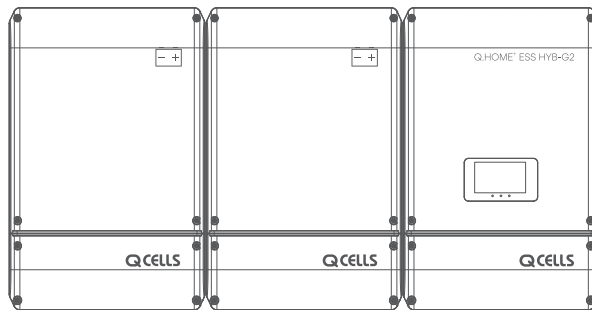


USER MANUAL

MODEL	GERMANY	AUSTRALIA
SYSTEM	Q.HOME ⁺ ESS HYB-G2	
INVERTER	Q.VOLT-G2 HYB-4.6kW.1.1	Q.VOLT-G2 HYB-5kW.1.1
BATTERY	Q.SAVE-G2 4kWh B1.1.1	
	Q.SAVE-G2 6.3kWh B1.1.1	



NOTICE



- Do not operate with other components not approved by the ESS systems.
(Connecting other products in parallel to Q.HOME⁺ ESS HYB-G2 may result in abnormal operation.)
- The internet connection is required to use all functions of the ESS system.
- If you have a problem, please contact the installer.
- The Specifications of the product may be modified without prior notice to improve product quality.

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1. Information in this Manual

1.1 About this Manual

This is the user's manual for the Q.HOME+ ESS HYB-G2. This user manual is specially designed to detail the device's functions and features. Please read this manual before using the device to ensure safe and proper use.

1.2 Target Group





This user manual applies only to the Q.HOME+ ESS HYB-G2.






1.3 Additional Information

The user manual and installation manual can be downloaded from the product download section at "<https://www.q-cells.com>".

















The specifications of the product can be changed for improvement without notice. Also, the software can be updated automatically without notice over the Internet.







1.4 Symbols Used

Symbols	Description
	CAUTION This symbol indicates a hazardous situation which could result in a light injury, if not avoided.
	NOTICE This symbol indicates a hazardous situation which could result in damage to the property, if not avoided.
	INFORMATION This symbol indicates valuable tips for optimum installation and operation of the product.
	DANGER High touch current, earth connection essential before connecting supply








Symbols	Description
	Beware dangerous voltage. The ESS operates at high voltage. All works related to the ESS can only be performed by an electrical technician.
	Beware of hot surface. The INVERTER can become hot during operation. Avoid contact during operation.
	Follow the guidelines in all relevant documents enclosed along with the INVERTER.
	Do not dispose of the INVERTER with household wastes. For further information on disposal, refer to the installation manual provided.
	The CE Indication : The relevant equipment complies with the requirements in the EC guidelines.

[Table 1-1 : Symbol Description 1]

Symbols	Description	Symbols	Description
	Direct current		Protective conductor terminal
	Alternating current		Frame or chassis terminal
	Both direct and alternating current		Refer to the operating instructions
	Three-phase alternating current		On (supply)
	Three-phase alternating current with neutral conductor		Off (supply)
	Earth terminal		Equipment protected throughout by double insulation or reinforced insulation
	Caution : Risk of Electric Shock		Caution : Hot Surface
	Caution : Risk of Danger		In position of a bi-stable push control

Symbols	Description	Symbols	Description
	Out position of a bi-stable push control		Input terminal or rating
	Output terminal or rating		Bidirectional terminal rating
	Caution : Risk of Electric Shock and Energy Storage Timed Discharge		
	Caution : Risk of Hearing Damage and Wear Hearing Protection Wear hearing protection		

[Table 1-2 : Symbol Description 2]

Symbols	Description
	Energy Storage Device To help avoid burns of electric shock : - Service by qualified personnel only - Disconnect main power before maintenance - Turn off the Battery System before maintenance
	Electric shock hazard Do not remove cover or disassemble.
	Explosive gas Do not expose to flame, incinerate, puncture, or impact
	Shield eyes Wear safety goggles at ALL times (Installation, maintenance, etc.)
	Electrolyte hazard Do not contact eyes, skin or clothing. If it happens, Flush with water and seek medical aid immediately.
	Do not dispose in trash Transport legally. Follow manufacturer's instructions for disposal. Please recycle Lithium ion Battery. Do not discard.
	Qualified technicians use this manual for service and replacement.

[Table 1-3 : Symbol Description (Battery)]

2. Safety

2.1 Intended Use



NOTICE

- The Q.HOME+ ESS HYB-G2 is intended for residential use only.
- The Q.HOME+ ESS HYB-G2 should not be used for commercial or building.

The Q.HOME+ ESS HYB-G2 is designed for residential use. It is a single-phase, Grid-connected system of solar energy sources and Li-Ion Battery energy storage.

The Q.HOME+ ESS HYB-G2 uses solar energy power connected to the input/output terminal installed on the side of the device in order to :

- 1) charge the Li-Ion Battery energy storage,
- 2) provide a supply to the household load, and
- 3) convert direct current (DC) electricity of the Battery to alternating current (AC) to discharge as household single-phase load or electric system.

This device should not be used for any purpose other than the purpose described in this installation manual. Any substitute use of this device, random change in any of its parts, and use of components other than sold or recommended by Q CELLS will nullify the product's guarantee. For example, Q CELLS Li-Ion Battery energy storage should not be replaced by other manufacturer's Battery storages. For further information on proper use of this device, contact the Q CELLS Service-Hotline.

2.1.1 Technical Specifications

Germany			
PV Data (DC)			
Max. input total power		6.6 kWp	
Max. input power per string		3.3 kWp	
Max. input voltage		550 V	
Min. input voltage / Initial input voltage		125 V / 150 V per string	
MPPT voltage range		125 V - 500 V	
Max. inverter backfeed current		0 A	
Max. input current per string		15 A	
Max. input short circuit current for each MPPT		20 A	
Max. PV port input short-circuit fault current (A)		62 A, 53.34 ms	
Number of independent MPPT trackers		2	
Number of DC inputs pairs for each MPPT		2	
Connection type		MC4 Type	
Over voltage Category		II	
Battery Data (DC)			
		1 Battery Pack	2 or more Battery Pack
Q.SAVE-G2 4kWh	Battery nominal capacity	4.0 kWh	4.0 kWh x Pack
	Battery voltage range / nominal voltage	176.4 Vdc - 225.12 Vdc / 203.84 Vdc	
	Max. discharge current	17 A	
	Max. charge current	9.8 A	17 A
	Max. charge power	2.0 kW	3.0 kW
	Short circuit current	771.25 A (701 μ s)	
Q.SAVE-G2 6.3kWh	Battery nominal capacity	6.3 kWh	6.3 kWh x Pack
	Battery voltage range / nominal voltage	173.6 Vdc - 228.2 Vdc / 202.7 Vdc	
	Max. discharge current	15.6 A	17 A
	Max. charge current	15.6 A	17 A
	Max. charge power	3.0 kW	
	Short circuit current	1070.5 A (0.4 ms)	
Max. discharge power		3.0 kW	
Battery technology		Rechargeable Li-Ion	
DC/DC converter technology		Non-Isolated	
Over voltage Category		II	
Grid Output			
Grid inrush current (A)		210.4 A, 19.598ms	
Rated power (at 230V, 50 Hz)		4.6 kW	
Max. output apparent AC power		4.6 kVA	
Nominal voltage / range		230 V / 184 V _{ac} - 264 V _{ac}	
Rated power frequency / range		50 Hz / 47.5 Hz - 51.5 Hz	
Max. current		25 A	
Max. Rated / Max. output current		20 A / 25 A	
Max. over-current protectionnt		32 A	
Max. grid port output short-circuit fault current (A)		210.4 A, 19.598 ms	
Adjustable power factor range		0.8 lagging to 0.8 leading	
Feed-in phases / connection phases		1 / 1	
Total Harmonic Distortion. (Total harmonic factor of the output current with total harmonic factor of the AC voltage < 2%, and AC power > 50% of the rated power)		5 %	
Over voltage Category		III	

