Wall-mounted 5KW Inverter User Manual

FENGRUI [2025]-[FR5K-SP]

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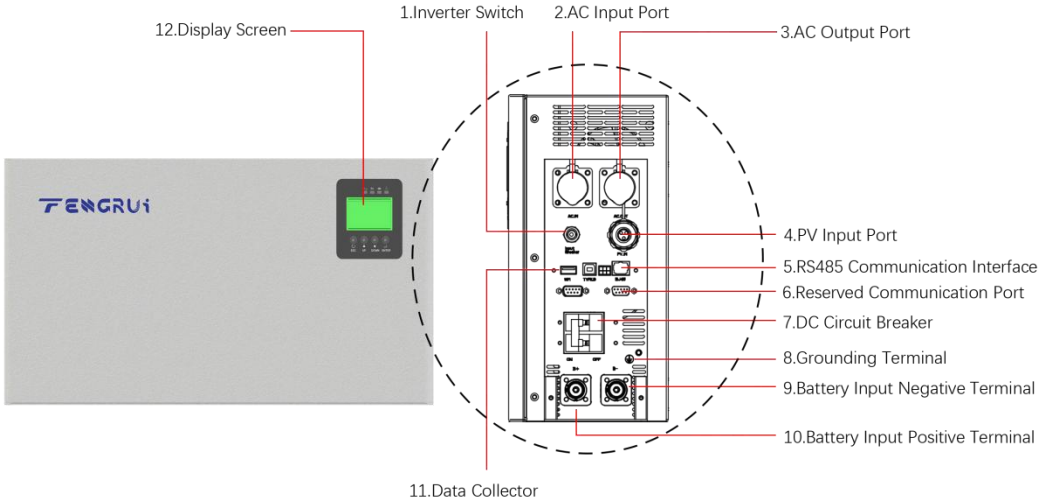


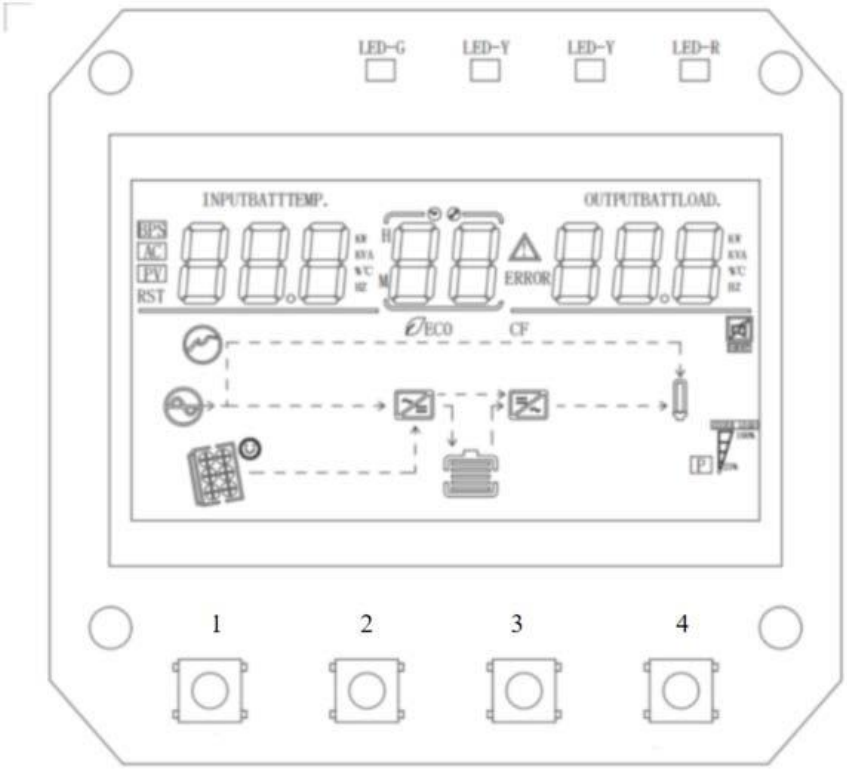
Inverter Interface Description:

1. **Inverter Switch:** Turns the inverter on/off. The battery power supply must be operational for 40 seconds before operating. If an abnormality occurs due to premature activation, turn this switch off and then back on.
2. **AC Input Port:** Connect wires according to the labels inside.
3. **AC Output Port:** Connect wires according to the labels inside.
4. **PV Input Port:** Connect wires according to the labels inside. Distinguish between PV+ and PV- ports; do not reverse the connections.
5. **RS485 Communication Interface:** For communication between the inverter and the battery BMS (Battery Management System).
6. **Reserved Communication Port:** Reserved for future use.
7. **DC Circuit Breaker:** Controls the DC power circuit.
8. **Grounding Terminal:** For connecting the grounding wire.
9. **Battery Input Negative Terminal:** Connect the battery's negative (-) cable.
10. **Battery Input Positive Terminal:** Connect the battery's positive (+) cable.
11. **Data Collector:** For detailed operation, refer to the manual included in the packaging.
12. **Display Screen:** See the screen panel instructions below for operation.

Screen Panel Instructions

1.1 Screen Panel Instructions

Four-Button Screen



1.1-1 Four-Button Functions

Button	Function
Function/Confirm	Press **Button 4** for >2 seconds to enter settings. Use Buttons 2/3 to navigate. Press **Button 1** (0.1–2 seconds) to confirm.
Page/Query	Press **Buttons 2/3** (>0.1 seconds) to switch pages.

1.1.2 LED Indicator Functions

Figure 1-1

LED Indicator	Name	Status
LED-G	Input (Green)	Solid: Grid power normal. Blinking: Grid detected but inactive. Off: Grid abnormal.
LED-Y	Inverter (Yellow)	Solid: Operating in battery mode. Off: Other statuses.
LED-Y	Battery (Yellow)	Solid: Float charging. Blinking: Constant voltage charging. Off: Other statuses.
LED-R	Warning (Red)	Solid: Inverter fault. Blinking: Inverter warning. Off: Normal.

1.1.3 LCD Display

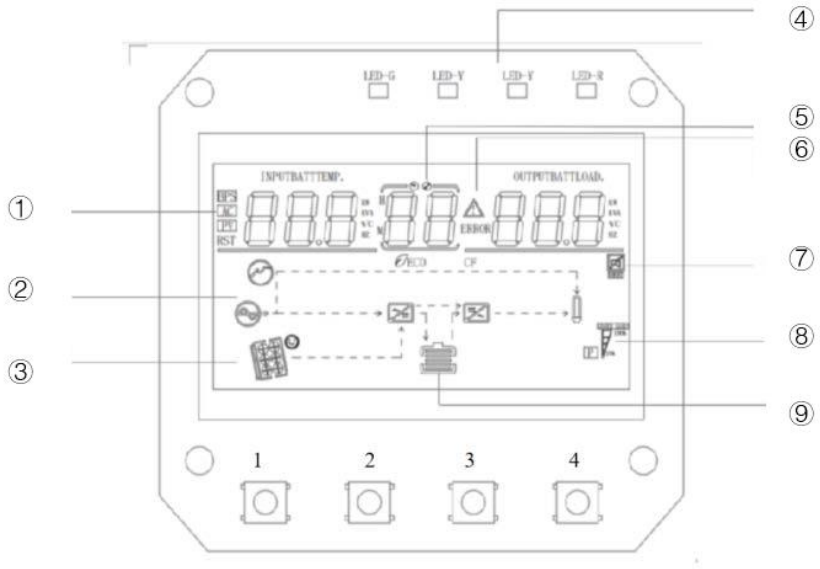


Figure 1-2 3/4 Button LCD Display

① Numerical Display and Function Settings Area

② Operating Mode Icon

③ PV Voltage Icon

④ LCD Display Icon

⑤ Setting Icon

⑥ Fault Icon

⑦ Mute Icon

⑧ Load Icon

⑨ Battery Capacity Display

The LCD display can be divided into: Icon Display, Numerical Display, Function Setting Area, and Operating Mode Display Area.

Icon Display:

- **Load and Battery Icons:**

The load and battery icons graphically represent their respective capacities. Each grid block indicates 25% capacity. The load icon blinks when the inverter is overloaded. The battery icon blinks when the battery capacity is critically low or the battery is disconnected.

- **Buzzer Icon:**

The buzzer icon indicates whether the buzzer is muted. Normally, this icon is hidden. If the background software sets MUTE ON in any mode, the inverter enters silent operation, and the "buzzer muted" icon appears.

- **Settings Icon:**

The settings icon illuminates when entering the setup menu and remains hidden in all other cases.

- **Fault Icon:**

The fault icon is displayed only in fault mode and hidden otherwise.

Numerical Display and Function Settings Area:

- This area displays inverter-related information in non-setting mode. In normal mode, output parameters are shown. Use the Up/Down navigation keys (Button 2 or 3, or Button 2 in a three-button setup) to cycle through: Input voltage & output voltage、Input frequency & output frequency、Battery voltage & current、PV voltage & PV current、PV voltage & power、Output power & output voltage、

Output apparent power & output voltage、 Load percentage & output voltage、 Software version、 In fault mode, fault codes are displayed.

- Function Settings Mode: Use the function setting keys and Up/Down navigation keys to configure parameters such as output voltage (OPU) and battery low-voltage shutdown point (EOd).

Operating Mode Display Area:

- After 4 seconds of startup, this area shows the inverter's operating mode, including: Standby mode, Utility mode, Battery mode, Fault mode

1.1.4 Buzzer Status Table Corresponding to Inverter Operating Modes

Buzzer Warning	Condition
Continuous (10 seconds)	Fault Mode
Three Beeps	PV voltage/input voltage lost or restored.
	Main switch turned ON/OFF.
1-second intervals (1 minute)	General warnings (e.g., low battery in battery mode).

1.2 Daily Startup and Shutdown

Refer to this manual for startup and shutdown operations.

1.2.1 Startup Procedure

Ensure the battery voltage exceeds 11.5V per cell or the grid power input range matches the output mode.

➢ Grid Power Startup

Connect to a stable grid power supply. Turn the switch to ON.

If set to Grid Priority, the system will initialize and display Grid Mode on the panel after startup.

➢ Battery Startup

Connect a functioning battery. Turn the switch to ON. The inverter will establish a working power supply.

The system will automatically start up and display Battery Mode on the panel after initialization.

1.2.2 Shutdown Procedure

While operating in Battery Mode or Grid Mode:

Press the switch to OFF. The system will shut down.

1.2.3 Mute Operation

Mute ON/OFF: Enable or disable the buzzer sound in any mode via the MUTE setting in the LCD menu.

1.2.4 Handling Alarms

If the buzzer sounds intermittently and the fault LED blinks:

Check the alarm code on the LCD. Troubleshoot based on the alarm description or contact the supplier.

1.2.5 Handling Faults

If the buzzer sounds continuously and the fault LED stays solid:

Note the fault code displayed on the LCD. Contact technical support or a certified technician for assistance.

1.3 Parameter Query

Display Pages

Normal Mode: 10 display pages. Use Button 2/3 (4-button screen) or Button 2 (3-button screen) for 0.2–1 second to cycle through:

Input/Output Voltage, Input/Output Frequency, Battery Voltage/Current, PV Voltage/Current, Load Percentage, Software Version, Alarm/Fault Codes (if triggered).

Default Display: Output voltage and frequency (no alarms/faults).

