

Installation and Operations Manual

Enphase Microinverter

Model M215™



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FCC Compliance

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.

Changes or modifications not expressly approved by the party responsible for compliance may void the user's authority to operate the equipment.

Other Information

Product information is subject to change without notice. All trademarks are recognized as the property of their respective owners.

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Important Safety Information

Read this Before Installing or Using the M215

This manual contains important instructions for use during installation and maintenance of the Enphase M215™ Microinverter. User documentation is updated frequently; Check the Enphase website (<http://www.enphase.com/support/downloads>) for the latest information.

To reduce the risk of electrical shock, and to ensure the safe installation and operation of the Enphase Microinverter, the following safety symbols appear throughout this document to indicate dangerous conditions and important safety instructions.



WARNING! This indicates a situation where failure to follow instructions may be a safety hazard or cause equipment malfunction. Use extreme caution and follow instructions carefully.



NOTE: This indicates information particularly important for optimal system operation. Follow instructions closely.

Safety Instructions

- Perform all electrical installations in accordance with all applicable local electrical codes and the National Electrical Code (NEC), ANSI/NFPA 70.
- Be aware that only qualified personnel should install or replace Enphase Microinverters.
- Do not attempt to repair the Enphase Microinverter; it contains no user-serviceable parts. If it fails, please contact Enphase customer service to obtain an RMA (return merchandise authorization) number and start the replacement process. Tampering with or opening the Enphase Microinverter will void the warranty.
- Before installing or using the Enphase Microinverter, please read all instructions and cautionary markings in the technical description and on the Enphase Microinverter System and the PV equipment.
- Connect the Enphase Microinverter to the utility grid only after receiving prior approval from the electrical utility company.
- Be aware that the body of the Enphase Microinverter is the heat sink. Under normal operating conditions, the temperature is 15°C above ambient, but under extreme conditions the microinverter can reach a temperature of 80°C. To reduce risk of burns, use caution when working with microinverters.
- Do NOT disconnect the PV module from the Enphase Microinverter without first removing AC power.

The Enphase Microinverter System

The Enphase Microinverter System is the world's most technologically advanced inverter system for use in utility-interactive applications. This manual details the safe installation and operation of the Enphase Microinverter.

The three key elements of an Enphase Microinverter System include the:

- Enphase M215 Microinverter
- Enphase Envoy™ Communications Gateway
- Enphase Enlighten™ web-based monitoring and analysis software

This integrated system maximizes energy harvest, increases system reliability, and simplifies design, installation and management.



How the Microinverter Works

The Enphase Microinverter maximizes energy production from your photovoltaic (PV) array. Each Enphase Microinverter is individually connected to one PV module in your array. This unique configuration means that an individual Maximum Peak Power Point Tracker (MPPT) controls each PV module. This ensures that the maximum power available from each PV module is exported to the utility grid regardless of the performance of the other PV modules in the array. That is, although individual PV modules in the array may be affected by shading, soiling, orientation, or PV module mismatch, the Enphase Microinverter ensures top performance for its associated PV module. The result is maximum energy production from your PV system.

System Monitoring

Indoors, you can install the Envoy Communications Gateway by plugging it into any convenient 120Vac wall socket and providing an Ethernet connection to your broadband router or modem. After installation of the Envoy, the Enphase Microinverters automatically begin reporting to the Enphase Enlighten web server. The Enlighten software presents current and historical system performance trends, and it informs you when the PV system is not performing as expected.

Optimal Reliability

Microinverter systems are inherently more reliable than traditional inverters. The distributed nature of a microinverter system ensures that there is no single point of system failure in the PV system. Enphase Microinverters are designed to operate at full power at ambient temperatures as high as 65° C (150° F). The microinverter housing is designed for outdoor installation and complies with the NEMA 6 environmental enclosure rating standard:

NEMA 6 rating definition: Indoor or outdoor use primarily to provide a degree of protection against hose-directed water, and the entry of water during occasional temporary submersion at a limited depth, and damage from external ice formation.

Ease of Design

PV systems using Enphase Microinverters are very simple to design and install. You will not need string calculations, and you can install individual PV modules in any combination of PV module quantity, type, age and orientation. You won't need to install cumbersome traditional inverters. Each microinverter quickly mounts on the PV racking, directly beneath each PV module. Low voltage DC wires connect from the PV module directly to the co-located microinverter, eliminating the risk of personnel exposure to lethal 600Vdc power.

Enphase Microinverter Installation

Follow the instructions in this section to install Enphase M215™ Microinverters.



WARNING: Be aware that only qualified personnel should connect the Enphase Microinverter to the utility grid.



WARNING: Be aware that installation of this equipment includes risk of electric shock. Normally grounded conductors may be ungrounded and energized when a ground fault is indicated.

Compatibility and Capacity

The Enphase M215 Microinverters are electrically compatible with most 60-cell PV modules. For more information, see Technical Data page 25 of this manual.



WARNING: The M215 should be paired only with a 60-cell PV module.

Refer to the Enphase website (<http://www.enphase.com/support/downloads>) for a list of **electrically**-compatible PV modules and approved PV racking systems. To ensure **mechanical** compatibility, be sure to order the correct connector type for both microinverter and PV module from your distributor.

Electrical Compatibility

Model Number	Works with PV Module Type	PV Module Connector Type
M215-60-2LL-S22 M215-60-2LL-S22-NA	60 cell	MC-4 Type 2 Locking or Amphenol H4 Locking
M215-60-2LL-S23 M215-60-2LL-S23-NA	60 cell	Tyco Solarlock Locking

Capacity

Maximum number of M215s per 20 amp AC Branch Circuit	
Service type	Max M215s per AC branch circuit
Split phase 240V	17
Three phase 208V	25