

Enphase Energy System Installation Compliance Guide

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Applicable countries

- Australia
- New Zealand

Overview

This guide is intended to be used with the IQ System Controller 3 INT and IQ Battery 5P quick installation guides and safety datasheets to ensure compliance handling, storage, and installation of the Enphase Energy System.

The guidelines described here adopt the current relevant AS/NZS 3000:2018, AS/NZS 4777.1:2016, and AS/NZS 5139:2019 standards, where these standards should supplant any disputes or interpretation herein.

Safety guide

Intended use (and prohibited use)

Use the battery system:

- Without modifying the recommended configuration as advised by Enphase.
- For its intended use and to provide home storage and backup support.
- Only when installed by a licensed electrician and Enphase-certified installer.
- Only when installed at a location adhering to AS/NZS 3000:2018 and AS/NZS 5139:2019 (refer to [Location guidelines for outdoor installation](#), [Location guidelines for indoor installation](#), and [Wiring guidelines](#)).

Do not use the battery system when:

- The platform is moving.
- In the presence of potential water ingress, water exposure, or high humidity.
- In flame-prone locations.
- In the presence of combustible dust and debris.
- In the presence of ammonia and other corrosive gases.
- At an altitude of over 2000 meters above sea level.
- Ambient temperature is outside the -20°C to 55°C non-condensing recommendation.
- They operate outside of the battery's intended use as a storage system.

General safety observation

The Enphase Energy System must operate according to its safety specifications. Observe the following safety aspects:

- Ensure the physical environment suits the requirements of the battery system as outlined in the IQ Battery 5P data sheet.
- Inspect any physical damage to the IQ Battery (physical, electrical burn, sparks).
- Ensure all safety devices (MCB, RCBO) are working.
- Ensure wiring interfaces are correctly wired and terminated per the product documentation and adhere to AS/NZS 3018.
- Any repairs (including replacement of battery microinverters) must only be performed by a licensed electrician and/or Enphase-accredited installer.

DC voltage battery module terminals

The battery module inside the IQ Battery 5P always presents open-circuit voltage across its positive and negative terminals and thus handles it carefully. As per the quick install guide (QIG), to activate the battery module, connect the negative terminal to the negative port of the battery management system (BMS) to ensure proper grounding before connecting the positive terminal connections.

Mitigating fire

The Enphase IQ Battery 5P system is a pre-assembled integrated battery system with no access to sealed cell components¹. Thus, it does not fall into the battery best-practice guide category that requires arc flash protection. Hence, fire resulting from an arc flash is doubtful.

However, in the case of fire, immediately de-energise the system by following the shutdown procedure in the installation manual² before extinguishing any fire.

Essential steps to isolate the IQ Battery 5P include:

1. Isolate the system electrically by switching off the system's main AC supply.
2. Ensure the main supply at the main AC switchboard is cut off.

If the system is installed in a dedicated room, only fire department personnel with complete PPE must enter to perform fire extinguishing work.

Storage and transportation

Storage ambient conditions requirement

In a de-energized state, store the IQ Battery 5P under the following environmental conditions:

- Ambient temperature: -20°C to 55°C.
- Maximum humidity: 5%-100% without condensation.
- Adequate ventilation as per AS/NZS 5139 storage ventilation requirements.
- Within permitted fire safety regulations.
- Free from dust, debris, and corrosive and/or explosive gases.
- Free from vibration or regular moving platform.

Best practice when storing IQ Battery 5P

IQ Battery 5P naturally discharges its energy even when stored or kept in a de-energized state. Therefore, do not let the battery deeply discharge over a prolonged period, as this will damage the battery modules.

¹ Refer to page 38 [BEST PRACTICE GUIDE: BATTERY STORAGE EQUIPMENT ELECTRICAL SAFETY REQUIREMENTS](#).

² To shut down the IQ Battery 5P, switch off the AC supply by switching off the AC breaker on the AC supply to the IQ Battery 5P and then switch off the DC supply of the IQ Battery 5P by pressing the DC switch.

Best practice when storing IQ Battery 5P:

- Ensure the minimum state of charge is at least 30% before de-energizing and storing.
- Never store the IQ Battery 5P for more than six months.
- The IQ Battery 5P requires service when stored for more than this duration. Contact Enphase Support for assistance.

Best practice when transporting IQ Battery 5P

IQ Battery 5P utilises lithium-ion phosphate chemistry for its battery modules³. This type of chemistry is classified as hazardous materials and, therefore, adheres to the following guidelines:

1. Provide the following material classification details to the transporter:
 - Hazardous material: Class 9
 - UN number: UN3480
 - Battery system handling weight: 63.4 kg
2. Inspect for any physical damage or leaks during the loading and unloading.
3. Ensure transportation temperatures are maintained between -20°C to 55°C, without condensation.

Location guidelines for outdoor installation

Environmental and location guide

Every Enphase IQ Battery system installed outdoors must observe factors including environmental, temperature, physical access to the system, and future servicing and maintenance work. Australian standards, codes, regulations, and Enphase installation instructions govern determining the equipment's final installation location.

Temperature

Prolonged exposure to the temperature outside the operating range of the IQ Battery system will shorten the life of the IQ Battery 5P. System operation is affected when the Enphase Energy System is exposed to extreme temperatures.

As such, follow the precautionary measures when installing the Enphase Energy System outdoors:

- Avoid installing the IQ Battery system on north, northwest, and west-facing walls without adequate sunlight protection.
- General recommended location includes south and southwest-facing walls.
- Enphase IQ Battery system should be installed inside a building enclosure to avoid early day start-up, especially if the chosen location temperature can drop to 10°C and below.

