

# Slimline Power System

24V DC Outside Plant and Customer Premise Solution



- Customer premise power for converged networks
- Large plant features in a small plant package
- 1000 Watts / 40 Amps single shelf capacity in 1RU
- 10.3 inches (264mm) depth is ideal where space is restricted
- Greater than 90% efficiency

## Overview

The Slimline Power System provides advanced controller features in a compact, cost-efficient footprint. The SPS shelf is 1.75" high, 10.3" deep and mounts in 19-inch or 23-inch wide frames, with two power slots for rectifiers and distribution. The Pulsar Edge controller has Ethernet connectivity to facilitate remote network management to monitor and control rectifiers, batteries, and distribution. SPS is a reliable DC power solution where system height and depth are restricted.

## Shelf Options

The Slimline Power System product line provides several shelf options equipped with Ethernet, alarm inputs/outputs, and 1-Wire™ connection for battery voltage and temperature monitoring. Shelves can be deployed in parallel to increase output capacity. The shelf configurations hold up to two 500 Watt rectifier modules and include an integrated distribution module with GMT fuse positions, and low-voltage battery disconnect circuit.

## SPS Rectifier

This hardened rectifier is a single phase, hot pluggable, fan cooled rectifier that provides up to 500 Watts of high availability DC power. The constant output power characteristics, extended temperature range, universal AC input, and compact size are key attributes that make this rectifier the right choice for your power needs.

## Pulsar Edge Controller

SPS features the Pulsar Edge controller delivering large system intelligence in a small system form factor. Ethernet connectivity with SNMP facilitates remote network management.

## Benefits

### Reliability

- Simplified deployment
- Proven field performance
- Hardened for extreme environments

### Intelligence

- Industry leading controller features
- Ethernet interface for remote access
- Centralized network management

### Investment Protection

- Engineered to reduce installation time
- Efficient operation

### On Time Delivery

- Standard building blocks
- 4 - 6 week availability
- 24/7 technical support

## Total Efficiency

The GE Energy Total Efficiency™ (TE) architecture reduces energy loss and lowers cooling costs by 50-70%. TE products will prioritize sustainable energy sources like solar, wind, water and fuel cells over traditional utility grid or diesel generator sources – and they will intelligently respond to smart grid information to reduce consumption during peak demand periods. Active Rectifier Management (ARM) and Battery Charging Optimization (BCO) features increase efficiency on current and legacy power infrastructures. The Total Efficiency architecture addresses issues end-to-end based on our proven experience and expertise in batteries, power distribution, DC energy systems, AC-DC power supplies, and DC-DC board mounted power to deliver a solution that is more safe, reliable and energy efficient than competitive alternatives.



imagination at work

## SPS Rectifiers



The SPS rectifiers are single phase, hot-pluggable, fan cooled rectifiers that provide highly reliable DC power. The SPS EP0500 rectifiers are cost-effective rectifiers that occupy just 1RU and it's shallow depth is an ideal power solution for space critical applications. The constant output power characteristics as well as the extended temperature range, universal AC input voltage range and compact size are key attributes that make this rectifier the right choice for your power needs.

These rectifiers are applicable for indoor and outdoor environments especially where equipment depth and height are restricted. The SPS rectifiers communicate digitally to the Pulsar Edge controller family over a RS485 bus to add extensive monitoring and alarm management facilities. Its flexible and sophisticated feature set makes this front-end supply an excellent choice for power in a variety of application spaces.

### Applications

- Telecommunications networks
- Digital subscriber line (DSL)
- Indoor/outdoor wireless
- Routers/switches
- Fiber in the loop
- Transmission
- Data networks
- PBX

### Key Features

- Extended temperature range
- Redundant fan cooling
- Front panel LED indicators
- 1U height, minimized depth
- Universal AC input
- Analog load sharing
- Hot pluggable
- RoHS compliant

Input	
Voltage Range	
- Low-Line	90 – 175 Vac (500W)
- High-Line	176 – 290 Vac (500W)
Input Frequency	45-65 Hz
Input Current	6 Amps
Inrush Transient	25 Apk
Total Harmonic Distortion (THD)	< 10 %
Power Factor	~1.0
Holdup Time	>10 ms full power

