



Supplemental Battery Stand J85504D-1 Lists 16, 17, and 18

Product Manual
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Notice:

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Table of Contents

1 Introduction

<i>J85504D-1 Battery Stands</i>	<i>1 - 1</i>
<i>Engineering and Installation Options</i>	<i>1 - 1</i>
<i>Documentation</i>	<i>1 - 1</i>
<i>Customer Service Contacts</i>	<i>1 - 3</i>
<i>Customer Service, Technical Support,</i>	
<i>Product Repair and Return</i>	<i>1 - 3</i>
<i>Customer Training</i>	<i>1 - 3</i>
<i>Warranty Service</i>	<i>1 - 3</i>
<i>On-Line Power Systems Product Manuals</i>	<i>1 - 3</i>
<i>EasyView Software</i>	<i>1 - 3</i>

2 Product Descriptions

<i>Battery Stands</i>	<i>2 - 1</i>
<i>Overview</i>	<i>2 - 1</i>
<i>Features</i>	<i>2 - 2</i>
<i>Construction</i>	<i>2 - 4</i>
<i>Optional equipment</i>	<i>2 - 4</i>
<i>Specifications</i>	<i>2 - 5</i>
<i>Dimensions and Seismic Ratings</i>	<i>2 - 5</i>
<i>Battery Specifications</i>	<i>2 - 8</i>

3 Ordering Information

<i>Battery Stand</i>	<i>3 - 1</i>
<i>Batteries</i>	<i>3 - 1</i>
<i>Options</i>	<i>3 - 2</i>
<i>Kits and Thermal Probe</i>	<i>3 - 3</i>
<i>Hardware</i>	<i>3 - 3</i>
<i>Anchor Bolts and Washer Plates</i>	<i>3 - 4</i>
<i>Wire Terminating Connectors</i>	<i>3 - 4</i>
<i>Wire</i>	<i>3 - 6</i>

4 Safety

<i>Safety Statements</i>	<i>4 - 1</i>
<i>Warning and Safety Symbols</i>	<i>4 - 2</i>
<i>Precautions</i>	<i>4 - 3</i>

5 Installation Guidelines and Preparations

<i>Tools and Materials</i>	5 - 1
<i>Environmental Requirements</i>	5 - 2
<i>Unpacking and Handling</i>	5 - 4
<i>Anchoring</i>	5 - 4
<i>Connections</i>	5 - 7
<i>Battery Stand</i>	5 - 7
<i>Voltage Drop</i>	5 - 7
<i>Class B Stranded Cables Lugs</i>	5 - 8
<i>Class I Stranded Cables Lugs</i>	5 - 8
<i>Battery String</i>	5 - 9
<i>Battery String Disconnect Switch</i>	5 - 10
<i>Other Connections</i>	5 - 11
<i>Terminal Plate</i>	5 - 11
<i>Optional Fuse Assembly</i>	5 - 14
<i>1000A Kit Contents</i>	5 - 14
<i>Fuse Electrical Characteristics and Ordering Information</i>	5 - 15

6 Installation Procedures

<i>Positioning Battery Stand</i>	6 - 1
<i>Installing HSL Type Anchors</i>	6 - 2
<i>Installing HDI Type Anchors</i>	6 - 3
<i>Anchoring Battery Stand</i>	6 - 4
<i>Installing Batteries</i>	6 - 4
<i>Placing a Battery String Into Service</i>	6 - 6

7 Maintenance and Battery Replacement

<i>Inspection and Cleaning</i>	7 - 1
<i>Re-torquing Inter-battery Connections</i>	7 - 1
<i>Battery Replacement</i>	7 - 1

8 Equipment Frames (Mini-Frames)

<i>Overview</i>	8 - 1
<i>Tools and Materials</i>	8 - 5
<i>Installing the Mini-frame</i>	8 - 5

9 Remote Power Off Switch (J85504C-1 List D)

10 210E Control Module

<i>Overview</i>	10 - 1
<i>Cable Kit</i>	10 - 2

List of Figures

<i>Figure 2-1: J85504D-1 List 16 Battery Stand</i>	<i>2 - 2</i>
<i>Figure 2-2: J85504D-1 List 17 and List 18 Battery Stands</i>	<i>2 - 3</i>
<i>Figure 2-3 - List 16 Battery Stand Dimension</i>	<i>2 - 6</i>
<i>Figure 2-4 - List 17 and List 18 Battery Stand Dimension</i>	<i>2 - 7</i>
<i>Figure 3-1: Two Hole Lug</i>	<i>3 - 5</i>
<i>Figure 5-1: Area Used for Floor Load Calculations</i>	<i>5 - 3</i>
<i>Figure 5-2: HDI - 3/8 (Kit 847135720)</i>	<i>5 - 6</i>
<i>Figure 5-3: HDI - 1/2 (Kit 847135662)</i>	<i>5 - 6</i>
<i>Figure 5-4: HSLG M12/0 (Kit 847320835)</i>	<i>5 - 6</i>
<i>Figure 5-5: HSLB M12/25 (Kit 847135688)</i>	<i>5 - 6</i>
<i>Figure 5-6: H569-407 Group 20 (Kits 847532678, 847532694, 847221074)</i>	<i>5 - 6</i>
<i>Figure 5-7: Schematic for 24V 12IR125 Battery String</i>	<i>5 - 9</i>
<i>Figure 5-8: Schematic for 48V 12IR125 Battery String</i>	<i>5 - 9</i>
<i>Figure 5-9: Schematic for 24V C11 Battery String</i>	<i>5 - 9</i>
<i>Figure 5-10: Schematic for All Battery Strings with List 17 and 18 Battery Stands (3ET, 6VF11, FAT100, M12V100, and PL125)</i>	<i>5 - 10</i>
<i>Figure 5-11: Battery String Disconnect Switch</i>	<i>5 - 10</i>
<i>Figure 5-12: Battery Stand Terminal Plate Assembly</i>	<i>5 - 11</i>
<i>Figure 5-13: List 16 Battery Stand Assembly</i>	<i>5 - 12</i>
<i>Figure 5-14: List 17 and List 18 Battery Stand Assembly</i>	<i>5 - 13</i>
<i>Figure 5-15: Fuse Assembly (optional)</i>	<i>5 - 14</i>
<i>Figure 5-16: Fuse Dimensions</i>	<i>5 - 15</i>

<i>Figure 6-1: Typical Battery Stand Footprint</i>	<i>6 - 1</i>
<i>Figure 8-1: Mini-frame Dimensions</i>	<i>8 - 2</i>
<i>Figure 8-2: Isometric View of Mini-Frame</i>	<i>8 - 3</i>
<i>Figure 8-3: Frame Assembly on Top of Battery Stand</i>	<i>8 - 4</i>
<i>Figure 10-1: 210E Thermal Probe Multiplexer Module</i>	<i>10 - 1</i>

List of Tables

<i>Table 2-A: Battery Stand Dimensions and Seismic Ratings</i>	2 - 5
<i>Table 2-B: Battery Stand Weight Specifications</i>	2 - 5
<i>Table 2-C: Batteries Physical and Thermal Specifications</i>	2 - 8
<i>Table 3-A: Battery Stands</i>	3 - 1
<i>Table 3-B: 12IR125 and 12IR125LP Ordering Information</i>	3 - 1
<i>Table 3-C: C11 Batteries</i>	3 - 2
<i>Table 3-D: List 17 and List 18 Battery Stand Batteries</i>	3 - 2
<i>Table 3-E: Options</i>	3 - 2
<i>Table 3-F: Kits and Thermal Probe</i>	3 - 3
<i>Table 3-G: Anchor Bolt Kits</i>	3 - 4
<i>Table 3-H: Washer Plates</i>	3 - 4
<i>Table 3-I: Wire Connectors</i>	3 - 5
<i>Table 3-J: KS-24194 List 2 Class “I” Stranding (No Cotton Braid)</i>	3 - 6
<i>Table 5-A: Battery Stand Floor Load Data</i>	5 - 3
<i>Table 5-B: Anchor Bolt Specifications</i>	5 - 5
<i>Table 5-C: Typical Values for Cable Voltage Drop Calculations</i>	5 - 7
<i>Table 5-D: KS24194 Class “B” Stranded Conductor Information</i>	5 - 8
<i>Table 5-E: KS24194 Class “I” Stranded Conductor Information</i>	5 - 8
<i>Table 5-F: Fuses for Optional 1000A Kit</i>	5 - 14
<i>Table 5-G: Fuse Electrical Characteristics and Ordering Information</i>	5 - 15
<i>Table 5-H: Electrical Characteristics</i>	5 - 16
<i>Table 6-A: Floor Drilling Data</i>	6 - 1
<i>Table 8-A: Mini-Frame Specifications</i>	8 - 2

1 Introduction

J85504D-1 Battery Stands

This product manual provides information on Lineage Power Supplemental Battery Stands, J85504D-1 List 16, 17, and 18, and their accessories.

These battery stands are designed for use in conjunction with a variety of valve-regulated lead acid batteries. See Section 2 for battery listing. These batteries and the accessories listed in this manual are designed by or recommended for use by Lineage Power, an acknowledged leader in technology, research, and design of power systems.

All products and the manufacturing processes meet strict specifications and quality standards. Lineage Power products have proved their field reliability by providing dependable standby reserve power for the telecommunications industry for decades.

Lineage Power maintains a nationally deployed force of battery specialists. Special engineering and consulting services for existing or new applications, or resolution of questions regarding any information in this manual are available. Refer to the “Customer Assistance Contacts” portion of this section.

Engineering and Installation Options

A customer or user can choose to fully or partially engineer and/or install equipment based on the information supplied and their own experience. But it is beyond the scope of this manual to give complete theoretical and tutorial information on the subject. However, Lineage Power offers complete engineering and installation services that result in “turn-key” plant operation. Contact your Lineage Power Account Representative for further information.

Documentation

This product manual is one of several that provide information on Lineage Power battery products. Other manuals, including those describing Lineage Power battery, controller, rectifier, and power plant products may be required, used, or referenced to fully configure,

engineer, and install a system. Each manual contains a technical description of the product, followed by detailed information on engineering, installation, operation, and maintenance. A documentation package is included with each product shipped. The contents of the documentation package for each product listed in this manual is identified for ordering and reference purposes in the various sections associated with product listed in this manual.

Customer Service Contacts

Customer Service, Technical Support, Product Repair and Return, and Warranty Service

For customers in the United States, Canada, Puerto Rico, and the US Virgin Islands, call 1-800-THE-1PWR (1-800-843-1797). This number is staffed from 7:00 am to 5:00 pm Central Time (zone 6), Monday through Friday, on normal business days. At other times this number is still available, but for emergencies only. Services provided through this contact include initiating the spare parts procurement process, ordering documents, product warranty administration, and providing other product and service information.

For other customers worldwide the 800 number may be accessed after first dialing the AT&T Direct country code for the country where the call is originating, or you may contact your local field support center or your sales representative to discuss your specific needs.

Customer Training

Lineage Power offers customer training on many Power Systems products. For information call 1-972-284-2163. This number is answered from 8:00 a.m. until 4:30 p.m., Central Time Zone (Zone 6), Monday through Friday.

Downloads and Software

To download the latest product information, product software and software upgrades, visit our web site at <http://www.lineagepower.com/>

2 *Product Descriptions*

Battery Stands

Overview

Figures 2-1 and 2-2 show the J85504D-1 List 16, 17, and 18 Supplemental Battery Stands. These battery stands are designed for 24 or -48 volt applications and for use with the following batteries:

List	Battery	Manufacturer
16	12IR125	Lineage Power
	12IR125LP	
	C11	Hawker
17, 18	3ET	East Penn
	FAT100	Fiamm
	6VF11	Power Safe
	M12V100	GNB
	NSB110FT	NorthStar

These battery stands are designed and tested to meet the requirements of Telcordia's Network Equipment Building Systems (NEBS - GR63-CORE) Generic Equipment Requirements for use in seismic zones 0 through 4. They have been seismically qualified using the anchoring hardware listed in this manual. The List 16 stand has been seismically qualified for use with the GPS half height cabinet products and equipment mounted in half height network bay frames. List 17 and 18 stands are for use with GPS systems only. Refer to Section 8, "Equipment Frames (Mini-frames)."

Features

- Four (Lists 16 and 17) and eight (List 18) shelf high welded metal superstructure
- Fire retardant UL94 V-0
- One battery string disconnect switch (125 amps maximum) provided on each shelf
- One battery terminal thermal probe provided on each shelf
- List 16 and 17 stands provide single point termination for connecting to your battery plant. All four battery shelves are wired in parallel to a common terminating bus bar assembly for easy, single point connection to the plant distribution. The eight shelf List 18 stand provides two similar bus assemblies, one for each set of four shelves.
- Front-access installation and maintenance
- Optional battery stand fuse kit
- Easy Installation: The Battery Stand arrives on site ready to install. Batteries are easily inserted into the shelves, and battery interconnections and cables are easily attached.

