QUICK INSTALL GUIDE (Model: HEMS-RM-01)

IQ Energy Router+ for Water Heater

The IQ Energy Router+ for Water Heater (HEMS-RM-01) for electric water heaters includes the Enphase IQ Energy Router, an Energy Meter, and a Relay. The IQ Energy Router integrates Enphase solar and storage battery systems with electric water heaters, EV chargers, and other devices to maximize self-consumption and minimize costs for the overall site. Installers should use the Enphase Installer App and the Enphase Installer Portal to install and maintain the system. System owners can use the Enphase App to monitor energy and control the system.

1. Introduction

The IQ Energy Router, Energy Meter, and Relay are connected to the home router directly or via an Ethernet switch. To install the IQ Energy Router, Energy Meter, and Relay, read and follow all warnings and instructions in this guide. Safety warnings are listed at the end of this guide. If you do not fully understand any of the concepts, terminology, or hazards outlined in these instructions, refer for the installation to a qualified electrician or installer. All installations must comply with national and local electrical codes. Professional installation is recommended.

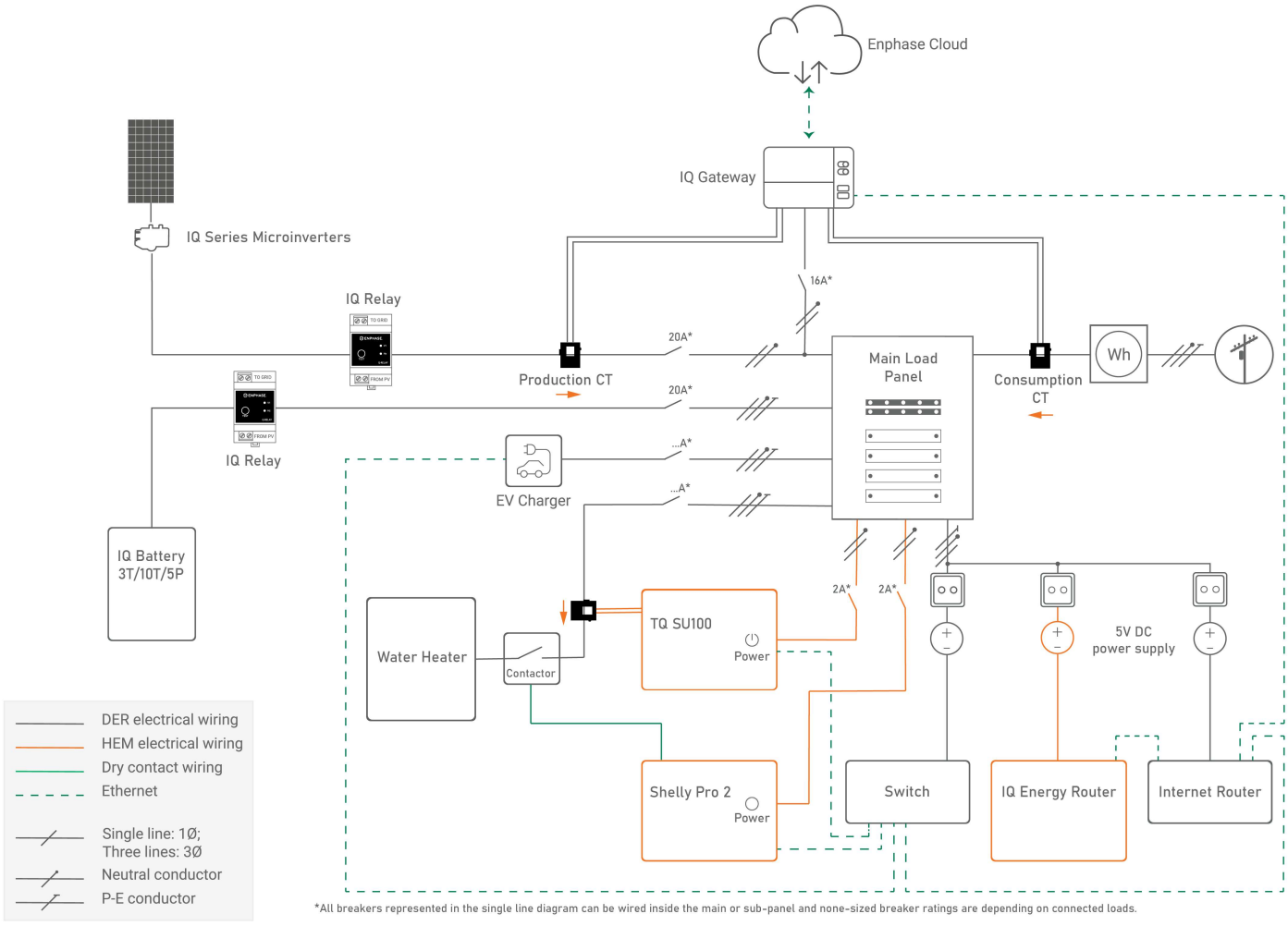


Figure 1: Single-phase setup

Applicable regions:

