

PHOTOVOLTAIC SYSTEMS

DAVENPORT, IOWA

PV WORKSHEET – STANDARD STRING ARRAY

Solar photovoltaic (PV) systems have widely gained acceptance as an alternative energy source and installations range from the small array supplying a bus stop luminaire to a large array that covers acres. Since each installation comes with its own characteristics this worksheet has been provided for the installer to complete and submit to his/her electrical inspector for obtaining a permit. The entire PV system installation must comply with Article 690 of the 2017 National Electrical Code (NEC).

To obtain a permit please provide the following documentation to Building Department:

1. Pages 2 and 3 of this document.
2. Signed & sealed letter from a structural engineer that states the roof can support the additional load of the panels & the wind uplift.
3. Equipment spec/cut sheets for grounding/bonding fittings, modules, inverters, micro inverters, or optimizers (if these are not available complete page 4 of this document)
4. A one-line diagram of the PV system including service interconnection
5. A site plan showing the relative location of the array and the PV equipment on the property. Also provide location of service and distance from array.
6. Roof structural components, Stick built _____ Trusses _____
7. Roof Covering Material (ex.shingles,steel,EPDM) _____ Layers _____

A PV installer is allowed to construct the support system, mount the modules, inverters or optimizers, and connect the factory provided module wiring harness (plug and play). The remainder of the installation such as panelboards,

raceways, boxes, fittings, breakers, and building wiring shall be installed by a

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PV SYSTEM INFORMATION

		TYPE OF ARRAY				
		Y	N	Y	N	
Roof Array?	<input type="checkbox"/>	<input type="checkbox"/>		Rapid Shutdown Required (690.12)?	<input type="checkbox"/>	<input type="checkbox"/>
Ground Array?	<input type="checkbox"/>	<input type="checkbox"/>		Guarding of Conductors Required (690.31A)?	<input type="checkbox"/>	<input type="checkbox"/>

PV SYSTEM OVERVIEW		
Maximum System Voltage		
#Modules/String		
#Strings in System		
Maximum Circuit Current		
Battery Storage?	Y	N

LOAD SIDE CONNECTION ¹	
Service Voltage	
Service Panel Main Breaker	
Service Panel Bus Rating	
Service Conductor Size	
PV System OCPD ² Rating	

CALCULATIONS:

MAXIMUM SYSTEM VOLTAGE – 690.7(A);

$$(Voc) \text{ (module label)} \times \text{Thermal Coefficient}^3 \times \# \text{ of modules/string} = V_{MAX}$$

MAXIMUM CIRCUIT CURRENT – 690.8(a)(1):

$$(Isc)(\text{module label}) \times (\text{Sum of the paralleled modules}) \times 125\% = I_{MAX}$$

OVERCURRENT DEVICE RATING – 690.9(B):

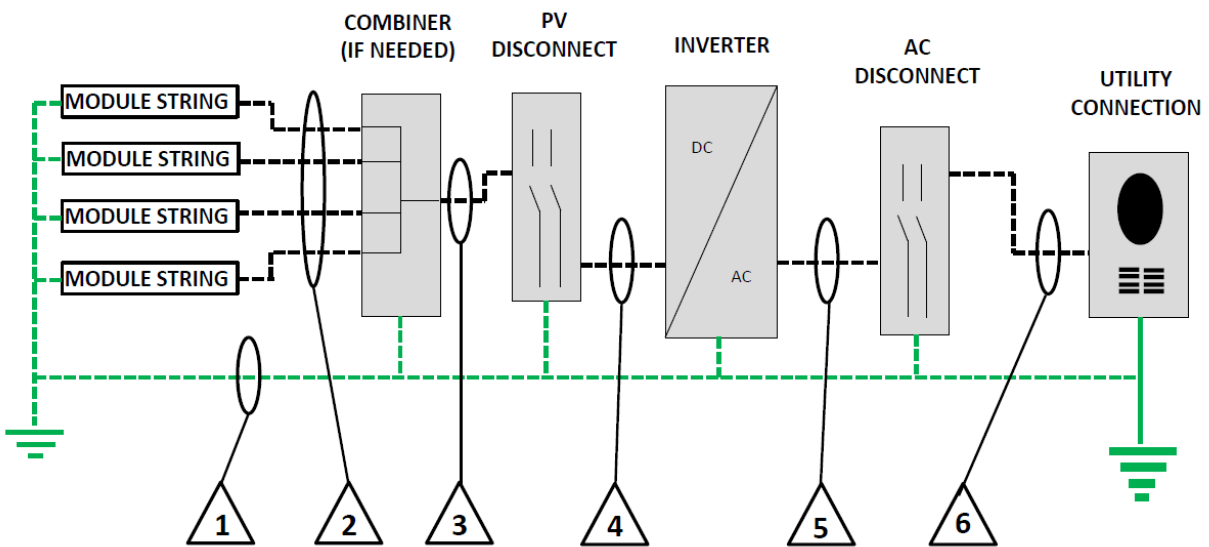
$$(I_{max}) \times 125\% = OCPD^2$$

¹Supply side connections may be allowed by your utility and shall comply with 705.12(A)

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CONDUCTOR AND RACEWAY SCHEDULE



△	Conductor Type	Conductor AWG	Conduit Type	Conduit Size
1	Copper Grounding Electrode Conductor Copper Equipment Grounding Conductor		NA	NA
2	PV Source Conductors Use -2 PV Wire		NA	NA
3	THWN-2 XHHW-2 RHW-2			
4	THWN-2 XHHW-2 RHW-2			
5	THWN-2 XHHW-2 RHW-2			

6	THWN-2 XHHW-2 RHW-2			
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