Vertiv[™] NetSure[™] -48 VDC Battery Rack System System Application Guide



SYSTEM OVERVIEW

See detailed specifications on page 15.

Description: Front Access Vertiv™ NetSure™ -48 VDC Battery Rack System consisting of a

nominal 19" wide 7' tall or 23" wide 7', 6', or 5' tall relay rack, battery trays, and busbar termination assembly. The battery trays accommodate a variety of front terminal -48V valve regulated lead acid (VRLA) batteries. Includes factory routed and lugged cabling from each battery tray to the termination assembly. May also be equipped with optional left or right side mounted battery disconnect circuit breakers. When equipped with battery disconnect circuit breakers, factory CB alarm wiring is provided to an alarm card. The

alarm card provides external relay contacts and resistive battery for connection to customer external alarm circuits.

Application: For use with Vertiv™ NetSure™ -48VDC Power Systems

and other -48VDC Power Systems.

Spec. Nos.: 588820100 (19").

588820200 (23").

Models: 48BA1200-19 (19").

48BA1200-23 (23").

Output Voltage: -48VDC.

Capacity: 960A, maximum, when equipped

with six (6) battery trays.

Agency Approval: UL Listed, Seismic Zone 4.

Framework Type: Relay Rack.

Mounting Width: 19" or 23" Wide (Nominal) Relay Rack (part of system).

Mounting Depth: 588820100: Determined by battery trays ordered.

A 16.5" deep, 21" deep, and 22" deep battery tray is available.

588820200: Determined by battery trays ordered.

A 22.5" deep battery tray is available.

Access: Front for Installation and Maintenance.

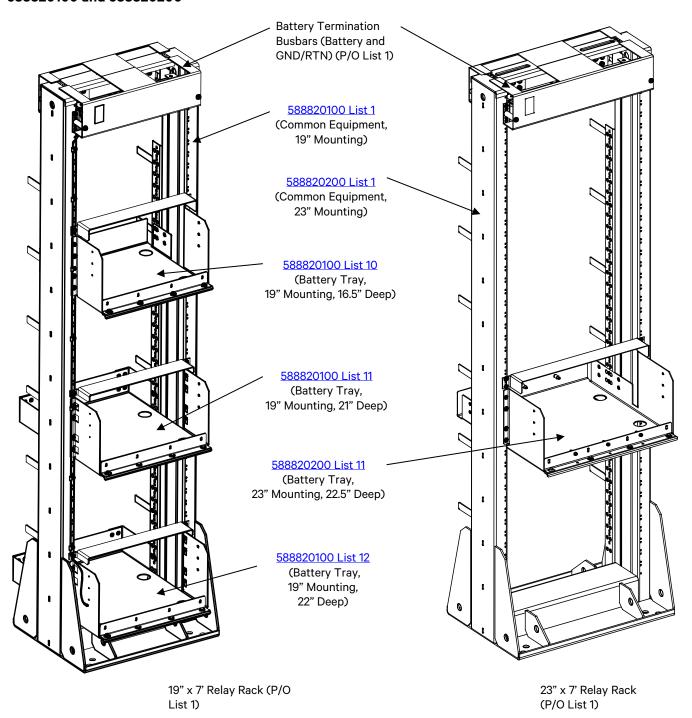
Color: Dark Gray.

Environment: $0^{\circ}\text{C to } +40^{\circ}\text{C } (+32^{\circ}\text{F to } +104^{\circ}\text{F}).$

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MAIN COMPONENTS ILLUSTRATIONS 588820100 and 588820200



ORDERING INFORMATION

List Options

Order the following by the items Part Number as specified in the following table.

When viewing electronically, click on the Link to jump to the detailed description page.

