

■ DC Power for  
*Business-Critical Continuity™*

# NetSure® 702

*DC Power System*



## Key Features

- **High efficiency** — approaching 97%, eSure™ rectifiers reduce power consumption for lower operating costs
- **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 168 rectifiers
- **LMS1000 monitoring with a single plug in card**
- **Remote access** — options allow users to view, control and interact with the system using an Ethernet (Telnet, web pages, SNMP or TL1), modem or RS 232
- **Plug'n'play** — add rectifiers without changing the settings and making adjustments; no system interruption
- **High density** — compact design takes up less floor space; houses (36) 3200 watt rectifiers per bay
- **Cabled plant** — offers unlimited configuration options
- **PowerShare** — allows the reuse of existing equipment with NetSure® 702
- **Safety compliance** — UL Listed to UL subject 1950

3,200 watt eSure™ high-efficiency rectifiers provide up to 67 amps each with an efficiency rate of nearly 97%. With 36 units per bay, these rectifiers provide up to a 2,000 amp output in a 25" x 18" footprint.

The modular NetSure® 702 power system with 3200 watt rectifiers provides up to 10,000 amps of power for -48 volt systems. The main component of the system is the 2000 amp power bay which houses the rectifiers and MCA chassis. The cabled architecture allows the placement of the bays anywhere the user desires without regard to any specific order. This also makes it more user friendly in applications where existing obstacles, such as support columns, need to be accommodated. The total plant size is defined by the maximum capacity of the Main Battery Termination Bars (MBTB).

The NetSure® 702 power system contains a powerful, microprocessor-based meter, control and alarm system capable of monitoring and controlling up to 168 rectifiers. The MCA provides a 4 line, 40-character alphanumeric display, which can be activated at the touch of a keypad. Each rectifier bay can accommodate up to 36 plug'n'play rectifiers, which are controlled by the MCA. Additional bays can be added as load requirements increase.

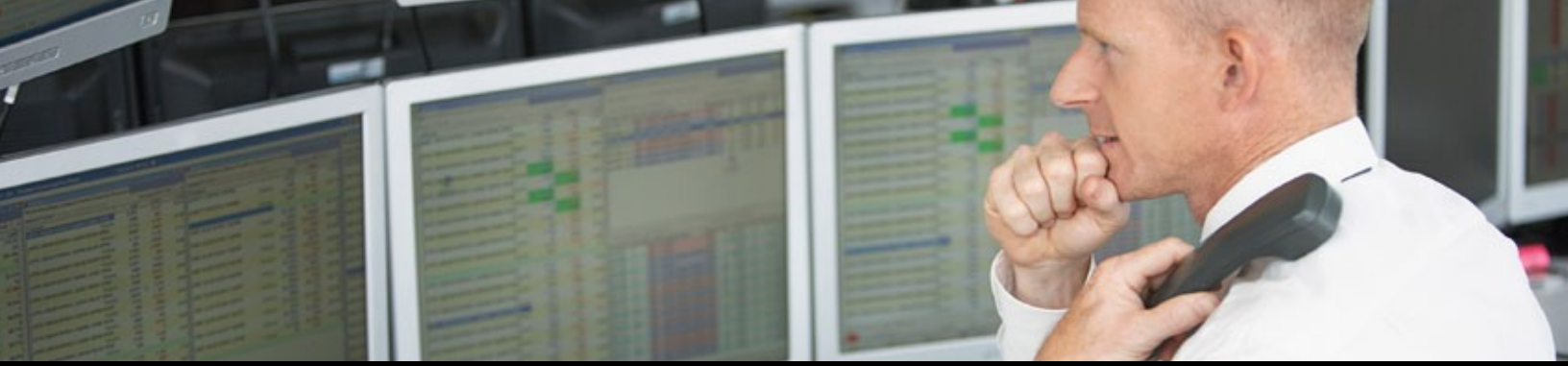
The NetSure® 702 power system is compatible with the NetSure® 801 6000 amp modular distribution bays. Each bay can be configured with up to 70 positions of fuses and circuit breakers from 1-800 amps. Multiple bays may be used to support load levels in excess of 10,000 amps. Consult the NetSure® 801 documentation for further details.

