OPERATION, MAINTENANCE, AND INSTALLATION MANUAL

GREEN BUILT
Solar power for our environment.
By MARATHON®

Marathon Equipment Company
OMI Manual No. 0075, Revision Date: December 2010
www.marathonequipment.com

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Introduction to GreenBuilt Power Units

Thank you for purchasing a GreenBuilt® Power Unit!.

The purpose of this manual is to provide the owner and operators with the necessary information to properly and safely install, operate, and maintain the Green Built® Power Units. This manual is intended as a supplement to the OMI Manual that is specific to your compactor model.

The employer involved in the operation, maintenance, and installation of the compactor and Green Built Power Unit should read and understand the most current version of the following applicable standards:

ANSI Standard No. Z245.2 "Stationary Compactors Safety Requirements"
A copy of this standards may be obtained from ANSI (www.ansi.org): or
25 West 43rd Street
New York, NY 10036

OSHA Title 29 CFR, Part 1910.147
"The Control of Hazardous Energy (Lock-Out and Tag-Out)" (**www.ansi.org**)

Any service or repair instructions contained in this manual should be performed by factory authorized personnel only.
If you should need assistance with your baler, please contact your distributor. When contacting your distributor, you will need to provide:

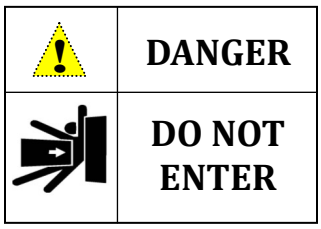
- Serial Number:_____
- Installation Date:_____
- Electrical Schematic Number:_____

If you have any safety concerns with the equipment, or need further information, please contact us at 1-800-633-8974 or:

Marathon Equipment Company
Attn: Field Service Department
P.O. Box 1798
Vernon, AL 35592-1798

Pre-Operating Instructions

WARNING: Do not operate until operating instructions are thoroughly understood. Wear safety glasses and gloves when operating this equipment.

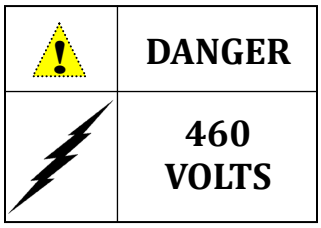


STAY CLEAR OF ALL INTERNAL AND EXTERNAL MOVING PARTS WHEN OPERATING UNIT. FAILURE TO DO SO COULD RESULT IN SERIOUS PERSONAL INJURY OR DEATH!

Never enter any part of unit unless disconnect switch has been turned off, locked, and all stored energy sources have been removed.
See "Lock-Out and Tag-Out Instructions" on page 5 ".
Before starting unit, be sure no one is inside. Be certain that everyone is clear of all points of operation, and pinch point areas before starting.

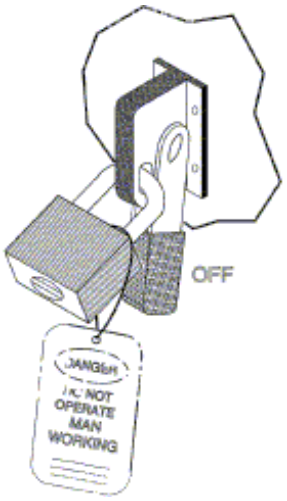
Employers should allow only authorized, and thoroughly trained personnel to operate this baler.
This unit is equipped with a key operated locking system. Keys should be in possession of only authorized personnel. Federal regulation prohibits operation by persons under 18 years of age. Turn off, and remove key after use.

The hydraulic system operates at high pressures, and at high temperatures. If you suspect a leak, **DO NOT CHECK WITH YOUR HANDS**, and avoid contact with piping, hoses, and cylinders.



ONLY AUTHORIZED PERSONNEL SHOULD BE ALLOWED INSIDE PANEL BOX. The panel box contains high voltage components.
See "Lock-Out and Tag-Out Instructions" on page 5 ".

Lock-Out & Tag-Out Instructions



WARNING: This machine contains multiple lockouts (1 for the AC circuit and 2 each for the DC circuits). All must be locked out before service or maintenance can be performed.

Before entering any part of the unit, be sure that all sources of energy have been shut off, all potential hazards have been eliminated, and the compactor is locked-out and tagged-out in accordance with OSHA and ANSI requirements.

If the ram is pressing against a load, move the ram rearward before shutting the compactor down. The specific lockout and tag-out instructions may vary by company. The following instructions are provided as minimum guidelines.

The battery disconnect is shown on the left.

Instructions

1. Move the main disconnect lever to the OFF position.
2. Padlock the disconnect lever with a keyed padlock and take the key with you.
3. Along with the padlock, place an appropriate, highly visible, warning tag on the disconnect lever. The tag should provide a warning such as:

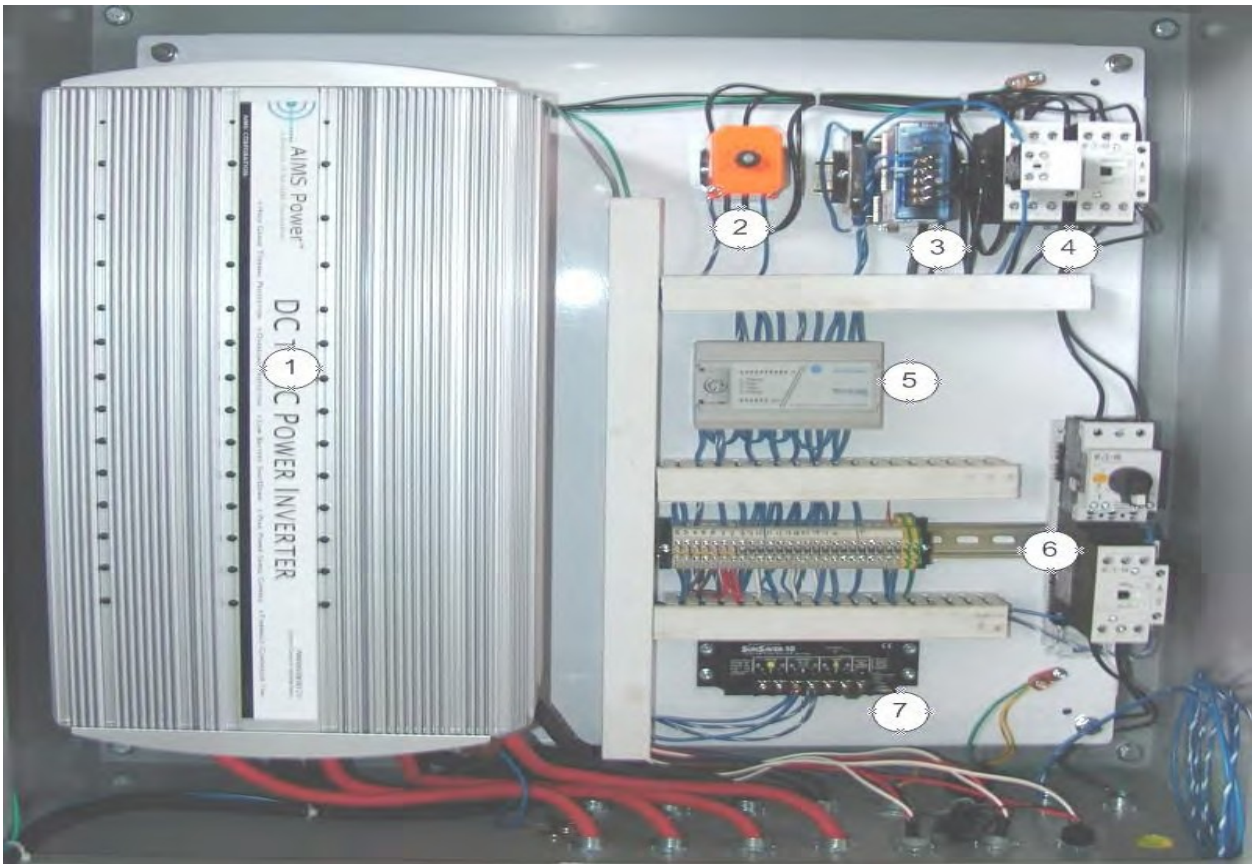
   "Danger: Do not operate equipment. Person working on equipment." Or:

   "Warning: Do not energize without the permission of _____."
4. Move each battery disconnect switch to the OFF position.
5. Padlock each disconnect switch with a keyed padlock and take the keys with you.
6. After locking and tagging the compactor, try to start and operate the compactor to make sure the lock-out and tag-out is effective. If it is, remove the key from the key-switch and take it with you.

⚠	**DANGER**
⚡	**120 VOLTS**

ELECTRICAL: The panel box contains high voltage components. Only authorized service personnel should be allowed inside the panel only after ALL the lock-out and tag-out procedures have been completed.

