REVISED PER 2017 NEC REQUIREMENTS

REVISED PER 2011 NEC REQUIREMENTS

REVISED PER APS REQUIREMENTS

ABC PROJECT #1111-9999

BREAKER LOCATION PER NEC 705.12(B)(2)(3)(b).

OVERCURRENT DEVICE” AND LOCATE BREAKER AT OPPOSITE END OF BUS FROM MAIN.

INSTALL AS REQUIRED TO ENSURE PHOTOVOLTAIC SYSTEM UTILITY DISCONNECT SWITCH AND LABEL “WARNING INVERTER OUTPUT CONNECTION. DO NOT RELOCATE THIS CIRCUIT CURRENT PER NEC 690.53. SWITCH TO BE LOCKED.

LABEL “PHOTOVOLTAIC SYSTEM METER DISCONNECT SWITCH”. SWITCH COVER TO BE LOCKED AT ALL TIMES. SWITCH TO BE ACCESSIBLE PER UTILITY REQUIREMENTS, CONFORM TO NEC 705.22.

LABEL “PHOTOVOLTAIC SYSTEM UTILITY DISCONNECT SWITCH”. SWITCH COVER TO BE LOCKED AT ALL TIMES. SWITCH TO BE ACCESSIBLE PER UTILITY REQUIREMENTS, CONFORM TO NEC 705.22.

LABEL “PHOTOVOLTAIC SYSTEM DC DISCONNECT” PER NEC 690.13(B). LABEL WITH THE MAXIMUM DC OPERATING VOLTAGE PER NEC 690.54.

LABEL “PHOTOVOLTAIC SYSTEM METER DISCONNECT SWITCH”. SWITCH COVER TO BE LOCKED AT ALL TIMES. SWITCH TO BE ACCESSIBLE PER UTILITY REQUIREMENTS, CONFORM TO NEC 705.22.

LABEL “DEDICATED PHOTOVOLTAIC SYSTEM COMBINER PANEL” AND “DO NOT ADD LOADS OR MORE IN PARALLEL EACH SERIES STRING REQUIRES OVERCURRENT DEVICES. FOR STRING INVERTERS WITH THREE STRINGS

INVERTER (TYPICAL OF 4)

SPECIFY MAKE AND MODEL #: 3-POLE, 480 VAC, 400 AMP, 600 VAC

SPECIFY MAKE AND MODEL #: 3-POLE, 480/277V, 3 PHASE, 400 AMP, 600 VAC

SPECIFY MAKE AND MODEL #: 3-POLE, 480/277V, 3 PHASE, 400A, FORM 9S

METALLIC CONDUIT SHALL BE USED WITHIN BUILDING PER NEC 690.3(G)

LABEL “DEDICATED PHOTOVOLTAIC SYSTEM COMBINED PANEL” AND “DO NOT ADD LOADS TO THIS PANEL.

LABEL “PHOTOVOLTAIC SYSTEM METER DISCONNECT SWITCH”, SWITCH COVER TO BE LOCKED AT ALL TIMES. SWITCH TO BE VISUAL OPEN, ACCESSIBLE PER UTILITY REQUIREMENTS, CONFORM TO NEC 705.22.

LABEL “PHOTOVOLTAIC SYSTEM DC DISCONNECT” PER NEC 690.13(B). LABEL, WITH THE MAXIMUM AC OPERATING VOLTAGE, MAXIMUM SYSTEM VOLTAGE, AND SHORT CIRCUIT CURRENT PER NEC 690.33. SWITCH TO BE LOCKED. [SWITCH IS INTERNAL TO INVERTER]

LABEL “PHOTOVOLTAIC SYSTEM METER”. METER ENCLOSURE AND SOCKET PROVIDED AND INSTALLED BY CUSTOMER PER APS ESRM. METER, CTs and TEST SWITCHES PROVIDED BY UTILITY COMPANY WHEN REQUIRED. NOTE: CUSTOMER TO SUBMIT SHOP DRAWINGS OF METERING CABINET TO APS METERSHOP FOR APPROVAL.

PROVIDE WARNING SIGN PER NEC 690.13(B) READING “WARNING-ELECTRIC SHOCK HAZARD—DO NOT TOUCH TERMINALS ON BOTH LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION.”