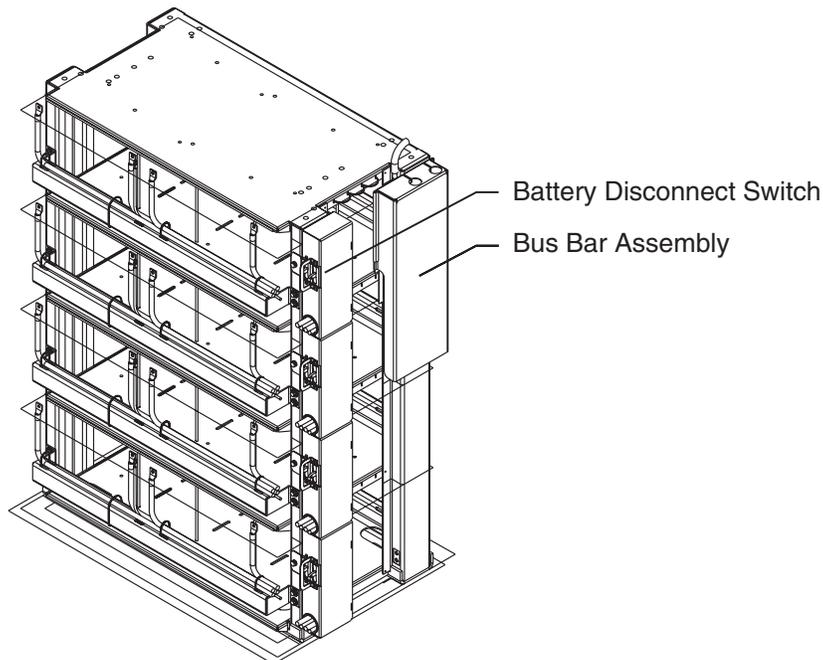


Figure 2-1: J85504D-1 List 16 Battery Stand

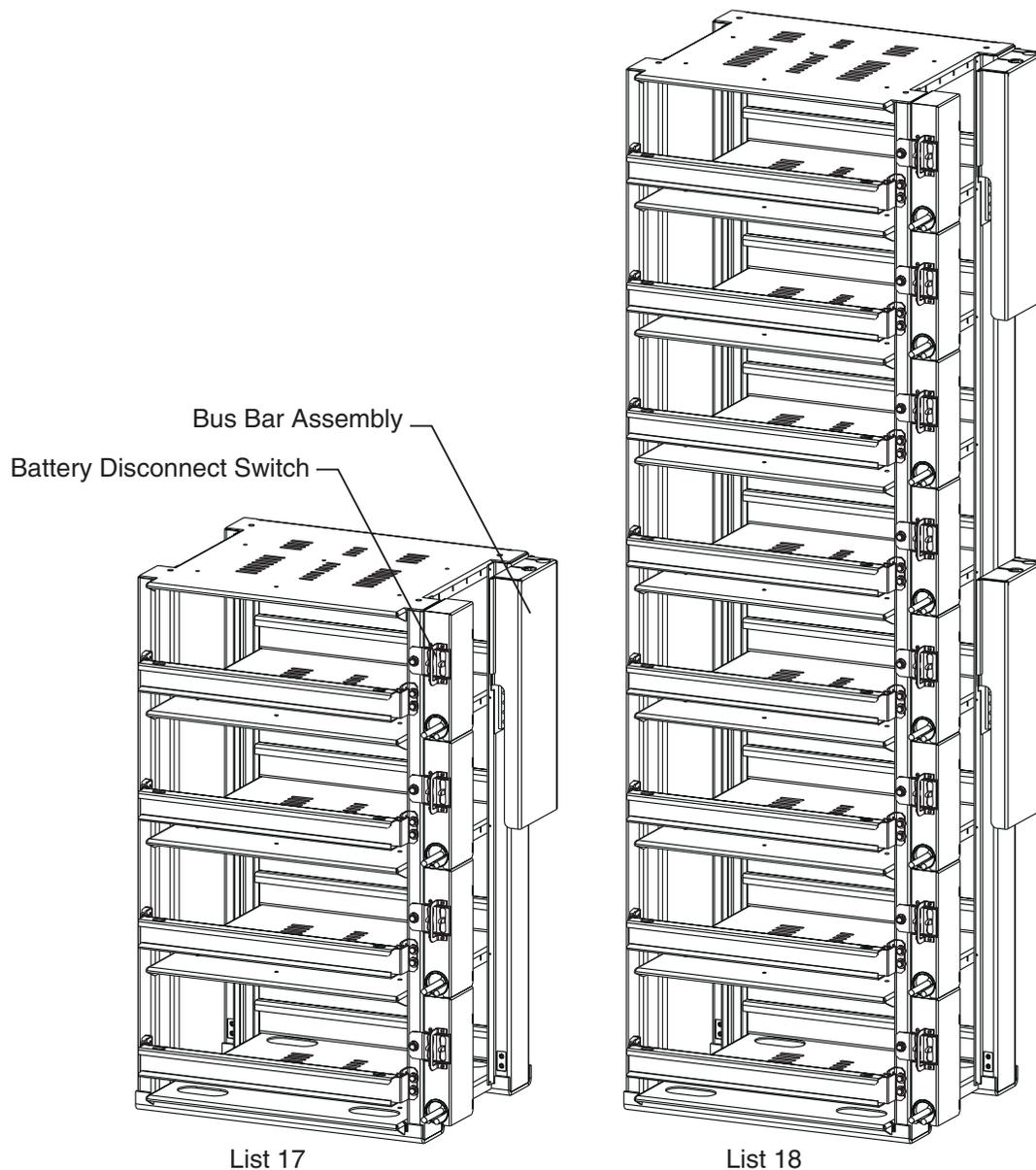


Figure 2-2: J85504D-1 List 17 and List 18 Battery Stands

Each shelf of the List 16 battery stand will hold either four 12IR125 (two 24V strings or one 48V string) series batteries or six C11 batteries (one 24V string). List 17 and 18 stands hold four of the recommended batteries. Each shelf is provided with a service disconnect switch (maximum rating of 125 amps) to remove the string (shelf) from service and battery terminal thermal probe (includes 35ft cable for connection to 210E or controller). All four switches/shelves are connected in parallel for a maximum total stand input/output rating of 500 amps.

Construction

These battery stands have been designed and tested to Bellcore's Network Equipment-Building System (NEBS) Generic Equipment Requirements (GR63-CORE). The maximum seismic rating this stand has been qualified to is shown in Table 2-A for the batteries indicated. These are the only batteries that have been tested for use in this stand.

List 16 battery stands are all welded steel construction. The welded assembly is pre-treated with either zinc phosphate or iron phosphate and coated with a electrically insulating epoxy finish (.002-.004 inch thick). The battery stand is provided with battery retainer and spacer bars to secure the batteries into position (spacers for the C11 batteries are provided with the C11 adapter kit - ordered separately). Battery terminal (front cover) shields to protect front access electrical connections from accidental contact are ordered separately for the 12IR125 battery and are provided with the C11 and 12IR125LP batteries.

Optional equipment

The following optional equipment is available for these battery stands:

- 1000 ampere fuse kit
- Supplementary equipment frame(s)
- Anchoring hardware
- Remote power off switch
- 210E Control Module (Thermal Probe Multiplexer)

In addition, battery covers for the 12IR125 battery and battery adapter/connection kits for C11 batteries (terminal covers provided with batteries) are available for the List 16 stand.

Section 5 lists the various types of anchoring hardware that have been assembled and tested for use with these stands in the various seismic zones.

The strength of concrete is usually measured as compressive strength-pressure in pounds per square inch (psi) required to crush it. Qualification testing of this stand, anchoring system, and respective seismic zones was made using concrete with compressive strength of 4000 psi.

Specifications

Dimensions and Seismic Ratings

Table 2-A: Battery Stand Dimensions and Seismic Ratings

Battery Stand List	Installed Battery	Shelves	Max Seismic Zone	Width inches (mm)	Depth inches (mm)	Height inches (mm)
16	12IR125 12IR125LP C11	4	4	34.11 (866)	19.18 (487)	44.24 (1123)
17	3ET M12V100	4	2	26 (660)	22.08 (561)	41.48 (1054)
	6VF11 FAT100	4	2	26 (660)	23.77 (604)	41.48 (1054)
	NSB110FT	4	2	26 (660)	23.99 (609)	41.48 (1054)
18	3ET M12V100	8	2	26 (660)	22.08 (561)	81.36 (2067)
	6VF11 FAT100	8	2	26 (660)	23.77 (604)	81.36 (2067)
	NSB110FT	8	2	26 (660)	23.99 (609)	81.36 (2067)

Table 2-B: Battery Stand Weight Specifications

List	Battery	With Batteries lbs (kg)	Without Batteries lbs (kg)	No. of Batteries
16	12IR125 12IR125LP	2210 (1003)	290 (132)	16
	C11	1876 (851)		24
17	3ET	1422 (645)	222 (101)	16
	6VF11	1918 (902)		
	FAT100	1806 (819)		
	M12V100	1518 (689)		
	NSB110FT	1894 (859)		
18	3ET	2825 (1281)	425 (193)	32
	6VF11	3817 (1731)		
	FAT100	3593 (1630)		
	M12V100	3017 (1368)		
	NSB110FT	3769 (1710)		

