



Fortress Power

Energy Storage Systems

FORTRESS

SECURE YOUR ENERGY



Part One: Design

Matt Moore – Technical Support
at Fortress Power

TOPICS

- PRODUCT SPECIFICATION
- PROJECT ASSESSMENT
- FORTRESS POWER ENERGY STORAGE SIZING TOOL
- HOME OWNER REPORT
- SELF-MANAGING CRITICAL LOAD PANEL

FORTRESS POWER LITHIUM ION PHOSPHATE BATTERY

SAFE • AFFORDABLE • EASY TO INSTALL

Size	LFP- 10	LFP- 15
Total Energy (kWh)	10.24	15.36
Max. Charge Current (Continuous) [A]	100	100
Max. Discharge Current (Continuous) [A]	100	100
Max. Pulse Current (for 10 sec) [A]	200	200
Capacity [Ah]	200	200
Voltage [V]	48	48
Charging Temperature [F]	-4 to 140	
Storage Temperature [F]	-4 to 131	
Dimension [H xW x D, inch]	33 x 16.4 x 9.4	33 x 16.6 x 13.4
Weight [lbs]	286	429
Depth of Discharge	100%	
Warranty	10 years	

FortressPower Lithium Battery



DARFON H5001 HYBRID INVERTER



PV Input	Grid Input
Up to 6.5kW	Up to 5kW
2 independent MPPTs	Auto-transfer Relay Rating: 48A
Max. 13A per string	20ms Typical Transfer Time
Voc: 120~500V; Mppt: 250-430V	240 Split Phase; 50/60 Hz
Grid Output	Critical Load
0 to 24A Feed-in Current	5kW Cont. Output
L-L: 211 to 264VAC \pm 3.0V	5.5/6.5/7.5kW Surge power at (40/5/1sec)
59.4 to 60.4Hz \pm .05 Hz	0 - 21A Output Current
Rule 21 Compliant	Voltage 240 2P; 50/60 Hz

PROJECT ASSESSMENT

- Assess PV Array
 - Location – space – tilt – azimuth
- Critical Load Circuits
 - What is essential to be backed up
 - Non-essentials to be backed up
- Customer Expectations
 - Hours of operation during grid outages

PV ARRAY SIZING TOOL

How to size the Energy Storage System

1. Sizing PV array
2. Estimate average daily PV production
3. Selecting critical load circuits
4. Calculating daily usage of critical load panel
5. Selecting battery bank size



Fortress Power Energy Storage Sizing Tool

HOME OWNER REPORT



- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15
- 16
- 17
- 18
- 19
- 20
- 21
- 22
- 23
- 24
- 25
- 26
- 27
- 28

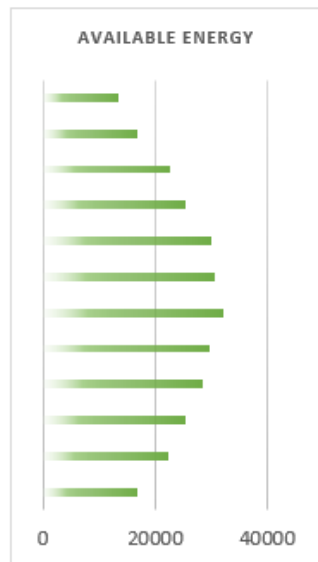
Fortress Power Battery

Fortress Power Battery	LFP -15
System Size:	15,360 Wh
Battery Quantity	1
Depth of Discharge:	10%
Available Power:	<u>13,824 Wh</u>

Solar PV System

System Size: 6 kW

	Solar Radiation	AC Energy	Energy Per Day (watts)	Full charge on battery	Energy after battery charged
15	January	2.14	329	10,613	(13,824) (3,211)
16	February	3.01	422	15,071	(13,824) 1,247
17	March	3.95	594	19,161	(13,824) 5,337
18	April	4.84	690	23,000	(13,824) 9,176
19	May	5.51	785	25,323	(13,824) 11,499
20	June	6.02	805	26,833	(13,824) 13,009
21	July	6	818	26,387	(13,824) 12,563
22	August	5.56	760	24,516	(13,824) 10,692
23	September	4.45	602	20,067	(13,824) 6,243
24	October	3.47	499	16,097	(13,824) 2,273
25	November	2.32	332	11,067	(13,824) (2,757)
26	December	1.71	259	8,355	(13,824) (5,469)



