

Technical information



SUNNY BOY SMART ENERGY / SUNNY BOY STORAGE / SUNNY ISLAND

Energy Efficiency of PV Storage Systems

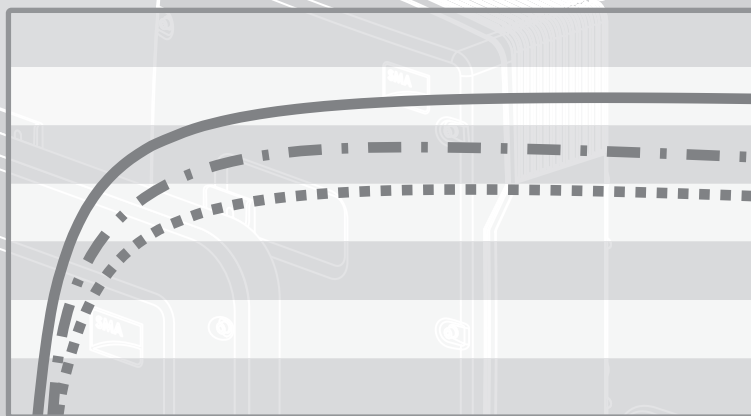


Table of Contents

1	Information on this Document	3
1.1	Validity	3
1.2	Target Group	3
2	Data Explanation	4
3	Sunny Boy Smart Energy	5
3.1	SB 3600SE-10	5
4	Sunny Boy Storage	7
4.1	SBS2.5-1VL-10	7
5	Sunny Island	9
5.1	SI4.4M-12	9

1 Information on this Document

1.1 Validity

This document uses graphs and tables to describe the energy efficiency of PV storage systems with the following SMA battery inverters (as of: June 2017, subject to technical changes):

- SB 3600SE (Sunny Boy Smart Energy)
- SBS2.5-1VL-10 (Sunny Boy Storage 2.5)
- SI4.4M-12 (Sunny Island 4.4M)

1.2 Target Group

The information in this document is intended for installers and operators of PV storage systems with SMA battery inverters as well as for PV storage system planners.

2 Data Explanation

The data provided was collected in accordance with the guidelines for the standard measurement of the energy efficiency of PV storage systems. An explanations of the energy conversion paths provided and the measurement procedure for determining the individual data can be found in the efficiency guidelines for PV storage systems published by the German Energy Storage Association (BVES) and the German Solar Industry Association (BSW).

3 Sunny Boy Smart Energy

3.1 SB 3600SE-10

Characterization of the PV storage system

	PV2AC	PV2BAT	AC2BAT	BAT	BAT2AC	BAT2PV
Energy paths	✓	✓	-	✓	✓	-

PV Connection

PV rated input power	5200 W
PV input voltage*	175 V / 350 V / 500 V

* Nominal voltage or minimum/nominal/maximum voltage

AC Connection

Rated output power*	3680 W
---------------------	--------

* Rated output power PV2AC and BAT2AC

Battery Connection

Battery voltage*	150 V
Nominal charging power**	1500 W
Nominal discharge power	1500 W

* Nominal voltage or minimum/nominal/maximum voltage

** Rated output power AC2BAT

Battery

Sunny Boy 3600 Smart Energy

Battery voltage*	- / 150 V / -
Battery capacity**	2.09 kWh / 2.08 kWh / 2.10 kWh
Battery efficiency**	94.9% / 96.2% / 97.9%
Power consumption of the battery management system (no-load operation/standby)	1.7 W / 0

* Rated output power AC2BAT

** At 100% and, if applicable, 50% and 25% of the nominal charging/discharge power

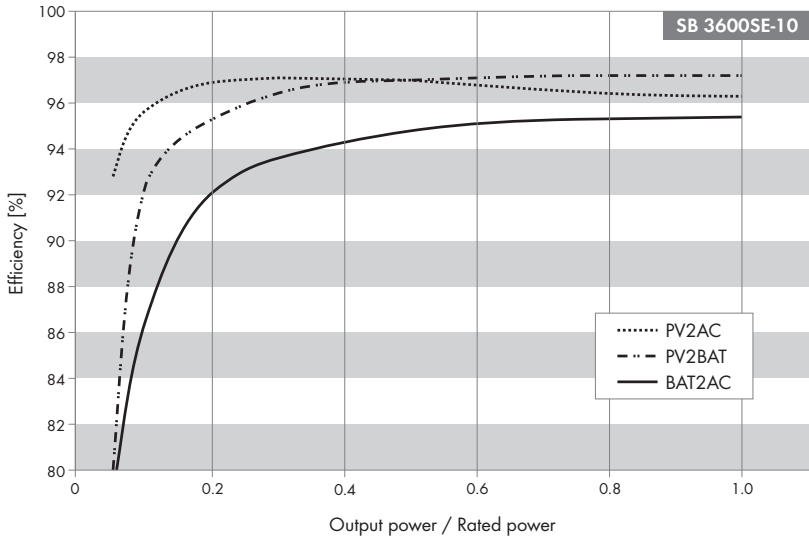
Standby losses of the power conversion system

