



ADAMS-COLUMBIA ELECTRIC COOPERATIVE DISTRIBUTED GENERATION GUIDELINES

INTRODUCTION:

These are Adams-Columbia Electric Cooperatives Distributed Generation guidelines for installing distributed or member-owned generation interconnected in parallel and operating with Adams-Columbia's electric distribution system.

For all Distributed Generation (DG) installations, please contact:

Jeremy Huhnstock – Key Accounts Coordinator

jhuhnstock@acecwi.com

Office: (608)339-5428

Members may also visit:

[Connecting Solar/Wind Systems - Adams-Columbia Electric Cooperative \(acecwi.com\)](http://www.acecwi.com)

PERMISSION TO INTERCONNECT

DG interconnection may be an option for single or three phase members. Characteristics of Adams-Columbia's electrical system may vary by circuit. Not every size, voltage, or type of generation can be interconnected at every location.

The member shall supply Adams-Columbia with the required drawings and application for the proposed DG prior to installation. Adams-Columbia may specify and/or require certain protective schemes based on the size, location, or other factors of the proposed generation unit.

MEMBER RESPONSIBILITIES:

You and your installer are responsible for coordination of design, installation, operation, and maintenance of any generation system you install, and for conforming to the requirements of our rules and regulations, and applicable governmental laws and regulations (local, state, and federal).

These requirements are designed to protect distribution system facilities; avoid electrical interference problems; ensure the safety of members, electric provider employees and the general public; and maintain overall system reliability.

You are required by law to maintain liability insurance (equal to or greater than the amounts indicated in Wisconsin PSC 119). You are required to notify us if a material modification is made to your generation facility at any time during or after the installation process. A material modification is any modification that changes the maximum electrical output of your facility or changes the interconnection equipment, including:

- Changing from certified to non-certified devices
- Replacing a component with a component of different functionality or UL listing

You also are responsible for the proper installation, operation, and maintenance of the specified protective devices. Finally, you shall obtain, at your expense, any and all authorizations, permits and licenses required for the construction and operation of your generating facilities.

TECHNICAL INFORMATION

Please see [Connecting Solar/Wind Systems - Adams-Columbia Electric Cooperative \(acecwi.com\)](http://www.acecwi.com) for all application, agreements, and other additional resources.

ADDITIONAL GUIDELINES



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- Wisconsin State Legislature (Wisconsin Administrative Code)
 - o Chapter PSC 119 – Rules for Interconnecting Distributed Generation Facilities

METERING EQUIPMENT

1. A bi-directional meter is required at all DG facilities to properly meter forward & reverse power flow. This may require a site visit by Adams-Columbia metering personnel.
2. Metering equipment may require replacement to accommodate DG metering. Such as, but not limited to:
 - A. Round-ring Sockets
 - B. Rusted or damaged sockets or cabinets
 - C. Sockets or cabinets with inadequate internal or external clearances
3. Modifying or installing lugs in a meter socket, pedestal, or metering transformer cabinet other than what is listed on the manufacturer's drawing associated with the UL Listing is not possible.
4. Metering equipment shall be accessible to Adams-Columbia personnel. Accessible means the metering equipment must be capable of being accessed for programming, reading, probing, inspection, and service without climbing, removing obstacles, utilizing ladders, entering locked areas, etc. Metering equipment that is not readily accessible will be required to be made accessible by the member before interconnection of DG will be allowed.

ADAMS-COLUMBIA DISTRIBUTION SYSTEM

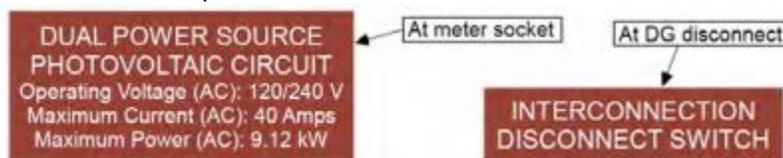
All modifications and additions to Adams-Columbia's electrical distribution system in order to accommodate distributed generation facilities will be at the member's expense.

OPTIONAL STANDBY GENERATOR USED WITH DG

Where a member operates both distributed generation and an optional generator, the standby generator must be installed with the connection and transfer switch requirements.