Access

When installing the IQ Battery system outdoors, consider the IQ Battery 5P weight and bulkiness to determine the type of lifting equipment or resources required to safely handle and install the equipment without compromising the safety of the personnel or equipment.

³ Refer to [IQ Battery 5P safety data sheet](#).

Observe and assess the suitability based on factors including but not limited to:

- Clear access path to the final location
- Steps or uneven platforms and slippery installation surfaces
- Tight access and requirement for manpower for difficult installation
- Availability of spaces for machine lifter (if required)

Servicing and maintenance

Maintain safe and clear access to equipment location for certified system maintainers to carry out service and maintenance of the IQ Battery 5P and IQ System Controller 3 INT.

- 150 mm of clearance is required on all vertical and horizontal sides of the IQ Battery 5P and IQ System Controller 3 INT for minimal tools required for service or maintenance.
- 900 mm of minimum bottom clearance is required for the IQ System Controller 3 INT.
- Observe AS/NZS 5139 required dimensions when installing IQ Battery 5P and IQ System Controller 3 INT outdoors.

Standards, codes, and regulations

The Enphase IQ Battery 5P and IQ System Controller 3 INT must be installed in compliance with the relevant standards, codes, and regulations. This includes the battery standard AS/NZS 5139. Considering the **BESS** standard, section 4 explains the requirement when determining the final location of the installation. This also covers other considerations for outdoor locations. Other sections that apply to the installation of a BESS include Sections 1, 2, 3, and 7 of AS/NZS 5139.

Type of wall material

The deciding factor for the chosen BESS location depends on whether the wall is combustible or non-combustible as tested to AS/NZS 1530.1 or as listed as non-combustible in the AS/NZS 5139. The material types include bricks, glass, terracotta, concrete, and cement sheets.

Fireproof barrier

Another consideration when selecting the wall for the IQ Battery system outdoor installation is whether the rear side of the wall is a habitable or non-habitable room. A wall with a habitable room behind it requires a fireproofing barrier installed where the equipment is to be installed. For any conduit penetrations larger than 5 mm through non-combustible material within restricted zones, it must be filled with fire-retardant material.

Definition of a habitable room as per the national building code 2019: A room used for normal domestic activities, including bedrooms, living room, lounge room, music room, kitchens, dining room, sewing room, study, playroom, family room, home theatre, and sunroom.

The following **does not** constitute the habitable room: Bathroom, laundry, water closet, pantry, walk-in wardrobe, corridor, hallway, lobby, photographic darkroom, clothes-drying room, and other areas of a specialized nature occupied neither frequently nor for extended periods.

Minimum clearance requirements in section 4 of AS/NZS 5139

The minimum clearances required according to the Standard AS/NZS 5139 to install the IQ Battery system on its final wall location in an outdoor setting are as follows:

1. Minimum 600 mm horizontally from windows to habitable rooms and/or entrance doorways and minimum 900 mm vertically from windows or egress to habitable rooms.
2. Minimum 600 mm horizontally from any appliances not associated with the IQ Battery system. This includes but is not limited to air conditioning units, hot water systems, and/or other electrical appliances outside the installation scope of the IQ Battery system.
 - Exception to other electrical appliances, including electrical switchboards, AC and DC isolators, and power outlets.
3. Minimum 900 mm front access of IQ System Controller 3 INT or IQ Battery 5P for cabling access and egress path for AC-coupled Enphase Energy System in reference to AS/NZS 5139 cl 4.2.5.
4. Associated appliances with the IQ Battery system are permitted to be located within the clearance zones, including the IQ System Controller, Enphase PV distribution board, and Solar PV inverters.
5. Follow the dimensions suggestions when installing IQ Battery 5P and IQ System Controller 3 INT outdoors, where the back wall is a habitable room, within the allowed dimensions in AS/NZS 5139:

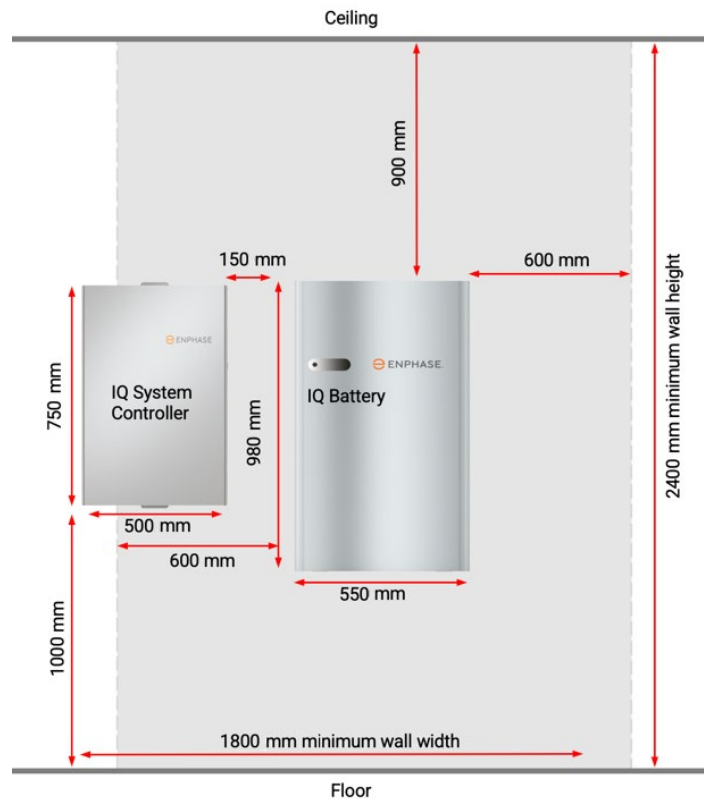


Figure 1: Dimensions suggestions for installing IQ Battery 5P and IQ System Controller 3 INT outdoors

- A. The shaded area represents AS/NZS 5139 designated areas that must be free from combustible equipment, non-Enphase-associated devices, any external exits, and windows or ventilation to the habitable room.
- B. The IQ Battery 5P can be positioned lower than the IQ System Controller 3 INT to meet a shorter wall.

