INSTALLATION MAP

To Sheet_____

Panel Group: Azimuth: Tilt: Sheet: ____ / ____	Client:	Installer:	N S E W

	1	2	3	4	5	6	7
A							
B							
C							
D							
E							
F							
G							
H							
I							
J							

To Sheet_____ (left)

To Sheet_____ (right)

IQ Relay serial label number:

IQ Gateway serial label number:

INSTALLATION MAP

To Sheet_____

Manufacturer:
Enphase Energy Inc., 47281 Bayside Pkwy., Fremont, CA, 94538,
The United States of America, PH: +1 (707) 763-4784

Importer:
Enphase Solar Energy Pvt. Ltd., IndiQube Golf View Homes, Ward No: 73 Airport, NAL Wind Tunnel Main Road,
Bangalore-560017. Tel: +91-80-6117-2500

Enphase Support: https://enphase.com/contact/support

QUICK **INSTALL** GUIDE

ENPHASE.

Install the **Enphase IQ8P** Microinverter

To install Enphase IQ8P Microinverters, read and follow all warnings and instructions in this guide and the ***Enphase IQ8P Microinverter Installation and Operation Manual*** at enphase.com/support. Safety warnings are listed at the end of this guide.

The Enphase microinverter models listed in this guide do not require grounding electrode conductors (GEC), equipment grounding conductors (EGC), or grounded conductors (neutral). The microinverter has a Class II double-insulated rating, which includes ground fault protection (GFP). To support GFP, use only PV modules equipped with DC cables labeled *"PV Wire"* or *"PV Cable"*.
IMPORTANT: Enphase IQ8P Microinverters require the IQ Cable. An IQ Gateway is required to monitor the performance of the IQ Microinverters. The IQ accessories work only with IQ8P Microinverters.

NOTE: 1) After you log in to your Enphase account from the Enphase Installer App, scan the microinverter serial numbers (1D barcode) and connect to the IQ Gateway to track the system installation progress.
2) Installer must check the manufacturing date of the products to ensure that the installation date is within one year of the manufactured date of the products. Contact your local distributor to validate the date code.

PREPARATION

A) Install the Enphase Installer App and log in to your Enphase account. With this app, scan microinverter serial numbers (1D barcode) and connect to the IQ Gateway to track system installation progress. To download, go to https://enphase.com/installers/apps or scan the below QR code:

Android iOS

B) Refer to the following table and check PV module electrical compatibility at https://enphase.com/en-in/installers/microinverters/calculator.

Model	DC connector	Typical PV module* cell count
IQ8P-72-2-INT	MC4	Pair with 60-cell /120-half-cell, 66-cell/132-half-cell, 72-cell/144-half-cell, 78-cell/156-half-cell modules

* Enphase IQ8P Microinverters are compatible with bifacial PV modules if the temperature-adjusted electrical parameters (maximum power, voltage, and current) of the modules, considering the electrical parameters, including the bifacial gain, are within the allowable microinverter input parameters range. Follow the module manufacturers' recommendations to evaluate the amount of bifaciality gain.

C) In addition to the Enphase microinverters, PV modules, and racking, you will need these Enphase items:
- IQ Gateway (model ENV-S-WM-230) communications gateway to monitor solar production.
- IQ RAW cable (Q-12-RAW-300)
- Tie wraps
- IQ Sealing Caps (Q-SEAL-10): to seal any unused connectors on the IQ Cable.
- IQ Terminator (Q-TERM-10): one needed at the end of each AC cable segment.
- IQ Disconnect Tool (Q-DISC-10)
- Enphase IQ Cable

Cable model	Connector spacing*	PV module orientation	Connectors per box
Q-12-10-240	1.3 m	Portrait (all)	240
Q-12-20-200	2.3 m	Landscape (72-cell)	200

*Allows for 30 cm of cable slack

D) Check that you have these additional items:
- AC junction box.
- Tools: Screwdrivers, wire cutter, voltmeter, torque wrench, sockets, and wrenches for mounting hardware.

