Installation, Operation and Maintenance Manual

EMS Metering Box: 7550-00228

Energy Management System (EMS) Metering Box

Revision B: 25-JUNE-2026

CONTENTS

Document Revision:

Item	Description of Revision	Current Rev	Date Released (DD-MM-YY)	Revision Initiated By:
1	Initial Release under revision control	A	23-MAR-2026	J.A. Foulis
2	Updates to: 1. The following paragraphs and associated images: 3.2, 3.3.1, 3.3.2, 3.4, 4.2.1, 4.3, 4.4, 4.5 to 4.6 (inclusive), 4.7, 4.8.1 to 4.8.4 (inclusive). 2. Paragraphs: 4.9, 4.9.1 3. Minor modified/clarification to the Commissioning Check List (paragraph 4.9) 4. Separated the Table found in paragraph 4.9.1, EMS Metering Box Commissioning Checklist into 7 discrete tables	B	25-JUN-2026	J.A. Foulis / N.S. LaMendola

1. Notice

As an express condition of the Viridi Parente warranty and to encourage utilization of industry best practices, Viridi requires that the installation, mobilization, and operation of the EMS only be completed by, or at the direction of, a qualified professional as defined by the jurisdiction(s) within which the installation, mobilization, and operation occurs. Specific applications can vary, so please direct specific questions to the following Viridi Contacts:

- Sales
    - Phone: 716-968-8658
    - Email: **sales@viridiparente.com**
- Service
    - Phone: 866-984-7434
    - Email: **service@viridiparente.com**

Viridi expressly disclaims liability for applications made in a manner inconsistent with this guide and/or in non-compliance with local building and electrical codes. This Installation, Operations & Maintenance Manual, incorporates all the terms and conditions of sale. All information provided in this manual is subject to change with or without notice.

Please refer to the warranty documents provided at the point of sale for further information.

2. Safety

2.1 General Safety Guidelines:

- **Qualified Personnel**: Installation, operation, and maintenance of the Energy Management System/Metering Box must be performed by qualified personnel who are trained and knowledgeable about the system and its components.
- **Personal Protective Equipment (PPE)**: Appropriate PPE, including high voltage gloves, safety glasses, and protective clothing, must be always worn when handling or working near the Metering Box.
- **Site Access**: Restrict access to the installation site to authorized personnel only. Implement security measures such as fencing, surveillance, and access control systems to prevent unauthorized entry.
- **Ventilation**: Ensure adequate ventilation in the installation area to prevent the accumulation of hazardous gases. Follow manufacturer guidelines for ventilation requirements.
- **Electrical Safety**: Follow all applicable electrical codes and standards. Ensure proper grounding and bonding of the system components. Use insulated tools and equipment when working on electrical connections.
- **Handling and Storage**: Handle Metering Box(s) with care to avoid mechanical damage. Store Metering Box(s) in a cool, dry place away from direct sunlight and sources of heat.
- **Inspection and Maintenance**: Regularly inspect the Metering Box for signs of wear, damage, or malfunction. Perform maintenance tasks as recommended by the manufacturer to ensure optimal performance and safety.

2.2 Specific Safety Precautions:

- **High Voltage**: The Metering Box may contain high voltage components. Always de-energize the system before performing any maintenance or repairs. Use lockout/tagout procedures to ensure the system remains de-energized during work.
- **Chemical Hazards**: The Metering Box may contain a lead acid battery if equipped with Viridi's VCOM telematics device. Batteries contain hazardous chemicals that can pose health risks if released. In the event of a battery leak or spill, follow appropriate hazardous material handling procedures and use spill containment equipment.
- **Mechanical Hazards**: Use proper lifting techniques and equipment when handling Metering Boxes. Ensure that battery packs are securely mounted and supported to prevent tipping or falling.

NOTE
By adhering to these safety guidelines and precautions, you can ensure the safe and reliable operation of Viridi Battery Energy Storage Systems

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3. OVERVIEW

3.1 Energy Management System Metering Box (Hardware)

Viridi Energy Management System (EMS) has the primary "BESS responsibility for the executing charge and discharge behavior in accordance with site goals. The EMS is comprised of two major components:

- ***Hardware:*** An Accuenergy revenue grade meter measures instantaneous voltage (V), current (A) power (KW) and power factor (PF) at up to six locations. Current Transformers (CTs) are placed at various locations to measure, for example:
  - **GRID:** point of building's interconnection with the utility grid – typically as close to the electric utility revenue meter as possible
  - **LOAD:** building distribution panel representing a building's entire or partial electrical consumption
  - **PV:** point of photovoltaic solar system AC coupling with building's electrical infrastructure
  - BESS: point of battery energy storage system AC coupling with building's electrical infrastructure
  - **CRIT**: a building installed subpanel containing only breakers designated as serving critical loads - to receive BESS power and remain operational during a grid outage

EMS Metering Box may also contain Viridi VCom IoT Edge Computing Device that runs the EMS software, networking switches, and other componentry.

- ***Software:*** EMS software runs on VCom Edge Devices within BESS and/or EMS Metering Boxes. The EMS can be configured through Viridi ViSTA Cloud monitoring and controls application. This cloud-based application shows the real-time performance and metrics of the system and generates reports.
- ***Hardware Dimensioning:***
  - All hardware enclosure dimensioning within this document shall be designated as follows:

$$\text{Dimensioning} = \frac{\text{[Inches]}}{\text{Millimeters}}$$

  - Note: Several Drawings are from the device/component manufacturer and dimensioned in inches only

3.2 Important Note on CTs

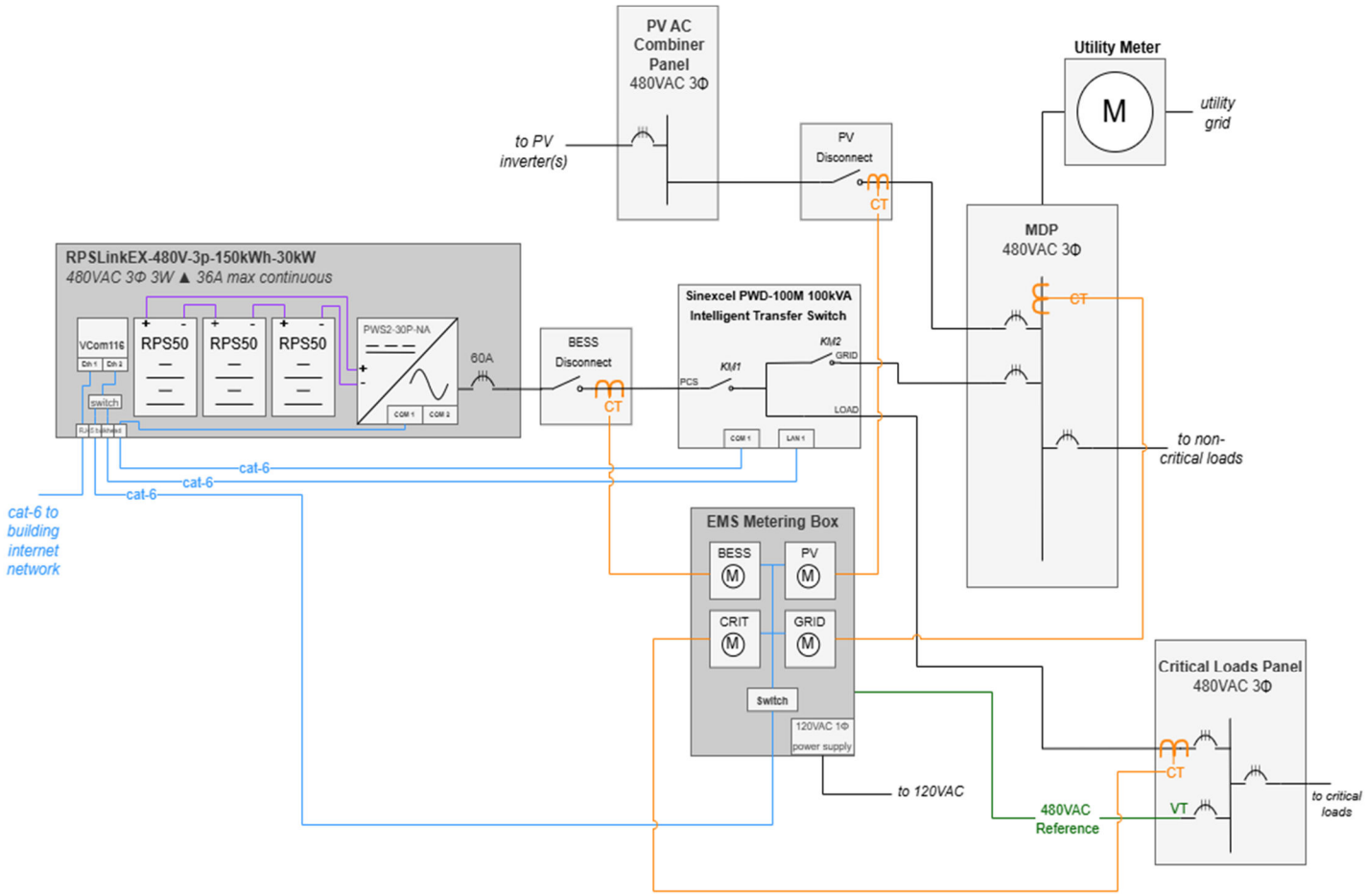
The EMS Metering Box is typically built and shipped from Viridi without CTs. CTs are specified per site based both on measured amperage and on physical size required to fit in a required location. CT selection and procurement is typically the responsibility of the project developer / design engineer / electrical contractor. See 4.5.1 CT Selection for acceptable CT type. Contact Viridi Technical Sales team at 716-968-8658 for configuration assistance.

