

Sungrow Hybrid range – AC current requirements for Grid and backup connections

Disclaimer

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Overview:

Some Sungrow Hybrid inverters are designed for 'Whole House Backup' operation.

All Sungrow hybrids have two functions that require power from the AC connection:

- Backup supply (when there is no PV or battery power available).
- Forced charging of the battery from the grid.

AC cable sizing considerations:

When calculating what size of AC cable and cable protection is required, the installer must take into consideration the information on the data sheet, in respect to AC grid, and Off-Grid currents.

The below cross reference will help with this determination.

Installer must use the calculation methodology that is mandatory in the standards.

	On-Grid mode			Off-Grid / Backup mode		Grid connection	
Inverter Model	Max AC pass-through (Backup port)	Max AC Passthrough current (per phase) at 230V		Max power on Backup (Surge not shown)**	Max AC Backup current (per phase) at 230V**	Max power from Grid	Rated current AC supply cable per phase at 230V
SH5.0RS	6 kW	27.3 A		5 kW	21.7 A	12 kVA	52.1 A
SH6.0RS	6 kW	27.3 A		6 kW	26.0 A	13 kVA	56.5 A
SH8.0RS	14.5 kW	63 A		8 kW	34.7 A	14.5 kVA	63 A
SH10RS	14.5 kW	63 A		9.99 kW	43.4 A	14.5 kVA	63 A

SH5.0RT	12.5 kVA	18 A		5 kW	7.2 A	12.5 kVA	18 A
SH10RT	12.5 kVA	18 A		9.999 kW	14.4 A	20.6 kVA	29.8 A
SH5T	43 kW	63 A		5 kVA	7.2 A	43 kVA	63 A
SH10T	43 kW	63 A		10 kVA	14.4 A	43 kVA	63 A
SH15T	43 kW	63 A		15 kVA	21.7 A	43 kVA	63 A
SH20T	43 kW	63 A		20 kVA	28.9 A	43 kVA	63 A
SH25T	43 kW	63 A		25 kVA	36.2 A	43 kVA	63 A

* For reference only. Please use calculations as per Australian standards.

**Surge values not shown here. Please refer to the data sheet

All currents calculated on 230 VAC abd are indicative only. Installer must caculate the currents based on the installation circumstances.

RCD's:

Single-Phase: Sungrow recommend Type B, although type A 'may' be successfully used.

Three-Phase: Type B should ideally be used.

Type AC

Type AC RCDs detect residual sinusoidal alternating currents. Type AC RCDs are suitable for general use and cover most of the applications in practice.

Type A

In addition to the detection characteristics of type AC RCDs, Type A RCDs detect pulsating DC residual current. Such waveforms can be caused by diode or thyristor rectifier circuit in electronic loads. Type A RCD are specifically intended to be used for single phase class 1 electronic loads.

Type F

Type F RCDs is a new RCD type recently introduced in IEC 62423 and in IEC60755. In addition to the detection characteristics of type A RCDs, type F RCDs are specially designed for circuit protection where single phase variable speed drives could be used. In these circuits, the waveform of residual current could be a composite of multi-frequencies including motor frequency, convertor switching frequency and line frequency. For the reason of energy efficiency, the use of frequency converters in certain loads (washing machine, air conditioner, ...) is increasing, and type F RCD will cover those new applications.

Type F also has enhanced disturbance withstand characteristics (non-tripping on surge current). They are capable of tripping even if a pure direct current of 10 mA is superimposed on a sinusoidal or pulsed DC differential current.

Type B

Type B RCDs can detect sinusoidal AC, pulsating DC, composite of multi-frequency as well as smooth DC residual currents. In addition, tripping conditions are defined with different frequencies from 50Hz to 1kHz. In an AC electrical distribution network, a pure DC residual current can be mainly generated from three-phase rectifying circuits, but also from some specific single phase rectifiers.

Type B RCD are intended to be used for loads with three-phase rectifier, such as variable speed drives, PV system, EV charging station and medical equipment.