List No.	Part Number	Description
1	58882010001	Common Equipment, -48V, 19" Battery Rack System Includes (1) relay rack, (2) vertical tray mounting brackets, (1) busbar kit with covers, (12) cable lacing brackets, (1) instruction manual, and packaging.
<u>10</u>	58882010010	Battery Tray, 19" Mount, 16.5" Deep Includes tray, hardware, cable cut to length, lugs.
<u>11</u>	58882010011	Battery Tray, 19" Mount, 21" Deep Includes tray, hardware, cable cut to length, lugs.
<u>12</u>	58882010012	Battery Tray, 19" Mount, 22" Deep Includes tray, hardware, cable cut to length, lugs.
1	58882020001	Common Equipment, -48V, 23" Battery Rack System Includes (1) 7' tall relay rack, (2) vertical tray mounting brackets, (1) busbar kit with covers, (12) cable lacing brackets, (1) instruction manual, and packaging.
<u>2</u>	58882020002	Common Equipment, -48V, 23" Battery Rack System Includes (1) 6' tall relay rack, (2) vertical tray mounting brackets, (2) busbar kits with covers, (10) cable lacing brackets, (1) instruction manual, and packaging.
<u>3</u>	58882020003	Common Equipment, -48V, 23" Battery Rack System Includes (1) 5' tall relay rack, (2) vertical tray mounting brackets, (1) busbar kit with covers, (8) cable lacing brackets, (1) instruction manual, and packaging.
<u>11</u>	58882020011	Battery Tray, 23" Mount, 22.5" Deep Includes tray, hardware, cable cut to length, lugs.

Notes:

- 588820100: Vertical tray spacing is automatically determined by battery tray selection; 7RU for List 10, 6RU for List 11, and 8RU for List 12.
 - 588820200: Vertical tray spacing is automatically determined by battery selection; 6RU, 7RU, or 8RU. If no battery is selected, spacing is 8RU.
- 2) 588820100: The locations of the cable lacing brackets is determined by the tray spacing, total of six (6) per side. 588820200: The locations of the cable lacing brackets is determined by the tray spacing, total of six (6) per side for 6RU or 7RU and five (5) per side for 8RU.
- 3) Cable size for each tray is 2AWG for optional battery disconnect circuit breakers selected up to 150A and 1/0AWG for circuit breakers selected over 150A or for systems without battery disconnects.
- 4) If a battery type is not selected, battery terminal lugs are provided and shipped loose for all batteries listed for use with the battery tray ordered and for the cable size determined in Note 3).

Accessory Options

Order the following by the items Part Number as specified in the following table. When viewing electronically, click on the *link* to jump to the detailed description page.

Description	Part Number
Relay Rack Isolation Kit	
<u>Batteries</u>	See ACCESSORY
Optional Front Battery Cover	DESCRIPTIONS Section
Optional Battery Disconnect Circuit Breaker Kits	

LIST DESCRIPTIONS

588820100 List 1: Common Equipment, -48V, 19" Battery Rack System

Features

- Provides the following equipment: (1) nominal 19" wide by 7" tall relay rack, (2) vertical tray mounting brackets, (1) busbar kit with covers, (12) cable lacing brackets, (1) instruction manual, and packaging.
- Factory assembled per battery trays and optional battery disconnect circuit breakers ordered.

Restrictions

The relay rack accommodates up to six (6) battery trays (spaced 6RU or 7RU apart, as determined by the battery tray ordered), or five (5) battery trays (spaced 8RU apart).

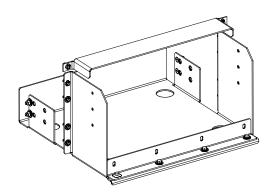
Ordering Notes

- 1) Order as required.
- 2) Order Relay Rack Isolation Kit, P/N 10019128, as required. See "Relay Rack Isolation Kit" on page 10.

588820100 List 10: Battery Tray, 19" Mount, 16.5" Deep

Features

- Provides a 16.5" deep battery tray for the nominal 19" wide relay rack provided as part of List 1. The battery tray holds four (4) 12V front terminal valve regulated lead acid (VRLA) batteries. Battery cabling is factory provided and connected to the system's main busbars. Batteries are configured as one (1) 48V string per tray.
- Trays can be ordered with or without a battery disconnect circuit breaker. When circuit breakers are ordered, one is provided in the – 48V lead of each battery string (1 circuit breaker per tray).
- Refer to the "Physical Size Information" section for dimensions.



Restrictions

Designed to accommodate the batteries listed under Batteries in the ACCESSORY DESCRIPTIONS section.

A single battery tray must mount at bottom of relay rack. Multiple battery trays must mount starting at bottom of relay rack and working upward. Factory spaces battery trays 7RU apart.

Cable size for each tray is 2AWG for optional battery disconnect circuit breakers selected up to 100A and 1/0AWG for circuit breakers selected over 100A or if circuit breakers are not selected.

Ordering Notes

- 1) Order up to six (6) battery trays per relay rack, as required.
- Order batteries separately. See Batteries in the ACCESSORY DESCRIPTIONS section. Battery cables and lugs factory provided and connected.
- 3) If an optional battery disconnect circuit breaker is desired, order per *Optional Battery Disconnect Circuit Breaker Kits* in the ACCESSORY DESCRIPTIONS section.

