A technical manual from the experts in *Business-Critical Continuity™*

NetSure™ ITM

Site Planning Data and System Drawings — 48V DC UPS

Section 6037 (Issue 10, October 21, 2010)

Contents

EMERSON™
Network Power

1 SITE PLANNING DATA

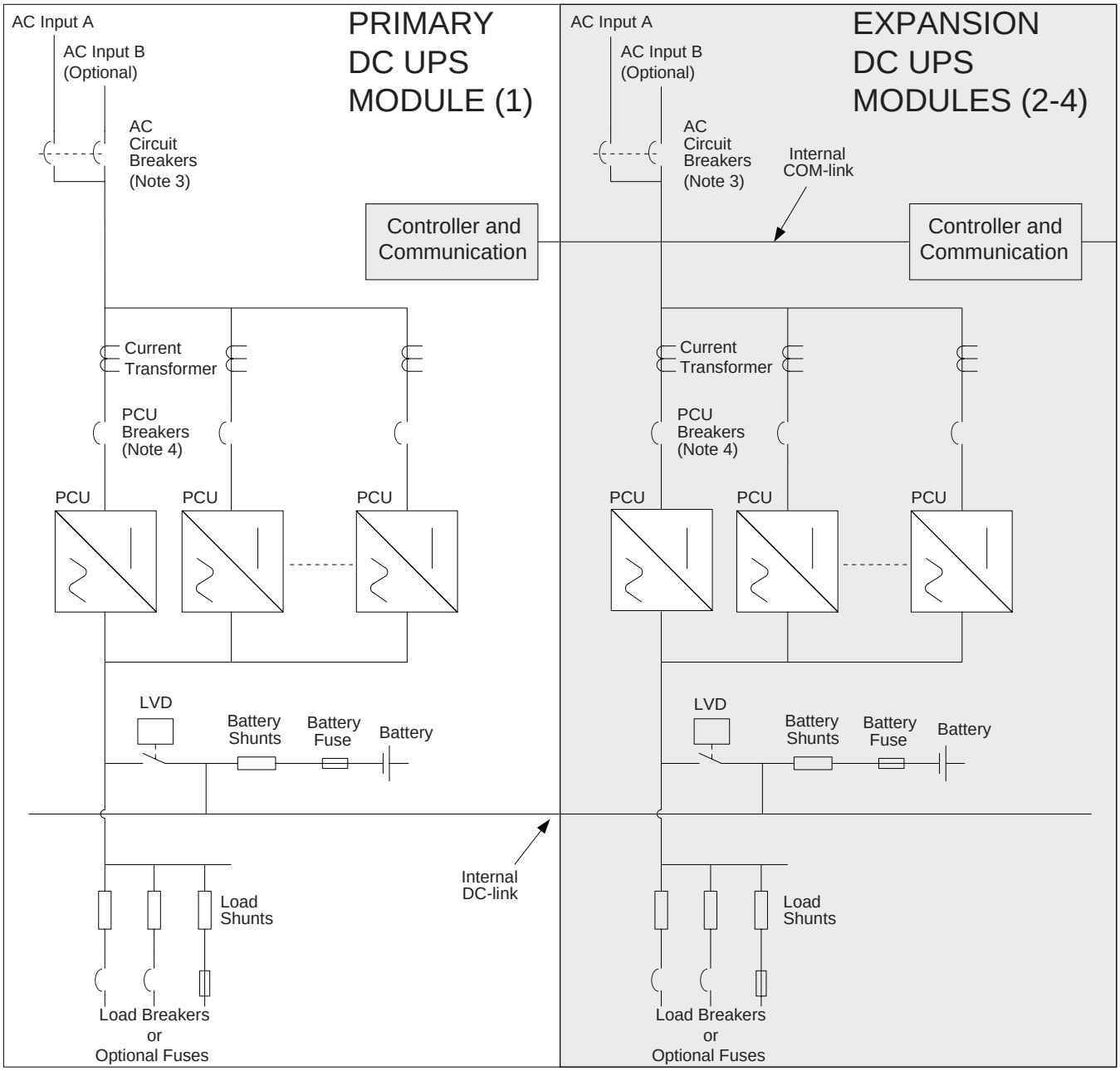
1.1 Technical Specifications

NetSure® ITM – Technical Specifications				
	Primary Module 1	**Expansion Module 2**	**Expansion Module 3**	**Expansion Module 4**
Power Rating (full) – kW	70	70	70	70
Power Rating (N + 1) – kW	64	70	70	70
AC Input Specifications				
Phase	3			
Power Factor	0.99 at full load, 0.98 at 50% load			
Frequency – Hz	45-65			
Input Voltage – Nominal	400 / 480V, 3 wire + ground			
Input Voltage – Range	304-530 VAC; shall withstand up to 600 VAC input without damage.			
Input Breaker Rating / AIC Rating – A	150 / 65,000			
Max Input Current / Module	480V: 115A @ 384V; 92A @ 480V			
	400V: 138A @ 320V; 110A @ 400V			
	380V: 145A @ 304V; 116A @ 380V			
Inrush Current	Inrush current does not exceed 150% of the rated input steady state peak value			
Total Harmonic Distortion	<5% from 50-100% of load			
DC Output Specifications				
Voltage	Nominal: -48VDC; normal operation: -54.5 VDC (battery float)			
	Range: -42 to -58 VDC			
System Efficiency	92.5% peak (system level including branch distribution losses)			
Energy Optimization Mode: Intelligent Power Matching	Allows operation at near-peak efficiency down to 5% overall load			
Branch Distribution Options	22 circuit breakers, 100-200A each; optional: 6 fuses, 2x500A + 4x200A			
Battery Specification				
Type	VRLA, Emerson Excellence EB4, 200 Ah			
Arrangement	3 strings; eight 6V blocks per string			
Backup Time	See backup time table at various loads			
Design Life	15 years @ 20 °C ; 10 years @ 25 °C			
Recharge Time (to 97% of nominal capacity)	Less than 3 hours for > 35% load; Less than 4 hours > 15% load			
Physical Data				
Form Factor	Rack			
Installed Dimensions (H x W x D) – in. (mm)	83 x 24 x 41 (2100 x 600 x 1040)			