LABELING REQUIREMENTS

1. It is the responsibility of the member to comply with any and all labels required by the NEC or other jurisdiction codes and requirements.
2. Member shall provide and install a "Dual Power Source" label at the meter socket indicating the operating voltage, maximum current and maximum power of the solar PV system that is installed. Member shall provide an "Interconnection Disconnect Switch" label at the DG disconnect. Example labels are shown below:



3. Permanent labeling is required; Labeling shall be rigid engraved plastic, engraved self-sticking brass, or engraved self-sticking aluminum.
4. Labeling shall use a minimum of ¼ inch block lettering.

INTERCONNECTION

1. Preferred Methods
 - a. DG connected via properly sized sub-breaker downstream from the main in the service panel.
2. Not Permitted when connecting DG



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- a. Splices
- b. Split Bolts
- c. Tap Connectors
- d. Insulation Piercing Connectors
- e. Installing more cables than lugs are designed to handle.
- f. Modifying or installing lugs in a meter socket, pedestal other than what is listed on the manufacturers drawing associated with the UL Listing.
- g. Any other modifications to meter sockets.

INTERCONNECTION DISCONNECT SWITCH REQUIREMENTS

1. A device capable of disconnecting DG facilities from the electrical distribution system shall be installed at every DG site within 10 ft of the utility electric meter on residential or single building structures. Disconnection device shall be located in an accessible location. If the disconnection device cannot be located within 10 ft of the utility electric meter, a permanent placard shall be installed on the meter socket indicating the location of the interconnection disconnect switch and distance in feet from the meter to the disconnection device.
2. Disconnection device shall be mounted at a height between 30 and 72 inches.
3. Disconnection device shall open with a visual break, be able to be locked open, be capable of disconnecting and de-energizing distributed generation and shall conform to technical guidelines and state requirements.
4. The disconnection device should disconnect the DG only and should not disconnect any load.
5. The DG facility shall only be interconnected with a single metered service.
 - a. This means the member is not allowed to feed DG from one building's electrical system into another building's electrical system when the two buildings are separately metered.
6. Remote buildings fed from main service panel or sub-panel.
 - a. For facilities with multiple buildings where the DG is installed on a remote building, a permanent placard shall be installed on the meter socket indicating the location of the interconnection disconnect switch and distance in feet from the meter to the disconnection device.
 - b. Main disconnection device for remote building may be used as the disconnection device at the meter. However, a separate DG only disconnect is recommended on the exterior of the remote building at the DG location.

BATTERY ENERGY STORAGE SYSTEMS

1. Battery energy storage systems shall use UL 1741 utility-interactive inverters and a UL 1008 or similar approved isolation device.
2. ACEC evaluates DG sites by the kW AC nameplate capacity. So, if the solar + storage is DC coupled, they share an inverter, we would evaluate the facility on that inverter. If they are AC coupled, they have separate inverters (one for solar, one for energy storage system (ESS)) and we would evaluate on the combined nameplate of each inverter, see example below. Solar + storage have numerous operating modes/functions that can limit potential adverse impacts which should be evaluated; however, the overall system size is driven by the AC nameplate ratings.

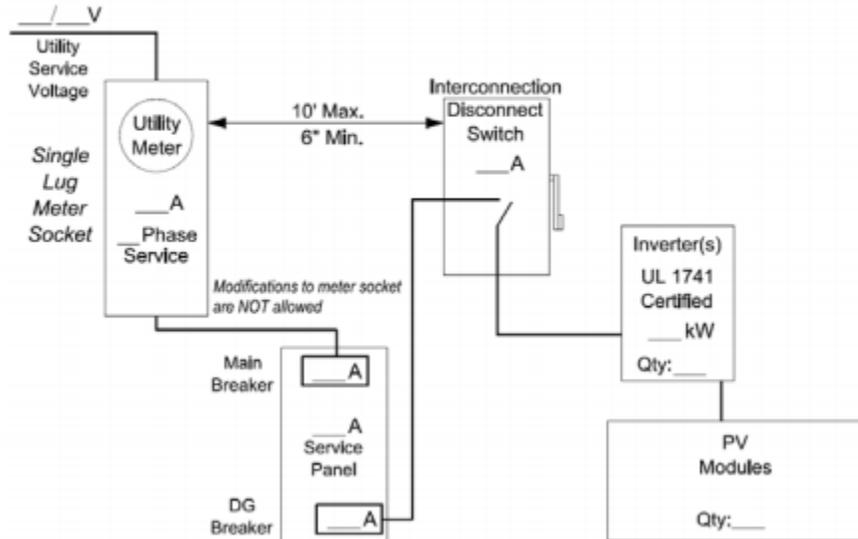
Example:

- DC Coupled = 15kW DC solar + 10kW DC ESS that share a 15kW AC inverter, we would view as a 15 kW AC nameplate capacity
- AC Coupled = 15kW DC solar + 10kW DC ESS, solar has a 15kW AC inverter and ESS has 10 kW AC inverter, we would view as a 25kW AC nameplate capacity

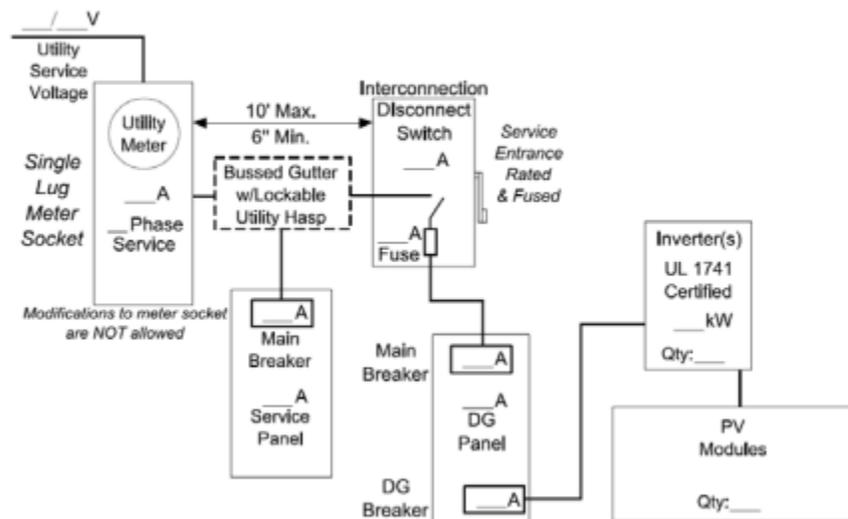


APPROVED DISTRIBUTED GENERATION DIAGRAMS

**1-PHASE/3-PHASE, SELF-CONTAINED, SINGLE LUG
MAIN + DG BREAKER \leq 120% OF SERVICE PANEL BUS RATING**



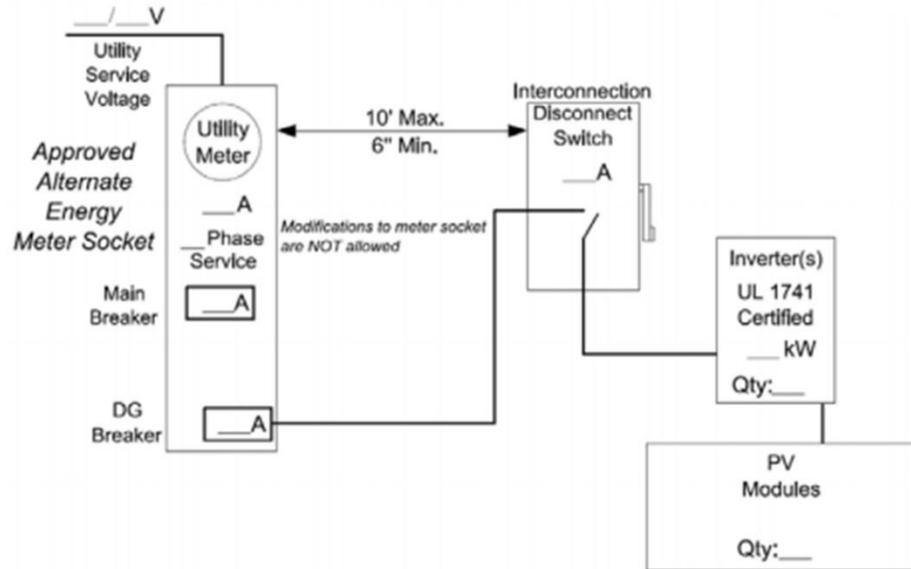
**1-PHASE/3-PHASE, SELF-CONTAINED, SINGLE LUG
MAIN + DG BREAKER $>$ 120% OF SERVICE PANEL BUS RATING**