Output	
Voltage Nominal	27 Vdc
Voltage Adjust Range	21-29 Vdc (software control)
Rated Output Current	
- Low-Line	20 Adc max
- High-Line	20 Adc max
Rated Output Power	
- Low-Line	500 Watts
- High-Line	500 Watts
Psophometric Noise	<2 mV max
Ripple	<200 mVpkpk
Overvoltage Protection	31.9 Vdc

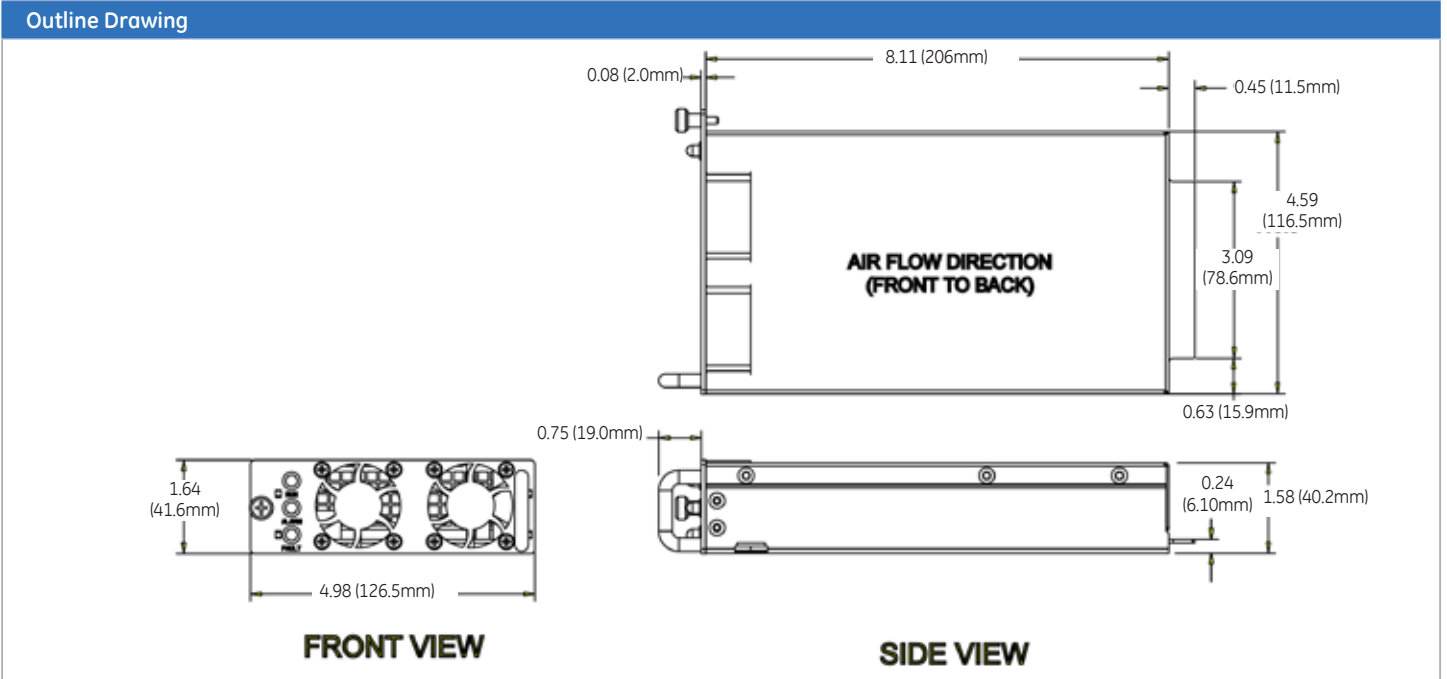
Control and Monitoring	
Visual Status Indicators	Run, Alarm and Fault LEDs
Serial Interface	Half duplex RS485 (GP Protocol)

Environmental	
Operating Temperature	-40°C to +75°C
Storage Temperature	-40°C to +85 °C
Power Derating	> +65°C 2% per degree Celsius
Relative Humidity	95% max, non-condensing
Altitude	4000m max
Audible Noise	< 55dBA

Mechanical	
Length (in./mm)	8.11 / 206.0
Width (in./mm)	4.98 / 126.5
Height (in./mm)	1.64 / 41.6
Weight (lb/kg)	3.08 / 1.4

General	
Cooling	Redundant Fan Cooled
Efficiency	>90%
Heat Dissipation	97 W / 331 BTU