Installed Weight – lb. (kg)	3214 (1458)			
Environmental Specifications				
System Operating Temp. – °F (°C)	-5 °C to +35 °C; recommended operation with battery: 20 °C to 25 °C air inlet			
System Storage Temp. – °F (°C)	-40 to 158 °F (-40 °C to +70 °C)			
Relative Humidity	0 to 95%, non condensing			
Operating Elevation – ft. (m)	6562 (2000) at full power			
Audible Noise	< 60dB			
Heat Rejection at Full Load – BTU/hr. (kW)	18,096 (5.3) per module			
EMI	FCC class A			
Safety Certifications				
Agency Approved	CE Marked to EN 60 950-1:2006			
	UL Listed to 60 950-1 + UL 1801; CSA certified			
Monitoring Capability				
Standard	Web-based monitoring, alarm reporting via SNMP, and integration with SiteScan via SiteLink-E module			
Optional	Energy Master Remote Supervision			

1.2 Battery Run Times

Battery Back-up Time (minutes)				
Load	**Single module 70kW**	**Two modules 140kW**	**Three modules 210kW**	**Four modules 280kW**
10kW	130	300	480	630
20kW	55	130	210	300
30kW	28	90	130	180
40kW	17	55	90	130
50kW	12	41	70	100
64kW	7	24	50	75
70kW	3	21	43	69
80kW		17	34	55
90kW		14	27	47
100kW		12	22	40
110kW		10	19	34
120kW		8	17	28
134kW		6	16	25
140kW		3	14	22
150kW			12	19
160kW			10	17
170kW			9	15
180kW			8	14
190kW			7	13
204kW			4	11
210kW			2	10
220kW				9
230kW				9
240kW				8
250kW				7
260kW				6
274kW				3
280kW				1

2 ONE LINE DIAGRAM



NOTES

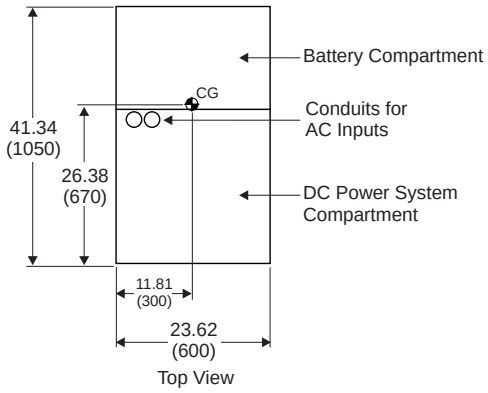
1. DUAL AC INPUT VERSION OPTIONAL.
2. RECOMMENDED INPUT WIRE SIZE 2/0 AWG, 90˚C (194˚F), SEE NEC TABLE 310.16.
3. MAX INPUT CURRENT:
   480V: 115A @ 384V; 92A @ 480V
   400V: 138A @ 320V; 110A @ 400V
   380V: 145A @ 304V; 116A @ 380V
3. SYSTEM AC INPUT BREAKER(S) RATED 150A, 65kAIC.
4. PCU AC INPUT BREAKERS RATED 32A, 5000AIC. TWO (2) PCUs PER BREAKER.

3 SYSTEM OUTLINE DRAWINGS

3.1 Mechanical Installation and Outline Drawings

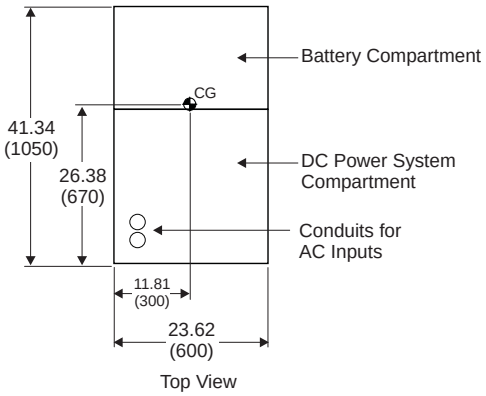
3.1.1 Individual Cabinet Mechanical Data

