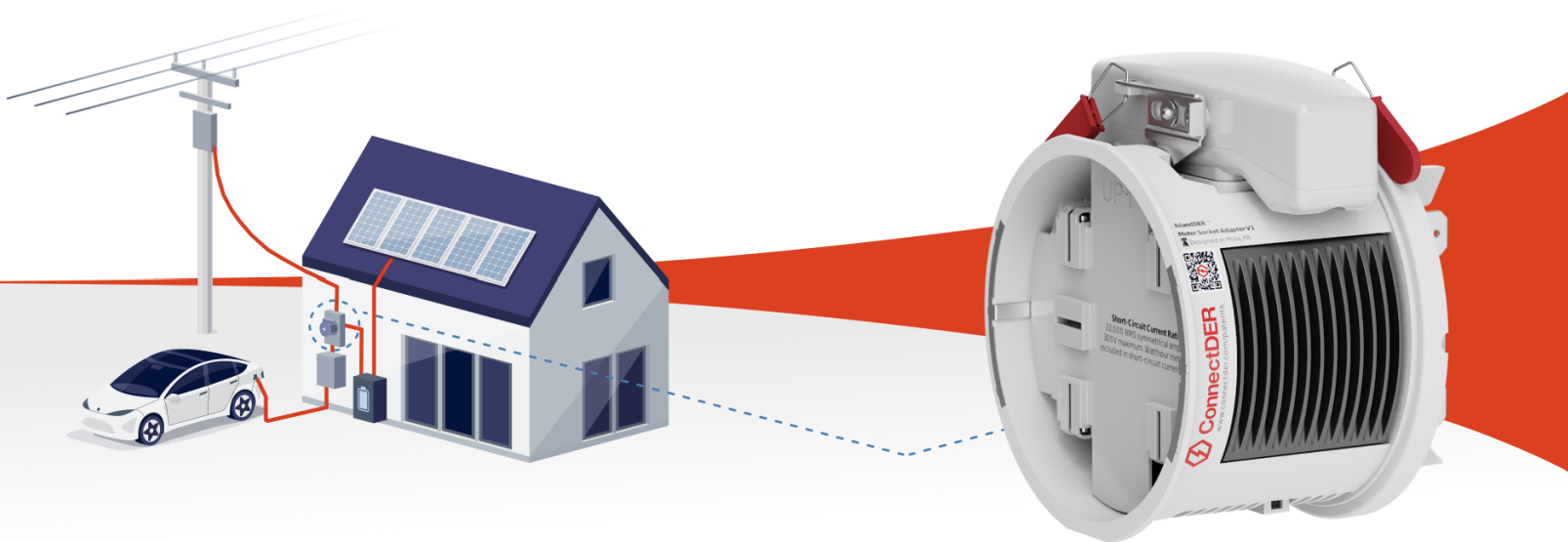




Installing a Meter Socket Adapter in a 'Separate Socket' Configuration (When Utility Approval is Unavailable)

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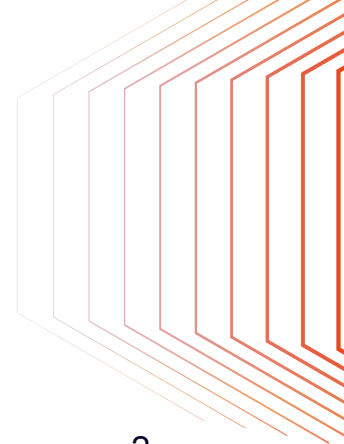


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ATTENTION

This technical note is intended for parties involved in the installation, distribution, design review, permitting, or approval of ConnectDER Meter Socket Adapters (MSAs), including AHJ code officials and permitting authorities, utility reviewers, installation contractors, engineers, and plan set reviewers.

This document provides application guidance for the installation of an IslandDER MSA in a separate meter socket where utility approval for installation behind the utility revenue meter is unavailable.



Both behind-the-meter and separate socket configurations are fully supported for IslandDER MSA. Installing behind-the-meter offers the most direct and cost-effective pathway, while the separate socket option provides a reliable, fully functional, and flexible alternative when needed.