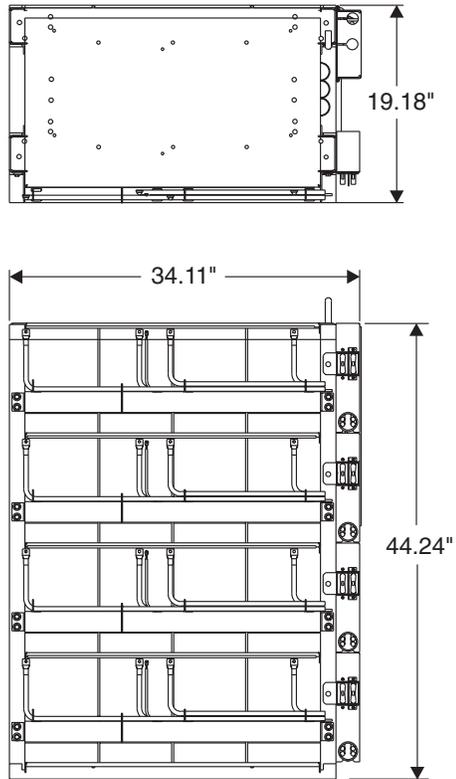


Figure 2-3 - List 16 Battery Stand Dimension

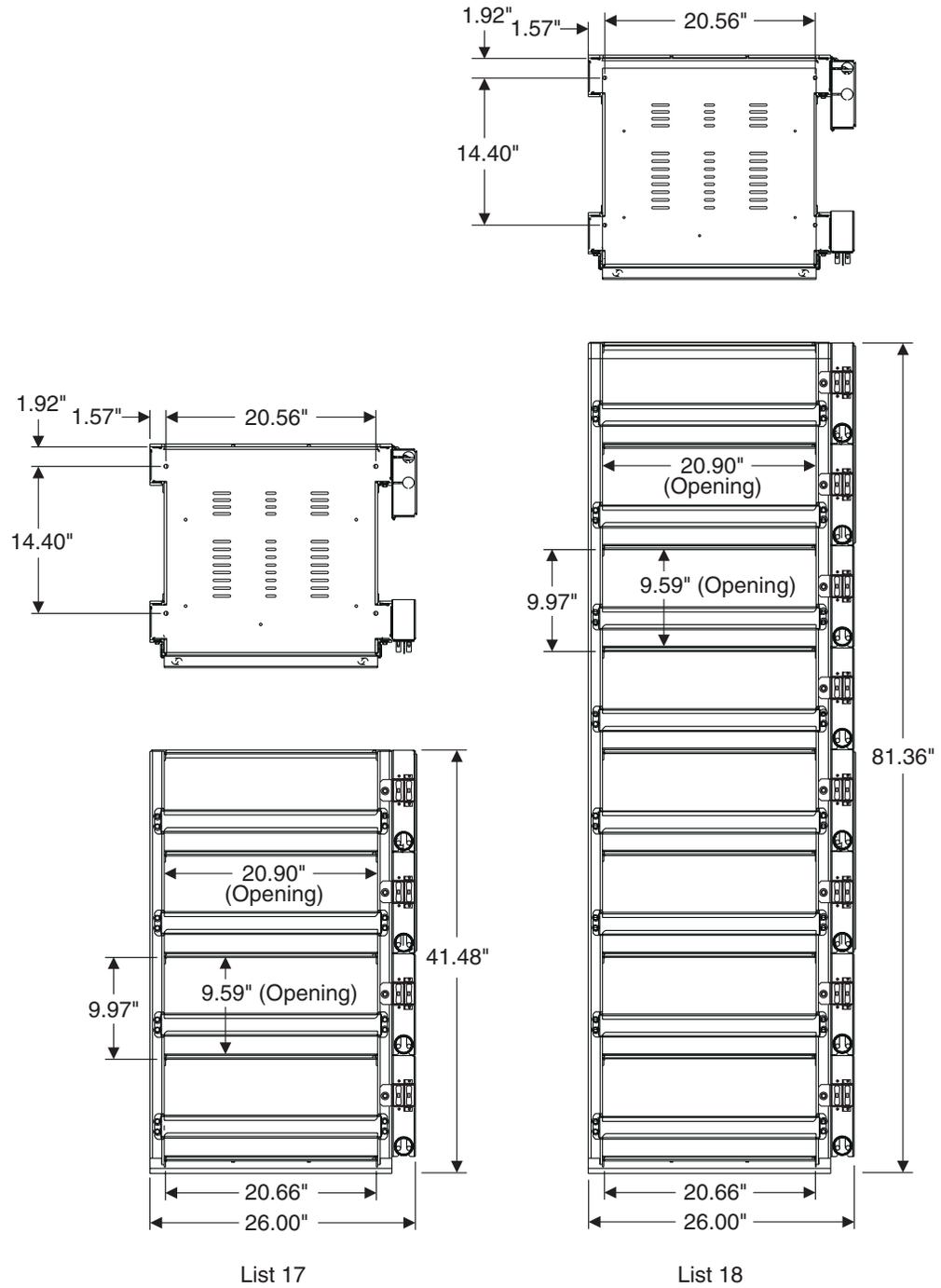


Figure 2-4 - List 17 and List 18 Battery Stand Dimension

**Battery
Specifications**

Table 2-C: Batteries Physical and Thermal Specifications

	12IR125 KS-23997 List 1		12IR125LP KS-23997 List 2		C11	
	8 HR	10 HR	8 HR	10 HR	8 HR	10 HR
Name Plate Capacity (AH)	120	125	120	125	91.9	91.2
Depth - in(cm)	16.82 (42.72)		17.82 (42.72)		15.6 (396)	
Width - in(cm)	6.97 (17.7)		6.97 (17.7)		4.1 (104)	
Height - in(cm)	10.10 (25.65)		9.36 (238)		10.00 (254)	
Weight - lbs(kg)	120 (54.55)		120 (54.55)		66.1 (30)	
Material	Polypropylene	Noryl	Polypropylene	Noryl	ABS	
Cycle Life @ 80% DOD*	400 cycles		400 cycles		400 cycles	
Nominal Float Voltage	12V					
UL Flammability Rating	V-0					
	3ET	6VF11	FAT100	M12V100	NSB110FT	
Name Plate Capacity (AH)						
Depth - in(cm)	20.10 (51.1)	22.00 (55.9)	20.85 (52.0)	20.10 (51.1)	22.00 (55.88)	
Width - in(cm)	4.33 (11)	4.90 (12.4)	4.96 (12.6)	4.30 (10.9)	4.92 (12.5)	
Height - in(cm)	9.40 (23.9)	8.90 (22.6)	9.06 (23.0)	9.40 (23.9)	8.94 (22.7)	
Weight - lbs(kg)	75 (34.02)	106 (48.08)	99 (44.9)	81 (36.74)	104.5 (47.40)	
Material	--	--	--	--	--	
Cycle Life @ 80% DOD*	--					
Nominal Float Voltage	12V					
UL Flammability Rating	V-0					

3 *Ordering Information*

Battery Stand

Table 3-A: Battery Stands

Comcode	Drawing	Description
848474656	J85504D-1 List 16	4 Shelf Supplemental Battery stand
848657896	J85504D-1 List 17	
848657888	J85504D-1 List 18	8 Shelf Supplemental Battery stand

Batteries

Ordering information for batteries used with the List 16 battery stand is shown in Tables 3-B and 3-C. Table 3-D shows ordering information for batteries used with the List 17 and List 18 battery stands.

Table 3-B: 12IR125 and 12IR125LP Ordering Information

Description (Battery Wet Filled with Acid, UN2794)	Comcode and Rating				Miscellaneous
	Rating	12IR125 KS-23997 L1	Rating	12IR125LP KS-23997 L2	
Ground Transport (Domestic shipments only)		407155399		408044295	Standard packaging, 6-sided box with 4 foam blocks, 36x36 pallet
Air Transport – 2/pallet (Domestic and International shipments)		407535103		408086528	Cargo Air Transport packed per IATA DGR
Air Transport – 8/pallet		407885128		408071041	Cargo Air Transport packed per IATA DGR
Ground Transport – 8/pallet (Domestic shipments only)	DA	408048916		408072064	Packed in a 5-sided box for shipment from the battery supplier to job site only. Note: Batteries cannot be shipped without a pallet.

Table 3-B: 12IR125 and 12IR125LP Ordering Information (Continued)

Description (Battery Wet Filled with Acid, UN2794)	Comcode and Rating				Miscellaneous
	Rating	12IR125 KS-23997 L1	Rating	12IR125LP KS-23997 L2	
Dummy (non-battery)		407885474		--	No hazard classification
Accessory Kit (Kit includes one bus bar, NO-OX-ID A [®] , and mounting hardware. One kit is provided with each battery. Supplementary kits may be ordered as required.)		847682754		847682754	
12IR125 battery terminal cover (one per two batteries)		848514097			

Table 3-C: C11 Batteries

Description	Comcode
C11 90AL high power density lead-acid battery (6 per shelf)	408188241 (300115979)
C11 Adapter Kit	848466900

Table 3-D: List 17 and List 18 Battery Stand Batteries

Battery	Manufacturer	Comcode
3ET	East Penn	408014140
6VF11	Power Safe	408108751
FAT100	Fiamm	408508703
M12V100	GNB	408406023
NSB110FT	NorthStar	408508752

Options

Table 3-E: Options

Description	Drawing	Comcode
Remote Power Off Switch	J85504C-1 List D	See Section 9
Equipment Frames (Mini-Frames) (Not for use with Lists 17 and 18)	J85504D-1	See Section 8
210E Control Module	J85501X-1 List K30	848353645

***Kits and
Thermal Probe***

Table 3-F: Kits and Thermal Probe

Description	Comcode
1000 amp Fuse Kit	848480372
35 foot long cable kit (alarm and power cables for connecting 210E control Module to the plant)	848480380
Additional thermal probe	848346847

Hardware

The J85504D-1 List 16 battery stand is not supplied with anchoring hardware. Select anchoring hardware for each application that is sized to meet the earthquake requirements for that application.

This battery stand has a maximum input/output rating of 500A when all four shelves of the stand are populated. Each shelf has a maximum rating of 125A. The string/shelf disconnect should not be exceeded.

Anchor Bolts and Washer Plates

Table 3-G outlines available anchoring kits. (See also Table 3-H.)

Table 3-G: Anchor Bolt Kits

Recommended Seismic Zone	Anchor (Individual)			Washer Plate*	Anchor Kit**
	Description	Hilti Item No.	Comcode	Comcode	Comcode
0 - 1	HDI - 3/8	000457531	405865948	841630155	847135720***
	HDI - 1/2	000457549	402980056	841628571	847135662***
0 - 3	HSLG M12/0	002172161	406967794	847303484	847320835
	HSLB M12/6	000457069	405814492	841628571	847532678
	HSLG M12/25	000685927	406241570	841628571	847135688****
4	HSLB M16/6	000457077	405821844	846818250	847532694
	HSLB M16/25	000674028	406876847	846818250	847221074

* Dimensions and ordering information for washer plates are given in Table 3-H.
 ** Anchor kits contain 4 anchors.
 *** Anchor kit is provided with 4 each of: 841628639 Insulating Bushing, Hold Down Washer, 84064793 Hex Nut, 841068208 Stud 3/4-13 x 3 °, 814251914 Washer.
 **** Anchor kit is provided with 4 each of: 841628621 Insulating Bushing, Hold Down Washer, 84064793 Hex Nut, 841068208 Stud 3/4-13 x 3 °, 814251914 Washer.

Table 3-H: Washer Plates

Comcode	Length	Width	Thickness	Hole Dia.
841628571	2	2	.25	.72
841630155	2	2	.19	.58
846818250	2	2	.19	1.06
847303484	2	4	.38	.58

Wire Terminating Connectors

All electrical connections should be made by Listed closed-loop pressure wire connectors secured by screw and star washers, Listed pressure cable connectors, Listed receptacles and plugs, or leads made mechanically secured before soldering, or Listed or Recognized Component wire connectors (ZMVV2).

The terminals on the J85504D-1 L16 battery stand are sized to accommodate termination lugs for various wire sizes. The lugs recommended for connections to this battery stand are listed in Table 3-I. The dimensions are illustrated in Figure 3-1.

Table 3-I: Wire Connectors

Wire Size	WP-91412 List No.	Dimensions						Crimp Die	Comcode
		A	B	C	D	E	T		
4/0 AWG	L27	1.81	.37	1.00	3/8	1.00	.15	62 Yellow	405347923
350 MCM	L183	1.817	.37	.96	3/8	1.00	.21	80	407890748
500 MCM	L185	2.053	.50	1.63	3/8	1.00	.26	99 Pink	407890755
750M CM	L184	2.076	.53	1.63	3/8	1.00	.32	115 Yellow	407890730

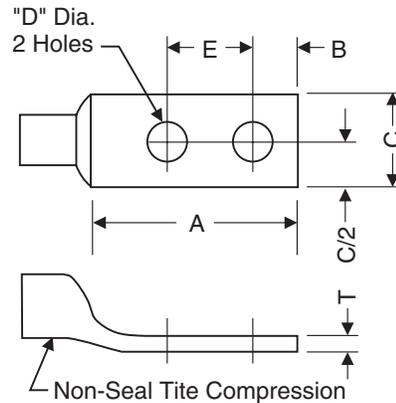


Figure 3-1: Two Hole Lug

Wire

The connections to the power distribution system should be made with 90°C ampacity conductors.

Table 3-J lists the various Class I wires that can be used for connections to the J85504D-1 L16 battery stand.

**Table 3-J: KS-24194 List 2 Class “I” Stranding
(No Cotton Braid)**

Gauge	Black	Blue	Gray	Red	Red-T	Blue-T
4/0	407409526	407399500	407399534	407399542	407399518	407399559
350	407403336	407403344	407403351	407403369	407403385	407403377
500	407403393	NONE	407403401	NONE	NONE	NONE
750	407403427	NONE	407403419	NONE	NONE	NONE

List 17 and List 18 battery stands are provided with 4/0 cables for connection to an immediately adjacent GPS cabinet. The cables are sized with sufficient length that the battery stand can be located on either side of the GPS cabinet, and have enough slack to pass up to an overhead cable rack 6 inches above the GPS cabinet (7' 6"). The cables are terminated with 2-hole lugs (3/8" or M10 bolt size). Additional lugs are provided for those applications where these cables need to be shortened.

4

Safety

Safety Statements

Please read and follow all safety instructions and warnings before servicing or installing the product listed in this manual. Reference the individual module product manuals for additional safety statements specific to the modules

- The system is in a restricted access area (dedicated equipment rooms, equipment closets, or the like) in accordance with articles 110-16, 110-17, and 110-18 240 of the U.S. National Electric Code (NEC), ANSI/NFPA No. 70, and pursuant to applicable local codes.
- This equipment is intended for use in a controlled environment (an area where the humidity is maintained at levels that cannot cause condensation on the equipment, the contaminating dust is controlled, and the steady-state ambient temperature is within the range specified).
- This equipment has been evaluated for use in a continuous ambient temperature of up to 40°C. Short term excursions to 45°C are acceptable.
- Torque electrical connections to the values specified on labels or in the product documentation.
- Fuses may not be provided with the equipment. Refer to the product documentation for the proper hardware. Use only the parts specified in the equipment documentation. Installing fuses not specified for use in this equipment may result in injury to service personnel or equipment damage.

Warning and Safety Symbols

The symbols may sometimes be accompanied by some type of statement; e.g., “Hazardous voltage/energy inside. Risk of injury. This unit must be accessed only by qualified personnel.” Signal words as described below may also be used to indicate the level of hazard

DANGER

Indicates the presence of a hazard that will cause death or severe personal injury if the hazard is not avoided.

WARNING

Indicates the presence of a hazard that can cause death or severe personal injury if the hazard is not avoided.

CAUTION

Indicates the presence of a hazard that will or can cause minor personal injury or property damage if the hazard is not avoided.



This symbol identifies the need to refer to the equipment instructions for important information.



These symbols (or equivalent) are used to identify the presence of hazardous ac mains voltage.



This symbol is used to identify the presence of hazardous ac or dc voltages. It may also be used to warn of hazardous energy levels.



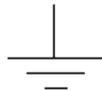
One of these two symbols (or equivalent) may be used to identify the presence of rectifier and battery voltages. The symbol may sometimes be accompanied by some type of statement, for example: “Battery voltage present. Risk of injury due to high current. Avoid contacting conductors with uninsulated metal objects. Follow safety precautions.”



One of these two symbols may be used to identify the presence of a hot surface. It may also be accompanied by a statement explaining the hazard. A symbol like this with a lightning bolt through the hand also means that the part is or could be at hazardous voltage levels.



This symbol is used to identify the protective safety earth ground for the equipment.



This symbol is used to identify other bonding points within the equipment.



This symbol is used to identify the need for safety glasses and may sometimes be accompanied by some type of statement, for example: “Fuses can cause arcing and sparks. Risk of eye injury. Always wear safety glasses.”