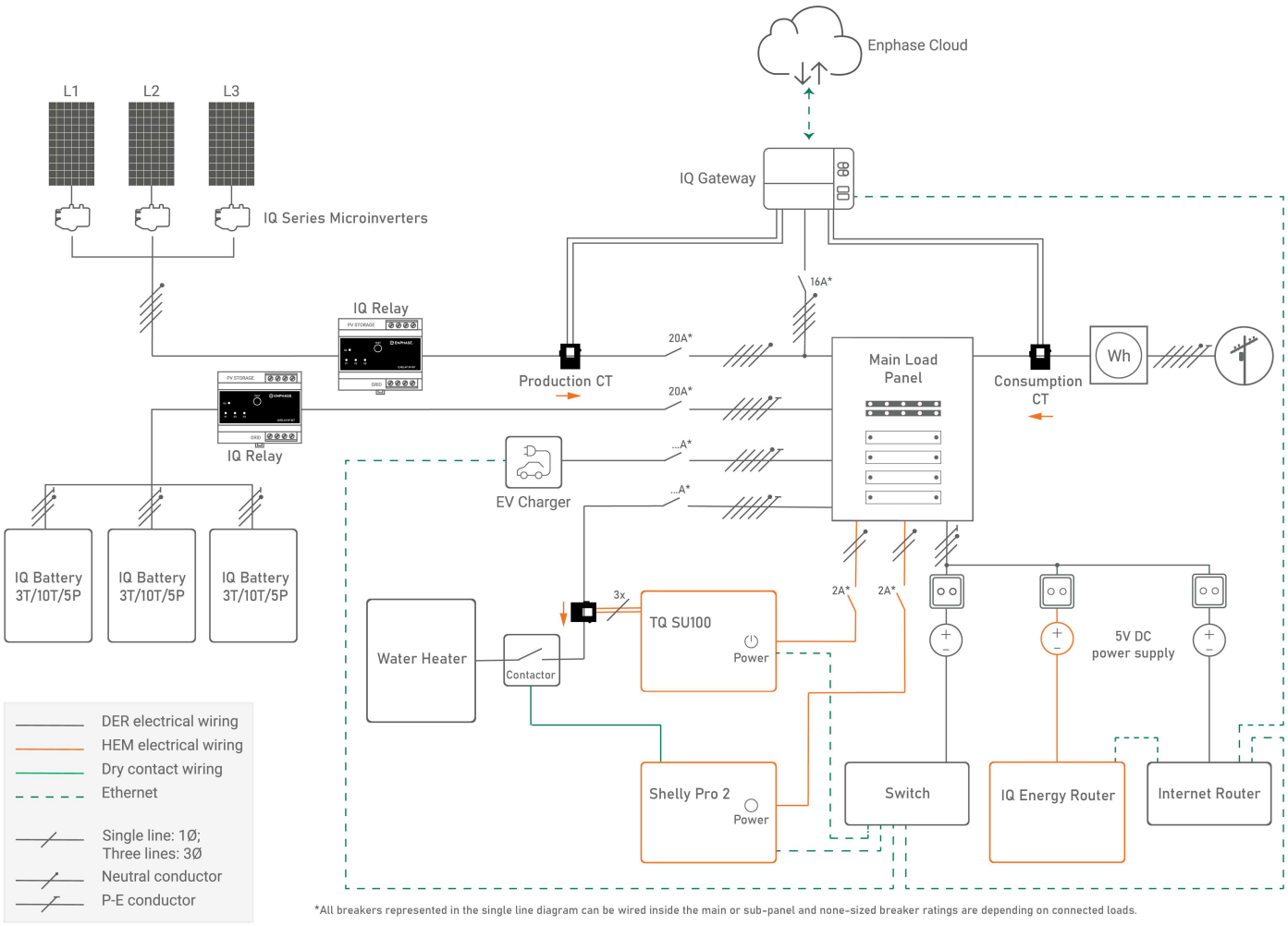


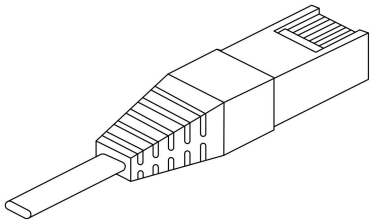
Figure 2: Three-phase setup

2. What's in the box

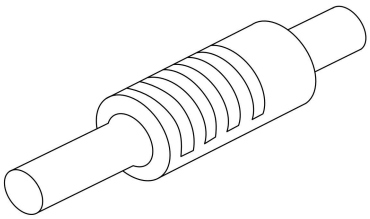
The box contains the IQ Energy Router, a CAT 6 Ethernet cable with RJ45 jacks on both ends, a DC power supply cable, a TQ SU100 Energy Meter, and a Shelly Pro 2 Relay.

IQ Energy Router

CAT 6 Ethernet cable with RJ45 jacks on both ends



DC power supply cable



TQ SU100 Energy Meter

It communicates with the IQ Energy Router via Ethernet and measures the energy consumption of the electric water heater. For more information, see https://www.tq-group.com/de/produkte/tq-automation/hems-loesungen/produkt-su100/ or scan the following QR code.

Shelly Pro 2 Relay

It communicates with the IQ Energy Router via Ethernet and is needed to switch the electric water heater on or off. The signal is sent through one output Relay. For more information, see https://www.shelly.com/products/shelly-pro-2 or scan the following QR code.

3. IQ Energy Router specifications

Environmental specifications, standards, and certification	
Temperature range	10°C to 40°C
Directive	RoHS, WEEE, REACH
