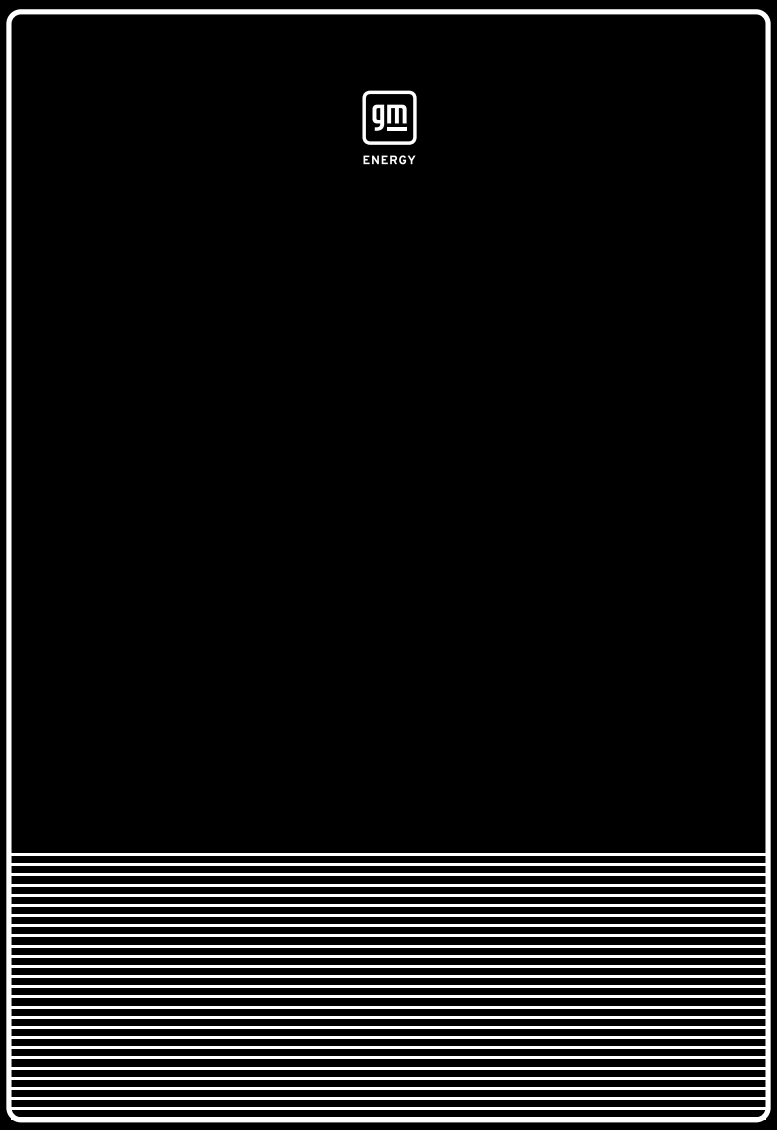


ENERGY

Inverter

Installation and Operation Manual

Version 06 - August 2024

Table of Contents

IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS

1 IMPORTANT SAFETY INFORMATION

This manual contains important instructions for GM Energy Inverter that should be followed during installation, operation and maintenance of the GM Energy Inverter. Note throughout this document the GM Energy Inverter may be referred to as the Inverter.

GM Energy Inverter is designed and tested to meet all applicable North American and International safety standards. However, like all electrical and electronic equipment, safety precautions must be observed and followed during installation and operation of the GM Energy Inverter to reduce the risk of personal injury and to ensure a safe installation.

Installation, commissioning, service and maintenance of GM Energy Inverter must only be performed by Qualified Personnel that are licensed and/or satisfied state and local jurisdiction regulations.

Before starting installation or commissioning of the GM Energy Inverter, read through the entire manual and pay special attention all DANGER! WARNING! CAUTION!, and NOTICE! statements.

All US electrical installations must comply and be in accordance with all the state, local, utility regulations, and National Electrical Code ANSI/NFPA 70.

For installations in Canada, please ensure these are done in accordance with applicable Canadian standards.

Ce manuel contient des instructions importantes concernant l'onduleur GM Energy qui doivent être suivies lors de l'installation, de l'utilisation et de l'entretien de l'onduleur GM Energy. Tout au long de ce document, l'onduleur GM Energy peut être désigné par le terme «onduleur».

Le convertisseur GM Energy est conçu et testé pour répondre à toutes les normes de sécurité nord-américaines et internationales en vigueur. Cependant, comme pour tout équipement électrique et électronique, des précautions de sécurité doivent être observées et suivies lors de l'installation et de l'utilisation du convertisseur GM Energy afin de réduire les risques de blessures et de garantir

une installation sûre.

L'installation, la mise en service, l'entretien et la maintenance de l'onduleur GM Energy ne doivent être effectués que par du Personnel Qualifié, titulaire d'une licence et/ou satisfaisant aux réglementations nationales et locales.

Avant de commencer l'installation ou la mise en service du Home Hub, lisez l'intégralité du manuel et accordez une attention particulière à tous les DANGER ! AVERTISSEMENT ! ATTENTION ! et AVIS !

Toutes les installations électriques nord-américaines doivent être conformes et respecter tous les règlements des services publics, nationaux, locaux ainsi que le National Electrical Code ANSI/NFPA 70.

Pour toute installation au Canada, veuillez vous assurer que les installations sont conformes aux normes canadiennes applicables.

1.1 Safety Symbols And Terminology Definitions

DANGER!

Indicates a hazardous situation which, if not avoided, will result in death or serious injury.

DANGER!

Indique une situation dangereuse qui, si elle n'est pas évitée, est susceptible de provoquer un décès ou des blessures graves.

WARNING!

Indicates a hazardous situation which, if not avoided, could result in death or serious injury.

AVERTISSEMENT!

Indique une situation dangereuse qui, si elle n'est pas évitée, est susceptible de provoquer un décès ou des blessures graves.

CAUTION!

Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

PRUDENCE!

Indique une situation dangereuse qui, si elle n'est pas évitée, est susceptible de provoquer des blessures légères ou de degré moyen.

NOTICE!

Indicates a situation that can result in property damage if not avoided.

AVIS!

Indique une situation susceptible de provoquer des dommages à la propriété, si elle n'est pas évitée.

INFORMATION!

Provided that when known and used will ensure optimal operation of the system.

INFORMATIONS!

La prémisse est que, lorsqu'il est connu et utilisé, le fonctionnement optimal du système sera assuré.

HIGH VOLTAGE WARNING!

Indicates hazardous high voltages are present, which, if not avoided, will result in death or serious injury. Thus, only authorized and trained personnel should install and/or maintain this product.

AVERTISSEMENT HAUTE TENSION!

Indique la présence de hautes tensions présentant un danger susceptibles de provoquer un décès ou des blessures graves si elles ne sont pas évitées. Par conséquent, l'installation et/ou l'entretien de ce produit doivent être entreprises uniquement par un personnel autorisé et formé.

Hot surface

Surface chaude

Equipment Grounding Conductor (EGC)

(EGC) Équipement conducteur de terre

Wait for a prescribed amount of time before engaging in the indicated action.

Patientez le délai requis avant d'entreprendre l'action indiquée.

1.2 Safety Instructions

The installer must be qualified to perform the installation pursuant to the requirements of local ordinances, the National Electric Code, and local building codes. This may include being Qualified Personnel that is active and in good standing with the state in which they are performing the installation services or working under the direction of such Qualified Personnel.

- The upper powerhead section (see figure 2) contains no user-serviceable parts. For all service and maintenance, the GM Energy Inverter should be returned to an Authorized Service Center.
- Read all of these instructions, cautions, and warnings for the GM Energy Inverter and associated PV array documentation.
- Before connecting the GM Energy Inverter to the AC distribution grid, approval must be received by the appropriate local utility as required by national and state interconnection regulations, and must be connected only by Qualified Personnel.
- In operation, the GM Energy Inverter wiring and connections can have hazardous high voltages and currents present, thus only authorized and Qualified Personnel shall install and/or maintain the GM Energy Inverter.
- In some operation instances, the GM Energy Inverter chassis and heat sink surfaces may become hot.
- PV solar arrays produce hazardous voltages and currents when exposed to light which can create an electrical shock hazard. Leave PV panels unplugged until safe to energize.

NOTICE!

This manual also includes references on how to connect the GM Energy Inverter and GM Energy Home Hub to DC Solar and Energy Storage. However, the GM Energy Inverter is ONLY intended to connect a compatible electric vehicle that is capable of vehicle to home discharge when grid power is not present. Please refer to most recent update of this document found at https://gmenergy.gm.com/for-home/resources-and-support for further information on any updates to future features.

L'installateur doit être qualifié pour effectuer l'installation conformément aux exigences des ordonnances locales, du code national de l'électricité et des codes de construction locaux. Il peut s'agir d'une Personne Qualifiée, active et en règle avec l'État dans lequel il effectue les services d'installation, ou travaillant sous la direction d'une telle Personne Qualifiée.

- La partie supérieure du balai (voir figure 2) ne contient aucune pièce répa-

rable par l'utilisateur. Pour toute opération d'entretien et de maintenance, l'onduleur doit être renvoyé à un centre d'entretien agréé.

- Lisez toutes ces instructions, précautions et avertissements concernant l'onduleur GM Energy et la documentation associée au réseau photovoltaïque.
- Avant de raccorder l'onduleur GM Energy au réseau de distribution CA, il convient d'obtenir l'autorisation du service public local approprié, conformément aux réglementations nationales et régionales en matière d'interconnexion, et le raccordement ne doit être effectué que par du Personnel Qualifié.
- Des courants et des tensions de hautes intensités dangereuses peuvent être présents dans le câblage et les connexions de l'onduleur en marche, par conséquent, l'installation et/ou la maintenance de l'onduleur doivent être entreprises uniquement par un personnel autorisé et qualifié.
- Sous certains régimes de fonctionnement, le châssis de l'onduleur et les surfaces des dissipateurs de chaleur peuvent devenir chaud.
- Les panneaux solaires photovoltaïques produisent tensions et courants dangereux lorsqu'ils sont exposés à la lumière et constituent un danger de choc électrique. Laisser les panneaux photovoltaïques débranchés jusqu'à ce qu'ils puissent être mis sous tension en toute sécurité.

AVIS!

Ce manuel contient également des références sur la manière de connecter l'onduleur GM Energy et le GM Energy Home Hub à un système solaire CC et à un système de stockage d'énergie. Cependant, l'onduleur GM Energy est UNIQUEMENT destiné à connecter un véhicule électrique compatible capable de décharger le véhicule à la maison en l'absence de réseau électrique. Veuillez vous référer à la dernière mise à jour de ce document à l'adresse https://gmenergy.gm.com/for-home/resources-and-support pour plus d'informations sur les mises à jour des futures fonctionnalités.

2 INTRODUCTION

The GM Energy Inverter e1.11 (GM Energy Inverter) converts energy from compatible photovoltaic systems, compatible energy storage systems and compatible electric vehicle to be used in the home (additional system equipment required). The GM Energy Inverter is characterized by an advanced housing design and state-of-the-art high-frequency technology, which enables the highest level of efficiency.

2.1 System

In the following system level technical description, the precise functions are explained to the installer, as well as the user, which are required for the installation, operational start-up and handling of the GM Energy Inverter.

The GM Energy Inverter is transformerless type without galvanic isolation. Therefore, the GM Energy Inverter may only be operated with ungrounded PV arrays. Furthermore, the PV arrays must be installed in accordance with the locally valid regulations for ungrounded PV arrays. Additionally, the PV array (PV modules and cabling) must have protective insulation and the PV modules used must be suitable for use with the GM Energy Inverter. PV modules with a high capacity to ground may only be used if their coupling capacity does not exceed 1,200 nF with 60Hz grid.

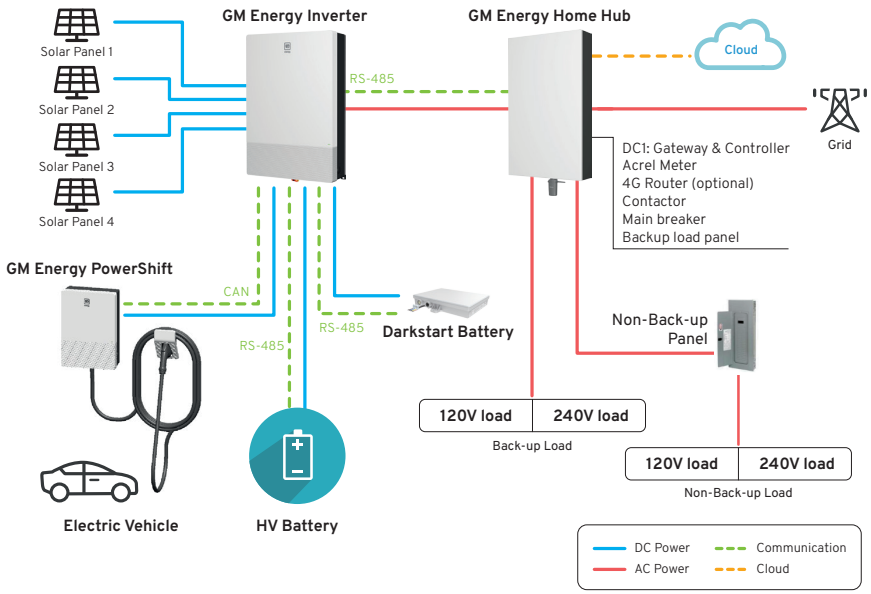


Figure 1: System equipment overview

GM Energy Inverter

The GM Energy Inverter manages PV, HV battery and compatible electric vehicle battery energy.

PV Panel

The GM Energy Inverter manages PV, HV battery and compatible electric vehicle battery energy.

For DC-couple system, PV panel works in MPPT mode or power reduction mode according to system operational mode. For AC-couple system, there may be no solar module connected to GM Energy Inverter, and the PV power option will be deactivated.

High Voltage Battery

If a high voltage(HV) battery is connected to the GM Energy Inverter, it must be activated before use. This setting can be done in factory test or via App after installation.

HV battery communicates with GM Energy Inverter via RS485 or CAN. And the battery must comply with the specifications of UL 1973.

GM Energy PowerShift

GM Energy PowerShift is connected between compatible electric vehicle and GM Energy Inverter responsible for the charge and discharge management of

the compatible electric vehicle. Throughout this document the GM Energy PowerShift may be referred to Electric Vehicle Supply Equipment(EVSE).

GM Energy Dark Start Battery(DSB)

GM Energy Dark Start Battery is connected to GM Energy Inverter. when the AC grid is lost, the Dark Start Battery supplies power to the control circuit of the GM Energy Inverter and the GM Energy PowerShift.

Rapid Shutdown Device

The RSD provides an automatic disconnect of residential or small commercial PV systems that are wired into the GM Energy Inverter DC MPPTs, fully compliant with the Rapid Shutdown requirements of NEC Article 690.12.

GM Energy Home Hub

GM Energy Home Hub is a 200A rated micro-grid interconnect device for the whole home or partial home backup. It can serve as the Main Service Panel and can be used to transfer energy between on-grid mode and off-grid mode with its auto grid detection. The number of breakers mounted inside offers more individual power supply options. The optional accessories inside makes the GM Energy Home Hub can be used to cooperate with the GM Energy Inverter or other residential energy storage solution.

Meter

Meter is used by the GM Energy Inverter to import / export consumption readings, and manage the battery charge / discharge accordingly for smart energy management applications, for example self-consumption, zero-export or TOU. Meter reports its electricity measuring value to GM Energy Inverter via RS485 following Modbus.To meet UL 1741 PCS CRD requirements, the meter must be installed.

Grid

240V / 208V grid are supported, and it can be configured via PowerShift Install App.

Android/iOS App

A very powerful tool for monitoring, configuration or diagnosis. PowerShift Install App is connected to GM Energy Inverter.

Current Transformer

Current transformer can detect the current of controlled conductor. It is shipped together with the meter. For CT installation, please refer to the system installation manual.

2.2 Equipment Overview

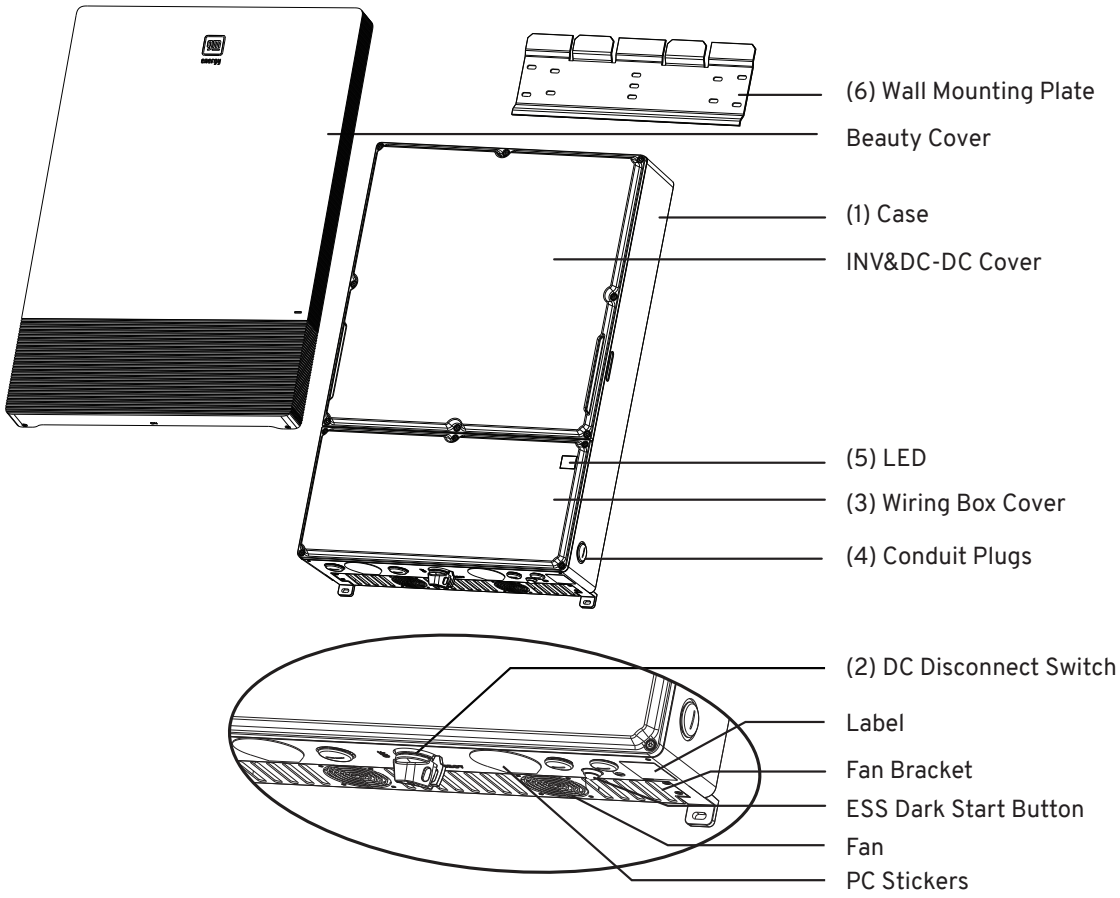


Figure 2: Exterior view of GM Energy Inverter main components

A further description of the equipment features:

(1) Case - This section contains the power convention part and wiring box part. The upper part is sealed at the factory and there are no user-serviceable parts inside. All wiring to install the GM Energy Inverter is done in the wiring box.

