconnect and battery disconnect options.

## Application

The NetSure™ 701NVBB system is ideal for wireline and wireless applications such as switch sites, co-location, huts and large vaults or enclosures.

### AC Input

Each rectifier shelf in the NetSure™ 701 power system allows for an AC input feed to each power conversion unit. There are conduit knockout openings on the rear and side of each shelf. Each conduit opening allows for installation of the (3) circuits necessary to power up the (3) PCUs on that side of the shelf. If space is a problem then an AC wireway option is available that will allow for the connection of the AC cables at the top of the bay. At the factory, cables are run from this connection point down into the shelves and enclosed in a sheet metal cover. Once again conduit knockouts are provided at that top of this cover.

### Distribution

The NetSure™ 701 power system includes a modular distribution product line that can be designed with one to two distribution cabinets – sized to accommodate from one to four distribution panels each. Each panel is rated at 500 amps load. The maximum load per distribution cabinet is 2000 amps. The two, three and four-row

distribution cabinets can be interconnected via copper inter-bay bus bars for a total system capacity of up to 4,000 amps with two bays.

The system can also be expanded with additional bays that are not adjacent to each other via extended length communications cables and inter-bay power cabling. The distribution cabinet can be factory mounted in a relay rack or shipped loose for mounting in a customer supplied relay rack or cabinet rails.

A wide variety of panels provide multiple combinations of distribution positions, low voltage disconnect and battery disconnect. Distribution cabinets are front accessible, modular in design and are initially configured in the factory. Circuit breakers and/or fuse modules plug into the multi-position distribution panels to provide for easy installation. Distribution device options include 1 to 250 amp plug-in circuit breakers, 3 to 100 amp TPS-style fuses in plug-in holders, 100 to 600 amp GJ/218-style circuit breakers and 70 to 600 amp TPH-style fuses. These devices can be configured for both load and battery disconnect. A GMT fuse module is also available.



*Top AC Wireway Input  
(cover removed)*



*Bottom AC Wireway Input  
(cover removed)*



*Modular Distribution Cabinets*

The NetSure™ 701NVBB power system's extensive monitoring capabilities, easy configuration and maintenance are all backed by the resources and quality reputation of a nationwide service organization.



MCA

#### Monitoring/Control

The MCA provides a single point of adjustment for such features as float voltage, test/equalize voltage, high voltage shut-down and current limit for all PCUs in the entire power system. The rugged, temperature hardened LED display allows users to view specific alarm conditions, system measurements and system settings. All measurements and adjustments can be performed locally via the alphanumeric display on the front of the MCA panel or remotely via optional

software and hardware. The MCA provides local indicators and the ability to transmit various alarm conditions such as PCU failure, high voltage shutdown and AC failure. Remote and local communication is available using an Ethernet connection (web browser (HTTP) or SNMP), modem or RS-232 interface. In addition, the LORAIN® Monitoring System, LMS1000, can be configured into this system (refer to 586505500 documentation for specifications).



-48VDC NetSure™ 701NVBB  
with Battery Trays

#### Battery Stand or Trays

The NetSure™ 701 power system can be configured with a NEBS Level 3 certified modular front access battery stand to provide an entire power plant in one bay. Available options include manual battery disconnect/protection, low voltage bat-

tery disconnect, battery current monitoring and battery recharge current limit (refer to 588820000 documentation for specifications). Rack-mount battery trays are also available with optional battery disconnect circuit breakers.



Power Conversion Unit  
1R483200

### Power Conversion Unit

The modular R48-3200 is a high frequency constant power PCU designed with the latest patented switch-mode technology using DSP (Digital Signaling Processor) functionality. Use of DSP technology results in fewer components and optimized operation. Plug'n'play technology allows for easy system configuration. System capacity can be increased by simply plugging an additional PCU into an existing rectifier shelf or a newly added expansion shelf — no adjustments or setup are required. The NetSure™ 701 power system can house up to 72 PCUs, which provide load power, battery float current

and battery recharge current. The PCUs are monitored and controlled by the MCA. The PCUs allow the user to appropriately size a power plant to meet specific applications.

### Rectifier Shelf

The NetSure™ 701 power conversion units are housed in modular rectifier shelves each of which accommodates six PCUs. The rectifier shelves are 23" (58.42cm) wide and 5.25" (13.33cm) high. System capacity can be easily expanded with additional shelves. A maximum of six rectifier shelves can be installed in each bay. An individual AC feed is provided for each rectifier on each rectifier shelf.

