ENPHASE

Q RELAY (single-phase) INSTALLATION

SAFETY

IMPORTANT SAFETY INSTRUCTIONS. SAVE THIS INFORMATION.

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

Safety Instructions

⚠	**DANGER**: Risk of electric shock. Risk of fire. Do not attempt to repair the Q Relay; it contains no user-serviceable parts. Tampering with or opening the Q Relay will void the warranty. Warranty void if cover removed. If the Q Relay fails, contact Enphase Customer Support for assistance (http://enphase.com/global/contact/).
⚠	**DANGER**: Risk of electric shock. Always open or disconnect circuit from power-distribution system (or service) of building before installing or servicing the Q 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 risk of electric shock. If you wire the Q 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 Q Relay.
⚠	**WARNING**: Before installing or using the Q Relay, read all instructions and cautionary markings in the technical description and on the Q Relay.
⚠	**WARNING**: Risk of equipment damage. When installing the Q Relay in an enclosure, choose an area for installation where ambient temperature remains between -40° C and 50° C.
✓	**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 Q Relay must be installed according to the instructions in this guide.

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PREPARATION

In Enphase installations, the single-phase Q Relay (network system relay controller) acts as a galvanic disconnection device. It is designed for single phase use and has built in contactors. During specified grid abnormalities, the Q Relay disconnects the Enphase Microinverters from the AC grid, and when the voltages return to normal and the grid frequency is in the acceptable range, the Q Relay reconnects the microinverters to the AC grid. The Q Relay has built in current sensing that can detect DC current injection required by VDE V 0126-1-1 requirements.

The Q Relay works together with the Envoy-S to meet the need to break both line and neutral per grid requirements. See full installation instructions for the Enphase Envoy-S and/or Enphase Microinverters at: enphase.com/support.

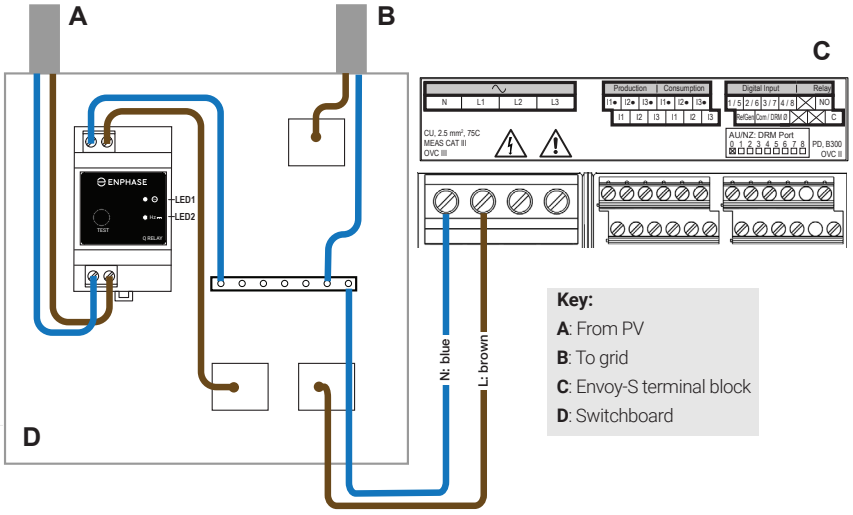
It is best practice to install the Q Relay when installing the Envoy-S and before commissioning the system.

The Q relay is IP-20 rated and supports up to 16 IQ 7 Microinverters or up to 13 IQ 7+ Microinverters.

You must mount it in an environmentally protected enclosure. Typically this is a switchboard.

You must also use 0.20 - 6.0 mm² conductors for relay connections.

Wiring Diagram



Key:

A: From PV

B: To grid

C: Envoy-S terminal block

D: Switchboard

INSTALLATION

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

A) Install the Enphase Envoy-S as directed in the *Envoy-S Quick Install Guide*.

B) Install the Q Relay in a protected environment (e.g., switchboard) on a 35 mm DIN rail near the Envoy-S.

C) Connect the Line and Neutral conductors (0.20 - 6.0 mm²) from the PV system to the "FROM PV" terminals of the Q Relay so that the Neutral is on the N terminal and the Line is on the L terminal.

D) Connect a Neutral conductor (0.20 - 6.0 mm²) from the "TO GRID" N terminal of the Q Relay to the Neutral busbar.

E) Connect a Line conductor (0.20 - 6.0 mm²) from the "TO GRID" L terminal of the Q Relay to an IEC/AS/NZS 60947-2 approved circuit breaker rated for no more than 20A. The circuit breaker must be suitably located and easily reached. It must also be marked as the disconnecting device for the PV system.

F) Tighten all relay terminal connections to 0.85 N m.

G) Energise the circuit.

H) Upon power up, the LEDs should both turn green to indicate the AC voltage and frequency are within specification of the grid code. See the LED states table.

I) Use the Enphase Installer Toolkit to apply a grid profile to the Q Relay and microinverters. Do not skip this step.

LED States

LED # 1 (voltage)	LED # 2 (Hz, DCI)	Description	Condition	Relay
OFF	OFF	AC on terminals too low	Unpowered; non-functional	OPEN
GREEN (solid)	X	Phase voltage within range	--	--
RED (solid)	X	One or more voltage setpoints has timed out or reconnection value not met	Fault	OPEN
GREEN (solid)	GREEN (solid)	Voltage, frequency within range & DCI, if used, is below fault levels	Normal	CLOSED
X	GREEN (solid)	Line frequency (and DCI, if used)are within limits	--	--
X	RED (solid)	Grid frequency timed out or reconnection value not met	Fault	OPEN
RED (flashing)	RED (flashing)	No profile set; device not configured	Fault	OPEN
RED (solid)	RED (solid)	Test button in use	Test contactor	toggle state

Specifications

Over voltage category	III
Pollution degree	2
Operating AC voltage range for power supply	230 to 240 Vrms
Nominal input frequency	50 Hz
Voltage and frequency acquisition time on valid input during normal operation	100 ms (5 line cycles @ 50Hz)
Output	2-pole normally open relay (L1 and N)
Output power rating	4.8 kVA
Output rating (typical)	230 to 240 VAC, 20A
Power consumption	10 VA
Conducted and radiated EMI	IEC 61326-1, BS EN 61000-3-2, BS EN 61000-3-3, BS EN 50065-1, BS EN 50065-2-2
Operating temperature range	-40 °C to 50 °C
IP rating	IP 20 (must be in protected environment)
Relative humidity	0 to 95 non-condensing
Compliance	IEC 61010

Enphase Customer Support: enphase.com/en-us/support/contact

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