

# GPS 4848/100 Galaxy Power System

-48V DC Large Power Plant H569-434



- Telecom central office and MTSO applications
- Streamlined system control and monitoring
- 20,000 Amp capacity
- Efficiency approaching 97%
- Large power applications requiring 3-phase input

## Overview

The industry standard for telecom power, the GPS 4848/100 is the first choice to meet dc power requirements of large central office and mobile switching office applications. The Lineage Power GPS provides output capacities up to 20,000A in an integrated, multi-cabinet configuration. True 3-phase 3-wire rectifiers operate on commercial 208/240Vac or 480Vac. The Galaxy Millennium II controller provides detailed system management and flexible control of Lineage and third party equipment. GPS is installed and supported by the most experienced services team in the world.

## Bay Options

The system can be deployed in centralized, hybrid, or distributed system architectures. GPS provides industry leading capacity of up to 3,080 Amps in a single cabinet which can scale to 20,000 Amps in a multi-cabinet configuration. A single Millennium II controller links all components of the system, while intelligently interacting with the smart grid.

## 595 Rectifier

The 595LT rectifier integrates proven technology with superior control features in a compact, cost effective solution. This true 3-phase rectifier delivers intrinsic phase balancing and superior power factor while lowering installation costs.

## Galaxy Millennium II Controller

The Galaxy Millennium II controller combines sophisticated power monitoring and remote management. This flagship controller simplifies operations and maintenance while lowering administrative costs. Remote peripheral modules support over 500 monitoring points for Lineage or third party devices. Ethernet, SNMP, and TL1 provide integration with power engineering and NOC workflow.

## Benefits

### Reliability

- Delivers decades of service
- High availability architecture
- NEBS level 3 certified

### Intelligence

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

### Investment Protection

- Backward compatibility
- Flexible upgrade options
- Seamless integration with ferro plants

### On Time Delivery

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

### Total Efficiency

The Lineage Power 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 alternatives from our competitors.

## Specifications

Input	
Nominal Input Voltage - 595A/LTA - 595B/LTB	380 Vac/400 Vac/480 Vac, 3-wire plus ground 208 Vac/220 Vac/240 Vac, 3-wire plus ground
Input Current - 595A/LTA - 595B/LTB	15A @ 480Vac Nominal 30A @ 208Vac Nominal
Input Voltage Range (per phase-phase): - 595A/LTA - 595B/LTB	320 Vac to 530 Vac 176 Vac to 260 Vac
Input Frequency Range	47-63 Hz
Power Factor	>0.99 at >50% load
Total Harmonic Distortion	<5% at >50% load

Output	
Voltage Nominal	-48 Vdc
Voltage Adjust Range	-44 Vdc to -58 Vdc
Output Current (system maximum)	20,000A
Regulation (line and load range)	±0.5%
Ripple	<100 mVrms
Noise Voiceband	<55dBmC

Environmental Specifications	
Operating Temperature	0°C to +50°C (32°F to 122°F)
Storage Temperature	-40°C to +85°C (-40 to 185 °F)
Operating Relative Humidity	5-95% non-condensing
Input Frequency Range	47-63 Hz
Power Derating	3% per °C from +55°C to +65°C
Altitude	4000M max

Mechanical	
Height (cabinet only) (cabinet with link bus-bar)	84.0 in. (2,134 mm) / 72.0 in. (1,829 mm) 89.5 in. (2,274 mm)
Width (cabinet only) (cabinet with link bus-bar)	23.6 in. (600 mm) 23.6 in. (600 mm)
Depth (cabinet only) (cabinet with link bus-bar)	23.6 in. (600 mm) 23.6 in. (600 mm)
Weight for 84.0" cabinet (approximate) Weight for 72.0" cabinet (approximate)	551 lb (250 kg) 485 lb (220 kg)

Safety and Standards Compliance	
NEBS	Evaluated by independent test lab with NRTL status to Telcordia GR63 and GR1089 (including level 3 testing)
Safety	UL Listed (US and Canada): UL Subject 1801 with applicable sections of UL1950/CSA3 950 Applicable sections of IEC950/EN60950 CE mark meets 72/23/EEC and 93/68/EEC directives
RoHS	Compliant to RoHS EU Directive 2002/95/EC
EMC	FCC and EN 55022, Class A; FCC, Class A
ESD	EN61000-4-2, Level 4

## Architecture Selection

### Centralized Architecture vs. Distributed

**Distributed Architecture:** In this system each cabinet contains ac distribution, dc distribution panels, battery connection panels, rectifiers, termination points for load circuits, and a battery shunt. The initial cabinet also contains the system controller and, as such, it can function as a stand-alone system. The rectifier output buses are interconnected to permit cabinets to share current and ensure common voltage references for all system rectifiers.

Because each cabinet is a self-contained system, the overall system capacity can be increased by simply adding cabinet/battery entities. However, growing the system requires a distinct, dedicated floor plan.

**Centralized Architecture:** In a centralized architecture system, each cabinet contains either rectifiers or distribution, but not both. The separate cabinets are cabled to external busbars where a single system shunt is provided to measure total system load current. The initial cabinet contains ac distribution, rectifiers, the controller, and termination points for the system interconnect cables. Growth cabinets contain ac distribution, rectifiers, and cable termination points. A separate cabinet provides load distribution and protection facilities and may include load disconnect/reconnect contactors.

This architecture requires extensive up-front planning to determine the ultimate system capacity and engineering to size the external busbars appropriately; however, the system plan is not constrained to dedicated layouts as required for distributed architecture systems.

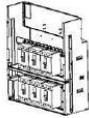
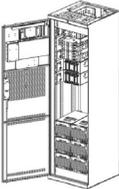
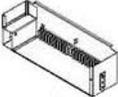
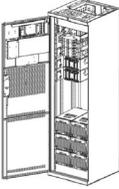
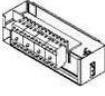
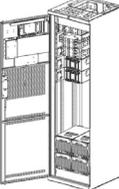
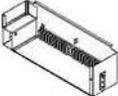
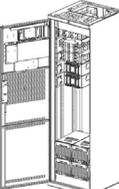
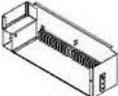
## AC Input Specifications