HOME OWNER REPORT

28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47

Load Consumption Report

Item	Watthours/Day
Incandescent Light Bulb-60 Watt	3240
LED Light Bulb-60 Watt Equivalent	2304
Refrigerator/Freezer-Energy Star	1600
Sump Pump-1/3 HP	0
Water Well Pump-1/3 HP	2250
Microwave Oven-800 Watts	0
Slow Cooker	1080
TV-Flat Screen-46"	760
Cell Phone Charger	200
Computer-Laptop	1000

Total **12,434 Wh/Day**

Available energy in Battery:	13,824 Wh	<u>1.11 Days</u>
Lowest daily available PV production:	8,355 Wh	<u>0.67 Days</u>
Highest daily available PV production:	26,833 Wh	<u>2.16 Days</u>



CRITICAL LOAD PANEL



Maximum single-pole circuits: 10

Maximum double-pole circuits: 5

Maximum running wattage: 7.5 kW

Self manage between grid and back-up

Part Two: Installation

Bryan Whitton – Product Manager at
Darfon

First Step

Your H5001 will come in a cardboard box. On the box will be a label with a description and the serial number. You should note both to make sure it is the right part and that you have the serial number for warranty purposes.

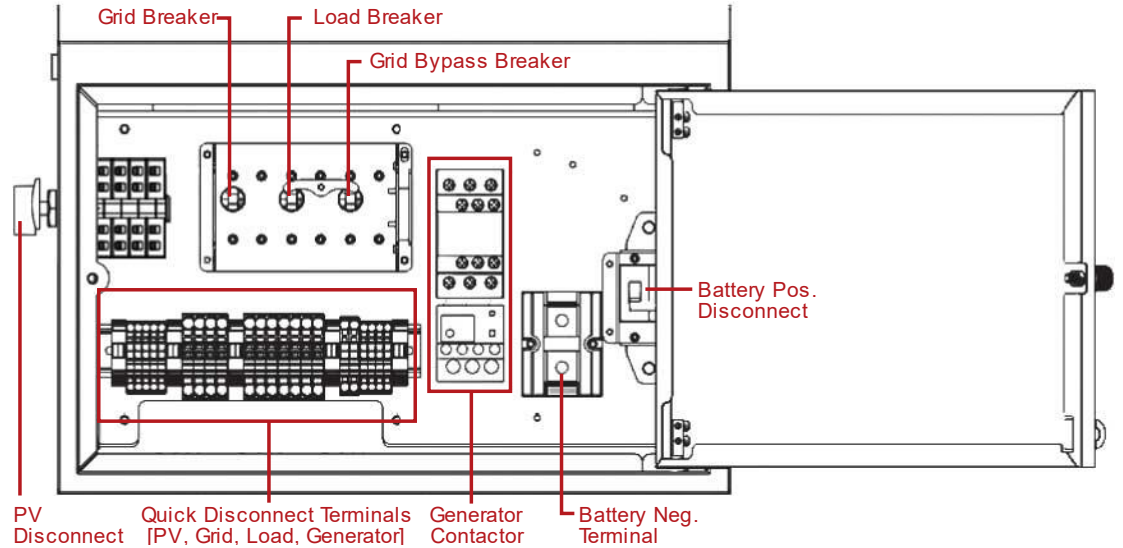


Removing the H5001

- Remove the accessories.
- Remove cardboard inserts and the H5001 from the plastic bag.
- Inspect for any possible damages.



