

# ***UL 9540A report summary***

## ***IQ Battery 3T/10T***

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## Result summary

Information in this document is based on reports as defined by UL 9540A, 4th Edition, November 12, 2019. The products were evaluated by Underwriters Solutions.

- Cell Level Test Report, Project Number: 4789479073, Date of issue: 2020-10-06
- Module Test Report, Project Number 478979073, Date of issue: 2021-05-11
- Unit Test Report, Project Number: 4790157346, Date of issue: 2022-01-28, Revised 2022-07-04
- UL Solutions File Number: [AACD.E518271](#)

## BESS intended installation

Enphase IQ Batteries (IQ Battery 3T model number ENCHARGE-3T-1P-NA and IQ Battery 10T model number ENCHARGE-10T-1P-NA) have been evaluated by UL Solutions to Standard UL 9540A for outdoor and indoor non-habitable residential spaces.

Residential indoor: Wall-mounted. The indoor wall-mount applications specified also include installations in garages.

## Cell-level information

Cell-level information	
Chemistry	LiFePO <sub>4</sub>
Was the cell certified?	Yes
Standard the cell was certified to	UL 1973

## Cell-level gas composition

Cell-level gas composition	Measured %
Carbon monoxide	6.91
Carbon dioxide	16.19
Hydrogen	63.75
Methane	4.65
Ethylene	3.2
Ethane	1.07
Propylene	2.21
Propane	0.27
Propidine	0.33
C4 (Total)	1.08
Pentane	0.33
Hexane	0.01
<b>Total</b>	<b>100</b>

## Module-level information

Module-level information	
Ratings (Vdc, Ah)	67.2 V, 52 Ah
Module cell configuration (xS/yP)	21S1P
Was the module certified?	Yes (unlisted component)
Standard the module was certified to	UL 1973
External flaming	No external flaming
Location(s) of flame venting	No external flaming
Flying debris	No flying debris
Re-ignition	No re-ignition
Test peak chemical heat release rate (kW)	No flaming observed

## Unit-level information

### Unit testing - No external flaming or hazardous debris

- No external flaming or debris hazards were observed.
- No evidence of flying debris was found in the test room after the conclusion of the test.
- The unit was covered with a single layer of cheesecloth used as an ignition indicator. The cheesecloth did not ignite, and no flame was observed.
- No evidence of re-ignition after completion of the test.
- Only unburned battery vent gas accumulation was observed following confirmation of thermal runaway in the initiating cell.

### No thermal runaway and re-ignitions post-test

No additional thermal runaway behavior or re-ignitions were observed during post-test observation, disassembly, and disposal of the sample.

### No unit-to-unit or module-to-module propagation

The thermal runaway did not propagate from module to module in the unit.

## Unit-level testing summary

Unit level information	Description
Model number	ENCHARGE-10T-1P-NA
Rated AC input/output power, kVA	3.84
BESS module configuration	3P1S
Number of modules in BESS	3
Module cell configuration (xS/yP)	21S1P
Number of cells in the module	21
BESS Intended Installation <b>Residential:</b>	Residential indoor wall-mounted Residential outdoor wall-mounted

Unit level information	Description
<b>Indoor:</b> wall-mounted and floor-mounted <b>Outdoor:</b> wall-mounted and ground-mounted <b>Non-residential:</b> <b>Indoor:</b> wall-mounted, floor-mounted, rooftop, open garage <b>Outdoor:</b> wall-mounted and ground-mounted	The indoor wall mount applications specified also include installation in garages.
Residential indoor use: smallest volume room installation	Smallest calculated room size of 54 m <sup>3</sup>
Was the unit certified?	Yes
Standard the unit was certified to	UL 9540
An organization that certified the unit	UL (File E488100)
External flaming from BESS	No external flaming
Location(s) of flame venting	No external flaming
Maximum target BESS temperature, °C	29°C
Maximum wall surface temperature, °C	99°C
Flying debris	No flying debris
Re-ignition	No re-ignition

## External surrounding temperatures

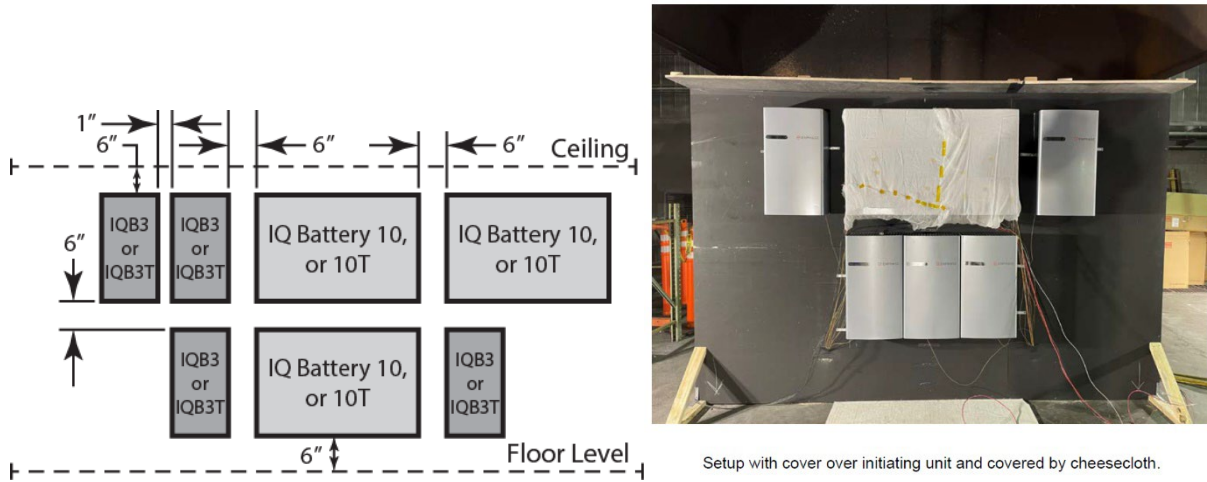
Surrounding temperatures	Values
Maximum temperature to target	29°C
Maximum wall temperature, absolute	99°C
Maximum wall temperature, delta (21°C ambient)	78°C

## Unit-level gas composition summary

Gas composition summary	Values
Total hydrocarbons	660 L
Minimum room size based on 25% LFL	54 m <sup>3</sup>

## Minimum separation distances

As a result of the test, the minimum recommended separation distances are shown for the IQ Battery 3 and 3T and IQ Battery 10 and 10T. Encharge is also known as IQ Battery (IQB).



## Revision history

Revision	Date	Description
TEB-00037-1.0	July 2023	Initial release

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