AC Input Recommendations						
For Group	Nameplate Rating	Breaker Size	Breaker Qty	Conduit Qty & Size	Wire Size	Ground Wire
320	2 AC Feeds at 80A	100A	(2) 3-Pole	(2) 1 1/2"	(6) 2 GA	(2) 6 GA
	2 AC Feeds at 80A	100A	(2) 3-Pole	(1) 2"	(6) 1/0 GA	(1) 6 GA
321	2 AC Feeds at 120A	150A	(2) 3-Pole	(2) 1 1/2"	(6) 1/0 GA	(1) 6 GA
322	1 AC Feed at 80A	100A	(1) 3-Pole	(1) 1 1/2"	(3) 2 GA	(1) 8 GA
323	2 AC Feed at 75A	90A	(2) 3-Pole	(1) 1 1/2"	(6) 2 GA	(1) 8 GA
324	4 AC Feeds at 40A	50A	(4) 3-Pole	(2) 1 1/2"	(12) 6 GA	(2) 8 GA
	4 AC Feeds at 40A	50A	(4) 3-Pole	(4) 3/4"	(12) 8 GA	(4) 8 GA
325	6 AC Feeds at 40A	50A	(6) 3-Pole	(2) 1 1/2"	(18) 6 GA	(2) 8 GA
	6 AC Feeds at 40A	50A	(6) 3-Pole	(6) 3/4"	(18) 8 GA	(6) 8 GA
326	4 AC Feeds at 20A	25A	(4) 3-Pole	(1) 1 1/2"	(12) 8 GA	(1) 8 GA
	4 AC Feeds at 20A	30A	(4) 3-Pole	(1) 1 1/2"	(12) 6 GA	(1) 8 GA
	4 AC Feeds at 20A	25A	(4) 3-Pole	(2) 3/4"	(12) 10 GA	(2) 8 GA
	4 AC Feeds at 20A	30A	(4) 3-Pole	(2) 3/4"	(12) 10 GA	(2) 8 GA
327	6 AC Feeds at 20A	25A	(6) 3-Pole	(1) 1 1/2"	(18) 8 GA	(1) 8 GA
	6 AC Feeds at 20A	30A	(6) 3-Pole	(1) 2"	(18) 6 GA	(1) 8 GA
	6 AC Feeds at 20A	25A	(6) 3-Pole	(2) 1"	(18) 10 GA	(2) 8 GA
	6 AC Feeds at 20A	30A	(6) 3-Pole	(2) 1 1/2"	(18) 8 GA	(2) 8 GA
328	6 AC Feeds at 20A	25A or 30A	(6) 3-Pole	(6) 3/4"	(18) 10 GA	(6) 8 GA
	12 AC Feeds at 20A	25A	(12) 3-Pole	(2) 1 1/2"	(36) 8 GA	(2) 8 GA
	12 AC Feeds at 20A	30A	(12) 3-Pole	(2) 2"	(36) 6 GA	(2) 8 GA
	12 AC Feeds at 20A	25A	(12) 3-Pole	(4) 3/4"	(36) 10 GA	(4) 8 GA
	12 AC Feeds at 20A	30A	(12) 3-Pole	(4) 1 1/2"	(36) 8 GA	(4) 8 GA
329	12 AC Feeds at 20A	25A	(12) 3-Pole	(6) 3/4"	(36) 10 GA	(6) 8 GA
	12 AC Feeds at 40A	50A	(12) 3-Pole	(6) 1"	(36) 6 GA	(6) 8 GA
330	12 AC Feeds at 40A	50A	(12) 3-Pole	(4) 1 1/2"	(36) 4 GA	(4) 8 GA
	8 AC Feeds at 20A	25A	(8) 3-Pole	(2) 1 1/2"	(24) 8 GA	(2) 8 GA
	8 AC Feeds at 20A	30A	(8) 3-Pole	(2) 1 1/2"	(24) 6 GA	(2) 8 GA
	8 AC Feeds at 20A	25A	(8) 3-Pole	(4) 3/4"	(24) 10 GA	(4) 8 GA
331	8 AC Feeds at 20A	30A	(8) 3-Pole	(4) 3/4"	(24) 10 GA	(4) 8 GA
	8 AC Feeds at 40A	50A	(8) 3-Pole	(2) 1 1/2"	(24) 6 GA	(3) 8 GA
	8 AC Feeds at 40A	50A	(8) 3-Pole	(1) 1"		
	8 AC Feeds at 40A	50A	(8) 3-Pole	(4) 1"	(24) 6 GA	(4) 8 GA
332	8 AC Feeds at 40A	50A	(8) 3-Pole	(8) 3/4"	(24) 8 GA	(8) 8 GA
	14 AC Feeds at 20A	25A	(14) 3-Pole	(2) 1 1/2"	(42) 8 GA	(2) 8 GA
	14 AC Feeds at 20A	30A	(14) 3-Pole	(2) 2"	(42) 6 GA	(2) 8 GA
	14 AC Feeds at 20A	25A	(14) 3-Pole	(5) 1"	(42) 10 GA	(5) 8 GA
	14 AC Feeds at 20A	30A	(14) 3-Pole	(4) 1 1/2" + (1) 1"	(42) 8 GA	(5) 8 GA
333	14 AC Feeds at 20A	25A	(14) 3-Pole	(7) 3/4"	(42) 10 GA	(7) 8 GA
334	14 AC Feeds at 40A	50A	(14) 3-Pole	(7) 1"	(42) 6 GA	(7) 8 GA
	4 AC Feeds at 60A	70A	(4) 3-Pole	(2) 1 1/2"	(12) 4 GA	(2) 8 GA
335	4 AC Feeds at 60A	70A	(4) 3-Pole	(4) 3/4"	(12) 6 GA	(4) 8 GA
	4 AC Feeds at 120A	150A	(4) 3-Pole	(4) 1 1/2"	(12) 1/0 GA	(4) 6 GA

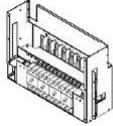
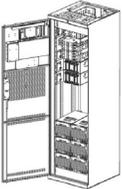
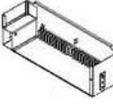
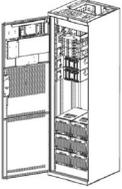
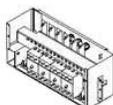
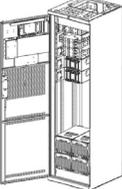
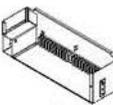
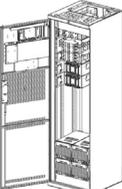
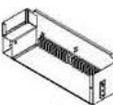
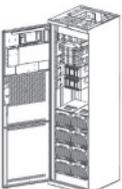
## Cabinet Specifications

Thermal	595LTA	595LTB
4 Rectifiers	2,480W (8,400 BTU / hr)	2,600W (8,800 BTU / hr)
6 Rectifiers	3,730W (12,600 BTU / hr)	3,900W (13,200 BTU / hr)
8 Rectifiers	4,970W (16,800 BTU / hr)	5,200W (17,600 BTU / hr)
10 Rectifiers	6,200W (21,000 BTU / hr)	6,500W (22,000 BTU / hr)
12 Rectifiers	7,450W (25,200 BTU / hr)	7,800W (26,400 BTU / hr)
14 Rectifiers	8,690W (29,400 BTU / hr)	9,100W (30,800 BTU / hr)

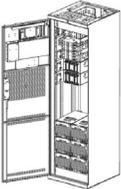
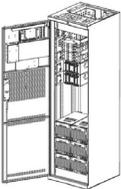
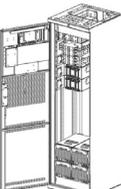
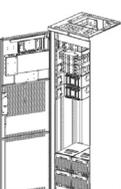
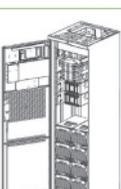
## Step 1: Select the Power Bays – Distributed Architecture