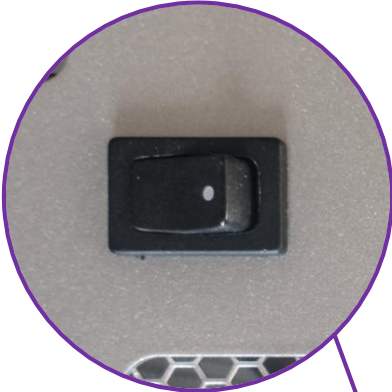
H5001 Distribution Box



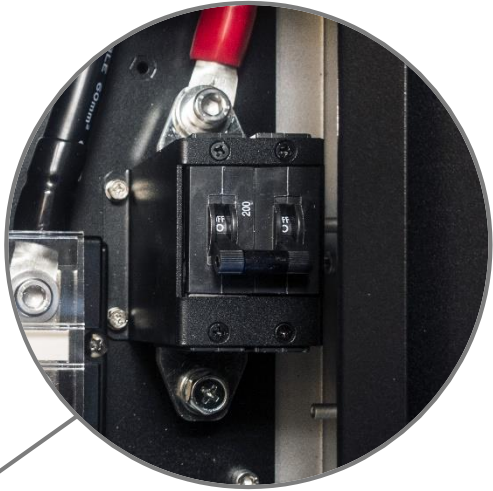
All the I/O happens here. Plenty of room to work with, easy to install and configure.

System Switches

Inverter On/Off



Battery Disconnect



PV Disconnect



Concentric Knockouts

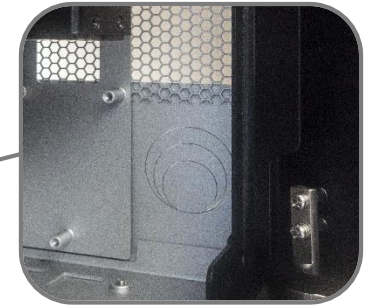
Located along the right, left and bottom of the distribution box

Clean install!

Typically for PV Connections



Right Side Access



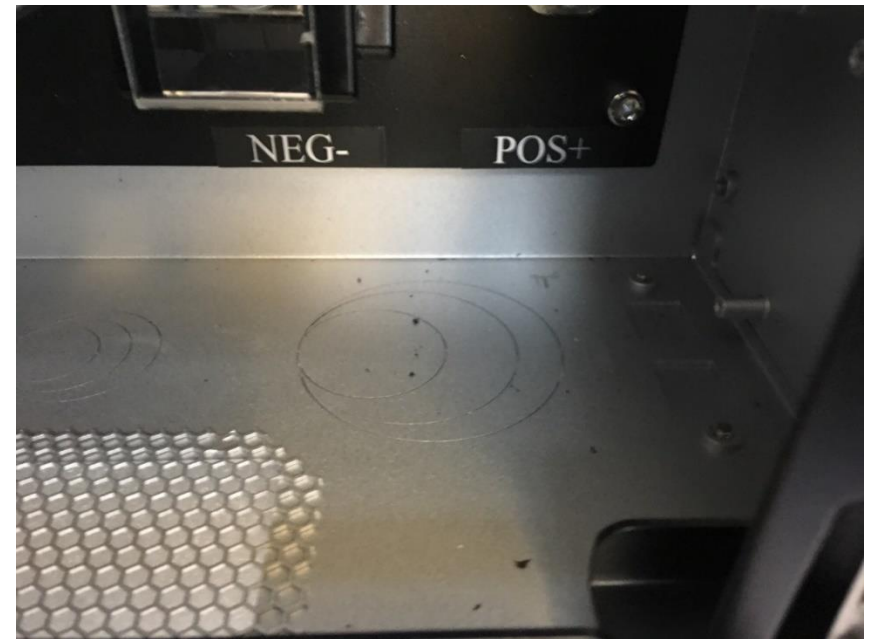
Typically for
AC & Generator
Connections