APPLICABLE PRODUCTS

The separate socket configuration is primarily applicable to the IslandDER MSA V1 (Digital or Analog). Other ConnectDER MSAs (e.g., Solar MSA V5.2, Solar MSA V5.2 Data Out, EV MSA V1.0) can also be installed in a separate socket, but the use case is unlikely. For this reason, this document refers to the IslandDER MSA as the representative use case.

SUMMARY

ConnectDER MSAs are UL 414 Listed and NEC compliant products, providing a meter socket-based interconnection point for distributed energy resources (DERs), including solar PV, battery energy storage systems (BESS), and backup capable DER systems. MSA installations and approvals are governed by the local serving utility as the MSA is installed behind the utility owned revenue grade meter. In some markets, utility approval for installation behind the utility revenue meter may be outstanding, unavailable, or pending. In those cases, an alternate architecture may be considered: installation of the ConnectDER MSA in a separate meter socket. The separate socket is not used as a utility revenue metering location. Instead, it functions as a dedicated socket enclosure for the IslandDER MSA.

This technical note provides a framework for documenting, designing, and reviewing a separate socket IslandDER MSA installation. It identifies typical components, plan set best practices, installation considerations, and applicable code and listing requirements.

This document does not supersede the ConnectDER installation manuals, product listings, utility requirements, AHJ requirements, or any applicable sections of NEC electrical code. Utility approval is still required for DER interconnection regardless of MSA use or other installation architecture.

You can access installer resources (e.g., manuals, technical specifications, and more), by either going to www.connectder.com/resources or scanning the QR code below:



WARNING: All ConnectDER installations must be performed by a licensed electrician, utility meter technician, and/or a Qualified Personnel having training and experience with ConnectDER meter socket adapters and utility service equipment. Always follow the installation manual, company and local safety/PPE requirements related to OSHA and NFPA 70E.



NOTE - Technical Notes are intended for informational and product application purposes only. They do not supersede any local codes or AHJ / utility requirements. They offer general guidance regarding certain product features, use-cases, unique applications, etc.

KEY DEFINITIONS

MSA - Meter Socket Adapter

A device installed in a meter socket to provide an electrical connection point for DERs and isolation of DERs.

MID - Microgrid Interconnect Device

A device used to isolate a premises wiring system or microgrid from the utility source during off grid operation or a utility outage.

BESS - Battery Energy Storage System

A battery-based energy storage system used for backup power, load shifting, solar self-consumption, grid services, or other DER applications.

Behind-the-Meter Socket Architecture

An installation configuration where the IslandDER MSA is installed in the existing utility meter socket, typically behind the utility revenue meter. This architecture generally requires utility approval and may require utility labor for meter removal, installation, resealing, and inspection.

Separate Socket Architecture

An installation configuration where a separate socket is installed specifically for the IslandDER MSA and located in series between the behind-the-meter socket and the main distribution panel (breaker box). The separate socket is not the utility revenue meter socket and is installed with an appropriately rated jumper cover / bypass cover rather than a billing meter.