-48V Distributed Architecture Primary (Control) Bays				
Output	Ordering Code	Model	AC Input	Picture
<b>-48V</b> Distributed	108997516	GPS 4848 Distributed Architecture Full Height <b>Control Bay</b> , Millennium II controller, bulk feed 480V AC input for up to six 595LTA rectifiers, battery shunt	<b>480Vac</b> 3-Phase	 
<b>1,320A</b>		H569434 G-1, 19, 323, 32	2 AC Feeds 6 Circuit Breakers	Vertical Distribution Available: 36"
<b>-48V</b> Distributed	108997425	GPS 4848 Distributed Architecture Full Height <b>Control Bay</b> , Millennium II controller, terminal strip feed 480V AC input for up to six 595LTA rectifiers, battery shunt	<b>480Vac</b> 3-Phase	 
<b>1,320A</b>		H569434 G-1, 19, 327, 32	6 AC Feeds Terminal Strip	Vertical Distribution Available: 45"
<b>-48V</b> Distributed	108997524	GPS 4848 Distributed Architecture Full Height <b>Control Bay</b> , Millennium II controller, bulk feed 480V AC input for up to four 595LTA rectifiers, battery shunt	<b>480Vac</b> 3-Phase	 
<b>880A</b>		H569-434 G-1, 19, 322, 32A	1 AC Feed 4 Circuit Breakers	Vertical Distribution Available: 54"
<b>-48V</b> Distributed	108997482	GPS 4848 Distributed Architecture Full Height <b>Control Bay</b> , Millennium II controller, terminal strip feed 480V AC input for up to four 595LTA rectifiers, battery shunt	<b>480Vac</b> 3-Phase	 
<b>880A</b>		H569-434 G-1, 19, 326, 32A	4 AC Feeds Terminal Strip	Vertical Distribution Available: 54"
<b>-48V</b> Distributed	CC109126182	GPS 4848 Distributed Architecture Full Height <b>Control Bay</b> , Millennium II controller, terminal strip feed 480V AC input for up to eight 595LTA rectifiers, battery shunt	<b>480Vac</b> 3-Phase	 
<b>1,760A</b>		H596-434 G-1, 19, 330, 32A	8 AC Feeds Terminal Strip	Vertical Distribution Available: 54"

## Step 1: Select the Power Bays – Distributed Architecture (cont.)

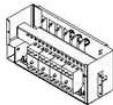
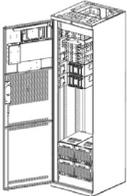
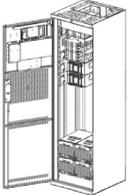
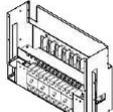
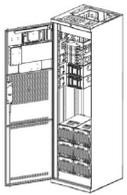
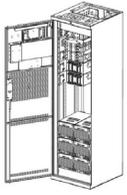
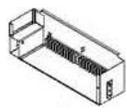
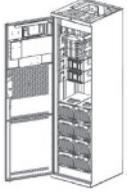
-48V Distributed Architecture Primary (Control) Bays				
Output	Ordering Code	Model	AC Input	Picture
<b>-48V</b> Distributed	CC109145942	GPS 4848 Distributed Architecture Full Height <b>Control Bay</b> , Millennium II controller, bulk feed 208-240V AC input for up to six 595LTB rectifiers, battery shunt	<b>240Vac</b> 3 Phase 	
<b>1,320A</b>		H569434 G-1, 19, 321, 32	2 AC Feeds 6 Circuit Breakers	Vertical Distribution Available: 36"
<b>-48V</b> Distributed	CC109150067	GPS 4848 Distributed Architecture Full Height <b>Control Bay</b> , Millennium II controller, terminal strip feed 208-240V AC input for up to six 595LTB rectifiers, battery shunt	<b>240Vac</b> 3 Phase 	
<b>1,320A</b>		H569434 G-1, 19, 325, 32	6 AC Feeds Terminal Strip	Vertical Distribution Available: 45"
<b>-48V</b> Distributed	CC109154571	GPS 4848 Distributed Architecture Full Height <b>Control Bay</b> , Millennium II controller, bulk feed 208-240V AC input for up to four 595LTB rectifiers, battery shunt	<b>240Vac</b> 3 Phase 	
<b>880A</b>		H569-434 G-1, 19, 320, 32	1 AC Feed 4 Circuit Breakers	Vertical Distribution Available: 51"
<b>-48V</b> Distributed	CC109154588	GPS 4848 Distributed Architecture Full Height <b>Control Bay</b> , Millennium II controller, terminal strip feed 208-240V AC input for up to four 595LTB rectifiers, battery shunt	<b>240Vac</b> 3 Phase 	
<b>880A</b>		H569-434 G-1, 19, 324, 32	4 AC Feeds Terminal Strip	Vertical Distribution Available: 54"
<b>-48V</b> Distributed	CC109128484	GPS 4848 Distributed Architecture Full Height <b>Control Bay</b> , Millennium II controller, terminal strip feed 208-240V AC input for up to eight 595LTB rectifiers, battery shunt	<b>480Vac</b> 3-Phase 	
<b>1,760A</b>		H596-434 G-1, 19, 331, 32A	8 AC Feeds Terminal Strip	Vertical Distribution Available: 54"

## Step 1: Select the Power Bays – Distributed Architecture (cont.)

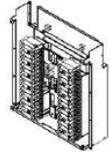
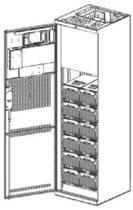
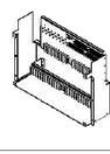
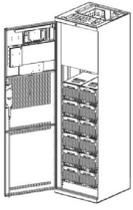
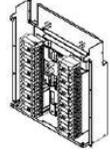
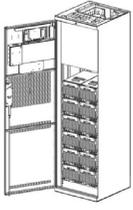
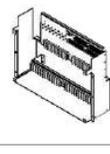
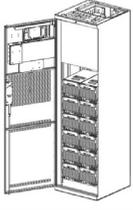
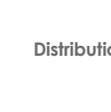
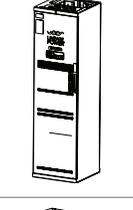
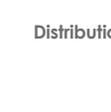
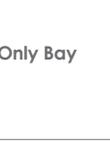
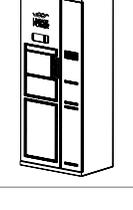
-48V Distributed Architecture Supplementary Bays				
Output	Ordering Code	Model	AC Input	Picture
	108997508	GPS 4848 Distributed Architecture Full Height <b>Supplemental Bay</b> , bulk feed 480V AC input for up to six 595LTA rectifiers, battery shunt	 2 AC Feeds 6 Circuit Breakers	
1,320A		H569434 G-1, 18D, 323, 32A		Vertical Distribution Available: 36"
	108997433	GPS 4848 Distributed Architecture Full Height <b>Supplemental Bay</b> , terminal strip feed 480V AC input for up to six 595LTA rectifiers, battery shunt	 6 AC Feeds Terminal Strip	
1,320A		H569434 G-1, 18D, 327, 32		Vertical Distribution Available: 45"
	108997532	GPS 4848 Distributed Architecture Full Height <b>Supplemental Bay</b> , bulk feed 480V AC input for up to four 595LTA rectifiers, battery shunt	 1 AC Feed 4 Circuit Breakers	
880A		H569-434 G-1, 18D, 322, 32A		Vertical Distribution Available: 54"
	108997490	GPS 4848 Distributed Architecture Full Height <b>Supplemental Bay</b> , terminal strip feed 480V AC input for up to four 595LTA rectifiers, battery shunt	 4 AC Feeds Terminal Strip	
880A		H569-434 G-1, 18D, 326, 32A		Vertical Distribution Available: 54"
	CC109126174	GPS 4848 Distributed Architecture Full Height <b>Supplemental Bay</b> , terminal strip feed 480V AC input for up to eight 595LTA rectifiers, battery shunt	 8 AC Feeds Terminal Strip	
1,760A		H596-434 G-1, 18D, 330, 32A		Vertical Distribution Available: 54"

**Note:** All supplemental bays include the interconnect bus bars to connect to an adjacent bay

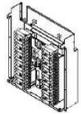
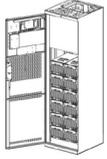
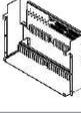
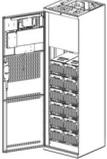
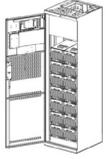
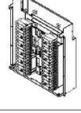
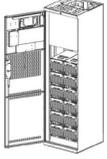
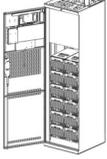
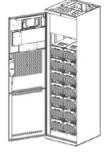
## Step 1: Select the Power Bays – Distributed Architecture (cont.)