Safety and Standards Compliance	
NEBs	Evaluated by independent NRTL test lab to Telcordia GR63 and GR1089-CORE, Issue 4
Safety	CE mark to Low Voltage Directive 2006/95/EC and EMC Directive 2004/108/E UL 609501-1 Recognized CSA C22.2 No. 60950-1-03 Certified VDE0805:200112 (EN 609501) Licensed
RoHS	Compliant to RoHS EU Directive 2002/95/EC
EMC	FCC and EN 55022, Class B; FCC, Class B
ESD	EN61000-4-2, Level 4



## Pulsar Edge Controller



The SPS Pulsar Edge controller delivers large system intelligence in a small system form factor. Its thin modular plug-in form factor minimizes shelf space consumption allowing maximum power module and distribution capabilities.

The controller is utilized in bulk power applications in data centers and enterprise

applications. Ethernet connectivity with SNMP facilitates remote network management. Access through its front-accessible USB port and aided by the EasyView2 graphical enables full user interface locally. 1U display allows convenient access to all controller functions without requiring external cable connections. The display also features alarm context sensitive backlighting for at-a-glance system status.

As a battery plant controller, it provides a complete set of features to monitor and control rectifiers, batteries, and distribution. A flexible set of configurable inputs allow the Pulsar Edge controller to monitor a wide

variety of system equipment and incorporate appropriate state information enabling a centralized point of management.

The controller utilizes standard network management protocols allowing for advanced network supervision. GE Energy Galaxy Manager™ software is the centralized visibility and control component of a comprehensive power management system designed to meet engineering, operations and maintenance needs. The Galaxy Manager client-server architecture enables remote access to system controllers across the power network.

### Applications

- Telecommunications networks
- Digital subscriber line (DSL)
- Indoor/outdoor wireless

- Routers/switches
- Fiber in the loop
- Transmission

- Data networks
- PBX

### Key Features

#### Remote Access and Features

- Integrated 10/100Base-T Ethernet Network
  - TCP/IP
  - SNMP V2c for management
  - SMTP for email
  - Telnet for command line interface
  - DHCP for plug-n-play
  - FTP for rapid backup and upgrades
  - HTTP for standard web pages and browsers
  - Compatible with Galaxy Manager and other management packages
  - Shielded RJ-45 interface referenced to chassis ground
- Password protected security levels: User, Super-User, Administrator for all access
- ANSI T1.317 command-line interface
- Modem access support
  - Remote via external modem
  - Callback security
- EasyView2, Windows-based GUI software for local terminal or Modem access
- 1U display with alarm indicating backlight feature

#### Standard System Features

- Monitor and control of more than 40 connected devices
  - Maximum of 32 rectifiers
  - Maximum of 6 distribution control cards
  - Robust RS485 system bus
- Standard and user defined alarms
  - Alarm test
  - Assignable alarm severity: Critical, Major, Minor, Warning, and record-only
- Rectifier management features
  - Automatic rectifier restart
  - Adaptive Rectifier Management (energy efficiency)
  - Remote rectifier (on/off)
  - Reserve Operation
  - Automatic rectifier sequence control
  - N + X redundancy check
- Multiple Low Voltage Load and Low Voltage Battery Disconnect thresholds (4)
- Configuration, statistics, and history
  - All stored in non-volatile memory
  - Remote/local backup and restore of configuration data
- Industry standard defaults
  - Customer specific configurations available
- Remote/ local software upgrade
- Basic, busy hour, and trend statistics
- Detailed event history
- User defined events and derived channels

#### Standard Battery Management Features

- Float/boost mode control
  - Manual boost
  - Manual timed boost locally, T1.317, and remotely initiated
  - Auto boost terminated by time or current
- Battery discharge testing
  - Manual (local/remote)
  - Periodic
  - Plant Battery Test (PBT) input driven
  - Configurable threshold or 20% algorithm
  - Graphical discharge data
  - Rectifiers on-line during test
- Slope thermal compensation
  - High temperature
  - Low temperature
  - Step temperature
  - STC Enable/Disable, low temperature Enable/Disable
  - Configurable mV/°C slopes
- State of charge indication
- High temperature disconnect setting
- Reserve-time prediction
- Recharge current limit
- Emergency Power-Off input

