Meter Collar Adapter Requirements

November 2025

Version 5

Terminology Overview

- Distributed Energy Resources (DER)
- Meter Collar Adapter (MCA)
  - Also called Meter Socket Adapter (MSA)
- Point of Interconnection (POI)
  - Creates a tap point for a load or DER source
- Microgrid Interconnection Device (MID)
  - Automatically isolates customer from the utility (like a transfer switch)
  - Function is similar to the service disconnect switch in the AMI meter
- Electric Vehicle (EV) - Charging only, not considered DER
- Energy Storage System (ESS)
  - Most generally batteries

Terminology Overview

- Energy Management System (EMS)
  - A system that monitors and/or controls an electrical load or a power production or storage source
- Power Control Systems (PCS)
  - A system that monitors and controls the output of one or more power production or storage sources
    - Can prevent the feeder or busbar from being overloaded
    - Can be used to limit or prevent export to the utility grid

Types Readily Available on the Market

- Metal Oxide Varistor (MOV) – Presently no products approved
  - Whole Home Surge Protection
- Standby Generator – Presently no products approved
- **DER**
  - **POI** – For PV & ESS not charged by utility grid. Not to be used for load additions per manufacturer documentation.
  - **MID**
- **EV**
- EMS (Span iO) – Presently no products approved

* For most up-to-date approved list, refer to Ameren Illinois Construction Services webpage.

Ameren IL Approved MCA Products

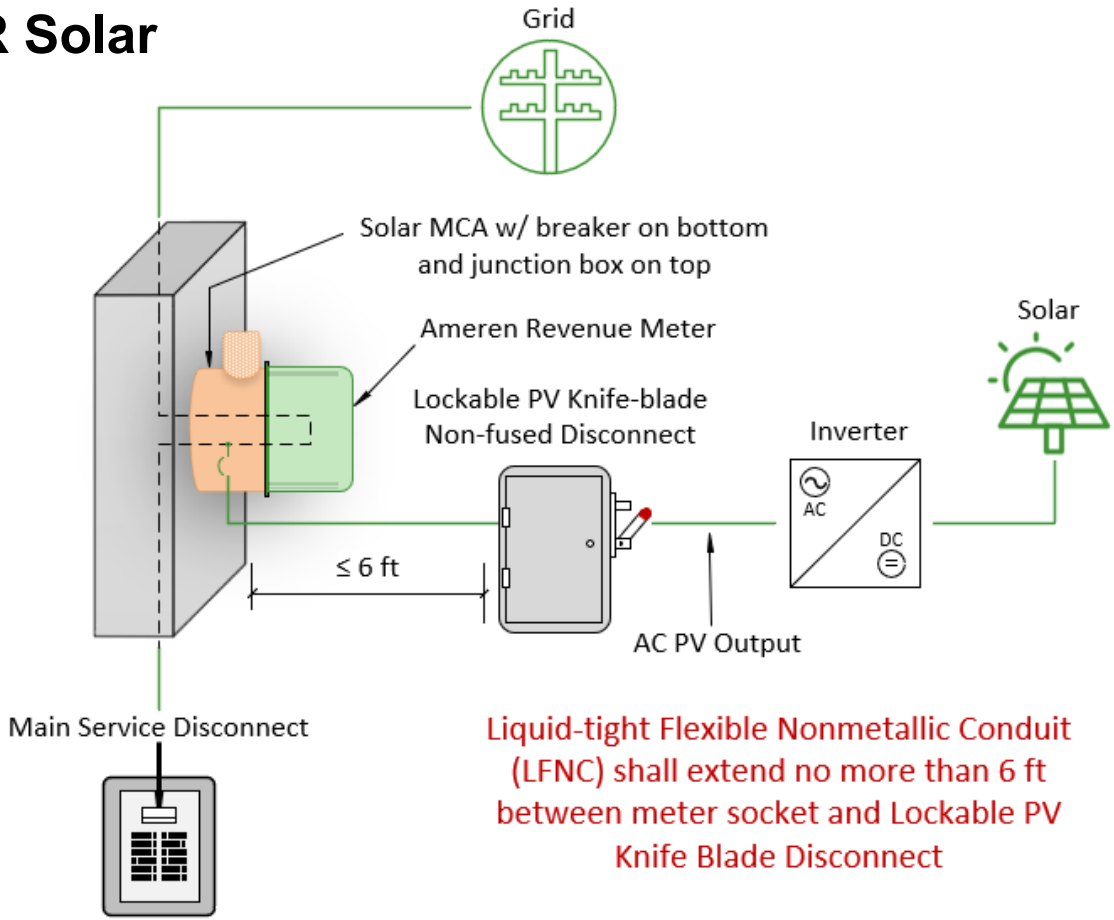
- POI Type
  - ConnectDER Solar - 10/01/2025
  - ConnectDER EV - 10/01/2025

- MID Type
  - Enphase IQ Meter Collar - 10/01/2025
  - ConnectDER IslandDER - 10/01/2025
  - Tesla Backup Switch (Re-design) – Under Review