-48V Distributed Architecture Supplementary Bays				
Output	Ordering Code	Model	AC Input	Picture
	CC109151148	GPS 4848 Distributed Architecture Full Height <b>Supplemental Bay</b> , bulk feed 208-240V AC input for up to four 595LTB rectifiers, battery shunt	 	
<b>880A</b>		H569-434 G-1, 18D, 320, 32	2 AC Feeds 4 Circuit Breakers	Vertical Distribution Available: 51"
	CC109150075	GPS 4848 Distributed Architecture Full Height <b>Supplemental Bay</b> , terminal strip feed 208-240V AC input for up to four 595LTB rectifiers, battery shunt	 	
<b>880A</b>		H569-434 G-1, 18D, 324, 32	4 AC Feeds Terminal Strip	Vertical Distribution Available: 54"
	CC109152690	GPS 4848 Distributed Architecture Full Height <b>Supplemental Bay</b> , bulk feed 208-240V AC input for up to six 595LTB rectifiers, battery shunt	 	
<b>1,320A</b>		H569434 G-1, 18D, 321, 32	2 AC Feeds 6 Circuit Breakers	Vertical Distribution Available: 36"
	CC109147955	GPS 4848 Distributed Architecture Full Height <b>Supplemental Bay</b> , terminal strip feed 208-240V AC input for up to six 595LTB rectifiers, battery shunt	 	
<b>1,320A</b>		H569434 G-1, 18D, 325, 32	6 AC Feeds Terminal Strip	Vertical Distribution Available: 45"
	CC109128476	GPS 4848 Distributed Architecture Full Height <b>Supplemental Bay</b> , terminal strip feed 208-240V AC input for up to eight 595LTB rectifiers, battery shunt	 	
<b>1,760A</b>		H596-434 G-1, 18D, 331, 32A	8 AC Feeds Terminal Strip	Vertical Distribution Available: 54"
<b>Note:</b> All supplemental bays include the interconnect bus bars to connect to an adjacent bay				

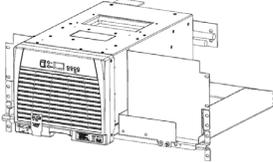
## Step 1: Select the Power Bays – Centralized Architecture

-48V Centralized Architecture Primary (Control) Bays					
Output	Ordering Code	Model	AC Input	Picture	
	108994406	GPS 4848 Centralized Architecture Full Height <b>Control Bay</b> , Millennium II controller, bulk feed AC breaker panel for 480 VAC input for up to 12 595LTA rectifiers			
	108994380	GPS 4848 Centralized Architecture Full Height <b>Control Bay</b> , Millennium II controller, terminal strip 480 VAC input for up to 12 595LTA rectifiers			
	CC109134235	GPS 4848 Centralized Architecture Full Height <b>Control Bay</b> , Millennium II controller, bulk feed AC breaker panel for 208 VAC input for up to 12 595LTB rectifiers			
	CC109145777	GPS 4848 Centralized Architecture Full Height <b>Control Bay</b> , Millennium II controller, terminal strip 208 VAC input for up to 12 595LTB rectifiers			
	108982752	GPS 4848 4800 Amp Centralized Architecture Full Height <b>Control Bay</b> , distribution only Vertical Distribution Space: 72.0"			
	CC109167607	GPS 4848 4800 Amp Centralized Architecture Full Height <b>Control WIDE Bay</b> , distribution only Vertical Distribution Space: 72.0" with Controller			

## Step 1: Select the Power Bays – Centralized Architecture (cont.)

-48V Centralized Architecture Supplementary Bays					
Output	Ordering Code	Model	AC Input	Picture	
<b>-48V</b> Centralized	108993275	GPS 4848 Centralized Architecture Full Height <b>Supplemental Rectifier Only Bay</b> , bulk feed 480VAC input for up to 12 595LTA rectifiers	<b>480Vac</b> 3-Phase		
<b>2,640A</b>		H569-434 G2, 18C, 334, 33	4 AC Feeds 12 Circuit Breakers		
<b>-48V</b> Centralized	CC109133006	GPS 4848 Centralized Architecture Full Height <b>Supplemental Rectifier Only Bay</b> , terminal strip 480VAC input for up to 12 595LTA rectifiers	<b>480Vac</b> 3-Phase		
<b>2,640A</b>		H569-434 G2, 18C, 328, 33	12 AC Feeds Terminal Strip		
<b>-48V</b> Centralized	108993283	GPS 4848 Centralized Architecture Full Height <b>Supplemental Rectifier Only Bay</b> , terminal strip 480VAC input for up to 14 595LTA rectifiers	<b>480Vac</b> 3-Phase		
<b>3,080A</b>		H569-434 G2, 18C, 332, 33	14 AC Feeds Terminal Strip		
<b>-48V</b> Centralized	CC109134227	GPS 4848 Centralized Architecture Full Height <b>Supplemental Rectifier Only Bay</b> , bulk feed 208-240VAC input for up to 12 595LTB rectifiers	<b>240Vac</b> 3 Phase		
<b>2,640A</b>		H569-434 G2, 18C, 335, 33	4 AC Feeds 12 Circuit Breakers		
<b>-48V</b> Centralized	CC109144333	GPS 4848 Centralized Architecture Full Height <b>Supplemental Rectifier Only Bay</b> , terminal strip 208-240VAC input for up to 12 595LTB rectifiers	<b>240Vac</b> 3 Phase		
<b>2,640A</b>		H569-434 G2, 18C, 329, 33	12 AC Feeds Terminal Strip		
<b>-48V</b> Centralized	CC109136660	GPS 4848 Centralized Architecture Full Height <b>Supplemental Rectifier Only Bay</b> , terminal strip 208-240VAC input for up to 14 595LTB rectifiers	<b>240Vac</b> 3 Phase		
<b>3,080A</b>		H569-434 G2, 18C, 333, 33	14 AC Feeds Terminal Strip		
<b>-48V</b> Centralized	108873415	GPS 4848 4800 Amp Centralized Architecture Full Height <b>Supplemental Bay</b> , distribution only Vertical Distribution Space: 72.0"	<b>Distribution Only Bay</b>		
<b>4,800A</b>		H569434 G2, 12, 29, 33			
<b>-48V</b> Centralized	CC109167615	GPS 4848 4800 Amp Centralized Architecture Full Height <b>Supplemental WIDE Bay</b> , distribution only Vertical Distribution Space: 72.0", No Controller	<b>Distribution Only Bay</b>		
<b>4,800A</b>		H569434 G2, 18C, 430, 33			

