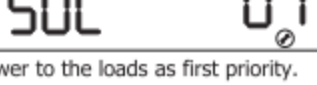
2K-3K Off Grid inverters with lithium-ion battery

Settings Introduction

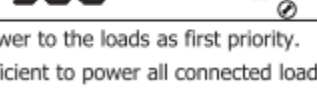
1st option: Output source Priority

Utility first (default)	
Utility will provide power to the loads as first priority. Solar and battery energy will provide power to the loads only when utility power is not available.	

Solar first	
Solar energy provides power to the loads as first priority. If solar energy is not sufficient to power all connected loads, battery energy will supply power the loads at the same time. Utility provides power to the loads only when any one condition happens: - Solar energy is not available - Battery voltage drops to either low-level warning voltage or the setting point in program 12.	

Low level warning voltage: 21th option + 2V

If you want to make full use of solar energy. The option can be chosen.

SBU priority	
Solar energy provides power to the loads as first priority. If solar energy is not sufficient to power all connected loads, battery energy will supply power to the loads at the same time. Utility provides power to the loads only when battery voltage drops to either low-level warning voltage or the setting point in program 12.	

If you want to make full use of battery energy. The option can be chosen.

Once SBU is chosen, 12^{th},13^{th} option need to be set.

2nd option: Charging current

02	Maximum charging current: To configure total charging current for solar and utility chargers. (Max. charging current = utility charging current + solar charging current)	80▲ 02 48V 5KVA/4KVA model:default 60A, 10A~140A settable 48V 3KVA/2KVA MPPT model:default 30A, 10A~45A settable 48V 3KVA/2KVA PWM model:default 65A, 10A~65A settable 48V 3KVA/2KVA MPPT model:default 60A, 10A~80A settable 24V 3KVA/2KVA PWM model:default 80A, 10A~80A settable （If Li is selected in program 5,this program can't be set up)	

For single lithium-ion battery, the charging current should be less than 30A . Or too large charging current will cause BMS protection on battery.

3rd option: AC input voltage range

03	AC input voltage range	APL 03 Appliance (default)	If selected, acceptable AC input voltage range will be within 90~280VAC
		UPS 03 UPS	If selected, acceptable AC input voltage range will be within 170~280VAC
		GEN 03 Generator	If selected, acceptable AC input voltage range will be within 90~280VAC

If you utility input is not stable, you can choose GEN 03, it accepts wide voltage range. Or unstable voltage will affect inverter.

Fourth option:

04	Power saving mode enable/disable	SdS 04 Saving mode disable (default)	If disabled, no matter connected load is low or high, the on/off status of inverter output will not be effected.
		SEN 04 Saving mode enable	If enabled, the output of inverter will be off when connected load is pretty low or not detected.

Default value is Sd5, If it is enabled, when the load is lower than 150W, inverter will stop AC output. **Please highlight the point.**

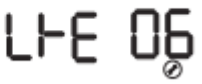
5th option:

05	Battery type	AGM (default) 	User-Defined  If "User-Defined" is selected, battery charge voltage and low DC cut-off voltage can be set up in program 19, 20 and 21.
		Flooded 	
		Lithium  (Only suitable when communicated with BMS)	

If lithium-ion battery is in compatibility list, LI 05 can be chosen.

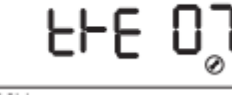
If lithium-ion battery is not in the compatibility list, US2 can be used, which is specially designed for lithium-ion battery without communication.

6th option:

06	Auto restart when overload occurs	Restart disable (default) 	Restart enable 

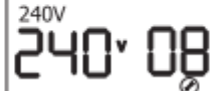
Default value is ok.

7th option:

07	Auto restart when over temperature occurs	Restart disable (default) 	Restart enable 

Default value is ok.

8th option:

08	Output voltage	230V (default) 	220V 
		240V 	208V 

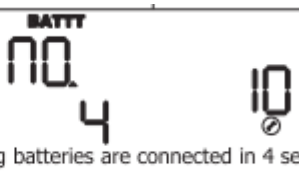
Default value is ok.

9th option:

09	Output frequency	50Hz (default) 	60Hz 

Default value is ok.

10th option:

10	Number of series batteries connected	 (e.g. Showing batteries are connected in 4 series)

It is fixed value. It means that your inverter matches 24V or 48V battery system. 48V will show 4, 24V will show 2.

11th option:

11	Maximum utility charging current	 48V model: default 30A, 10A~60A Settable(4KVA/5KVA) 24V model: default 20A, 20A~30A Settable(2KVA/3KVA) 48V model: default 10A, 10A~15A Settable(2KVA/3KVA) (If Li is selected in program 5,this program can't be set up)

Set max utility input charging current.

If Li is selected in program 5, it can't be modified.

12th option:

12	Setting voltage point back to utility source when selecting "SBU priority" or "Solar first" in program 01	 48V model: default 46.0V, 44.0V~51.2V Settable 24V model: default 23.0V, 22.0V~25.6V Settable

It is used to set the battery voltage point that comes back to utility input. If battery voltage is lower than the voltage point, it will transfer to utility input and charge the battery.