588820100 List 11: Battery Tray, 19" Mount, 21" Deep

Features

- Provides a 21" deep battery tray for the nominal 19" wide relay rack provided as part of List 1. The battery tray holds four (4) 12V front terminal valve regulated lead acid (VRLA) batteries. Battery cabling is factory provided and connected to the system's main busbars. Batteries are configured as one (1) 48V string per tray.
- ◆ Trays can be ordered with or without a battery disconnect circuit breaker. When circuit breakers are ordered, one is provided in the -48V lead of each battery string (1 circuit breaker per tray).
- Refer to the "Physical Size Information" section for dimensions.

Restrictions

Designed to accommodate the batteries listed under Batteries in the ACCESSORY DESCRIPTIONS section.

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A single battery tray must mount at bottom of relay rack. Multiple battery trays must mount starting at bottom of relay rack and working upward. Factory spaces battery trays 6RU apart.

Cable size for each tray is 2AWG for optional battery disconnect circuit breakers selected up to 100A and 1/0AWG for circuit breakers selected over 100A or if circuit breakers are not selected.

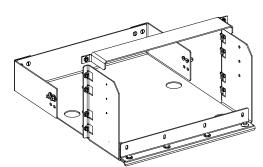
Ordering Notes

- 1) Order up to six (6) battery trays per relay rack, as required.
- Order batteries separately. See Batteries in the ACCESSORY DESCRIPTIONS section. Battery cables and lugs factory provided and connected.
- 3) If an optional battery disconnect circuit breaker is desired, order per *Optional Battery Disconnect Circuit Breaker Kits* in the ACCESSORY DESCRIPTIONS section.

588820100 List 12: Battery Tray, 19" Mount, 22" Deep

Features

- Provides a 22" deep battery tray for the nominal 19" wide relay rack provided as part of List 1. The battery tray holds four (4) 12V front terminal valve regulated lead acid (VRLA) batteries. Battery cabling is factory provided and connected to the system's main busbars. Batteries are configured as one (1) 48V string per tray.
- Trays can be ordered with or without a battery disconnect circuit breaker. When circuit breakers are ordered, one is provided in the – 48V lead of each battery string (1 circuit breaker per tray).
- Refer to the "Physical Size Information" section for dimensions.



Restrictions

Designed to accommodate the batteries listed under Batteries in the ACCESSORY DESCRIPTIONS section.

A single battery tray must mount at bottom of relay rack. Multiple battery trays must mount starting at bottom of relay rack and working upward. Factory spaces battery trays 8RU apart.

Cable size for each tray is 2AWG for optional battery disconnect circuit breakers selected up to 100A and 1/0AWG for circuit breakers selected over 100A or if circuit breakers are not selected.

- 1) Order up to five (5) battery trays per relay rack, as required.
- 2) Order batteries separately. See *Batteries* in the ACCESSORY DESCRIPTIONS section. Battery cables and lugs factory provided and connected.
- 3) If an optional battery disconnect circuit breaker is desired, order per *Optional Battery Disconnect Circuit Breaker Kits* in the ACCESSORY DESCRIPTIONS section.

588820200 List 1: Common Equipment, -48V, 23" Battery Rack System

Features

- Provides the following equipment: (1) nominal 23" wide by 7' tall relay rack, (2) vertical tray mounting brackets, (1) busbar kit with covers, (12) cable lacing brackets, (1) instruction manual, and packaging.
- Factory assembled per battery trays and optional battery disconnect circuit breakers ordered.

Restrictions

The relay rack accommodates up to six (6) battery trays when spaced 6RU or 7RU apart and five (5) battery trays when spaced 8RU apart. Battery selection determines tray spacing.

Ordering Notes

- Order as required.
- 2) Order Relay Rack Isolation Kit, P/N 10019125, as required. See "Relay Rack Isolation Kit" on page 10.

588820200 List 2: Common Equipment, -48V, 23" Battery Rack System

Features

- Provides the following equipment: (1) nominal 23" wide by 6' tall relay rack, (2) vertical tray mounting brackets, (2) busbar kits with covers, (10) cable lacing brackets, (1) instruction manual, and packaging.
- Factory assembled per battery trays and optional battery disconnect circuit breakers ordered.