## Step 2: Select Rectifiers

Rectifiers			
Output	Ordering Code	Model	Picture
	108979238	220 amp, 48VDC output, 480VAC 3 Ph input Rectifier	
220A		595LTA	
	108990405	220 amp, 48VDC output, 208VAC 3 Ph input Rectifier	
220A		595LTB	
	108994686	595LT Filler bracket and keying kit for LT on single rectifier shelf	
	CC848809178	595LT Filler bracket for dual shelf, use when one 595LT rectifier is installed on shelf (one included with each bay with LT shelves)	
	<b>Ordering Code</b>	<b>Model</b>	
	848693586	Spare Rectifier Fan Assembly [(2) required for each rectifier]	

## Step 3: Select Field Installed Distribution Panels

Field Installed Distribution Panels			
Ordering Code	Panel Description	Vertical Space (in.)	Internal Return Bars (Dist Arch Only)
108971474	6 Position 125A-800A Circuit Breaker Panel	12	108908070
108971318	3 Position 125A-600A Circuit Breaker Panel	6	108908070
108971417	5 Position 125A-800A Circuit Breaker Panel	9	108908070
108971532	10 Position 3A-100A Bullet Breaker Panel	6	108908104
108971680	14 Position 3A-200A Bullet Breaker Panel	6	108908104
108987678	22 Position 3A-200A Bullet Breaker Panel	9	108908104
108970872	10 Position 3A-60A TPS Fuse Panel	6	108908104
108986746	5 Position 70A-225A TPL-B Fuse Panel	9	108908070
CC109133113	2 Position 70A-600A TPL Fuse Panel	6	108908070
108985235	6 Position 1A-15A GMT Fuse Panel	0	NA
108908278	Low Voltage Load Disconnect Option		
108908070	Return Bus for panels in like shaded lines		
108908104	Return Bus for panels in like shades lines		

Distribution panels with Ground Return included			
Ordering Code	Panel Description	Vertical Space (in.)	Internal Return Bars (Dist Arch Only)
108971466	6 Position 125A-800A Circuit Breaker Panel	12	G43
108971292	3 Position 125A-600A Circuit Breaker Panel	6	G42
108971409	5 Position 125A-800A Circuit Breaker Panel	9	G48
CC109133105	2 Position 70A-600A Fuse Panel	6	G59
406628222	Fuse holder for 70-250A fuses in G59	-	-
108986738	5 Position 70A-225A Fuse Panel	9	G54
108970864	10 Position 3A-100A Bullet Breaker Panel	6	G96
108971672	14 Position 3A-200A Bullet Breaker Panel	6	G97
108987686	22 Position 3A-200A Bullet Breaker Panel	9	G98
108985235	6 Position GMT holder up to 15A	0	G58

## Step 4: Select Distribution Components

**Note:** Plug in, and bolt in distribution components are listed below. These must be selected to match the distribution panels selected in Step 4.

Bullet Style Load Circuit Breakers				
Ordering #	Amperage	CB Positions (Poles)	Min Wire Gage	Photo
407998137	3	1	10	
407998145	5	1	10	
407998152	10	1	10	
407998160	15	1	10	
407998178	16	1	10	
407998186	20	1	10	
407998194	25	1	10	
407998202	30	1	10	
408213486	40	1	8	
407998210	45	1	8	
407998228	50	1	6	
407998236	60	1	6	
407998244	70	1	2	
407998251	80	1 (+1 vacant)	2	
407998269	90	1 (+1 vacant)	2	
CC848808551	100	2	2	
408185353	125	2	2	
408185346	150	2	1/0	
408564941	200	3	2/0	
408535752	250	3	4/0	
848631479	2-pole adapter bus kit (includes bus for 1/4" hole lug on 5/8" centers and hardware), order one per breaker			
848745662	3-pole adapter bus kit (includes bus for 5/16" hole lug on 1" centers and hardware), order one per breaker			

## Step 4: Select Distribution Components (cont.)

**Note:** Plug in, and bolt in distribution components are listed below. These must be selected to match the distribution panels selected in Step 4.

Large Circuit Breaker Kits				
Ordering #	Amperage	CB Positions (Poles)	Min Wire Gage	Photo
108908187	125	1	2	
108908179	150	1	1/0	
108908195	175	1	2/0	
108908203	225	1	4/0	
108908211	300	2	2 x 4/0	
108908237	400	2	2 x 4/0	
108908229	500	3	3 x 4/0	
108908252	600	3	3 x 4/0	
108984782	800	4	4 x 4/0	

## Step 4: Select Distribution Components (cont.)

**Note:** Plug in, and bolt in distribution components are listed below. These must be selected to match the distribution panels selected in Step 4.

Bullet Style Fuse Holder and TPS Fuses				
Ordering #	Amperage	WP-92461 List	Min Wire Gage	Photo
406700567	3	100	10	
406700583	5	101	10	
406700591	6	102	10	
406700609	10	103	10	
406700617	15	104	10	
406700625	20	105	10	
406700633	25	106	10	
406700641	30	107	10	
406700658	40	108	10	
406700674	50	109	8	
406700682	60	110	6	
406700690	70	111	6	
402328926	0.18 Alarm Fuse			
408548944	Bullet Fuse Holder, TFD-101-011-09 (Alarms on Blown Fuse or Fuse Head Removal)			
CC408617410	Bullet Fuse Holder, TFD-101-011-10 (Alarms on Blown Fuse Only)			
GMT Fuses				
405006222	0.25A			
3150439	0.5A			
405673146	1.33A			
405181983	2A			
406976985	3A			
406159061	5A			
405725433	7.5A			
406159236	10A			
406473959	15A			
408515823	Fuse Puller			

## Step 4: Select Distribution Components (cont.)

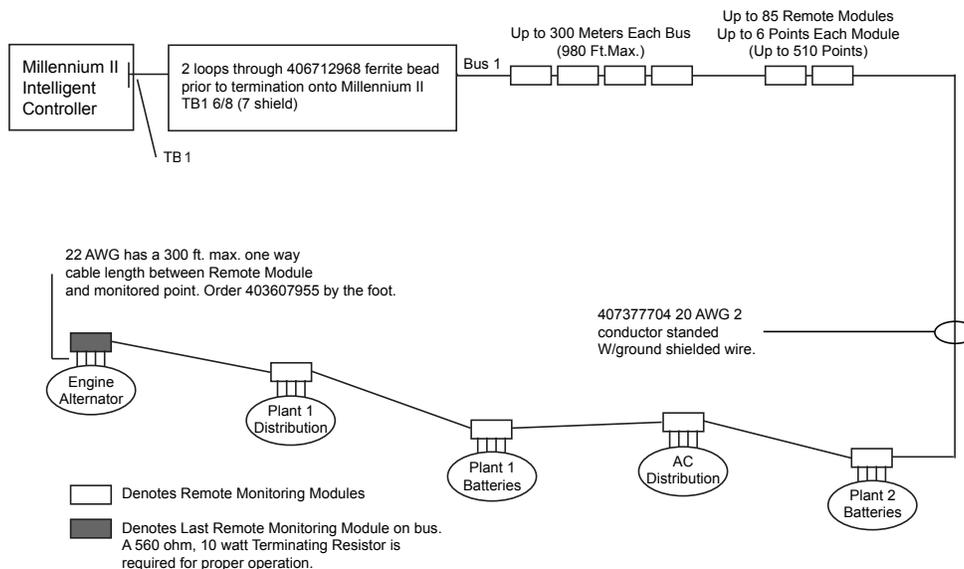
**Note:** Plug in, and bolt in distribution components are listed below. These must be selected to match the distribution panels selected in Step 4.