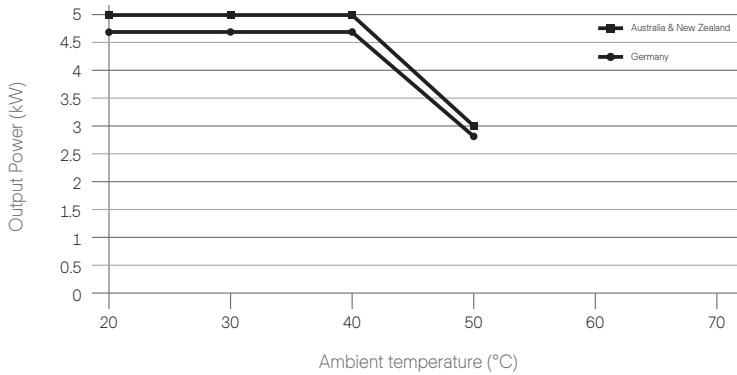
Grid Input	
Rated / Maximum input apparent power	3000 / 4000 VA
Rated / Maximum input active power	3000 / 4600 W
Rated input voltage	230 V a.c.
Rated / Maximum continuous input current	13/25 A a.c.
Rated input frequency	50 Hz
Max. grid port input short-circuit fault current (A)	56.5 A (191.048 ms)
Back-up Output	
AC connection type	Single phase
Nominal apparent power	3000 VA
Nominal AC voltage	230 VAC
Nominal frequency	50 Hz
AC Nominal Active Power / Max	3000 W / 4600 W (10 min)
Max. back-up port output short-circuit fault current (A)	125 A, 4.384 ms
Efficiency (PV to Grid)	
European efficiency	95.5 %
Max. efficiency	96.2 %
Protective Device	
DC disconnection device for PV	Yes
Ground-fault monitoring / grid monitoring	Yes / Yes
General Data	
Dimensions (W x H x D, mm)	467.6 x 721.6 x 212.5 (INVERTER)
	467.6 x 721.6 x 212.5 (Battery)
Weight	31.28 kg (INVERTER)
	52.26 kg (4 kWh) / 59.36 kg (6.3 kWh)
Protective class (I, II, III)	Class I
Degree of protection	IP 65 (Both)
Max. permissible value for relative humidity	4 % to 100 % (Condensing)
Operating temperature	INVERTER (Derates > 40°C)
	Battery (Derates outside these temperatures)
Suggested operating temperature	-20 - +50 °C
Storage temperature	+0 - +40 °C (4kWh) / -10 - +40 °C (6.3 kWh)
INVERTER topology	+0 - +40 °C
Noise emission	-20 - +60 °C (Both)
Intend to use	Non-Isolated
Wet condition	≤ 40 dB(A) @ 1m
Pollution degree	Outdoor
Maximum altitude rating	Yes
Features	
Display	Touch TFT LCD "4.95" inch
Communication	LAN (Modbus TCP / IP), RS485, CAN
Energy management system	Integrated
Certificates and approvals	IEC 62109-1/2, VDE-AR-N 4105:2018, EN 61000-6-2/3, EN 61000-3-11/12 (INVERTER)
	IEC 62619, IEC 62477-1, EN 61000-6-2/3 (Battery)
Island protection	Shifting the frequency of the INVERTER away from nominal conditions in the absence of a reference frequency. (Frequency shift)

[Table 2-1 : Technical Specifications (Germany)]

Australia & New Zealand			
PV Data (DC)			
Max. input total power		6.6 kWp	
Max. input power per string		3.3 kWp	
Max. input voltage		550 V	
Min. input voltage / Initial input voltage		125 V / 150 V per string	
MPPT voltage range		125 V - 500 V	
Max. inverter backfeed current		0 A	
Max. input current per string		15 A	
Max. input short circuit current for each MPPT		20 A	
Max. PV port input short-circuit fault current (A)		62 A, 53.34 ms	
Number of independent MPPT trackers		2	
Number of DC inputs pairs for each MPPT		2	
Connection type		MC4 Type	
Over voltage Category		II	
Battery Data (DC)			
		1 Battery Pack	2 or more Battery Pack
Q.SAVE G2 4kWh	Battery nominal capacity	4.0 kWh	4.0 kWh x Pack
	Battery voltage range / nominal voltage	176.4 Vdc - 225.12 Vdc / 203.84 Vdc	
	Max. discharge current	17 A	
	Max. charge current	9.8 A	17 A
	Max. charge power	2.0 kW	3.0 kW
	Short circuit current	771.25 A (701 μ s)	
Q.SAVE G2 6.3kWh	Battery nominal capacity	6.3 kWh	6.3 kWh x Pack
	Battery voltage range / nominal voltage	173.6 Vdc - 228.2 Vdc / 202.7 Vdc	
	Max. discharge current	15.6 A	17 A
	Max. charge current	15.6 A	17 A
	Max. charge power	3.0 kW	
	Short circuit current	1070.5 A (0.4 ms)	
Max. discharge power		3.0 kW	
Battery technology		Rechargeable Li-Ion	
DC/DC converter technology		Non-Isolated	
Over voltage Category		II	
Grid Output			
Grid inrush current (A)		210.4 A, 19.598 ms	
Rated power (at 230V, 50 Hz)		5.0 kW	
Max. output apparent AC power		5.0 kVA	
Nominal voltage / range		230 V / 184 V _{ac} - 264 V _{ac}	
Rated power frequency / range		50 Hz / 47.5 Hz - 51.5 Hz	
Max. current		25 A	
Max. Rated / Max. output current		20 A / 25 A	
Max. over-current protectionnt		32 A	
Max. grid port output short-circuit fault current (A)		210.4 A, 19.598 ms	
Adjustable power factor range		0.8 lagging to 0.8 leading	
Feed-in phases / connection phases		1 / 1	
Total Harmonic Distortion. (Total harmonic factor of the output current with total harmonic factor of the AC voltage < 2%, and AC power > 50% of the rated power)		5 %	
Over voltage Category		III	