DC UPS MODULE WITH
BOTTOM FEED DC DISTRIBUTION

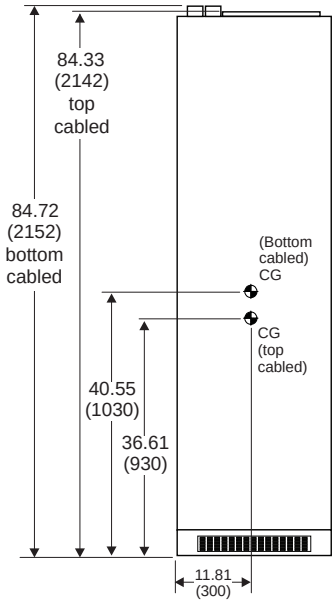


Top View

DC UPS MODULE WITH
TOP FEED DC DISTRIBUTION

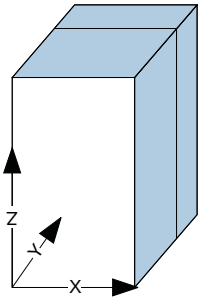


Top View



Front View

CENTER OF GRAVITY

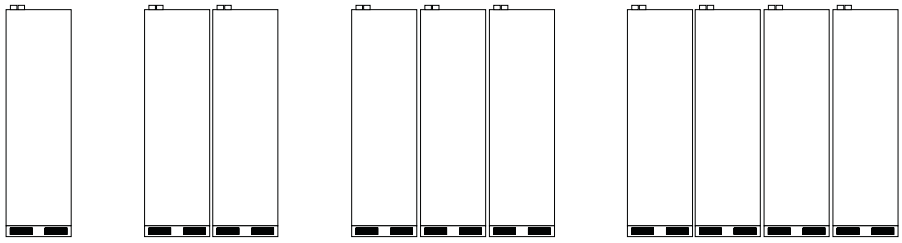


Top Cabled Version
X = 11.81 (300)
Y = 26.38 (670)
Z = 36.61 (930)

Bottom Cabled Version
X = 11.81 (300)
Y = 26.38 (670)
Z = 40.55 (1030)

Notes:
1. Dimensions are in inches (millimeters).
2. Weight (fully loaded): 3240 lbs / 1470 kg.
3. Heat Rejection: 18096 BTU/h at full load (per module)
4. May be installed on concrete slab or raised floor.

3.1.2 System Configurations



Single Module
70kW (full)
64kW (n+1)

Two Modules
140kW (full)
134kW (n+1)

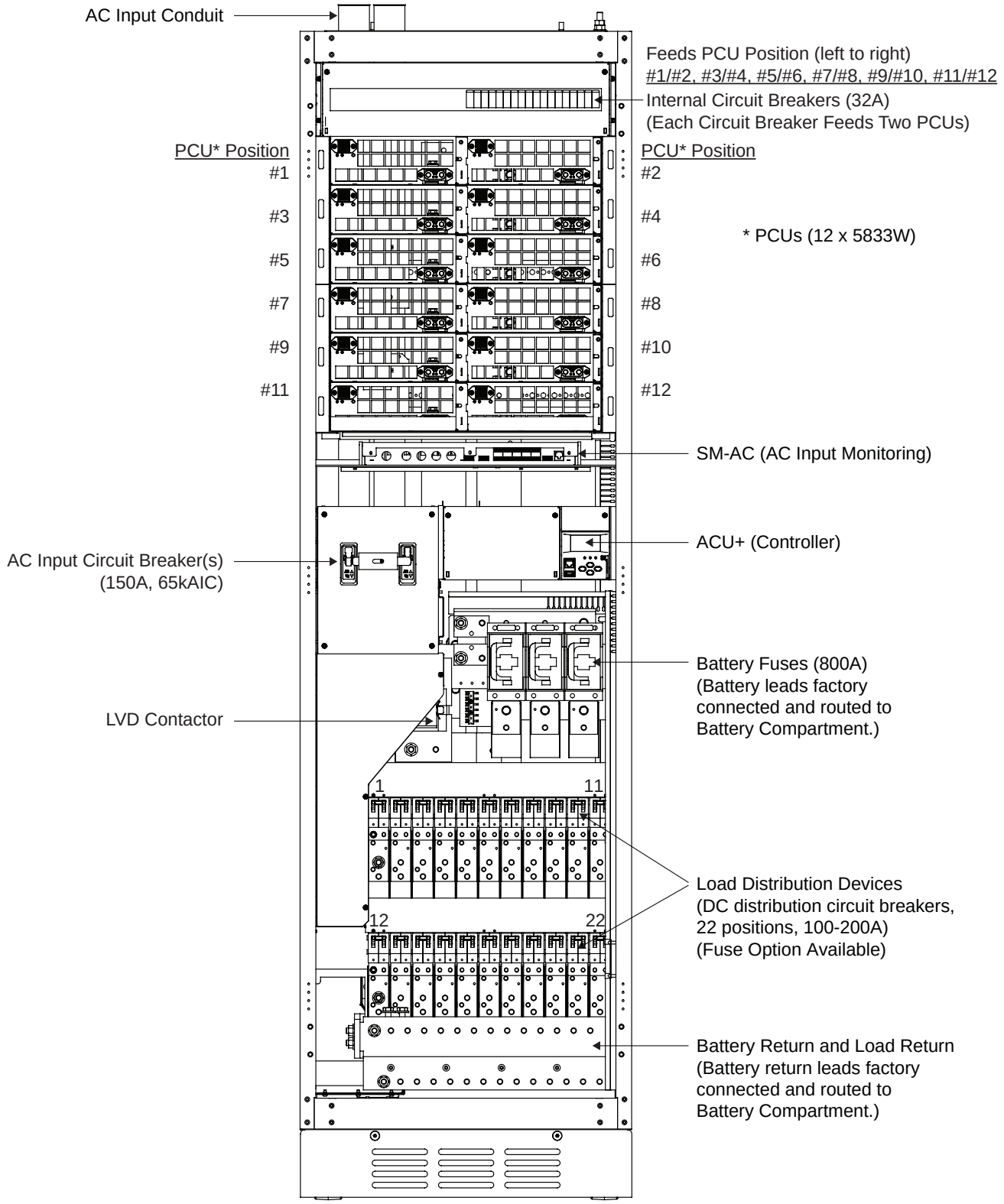
Three Modules
210kW (full)
204kW (n+1)