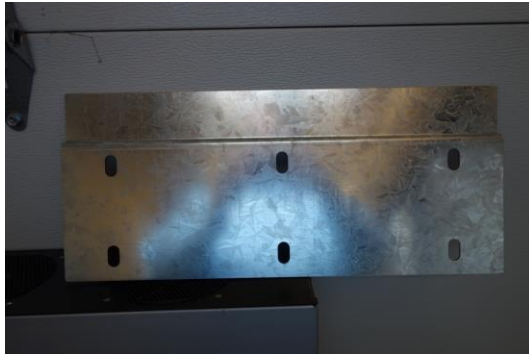
Concentric Knockouts

Battery Connection:

Right below the battery terminals and shutoff switch is a concentric knockout for 1", 1.25" and 1.5" connectors. You will need 2/0 conductors for the battery.



How it mounts



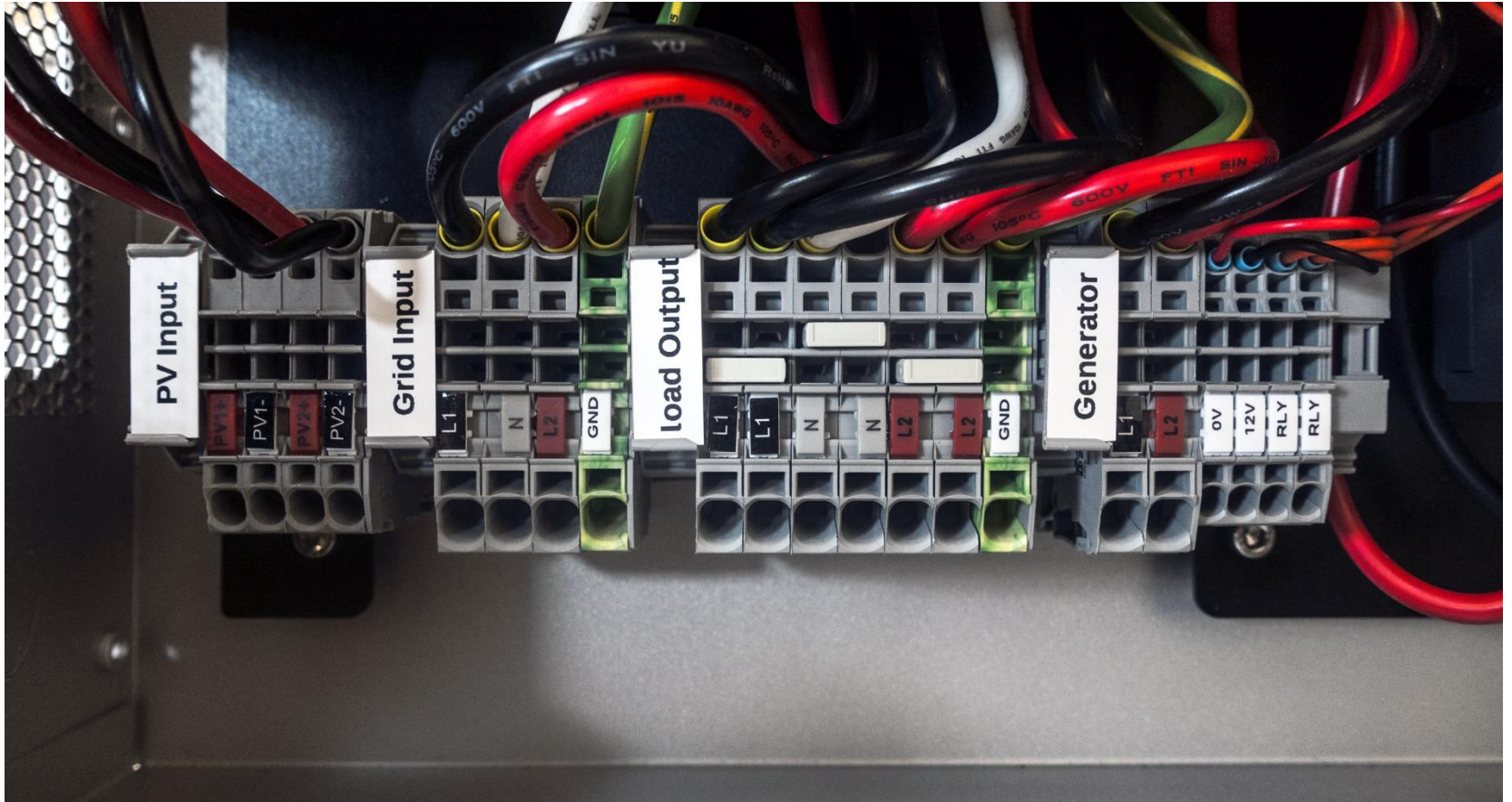
The hanger bracket it is designed to bolt to the wall and hang inverter.