Large TPL Fuses				
Ordering #	Amperage	Max # wires per position	Min Wire Gage	Photo
408472322	70-250A Fuse Holder Head (only required for 2 Position 70A-600A TPL Fuse Panel)			
402328926	0.18A Alarm Fuse			
406794776	70	3	6	
408239648	80	3	4	
406794784	100	3	2	
406925685	125	3	2	
406794792	150	3	1/0	
406794818	200	3	4/0	
406794982	225	3	4/0	
406794842	250	3	4/0	
406794867	300	3	2 x 4/0	
406794875	400	3	2 x 4/0	
406794883	500	3	2 x 4/0	
406794891	600	3	3 x 4/0	

## Step 5: Select Remote Peripheral Monitoring Options

Ordering #	Description			Photo
	Modules	# Inputs	# Temp	
108469461	J85501G1L21 RPM Shunt Monitoring (221F)	6	1	
108469479	J85501G1L22 RPM Voltage 0-200VDC (221D)	6	1	
108469495	J85501G1L23 RPM Transducers (221J)	6	1	
108298431	J85501G1L24 RPM Voltage 0-3VDC (221A)	6	1	
108298498	J85501G1L25 RPM Voltage 0-16VDC (221B)	6	1	
108469503	J85501G1L26 RPM Voltage 0-70VDC (221C)	6	1	
108298449	J85501G1L27 RPM Binary (222A)	6	1	
108483538	J85501G1L28 RPM Temperature (223T)	0	7	
108298456	J85501G1L9 RPM Control Relay (214A)	3	0	
Supporting Material				
407377704	Connecting Cable for RPMs (Order by foot)			
848535332	Blue panel for mounting 6 modules above a GPS cabinet			
848412367	White panel for mounting 6 modules in a 23-inch frame inside GPS bay			
847307410	12' Cable to be used with Temperature Probes			
847917879	½" Diameter Ring Terminal Temperature Probe (Cable Required)			
848528881	5/16" Diameter Ring Terminal Temperature Probe (Cable Required)			
405298308	Termination Resistor (1 per bus)			
406712968	Ferrite Bead (1 per bus)			
403607955	Monitor Channel cable KS13385 22AWG stranded pair, R&Bk (order by the foot)			
108984477	23" grey panel, 6 RPM mounting panel for Lorain plants			

### Millennium Remote Monitoring

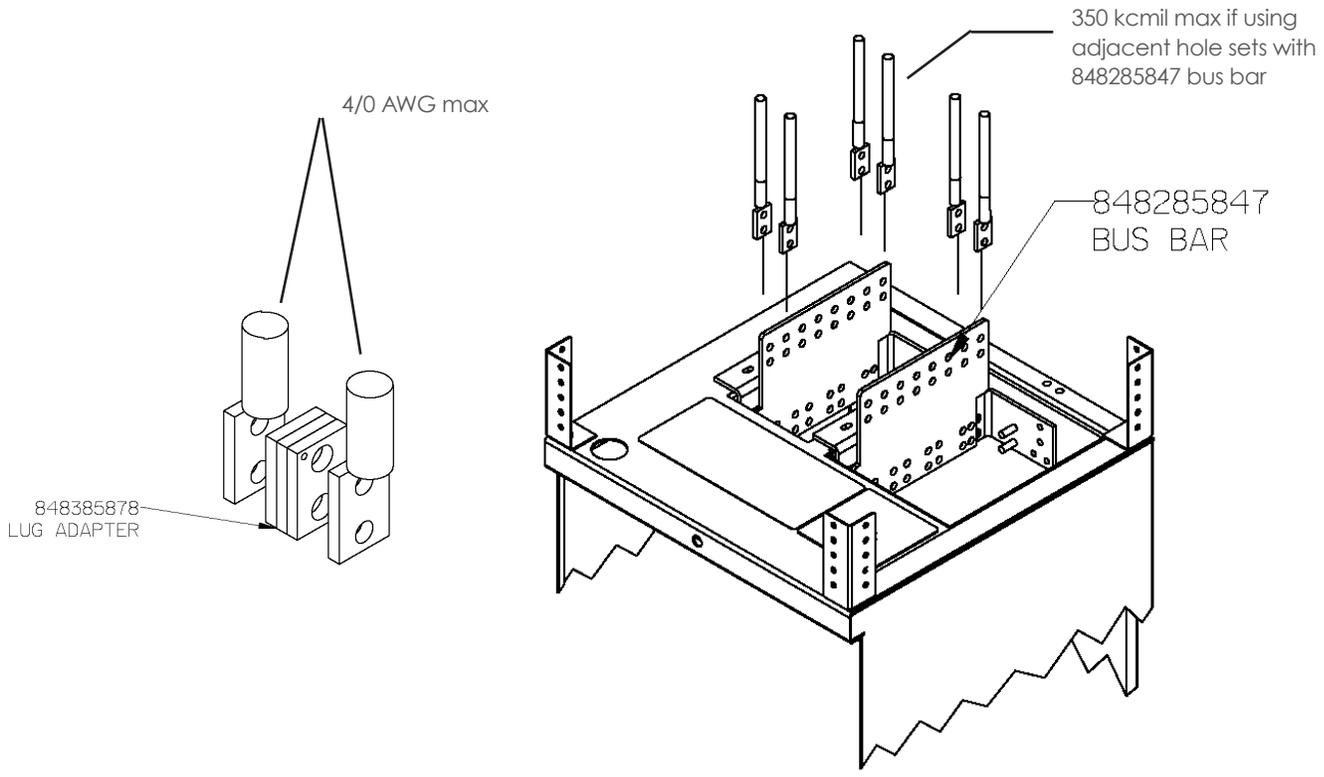


## Step 6: Select Optional AC Monitoring Equipment

AC Monitoring Options		
Ordering Code	Description	Photo
<b>Configured Panels</b>		
CC408646005	3P/3W 208/240V Line to Line, 10x12x14 box provides current, voltage, and power	
CC408646046	3P/3W 480V Line to Line, 10x12x14 box provides current, voltage, and power	
CC408646054	3P/4W 208V Line to Neutral, 10x12x14 box provides current, voltage, and power	
<b>Transducers</b>		
CC408645808	1-phase AC Current Transducer (Built-in CT; 150A max current; 350 kcmil max conductor size)	
CC408645816	1-phase AC Voltage Transducer 120V	
CC408645824	1-phase AC Voltage Transducer 208/240V	
CC408644537	3-phase AC Voltage Transducer 208/240V Line to Line	
CC408645741	3-phase AC Voltage Transducer 208/240V Line to Neutral (120V)	
CC408645832	3-phase AC Voltage Transducer 480V Line to Line	
CC408645840	3-phase AC Current Transducer	
<b>Current Transformers (Required for configured panels and current transducers)</b>		
CC408645857	Current Transformer, 200A primary, 5A secondary, 4 in inside diameter	
408524862	Current Transformer, 400A primary, 5A secondary, 4 in inside diameter	
CC408645865	Current Transformer, 600A primary, 5A secondary, 6 in inside diameter	
CC408645873	Current Transformer, 800A primary, 5A secondary, 6 in inside diameter	
CC408645881	Current Transformer, 1000A primary, 5A secondary, 8 in inside diameter	
CC408645898	Current Transformer, 1200A primary, 5A secondary, 8 in inside diameter	
<b>Miscellaneous</b>		
CC408645907	Barrier terminal block to extend the CT secondary leads beyond their 12 ft factory length. Use 12 AWG THHN wire in conduit.	
CC408645915	Bud Industries Wall Box (12H x 10W x 8D) w/captive screw cover & internal mounting panel. For mounting transducers	