- Standby Generator Automatic Transfer Switch Type
  - Generlink – Under Review

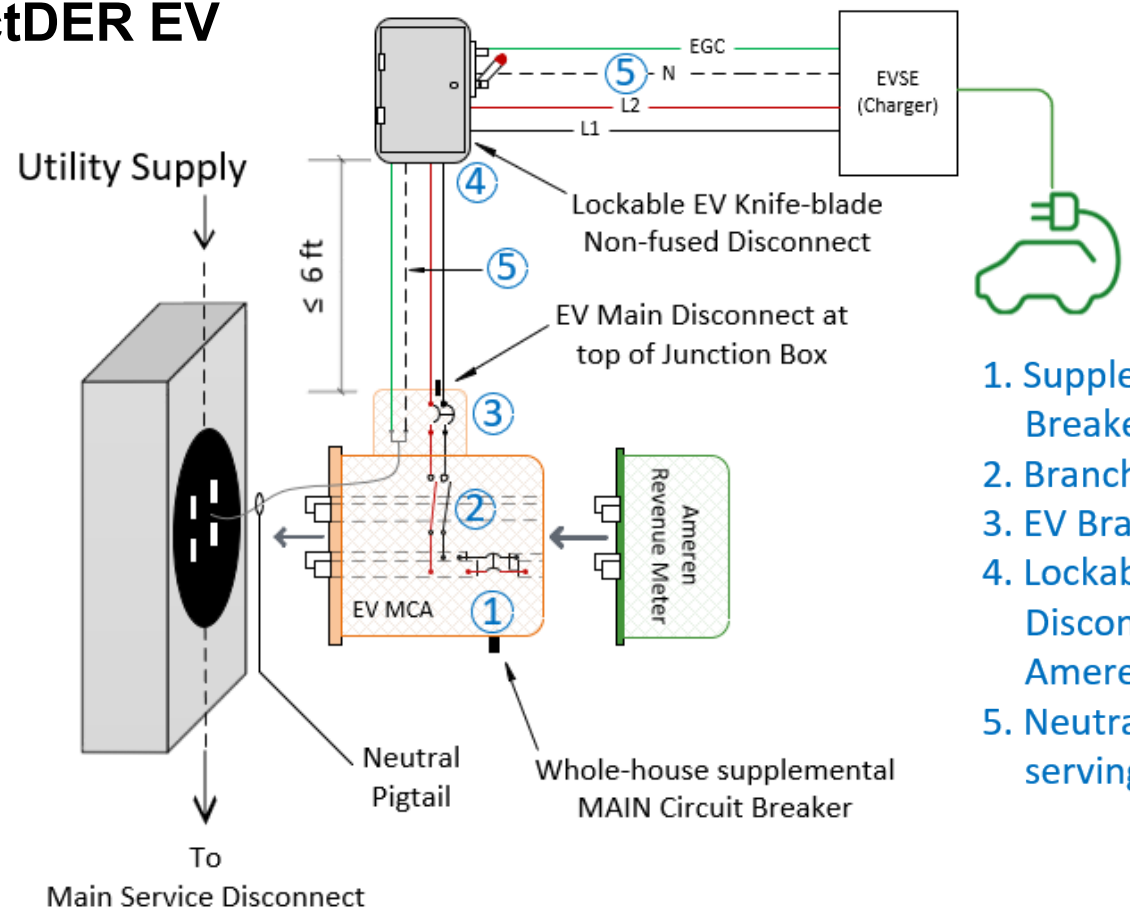
* For most up-to-date approved list, refer to Ameren Illinois Construction Services webpage.

ConnectDER Solar



Liquid-tight Flexible Nonmetallic Conduit (LFNC) shall extend no more than 6 ft between meter socket and Lockable PV Knife Blade Disconnect

ConnectDER EV

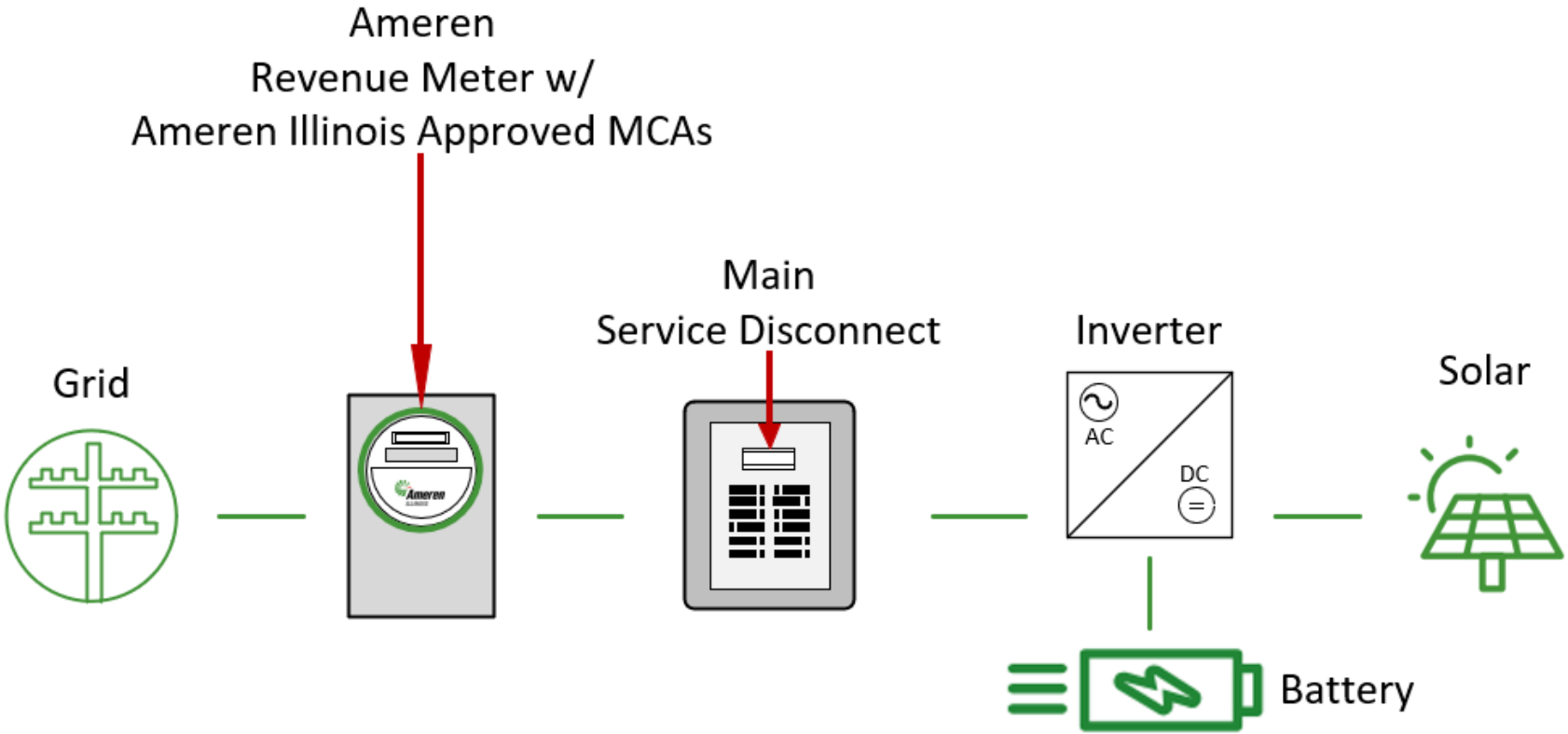


1. Supplemental Main Circuit Breaker
2. Branch Circuit Control
3. EV Branch Circuit Breaker
4. Lockable Knife Blade EV Disconnect Required by Ameren Illinois
5. Neutral required when serving 120V loads