SOLAR PANEL BOX

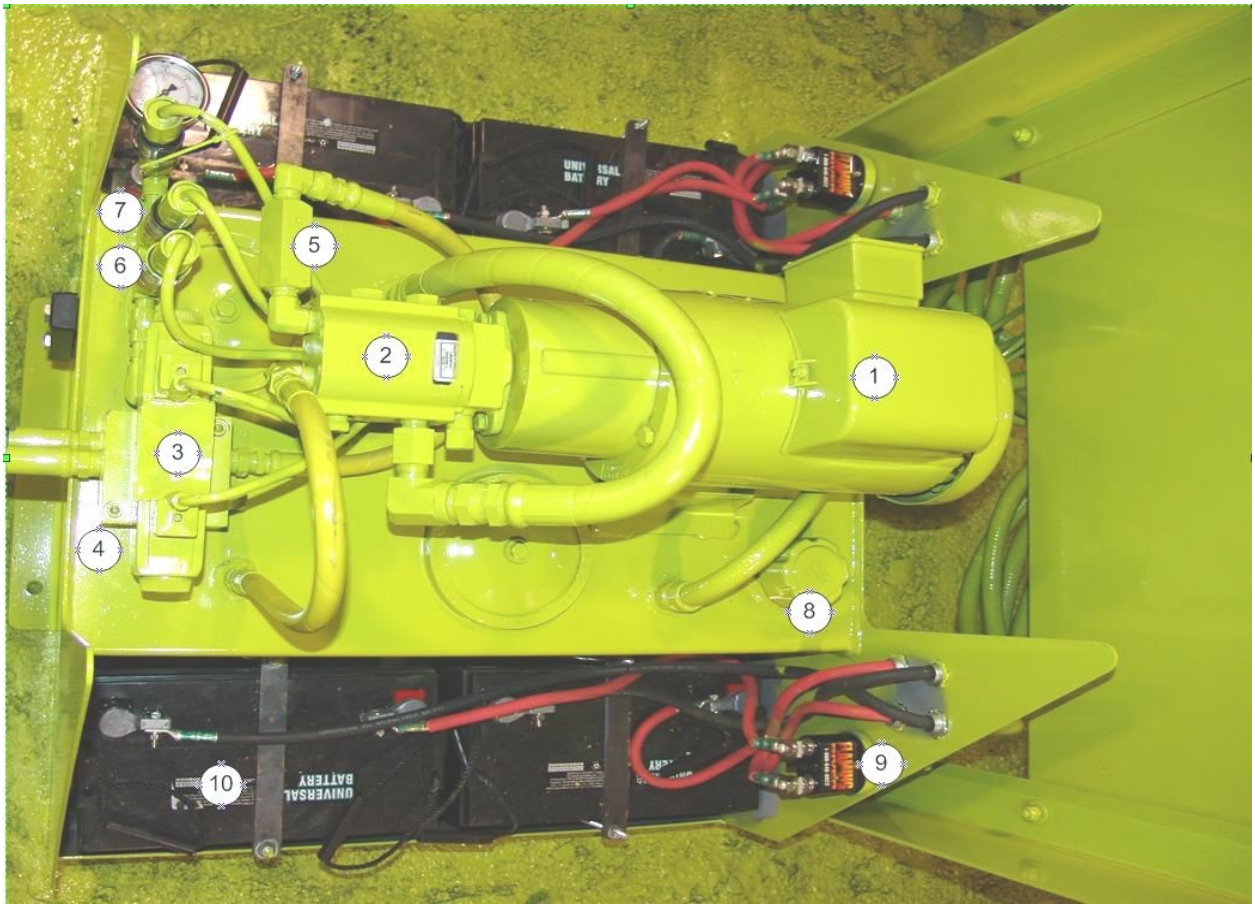


This diagram represents a typical panel box configuration for the self-contained or stationary compactors. The panel box on your compactor may differ depending on the model and/or optional equipment/controls.

To order replacement parts, please call our Parts Department at **1-800-633-8974** or order online by logging on **www.parts1stop.com**.

Ref #	Part #	Description
1	03-5630	Inverter 8000 W
2	03-5634	Voltage Relay
3	03-4732	Power Supply
4	03-5631	Reversing Contactor
5	03-5638	PLC
6	03-5637	Motor Starter
7	03-5633	Solar Controller

Power Unit Drawing



Match the reference numbers with the following chart to identify components. For replacement part ordering, call our parts department at **1-800-633-8974** or log on to **www.parts1stop.com** to quickly place your order online.

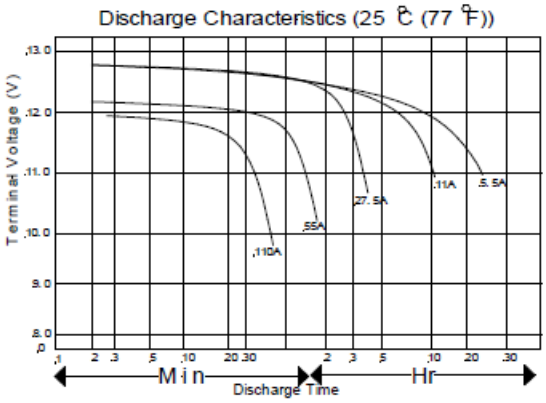
Ref. #	Part #	Description	Qty
1	03-2649	Motor 1-1/2	1
2	02-3970	Pump 3GPM	1
3	02-5265	Valve w/Regen Center	1
4	02-3958	Subplate w/ Relief	1
5	02-0185	Check Valve	1
6	03-0658	Pressure Switch	1
7	03-0658	Pressure Switch	1
8	02-0197	Breather Cap	1
9	03-5635	Battery Disconnect	1
10	03-5247	Battery 12 V	1