Restrictions

The 6-foot relay rack accommodates up to five (5) battery trays when spaced 6RU apart and four (4) battery trays when spaced 7RU or 8RU apart. Battery selection determines tray spacing.

Ordering Notes

- 1) Order as required.
- 2) Order Relay Rack Isolation Kit, P/N 10019125, as required. See "Relay Rack Isolation Kit" on page 10.

588820200 List 3: Common Equipment, -48V, 23" Battery Rack System

Features

- Provides the following equipment: (1) nominal 23" wide by 5' tall relay rack, (2) vertical tray mounting brackets, (1) busbar kit with covers, (8) cable lacing brackets, (1) instruction manual, and packaging.
- Factory assembled per battery trays and optional battery disconnect circuit breakers ordered.

Restrictions

The 5-foot relay rack accommodates up to four (4) battery trays when spaced 6RU apart and three (3) battery trays when spaced 7RU or 8RU apart. Battery selection determines tray spacing.

- Order as required.
- 2) Order Relay Rack Isolation Kit, P/N 10019125, as required. See "Relay Rack Isolation Kit" on page 10.

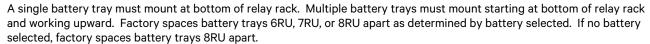
588820200 List 11: Battery Tray, 23" Mount, 22.5" Deep

Features

- Provides a 22.5" deep battery tray for the nominal 23" wide relay rack provided as part of List 1. The battery tray holds four (4) 12V front terminal valve regulated lead acid (VRLA) batteries. Battery cabling is factory provided and connected to the system's main busbars. Batteries are configured as one (1) 48V string per tray.
- ◆ Trays can be ordered with or without a battery disconnect circuit breaker. When circuit breakers are ordered, one is provided in the -48V lead of each battery string (1 circuit breaker per tray).
- Refer to the "Physical Size Information" section for dimensions.

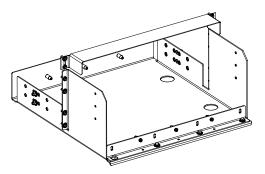
Restrictions

Designed to accommodate the batteries listed under *Batteries* in the ACCESSORY DESCRIPTIONS section.



Cable size for each tray is 2AWG for optional battery disconnect circuit breakers selected up to 150A and 1/0AWG for circuit breakers selected over 150A or if circuit breakers are not selected.

- 1) Order quantity of battery trays up to the maximum quantity that can be accommodated in the relay rack per the common equipment selected, as required.
- Order batteries separately. See Batteries in the ACCESSORY DESCRIPTIONS section. Battery cables and lugs factory provided and connected.
- 3) If optional front battery covers are desired, order per *Optional Front Battery Covers* in the ACCESSORY DESCRIPTIONS section.
- 4) If an optional battery disconnect circuit breaker is desired, order per *Optional Battery Disconnect Circuit Breaker Kits* in the ACCESSORY DESCRIPTIONS section.



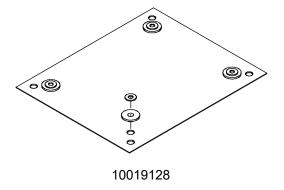
ACCESSORY DESCRIPTIONS

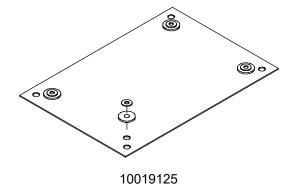
Relay Rack Isolation Kit

Features

• Provides electrical isolation of the relay rack from the concrete floor. Includes an insulating pad, four (4) insulating bushings, and four (4) flat washers to be used with the anchors used to mount the relay rack to the floor.

- 1) Order P/N 10019128 for a Relay Rack Isolation Kit to be used with 588820100.
- 2) Order P/N 10019125 for a Relay Rack Isolation Kit to be used with 588820200.





