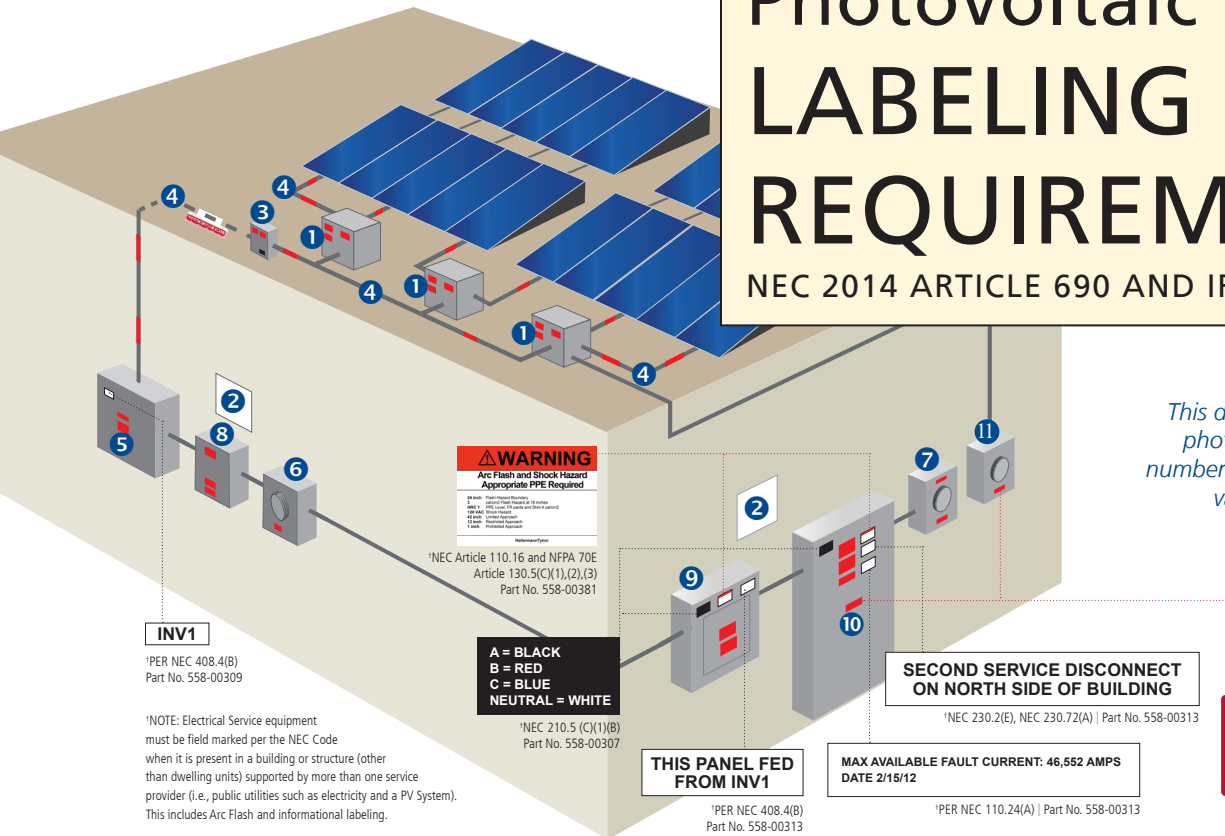


Photovoltaic System LABELING REQUIREMENTS

NEC 2014 ARTICLE 690 AND IFC 2012



This diagram is an illustration of one photovoltaic labeling scenario. The number and type of labels needed will vary based on the project scope and its related specifications. Check with AHJ for local requirements.

INV1

*PER NEC 408.4(B) Part No. 558-00309

*NOTE: Electrical Service equipment must be field marked per the NEC Code when it is present in a building or structure (other than dwelling units) supported by more than one service provider (i.e., public utilities such as electricity and a PV System). This includes Arc Flash and informational labeling.

