Sungrow Hybrid inverters – Sizing the AC cable

Disclaimer

The material in this document has been prepared by Sungrow Australia Group Pty. Ltd. ABN 76 168 258 679 and is intended as a guideline to assist solar installers for troubleshooting. It is not a statement or advice on any of the Electrical or Solar Industry standards or guidelines. Please observe all OH&S regulations when working on Sungrow equipment.

Overview:

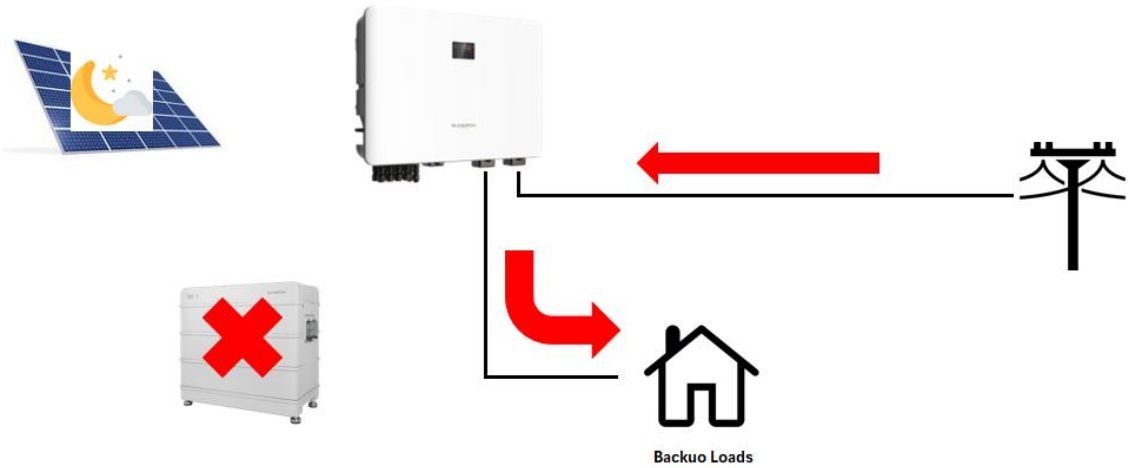
Hybrid inverters operate differently from normal grid inverters in relation to AC supply cable calculations.

With a grid inverter, the calculation is based on the AC output of the inverter.

On a Hybrid inverter, the AC input must be taken into account.

Scenario 1:

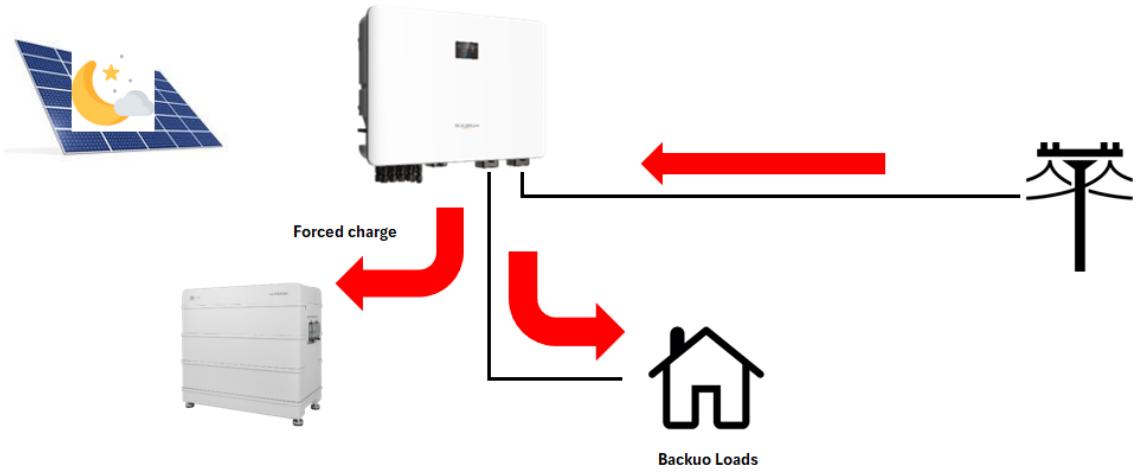
In the case where it is night time, and there is no PV energy, and the battery is discharged, all power for the backup loads will flow from the grid, through the inverter, and out to the backup loads. Depending on the inverter and loads, this can be as high as 63A.



Scenario 2:

Forced charging. The end user may, for whatever reason, decide they want to force charge the battery.

As there is no PV available, this current also comes from the AC supply.



Total possible current:

It is entirely possible that both scenarios are in play at the same time, and can in some cases result in currents double what a normal inverter may be.

How to calculate:

On all Hybrid data sheets, the total max AC import power is listed. This is the magik number we use to calculate the max possible AC current, and therefore the size of cable required.

Two examples are shown below.

Type designation	SH5.0RS	SH6.0RS
Input (DC)		
Recommended max. PV input power	12000 Wp	13000 Wp
Max. PV input voltage *	600 V	
Min. PV input voltage / Startup input voltage	40 V / 50 V	
Rated PV input voltage	360 V	
MPPT operating voltage range **	40 V – 560 V	
No. of independent MPP trackers	2	
No. of PV strings per MPPT	1 / 1	
Max. PV input current	32 A (16 A / 16 A)	
Max. DC short-circuit current	40 A (20 A / 20 A)	
Max. current for input connector	20 A	
Battery data		
Battery type	Li-ion battery	
Battery voltage range	80 V - 460 V	
Max. charge *** / discharge current ***	30 A / 30 A	
Max. charge / discharge power	6600 W	
Input / Output (AC)		
Max. AC power from grid	12000 VA	13000 VA
Rated AC output power	4999 W	6000 W
Max. AC output apparent power	4999 VA	6000 VA
Rated AC output apparent power	4999 VA	6000 VA
Rated AC output current (at 230 V)	21.7 A	26.1 A
Max. AC output current	22.7 A	27.3 A
Rated AC voltage	230 V	

Example – SH5.0/6.0RS

Type designation	SH8.0RS	SH10RS
Input (DC)		
Recommended max. PV input power	16000 Wp	20000 Wp
Max. PV input voltage *	600 V	
Min. PV input voltage / Startup input voltage	40 V / 50 V	
Rated PV input voltage	360 V	
MPPT operating voltage range **	40 V – 560 V	
No. of independent MPP inputs	4	
No. of PV strings per MPPT	1 / 1 / 1 / 1	
Max. PV input current	64 A (16 A / 16 A / 16 A / 16 A)	
Max. DC short-circuit current	80 A (20 A / 20 A / 20 A / 20 A)	
Max. current for input connector	20 A	
Battery data		
Battery type	Li-ion battery	
Battery voltage range	80 V – 460 V	
Max. charge / discharge current	50 A *** / 50 A ***	
Max. charge / discharge power	10000 W / 10000 W	
Input and Output (AC)		
Max. AC power from grid	14500 VA	
Rated AC output power	8000 W	9999 W
Max. AC output apparent power	8000 VA	9999 VA
Max. AC output current	36.4 A	45.5 A
Rated AC voltage	1 / N / PE, 220 V / 230 V / 240V	
AC voltage range	154 V – 276 V	

Example SH8.0/10RS

If the issue still persists, please take photos testing on site and contact Sungrow Service Department on 1800 786 476 or email to service@sungrowpower.com.au.