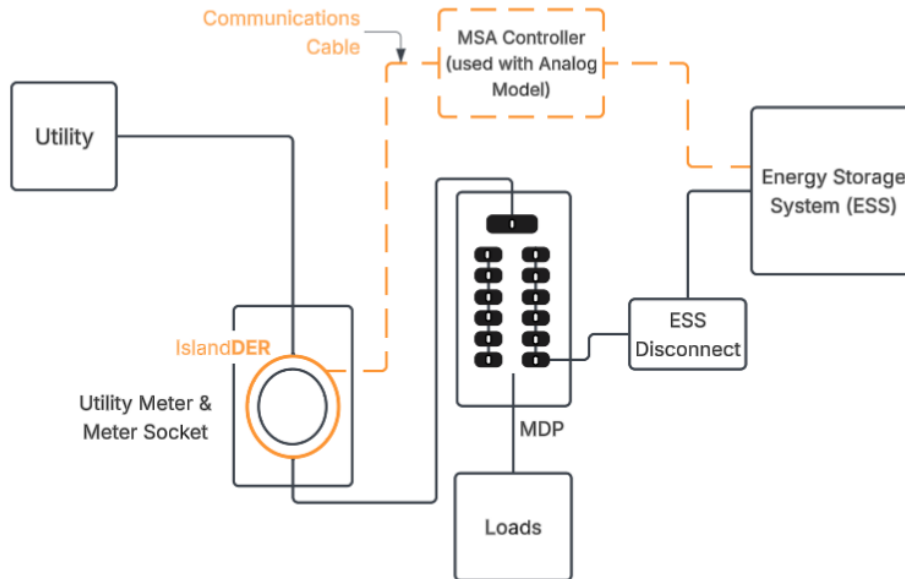


NOTE on the separate socket architecture - While this configuration is most common when the behind-the-meter socket is the stand-alone type (socket separate from service panel, as shown in Figure 1), the separate socket configuration may also be utilized on the load side of an all-in-one 'meter-main-combo' socket. However, this specific configuration requires additional circuit relocation and may have grounding/bonding considerations.

METER SOCKET ADAPTER INSTALLATION ARCHITECTURE

There are two primary field architectures for installing an IslandDER MSA: behind-the-meter and in a separate socket. See Figure 1.

BEHIND-THE-METER



SEPARATE SOCKET

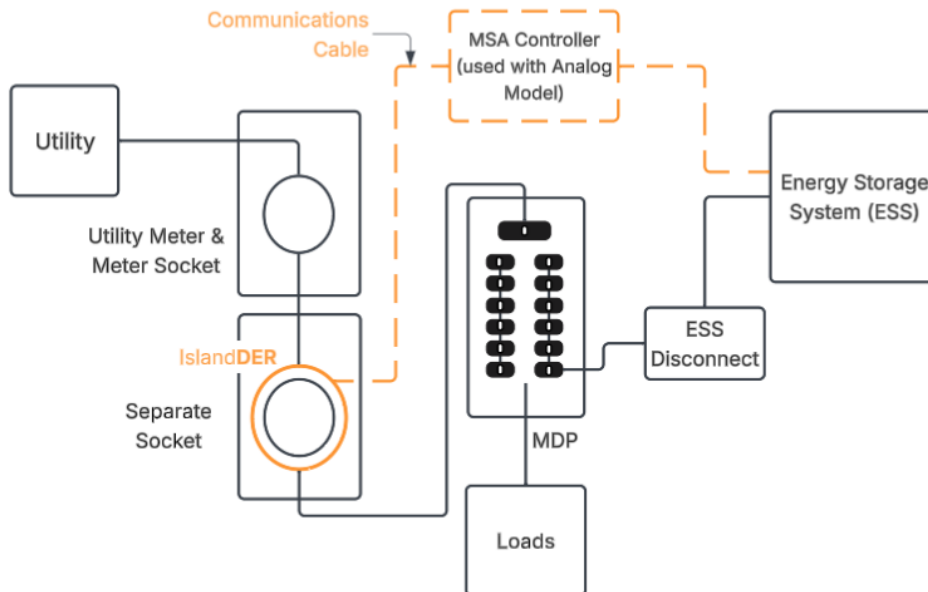


Figure 1. Single Line Diagram of IslandDER MSA Installation Architectures. Top Image: IslandDER MSA installed in the existing meter socket, behind the utility revenue meter. Bottom Image: IslandDER MSA installed in a separate socket.

UTILITY APPROVED BEHIND-THE-METER ARCHITECTURE

In the utility approved behind-the-meter socket architecture, the IslandDER MSA is installed in the existing utility meter position, behind the utility billing meter. The MSA sits between the utility meter and the existing meter socket.

This architecture is the cleanest, quickest, and most cost-effective physical installation because it minimizes additional customer owned hardware and uses the existing service entrance meter location. However, it is also the most utility sensitive because it requires interaction with the utility revenue meter and meter socket. In most jurisdictions, this installation requires utility approval, utility coordination, and may require utility personnel to remove, install, seal, or inspect the metering equipment.