Flammability	UL 94
EMC	EN 55032: 2015
Electrical safety	EN IEC 62368-1:2020+A11: 2020
Compliance	CE
Max. radiated power	<10 dBm
Frequency	2405–2480 MHz

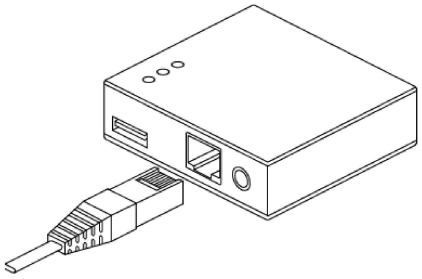
Electrical specifications	
Input voltage	5 VDC
Input current	1 A
Consumption	5 W

Mechanical specifications	
Weight	114 g
Height	27.3 mm
Width	96.1 mm
Length	96.6 mm
DC power cable	USB A to 5 V DC jack cable (2.5 mm × 5.5 mm barrel connector)
EU power supply - Voltage	100 V–240 V@ 50 Hz–60 Hz
EU power supply - Current	0.2 A
Ethernet port	RJ-45
Color	White

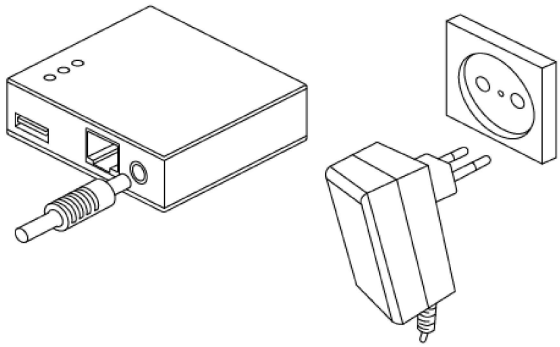
Packaging specifications	
Weight	270 g
Height	72 mm
Width	115 mm
Length	117 mm
Included in the box	EU power supply, USB A to jack cable (2.5 mm × 5.5 mm DC plug), CAT 6 Ethernet cable with RJ45 jacks at both ends, TQ SU100, and Relay

4. Setting up the IQ Energy Router

1. **Location:** Set up the IQ Energy Router close to the internet router or an Ethernet switch connected to the internet router.
2. **Network connectivity:** Plug one end of the CAT 6 Ethernet cable to the IQ Energy Router and the other end into the Ethernet port of your internet router or Ethernet switch.