Four Modules
280kW (full)
274kW (n+1)

System can be expanded either to
the left or the right of the Primary Module.

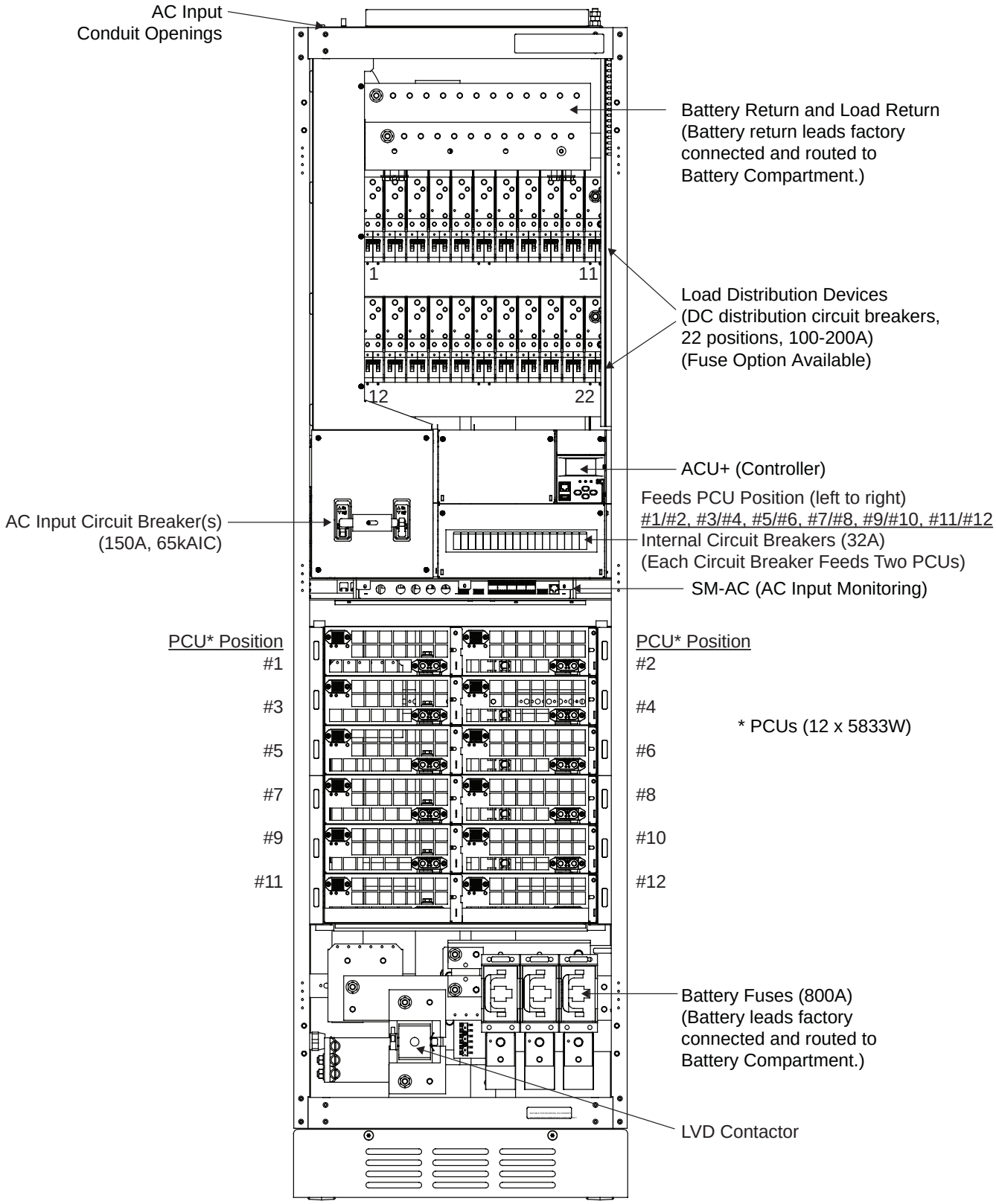
3.1.3 Main Components

3.1.3.1 Bottom Cabled Configuration - Circuit Breaker Load Distribution (Standard)



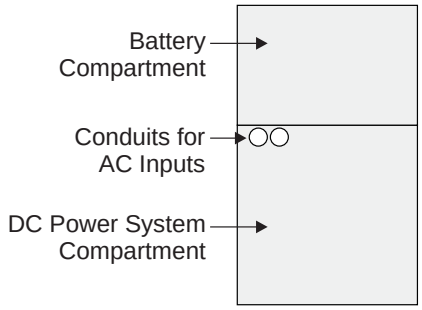
Front View
(door removed)

3.1.3.2 Top Cabled Configuration - Circuit Breaker Load Distribution (Standard)