(2) Lockable DC Disconnect - The DC disconnect is lockable per the UL code and allows the PV power to be switched off to the GM Energy Inverter.

(3) Wiring Box - This is the compartment where all the wiring for the GM Energy Inverter inputs and outputs plus the RS485 communication are done.

(4) Conduit Plugs - 1 inches (4x), 3/4 inches (2x) and 1/2 inches (2x) conduit holes are provided, remove the PC stickers which are needed to use. Two of the recommend 1 inches conduit holes are covered by PC stickers. If use other 1 inches holes, please replace the PC stickers with the conduit plugs teared. To maintain GM Energy Inverter NEMA rating conduit fittings need to be water tight with either NEMA 4, 4X, 6, or 6X rated (insulated type preferred). Installa-

tion indoors may use non-water tight conduit fittings if compliant with electrical code requirements.

(5) LED indicator - The one LED lights indicate errors or status as described in section 5.1.

(6) Wall Mounting Plate - The GM Energy Inverter ships with a mounting plate that allows easy attachment of the GM Energy Inverter to a wall.

2.3 GM Energy Inverter Type And Safety Labels

The type label is shown in figure 3. Different type labels can be found on the model. The GM Energy Inverter serial number can be found on the type label.

The main caution labels in English and French are on the left side of the GM Energy Inverter.

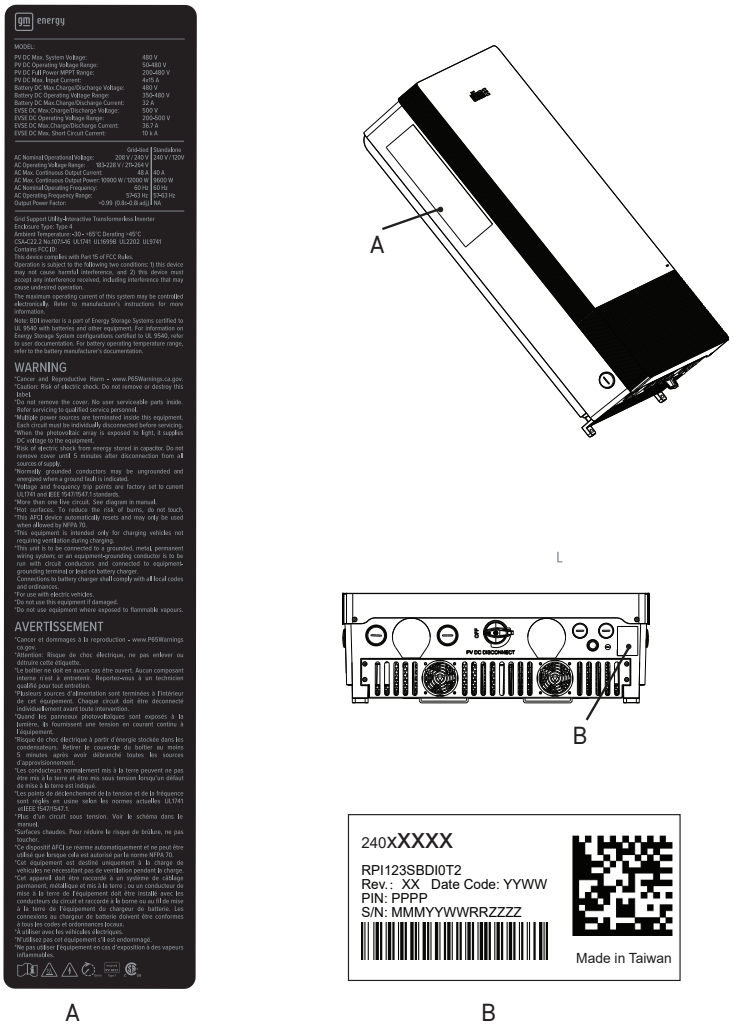


Figure 3: Location of sample label

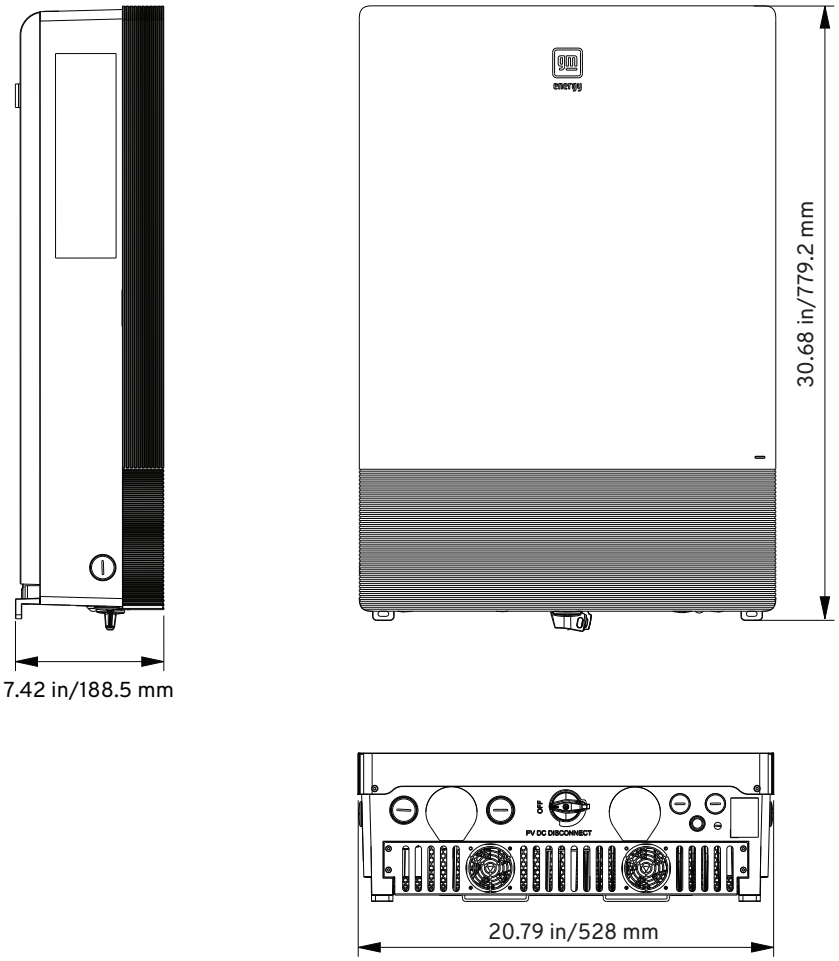


Figure 4: Dimensions of GM Energy Inverter

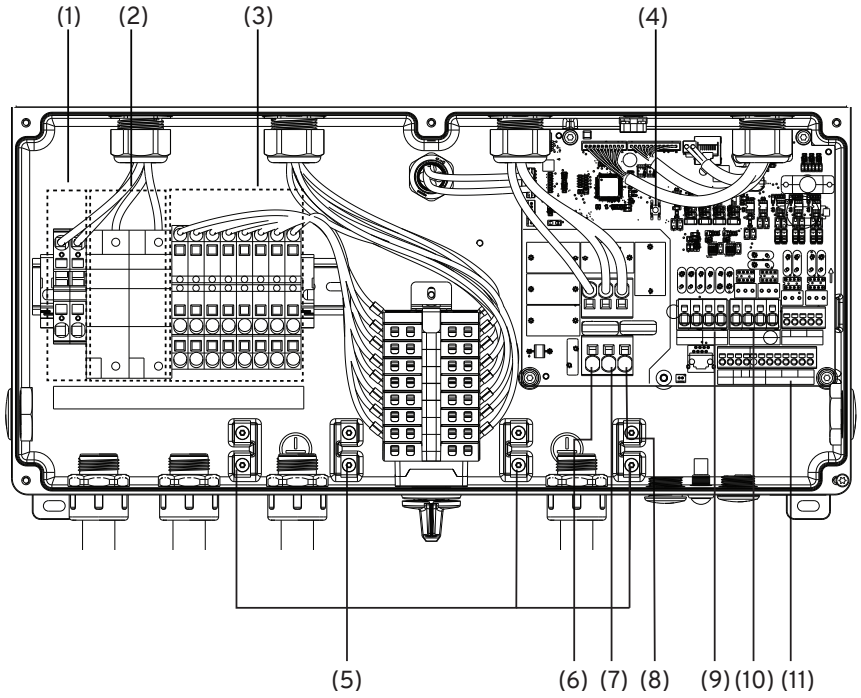


Figure 5: Wiring box of GM Energy Inverter

(1) EVSE Terminals

(2) BAT Terminals

(3) PV Teminals

(4) Reset Button

(5) Grounding

(6) AC Side L1

(7) AC Side Netural

(8) AC Side L2

(9) MID 12V Terminals

(10) DSB Terminals

(11) RS485 Communication Ports

Required Torques For Wiring Box Terminals

Terminals in Figure 5	Wire size permitted	Torque
5(Grounding)	8-6 AWG copper(8.4 - 13.3 mm^2)	16 in-lbs
2(BAT teminals)	8-6 AWG copper(8.4 - 13.3 mm^2)	28 in-lbs

Table 1: Required torques for wiring box terminals

3 INSTALLATION

WARNING!

Read all of these instructions, cautions, and warnings for the GM Energy Inverter and associated PV array documentation.

AVERTISSEMENT!

Lisez toutes ces instructions, précautions et avertissements concernant l'onduleur GM Energy et la documentation associée au réseau photovoltaïque.

WARNING!

The installer must be qualified to perform the installation pursuant to the requirements of local ordinances, the National Electric Code, and local building codes. This may include being a Qualified Personnel that is active and in good standing with the state in which they are performing the installation services or working under the direction of such Qualified Personnel.

AVERTISSEMENT!

L'installateur doit être qualifié pour effectuer l'installation conformément aux exigences des ordonnances locales, du code national de l'électricité et des codes de construction locaux. Il peut s'agir d'une Personne Qualifiée, active et en règle avec l'État dans lequel il effectue les services d'installation, ou travaillant sous la direction d'une telle Personne Qualifiée.

WARNING!

The installation and wiring methods used in the installation of the GM Energy Inverter in the U.S. must comply with all US National Electric Code (NEC) requirements and local AHJ inspector requirements. In Canada, the installation and wiring methods used must comply with the Canadian Electric Code, Part I and II, and the local AHJ inspector requirements. System grounding when required by the Canadian Electrical Code, Part I, is the responsibility of the installer.

AVERTISSEMENT!

Les méthodes d'installation et de câblage utilisées pour l'installation de l'onduleur GM Energy aux États-Unis doivent être conformes à toutes les exigences du National Electric Code (NEC) américain et aux exigences de l'inspecteur local de l'AHJ. Au Canada, l'installation et les méthodes de câblage utilisées doivent être conformes au Code canadien de l'électricité, parties I et II, et aux exigences de l'inspecteur local de l'AHJ. La mise à la terre du système, lorsqu'elle est exigée par le Code canadien de l'électricité, partie I, relève de la responsabilité de l'installateur.

WARNING!

These servicing instructions are for Qualified Personnel use only. To reduce the risk of electric shock, refer all servicing to factory qualified service personnel. No user service parts are contained inside the GM Energy Inverter.

AVERTISSEMENT!

Ces instructions d'entretien sont réservées à un Personnel Qualifié. Pour réduire le risque d'électrocution, confiez toutes les opérations d'entretien à un personnel qualifié. L'onduleur GM Energy ne contient aucune pièce destinée à l'entretien par l'utilisateur.

WARNING!

GM Energy Inverter is heavy (see 9.2 Technical data), must be lifted and carried by at least two people.

Handle with care, do not drop, impact GM Energy Inverter during installation to prevent damage.

AVERTISSEMENT!

L'onduleur GM Energy est lourd (voir 9.2 Caractéristiques techniques) et doit être soulevé et porté par au moins deux personnes.

Manipuler avec précaution, ne pas laisser tomber, ne pas heurter l'onduleur GM Energy pendant l'installation afin d'éviter tout dommage.

CAUTION!

The secondary short-circuit current rating is increased at the transfer connection point to the public electricity supply system by the nominal current of the connected GM Energy Inverter.

PRUDENCE!

Le courant nominal secondaire du court-circuit est augmenté au point de connexion du transfert vers le réseau électrique public par le courant nominal de l'onduleur solaire connecté.

CAUTION!

To reduce the risk of fire, connect only to a circuit provided with branch circuit over current protection in accordance with the National Electrical Code, ANSI/NFPA70.

PRUDENCE!

Afin de réduire les risques d'incendie, effectuez une connection uniquement avec un circuit équipé d'une protection contre les surintensités des circuits de dérivation, conformément au National Electrical Code, ANSI/NFPA70.

Notice

Leave protective film on front cover until installation complete to avoid scratching.

Avis

Laisser le film protecteur sur le couvercle avant jusqu'à la fin de l'installation pour éviter les rayures.

INFORMATION!

In order to be able to carry out an energy measurement, a KWH revenue meter must be attached between the networks feed-in point and the GM Energy Inverter.

INFORMATIONS!

Pour pouvoir effectuer une mesure de l'énergie, un compteur de KWH doit être installé entre le point d'alimentation du réseau et l'onduleur GM Energy.

3.1 Visual Inspection

All GM Energy Inverters are 100% tested, packaged in a heavy duty cardboard shipping carton, and visually inspected before leaving our manufacturing facility. If you receive the GM Energy Inverter in a damaged shipping carton, please reject the shipment and notify the shipping company.

Verify GM Energy Inverter shipping carton contains:

a. Correct inverter model: GM Energy Inverter e1.11

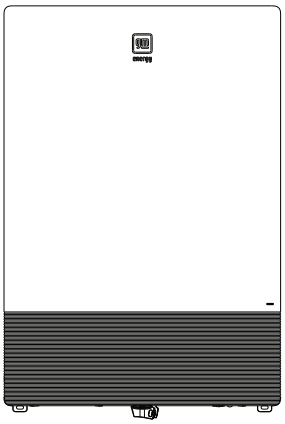
b. Mounting plate

c. Beauty cover

d. Quick installation Guide

Visually inspect the GM Energy Inverter for any physical damage such as a bent heat sink fin and dented chassis.

If the GM Energy Inverter appears to be damaged or if the GM Energy Inverter needs to be returned, please contact your local GM Energy representative at 1-833-64POWER.



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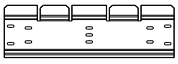

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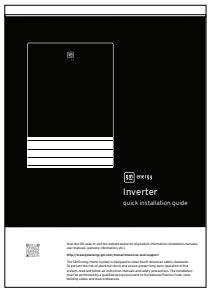

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No user serviceable parts are contained in the GM Energy Inverter section. Do not attempt to open or repair the GM Energy Inverter. The GM Energy Inverter section is factory sealed to maintain its NEMA 4 rating and opening the top cover of the power head will void the GM Energy Inverter Limited Warranty (see section 10 on Limited Warranty Exclusions).

La section du convertisseur GM Energy ne contient aucune pièce réparable par l'utilisateur. N'essayez pas d'ouvrir ou de réparer l'onduleur GM Energy. La section de l'onduleur GM Energy est scellée en usine pour maintenir sa classification NEMA 4 et l'ouverture du couvercle supérieur du bloc d'alimentation annulera la garantie limitée de l'onduleur GM Energy (voir section 10 sur les exclusions de la garantie limitée).

3.2 Installation Location

1. Install the GM Energy Inverter on a non-flammable support base.
2. The GM Energy Inverter must be mounted vertically on a flat surface.
3. A minimum distance of 6 inches (15.2 cm) of unobstructed clearance on all sides to promote free convection is required.
4. Ensure the mounting hardware and structure can support the weight of the GM Energy Inverter.
5. Ensure the mounting hardware meets the appropriate building code.
6. Avoid installation on resonating surfaces (light construction walls etc.).
7. Installation can be indoors or in protected outdoor areas.
8. Ensure GM Energy Inverter ambient temperature is within -22 °F to 149 °F (-30 °C to 65 °C). The system will derate performance above 113°F (45°C). For optimal efficiency it is recommended to provide sun shading for the GM Energy Inverter in applications where ambient temperatures can exceed 104°F (40°C).
9. Despite having a NEMA 4 enclosure with a soiling category III certification, the GM Energy Inverter must not be exposed to heavy soiling.
10. Unused connectors and interfaces must be covered with sealing connectors.

3.3 Mounting The GM Energy Inverter

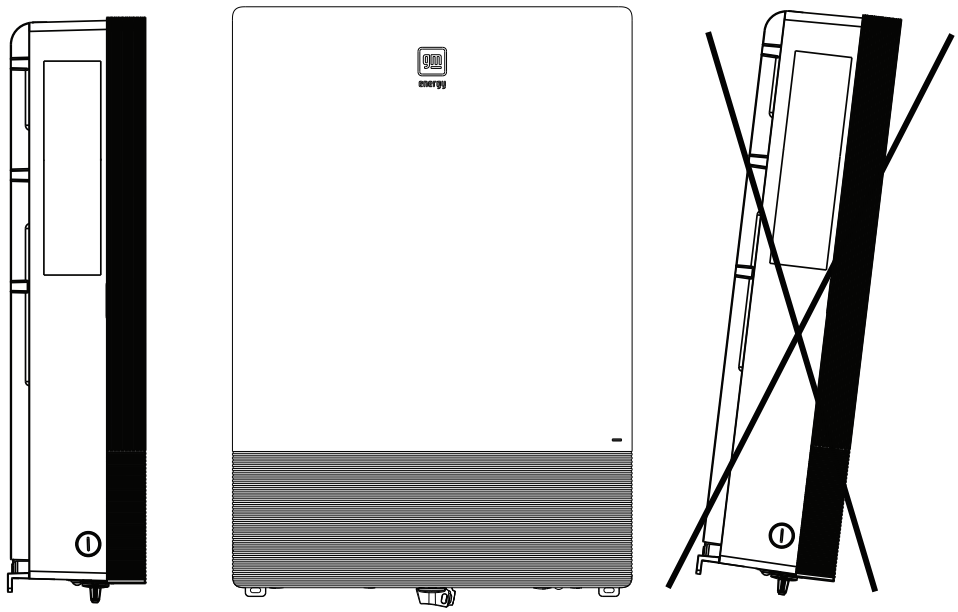


Figure 6: Mounting directions

Please make sure the GM Energy Inverter is installed vertically, especially if it is to be installed outdoors.