Precautions

When working on or using this type of equipment, the following precautions should be noted:

- This unit must be installed, serviced, and operated only by skilled and qualified personnel who have the necessary knowledge and practical experience with electrical equipment and who understand the hazards that can arise when working on this type of equipment.
- High leakage currents may be possible on this type of equipment. Make sure the equipment is properly safety earth grounded before connecting power.
- Hazardous energy and voltages are present in the unit and on the interface cables that can shock or cause serious injury. Follow all safety warnings and practices when servicing this equipment. Exercise care when servicing this area.
- Electricity produces magnetic fields that can affect implanted medical electronic devices, such as pacemakers. The strength of the magnetic field depends on the amount of current in the circuit, as well as other conditions (such as number of conductors, placement, and distance from the conductor). DC power and distribution systems, including the batteries, that are typically used in telecommunications utility rooms can operate at high current levels. Personnel with electronic medical devices need to be aware of their restrictions when working around electricity.
- In addition to proper job training and safety procedures, the following are some basic precautions that should always be used:
 - Use only properly insulated tools.
 - Remove all metallic objects (key chains, glasses, rings, watches, or any other jewelry).
 - Wear safety glasses.
 - Test circuits before touching.
 - Lock out and tag any circuit breakers/fuses when possible to prevent accidental turn on.
 - Be aware of potential hazards before servicing equipment.
 - Identify exposed hazardous electrical potentials on connectors, wiring, etc. (note the condition of these circuits, especially any wiring).
 - Use care when removing or replacing any covers - avoid contacting any circuits.

5 ***Installation Guidelines and Preparations***

Tools and Materials

The following tools and materials are recommended for installation of the battery stands.

- Center punch
- Floor marking device (e.g., pen, pencil)
- Anchor drilling tools as recommended for each anchor type or supplier (see anchoring section)
- Anchor setting tool and torque wrench suitable for setting anchor as recommended for each anchor type or supplier (see anchoring information in this section)
- Insulated nut driver or socket set
- Insulated torque wrench capable of reading 60 inch-pounds
- Blow out bulb or compressed air line
- Wet/dry shop vacuum
- Chemical and impact resistant safety goggles and safety hard hat.
- Acid resistant gloves, rubber overshoes, and apron
- Lime and/or soda (sodium bicarbonate or sal soda)
- Class C fire extinguisher
- Clean cloth
- Thermocouple-base or infrared-based temperature measuring device
- Digital multimeter (DMM) with an accuracy of 0.05 percent on the DC scale
- Proper crimping tools and dies for connectors used

Environmental Requirements

- The environment must comply with the NFPA 70, National Electric Code Article 110, “Requirements for Electrical Installations” and Article 480-8, “Battery Locations.”
- All lead-acid batteries are affected by its ambient temperature. Lineage Power valve regulated batteries can tolerate extreme temperatures in the range of -40°F to 149°F (-40°C to 65°C) for short, infrequent periods. Nevertheless, try to prevent the battery from being exposed to extreme temperatures. Battery temperatures above 77°F (25°C) decrease battery life while increasing battery capacity. Battery temperatures lower than 77°F (25°C) have the opposite effect; batteries may last longer but capacity is decreased. The product manual for the batteries you have chosen will describe the life and operating characteristics for the battery you have chosen.

Note

Lineage Power strongly recommends a temperature compensation device in high-temperature environments. Failure to use such a device may result in high battery temperatures that can cause premature battery failure and reduce or void the warranty. Lineage Power offers two types of temperature compensation devices: step compensation and slope compensation.

- Battery temperatures within the same string must be maintained within 10°F (5.5°C) of each other. When batteries must be installed where they will be exposed to heat radiation or direct sunlight, provide shields for the radiators or blinds for the windows to maintain the allowable temperature gradient. In particular, the top row of a multi-tiered stand is apt to have a higher environmental temperature than the bottom. Where necessary, use fans or other means of ventilation to minimize the temperature variation.
- The front and rear aisle space around a battery stand should conform to the requirements of NEC or other applicable codes. A minimum aisle width of 30 inches is recommended. When no rear aisle is required, the battery stand may be mounted flush against the wall. However, it is recommended that a minimum gap of 3 inches be maintained to allow for proper ventilation and cooling air flow around the stand.
- A fully loaded battery stand may impart extreme loads on a building floor. The safe floor load for the facility where the battery stand is to be installed should be checked. In addition, the floor thickness should be checked for the type and size of anchor that will be used in the application.

Note

The floor load for the battery stand equipped with batteries is computed by averaging the load over the floor area bounded by the stand outline (sides) and the center lines of the front and rear aisles. Special precautions (such as increasing aisle widths or space from adjacent equipment) must be taken to insure that this equipment does not overload the floor on which it will be used.

The floor loads for the stands in this section are shown in Table 5-A. See Figure 5-1.

Table 5-A: Battery Stand Floor Load Data

Battery Stand List No.	Installed Battery	No of Shelves	Stand Weight (lbs)	Stand Loaded Weight (lbs)	Floor Area (sq ft)	Floor Load (lbs/sq ft)	Floor Area w/Front and Rear Aisles (sq ft)	Floor Load w/Front and Rear Aisles lbs/(sq ft)
16	12IR125	4	290	2210	4.54	486	11.65	190
	C11	4	290	1876	4.54	413	11.65	161
17	3ET	4	222	1422	3.99	356	9.40	151
	6VF11	4	222	1918	4.29	447	9.71	198
	FAT100	4	222	1806	4.29	421	9.71	186
	M12V100	4	222	1518	3.99	380	9.40	161
	NSB110FT	4	222	1902	4.33	439	9.75	195
18	3ET	8	425	2825	3.99	708	9.40	301
	6VF11	8	425	3817	4.29	890	9.71	393
	FAT100	8	425	3593	4.29	838	9.71	370
	M12V100	8	425	3017	3.99	756	9.40	321
	NSB110FT	8	425	3731	4.33	862	9.75	383

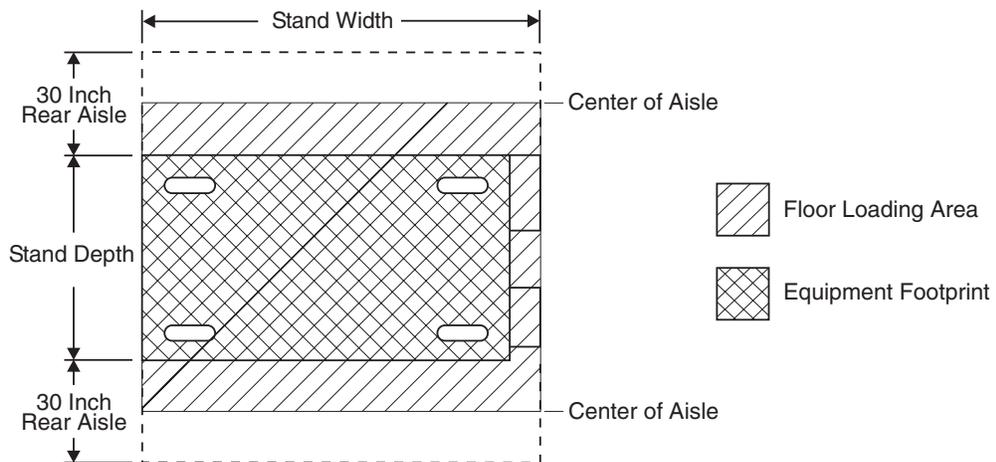


Figure 5-1: Area Used for Floor Load Calculations

Unpacking and Handling

Product is fully inspected prior to shipping from the factory. However, upon receipt of any product and at the time of unloading, each package should be visually inspected for damage. If damage is evident, a more detailed inspection of the entire shipment should be conducted and noted on the bill of lading. Record receipt date and inspection data and notify the carrier of any damage. Check the contents of the package against the packing list and also check for any visible defects. Report any missing parts or shipping damage to Lineage Power.

Use appropriate material handling equipment to ensure personnel safety and equipment protection while installing the battery stand and batteries. Move crated equipment and batteries to a convenient predetermined area where the appropriate unpacking and handling equipment and tools are available.

Anchoring

- Anchor bolts for mounting the battery stand should be located in positions labeled A1 and B1 (Figure 6-1). Positions marked A2 and B2 are alternate anchoring locations and should only be used when interference with floor reinforcing bars occurs during installation of the battery stand.
- Anchor bolts are provided in kit form and are ordered in addition to the battery stand. Three anchor bolt kits are available for seismic zones 0 through 1, 2 through 3, and zone 4. (See Table 3-F.) Each kit provides all the hardware required to properly anchor the battery stand (4 each - anchor bolts and washer plates).
- When selecting HDI type anchor(s), the installer should use the anchor setting tool listed in Table 5-B to properly set the anchor. Table 5-B also provides the anchor specifications.
- When using the HDI type anchors, follow the instructions in Section 6. Position the equipment to be anchored, insert threaded rods provided with the anchor kits, and fasten using hardware provided. Torque to maximum tightening torque listed in Table 5-B.

Notes

- | |
|--|
| <ul style="list-style-type: none">• The HSL type anchor bolts can be installed in a bottomless hole. (See Table 5-B for recommended drill (hole) size.• For HDI type anchor bolts, the hole depth should be adjusted so that the anchor will be flush with the base material surface. |
|--|

Table 5-B: Anchor Bolt Specifications

Specification	HDI - 1/2		M12/0		M16/25	
	mm	in	mm	in	mm	in
Drill Bit Diameter = Anchor OD	16	5/8	18	11/16	24	1
Hole Depth	51	2	100	4	125	5
Min. Depth of Embedment	51	2	80	3-5/32	105	4-1/8
Max. Thickness Fastened		--	25	1	25	1
Anchor Length	51	2	120	4-11/16	148	5-15/16
Usable Thread Length	17	11/16				
Head Height + Washer	--	--	11	7/16	14	9/16
Wrench Size			19	3/4	24	15/16
HSL/HSLG	--	--	24	15/16	30	1-3/16
HSLB						
Max. Gap Between Concrete and Fastened Material	--	--	8	5/16	9	3/8
Min. Base Material Thickness (mm)	--	--	160	6-1/4	180	7-3/32
Specification	HDI - 1/2		M12/0		M16/25	
	N-m	ft-lbs	N-m	ft-lbs	N-m	ft-lbs
Max. Tightening Torque	29.8	22	**82	**60	204	150
Specification	Tension lbs	Shear kN	Tension lbs	Shear kN	Tension lbs	Shear kN
Ultimate Load in 4000 psi	7140 31.8	8500 37.8	11240 50.0	18900 84.1	20205 90.1	33640 149.6
Hand Setting Tool	HST 1/2 000329805					
Automatic Setting Tool	TE-C-SD-12 00032980					
Drill Bit (Hilti)			TE-C+18/20 TE-Y-18/34		TE-C+24/25 TE-P24/32	
Notes: * Use Hilti Setting Tool ** Initial installation of HSLB anchor requires no torque wrench. The torque cap shears off at a predetermined torque value.						

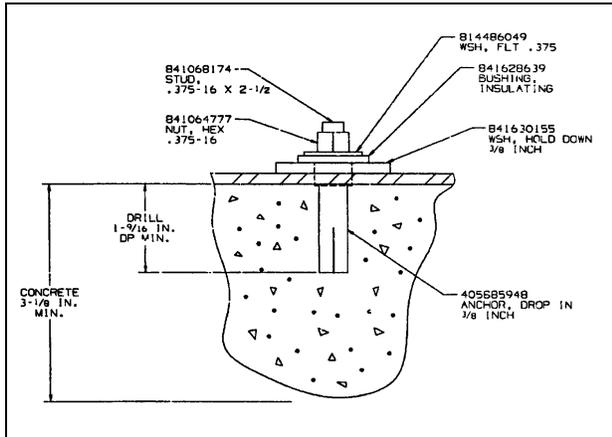


Figure 5-2: HDI - 3/8 (Kit 847135720)

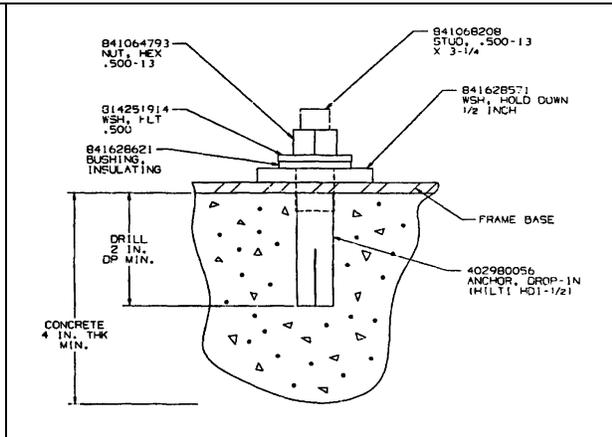


Figure 5-3: HDI - 1/2 (Kit 847135662)

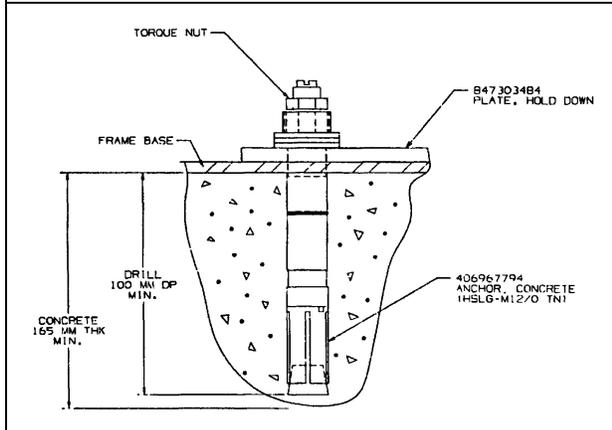


Figure 5-4: HSLG M12/0 (Kit 847320835)

