# **INSTALLATION MAP**

	To sheet: _			1		
Pane	el Group:		Client:	·	Installer:	
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	1	2	3	4	5	6
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	IQ Gateway serial label number:					
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#### Compliance with EU Directives

This product complies with the following EU Directives and can be used in the European Union without any restrictions.

Electro Magnetic Compatibility (EMC) directive 2014/30/EU

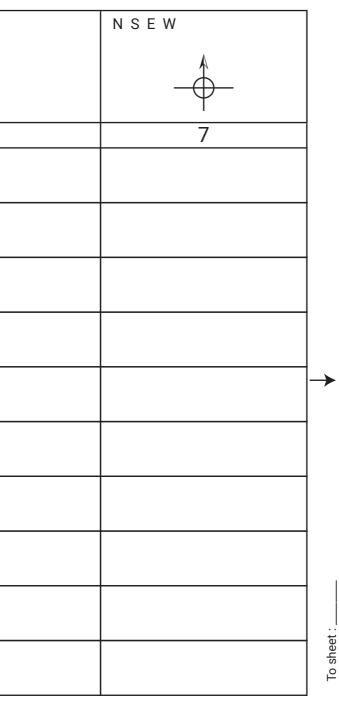
Low Voltage Directive (LVD) 2014/35/EU

Restriction of Hazardous Substances (RoHS) 2011/65/EU

The full text of the EU declaration of conformity (DoC) is available at the following internet address https://enphase.com/en-gb/installers/ resources/documentation

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Importer Enphase Energy NL B.V., Het Zuiderkruis 65, 5215MV, 's-Hertogenbosch, The Netherlands, PH: +31 73 3035859



#### INSTALLATION MAP

#### QUICK INSTALL GUIDE - EN

# Installing Enphase IQ7, IQ7+, and IQ7X Microinverters

To install Enphase IQ Series Microinverters, read and follow all warnings and instructions in this guide and the Enphase IQ7 and IQ7+ Microinverter Installation and Operation Manual at enphase.com/contact/support. Safety warnings are listed at the end of this guide.

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 labelled PV wire or PV cable. Refer to local electrical codes and standards for PV array and racking grounding requirements.

IMPORTANT: IQ Series Microinverters require the IQ Cable and are incompatible with previous cabling. An IQ Gateway is required to monitor the performance of the IQ Microinverters. The IQ accessories work only with IQ Series Microinverters.

NOTE: The 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) Download the Enphase Installer App and open it to log into your Installer App account. With this app, you can scan microinverter serial numbers and connect to the IQ Gateway to track the system installation progress. To download, go to https://enphase.com/en-gb/installers/ apps or scan the QR code.



B)	Refer to the following table and check PV module compatibility at:	
	IIV: https://apphaas.com/ap.gh/installars/miarainvarters/aalaulata	

UK: https://enphase.com/en-gb/installers/microinverters/calculato ANZ: https://enphase.com/en-au/installers/microinverters/calculator

Model	DC connector adapter cable	PV module cell count
IQ7-60-2-INT	Stäubli MC4	Pair only with 60-cell modules.
IQ7PLUS-72-2-INT	Stäubli MC4	Pair with 60-cell or 72-cell modules.
IQ7X-96-2-INT	Stäubli MC4	Pair only with 96-cell modules.

C) In addition to the Enphase microinverters, PV modules and racking, you will need these Enphase items:

 An IO Gateway communications gateway is required to monitor solar production and may be required to propagate a grid profile to the microinverters. If you are in the European region, refer to the IQ Gateway Quick Install Guide in IQ Gateway Standard & Line Filter Kit or IQ Gateway Metered & Line Filter Kit; for other regions, refer to the IQ Gateway Quick Install guide in IQ Gateway Standard or IQ Gateway Metered.

**NOTE**: Depending on your region, IQ Series Microinverters may not produce until an IQ Gateway is installed and configured with the appropriate grid profile. See the IQ Gateway Quick Install Guide for details.

