ABB solar inverters
Quick installation guide
UNO-DM-6.0-TL-PLUS-US (6.0 kW)

Before starting installation, download the product manual from www.abb.com/solarinverters. Choose the correct country, string inverters, single phase, or during periods of high humidity (>95%).

1. Installation site and position

- Confirm that the maximum PV array short circuit current for each DC input channel is within the inverter specification (see table in Section 19).
- Confirm the correct polarity in the input strings.

2. Components

- Display
- Loud bracket
- CLINI-led terminal blocks
- U/T communications conduit
- Wiring box
- Emergency stop
- Inverter front cover
- LCD panel
- Locking Screw
- AC output terminal blocks
- Front view
- DC input terminal blocks
- Panel (FP101F)
- AC power cables
- Warranty Label
- Mounting screws
- AC input terminal blocks
- DC PV string wire
- Equipment Grounding Conductor (EGC)

3. Important safety instructions

SAVE THESE INSTRUCTIONS -- KEEP IN A SAFE PLACE!

The installer must read these safety instructions before installing the equipment. If the installer does not follow these instructions, the installer’s life could be endangered; and any warranty or implied guarantee on the equipment may be voided. The installation manual contained in the product box must also be read and followed. Please refer to the inverter technical documentation.

4. Installation

Conduit must be sealed using water-tight fittings to maintain NEMA Type 4X enclosure integrity.

5. Connect the power cables to the inverter

- Connect the DC wiring to +IN1 and the negative side to -IN1.
- Connect the positive side of the second PV array to +IN2 and its negative side to -IN2.
- Connect the AC power cables to the AC output terminals.

6. Confirm the correct polarity in the input channels

- Confirm them in no ground leakage current in the PV array.
- When exposed to extreme temperatures, the PV panels supply DC direct voltage to the inverter.

7. Independent mode configuration

In case of two PV arrays, if each of them has a current rating lower than the inverter current rating for a single inverter channel, they may be connected in parallel. It is recommended to maintain the same current regulation of the two inverters by setting the parallel mode configuration to the independent mode configuration.

Parallel mode configuration

If a PV array’s current is more than the rating for a single inverter channel, it should be configured for independent mode configuration. In this configuration, the two inverters will be connected in parallel, allowing the inverter to handle the total power output of the PV system. The parallel mode configuration is selected by setting the “Parallel mode” parameter to “Detroit configuration” in the inverter’s display menu.

NOTE: If a RSD device was installed into the plant, it also will need to connect the AC grid to allow for grid interconnection. The installer must read this document in its entirety before installing or commissioning this equipment.
To prevent electrical hazards, open and test the external AC disconnect switch before connecting the AC conductors, and any time the AC wiring box cover is to be removed. Proper PPE is required.

AC output voltage protection is not provided to this inverter. It is the responsibility of the end user to provide overscore protection for the AC output circuit. To reduce the risk of fire, connect only to a circuit protected with an overscore protection in accordance with Article 240-21 of the National Electrical Code (NEC) and UL 477B. This inverter must be connected only to a dedicated distribution circuit that has a nominal maximum circuit overcurrent protection of 150 A or less.

Size conductors per the NEC. Article 310—use 90°C copper wire only, conductors must be sized according to operating temperature range and current ratings. The AC grid wiring is connected by the installer with inverter.

AC output wire must be listed wire rated minimum 600V.

Run an approved crossover between the inverter and external AC disconnect switch.

This AC wire then proceeds through the opening dedicated to the AC conduit.

When complete, seal conduit with water-girt fittings to maintain the NMDA type 4X extreme rating. Installer should follow manufacturer guidelines andtest before installation.

AC output wiring is approved for use with AFCI/GFI protection. Only wiring connections based on the AC grid site are shown in the table below found on a label in the wiring kit.

The default 240V split-phase connection phase grid Neutral is connected to the inverter for proper operation. Before connecting the inverter to the grid, the grid must be switched off during commissioning phase. If several inverters are installed to a three-phase grid, then always distribute the power inverter to reduce power imbalance between the phases.

If all connections are complete, reinstall the front covers and tighten the cover screws with 1.5Nm (13.2 inch-lb).

The LCD has two visible text lines and the UP and DOWN control keys are used to scroll through the menu items. An arrow on the left side of the display highlights the current selection. Move the arrow UP or DOWN to the desired selection and press ENTER to access the associated submenu. To return to the preceding menu, press the ESC key again.

The default password for Setting menus is 0000. Move the selection to the desired menu option and press ENTER to access the menu. A menu option is selected when the arrow points at it with an asterisk (*) before it.

The LCD is a material that is currently used. The LCD has a maximum of 2000000 display hours. The inverter will display the estimated number of display hours on the final display when it is retired.

The inverter offers several modes for reactive power control and are described below:

1. Frequency Ride-Through (FRT): In this mode, the inverter can continue to operate normally, even if the frequency of the grid is outside of the normal operating range of the inverter.
2. Q Fixed (Q Set): Sets the reactive power to a fixed value. When enabled, a new value will be set in the inverter.
3. Power factor as function of output power (Watt/Cosφ Settings: Cosφ(P)): In this mode, the inverter reduces the power factor (cos-phi) as a function of the output power of the grid. When the power of the grid is lower than the predefined value, the power factor is adjusted to maintain grid stability.
4. Dynamic Q Control (V/Hz Control Settings: Q/V): Under this mode, the level of reactive power expander is a function of the operating grid voltage, grid frequency and inverter load. The purpose of the reactive power expander is to improve the power factor of the inverter and maintain grid stability.
5. Reactor Control: The inverter is designed to control the rate at which output power is increased, either at startup, or at temporary low power conditions on the PV array such as bird strikes or partial shading. The inverter is designed to reduce the power factor to a level that is acceptable to the grid operator.

Reactors are recommended downstream to the inverter to reduce power imbalance between the phases.

The inverter provides several modes of operation for reactive power control and are described below:

1. Reactive power control
2. Frequency ride-through
3. Power factor as function of output power (Watt/Cosφ Settings: Cosφ(P))

The inverter is designed to control the rate at which output power is increased, either at startup, or at temporary low power conditions on the PV array such as bird strikes or partial shading. The inverter is designed to reduce the power factor to a level that is acceptable to the grid operator. Furnish a suitable transformer to transform the solar output to the voltage that is acceptable to the grid operator.

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