Technical Note

BACKUP GUIDE

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SCOPE

This document is intended as a resource for accredited installers and designers. It explains how to calculate backup capacity, considering the EPS discharge power under different power ratings and different battery capacities for the following SunPower energy storage systems:

Model	Description
SP-ARSH-5kW-G1 + SP-RH-BxK-G1	1-phase 5kW All-in-One inverter and battery system
SP-ARSH-6kW-G1 + SP-RH-BxK-G1	1-phase 6kW All-in-One inverter and battery system
SP-ARSH-10kW-G1 + SP-RH-BxK-G1	1-phase 10kW All-in-One inverter and battery system

1-phase inverter x=1/2/3/4 batteries

Backup – what is it and why use it

The backup functionality of the hybrid inverter allows the system to provide power to selective appliances/loads during a grid outage / black out event, allowing system owners to power essential appliances.

ATTENTION

The product is not designed to backup the loads of entire households and only critical loads should be connected to the backup line.

The backup function has a limited capacity so installers must advise the system owner to choose only the most important home circuits for backup, and remove any unnecessary loads. If the backed-up loads exceed the inverter's output limit, the system will shut down to protect itself, impacting power supply during normal grid operation and grid outage.

Power Rating and the Backed-up Loads

SunPower energy storage EPS output is determined by the inverter power rating and the battery capacity.

NOTE: Installing batteries in parallel does not boost backup power.

Backup power thresholds

A single battery pack is 96V, with a charge and discharge current of 50A (1-phase).

Two conditions define the upper and lower backup power (EPS) thresholds:

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1. During a grid outage when PV production is unavailable, the backup output will correspond to the battery capacity (e.g. 1 battery module with a 1-phase inverter provide 96*50*1=4800W). This is the lower limit of EPS discharge, which depends on two factors: the inverter rated power and the battery capacity. The actual output power of the EPS port depends on the smaller of these two factors.

2. During a daytime grid outage with sufficient sunshine, the backup output will be equivalent to the battery power + PV power – in-between the lower limit (no PV and grid) and the upper limit (connected to the grid).

Changeover or bypass switch

It is recommended to install a changeover switch. A changeover switch provides the ability to bypass the inverter to supply the backup loads directly from the grid. This bypass may be required during maintenance visits and ensures an option for the customer to restore supply in the case of any technical issue, or in case the system owner accidently adds unplanned loads on the backup line, causing tripping.

1-PHASE BACKUP POWER BY INVERTER RATING AND BATTERY CAPACITY

Backup output power	5 kW	6 kW	10 kW
Maximum current	21.8 A	26.1 A	43.5 A
Current - Amps			
5 kWh	20.8 A	20.8 A	20.8 A
10 kWh	21.7 A	26.1. A	41.7 A
15 kWh	21.7 A	26.1 A	43.5 A
20 kWh	21.7 A	26.1 A	43.5 A
Current – Watts			
5 kWh	4800 W	4800 W	4800 W
10 kWh	5000 W	6000 W	9600 W
15 kWh	5000 W	6000 W	10000 W
20 kWh	5000 W	6000 W	10000 W

NOTE: Maximum charge/discharge current: 50A | 1C discharge rate.

When selecting backup loads, installers should consider both the continuous and surge/peak output power rating, measured in kW or kVA.

Surge/peak output for the 1-phase inverter

Rated power	**Surge/peak power**	**Duration**
5kW	7.5kW	10 seconds
6kW	9kW	10 seconds
10kW	14.49kW	10 seconds

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