

# DIY Solar Energy System

## CSL LABORATORIES



### Overview:

A simple solar energy system is described below. Figure 1.1 shows the connection between different components of the system. [Figure 1.2](#) shows the connections inside the Breaker Panel. We chose a 24V DC to 120V AC inverter mainly because of the price point. We had to connect two 12V batteries in series to get the 24V. Similarly, we had to connect two 12 V solar panels in series to get the required 24V. The charge controller can automatically detect the input voltage from the solar panels which is 24V in our case. All the components are marked with their respective numbers in the parts list described in [Parts list section](#).

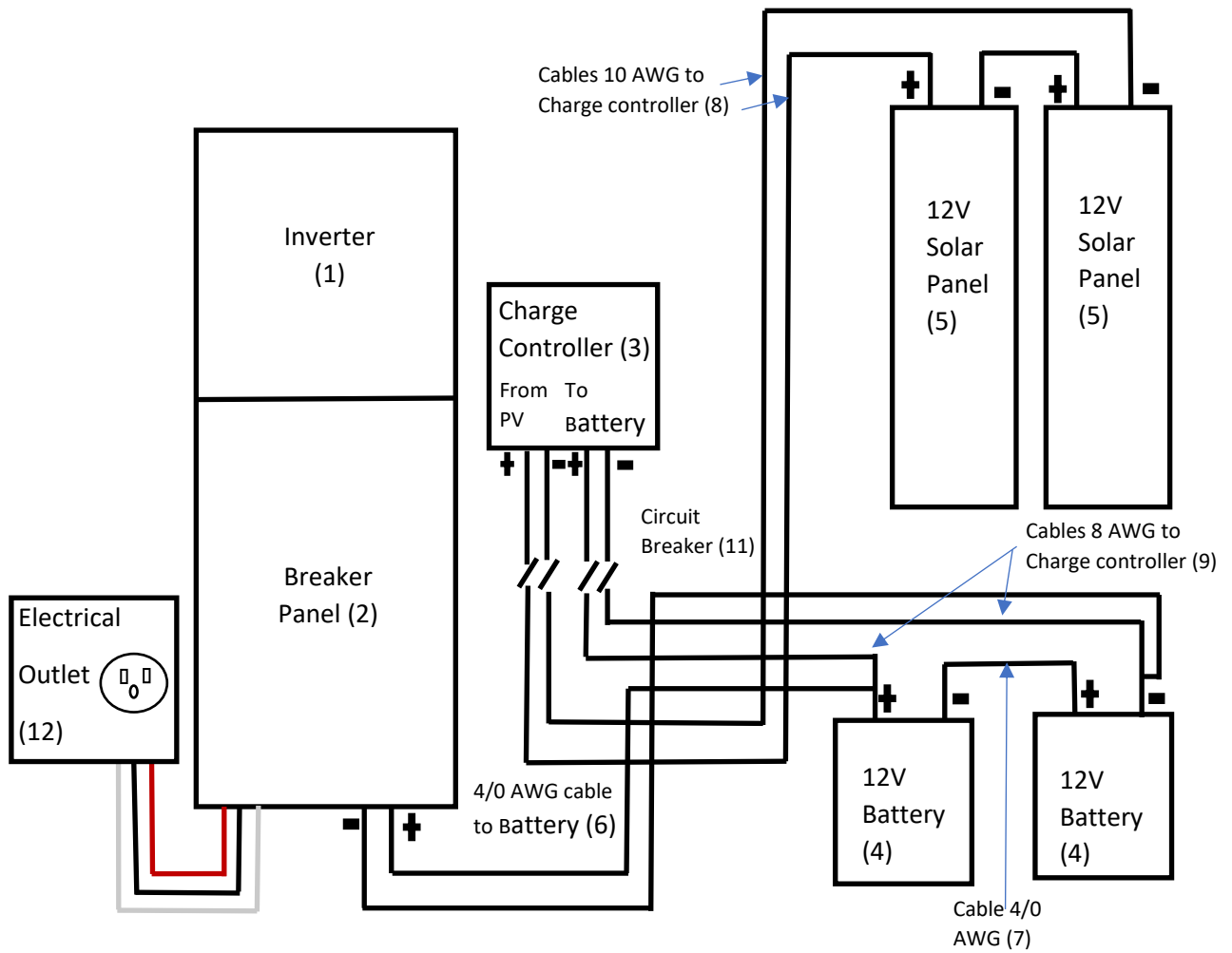


Figure: 1.1 Solar Energy System Circuit Diagram.