WARNING
Arc Flash and Shock Hazard
Appropriate PPE Required

*NEC Article 110.16 and NFPA 70E Article 130.5(C)(1),(2),(3) Part No. 558-00381

A = BLACK
B = RED
C = BLUE
NEUTRAL = WHITE

*NEC 210.5 (C)(1)(B) Part No. 558-00307

THIS PANEL FED FROM INV1

*PER NEC 408.4(B) Part No. 558-00313

SECOND SERVICE DISCONNECT ON NORTH SIDE OF BUILDING

*NEC 230.2(E), NEC 230.72(A) | Part No. 558-00313

MAX AVAILABLE FAULT CURRENT: 46,552 AMPS
DATE 2/15/12

*PER NEC 110.24(A) | Part No. 558-00313

PHOTOVOLTAIC SYSTEM EQUIPPED WITH RAPID SHUTDOWN

*NEC Article 690.56(C) | Part No. 596-00474
Reflective Material Required.

1 Combiner Box, Circuits / Conduit Combiner Box / Enclosures / EMT Enclosures

WARNING
ELECTRICAL SHOCK HAZARD
DO NOT TOUCH TERMINALS
TERMINALS ON BOTH LINE AND
LOAD SIDES MAY BE ENERGIZED
IN THE OPEN POSITION

NEC 690.17(E) | Part No. 596-00497

WARNING
ELECTRICAL SHOCK HAZARD
THE DC CONDUCTORS OF THIS
PHOTOVOLTAIC SYSTEM ARE UNGROUNDED
AND MAY BE ENERGIZED

NEC 690.35(F) | Part No. 596-00588

WARNING
TURN OFF PHOTOVOLTAIC
AC DISCONNECT PRIOR TO
WORKING INSIDE PANEL

NEC 110.27(C) & OSHA 1910.145(i)(7) Part No. 596-00499

2 Building / Structure

CAUTION
POWER TO THE SERVICE IS ALSO SUPPLIED
FROM THE FOLLOWING SOURCES WITH
DISCONNECTS LOCATED AS SHOWN

NEC 690.56(B) | Part No. 558-00350

3 DC Disconnect / Breaker / Recombiner Box

WARNING
ELECTRICAL SHOCK HAZARD
THE DC CONDUCTORS OF THIS
PHOTOVOLTAIC SYSTEM ARE UNGROUNDED
AND MAY BE ENERGIZED

NEC 690.35(F) | Part No. 596-00588

WARNING
ELECTRICAL SHOCK HAZARD
DO NOT TOUCH TERMINALS
TERMINALS ON BOTH LINE AND
LOAD SIDES MAY BE ENERGIZED
IN THE OPEN POSITION
DC VOLTAGE IS ALWAYS PRESENT
WHEN SOLAR MODULES
ARE EXPOSED TO SUNLIGHT

NEC 690.17(E) | Part No. 596-00496

RATED AC OPERATING CURRENT
MAX RATED AC OPERATING CURRENT
RATED AC OPERATING VOLTAGE
MAX RATED AC OPERATING VOLTAGE
RATED SHORT CIRCUIT CURRENT
MAXIMUM SYSTEM VOLTAGE

FOR MARKING DC BACKUP SYSTEMS | Part No. 596-00240

PHOTOVOLTAIC
DC DISCONNECT

IFC 605.11.3, NEC 690.15 & NEC 690.13(B) Part No. 596-00238

PHOTOVOLTAIC SYSTEM
DC DISCONNECT

OPERATING CURRENT: _____
OPERATING VOLTAGE: _____
MAXIMUM SYSTEM VOLTAGE: _____
SHORT CIRCUIT CURRENT: _____

NEC 690.53 | Part No. 596-00241

RATED MAX POWER-POINT CURRENT
RATED MAX POWER-POINT VOLTAGE
MAXIMUM SYSTEM VOLTAGE
MAXIMUM CIRCUIT CURRENT
MAX RATED OUTPUT CURRENT OF
THE CHARGE CONTROLLER IF INSTALLED

NEC 690.53 | Part No. 596-00253

4 EMT / Conduit Raceways

* (Reflective Material Required)

**WARNING: PHOTOVOLTAIC
POWER SOURCE**

NEC 690.31(G)(3)(4) | Part No. 596-00206

WARNING
PHOTOVOLTAIC POWER SOURCE
DO NOT REMOVE UNLESS REPLACED IN EXACT LOCATION - PV POWER CIRCUIT DIRECTLY BELOW

NEC 690.31(G)(1) | Part No. 596-00257

5 Inverter

WARNING
ELECTRICAL SHOCK HAZARD
IF A GROUND FAULT IS INDICATED
NORMALLY GROUNDED CONDUCTORS
MAY BE UNGROUNDED AND ENERGIZED