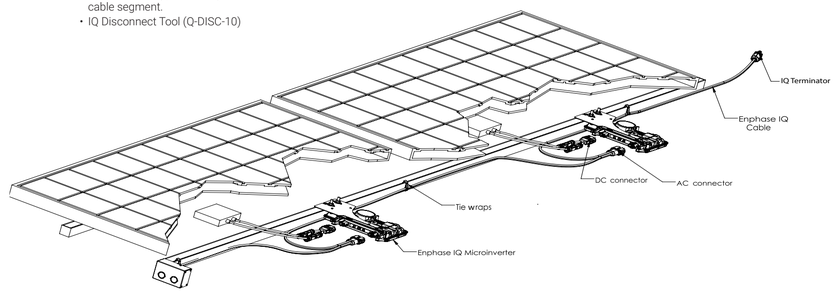
E) Protect your system with lightning and surge suppression devices. It is also important to have insurance that protects against lightning and electrical surges.

F) Plan your AC branch circuits to meet the following limits for the maximum number of microinverters per branch when protected with a 20 A overcurrent protection device (OCPD).

Maximum* IQ8P Microinverters per AC branch circuit (single-phase)	7

* Limits may vary. Refer to local requirements to define the number of microinverters per branch in your area.

G) Size the AC wire gauge to account for voltage rise. Select the correct wire size based on the distance from the beginning of the IQ Cable to the breaker in the load center. Design for a voltage rise total of less than 2% for these sections. Refer to the Voltage Rise Technical Brief at https://enphase.com/en-in/installers/resources/documentation for more information.



140-00338-01

INSTALLATION

1 Position the IQ Cable

A) Plan each cable segment to allow connectors on the IQ Cable to align with each PV module. Allow extra length for slack, cable turns, and any obstructions.

B) Mark the approximate centers of each PV module on the PV racking.

C) Lay out the cabling along the installed racking for the AC branch circuit.

D) Cut each segment of cable to meet your planned needs.

WARNING: When transitioning between rows, secure the cable to the rail to prevent cable or connector damage. Do not count on the connector to withstand tension.

2 Position the junction box

A) Verify that AC voltage at the site is within range:

Microinverter models:	**Single-phase service**	
	L1 to N	184 to 276 VAC*
IQ8P-72-2-INT	**Three-phase service**	
	L1 to L2 to L3	319 to 478 VAC*
	L1, L2, L3, to N	184 to 276 VAC*

* Nominal voltage range can be extended beyond nominal if required by the utility.

B) Install a junction box at a suitable location on the racking.

C) Provide an AC connection from the junction box back to the electricity network connection using equipment and practices as required by local jurisdictions.

3 Mount the microinverters

A) The microinverters can be mounted beneath the modules in either horizontal or vertical orientation to the module. They must be protected from direct exposure to rain, UV, and other harmful weather events. Refer to the below image for clearance requirements during vertical mounting.

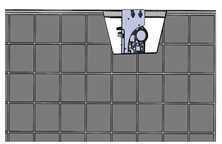
B) Mount the microinverter horizontally, bracket side up or vertically. Always place it under the PV module, protected from direct exposure to rain, sun, and other harmful weather events. Allow a minimum of 1.9 cm (3/4") between the roof and the microinverter. Also, allow 1.3 cm (1/2") between the back of the PV module and the top of the microinverter.

For vertical mount, maintain > 30 cm (12") clearance from the edges of the PV module to protect the microinverter from direct exposure to rain, UV, and other harmful weather events.

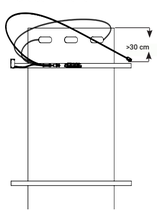
WARNING: Install the microinverter under the PV module to avoid direct exposure to rain, UV, and other harmful weather events. Do not mount the microinverter upside down.

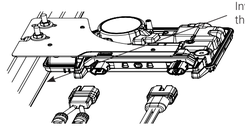
C) Torque the mounting fasteners as follows. Do not over-torque.
- 6 mm (1/4) mounting hardware: 5 N m (45 to 50 in-lbs)
- 8 mm (5/16") mounting hardware: 9 N m (80 to 85 in-lbs)

Horizontal mount:



Vertical mount:





Inverter should be in contact with the mounting rail

- The primary bolt must be connected during installation.
- A secondary bolt is recommended for further robustness of the mounting.

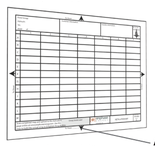
4 Create an installation map

Create a paper installation map to record microinverter serial numbers and positions in the array.

A) Peel the removable serial number label from each microinverter and affix it to the respective location on the paper installation map.