Grid Input	
Rated / Maximum input apparent power	3000 / 4000 VA
Rated / Maximum input active power	3000 / 4600 W
Rated input voltage	230 V a.c.
Rated / Maximum continuous input current	13/25 A a.c.
Rated input frequency	50 Hz
Max. grid port input short-circuit fault current (A)	56.5 A (191.048 ms)
Back-up Output	
AC connection type	Single phase
Nominal apparent power	3000 VA
Nominal AC voltage	230 VAC
Nominal frequency	50 Hz
AC Nominal Active Power / Max	3000 W / 4600 W (10 min)
Max. back-up port output short-circuit fault current (A)	125 A, 4.384 ms
Efficiency (PV to Grid)	
European efficiency	95.5 %
Max. efficiency	96.2 %
Protective Device	
DC disconnection device for PV	Yes
Ground-fault monitoring / grid monitoring	Yes / Yes
General Data	
Dimensions (W x H x D, mm)	467.6 x 721.6 x 212.5 (INVERTER)
	467.6 x 721.6 x 212.5 (Battery)
Weight	31.28 kg (INVERTER)
	52.26 kg (4 kWh) / 59.36 kg (6.3 kWh)
Protective class (I, II, III)	Class I
Degree of protection	IP 65 (Both)
Max. permissible value for relative humidity	4% to 100 % (Condensing)
Operating temperature	INVERTER (Derates > 40°C)
	Battery (Derates outside these temperatures)
Suggested operating temperature	+0 - +40 °C
Storage temperature	-20 - +60 °C (Both)
INVERTER topology	Non-Isolated
Noise emission	≤ 40 dB(A) @ 1m
Intend to use	Outdoor
Wet condition	Yes
Pollution degree	3
Maximum altitude rating	< 2000 m
Features	
Display	Touch TFT LCD "4.95" inch
Communication	LAN (Modbus TCP / IP), RS485, CAN
Energy management system	Integrated
Certificates and approvals	IEC 62109-1/2, AS 62040.1.1, AS/NZS 4777.2, IEC 62116, IEC 60068-2-52 (INVERTER)
	IEC 62619, IEC 62040-1, IEC60068-2-52 (Battery)
Island protection	Shifting the frequency of the INVERTER away from nominal conditions in the absence of a reference frequency. (Frequency shift)

[Table 2-2 : Technical Specifications (Australia & New Zealand)]



[Figure 2-1 : Derating Curve]

Item		Cell body / module temperature		Specification
Maximum Charge Current(*)	Q.SAVE G2 4kWh	T < 0 °C		0 A
		0 °C ≤ T < 10 °C		3.5 A
		10 °C ≤ T < 25 °C		7 A
		25 °C ≤ T < 40 °C		9.8 A
		40 °C ≤ T < 50 °C		3.5 A
		50 °C ≤ T		2.1 A
	Q.SAVE G2 6.3kWh	Cell body temperature	Max Cell V	Specification
		T < -10 °C	-	0 A
		-10 °C ≤ T < 0 °C	Max Cell V < 3.8	7.5 A
			3.8 ≤ Max Cell V < 3.9	3 A
			3.9 ≤ Max Cell V	0 A
		0 °C ≤ T < 10 °C	Max Cell V < 3.8	7.5 A
			3.8 ≤ Max Cell V < 4.0	3 A
			4.0 ≤ Max Cell V	0 A
10 °C ≤ T < 20 °C	Max Cell V < 3.8	15.6 A		
	3.8 ≤ Max Cell V	10 A		
20 °C ≤ T < 45 °C	-	15.6 A		
45 °C ≤ T < 55 °C	-	10 A		
55 °C ≤ T	-	3 A		

(*) : Maximum Charge Current





- If the battery is discharged at the maximum discharge current / power, the battery should be cooled its ambient temperature before discharging again.

[Table 2-3 : Maximum Charge Current Limit]

Item		Cell body / module temperature	Specification	
Maximum Discharge Current(*)	Q.SAVE-G2 4kWh	$T < -20\text{ }^{\circ}\text{C}$	0 A	
		$-20\text{ }^{\circ}\text{C} \leq T < -10\text{ }^{\circ}\text{C}$	7 A	
		$-10\text{ }^{\circ}\text{C} \leq T < 0\text{ }^{\circ}\text{C}$	10.5 A	
		$0\text{ }^{\circ}\text{C} \leq T < 40\text{ }^{\circ}\text{C}$	19.6 A	
		$40\text{ }^{\circ}\text{C} \leq T < 50\text{ }^{\circ}\text{C}$	10.5 A	
		$50\text{ }^{\circ}\text{C} \leq T$	7 A	
	Q.SAVE-G2 6.3kWh	Cell body temperature		Specification
		$T < -10\text{ }^{\circ}\text{C}$	0 A	
		$-10\text{ }^{\circ}\text{C} \leq T < 50\text{ }^{\circ}\text{C}$	15.6 A	
		$50\text{ }^{\circ}\text{C} \leq T < 55\text{ }^{\circ}\text{C}$	10 A	
	$55\text{ }^{\circ}\text{C} \leq T$	3 A		

[Table 2-4 : Maximum Discharge Current Limit]

2.2 Safety Guidelines

	<p>DANGER</p> <p>High voltages in power conditioning circuits. Lethal hazard of electric shock or serious burns.</p> <p>The following work on the ESS must be carried out by qualified personnel only.</p> <ul style="list-style-type: none">• Electrical insulation• Repairs• Modification <p>Except when under supervision by qualified personnel, children or people lacking physical, mental, or intellectual capabilities should not work on this system.</p> <p>The system should be installed out of the reach of children.</p> <p>Even when no external voltage is applied to the system, it may have internal high voltage in the device, which can cause lethal damage to the human body.</p> <p>High voltage can cause lethal damage to the human body.</p>
	<p>CAUTION</p> <p>When the photovoltaic array is exposed to light, it supplies DC voltage to the Q.HOME+ ESS HYB-G2.</p> <p>Do not touch the PV cable when it PV cable is connected to the PV arrays.</p>
	<p>CAUTION</p> <p>After disconnecting the INVERTER from Battery or PV, wait 5 minutes to discharge the INVERTER.</p>
	<p>CAUTION</p> <p>Li-Ion Battery energy storage system (ESS) inside. When assembling the system, do not intentionally short the positive (+) and negative (-) terminals with metallic object. All work on the ESS and electrical connections must be carried out by qualified personnel only. The ESS within Q.HOME+ ESS HYB-G2 provides a safe source of electrical energy when operated as intended and as designed.</p> <p>A potentially hazardous circumstance such as excessive heat or electrolyte mist may occur due to improper operating conditions, damage, misuse and/or abuse.</p> <p>The following safety precautions and the warning messages described in this section must be observed. If any of the following precautions are not fully understood, or if you have any questions, contact Customer Support for guidance.</p> <p>The safety section may not include all regulations for your locale; personnel working with Q.HOME+ ESS HYB-G2 must review applicable federal, state and local regulations as well as the industry standards regarding this product.</p>



CAUTION

When transporting the Q.HOME+ ESS HYB-G2, work with at least two persons (Overweight).