## Step 7: Select Battery Termination Options

Distributed Architecture	
Ordering #	Description
848285847	Optional bus bar that provides 16 output terminations. (Two required and provided with each rectifier-only cabinet))
848385878	Optional adapter that allows two lugs to be stacked and connected at one location. (Provides one adapter)
CC848769570	Optional bus bar that provides 10 output terminations spaced specifically for 750 MCM wide barrel terminations. (Two required per cabinet)

4/0 AWG max

848385878 LUG ADAPTER

350 kcmil max if using adjacent hole sets with 848285847 bus bar

848285847 BUS BAR

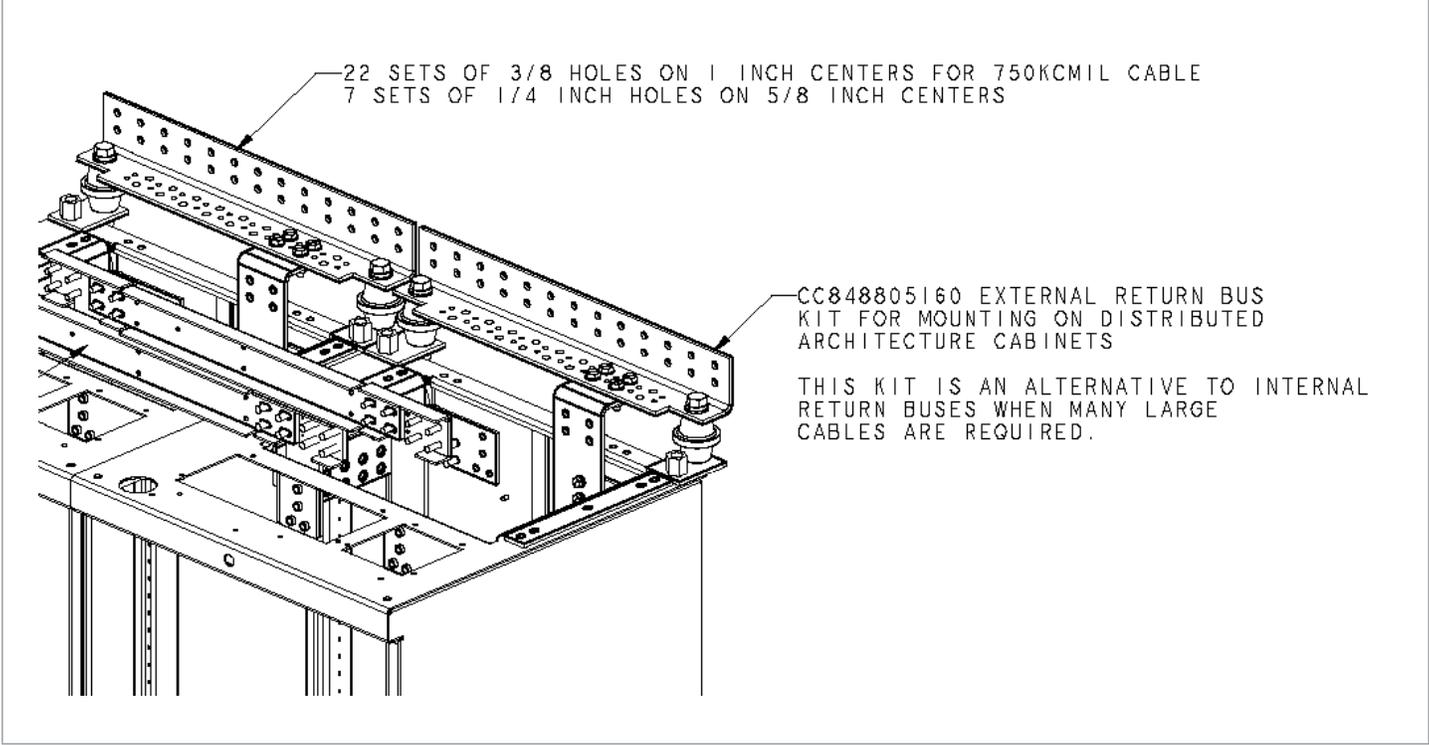
## Step 8: Select Distributed Return Bus Bars

**Distributed Architecture**

Ordering #	Description
CC848805160	External Return Bus Kit for Mounting on Distributed Architecture Cabinets, 1 per cabinet

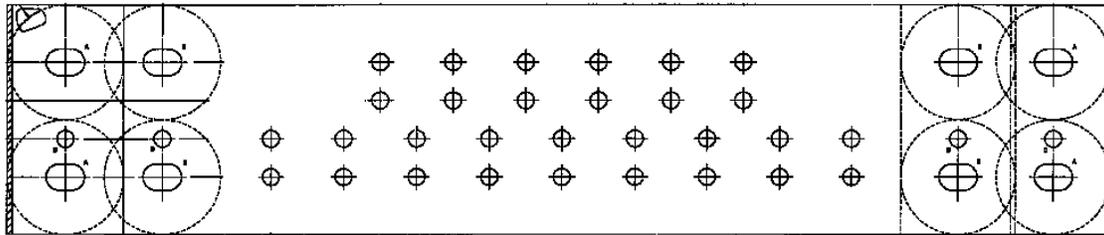
Only required if internal return bus bars were not ordered in Step 3. The external return bus kit is an alternative to internal return buses when many large cables are required.

Please contact Lineage Power for additional options for external return bus bars.