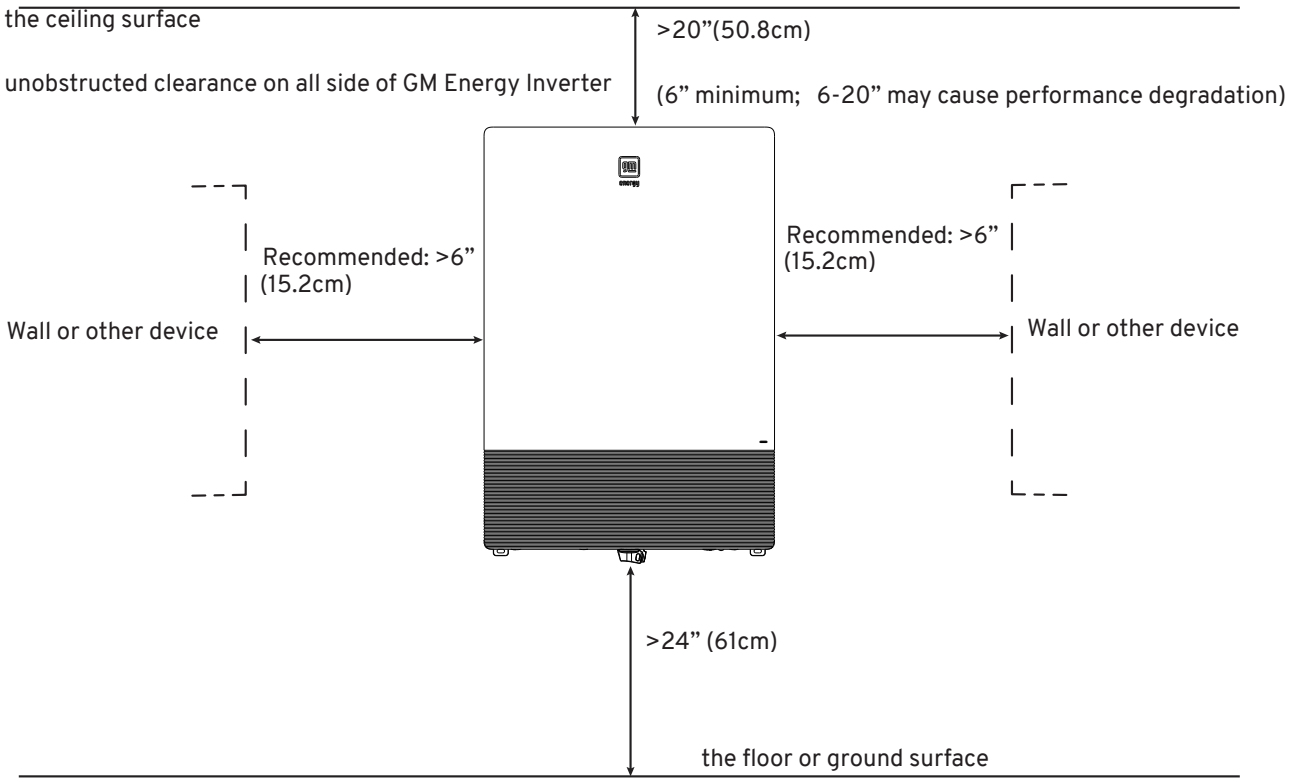


Figure 7: GM Energy Inverter clearances

The National Electric Code may require additional working clearances (see NEC Section 110.26).

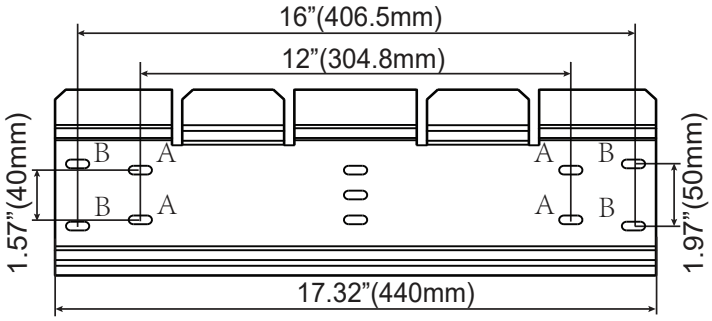


Figure 8: Dimension drawing of mounting plate

Mounting the plate

1. **Mount the mounting plate to the wall with at least 4 screws and anchors (Ø 6mm). With 4 screws use 4 holes A or 4 holes B (see Figure 8). You can use the mounting plate as a template for marking the positions of the boreholes.Avoid installation on a non-load bearing wall.**
2. **Tighten the screws firmly to the wall.**
   - Sheathed Wall with Wood Studs (covering finish: gypsum board, Stucco, wood siding+latching, straping+wood siding) If anchoring directly into wood studs, use at least four (one in each corner) 1/4-inch wood screws with washers, of sufficient length for at least 2.5 in embedment into the studs.

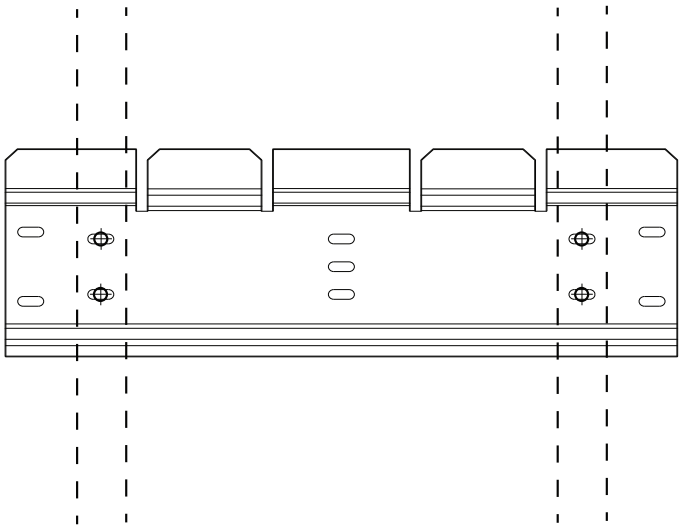


Figure 9: Mount to wood stud wall

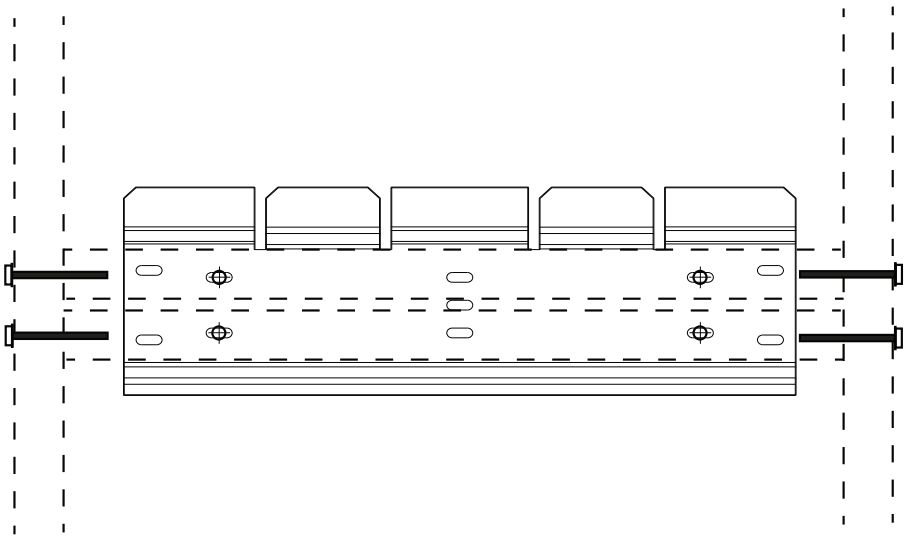


Figure 10: Mount to wood stud wall

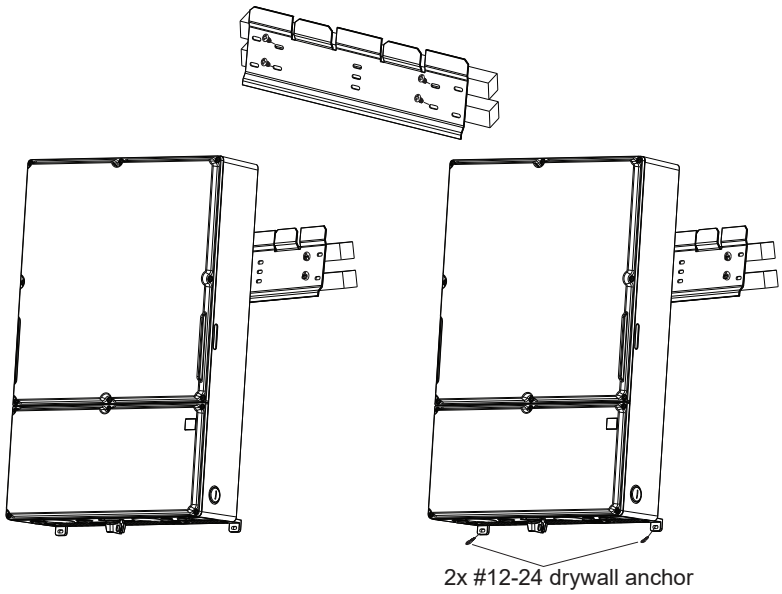


Figure 11: Installing the plate and GM Energy Inverter on a wood stud wall

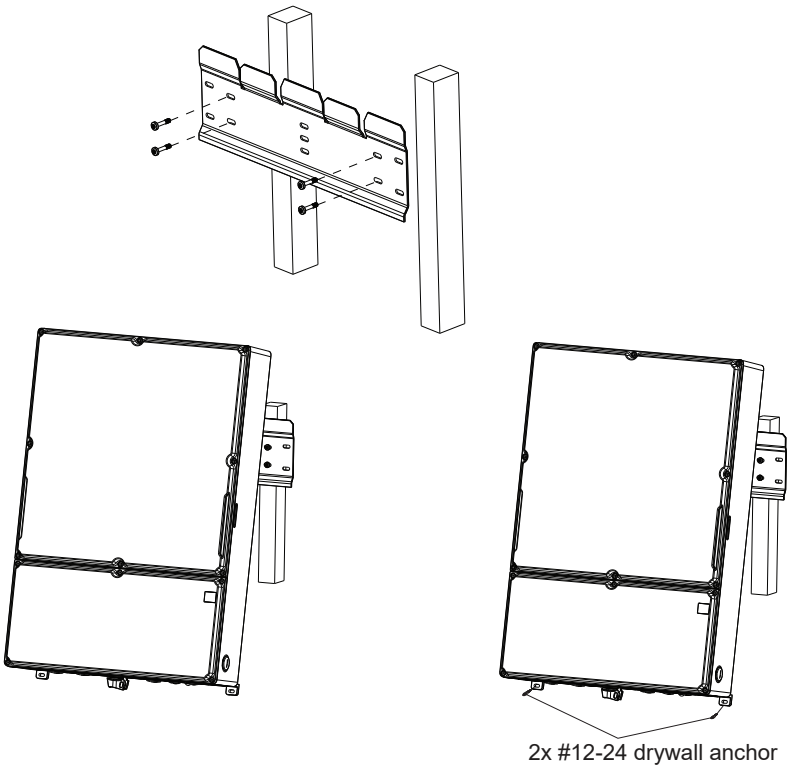


Figure 12: Installing the plate and GM Energy Inverter on a wood stud wall

Mounting the GM Energy Inverter

1. Using the mounting plate as a template, mark four screw holes onto the wall. Use the four holes that are indicated for this purpose in the figure 8. Make sure the holes are in the center of each stud before marking the drill location.
2. After marking the screw hole locations, drill the pilot holes for the appropriate screw type that will hold the weight of the GM Energy Inverter in the selected material. 1/4“ lag bolts are recommended for mounting on wood framed walls.
3. Align the mounting plate over the pilot holes and install the mounting hardware to mounting surface. Please tighten to the recommended torque necessary to hold the mounting plate firmly to the wall surface type.
4. As the GM Energy Inverter is heavy, weighs around 93.0 lbs (42.2 kg), it should be lifted out of the cardboard container by at least two persons.
5. With at least one person on each side of the GM Energy Inverter, lift it up and place it carefully onto the mounting plate. Install two screws as shown in the figure 11/ figure 12 to secure the device.
6. Check that the GM Energy Inverter is seated securely on the wall.

   It is recommended to use stainless steel screws, especially if installed outdoors. Be sure to verify sheer and pullout strength of anchors or other wall attachments.

Required Torques For GM Energy Inverter

Part	Description	Required Torque
Wiring Box Cover Screw	M4 screws(T20 head x5) for attaching the wiring box cover to the wiring box	Max. 18 in-lbs(2 Nm)

Table 2: Required Torques

4 ELECTRICAL CONNECTIONS

4.1 Important Safety Information

DANGER!

PV solar arrays produce hazardous voltages and currents when exposed to light which can create an electrical shock hazard. Leave PV panels unplugged until safe to energize.

DANGER!

Les panneaux solaires photovoltaïques produisent des tensions et des courants dangereux lorsqu'ils sont exposés à la lumière, ce qui peut créer un risque d'électrocution. Laissez les panneaux photovoltaïques débranchés jusqu'à ce que vous puissiez les mettre sous tension en toute sécurité.

WARNING!

Read all of these instructions, cautions, and warnings for the GM Energy Inverter and associated PV array documentation.

AVERTISSEMENT!

Lisez toutes ces instructions, précautions et avertissements concernant l'onduleur GM Energy et la documentation associée au réseau photovoltaïque.

WARNING!

The installer must be qualified to perform the installation pursuant to the requirements of local ordinances, the National Electric Code, and local building codes. This may include being Qualified Personnel that is active and in good standing with the state in which they are performing the installation services or working under the direction of such Qualified Personnel.

AVERTISSEMENT!

L'installateur doit être qualifié pour effectuer l'installation conformément aux exigences des ordonnances locales, du code national de l'électricité et des codes de construction locaux. Il peut s'agir d'une Personne Qualifiée, active et en règle avec l'État dans lequel il effectue les services d'installation, ou travaillant sous la direction d'une telle Personne Qualifiée.

WARNING!

Before connecting the GM Energy Inverter to the AC distribution grid, approval must be received by appropriate local utility as required by national and state interconnection regulations, and must be connected only by Qualified Personnel.

AVERTISSEMENT!

Avant de raccorder l'onduleur GM Energy au réseau de distribution de courant alternatif, il faut obtenir l'autorisation du service public local compétent, conformément aux réglementations nationales et régionales en matière d'interconnexion, et le raccordement ne doit être effectué que par du personnel qualifié.

WARNING!

Do not use this equipment if damaged.

AVERTISSEMENT!

N'utilisez pas cet équipement s'il est endommagé.

WARNING!

Do not use equipment where exposed to flammable vapors.

AVERTISSEMENT!

Ne pas utiliser l'équipement en cas d'exposition à des vapeurs inflammables.

CAUTION!

Do not attempt to open or repair the upper powerhead (reference figure 2) as the GM Energy Inverter is factory sealed to maintain its NEMA 4 (NEMA 3R for wiring box) rating and will void the GM Energy Inverter Limited Warranty (see section 10 on Limited Warranty Exclusions).

PRUDENCE!

N'essayez pas d'ouvrir ou de réparer le bloc d'alimentation supérieur (voir figure 2) car l'onduleur GM Energy est scellé en usine pour conserver sa classification NEMA 4 (NEMA 3R pour le boîtier de câblage) et annulera la garantie limitée de l'onduleur GM Energy (voir section 10 sur les exclusions de la garantie limitée).

CAUTION!

The PV AC output circuits are isolated from the enclosure. The PV system Equipment Grounding Conductor (EGC) when required by National Electric Code (NEC), is the responsibility of the installer.

PRUDENCE!

Les circuits d'entrée et de sortie de cette unité sont isolés du boîtier. La mise à la terre du système doit être effectuée conformément au National Electrical Code (NEC), et l'installateur est responsable de cette mise en conformité.

NOTICE!

For use with compatible electric vehicles.

AVIS!

Pour les véhicules électriques compatibles.

4.2 Utility AC Voltage

The GM Energy Inverter not only meets the safety requirements of UL 1741, but also complies with the specifications of UL 1741 supplement SA and SB for Grid Support Utility Interactive Inverters that support a more stable utility grid. GM Energy Inverter was testing to the UL 1741 supplement SA and SB for CA Rule 21 and other Source Requirement Document (SRD) including 'PG&E Electric Rule No.21 Hh', 'SCE Rule21 Hh', 'SDGE Rule21 Hh' and 'HECO SRD V2.0'.

The GM Energy Inverter fulfills the directives of ANSI/NFPA 70, NEC 690.5, UL 1741, UL 1741 supplement SA and SB, IEEE 1547-2018, IEEE 1547a-2020 and IEEE 1547.1-2020 for parallel operation of power generation plants on low-voltage network of regional electrical utility companies. The operating performance category is Cat B, and the abnormal category is Cat III.

The function of the anti-islanding protection (automatic isolation point for in-plant generation systems)stipulates compliance with the specifications of UL 1741,UL 1741 supplement SA and SB, IEEE 1547-2018.

The GM energy inverter is grid-tied to the public utility. Inverters are software configurable panel for 208 Vac or 240 Vac 60 Hz public utility grid as shown in figure 13 to figure 19.

CAUTION!

The GM Energy Inverters should never be connected to a 120 Vac utility service. NEC 705 requires that the GM Energy Inverter be connected to a dedicated circuit with no other outlets or devices connected to the same circuit.

PRUDENCE!

Les onduleurs GM Energy ne doivent jamais être connectés à un service public de 120 Vac. La norme NEC 705 exige que l'onduleur GM Energy soit connecté à un circuit dédié, sans autres prises ou appareils connectés au même circuit.