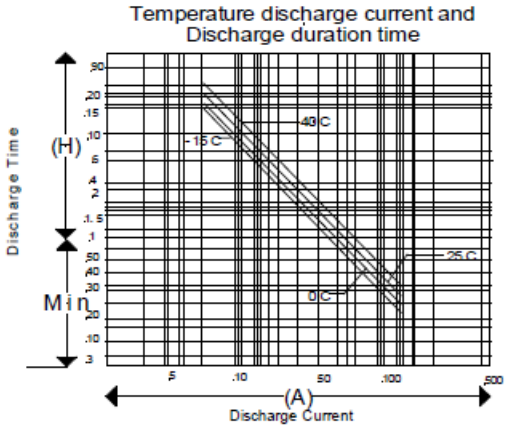
Battery Specifications

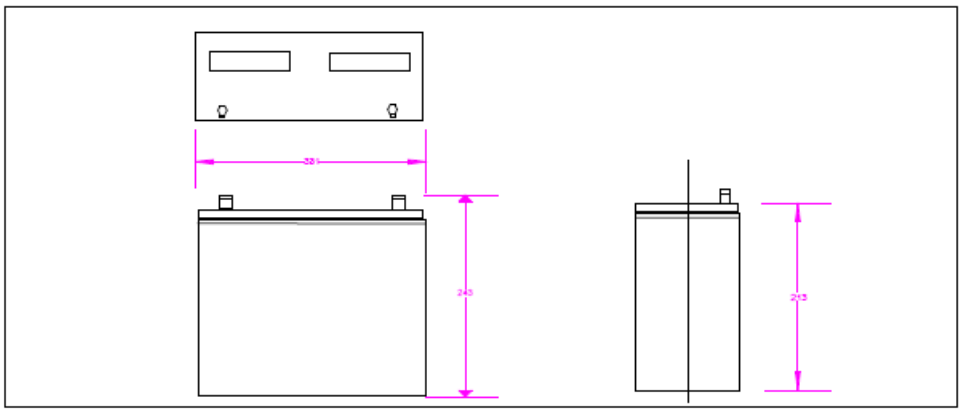
Specifications & Characteristics

Nominal Voltage		12V
Rated Capacity		110 Ah/20HR
Dimensions	L	331 mm
	W	173 mm
	Total H.	243 mm
Weight		Approx. 33 kg(72.75lbs)
Capacity 20°C (68°F)	20 HR 5.5 A	110 Ah
	10 HR 10.0A	100 Ah
	5 HR 18 A	90 Ah
	4 HR	87.7 Ah
	1 HR 80 A	80 Ah
Internal resistance		Approx. 4 milliohms
Terminal		Flag
Charging (Constant-Voltage)	Cycle	Initial charging current less than 40A Voltage 14.40 – 15.0V
	Float	Voltage 13.50 – 13.80
Capacity affected by Temp (20 HR)		40 °C => 102% 25 °C => 100% 0 °C => 95% -15 °C => 65%
Self Discharge (25 °C)		Capacity after 3 mth. storage 91% Capacity after 6 mth. storage 82% Capacity after 12 mth. Storage 64%

The Plate material: Pb-Ca-Sn alloy and oxide of Pb (activity material)	
Construction: Positive plate and negative plate, battery case – ABS, AGM separator, H_2SO_4 and valve.	
Electrolyte concentration: 1.32	
Watts per cell @ 4 hour = 44	
Run time @ 25 A = 4 hours 16 min	
CCA	720A
Discharge rate @ 4 hours = 22A	







Solar Panel & Power Unit Maintenance

WARNING: Never perform maintenance on the Solar Power Unit without first following the "Lock-Out & Tag-Out Instructions" on page 5.

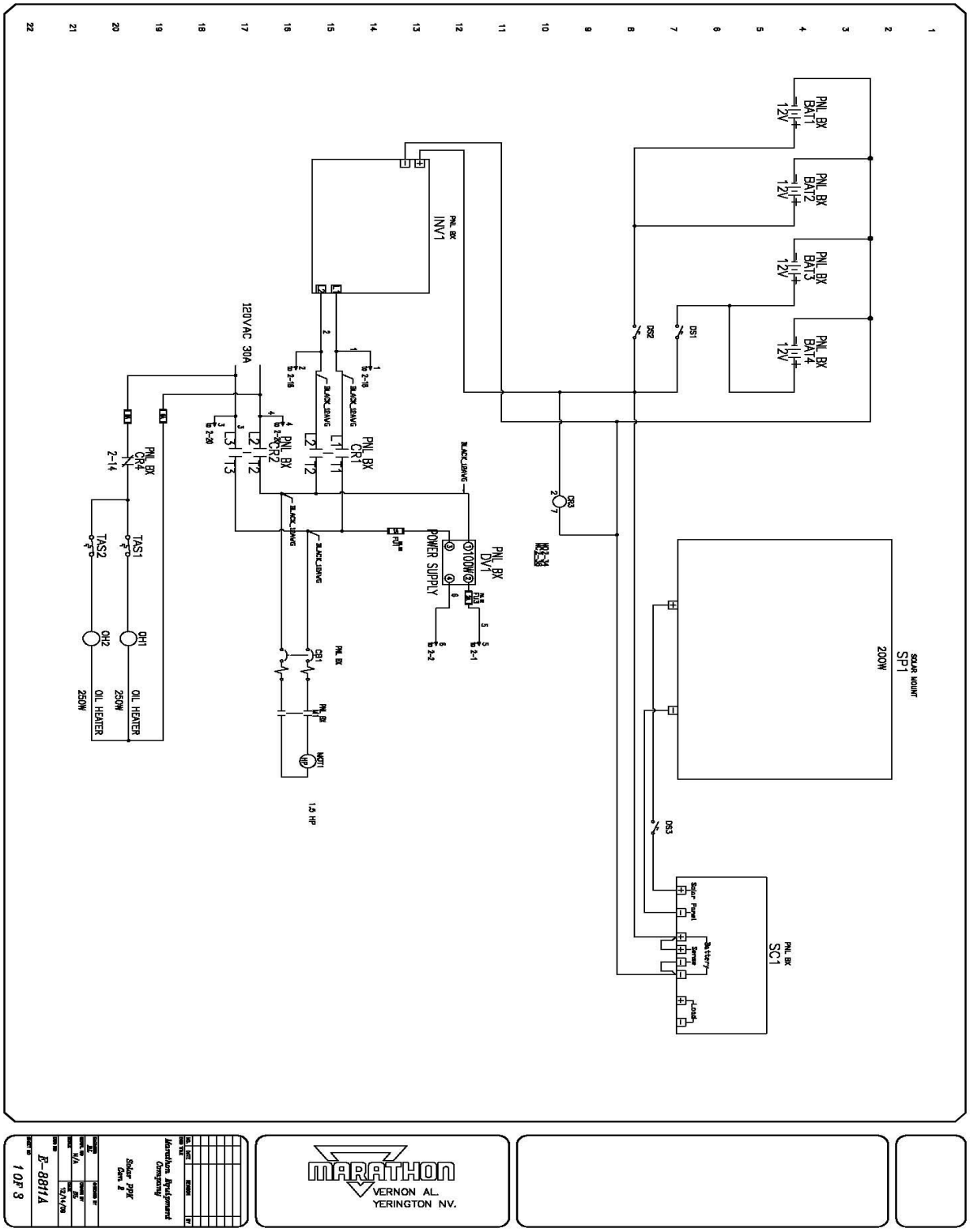
Follow all Periodic Maintenance procedures in the OMI Manual that is specific to your compactor, as well as the following:

Monthly

1. Check the solar panel for dust or residue (especially in heavily particulate or urban environment) and clean as necessary. Usually a hose stream or wiping it off with a clean, damp cloth is sufficient. Avoid using harsh chemical or cleaning the panel while it is hot.
2. Check battery cables, connections, and terminals for wear and/or corrosion.

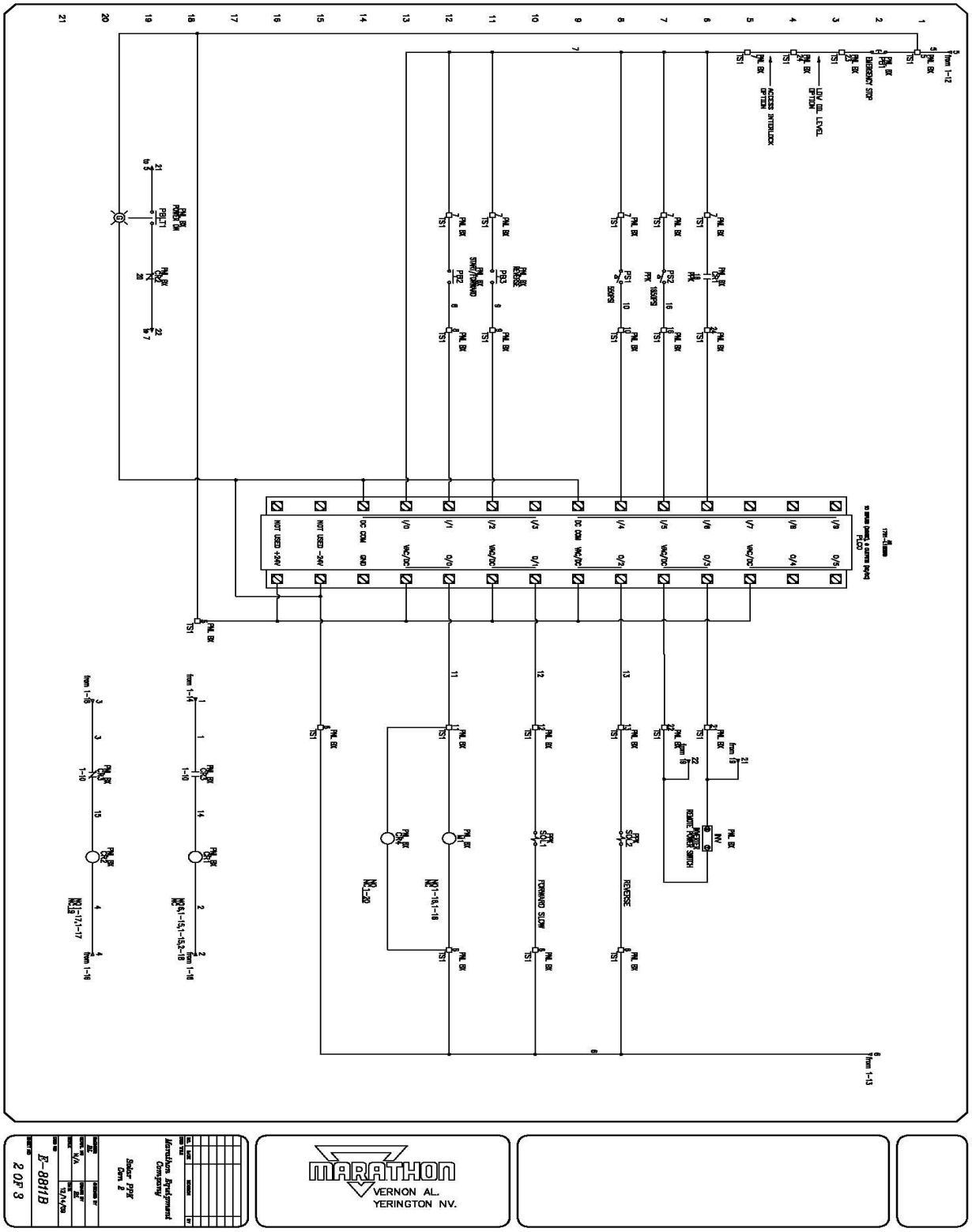
Electrical Schematic

Drawing Number: E-8811A



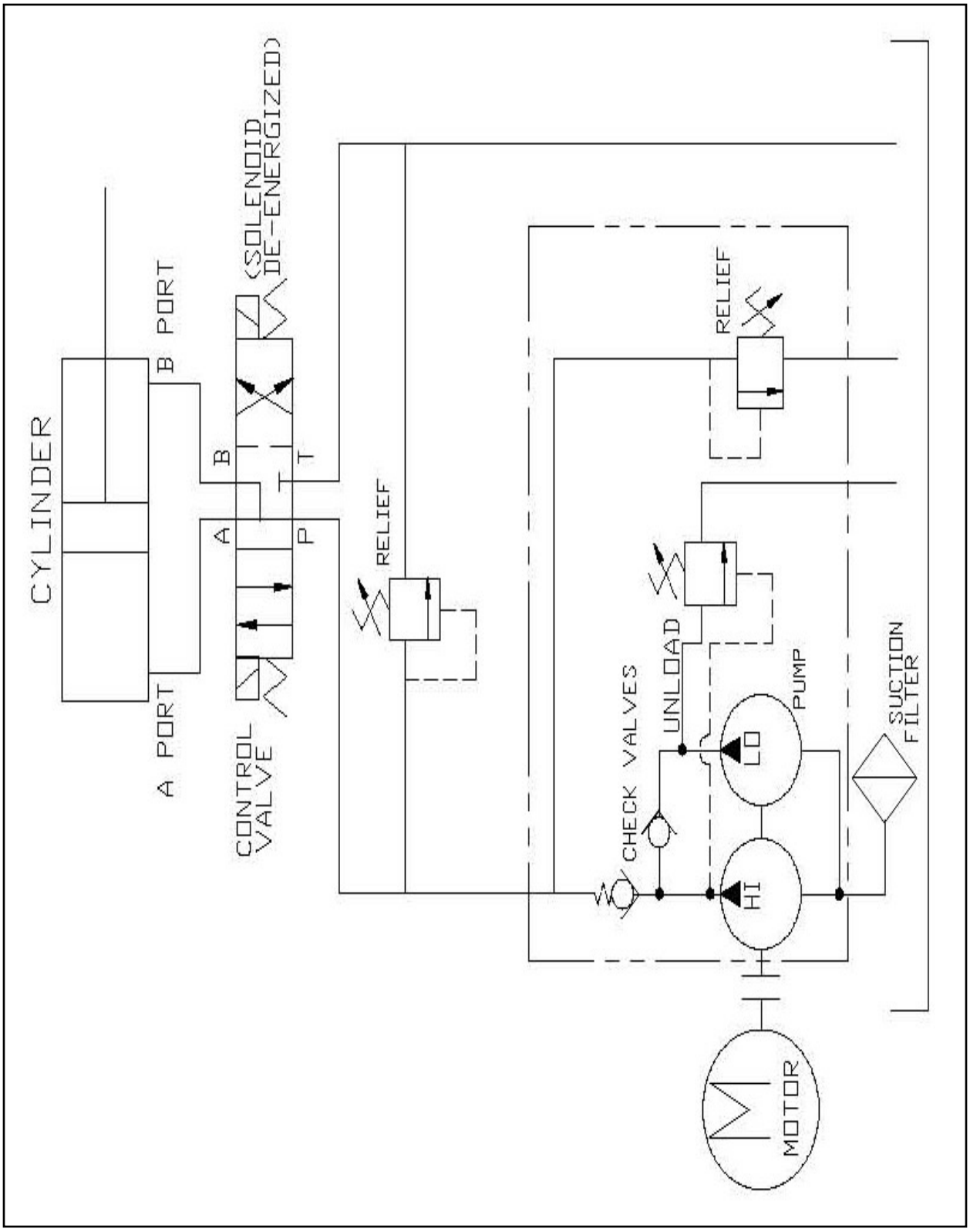
Electrical Schematic

Drawing Number: E-8811B



Electrical Schematic

Drawing Number: E-0647



Anchoring

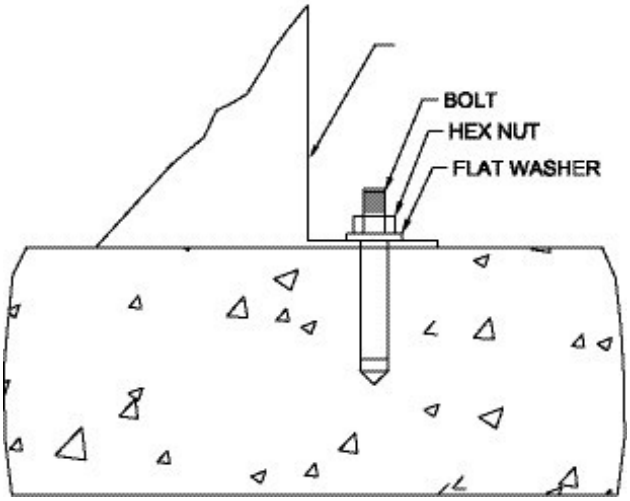
CAUTION: The panel box contains high voltage components. Only authorized service personnel should be allowed inside.

See "Lock-Out & Tag-Out Instructions" on page 5.

The power unit should be anchored to the concrete pad using a minimum of four 1/2" x 6" long anchor bolts. These bolts can be secured to the concrete pad using "Porok" or special concrete anchors.

It is recommended to drill these holes into the concrete after pre-locating the power unit to its desired location. When the power unit has been permanently located, shimmed to compensate for unevenness, and anchor bolts set, then tighten all nuts securely.

NOTE: Ensure that anchor bolts are not allowed to torque or twist the power unit when tightened.