I use Unistrut on the top and bottom. The H5001 simply hangs on the bracket. Be sure to bolt directly into studs.



The bottom inverter bracket bolts directly to the Unistrut.

Quick Disconnect Terminals



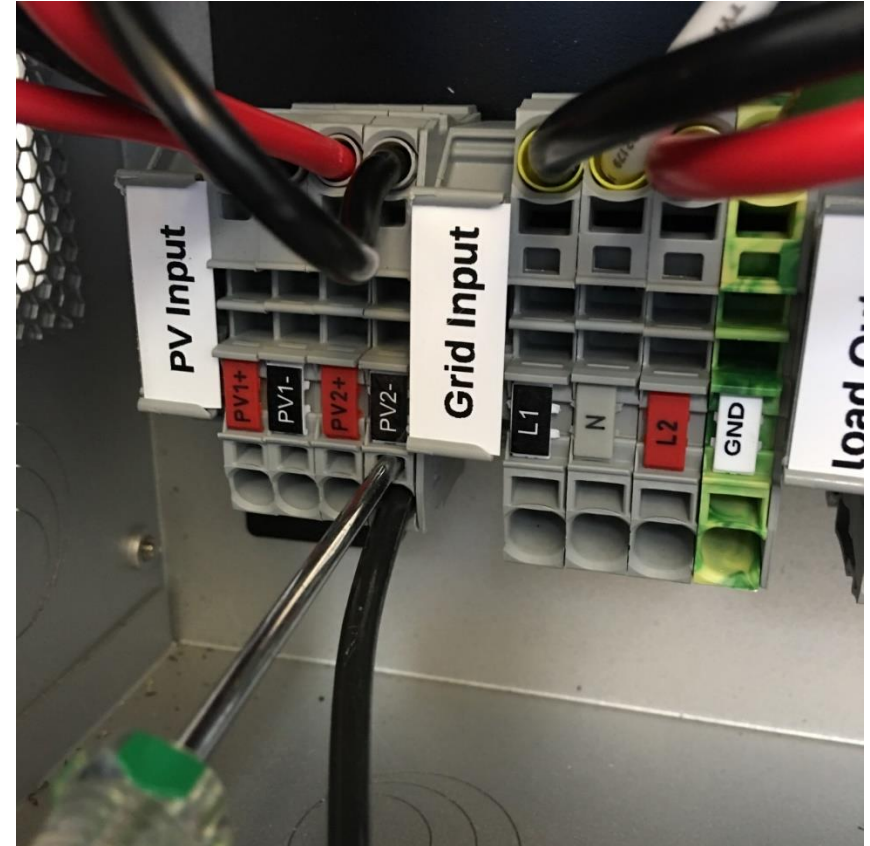
Installing/Removing Conductors

Installing Conductors

- Push a small screwdriver into the release access.
- Insert the wire and remove the screwdriver.

Removing Conductors

- Push the screwdriver into the release access and pull the wire out.