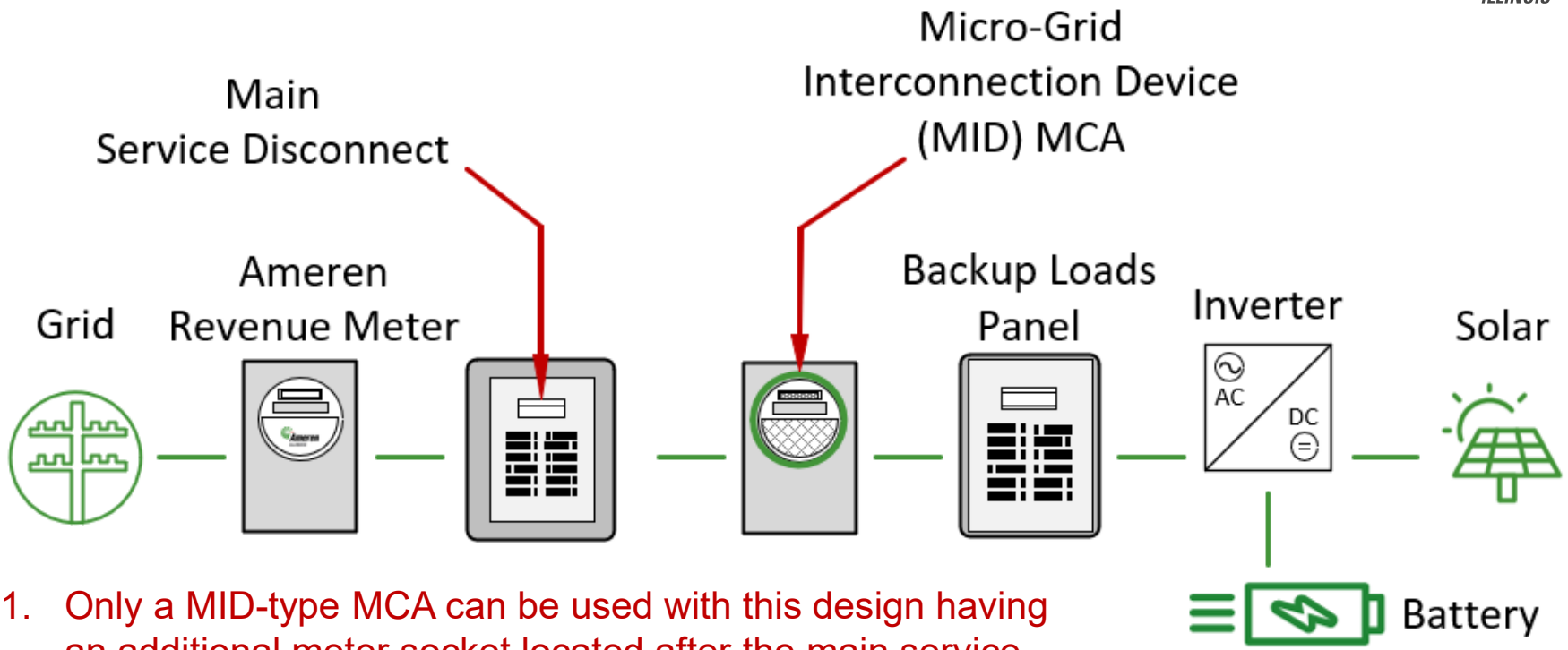
ConnectDER IslandDER

- Product recently launched
    - Limited public documentation

MCA – Acceptable Location #1

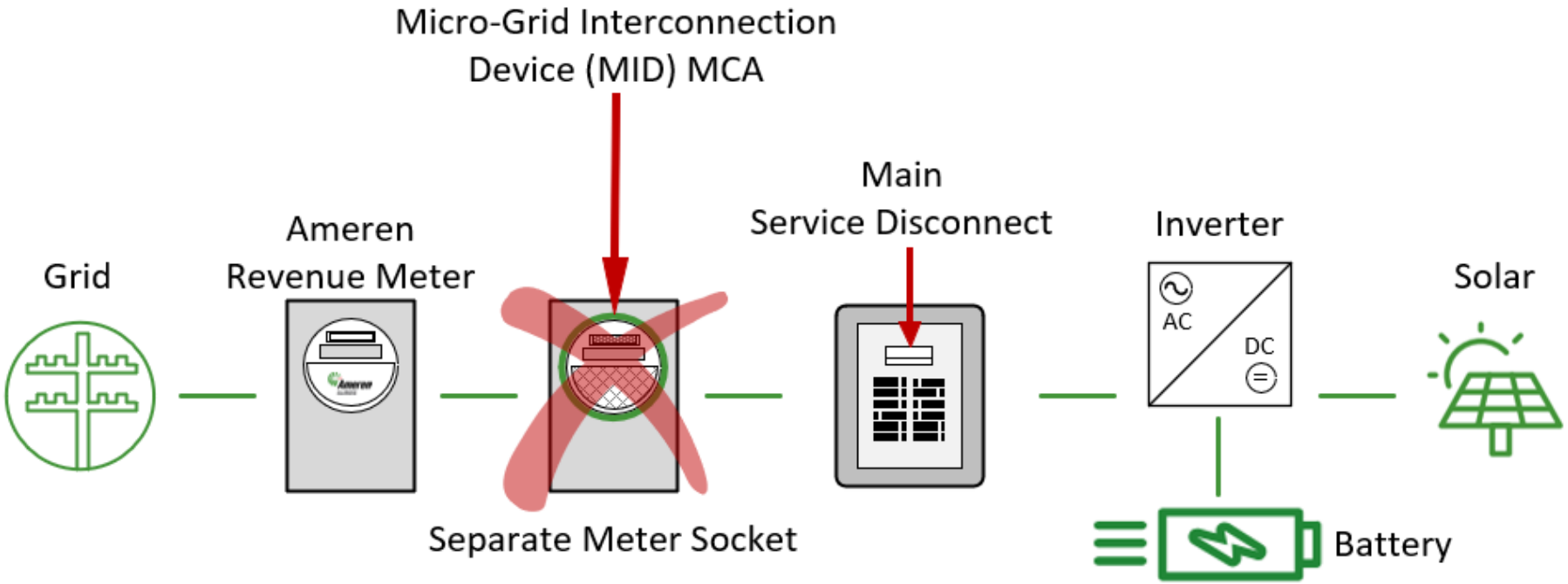


MCA – Acceptable Location #2



1. Only a MID-type MCA can be used with this design having an additional meter socket located after the main service disconnect.
2. The second meter socket must have the neutral electrically isolated from the enclosure.

MCA – Locations Not Approved For Any MCAs



This design with a second meter socket on the supply side of the main service disconnect is Not Approved in Ameren Illinois service territory for ANY MCA products.

Ameren IL Technical Review Process

UL Standards Applicable in 2025

- UL 414 Meter Sockets
- UL 414SA - 75 lbs downward & upward force ring/ringless
- UL 414SB - MSAs for DER that contain OCPD
- UL 414SC - MSAs with Branch Circuits
  - Effective in 2027
- UL 746C - Flammability/Crushing/Impact/Distortion
- UL 916 Energy Management Equipment
- UL 3010 - Single Site Energy Systems
- UL 3141 Power Control Systems
- UL 2735 Electric Utility Meters
- UL 1741 SA/SB Safety
  - Testing standard for IEEE 1547
- FCC CFR 47 Part 15, Class B ICES 003
- IEEE 1547-2018, Interconnection and Interoperability of Distributed Energy Resources with Associated Electric Power Systems
- IEEE 1547.1 Test Procedures

Ameren IL Technical Review Process

- Meter socket fit testing
- Durability assessment