3.3 Conceptual Layout: EMS Metering Panel

Viridi makes modular Battery Energy Storage Systems that can be designed into many configurations – the following 1-line diagrams represent a few typical arrangements but are by no means representative of every system. Please contact Viridi's Technical Sales Department at 716-968-8658 for configuration assistance.

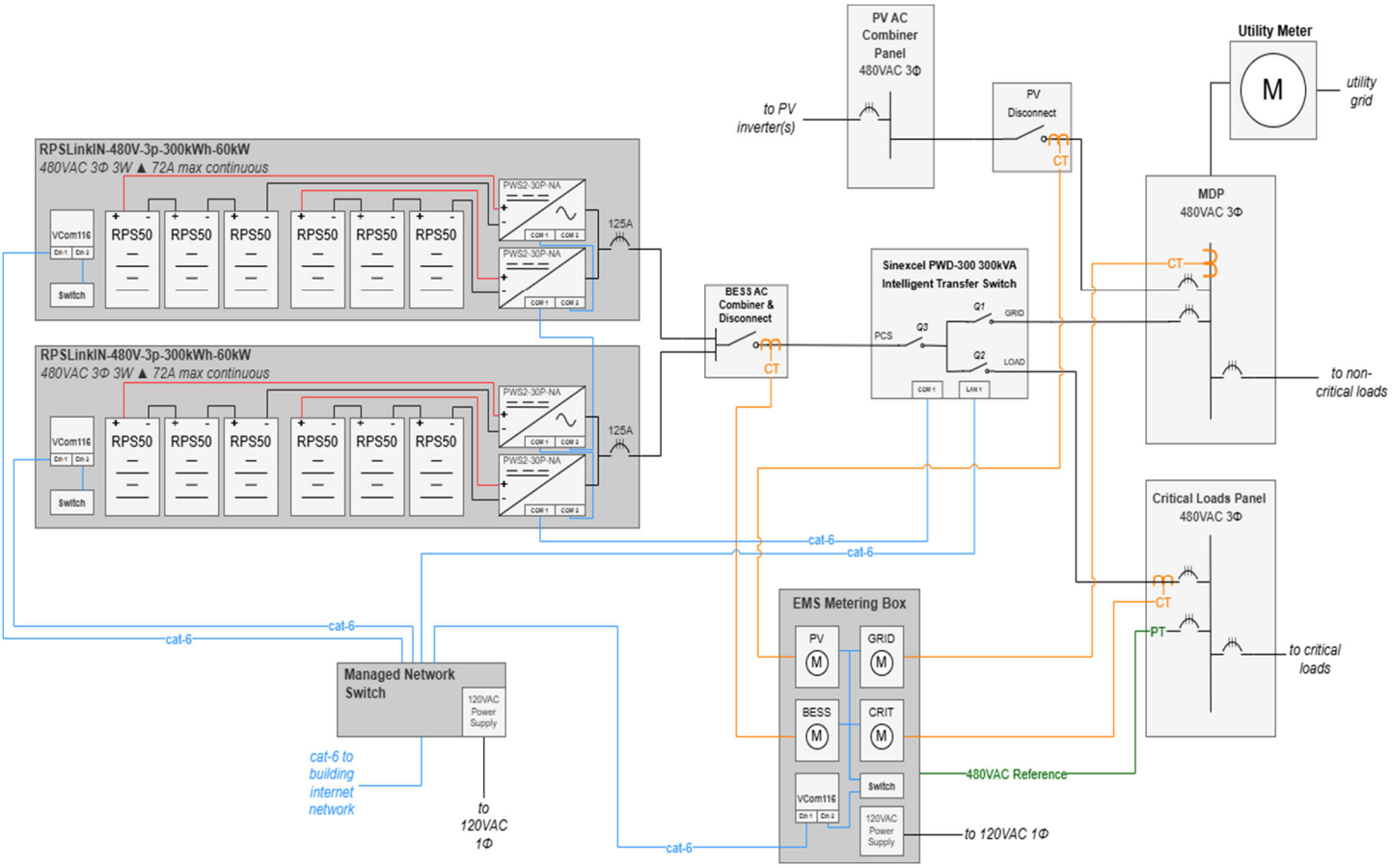
3.3.1 Example 1: 150KWh RPS EX Outdoor BESS

[*Behind The Meter*] 480VAC 3Φ Solar PV + RPSLinkEX-480V-3p-150KWh-30KW, includes Intelligent Transfer Switch required for BESS to operate as on- and off- grid device