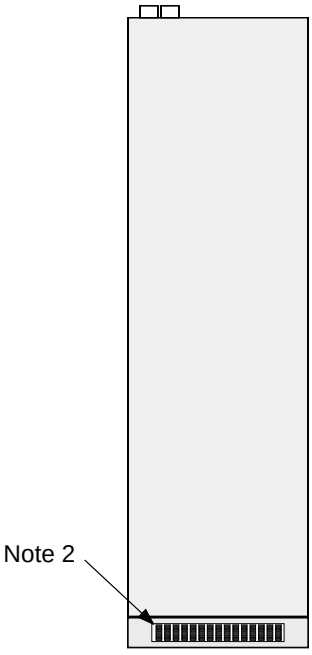
Front View
(door removed)

3.1.4 Bottom Cable Entry

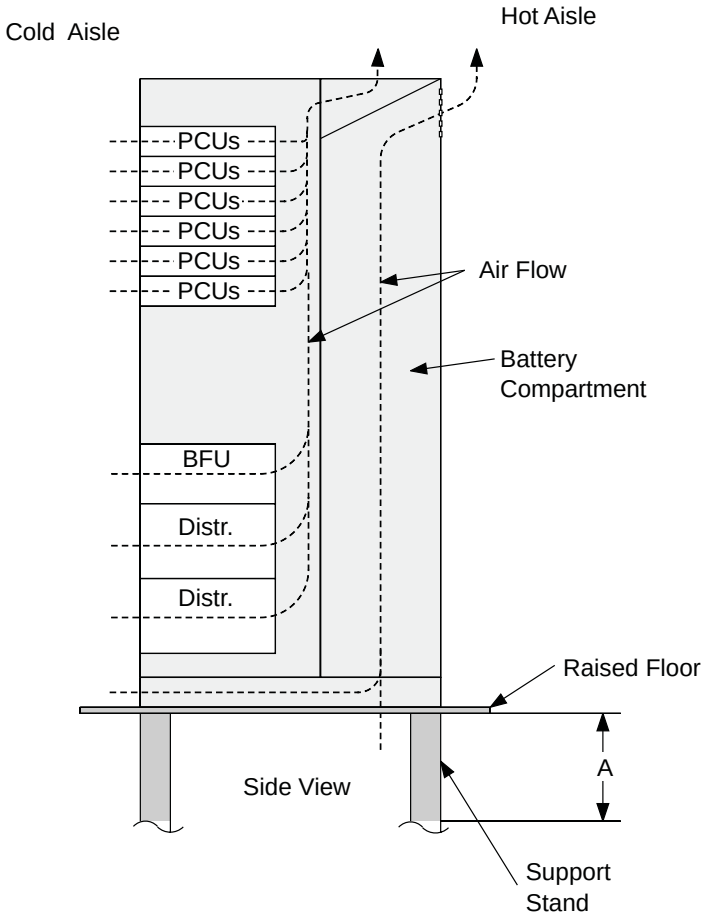


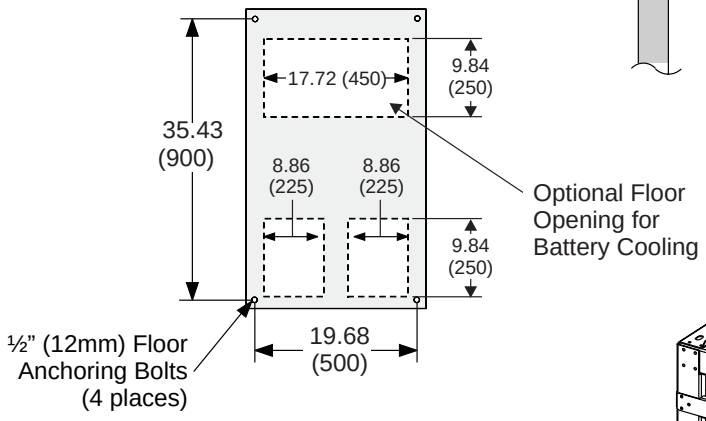
Top

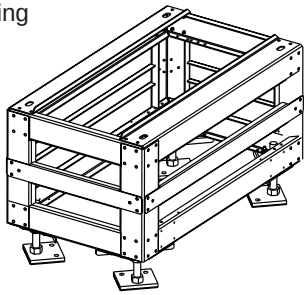
Notes:
1. Dimensions are in inches (millimeters).
2. Do not block air intake openings.
3. Minimum under floor space for underfloor output cable runs: A = 1f (300mm).
4. Run cables not to block air openings for battery cooling.



