

IQ Battery emergency response

Applicable regions: North America

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1. Overview

This document is intended for Emergency Response Teams and Authorities Having Jurisdiction (AHJs) to learn more about safety measures and emergency response strategies for Enphase IQ Batteries (IQ Battery 5P, IQ Battery 3T/10T, IQ Battery 3/10, Enphase IQ Battery and Enphase AC Battery). The document will help readers better understand product identification, potential product hazards, emergency responses and first aid measures.

Customer, installers, and other individuals can know about IQ Battery safety information from the respective product installation guides available at the [Documentation Center](#). In any emergency situations, contact local emergency response teams (by dialling 911, in the U.S.) and evacuate the area as quickly as possible.

Enphase IQ Batteries are all-in-one AC-coupled lithium-ion batteries that can be installed at home to store excess solar energy for reuse. This document pertains to the IQ Battery product variants; the terms "IQ Battery, the battery, and the batteries" are used interchangeably unless generation-specific features are indicated, in which case the specific model name is used.


2. Product identification

All Enphase IQ Battery products are designed to meet and are certified to *UL 9540 – Standard for Safety - Energy Storage Systems and Equipment*. This ensures that it meets the industry recognized standard for safety for use in stationary energy storage installations.

All Enphase IQ Battery products are manufactured with Lithium Iron Phosphate (LFP) chemistry, which is one of the safest Li-ion chemistry in the industry. Each IQ Battery is powered by IQ Microinverters that function on a distributed architecture, making the IQ Battery safer and more reliable compared to other systems. Still, all batteries can be dangerous goods, and hence, users are expected to follow all the recommendations.

2.1 IQ Battery product variants




The following table lists the IQ Battery product variants and their specifications.

Product	SKUs	Power (kW)	Capacity (kWh)	Max DC voltage (Vdc)	Weight (kg)	Dimensions (H x W x D)
IQ Battery 5P 	IQ BATTERY-5P-1P-NA IQ BATTERY-5P-1P-ROW IQ BATTERY-5P-1P-INT	3.84	5.00	86.4	78.9	98 cm x 55 cm x 19 cm (38.6 in x 21.7 in x 7.4 in)

Product	SKUs	Power (kW)	Capacity (kWh)	Max DC voltage (Vdc)	Weight (kg)	Dimensions (H x W x D)
IQ Battery 3 	ENCHARGE-3T-1P-NA	1.28	3.36	75.6	48.8	78 cm x 43 cm x 19 cm (30.5 in x 16.9 in x 7.4 in)
	ENCHARGE-3T-1P-INT		3.50			
IQ Battery 10T 	ENCHARGE-10T-1P-NA	3.84	10.08	75.6	143.6	78 cm x 128 cm x 19 cm (30.5 in x 50.5 in x 7.4 in)
	ENCHARGE-10T-1P-INT		10.50			
IQ Battery 3 	ENCHARGE-3-1P-NA	1.28	3.36	73.5	52	66 cm x 37 cm x 32 cm (26.1 in x 14.5 in x 12.6 in)
IQ Battery 10 	ENCHARGE-10-1P-NA	3.84	10.33	73.5	154.7	66 cm x 107 cm x 32 cm (26.1 in x 42.1 in x 12.6 in)
Enphase AC Battery 	B280-1200-LL-I-US00-RFO IQ7-B1200-LN-I-INT01-RVO	0.27	1.2	25.6	25	33 cm x 39 cm x 22 cm (12.8 in x 15.4 in x 8.7 in); without bracket
Enphase IQ Battery 	IQ6PLUS-B1200-LL-I-US00-RV1	0.27	1.2	25.6	25	33 cm x 39 cm x 22 cm (12.8 in x 15.4 in x 8.7 in); without bracket

2.2 Reference documents

The Enphase IQ Battery safety datasheets can be downloaded from the following links:

Links	QR code
IQ Battery 5P safety data sheet	
IQ Battery 3,10, 3T, and 10T safety data sheets	
Enphase AC Battery and IQ Battery safety data sheets	

2.3 Product installations

A few actual product installation images are shown below.



