

SOLAR ELECTRIC SYSTEM

Contractor: Solar Direct

Job: Stuart Singer
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System Overview

Solar Electric System consisting of the following major components (see Typical Wiring Diagram):

SolarWorld Solar Module 30 @ 175W @ 24VDC Nominal #SW175mono
UniRac SolarMount Mounting System
Grid-Interactive Control Center w/
SMA DC Disconnect 600VDC, 30A, Nema3R
SMA Inverter #SB5000US w/Internal GFI protection
Square-D AC Disconnect 240VAC, 60A, Nema3R, Lockable Handle (or similar)

Description

The Solar PV Modules are mounted flush to the roof. Due to the complexity of this roof and the amount of valleys and cuts, this design aims for only one roof section but provides alternative locations on another roof section. The total number of modules will be 30, and any additional module displayed on the print is just a potential location and orientation for the solar module. The final location and orientation of the solar array will be determined by installer on the job site. The roof tilt angle is 22.5 degrees and the array is facing 28deg East of south. All the different mounting locations and orientations are designed for Roof Zone 3 @ Exposure Category B @ 120mph wind speeds,

The array is wired into 3 parallel strings of 10 series modules each with a maximum operating voltage of 358 VDC and a maximum operating current of 14.67A (under standard test conditions according to manufacturer - 35.8V x 10 modules - 4.89A x 3 strings). Outdoor NEMA rated UV resistant #10AWG XLP USE-2 "MC" cables are used to connect the modules into a series array, which terminate in a Nema4x Wet Pull Junction Box. The array wiring, #10AWG THWN-2/THHN, is routed via conduit to the Control Center and connected via DC disconnect. The Control Center contains disconnects and over-current devices for the PV array and the inverter.

The Control Center is fed by a 120VAC 60 – 70A circuit breaker in the Main Distribution box using #6AWG THHN wire. This circuit has an outdoor disconnect w/lockable handle to allow for disconnection to the grid power system.

All wiring and components are installed as per NEC Code.

Bonding Wire for Ground for Solar Array, Disconnect Box, Control Center and Breaker Box
Wire Size #8AWG

Distribution Panel Bonding Wire to Grounding Rod (existing)