Solar Power Unit - Wire Sizes

100 Watts (1 x 100 Watt Panel)

Distance (Feet)	Wire Size (Gauge)	Wire Diameter (Inches)	Conduit Size (Inches)
20	10	< 3/16	1/2
25	10	< 3/16	1/2
30	10	< 3/16	1/2
35	8	< 1/4	1/2
40	8	< 1/4	1/2
45	8	< 1/4	1/2
50	6	1/4	3/4
60	6	1/4	3/4
70	6	1/4	3/4
80	4	> 5/16	1
90	4	> 5/16	1
100	4	> 5/16	1
125	3	> 3/8	1
150	3	> 3/8	1
200	1	>7/16	1-1/4

200 Watts (2 x 100 Watt Panel)

Distance (Feet)	Wire Size (Gauge)	Wire Diameter (Inches)	Conduit Size (Inches)
20	4	> 5/16	1
25	4	> 5/16	1
30	3	< 3/8	1
35	2	> 3/8	1
40	2	> 3/8	1
45	1	> 7/16	1-1/4
50	1	> 7/16	1-1/4
60	1/0	< 1/2	1-1/4
70	2/0	> 1/2	1-1/2
80	2/0	> 1/2	1-1/2
90	3/0	> 9/16	1-1/2
100	3/0	> 9/16	1-1/2
125	4/0	> 5/8	2
150	250 kcmil	< 3/4	2
200	350 kcmil	13/16	2-1/2

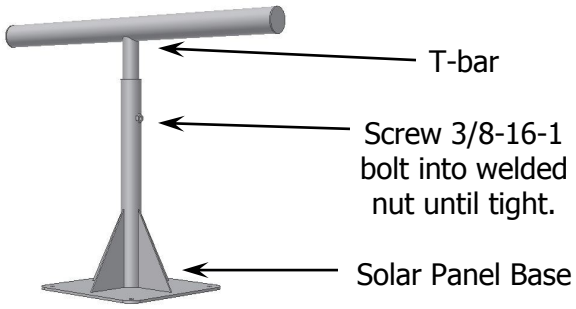
300 Watts (3 x 100 Watt Panel)

Distance (Feet)	Wire Size (Gauge)	Wire Diameter (Inches)	Conduit Size (Inches)
20	3	< 3/8	1
25	2	> 3/8	1
30	1	> 7/16	1-1/4
35	1	> 7/16	1-1/4
40	1/0	< 1/2	1-1/4
45	2/0	> 1/2	1-1/2
50	2/0	> 1/2	1-1/2
60	3/0	> 9/16	1-1/2
70	3/0	> 9/16	1-1/2
80	4/0	> 5/8	2
90	250 kcmil	< 3/4	2
100	250 kcmil	< 3/4	2
125	300 kcmil	< 13/16	2-1/2
150	400 kcmil	< 15/16	2-1/2
200	500 kcmil	< 1	3

Assembling the Solar Panel Stand

The following instructions describe the assembly process for the standard solar panel stand, which can then be mounted on top of the power unit, roof, or other applicable horizontal surface. The components and assembly process for pole mounted or wall mounted stands may vary. See the next page for details on mounting options.

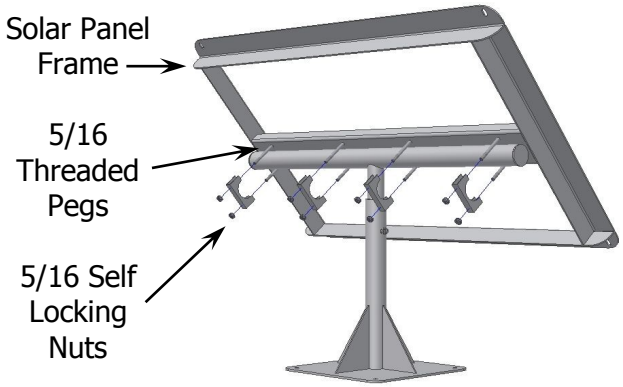
STEP 1
Slide the T-bar neck into the solar panel base as shown in the diagram on the right. Screw the 3/8-16 x 1" bolt into the lock nut welded to the neck of the solar panel base until tightened.



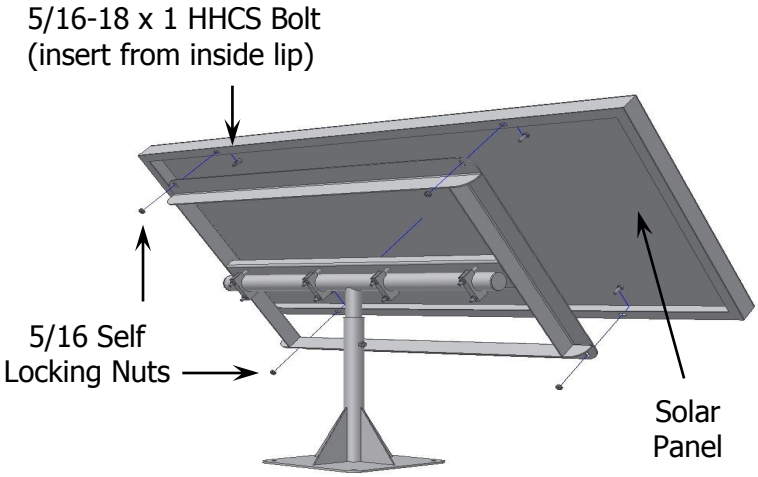
STEP 2

Locate the solar panel frame over the T-bar as shown in the diagram. Slide the 4 tube clamps into each pair of 5/16 threaded pegs and fasten using the provided 5/16 hex self-locking nuts.