B) Peel the label from the IQ Gateway and affix it to the installation map.

C) Always keep a copy of the installation map for your records.

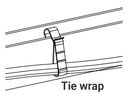


Affix serial number labels

5 Manage the cabling

A) Use tie wraps to attach the cable to the racking. The cable must be supported at least every 1.8 m (6 feet).

B) Dress any excess cabling in loops to avoid contacting the roof. Do not form loops smaller than 12 cm (4.75 inches) in diameter.

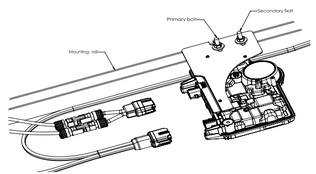


Tie wrap

6 Connect the microinverters

A) Connect the microinverter. Listen for a click as the connectors engage.

B) Cover any unused connectors on the IQ Cable with IQ Sealing Caps. Listen for a click as the sealing caps engage.



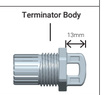
WARNING: Install sealing caps on all unused AC connectors as these connectors become live when the system is energized. Sealing caps are required for protection against moisture ingress.

To remove a sealing cap or AC connector, you must use an IQ Disconnect Tool.

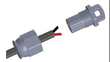
7 Terminate the unused end of the cable

Single-phase IQ Cable

A) Remove 13 mm of the cable sheath from the conductors. Use the terminator body loop to measure.



B) Slide the hex nut onto the cable.



C) Insert the cable into the terminator body so that the two wires land on opposite sides of the internal separator. The grommet inside the terminator body must remain in place.

D) Insert a screwdriver into the slot on the top of the terminator to hold it in place. Hold the terminator body stationary with the screwdriver and turn only the hex nut to prevent the conductors from twisting out of the separator. Torque the nut to 7.0 N m.

E) Attach the terminated cable end to the PV racking with a cable clip or tie wrap so that the cable and terminator do not touch the roof.

WARNING: The terminator cannot be re-used. If you unscrew the nut, you must discard the terminator.

8 Complete the installation of the junction box

A) Connect the IQ Cable to the junction box.

B) The IQ Cable uses the following wiring color code:

Wire colors
Black – N
Red – L

9 Connect the PV modules

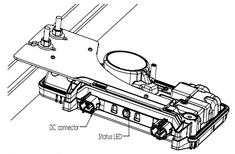
DANGER! Electric shock hazard. The DC conductors of this PV system are ungrounded and may be energized.

A) Connect the DC leads of each PV module to the DC input connectors or adapters of the microinverter.

B) Check the LED on the connector side of the microinverter. The LED flashes six times when DC power is applied.

C) Mount the PV modules above the microinverters.

D) If the default DC cable length is insufficient to access the microinverter connectors, external DC cable + MC4 connector with proper crimping is to be planned.



10 Energize the system

A) Turn ON the AC disconnect or circuit breaker for the branch circuit.

B) Turn ON the main utility-grid AC circuit breaker. Your system will ramp up to full power production after completing grid profile propagation and device provisioning. It may take 20–30 minutes for full power production based on the number of microinverters in the system.

C) Check the LED on the connector side of the microinverter:

LED	Indicates
Flashing green	Normal operation. AC grid function is normal, and there is communication with the IQ Gateway. The LED will flash green only after provisioning.
Flashing orange	The AC grid is normal but there is no communication with the IQ Gateway.
Flashing red	The AC grid is either not present or not within specification.
Solid red	There is an active "DC Resistance Low, Power Off" condition. To reset, refer to the *Enphase IQ Gateway Installation and Operation Manual* at https://enphase.com/en-in/installers/resources/documentation. If the problem persists, measure resistance between PV+ to EARTH and then PV to EARTH on the PV module and then inverter. Anything less than ~7 kohm will trip DCR. Usually, the value is in Megaohms on the inverter or PV module. Swap out faulty PV module or PCU.

ACTIVATE MONITORING AND CONTROLS

After installing the microinverters, follow the procedures in the IQ Gateway Quick Install Guide to activate system monitoring, set up grid management functions, and complete the installation.

- Connect the IQ Gateway, detect devices, and select the grid profile
- Connect to the Enphase Installer Platform, register the system, and build the virtual array

Enphase connector rating

Enphase connectors on the cable assemblies in the following table have a maximum current of 20 A, a maximum OCPD of 20 A, and maximum ambient temperature of -40°C to 85°C (-40°F to 185°F) and are rated for disconnection under load.