LABEL "WARNING INVERTER OUTPUT CONNECTION” DO NOT RELOCATE THIS CIRCUIT CURRENT DEVICE” AND LOCATE BREAKER AT OPPOSITE END OF BUS FROM MAIN BREAKER LOCATION PER NEC 705.12(B)(2)(3)(b).

ALL EQUIPMENT SHALL BE INSTALLED AND Labeled IN ACCORDANCE WITH THE NEC AND ALL APPLICABLE REQUIREMENTS OF THE SERVING ELECTRIC UTILITY COMPANY AND OF THE LOCAL AUTHORITY HAVING JURISDICTION.

CT-RATED B-DIRECTIONAL UTILITY METER INSTALLED BY UTILITY COMPANY.

LABEL BREAKER “PHOTOVOLTAIC ELECTRIC POWER SOURCE” PER NEC 705.12(B)(3), AND BREAKERS ARE SUITABLE FOR BACKFEED PER NEC 705.12(B)(3), LABEL WITH THE MAXIMUM AC OPERATING VOLTAGE CURRENT AND THE OPERATING VOLTAGE PER NEC 690.54.

LABEL "PHOTOVOLTAIC SYSTEM UTILITY DISCONNECT SWITCH”, SWITCH COVER TO BE LOCKED AT ALL TIMES. SWITCH TO BE VISUAL OPEN, ACCESSIBLE PER UTILITY REQUIREMENTS, CONFORM TO NEC 705.22, AND RATED FOR THE AVAILABLE FAULT CURRENT.

BREAKER WITH GROUND FAULT PROTECTION HAS BEEN IDENTIFIED AND LISTED AS SUITABLE FOR BACKFEED PER NEC 705.22.

IF DC FUSES ARE ADDED, LABEL: “WARNING, DO NOT OPEN FUSES UNDER LOAD.”

THE STRING INVERTERS DEPICTED HAVE A MAXIMUM OF TWO STRINGS PER MPPT; THEREFORE, THE STRINGS DO NOT REQUIRE OVERCURRENT DEVICES. FOR STRING INVERTERS WITH THREE STRINGS OR MORE IN PARALLEL EACH SERIES STRING REQUIRES OVERCURRENT DEVICES.

LABEL "BREAKER HAS BEEN DE-RATED TO 1500A PER NEC 705.12(B)(2)(3)(b)."

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LABEL "BREAKER HAS BEEN DE-RATED TO 1500A PER NEC 705.12(B)(2)(3)(b)."

LABEL "DEDICATED PHOTOVOLTAIC SYSTEM METER DISCONNECT SWITCH”. SWITCH COVER TO BE LOCKED AT ALL TIMES AND COMPLY WITH NEC 705.22.

NOTE: SOME INVERTERS DO NOT HAVE A MPPT FUNCTION AT THE MODULE LEVEL. THROUGH THE DC TO DC RELEAVER.

AFCI UL 1699B NEC 690.11

GFCI UL 1741 NEC 690.41

DATA

DATE

ABC SOLAR COMPANY INC.

THREE-LINE ELECTRICAL DIAGRAM

200 KW AC PHOTOVOLTAIC SYSTEM

999 N. CATUS BIRD RD.

ANY CITY, AZ 85123

SAMPLE LOAD SIDE CONNECTION 3-LINE DIAGRAM

ABC PROJECT #1111-9999

REV. D

PAGE: 1

Per 480V, 3 Phase, 4 wire.

Per 480V, 3 Phase, 4 wire.
REV. DESCRIPTION
08-18-10 THREE-LINE ELECTRICAL ARRAY DIAGRAM
200 KW AC PHOTOVOLTAIC SYSTEM
999 N. CACTUS BIRD RD.
ANY CITY, AZ 85123
DRAWN ABC PROJECT #1111-9999
ENGINEER
CHECKED
REV. C
APPROVALS
SCALE NA
SIZE B
09-10-10