Figure 1: IQ Battery 5P in North America



Figure 2: IQ Battery 5P outside North America

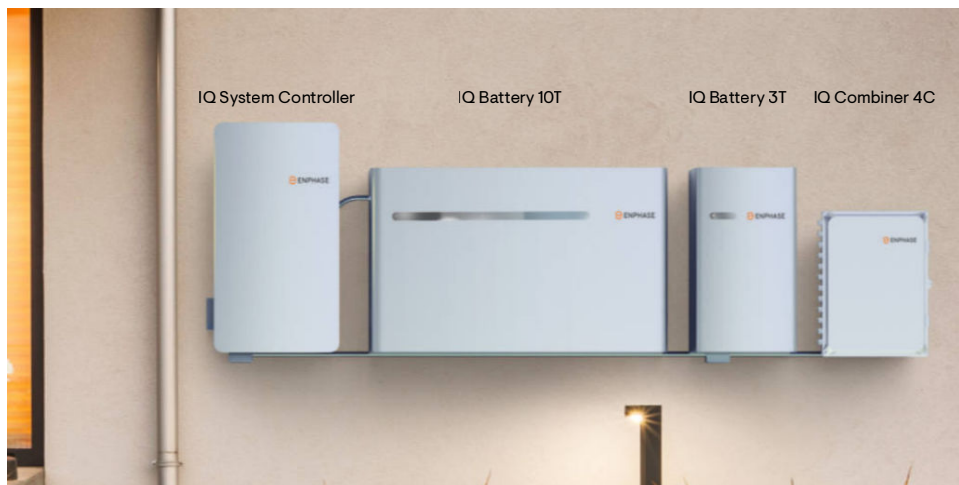


Figure 3: IQ Battery 3T/10T



Figure 4: IQ Battery 3/10

2.4 Enphase Energy System shutdown procedure

The System Shutdown Switch (EP200G-NA-02-RSD) is an accessory for the IQ System Controller 2 (EP200G101-M240US01), IQ System Controller 3(SC200D111C240US01), and IQ System Controller 3G (SC200G111C240US01). The switch is wired to the IQ System Controller 2 and IQ System Controller 3/3G and can act as initiation device for NFPA 70 – 2023 NEC Article 706.15B emergency shutdown function requirements, when located at a readily accessible location outside the building.

☑ **NOTE:** The System Shutdown Switch is lockable in the off, that is, open position in accordance with 2023 NEC 110.25.



Refer to the [PV rapid shutdown and energy storage system disconnect in the Enphase Energy System technical brief](#) for detailed instructions regarding system shutdown procedure.

2.4.1 Grid-interactive (grid-tied) systems (no backup)

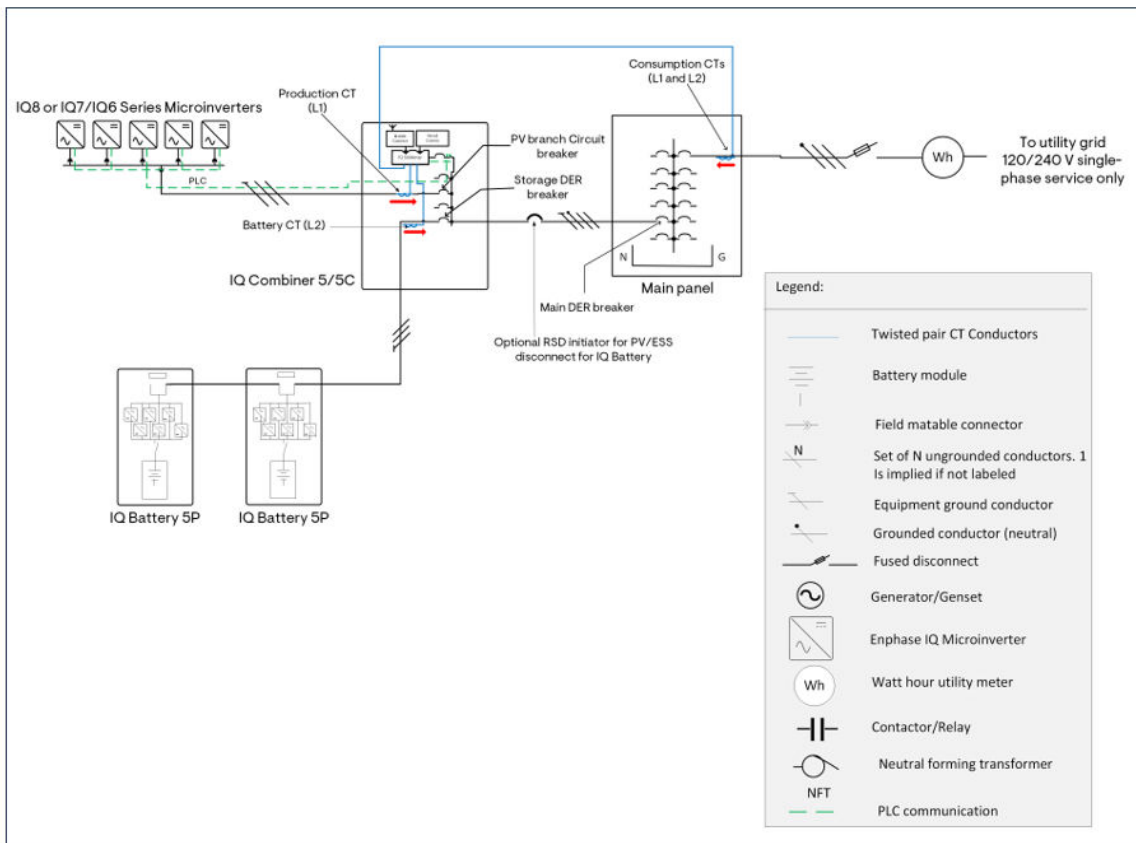
If the IQ Combiner is readily accessible:

- The PV branch circuit breaker inside the IQ Combiner can act as the PV rapid shutdown device (RSD) as specified in 2023 NEC 690.12.
- The battery breakers (in the IQ Combiner or an electrical panel) can act as the Enphase Energy System (ESS) disconnecting means as specified in 2023 NEC 706.15.

If the IQ Combiner is not readily accessible, the main DER breaker in the main panel can also act as the rapid shutdown device, and the ESS disconnecting means that the main panel is readily accessible.

If the IQ Combiner and the main panel are not readily accessible, an additional disconnect may be installed as the RSD device and ESS disconnecting means.

✓ **NOTE:** IQ Combiner 3/3C/3-ES/3C-ES/4/4C/5/5C provides the facility to lock the enclosure to enable compliance with 2023 NEC 690.13, which specifies requirements for photovoltaic system disconnecting means.

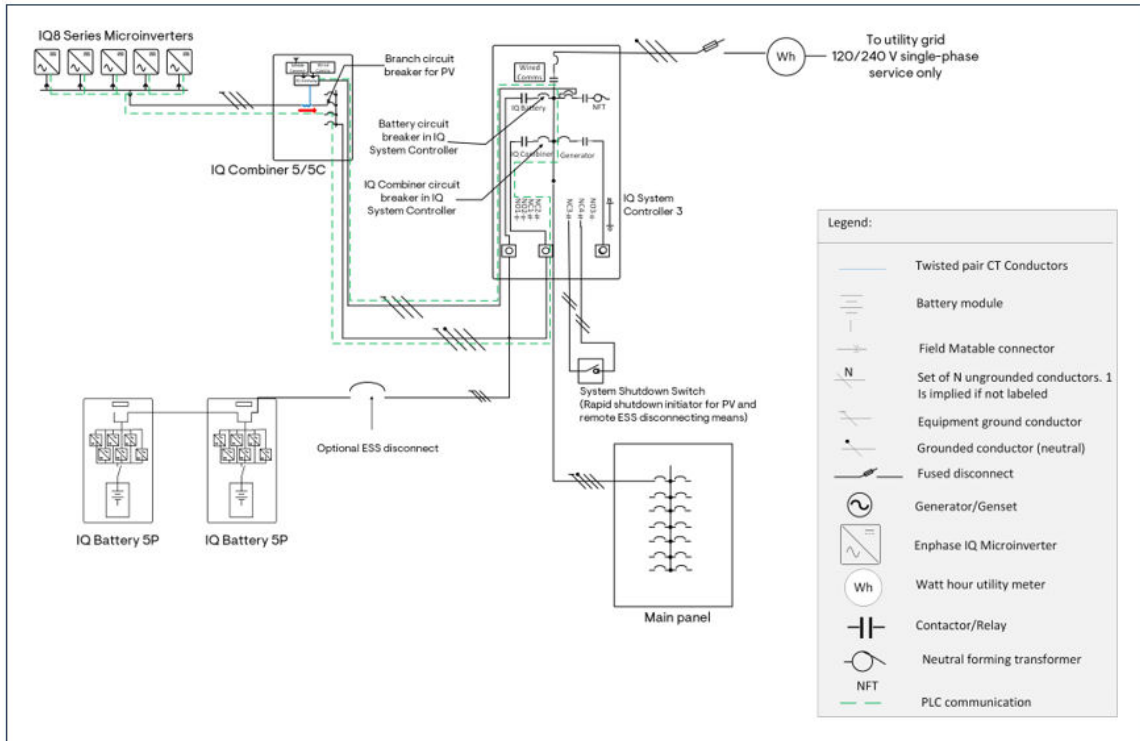


✓ **NOTE:** The circuit diagrams in the document only show system components relevant to rapid shutdown or energy storage system disconnect. For complete single-line diagrams, refer to the [Enphase System planning guide](#).

✓ **NOTE:** The circuit diagrams in the document only show IQ Combiner 5/5C, IQ System Controller 3, and IQ Battery 5P. However, the notes are applicable to systems with IQ Combiner 4/4C, IQ System Controller 2, IQ System Controller 3G, and IQ Battery 3T/10T.

2.4.2 Grid-forming systems (with backup)

The site can have System Shutdown Switch installed near IQ System Controller that can act as ESS disconnecting means. If System Shutdown Switch is missing, the ESS breaker inside the IQ System Controller can also be the disconnecting means. The IQ System Controller enclosure provides a means for locking.



✓ **NOTE:** The circuit diagrams in the document only show system components relevant to rapid shutdown or energy storage system disconnect. For complete single-line diagrams, refer to the [Enphase System planning guide](#).