AC Connection Voltage And Frequency Limits	
Voltage Range For 208 V	183 V - 228 V
Voltage Range For 240 V	211 V - 264 V
Frequency Range	59.3 Hz - 60.5 Hz

Table 3: AC connection voltage and frequency limits

Examples Of Public Grid Configurations Allowed

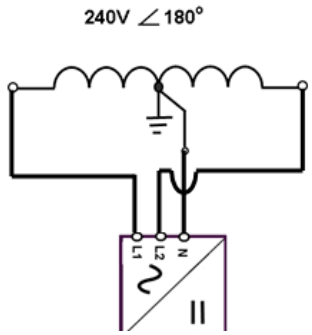


Figure 13: 240V / 120V Split Phase AC Grid

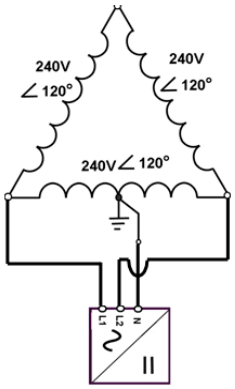


Figure 14: 240V / 120V Stinger AC Grid

Examples Public Grid Configurations NOT Allowed

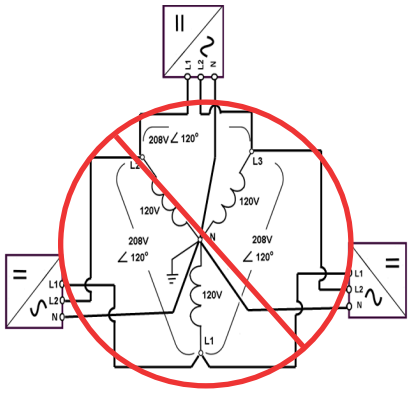


Figure 15: 208V / 120V WYE AC Grid

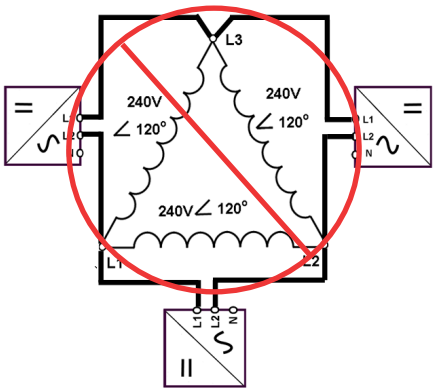


Figure 16: 240V Delta AC Grid

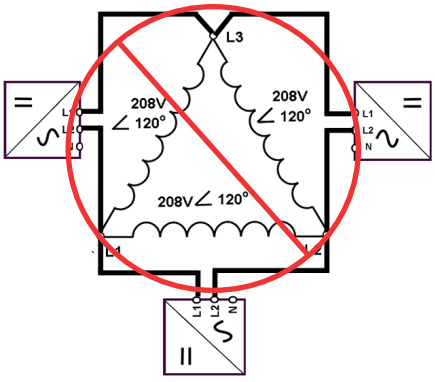


Figure 17: 208V Delta AC Grid

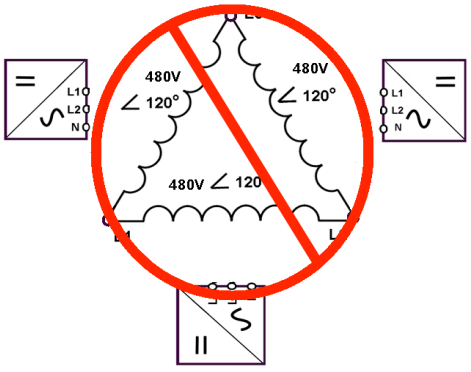


Figure 18: 480V Delta AC Grid

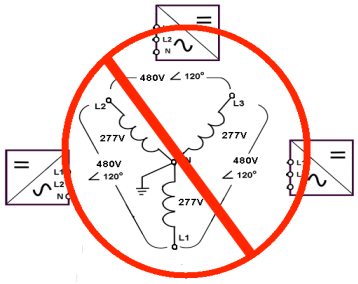


Figure 19: 480V / 277V WYE AC Grid

4.3 AC Circuit Breaker Requirements

GM Energy Inverter is designed to withstand a Max. 10kA fault current interrupt rating, and the GM Energy Home Hub has a Max. 10kA fault current interrupt rating. A dedicated circuit breaker in the building circuit panel is required for GM Energy Home Hub. A separate dedicated circuit breaker for the GM Energy Inverter will be located in the GM Energy Home Hub. There must be a circuit breaker or fuse to protect each AC line, L1 and L2. The circuit breaker must be able to handle the rated maximum output voltage and current of the GM Energy Inverter. Please refer to the table 4 below to determine the appropriate circuit breaker size to avoid potential fire hazards. The National Electrical Code (NEC), ANSI/NFPA 70 or applicable local electrical codes must be followed when determining maximum branch-circuit over-current protection requirements.

Suggested Branch Protection		
Model Name	**Suggested AC Branch Protection**	**Recommended AC wire gauge**
GM Energy Inverter e1.11	2-pole, 60 A 240 Vac	6 AWG
GM Energy Home Hub e1.200	2-pole, 200 A 240 Vac	3/0 Copper / 250 kcmil

Table 4: Suggested branch protection

For GM Energy Home Hub the rating of AC branch protection can be selected according to the load condition. The wire gauge can be the selected according to the AC branch protection.

4.4 Equipment Grounding Conductor (EGC)

Grounding must be installed in accordance with NEC 690.47. The EGC conductor should be terminated at the EGC screw terminal inside the wiring box compartment.

4.5 Lightning And Surge Protection

GM Energy Inverter is designed and certified to meet stringent UL 1741 / IEEE 1547 and ANSI/ IEEE 62.41/62.42 AC lighting and surge requirements. However, every PV installation is unique, thus additional external UL/NEC AC and DC surge protection and solid grounding practice is recommended.

4.6 PV String Considerations

There are a large number of PV module string combinations that will offer optimal performance from the GM Energy Inverter

CAUTION!

Recommended system wiring voltage loss is no greater than 2 percent for optimal system efficiency and performance.

PRUDENCE!

Les pertes de tension du câblage du système recommandées ne sont pas supérieures à 2% pour une efficacité et des performances optimales du système.

INFORMATION!

Follow the temperature multiplication factors given in NEC 690.7 table and the PV module manufacturer specified V/Temp coefficient to ensure PV string voltage is less than allowed maximum system voltage. Maximum PV input voltage need to be considered for all possible weather conditions in the location of installation.

INFORMATIONS!

Suivre les facteurs de multiplication de la température indiqués dans le tableau NEC 690.7 et le coefficient V/Temp spécifié par le fabricant du module PV pour s'assurer que la tension de la chaîne PV est inférieure à la tension maximale autorisée du système. La tension d'entrée PV maximale de l'onduleur doit être prise en compte pour toutes les conditions météorologiques possibles sur le lieu d'installation.

4.7 GM Energy Inverter Connections

4.7.1 Important Safety Information

DANGER!

PV solar arrays produce hazardous voltages and currents when exposed to light which can create an electrical shock hazard. Leave PV panels unplugged until safe to energize.

DANGER!

Les panneaux solaires photovoltaïques produisent tensions et courants dangereux lorsqu'ils sont exposés à la lumière et constituent un danger de choc électrique. Laisser les panneaux photovoltaïques débranchés jusqu'à ce qu'ils puissent être mis sous tension en toute sécurité.

WARNING!

Input and output circuits of this unit are isolated from the enclosure. System grounding must be done in accordance with the National Electrical Code (NEC), ANSI/NFPA 70 and compliance is the responsibility of the installer.

AVERTISSEMENT!

Les circuits d'entrée et de sortie de cette unité sont isolés du boîtier. La mise à la terre du système doit être effectuée conformément au National Electrical Code (NEC), ANSI/NFPA 70, et l'installateur est responsable de cette mise en conformité.

WARNING!

Ensure no live voltages are present on PV input and AC output circuits, and verify that the DC disconnect, AC disconnect, and dedicated AC branch circuit breaker are in the "OFF" position, before GM Energy Inverter installation.

AVERTISSEMENT!

Assurez-vous qu'aucune tension directe n'est présente sur les circuits photovoltaïques d'entrée et de sortie du CA, vérifiez que le CC et le CA sont déconnectés, et que le disjoncteur de dérivation dédié est sur position "OFF", avant de procéder à l'installation de l'onduleur GM Energy.

WARNING!

The installer must be qualified to perform the installation pursuant to the requirements of local ordinances, the National Electric Code, and local building codes. This may include being Qualified Personnel that is active and in good standing with the state in which they are performing the installation services or working under the direction of such Qualified Personnel.

AVERTISSEMENT!

L'installateur doit être qualifié pour effectuer l'installation conformément aux exigences des ordonnances locales, du code national de l'électricité et des codes de construction locaux. Il peut s'agir d'une Personne Qualifiée, active et en règle avec l'État dans lequel il effectue les services d'installation, ou travaillant sous la direction d'une telle Personne Qualifiée.

WARNING!

GM Energy Inverter Limited Warranty (see section 10 on Limited Warranty Exclusions) is void if the DC input voltage exceeds the GM Energy Inverter's maximum input voltage of 450V with GM Energy PowerBank connected and 480V without Battery connected.

AVERTISSEMENT!

Les garanties limitées de l'onduleur GM Energy (voir section 10 sur les exclusions de la garantie limitée) sont annulées si la tension d'entrée DC dépasse la tension d'entrée maximale de l'onduleur GM Energy de 450V avec le GM Energy PowerBank connecté et de 480V sans la batterie connectée.

WARNING!

Energy Storage Solution! Do not exceed the GM Energy Inverter's maximum input voltage of 450V when the GM Energy PowerBank is connected in the system. Risk of component failure in DCDC converter inside the PowerBank if GM Energy Inverter's maximum input voltage is over 450V under GM Energy PowerBank connected scenario. Product Limited Warranty (see section 10 on Limited Warranty Exclusions) will be void if over 450V is used.

AVERTISSEMENT!

Solution de stockage d'énergie ! Ne pas dépasser la tension d'entrée maximale de 450 V de l'onduleur GM Energy lorsque le PowerBank GM Energy est connecté au système. Risque de défaillance d'un composant du convertisseur DCDC à l'intérieur de la PowerBank si la tension d'entrée maximale de l'onduleur GM Energy est supérieure à 450 V lorsque la GM Energy PowerBank est connectée. La garantie limitée du produit (voir section 10 sur les exclusions de la garantie limitée) sera annulée si une tension supérieure à 450V est utilisée.

WARNING!

The GM Energy Inverter has POWER FED FROM MORE THAN ONE SOURCE, MORE THAN ONE LIVE CIRCUIT. Please note that all DC and AC terminals maybe energized with dangerous voltage even without connected wires.

AVERTISSEMENT!

L'onduleur GM Energy est alimenté par PLUS D'UNE SOURCE, PLUS D'UN CIRCUIT SOUS TENSION. Veuillez noter que toutes les bornes CC et CA peuvent être alimentées par une tension dangereuse, même si aucun fil n'est connecté.

CAUTION!
PRUDENCE!

CAUTION!

Before any electrical wiring can be connected to the GM Energy Inverter, the GM Energy Inverter must be permanently mounted.

PRUDENCE!

Avant de pouvoir raccorder des câbles électriques au convertisseur GM Energy, ce dernier doit être monté de manière permanente.

INFORMATION!
INFORMATIONS!

INFORMATION!

Use solid or stranded copper conductors only.

10 AWG (5.3 mm^2) for PV, is maximum allowed wire size.

INFORMATIONS!

Utilisez uniquement des conducteurs en cuivre torsadés ou solides. La taille maximum de câble autorisée est de 10 AWG (5.3 mm^2).

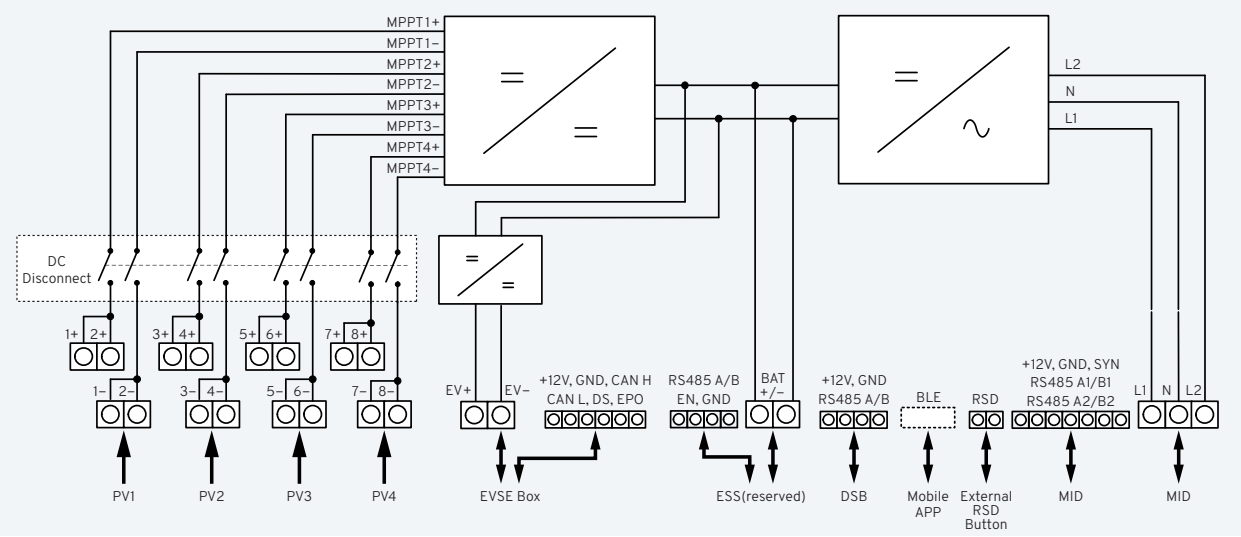


Figure 20: GM Energy Inverter electrical diagram

4.7.2Opening The Wiring Box Cover

WARNING!

Ensure no live voltages are present on PV input and AC output circuits, and verify that the DC disconnect, AC disconnect, and dedicated AC branch circuit breaker are in the “OFF” position, before GM Energy Inverter installation.

AVERTISSEMENT!

Assurez-vous qu’aucune tension directe n’est présente sur les circuits photovoltaïques d’entrée et de sortie du CA, vérifiez que le CC et le CA sont déconnectés, et que le disjoncteur de dérivation dédié est sur position “OFF”, avant de procéder à l’installation de l’onduleur.

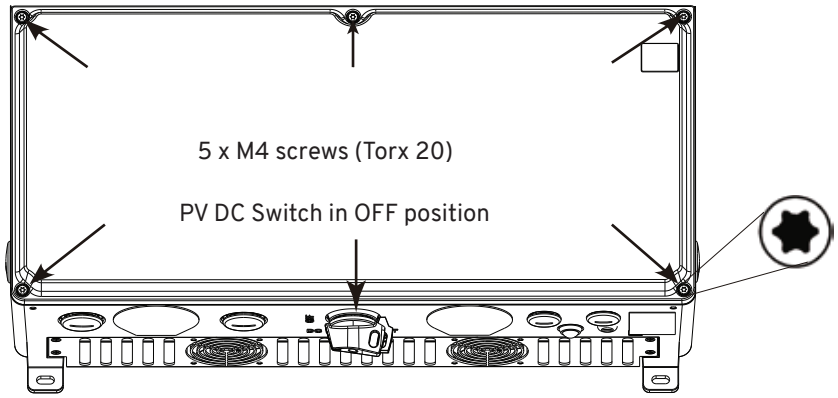


Figure 21: Removing the wiring box cover

1. **Place DC Disconnect switch in “OFF” position. Please note the cover cannot be removed when the DC Disconnect switch is in the “ON” position.**
2. **Remove the 5 cover screws indicated above with a T20 Torx screw driver. Recommended**
3. **Screw torque is 18 in-lbs (2Nm), and remove the cover.**
4. **Lift the cover upward and place off to the side.**

4.7.3Wiring Box Conduit Plugs

1 inches (4x), 3/4 inches (2x) and 1/2 inches (2x) conduit holes are provided, remove the PC stickers which are needed to use. Two of the recommend 1 inches conduit holes are covered by PC stickers. If use other 1 inches holes, please replace the PC stickers with the conduit plugs teared.

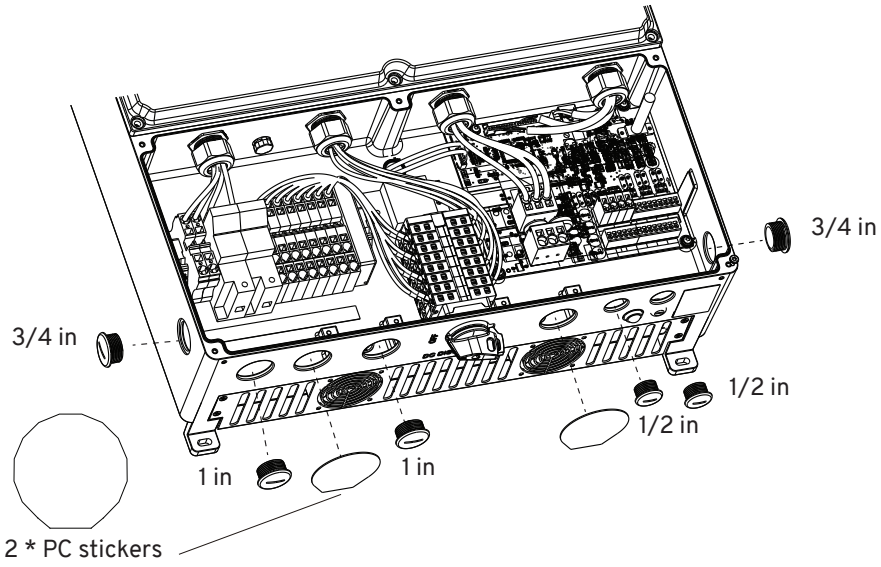


Figure 22: Locations of wiring box conduit plugs

CAUTION!

Do not enlarge the wiring compartment conduit openings as the wiring box enclosure will be damaged which will void the GM Energy Inverter Limited Warranty (see section 10 on Limited Warranty Exclusions).

PRUDENCE!

N'agrandissez pas les ouvertures des conduits du compartiment de câblage car le boîtier de câblage serait endommagé, ce qui annulerait la garantie limitée de l'onduleur GM Energy (voir section 10 sur les exclusions de la garantie limitée).

The conduit plugs are removed by placing a flat blade screwdriver in the slot on the conduit plug face and turning while gripping the nut on the inside of the enclosure to ensure it does not slip. Unscrew the nut from the conduit plug and slip the conduit plug out of the conduit opening.

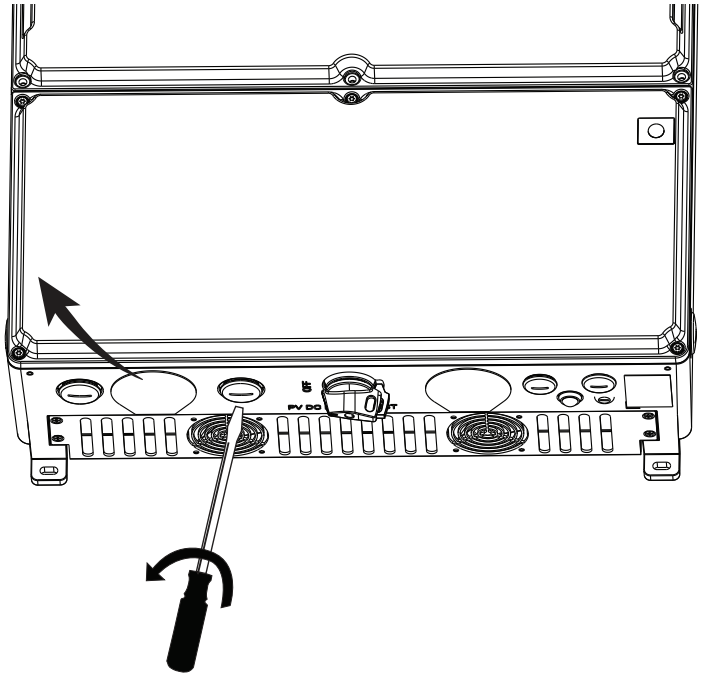


Figure 23: Wiring box conduit plug removal (Illustration showing the removal of a conduit plug)

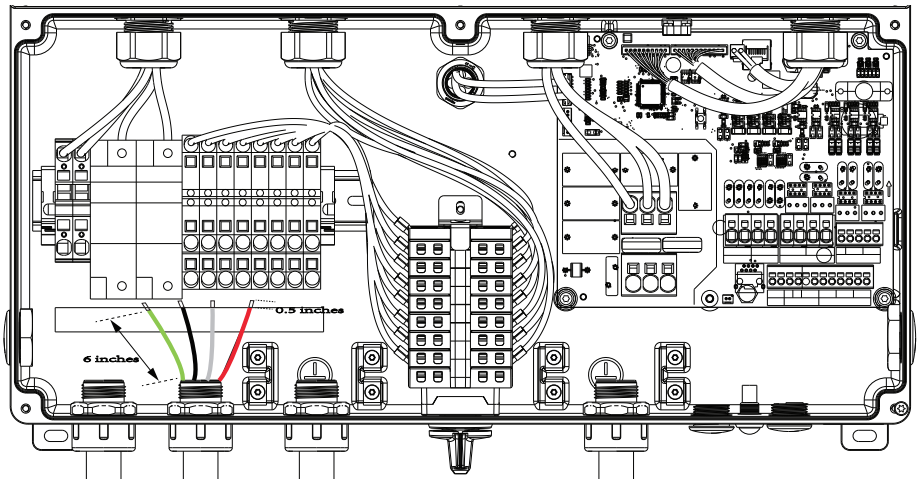


Figure 24: Conduit installation and wiring routing

To maintain GM Energy Inverter NEMA rating conduit fittings need to be water tight with either NEMA 4, 4X, 6, or 6X rated (insulated type preferred). Installation indoors may use non-water tight conduit fittings if compliant with electrical code requirements.

