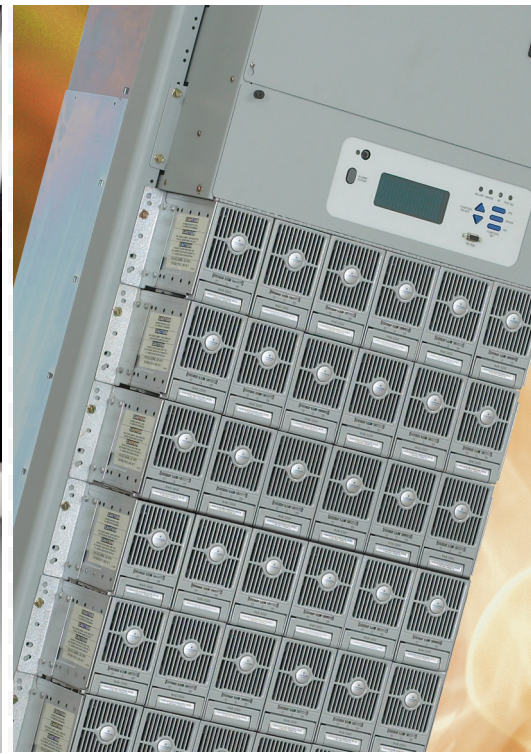
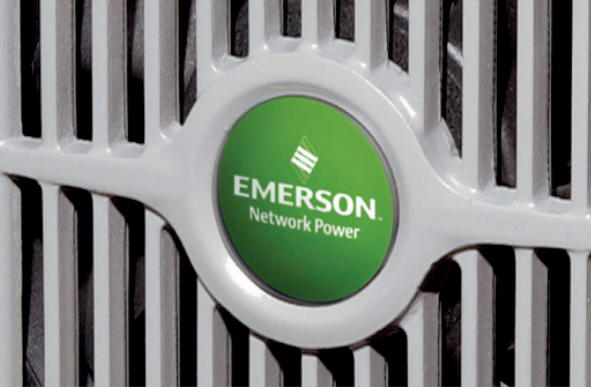


■ DC Power for
Business-Critical Continuity™

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) 3500 or 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

3,500 watt eSure™ high-efficiency rectifiers provide up to 73 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 3500 watt and 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.

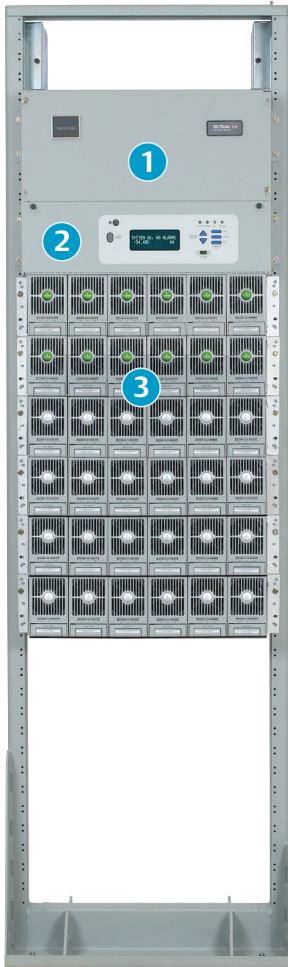
Application

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

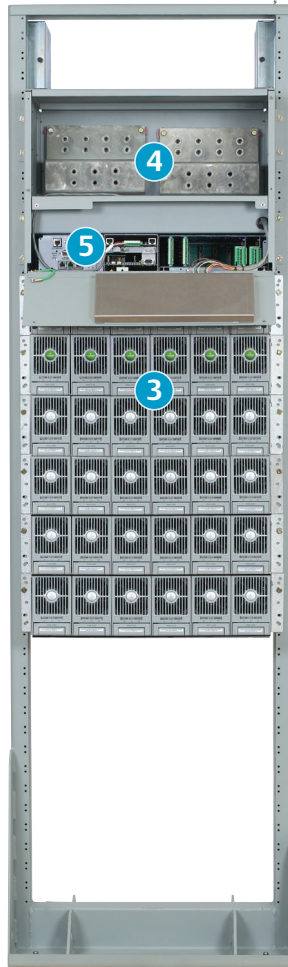
Additional Info

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

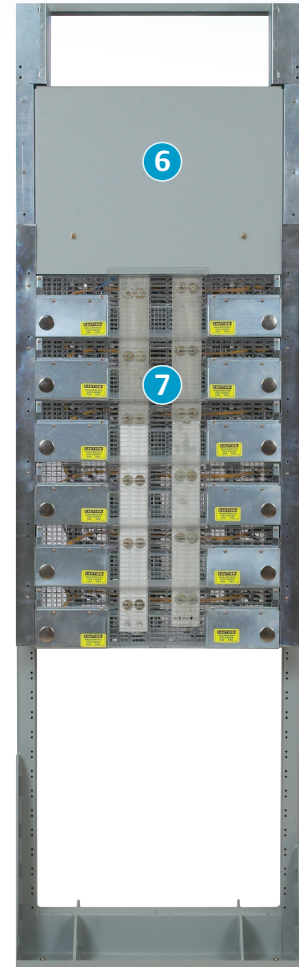
NetSure® 702 Series – System Elements



NetSure® 702 (front view)



NetSure® 702 (front view shown open)