NEC 690.5(C) | Part No. 596-00498

WARNING
BIPOLAR PHOTOVOLTAIC ARRAY.
DISCONNECTION OF NEUTRAL
OR GROUNDED CONDUCTORS
MAY RESULT IN OVERVOLTAGE
ON ARRAY OR INVERTER

NEC 690.31(I) | Part No. 596-00590

PHOTOVOLTAIC AC DISCONNECT
MAXIMUM AC OPERATING CURRENT: _____
NOMINAL OPERATING AC VOLTAGE: _____

NEC 690.54 | Part No. 596-00239

6 Production / Net Meter

WARNING
ELECTRICAL SHOCK HAZARD
IF A GROUND FAULT IS INDICATED
NORMALLY GROUNDED CONDUCTORS
MAY BE UNGROUNDED AND ENERGIZED

NEC 690.5(C) | Part No. 596-00498

7 Production / Net Meter (Bi-directional)

**CAUTION: SOLAR ELECTRIC
SYSTEM CONNECTED**

NEC 690.15 & NEC 690.13(B) | Part No. 596-00613

WARNING DUAL POWER SOURCE
SECOND SOURCE IS PHOTOVOLTAIC SYSTEM

NEC 705.12(D)(3) & NEC 690.64 | Part No. 596-00495

8 AC Disconnect / Breaker / Points of Connection

PHOTOVOLTAIC
AC DISCONNECT

IFC 605.11.3, NEC 690.15, NEC 690.13(B) Part No. 596-00237

WARNING
ELECTRICAL SHOCK HAZARD
DO NOT TOUCH TERMINALS
TERMINALS ON BOTH LINE AND
LOAD SIDES MAY BE ENERGIZED
IN THE OPEN POSITION

NEC 690.17(E) | Part No. 596-00497

NOMINAL OPERATING AC VOLTAGE
NOMINAL OPERATING AC FREQUENCY
MAXIMUM AC POWER
MAXIMUM AC CURRENT
MAX OVERCURRENT DEVICE RATING
FOR AC MODULE PROTECTION

NEC 690.52 | Part No. 596-00252

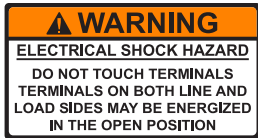
PHOTOVOLTAIC AC DISCONNECT
MAXIMUM AC OPERATING CURRENT: _____
NOMINAL OPERATING AC VOLTAGE: _____

NEC 690.13(B) | Part No. 596-00239

9 Breaker Panel / Pull Boxes



NEC 690.5(C) | Part No. 596-00498



NEC 690.17(E) | Part No. 596-00497



NEC 110.27(C) & OSHA 1910.145(f)(7) | Part No. 596-00499



NEC 705.12(D)(3) & NEC 690.64 | Part No. 596-00495

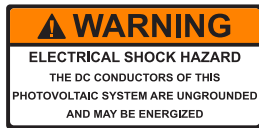


NEC 705.12 (D)(2)(3b) | Part No. 596-00589



NEC 705.12(D)(3-4) & NEC 690.64 | Part No. 596-00587

10 Main Service Disconnect



NEC 690.35(F) | Part No. 596-00588



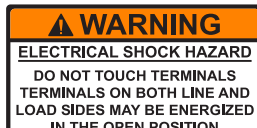
NEC 690.10(C) | Part No. 596-00591



NEC 690.33(E)(2) | Part No. 596-00244



NEC 690.54 | Part No. 596-00239



NEC 690.17(E) | Part No. 596-00497



NEC 110.27(C) & OSHA 1910.145(f)(7) | Part No. 596-00499



NEC 690.15 & NEC 690.13(B) | Part No. 596-00243



NEC 690.15 & NEC 690.13(B) | Part No. 596-00613

11 Main Service Disconnect



NEC 690.15 & NEC 690.13(B) | Part No. 596-00243

Adhesive Fastened Signs

ANSI Z535.4 – 2011 Product safety signs and labels, provides guidelines for the design and durability of safety signs and labels for application to electrical equipment. **NEC 110.21(B)(1)**

The label shall be suitable for the environment where it is installed. **NEC 110.21(B)(3)**

Where required elsewhere in this code and field applied labels, warning(s) and marking shall comply with ANSI Z535.4. **NEC 110.21(B) FIELD MARKING**

Adhesive fastened signs may be acceptable if properly adhered. Vinyl signs shall be weather resistant. **IFC 605.11.1.3**

Requirements for Electrical Installations (Field Marking)

NEC 110.16 Electrical equipment that are in other than dwelling units shall be field marked to warn qualified persons of a potential Arc Flash hazard.