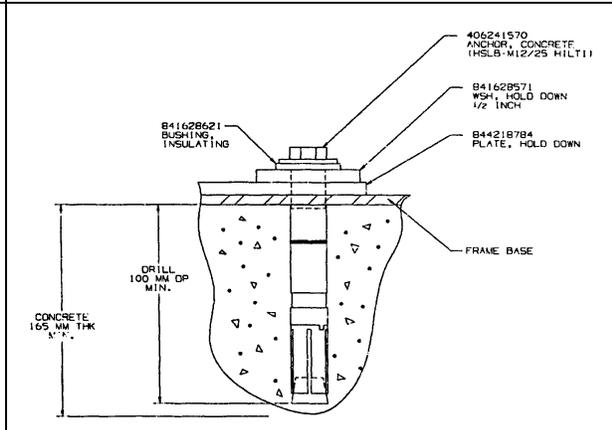


Figure 5-5: HSLB M12/25 (Kit 847135688)

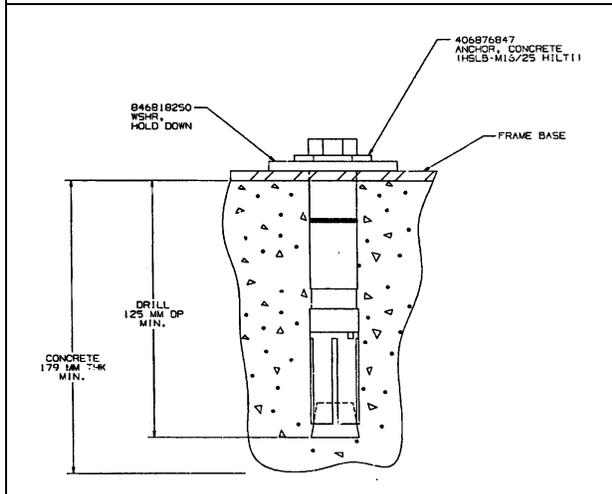


Figure 5-6: H569-407 Group 20 (Kits 847532678, 847532694, 847221074)

Connections

Battery Stand

This battery stand is designed to be easily connected to your plant distribution. Two connection points are provided on the battery stand terminal plate for an easy, single point connection. A maximum of two cables may be connected to each positive and negative terminal. Connections to the battery stand should be designed such that maximum current rating of 500 amperes and maximum loop drop voltage of .25 volts are not exceeded. The terminals of the terminal plate are sized to accept the various size cables from 4/0 through 750 MCM. Refer to Tables 5-D and 5-E.

This stand may be used by itself or in a lineup of battery stands. Careful consideration of the cable sizes for each run of cable from the plant distribution to each stand should be made such that the loop drop voltage and cables current carrying capacity are not exceeded.

Voltage Drop

$$\# \text{ of cables} = \frac{\text{battery current/hr} \times \text{cable resistance/ft} \times \text{total loop length}}{\text{loop voltage drop}}$$

Table 5-C: Typical Values for Cable Voltage Drop Calculations

KS20921 Wire (Class I Flex)	Ohms/Feet at 20°C	KS5482 Wire (Class B Std.)	Ohms/Feet at 20°C
2	0.000172	2	0.000169
1/0	0.000109	1/0	0.000109
2/0	0.0000868	2/0	0.000084
4/0	0.0000546	4/0	0.000052
350 MCM	0.0000334	350 MCM	0.000032
500 MCM	0.0000234	500 MCM	0.000022
750 MCM	0.0000157	750 MCM	0.000015

**Class B Stranded
Cables Lugs**

Table 5-D: KS24194 Class “B” Stranded Conductor Information

Wire Size AWG or KCMIL	Area (Circ Mils) (NOM)	Current		Max. DC Res. Ohms/ 1000 ft. @20C	Number of Strands	Dia. of Strand Const.*	Avg. Ins. Thick (in.)	Diameter		Max. Ship Length Per Reel
		Capacity AMPS (see Notes)	Cond Dia. (in.)					List 3	Weight/ 1000 ft. (lb.) List 3	
2/0	133100	195	0.419	0.084	19	0.405	0.080	0.622	534	1500
4/0	211600	260	0.528	0.052	19	0.512	0.080	0.730	806	1000
350	350000	350	0.681	0.032	37	0.661	0.095	0.922	1301	700
500	500000	430	0.813	0.022	37	0.789	0.095	1.052	1804	500
750	750000	535	0.998	0.0148	61	0.968	0.110	1.265	2669	350

Note: Minimum bend radius is equal to 5X the overall wire diameter.
*Minimum diameter compressed stranded construction.

**Class I Stranded
Cables Lugs**

Table 5-E: KS24194 Class “I” Stranded Conductor Information

Wire Size AWG or KCMIL	Area (Circ Mils) (NOM)	Current		Max. DC Res. Ohms/M @20C	Strand Construction	Number of Strands	Avg. Ins. Thick (in.)	Diameters (in.)		Max. Ship Length Per Reel
		Capacity AMPS (see Notes)	Cond Dia. (in.)					List 2	Weight/ 1000 ft. (lb.) List 2	
4/0	211600	260	0.613	0.0546	19x28	532	0.080	0.800	835	1000
350	350000	350	0.800	0.0334	19x45	855	0.095	0.960	1337	700
500	500000	430	0.941	0.0234	37x33	1221	0.095	1.170	1830	500
750	750000	535	1.100	0.0157	37X50	1850	0.110	1.340	2734	350

Note: Minimum bend radius is equal to 5X the overall wire diameter.
*Minimum diameter compressed stranded construction.

Battery String

The batteries used in this stand may be wired in various ways to generate the string voltage required for the plant. The schematics in Figures 5-7, 5-8, and 5-9 show the various wiring options for the 12IR125 and C11 battery strings. Figure 5-10 shows the schematic for all List 17 and List 18 battery strings.

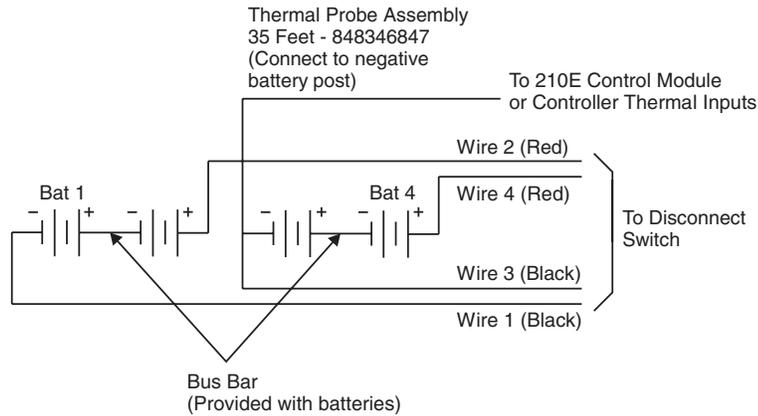


Figure 5-7: Schematic for 24V 12IR125 Battery String

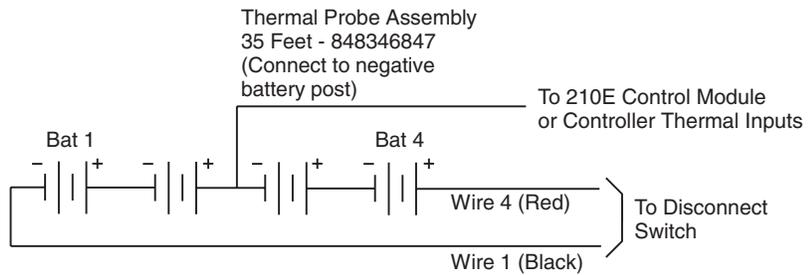


Figure 5-8: Schematic for 48V 12IR125 Battery String

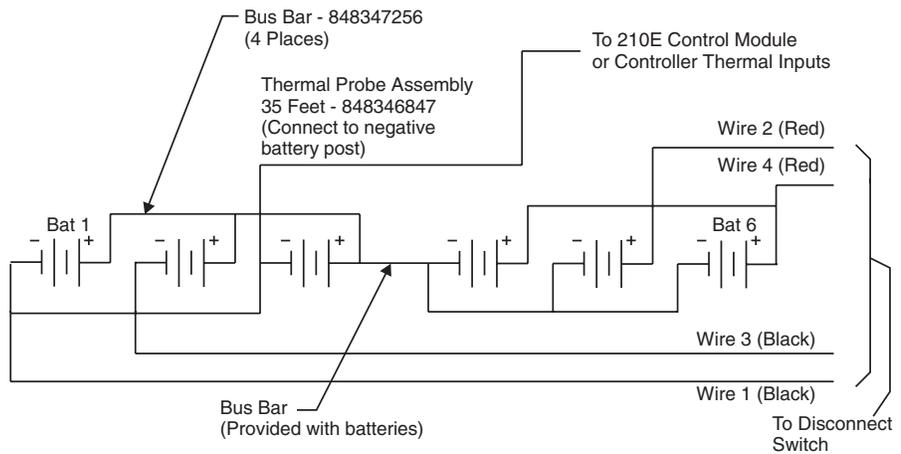


Figure 5-9: Schematic for 24V C11 Battery String

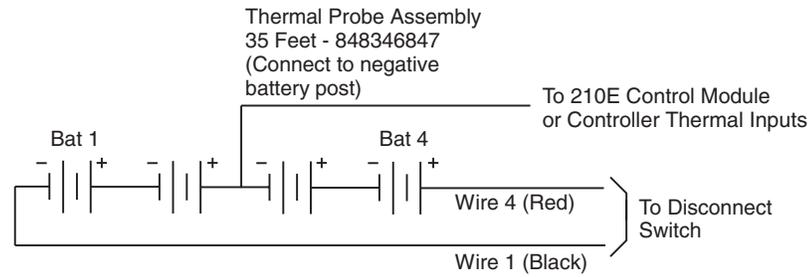


Figure 5-10: Schematic for All Battery Strings with List 17 and 18 Battery Stands (3ET, 6VF11, FAT100, M12V100, and PL125)

Battery String Disconnect Switch

The battery stand is provided with four battery string disconnect switches. One switch is provided for each shelf of batteries, and is intended to serve as a means to disconnect a string(s) of batteries from the plant for service. **NO OVERCURRENT PROTECTION IS PROVIDED.** Each disconnect switch is connected in parallel to the battery stand terminal plate. See Figure 5-11.

The disconnect switch alarm should be brought to the plant controller as an open string alarm. This is a resistive battery open string alarm that can be used with Millennium, Vector, and ECS controllers. Refer to Drawing T-83280-30 for connection to the Vector controller.

The maximum rating for the disconnect switch is 125A, providing the battery stand bus bar maximum output rating of 500A at either 24 or 48 volts. **DO NOT EXCEED THE MAXIMUM STAND OUTPUT/ INPUT RATING OF 500A OR SWITCH RATING OF 125A.**

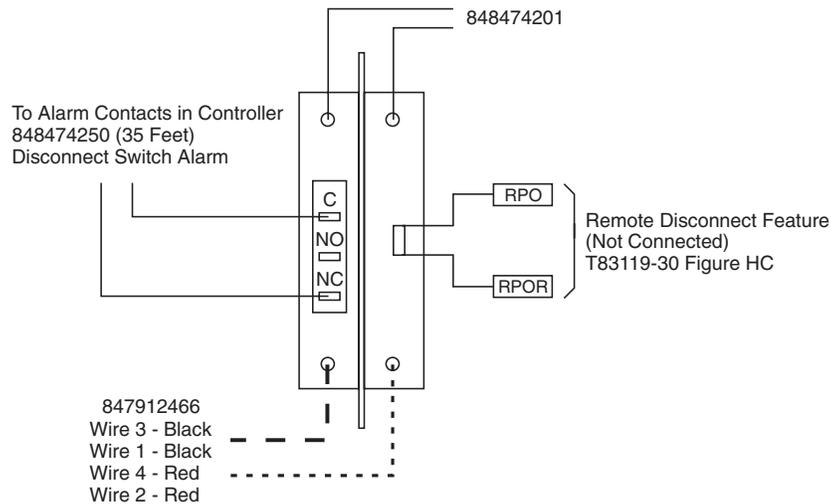


Figure 5-11: Battery String Disconnect Switch

Other Connections

Input, output, and open string alarm connections are already made on the stand. Connections for an optional remote disconnect feature are available (see Section 9, Remote Power Off Switch (J85504C-1 List D)).

Terminal Plate

The battery stand is equipped with a terminal plate (848474714) to which all plant connections are made. All the stand disconnect switches are connected in parallel to this plate. The plant connection to this terminal plate assembly consists of two 3/8-16 threaded studs, 1 inch long and spaced on 1 inch centers. Both the positive and negative terminals are sized for terminations using two lugs (back to back). Lug sizes from 4/0 to 750 MCM are available (see Table 3-H).