Ensure that the frame is centered with the T-bar and base assembly. Tighten the tube clamps sufficiently to prevent slippage of the frame angle chosen for optimum installation (See "Connecting and Orienting the Solar Panel" on page 5-12



STEP 3
Attach the solar panel to the frame using four 5/16-18 x 1 HHCS bolts and four self-locking nuts as shown in the diagram.

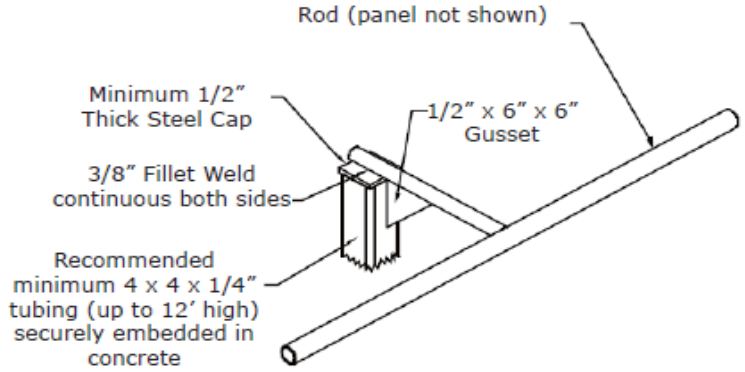


Mounting the Solar Panel Stand

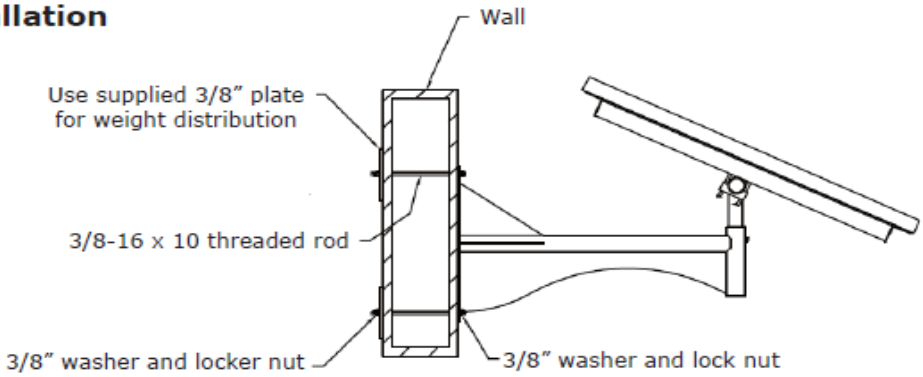
NOTE: Before choosing where to mount the solar panel stand, read the "Orientation of the Solar Panel" recommendations on the next page. The solar panel and stand can be mounted on either the top of the power unit, a wall, roof, or on a pole located within 100 feet of the power unit and connected to the solar charger controller with an S.O. cord or 12 gauge wiring in conduit or sealtite.

The required bolts for mounting the panel will vary depending on the chosen installation. There are four 1/2" holes on the mounting bracket, all 10" apart from the centers of the adjacent holes. These match the holes in the top of the power unit. For wall, roof, or pole installations, use the proper anchor bolts rated for the specific composition and reference the diagrams below as guidelines for installation.

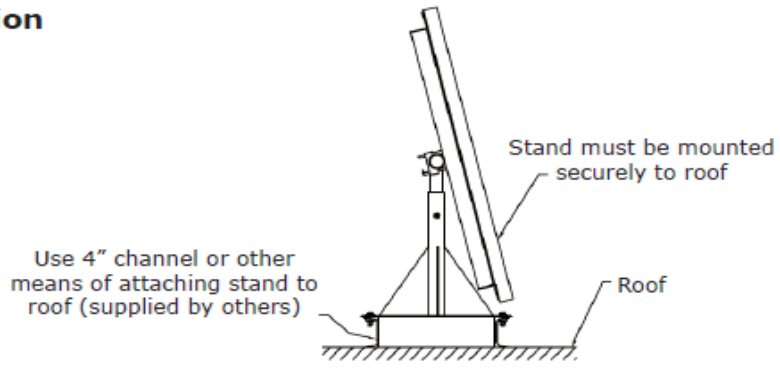
Pole Mount Installation



Wall Mount Installation



Roof Mount Installation



Connecting and Orienting the Solar Panel

After mounting the solar panel, connect the cord to the plug in on the power unit.

Orientation of the Solar Panel

In the northern hemisphere, it is best for the solar panels to face southward. In the southern hemisphere, it is best that they face northward. The best angle from the horizontal position will vary by season, but the following equation is given as a general example for winter tilt, which is about 10 degrees steeper than normal recommendations:

Site Latitude x (0.9) + 29 degrees = angle from horizontal position for best tilt.

The best angle for optimum solar insolation will have to be determined on site. Some factors that will prohibit optimum solar insolation are clouds, haze, trees, or any other opaque object obstructing sunlight from the solar panel. These factors are just as important in determining the best position and angle for the solar panel.

Latitude	Angle	% of Optimum
25° (Key West, Taipei)	51.5°	85%
30° (Houston, Cairo)	56°	86%
35° (Albuquerque, Tokyo)	60.5°	88%
40° (Denver, Madrid)	65°	89%
45°(Minneapolis, Malano)	69.5°	89%
50° (Winnipeg, Prague)	74°	93%

It is recommended that you independently research and assess your site for the best placement.