- Did not involve full system set up
- No products with wireless communication capability have been submitted for review at this time

* Independent of actual site assessment

Installation Requirements

Excluded Installations

- Excluded Installations
  - Button/Puck Sockets
  - A-base enclosures
  - 320/400 A services
  - K-base
  - Multi-position meter installations
  - Ring style meter socket when neutral pigtail is required (POI & EV)
  - No more than 1 MCA per socket
  - Existing deficiencies & violations
  - Installations with ampacities greater than mfg. specifications
  - CT-rated services

Excluded Installations

A-base

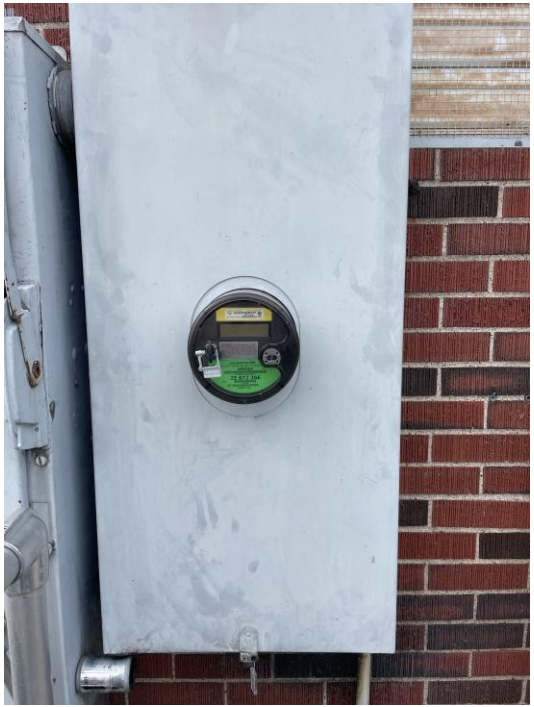
Excluded Installations

Button/Puck Style Meter Socket

- Additional reasons for exclusion:
  - Socket is not firmly attached to the wall
  - Frayed service entrance cable

Excluded Installations

320/400A & 400A-600A K-base



Excluded Installations

Multi-Position Metering

Excluded Installations

Indoor Meter Sockets, Secondary Meter Pedestals, & Low Meter Sockets

- Customer may have built room addition or carport/garage around meter socket
  - Meter socket has to be moved outdoors
- Secondary meter pedestals
  - Meter is at 36 in.
  - Junction box, breaker, etc. on bottom of most MCAs
- Meter socket less than 54 in. to center of meter glass

Excluded Installations

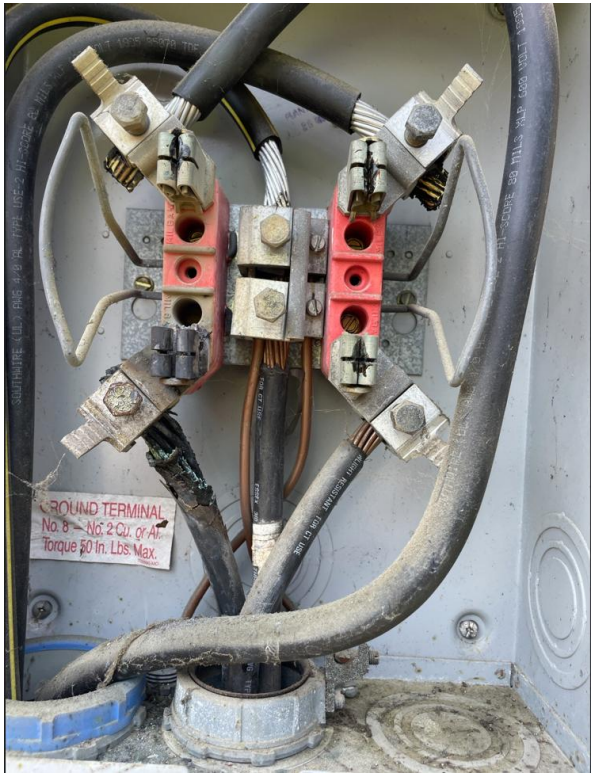
Working Space Violations & Meter Socket Height Requirements