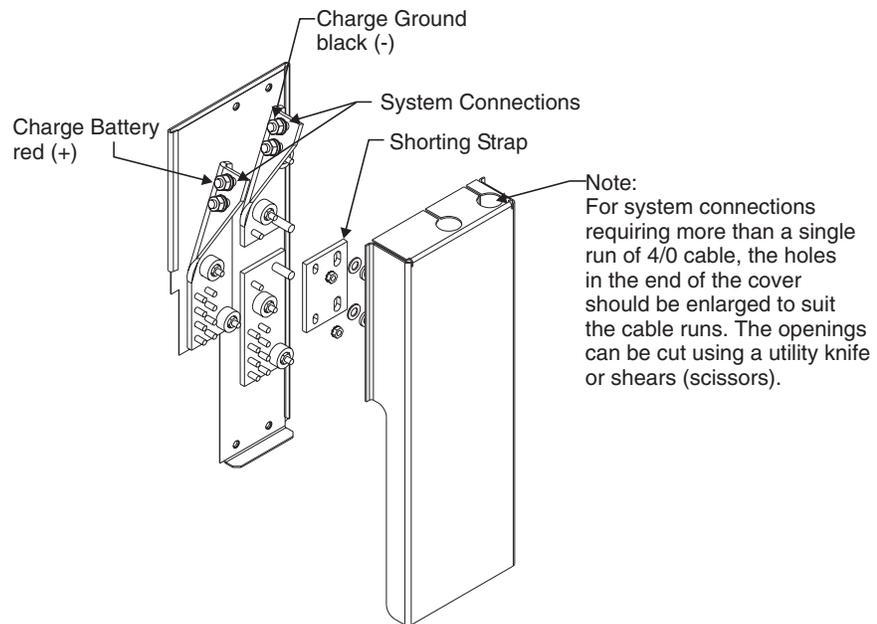


Figure 5-12: Battery Stand Terminal Plate Assembly

The battery stand comes configured so that the positive terminals of the batteries are connected to the charge battery and the negative battery terminals are connected to the charge ground bus bars of the terminal plate assembly. See Figure 5-13 for List 16 battery stands, and Figure 5-14 for List 17 and List 18 battery stands. For positive ground systems, the plant connection should be reversed at the battery and ground system connections shown in Figure 5-12.

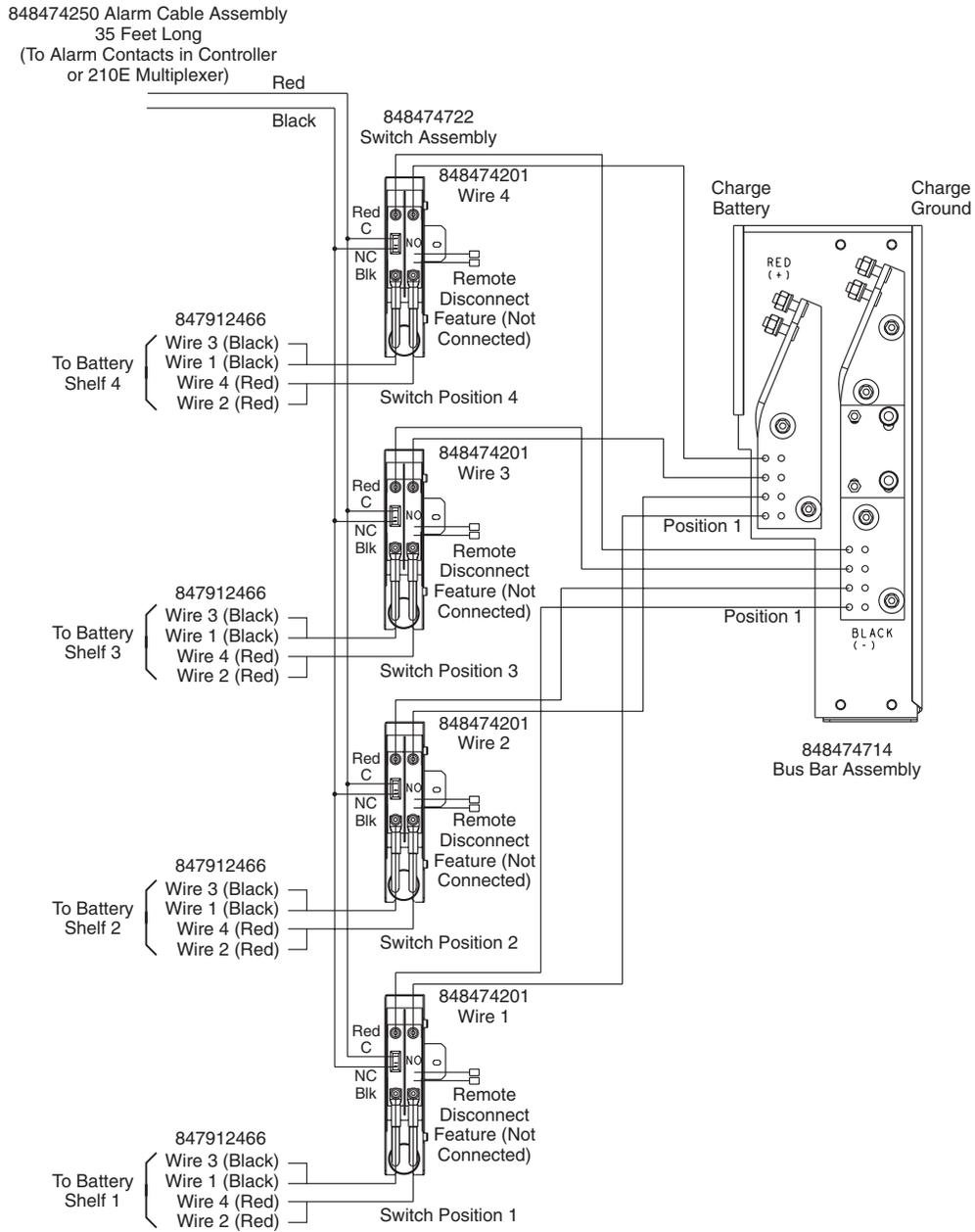


Figure 5-13: List 16 Battery Stand Assembly

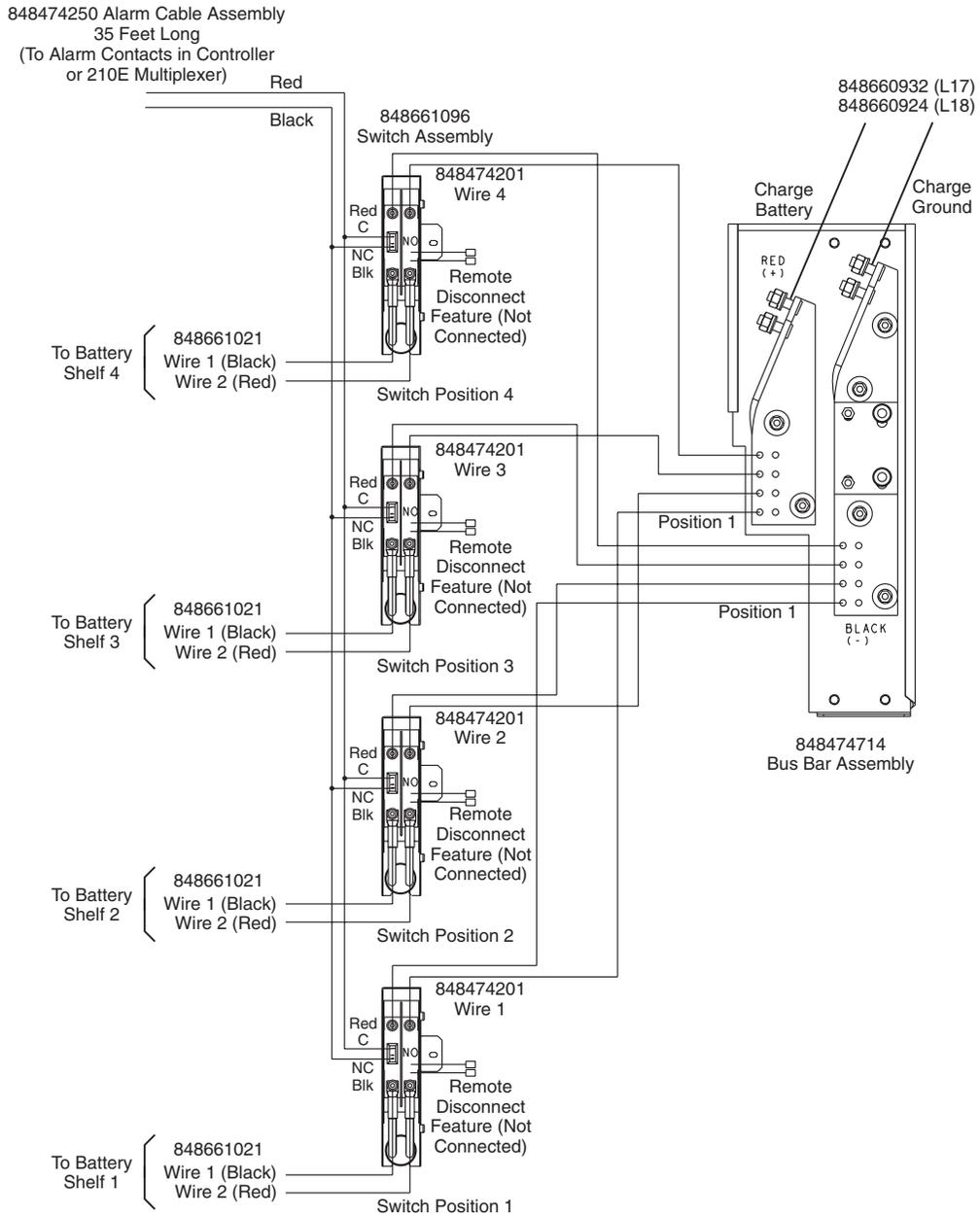


Figure 5-14: List 17 and List 18 Battery Stand Assembly

Optional Fuse Assembly

An optional 1000A fuse kit is available for use with this battery stand. This kit provides a 1000A fuse, an alarm indicating fuse, and remote alarm indicating switch. This kit is intended for use where customer or code requirements specify the need for circuit protection. Careful consideration for the size and usage of fuses in you back up power system is essential to ensure proper over-current protection.

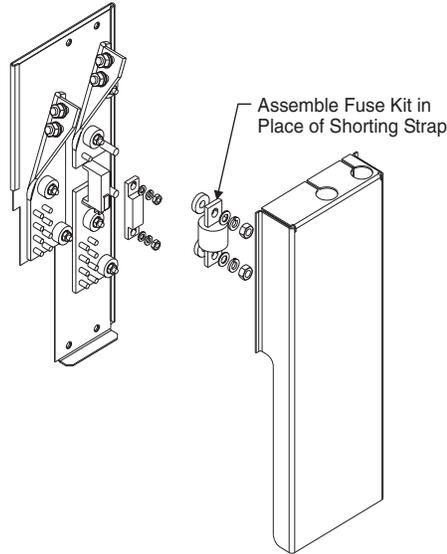


Figure 5-15: Fuse Assembly (optional)

1000A Kit Contents

The fuses provided in this kit are:

Table 5-F: Fuses for Optional 1000A Kit

Comcode	Description	Manufacturer
407676972	Alarm-indicating Fuse, IA6160-01	Bussman
408151140	Fuse, FWA-1000A	Bussman **
408342541	Switch, 170H3027	Bussman
**Other fuse sizes suitable for use in this application are available from Bussman but only those that can mount using the same mounting centers and hardware should be used.		

The kit also provides mounting hardware, assembly instructions, and a wire assembly for connecting the remote alarm signal.

Note: This option is only available as a field upgrade and should be assembled before connecting the battery stand to the battery plant.

**Fuse Electrical
Characteristics and
Ordering
Information**

**Table 5-G: Fuse Electrical Characteristics
and Ordering Information**

Electrical Characteristics				Ordering Information				Dimensions
Type	Rated Current RMS-Amps	I ² t (A ² Sec)		Watts Loss	Part No.	Carton Qty.	Carton Weight (lbs)	
		Pre-arc	Clearing at 150V					
FWA 150V	500	39000	120000	35.0	FWA-500A	5	2.42	See Figure 5-16
	600	46000	140000	47.0	FWA-600A			
	700	75000	220000	49.0	FWA-700A			
	800	92000	280000	58.0	FWA-800A			
	1000	170000	510000	60.0	FWA-1000A			

- Interrupting rating 100kA RMS Symmetrical.
- Watts loss provided at rated current.
- 150 Vdc UL Recognition on 70 through 800A only. Consult Bussmann for additional ratings.