Clearances requirement based on AS/NZS 3000

Adhere to the clearance requirement Standard AS/NZS 5139 and AS/NZS 3000.

1. The IQ System Controller 3 INT is classified as a switchboard under AS/NZS 3000. It should meet the general installation requirements for domestic switchboards as per Section 2.10.
2. Both the IQ Battery 5P and IQ System Controller 3 INT are considered sources of ignition under AS/NZS 3000 and, therefore, would need to meet the requirements of clause 4.18.4 – Clearance from gas relief vent terminal including natural gas, LP gas, or biogas.

Location guidelines for indoor installation

Environmental and location guide

When installing the IQ Battery system indoors, consider physical access to the system and future servicing and maintenance work. The battery Standard AS/NZS 5139 is the guiding document overseeing this section.

Access

When installing the IQ Battery system indoors, consider the IQ Battery 5P weight and bulkiness to determine the lifting equipment or resources required to safely handle and install the equipment without compromising the personnel's or equipment's safety.

Observe and assess the suitability based on factors including but not limited to:

- Clear access path to the final location
- Steps or uneven platforms and slippery installation surfaces
- Tight access and requirement for manpower for difficult installation
- Availability of spaces for machine lifter (if required)

Servicing and maintenance

Maintain safe and clear access to equipment location for certified system maintainers to carry out service and maintenance of the IQ Battery 5P and IQ System Controller 3 INT.

- 150 mm of clearance is required on all vertical and horizontal sides of the IQ Battery 5P and IQ System Controller 3 INT for minimal tools required for service or maintenance.
- 900 mm of minimum bottom clearance is required for the IQ System Controller 3 INT.
- Observe AS/NZS 5139 required dimensions requirements when installing IQ Battery 5P and IQ System Controller 3 INT indoors.

Standards, codes, and regulations

The Enphase IQ Battery 5P and IQ System Controller 3 INT must be installed in compliance with the relevant standards, codes, and regulations. This includes the Battery Standard AS/NZS 5139. Considering the BESS standard, section 4 explains the requirement when determining the final location of the installation. This also covers other considerations for indoor locations.

Restricted locations definition as per AS/NZS 5139 Clause 4.2.2.2

In areas of domestic or residential electrical installations, pre-assembled integration BESS is not located in a habitable room (AS/NZS 5139 clause 4.2.2.2):

- In-ceiling spaces or wall cavities
- Under stairways or access paths
- In restricted locations as defined for switchboards in AS/NZS 3000

Acceptable locations

Suitable locations for installation may include garages, storage rooms, a dedicated BESS room, and verandas (AS/NZS 5139 clause 4.2.2.1). Ensure that a smoke alarm detector is installed in an enclosed room.

Consider a possible complication from the selected installation location of the BESS and assess suitability. That is the possible damage that can be caused by a vehicle if installed in a carport or garage (refer to [Minimum clearance requirements in section 4 of AS/NZS 5139](#)). To mitigate this risk, consider a bollard or equivalent protection.

Fireproof barrier

Another consideration when selecting the wall for the IQ Battery system for indoor installation is whether the rear side of the wall is a habitable or non-habitable room. A wall with a habitable room behind it requires a fireproofing barrier installed where the equipment is to be installed. For any conduit penetrations larger than 5 mm through non-combustible material within restricted zones, it must be filled with fire-retardant material.

The definition and requirements are as described in the section [Fireproof barrier](#).

Minimum clearance requirements in section 4 of AS/NZS 5139

The minimum clearances required according to the Standard AS/NZS 5139 to install the IQ Battery system on its final wall location in an indoor setting are as follows:

1. Minimum 600 mm horizontally from windows to habitable rooms and/or entrance doorways and minimum 900 mm vertically from windows or egress to habitable rooms.
2. Minimum 600 mm horizontal clearance from any appliances not associated with the IQ Battery system. This includes but is not limited to any customer's electrical appliances, that is, refrigerators, TVs, and/or other electrical appliances outside the installation scope of the IQ Battery system.
 - Exceptions to other electrical appliances include electrical switchboards, AC and DC isolators, and power outlets.
3. Minimum 900 mm front access (working side, where the AC terminals) of IQ System Controller or IQ Battery 5P for cabling access and egress path for AC-coupled EES in reference to AS/NZS 5139 cl 4.2.5.
4. Associated appliances with the IQ Battery system are permitted to be located within the clearance zones, including the IQ System Controller, Enphase PV distribution board, and solar PV inverters. Consider the following dimension recommendation when installing IQ Battery 5P and IQ System Controller 3 INT indoors, where the back wall is a habitable room within the allowed dimensions in AS/NZS 5139:

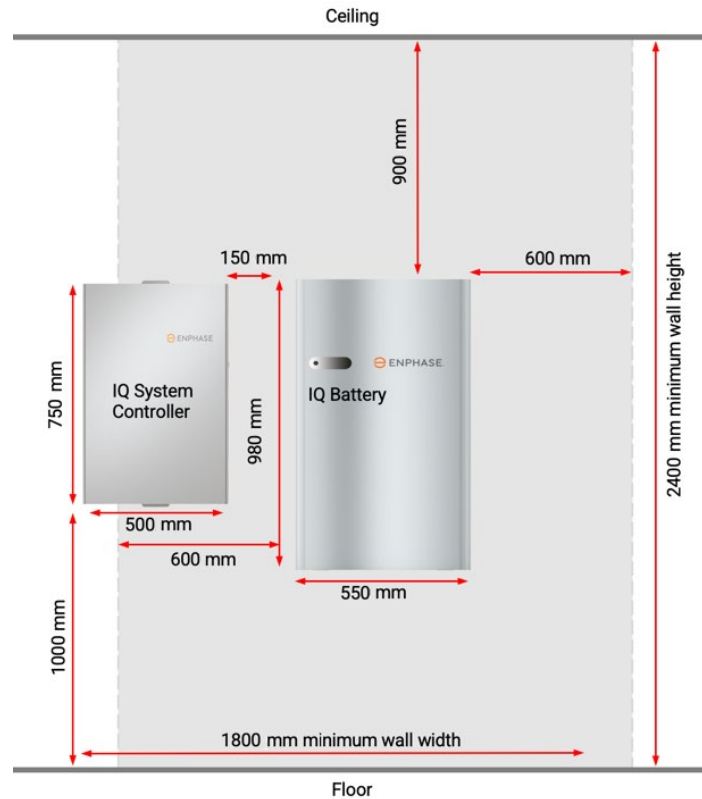


Figure 2: Dimensions suggestions for installing IQ Battery 5P and IQ System Controller 3 INT indoors

- A. The shaded area represents AS/NZS 5139 designated areas that must be free from combustible equipment, non-Enphase-associated devices, any external exits, and windows or ventilation to the habitable room.
- B. The IQ Battery 5P can be positioned lower than the IQ System Controller 3 INT to meet a shorter wall.

Bollard requirements in section 4 of AS/NZS 5139

Clause 4.2.2.1 of AS/NZS 5139 determines that the selected location of BESS installation must be a location that is protected from mechanical damage, that is, getting hit by a car in a garage or carport.

Additional mechanical protection, such as a bollard or barrier, should be provided in garages or carports for both rear wall and side wall-mounted batteries where there is potential for damage during normal vehicle movement.

The IQ Battery system is installed in the front corner of a standard 6 m long garage, and a solid front pillar or wall protects it. Therefore, vehicle impact could not occur, and bollards are not required in this location. See the following image.

As a guideline, the protected area is calculated at a ratio of 1:2.5; that is, a 500 mm garage pillar would allow for an area of 1250 mm of protection along the wall.

When installing the IQ System Controller 3 INT and IQ Battery 5P at the rear of a double car garage, protection, that is, bollard, is generally expected (as per ESV advice) to prevent a vehicle that's coming into the garage and impacting the controller and batteries⁴.

IQ System Controller 3 INT and IQ Battery 5P do not provide impact sustainability, so the requirements mentioned above apply.

Wiring guidelines

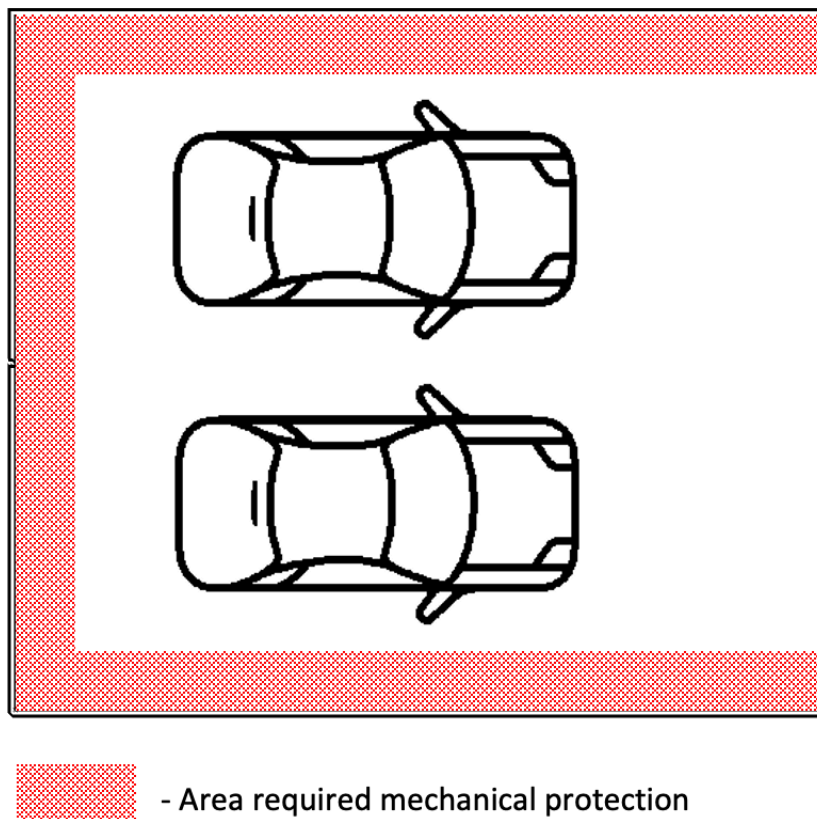


Figure 3: Wiring guidelines

IQ System Controller electrical connections

Wire the Enphase IQ Battery system per AS/NZS 3000:2018, AS/NZS 3008:2017, and AS/NZS 4777.1:2016 standards.

The IQ System Controller 3 INT is the main hub for the IQ Battery 5P and IQ Microinverters. It cannot, however, be used as a main switchboard as it is certified for overvoltage category 3. In this case, maintain the multiple earth-neutral (MEN) connections at the existing MEN in the electrical reticulation. Do not bridge the neutral and earth bars in the IQ System Controller.

⁴ This requirement varies according to the safety organization of different states. This guide is an excerpt from [Energy Safety Victoria](#) and [Solar Victoria](#).