NOTICE

1. Over voltages in the power conditioning circuits.
Any damage to the Q.HOME+ ESS HYB-G2 will result in voiding of warranty claims.
Danger to life from electric shock due to damaged Q.HOME+ ESS HYB-G2. Inadvertent operation of damaged Q.HOME+ ESS HYB-G2 can lead to a hazardous situation that may result in death or serious injury due to electrical shock. Only operate Q.HOME+ ESS HYB-G2 when it is technically faultless and in an operationally safe stat.
Regularly check the Q.HOME+ ESS HYB-G2 for visible damage.
Make sure that all safety equipment is freely accessible at all times.
If the Q.HOME+ ESS HYB-G2 is damaged, do not touch it. Please immediately contact your installer or Q CELLS for arrange for a repair.
2. Please contact your installer or Q CELLS if a significant event message is shown on the LCD screen or if the Q.HOME+ ESS HYB-G2 reports an event. Refer to the table of event messages for different significant/general events.

2.3 Symbol Indication

* INVERTER Symbols

Symbols	Description	Symbols	Description
	INVERTER		dc/dc converter

[Table 2-5 : INVERTER symbols]

3. Operating Modes

This system is composed of six modes : PV Auto, PV Only, Battery discharge, Standby, Maintenance (forced charge), and Stand-Alone (Back-up). The event check status should not be considered as any specific mode.

3.1 Standby Mode

This is the standby mode before converting to operation mode (PV Auto, PV Only, Battery discharge mode). Conversion to the operation mode (PV Auto, PV Only, Battery discharge mode) is made by the EMS decision.

3.2 Event Check Mode

This mode stops solar energy generation and put it in standby mode as an event occurs.

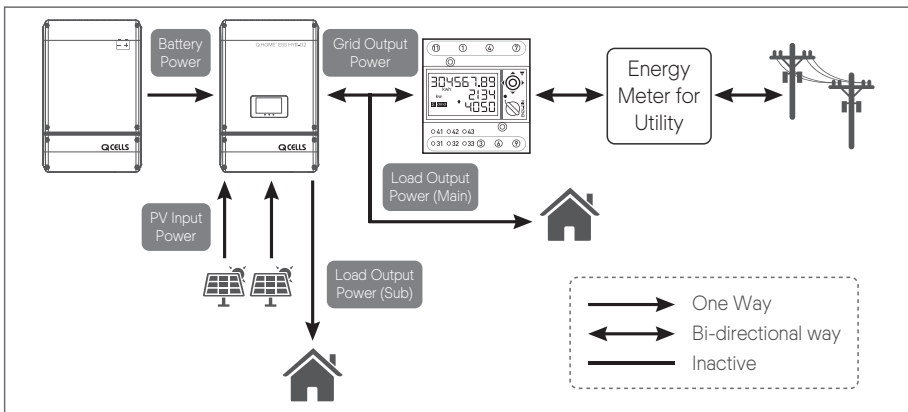
3.3 PV-Auto Mode

This mode is divided into three types depending on the state of the Battery power.

3.3.1 Weak

Solar energy generation and Battery discharging are available. The solar-generated power is supplied to sub and load. In case of insufficient power, the battery is discharged on the EMS decision. When Load Output Power (Sub) is higher than power generation of PV and Battery, Grid power supplied to the Sub.

- Use smart meter. The energy supply priority is : load (sub+main) > grid
- Not use smart meter. The energy supply priority is : sub_load > grid

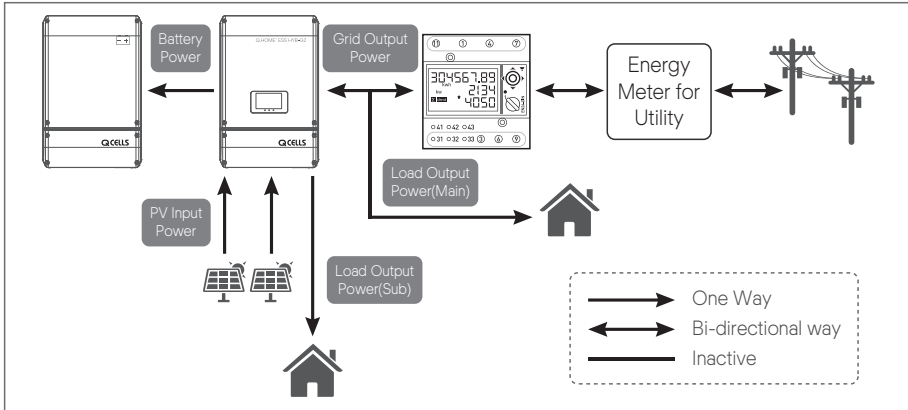


[Figure 3-1 : Diagram of PV-Auto Weak Mode]

3.3.2 Strong

Solar energy generation and Battery charging are available. The solar-generated power is charged to the Battery based on the EMS decision.

- Use smart meter. The energy supply priority is : load (sub+main) > battery > grid
- Not use smart meter. The energy supply priority is : sub_load > battery > grid

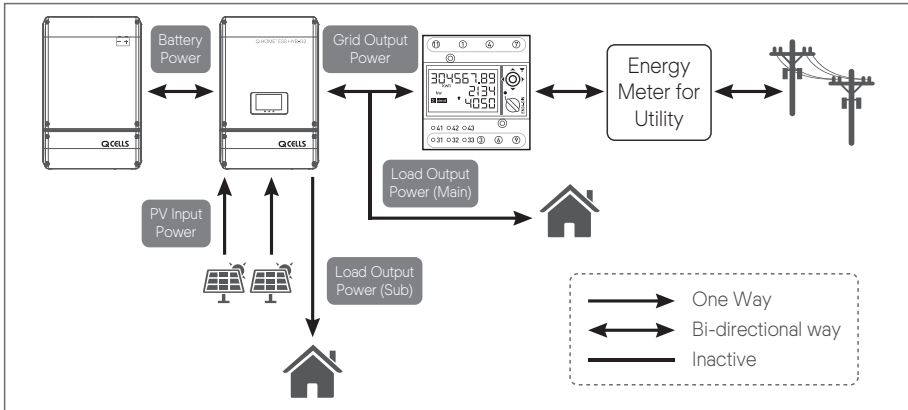


[Figure 3-2 : Diagram of PV-Auto Strong Mode]

3.3.3 Both

Solar energy generation and Battery charging are available. The solar-generated power is charged or discharged to the Battery based on the EMS decision.