- IQ Relay, single-phase (Q-RELAY-1P-INT) or IQ Relay, multi-phase (Q-RELAY-3P-INT)
- For the Italy region, use IQ Relay (Q-RELAY-2-3P-ITA) for both single-phase and multi-phase applications.
- The Mutli-phase IQ Relay also provides phase coupling to allow microinverters on all phases to communicate with the IQ Gateway. Use a phase coupler (LPC-01) for the multi-phase system for phase coupling if IQ Relay is not installed in the multi-phase system
- Tie wraps or cable clips (ET-CLIP-100): works with both multi-phase and single-phase cable
- IQ Sealing Caps (Q-SEAL-10): for any unused connectors on the IQ Cable.
- IQ Terminator (Q-TERM-R-10 for single-phase or Q-TERM-3P-10 for multiphase); one for each AC cable segment end.
- · IQ Disconnect Tool (Q-DISC-10).
- IO Cable for single-phase or multi-phase

Cable model	Connector spacing*	PV module orientation	Connectors per box
Single-phase	9		
Q-25-10-240	1.3 m	Portrait (all)	240
Q-25-17-240	2.0 m	Landscape (60-cell and 96-cell)	240
Q-25-20-200	2.3 m	Landscape (72-cell)	200

Multi-phase				
Q-25-10- 3P-200	1.3 m	Portrait (all)	200	
Q-25-17- 3P-160	2.0 m	Landscape (60-cell and 96-cell)	160	
Q-25-20- 3P-160	2.3 m	Landscape (72-cell)	160	
*Allows for 30 cm of cable slack.				

D) Check that you have these items:

#### An AC junction box.

- Tools: screwdrivers, wire cutter, voltmeter, torque wrench, sockets, and wrenches for mounting hardware.
- IQ Field Wireable Connectors (Q-CONN-R-10M and Q-CONN-R-10F for single-phase IQ Cable or Q-CONN-3P-10M and Q-CONN-3P-10F for multi-phase IQ Cable): optional male and female connectors.

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

Note for installations in South Africa: For the Enphase warranty to be valid in South Africa, Enphase requires that you protect your system with a lightning and/or surge protection device (SPD) as a part of the installation. We recommend that the SPD meets the following electrical requirements:

Electrical characteristics		Value
Clamping voltage of L-N, L-G, N-G @5 kA (8/20 µs)	Up-5 kA	600 V

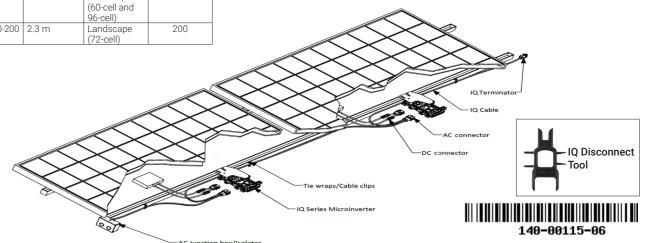
F) Plan your AC branch circuits to meet the following limits for the maximum number of microinverters per branch when protected with a 20 A overcurrent protection device (OCPD). For multi-phase installations, use a 3-pole 20 Å/25 A OCPD.

Maximum* IQ Microinverters per AC branch circuit					
IQ7 IQ7+ IQ7X					
Single-phase	15	12	11		
Multi-phase	45 (20 A OCPD) 60 (25 A OCPD only in ANZ)	36 (20 A OCPD) 48 (25 A OCPD only in ANZ)	33 (20 A OCPD) 42 (25 A OCPD only in ANZ)		

: Limits may vary. Refer to the 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 centre.

Best practice: Centre-feed the branch circuit to minimise voltage rise in a fully-populated branch.



# INSTALLATION

## 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 centres 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:

Single-pl	hase service	Multi-phase ser	vice
L1 to N	207 to 253 VAC	L1 to L2 to L3	360 to 440 VAC
		L1, L2, L3 to N	207 to 253 VAC

- 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.