- Working Space
  - Requirements
    - Depth: 42 in.
    - Width: greater of 30 in. or width of enclosure
    - Headroom: 78 in.
  - Violation Example
    - Air conditioning unit in front of meter socket
- Gas meter vent must be at least 36 in. from energized contacts
- Meter socket must be 54-66 in. to center of meter glass

- **General Statement: Ameren IL will not allow the installer to add an MCA to an installation with existing deficiencies or violations.**

Excluded Installations

Meter Socket in Subpar Condition



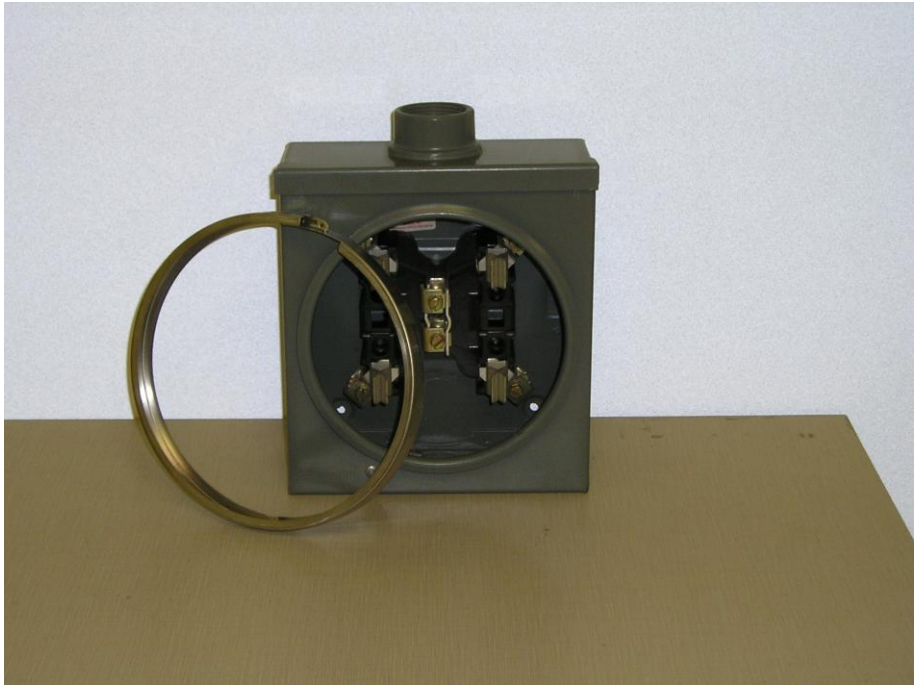
Excluded Installations

No More than 1 MCA Per Meter Socket (Customer or Ameren Owned)

Excluded Installations

Ring Style when MCA has Neutral Pigtail

- However, will allow for MCAs without neutral pigtail (i.e. MID Type) in ring style



General Installation Requirements

- Outdoor Disconnects: When a meter socket is upgraded to a clamp-jaw lever-bypass, an outdoor service disconnect is also required for 1 and 2 family dwellings.
  - 2020/2023 NEC 230.85
  - 2026 NEC 230.70

- MID Type MCAs
  - Hangar bracket support for COM umbilical cable shall be not less than 20 inches and not more than 36 inches from MCA
  - Additional hangar bracket supports are required at intervals not greater than 36 inches

- POI and EV Type MCAs
  - Length of Liquid-tight Flexible Non-metallic Conduit (LFNC) between MCA and disconnect shall be not more than 6 ft
  - Hangar bracket supports for LFNC shall be not less than 20 inches and not more than 36 inches from MCA and disconnect
  - Liquid-tight flexible metallic conduit (LFMC) not permitted

COM Umbilical Cable

- Caution must be exercised when locating COM cable support clip
- Routing of the COM umbilical cable shall not tightly wrap around enclosures
  - First COM cable support clip cannot crowd meter socket
- Transitions from conduit to TC-ER or equivalent weatherproof control cable must occur level with or above MCA junction box
  - Prevents developing tension on TC-ER cable
- Must install with slack creating a drip loop between MCA and first COM cable support clip
- COM umbilical cable shall not interfere with removal of covers or operation of equipment.

Installation Requirements

MID Style (pass through)

- No neutral pigtail
- Allowed in ring and ringless style meter sockets
- Spring tension of jaw in non-lever bypass meter socket must be verified
- Must use communication cable only going into MCA junction box
  - Conduit shall not be run directly to the junction box because it will not allow the junction box to slide out of the way to allow access to the removable MCA “Phoenix type” COM connector
    - Ameren requires the use of sunlight resistant communications cable (TC-ER or equivalent) & gland fitting in the junction box
    - If part of the run is installed in a location subject to physical damage, that section must be protected by rigid conduit (excludes schedule 40 PVC)
  - This needs communicated to the installer and verified before installing the MCA
  - Exception: ConnectDER IslandDER
    - Head unit options allow for prefabricated COM cable harness or ethernet attachment
    - First hangar bracket support shall be not less than 20 inches and not greater than 36 inches from MCA