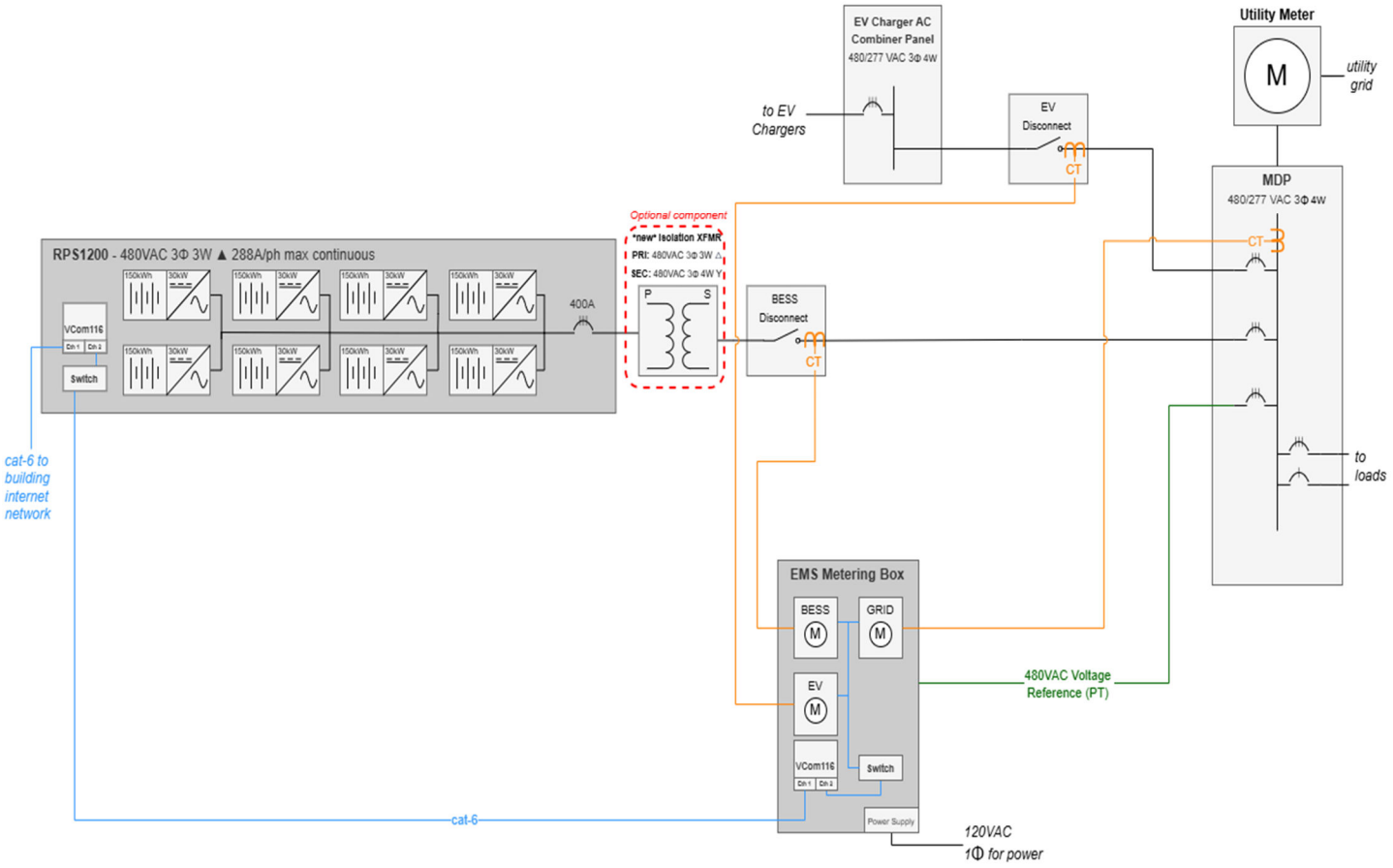
3.3.2 Example 2: 600KWh RPSLinkIN Indoor BESS

[*Behind The Meter*] 480VAC 3Φ Solar PV + (2) RPSLinkIN-480V-3p-300KWh-60KW, including Intelligent Transfer Switch required for BESS to operate as on- and off- grid device