This approach should only be used when the serving utility has approved the IslandDER MSA for installation behind-the-meter and where the installation is consistent with the product instructions, utility requirements, and AHJ approval.

SEPARATE SOCKET ARCHITECTURE

In the separate socket architecture, a separate meter socket is installed in series between the existing socket and the main distribution panel. The MSA is installed in this separate socket rather than behind the utility revenue meter. The separate socket is not used for utility revenue metering and does not replace or bypass the utility billing meter.

The separate socket architecture may be considered where utility approval for behind-the-meter socket installation is unavailable or where the project requires a dedicated socket location for the IslandDER MSA. In this arrangement, the separate socket provides a controlled and inspectable installation point for the MSA while avoiding removal of the utility revenue meter. As this configuration requires additional equipment and materials (i.e., a separate socket, meter jumper, service wire/cable, etc.), this installation method generally costs more and takes longer to install when compared with the behind-the-meter method.

The separate socket architecture still requires code compliance, AHJ approval, and compliance with applicable utility interconnection rules. It should not be represented as exempt from utility review where utility interconnection approval is otherwise required.

SEPARATE SOCKET COMPONENTS AND MATERIALS

A typical separate socket installation may include the following components. Final component selection must be verified against the ConnectDER installation manual, product rating, project one-line, socket compatibility, local code, and AHJ requirements.

COMPONENTS AND DESCRIPTION

- Meter Socket (for ConnectDER MSA) -UL listed, NEMA 3R outdoor rated meter socket, typically 200A and 'ringless' type.
- Socket Jumper Cover / Bypass Cover - UL listed or approved cover used in place of a utility billing meter where applicable. Not to be confused with a cover/sealing plate which will NOT work.
- Lock Ring - Compatible meter retaining ring (also referred to as sealing ring, or lock ring) required for the selected socket and jumper cover configuration. Note: (1) lock ring included in the box with MSA can be used to secure the jumper cover to the MSA. An additional lock ring is only required if a ring-type separate socket is used, to secure the MSA to the socket.
- Service Entrance Cable or Service Conductors - Properly sized service entrance cable or equivalent conductors sized per the service rating, conductor temperature rating, termination rating, and applicable NEC requirements.
- Conduit Fittings/terminal adapters/Hubs - Compatible with the meter socket enclosure and project raceway design.
- (Only if required by local AHJ): Additional service disconnect enclosure on line-side of separate socket. See informational note in 'Installation Guidance' section below.