The IQ System Controller 3 INT is generally set up as a gateway and simplifies the wiring. The grid supply is fed into the IQ System Controller 3 INT through a 63 A miniature circuit breaker (MCB) before feeding back to the downstream loads or the main switchboard. The following example shows a connection to a full home backup MSB.

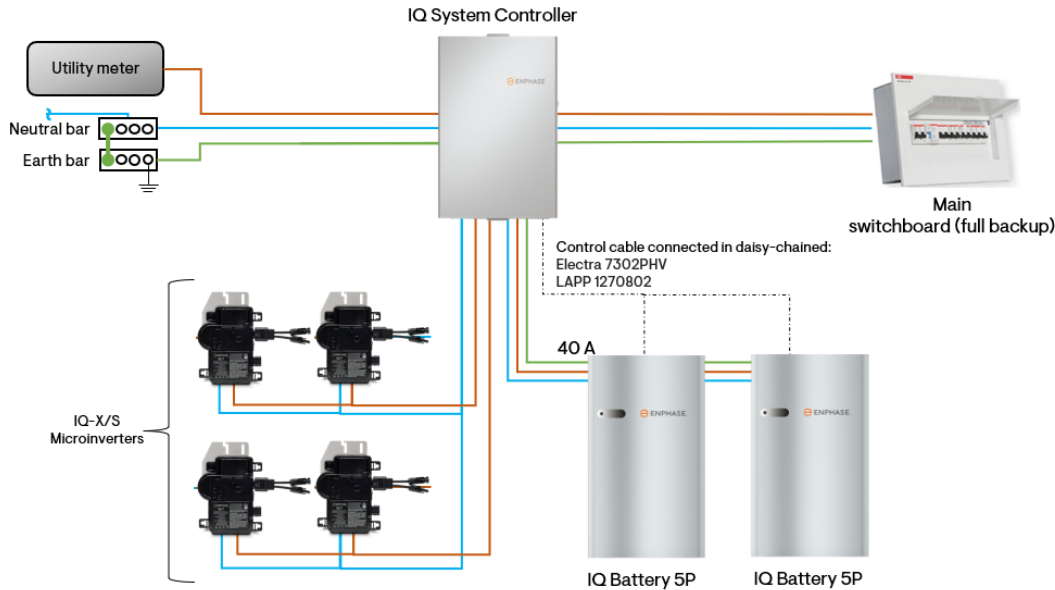


Figure 4: Full home backup

Alternatively, segregate the nominal and essential loads to connect to a partial home backup switchboard, as shown in the following image.

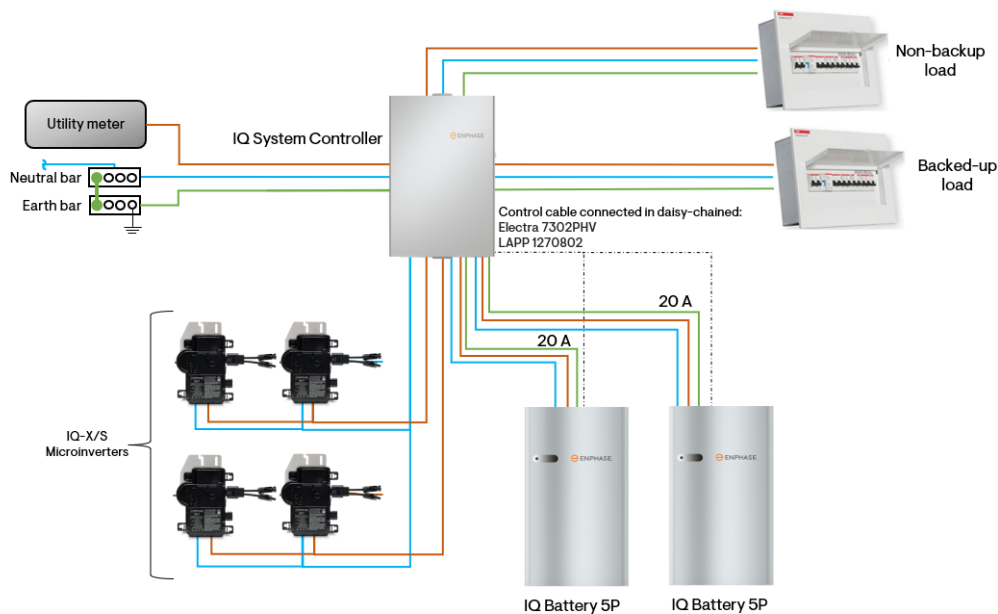


Figure 5: Partial home backup

You can feed the main switchboard from the IQ System Controller backup or non-backup lugs, as shown in the following image.