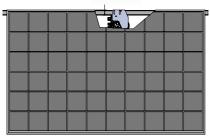
# **3** Mount the microinverters

- A) The microinverters should be mounted beneath the modules either horizontally, bracket side up, or vertically. They must be protected from direct exposure to rain, sun, UV, and other harmful weather events. Refer to the image below for clearance requirements during vertical mounting.
- B) 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 also maintain >300 mm (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.

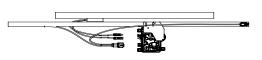
- C) Torque the mounting fasteners as follows. Do not over-torque.
- 6 mm mounting hardware: 5 N m
- 8 mm mounting hardware: 9 N m
- When using mounting hardware, use the manufacturer's recommended torque value

#### Horizontal mount

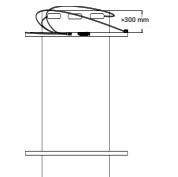


>38 mm

#### Vertical mount



Vertical mount



# 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.



# **5** Manage the cabling

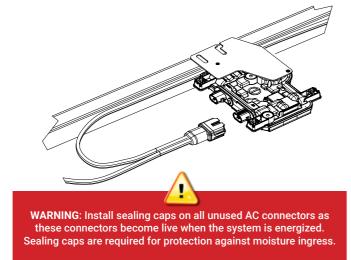
- A) Use IQ Cable Clips or tie wraps to attach the cable to the racking. The cable must be supported at least every 1.8 m.
- B) Dress any excess cabling in loops so that it does not contact the roof. Do not form loops smaller than 12 cm in diameter.

# 6 Connect the microinverters

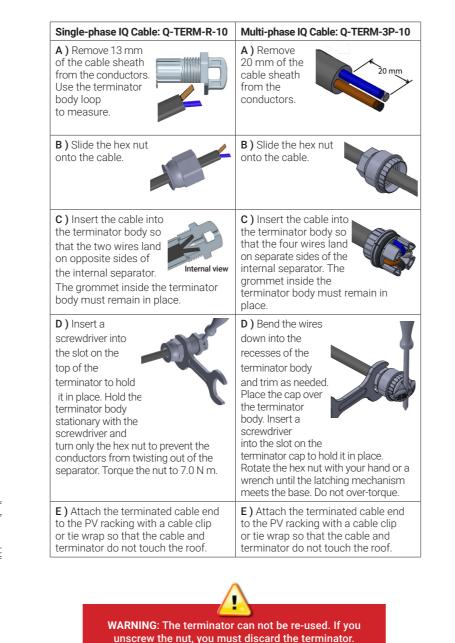
A) Connect the microinverter. Listen for a click as the connectors engage.

Cable clip

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



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



**7** Terminate the unused end of the IQ Cable

8 Complete installation of the junction box

- A) Connect the IQ Cable to the junction box.
- B) Note that the IQ Cable uses the following wiring colour code

Single-phase	Multi-phase	
Brown – L1	Brown – L1	
Blue - N	Black – L2	
	Grey – L3	
	Blue - N	

**NOTE**: The IQ Cable internally rotates L1, L2, and L3 to provide balanced 400 VAC (multi-phase), thus alternating phases between microinverters

**NOTE**: Minimise the number of unused IO Cable connectors with multi-phase systems. When cable connectors are left unused on a multi-phase system, it creates a phase imbalance on the branch circuit. If multiple cable connectors are skipped over multiple branch circuits, the imbalance can multiply.

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 of the corresponding microinverter.

 $\triangle$ 

company.

prior approval from the electrical utility

nicroinverters to the grid or energize the AC circuit(s) until you have completed all of the installation procedures and have received

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 microinvert ers.

# **1** 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 start producing power after a five-minute wait time.
- 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.			
Flashing orange	The AC grid is normal, but there is no communi- cation with the IQ Gateway.			
Flashing red	The AC grid is either not present or not within the specification.			
Solid red	There is an active "DC Resistance Low, Power Off" condition. To reset, refer to the <u>IQ Gateway</u> <u>Installation and Operation Manual</u> .			