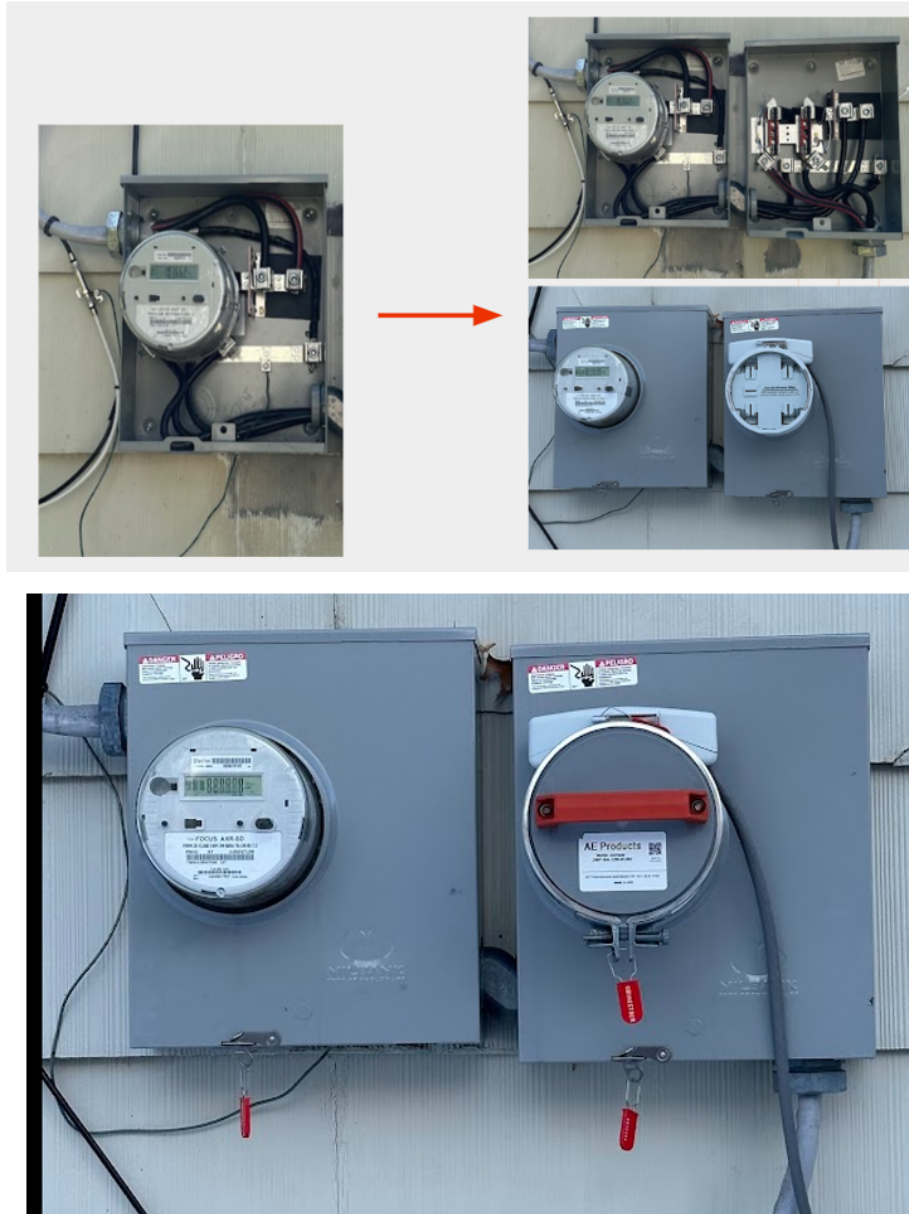


Figure 2. Separate Socket Example. The top left image shows a utility meter on the only socket installed in the home. The top right image shows a separate socket installed right beside it, with an IslandDER MSA installed on the separate socket. The bottom image shows the final set up, with a meter Jumper Cover / Bypass Cover plugged into the IslandDER MSA on the separate socket, and secured to the MSA with a lock ring.

INSTALLATION GUIDANCE

For separate socket installations, ConnectDER recommends standardizing on a limited set of commercially available, name brand, 200 A, ringless, hard top meter sockets. The objective is to reduce cost and field variability, simplify procurement, improve AHJ acceptance, and

minimize installer errors.



NOTE - In certain circumstances, selecting further customized / fully featured separate socket-related equipment may be desirable or required. For example, if access to the main distribution panel is particularly challenging, a 'meter-main-combo' type socket with available breaker space may be useful. In another example, if an AHJ requires a disconnecting means ahead of a separate socket, a separate service disconnect enclosure will be needed (note - this may have grounding/bonding implications). As these variants add notable cost and complexity, they should only be specified if specifically required by either the 3rd party DER equipment connected to the MSA, or by a local AHJ / code enforcement official.

RECOMMENDED METER SOCKET OPTIONS

The following sockets are representative options for standard separate socket installations that meet the above criteria.

Manufacturer	Socket Model	Neutral Isolation Kit (if needed) *	Notes
Milbank	U7040-XL-TG	K1047	200A ringless socket with hub cover included for top entry if needed. Neutral isolation kit* available.
Milbank	U7040-O-TG	K1047	200A ringless socket. Bottom/side entry only (hard top). Neutral isolation kit* available.
Eaton / Cutler-Hammer	UHTRS223ACH	ARP00759CH	200A ringless socket. Bottom/side entry only (hard top). Neutral isolation kit* available.
Siemens / Talon	UAT417-PGF	H64685-1	200A ringless socket. Bottom/side entry only (hard top). Neutral isolation kit* available.
Square D / Schneider Electric	UTRS213A	N/A	Consider only where it is known that a neutral isolation kit will not be required, or where the neutral configuration has been reviewed and approved.