- Use smart meter. The energy supply priority is : load (sub+main) > battery > grid
- Not use smart meter. The energy supply priority is : sub_load > battery > grid

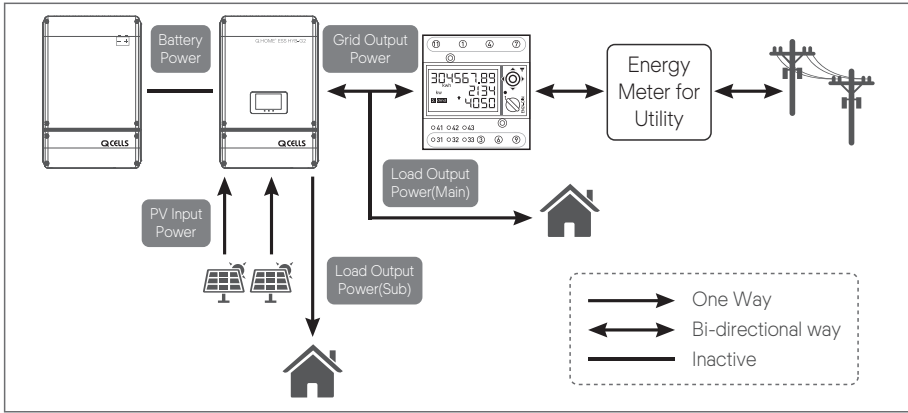


[Figure 3-3 : Diagram of PV-Auto Strong Both Mode]

3.4 PV-Only Mode

This mode enables the solar energy to be generated. However, the Battery charge-discharge does not operate. A maximum of power or less of solar energy generation power can be sent to Grid based on the EMS decision.

- Use smart meter. The energy supply priority is : load (sub+main) > grid
- Not use smart meter. The energy supply priority is : sub_load > grid

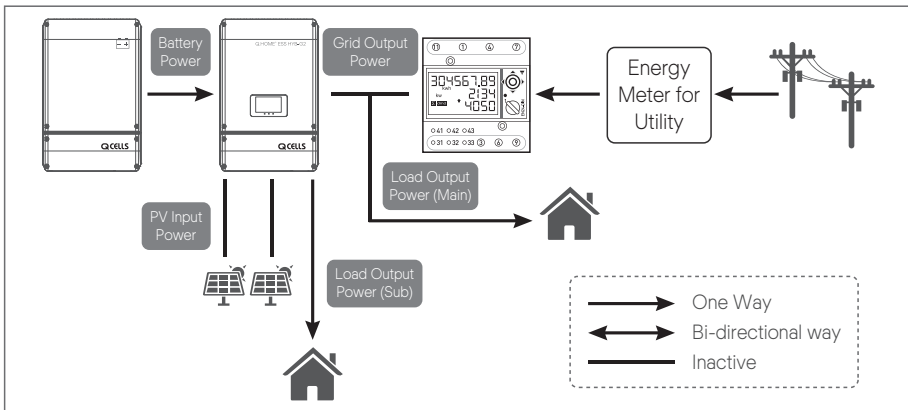


[Figure 3-4 : Diagram of PV-Only Mode]

3.5 Battery-Discharge Mode

This mode permits of no solar energy generation. Battery discharge is only available on this mode. Based on the EMS decision, the Battery discharge power can be sent maximum 3kW or less only to the Load.

- Use smart meter. The energy supply priority is : only load (sub+main)
- Not use smart meter. The energy supply priority is : sub_load

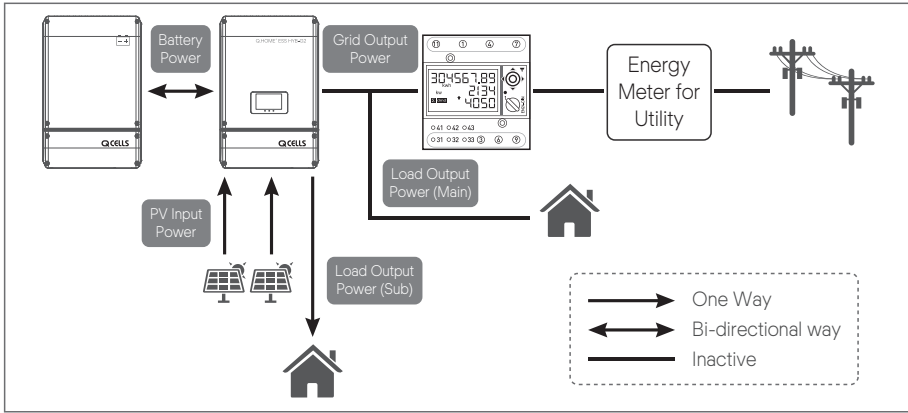


[Figure 3-5 : Diagram of Battery-Discharge Mode]

3.6 Stand-Alone (Back-up) Mode

When Q.HOME+ ESS HYB-G2 is disconnected from the grid, Q.HOME+ ESS HYB-G2 enters into the Stand-Alone (Back-up) Mode.

- Use smart meter. The energy supply priority is : sub_load > battery
- Not use smart meter. The energy supply priority is : sub_load > battery

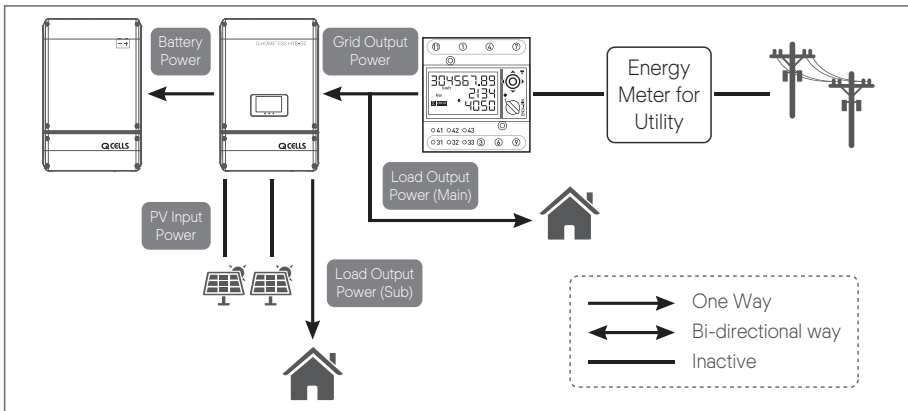


[Figure 3-6 : Diagram of Stand-Alone (Back-up) Mode]

3.7 Grid Charge Mode

The grid charging function operates when the battery is in the emergency mode. (Battery soc works when less than 3 %) Maximum input power is only 4600 W.

- Use smart meter. The energy supply priority is : load > battery
- Not use smart meter. The energy supply priority is : load > battery



[Figure 3-7 : Grid Charge Mode]

4. Communication

4.1 Overview

When the Internet connection is properly completed, you can monitor the system operation status on the computer.

4.2 Homepage

Any customer who has purchased this device can use a web browser (<https://www.ghomestory.com>) or a smart phone to check its current operation status and receive various statistical information on operation in the house or remotely.

4.2.1 Service Terms

This service is provided only when the device is connected to the Internet, and specific services may require additional information only after approval from the customer.