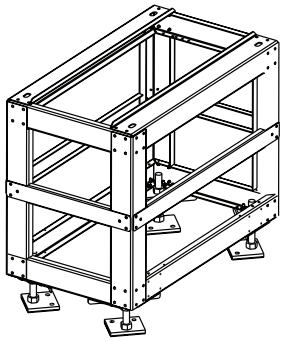
Front





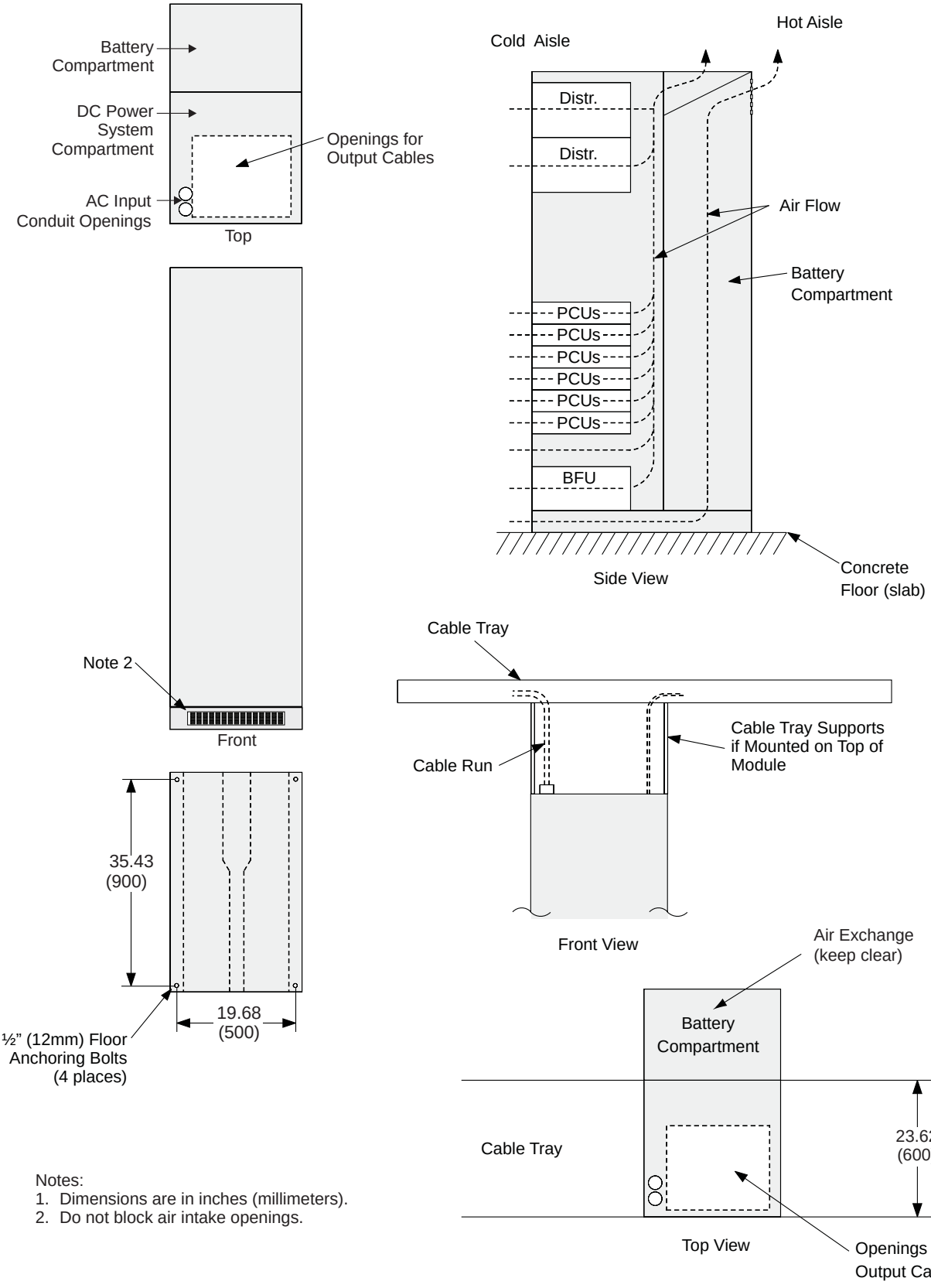


P/N 547822
24" Tall Floor Stand



P/N 547823
36" Tall Floor Stand

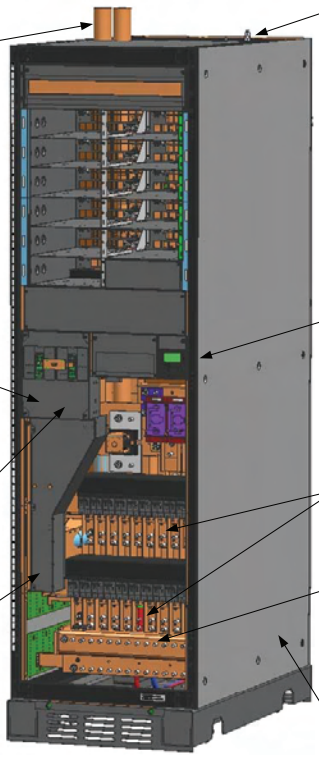
3.1.5 Top Cable Entry



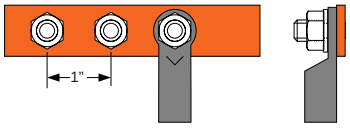
Notes:
1. Dimensions are in inches (millimeters).
2. Do not block air intake openings.

4 CONNECTON DETAILS

4.1 Bottom Cable Entry Electrical Connection Detail

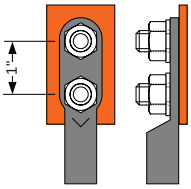


DETAIL B (Circuit Breaker Option)



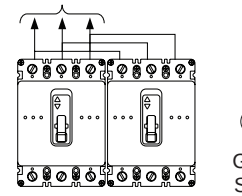
SUITABLE CABLE LUGS WITH HOLE DIA 3/8" (M10)
TYPICAL LUG THOMAS & BETTS TYPE 54109
RECOMMENDED TORQUE 407-434 in-lbs (46-49 Nm)

DETAIL C (Circuit Breaker Option)