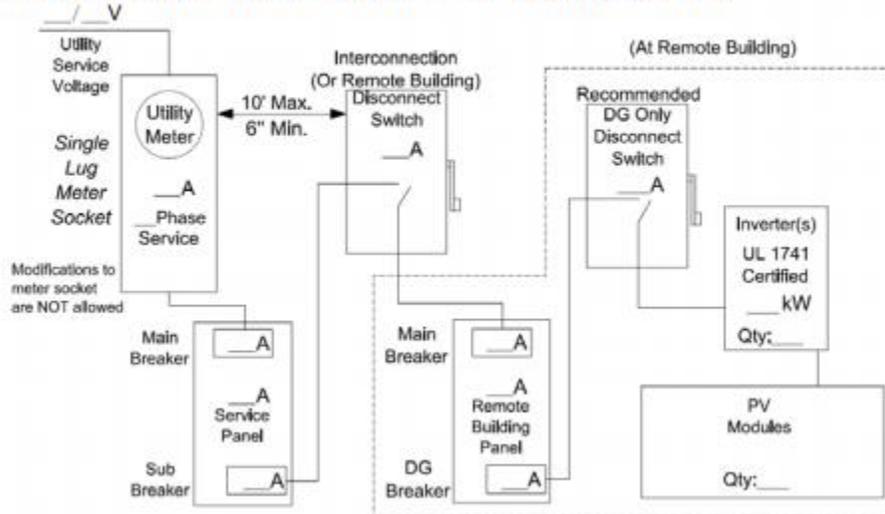
ESR512.dgn



1-PHASE/3-PHASE, SELF-CONTAINED, APPROVED ALTERNATE ENERGY METER SOCKET, 200 AMP MAIN, 60-70 AMP DG BREAKER

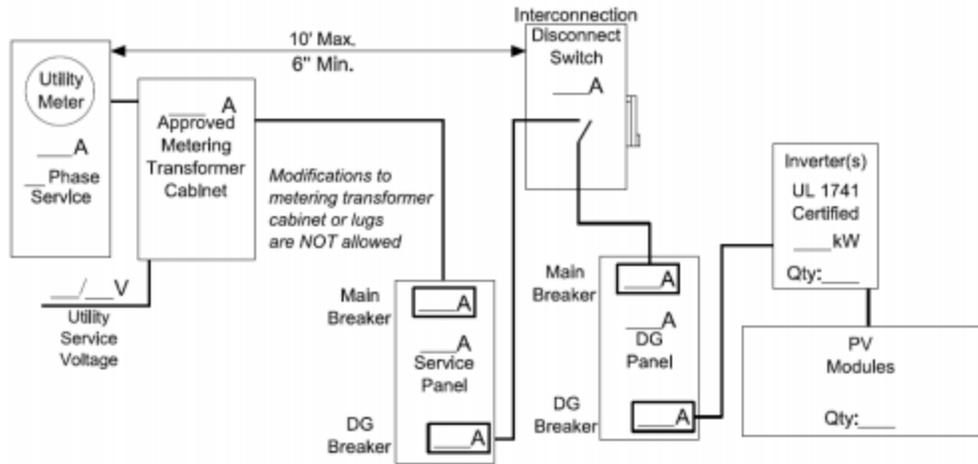


**1-PHASE/3-PHASE, SELF-CONTAINED, SINGLE LUG MAIN+DG/REMOTE BUILDING ≤ 120% OF SERVICE PANEL BUS RATING
REMOTE BUILDING WITH DG > 30' FROM METER**