4.2.2 Membership

To use this service, you must register for membership through our homepage. During membership registration, the member's information such as ID, password, name and the address are collected, and additional data may also be collected to provide statistical information upon customer's approval.

4.2.3 Membership Withdrawal

For a customer who does not want to use this service, membership withdrawal is available through the personal information modification menu on the homepage.

4.2.4 Log-In

Log in to the homepage through the ID and the password generated through membership registration. You can monitor the product online only when you are logged in. Also, if a log-in ID error or a password error occurs five consecutive times, access is blocked for 10 minutes for security reasons, and access is permitted after this waiting period of time.



[Figure 4-1 : Log-in Page]

4.2.5 Password Initialization

A customer who forgets the password during use can initialize the password by using the password initialization menu on the homepage. On the log-in page, select the “Forgot your id or password?” menu, and when the customer confirms the ID and the e-mail address created during membership registration, the initialized password is sent to the registered e-mail address.



[Figure 4-2 : Password Initialization Page]

4.2.6 Types of Service Offered

After completing log-in, normal service is available. This service currently provides such menu items as monitoring, consumption reports, ESS reports, ESS forecasts, and notices.

4.2.6.1 Monitoring

The operational status of the product is indicated. You can check the current status of operation, the customer's power consumption information, and power generation amount information in real-time. You can also check event codes generated during run time on the monitoring page. You can check the details of the event codes by clicking the exclamation marks which appear on the ESS icon. If the Internet is not available, the event codes cannot be checked.



[Figure 4-3 : Monitoring Page]

The [Figure 4-4] shows the backup mode screen. This mode can be specified by the user. Since the grid does not consume power separately in the backup mode, it shows only the ESS. In the figure below, warning on ESS is an error that power does not come on the Grid.



[Figure 4-4 : Backup Mode Monitoring Page]

4.2.6.2 Consumption Report

The household power consumption information collected during energy meter linkage is provided. In particular, such information on as the household type, the size, and the number of family residents is collected according to the customer's approval. You can use these data to identify various types of statistics and comparative analysis data.



[Figure 4-5 : Consumption Report Page]

4.2.6.3 ESS Report

On the ESS Report page, you can check various types of data generated through ESS operation. You can also use the ESS Report to check the amount of energy charged or discharged and other data comparisons with the solar energy production amount or the power sales amount.

4.2.6.4 Notices

You can check the notice message whenever there is an update or any other change in the service.

4.2.6.5 Software Versions

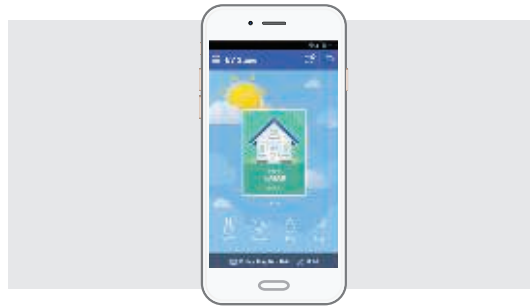
You can check the software version of the product on the monitoring page.



[Figure 4-6 : Setting Page]


4.2.7 Mobile Service

Customers who use Android or I-Phone can use a smart phone to easily check the product status anytime, anywhere. To use the mobile service, the customer must first register the membership through the webpage and use the ID and the password to log-in.




[Figure 4-7 : Mobile Service Page]

5. Maintenance for Problem Solving

	CAUTION
	<p>Do not disassemble the parts in operation for cleaning purposes. High voltage can cause lethal damage to the human body.</p> <ol style="list-style-type: none">1. Please make sure that the AC and DC switch relay in the distribution box is disconnected.2. Open the bottom cover of the Battery pack, and then turn off the circuit breaker to cut off the Battery DC.3. Disassembling the system.

5.1 Cleaning the Cover

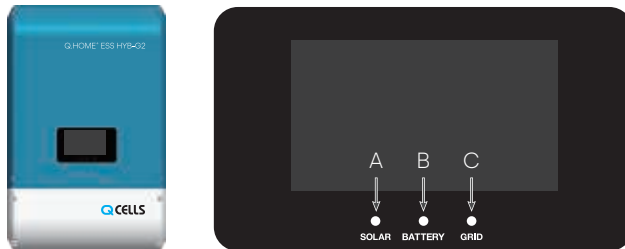
	NOTICE
	<p>Qualified Person Only! Damage to the ESS due to the use of cleaning agents. If the ESS is dirty, clean the enclosure, the enclosure lid, the type label and the LEDs using only clean water and a cloth.</p>

Ensure that the ESS is free of dust, foliage and other dirty.

6. Message Description

6.1 LED Indications

As shown in the [Figure 6-1], the LED of Q.HOME+ ESS HYB-G2 is located at bottom of LCD. The color of LED depend on current status of INVERTER and LED display information can be checked in [Table 6-1].



[Figure 6-1 : LCD Location]

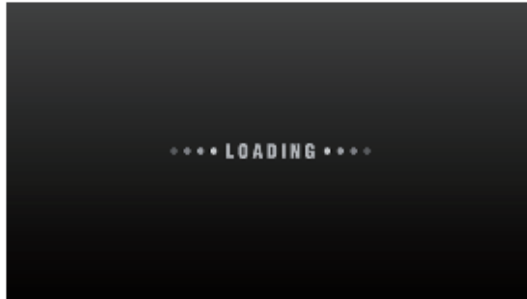
	Solar (A)	Battery (B)	Grid (C)
OFF	Energy is not being generated.	Battery is not connected.	Grid is not connected.
Green	Energy is being generated.	Battery is connected.	Grid is connected.
Red	Fault	Fault	Fault

[Table 6-1 : LED Indications]

6.2 Starting the System

After completing the installation, turn on the AC circuit breaker installed in the distribution box and then turn on the DC disconnect switch on the product. Check the system check message on the front LCD screen.

6.2.1 Loading Screen & Update Screen



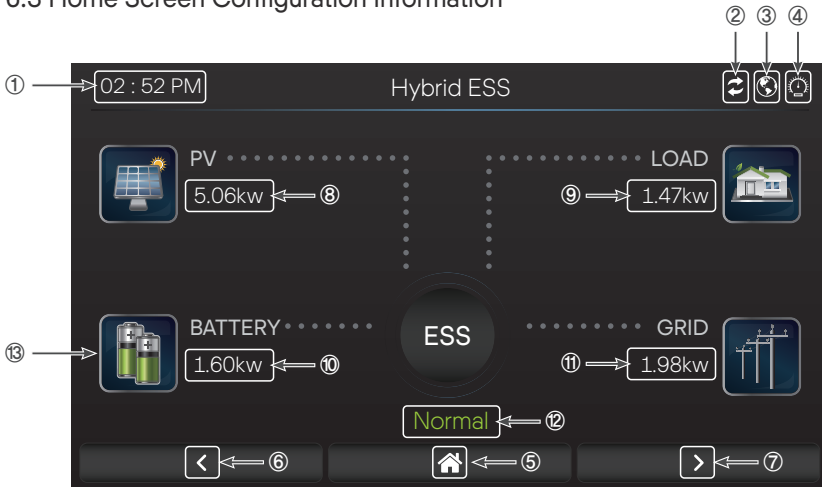
[Figure 6-2 : Initial Indication Screen on Power On]



[Figure 6-3 : Update Screen]

The [Figure 6-2] is displayed at the time of initial boot, and the home screen is displayed when internal communication is normal. The time setting is automatically renewed when connected to the network. The [Figure 6-3] is a screen display when ESS Software (PMS & PCS) is updated.