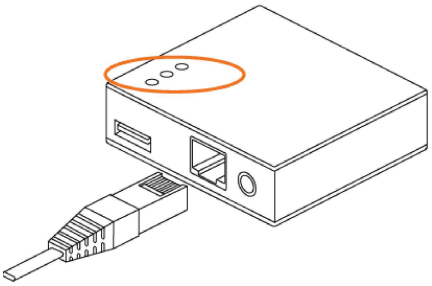
3. **Powering the IQ Energy Router:** Connect the IQ Energy Router to an electrical outlet using the provided DC power cable.



4. **Monitoring IQ Energy Router:** Wait for the IQ Energy Router to boot up. This can take a few minutes. A solid green light indicates that the IQ Energy Router is ready.

   Monitor the LED pattern of the IQ Energy Router:

   - Flashing green: The IQ Energy Router is booting up.
   - Solid green: Normal operation.
   - Rapid flashing red: The IQ Energy Router is experiencing issues and is attempting to re-establish connectivity with both the internet and LAN. If the issue persists, contact Enphase Support.



5. Setting up the Energy Meter

Requirements

The following hardware (not included in the box) is required for installation:

1. Miniature circuit breaker: The rating depends on the power rating of the electric water heater. Refer to the electric water heater's data sheet before selecting the circuit breaker.
2. Voltage input fuse: To protect the voltage input (L1) of the Energy Meter with 2 A type B fuse.
3. Electrical cabling: The cable size depends on the power rating of the electric water heater. Refer to the electric water heater's data sheet before selecting the cabling. Compatible cable cross-sections for the Energy Meter are 0.20 ... 2.50 mm^2.
4. Ethernet cable: To connect to the home router or connected switch. IEEE 802.3 CAT 6, unshielded twisted pair (UTP).

Installation

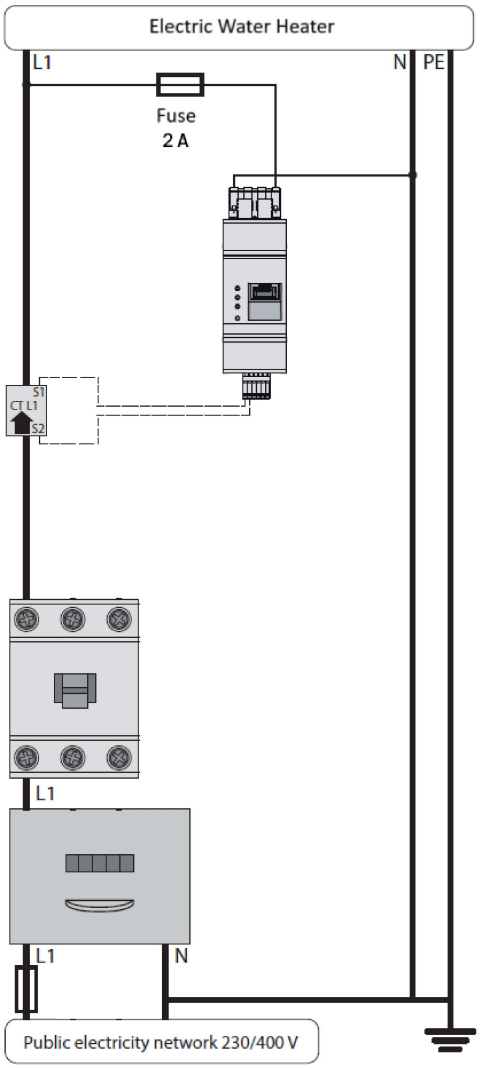
1. **Location:** The Energy Meter can be installed in the main panel if space is not a constraint or can be installed in a separate subpanel closer to the location of the electric water heater.

   NOTE: Ethernet cable from the home router or Ethernet switch should reach the location of the Energy Meter to ensure network connectivity.