✓ **NOTE:** The circuit diagrams in the document only show IQ Combiner 5/5C, IQ System Controller 3, and IQ Battery 5P. However, the notes are applicable to systems with IQ Combiner 4/4C, IQ System Controller 2, IQ System Controller 3G, and IQ Battery 3T/10T.

2.4.3 Circuit breaker lockout device as a means for locking

In situations where an enclosure lockout is not acceptable by Authorities Having Jurisdiction (AHJs), an aftermarket circuit breaker lockout device provides a reliable alternative. This device securely locks the circuit breaker in the “off”, that is, open position, preventing accidental or unauthorized re-energization. It is designed to fit various breaker types and sizes, ensuring compatibility and ease of use. By physically blocking the switch, it enhances safety during maintenance or emergency situations. These can help when using the DER breaker as a rapid shutdown initiator in a grid-tied system or ESS breakers as ESS disconnecting means in grid-tied or grid-forming systems.

Here are a few examples:

- <https://www.eaton.com/us/en-us/skuPage.BRLWCS.html>
- <https://www.lockoutsafety.com/product/master-lock-grip-tight-circuit-breaker-lockout/>

2.5 IQ Battery shutdown procedure

IQ Battery can be shut down by turning OFF operating the DC switch on the product. In older generations of the product, the DC switch (rotary mechanism) of the product was inside the IQ Battery cover, and in new generations, it can be accessed directly (in the form of a press button).

2.5.1 IQ Battery 5P shutdown procedure

Press the IQ Battery 5P DC control button and then turn the ESS DER breaker to the OFF position. The LED around the switch should turn OFF to indicate that the battery is powered off.



The battery storage DER breaker can act as the ESS disconnecting means as specified in 2023 NEC 706.15. If the battery storage DER breaker is not accessible or safe to operate, the AC mains DER breaker can be used as a disconnecting means for isolating the product. The storage DER breaker should be installed inside the IQ Combiner box or IQ System Controller. For some of the sites, a System Shutdown Switch may also be installed as the ESS disconnecting or remote actuation means.