**Integrated Monitoring Inputs/Outputs**

- System plant voltage (accuracy  $\pm 0.5\%$ , resolution 0.01V)
- One system shunt (accuracy  $\pm 1\%$  full scale, resolution 1A)
  - Battery or load
  - Mounted in the return side of DC bus
- User assignable Form-C input or output alarm (60VDC @.3A)
  - 5 Form-C output alarms (60VDC @ .3A)
- 1-Wire™ bus devices
  - Up to 16 temperature probes (QS873)
  - Up to 6 mid-string monitors (ES771)

**Galaxy Manager Compatible**

- Centralized web server and database with multiple user access to live or managed data with drill down to problem details
- Monitor and control of more than 40 connected devices
- Management information from polling or alarms received from alarm traps from multiple sites are available on one screen via the inter/intranet
- Trend user selected data over time
- Automatic or manual report generation
- Standard engineering tools like reserve time calculators and cable voltage drop analyzer

General	
Operating Voltage	$\pm 24$ Vdc, $\pm 48$ Vdc (Range: $\pm 18$ to $\pm 60$ Vdc)
Input Power	Less than 7W
Operating Temperature Range	-40°C to +70°C (-40 to 167 °F)
Operating Relative Humidity	0 - 95% (non-condensing)
Storage Temperature Range	-40°C to +85°C (-40 to 185 °F)
Physical Specifications	1.75 in. H, 0.75 in. W, 8.00 in. D; 0.5lb
Display	8-line by 40-character backlit LCD
EMC	FCC/EN55022 Class A, CISPR22 Level A

Agency Certifications	
Electrostatic Discharge	EN 61000-4-2 level 4
Radiated Emissions	FCC, Class A; EN 55022, Class A
Safety	UL Listed Component as Part of CPL or SPS Power System

# Ordering Information – Slimline Power System

## 24V DC Outside Plant and Customer Premise Solution

The Slimline Power System power shelf provides advanced controller features in a compact, cost-efficient footprint. The SPS shelf is 1.75" high, 10.3" deep and mounts in 19-inch or 23-inch wide frames, with two power slots for rectifiers and distribution. The Pulsar Edge controller has Ethernet connectivity to facilitate remote network management to monitor and control rectifiers, batteries, and distribution. SPS is a reliable DC power solution where system height and depth are restricted.