2. **Mounting:** The Energy Meter is DIN rail mountable.
3. **Electrical connections**

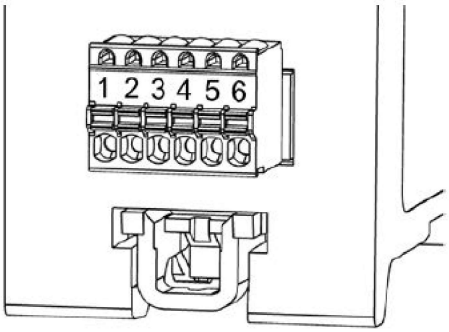
   WARNING: Ensure the circuit is not energized while working on the electrical connections. Ensure upstream breakers are open and zero voltage is verified using a multimeter.

   The following wiring diagram is for single-phase connections.



   For a single-phase connection, follow these steps:

   a. First, connect the current transformer (CT) at the bottom of the Energy Meter. See the following figure and table to determine the correct input terminals.

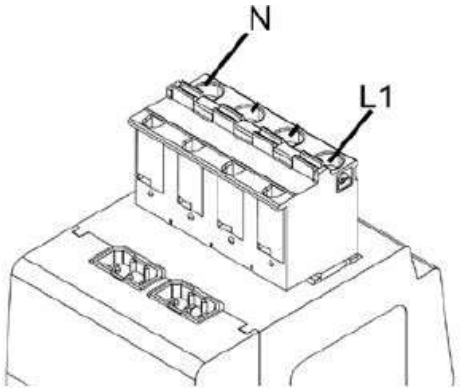


Input on the Energy Meter	Phase	Wire of CT
1	L1	S1 (red)
2		S2 (black)

NOTE: The arrow printed on the CT must always show in the direction of the current flow. In this case towards the electrical water heater.

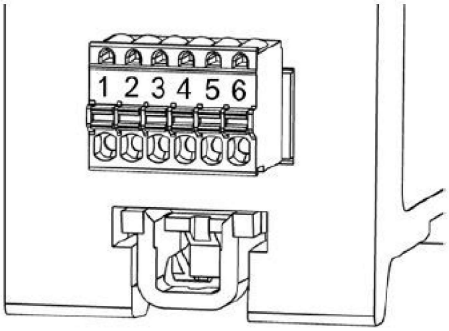
b. Open the CT, insert the conductor of the water heater, and close the CT until you hear a click.

c. Connect the L1 and N cables to the Energy Meter. Use the input terminals on the top of the Energy Meter as shown in the following figure.



For a three-phase connection, follow these steps:

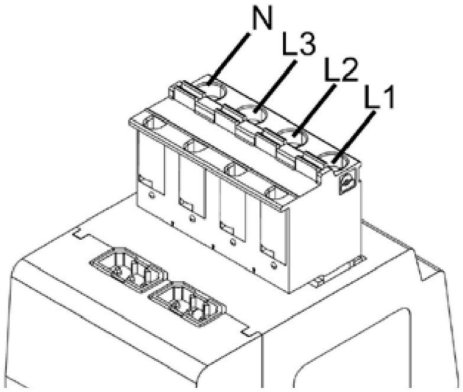
a. First, connect the three current transformers (CT) to the bottom of the Energy Meter. See the following figure and table to determine the correct input terminals.



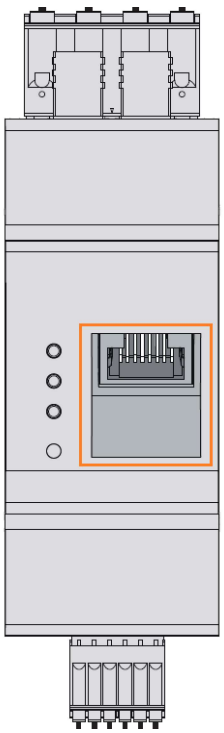
Input on the Energy Meter	Phase	Wire of CT
1	L1	S1 (red)
2		S2 (black)
3	L2	S1 (red)
4		S2 (black)
5	L3	S1 (red)
6		S2 (black)

b. Open the three CTs, insert the three conductors of the water heater in each of the CTs, and close the CTs until you hear a click.

c. Connect the L1, L2, L3 and N cables to the Energy Meter. Use the input terminals on the top of the Energy Meter as shown in the following figure.



4. **Network connection:** Plug the CAT6 Ethernet cable coming from the home router or Ethernet switch to the LAN port of the Energy Meter as shown in the following figure.



The following table lists the LED statuses of the Energy Meter.