REVISED PER 2017 NEC REQUIREMENTS
259,200 WATTS
Voc = 896.4 VDC, Isc = 372.96 AMPS
Vmp = 750.6 VDC, Imp = 345.6 AMPS
7,200 WATTS
18 MODULES IN SERIES PER STRING
Voc=896.4 VDC, Isc=10.36 AMPS
Vmp=750.6 VDC, Imp=9.6 AMPS
TYPICAL OF 36 STRINGS
(9 STRINGS PER INVERTER)

PV STRING OF 18 MODULES (TYPICAL OF 9)

PV STRING OF 18 MODULES (TYPICAL OF 9)

NOTES:
1. EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE NEC AND ALL APPLICABLE
   REQUIREMENTS OF THE LOCAL AUTHORITY HAVING JURISDICTION.
2. FOLLOW MANUFACTURERS SUGGESTED INSTALLATION PRACTICES AND WIRING SPECIFICATIONS.
3. WIRES SHALL BE RATED AND LABELED "SUNLIGHT RESISTANT" WHERE EXPOSED TO AMBIENT
   CONDITIONS.

This Sample Drawing is for illustration purposes only and is not to be used for design or
construction. This drawing and its suitability for end use is not implied. The intent is to only
illustrate typical minimum information required at time of application to APS. Additional
information may be required.

1204 South Main Street
Any City, Arizona 85123
Tel: 602-555-5555

ABC SOLAR COMPANY INC.
THREE-LINE ELECTRICAL ARRAY DIAGRAM
200 KW AC PHOTOVOLTAIC SYSTEM
999 N. CACTUS BIRD RD.
ANY CITY, AZ 85123

SAMPLE LOAD SIDE CONNECTION ARRAY DRAWING

ABC PROJECT #1111-9999
REV. C
SHEET 3 OF 5

TS4-F FIRE SAFETY RAPID
SHUTDOWN RECEIVERS

50KW INVERTER #1
STRINGS 1-9

50KW INVERTER #2
STRINGS 10-18

50KW INVERTER #3
STRINGS 19-27

50KW INVERTER #4
STRINGS 28-36

Continuous Conductor to Strings
(Up to 4 strings)

#10 CU XLPE GROUND

Continuous Conductor to Strings
(Up to 4 strings)

#10 CU XLPE GROUND

WIRING TO STRINGS 19-36
IDENTICAL TO SHOWN ON
THIS PAGE

Rapid Shutdown Transmitter and Receiver Components shall be listed or field
labeled as an assembly in accordance with
2017 NEC 690.12

Rapid Shutdown
Transmitter and
Receiver Components
shall be listed or field
labeled as an assembly in
accordance with
2017 NEC 690.12

#10 CU XLPE GROUND

WIRING TO STRINGS 19-36
IDENTICAL TO SHOWN ON
THIS PAGE

Continuous Conductor to Strings
(Up to 4 strings)

#10 CU XLPE GROUND

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NOTE: UTILITY HAS 24-HR UNRESTRICTED ACCESS TO THE PHOTOVOLTAIC SYSTEM METER AND PHOTOVOLTAIC SYSTEM UTILITY DISCONNECT SWITCH THROUGH THE SECURITY GATE

PHOTOVOLTAIC PANEL ARRAY MOUNTED ON FLAT ROOFTOP

DEDICATED PHOTOVOLTAIC SYSTEM COMBINER PANEL

PHOTOVOLTAIC SYSTEM METER DISCONNECT SWITCH

FOUR 50 KW INVERTERS

PLACARD INSTALLED AT MAIN BREAKER WITH EXPLICIT DIRECTIONS TO THE PHOTOVOLTAIC SYSTEM UTILITY DISCONNECT SWITCH AND PHOTOVOLTAIC SYSTEM METER

APS PROVIDED LOCK BOX

ELECTRICAL SERVICE ENTRANCE AND UTILITY REVENUE METER

NOTE: UTILITY HAS 24-HR UNRESTRICTED ACCESS TO THE PHOTOVOLTAIC SYSTEM METER AND PHOTOVOLTAIC SYSTEM UTILITY DISCONNECT SWITCH THROUGH THE SECURITY GATE

DRIVEWAY WITH GATE & KEY
CODE SECURITY IN APS PROVIDED LOCKBOX

ACCESS CODE: 12345#