2.5.2 IQ Battery 3, 10, 3T and 10T shutdown procedure

To shutdown IQ Battery 3, 10, 3T, and 10T:

- Remove the IQ Battery cover. Refer to the instructions on removing the cover of the IQ Battery [3/10](#) or [3T/10T](#), based on the applicable model.
- Locate the DC switch(es) on the front side of the IQ Battery and turn them to the OFF position.

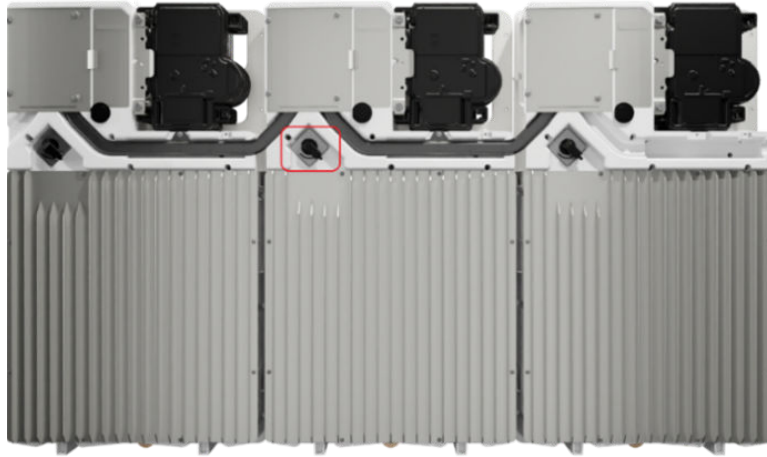


Figure 5: One of the three DC switches on IQ Battery 10T

- Rotate the switch to the OFF position to de-energize the battery.

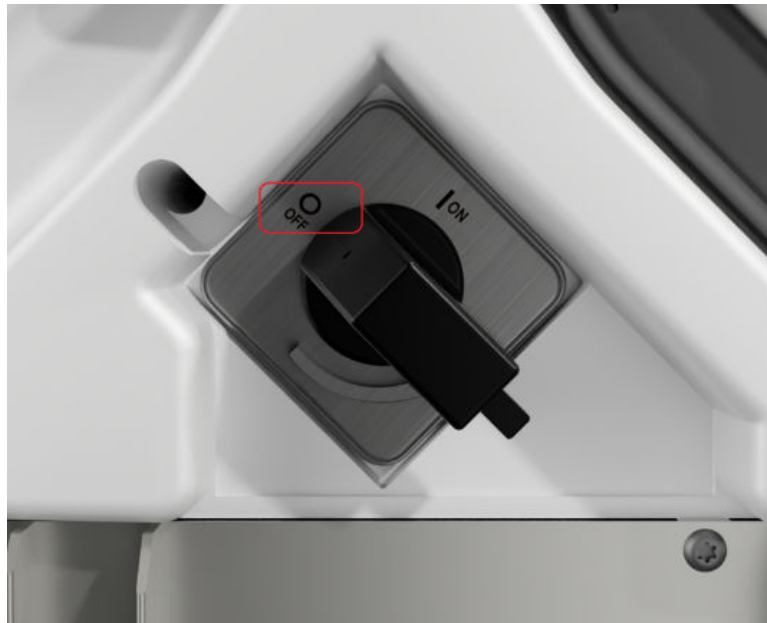


Figure 6: DC switch in OFF position

- Turn the ESS DER breaker to the OFF position. The LED around the switch should turn off to indicate that the battery is powered OFF.

3. Emergency situation response

In all emergency situations, homeowners should follow the steps mentioned below:

- Evacuate the area.
- Contact the fire department or other required emergency response team in your area such as 911.

- Contact Enphase Support ([Emergency contact details](#) on page 16) for further assistance.

In all emergency situations, emergency response team can follow the below mentioned activities:

- Wear personal protective equipment highlighted in section 4 along and self-contained breathing apparatus (SCBA).
- Evacuate and ventilate the area without causing any sparks as the venting gasses may catch fire.
- Announce the presence, extent of involvement, and any potential risks of alternate energy sources such as IQ Battery or Enphase solar microinverter during the size-up.
- If safe, initiate an emergency shutdown of the IQ Battery system as per the details given in [IQ Battery shutdown procedure](#) on page 11.