LED statuses	
○	Off
●	Flashing slowly
✺	Flashing rapidly
●	Permanently on

Status LED	
●	Device ready-to-operate
✺	Device in update mode with active web interface
2x	Confirmation for reset to factory default settings, see section "12.1. Restore the SU100 factory settings"
●	Error - see section "13. Fault finding"
✺	Firmware update in progress, see section "1.2.3. Firmware update"

Network LED	
○	No connection
●	Ethernet link active
✺	Communication running
●	Communication error

Serial bus LED	
○	No connection
✺	Communication running
●	Communication error

6. Setting up the Relay

Requirements

The following hardware (not included in the box) is required for installation:

- Miniature circuit breaker (MCB): C2-rated 2A can be used to protect the Relay.
- Electrical cabling: To power the Relay (two-wire L/N 1.5 mm^2).
- Ethernet cable: To connect to home router or Ethernet switch. IEEE 802.3 CAT 6, twisted pair (UTP).

Installation

WARNING: Connecting the device with solid single-core cables with increased insulation heat resistance, which is not less than PVC T105°C.

1. **Location**

WARNING: Leave at least 10 mm space around the Relay if you expect currents higher than 5 A per channel.

NOTE: Ethernet cable from the home router or Ethernet switch should be accessible to the location of installation of the Relay to ensure network connectivity.

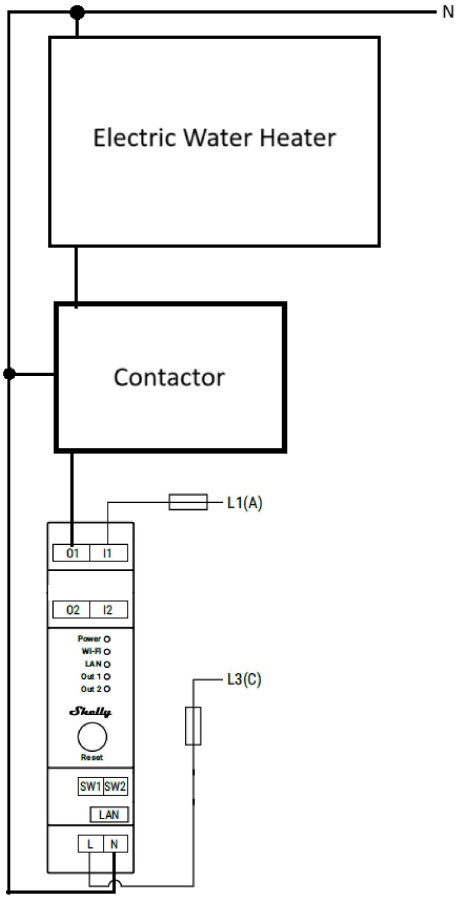
The Relay can be installed in the main panel if space is not a constraint or can be installed in a separate subpanel closer to the location of the electric water heater.

2. **Mounting:** The Relay is DIN rail mountable.

3. **Electrical connections**

WARNING: Ensure the circuit is not energized while working on the electrical connections. Ensure upstream breakers are open and zero voltage is verified using a multimeter.

The following wiring diagram shows single-phase and three-phase connections.



Terminal	Description
O1, O2	Contactor output terminal
I1, I2	Contactor input terminal
SW1, SW2	Switch input terminals controlling O1 and O2
L	Live terminal
N	Neutral terminal
LAN	RJ45 LAN connector

Cables	Description
N	Neutral cable
L1 (A)	Electric water heater circuit
L3 (C)	Relay power circuit

For both single-phase and three-phase connections, follow these steps:

a. Connect terminal N to the Neutral cable.

b. Connect terminal L to the Relay power supply circuit breaker.

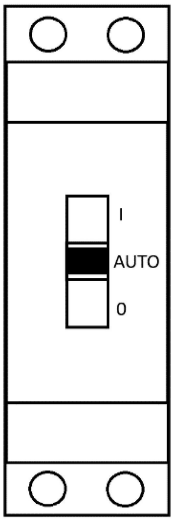
c. Connect the contactor control circuit to the O1 terminal.

d. Connect terminal I1 to the contactor circuit breaker.

4. **Network connection:** Plug the Ethernet cable coming from the Internet router or switch into the LAN connection of the Relay as shown in the following figure.

