

HYD 5...20KTL-3PH Generator User Guide

This feature supports the battery charging from a diesel generator connected at the GRID connection of the hybrid inverter HYD 5...20KTL-3PH from SofarSolar.

Important: to support this feature, the firmware version must be at least V090101_01_03

Energy storage mode selection

1. Generator mode – manual start

This mode is used to manually start to charge the battery from the generator.

The setting is done in the LCD screen, in menu System Setting – Energy Storage Mode – Genset Mode. The maximum generator input power in kW must be set according to the actual specification of the generator connected to the inverter.

2. Off-grid mode

This mode is used in pure off-grid applications, to supply the loads from battery and / or PV power.

The setting is done in the LCD screen, in the menu System Settings – Energy Storage Mode – Offgrid Mode: select “DG charge” and set the maximum generator input power in kW.

3. Automatic dry contact activation

This mode can be used in the off-grid mode, to automatically start the generator when the battery is below a specific SOC level, to recharge the battery.

The setting can be activated here: Advanced Settings – Dry Contact and select “Genset Mode”.

When this mode is active, the inverter closes the dry contact at the following conditions:

- 1) The State of Charge (SOC) falls below the limit of $(100\% - \text{EPS DOD}^* + 2\%)$.
- 2) The battery is prohibited from discharging for other reasons such as discharging current is limited to 0 A or minimum battery module voltage is reached.

In this case, 12V is provided between Pin 14 and Pin 16 of the Multi COM Port of the inverter.

The inverter opens the dry contact, 3 minutes after the battery SOC has reached $(100\% - \text{EPS DOD} + \text{EPS buffer})$ to stop the generator.

EPS DOD = Depth of Discharge during the Emergency Power Supply mode

EPS buffer = Emergency Power Supply Buffer

Both values can be set in the Menu Advanced Settings – Battery Settings – Battery 1 / 2 – EPS DOD

Dry contact Function

The dry contact can be programmed as NO or NC contact.

Genset Mode: see above

Relay Mode1: the contact opens at grid-tied operation, and closes at EPS Mode

Relay Mode2: the contact closes at grid-tied operation, and opens at EPS Mode

Disabled: Dry contact not used

Built-in countdown and rise rate

- 1) The default countdown time is 180 seconds, which corresponds to a delay of 3 minutes for the generator to warm up before it is allowed to work
- 2) Limiting the power rise rate to a fixed 6% per minute for charging from the grid when connected to the grid.

Notes

- 1) The “generator mode” or “off-grid mode” must be selected in System Settings – Energy Storage Mode to allow the generator to start.
- 2) When the generator is connected, the inverter will only allow the charging of the battery, the battery cannot be discharged to provide energy to loads connected to the LOAD connection.
- 3) In the grid-connected mode and if PV power is present, the battery can be discharged case also does not allow inverter discharge, in order to prevent power backflow generator, off-grid is not restricted.
- 4) The generator needs to be warmed up, so when the machine detects grid voltage from the generator, there is a 3-minute delay before the bypass relay is closed to carry the load
- 5) The generator needs to run for 3 minutes without load without charging and then shut down is preferable.
- 6) If the generator draws power exceeding the set maximum genset power 105% for more than 20 seconds, the inverter enters overload 2 protection and switches the bypass relay to off-grid mode
- 7) Avoid running a load when the generator is low on diesel fuel.
- 8) Set the generator input power not to the nominal generator power, leave a margin for stable operation.
- 9) In generator mode, the “unbalanced support” of the inverter cannot be discharged for three-phase balancing and should be avoided, when running a load with a large unbalance.