3.1 In case of unusual noise, smell, or smoke

- Ensure nothing is in contact with the IQ Battery(ies) or in the ventilation clearance area around the IQ Battery(ies). Ventilate the room.
- If safe, initiate an emergency shutdown of the IQ Battery system as per the as per the details given in [IQ Battery shutdown procedure](#) on page 11.

3.2 In case of a thermal event

In case of IQ Battery on fire, the emergency response team should:

- Follow the emergency response applicable for all emergency situations as given in [Emergency situation response](#) on page 12.
- Wear an appropriate PPE and use a broken stream from the initial attack line deployed to extinguish the fire. Additional extinguishing media include fire extinguishers. Just be aware that the fire extinguisher will only help with any fire surrounding the lithium battery pack. It will be ineffective in extinguishing the fire within a lithium battery pack. However, this will attempt to contain excessive heat exposure from the burning battery pack. If there is any off gassing from the battery after an exposure to water, immediately ventilate the area using positive pressure ventilation with an intrinsically safe electric fan.
- Keep monitoring the temperature with thermal imaging and ensure that the internal temperature is below 176°F (80°C). Intermittently, cool the battery if needed with the same initial attack line using a broken stream.
- Use a thermal imaging camera to ensure the battery does not generate heat for the initial hour after the fire has been extinguished, and then have a qualified person inspect the battery for electrical hazards before removing it.

In case there is a structural fire or fire within the vicinity surrounding an IQ Battery at the site and the battery is not consumed by flames:

- Follow the emergency response applicable for all emergency situations as given in [Emergency situation response](#) on page 12.
- Stay clear of any gases coming from the battery and the fire.
- Wear an appropriate PPE and extinguish the fire with the initial fire attack line. If the battery was exposed to heat from the flames, cool the battery with the same line using a broken stream.
- Keep monitoring the temperature for 24 hrs with thermal imaging and ensure that the temperature of IQ Battery is below 176°F (80°C).
- Contact Enphase Support ([Emergency contact details](#) on page 16) for further guidance.

3.3 In case of flooding

- Do not touch the battery and have a qualified person evaluate the unit for any electrical hazards.
- If possible, protect the system by finding and stopping the source of the water and pumping it away.
- If possible, disconnect all power to the home at the main breaker to the house.
- If water has contacted the battery, call your installer to arrange an inspection. If you are sure that water has never contacted the battery, let the area dry thoroughly before use.

3.4 In case of electrolyte spillage

- Keep all persons and animals away from the spill area to a minimum distance of 25 m to avoid breathing vapours and wear appropriate PPE if you are working in the contaminated area.
- Ensure adequate ventilation and if needed ventilate using positive pressure ventilation using an intrinsically safe electric fan.
- Eliminate all ignition sources (no smoking, sparks, flames, or hot equipment) in the immediate area around the spill.
- Do not touch or walk through spilled material.
- If safe, remove any items surrounding the spill area to avoid contamination.

4. Personal protective equipment

The following personal protective equipment should be worn if the IQ Battery 5P is mechanically, thermally, or electrically abused to the point where the protective case is damaged, posing a risk of electrolyte exposure.

- **Skin/Body protection:** Wear closed-toe shoes, chemical-resistant overalls, and protective over boots. Firefighters should wear structural firefighting gear to protect themselves from heat, flames, and potential chemical exposure.
- **Respiratory protection:** Wear a self-contained breathing apparatus (SCBA). When batteries are damaged, they can release toxic fumes and gases, so respiratory system protection is crucial for firefighter safety.
- **Gloves:** 15-millimeter nitrile rubber gloves. Nitrile gloves provide immersion protection when worn over laminated film barrier gloves (Ansell Barrier 2-100 or equivalent).
- **Eye/Face protection:** Wear protective eye and face gear, such as chemical splash goggles and a face shield, to prevent exposure to the eyes and face.

5. Risky scenarios associated with IQ Battery

The Enphase IQ Battery has been designed to safeguard itself against various events occurring around it. However, like any lithium-ion battery, it can pose dangers if mishandled, damaged, or improperly installed. Following manufacturer guidelines for use and storage is essential for safety.

5.1 Risk associated with exposure to high temperature

The IQ Battery is designed to withstand temperatures of up to 176°F (80°C) for a short duration without affecting its health; however, prolonged exposure may result in product damage.