## Application

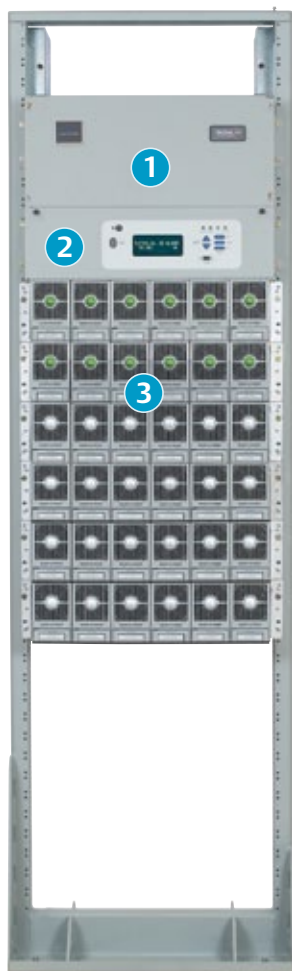
The NetSure® 702 system is ideal for wireline, wireless and data center applications such as CO, MTSO, co-location and data processing centers.

## Additional Info

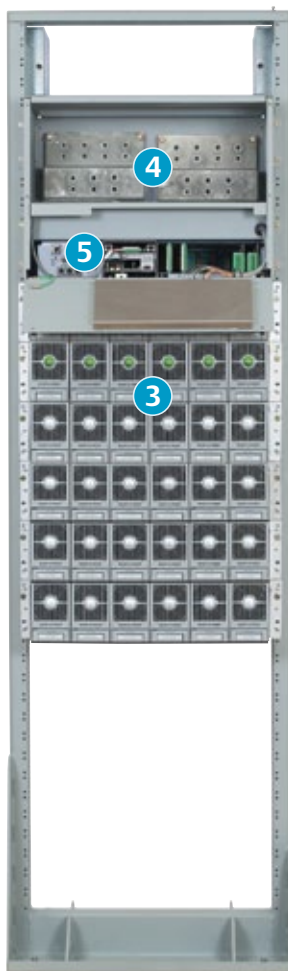
For ordering information, request SAG582126100. For additional specification, engineering and installation information use specification number 582126100, model number 702 NBDB.



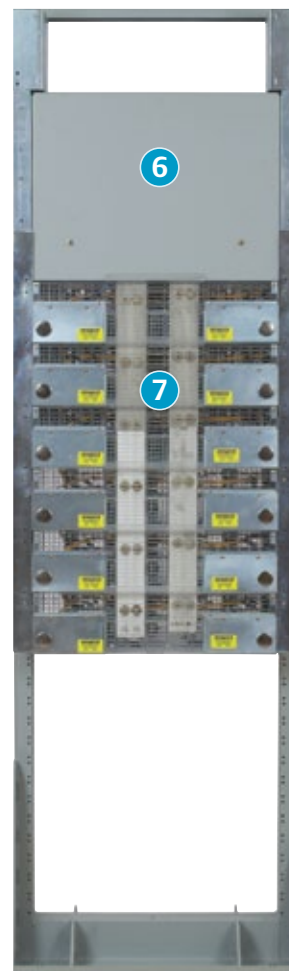
## NetSure® 702 Series – System Elements



NetSure® 702 (front view)



NetSure® 702 (front view shown open)



NetSure 702™ (rear view)