Batteries

19" Battery Shelf

Manufacturer*	Manufacturer P/N	Vertiv P/N (12V Module)	Capacity (A-Hr)	Dimension W x L x H (Inches) (per 12V Module)	Min Tray Spacing (RU)	Weight (lb) (per 12V Module)	Lug Kit 2AWG	Lug Kit 1/0AWG
Deka	12AVR100ET	241270905	96	4.33 x 20.13 x 9.38	6	75	528234	528235
Douglas	DSN12-100F		100	4.24 x 15.59 x 11.30	7	77.7	528234	528235
Douglas	DSN12-90F		88	4.24 x 15.59 x 10.04	7	70.6	528234	528235
Enersys	12V92F	122005	92	4.10 x 16.40 x 10.10	7	61.7	528234	528235
Enersys	12VE115F		101	4.33 x 20.10 x 9.25	6	80.5	528234	528235
Enersys	SBS 100F		100	4.30 x 15.60 x 11.30	7	71.9	528234	528235
Enersys	SBS C11F		91	4.10 x 16.40 x 10.10	7	61.6	528234	528235
Enersys	12V125F	122009	125	4.10 x 22.10 x 12.40	8	124	528234	528235
FIAMM	12UMTX100/19FT		100	4.25 x 15.55 x 10.83	7	74.8	528234	528235
GNB	M12V105FT	103715	100	4.33 x 20.12 x 9.37	6	78.8	528234	528235
GNB	M12V90FT	524858	86	4.13 x 15.55 x 10.63	7	68.2	528234	528235
Northstar	NSB100FT		100.5	4.24 x 15.59 x 11.30	7	78.5	528234	528235
Northstar	NSB12-330FT		(330W)	4.20 x 15.60 x 10.00	7	70.6	528234	528235
Northstar	NSB12-380FT		(380W)	4.20 x 15.60 x 11.30	7	78.3	528234	528235
Northstar	NSB90FT		87.8	4.24 x 15.59 x 10.04	7	70.6	528234	528235

^{*} See Battery Manufacturer Information

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23" Battery Shelf

Manufacturer*	Manufacturer P/N	P/N (12 V Module)	Capacity (A-Hr)	Dimension W x L x H (Inches) (per 12 V Module)	Min Tray Spacing (RU)	Weight (Ib) (per 12V Module)	Lug Kit 2 AWG	Lug Kit 1/0 AWG
C&D	TEL12-160F	140456	157	5.0 x 22.0 x 11.10	7	116.8	528236	528237
C&D	TEL12-180F		181	5.0 x 22.0 x 12.60	8	132.3	528236	528237
C&D	TEL12-210F	554579	202	5.0 x 22.0 x 12.60	8	132.3	528236	528237
Deka	12AVR-150ET	122018	150	4.90 x 22.00 x 11.75	8	115	528234	528235
Deka	12AVR-170ET	541381	170	4.90 x 22.0 x 12.60	8	120	528234	528235
Deka	HT170ET		164	4.93 x 22.17 x 12.58	8	118	528234	528235
Enersys	12V155FS	122010	155	4.90 x 22.10 x 11.10	7	106.9	528234	528235
Enersys	12V170FS		170	4.90 x 22.10 x 11.10	7	112	528234	528235
Enersys	SBS 170F		170	4.92 x 22.10 x 11.10	7	116	528234	528235
Enersys	SBS 190F		190	4.90 x 22.10 x 12.40	8	132	528234	528235
FIAMM	12FAT100		100	4.96 x 21.97 x 9.06	6	95	528234	528235
FIAMM	12FAT155		155	4.96 x 21.97 x 12.64	8	129	528234	528235
FIAMM	12FAT180		100	4.96 x 21.97 x 12.64	8	134	528234	528235
FIAMM	12FAT181		180	4.96 x 21.97 x 12.64	8	130	528234	528235
Northstar	NSB155FT RED		155	4.90 x 22.0 x 11.00	7	101	528234	528235
Northstar	NSB170FT RED	126111	170	4.90 x 22.00 x 12.60	8	116	528234	528235
Northstar	NSB190FT RED		190	4.90 x 22.00 x 12.60	8	123	528234	528235
Northstar	NSB155FT HT		154	4.90 x 22.00 x 11.0	7	117	528234	528235
Northstar	NSB170FT HT		174	4.90 x 22.00 x 12.60	8	121	528234	528235
Northstar	NSB190FT HT		190	4.90 x 22.00 x 12.60	8	132	528234	528235
GS Yuasa	PYL12V160FT		160	4.90 x 21.90 x 11.0	7	116.2	528234	528235
GS Yuasa	PYL12V185FT		185	4.90 x 21.90 x 12.50	8	133.8	528234	528235

^{*} See Battery Manufacturer Information

Optional Front Battery Cover Kits

Features

• Provides a front battery cover to the battery tray.

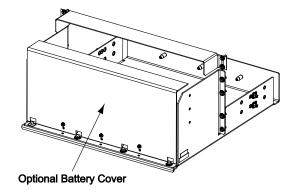
Restrictions

For 23" battery trays only.