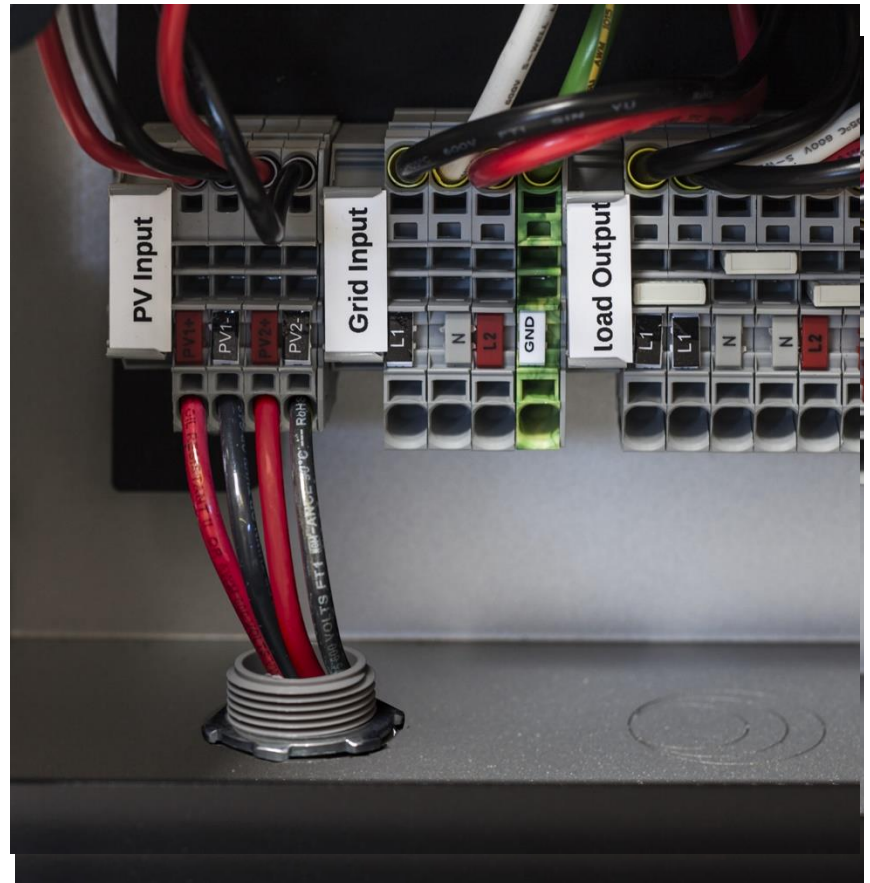


Note: Terminals use high tension springs that require a strong push to get the contact to open.

PV Conductors

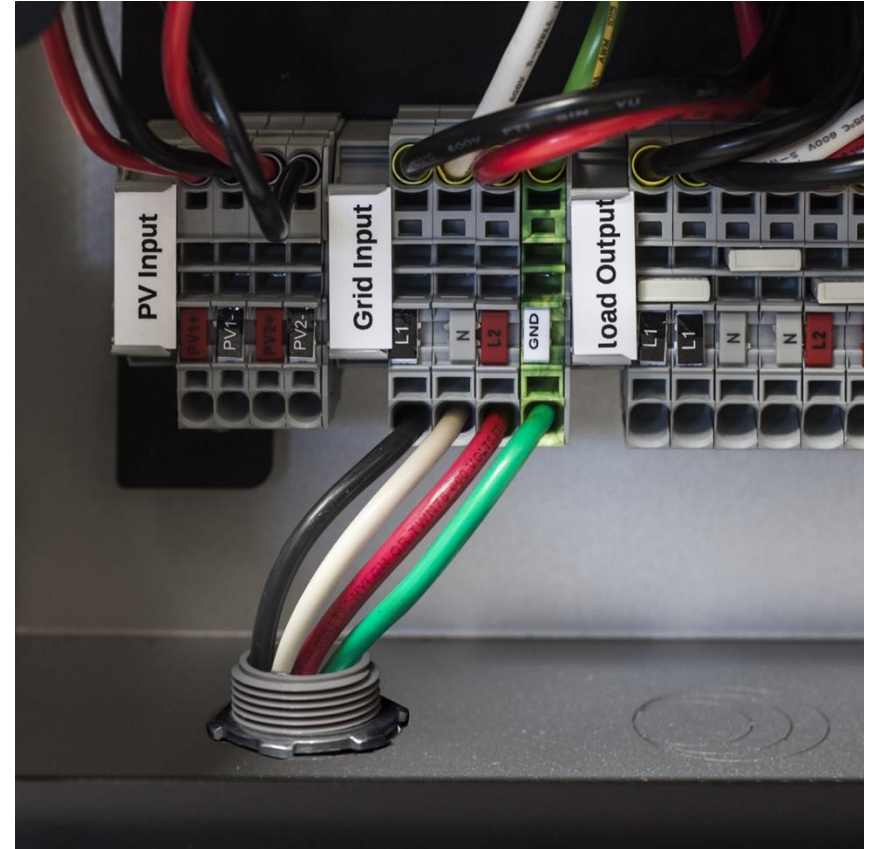
- **Two MPPTs in the PV inverter** *(It doesn't matter which string inputs you use if you only have one string)*
- **Maximum wire size is #10 AWG.**

