

# **Application Note – HPS series Quick Installation Guide**

**SegenSolar** 

 **ATESS**

# Installation

This document is a guide on the installation of the HPS series inverters.

Hardware required:

- HPS 30/50/120/150
- Pylontech Power-cube H2 batteries available on the Segen Portal: PYL-PC-H2-BAT .
- The high voltage batteries recommend setup is 11 Power-cube batteries in series with nominal voltage within 352-600V.
- BMS unit for Powercube H2 batteries available on the portal: PYL-PC-SC1000-100.
- The M-BMS unit for multiple battery racks available on the Segen Portal: PYL-PC-MBMS1000.
- BMS cable to be purchased separately.
- Automatic Transfer Switch by ATESS: AT-ATS30/50/120/150
- Shinemaster

## Setup

Dip switch settings

NB: 1 indicates on(or up) 0 indicates off(down).

1. Battery control module(SC1000-100) should be set as 100001. Please see figure 1.
2. CAN communication is required for BMS, please use the CAN/Link Port B port on the BMS unit for successful BMS communication. Please see encircled port in figure 2.



Figure 1: BMS dip switch settings



Figure 2: CAN port for BMS communication

1. CAN-A of the HPS is used for BMS communication as seen in figure 3.
2. The pins 4 and 5 of the BMS cables connected to CANH and CANL respectively as in figure 4.



Figure 3: Inverter CAN pins for BMS communication.

Pin 4 (Green)	CANH-A
Pin 5 (Blue)	CANL-A



Figure 4: BMS CAN pinouts

## Using with ATS

The ATS is used to switch between Grid and Generator power.

The HPS and ATS communicate via CAN communication.

CAN-B of the HPS is used to communicate with HPS.

A shielded ground CAN cable is used for long distance communication.



Figure 5: HPS CAN-B terminals and ground connection.



Figure 6: ATS CAN-A terminals and ground connection.

The ATS is powered by battery power from the HPS. Please see figure 7 for connection to battery terminals.



Figure 7: DC Power cable connections to ATS



Figure 8: Control board DC power breaker on ATS.

# Commissioning

## 1. Battery

Switch the battery breaker on, then press and hold start button until status indicator turns green, the rest of the status indicators should sequentially turn green. The status indicator on the controller should then go into standby mode by turning solid red. Press and hold the start button again until the status indicator turns green indicating batteries are on.

Please note that the inverter should power up using the recommended nominal battery voltage.

## Start- up

Upon battery start up the HPS LCD should come on. The inverter should be in wait state, please see figure 9. Depending on the check time, by default 60s the inverter will move from wait state to operating state "fault" and if BMS is successful the BMS state will be in discharge state as in figure 10.

When in fault mode, the HPS requires that you check the warnings menu. AC undervoltage warnings are common on battery start-up, these can be ignored at this stage. See example 1.



Figure 9: HPS in wait state



Figure 10: HPS in wait state

Time	Context
1-1 4:33:40	AC WU UnderVolt Fmt Warning
1-1 4:33:40	AC VW UnderVolt Fmt Warning
1-1 4:33:40	AC UV UnderVolt Fmt Warning

Example 1: AC under voltage

Navigating into the settings window will take you to figure 11. The main settings are navigated in the Maintenance sub-menu. As seen in figure 12, this requires a user password: 1234

This is where user sets the protection parameters, (sample calibration) control parameters, grid management and factory settings.

For more on these please see HPS user manual



Figure 11: HPS in wait state

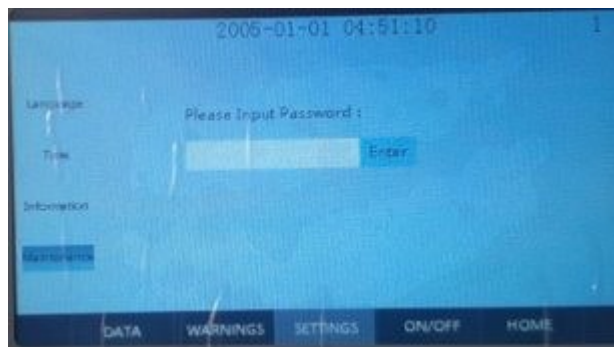


Figure 12: HPS in wait state

**NB: Please note settings have 3 columns, the description, current value and new value, to enter new value click on the new value column of that specific setting and a window will open for you to enter a numerical value, press certain to move the new value into current value column**

Please ensure that the number of cells as seen on page 2 of Protection parameters is accurate. The Powercube-H2 batteries have 15 cells each, for figure 9, the number of batteries is equivalent to 8 batteries in a single pack. Ensure that the battery capacity is correct as per battery used, these are specifically for the Powercube H2 batteries.