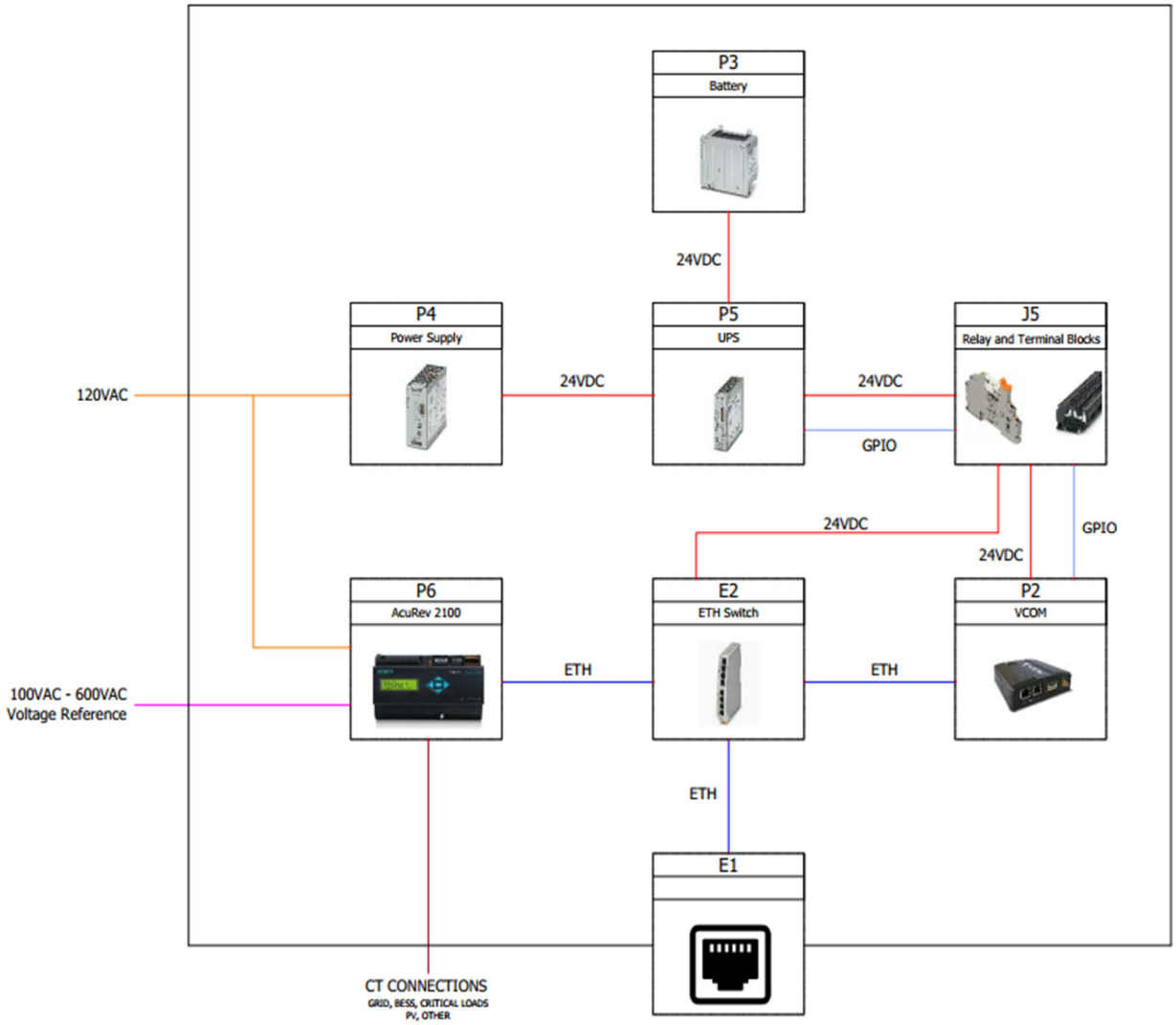


3.3.3 Example 3: 1200KWh RPS1200 Outdoor BESS

[*Behind The Meter*] 480VAC 3Φ DC Fast EV Charger + 1200, on-grid operation only

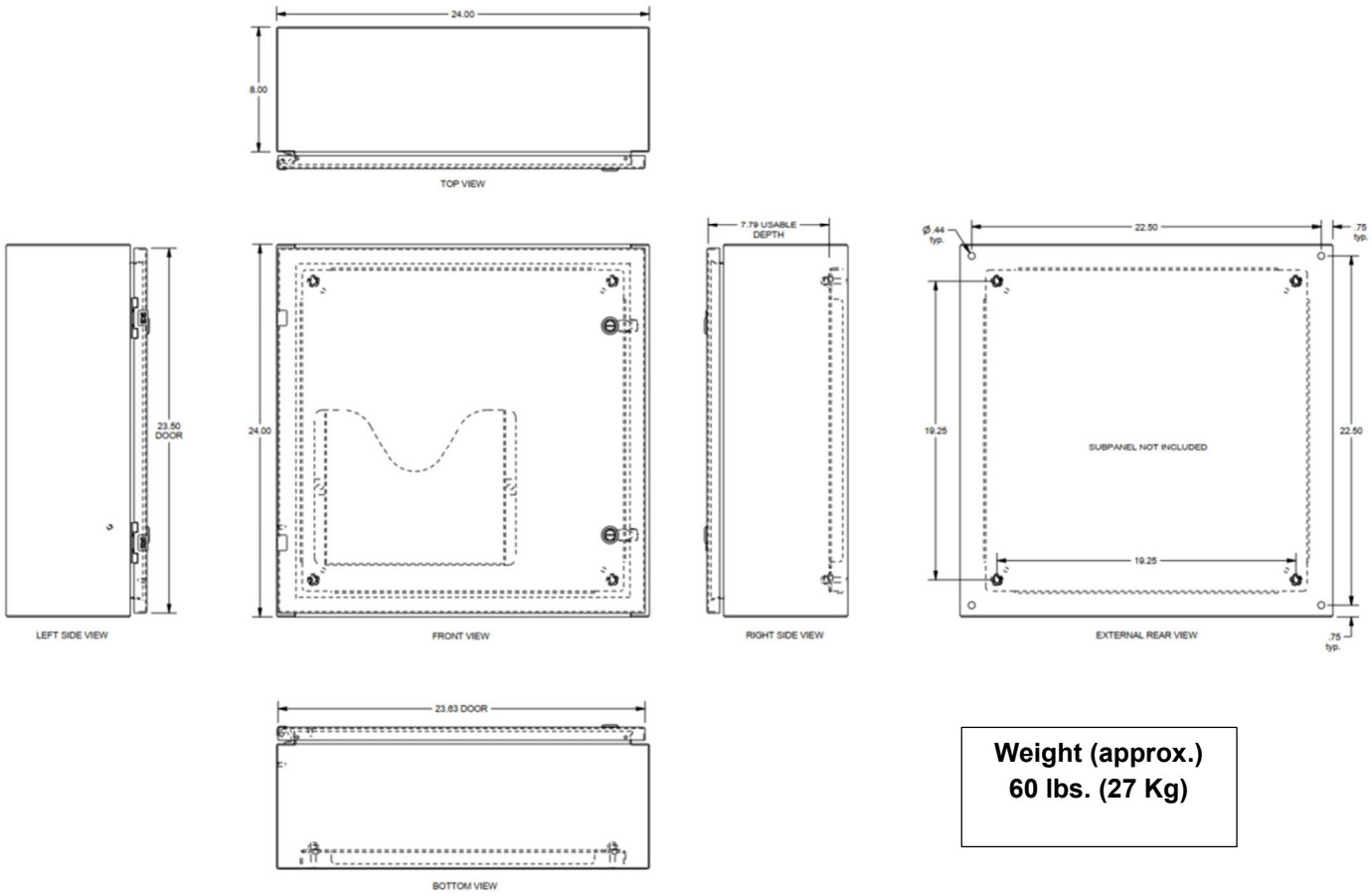


3.4 System Level Electrical Diagram: EMS Metering Box



3.5 EMS Metering Box Dimensional Drawings

Inside the National Electrical Manufacturers Association (NEMA) Enclosure*:* 120VAC / 24VDC power supply, terminal blocks for power, CTs & VTs, ethernet switch, and 1 EMS meter

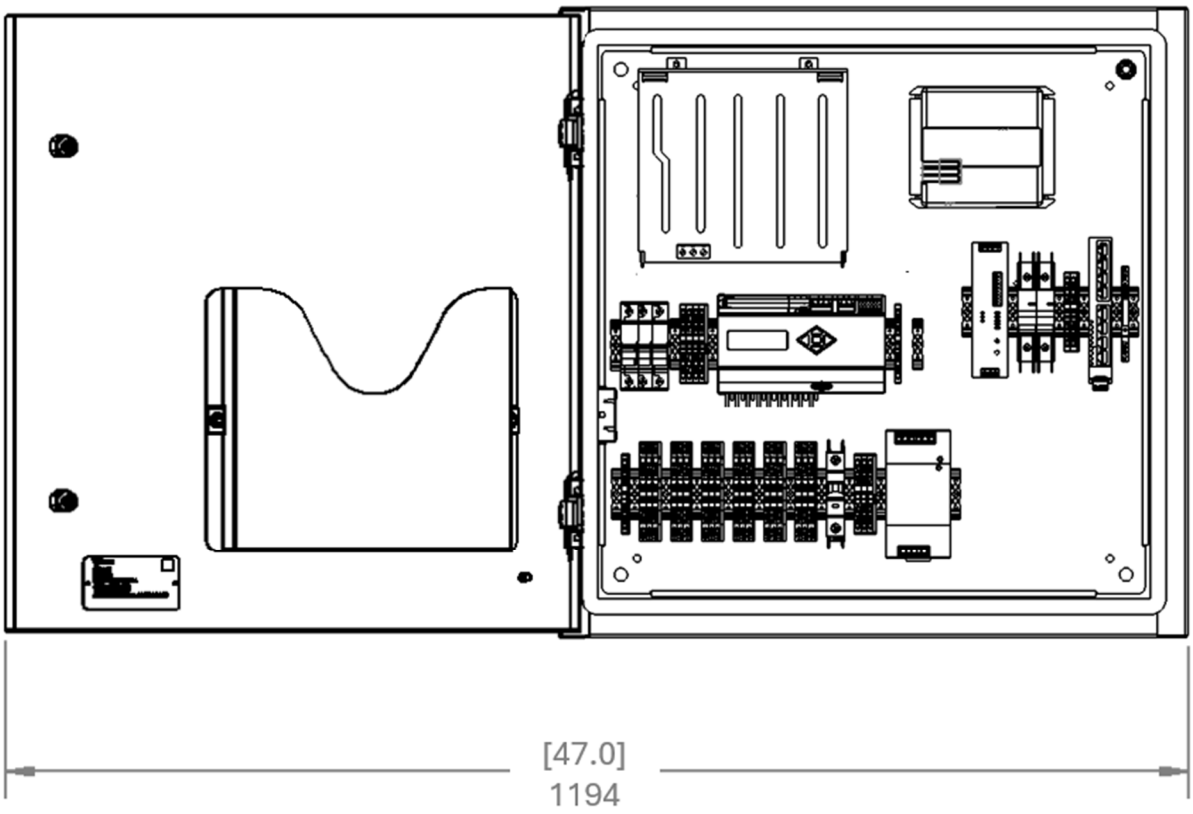


Weight (approx.)
60 lbs. (27 Kg)

EMS Metering Box Detailed Dimensions

3.6 EMS Metering Box

The door swing full extension of the metering box is shown below:



EMS Metering Box Open Door Swing

4. INSTALLATION

4.1 Pre-Installation Considerations

4.1.1 Safety Planning

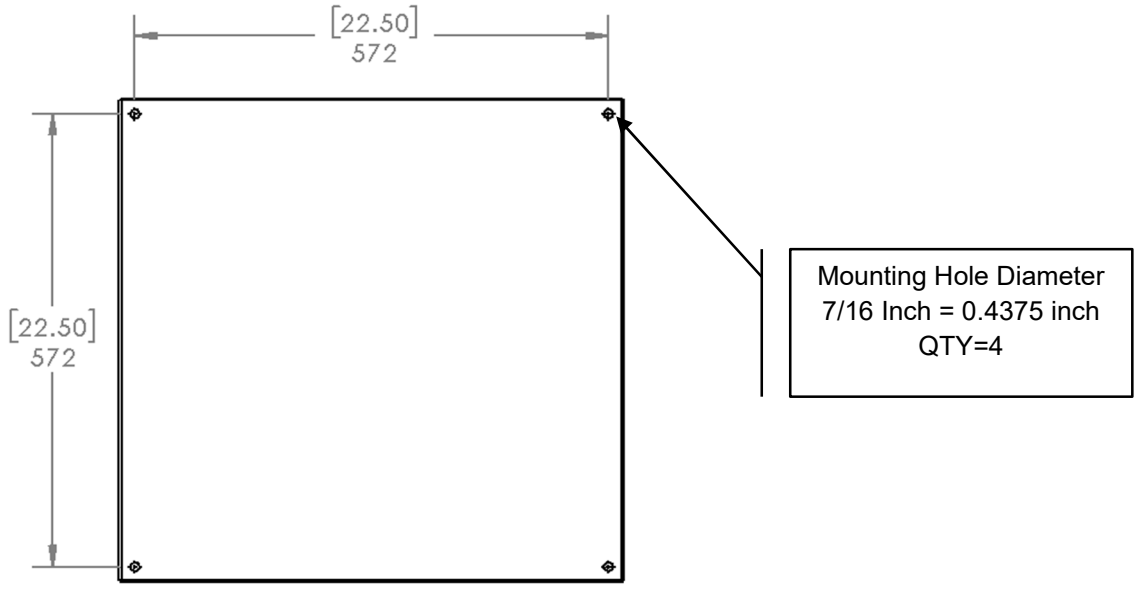
Developing a Safety Plan should consider all activities. Key aspects may include:

- Rules and regulations for site access
- Assigned personnel access
- Management of access keys
- Identification of site hazards
- Safety training for site access
- Personal Protective Equipment (PPE) provisioning
- Loading / unloading equipment (i.e.: rigging instructions)
- Technician certification requirements
- Emergency shutdown procedures / fail-safe states
- Emergency Power Off (EPO) interlock strategies with related equipment / systems
- First responder action plans
- Lock Out / Tag Out (LOTO) procedures
- Post-commissioning removal of temporary equipment
- Post-commissioning review, assessment, and documentation
- All mechanical and electrical installation procedures must comply with local code requirement

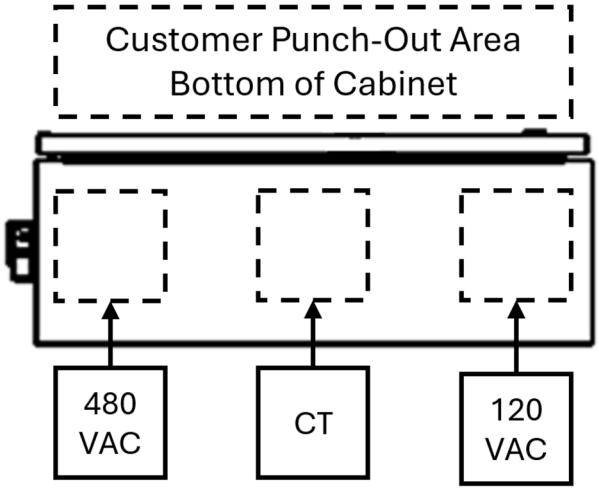
4.2 Energy Management System Metering Boxes Installation Procedure

4.2.1 Mounting and Securing EMS Metering Box

- Mounting holes in rear of enclosure Mount cabinet to wall - mounting dimension in shown below



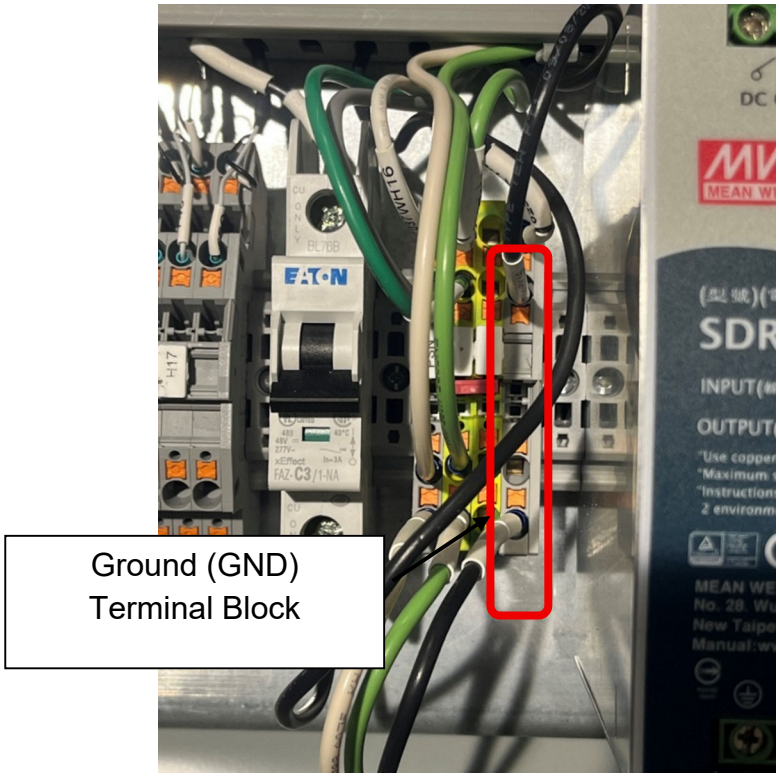
EMS Metering Box Mounting Plate



Recommended Customer Punch-Out Locations

4.3 Connecting Ground to EMS Metering Box

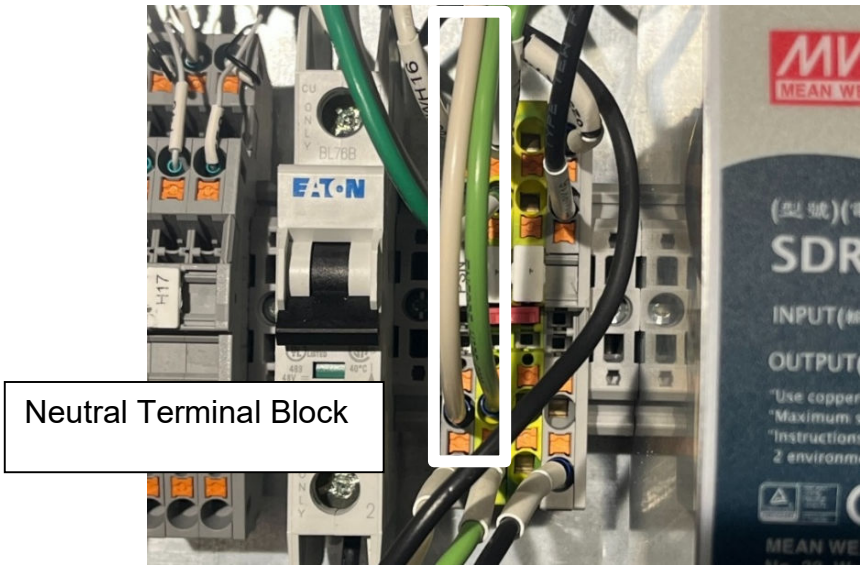
- Pull 120VAC ground wire through punch out
- Connect ground wire to GND Terminal Block
- Choice of wire for grounding is 14 AWG