**If the main service disconnect is located on the line side (upstream) of the separate socket, the project team should verify whether the separate socket requires a neutral isolation kit so that neutral and equipment grounding conductors remain configured correctly for the service architecture. These isolation kits are sold separately.*

ConnectDER's preferred approach is to standardize on the fewest practical socket SKUs to reduce installation risk. Overly broad material options can create avoidable field/distribution errors, including missing hub covers, incorrect neutral configuration, incorrect ring or cover hardware, or incompatible socket selections.

The models above are provided as standardization options, not an exhaustive list or blanket approval. The installer, designer, and/or authority having jurisdiction must verify that the selected socket is suitable for the project conditions, conductor routing, service configuration, neutral bonding point, environmental exposure, and ConnectDER product requirements. Other sockets not listed above but that meet the key criteria would also likely be acceptable.

Although ring type sockets may offer a slightly faster installation in some cases, the ringless approach is preferred for separate socket applications because it avoids the need to manage and install a separate retaining/lock ring.

Where 100 A sockets, ring type sockets, or other configurations are specifically required by project design, AHJ interpretation, or site conditions, equivalent models may be used if they meet the ConnectDER installation requirements, product compatibility requirements, listing requirements, and approved plan set.

RECOMMENDED SOCKET JUMPER COVER / BYPASS COVERS

A socket jumper cover or bypass cover is required as the separate socket does not contain a utility revenue meter. The jumper cover must be compatible with the selected socket, ampacity, jaw configuration, ring/ringless design, enclosure rating, and approved architecture. The exact manufacturer and model should be listed in the planset BOM and not left to field selection. The following jumper covers are representative options, not an exhaustive list for blanket approval.



NOTE - 'Meter socket covers' or cover plates are **NOT** the same as socket 'jumpers' as they do not include jumper bus bars that complete the circuit between the line and load side jaws of a socket or MSA. They are not suitable for use in the separate socket configuration.



NOTE - Jumper covers must be secured to the MSA with a reputable meter retaining/sealing/lock ring (see section below), to provide a sound mechanical connection and prevent water ingress. When a ringless socket is used, the lock ring that comes in the box with the IslandDER MSA can be used.

Manufacturer	Jumper Cover Model	Buy / Source Link
TESCO Metering	277-4	https://www.tescometering.com/product/safety-products-and-accessories/covers-and-adapters/meter-socket-jumper-covers-277
Marwell	JC-4B-GRAY-200	https://marwellcorp.com/orange-section/jumper-covers/
Brooks Utility Products	EJC-4B or JC-4B-UL	https://brooksutility.com/product/meter-socket-jumper-covers/
A.E. Products	JMP-BA-02S	https://www.aeproducts.net/meter-socket-jumpers

LOCK RINGS

A meter retaining ring, also known as a sealing ring or lock ring is required to secure the IslandDER MSA to the jumper cover / bypass cover. The ring mechanically secures the MSA to the jumper cover and helps maintain the intended fit, enclosure integrity, and tamper-resistant configuration of the assembly. If not installed, or not installed properly, water ingress may occur, the MSA could be damaged, and the product warranty may be voided.

Lock rings are not always universal. The required ring must be compatible with the IslandDER MSA, jumper cover, MSA ring depth, and cover profile.



NOTE - Where a ringless socket is used (as recommended above), a separate lock ring is typically not required, as one is already provided in the box with the IslandDER MSA. This is in part why ringless sockets are preferred for separate socket installations. Ringless sockets are also less prone to installation errors.

The following lock ring examples are provided for procurement and compatibility review only, should an additional lock ring be needed when used with a ring-type separate meter socket. Final selection and fitment must be verified against the MSA, jumper cover / bypass cover, AHJ requirements, and project bill of materials.