6.3 Home Screen Configuration Information



[Figure 6-4 : Standby State Indication Screen before the EMS Command]

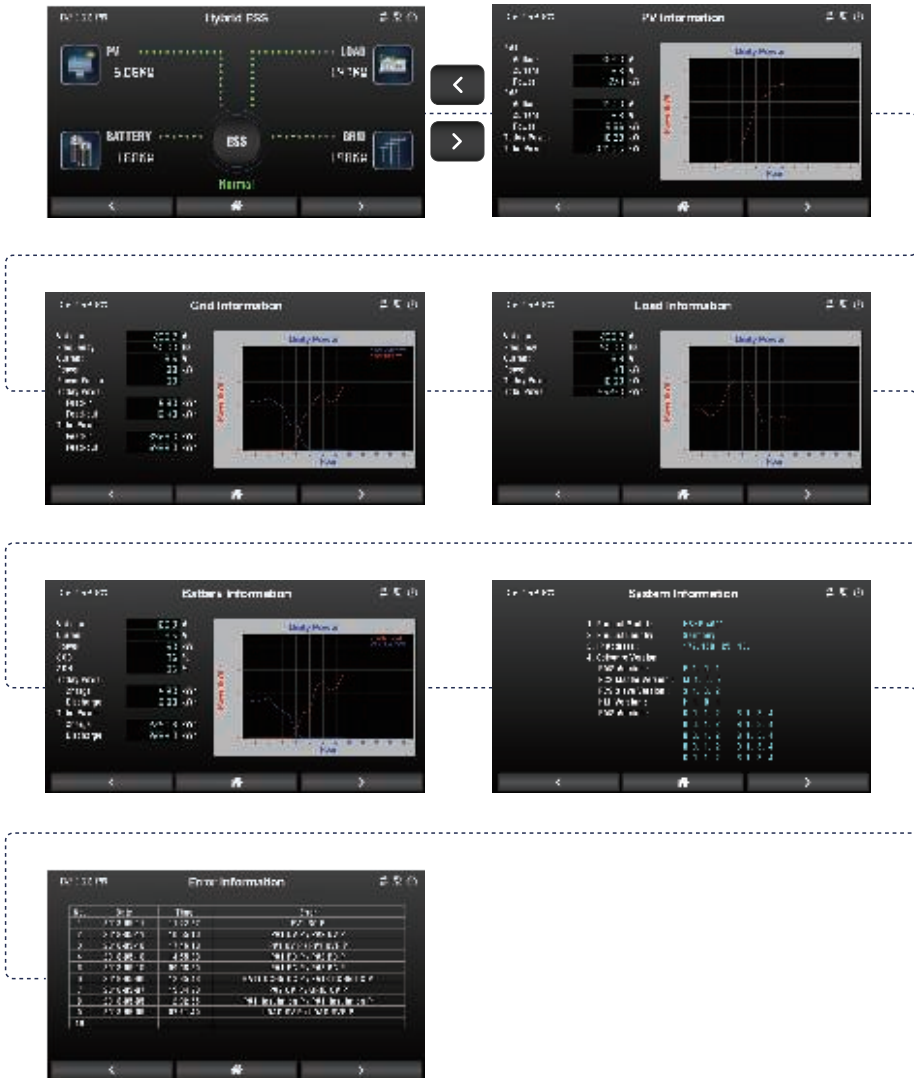
No.	Screen Information	Description
①	Time Information	Display time information
②	Operation Status	Internal communication connection status (PV, Battery, Indication during independent operation)
③	Network Connection Status	Display status when connecting to Ethernet network
④	Meter Connection Status	Display status when connecting to meter
⑤	Home Button	Go to home display
⑥	Previous Button	Go to previous screen
⑦	Next Button	Go to next screen
⑧	PV Power	Display current PV power
⑨	Load Power	Display current Load power
⑩	Battery Power	Display current Battery power
⑪	Grid Power	Display current Grid power
⑫	ESS Status Information	Display ESS normal operation (Standby/Normal/Fault/Fault Lock/Error Comm)
⑬	Battery SOC	Battery SOC status

[Table 6-2 : Screen Configuration Information]

You will receive the command from the EMS to convert to operation mode. For individual operation mode screen, refer to Chapter 6.6.













6.4 Home Menu Structure

If you touch next or previous button, the screen is displayed as shown in the [Figure 6-4]. The description of each screen refer to Chapter 6.7.



[Figure 6-5 : Home Menu Structure]

6.5 Status Description

Mode	Display	Description
PV Generation	 	The electrical power is generated by PV.
Battery Charge	 	The Battery is charging.
Battery Discharge	 	The Battery is discharging.
Grid Input	 	Supply the electrical power of Grid to INVERTER.
Grid Output	 	The power generated from the PV is fed into the Grid.
Load Input	 	The power generated by INVERTER is supplied to Load.

[Table 6-3 : Status Description]

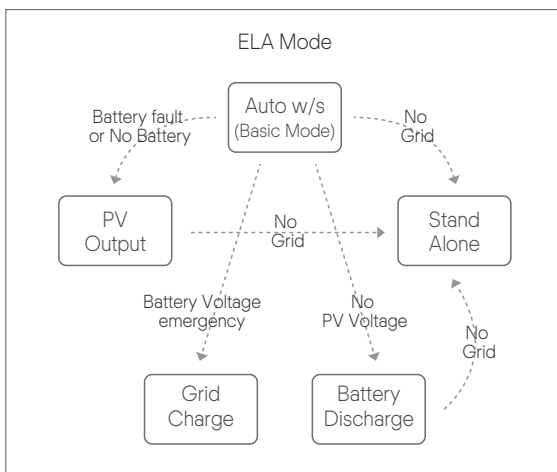
6.6 Operation Sequence

ELA				
	PV	Battery	Grid	Load
Auto W/S Mode	○	○	○	○
PV Output	○		○	○
Grid Charge		○	○	○
Battery Discharge		○	○	○
Stand Alone	X	X		○

○ : It enters when there is a battery fault.