During use, when stored, or during transport, keep the IQ Battery(ies) in an area that is well-ventilated and protected from the elements, where the ambient temperature and humidity are within -4°F to 131°F (-20°C to 55°C) and 5% to 95% RH, non-condensing. While installing for use, avoid direct sunlight to ensure the temperature stays in the optimal operating range. This ensures charging and discharging currents will not be de-rated due to temperature. The full performance will occur within 59°F to 113°F (15°C to 45°C) while charging and within 41°F to 122°F (5°C to 50°C) while discharging.

5.2 Risk associated with exposure to physically damaged battery

IQ Battery contains a LFP battery module that, when subjected to damage through puncture, piercing, crushing, forced heating, or dropping from height, etc., can lead to multiple issues such as:

- Electrolyte leakage
- Uncontrolled heating of cells due to an exothermic reaction followed by thermal runaway
- Venting of gases
- Fire or explosion

Physically damaged batteries can lead to exposed conductors, creating a risk of electric shock. It is always recommended to carefully follow all the handling instructions provided in product documentation while dealing with storage and installation.

5.3 Risk of exposure to venting gases from the battery

Each IQ Battery has vent holes provided at the bottom towards the wall side. Under normal circumstances, it is unlikely for the LFP battery to heat up and vent gases. In rare cases where the batteries are mechanically, thermally, or electrically abused to the point of compromising its integrity, it may result in the production of gas. This gas is expected to vent out from these holes to relieve pressure inside the casing. The gases consist of a mixture of flammable and non-flammable gases. Vented gases are early signs of potential thermal runaway – a hazardous situation.

Proximity to these gases can lead to temporary eye irritation or burning, skin irritation, and respiratory irritation. Sometimes, these gases can be hot and pose a risk of fire hazard.

5.4 Risk of exposure to leaking electrolyte from battery

The IQ Battery has LFP cell containing organic electrolytes sealed in a protective case. The risk of exposure occurs only if the cell is mechanically, thermally, or electrically abused to the point of compromising the protective case. If an individual comes in contact with electrolyte leaking from the battery, they may experience eye irritation or burning, skin irritation, and respiratory irritation.

5.5 Risk of IQ Battery installation when exposed to flooding

If the installation site is flooded, do not touch the battery. Have a qualified person evaluate the battery for any electrical hazards before handling the battery.

6. Emergency contact details

Emergency response team can reach out to Enphase Support (<https://enphase.com/contact/support>) to enquire any additional information required during the event or any general queries. The emergency response team should have basic details about the site such as Enphase equipment installed at site, its layout photos and details on which components are involved in the event.

In case of emergency, contact the numbers listed in the following table.

Table 1: Emergency contact details

Country	Enphase Support numbers	Local emergency fire department
United States	(877) 797-4743	911
Canada	(877) 797-4743	911
Mexico	(877) 797-4743	911
Puerto Rico	(877) 797-4743	911
Brazil	(19) 4560-1844	193
Australia	1800 006 374	000
India	1800 309 3765	101
New Zealand	09 887 0421	111
Thailand	+66 2506 1917	199
Italy	+39 800 593 838	115
Belgium NL	+32 (0)7 848 2728	112
Netherlands	+31 (0)85 20 823 05	112
Switzerland DE	+41 (0)43 588 0565	118

Country	Enphase Support numbers	Local emergency fire department
Switzerland FR	+41 (0)43 588 0565	118
Switzerland IT	+39 800 593 838	118
Germany	+49 (0) 89 38037726	112
United Kingdom	+44 330 808 8522	999 or 112
France	+33 (0) 97 0731076	112 or 118
Spain	+34 91 123 40 17	112
Poland	+48 22 104 60 79	998 or 112
Austria	+43 (0)720115456	122
Belgium FR	+32 (0) 2 588 54 69	112
South Africa	087 550 2305	10 177

7. Regional office contact details

North America (For all NA regions, use (833) 963-3820)