# ACTIVATE MONITORING AND SELECT THE GRID PROFILE

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

- Connect the IQ Gateway
- Detect devices and select grid profile
- Connect to Enphase Installer App
- Register the system
- Build the virtual array

#### Note for installations in South Africa only:

For IQ7 Series product used in South Africa, check the Enphase website (https://www.enphase.com/southafrica) for the latest user documentation.

#### Note for third-party products:

Any third-party manufacturer or importer product(s) used to install or commission Enphase product(s) shall comply with the applicable EU Directive(s) and requirements in the EEA (european economic area). It is the responsibility of the installer to confirm that all such products are labelled correctly and have the required compliant supporting documentation

		Gene	ral safety, continued	$\checkmark$	NOTE: The Enphase microinverter has
	<b>ETY</b>	$\triangle$	WARNING: When the PV array is exposed to light, DC voltage is supplied to the PCE.	V	field-adjustable voltage and frequency trip points that may need to be set, depending upon local requirements. Only an authorized
AVE ins imp	THIS INFORMATION. This guide con- ortant instructions to follow during the installa-	$\checkmark$	<b>NOTE</b> : To ensure optimal reliability and to meet warranty requirements, install the Enphase microinverters and IQ Cable		installer with the permission and following requirements of the local electrical authorities should make adjustments.
on of th	e Enphase IQ7, IQ7+, and IQ7X Microinverters.		according to the instructions in this guide.	IQ Ca	ble safety
	WARNING: Hot surface.	$\checkmark$	NOTE: Provide support for the IQ Cable at least every 1.8 m. NOTE: Perform all electrical installations in		<b>DANGER</b> : Risk of electric shock. Do not install the IQ Terminator while power is connected.
$\wedge$	WARNING: Refer to safety instructions.		accordance with all applicable local electrical codes.	A	<b>DANGER:</b> Risk of electric shock. Risk of fire. When stripping the sheath from
<u>^</u>	DANGER: Risk of electric shock.	$\checkmark$	<b>NOTE</b> : The AC and DC connectors on the cabling are rated as a disconnect only when used with an Enphase microinverter.		the IQ Cable, ensure the conductors are not damaged. If the exposed wires are damaged, the system may not function
	Double insulated	$\checkmark$	<b>NOTE</b> : Protection against lightning and re- sulting voltage surge must be in accordance with local standards.	A	properly. DANGER: Risk of electric shock. Risk of fire. Do not leave AC connectors on the IQ Cable
					uncovered for an extended period. You mus cover any unused connector with a sealing cap.
afet	y symbols	Micro	binverter safety	•	DANGER: Risk of electric shock. Risk of fire.
∕∧ ∧	DANGER: Indicates a hazardous situation, which, if not avoided, will result in death or serious injury. WARNING: Indicates a situation where		DANGER: Risk of electric shock. Risk of fire. Do not attempt to repair the Enphase microinverter; it contains no user-serviceable parts. If it fails, contact Enphase customer service to obtain an RMA (return merchan-		Ensure protective sealing caps have been installed on all unused AC connectors. Unused AC connectors are live when the system is energized.
<u>.</u>	failure to follow instructions may be a safety hazard or cause equipment malfunction. Use extreme caution and follow instructions carefully.		dise authorization) number and start the replacement process. Tampering with or opening the Enphase microinverter will void the warranty.		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
	WARNING: Indicates a situation where failure to follow instructions may result in burn injury. NOTE: Indicates information particularly		<b>DANGER:</b> Risk of fire. The DC conductors of the PV module must be labelled "PV Wire" or "PV Cable" when paired with the Enphase microinverter.		mechanism is defective, do not use the terminator. Do not circumvent or manipulate the latching mechanism.
/	important for optimal system operation.	$\wedge$	WARNING: You must match the DC	$\land$	WARNING: When installing the IQ Cable, secure any loose cable to minimise tripping hazard.
ene	ral safety DANGER: Risk of electric shock. Do not		with the allowable input voltage range of the Enphase microinverter.	$\checkmark$	<b>NOTE</b> : When looping the IQ Cable, do not form loops smaller than 12 cm in diameter.