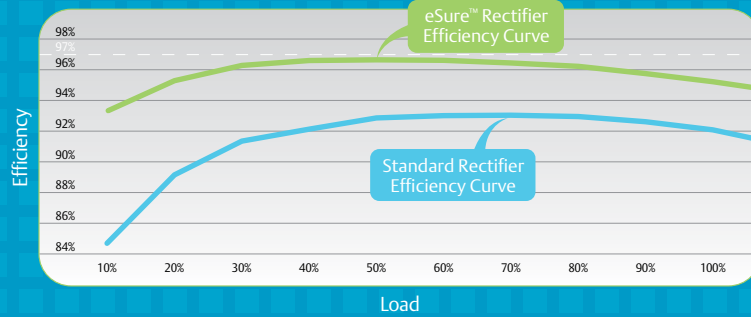
- 1 Bulk DC Output
- 2 MCA Controller
- 3 R48-3200 Rectifiers

- 4 Bulk DC Output (shown open)
- 5 MCA (shown open)

- 6 Bulk Output Cabinet (rear view)
- 7 Rectifier Shelves & Bussing (rear view)



This graph demonstrates eSure™ ultra high efficiency approaching 97% versus a standard rectifier efficiency curve around 92%



## Rectifiers

Introducing the eSure™ rectifier from Emerson. The R48-3200e approaches 97% efficiency and is the first of the ultra high efficient eSure™ rectifier line. eSure™ rectifiers deliver the most reliability and highest efficiency in the industry, reducing power consumption and lowering operation cost.

The NetSure® 702 Series supports eSure™ rectifiers and standard rectifiers. The R48-3200e and R48-3200 are both modular, high frequency constant power rectifiers designed with the latest patented switch-mode technology using DSP (Digital Signal 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 rectifier into an existing shelf or a newly added expansion shelf — no adjustments or setup are required.

The NetSure® 702 Series houses up to 168 rectifiers, which provide load power, battery float current and battery recharge current. The rectifiers are monitored and controlled by the MCA. The modular design of these units facilitates power plant sizing to application needs.

Beyond reducing operating costs, Emerson has maximized the value of eSure™ rectifiers by making them backwards compatible with existing NetSure® DC Power Systems. Both unit types can be used in a system together.



eSure™ Rectifiers

## Rectifier Shelf

The NetSure® 702 rectifiers are housed in modular shelves that accommodate up to six rectifiers each. The rectifier shelves are 23" (58.42cm) wide and 5.25" (13.33cm) high. Each bay is equipped with six shelves. AC connections are wired from each shelf to the top of the bay. There are two 3-phase feeds per shelf.



### Hybrid Applications

The NetSure® 702 power system is designed to operate in conjunction with existing equipment. Leverage our patented PowerShare technology to deploy a true hybrid power plant by reusing existing power and/or distribution. Alarming and telemetry are centralized within the NetSure® 702 providing a single point of contact. PowerShare offers significant cost savings through the reuse of existing equipment already on site.

**Emerson Network Power** —  
The NetSure® 702 power system's extensive monitoring capabilities, easy configuration and maintenance are all backed by the resources and quality reputation of a nationwide service organization.

The NetSure® platform is globally renowned with over **1 million** units deployed and an unmatched reliability of less than 0.5% failure rate (200 years MTBF).

## Modules & Options

### AC Input

The NetSure® 702 is configured for 208/240 VAC three-phase service. Each three-phase feed powers three rectifiers. The AC connections are located at the top of the bay.

### DC Output

The DC output is provided through a termination bus rated at 2000 amps per bay. The bus accommodates up to (7) 750 mcm cables per polarity.



*DC Output Termination Panel*

### 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 rectifiers in the entire power system. The MCA provides local indicators and the ability to transmit various 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 using the optional LMS1000 monitor.

The MCA provides local indicators and the ability to transmit various alarm conditions such as rectifier failure, high voltage shutdown and AC failure. Alarm relays are programmable and will respond to SNMP

gets and send traps when combined with the SNMP option. Remote communication is available using an Ethernet connection (HTTP web browser, Telnet or SNMP), modem or RS-232 interface.