Polling Mode

Activate: Long-press Button 2 (3-button screen) for >1 second. Pages auto-cycle every 2 seconds.

Deactivate: Long-press Button 2 again.

Display Page 1: Main Interface

Shows Input/Output Voltage of Inverter (see Figure 1-3).

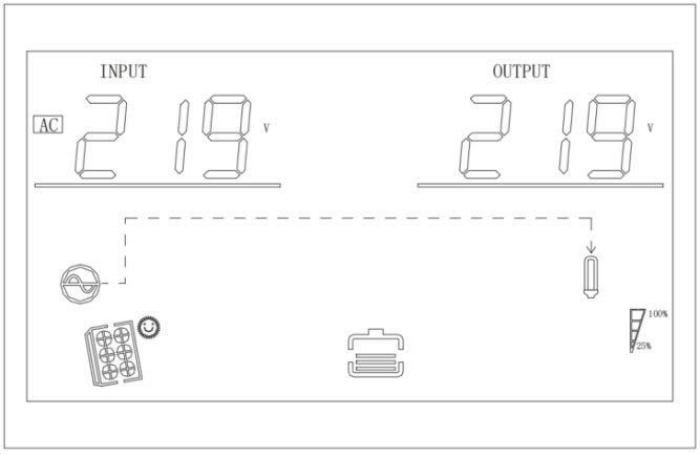


Figure 1-3 Display Page 1

Display Page 2: Inverter Information

Shows Input/Output Frequency of Inverter (see Figure 1-4).

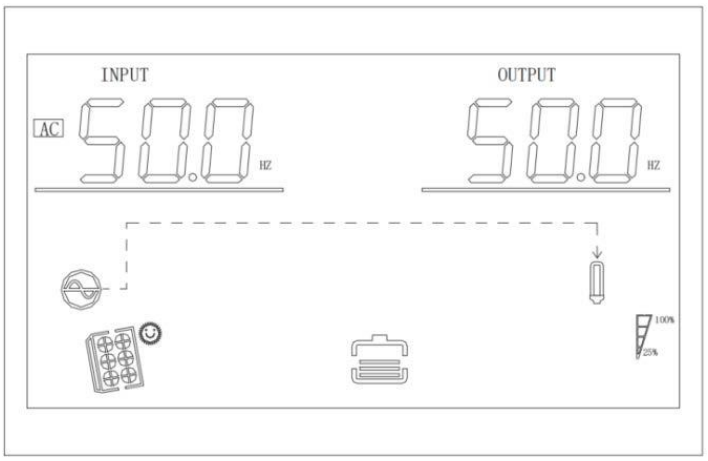


Figure 1-4 Display Page 2

Display Page 3: Battery Information

Shows Battery Voltage & Battery Charging Current (see Figure 1-5).

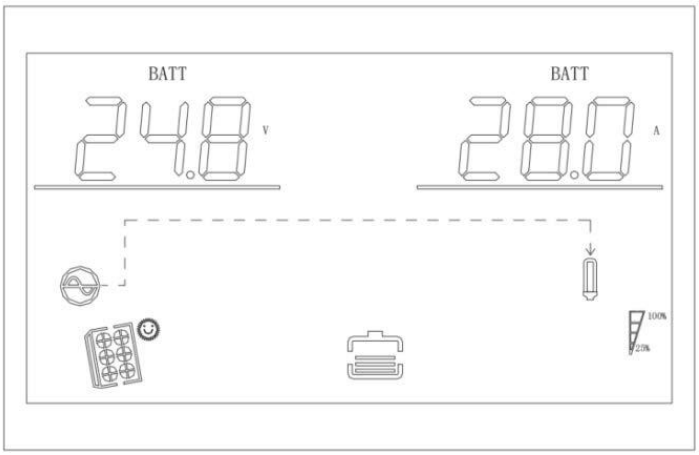


Figure 1-5 Display Page 3

Display Page 4: PV Information

Shows PV Voltage & PV Charging Current (see Figure 1-6).

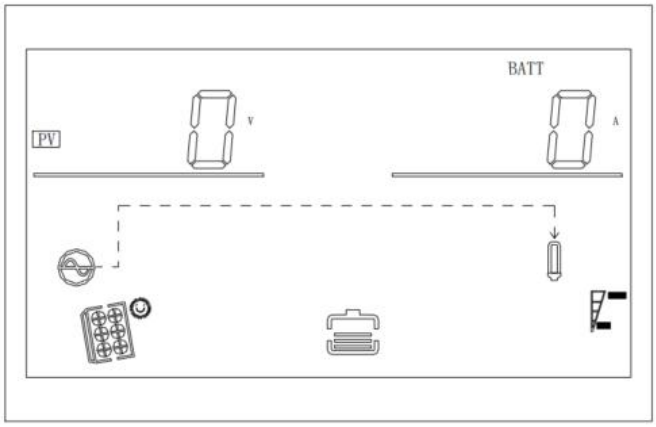


Figure 1-6 Display Page 4

Display Page 5: PV Information

Shows PV Voltage & PV Power (see Figure 1-7).

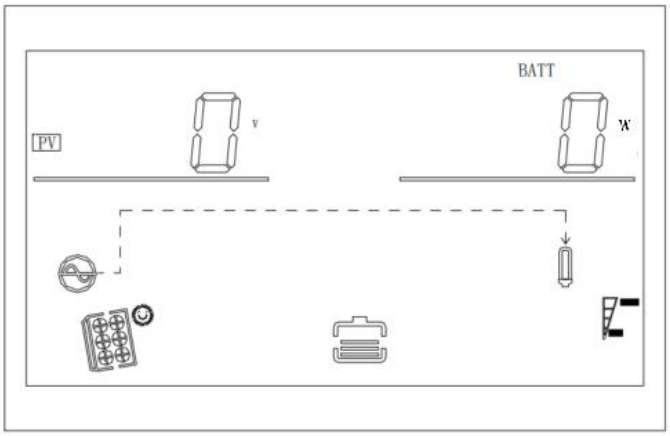


Figure 1-7 Display Page 5

Display Page 6: Output Information

Shows Output Power & Output Active Power (see Figure 1-8).

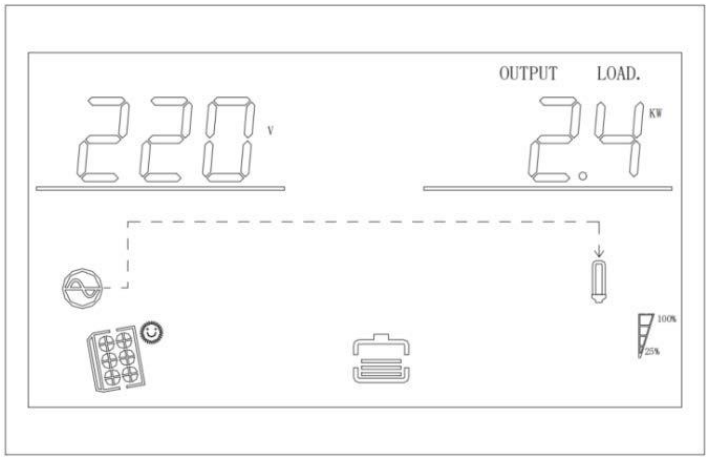


Figure 1-8 Display Page 6

Display Page 7: Output Information

Shows Output Voltage & Output Complex Power (see Figure 1-9).

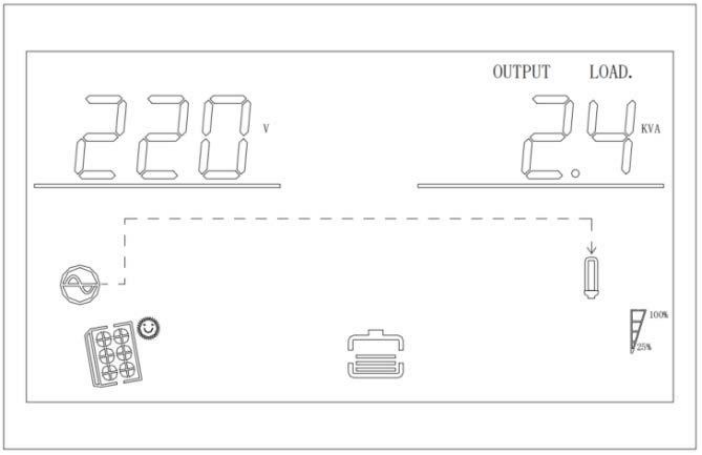


Figure 1-9 Display Page 7

Display Page 8: Output Information

Shows Output Display Voltage and Load Percentage (see Figure 1-10).

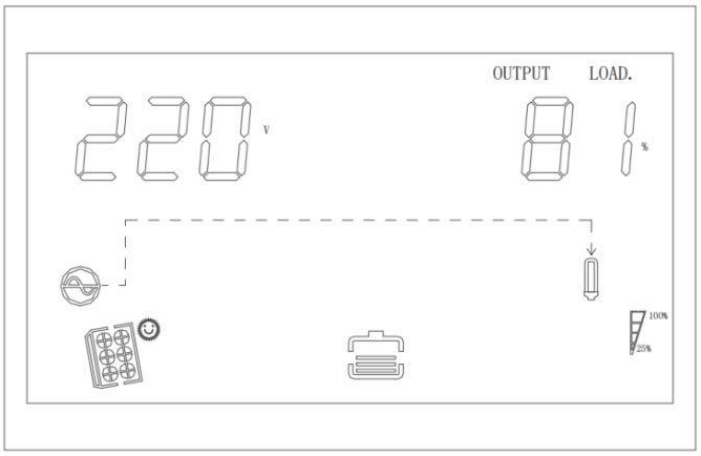


Figure 1-10 Display Page 8

Display Page 9: Software Version

Shows Software Version of Inverter System (see Figure 1-11).

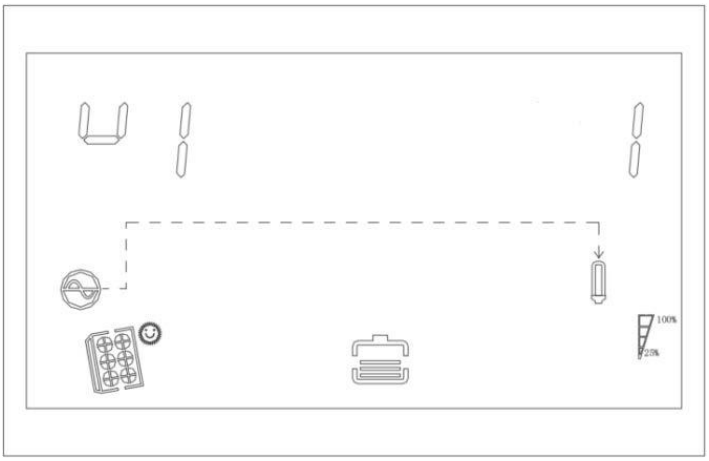


Figure 1-11 Display Page 9

Display Page 10: Software Version

- 3KVML/3KVP: Displays the MPPT system software version (see Figure 1-12).
- 5KVMH: Displays photovoltaic power generation data (see Figure 1-13).