Part number	Model	Maximum voltage
840-00387	Q-12-10-240	250 VAC
840-00389	Q-12-20-200	250 VAC
840-00436	QDCC-2-P-INT	100 VDC

SAFETY

IMPORTANT SAFETY INSTRUCTIONS

SAVE THIS INFORMATION. This guide contains important instructions to follow during the installation of the Enphase IQ8P Microinverters.

	WARNING: Hot surface.
	WARNING: Refer to the safety instructions.
	DANGER: Risk of electric shock.
	Refer to the manual
	Double Insulated

Safety symbols

	DANGER: Indicates a hazardous situation, which if not avoided, will result in death or serious injury.
	WARNING: Indicates a situation where failure to follow instructions may be a safety hazard or cause equipment malfunction. Use extreme caution and follow instructions carefully.
	WARNING: Indicates a situation where failure to follow instructions may result in burn injury.
✓	**NOTE**: Indicates information particularly important for optimal system operation.

General safety

	DANGER: Risk of electric shock. Do not use Enphase equipment in a manner not specified by the manufacturer. Doing so may cause death or injury to persons, or damage to equipment.
	DANGER: Risk of electric shock. Be aware that installation of this equipment includes risk of electric shock.
	DANGER: Risk of electric shock. The DC conductors of this photovoltaic system are ungrounded and may be energized.
	DANGER: Risk of electric shock. Always de-energize the AC branch circuit before servicing. Never disconnect the DC or AC connectors under load.
	DANGER: Risk of electric shock. Risk of fire. Only use electrical system components approved for wet locations.
	DANGER: Risk of electric shock. Risk of fire. Only qualified personnel should troubleshoot, install, or replace microinverters or the IQ Cable and Accessories.
	DANGER: Risk of electric shock when Solid red light is flashing from the microinverter's LED.
	DANGER: Risk of electric shock. Risk of fire. Ensure that all AC and DC wiring is correct and that none of the AC or DC wires are pinched or damaged. Ensure that all AC junction boxes are properly closed.
	DANGER: Risk of electric shock. Risk of fire. Do not exceed the maximum number of microinverters in an AC branch circuit as listed in this guide. You must protect each microinverter AC branch circuit with a 20 A maximum breaker or fuse, as appropriate.
	DANGER: Risk of electric shock. Risk of fire. Only qualified personnel may connect the microinverter to the utility grid.
	WARNING: Microinverter's bulkhead and adapter cable's male, female DC connector must only be mated with the identical type and manufacturer brand of male/female connector.
	WARNING: Before installing or using the microinverter, read all instructions and cautionary markings in the technical description, on the microinverter system, and on the photovoltaic (PV) equipment.
	WARNING: Do not connect microinverters to the grid or energize the AC circuit(s) until you have completed all of the installation procedures and have received prior approval from the electrical utility company.
	WARNING: When the PV array is exposed to light, DC voltage is supplied to the PCE.
✓	**NOTE**: To ensure optimal reliability and to meet warranty requirements, install the microinverters and IQ Cable according to the instructions in this guide.
✓	**NOTE**: Provide support for the IQ Cable at least every 1.8 m (6 feet).
✓	**NOTE**: Perform all electrical installations in accordance with all applicable local electrical codes.
✓	**NOTE**: Protection against lightning and resulting voltage surge must be in accordance with local standards.