**NB: If this is calculated incorrectly a low/High battery voltage fault will occur.**

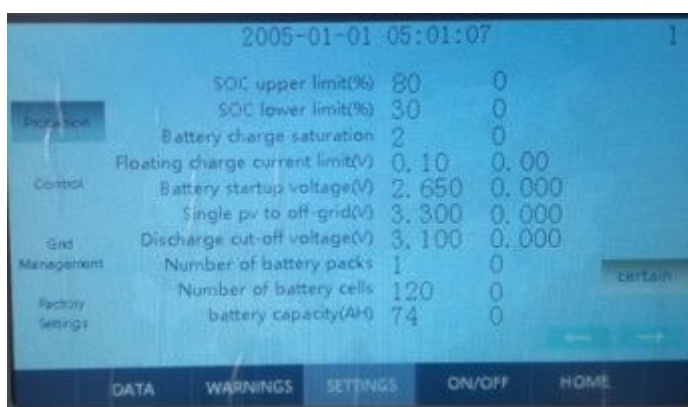


Figure 13: HPS in wait state

**NB: Please note settings have 3 columns, the description, current value and new value, to enter new value click on the new value column of that specific setting and a window will open for you to enter a numerical value, press certain to move the new value into current value column**

Control parameters are used to enable/disable functions performed by the HPS.

**Enable is indicated by 1, disable indicates 0.**

Please confirm with the below statements regarding figure 9

- Island protection mode should always be enabled to allow inverter to switch to off-grid when AC is unstable.
- Bypass cabinet is enabled when the ATS is used with the HPS.

Please set to 0 if ATS is not connected

- BMS communication enable should be set to 2 to enable two-way CAN communication between battery and inverter.
- Please note Anti-backflow enable prohibits feeding back to grid when enabled. When set to 1 inverter will NOT allow feedback to grid.
- Generator enable should be set to 1 when a generator is used with or without the ATS.
- To allow grid to charge Grid and PV charging enable should be set to 1.

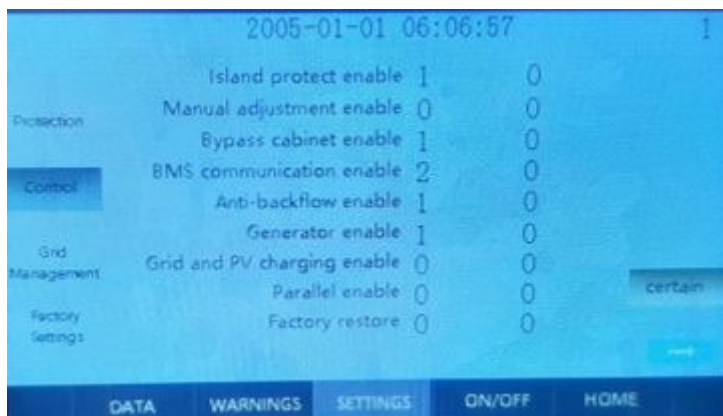


Figure 14: HPS in wait state

When user wants grid to charge battery, the on-grid operation mode should be set to 1 for Battery first.

To switch inverter ON, turn the knob in figure to ON, then press on the ON/OFF menu to switch it on. For emergencies, press emergency stop button, once it is safe to switch inverter on, please turn the emergency stop clockwise in order to engage the DC and AC contactors.



Figure 15: Grid mode select



Figure 16: Grid mode select

If BMS is not successful, the inverter battery contactor will disconnect for safety.

The bypass switch allows Utility to provide power directly to loads. Utility power does not go through the inverter when bypass breaker is on. See figure. The HPS can be repaired by switching off the PV, BATTERY and Output breakers but switch the bypass breaker on.

Please note that you can limit the power taken from grid in protection parameters. However, export power is determined by the availability of PV power after supplying load and charging the battery.



Figure 17: Inverter working in bypass mode.