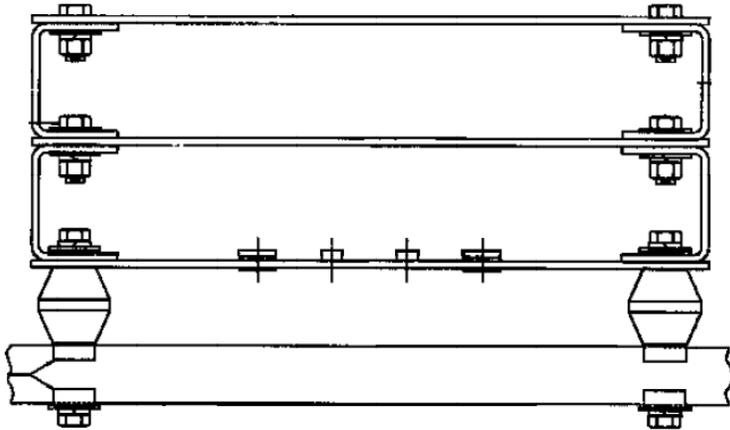


## Step 9: Select Centralized Return Bus Bars

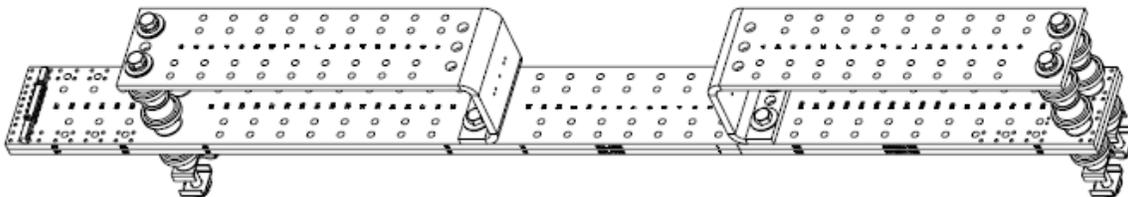
Centralized Architecture	
Ordering #	Description
108298472	ED8301950G9 2600A Ground Bar arranged for mounting on auxiliary framing, or 20 or 25 inch ladder-type cable rack
109006080	ED8301950G11 2600A Ground Bar for stacking with a Group 9, Maximum of 2 can be stacked
108662933	ED8301950G9,2-11 Commonly ordered configuration containing 3 stacked 2600A ground bars
Please see ED83019-50 Drawing, or contact Lineage Power, for more ground bar options.	
ED83019-50 Outline Drawing for the main bus bar in Groups 9 and 11 (28.62 inches long by 6.00 inches wide)	



ED83019-50 Outline Drawing for stacking two Group 11's with a Group 9 (Height of 4.5 inches per stack)



Centralized Architecture	
Ordering #	Description
105579163	5200A Ground Bar arranged for mounting on auxiliary framing, or 20 or 25 inch ladder-type cable rack
Please see 105579163 Drawing, or contact Lineage Power, for more ground bar options of this style.	
Outline Drawing for 105579163 bus bar (72.0 in long by 6.00 in wide)	

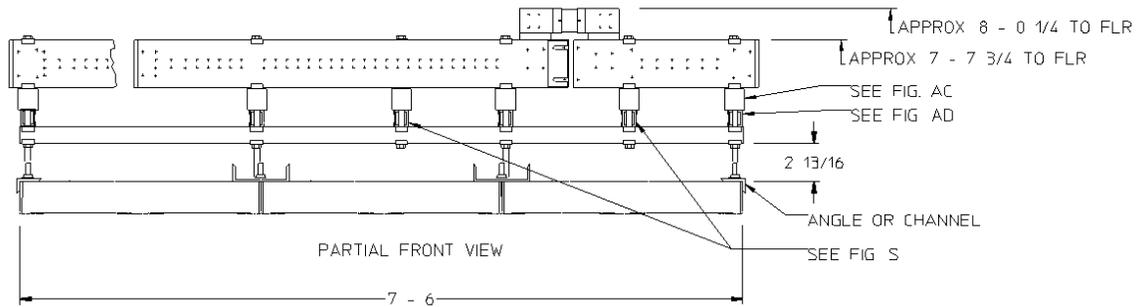


## Step 10: Select Chandelier Bus Bar (Centralized Architecture)

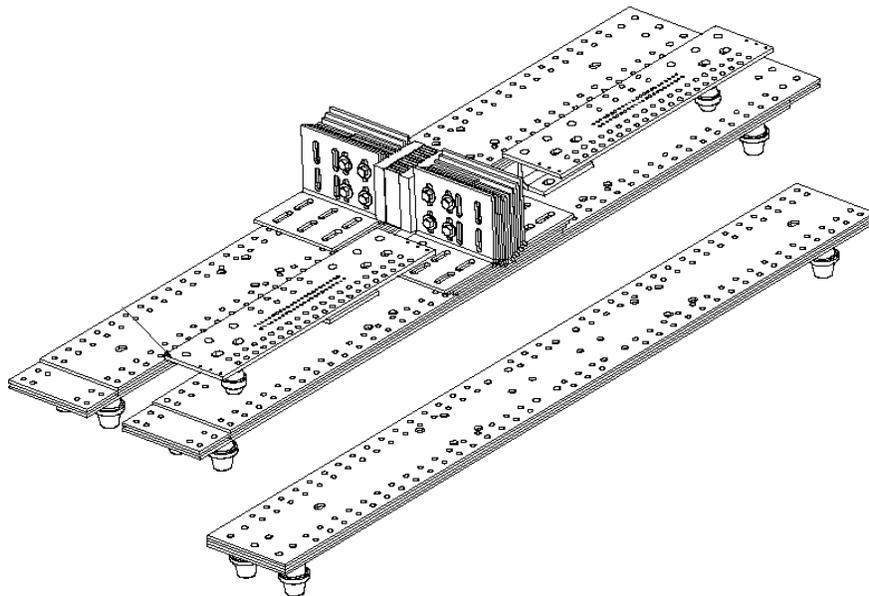
Centralized Architecture	
Ordering #	Description
601412273	J85504A1L5 1,200 Amp Chandelier Bus Bar Assembly, Shunt Ordered Separately
848734851	J85504A1LG Growth busbars to List 5 for a 2,600 Amp Capacity
601412265	J85504A1L15 2,600 Amp Chandelier Bus Bar Assembly, Shunt Ordered Separately
601412257	J85504A1LQ Growth busbars to List 15 for a 5,200 Amp Capacity
601978323	J85504A1L20 5,200 Amp Chandelier Bus Bar Assembly, Shunt Ordered Separately
847627650	50mV Shunt with 800 Amp Capacity
846799906	50mV Shunt with 1200 Amp Capacity
846799922	J85504A1LF 50mV Shunt with 2600 Amp Capacity
846799963	50mV Shunt with 4000 Amp Capacity
846799989	J85504A1LP 50mV Shunt with 6000 Amp Capacity
848656294	ED8301950G23 10,000 Amp Chandelier Bus Bar Assembly, Shunt Included

Please see contact Lineage Power for more Chandelier options.

J85504A-1 List 15 and Q Front View Outline Drawing **Vertical Busbars** J85504A-1 List 20 **Horizontal Bus Bars**



ED83019-50 Group 23 Outline Drawing (Busbar is 72.00 inches long by 8.00 inches wide) **Horizontal Busbars**



## Step 10: Select Chandelier Bus Bar (Centralized Architecture)

Centralized Architecture	
Ordering #	Description
CC408618953	Site-specific bus duct. These busducts are sheet metal-enclosed busways manufactured in sections of varying length and used to tie together your battery, rectifier, and power distribution bays.



Notes:

Area with horizontal dotted lines for taking notes.

## Additional Information

### Product Documentation

H569434	Ordering Guide A copy of the appropriate installation manuals below ship with each system.
108994042	Galaxy Power System 4848/100 with dual rectifier shelf Product Manual
108327362	Installation Guide for Galaxy Power Systems

### 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

Lineage Power 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

Lineage Power 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

Lineage Power 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.

The GPS comes with a two year hardware warranty. For full warranty terms and conditions please go to [www.lineagepower.com/warranty](http://www.lineagepower.com/warranty).

## Contact Us

For more information, call Lineage Power toll free at **877-LINEAGE (877-546-3243)**, or +1 972 244 9288 and visit us on the Web at [lineagepower.com](http://lineagepower.com)

Lineage Power reserves the right to change specifications without notice. Please contact your Lineage representative to confirm current specifications. Please visit [www.lineagepower.com/patents](http://www.lineagepower.com/patents) for patents and trademark information.