Fremont, California	Enphase Energy, Inc. 47281 Bayside Pkwy., Fremont, CA 94538.
Petaluma, California	Enphase Energy, Inc.1 420 N. McDowell Blvd. Petaluma, CA 94954
Austin, Texas	Enphase Energy, Inc. 1835 Kramer Ln. Building B Suite 125, Austin, TX 78758
Meridian, Idaho	Enphase Energy, Inc. 1819 S. Cobalt Point Way Meridian, ID 83642

Europe

's -Hertogenbosch, The Netherlands	Enphase Energy NL B.V. Het Zuiderkruis 65, 5215 MV, 's -Hertogenbosch, The Netherlands, Tel: +31 73 3035859
Lyon, France	Enphase Energy SAS Hub 2, 2ème étage 905 rue d'Espagne, BP 128 69125 Aéroport Lyon Saint Exupéry, France, Tel: +33 (0)4 74 98 29 56

Europe	
Freiburg, Germany	Enphase Energy Germany GmbH Fahnenbergplatz 1, 79098 Freiburg, Germany, Tel: +49 (0) 761 887 89033
APAC	
Shanghai, China	Enphase Energy Room 32D, No.18 North Caoxi Road Xuhui District, Shanghai, China 200030, Tel: +86 21-64686815
Melbourne, Australia	Enphase Energy Australia Pty. Ltd. 88 Market Street, South Melbourne VIC 3205 Australia, Tel: +61 (0)3 8669 1679
Christchurch, New Zealand	1 Treffers Road Wigram, Christchurch, Enphase Energy NZ Ltd. New Zealand, Tel: +64 (0)9 887 0421
Bangalore, India	Enphase Solar Energy Pvt. Ltd. IndiQube Golf View Homes, Ward No.73 Airport, NAL Wind Tunnel Main Road, Murugeshpalaya, Bangalore-560 017, India, Tel: +91-80-6117-2500

8. Site monitoring

Damaged cells/batteries can cause rapid heating, release of flammable gases, and self-heating reactions. It is advisable to wait for 24 hours before attempting to handle or transport a damaged product to check for any potential thermal reactions. If no problems are detected during this monitoring period, the product may be relocated to a secure area after being disconnected. Consider the following criterias for batteries falling into a damaged, defective and recalled (DDR) category.

- **Visual Identifications:**
 - Acute hazards include gas, fire, or noticeable leaking electrolyte or already leaked.
 - The battery or cell has vented, leading to the acute hazard of expelling gases, or already vented.
 - One or more cells have had a thermal event.
 - Cell or battery is physically damaged as evidenced by punctures, dents or crushing of the component battery cells.
 - Wires are broken and exposed, increasing the likelihood of a short circuit.

- **Other Scenarios:** It is suspected to be damaged or defective but cannot be diagnosed before transport. Batteries that belong to DDR category describe critical guidelines in terms of packaging and transportation. These guidelines may be country specific. Contact Enphase Support for guidance if disposal is required during a damaged, depleted, or electrolyte-leaking battery.
 - When disposing of the product, always follow local, state, and federal regulations regarding disposal requirements.
 - While recycling the product, always follow local, state, and federal regulations on recycling requirements.
 - In European Union member nations, the product must be disposed of as per EU Battery and WEEE directives.

9. First aid measures

If the battery is physically damaged, an electrolyte is leaked, and person(s) are exposed, the following initial care should be taken:

- Move victims from a dangerous area to an area with fresh air.
- Show the product safety data sheet to the medical professionals in attendance.
- Quickly transport the victim to emergency care during eye contact, skin irritation, ingestion, or inhalation.

If you contact electrolytes or gases coming out of the battery, it is recommended to follow these additional instructions along with the advice mentioned above:

- **Eye contact:** Immediately flush the eyes with clean water for at least 15 minutes without rubbing. If appropriate procedures are not taken, this may cause eye irritation. Seek medical attention if eye irritation persists.
- **Skin contact:** Immediately remove all contaminated clothing and wash before reusing. Rinse your skin with water. If appropriate procedures are not taken, this may cause skin irritation. Seek medical attention if skin irritation occurs.
- **Inhalation contact:** Move victims to an area with fresh air immediately and remove the source of contamination from the affected area. Seek medical attention.
- **Ingestion:** Have the victim rinse their mouth thoroughly with water. Seek medical attention.

10. Revision history

Revision	Date	Description
TEB-00190-1.0	October 2024	Initial release.