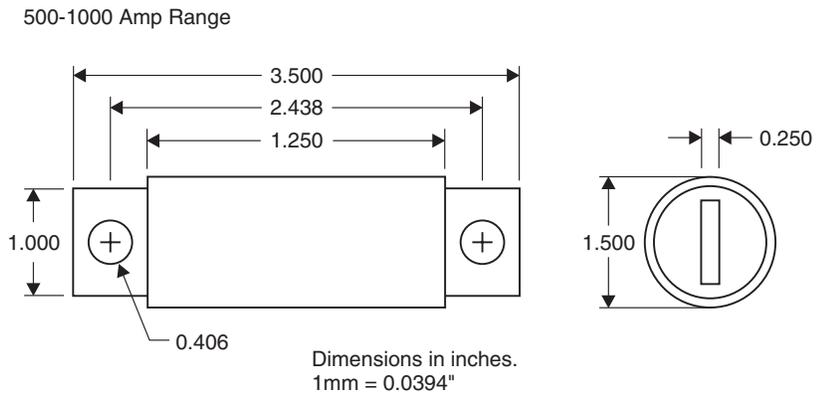


Figure 5-16: Fuse Dimensions

Table 5-H: Electrical Characteristics

<p>Total Clearing I^2t</p> <p>The total clearing I^2t at rated voltage and at power factor of 15% are given in Table 5-H. For other voltages, the clearing I^2t is found by multiplying by correction factor K, given as a function of applied working voltage E_g (RMS).</p>	<p>1) 500-1000 Amp Range 2) 70-400 Amp Range</p>
<p>Arc Voltage</p> <p>This curve gives the peak arc voltage U_L, which may appear across the fuse during its operation as a function of the applied working voltage E_g (RMS) at a power factor of 15%.</p>	
<p>Power Losses</p> <p>Watts loss at rated current is given in the electrical characteristics. The curve allows the calculation of the power losses at load currents lower than the rated current. The correction factor K_p is given as a function of the RMS load current I_b in % of the rated current.</p>	

6 Installation Procedures

Positioning Battery Stand

1. Temporarily position the stand per office layout and mark (trace) holes for anchor bolts using marking pen or pencil.

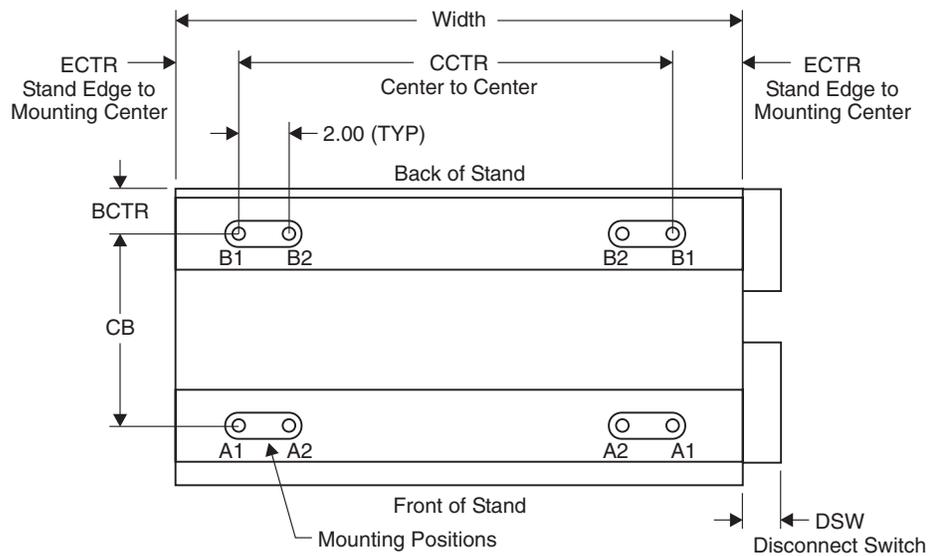


Figure 6-1: Typical Battery Stand Footprint

2. Remove stand, and drill holes for the anchors specified for the application. Holes should be drilled in preferred anchor positions shown in Figure 6-1 designated as A1 and B1. Anchor positions A2 and B2 should only be used when interference with floor reinforcing bars occurs.

Table 6-A: Floor Drilling Data

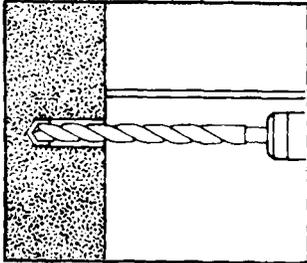
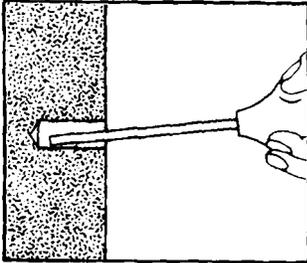
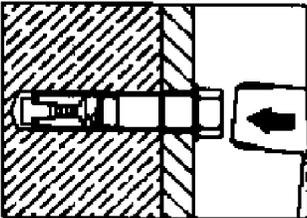
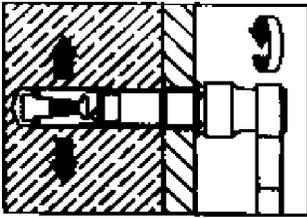
List No.	Width	CCTR	ECTR	CB	BCTR	DSW
16	31.68	24.18	3.75	12.90	1.77	2.43
17,18	26	14.2	3.75	15.88	1.78	2.43

Installing HSL Type Anchors

Refer to Table 6-B for spacing requirements for HSL anchors.

Caution

Use eye protection during this procedure.

<p>1. Drill hole with the prescribed drill bit.</p> <p>Note: The HSL anchors can be installed in a bottomless hole.</p> 	<p>2. Clean hole using a blow-out bulb or compressed air.</p> 
<p>3. Using a hammer, tap the pre-assembled anchor through the material being fastened and into the hole. The anchor should be seated firmly against the base plate.</p> <p>Note: Do not expand the anchor by hand before tapping it into the hole.</p> 	<p>4. Tighten anchor bolt to the maximum specified torque, using a torque wrench.</p> <p>Note: When using an HSLB anchor, no torque wrench is required. The torque cap shears off at a predetermined torque value.</p> 

Installing HDI Type Anchors

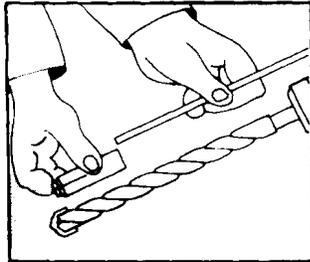
The HDI Drop-in anchor is an internally threaded, flush mounted expansion anchor for use in concrete. These anchors meet the description in Federal Specification FF-S-325, Group VIII, Type 1, for expansion shield anchors.

Refer to Table 6-C for spacing requirements for HDI anchors.

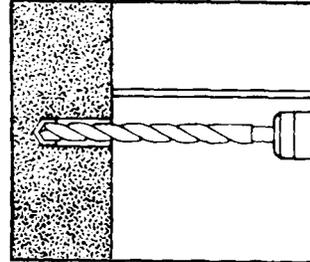
Caution

Use eye protection during this procedure.

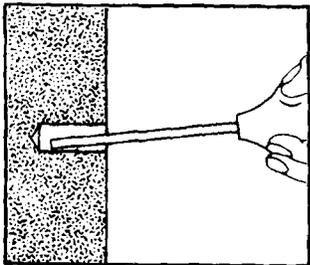
1. Adjust depth gauge so anchor will be flush with the base material surface.



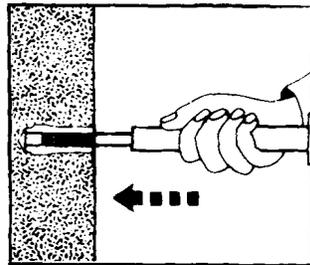
2. Drill hole with the prescribed drill bit.



3. Clean hole using a blow-out bulb or compressed air.



4. Install anchor using proper setting tool. Drive setting tool into anchor until shoulder meets top of anchor.



Anchoring Battery Stand

1. Position battery stand over anchor holes or bolts. Some anchor types require being inserted into the holes prior to positioning the equipment to be anchored. See Figures 5-2 through 5-6 for anchor hardware assembly.
2. Tighten the anchor bolt to the torque value specified for the anchor. See Table 5-B, Anchor Bolt Specifications.
3. Connect the framework ground pigtail (provided with the battery stand) to the building ground. The framework ground is provided loose with the battery stand and should be assembled onto one of the four non-painted ground connection points that are provided on the stand. This cable is provided with additional lugs and c-tap for connections to the building ground. Additional hardware may be discarded.
4. BEFORE PROCEEDING BE SURE THAT ALL DISCONNECT SWITCHES ARE SET TO THE OFF (DOWN) POSITION.
5. Connect the stand to the plant distribution (bus work). (see “plant connection”).
6. Remove battery retainer bars and position to the side for battery installation. Do not cut wire ties securing retainer bars to disconnect switch wiring.

Installing Batteries

1. Before proceeding with the installation of the batteries, review or determine the arrangement of the batteries for the application. Also review the batteries Pre-Service Checking and Charging instructions. All batteries should be fully charged before being put into service
2. For List 16 applications using batteries other than the 12IR125 series of batteries the spacer rods provided with the stand should be removed and replaced by spacers ordered for the batteries to be used in your application. The spacer rods may be removed by sliding through the holes in the top of the battery stand and should be removed before mounting any equipment on top of the stand.
3. For List 16 applications using Hawker C11 batteries, install the battery adapter kit (comcode 848466900). The kit contains: (1) rear mounted spacer, (7) battery spacers, and (4) battery inter-connection bus bars. The rear mounted spacer mounts into slots in the rear of each battery shelf. The battery spacers should be positioned between each of the batteries and on each end of the

string. Connect the inter-connection bus bars as described in the wiring section of this manual. Reserve bus bars and proceed to next step of these instructions before making battery connections.

4. Beginning with the bottom shelf, slide the batteries onto the shelf. Each shelf should be completely filled with batteries. Un-even distribution of batteries on a shelf or improper loading of batteries causing the center of gravity to be shifted to one side or elevated will adversely affect the seismic rating of the stand. Orient the batteries so that the narrow end with battery posts are facing the front of the stand (note positive post location in schematic for the type of battery and wiring option chosen). Observe proper handling instructions for the batteries.
5. Before proceeding, measure and record all battery voltages. Any battery whose voltage does not agree with values as specified in its product manual should be measure a second time and replaced if found to be defective.
6. Install the battery retainer bars using the 1/4-20 hardware (flat washer, lockwasher and bolt) provided with the battery stand. Torque to 60 in-lbs.
7. The battery terminals are pre-coated with NO-OX-ID "A" compound. If terminals appear dirty, clean surface areas of the exposed terminal with a non-abrasive cloth and re-coat with NO-OX-ID "A" (provided with batteries).
8. Using the hardware provided with the batteries, or the respective adapter kit, connect the batteries into strings. Refer to "Connections" in Section 5.
9. Each shelf of the battery stand is pre-wired for connection to the string disconnect switch. List 16 battery stands have two wires marked with red bands, and List 17 and 18 battery stands have one. The wires marked with red bands are intended for connection to the positive (+) post of the battery string and the remaining wires (black) are for connection to the negative (-) post of the battery string. Remove the protective insulation from the ends of the wires by cutting around the barrel of the wires terminating lug. Connect wires to the respective positive and negative posts of the battery string. Assemble all hardware hand tight until all connections are made.
10. Torque battery connections to 60 inch pounds or as otherwise specified in the batteries product manual.

11. For List 16 applications, install the battery covers to protect the battery terminals. Battery covers are ordered separately for the 12IR125 batteries and are provided with the 12IR125LP and C11 batteries.
12. Determine the appropriate charging procedures before connecting the batteries to the plant bus work. (See specifications provided with the plant for plant bus work torque requirements.)

Caution

Do not connect the stand to the plant bus until instructed to do so.
--

***Placing a
Battery String
Into Service***

Before connecting parallel strings together or individual strings to the plant bus, make the following voltage measurements:

1. Measure across each string to verify that the batteries are connected properly and that the polarity is correct. The string voltage should be 24 or 48 volts as determined by wiring option chosen (see "Connections" in Section 5).
2. Measure across the plant charge and discharge battery buses. The voltage difference between the string and plant should not exceed 0.05 volts unless the plant is at 0 volts because the chargers are turned off. If a larger differential exists, the string should be charged at the plant voltage (or the plant voltage lowered) until the voltage differential is less than 0.05 volts. This should prevent arcing during the final connection.
3. After the battery strings have been connected to the plant bus for one hour, make the final reading to record voltages of individual batteries or strings. Record these in the Installation Battery Report (see battery product manual).

7 *Maintenance and Battery Replacement*

Inspection and Cleaning

A visual inspection of the battery plant should be done on an annual basis. If necessary, the battery modules and racks can be cleaned using a soft cloth dampened in water or battery cleaning kit (available from Lineage Power). The inter-battery connections should be inspected for corrosion. Report any sign of acid or corrosion to Lineage Power.

Re-torquing Inter-battery Connections

All battery connections (i.e. inter-battery, disconnect switch) made during installation will require periodic re-torquing. Using an insulated torque wrench, re-torque each connection to the torque recommended for the battery.

Warning

An explosion could occur when sparks are created near the battery string. Use insulated tools and discharge all static electricity from your body before performing any work.

Caution

Over-tightening of connectors could strip or damage the bolt and/or nut threads, resulting in loose connections that will increase circuit resistance and operating temperatures.

Battery Replacement

If you need to replace one or more batteries in a battery string, charge the replacement batteries according to instructions provided with the battery.

When you replace a battery in an existing string, you can exchange it without removing the whole stand from the plant bus. Disconnect the string by setting the respective string disconnect switch to the OFF (down) position. Remove the battery stand retainer bar and connections for the string being exchanged. Replace the defective battery(ies) and reconnect by reversing order of disassembly.

Before reconnecting to the plant see “Placing a Battery String Into Service.”

When a single replacement battery is being installed in an existing string, both the “End of Charge Voltage” and the “Float Voltage at Turnover” must be recorded. The “Float Voltage at Turnover” is recorded one hour after the battery is installed in the string. The record should also include a brief description of the charging procedure. For example, “Battery was charged at a central location at 2.25V (for EVR type batteries) for 2 weeks before being brought to this site for installation. The module was on open circuit for about 13 hours in transit.” Alternatively, the replacement battery(ies) may be installed in the string and then given an initial charge using a portable charger. The portable charger must be left across the replacement battery for seven days, even if the initial charge is given at the float voltage.