Now is a good time to check the PV voltage and polarity



AC Grid-Tie Conductors

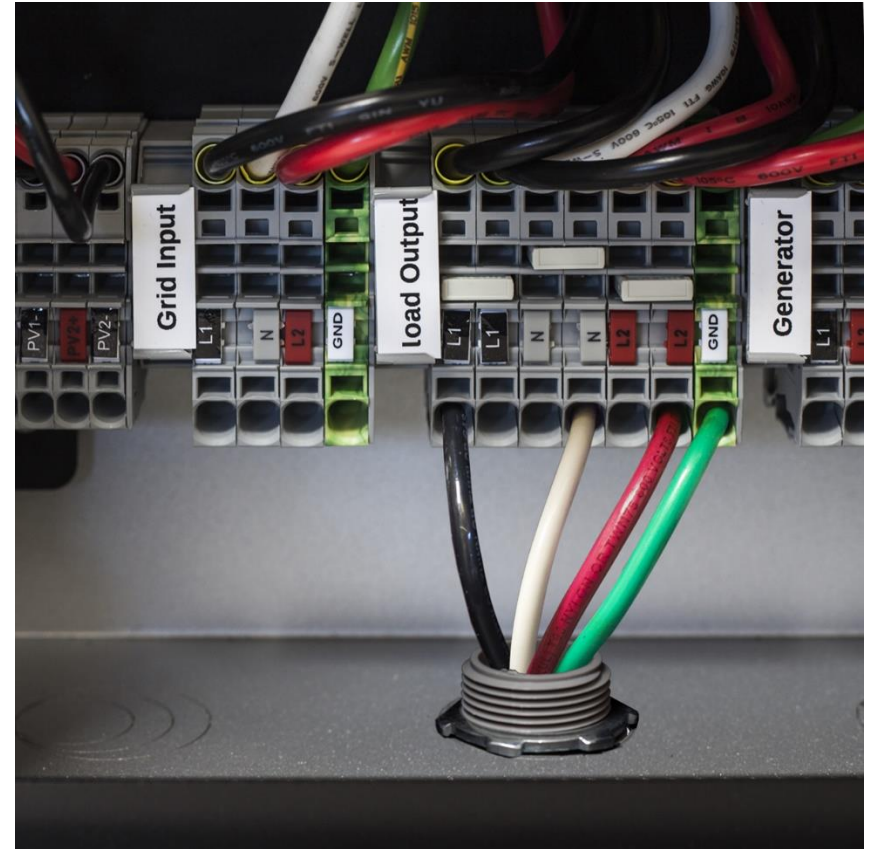
- Make sure the grid is powered down when you are connecting the wires
- We can handle #8 AWG wire in these connectors
- It takes 2 minutes to do.
- There is a fair amount of room in the distribution box to work with so leave a little extra wire length to make it even easier.



Now is a good time to check the AC voltages

Critical Load Panel

- Same as the Grid-Tie but an extra set of inputs.
- Double the inputs. Again, it gives you flexibility. Occasionally you may want to split the loads such as lights and receptacles or something along those lines. This simply gives flexibility.