Microinverter safety

	DANGER: Risk of electric shock. Risk of fire. Do not attempt to repair the microinverter; it contains no user-serviceable parts. If it fails, contact Enphase Support to obtain an RMA (return merchandise authorization) number and start the replacement process. Tampering with or opening the microinverter will void the warranty.
	DANGER: Risk of fire. The DC conductors of the PV module must be labeled "PV Wire" or "PV Cable" when paired with the microinverter.
	WARNING: You must match the DC operating voltage range of the PV module with the allowable input voltage range of the microinverter.
	WARNING: The maximum open circuit voltage of the PV module must not exceed the specified maximum input DC voltage of the microinverter.Refer to the Enphase compatibility calculator to verify PV module electrical compatibility with microinverter. Use IQ8P-Microinverters only with compatible PV modules as per Enphase compatibility calculator. Using electrically incompatible PV module voids Enphase warranty
	WARNING: Risk of equipment damage. Install the microinverter under the PV module to avoid direct exposure to rain, UV, and other harmful weather events. Always install the microinverter bracket side up. Do not mount the microinverter upside down. Do not expose the AC or DC connectors (on the IQ Cable connection, PV module, or the microinverter) to rain or condensation before mating the connectors.
	WARNING: Risk of equipment damage. The microinverter is not protected from damage due to moisture trapped in cabling systems. Never mate microinverters to cables that have been left disconnected and exposed to wet conditions. This voids the Enphase warranty.
	WARNING: Risk of equipment damage. The microinverter functions only with a standard, compatible PV module with appropriate fill-factor, voltage, and current ratings. Unsupported devices include smart PV modules, fuel cells, wind or water turbines, DC generators, and non-Enphase batteries, etc. These devices do not behave like standard PV modules, so operation and compliance is not guaranteed. These devices may also damage the microinverter by exceeding its electrical rating, making the system potentially unsafe.

DC cable safety

✓	**NOTE**: Ensure proper routing of PV module DC cable using the clips to prevent the leads from resting on the roof. Do not wrap extra DC cable around the microinverter.
✓	**NOTE**: Avoid direct exposure to sunlight.
✓	**NOTE**: Avoid sharp edges on racking.
✓	**NOTE**: Avoid cable touching rough surfaces or moving parts within the racking system.
✓	**NOTE**: Avoid overly tight bending radii. The minimum bend radii for the DC cable is eight times the cable outer diameter or 55 mm.
✓	**NOTE**: Avoid overly tightly sized cable clips for routing.

	WARNING: Risk of skin burn. The chassis of the microinverter is the heat sink. Under normal operating conditions, the temperature could be 20°C above ambient, but under extreme conditions the microinverter can reach a temperature of 90°C. To reduce risk of burns, use caution when working with microinverters.
✓	**NOTE**: The microinverter has adjustable voltage and frequency trip points that may need to be set within grid profile, depending upon local requirements. Contact Enphase Support to request a new custom grid profile If there is no pre-existing grid profile meeting local AHJ requirements.

Enphase IQ Cable safety

	DANGER: Risk of electric shock. Do not install the Enphase IQ Cable Terminator while power is connected.
	DANGER: Risk of electric shock. Risk of fire. When stripping the sheath from the Enphase IQ Cable, make sure the conductors are not damaged. If the exposed wires are damaged, the system may not function properly.
	DANGER: Risk of electric shock. Risk of fire. Do not leave AC connectors on the Enphase IQ Cable uncovered for an extended period. You must cover any unused connector with a sealing cap.
	DANGER: Risk of electric shock. Make sure protective sealing caps have been installed on all unused AC connectors. Unused AC connectors are live when the system is energized.
	WARNING: Use the terminator only once. If you open the terminator following installation, the latching mechanism is destroyed. Do not reuse the terminator. If the latching mechanism is defective, do not use the terminator. Do not circumvent or manipulate the latching mechanism.
	WARNING: When installing the IQ Cable, secure any loose cable to minimize tripping hazard
✓	**NOTE**: When looping the IQ Cable, do not form loops smaller than 12 cm (4.75 inches) in diameter.
✓	**NOTE**: If you need to remove a sealing cap, you must use the Enphase Disconnect Tool.
✓	**NOTE**: When installing the IQ Cable and accessories, adhere to the following: • Do not expose the terminator or cable connections to directed, pressurized liquid (water jets, etc.). • Do not expose the terminator or cable connections to continuous immersion. • Do not expose the terminator or cable connections to continuous tension (e.g., tension due to pulling or bending the cable near the connection). • Use only the connectors and cables provided. • Do not allow contamination or debris in the connectors. • Use the terminator and cable connections only when all parts are present and intact. • Do not install or use in potentially explosive environments. • Do not allow the terminator to come into contact with open flame. • Fit the terminator using only the prescribed tools and in the prescribed manner. • Use the terminator to seal the conductor end of the Enphase IQ Cable; no other method is allowed.

Revision history

REVISION	DATE	DESCRIPTION
140-00338-01	August 2023	Initial release

Enphase Support: https://enphase.com/contact/support