<u>\$</u>	use Enphase equipment in a manner not specified by the manufacturer. Doing so may cause death or injury to persons, or damage	$\triangle$	WARNING: The maximum open circuit voltage of the PV module must not exceed the specified maximum input DC voltage of		form loops smaller than 12 cm in diameter. <b>NOTE</b> : If you need to remove a sealing cap, you must use the IQ Disconnect Tool.
Â	to equipment. <b>DANGER</b> : Risk of electric shock. Be aware that installation of this equipment includes risk of		the Enphase microinverter. WARNING: Risk of equipment damage. Install the microinverter under the PV	$\checkmark$	NOTE: When installing the IQ Cable and accessories, adhere to the following:
<u>/</u> }	electric shock. DANGER: Risk of electric shock. The DC conductors of this photovoltaic system are ungrounded and may be energized.		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 terminator or cable connections to directed, pressurized liquic (water jets, etc.),     Do not expose the terminator or cable
Ŗ	DANGER: Risk of electric shock. Always de-energize the AC branch circuit before ser- vicing. Never disconnect the DC connectors under load.		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.		<ul> <li>connections to continuous immersion.</li> <li>Do not expose the terminator or cable connections to continuous tension (e.g., tension due to pulling or bending the cable</li> </ul>
ß	DANGER: Risk of electric shock. Risk of fire. Only use electrical system components approved for wet locations.		WARNING: Risk of equipment damage. The Enphase microinverter is not protected from damage due to moisture trapped in cabling systems. Never mate microinverters to		<ul> <li>near the connection).</li> <li>Use only the connectors and cables provided.</li> <li>Do not allow contamination or debris in the connectors.</li> </ul>
ß	DANGER: Risk of electric shock. Risk of fire. Only qualified personnel should troubleshoot, install, or replace Enphase microinverters or the IQ Cable and Accessories.		cables that have been left disconnected and exposed to wet conditions. This voids the Enphase warranty. WARNING: Risk of equipment damage. The		<ul> <li>connectors.</li> <li>Use the terminator and cable connections only when all parts are present and intact.</li> <li>Do not install or use in potentially explosive</li> </ul>
ß	<b>DANGER:</b> 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.		Enphase 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.		<ul> <li>environments.</li> <li>Do not allow the terminator to come into contact with open flame.</li> <li>Fit the terminator using only the prescribed tools and in the prescribed manner.</li> <li>Use the terminator to seal the conductor end of the IQ Cable; no other method is</li> </ul>
A	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.		These devices do not behave like standard PV modules, so operation and compliance is not guaranteed. These devices may also damage the Enphase microinverter by exceeding its electrical rating, making the system potentially unsafe.		allowed.
Ŷ	DANGER: Risk of electric shock. Risk of fire. Only qualified personnel may connect the Enphase microinverter to the utility grid.		<b>WARNING:</b> Risk of skin burn. The chassis of the Enphase microinverter is the heat sink. Under normal operating conditions, the temperature could be 20°C above ambient, but		
$\wedge$	WARNING: Risk of equipment damage. Enphase male and female connectors must only be mated with the matching male/female connector.		perature 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.		
$\wedge$	WARNING: Before installing or using the Enphase microinverter, read all instructions and cautionary markings in the technical description, on the Enphase microinverter System, and on the photovoltaic (PV) equipment.		Enphase Energy. All rights reserved. Enphase, the enphase.com/trademark-usage-guidelines are trade	lemarks o	f Enphase Energy, Inc. in the US and other
٨	WARNING: Do not connect Enphase		CO	untries. Da	ata subject to change. Rev 06/2023-10-31

#### Revision history

REVISION	DATE	DESCRIPTION		
140-00115-06	October 2023	Updated the document for product names and editorial changes.		
Previous releases				