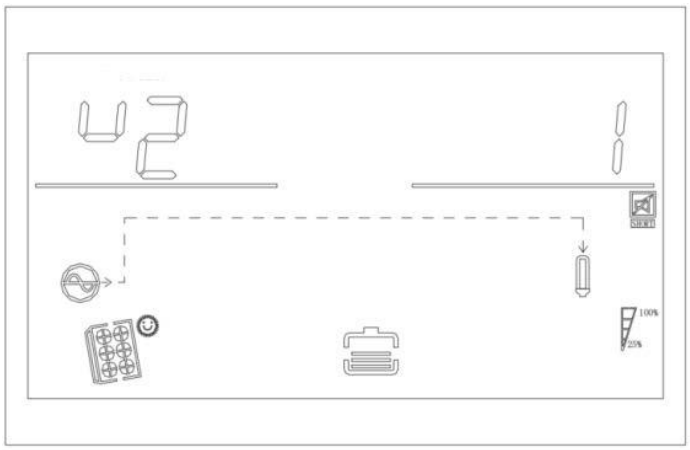


Figure 1-12 Display Page 10 (Software Version)

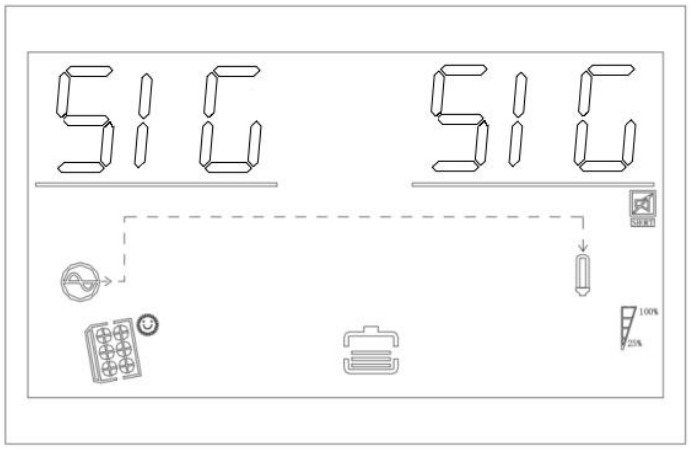


Figure 1-13 Display Page 10 (PV Power)

Display Page 11: Parallel Status

- 3KVML/3KVP: This page is not applicable.
- 5KVMH: Displays photovoltaic power generation data (see Figure 1-14).

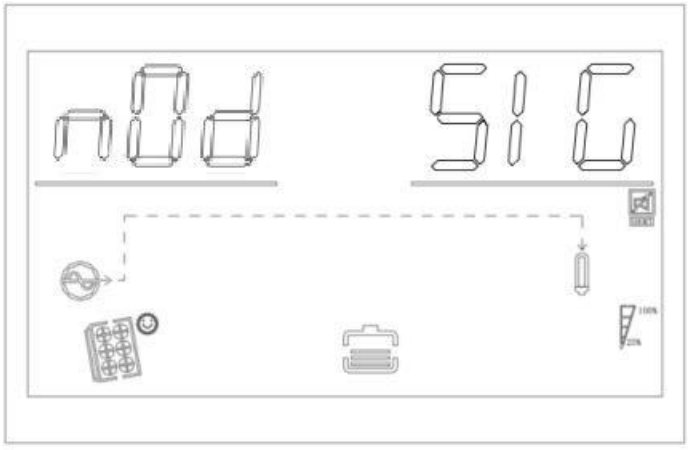


Figure 1-14: Display Page 11 (Parallel Status)

Display Page 12: Lithium Battery Networking Status

Top-right indicator:

SIG (steady): Single battery pack in operation.

PAR (steady): Multiple battery packs in parallel/series operation.

PAR (blinking): Establishing parallel/series connections.

Display Page 13: Lithium Battery Voltage/Current Information

Top-left: BMS battery voltage.

Top-right: BMS battery current.

BMS communication failure: Both fields display blinking ERR.

Display Page 14: Lithium Battery Temperature & SOC

Top-left: BMS temperature.

Top-right: BMS State of Charge (SOC).

BMS communication failure: Both fields display blinking ERR.

Display Page 15: Lithium Battery Capacity

Top-left: Rated capacity.

Top-right: Current capacity.

BMS communication failure: Both fields display blinking ERR.

Display Page 16: Lithium Battery Constant Voltage (CV) Point

Top-left: Fixed label CV.

Top-right: BMS constant voltage charging point.

BMS communication failure: Both fields displays blinking ERR.

Display Page 17: Lithium Battery Fault/Alarm Information

Top-left: BMS alarm details.

Top-right: BMS fault details.

BMS communication failure: Both fields display blinking ERR.

1.4 Function Settings Operation

Steps to Access/Exit Function Settings

- Enter Settings:

Press and hold Button 4 (3-key screen: Button 3) for >2 seconds to enter the settings menu. Use Buttons 2/3 (3-key screen: Button 2) for 0.1–2 seconds to navigate pages. The selected function will blink.

- Select Function:

Press Button 4 (3-key screen: Button 3) for 0.1–2 seconds to enter the selected function's submenu. The function label will stay lit, and its parameter value will blink. Use Buttons 2/3 (3-key screen: Button 2) for 0.1–2 seconds to adjust the parameter value.

- Confirm and Save:

Press Button 4 (3-key screen: Button 3) for 0.1–2 seconds to confirm. The parameter value will stop blinking.

Press Button 1 for >0.1–2 seconds to exit settings and return to the main display (or wait 30 seconds for auto-exit).

1.4.1 Output Voltage (OPU)

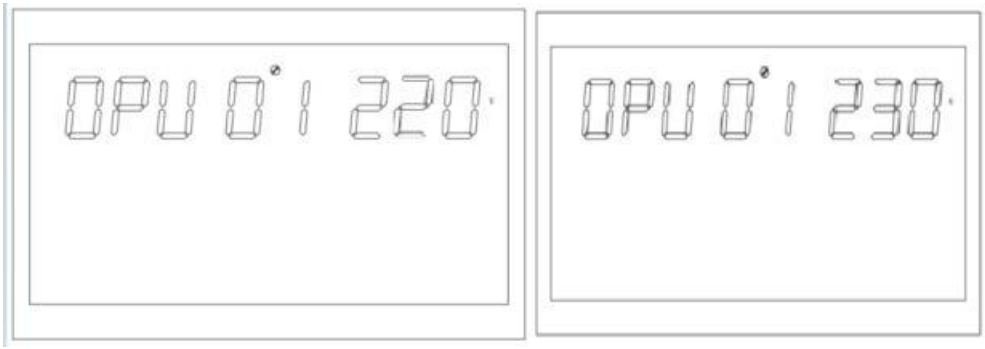


Figure 1-12 Output Voltage Setting Page

- Output Voltage (OPU) Settings:

Default: 230V. Adjustable to 208V, 220V, 230V, 240V. Settings take effect immediately.

- Enter Settings:

Press and hold Button 4 (3-key screen: Button 3) for >2 seconds to enter the settings menu. Use Buttons 2/3 (3-key screen: Button 2) for 0.1–2 seconds to navigate to the OPU page. The "OPU" label will blink.

- Select Voltage:

Press Button 4 (3-key screen: Button 3) for 0.1–2 seconds to enter the OPU submenu. The "OPU" label will stay lit, and the voltage value will blink. Use Buttons 2/3 (3-key screen: Button 2) for 0.1–2 seconds to cycle through options: 208V, 220V, 230V, 240V. By default, the output voltage is 230V, and the settings are saved in real-time.

- Confirm:

Press Button 4 (3-key screen: Button 3) for 0.1–2 seconds to save. The selected voltage will stay lit.

Press Button 1 for >0.1–2 seconds to exit, or wait 30 seconds for auto-exit.

Note:

When set to 208V, output power is derated to 90%.

1.4.2 Other Function Settings

1.4.2.1 Output Frequency (OPF)

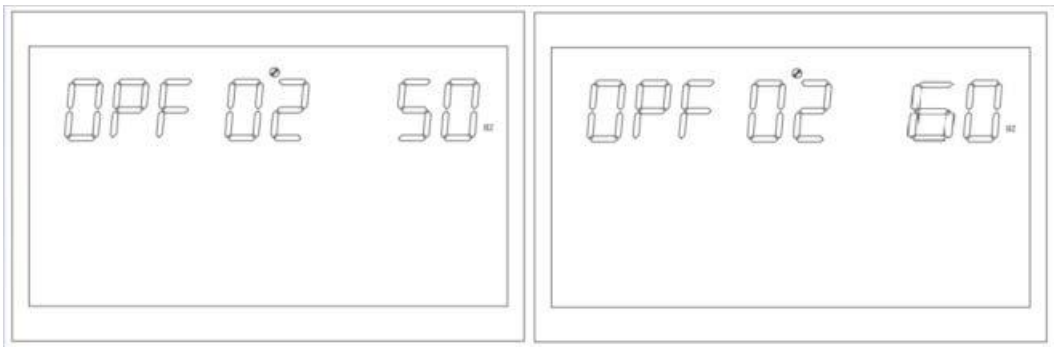


Figure 1-13: Output Frequency Settings

Function: Configurable output frequency (50Hz/60Hz), default 50Hz.

Conditions:

Battery mode: Takes effect after next system reboot

Grid mode: Immediate effect

When switching back to battery mode, frequency changes gradually

1.4.2.2 Output Priority (OPP)

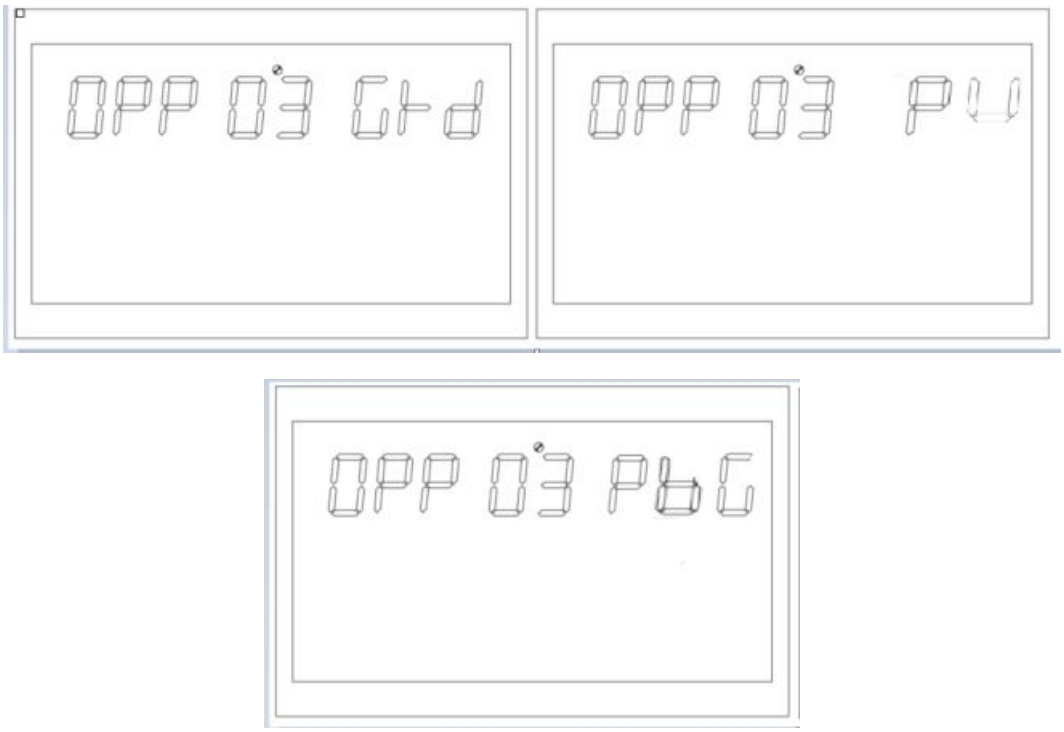


Figure 1-14: Output Priority Settings

Function: Three output priorities:

GRD (Grid Priority) - Default

PU(PV) (PV Priority)

PBG (PV-Battery-Grid Priority)

Conditions: Instant effect after configuration

1.4.2.3 Output Mode (MOD)

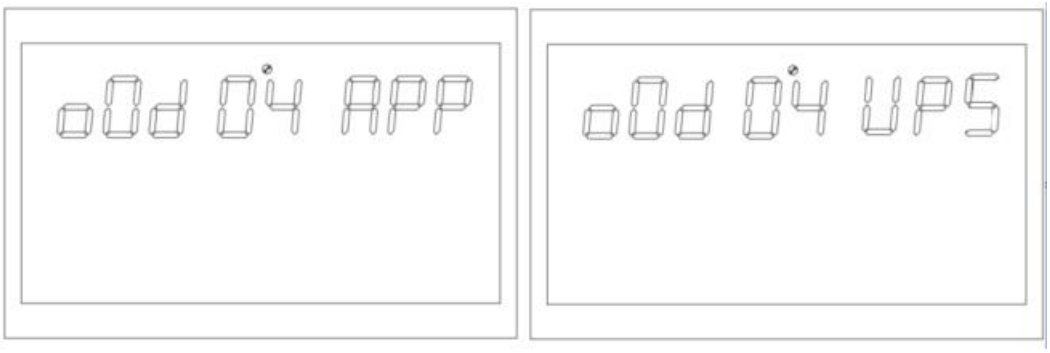


Figure 1-15: Output Mode Settings

Function: Two modes:

1. APP (Appliance Mode) - Default for household appliances
2. UPS Mode - For computer equipment (Typical switching time: 10ms)

Conditions: Instant effect

1.4.2.4 Charging Priority (CHP)

Figure 1-16: Charging Priority Settings

Function: Four charging priorities:

1. PNG (PV + Grid Simultaneous) - Default
2. OPV (PV Only)
3. GRD (Grid Priority)

4. PV (PV Priority)

Conditions: Instant effect

1.4.2.5 Grid Charge Current (RCC)

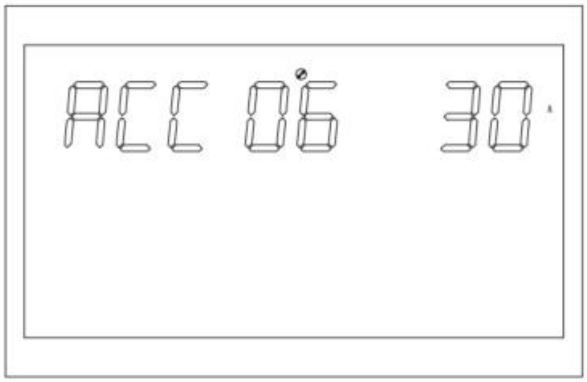


Figure 1-17: Grid Charge Current Settings

Function: Sets maximum grid charging current:

- 3K VML-24V: 40A default (Range: 2-60A)
- 3K VP-24V: 40A default (Range: 2-50A)
- 5K VMH-48V: 30A default (Range: 2-80A)

Conditions: Configurable in all states

1.4.2.6 Maximum Charge Current (MCC)

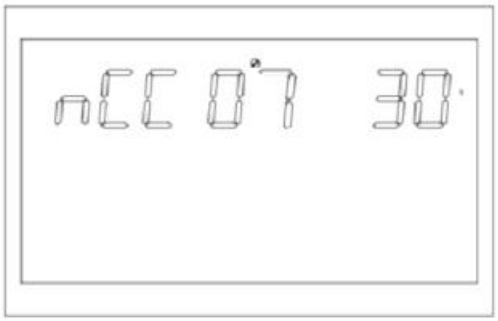


Figure 1-18: Maximum Charge Current Settings

Function: Sets combined PV+Grid max current:

- 3K-VML-24V: 2/10/20/30/40/50/60/70/80/90/100/110/120A
- 3K-VP-24V: 2/10/20/30/40/50/60/70/80/90/100A
- 5K-VMH-48V: 2/10/20/30/40/50/60/70/80A

Conditions: Configurable in all states

1.4.2.7 Menu Default (MDF)

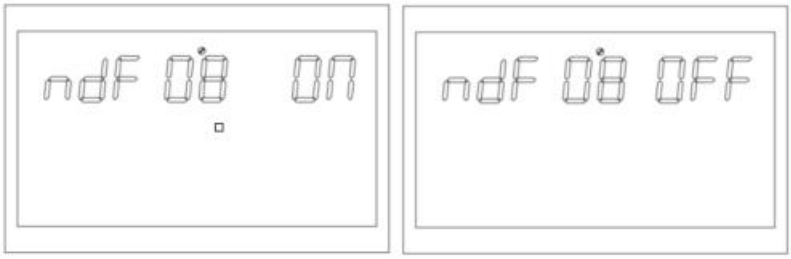


Figure 1-19: Menu Default Settings

Function:

- ON (Default): Returns to P1 screen after 1min inactivity
- OFF: Maintains current screen indefinitely

Conditions: Always configurable

1.4.2.8 Overload Restart (LrS)

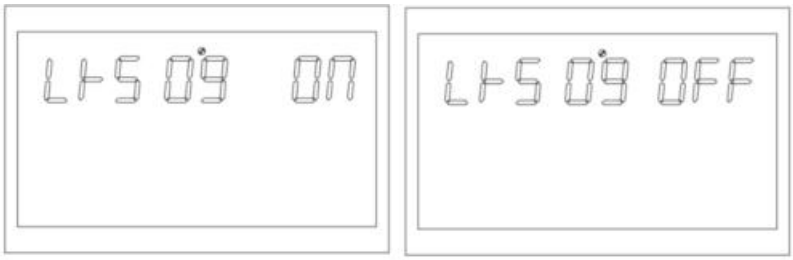


Figure 1-20: Overload Restart Settings

Function: Automatic restart after overload (Default: ON)

1.4.2.9 Overtemperature Restart (TrS)

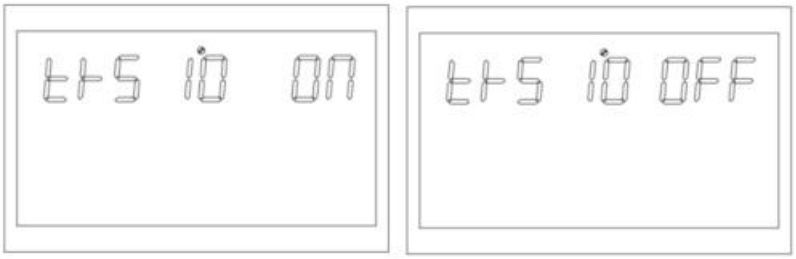


Figure 1-21: Overtemperature Restart Settings

Function: Automatic restart after overheating (Default: ON)

1.4.2.10 Main Input Loss Alarm (MIP)

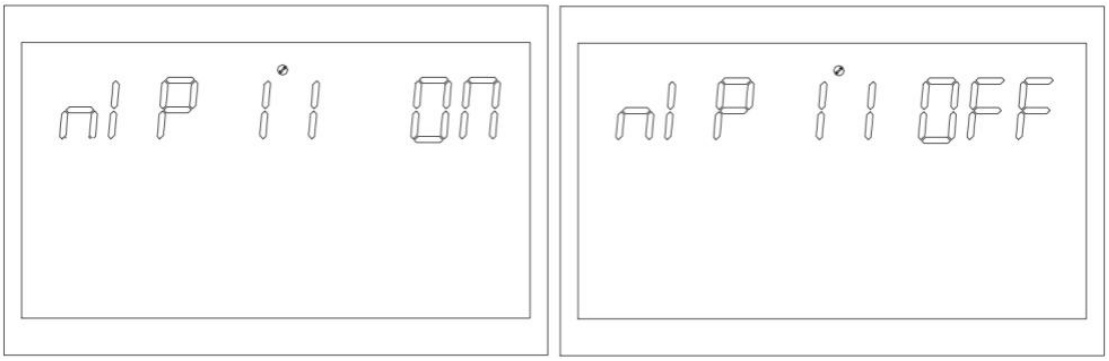


Figure 1-22: Main Input Loss Alarm Settings

Function:

- ON (Default): Continuous 3s buzzer alarm on input loss
- OFF: Disables alarm

1.4.2.11 Power Saving Mode (PWS)

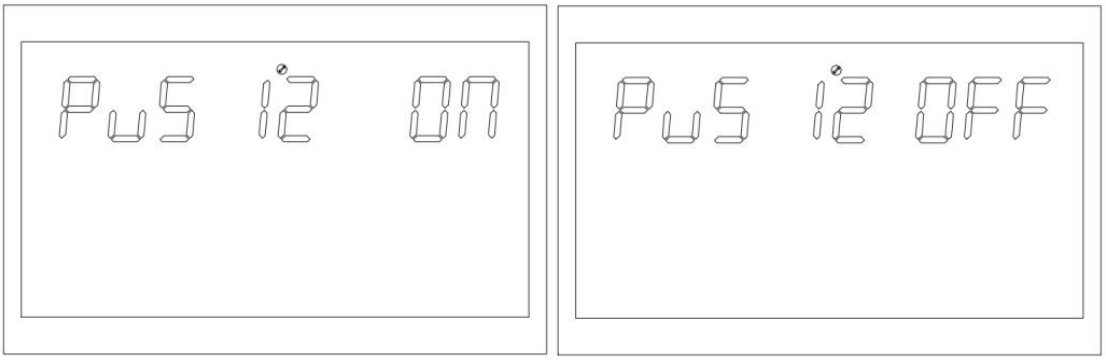


Figure 1-23: Power Saving Mode Settings

Function:

- OFF (Default): Standard operation
- ON: Suspends output in battery mode below 25W load, resumes above 35W

Conditions: Only configurable in standalone mode

1.4.2.12 Overload Bypass (OLG)

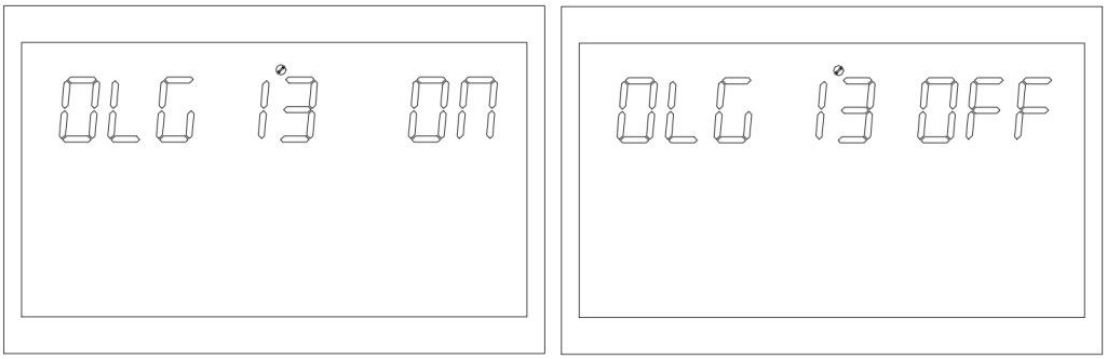


Figure 1-24: Overload Bypass Settings

Function:

- OFF (Default): Maintains battery mode during overload
- ON: Auto-switches to grid bypass during overload

1.4.2.13 Mute Settings (MUE)

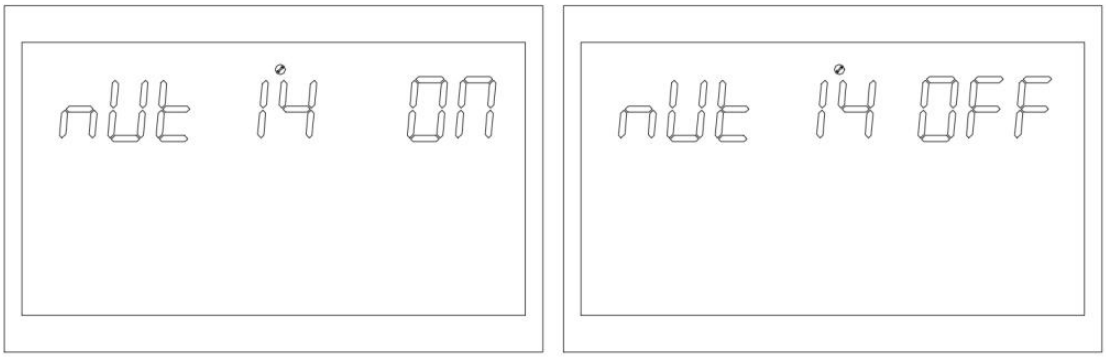


Figure 1-25: Mute Settings

Function:

- OFF (Default): Audible alarms enabled
- ON: Disables all buzzer alerts

1.4.2.14 Back to Grid Voltage (BTG)

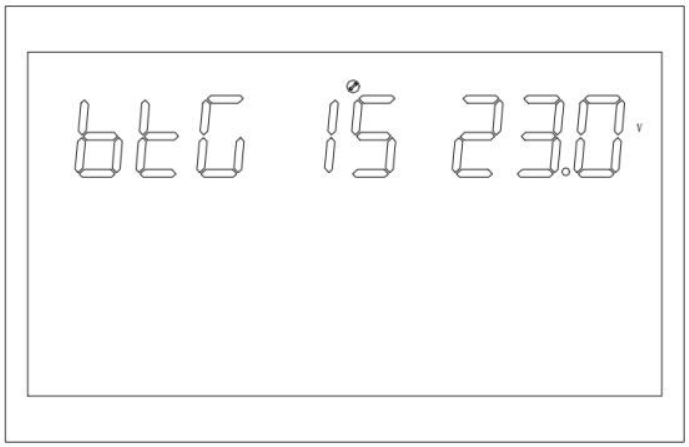


Figure 1-26: Back to Grid Voltage Settings

Function: Battery cutoff voltage for grid switchover:

Model	Default	Custom Range	LIB Range
24V Systems	23V	22-26V	20-25V (23.8V)
48V Systems	46V	44-52V	40-50V (47.6V)

Conditions: Applies to PV/PBG priority modes

1.4.2.15 Back to Battery Voltage (BTB)

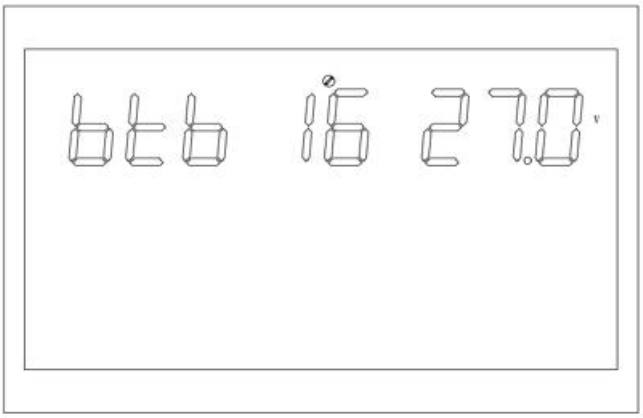


Figure 1-27: Back to Battery Voltage Settings

Function: Recovery voltage threshold:

Model	Default	Custom Range	LIB Range
24V Systems	26V	24-29V	23-29V (27.2V)
48V Systems	52V	48-58V	46-58V (54.4V)

Special Option: FUL (Full charge required)

1.4.2.16 Battery Type (BAT)

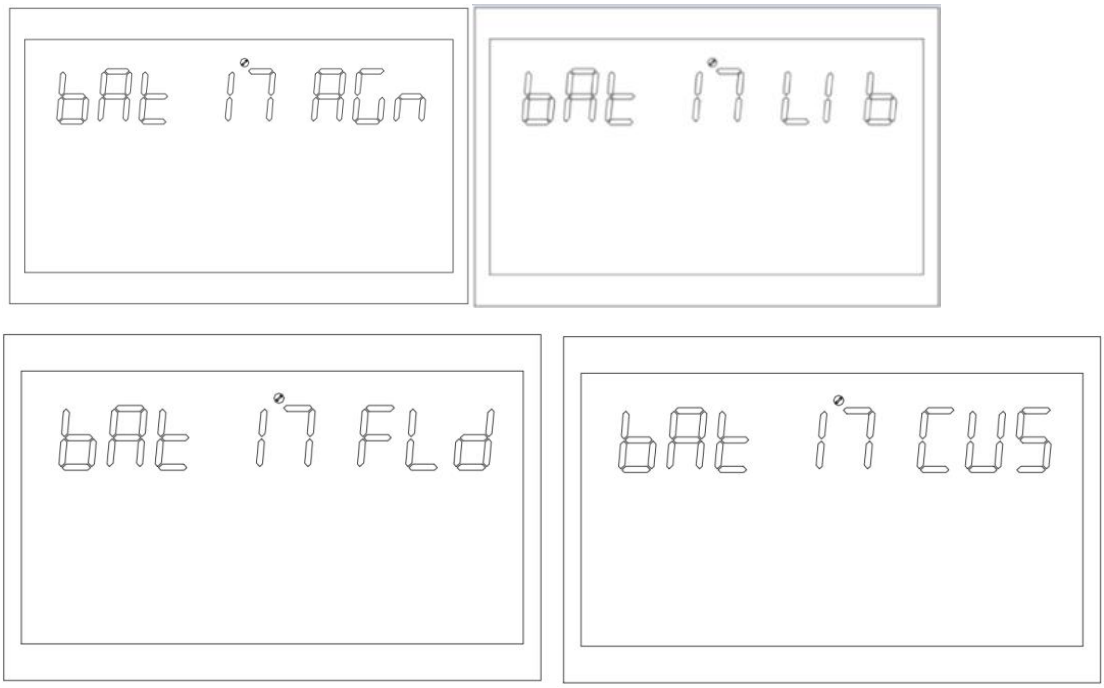


Figure 1-28: Battery Type Settings

Options:

1. AGM (Default)
2. FLD
3. LIB (Enables always-on display)
4. CUS

1.4.2.17 Battery Low Voltage Alert (bAL)

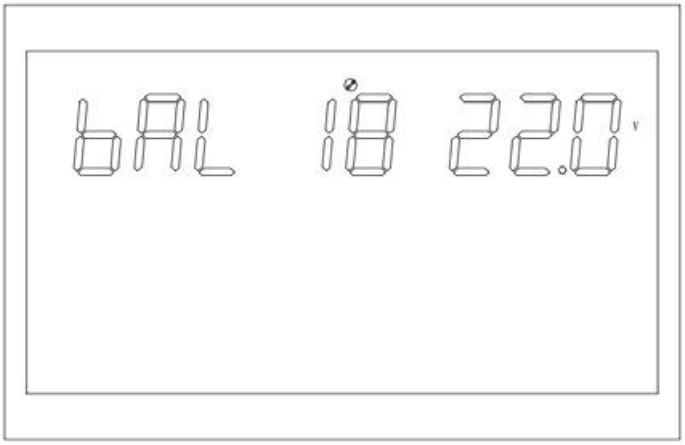


Figure 1-29: Battery Low Voltage Alert Settings

Function: Configurable only for LIB/CUS types:

Model	Default	Custom Range	LIB Range
24V Systems	21.6V	21-27V	20.6-25.0V
48V Systems	44V	42-54V	41.2-50.0V

1.4.2.18 Battery Shutdown Voltage (bAU)

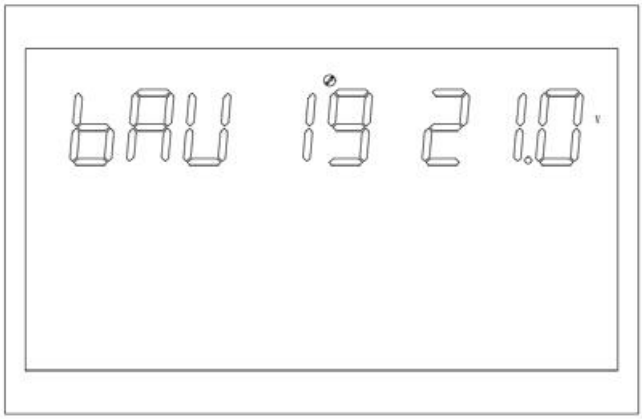


Figure 1-29: Battery Shutdown Voltage Settings

Function: Configures battery undervoltage shutdown threshold

Conditions:

- Not configurable for AGM/FLD battery types
- Available for CUS/LIB types

Model	Default	CUS Range	LIB Default	LIB Range
24V Systems	21V	20-24V	23V	20-24V
48V Systems	42V	40-48V	46V	40-48V

1.4.2.19 Constant Voltage Mode Voltage Point Setting (bCV)

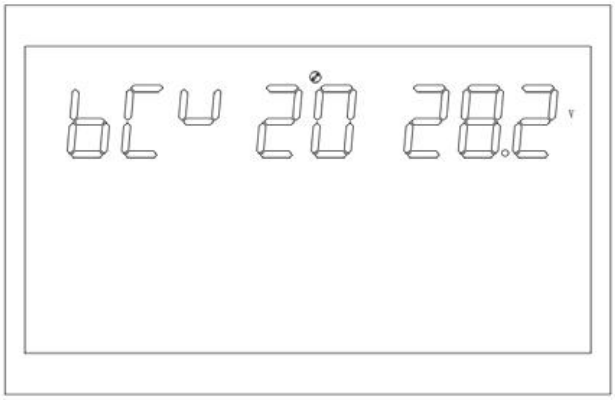


Figure 1-30 Constant Voltage Mode Voltage Point Setting Page

Function: Sets absorption/constant voltage stage

Conditions:

- Not configurable for AGM/FLD types (preset values):

AGM: 28.2V (24V)/56.4V (48V)

FLD: 29V (24V)/58V (48V)

- Configurable for CUS/LIB types with voltage > float charge level

Configuration	24V Systems	48V Systems
CUS Range	24-29V (must > float)	48-60V (must > float)
LIB Default	28.2V	56.4V
LIB Range	25-29V (must > float)	48-60V (must > float)