Ordering Notes

1) Order one (1) kit per tray, as required, from the following table.

Part Number	Height
562128	8U
562053	7U
562145	6U



Optional Battery Disconnect Circuit Breaker Kits

Features

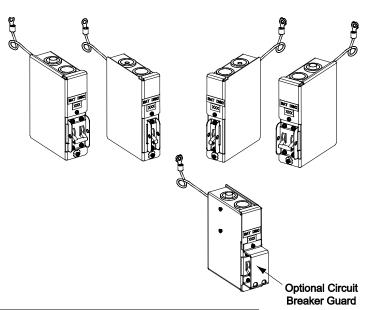
 Provides a battery disconnect circuit breaker housing mounted on the left or right side of the battery tray. Selected circuit breaker factory installed and wired.

Restrictions

Factory wires Battery Rack System with 2AWG cables for battery disconnect circuit breakers selected up to 150A and 1/0AWG cables for circuit breakers selected over 150A.

Ordering Notes

 Order one (1) kit per tray, as required, from the following table. Also order an optional circuit breaker guard per circuit breaker if desired.



Part Number	Description	Circuit Breaker Guard
559813	Single Pole, Right Side Mounted	not available
559814	Single Pole, Left Side Mounted	not available
559815	Double Pole, Right Side Mounted	548014
559816	Double Pole, Left Side Mounted	

2) Order one (1) circuit breaker per tray from the following table.

Ampere Rating	P/N Electrical/Mechanical Trip ¹ (Black Handle)	No. of Poles
30	256693100	
35	256693500	
40	256693900	
50	256694300	1-Pole
60	256694700	1-Pole
70	256695100	
75	256695500	
100	256695900	
125	100765	
150	100763	2-Pole
200	121810	

Circuit Breaker Alarm Operation:

¹Provides an alarm during an electrical or manual trip condition.

Optional Battery Tray Anderson Battery Connector Kit

Features

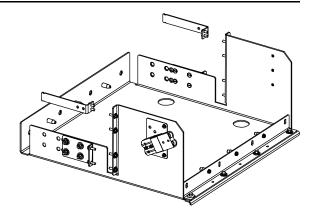
 Provides an Anderson battery connector (SB 120) factory mounted on the left or right side of the List 11 battery trays.

Restrictions

For use in List 11 battery trays.

Ordering Notes

 For each battery tray, order one (1) Anderson battery tray connector kit P/N 563297.



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SPECIFICATIONS

- 1.1 Environmental Ratings
 - 1.1.1 Operating Ambient Temperature Range: 0°C to +40°C (+32°F to +104°F).
 - 1.1.2 Storage Ambient Temperature Range: -40°C to +85°C (-40°F to +185°F).
 - 1.1.3 Humidity: This system is capable of operating in an ambient relative humidity range of 0% to 95%, non-condensing.
 - 1.1.4 Altitude:
 - (A) Operating: -200 feet (-61 meters) to 10,000 feet (3048 meters). Derate operating ambient temperature range by 2°C per 1000 feet (305 meters) above 5000 feet (1524 meters).
 - (B) Storage and Transportation: -1,000 feet (-305 meters) to 50,000 feet (15,241 meters).
 - 1.1.5 Mounting: This equipment is intended only for installation in a Restricted Access Location on or above a non-combustible surface.
 - 1.1.6 Aisle Space Clearance: Recommended minimum aisle space clearance is 2'6" for the front of the Battery Rack System and 4" for the rear of the Battery Rack System.
- 1.2 Compliance Information
 - 1.2.1 Safety Compliance: This power board is UL Listed as a DC Power Distribution Center for Communications Equipment. This unit meets the requirements of CSA 22.2, No. 225 and is tested and Certified by UL ("c UL") as a Custom Built Power Distribution Center for Communications Equipment.
 - 1.2.2 Seismic Compliance: NEBS Zone 4 Earthquake compliant when equipped with four (4) or fewer battery trays.