Once conduit and fittings are installed, route wiring thru conduit and fitting and allowing a 6 inch strain relief loop within the wiring box compartment.

4.7.4 PV Array String Input Connections

DANGER!

To ensure maximum protection against hazardous contact voltages while assembling photovoltaic installations, both the positive and the negative leads must be strictly isolated electrically from the protective ground potential (EGC).

DANGER!

Afin d'assurer une protection maximale contre les tensions dont le contact est dangereux lors du montage des installations photovoltaïques, les câbles positifs et négatifs doivent être strictement isolés électriquement de la mise à la terre (EGC).

WARNING!

Risk of electric shock and fire. Use only with PV modules with a maximum system voltage of rating of 480V or Higher.

AVERTISSEMENT!

Risque de choc électrique et d'incendie. Utilisez uniquement des modules photovoltaïques avec une tension maximale du système de 480V ou supérieur.

WARNING!

Electric shock hazard. The DC conductors of this photovoltaic system are ungrounded and may be energized.

AVERTISSEMENT!

Hasard de choc électrique. Les conducteurs CC de ce système photovoltaïque ne sont pas mis à la terre et peuvent être alimentés.

WARNING!

Electric shock hazard. The DC conductors of this photovoltaic system are ungrounded but will become intermittently grounded without indication when the GM Energy Inverter measures the PV array isolation.

AVERTISSEMENT!

Risque d'électrocution. Les conducteurs CC de ce système photovoltaïque ne sont pas mis à la terre mais le seront par intermittence sans indication lorsque l'onduleur GM Energy mesurera l'isolation du réseau PV.

CAUTION!

Verify DC conductor voltage polarity with voltage meter because damage to the GM Energy Inverter could result if incorrect DC input polarity is connected.

PRUDENCE!

Vérifier la polarité de la tension du conducteur CC à l'aide d'un appareil de mesure de la tension, car une polarité d'entrée CC incorrecte pourrait endommager l'onduleur GM Energy.

CAUTION!

Risk of damage. Be sure that the polarity is correct when you make the connection. Connecting it wrongly will cause damage to the GM Energy Inverter.

PRUDENCE!

Risque d'endommagement. Assurez-vous que la polarité est correcte lorsque vous effectuez la connexion. Une mau vaise connexion est susceptible d'endommager l'onduleur GM Energy.

INFORMATION!

The PV Array positive or negative leads must not be connected to ground before the GM Energy Inverter.

INFORMATIONS!

Les fils du positif ou du négatif du groupe solaire PV ne devront jamais être reliés à la terre avant l'onduleur GM Energy !

INFORMATION!

All PV terminals are recommended solid or stranded copper 10 AWG wire only.

INFORMATIONS!

Toutes les bornes PV sont recommandées pour des fils de cuivre solides ou toronnés de 10 AWG uniquement.

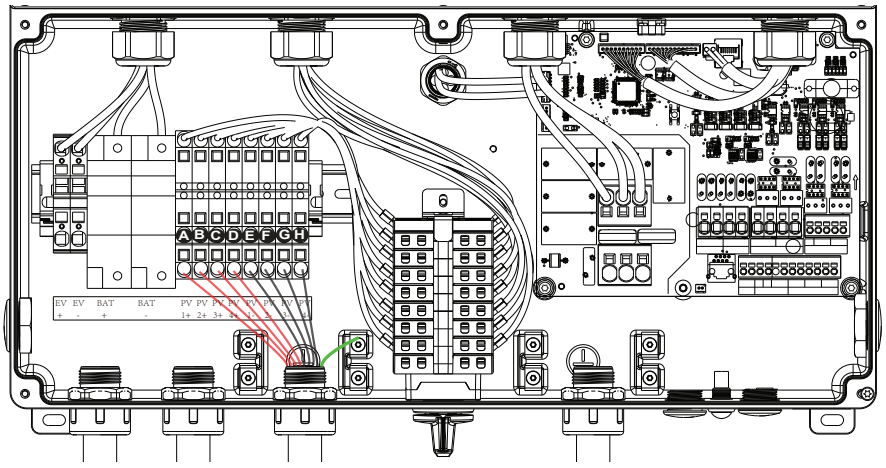
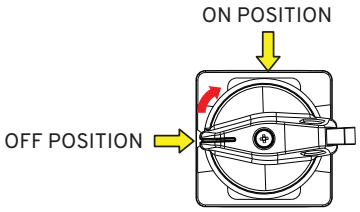


Figure 25: Wiring box of GM Energy Inverter

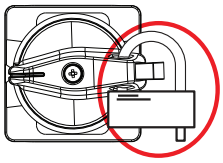
A. PV1_Positive Terminals	E. PV1_Negative Terminals
B. PV2_Positive Terminals	F. PV2_Negative Terminals
C. PV3_Positive Terminals	G. PV3_Negative Terminals
D. PV4_Positive Terminals	H. PV4_Negative Terminals

1. **Verify that the exposed wires are at least 6 inches in length to provide adequate strain relief and wire end strip length required. The recommended wire gauge for PV array string input connection is 10 AWG. The recommended wire gauge for grounding is 8 AWG.**
2. **Connect the positive lead from each PV array string to PV_Positive Terminals (A / B / C / D) in the wiring box compartment.**
3. **Connect the negative lead from each PV array string to PV_Negative Terminals (E / F / G /H) in the wiring box compartment.**
4. **Verify GM Energy Inverter to wiring box compartment connections DC wiring board assembly:**
   - "RED" wire goes to "PV_Positive" Terminal.
   - "BLACK" wire goes to "PV_Negative" Terminal.

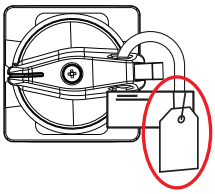
4.7.5PV Switch LOCK Out and TAG Out Procedure



1. Remove power to the System by turning each operation handle of the DC switch to the [OFF] Position. Then lockout each circuit breaker as shown below.



2. Attach a padlock. After attaching the lock, attempt to turn the circuit breaker to the ON position. The lock should prevent the circuit breaker from being turned on.



3. Attach a tag to the locking plate. The tag should contain the following information: WHO locked the circuit breaker out WHY the circuit breaker is locked out WHEN the circuit breaker was locked out. The contact information of who locked out the DC switch.

4.7.6 Battery Wire Connections

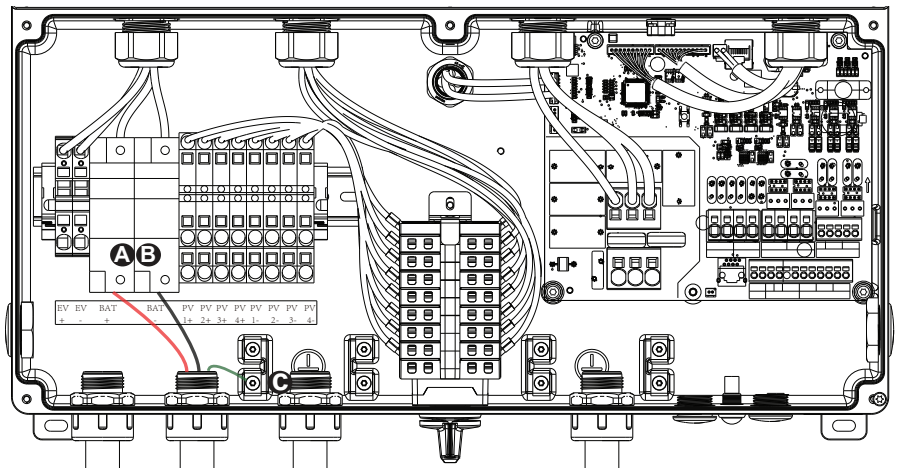


Figure 26: Wiring box of GM Energy Inverter

A. Battery_Positive Fuse Holder

B. Battery_Negative Fuse Holder

C. Grounding

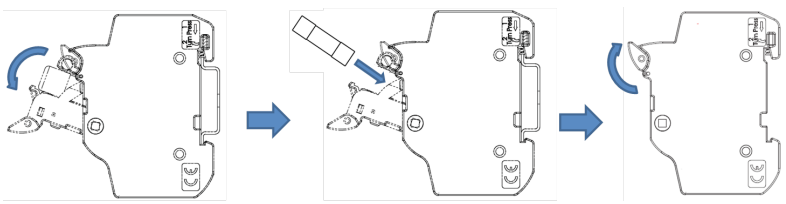
1. **Verify that the exposed wires are at least 6 inches in length to provide adequate strain relief and wire end strip length required. The recommended wire gauge for Battery connection is 8 AWG, screw torque is 28 in-lbs(3.2Nm). The recommended wire gauge for grounding is 8 AWG.**
2. **Connect the positive lead to Battery_Positive fuse holder (A).**
3. **Connect the negative lead to Battery_Negative fuse holder (B).**
4. **Verify GM Energy Inverter to wiring box compartment connections DC wiring board assembly.**

Note:

Must ensure the positive lead connect to positive fuse holder, negative lead connect to negative fuse holder. Change the fuse as shown below.

WARNING – For Continued Protection Against Risk Of Fire, Replace Only With Same Type And Ratings of Fuse.

Recommended fuse type: BUSSMANN FWP-50A14FA



4.7.7 GM Energy PowerShift Wire Connections

WARNING!

This equipment is intended only for charging vehicles not requiring ventilation during charging.

AVERTISSEMENT!

Cet équipement est destiné uniquement à la charge de véhicules ne nécessitant pas de ventilation pendant la charge.

CAUTION!

Risk of electric shock or electric energy-high current levels. Dangerous electric charge is sometimes stored in (identify capacitor) and associated circuitry. Test before touching.

PRUDENCE!

Risque de choc électrique ou d'énergie électrique - niveaux de courant élevés. Une charge électrique dangereuse est parfois stockée dans (identifier le condensateur) et les circuits associés. Testez-les avant de les toucher.

CAUTION!

Risk Of Electric Shock

Multiple power sources are terminated inside this equipment. Each circuit must be individually disconnected before servicing.

PRUDENCE!

Risque d'électrocution

Plusieurs sources d'alimentation sont terminées à l'intérieur de cet équipement. Chaque circuit doit être déconnecté individuellement avant de procéder à l'entretien.

CAUTION!

GROUNDING INSTRUCTIONS – This unit is to be connected to a grounded, metal, permanent wiring system; or an equipment-grounding conductor is to be run with circuit conductors and connected to equipment-grounding terminal or lead on battery charger. Connections to battery charger shall comply with all local codes and ordinances.

PRUDENCE!

INSTRUCTIONS DE MISE À LA TERRE - Cet appareil doit être raccordé à un système de câblage permanent, métallique et mis à la terre ; ou un conducteur de mise à la terre de l'équipement doit être installé avec les conducteurs du circuit et raccordé à la borne de mise à la terre de l'équipement ou au fil

du chargeur de batterie. Les connexions au chargeur de batterie doivent être conformes à tous les codes et ordonnances locaux.

INFORMATION!
INFORMATIONS!

INFORMATION!

Use solid or stranded copper conductors only.

INFORMATIONS!

N'utilisez que des conducteurs en cuivre solide ou toronné.

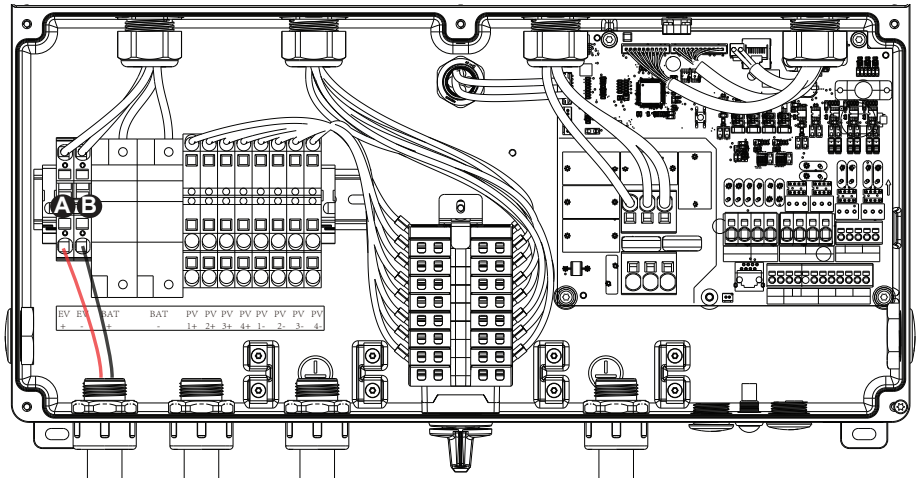


Figure 27: Wiring box of GM Energy Inverter

A. EVSE_Positive Teminals

B. EVSE_Negative Teminals

1. Verify that the exposed wires are at least 6 inches in length to provide adequate strain relief and wire end strip length required. The recommended wire gauge for GM Energy PowerShift teminals input connection is 8 AWG, 90°C.
2. Connect the positive lead to EVSE_Positive teminals (A) in the wiring box compartment.
3. Connect the negative lead to EVSE_Negative teminals (B) in the wiring box compartment.
4. Verify GM Energy Inverter to wiring box compartment connections DC wiring board assembly:
   - "RED" wire goes to "EVSE_Positive" Teminals
   - "BLACK" wire goes to "EVSE_Negative" Teminals

4.7.8GM Energy Inverter AC Output Connections

WARNING!

Read all of the instructions, cautions, and warnings for the GM Energy Inverter, associated PV array documentation.

AVERTISSEMENT!

Lisez toutes les instructions, les précautions et les avertissements relatifs à l'onduleur GM Energy et à la documentation associée au réseau photovoltaïque.

WARNING!

The installer must be qualified to perform the installation pursuant to the requirements of local ordinances, the National Electric Code, and local building codes. This may include being Qualified Personnel that is active and in good standing with the state in which they are performing the installation services or working under the direction of such Qualified Personnel.

AVERTISSEMENT!

L'installateur doit être qualifié pour effectuer l'installation conformément aux exigences des ordonnances locales, du code national de l'électricité et des codes de construction locaux. Il peut s'agir d'une Personne Qualifiée, active et en règle avec l'État dans lequel il effectue les services d'installation, ou travaillant sous la direction d'une telle Personne Qualifiée.

WARNING!

Ensure no live voltages are present on PV input and AC output circuits, and verify that the DC disconnect, AC disconnect, and dedicated AC branch circuit breaker are in the "OFF" position, before GM Energy Inverter installation.

AVERTISSEMENT!

Assurez-vous qu'aucune tension directe n'est présente sur les circuits photovoltaïques d'entrée et de sortie du CA, vérifiez que le CC et le CA sont déconnectés, et que le disjoncteur de dérivation dédié est sur position "OFF", avant de procéder à l'installation de l'onduleur GM Energy.

WARNING!

Verify that dedicated 2-pole 240 Vac / 208 Vac circuit breaker in the building electrical service panel is turned-off.

AVERTISSEMENT!

Vérifiez que le disjoncteur à 2 circuits de 240 Vca / 208 Vca du tableau d'alimentation électrique du bâtiment est mis hors tension.

WARNING!

Risk of Shock and Fire - No internal bonding. DO NOT operate without connection to a wiring system with Neutral to ground bonding.

AVERTISSEMENT!

Risque de choc et d'incendie - Absence de liaison interne. NE PAS faire fonctionner l'appareil sans le raccorder à un système de câblage avec mise à la terre du neutre.

NOTICE!

Neutral wire must be connected. Please double check whether the Neutral wire is connected reliably. The unsuccessful Neutral wire connection will make the unit fail to feed in power to the grid because of the wrong phase voltage detection.

AVIS!

Le fil neutre doit être connecté. Veuillez vérifier que le fil neutre est bien connecté. Si le fil neutre n'est pas connecté, l'unité ne pourra pas alimenter le réseau en raison de la détection d'une tension de phase erronée.

INFORMATION!

All terminals are recommended solid or stranded 90°C(194°F) copper wire. PV terminal:10 AWG wire, Battery terminal: 8 AWG wire, AC terminal: 6 AWG, EVSE teminal: 8 AWG.

INFORMATIONS!

Toutes les bornes sont recommandées avec un fil de cuivre solide ou toronné de 90°C (194°F). Borne PV : fil 10 AWG, Borne batterie : fil 8 AWG, borne AC : 6 AWG, borne EVSE : 8 AWG.

INFORMATION!

The AC output (neutral) is not bonded to ground in the GM Energy Inverter.

INFORMATIONS!

La sortie de courant alternatif (neutre) n'est pas lié à la masse de l'onduleur GM Energy.

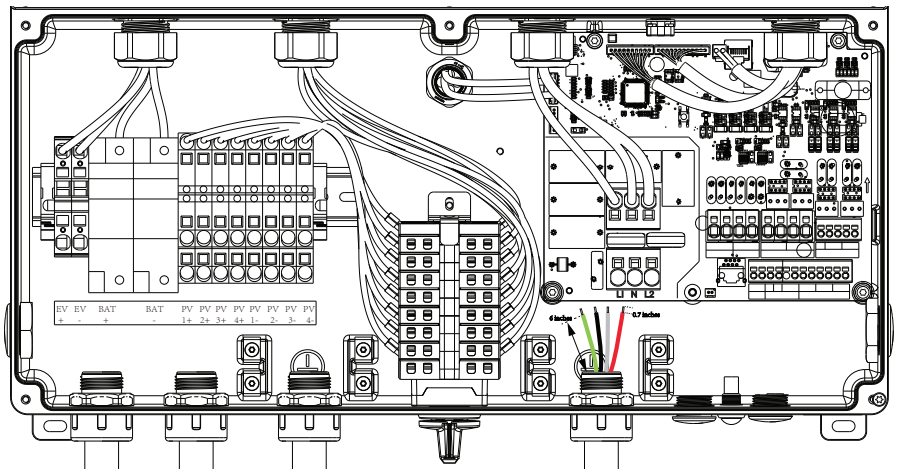


Figure 28: Conduit installation and AC wiring routing

To maintain GM Energy Inverter NEMA rating conduit fittings need to be water tight with either NEMA 4, 4X, 6, or 6X rated (insulated type preferred). Installation indoors may use non-water tight conduit fittings if compliant with electrical code requirements.

Once conduit and fittings are installed, route wiring thru conduit and fitting and allowing a 6 inch strain relief loop within the wiring box compartment.

Potential AC voltage loss in AC wires is possible to determine for a given wire cross section and wire length. It is recommended you select a wire size and length to ensure a maximum voltage loss is no higher than 2 %. Please note that the diagrams only offer approximate voltage loss and more precise voltage loss should be calculated by Qualified Personnel in accordance with local, state, and National Electrical Code ANSI/NFPA 70 requirements.

Percentage of voltage loss with 208 Vac and 240 Vac service. The load used in the calculation is the maximum continuous AC current of the GM Energy Inverter.

