

SAFETY

IMPORTANT SAFETY INSTRUCTIONS. SAVE THIS INFORMATION.

Follow all safety and assembly instructions when installing the IQ Relay.

Safety Instructions

	DANGER: Risk of electric shock. Risk of fire. Do not attempt to repair the IQ Relay; it contains no user-serviceable parts. Tampering with or opening the IQ Relay will void the warranty. The warranty is void if the cover is removed. If the IQ Relay fails, contact Enphase customer support for assistance (http://enphase.com/contact/support).
	DANGER: Risk of electric shock. Always open or disconnect the circuit from the power distribution system (or service) of the building before installing or servicing the IQ Relay.
	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 the risk of electric shock. If you wire the IQ Relay at the sub-board, always de-energise the sub-board before beginning.
	DANGER: Risk of electric shock. Risk of fire. Only qualified personnel should troubleshoot, install, or replace the IQ Relay.
	WARNING: Risk of electric shock. Always make the PV terminal connections before completing the grid terminal connections. If grid terminals are connected first, the PV terminals become live.
	WARNING: Before installing or using the IQ Relay, read all instructions and cautionary markings in the technical description and on the IQ Relay.
	WARNING: Risk of equipment damage. When installing the IQ Relay in an enclosure, choose an area for installation where the ambient temperature remains between -40°C and 50°C.
	WARNING: The temperature of the terminals may exceed 60°C. Use an appropriately temperature-rated cable to connect to the terminals.
	NOTE: Perform all electrical installations in accordance with all national and local electrical codes.
	NOTE: Install a residual current circuit breaker if required by national regulations.
	NOTE: To ensure optimal reliability and to meet warranty requirements, the Enphase IQ Relay must be installed according to the instructions in this guide.

SPECIFICATIONS

Overtoltage category IEC 61010-1: 2010	III
CAT III	GRID terminal is rated for measurement category III
Pollution degree IEC 61010-1: 2010	2
Number of phases	Single-phase or multi-phase modes
Supply range	85 to 276 Vrms*
Nominal input frequency	50 Hz
Voltage and frequency acquisition time on valid input during normal operation	100 ms (5-line cycles @ 50 Hz)
Relay trip time	100 ms
Output	4-pole normally open relay (L1, L2, L3, and N)
Output power rating	5.75 kVA/6 kVA per phase
Output rating (typical)	230/240 Vrms, 25 A
Power consumption	18 VA (active power 4 W)
Safety, conducted and radiated EMI	IEC 61010-1: 2010, CISPR 11 (Ed. 6.0) 2015/AMD1: 2016, IEC 61000-4-2(Ed. 2.0): 2008, IEC 61000-4-3 (Ed. 4.0): 2020, IEC 61000-4-4 (Ed. 3.0): 2012, IEC 61000-4-5: (Ed. 3.1): 2017, IEC 61000-4-6(Ed. 4.0): 2013, IEC 61000-4-8(2nd Ed.): 2009 IEC 61000-4-34: 2005 AMD1: 2009
Operating temperature range	-40°C to 50°C
Altitude	< 2000 m
IP rating	IP20 (in an IP54-rated, or better enclosure)
Relative humidity	0 to 95% non-condensing

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

PREPARATION

In Enphase installations, the IQ Relay acts as a grid monitoring and disconnection device and includes a built-in phase coupler to distribute power line communications (PLC) signals across phases. It is designed for single-phase or multi-phase use and has 25 A built-in contactors. During specified grid abnormalities, the IQ Relay disconnects the Enphase microinverters from the AC grid. When the voltages return to normal and the grid frequency is in the acceptable range, the IQ Relay reconnects the microinverters to the AC grid.

The IQ Relay works together with the IQ Gateway Metered to meet the need to break lines and neutral per grid requirements.

See full installation instructions for the Enphase IQ Gateway Metered and/or Enphase microinverters at: <https://enphase.com/en-in/installers/resources/documentation>

It is best practice to install the IQ Relay when installing the IQ Gateway Metered and before commissioning the system.

The IQ Relay is IP20 rated and supports up to 12 (per phase) IQ7+ Microinverters or up to 10 (per phase) IQ7A Microinverters for single-phase/multi-phase grid interconnection with 20 A breaker.

Note: The IQ Cable in IQ7 system is rated for 20 A and should be used with a 20 A breaker for the branch circuit.

Note: Multiple branch circuits can be combined in a single IQ Relay up to a maximum combined current of 25 A.

You must mount the IQ Relay in an environmentally protected enclosure (in an IP54-rated, or better enclosure). Typically, this is a switchboard.

Note: It is recommended to install the IQ Relay under shadow to avoid direct exposure to sunlight in the protected enclosure.

You must also use 2.5 mm²–6.0 mm² conductors for the IQ Relay connections.

INSTALLATION

 **DANGER!** Risk of electric shock. Always de-energise circuits before beginning wiring.

- Install the Enphase IQ Gateway Metered. See full installation instructions for the Enphase IQ Gateway Metered at: <https://enphase.com/en-in/installers/resources/documentation>.
- Install the IQ Relay in a protected environment (for example, switchboard) on a 35 mm DIN rail near the IQ Gateway Metered.
- Connect the Line and Neutral conductors (2.5 mm²–6.0 mm²) from the PV system to the "FROM SOLAR INVERTERS" terminals of the IQ Relay so that the Neutral is on the N terminal and the Lines connect to the L1, L2, and L3 terminals.
-  **DANGER:** Risk of electric shock. Always make the PV connections before completing the grid connections. If grid terminals are connected first, the PV terminals become live.
- Connect a Neutral conductor (2.5 mm²–6.0 mm²) from the "TO AC GRID" N terminal of the IQ Relay to the Neutral busbar.
- Connect the Line conductors (2.5 mm²–6.0 mm²) from the "TO AC GRID" L terminal of the IQ Relay to an IEC 60947-2 approved circuit breaker, rated for no more than 20 A. The circuit breaker must be suitably located and easily reached. It must also be marked as the disconnecting device for the PV system.
- Tighten all the IQ Relay terminal connections to 0.85 N m.
- Energise the circuit.
- Upon power up, the LEDs should all turn green to indicate the AC voltage and frequency are within the specification of the grid code. See the LED states table.
- Use the Enphase Installer App to apply a grid profile to the IQ Relay and microinverters. Do not skip this step.