MECHANICAL SPECIFICATIONS

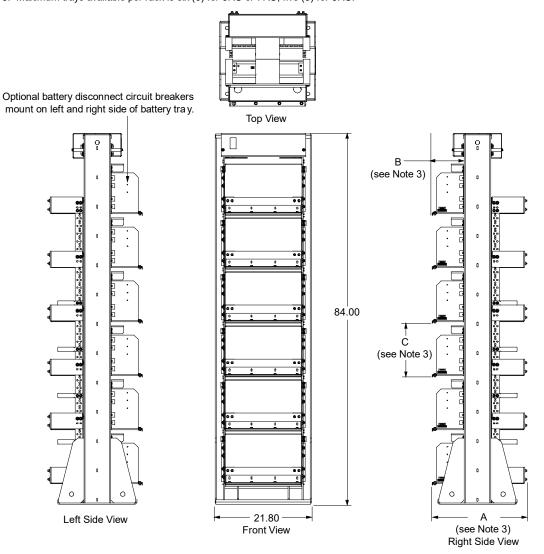
Overall Dimensions - 588820100 List 1 with List 10, List 11 or List 12

Notes:

- 1. Dimensions are in inches.
- 2. P/N 565381 battery tray shown, P/N 565376 similar.

3.				Weigh	Weight (LBS)		Dimensions			
	List No.	Tray P/N	Tray Overall Dimensions	w/ Circuit Breaker Option	w/out Circuit Breaker Option	A	7.29 7.29	С		
	588820100 List 10	565376	19" Mounting 16.5" Deep			16.5	7.29	7RU		
	588820100 List 11	565381	19" Mounting 21" Deep			21.0	7.29	6RU		
	588820100 List 12	565384	19" Mounting 22" Deep			22.35	7.29	8RU		

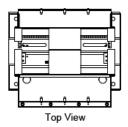
- 4. Finish: Dark Gray
- 5. Maximum trays available per rack is six (6) for 6RU or 7RU, five (5) for 8RU.



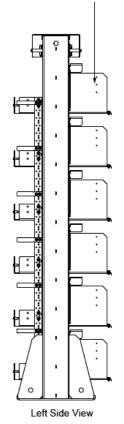
Overall Dimensions - 588820200 List 1, List 2, List 3 with List 11

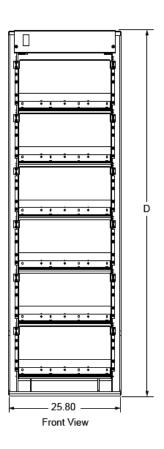
1. I 2. I	. Dimensions are in inches.								
۷.				Weight (LBS)		Dimensions (in)			
	List No.	Tray P/N	Tray Overall Dimensions	w/ Circuit Breaker Option	w/out Circuit Breaker Option	A	С	Height (Rack) D	
	588820200 List 1			276.5	275		6RU, 7RU, or 8RU	84	
	588820200 List 2	565398	23" Mounting 22.5" Deep	251.5	250	22.5		72	
	588820200 List 3			228.5	227			60	

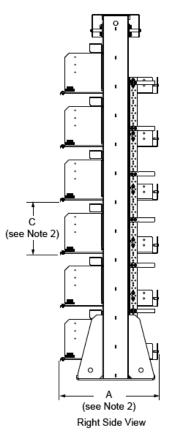
3. Finish: Dark Gray



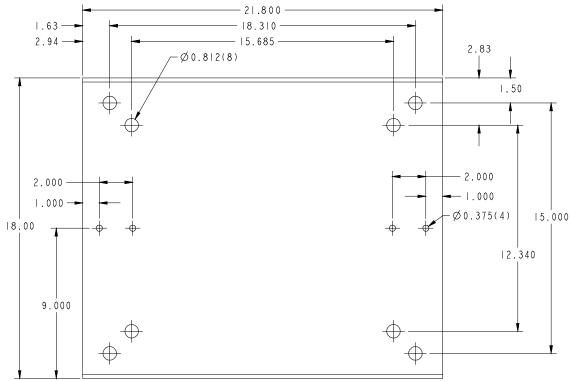
Optional battery disconnect circuit breakers mount on left or right side of battery tray.