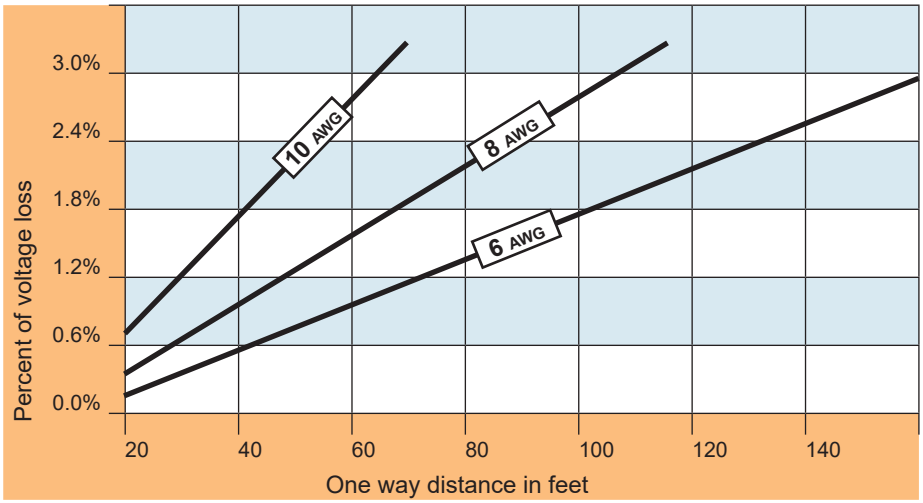


Figure 29: GM Energy Inverter voltage loss in different wire sizes and lengths

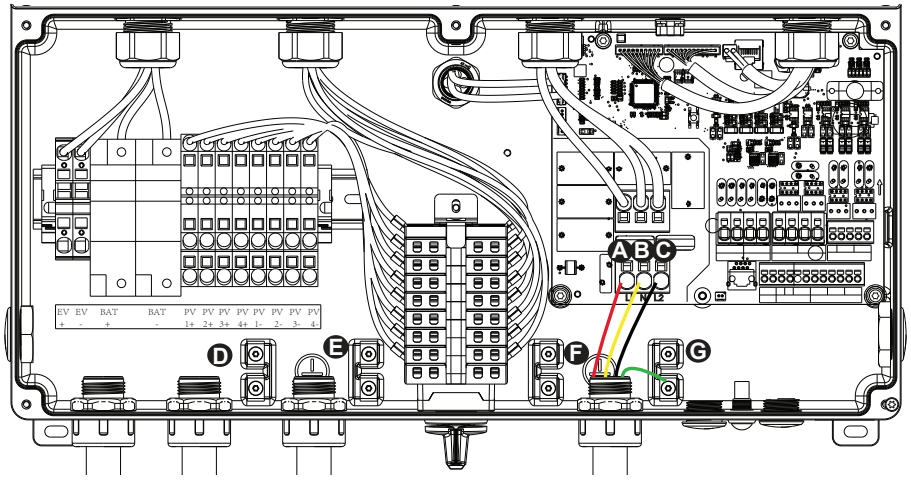


Figure 30: Wiring box AC assembly – terminal labeling

A. L1 Terminal	D. Ground	G. Ground
B. N Terminal	E. Ground	
C. L2 Terminal	F. Ground	

WARNING!

AC disconnect may be required by your local AHJ. Please check local regulations to determine if the AC disconnect is required for your installation.

AVERTISSEMENT!

Une déconnexion du AC peut être requise par votre AHJ local. Veuillez consulter les règlements locaux afin de déterminer si la déconnexion du AC est requise pour votre installation.

NOTICE!

Stranded copper wire should be checked so that all strands go into the terminal opening.

AVIS!

Il conviendra d'inspecter le fil de cuivre multi-filaire afin de s'assurer que tous ses brins sont insérés dans l'alésage de la borne.

1. **Mount the AC disconnect (if required by local AHJ) close to the GM Energy Inverter as much as possible.**
2. **Install conduit fitting and conduit into the wiring box compartment from AC disconnect or utility service panel.**
3. **Thread the GM Energy Inverter's AC output wires through cup piece of conduit and loosely fit the conduit into the GM Energy Inverter's open conduit fitting and the DC disconnect or junction box conduit fitting.**
4. **Route AC wiring through conduit and verify that the exposed wires are at least 6 inches in length to provide adequate strain relief and wire end strip length required. Secure the conduit into both fittings then tighten conduit fittings to manufacturer's recommended torque. The AC grounding shall be connected, and the recommended wire gauge is 8 AWG.**
5. **Terminate GM Energy Inverter's AC output wires inside the AC disconnect or junction box.**
    - Connect the AC equipment ground wire to the EGC screw terminal (G).
    - Connect the "WHITE" Neutral wire to the "N" terminal (B).
    - Connect "BLACK" L1 wire to the "L1" terminal (A)
    - Connect "RED" L2 wire to the "L2" terminal (C)

Note:

- The neutral is not connected to ground inside the GM Energy Inverter in any case. The GM Energy Inverter shall be connected to the equipment with a service ground bond such as Main Service Panel or other service equipment. It shall have one and only one ground bond for the system, typically in the Main Service Panel. And the Neutral shall be reliably bonded to ground. Installation for multimode units shall reference to the NEC 705, 706 and 710.

4.7.9 Dark Start Battery Wire Connections

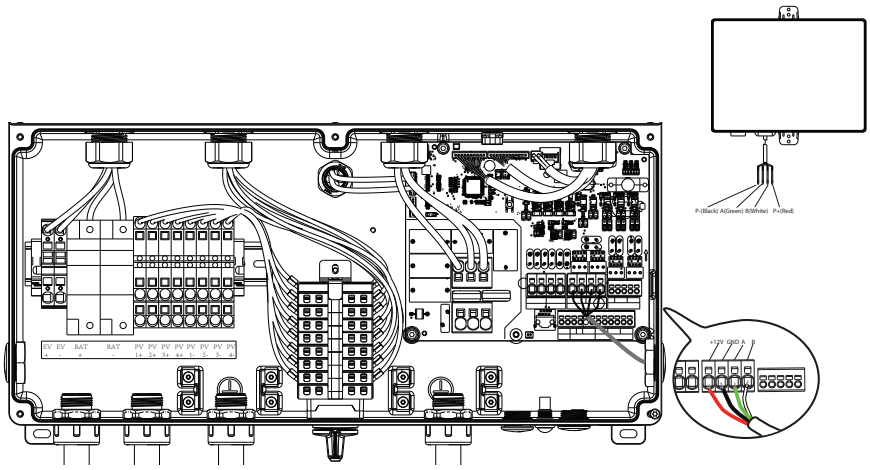


Figure 31: Dark start battery wire connection

1. **Strip four wires of the battery cable and insert stripped wire-ends to the corresponding wire hole on the plug.**
2. **Match the names in the figure with the connectors on the battery.**
   - Connect “RED” P+ wire to the “+12V” terminal
   - Connect “BLACK” P- wire to the “GND” terminal
   - Connect “GREEN” A wire to the “A” terminal
   - Connect “WHITE” B wire to the “B” terminal

NOTICE!
AVIS!

NOTICE!

Stranded copper wire should be checked so that all strands go into the terminal opening.

AVIS!

Il conviendra d‘inspecter le fil de cuivre multi-filaire afin de s‘assurer que tous ses brins sont insérés dans l‘alésage de la borne.

NOTICE!
AVIS!

NOTICE!

If the grid type with Neutral connection is selected, please double check whether the Neutral wire is connected reliably. The un-successful Neutral wire connection will make the unit fail to feed in power to the grid because of the wrong phase voltage detection.

AVIS!

Si un réseau électrique avec connexion de neutre est choisie, veuillez vérifier attentivement si le conducteur neutre est connecté de manière fiable. Une connexion échouée du conducteur neutre causera le manque d'énergie de l'appareil à cause de la détection de tention en mauvais phase.

4.7.10 Communication Wiring

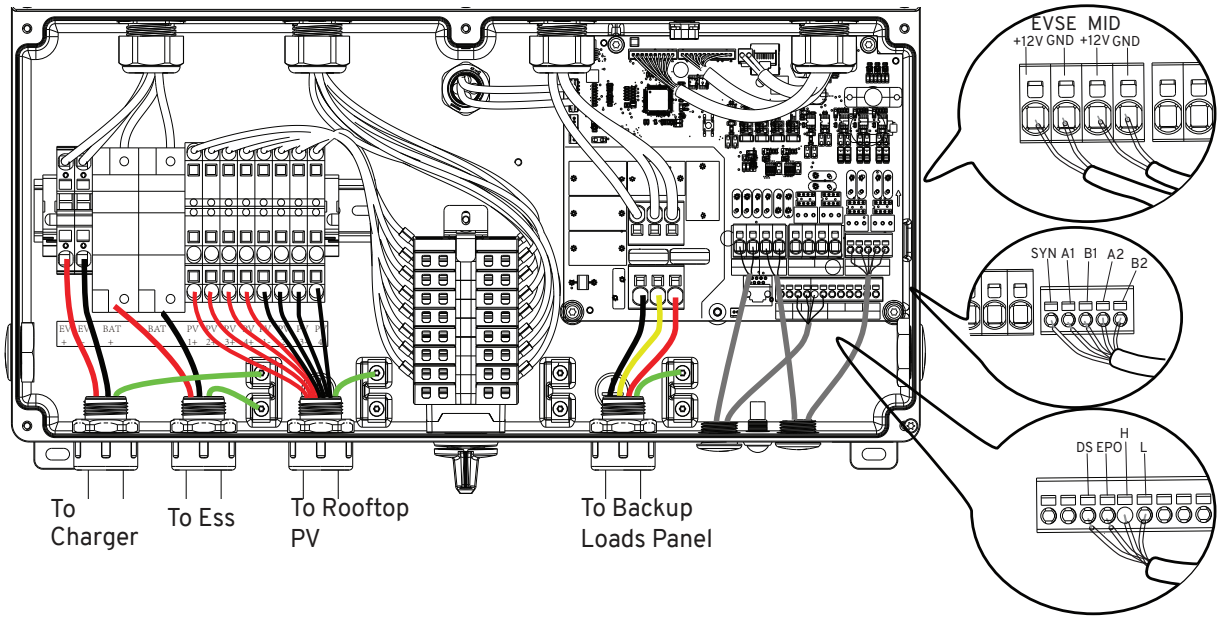


Figure 32: Wiring overview

It is recommended use 18 AWG and twisted pair wiring for RS485, DS, EPO, CAN connected to GM Energy PowerShift(EVSE), GM Energy DSB, GM Energy PowerBank and GM Energy Home Hub.

4.8 Installations of Optional Accessories

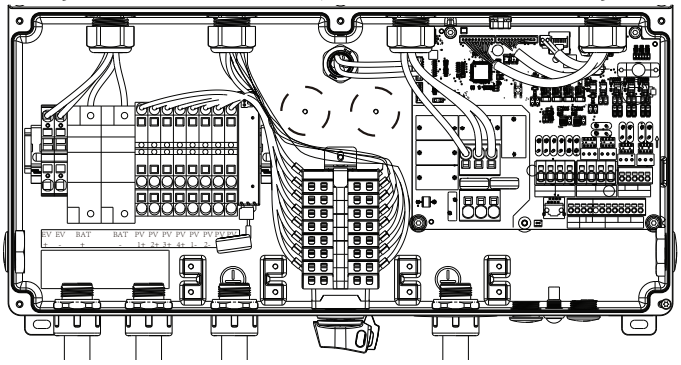
For GM Energy Dark Start Battery, please refer to the installation manual of DSB and carefully read the safety instructions before installation.

For other accessories such as smart meter, please refer to the GM Energy Home Hub installation manual.

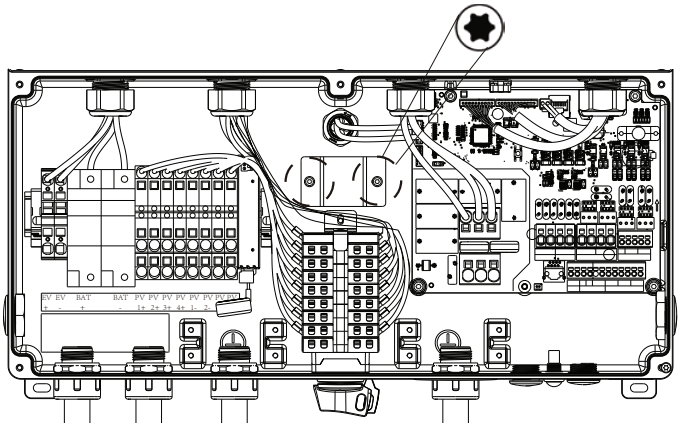
During V2H session, a proper soft starter for LRA>62A motor load will be needed.

4.8.1 Installation of 6V Battery

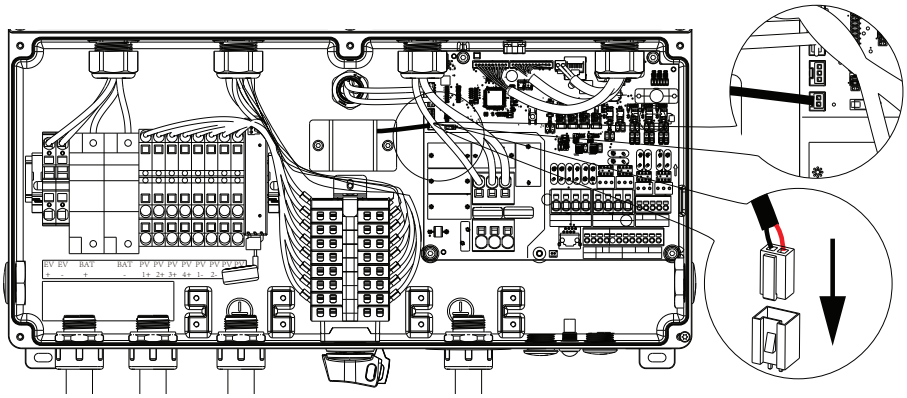
If GM Energy PowerBank is integrated in the system, a 6V battery is needed in wiring box. The installation procedure is as following.



1. **Pull apart the wires and core to expose the screw holes on the case.**



2. **Fix the battery holder with M4*2 screws, the recommended torque is 12.39 in-lbs (1.4 Nm).**



3. **Connect the harness of 6V battery to the 2 Pin connector on PCB board in the wiring box.**

4.8.2 Installation of APS Transmitter

The GM Energy Inverter is listed with APS PVRSS, which is compliance with the requirement of module level rapid shutdown per NEC 2020.

The certified model type of APS transmitter is:

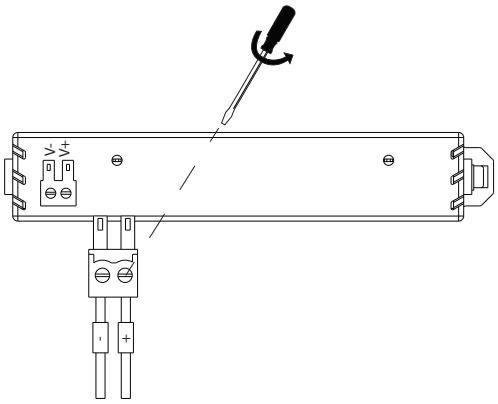
- Transmitter-PLC-1P

And the following model type of APS rapid shutdown device are compatible and certified with GM Energy Inverter.

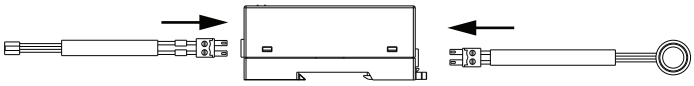
- RSD-S-PLC-A
- RSD-S-PLC-B
- RSD-D-15-1000
- RSD-D-20-1000
- RSD-D-25-1000
- RSD-D-15-1500
- RSD-D-20-1500
- RSD-D-25-1500

If integrating DC solar in the system, rapid shutdown function is required. The APS transmitter need to be installed in the wiring box of GM Energy Inverter to support this function.

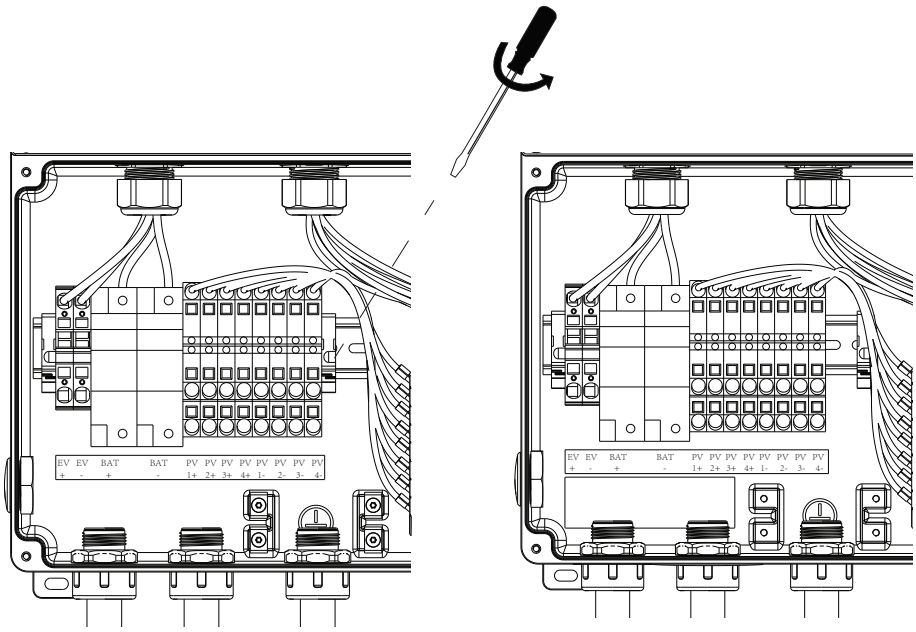
The installation procedure of APS transmitter is as following



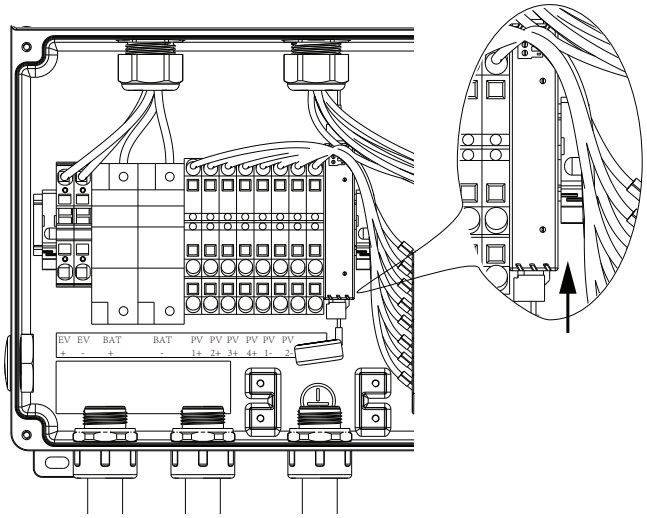
1. **Remove the green terminal from the transmitter. Use the slotted screwdriver to connect harness for 12V power supply by following the markings of polarity on the transmitter. The recommended torque is 1.77 in-lbs(0.2Nm).**