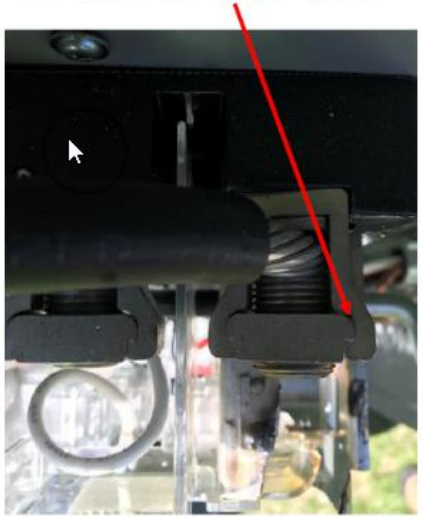
Installation Requirements

Ameren IL Policy on Tap Connectors not Changing with MCA Installation

- No insulated or non-insulated floating tap connectors allowed in meter sockets
- Milbank tap connector slide-in nut assembly allowed in Milbank lever bypass meter socket with lay-in lug provisions
  - The tap connector slide-in nut assembly replaces the standard load side slide-in nut assembly for 100A and 200A meter sockets
  - Milbank is the only manufacturer that makes a tap connector slide-in nut assembly for tapping
  - Milbank tap connector slide-in nut assembly can only be used in Milbank meter sockets per UL listing
  - Meter socket must not have pre-existing deficiencies

Installation Requirements

This is a picture taken looking down at the top lay-in lugs of the Eaton meter socket. Note how tight the lug assembly fits together.



Milbank Tap Connectors

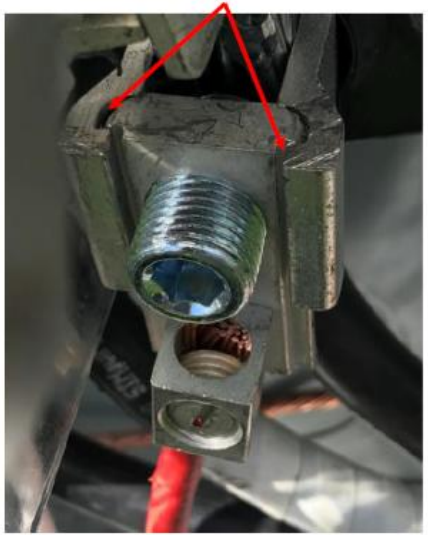
Milbank Tap Connector Kit is only allowed to be used on DER installations. This is not allowed for adding load such as an outdoor barn or hot tub to the service installation

Tap Connectors (3 per set)

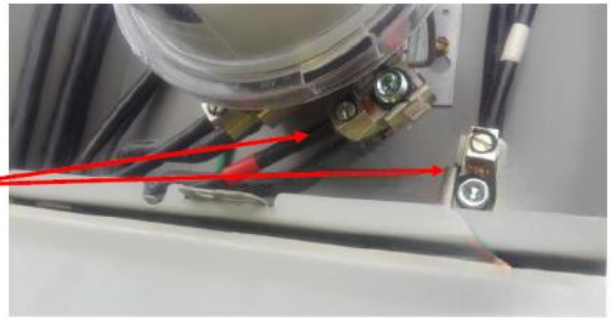
Replaces the load or line side slide-in nut assembly on Milbank 200 amp sockets. Allows for a 100 amp tap location in addition to the #6-350 kcmil load-side connector. **K5022** includes safety barrier extensions for applications over 300 VAC. Three lugs per kit.

K4977-INT - Internal Hex
K4977-EXT - External Hex
K5022-INT - Internal Hex (set of 4 w/ barrier)

This is a view looking down at the bottom lugs of the meter socket where they have swapped out the Eaton lay-in lug assembly with that of a Milbank tap connector. Notice how the slide edges do not fill the jaws. This is not a good mechanical fit.



Tap Connector properly installed in a Milbank Meter / Main Combo box. This is not considered as making the meter socket a junction box.