Breaker Panel wiring is explained in the Figure below:

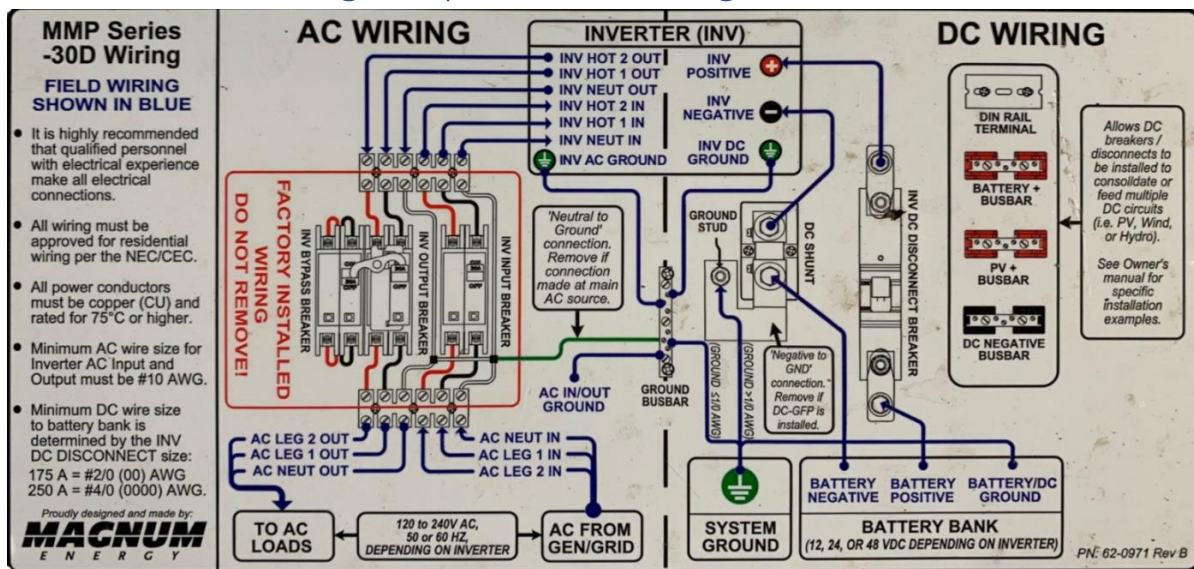


Figure: 1.2 Breaker Panel Wiring Diagram.

Parts list:

1. [Magnum MS4024 4000W 24V True-Sine Inverter/Charger](#)
2. [Magnum Energy MMP250-30D MMP-Series Mini Panel with 250A \(fits 12 VDC and 24 VDC models\) DC Breaker and 30A Dual Pole AC Input Breaker Fits one ME, RD, MS, MS-AE or MS-PAE](#)
3. [Renogy Rover 40 Amp 12V/24V DC Input MPPT Solar Charge Controller Auto Parameter Adjustable LCD Display Solar Panel Regulator fit for Gel Sealed Flooded and Lithium Battery](#)
4. [Renogy Deep Cycle Hybrid Gel 12 Volt 100Ah Battery](#) x 4
5. [Renogy 100 Watt 12 Volt Extremely Flexible Monocrystalline Solar Panel](#) x 4
6. [4/0 AWG Gauge Red + Black Pure Copper Battery Inverter Cables Solar, RV, Car, Boat 5 feet 3/8 in Lugs](#)
7. [4/0 AWG Gauge Red + Black Pure Copper Battery Inverter Cables Solar, RV, Car, Boat 12 in 3/8 in Lugs](#) X 2
8. [RENOGY 8ft. 8 AWG Wire Copper Tray Cable - Connect Charge Controller and Battery](#)
9. [WindyNation 8 AWG 8 Gauge 1 Pair 20 Feet Black + 20 Feet Red Solar Panel Extension Cable Wire Solar Connector](#)

10. [JHBOX Y Branch Connectors Solar Connectors Y Connector Solar Panel mounts](#)
11. [Canyita Low-Voltage DC Miniature Circuit Breaker, 250V DC 2P Circuit Breakers for Solar Panels Grid System\(3# 63A\) X 2](#)
12. [Siemens TL137US Talon Temporary Power Outlet Panel with a 20, 30, and 50-Amp Receptacle Installed, Unmetered](#)
13. [8 Gauge THHN Wire Stranded 4 Colors 25 FT Each THWN 600V Copper Cable AWG](#)
14. [2 Pieces DIN Rail Slotted Aluminum RoHS 12" Inches Long 35mm Wide 7.5mm High](#)