Power consumption during no-load operation (AC/DC)	16.0 W / < 0.2 W
Power consumption in standby (AC/DC)	3.3 W / < 0.2 W

Control characteristics of the power conversion system

Average stationary deviation of the charging power	76 W
Average stationary deviation of the discharge power	3 W
Average downtime	2 s
Average recovery time	6 s

Efficiency Rating of the Energy Conversion Paths



4 Sunny Boy Storage

4.1 SBS2.5-1VL-10

SUNNY BOY 5.0 with SUNNY BOY STORAGE 2.5

Characterization of the PV storage system						
	PV2AC	PV2BAT	AC2BAT	BAT	BAT2AC	BAT2PV
Energy paths	✓	-	✓	-	✓	-

AC Connection

Nominal charging power	2500 W
Nominal discharge power*	2500 W

* Rated output power BAT2AC

Battery Connection

Battery voltage*	100 V / 360 V / 500 V
Nominal charging power**	2500 W
Nominal discharge power	2500 W

* Nominal voltage or minimum/nominal/maximum voltage

** Rated output power AC2BAT

Battery

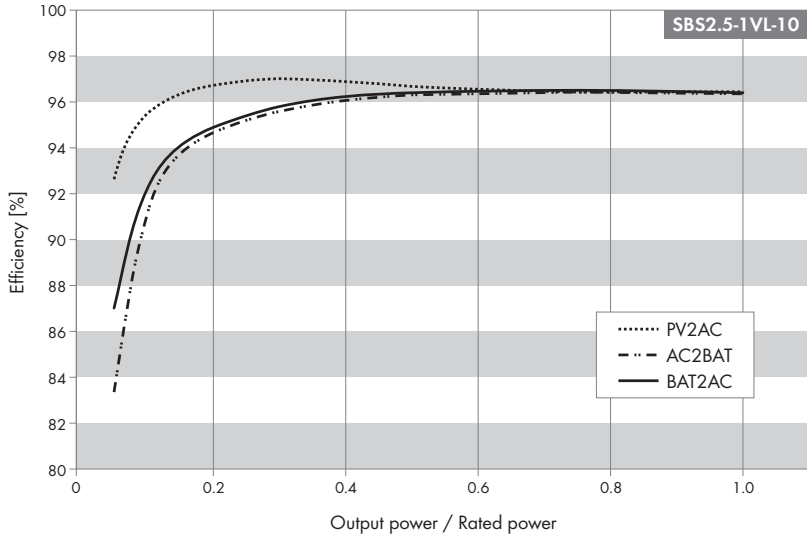
Standby losses of the power conversion system

Power consumption during no-load operation (AC/DC)	8.4 W / 10 W
Power consumption in standby (AC/DC)	1.8 W / 0 W

Control characteristics of the power conversion system

Average stationary deviation of the charging power	-10 W
Average stationary deviation of the discharge power	3 W
Average downtime	< 1 s
Average recovery time	4.7 s

Efficiency Rating of the Energy Conversion Paths



5 Sunny Island

5.1 SI4.4M-12

Characterization of the PV storage system

	PV2AC	PV2BAT	AC2BAT	BAT	BAT2AC	BAT2PV
Energy paths	✓	-	✓	✓	✓	-

AC Connection

Nominal charging power	3300 W
Nominal discharge power*	3300 W

* Rated output power BAT2AC

Battery Connection

Battery voltage*	41 V / 48 V / 63 V
Nominal charging power**	2500 W
Nominal discharge power	2500 W

* Nominal voltage or minimum/nominal/maximum voltage

** Rated output power AC2BAT

Battery

Mercedes-Benz Energy Storage Home 5.0

Battery voltage*	39.7 V / - / 54 V
Battery capacity**	3.75 kWh / 3.74 kWh / 3.69 kWh
Battery efficiency	94.3% / 95.5% / 95.2%
Power consumption of the battery management system (no-load operation/standby)	6 W / 4 W

* Rated output power AC2BAT

** At 100% and, if applicable, 50% and 25% of the nominal charging/discharge power

Standby losses of the power conversion system

Power consumption during no-load operation (AC/DC)	3 W / 16.1 W
Power consumption in standby (AC/DC)	0 W / 7.7 W

Control characteristics of the power conversion system

Average stationary deviation of the charging power	-10 W
--	-------

Average stationary deviation of the discharge power	6 W
Average downtime	1.2 s
Average recovery time	6.5 s

Efficiency Rating of the Energy Conversion Paths