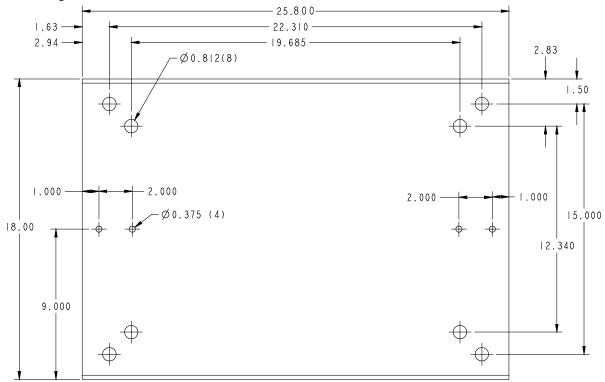




Floor Mounting Dimensions - 588820100



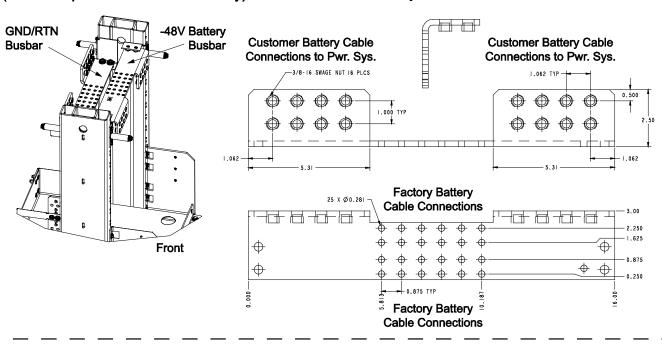
Floor Mounting Dimensions - 588820200



Battery Lug Landing Dimensions - 588820100 and 588820200 588820100

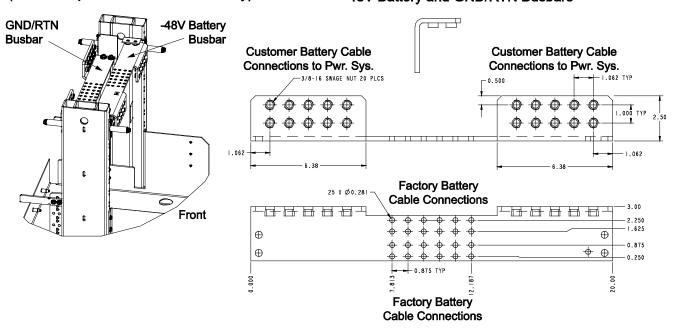
Top of Relay Rack (some components removed for clarity)

-48V Battery and GND/RTN Busbars

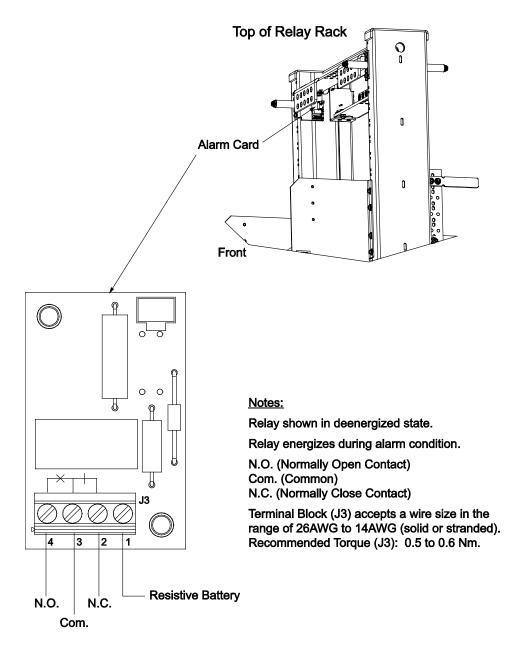


588820200 Top of Relay Rack (some components removed for clarity)

-48V Battery and GND/RTN Busbars



Circuit Breaker Alarms



BATTERY MANUFACTURER INFORMATION

The Battery Rack Systems described in this System Application Guide are designed to accommodate batteries from various manufacturers. The following are referenced in this document.

C&D: C&D Technologies, Inc., Powercom Div., 1400 Union Meeting Road, Blue Bell, PA 19422-0858

Deka*: East Penn Mfg. Co., Inc., Lyon Station, PA 19536-0147

Douglas: Douglas Battery Mfg. Co., 500 Battery Dr., Winston-Salem, NC 27117-2159 **Fiamm:** FIAMM T.I, 23880 Industrial Park Drive, Farmington Hills, Detroit, MI 48335

GNB Marathon™: GNB Industrial Power, a Division of Exide Technologies, Princeton, NJ 08543

Northstar: NorthStar Battery Co. LLC, 4000 Continental Way, Springfield, MO 65803

PowerSafe Enersys™: EnerSys Inc., Reading, PA, 196212-4145

RELATED DOCUMENTATION

Schematic Diagram: SD588820100/SD588820200 **Wiring Diagram:** T588820100/T588820200

Instructions: Section 6045

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