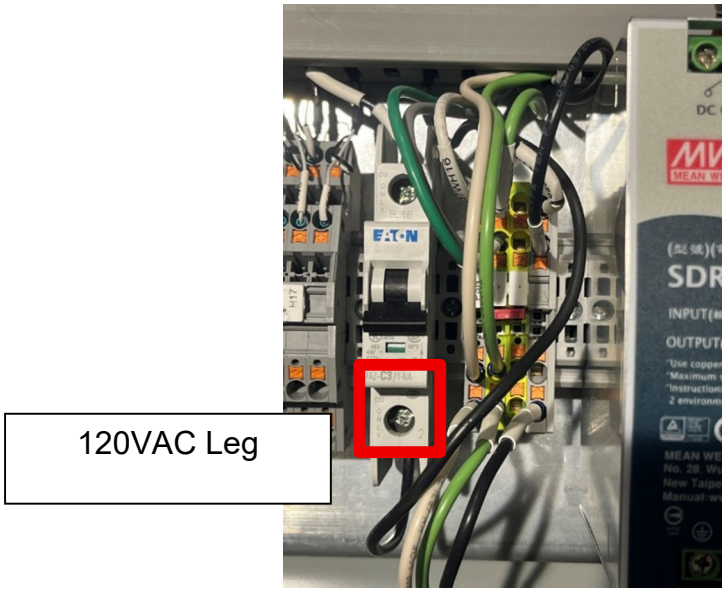
Ground Connection

4.4 Connecting Power to EMS Metering Box

1. Punch a hole in the bottom of the enclosure for the 120VAC.
2. Pull wires through and secure with proper strain relief.
3. Land the GND on the GND terminal block (reference Connecting Ground to EMS Metering Box – [Paragraph 4.3]).
4. Land neutral on the Neutral Terminal Block



5. Land the 120VAC leg on the bottom side of the breaker



4.5 Installing Current Transformers

4.5.1 CT Selection

The Viridi EMS Metering Box supports Rogowski Coils (RCTs) and 333mV CTs. Mixing CT types is not recommended or supported.

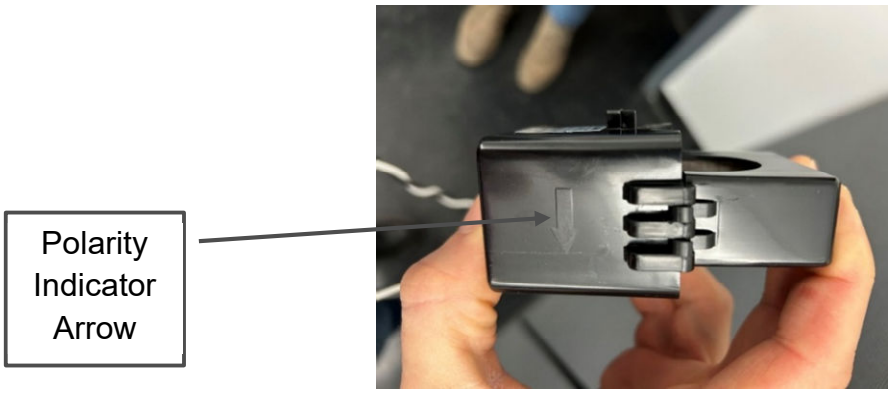
Viridi recommends the use of Accuenergy AcuCT R Series or Flex Series.

4.5.2 CT Polarity

The Viridi EMS Metering Box is a generic power monitoring device. When paired with the Viridi EMS, the following CT polarities shall be used:

Metering Point	Polarity
Grid	Arrow away from the grid towards the building: • (+) Importing • (-) Exporting
BESS	Arrow towards BESS: • (+) Charging • (-) Discharging
Load	Arrow towards load: • (+) Consuming • (-) Producing
PV	Arrow towards Solar: • (+) Consuming • (-) Producing

Example CT with polarity indicator arrow:



Current Transformers (CT) Polarity Indicator

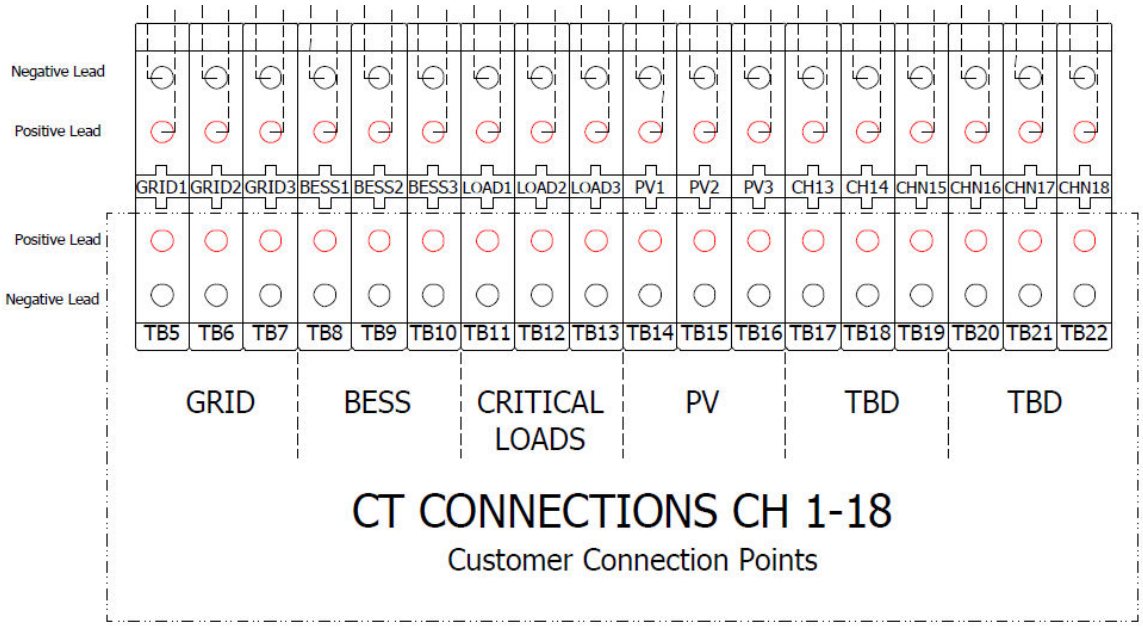
4.5.3 CT Extension

If CT leads need to be extended the following rules apply:

- **Rogowski Coils:** Extend with shielded 18-26AWG twisted pair following manufacturer recommendations
- **mV CT**: Extend with 14AWG twisted pair