NEC 110.24(A) Service equipment in other than dwelling units shall be legibly field marked with the available fault current.

NEC 110.27(C) Entrances to rooms or other guarded locations that contain exposed live parts shall be marked with conspicuous warning signs forbidding unqualified persons to enter.

NEC 230.2(E) Where a building or structure is supported by more than one service, add a plaque to denote all other services.

NEC 210.5(C)(1)(B) Branch Circuits: The identification methods used for conductors originating within each branch circuit shall be documented in a manner that is readily available or shall be permanently posted at each branch-circuit panelboard or distribution equipment.

NEC 408.4(B) All switchboards and panelboards supplied by a feeder in other than one or two family

dwellings shall be marked to indicate the device or equipment where the power supply(s) originates.

NEC 705.12(D)(2)(3b) Where two sources, one a utility and the other an inverter, are located at opposite ends of a busbar that contains loads, a permanent warning label shall be applied to the distribution equipment adjacent to the back-fed breaker from the inverter that displays the following or equivalent wording.

NEC 705.12(D)(3-4) Equipment containing overcurrent devices in circuits supplying power to a busbar or conductor supplied from multiple sources shall be marked to indicate the presence of all sources.

NFPA 2012 130.5(C) Same as NEC 110.16 but includes additional label information that is required after 9/30/2011. Check latest 2012 NFPA Arc Flash requirements.

OSHA 1910.145(F)(7) Warning tags are used to represent a hazard level between "Caution" and "Danger".

Labeling Requirements for Article 690

NEC 690.13(B) Each photovoltaic system disconnecting means shall be permanently marked to identify it as a photovoltaic system disconnect.

NEC 690.15, IFC 605.11.3 If the equipment is energized from more than one source, the disconnecting means must be grouped and identified.

NEC 690.16(B) Non-load break rated disconnect means shall be marked.

NEC 690.17(E) Where all terminals of the disconnecting means may be energized in the open position, a warning label shall be mounted on or adjacent to the disconnecting means.

NEC 690.31(B) Identification and Grouping Photovoltaic system conductors shall be identified and grouped. The means of identification shall be permitted by separate color coding, marking tape, tagging or other approved means.

NEC 690.31(G)(3)(4), IFC 605.11.1.2 Labels shall appear at every section of the wiring system that is separated by enclosures, walls, partitions, ceilings or floors. Spacing between labels not to exceed 10 feet (3M).

NEC 690.33(E)(2) Interruption current - be a type that requires the use of a tool to open will be marked "Do Not Disconnect Under Load".

NEC 690.35(F) A PV power source shall be labeled at each junction box, combiner box or disconnect, and device where energized, ungrounded circuits may be exposed during service.

NEC 690.31(G)(1) Where circuits are embedded in build up, laminate or membrane roofing materials not covered by PV modules and associated equipment, the location of the circuits shall be clearly marked.

NEC 690.31(I) Bipolar photovoltaic systems shall be clearly marked with a permanent, legible warning notice indicating that the disconnection of the grounded conductor(s) may result in overvoltage on the equipment.

NEC 690.5(C) A label shall appear on the utility interactive inverter or be applied by the installer near the ground fault indicator at a visible location.

NEC 690.52 AC modules shall be marked with identification terminals or leads with the ratings as shown on the label.

NEC 690.53 A permanent label for the direct-current PV power source shall be provided by the installer at the PV disconnecting means.

NEC 690.54 All interactive system points of interconnection with other sources shall be marked at an accessible location at the disconnecting means as the power source and with the rated AC output current and the nominal operating AC voltage.

NEC 690.55 PV power systems employing energy storage shall also be marked with the maximum operating voltage, including any equalization voltage and polarity of the grounded circuit conductor.

NEC 690.56(C) Each Rapid Shutdown Switch shall be permanently marked to identify it as a Photovoltaic Rapid Shutdown. The sign or placard shall be marked as "PHOTOVOLTAIC SYSTEM EQUIPPED WITH RAPID SHUTDOWN" using white letters that are 3/8" tall on a red background and shall be reflective.

NEC 690.64 Points of connection shall be in accordance with NEC 705.12.