7. Setting up the contactor

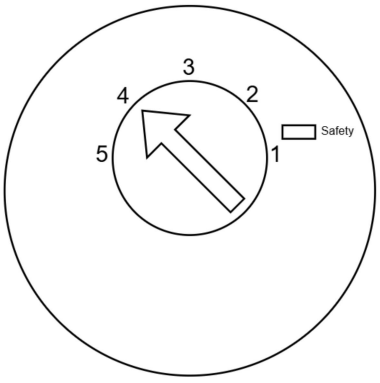
A day-night contactor is often present in electric water heater installations. After wiring the Relay to the contactor, ensure that the contactor is set to the Relay-controlled position (often marked as "**AUTO**"; see the following figure). This allows the contactor to open or close the water heater circuit, turning the water heater on or off based on the signal from the Relay.



NOTE: Keep in mind that the water heater is not always heating water when the contactor is closed. If the set temperature has already been reached, the water heater's thermostat may have automatically opened the power circuit, shutting off the heating cycle. The thermostat will close the power circuit again when the temperature falls below the set level.

8. Controlling the water heater thermostat

- Ensure that the water heater thermostat is set to at least 60°C to maintain optimal water temperature and prevent Legionella bacteria growth.
- The thermostat is typically located behind an access panel on the side or bottom of the water heater. Refer to the water heater manual for its exact location and instructions on how to access it.
- Thermostats often do not display temperature values but instead have markings or numbers, as shown in the following figure. These numbers correspond to specific temperature values (for example, 1 = 15°C, 2 = 30°C, 3 = 45°C, 4 = 60°C, 5 = 75°C). Refer to the water heater manual to understand the markings on the thermostat.



- Ensure the thermostat is set to at least 60°C or higher.

9. Commissioning the devices in the Enphase Installer App

Go to the Enphase Installer App and follow the steps to commission the IQ Energy Router, Energy Meter, and Relay.

10. Safety

Safety and advisory symbols

DANGER: This indicates a hazardous situation, which if not avoided, will result in death or serious injury.

WARNING: This indicates a situation where failure to follow instructions may be a safety hazard or cause equipment malfunction. Use extreme caution and follow the instructions carefully.

NOTE: This indicates information particularly important for optimal system operation. Follow the instructions carefully.

Safety instructions

DANGER: Risk of electric shock. Risk of fire. Do not attempt to repair the IQ Energy Router, Relay, or Energy Meter. They contain no user-serviceable parts. Tampering with or dismantling the IQ Energy Router, Relay, or Energy Meter will void the warranty. If the equipment fails, contact Enphase Support for assistance or replacement equipment.

DANGER: Risk of electric shock. Do not use the IQ Energy Router, Relay, or Energy Meter 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. Risk of fire. Only qualified personnel should troubleshoot, install, or add parts to the IQ Energy Router.

DANGER: Risk of electric shock. All sources to the equipment being serviced must be disconnected external to the device. In particular, the storage system may energize conductors, so storage circuits must ALWAYS be isolated via a circuit breaker or disconnected before working on any portion of the system.

DANGER: Risk of electric shock. Be aware that installation of this equipment includes risk of electric shock. If you wire the Relay and Energy Meter at the subpanel, always de-energize the subpanel before beginning.

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. Ensure that all wiring is correct and that none of the wires are pinched or damaged.

DANGER: Risk of electric shock. Risk of fire. Do not work alone. Someone should be in the range of your voice or close enough to come to your aid when you work with or near electrical equipment. Remove rings, bracelets, necklaces, watches, etc. when working with batteries, photovoltaic modules, or other electrical equipment.

WARNING: Before installing or using the IQ Energy Router, Relay, or Energy Meter read all instructions and cautionary markings in the technical description and on the components.

NOTE: Using unapproved attachments or accessories could result in damage or injury.

NOTE: Perform all electrical installations in accordance with all national and local electrical codes.

Environmental Protection ELECTRONIC DEVICE: DO NOT THROW AWAY. Waste electrical products should not be disposed of with household waste. Proper disposal is required. Refer to your local codes for disposal requirements.

Compliance with EU Directives

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

- Radio Equipment Directive (RED): 2014/53/EU
- Restriction of Hazardous Substances (RoHS): 2011/65/EU

The complete text of the EU Declaration of Conformity is available at https://enphase.com/en-de/installers/resources/documentation/home-energy-management.

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11. Revision history

Revision	Date	Description
140-01014-02	March 2025	Added French translations.
140-01014-01	February 2025	Initial release.