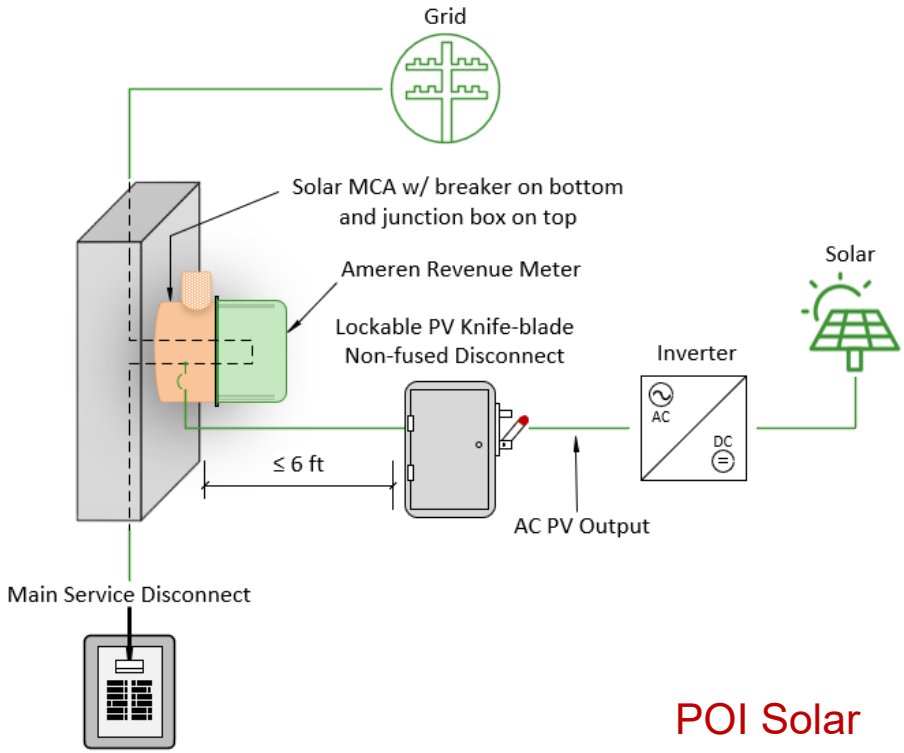
Installation Requirements

Point of Interconnection (POI) Solar & Electric Vehicle (EV) Style MCAs

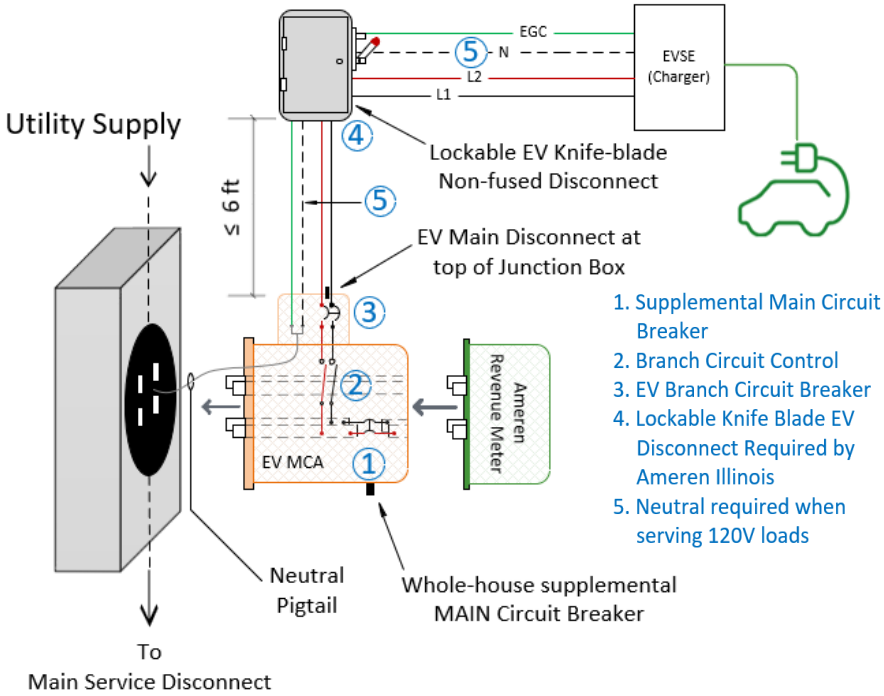
- **Ameren requires external lockable disconnect on tap**
  - Must be within 6 ft of MCA
  - No overcurrent protection required in external disconnect
    - Circuit breaker built into MCA
- **Neutral pigtail is required**
- Approved Neutral Installation Methods
  - 200A single-phase self-contained meter/main combo w/ extended insulated pigtail terminating in load center
    - Existing Meter/Main Combo not required to be lever bypass
  - Milbank Standalone Lever-bypass only: Install Milbank tap connector (lay-in piggyback slide nut) on neutral lug
  - **Must de-energize service to install**
- Caution is needed when removing the MCA because of the neutral pigtail connection
- Liquidtite flexible non-metallic conduit (LFNC) shall not interfere with removal of covers or operation of equipment.

Installation Requirements (continued)

Point of Interconnection (POI) Solar & Electric Vehicle (EV) Style MCAs



POI Solar



Electric Vehicle

Installation Requirements

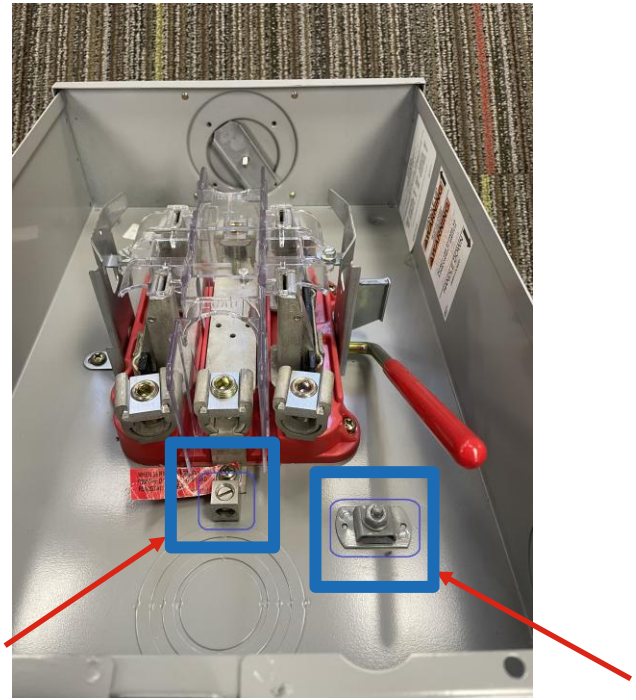
Point of Interconnection (POI) & Electric Vehicle (EV) Style MCAs

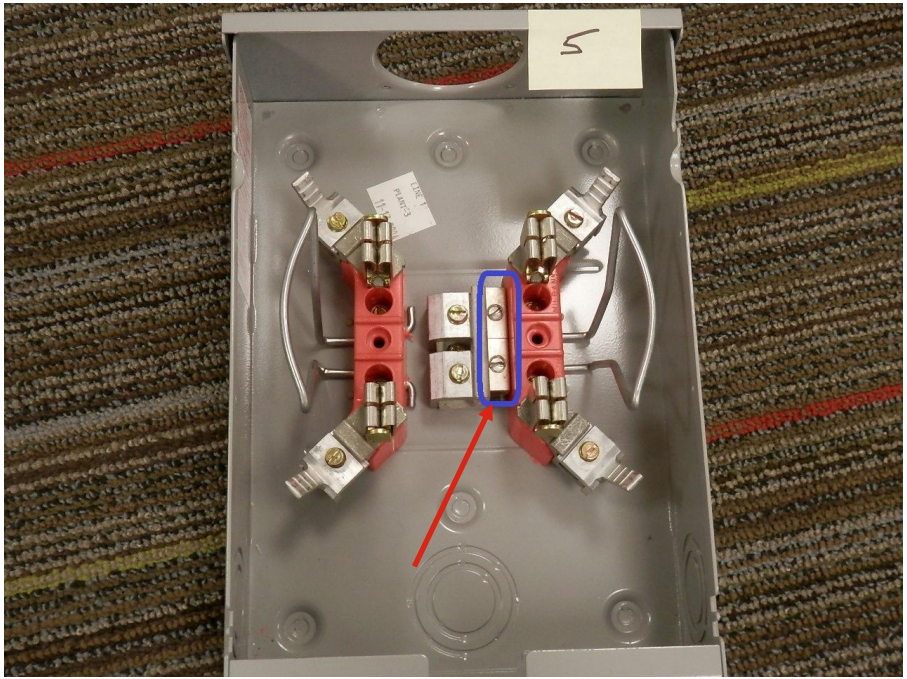
- Not Approved (Disallowed) Installation Methods
  - Cannot insert pigtail into the same lug as the main service neutral conductor
  - Split bolt connectors are not allowed because of clearance concerns
    - Creates a floating (not-affixed) connection
  - Tap connectors have the same issues as split bolts and are also not approved
  - Ground lug(s) is not an acceptable neutral termination location
    - Not UL tested for carrying current so voids UL listing
    - UL test is for mechanical connection only
    - Customer equipment must be UL listed and installed accordingly