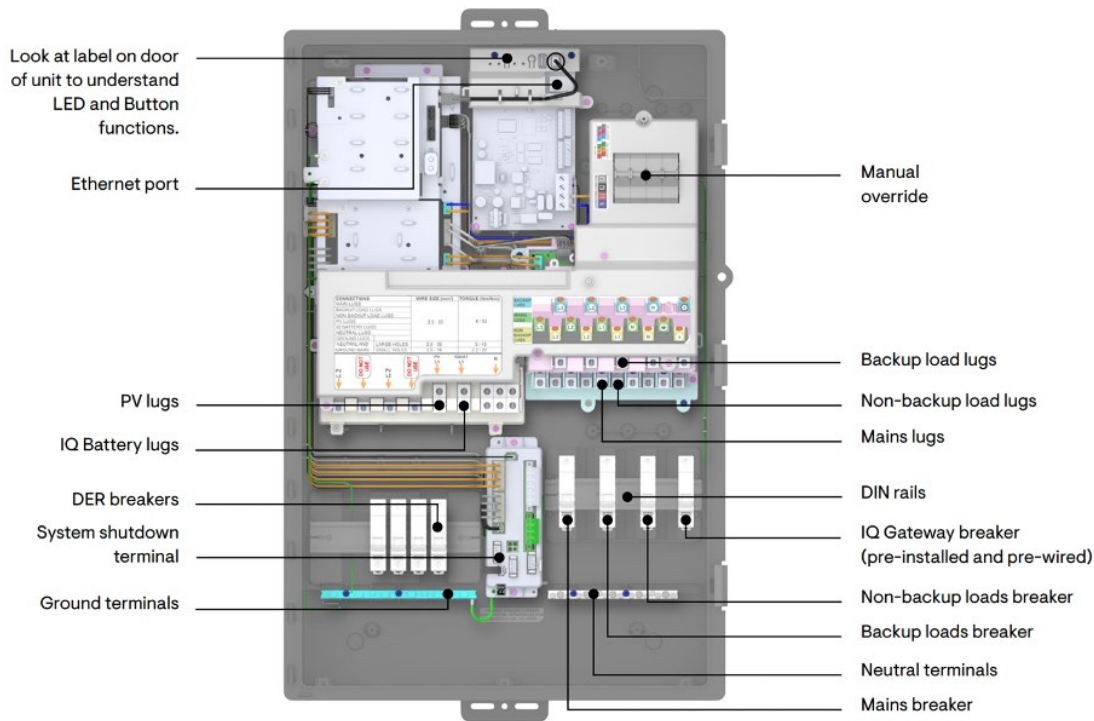


Figure 6: IQ System Controller 3INT

For whole home backup, wire the subdomains of the main switchboard through a 63 A MCB into the backup terminal of the IQ System Controller located on the right-hand side. The IQ System Controller is rated for 80 A continuous current (per phase). As most houses have 63 A supply, it is recommended to use 16 mm² wires when wiring the mains back to the main switchboard.

The left-hand side terminals of the IQ System Controller 3 INT are where the DER sources (IQ Battery 5P and microinverters) terminate. There is an 80 A shared bus between the IQ Microinverters and the IQ Battery system, but only the IQ Microinverter terminals will have the embedded Production CT. Ensure to wire the right terminal for IQ Microinverters.

The recommended MCB for each microinverter branch is 25 A, and the minimum PV submains are 6 mm² each. For microinverter branch circuit sizing, refer to the [Designing with Enphase guide](#) on the Enphase website.

For wiring the PV circuit in the Enphase Energy System, the pre-installed 4-pole 25 A PV breaker in the IQ System Controller 3 INT is to be used with the PV neutral wire connected to the pre-wired N-line in the 4-pole breaker. Connecting the PV neutral to the neutral bar of the IQ System Controller 3 INT may hamper power line communication (PLC) in the system.

IQ Battery 5P electrical connections

Wire the IQ Battery 5P into the IQ System Controller battery terminals via an independent breaker or daisy chain to a common breaker. For example, when wiring the IQ Battery 5P in a daisy chain (see [Figure 6](#)), you can use a 40 A MCB or two 20 A MCBs when wiring the IQ Battery 5P into individual circuits, as shown in the following image.

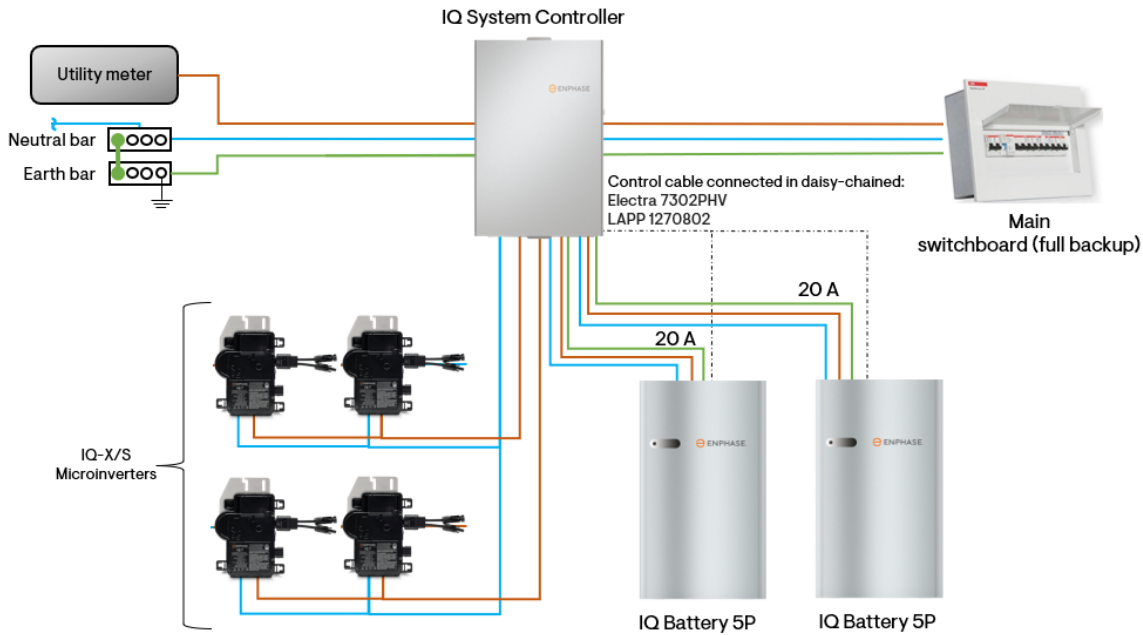


Figure 7: Full home backup with two 20 A MCBs

The typical minimum wire sizes to install two units of IQ Battery 5P are:

- 16 mm² for the main IQ Battery 5P connection and 10 mm² for the sub-connection (daisy chain)
- 10 mm² for both main IQ Battery 5P connections (individual MCB)

The following top-view image shows the daisy chain wiring of the IQ Battery 5P mains:

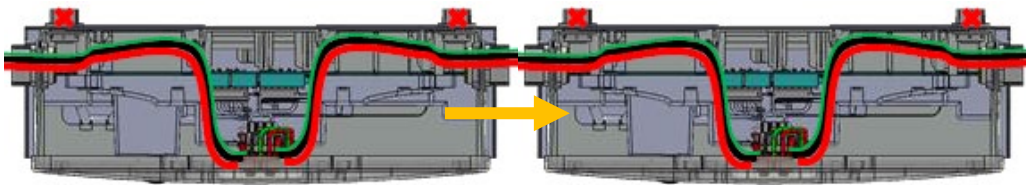


Figure 8: Daisy chain wiring of the IQ Battery 5P mains

All the IQ Battery 5P neutral wires coming from the batteries of each phase must be connected to the N-bar in the IQ System Controller 3 INT.

IQ Battery 5P communication wire connections

Enphase IQ Battery 5P uses Control/CTRL cable communication, and the required cable is a 2*(2*P) + G twisted/shielded and field wired into a 5-pin terminal block. The termination guidance for the terminal block is shown in the following image. The tested and supported Control/CTRL cable makes and models are Electra EAS7302PHV, EAS7502PHV, or the LAPP 1270802.

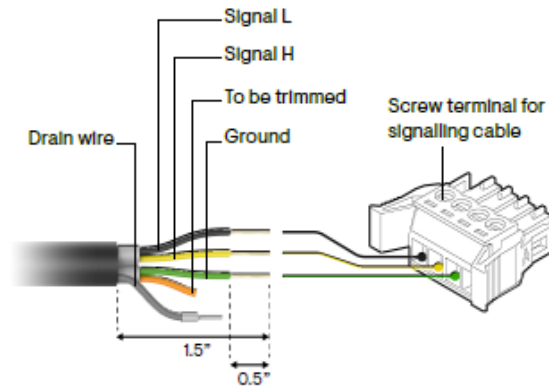


Figure 9: Termination guidance

Wire the Control/CTRL cable in a daisy chain, connecting the IQ System Controller, first IQ Battery 5P, and second IQ Battery 5P. The IQ System Controller CTRL cable termination is shown in the following image.

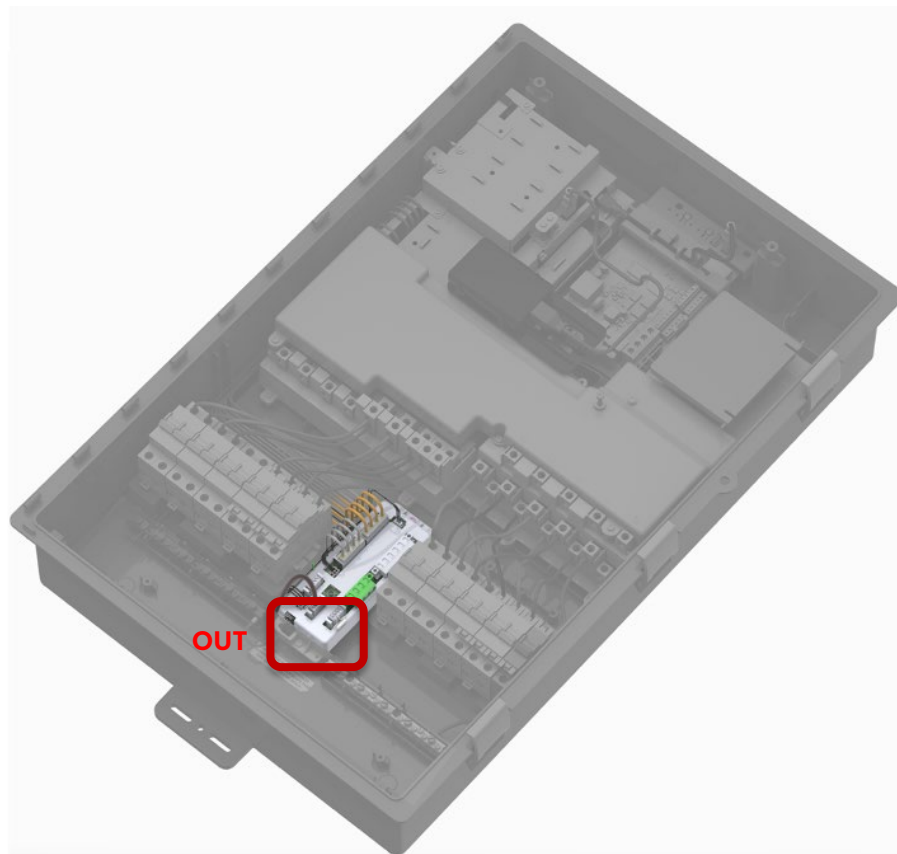


Figure 10: IQ System Controller CTRL cable termination

The IQ Battery 5P Control/CTRL cable terminations are shown in the following image. Note the IN and OUT labels on the IQ Battery 5P CTRL board must be wired in the correct order.