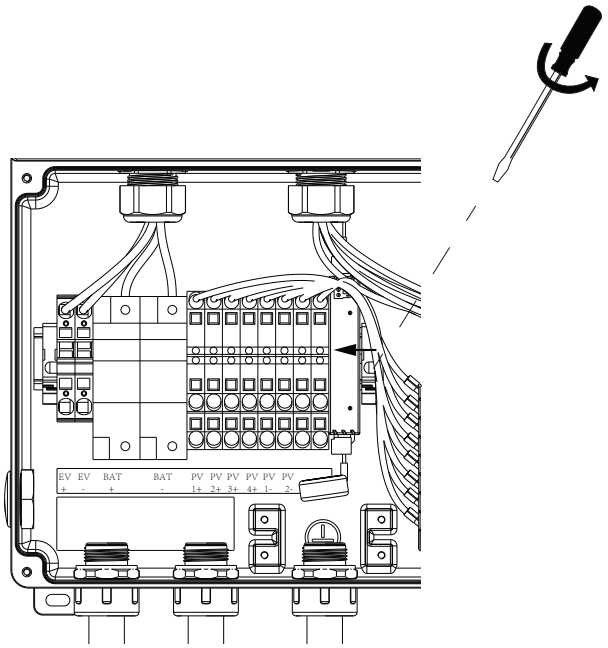
2. **Connect the terminals of 12V power wire and CT wire to the both sides of the transmitter.**



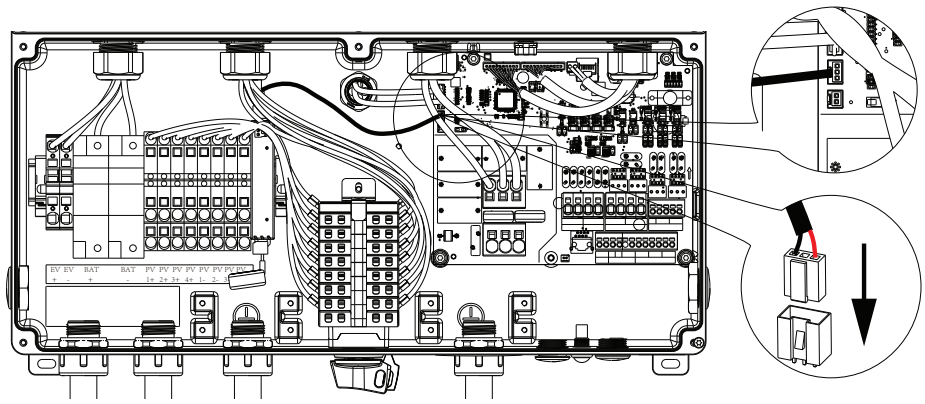
3. **Use a slotted screwdriver to loose the right side bracket and move it away.**



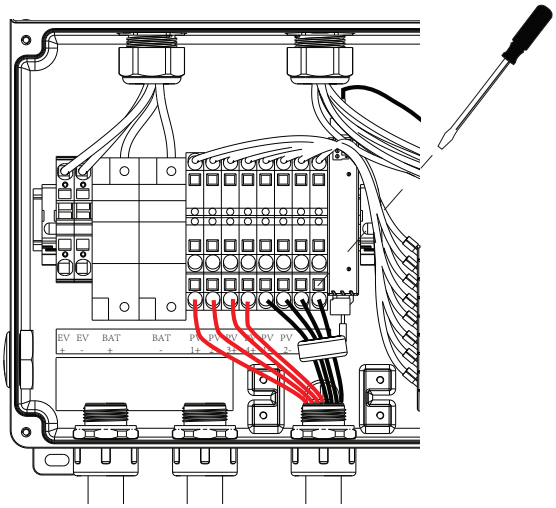
4. Snap in the transmitter to the metal DIN rail and lock the red buckle of transmitter.



5. Move the side bracket close to the transmitter and fasten it by the slotted screwdriver. The recommended torque is 2.66in-lbs(0.3Nm).



6. Connect the harness of 12V power supply to the 3 Pin connector on PCB board in the wiring box.



7. Run all the PV- wires through the CT. Connect the PV- wires to the PV- terminal blocks by using 3mm slotted screwdriver.

4.9 Installation For PCS CRD Compliance

GM Energy Inverters comply with UL 1741 PCS CRD. This system is equipped with a power control system (PCS). All PCS controlled busbars or conductors shall be protected with suitably rated over current devices appropriately sized for the busbar rating or conductor ampacity. For the territory which enforced to PCS CRD, the following safety instructions need to be considered. The system without GM Energy Powerbank does not support PCS CRD ESS mode.

WARNING!

Only Qualified Personnel shall be permitted to set or change the setting of the maximum operating current of the PCS. The maximum PCS operating current setting shall not exceed the busbar rating or conductor ampacity of any PCS controlled busbar or conductor.

AVERTISSEMENT!

Seul le Personnel Qualifié est autorisé à régler ou à modifier le réglage du courant de fonctionnement maximal du PCS. Le réglage du courant maximal de fonctionnement du PCS ne doit pas dépasser l'intensité nominale du jeu de barres ou l'ampacité du conducteur de tout jeu de barres ou conducteur contrôlé par le PCS.

WARNING!

This CT of the meter is part of a Power Control System. Do not remove. Replace only with same type and rating.

AVERTISSEMENT!

Ce TC du compteur fait partie d'un système de contrôle de la puissance. Ne pas l'enlever. Remplacer uniquement par le même type et le même calibre.

CAUTION!

PCS can be programmed such that the system does not exceed the limitations of the overcurrent devices in the panelboard and connected circuit. But the PCS shall be coordinated with the limits defined by NEC 210.20, 705.12 or NFPA 70 2020 edition section 705.13.

PRUDENCE!

Le PCS peut être programmé de manière à ce que le système ne dépasse pas les limites des dispositifs de surintensité du tableau de distribution et du circuit connecté. Mais le PCS doit être coordonné avec les limites définies par NEC 210.20, 705.12 ou NFPA 70 édition 2020 section 705.13.

NOTICE!

This system is equipped with a power control system (PCS). All PCS controlled busbars or conductors shall be protected with suitably rated overcurrent de

vices appropriately sized for the busbar rating or conductor ampacity.

AVIS!

Ce système est équipé d'un système de contrôle de la puissance (PCS). Tous les jeux de barres ou conducteurs contrôlés par le PCS doivent être protégés par des dispositifs de protection contre les surintensités d'un calibre approprié, adapté au calibre du jeu de barres ou à l'ampacité du conducteur.

NOTICE!

The maximum operating current of this system may be controlled electronically. Refer to manufacturer's instructions for more information.

AVIS!

Le courant maximum de fonctionnement de ce système peut être contrôlé électroniquement. Reportez-vous aux instructions du fabricant pour plus d'informations.

NOTICE!

The maximum operating current in controlled busbars or conductors are limited by the settings of the power control system and may be lower than the sum of the currents of the connected controlled power sources. The settings of the PCS controlled currents may be used for calculation of the design currents used in the relevant sections of NEC Article 690 and 705.

AVIS!

Si le type de réseau avec connexion neutre est sélectionné, vérifiez que le fil neutre est connecté de manière fiable. Si le fil neutre n'est pas connecté, l'appareil ne pourra pas alimenter le réseau en raison de la détection d'une tension de phase erronée. Le courant maximum de fonctionnement de ce système peut être contrôlé électroniquement. Reportez-vous aux instructions du fabricant pour plus d'informations.

NOTICE!

The PCS controlled current setting for each PCS controlled conductor or bus bar shall be indicated with a field applied marking label on the conductor or in close proximity to the busbar. The current settings shall be indicated on a label as follow:

PCS controlled current setting: _____ Amps.

AVIS!

Le réglage du courant contrôlé par le PCS pour chaque conducteur ou barre omnibus contrôlé par le PCS doit être indiqué par une étiquette de marquage appliquée sur le terrain sur le conducteur ou à proximité de la barre omnibus. Les réglages de courant doivent être indiqués sur une étiquette comme suit :

Réglage du courant contrôlé par PCS : _____ Amps.

INFORMATION!

The max response time of GM Energy Inverter to control the output power of the Controlled conductor in the PCS system is 28 seconds.

INFORMATIONS!

Le temps de réponse maximal de l'onduleur GM Energy pour contrôler la puissance de sortie du conducteur contrôlé dans le système PCS est de 28 secondes.

INFORMATION!

To fulfill PCS CRD function, the meter is needed and current sensor shall be installed at the electrical service entrance and after the main breaker in the main panel. The electrical service entrance wire is the controlled conductor. The overcurrent protection rating depends on the capacity of all home load.

INFORMATIONS!

Pour remplir la fonction PCS CRD, le compteur est nécessaire et le capteur de courant doit être installé à l'entrée du service électrique et après le disjoncteur principal dans le panneau principal. Le fil du branchement électrique est le conducteur contrôlé. L'intensité de la protection contre les surintensités dépend de la capacité de toutes les charges domestiques.

4.10 Installation For PVRSE Compliance

GM Energy Inverter can convert and transmit the energy of solar panel to power grid, compatible electric vehicle and(or) GM Energy PowerBank. At the same time, combined with the external RSD button, GM Energy Inverter can function as a part of the PVRSS system, when initiated the rapid shut down through the RSD button, the conductors of PV, compatible electric vehicle and GM Energy PowerBank port will become de-energized below 30V in 30 seconds. The AC circuit breaker should be disconnected to de-energize the AC cable.

WARNING!

If the GM Energy Inverter was installed as a part of PVRSS, the system shall mark the method(s) of initiating Rapid shutdown function and the label shall be marked in accordance with Section 690.56(C) of the NEC (NFPA 70).

AVERTISSEMENT!

Si l'onduleur GM Energy a été installé dans le cadre du système PVRSS, le système doit indiquer la ou les méthodes de déclenchement de la fonction d'arrêt rapide et l'étiquette doit être marquée conformément à la section 690.56(C) du NEC (NFPA 70).

WARNING!

Both the PV port and battery port of GM Energy Inverter are controlled. The DC conductors of both PV and battery port become de-energized below 30V in 30 seconds after rapid shutdown initiated.

AVERTISSEMENT!

Le port PV et le port batterie de l'onduleur GM Energy sont tous deux contrôlés. Les conducteurs DC du port PV et du port batterie sont mis hors tension en dessous de 30V dans les 30 secondes qui suivent le déclenchement de l'arrêt rapide.

WARNING!

The GM Energy Inverter shall be installed and operated in an environment within the ratings and limitations of the equipment as published in these installation instructions.

AVERTISSEMENT!

L'onduleur GM Energy doit être installé et utilisé dans un environnement conforme aux valeurs nominales et aux limites de l'équipement telles qu'elles sont publiées dans ces instructions d'installation.

WARNING!

This photovoltaic rapid shutdown equipment(PVRSE) does not perform all of the functions of a complete photovoltaic rapid shutdown system(PVRSS). This PVRSE must be installed with other equipment to form a complete PVRSS that meets the reqiurements of NEC(NFPA 70)section 690.12 for controlled conductors outside the array. Other equipment installed in or on this system may adversly affect the operation of the PVRSS. It is the responsibility of the installer to ensure that the completed PV system meets the rapid shut down functional requirements. This equipment must be installed according to the manufacturer's installation instructions.

AVERTISSEMENT!

Cet équipement d'arrêt rapide photovoltaïque (PVRSE) ne remplit pas toutes les fonctions d'un système complet d'arrêt rapide photovoltaïque (PVRSS). Ce PVRSE doit être installé avec d'autres équipements pour former un PVRSS complet qui répond aux exigences de la section 690.12 du NEC (NFPA 70) pour les conducteurs contrôlés à l'extérieur de l'installation. Les autres équipements installés dans ou sur ce système peuvent avoir un effet négatif sur le fonctionnement du PVRSS. Il est de la responsabilité de l'installateur de s'assurer que le système PV complet répond aux exigences fonctionnelles d'arrêt rapide. Cet équipement doit être installé conformément aux instructions d'installation du fabricant.

NOTICE!

GM Energy Inverter working in conjuction with SMART RSS or MCI is compatible with grid support functions and any limitations on the grid support functionality.

AVIS!

L'onduleur GM Energy fonctionnant en conjonction avec SMART RSS ou MCI est compatible avec les fonctions de support du réseau et toutes les limitations de la fonctionnalité de support du réseau.

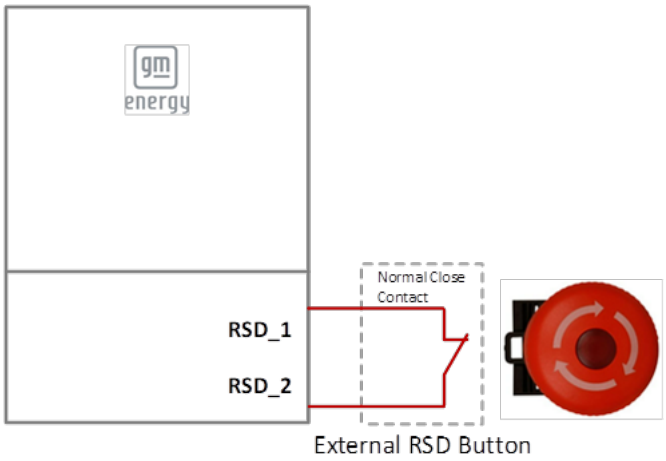


Figure 33: RSD button wiring block

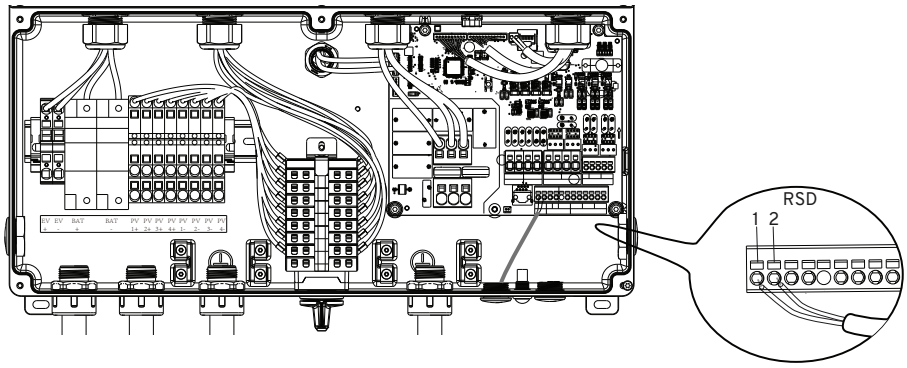


Figure 34: RSD button wiring

Wiring the external RSD button

- Connect the external RSD button wire to the RSD_1 and RSD_2 terminal in the wiring box.
- Verify the connection.

Note:

- The external RSD button is required to be lockable and normal closed type, and certified for rapid shutdown function requirement. It requires to be installed for quickly and easily accessible in an emergency.

In any emergency situation, press the RSD button to shut down GM Energy Inverter immediately and turn off the AC power. Then the system will be de-energized.

4.11 Mounting The Beauty Cover

1. Check if the beauty cover is damaged. Install the plastic clip on the beauty cover into the slot on the top of the case.
2. Rotate the beauty cover so that the two holes in the bottom of the cover align with the screw holes on the case.
3. Use 2x M4 screws to fix the beauty cover to the case. Check if beauty cover is fixed securely on the case. Torque beauty cover fasteners to 10.4 in-lbs (12 kgf-cm) using torque driver with T20 Torx head bit.

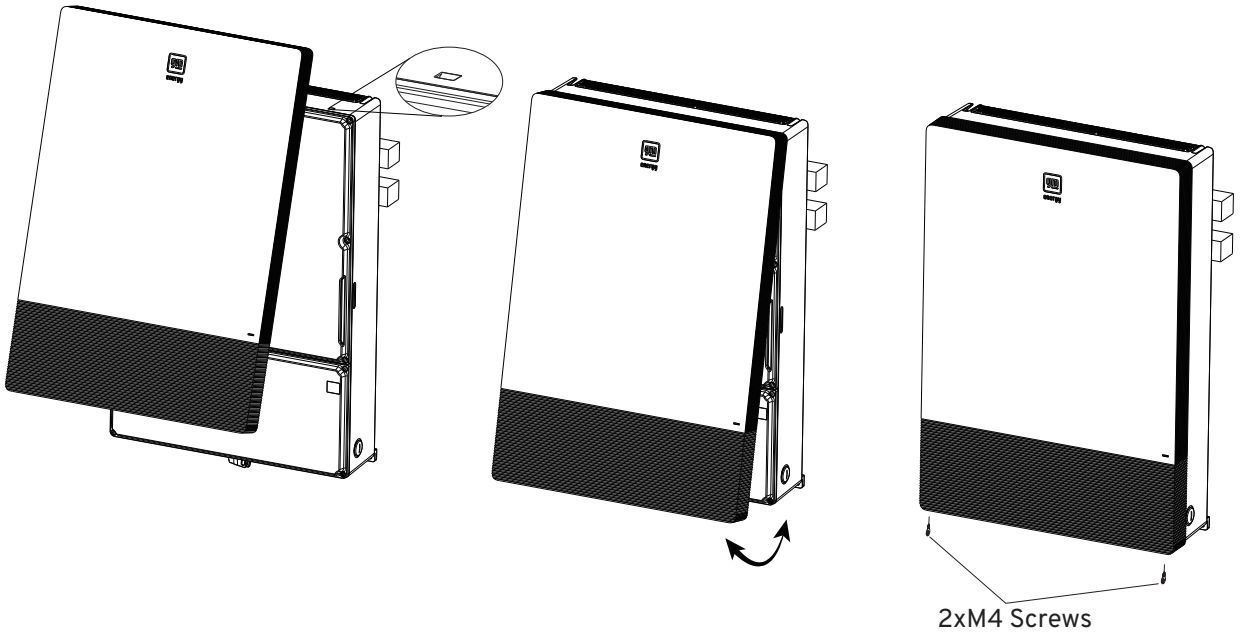


Figure 35: Installing the beauty cover

5 COMMISSIONING THE SYSTEM

WARNING!

Read all of these instructions, cautions, and warnings for the GM Energy Inverter and associated PV array documentation.

AVERTISSEMENT!

Lisez toutes ces instructions, précautions et avertissements concernant l'onduleur GM energy et la documentation associée au réseau photovoltaïque.

WARNING!

The installer must be qualified to perform the installation pursuant to the requirements of local ordinances, the National Electric Code, and local building codes. This may include being Qualified Personnel that is active and in good standing with the state in which they are performing the installation services or working under the direction of such Qualified Personnel.

AVERTISSEMENT!

L'installateur doit être qualifié pour effectuer l'installation conformément aux exigences des ordonnances locales, du code national de l'électricité et des codes de construction locaux. Il peut s'agir d'une personne qualifiée, active et en règle avec l'État dans lequel il effectue les services d'installation, ou travaillant sous la direction d'une telle personne qualifiée.

WARNING!

Verify that the dedicated 2-pole 240 Vac / 208 Vac circuit breaker in the building electrical service panel is turned-off.

AVERTISSEMENT!

Vérifiez que le disjoncteur à 2 circuits de 240 Vca / 208 Vca du tableau d'alimentation électrique du bâtiment est mis hors tension.

NOTICE!

Disconnect in the "OFF" position, verify the PV input polarity once more simply by carefully using a 600 V, DC rated digital volt meter and probing the positive (+) and negative (-) PV array connections.