1.4.2.20 Float Charge Mode Voltage Point Setting (bFL)

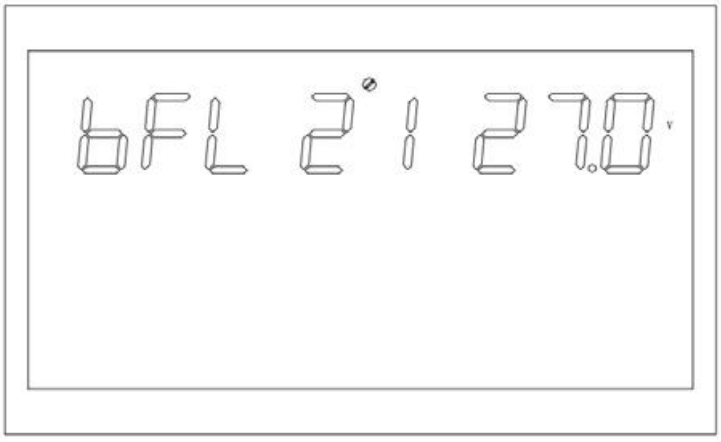


Figure 1-31 Float Charge Mode Voltage Point Setting Page

Function: Configures battery float charge voltage

Conditions:

- Not adjustable for AGM/FLD types (preset values):

AGM/FLD Defaults:

24V Systems: 27V

48V Systems: 54V

- Configurable for CUS/LIB types with voltage < constant voltage level

Configuration	24V Systems	48V Systems
CUS Range	26.6-27.8V*	48-60V*
LIB Default	27.6V	55.2V
LIB Range	24-28V*	50-58V*

* Constant voltage (bCV) must always exceed float voltage (bFL)

1.4.2.21 Line Low Voltage Point Setting (LLV)

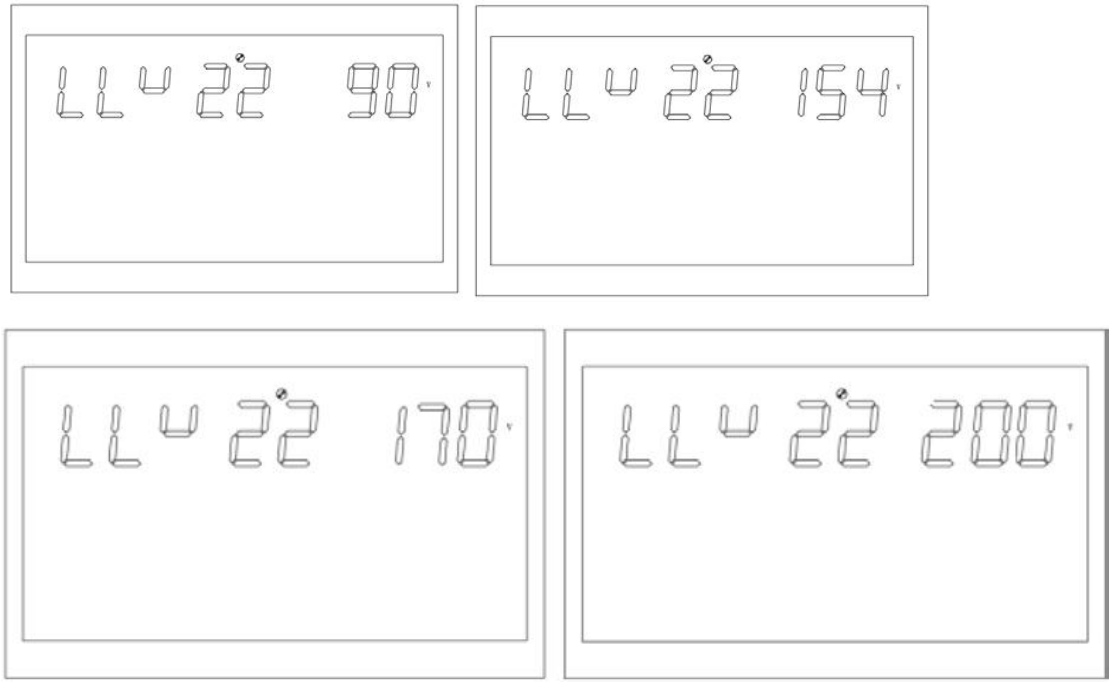


Figure 1-32 Inverter Mode Line Low Voltage Point Setting Page

Function: Sets undervoltage threshold for grid input

Conditions:

- APP Mode:

Default: 154V (Range: 90-154V)

- UPS Mode:

Default: 185V (Range: 170-200V)

1.4.2.22 Line High Voltage Point Setting (LHV)

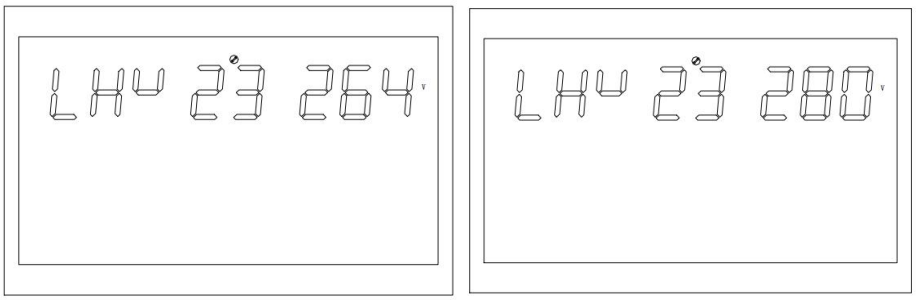


Figure 1-33 Inverter Mode Line High Voltage Point Setting Page

Function: Sets overvoltage threshold for grid input

Conditions: APP Mode only

- Default: 264V (Range: 264-280V)

1.4.2.23 Low Power Discharge Time Setting (LWD)

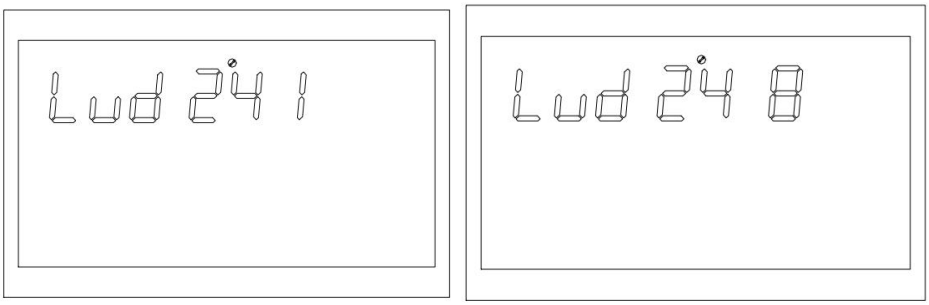


Figure 1-34 Low Power Discharge Time Setting Page

Function: Prevents deep discharge during low-load battery operation

Conditions: APP Mode

- Default Timer: 8hrs (Range: 1-8hrs)
- Battery Shutdown Voltage Adjustment:

24V Systems: 22V (Triggered after timer expires)

48V Systems: 44V (Triggered after timer expires)

Safety Logic:

- Resets if battery voltage exceeds 13.2V/cell for 30s

1.4.2.24 Inverter Soft Start Setting (SRE)

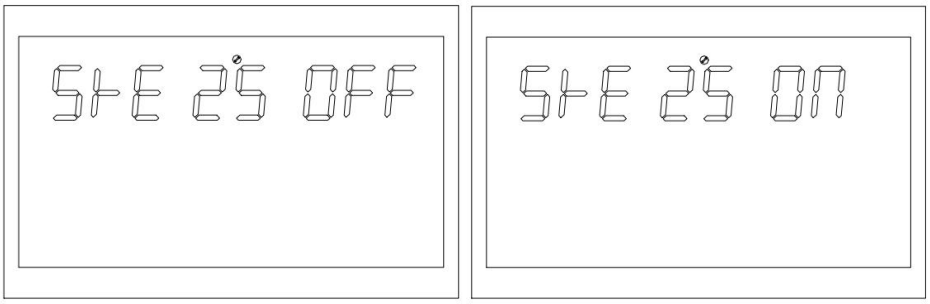


Figure 1-35 Inverter Soft Start Setting Page

Function: Controls output voltage ramp-up method

Conditions: Standalone operation mode

- OFF (Default): Instant output activation
- ON: Gradual voltage rise before relay engagement

1.4.2.25 Default Value Setting (STD)

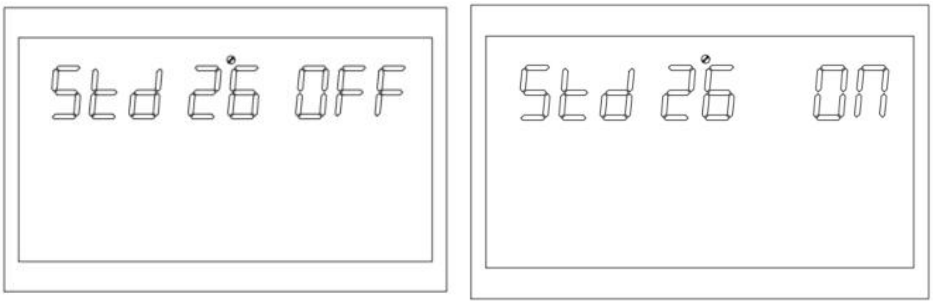


Figure 1-36 Default Value Setting Page

Function: Restores all settings to defaults

Conditions: Grid mode or standby (Not battery mode)

- Confirmation: OFF → ON → OFF (auto-revert)

1.4.2.26 Parallel Operation Mode Setting (PAM)

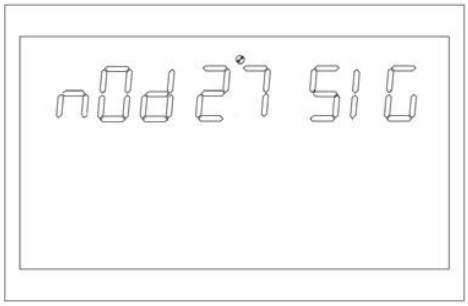


Figure 1-36 Default Value Setting Page

Function: Configures multi-unit synchronization

Conditions:

- Exclusive to 5K-VMH-48V (Grid/standby only)
- Modes:

1. SIG (Single - Default)
2. PAR (Parallel)
3. 3P1/3P2/3P3 (Three-phase)

Fault Logic:

- Mixed mode configurations trigger Fault 24

1.4.2.27 Battery Disconnected Alarm Setting (SBA)

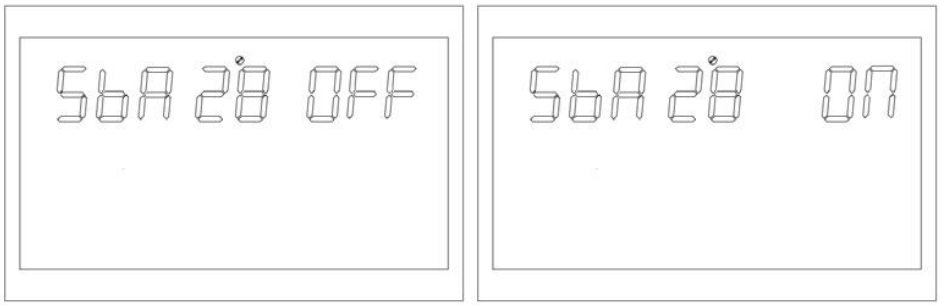


Figure 1-36 Default Value Setting Page

Function: Enables battery absence alerts

Conditions:

- Default: OFF (No alarms)
- 5K-VMH-48V exclusive in standalone mode

1.4.2.28 Equalization Mode (EQM)

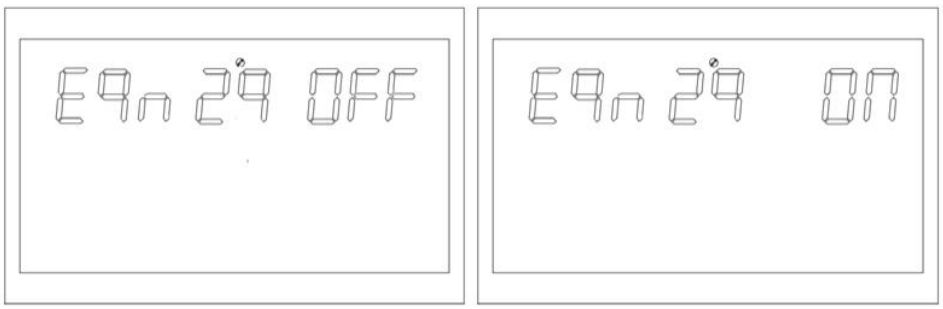


Figure 1-37 Equalization Mode Setting Page

Function: Enables battery equalization charging

Conditions: Configurable in all operational states

- OFF (Default): Equalization disabled
- ON: Activates equalization when:

Float charge duration reaches preset interval

Immediate trigger via EQN command

1.4.2.29 Equalization Voltage Point Setting (EQV)

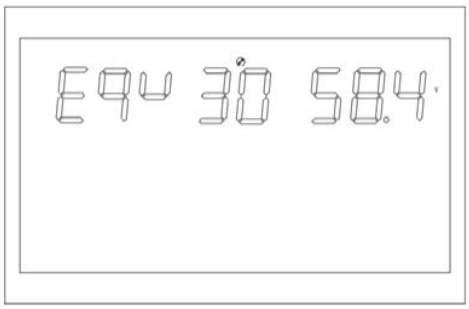


Figure 1-38 Equalization Voltage Point Setting Page

Function: Sets target voltage for equalization phase

Conditions: Configurable in all modes

System	Default	Adjustable Range
3k-VML-24V/VP	29.2V	25-31.5V
5k-VMH-48V	58.4V	48-60V

1.4.2.30 Equalization Charge Time Setting (EQT)

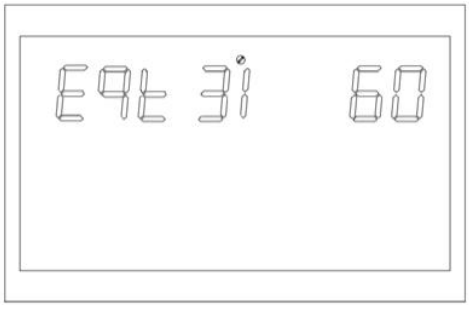


Figure 1-39 Equalization Charge Time Setting Page

Function: Duration of equalization phase

Conditions: Configurable in all states

- Default: 60 minutes
- Range: 5-900 minutes (5-minute increments)

Operation Logic:

1. Charges at maximum current until battery reaches bCV
2. Maintains bCV until timer expires

1.4.2.31 Equalization Timeout Setting (EQO)

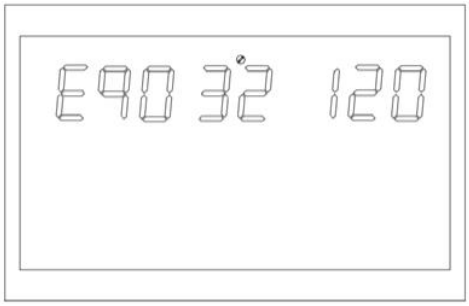


Figure 1-40 Equalization Timeout Setting Page

Function: Extended equalization duration for under-voltage scenarios

Conditions: Configurable in all states

- Default: 120 minutes
- Range: 5-900 minutes (5-minute increments)

Safety Protocol:

- Terminates equalization and reverts to float if voltage remains below bCV after timeout

1.4.2.32 Equalization Interval Setting (EQI)

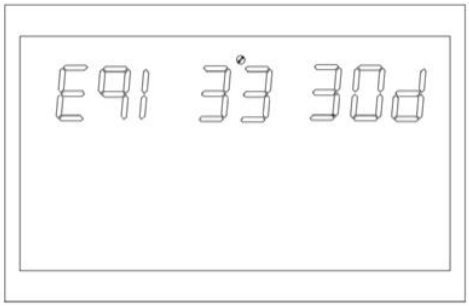


Figure 1-41 Equalization Interval Setting Page

Function: Sets periodic equalization frequency

Conditions: Configurable in all states

- Default: 30 days
- Range: 1-90 days (daily increments)

Trigger Condition: Requires battery connection during float phase

1.4.2.33 Immediate Equalization Activation (EQN)

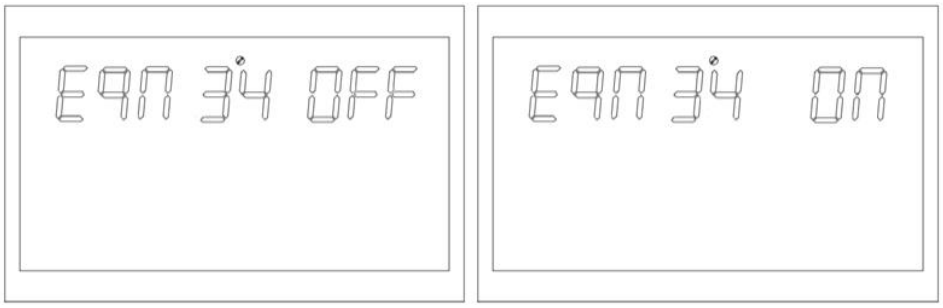


Figure 1-42 Immediate Equalization Activation Setting Page

Function: Manual equalization initiation

Conditions: Configurable in all states

- OFF (Default): Scheduled operation only
- ON: Forces immediate equalization when:

Equalization mode enabled (EQM=ON)

Battery connected in float phase

1.4.2.34 Grid-Tie Inverter Function (GTI)

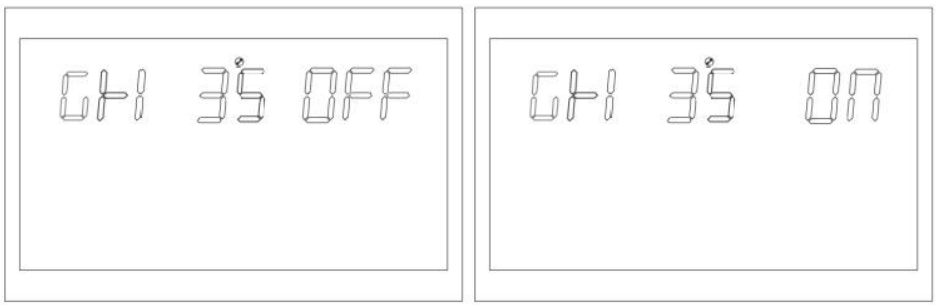


Figure 1-43 Grid-Tie Inverter Function Setting Page

Function: Enables PV surplus energy export to grid

Conditions: Configurable in all states (PV/PBG modes)

- OFF (Default): No grid feed-in
- ON: Activates MPPT-based grid-tie operation

Dependencies:

- Requires central control board
- Triggers Alarm 56 on communication failure

1.4.2.35 Dual-Output Battery Low Voltage Shutdown Point (DBV)

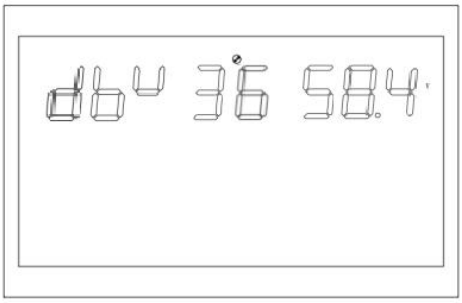


Figure 1-44 Dual-Output Battery Low Voltage Shutdown Point Page

Function: Secondary circuit control via battery voltage

Conditions: Configurable in all states

System	Default	Adjustable Range
24V Systems	24V	22-32V
48V Systems	48V	44-60V

Recovery Logic:

- Restores output when voltage > (CV point - 1V/cell)

Dependency: Requires dual-output accessory board

1.4.2.36 Dual-Output Battery Mode Cut-off Time (DBT)

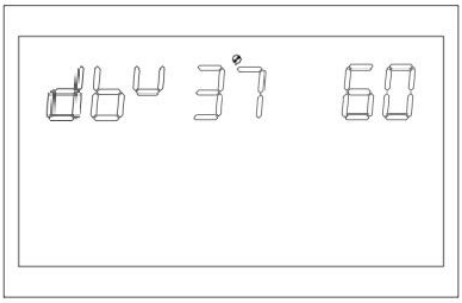


Figure 1-45 Dual-Output Battery Low Voltage Shutdown Point Page

Function: Secondary circuit runtime limitation

Conditions: Configurable in all states

- OFF (Default): No time restriction
- Range: 5-890 minutes
- FUL: Unlimited operation

Dependency: Requires dual-output accessory board

1.4.2.37 BMS Communication Function (BMS)

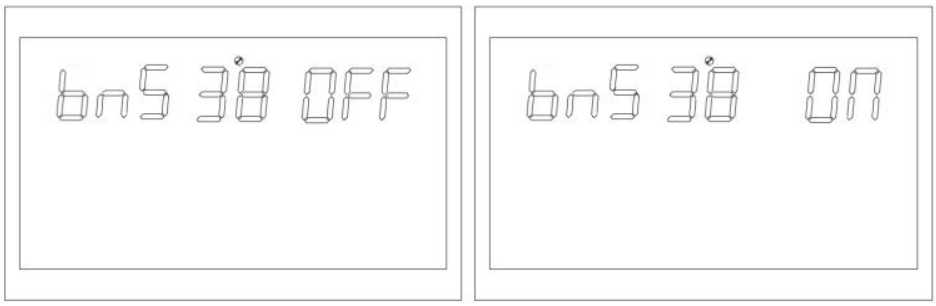


Figure 1-46 BMS Management Function Setting Page

Function: Lithium battery management integration

Conditions: Configurable in all states

- OFF (Default): Standalone operation
- ON: Enables BMS data exchange via central control board

Protocol:

- Triggers Alarm 56 on communication failure
- Menu hidden without central control board connection

1.4.2.38 Low SOC Shutdown Function (BSU)

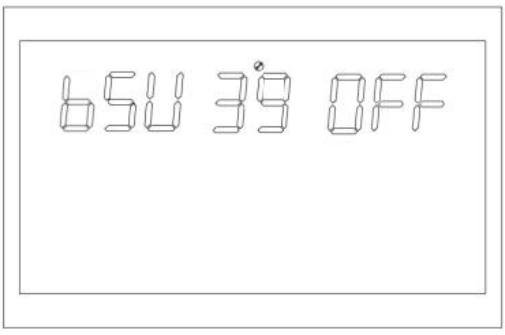


Figure 1-47 Low SOC Shutdown Function Setting Page

Function: SOC-driven system shutdown

Conditions: Configurable in all states

- Default: 20% (Range: 5-50% or OFF)

Alarm Logic:

Event	Action
SOC ≤ Setpoint (Battery mode)	Shutdown + Alarm 68
SOC ≥ Setpoint+5%	Clears Alarm 68
SOC < Setpoint+10% (Standby)	Blocks battery mode + Alarm 69

System Dependencies:

- All SOC functions require central control board
- SOC menus hidden without board connection
- Communication failures disable SOC logic and clear related alarms

1.4.2.39 Low SOC Switch to Grid Mode (STB)

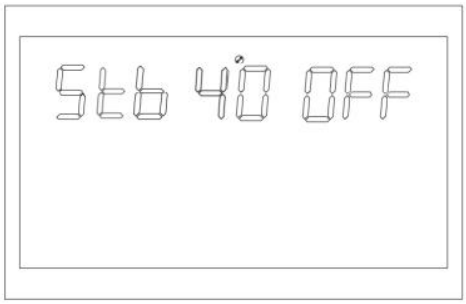


Figure 1-48 Low SOC Switch to Grid Mode Setting Page

Function: Grid-to-battery transition criteria

Conditions: Configurable in all states (PBG priority)

- Default: 90% (Range: 10-100% or OFF)

Activation Requires:

1. SOC > Setpoint
2. Battery voltage > BTB threshold (Ref. 1.4.2.15)

System Dependencies:

- All SOC functions require central control board
- SOC menus hidden without board connection
- Communication failures disable SOC logic and clear related alarms

1.4.2.40 Low SOC Switch to Grid Mode (STG)

Figure 1-49 Low SOC Switch to Grid Mode Setting Page

Function: Battery-to-grid transition criteria

Conditions: Configurable in all states (PBG priority)

- Default: 50% (Range: 10-90% or OFF)

Activation Triggers:

1. SOC < Setpoint OR
2. Battery voltage < BTG threshold (Ref. 1.4.2.14)

Priority Override: Disables STB if setpoint > STB

System Dependencies:

- All SOC functions require central control board
- SOC menus hidden without board connection
- Communication failures disable SOC logic and clear related alarms

1.5 Fault and Alarm Descriptions

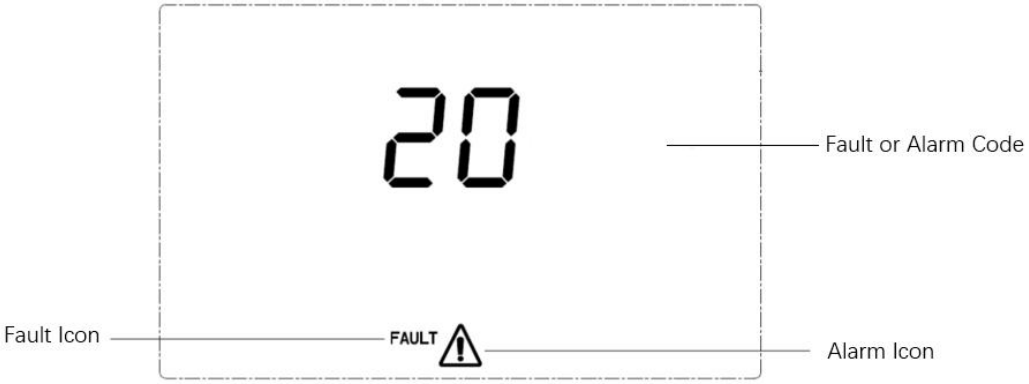


Figure 1-50 Fault and Alarm Icons

Function Description:

Alarm:

Alarm code ALA flashes, and the buzzer beeps once per second for 1 minute.

Fault:

Fault code remains lit, and the buzzer emits a continuous tone for 10 seconds before stopping.

After the fault clears, the system attempts to restart. If 6 restart attempts fail, the system remains in fault mode.

A full power reset (screen off) or 30-minute wait is required before restarting.

LCD Display:

Fault mode: Fault icon is solid.

Alarm state: Alarm icon flashes.

Contact the manufacturer for troubleshooting based on the displayed fault/alarm code.

1.5.1 Fault Description

Fault: The inverter enters fault mode. LED turns solid red, and the LCD displays a fault code.

Fault Code Table

Fault Code	Chinese Description	English Description	Action	Trigger Condition	Recovery Condition	Fault/ Alarm
1	母线升压软起失败	Bus Boost Soft Start Failure	Switch to Fault Mode	Bus voltage fails to reach target during soft start	Non-recoverable	Fault
2	母线过压	Bus Overvoltage	Switch to Fault Mode	Bus voltage exceeds threshold	Non-recoverable	Fault
3	母线欠压	Bus Undervoltage	Switch to Fault Mode	Bus voltage drops below threshold	Non-recoverable	Fault
4	电池过流	Battery Overcurrent	Switch to Fault Mode	Instantaneous battery current exceeds 580A	Non-recoverable	Fault
5	过温	Over Temperature	Switch to Fault Mode	PFC or INV temperature sensor exceeds threshold	Non-recoverable after 6 failed restarts	Fault
6	电池过压	Battery Overvoltage	Switch to Fault Mode	Battery voltage exceeds threshold	Recoverable	Fault
7	母线软起故障	Bus Soft Start Failure	Switch to Fault Mode	DC soft start voltage fails to reach target	Non-recoverable	Fault
8	母线短路	Bus Short Circuit	Switch to Fault Mode	Bus voltage drops abruptly below threshold during operation	Non-recoverable	Fault
9	逆变软起故障	Inverter Soft Start Failure	Switch to Fault Mode	Inverter output voltage fails to reach rated value after soft start	Non-recoverable	Fault
10	逆变输出过压	Inverter Output Overvoltage	Switch to Fault Mode	Inverter voltage exceeds threshold in battery mode	Non-recoverable	Fault
11	逆变输出欠压	Inverter Output Undervoltage	Switch to Fault Mode	Inverter voltage drops below threshold in battery mode	Non-recoverable	Fault
12	逆变短路	Inverter Short Circuit	Switch to Fault Mode	Inverter voltage drops abruptly + current surges beyond thresholds	Non-recoverable after 6 failed restarts	Fault

13	负功保护	Reverse Power Protection	Switch to Fault Mode	Inverter power remains below threshold for extended period	Non-recoverable	Fault
14	过载故障	Overload	Switch to Fault Mode	Load exceeds rated capacity	Non-recoverable after 6 failed restarts	Fault
15	机型故障	Model Mismatch	Switch to Fault Mode	Software detects hardware-model mismatch	Non-recoverable	Fault
16	无引导程序	Bootloader Missing	Switch to Fault Mode	Bootloader not detected	Non-recoverable	Fault
17	PV 程序烧录中	PV Firmware Updating	Switch to Fault Mode	VML model is updating PV control firmware	Recoverable after update completes	Fault
19	相同序列号	Duplicate Serial Numbers	Switch to Fault Mode	Multiple units with identical serial numbers detected in parallel mode	Non-recoverable	Fault
20	CAN 通信错误	CAN Communication Error	Switch to Fault Mode	CAN bus failure in parallel mode	Non-recoverable	Fault
21	电池压差过大	Excessive Battery Voltage Deviation	Switch to Fault Mode	Battery voltage imbalance in parallel mode	Non-recoverable	Fault
22	输入电压压差过大	Excessive Input Voltage Deviation	Switch to Fault Mode	Input voltage imbalance in parallel mode	Non-recoverable	Fault
23	输入电压频率差异	Input Frequency Deviation	Switch to Fault Mode	Input frequency mismatch in parallel mode	Non-recoverable	Fault
24	异步设置输出参数	Asynchronous Output Parameters	Switch to Fault Mode	Phase configuration error in three-phase parallel mode	Recoverable if switched to standalone mode or corrected	Fault
25	输出失步	Output Desynchronization	Switch to Fault Mode	Loss of output synchronization in parallel mode	Non-recoverable	Fault
26	BMS 故障	BMS Fault	Switch to Fault Mode	Battery Management System (BMS) reports an error	Recoverable if BMS communication is disabled or error resolved	Fault

1.5.2 Alarm Description

Alarm: The inverter does not enter fault mode. LED flashes red, and the LCD displays an alarm code.

Alarm Code Table

Alarm Code	Chinese Description	English Description	Action	Trigger Condition	Recovery Condition	Fault/ Alarm
50	电池未接	Battery Disconnected	Alarm, battery charging disabled	Battery voltage < 8V per cell	Recoverable (≥10V per cell)	Alarm
51	电池低压关机	Low Battery Voltage Shutdown	Alarm, shutdown or startup blocked	Battery voltage < 10.5V per cell (default)	Recoverable (≥10V per cell + 0.2 * N (number of cells))	Alarm
52	电池低压	Low Battery Voltage	Alarm	Based on bAL setting	Recoverable (threshold + 0.2V per cell)	Alarm
53	充电器短路	Charger Short Circuit	Alarm, battery charging disabled	Battery voltage < 5V and charging current > 4A	Non-recoverable	Alarm
54	低功率放电	Low Power Discharge	Alarm	Battery discharge exceeds configured low-power discharge time	Recoverable (battery voltage ≥ 13.2V per cell)	Alarm
55	电池过冲	Battery Overcharge	Alarm, battery charging disabled	Battery voltage exceeds threshold	Recoverable	Alarm
56	BMS 丢失	BMS Communication Loss	Alarm, locked in standby mode	BMS communication failure after enabling BMS function	Recoverable	Alarm
57	过温	Over Temperature	Alarm, battery charging disabled	PFC or INV temperature sensor exceeds threshold	Recoverable (temperature drops below threshold)	Alarm
58	风扇故障	Fan Fault	Alarm; remaining fan runs at full speed	No fan speed signal detected	Recoverable	Alarm
59	EEPROM 故障	EEPROM Fault	Alarm	EEPROM read/write failure	Non-recoverable	Alarm
60	过载	Overload	Alarm, battery charging disabled	Load > 102% rated capacity	Recoverable (load < 97%)	Alarm

61	发电机波形异常	Generator Waveform Anomaly	Alarm, remains in battery mode	Abnormal generator waveform detected	Recoverable	Alarm
62	PV 能量弱 (5K)	PV Weak Input (5K)	Disable PV output and charging	Bus voltage < threshold when battery is disconnected	Recoverable after 10 minutes	Alarm
63	同步丢失	Synchronization Loss	Alarm, switch to fault mode	Parallel board disconnection	Recoverable by switching to standalone mode or resolving disconnection	Alarm
64	并机设置不兼容	Incompatible Parallel Settings	Alarm, switch to standby mode	Phase configuration error in three-phase parallel mode	Recoverable with correct phase settings	Alarm
65	并机版本不兼容	Incompatible Firmware Versions	Alarm, switch to standby mode	Version mismatch in parallel system	Recoverable when all versions are compatible	Alarm
66	并机通讯故障	Parallel Communication Failure	Alarm, switch to standby mode	Slave unit not detected in parallel system	Recoverable upon slave detection or switching to standalone mode	Alarm
67	并机市电存在差异	Grid Input Deviation	Alarm	Excessive voltage/frequency deviation in parallel grid input	Recoverable when deviation is resolved	Alarm
68	低 SOC 关机	Low SOC Shutdown	Alarm, switch to standby mode	Lithium battery SOC < set value	Recoverable by disabling low SOC shutdown/BMS or SOC ≥ set value + 5%	Alarm
69	低 SOC	Low SOC	Alarm; remains in standby if applicable	Lithium battery SOC < set value + 5% (grid/battery mode) or < set value + 10% (standby mode)	Recoverable by disabling low SOC shutdown/BMS or SOC ≥ set value + 10%	Alarm

Note:

The images and diagrams in this manual are for reference only. Refer to the actual product for final specifications. Content may be updated without prior notice.