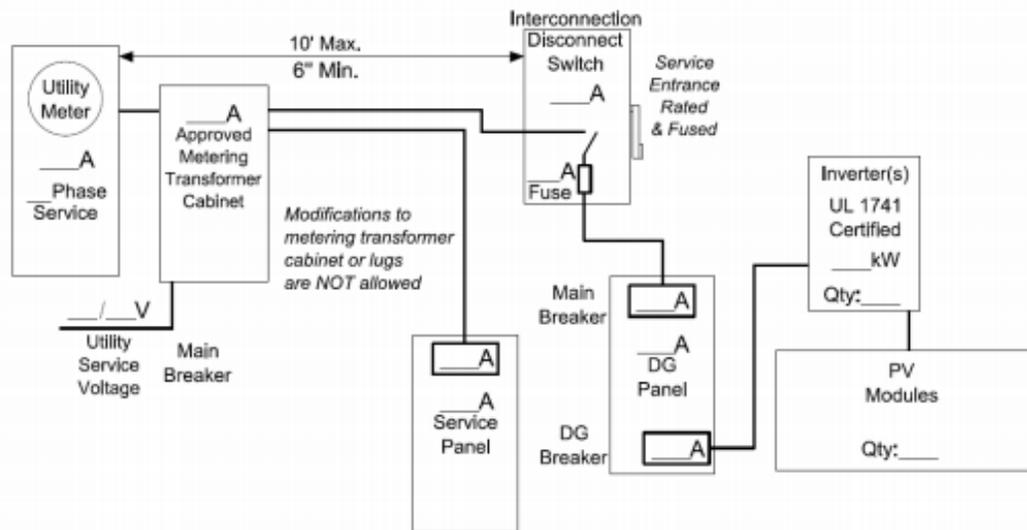




**1-PHASE/3-PHASE, METERING TRANSFORMER CABINET,
MAIN + DG BREAKER \leq 120% OF SERVICE PANEL BUS RATING**



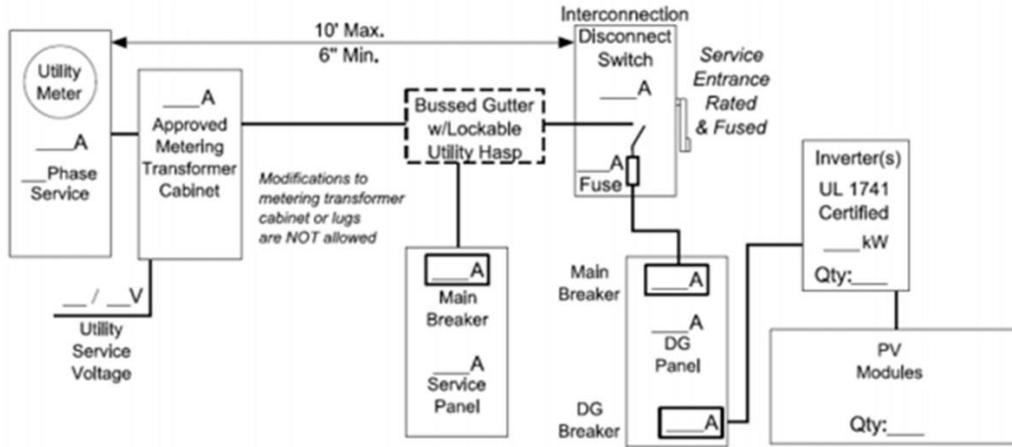
**1-PHASE/3-PHASE, METERING TRANSFORMER CABINET,
WITH AVAILABLE LUGS IN METERING TRANSFORMER CABINET
MAIN + DG BREAKER $>$ 120% OF SERVICE PANEL BUS RATING**



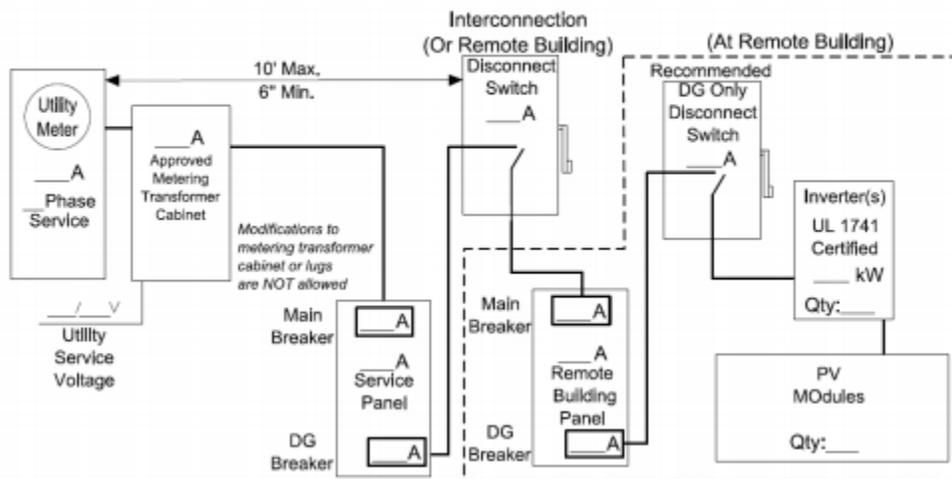


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1-PHASE/3-PHASE, METERING TRANSFORMER CABINET, SINGLE LUG, MAIN + DG BREAKER > 120% OF SERVICE PANEL BUS RATING