13th option:

13	Setting voltage point back to battery mode when selecting "SBU priority" or "Solar first" in program 01	 48V model: default 54.0V, 48.0V~58.0V Settable 24V model: default 27.0V, 24.0V~29.0V Settable

It is used to set the battery voltage point that comes back to battery supply. If battery voltage is higher than the voltage point, it will transfer to battery mode.

14th option:

14	Charger source priority: To configure charger source priority	If this off grid solar inverter is working in Line, Standby or Fault mode, charger source can be programmed as below:	
		Solar first 	Solar energy will charge battery as first priority. Utility will charge battery only when solar energy is not available.
		Utility first 	Utility will charge battery as first priority. Solar energy will charge battery only when utility power is not available.
		Solar and Utility 	Solar energy and utility will both charge battery.
		Only Solar 	Solar energy will be the only charger source no matter utility is available or not.
		If this off grid solar inverter is working in Battery mode or Power saving mode, only solar energy can charge battery. Solar energy will charge battery if it's available and sufficient.	

It is battery charging source priority.

C50 means solar first, Solar energy will charge the battery as first priority. Utility input will charge battery only when solar energy is not available.

CUT means Utility first, utility will charge the battery as first priority. Solar energy will charge battery only when utility power is not available.

SNU means solar energy and utility will both charge battery.

050 means solar energy will be the unique charging source no matter utility input is available or not.

15th option:

15	Alarm control	Alarm on (default) buzz ON 015	Alarm off buzz OFF 015

Default value is ok.

16th option:

16	Backlight control	Backlight on (default) LCdb ON 016	Backlight off LEdb OFF 016

Backlight of LCD. Default value is ok.

17th option:

17	Beeps while primary source is interrupted	Alarm on (default) ALAr ON 017	Alarm off ALAr OFF 017

Primary source means Solar power.

18th option:

18	Overload bypass: When enabled, the unit will transfer to line mode if overload occurs in battery mode.	Bypass disable (default) byP dIS 018	Bypass enable byP ENA 018

Line mode means utility input mode. When overload occurs on battery mode, inverter will switch to utility input.

19th option:

19	Bulk charging voltage (C.V voltage). If self-defined is selected in program 5, this program can be set up	C.V 56.4V 019 Default:56.4V,48.0V~58.4V Settable

For lithium-ion battery, you need to confirm how many cells inside the battery. Like Pylontech battery, just 15 cells, so when 15 cells:

Bulk Charging voltage 52.5 V

If 16 cells inside the lithium-ion battery:

Bulk Charging voltage: 56.5V

Floating Voltage: 54V

20th option:

20	Floating charging voltage. If self-defined is selected in program 5, this program can be set up	 Default:54.0V,48.0V~58.4V Settable

For lithium-ion battery, you need to confirm how many cells inside the battery. Like Pylontech battery, just 15 cells, so when 15 cells:

Floating voltage range: 52.5V

If 16 cells inside the lithium-ion battery:

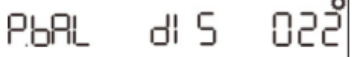
Floating voltage range: 54V

21th option:

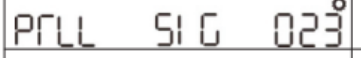
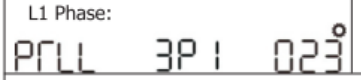
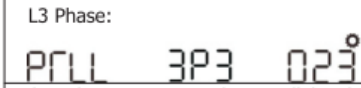
Low DC cut-off voltage means when the battery voltage reaches cut-off voltage, inverter will force utility input to charge the battery until 50% so that it can protect battery system.

For lithium-ion battery, 46V or 20%-50% is ok.

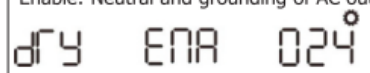
22th option:

22	Solar power balance. When enabled, solar input power will be automatically adjusted according to connected load power.	Solar power balance enable (Default): 	If selected, solar input power will be automatically adjusted according to the following formula: Max. input solar power = Max. battery charging power + Connected load power.
		Solar power balance disable: 	If selected, the solar input power will be the same to max. battery charging power no matter how much loads are connected. The max. battery charging power will be based on the setting current in program 2. (Max. solar power = Max. battery charging power)

23th option:

23	AC output mode *This setting is only available when the inverter is in standby mode (Switch off).	Single:  Parallel:  L1 Phase:  L2 Phase:  L3 Phase:  When the units are used in parallel with single phase, please select "PAL" in program 23. It requires 3 inverters to support three-phase equipment, 1 inverter in each phase. Please select "3P1" in program 23 for the inverters connected to L1 phase, "3P2" in program 23 for the inverters connected to L2 phase and "3P3" in program 23 for the inverters connected to L3 phase. Be sure to connect share current cable to units which are on the same phase. Do NOT connect share current cable between units on different phases. Besides, power saving function will be automatically disabled.

24th option:

24	Allow neutral and grounding of AC output is connected together: When enabled, inverter can deliver signal to trigger grounding box to short neutral and grounding (for expansion)	Disable: Neutral and grounding of AC output is disconnected. (Default)  Enable: Neutral and grounding of AC output is connected.  This function is only available when the inverter is working with external grounding box. Only when the inverter is working in battery mode, it will trigger grounding box to connect neutral and grounding of AC output.