PROGRAM FOR SINGLE-PHASE OPERATION

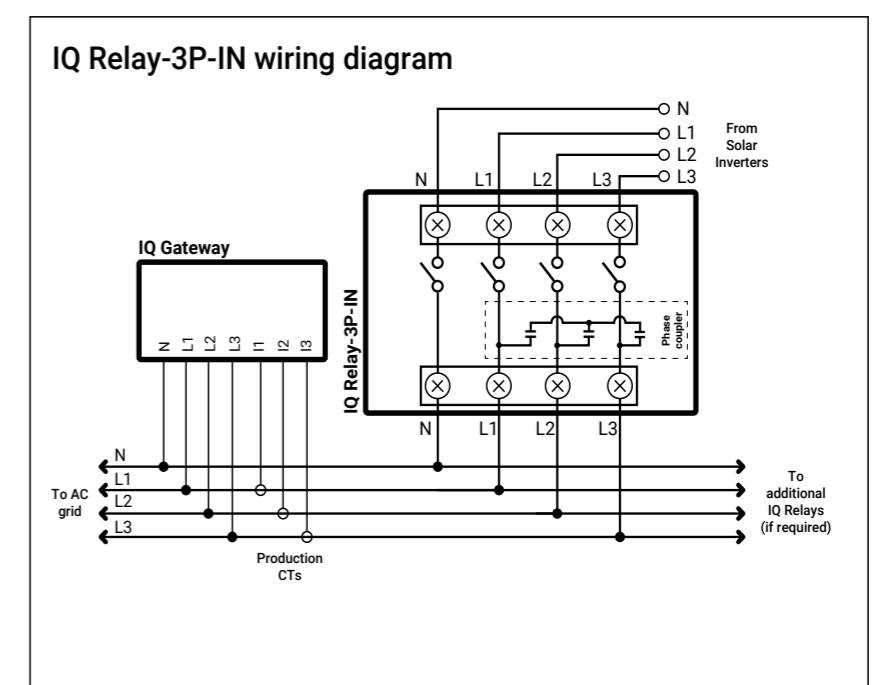
The multi-phase IQ Relay can also support single-phase applications. To program the number of phases:

- Press and hold the TEST button. The phase voltage indicators (V1, V2, and V3) will turn red and the relay will click. After approximately six seconds, the phase voltage LEDs will start flashing red. The number of red LEDs flashing corresponds to the number of phases. A sequence of 3, then 2, then 1 flashing LEDs is repeated.
- Release the TEST button when the appropriate number of LEDs are flashing.

NOTE:

- The selected mode will persist through power cycling.
- The selected number of phases must be connected in sequence starting at L1.
- All options must include a Neutral.

WIRING DIAGRAM



LED BEHAVIOR

LED V1 (Voltage and V1-N)	LED V2 (Voltage and V2-N)	LED V3 (Voltage and V3-N)	LED (Hz)	Description/status	Condition	Relay
OFF	OFF	OFF	OFF	Unit does not have enough AC voltage (i.e. V1-N < 85 VAC) on terminals to operate.	Unpowered or non-functional	Open
Green (solid)	X	X	X	Phase voltage (V1-N) is within range.	—	—
X	Green (solid)	X	X	Phase voltage (V2-N) is within range.	—	—
X	X	Green (solid)	X	Phase voltage (V3-N) is within range.	—	—
X	X	X	Green (solid)	Frequency is all within specifications.	—	—
Green (solid)	Green (solid)	Green (solid)	Green (solid)	Voltage and frequency are all within specifications.	Normal	Closed
Red (solid)	X	X	X	Phase voltage (V1-N) setpoints (Undervoltage and Overvoltage) has timed out or the reconnection value has not been met.	Fault	Open
X	Red (solid)	X	X	Phase voltage (V2-N) setpoints (Undervoltage and Overvoltage) has timed out or the reconnection value has not been met.	Fault	Open
X	X	Red (solid)	X	Phase voltage (V3-N) setpoints (Undervoltage and Overvoltage) has timed out or the reconnection value has not been met.	Fault	Open
X	X	X	Red (solid)	Grid frequency (V1) has timed out or reconnect frequency has not been met yet and the relay is opened.	Fault	Open
Red (solid)	Red (solid)	Red (solid)	Red (solid)	TEST button is being pushed.	Test contactor and autoconfig phase assignments	Toggle state
Red (flashing)	Red (flashing)	Red (flashing)	Red (flashing)	Corrupted flash	Fault	Open

NOTE: Phase voltage, frequency, undervoltage/overvoltage set points and reconnection values are set through the grid profile for the system.

Manufacturer:

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



140-00282-84

Enphase customer support: <https://enphase.com/contact/support>

Revision history

REVISION	DATE	DESCRIPTION
140-00282-04	June 2023	Updated the document for product names and editorial changes.
Previous releases		

© 2023 Enphase Energy. All rights reserved. Enphase, the e and CC logos, IQ, and certain other marks listed at <https://enphase.com/trademark-usage-guidelines> are trademarks of Enphase Energy, Inc. in the US and other countries.
Data subject to change.