## NetSure™ 701 NVBB General Specifications

### System Characteristics

Nominal System Voltage	-48VDC
Rated Output Capacity	
System	4000 amps
Bay	2000 amps
PCU	3200W PCU (R48-3200)
Shelf	330 amps to 402 amps
Distribution Panel	500 amps
Framework Type	Relay Rack (can be mounted in enclosures)
Mounting Width	23 Inches
Mounting Depth	18 Inches Single Bay 21 Inches Two Bays
Access	Front, sides and rear for installation, front for operation and maintenance
Control	Microprocessor (MCA)

### Environmental

Operating Temperature	-40°F to 104°F (-40°C to 40°C) continuous operation
Storage	-40°F to 185°F (-40°C to 85°C)
Humidity	0% to 95% relative humidity, non-condensing
Ventilation	Fan-cooled front to rear
EMI/RFI Suppression	Conforms to FCC rules Part 15, Subpart B, Class A and EN55022 Class A, radiated and conducted
Safety Compliance	UL Listed 1801, cUL, designed to NEBS Level 3

## R48-3200 Rectifier Specifications

### Electrical Specifications

#### AC Input

Nominal Voltage	Single phase 208/240VAC
Operating Voltage Range	186VAC to 256VAC
Frequency	45 Hz to 65 Hz
Power Factor (PF)	>0.98 from 50% to 100% load
Total Harmonic Distortion	≤5% from 50% to 100% load
Input Current	Max 20 amp
Inrush Current	Inrush current does not exceed 150% of the rated input steady state peak value.
Input Protection	If the input voltage decreases or increases beyond a non-adjustable predetermined value, the rectifier circuitry shuts down, disabling the output. The rectifier will recover automatically when the AC input is re-established and exceeds 95VAC (low voltage restart point) or when it decreases to 285VAC (high voltage restart point). Overcurrent is protected by an internal fuse.
Operating Efficiency	92% peak 90% minimum at full load

#### DC Output

Output Voltage Range	-42.0VDC to -58.0VDC
Output Power	Constant power limiting operation 3200W maximum from 176VAC to 290VAC 1600W @ 120VAC 600W @ 85VAC
Output Current	55 to 67 amps
Regulation	Steady state output voltage remains within +/-0.25% for any combination of input voltage from 5% to 100% load
Voice Band Noise	The voice-frequency noise generated by a rectifier does not exceed 32dBmC output noise from 10% to 100% load
Wide Band Noise	Does not exceed 250 mv peak-to-peak, or 100 mv rms per Telcordia GR-947-CORE
Psophometric Noise	Does not exceed 1 mv 10% to 100% load
Protection	
Current Limiting	The output current is limited to 67 amp
Over Current	Internal fuse
High Voltage Shutdown	If rectifier detects over voltage it will turn off. After 5 seconds it will restart; if it encounters an over voltage within 5 minutes it will turn off and remain off until reset.

## R48-3200 Rectifier Specifications (continued)

### Environmental

Temperature	-40°F to 113°F (-40°C to 45°C) at full rated output
Altitude	Up to 6562' (2000m) at full rated output
Ventilation	Front to back with speed-controlled fan (field replaceable)
Audible Noise	The rectifier does not produce sound levels above 53dB(A), measured 0.6m in front of the rectifier, at the same horizontal line as the middle of the rectifier at 25°C

### Status / Alarm Indicators and Monitoring

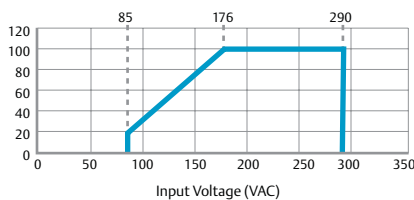
Visual Indicators	Status	Visual indicator color
	Normal operation	Green
	Alarm	Yellow
	Rectifier failure alarm	Red
	Fan failure alarm	Flashing red

Status Settings The MCA controller establishes all rectifier settings)

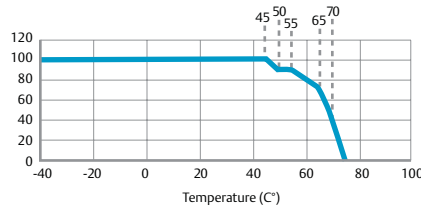
### Rectifier Physical Specifications

Mounting	Plug-in installation
Dimensions (H x W x D)	5.20 x 3.36 x 11.3 inches (132 x 85.3 x 287mm)
Weight	7.7 lbs. (3.5kg)
Safety Compliance	UL recognized (UL60950) for USA & Canada, CE marked

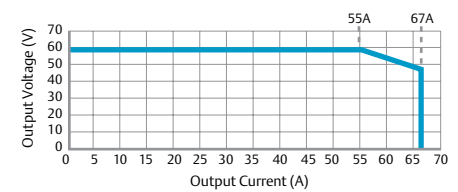
**Output power vs. Input voltage at Tamb <45°C**



**Output Power vs. Temperature at Uin>176VAC**



**Output voltage vs. Output current, max. output power 3200W**



### Additional Information

For additional specification, engineering and installation information use specification numbers 582126000 (power system) and 588705000 (power shelf for 3200W PCUs).

For ordering information, request SAG582126000, PD588705000.

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