4.5.4 CT Landing

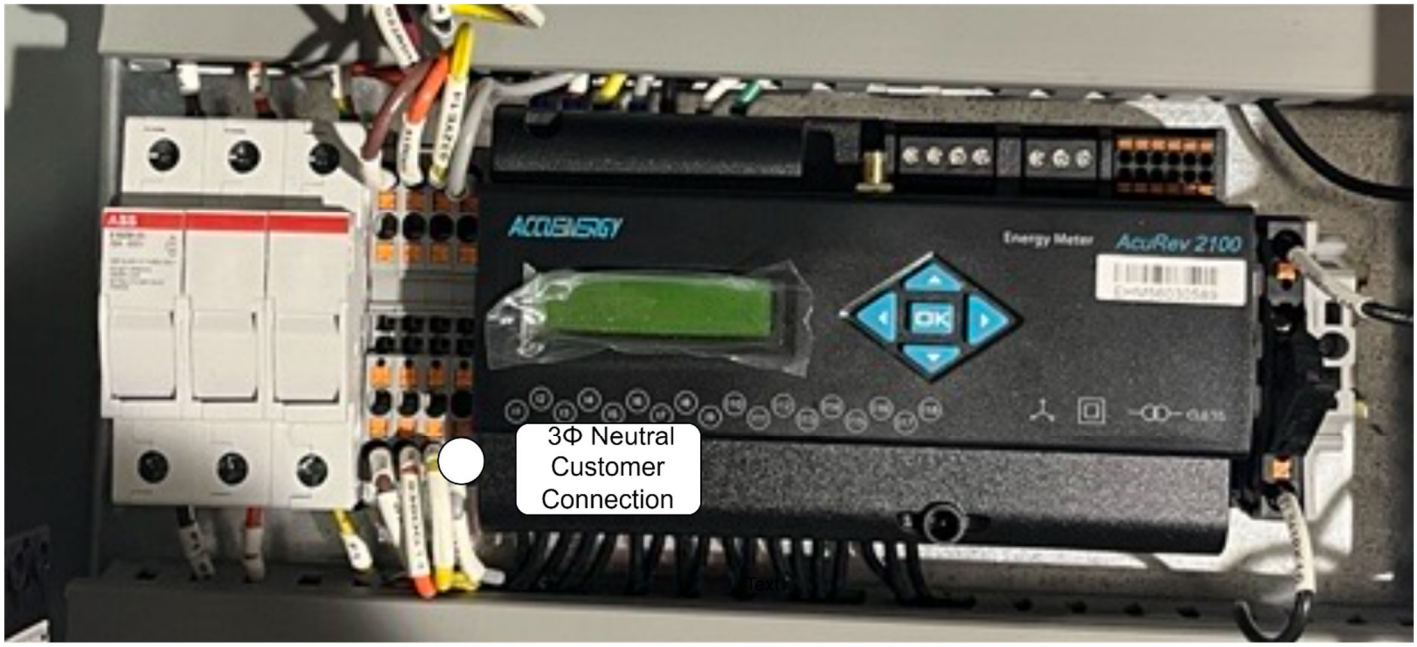
CT's shall be pulled through punchouts (see §4.2.1) on EMS Metering Box. CT's shall be landed on the corresponding terminal blocks.



CT Connections

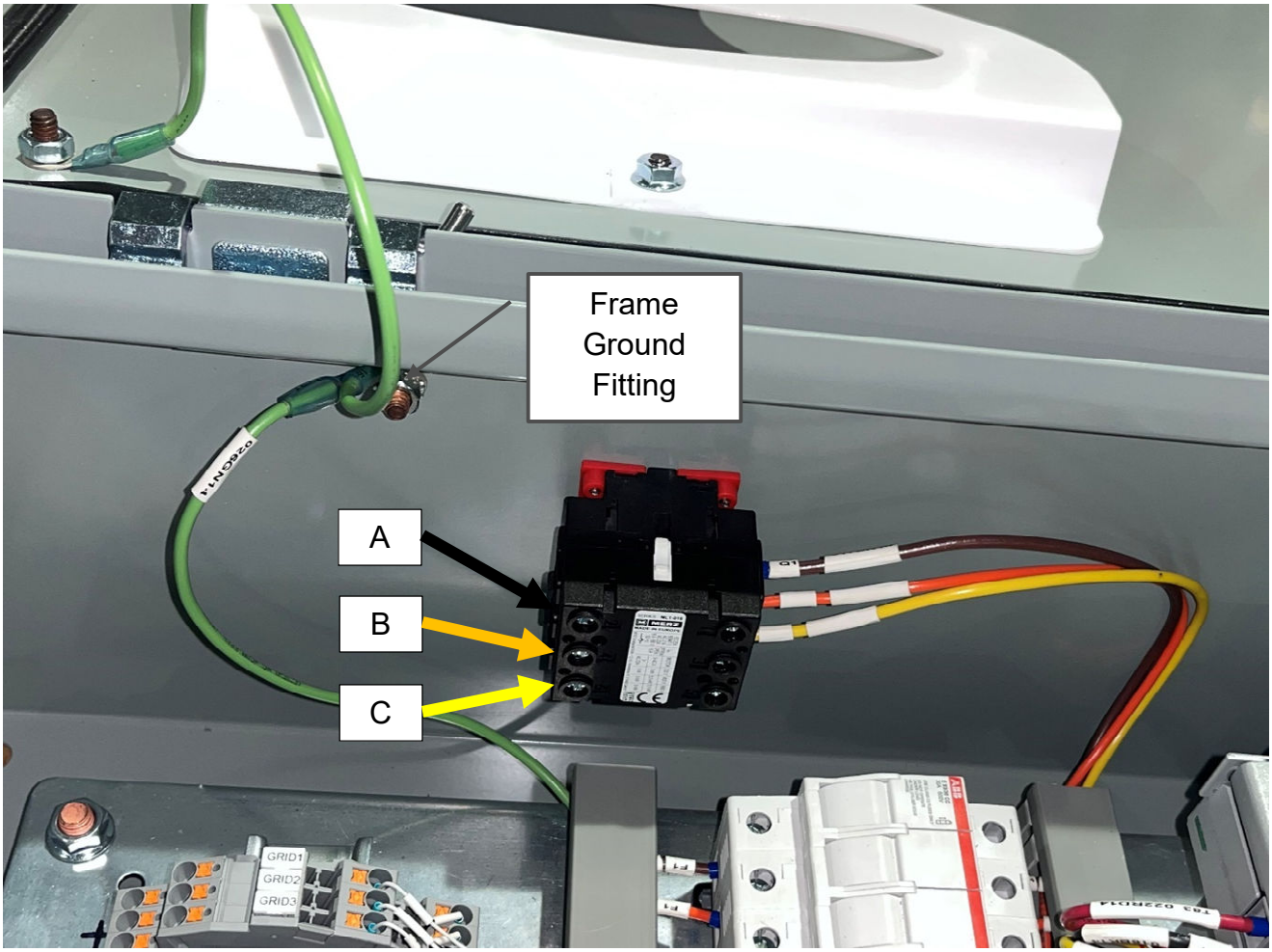
4.6 Connecting Voltage Taps (VTs)

- Pull 3 Phase and Neutral Voltage References cable through punchout
- Connect neutral to the corresponding terminal block



Neutral Connection for 3 Phase

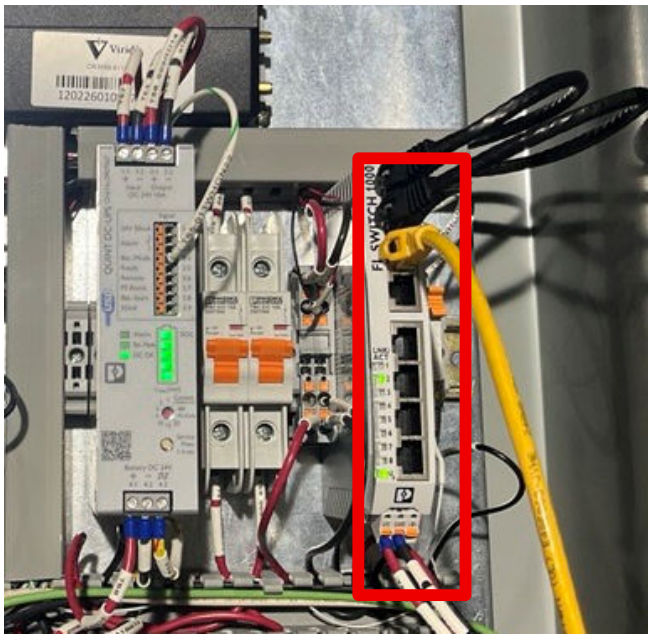
- Connect Phase A, B, C to the 3 Phase disconnect
- The choice of wire for VTs is 14-10 AWG.



Voltage Tap Connection to 3 Phase Disconnect

4.7 Communications Connections

A communications connection is required from the other equipment on the site. Either directly from the BESS onsite, or a switch that is aggregating the BESS and any other metering boxes and/or assets on site. All connections are Gigabit Ethernet RJ45. Punch a hole in the enclosure to run properly strain relieved CAT cable. Connect RJ45 to any open port on the switch.