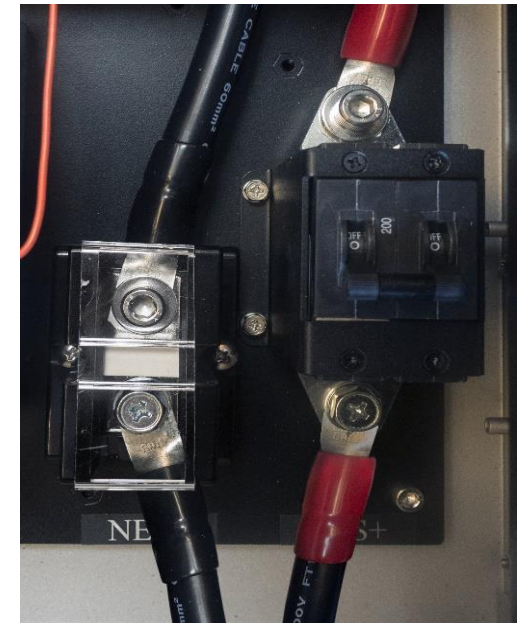
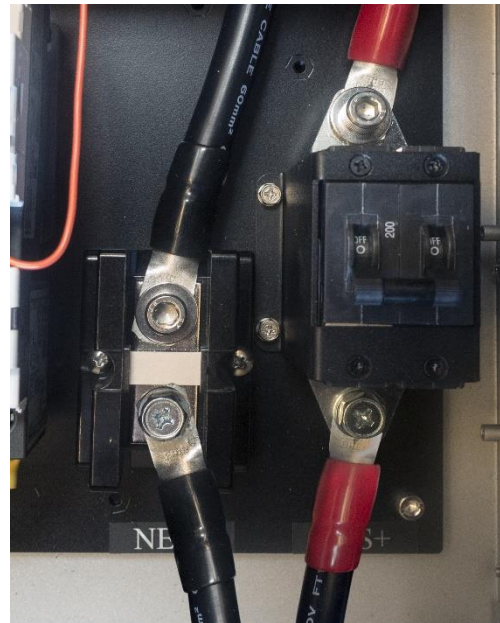
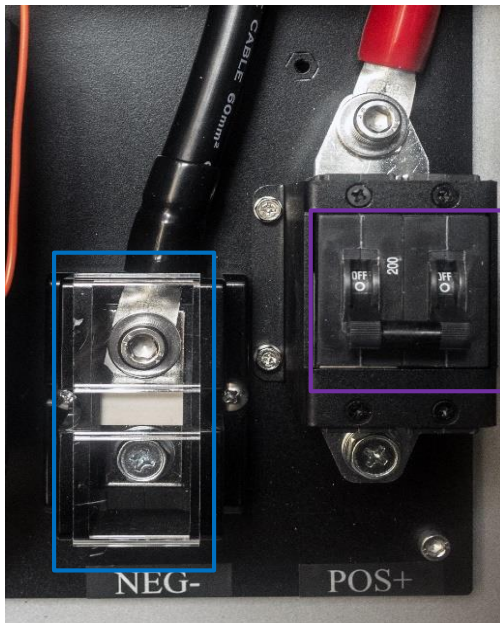
Landing the Battery Conductors

Step 1. Switch off the Battery.

Step 2. Pull the clear finger shield off from the negative connector.

Step 3. Attach the negative cable to the negative connector and the positive cable to the positive connector. Use a 5/16" lug.

Step 4. Clip the finger guard back over the negative connector for safety.



Note: Keep the cables as short as possible.

Finished!

You have successfully installed and wired an H5001 inverter. At this point you will need to set the date, time and mode of operation but that is in the next session.

THANK YOU – Contact Us!

Matt Moore

Technical Support

mattm@fortresspower.com

(877) 497- 6937

www.fortresspower.com

Bryan Whitton

Product Manager

Bryan.whitton@darfon.com

(650) 815-7121

www.darfon.com