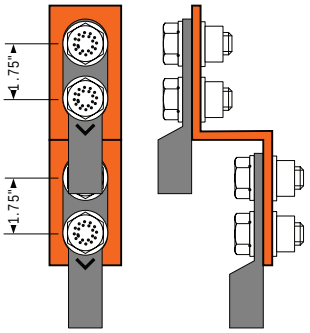
SUITABLE CABLE LUGS WITH HOLE DIA 3/8" (M10)
TYPICAL LUG THOMAS & BETTS TYPE 54209
RECOMMENDED TORQUE 407-434 in-lbs (46-49 Nm)

DETAIL A



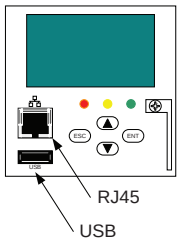
ONE OR TWO AC CIRCUIT BREAKERS,
NO LUGS NEEDED.
MARK CABLES A-L1, A-L2 AND A-L3 (B-L1, B-L2, B-L3)
RECOMMENDED TORQUE 124 in-lbs (14 Nm)

DETAIL B (Fuse Option)

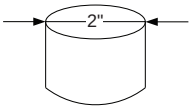


SUITABLE CABLE LUGS WITH HOLE DIA 1/2" (M12)
TYPICAL LUG THOMAS & BETTS TYPE 54282 (350kcmil)
RECOMMENDED TORQUE 690-743 in-lbs (78-84 Nm)

DETAIL D

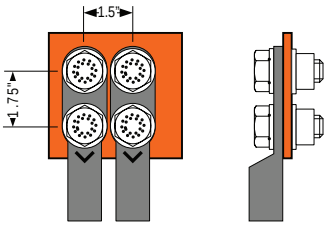


DETAIL E



RECOMMENDED COUPLING:
RACO TYPE 2628
(GRAINGER 3LV08) OR
THOMAS BETTS TYPE
TK126US

DETAIL C (Fuse Option)