Manufacturer	Model Number	Link
Brooks Utility Products	10-9090	https://brooksutility.com/product/handi-ring-screw-type-sealing-ring/
DeWalch Technologies	Rapid Ring	https://www.dewalch.com/products/rapid-ring/
Meter Lock Rings	MLR-R17	https://mlrmeterings.com/meter-lock-rings
Eaton	25016D	https://buy.wesco.com/Electrical-and-Power-Distribution/Metering-Equipment/Meter-Accessories/Meter-Rings/EATON-B-LINE-SERIES/Meter-Socket-Sealing-Aluminum/25016D/p/78205139420-1

RECOMMENDED WIRING BETWEEN SOCKETS

The separate socket architecture requires an electrical connection between the existing behind-the-meter socket and the separate socket. The final connection method must be shown on the approved one-line diagram and must comply with the ConnectDER installation manual, meter socket manufacturer instructions, NEC requirements, AHJ requirements, and applicable utility interconnection requirements.

The separate socket shall not replace, bypass, or interfere with the utility revenue meter. The existing utility billing meter remains the utility metering point. The separate socket provides a dedicated installation location for the IslandDER MSA.

To connect the two sockets, service entrance cable, SER cable, or service-rated conductors may be used where permitted by the approved design, equipment listing, installation instructions, NEC requirements, and AHJ approval. For a 200A residential separate socket architecture, typical conductor sizing is 4/0 AWG aluminum or 2/0 AWG copper, subject to confirmation of service configuration, conductor type, insulation rating, terminal temperature rating, ambient conditions, raceway/cable installation method, neutral sizing, grounding/bonding requirements, and any required derating.

BEST PRACTICES FOR PLAN SETS

Plan sets should clearly document the separate socket architecture so that AHJ reviewers, utility reviewers (if applicable), inspectors, and installers understand the purpose of the separate socket, the ownership boundary, the wiring method, and the DER interconnection configuration.

The plan set should avoid ambiguity around whether the separate socket is a utility metering point. The separate socket should be clearly identified as customer-owned equipment used to house the IslandDER MSA. Make sure to include the model number of IslandDER MSA for upmost clarity.

LIMITATIONS AND APPROVAL BOUNDARIES

The separate socket architecture provides an alternate installation location for the IslandDER MSA when approval for the behind-the-meter socket architecture is outstanding, unavailable, or pending. It does not eliminate applicable AHJ approval, utility interconnection requirements, inspection requirements, or compliance with ConnectDER installation instructions.

The existing utility billing meter remains the utility revenue meter. The separate socket is customer-owned equipment and shall not be used or labeled as a utility revenue metering location.

Final approval depends on the ConnectDER installation manual, product listing, selected meter socket, jumper cover, lock ring or retention method, wiring method, grounding and bonding configuration, service disconnect location, AHJ requirements, and applicable utility rules.

Plan sets should clearly document the separate socket architecture, so AHJ reviewers, utility reviewers, inspectors, and installers understand the ownership boundary, wiring method, DER interconnection path, and purpose of the separate socket.

The plan set should clearly show that the existing utility billing meter remains the revenue meter and that the separate socket is customer-owned equipment used to house the IslandDER MSA.

At minimum, the plan set should include:

Plan Set Element	Required Information
One-line diagram	Utility service, existing revenue meter, behind-the-meter socket or meter-main, separate socket, IslandDER MSA (with model number), jumper cover, main disconnect, service panel, PV, BESS, inverter/controller, disconnects, OCPD, conductor sizes, grounding/bonding, and line/load orientation, etc.
Site plan / elevation	Physical locations of the existing meter, separate socket, service equipment, BESS, inverter/controller, raceway or cable routing, working clearances, mounting heights, labels, and physical protection.
Equipment schedule	IslandDER MSA model number, socket manufacturer/model, socket ampacity, ring/ringless type, enclosure rating, neutral isolation kit if required, jumper cover, lock ring or retention method, conductors, raceways/fittings, disconnects, OCPD, and applicable listings.
Notes and labels	Identify the separate socket as customer-owned DER interconnection equipment, not a utility revenue meter position; state that installation must follow ConnectDER instructions, NEC requirements, AHJ approval, and applicable utility interconnection requirements.