### Features

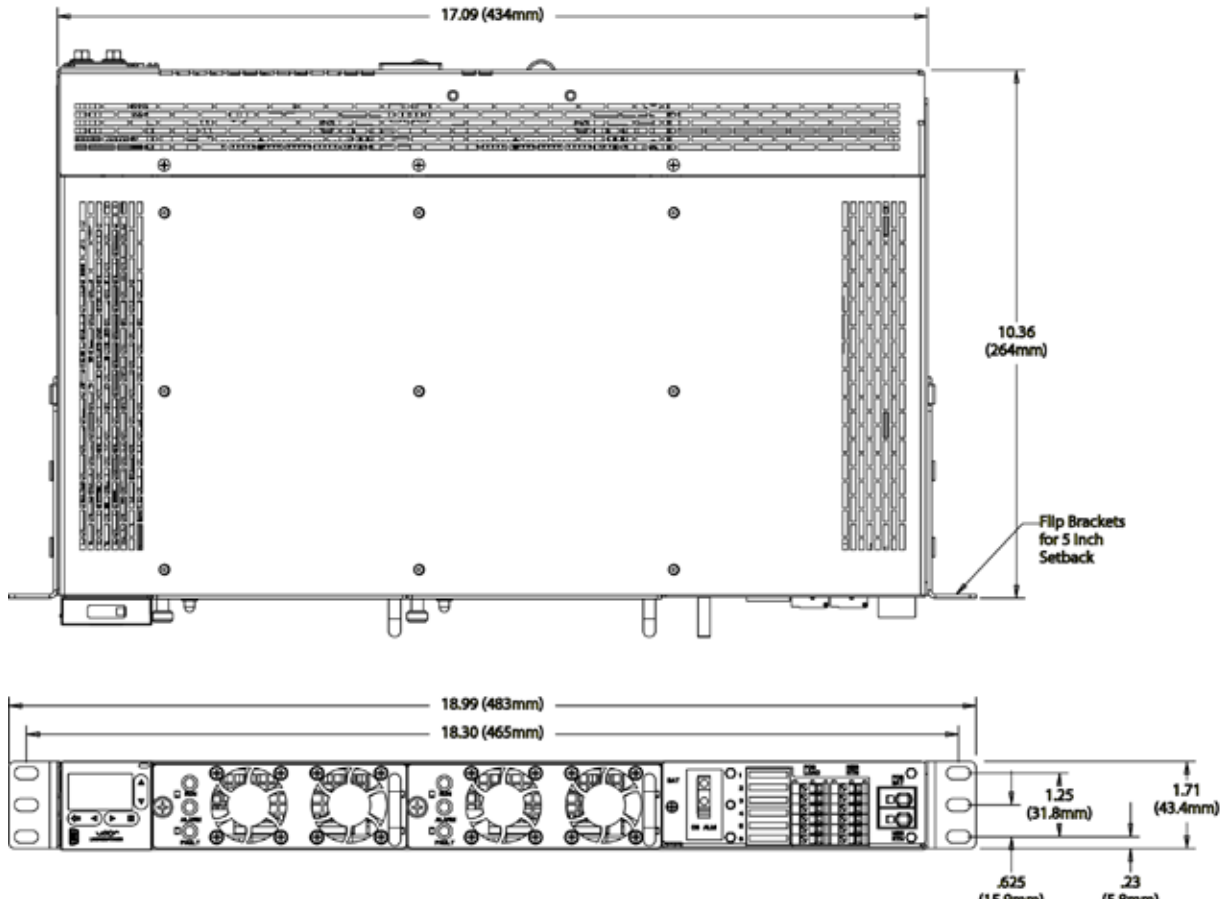
- SPS rectifiers produce 21Vdc to 29Vdc output; up to 500W high line
- Universal AC input: 90-290VAC
- AC input: IEC-320 C13 style cord per shelf
- DC output bus is rated for 40A with screw terminal landing for 12 AWG wire
- Temperature hardened harsh environments. (-40°C to +75°C)
- Compact size: 1U (1.75") high, 10.3" deep
- Adjustable mounting ears for either flush front or 5-inch set back position
- Plug-N-Play SPS841A controller with Web based interface available with display. Display has USB craft port and remote LAN access.
- Distribution includes a battery connection, 6 GMT load fuses and Low Voltage Battery Disconnect (LVBD)

The SPS product line provides Ethernet, alarm inputs/outputs, and 1-Wire™ connection for battery voltage and temperature monitoring. The shelf configuration holds up to two 500 Watt rectifier modules and include an integrated distribution module with GMT fuse positions, and low-voltage battery disconnect circuit.

### List 102B Power Shelf with Distribution



Shelf Line Drawing - J2007003List102B

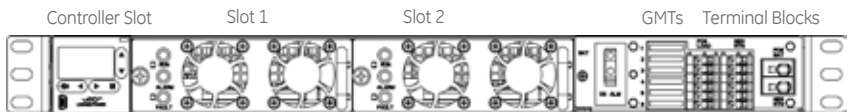


Shelf Configuration

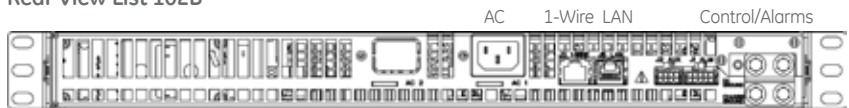
List 102B Power Shelf with Distribution

- Full front access for battery and load connections
- 60A battery connection with terminal block input for 8 gage wire, LVBD
- 6 GMT fuses with terminal block output for 12 gage wire, 15A max fuse size
- AC input is single IEC-320 C13 style cord
- 1-Wire port for battery voltage and temperature monitoring, LAN port and alarm input and output connectors

Front View List 102B

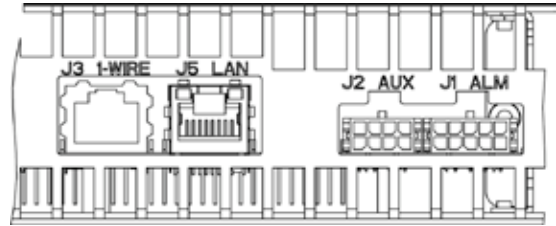


Rear View List 102B



**Controller Communication**

- SPS841A plugs into shelf. USB craft port is on the front of the unit. Alarm inputs and outputs, and Ethernet connection are located on the back of the shelf.
- Ethernet Interface – TCP/IP, FTP, Telnet, HTTP, SMTP support
- Advanced battery management
- J1 provides 5 output alarm relays. These relays are customer defined on the controller's web pages
- J2 provides alarm inputs (see table below). Alarm inputs are contact Closures or Opens to the non-grounded side of the DC bus +24V. Pins 6, 7, 8 provide +24V for these alarm inputs.
- J3 battery thermal probe (QS873A) or battery mid-string voltage monitor (ES771) with battery thermal probe.
- J5 LAN/Ethernet.