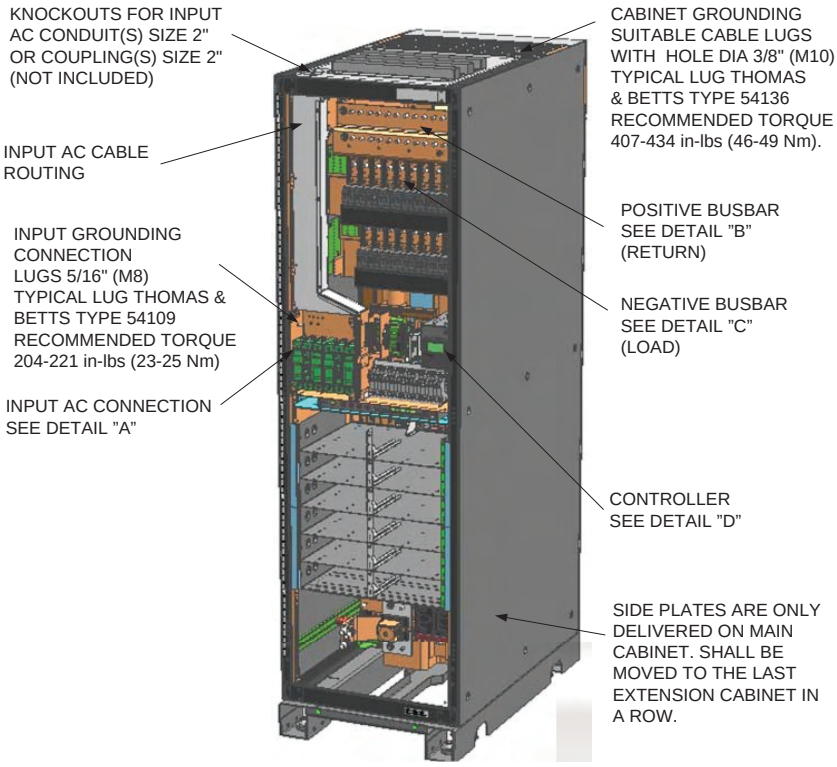


SUITABLE CABLE LUGS WITH HOLE DIA 1/2" (M12)
TYPICAL LUG THOMAS & BETTS TYPE 54282 (350kcmil)
RECOMMENDED TORQUE 690-743 in-lbs (78-84 Nm)

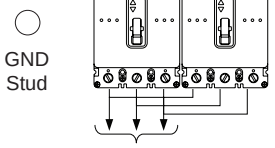
COMMUNICATION LINKS BETWEEN CABINETS:
1. RS-485 BUS WIRES (TWISTED YELLOW/WHITE WIRES) SHALL BE CONNECTED TO SM-AC.
2. CAN-BUS WIRES (TWISTED BLACK/WHITE WIRES) SHALL BE INTERCONNECTED.
3. CONTACTOR CONTROL CABLES SHALL BE INTERCONNECTED.

NOTE
1. WHEN CONNECTING OUTPUT DISTRIBUTION CABLES – START WHITH INNER ROW FIRST.

4.2 Top Cable Entry Electrical Connection Detail

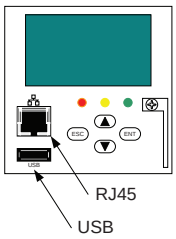


DETAIL A

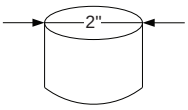


ONE OR TWO AC CIRCUIT BREAKERS, NO LUGS NEEDED.
MARK CABLES A-L1, A-L2 AND A-L3 (B-L1, B-L2, B-L3)
RECOMMENDED TORQUE 124 in-lbs (14 Nm)

DETAIL D



DETAIL E



RECOMMENDED COUPLING:
RACO TYPE 2628
(GRAINGER 3LV08) OR
THOMAS BETTS TYPE
TK126US

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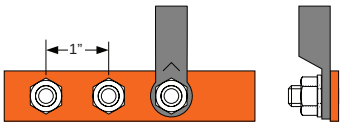
3. CONTACTOR CONTROL CABLES SHALL BE INTERCONNECTED.

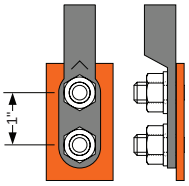
NOTE
1. WHEN CONNECTING OUTPUT DISTRIBUTION CABLES – START WITH INNER ROW FIRST.

DETAIL B (Circuit Breaker Option)



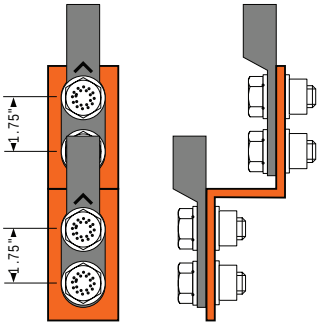
SUITABLE CABLE LUGS WITH HOLE DIA 3/8" (M10)
TYPICAL LUG THOMAS & BETTS TYPE 54109
RECOMMENDED TORQUE 407-434 in-lbs (46-49 Nm)

DETAIL C (Circuit Breaker Option)



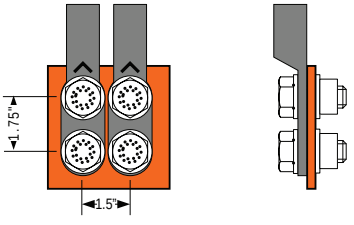
SUITABLE CABLE LUGS WITH HOLE DIA 3/8" (M10)
TYPICAL LUG THOMAS & BETTS TYPE 54209
RECOMMENDED TORQUE 407-434 in-lbs (46-49 Nm)

DETAIL B (Fuse Option)



SUITABLE CABLE LUGS WITH HOLE DIA 1/2" (M12)
TYPICAL LUG THOMAS & BETTS TYPE 54282 (350kcmil)
RECOMMENDED TORQUE 690-743 in-lbs (78-84 Nm)

DETAIL C (Fuse Option)



SUITABLE CABLE LUGS WITH HOLE DIA 1/2" (M12)
TYPICAL LUG THOMAS & BETTS TYPE 54282 (350kcmil)
RECOMMENDED TORQUE 690-743 in-lbs (78-84 Nm)

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Learn more about the NetSure™ ITM DC UPS from Emerson at: **EmersonNetworkPower.com/NetSureITM.**

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- Services
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