*MCA (Meter, Control & Alarm)*



## NetSure® 702 – System Specifications

### System Features

Nominal System Voltage -48VDC (-47 to -58 VDC)

Control Microprocessor (MCA)

### Rated Output Capacity

System 10,000 amps

Power Bay 2,000 amps

Rectifier 3200 watt rectifier (R48-3200)

### Physical Characteristics

Framework Type Relay Rack

Mounting (H x W x D) Power Bay – 7' x 25" x 18"

Access Front and back

### Environmental

Operating Temperature -32°F to 104°F (-0°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 B and EN55022 Class B

### Safety Compliance

UL Listed 1950, cUL

## Rectifier Specifications

### Environmental

#### R48-3200

#### R48-3200e

Temperature\* -40°F to 113°F (-40°C to 45°C) at full rated output.  
-40 to +167°F, -40 to +75°C (operating and storage).

Altitude\* Up to 6562' (2000m) at full rated output

Relative Humidity\* 0 to 95%

Ventilation (field replaceable)\* Front to back with speed-controlled fan

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\* Normal operation = Green LED      Rectifier failure alarm = Red LED  
Alarm = Yellow LED      Fan failure alarm = Flashing red LED

Status Settings\* The MCA controller establishes all rectifier settings. Reported via CAN bus to system controller.

### 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)

**6.8 lbs. (3.1kg)**

Safety Compliance\* UL 60950 recognized (USA/Canada), CE marked, EN 300 386:2001 class B, FCC part 15 class B, IEC 60950, EN 60950

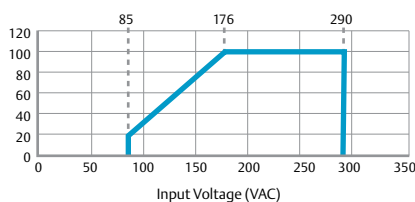
\* Applies to both rectifiers.

## Rectifier Specifications (continued)

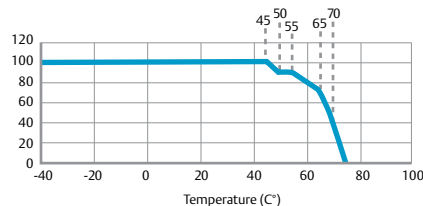
AC Input	R48-3200	R48-3200e
Nominal Voltage*	Single phase 208/240VAC	
Operating Voltage Range*	176VAC to 275VAC	
Frequency*	45 Hz to 65 Hz	
Power Factor (PF)*	>0.98 from 50% to 100% load	
Total Harmonic Distortion*	≤5% from 50% to 100% load	
Input Current	Max 20.4 amp	<b>Max 19.4 amp</b>
Inrush Current*	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	<b>96.8% peak</b>
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 Derated for input voltage (see diagram) 3200W @ Vout >48VDC
Output Current*	67 amps max	
Regulation*	Steady state output voltage remains within +/-0.25% for any combination of input voltage from 5% to 100% load	
Voice Band Noise*	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 30 mv rms per Telcordia GR-947-CORE	
Psophometric Noise	Does not exceed 1 mv 10% to 100% load	<b>Does not exceed 2 mv</b> 10% to 100% load
Output Protection*	Current Limiting Over Current High Voltage Shutdown	Output current is limited to 67amps. Output current limit set point 5.5 to 67 amps. Internal fuse 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.

\* Applies to both rectifiers.

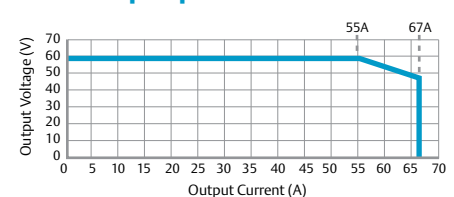
**Output power vs. Input voltage at Tamb <45°C**



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



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



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The global leader in enabling *Business-Critical Continuity™*.

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