All Shelves

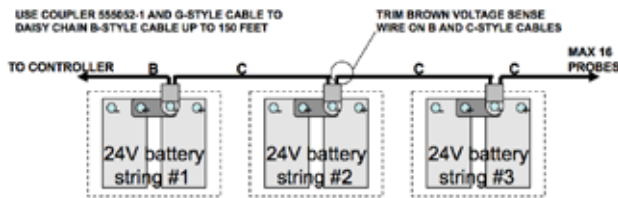
J1 ALARM CONNECTOR	
Pin	Signals for SPS841A_015R
1	Alarm Relay 3 Rtn
2	Alarm Relay 2 Rtn
3	Alarm Relay 1 Rtn
4	Power Minor Rtn
5	Power Major Rtn
6	Alarm Relay 3
7	Alarm Relay 2
8	Alarm Relay 1
9	Power Minor
10	Power Major

J2 CONNECTOR	
Pin	Signal
1	ALM6 Input
2	—
3	ALM3 Input
4	ALM4 Input
5	ALM5 Input
6	+24V
7	+24V
8	+24V

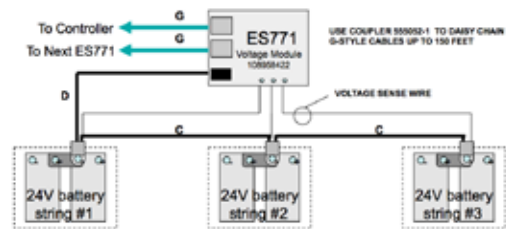
**Battery Monitoring**

Temperature/voltage probes are needed for battery monitoring. They are connected to each battery or battery string to provide slope thermal

compensation, temperature alarms and voltage imbalance alarms.



Temperature Measurement



Temperature/Voltage Measurement



Alarm and Communication Cables		AC Input, DC Output Cables (105°C Wire)	
5' Alarm (J1) or distribution (J7) cable	CC848890153	C13 plug with 5-15P plug, 14AWG, 10'	CC848776105
15' Alarm (J1) or distribution (J7) cable	CC848865980	C13 plug with L6-20P plug, 14AWG, 10'	CC848820317
50' Alarm (J1) or distribution (J7) cable	CC848817651	C13 plug, unterminated, 14AWG, 10'	847861192
5' Alarm input cable (J2)	CC848890203	C13 AC Cord Retaining Clamp	CC848885698
15' Alarm input cable (J2)	CC848853614		
50' Alarm input cable (J2)	CC848890211		

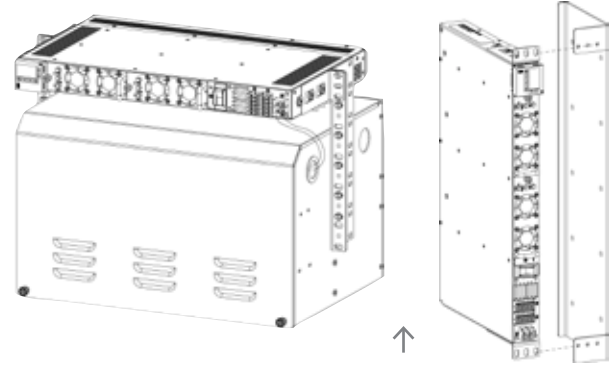
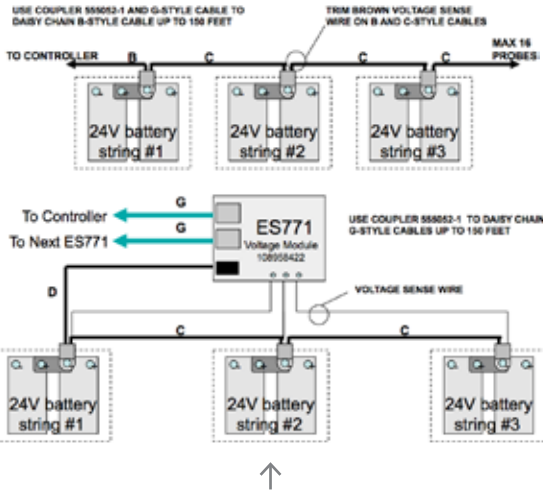
Mounting Brackets	
19" to 23" frame mount bracket	CC848844803