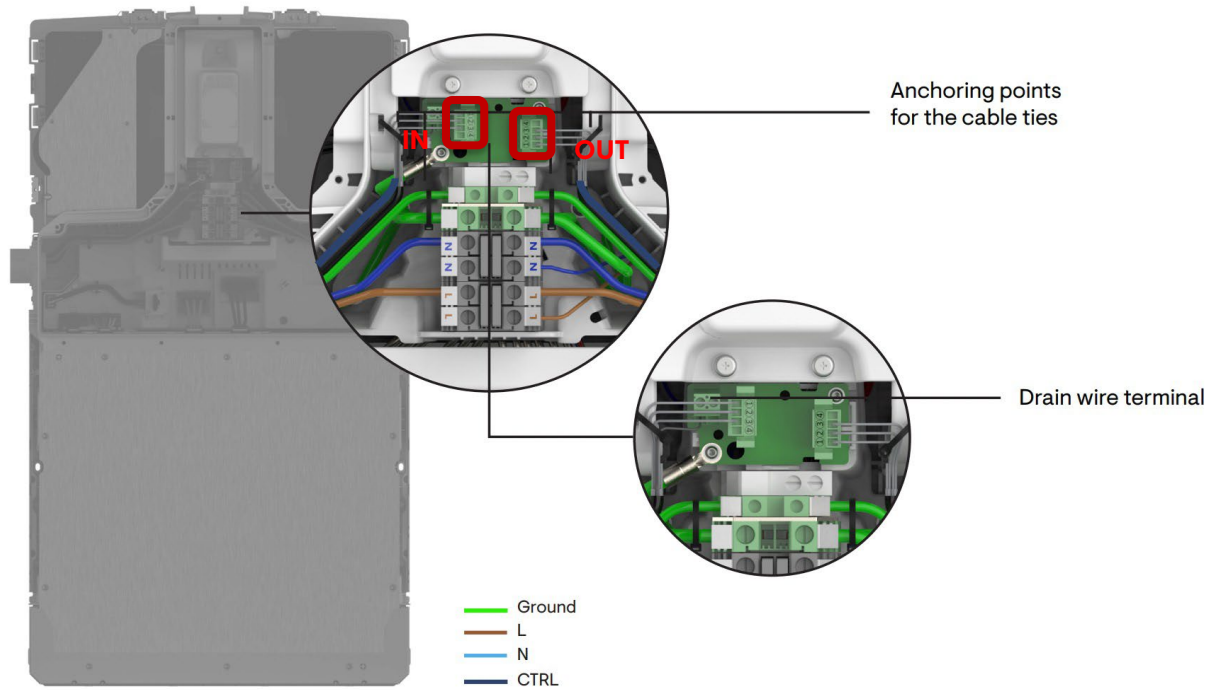


Figure 11: IQ Battery 5P Control/CTRL cable termination

Labelling

Energy storage label with UN number

A circular green reflector sign. Install the label on or immediately adjacent to the main metering panel and the main switchboard.



Inverter location label

Install the label on the main switchboard or metering panel.

INVERTER LOCATIONS	
BATTERY	_____
SOLAR	_____

Multiple supplies warning sign

Install the label on the main switchboard and any intermediary board(s) when there are multiple sources of IQ Microinverters and/or IQ Battery 5P installed.



Multiple mode IES connected sign

Install the label on the main switchboard and any intermediary boards warning that the IQ Battery 5P may operate in stand-alone mode. The shutdown procedure must be followed before operating on this board.



Stand-alone warning sign

The label indicates the final subcircuits may be powered by a stand-alone supply. Install it on the switchboard where all backed-up final subcircuits terminate.



IQ Battery system rating label

The label clearly states the IQ Battery 5P voltage and current, both AC and DC. Install it on the IQ System Controller 3 INT.



Battery shutdown procedure

The label details the shutdown procedure for the IQ Battery 5P in the event of an emergency. Install it on the IQ System Controller 3 INT or adjacent to and visible from the IQ Battery 5P or the IQ Battery 5P main switch.

**ENERGY STORAGE
SHUTDOWN PROCEDURE**

1. Turn the SSD switch to the "OFF" position.
2. Press the DC switches on all IQ Battery 5P units to turn them "OFF"
3. Turn the PV breakers in the IQ System Controller 3 INT to "OFF" position.
4. Turn the IQ Battery 5P breakers in IQ System Controller 3 INT to "OFF" position.

TO START UP FOLLOW PROCEDURE BELOW

1. Turn the SSD switch to the "ON" position.
2. Press the DC switches on all IQ Battery 5P units to turn them "ON"
3. Turn the PV breakers in the IQ System Controller 3 INT to "ON" position.
4. Turn the IQ Battery 5P breakers in IQ System Controller 3 INT to "ON" position.

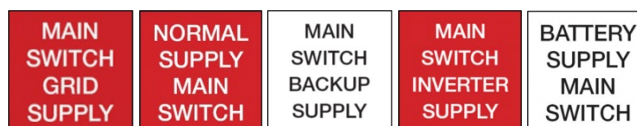
Toxic fume hazard

A label stating a toxic fume hazard warning in AS/NZS 5139 Table 3.1 for lithium iron phosphate batteries.



Main switch label for all connections inside IQ System Controller 3 INT

The labels identify the respective switches inside the IQ System Controller. Install on the connected breakers respectively. Where multiple inverters of one type (solar or battery) are installed on one side, the A.C. isolator label can be engraved with the inverter's number, that is, "BATTERY SUPPLY #1" and/or "INVERTER SUPPLY #1".



AC isolators label for IQ Microinverters and IQ Battery 5P

Install the labels adjacent to the IQ Microinverters rooftop isolator. If there is more than one branch, use isolator numbering to represent the number of branches. Do not apply on any IQ Battery 5P isolator as it terminates into the IQ System Controller.



Revision history

Revision	Date	Description
TEB-00047-2.0	October 2023	Added toxic fume hazard section. Added shutdown procedure.
TEB-00047-1.0	July 2023	Initial release

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