AVIS!

Débranchez l'appareil lorsqu'il est éteint (« OFF ») puis vérifiez à nouveau la polarité de l'entrée PV en utilisant simplement avec précaution un voltmètre numérique de valeur nominale de 600 Vcc et en prélevant les mesures au niveau des connexions positive (+) et négative (-) du groupe solaire PV.

5.1 LED Indication

There are one LED light in the front side of the GM Energy Inverter, it indicates different status and messages of GM Energy Inverter.

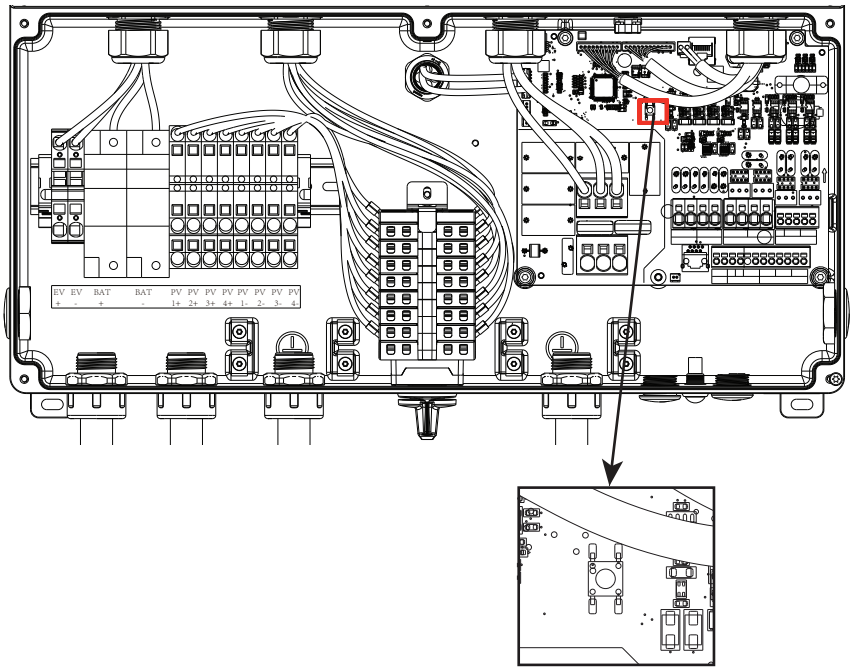
LED Behavior		
WHITE	Blinking (1s on, 1s off)	Firmware Update
	Blinking (1s on, 4s off)	Sleep Mode
	Solid	Initializatizing
GREE N	Blinking (1s on, 1s off)	Inverter is Initializing a Charge / Discharge Session
	Blinking (1s on, 4s off)	Idle / Standby
	Solid	Normal Operation (Converting Power)
YELLOW	Blinking (1s on, 1s off)	PowerBank / Dark Start Battery Fault
	Blinking (1s on, 4s off)	Inverter Warning
	Solid	Equipment Alarm
RED	Blinking (0.5s on, 0.5s off, 2s on, 0.5s off)	Over Current Protection Fault
	Blinking (1s on, 1s off)	Ground Fault
	Solid	Arc Fault

5.2 Button

5.2.1 Reset Button

There is button located inside the wiring box, for this button, there are following functions.

1. **Arc reset**
   - Application: Clear arc fault.
   - Trigger condition: Press the button for 3-5 seconds.



Reset Button

5.3 GM Energy Inverter Turn-on Procedure

1. **Turn on the DC disconnect (turn to "ON" position, if rapid shutdown device is connected turn on AC disconnect first).**
2. **Check for GM Energy Inverter initialization (LED light turns white and constantly on).**
3. **Turn on the dedicated 2-pole 240Vac / 208Vac circuit breaker in the building electrical service panel (put in closed position).**
4. **If there is AC disconnect, turn on the AC disconnect.**
5. **Refer to section 6 for setup process that needs to be completed before the GM Energy Inverter can begin feeding power to the grid.**

5.4 GM Energy Inverter Turn-off Procedure

Multiple power sources could be connected inside the GM Energy Inverter, each circuit must be individually disconnected before servicing.

1. **Turn off the DC disconnect (turn to "OFF" position).**
2. **Turn off the dedicated 2-pole 240Vac circuit breaker for GM Energy Inverter in the GM Energy Home Hub (place in "OFF" position). If there is AC disconnect, turn off the AC disconnect.**
3. **Unplug the compatible electric vehicle charger gun to disconnect the GM Energy Inverter from the compatible vehicle battery.**
4. **Turn off the DC disconnect of GM Energy PowerBank if it is included in the system.**

5.5 Commissioning The System

Please refer to the system installation guide for details on commissioning the system. The system install guide, install app, and other installer support resources are available at the website below.

https://gmenergy.gm.com/for-home/installation-support

6 PRODUCTION INFORMATION

NOTICE!

All production information is provided for orientation purposes only. The measuring devices and meters provided by the electricity supply company are the authoritative source of information for invoicing.

AVIS!

Toutes les informations de production ne sont fournis qu'à titre d'orientation. Les appareils de mesure et les compteurs fournis par la société de distribution d'électricité constituent la source officielle de la facturation.

7 REPAIR

DANGER!

Danger of death from hazardous voltage.

Hazardous voltage is applied to the GM Energy Inverter during operation. Hazardous voltage is still present 5 minutes after all power sources have been disconnected.

Never open the GM Energy Inverter. The GM Energy Inverter contains no components that are to be maintained or repaired by the operator or installer. Opening the cover will void the Limited Warranty (see section 10 on Limited Warranty Exclusions).

DANGER!

Risque de mort par une tension dangereuse.

Une tension dangereuse est appliquée à l'onduleur GM Energy pendant le fonctionnement. Une tension dangereuse est toujours présente 5 minutes après que toutes les sources d'alimentation ont été déconnectées.

N'ouvrez jamais le convertisseur GM Energy. L'onduleur GM Energy ne contient aucun composant qui doit être entretenu ou réparé par l'opérateur ou l'installateur. L'ouverture du couvercle annule la garantie limitée (voir section 10 sur les exclusions de la garantie limitée).

NOTICE!

The GM Energy Inverter contains no components that are to be maintained by the operator or installer.

AVIS!

L'onduleur GM Energy ne contient aucun composant devant être entretenu par l'opérateur ou l'installateur.

8 DECOMMISSIONING, TRANSPORT, STORAGE, DISPOSAL

DANGER!

Danger of death or severe injuries from dangerous voltage

Disconnect the GM Energy Inverter from the grid before removing or inserting the AC connector.

DANGER!

Danger de mort ou de blessures graves par une tension dangereux

Déconnecter l'onduleur solaire du réseau électrique avant de retirer ou d'insérer le connecteur AC.

DANGER!

Danger of death or severe injuries from dangerous voltage

Dangerous voltages can be present at the DC connections of the GM Energy Inverter.

Never disconnect the PV modules when the GM Energy Inverter is under load. First switch off the grid connection so that the GM Energy Inverter cannot feed energy into the grid. Then open the DC disconnector.

Secure the DC connections against being touched.

DANGER!

Danger de mort ou de blessures graves par une tension dangereux

Des tensions dangereuses peuvent être présentes sur les connexions CC de l'onduleur solaire.

Ne jamais déconnecter les modules PV lorsque l'onduleur solaire est en cours de charge. D'abord désactiver la connexion au réseau électrique de sorte que l'onduleur solaire ne peut pas fournir de l'énergie dans le réseau. Ensuite, déconnectez le sectionneur CC.

Sécuriser les connexions CC contre être touché.

WARNING!

Danger of injury due to heavy weight

The GM Energy Inverter is heavy (see "9.2 Technical data"). Incorrect handling can lead to injuries.

The GM Energy Inverter must be lifted and carried by two people.

AVERTISSEMENT!

Risque de blessure en raison du poids lourd

L'onduleur solaire est lourd (voir «9.2 Caractéristiques techniques»). Une mauvaise manipulation peut entraîner des blessures.

Il faut que l'onduleur solaire soit soulevé et déplacé par deux personnes.

8.1 Decommissioning

1. **Switch off the AC cable to be free of voltage.**
2. **Open the DC disconnector.**
3. **Remove all cables from the GM Energy Inverter.**
4. **Unscrew the GM Energy Inverter from the wall bracket.**
5. **Lift the GM Energy Inverter from the wall bracket.**

8.2 Packaging

Use the original packaging or packaging of the same quality.

8.3 Transport

Always transport the GM Energy Inverter in the original packaging or packaging of the same quality.

8.4 Storage

Always store the GM Energy Inverter in the original packaging or packaging of the same quality. Recommended storage condition: temperature 5°C ~ 35 °C, humidity less than 70%RH.

8.5 Dispose

Dispose of the GM Energy Inverter in a technically appropriate manner according to the legal requirements of your country.

9 CERTIFICATE AND TECHNICAL DATA

9.1 Certificate

Please check at: https://www.csagroup.org/testing-certification/product-listing for the most recent certificates.

9.2 Technical Data

EVSE PORT	
Maximum I/O power	10 kW
Acceptable input voltage range	200 V to 500 V
Maximum continuous I/O current	36.7 A
AC maximum short circuit current	10 kA
Charging/discharging efficiency(to AC), peak	>95.5%
EVSE terminal	Spring type
BATTERY PORT	
Compatible battery pack size	5 kWh to 35.4 kWh
Maximum I/O power	12000 W [1)]
Acceptable input voltage range	350 V to 480 V (max 450 V with Powerbank installed) [2)]
Maximum continuous I/O current	32 A [1)]
Round trip efficiency (PCS Only), peak	>97.5%
Fuse rating	50 A
Battery terminal	Screw type
PV INPUT	
Absolute maximum input voltage	480 V (450 V with Powerbank Installed) [2)]
Start-up voltage	120 V
Operating MPPT voltage range	50 V to 480 V (50 V to 450 V with Powerbank installed) [2)]
Maximum input short circuit current	20 A
Maximum input current per MPPT	15 A
MPP tracker	4
Maximum DC/AC ratio	1.3
Maximum allowable MPPT in parallel	2 (strings)
MPPT scan (Shading option)	~ 15min (high) /~ 30min (default) /~ 60min (low)
DC disconnect	Integrated
AC PORT (ON-GRID MODE)	
Maximum output power @ 240Vac	11520 W
AC operating voltage range	211 Vac to 264 Vac @ 240 Vac
Maximum continuous current	48 A
Operating frequency range	59.3 Hz to 60.5 Hz
Adjustable frequency range	50 Hz to 66 Hz
Adjustable power factor range	0.8i to 0.8c
THD @ nominal power	<3%
Grid support compliance	UL 1741 SB, CA Rule 21 phase 1, 2, 3, HECO
AC terminal [3)]	Spring type
AC PORT (OFF-GRID MODE)	
Output	Pure sin-wave voltage
Maximum output power	9600W @ 45ºC, 4800W @ 55ºC, 0W @ 65ºC
AC output voltage	120 / 240 Vac (split)
Maximum continuous current	40 A
Maximum LRA allowed	62 A
Operating frequency range	57 Hz to 63 Hz
THD @ nominal power	<5%
Maximum allowed crest factor	2.0
AC terminal	Spring type

1) Adjustable value, limited by the output power capability of battery pack (ESS).

2) Adjustable value, limited by the maximum voltage of the battery pack (ESS). The GM Energy PowerBank is limited to 450V.
If integrating DC solar with GM Energy PowerBank, ensure the DC solar voltage does not exceed 450V.

3) On-grid mode and off-grid mode are using the same AC port terminal.

GENERAL SPECIFICATION	
Peak efficiency (PV inverter)	98.0%
CEC efficiency (PV inverter)	97.5 % @ 240 Vac
Operating temperature range	-22 ºF to 149 ºF (-30 ºC to 65 ºC), with derating above 113 ºF (45ºC)
Humidity	0% to 95%
Maximum operating altitude	9,843 ft (3,000 m)
Audible noise	≤ 45 dB(A) @ 3 ft (1 m)
Standby power	< 18 W
MECHANICAL DESIGN	
Dimensions (W x H x D)	20.9 x 30.7 x 7.5 in (530 x 780 x 190 mm)
Weight	94.8 lbs (43 kg)
Cooling	Forced air
Enclosure material	Die-casting aluminum
INTERFACE	
Display	APP, LED indicators
Communication interface	RS-485, CAN
Protocol	Modbus - RTU
STANDARDS	
Battery safety	UL 1973
Enclosure protecting rating	UL 50E Type 4
Safety	UL 1741, CSA - C22.2 No. 107.1-16
Software approval	UL 1998
Grounding fault protection	UL 1741 CRD
PCS	UL 1741 PCS CRD, NEC 705.13
Multimode	UL 1741 multimode CRD
Anti-islanding protection	IEEE 1547-2018, IEEE 1547.1-2020
EMC	FCC part 15 Class B
AFCI	UL 1699B (Type 1), NEC 2020 690.11
Rapid shutdown protection	NEC 2020 690.12 [4]
Rapid shutdown transmitter	AP Smart Transmitter, Model Type: Transmitter-PL-1P
Grid support regulation	UL 1741 SB, IEEE 2030.5, California Rule 21 phase 1 & 2 & 3, HECO Compliant
EV Charger system certification	UL 2202, UL 9741
LIMITED WARRANTY	
Limited Warranty	10 years [5]

4) Compliant with APS rapid shutdown system.

5) For more info on limited warranty go to https://gmenergy.gm.com/for-home/here-to-help

Max. output fault current and duration is 96.37Apk, 1.3ms duration. GM Energy Inverter is designed to withstand a max 10kA fault current interrupt rating.It complies when a compatible AC breaker is used.

Utility Interconnection Voltage And Frequency Trip Limits And Trip Times For All Models

Simulated utility source		Maximum time (sec) at 60Hz before cessation of current to the simulated utility
Voltage (V)	**Frequency (Hz)**	
< 50% V	Rated (60 Hz)	0.16
50% V ≤ V < 88% V	Rated (60 Hz)	2
110% V < V <120% V	Rated (60 Hz)	1
120% V ≤ V	Rated (60 Hz)	0.16
Rated	f > 60.5	0.16
Rated	f < 59.3	0.16

Trip Limit And Trip Time Accuracy For All Models

Voltage (V)	±1% (L-L)
Frequency (Hz)	±0.01Hz
Time	1%, but not less than 100ms

9.3 FCC Compliance Information

This GM Energy Inverter, complies with Part 15 of the FCC Rules. Operation is subject to the following conditions:

1. **This device may not cause harmful interference**
2. **This device must accept any interference received, including interference that may cause undesired operation.**

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

Reorient or relocate the receiving antenna

Increase the separation between the equipment and the receiver

Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

Consult the dealer or an experienced radio/TV technician for help.

The user is cautioned that changes or modifications not expressly approved by GM Energy could void the user‘s authority to operate this equipment.

Please contact GM Energy Customer Support Center at 1-833-64POWER for more information.

9.4 Canada Compliance Information

This Class B digital apparatus complies with Canadian ICES-003.

10 LIMITED WARRANTY EXCLUSIONS

For more information about the limited warranty and assistance with warranty repairs or returns you may contact our GM Energy Support Center at 1-833-64POWER or go to https://gmenergy.gm.com/for-home/here-to-help. Failure to strictly comply with this GM Energy Inverter Installation and Operation Manual voids any such warranty.

11 APPENDIX

12 GLOSSARY

AC

Abbreviation for “Alternating Current”.

AFCI

Abbreviation for “Arc-Fault Circuit Interrupters”.

AHJ

Abbreviation for “Authority Having Jurisdiction”.

Anti-islanding protection

This is a unit for grid monitoring with assigned switching elements (anti-islanding protection) and is an automatic isolation point for small power generation systems (to 30 kWp).

Basic Insulation

Insulation to provide basic protection against electric shock.

CEC

Abbreviation for the California Energy Commission

CEC Efficiency

CEC Efficiency is the California Energy Commission Efficiency rating, a performance rating for modules and inverters based on the real environment that a system will be in.

CSA

Abbreviation for the Canadian Standards Association.

DC

Abbreviation for “Direct Current”.

EGC

Equipment Grounding Conductor

EMC

The Electro-Magnetic Compatibility (EMC) concerns the technical and legal basics of the mutual influencing of electrical devices through electromagnetic fields caused by them in electrical engineering.

EVSE

electrical vehicle supply equipment

FCC

FCC is the abbreviation for Federal Communications Commission.

Galvanic isolation

No conductive connection between two component parts.

GND

Ground

IEEE

The Institute of Electrical and Electronics Engineers or IEEE (read I-Triple-E) is an international non-profit, professional organization for the advancement of technology related to electricity.

IMI

Isolation Monitor Interrupter

Initialization

Under initialization (cf. English to initialize) is understood the part of the loading process of a program, in which the storage space required for the execution (e.g. variable, code, buffers ...) for the program is reserved and is filled with initial values.

ISC

Short Circuit Current

Local utility company

A local utility company is a company which generates electrical energy and distributes it over the public grid.

MPP

The Maximum Power Point is the point on the current-voltage (I-V) curve of a module, where the product of current and voltage has it's maximum value.

NEC

The National Electrical Code (NEC), or NFPA 70, is a United States standard for the safe installation of electrical wiring and equipment.

Nominal power

Nominal power is the maximum permissible continuous power output indicated by the manufacturer for a device or a system. Usually the device is also optimized so that the efficiency is at its maximum in case of operation with nominal power.

Nominal current

Nominal current is the absorbed current in case of electrical devices if the device is supplied with the nominal voltage and yields its nominal power.

PE

In electric systems and cables a protective earth conductor is frequently employed. This is also called grounding wire, protective grounding device, soil, grounding or PE (English "protective earth").

Photovoltaics (abbr.: PV)

The conversion of PV energy into electrical energy.

The name is composed of the component parts: Photos - the Greek word for light - and Volta - after Alessandro Volta, a pioneer in electrical research.

Power dissipation

Power dissipation is designated as the difference between absorbed power and power of a device or process yielded. Power dissipation is released mainly as heat.

PV cell

PV cells are large-surface photodiodes which convert light energy (generally sunlight) into electrical energy. This comes about by utilization of the photoelectric effect (photovoltaics).

PV generator

System comprising of a number of PV modules.

PV module

Part of a PV generator; converts PV energy into electrical energy.

RJ45

Abbreviation for standardized eight-pole electrical connector connection. RJ stands for Registered Jack (standardized socket).

RS485 (EIA485)

Differential voltage interface on which the genuine signal is transmitted on one core and the negated (or negative) signal on the other core.

Separate grid system

Energy supply equipment which is completely independent of an interconnected grid.

Solar inverter

is an electrical device which converts DC direct voltage into AC voltage and/or direct current into alternating current.

String

Designates a group of electrical PV modules switched in series.

String solar inverter (solar inverter concept)

The PV generator is divided up into individual strings which feed into the grid over their own string solar inverters in each case. In this way, the installation is considerably facilitated and the gain decrease, which can arise from the installation or from different shading conditions of the PV modules, is considerably reduced.

UL

Stands for Underwriters Laboratory, a non-profit organization that sets standards for different product categories and tests products to make sure they meet the standards.

Voc

Open Circuit Voltage

gm energy

Inverter