Common rejection risks include unclear revenue-meter ownership, missing jumper cover or lock-ring details, incorrect neutral bonding or isolation, unclear conductor sizing, unclear service-versus-feeder classification, missing cable protection, incomplete equipment compatibility review, utility approval ambiguity, and missing labels.

COMMON REJECTION RISKS

Rejection Risk	How to Avoid
Separate socket appears to be a separate utility revenue meter location	Label as a customer-owned DER interconnection socket; show existing utility meter remains
Missing jumper cover / bypass cover part number	Include exact manufacturer and model in BOM
Missing retaining ring / lock ring where required	Identify whether socket is ringless or ring-type; include ring hardware if required
Incorrect neutral bonding / isolation	Show main disconnect location and neutral/ground configuration; specify neutral isolation kit if required
Unclear conductor sizing	Show conductor size, material, insulation, temperature rating, and wiring method
Unclear service vs. feeder classification	Identify whether conductors are ahead of or downstream of the service disconnect
Missing physical protection	Show conduit, guards, or approved cable protection where subject to damage
Incomplete equipment compatibility	Verify socket, jumper cover, IslandDER MSA, and neutral kit compatibility before permit submission
Utility approval ambiguity	State that the separate socket is customer-owned but does not eliminate applicable utility interconnection requirements
Missing labels	Include required labels for separate socket, DER source, disconnects, BESS, and non-revenue meter position

REFERENCES

1. UL 414, Standard for Meter Sockets, Edition 10, including applicable Annex B and Annex C provisions
2. NFPA 70, National Electrical Code (NEC): NEC 2023 Article 110.3 – Examination, Identification, Installation, Use, and Listing of Equipment, NEC 2023 Article 230 – Services, NEC 2023 Article 250 – Grounding and Bonding, NEC 2023 Article 300 – General Requirements for Wiring Methods and Materials, NEC 2023 Article 705 – Interconnected Electric Power Production Sources, NEC 2023 Article 706 – Energy Storage Systems, NEC 310.12 – Single Phase Dwelling Services and Feeders
3. ConnectDER Installation Manuals
4. ConnectDER Technical Specifications
5. Applicable meter socket manufacturer installation instructions
6. Applicable meter socket jumper cover / bypass cover installation instructions
7. Local AHJ requirements
8. Serving utility interconnection requirements

APPENDIX 1: SAMPLE BILL OF MATERIALS (BOM)



NOTE - The following is an example BOM only. Other component options may be substituted if they meet the same criteria and are commercially available. The local AHJ or utility company may in some cases require additional components not listed here. Not listed is an IslandDER MSA, which would still be required. Approximate component cost ranges are shown, but they may vary based on purchasing volume, geography, source of supply, etc.

Qty	Component	Model	Notes
1	Meter Socket	Milbank U7040-XL-TG	200A ringless socket with hub cover included for top entry if needed. Approximate cost: \$80-\$130
TBD	Socket Neutral Isolation Kit	Milbank K1047	Accessory - only if required by code/AHJ (i.e., socket on load side of service disconnect) Approximate cost: \$50-\$70
1	Socket Jumper Cover	Brooks JC-4B-UL	200/320A, 600V, UL 414 listed, 4-blade single phase. Approximate cost: \$40-\$70
TBD	Lock Ring	Brooks 10-9090	Screw-type, stainless steel, sealable. Only required if 'ring-type' socket is used. 1 x lock ring already included in the box with the IslandDER MSA. Approximate cost: \$10-\$20
1 lot	Service cable / conductors	Varies	Properly sized per the service rating, conductor temperature rating, termination rating, and applicable NEC requirements. Site specific.
1 lot	Conduit Fittings / misc.	Varies	Misc. materials to complete electrical installation and compatible with socket and raceway design, including but not limited to conduit TA's and couplers, cable straps, cable glands, etc.