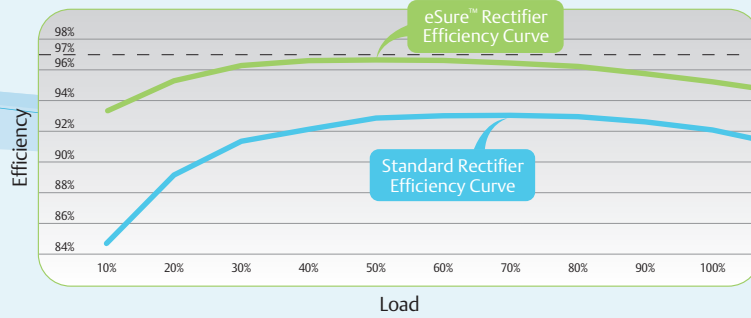
NetSure 702™ (rear view)

- 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%



eSure™ Rectifiers

Ultra high efficiency approaching 97% is achieved with the eSure™ R48-3500e and R48-3200e rectifiers. 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 R48-3500e, R48-3200e and R48-3200 are 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.

With over 2 million NetSure® rectifiers deployed in the field, Emerson has achieved remarkable MTBF and reliability performance.

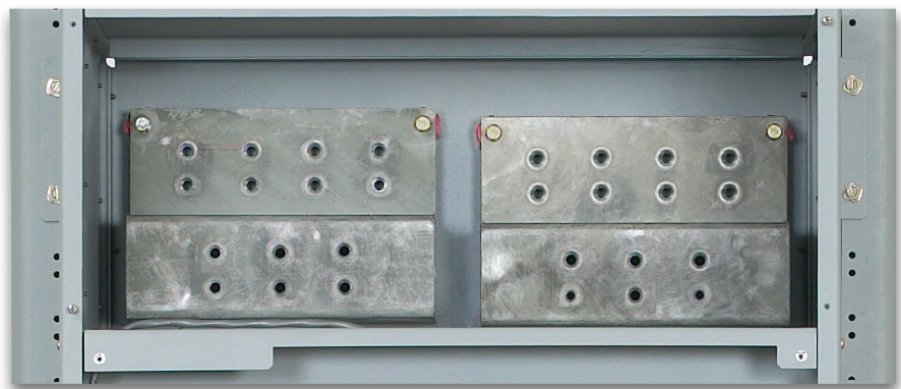
Modules & Options

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	2000 amps
Rectifier	3500 watt and 3200 watt units available
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

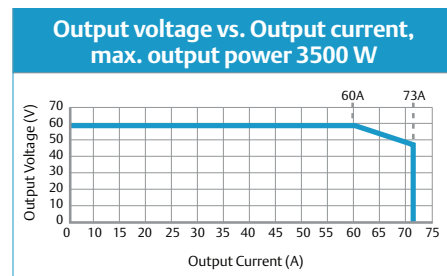
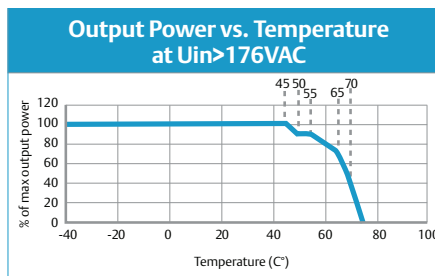
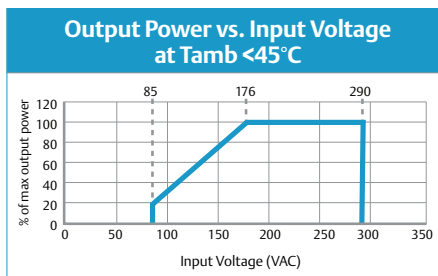
Rectifier Specifications – R48-3200, R48-3200e and R48-3500e

Electrical Specifications	R48-3200	R48-3200e	R48-3500e
Environmental			
Temperature	-40°F to 113°F (-40°C to 45°C) at full rated output. -40°F to +167°F (-40°C to +75°C) with derating.		
Altitude	Up to 6562' (2000m) at full rated output		
Relative Humidity	0 to 95%		
Ventilation	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 Alarm = Yellow LED	Rectifier failure alarm = Red 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)	7.7 lbs. (3.5kg)	7.7 lbs. (3.5kg)
Compliance	UL 60950 recognized (USA/Canada), CE marked, EN 300 386:2001 class B, FCC part 15 class B, IEC 60950, EN 60950		

Emerson Network Power —
*a complete spectrum of best-in-class reliable power,
precision environmental and connectivity solutions for today's
telecommunications and data network infrastructure.*

Rectifier Specifications – R48-3200, R48-3200e and R48-3500e

Electrical Specifications	R48-3200	R48-3200e	R48-3500e
AC Input			
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	16.0A typical, 20.3A max	15.2A typical, 19.6A max	16.5A typical, 21.4A max
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	96.8% peak	96.7% peak
DC Output			
Output Voltage Range	-42.0VDC to -58.0VDC		
Constant Power Limiting Operation	3200 W maximum from 176VAC to 290VAC at >48VDC output	3500 W maximum from 176VAC to 290VAC at >48VDC output	
Output Current	67 amps max	73 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	Does not exceed 2 mv 10% to 100% load	
Output Protection			
Current Limiting	Current limit adjustable from 5 to 67A	Current limit adjustable from 6 to 73A	
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.		



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