- ConnectDER EV literature indicates that these MCAs should only be installed on 100A/125A services due to whole-house supplemental main circuit breaker rating (in collar)
  - Installing on 200A service limits service capacity to 100A/125A (dependent on model)

Examples of Ground Lugs

Neutral Pigtail Connection NOT Allowed





Installation Requirements

Meter Sockets Downstream of Revenue Meter Socket and Upstream of Main Service Disconnect

- Not allowed to be installed in separate meter socket between revenue meter socket and main service disconnect
  - Would create additional exposure to Ameren system not protected by main overcurrent device
  - Some manufacturer's install guides suggest this method of installation, but Ameren is not allowing
  - Would trigger Ameren Service Manual Rewire Policy
    - Existing revenue meter base would have to be brought up to present standards (i.e. clamp-jaw lever-bypass)
    - Outdoor main service disconnect for 1- and 2-family dwellings

Installation Requirements

Meter Sockets Downstream of Revenue Meter Socket and Downstream of Main Service Disconnect

- **POI & EV Style** (neutral pigtail)
  - Not allowed to be installed in this location because it has a main bonding jumper between neutral and equipment ground
  - Neutrals and equipment grounds cannot touch after service disconnect
- **MID Style** (no neutral pigtail)
  - Installer may choose to install downstream of main service disconnect because there is no main bonding jumper in MID style MCA
  - May choose to do this if they do not want to back up the entire service
  - Installer would need to isolate (float) neutral from meter socket enclosure by one of following methods
    - Remove ground strap
    - Install OEM neutral isolation kit from meter socket manufacturer
    - Insulated connector

Installation Requirements

Ameren Responsibility

- How will the public know if an MCA is Ameren Illinois approved?
  - Approved list maintained on the Ameren Illinois Construction Service webpage
  - List will be updated as new MCA products are approved

Application Process

- Developer submits DER application in PowerClerk
  - Developer selects approved MCA from PowerClerk drop down list
  - Developer submits pictures of existing meter socket exterior
    1. Overview of equipment on wall + 6 ft each side
    2. Front of meter socket
    3. Side view of meter socket
    4. Bottom of meter socket
  - DER review of customer submitted pictures in PowerClerk
    - Catch obvious rejects
    - Initial screening to determine if meter socket needs replaced
      - If not acceptable, Ameren to respond that meter socket will have to be replaced or design changed

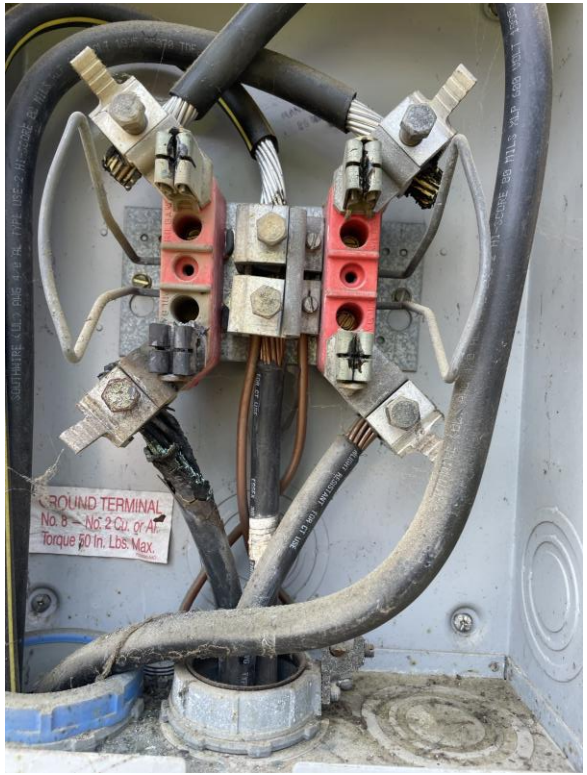
Application Process

- MCA is approved/rejected for installation
  - Rejected applications could be remedied by meter socket and/or service upgrade to include the outdoor main service disconnect
- Three levels of approval
  - Allowed with no modifications necessary
    - Pending site assessment during construction
  - Conditionally allowed because modifications are required
  - Not allowed at all

Site Meet to Install MCA

- If pictures appear to be acceptable, developer must call in for a site meet during construction phase to install MCA
- Site Meet Activity
    - Assess meter socket condition
        - Jaw Tension test for spring tension jaw socket
        - Verify lugs are in good condition
        - If rejected, LHO takes pictures for failure reasons and emails to **@IL DER** or **ILDER@ameren.com**.
            - Subject line: **Meter Collar – [Specific Site Address]**
- Installer to connect neutral pigtail, when applicable, within meter socket and to MCA
- LHO to plug in MCA and re-install revenue meter
- Installers still not allowed to cut meter seals, despite what is shown on some vendor's promotional videos

Meter Socket Inspection - Rejected



Jaw Tension Tester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