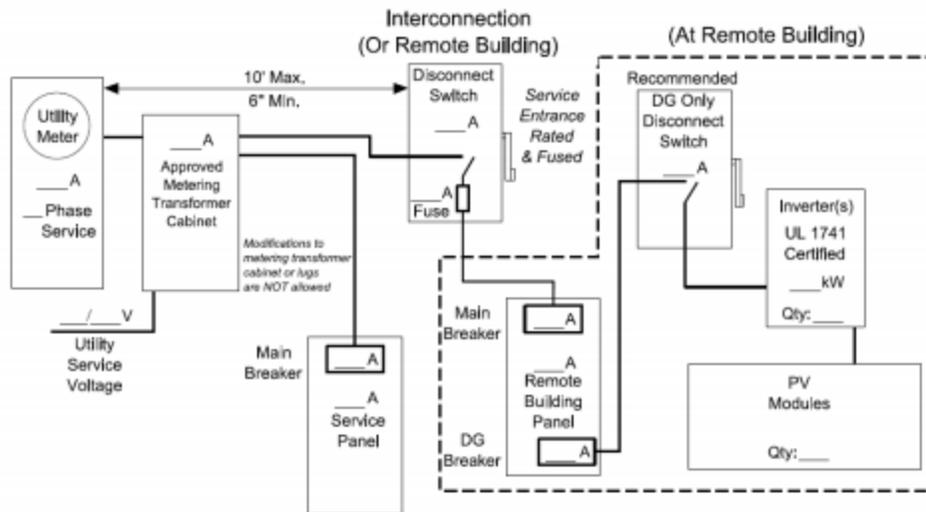


1-PHASE/3-PHASE, METERING TRANSFORMER CABINET, MAIN+DG/REMOTE BUILDING \leq 120% OF SERVICE PANEL BUS RATING REMOTE BUILDING WITH DG > 30' FROM METER

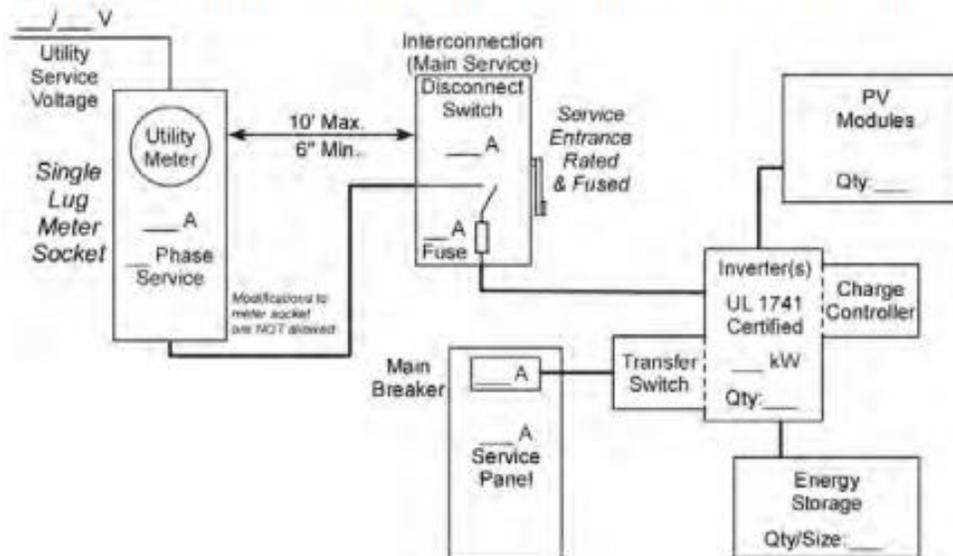




**1-PHASE/3-PHASE, METERING TRANSFORMER CABINET,
MAIN+DG/REMOTE BUILDING > 120% OF SERVICE PANEL BUS RATING
REMOTE BUILDING WITH DG > 30' FROM METER**



**1-PHASE/3-PHASE, SELF-CONTAINED, SINGLE LUG
+ BATTERY STORAGE SYSTEM (ENTIRE SERVICE BACKUP)**





**1-PHASE/3-PHASE, SELF-CONTAINED, SINGLE LUG
MAIN + DG BREAKER \leq 120% OF SERVICE PANEL BUS RATING
+ BATTERY STORAGE SYSTEM LOAD PANEL**