Controller		Rectifier	
SPS841A_015R_D with Display	CC109156898	EP0500_U 500W (RoHS 5/6)	CC109163176
		Slot Filler	CC848883297

Shelf	
Shelves with 2 rectifier slots, 1 slot for distribution, controller slot	
List 102B Rectifier/Distribution	CC109163184



Battery Management Accessories	
A: QS873A Thermal Probe	CC109142980
B: 10' probe to controller wireset	CC848817024
B: 20' probe to controller wireset	CC109157434
C: 1' probe to probe wireset	CC848822560
C: 5' probe to probe wireset	848719803
C: 10' probe to probe wireset	CC848822321
ES771A Voltage Monitor Card	108958422
D: 2 1/2' ES771A to probe wireset	CC848791517
D: 6' ES771A to probe wireset	CC848797290
D: 10' ES771A to probe wireset	848719829
G: 4' ES771A to ES771A or controller wireset	CC848791500
G: 10' ES771A to ES771A or controller wireset	848652947

Battery Box and Accessories	
Battery box with rack/shelf mounting brackets (3U for 12Ah batteries)	CC848903187
Battery box with rack/shelf mounting brackets (6U for 40Ah batteries)	CC848870832
IR-40 Battery	408538854
IR-40 cable, 3 1/2 ft., 10ga Wireset, Battery Harness Shelf to Battery Cabinet	CC848885715
ES12-12 Battery	CC408638183
ES12-12 breaker wireset	CC848873546
30A breaker disconnect	CC109164471
50A breaker disconnect	CC109153202
Wall mount bracket	CC848864504

**Shelf Specifications**

<b>Mechanical</b>	
Height	1.71inches (43.4mm)
Width (with mounting ears)	19 inches (483mm)
Depth	10.37 inches (264mm)
Weight (without rectifiers)	6lbs/2.7kg
<b>Environmental</b>	
Operating Temperature Range	-40°C to +75°C
Operating Relative Humidity	0 - 95% (non-condensing)
Storage Temperature Range	-40°C to +85°C
<b>Agency Certifications</b>	
CSA	Canada/CSA C22.2; cCSAus
EMI/EMC	FCC Part 15, Class A; EN 55022, Class A (emission); EN 55024 (immunity); EN 55024, levels 3 (CI & RI) and level 4 (ESD)
CE	CE mark meets Low Voltage Directive 2006/95/EC and EMC Directive 2004/108/EC
NEBs	Level 3 certified



## Management Visibility

Galaxy Manager™ software is the centralized visibility and control component of a comprehensive power management system designed to meet engineering, operations and maintenance needs. The Galaxy Manager client-server architecture enables remote access to system controllers across the power network.

- Dashboard display with one-click access to management information database
- Trend analysis
- Scheduled or on demand reports
- Fault, configuration, asset, and performance management

## Training

GE Energy offers on-site and classroom training options based on certification curriculum. Technical training can be tailored to individual customer needs. Training enables customers and partners to more effectively manage and support the power infrastructure. We have built our training program on practical learning objectives that are relevant to specific technologies or infrastructure design objectives.

## Service & Support

GE Energy field service and support personnel are trusted advisors to our customers – always available to answer questions and help with any project, large or small. Our certified professional services team consists of experts in every aspect of power conversion with the resources and experience to handle large turnkey projects along with custom approaches to complex challenges. Proven systems engineering and installation best practices are designed to safely deliver results that exceed our customers' expectations.

## Warranty

GE Energy is committed to providing quality products and solutions. We have developed a comprehensive warranty that protects you and provides a simple way to get your products repaired or replaced as soon as possible.

For full warranty terms and conditions please go to [www.ge.com/powerelectronics](http://www.ge.com/powerelectronics).



GE Energy

## Contact Us

For more information, call us toll free at **+1 877 546 3243**, or +1 972 244 9288 and visit us on the web at [www.ge.com/powerelectronics](http://www.ge.com/powerelectronics)