8

Equipment Frames (Mini-Frames)

Overview

In addition to the battery stands listed in Section 2, Lineage Power has reduced height equipment bay frames (mini-frames) designed for mounting separately, or on top of List 16 battery stands. These mini-frames are designed to mount power and distribution equipment used in conjunction with the batteries on top of the four shelf high battery stands. The available frame heights are designed to maintain the standard equipment height of 7'-0" (2.13 meters). These mini-frames are designed and tested to meet the requirements of Bellcores Network Equipment Building Systems (NEBS) Generic Equipment Requirements for use in seismic zones 0 through 4 when used in conjunction with the stands as shown in Table 8-A, Mini-Frame Specifications.

The seismic qualifications for each of the mini-frames listed only applies to that frame when mounted/assembled on top of the respective battery stand listed. The mini-frames may be mounted separately (on the floor), but no seismic ratings have been assigned for these applications. Proper anchoring to the mounting surface (i.e. concrete floor) should be specified by the job engineer.

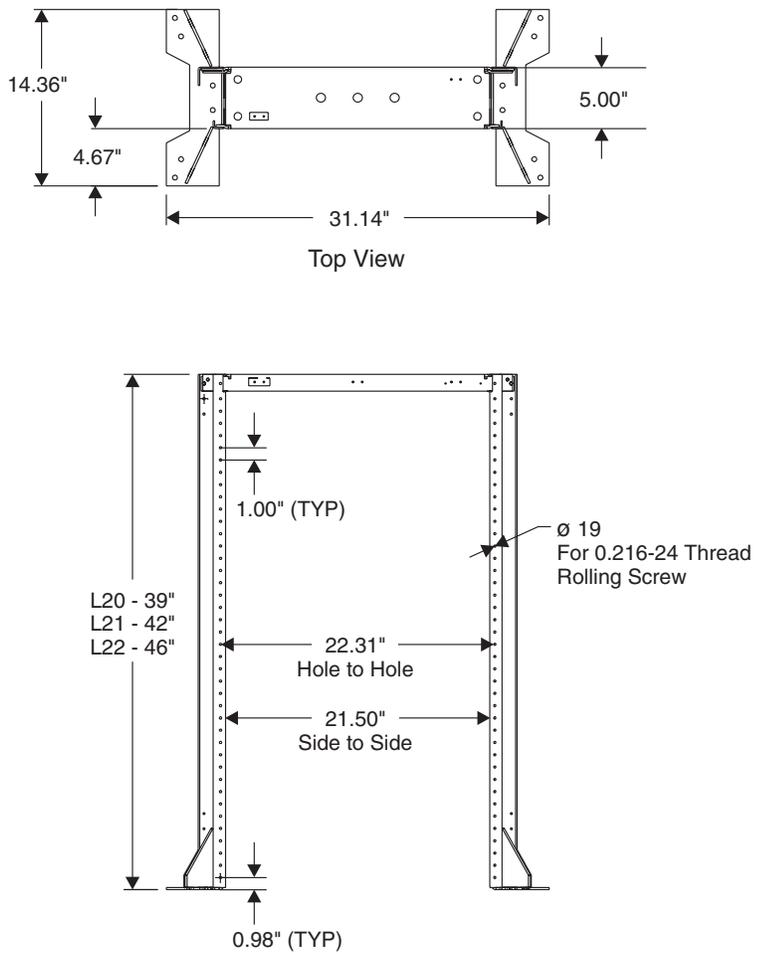


Figure 8-1: Mini-frame Dimensions

Table 8-A: Mini-Frame Specifications

Drawing	List No.	Max Seismic Zone	Dimensions					1-inch Mounting Spaces
			Width inch (mm)	Depth inch (mm)	Height inch (mm)	Open Height	Open Width	
J85504D-1	20	4	31.14 (791)	14.36 (365)	39 (991)	37 (944)	21.50 (546)	36 (915)
	21				42 (1067)	40 (1016)		39 (991)
	22				46 (1169)	44 (1118)		43 (1092)

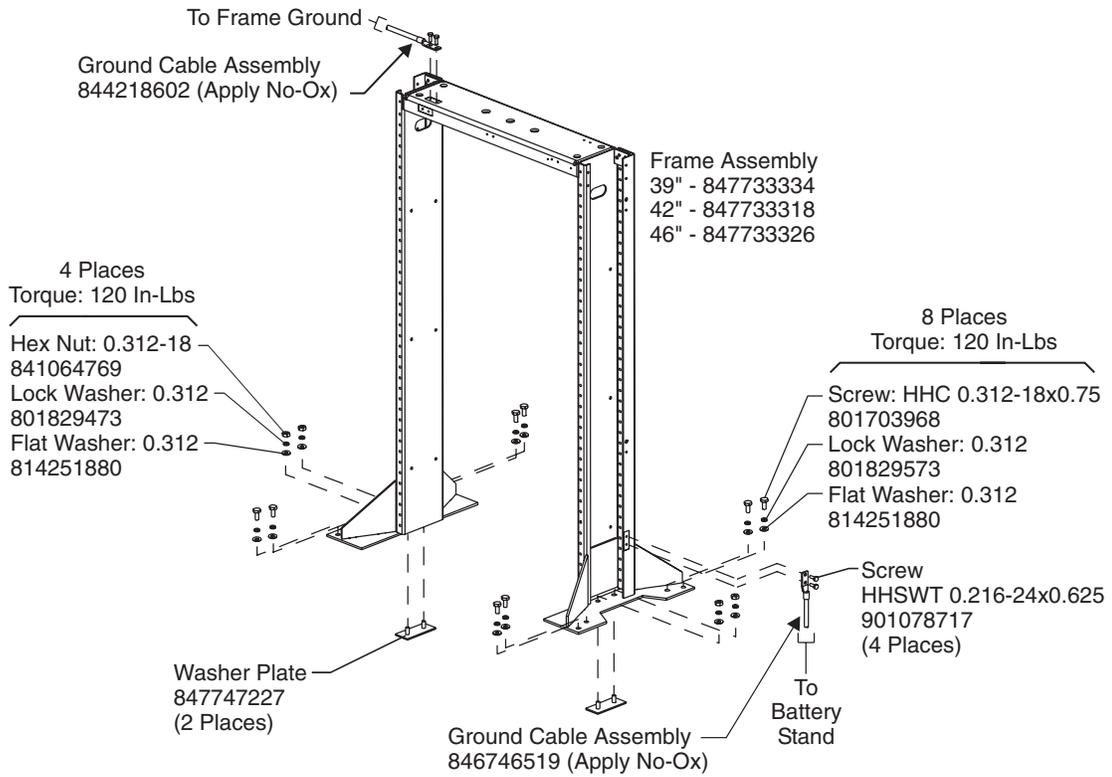


Figure 8-2: Isometric View of Mini-Frame

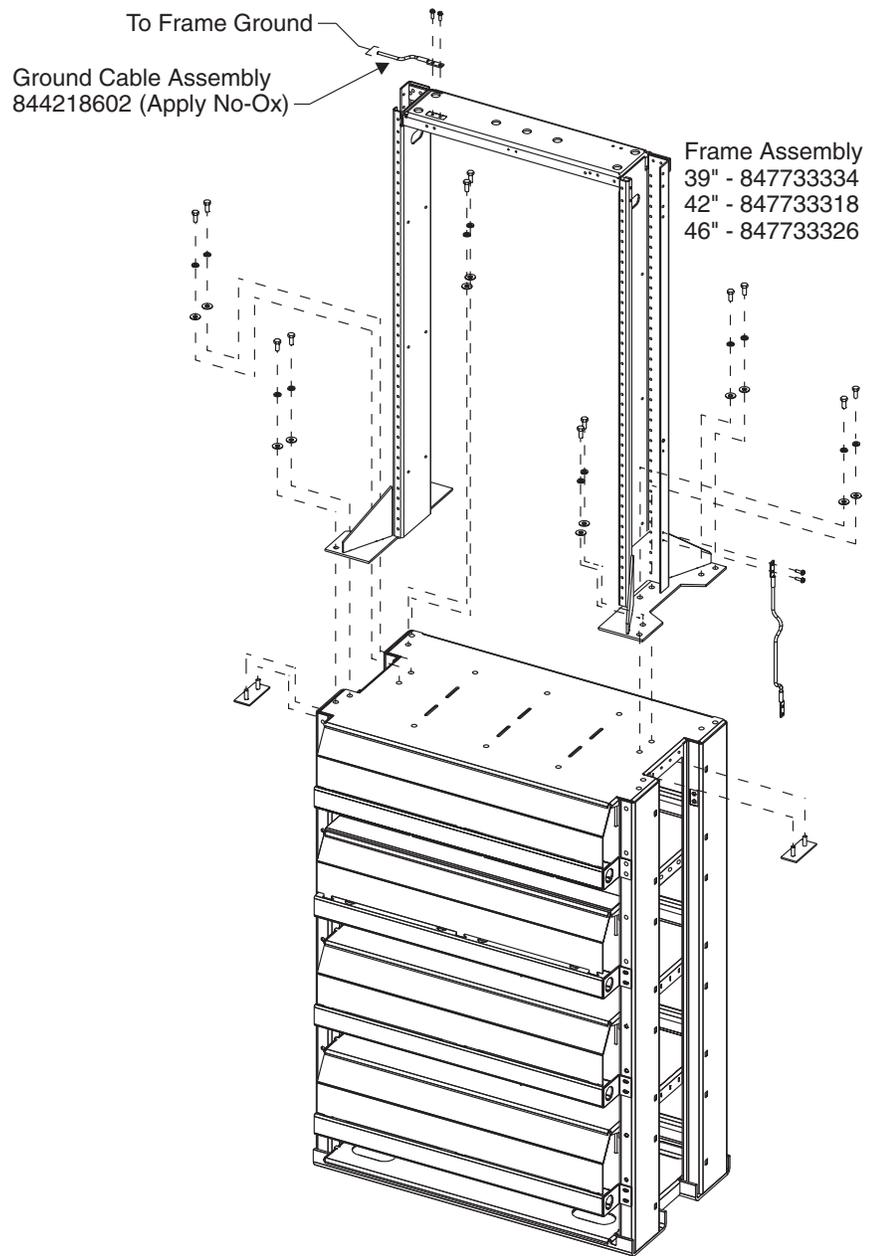


Figure 8-3: Frame Assembly on Top of Battery Stand

Tools and Materials

The following tools and materials are recommended for installation of the battery stands.

- Nut driver or socket set
- Torque wrench capable of reading 60 inch-pounds

Installing the Mini-frame

1. Position the mini-frame over mounting holes of battery stand. Batteries should not be installed in the top shelf of the battery stand when mounting the mini-frame.
2. When mounting the mini-frames per J85504D-1 on top of the List 16 12IR125 battery stand, insert the washer plates thru holes in the uprights of the frame. The washer plate stud should face upward through the holes so that the hardware can be assembled and tightened from the top.
3. Torque the mounting hardware to 120 inch-pounds.
4. Connect the framework ground pigtail (provided with the mini-frame) to the building ground. Framework ground is located on the cross member at the top of the frame. Torque to 35 inch-pounds.
5. A secondary framework ground is provided on the uprights. This ground is used to ground the framework to the battery stand. Torque to 35 inch-pounds.

9 *Remote Power Off Switch* ***(J85504C-1 List D)***

This optional Remote Power Off switch provides the ability to remotely operate each of the disconnect switches on the battery stand. This switch may be added at any time. Refer to installation and operating instructions provided with the switch.

10 *210E Control Module*

Overview

The 210E control module monitors the temperature of up to 8 thermal probes and provides the highest temperature to its output. The output of the 210E control module is equivalent to the output of the 10K standard thermistor thermal probe used with a Lineage Power Cabinet Power System. When used in conjunction with a Lineage Power controller (i.e., CPS or Vector), the 210E expands the thermal management capability by increasing the number of thermal probes that may be used.

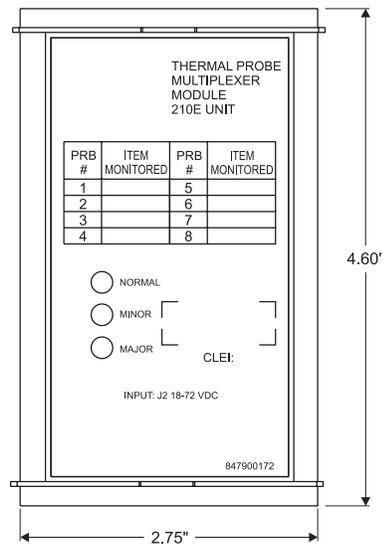


Figure 10-1: 210E Thermal Probe Multiplexer Module

For a complete description of this product refer to the "Thermal Probe Multiplexer 210E Control Module" Product Manual (Select Code 157-010-202, Comcode 108001728).

Cable Kit

An optional 35 ft-long cable kit for connecting the 210E to the plant controller is available (see Table 3-F). The wires provided are terminated with connectors used in the Vector outdoor controller. For indoor Vector controllers, these connectors should be removed and the wires connected as shown in T-83280-30.