Communications Connection

4.8 Configuration

4.8.1 Configure IP Address (if applicable)

The EMS Metering Box is pre-configured to work in most installations with an IP address of: **https://192.168.82.50** and subnet mask of **https://255.255.255.0**

If multiple EMS Metering Boxes are being installed on one site, then the IP addressing will need to be updated by following the following steps.

1. Press any key to activate the meter.
2. Press left and right arrow keys simultaneously to access menu.
3. Use left and right arrow keys to navigate to NET and press OK to enter network settings.
4. When the PASSWORD is displayed, press OK.
5. Use left and right arrow keys to navigate to P02 IP Address and press OK to edit.
6. Use up and down arrow keys to modify the flashing digit.
7. Use left and right arrow keys to navigate to other digits and repeat step 6 to modify them.
8. Press OK to exit editing.
9. Use left and right arrow keys to navigate to P03 Submask and press OK to edit.
10. Use up and down arrow keys to modify the flashing digit.
11. Use left and right arrow keys to navigate to other digits and repeat step 6 to modify them.
12. Press OK to exit editing.

4.8.2 Login to Meter

1. Configure laptop IP address to one compatible with a meter IP address set in paragraph 4.8.1. If you use the default IP settings, then **https://192.168.82.100** may be used.
2. Connect ethernet cable from laptop to ethernet switch.
3. Navigate to meter IP address set in paragraph 4.8.1. Default: **https://192.168.82.50**
4. Login with username **admin** and password **admin**.
5. If prompted to change the password, click Cancel.

4.8.3 Configure CTs on Meter

1. Login to the meter as described in paragraph 4.8.2.
2. Navigate to Settings > Meter > General.
3. Adjust Device Transformer to 333mV or RCT depending on the type of CTs connected.
4. Navigate to Settings > Meter > User and CT.
5. Enter CT ratings under CT Model.

4.8.4 Validate Power Readings

1. Login to the meter as described in paragraph 4.8.2
2. Navigate to Metering > Phase Angles.
3. Note the rotation order of the voltage phase angles.
4. Switch to the Current tab.
5. Check that the current phase angles of each channel match the voltage phase angles.
6. Navigate to Metering > Basic Metering
7. Check that the sign of the Total Active Power of each channel is correct for the current situation and intended reading. Reference paragraph 4.5.2 (CT Polarity) for intended polarities for Viridi EMS use.

4.9 Commissioning Checklist

4.9.1 EMS Metering Box Commissioning Checklist

RPSLink Serial Number:
Test Start Date:
Test End Date:
Commissioning Performed By:
Document # 9340-00067
Revision # 1

Phase 1 — Pre-Commissioning / Documentation Review

Step	Checklist Item	Status (OK / Pending / N/A)	Comments / Notes
1.1	Verify design documentation set (single-line diagrams, layout, control logic, network diagram).		
1.2	Confirm utility witness test plan readiness.		
1.3	Review as-built wiring vs drawings; mark deviations.		
1.4	Verify system labeling, nameplates, and warning signage.		
1.5	Safety documentation — lockout/tagout plan, emergency response plan.		
1.6	Verify quality QA/QC checks completed for EMS Metering Box(es)		

Phase 2 — Mechanical & Installation Inspection

Step	Checklist Item	Status (OK / Pending / N/A)	Comments / Notes
2.1	Check physical mounting of EMS Metering Box(es)		
2.2	Confirm EMS Metering Box(es) are located away from physical obstructions and has access for maintenance support		
2.3	Inspect conduit entries and gland seals to be properly secured		
2.4	Verify Unit is mechanically secured		

Phase 3 — Electrical Verification (Before Energization)

Step	Checklist Item	Status (OK / Pending / N/A)	Comments / Notes
3.1	Confirm system grounding/bonding continuity meets the NEC, verified by electrical contractor		
3.2	Verify OCPD reset/close and open without issues.		
3.3	Verify auxiliary power circuits (control, UPS, Network Switch, VCOM)		
3.4	Verify all ethernet connections are made to drawing		

Phase 4 — Controls, Communication & Software

Step	Checklist Item	Status (OK / Pending / N/A)	Comments / Notes
4.1	Power up control system on auxiliary power only.		
4.2	Verify VCom antenna connections are correct and secured		
4.3	Verify VCom communication (LTE, Wi-Fi or Ethernet connection)		
4.4	Provision EMS Site in ViSTA Cloud		
4.5	Verify ViSTA Cloud is receiving data		
4.6	Configure meter CT settings		
4.7	Power up BESS control system(s) on auxiliary power only. • BESS (es) must be commissioned to Phase 4		
4.8	Verify communication with BESS (es).		

Phase 5 — Functional / Dry Run Tests

Step	Checklist Item	Status (OK / Pending / N/A)	Comments / Notes
5.1	Energize 3-phase feed to EMS Metering Box(es) and BESS(es). • BESS (es) must be commissioned to Phase 5.		
5.2	Check AcuRev meter readings for correct phasing and polarity.		
5.3	Confirm AcuRev meter voltage readings with a voltmeter.		
5.4	Confirm AcuRev meter amperage readings with a current clamp. • Check each phase of each channel except for BESS, which is checked in step: 6.2		
5.5	Confirm alarm notifications through ViSTA Cloud.		

Phase 6 — Performance / Integration Tests			
Step	**Checklist Item**	**Status (OK / Pending / N/A)**	**Comments / Notes**
6.1	Run charge/discharge command tests at low power capacity (< 10%) on each BESS through the EMS.		
6.2	Check AcuRev meter BESS channel readings for correct phasing and polarity during charge/discharge.		
6.3	Check AcuRev meter BESS channel current accuracy with a current clamp. • Check and verify each phase		

Phase 7 — Final Acceptance & Documentation			
Step	**Checklist Item**	**Status (OK / Pending / N/A)**	**Comments / Notes**
7.1	Collect test data, sign-off sheets, torque records, calibration certificates.		
7.2	Train operations personnel on normal and emergency procedures.		
7.3	Submit commissioning report and punch-list closure.		
7.4	Provide as-built drawings and configuration backups as required.		
7.5	Transition to warranty/start of service period.		

5. OPERATION

The EMS Metering Box is used to monitor the power flow at the site and control the BESS for the optimal operation of the system. As a result, there is no direct interaction with either product during normal operation. The performance of the system can be monitored through Viridi's ViSTA™ Cloud platform.

6. Maintenance

Note:

- Unit must be completely disconnected from all external connections prior to any maintenance.
- For part numbers or replacement information, contact **service@viridiparente.com** or **parts@viridiparente.com**

6.1 Cleaning

While every effort has been made to ensure the accuracy of the content, the authors and publishers make no warranties, either express or implied, regarding the completeness or reliability of the information contained herein. Under no circumstances shall the authors, publishers, or any affiliated parties be liable for any direct, indirect, incidental, consequential, or punitive damages arising from the use or inability to use the information in these guidelines, even if advised of the possibility of such damages. By using this document, you agree to these terms and conditions.

- DO NOT power-wash of any part of the unit
- DO NOT spray any part of the unit (with a hose or other instrument)
- DO NOT touch the battery caps or high-voltage electrical connections
- Hand wash exterior of the EMS Metering Box with an all-purpose cleaner and rag as needed.

6.2 Contact Viridi Customer Service

If the issue is unresolved, please contact Viridi Customer Support at 1-866-984-7434

The following information will be requested:

Company Name	
Contact Name and Call Back #:	
Serial Number	
Set Up Details:	
Fault Details, including history relevant to the fault:	