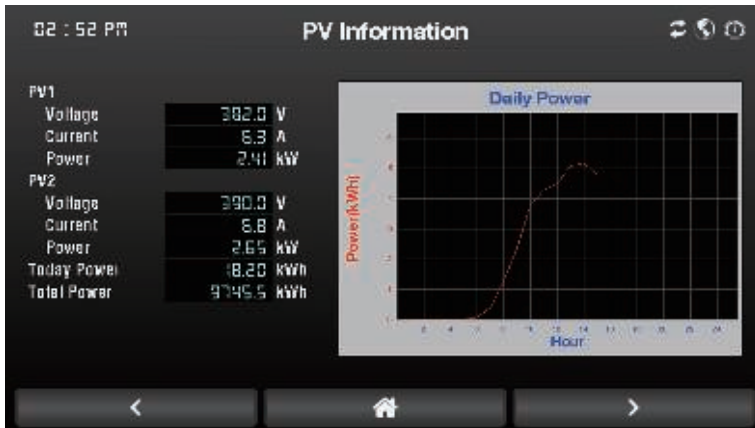
X : Don't care. One of the PV and the battery is in a steady state.

[Table 6-4 : ELA Mode]



6.7 Information Display

6.7.1 PV Information Display

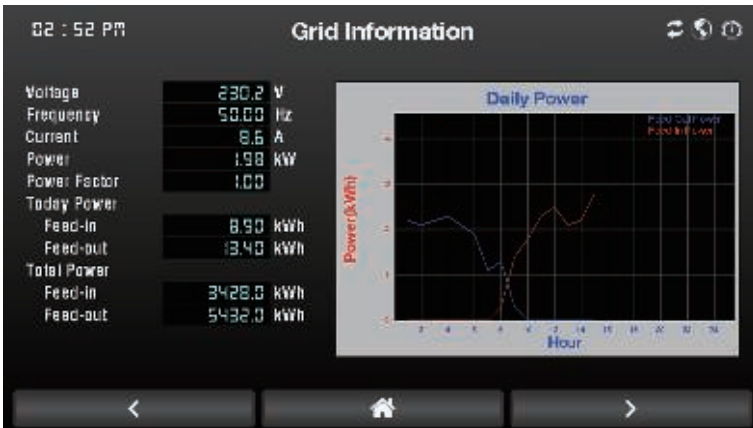


[Figure 6-6 : PV Information Display]

Display	Description
PV1 Voltage	Display current PV1 voltage
PV1 Current	Display current PV1 current
PV1 Power	Display current PV1 power
PV2 Voltage	Display current PV2 voltage
PV2 Current	Display current PV2 current
PV2 Power	Display current PV2 power
Today Power	Display today's PV power
Total Power	Display the amount of PV power
Graph	Display PV power graph (Daily/Weekly/Monthly/Yearly) (If you want to see the next graph, touch graph screen.)

[Table 6-5 : PV Information Display Description]

6.7.2 Grid Information Display

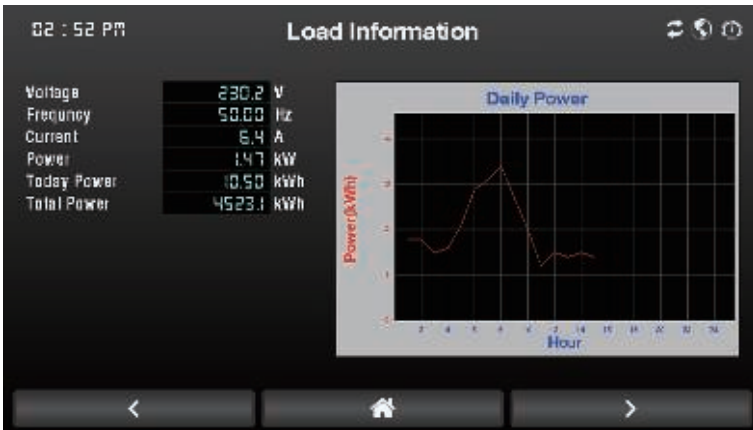


[Figure 6-7 : Grid Information Display]

Display	Description
Voltage	Display Grid voltage
Frequency	Display Grid frequency
Current	Display Grid current
Power	Display Grid active power
Power Factor	Display Grid power factor
Today Feed-in Power	Display today's power received from the Grid
Today Feed-out Power	Display today's electricity sent to the Grid
Total Feed-in Power	Display the amount of electricity received from the Grid
Total Feed-out Power	Display the amount of electricity sent to the Grid
Graph	Display Grid power graph (Daily/Weekly/Monthly/Yearly) (If you want to see the next graph, touch graph screen.)

[Table 6-6 : Grid Information Display Description]

6.7.3 Load Information Display

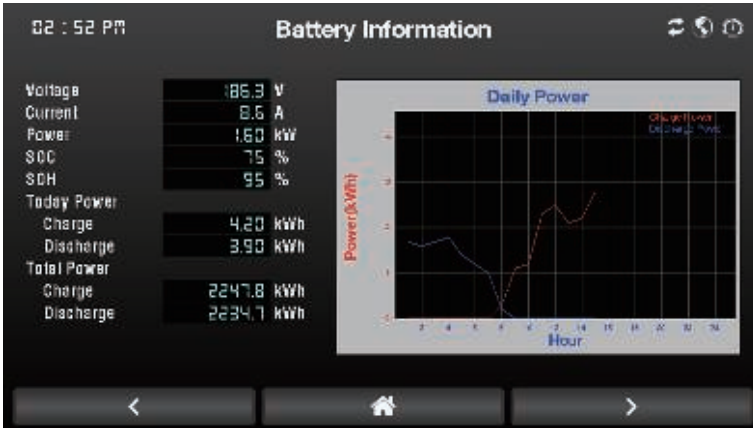


[Figure 6-8 : Load Information Display]

Display	Description
Voltage	Display Load voltage
Current	Display Load current
Frequency	Display Load frequency
Power	Display Load active power
Today Power	Display today's Load power
Total in Power	Display the amount of power used in today's Load
Graph	Display Load power graph (Daily/Weekly/Monthly/Yearly) (If you want to see the next graph, touch graph screen.)

[Table 6-7 : Load Information Display Description]

6.7.4 Battery Information Display

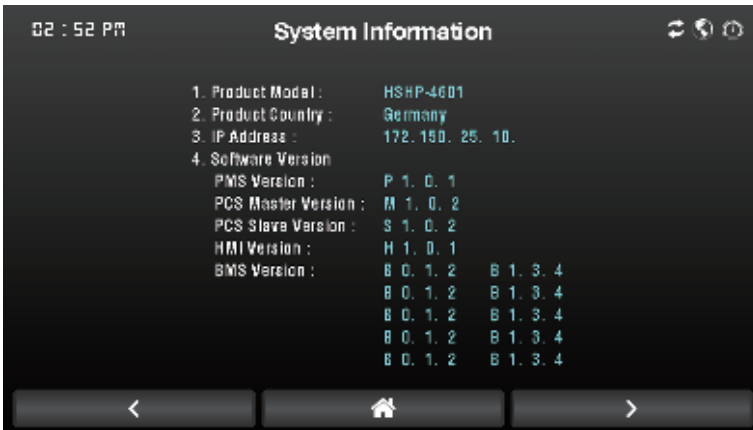


[Figure 6-9 : Battery Information Display]

Display	Description
Voltage	Display Battery voltage
Current	Display Battery current
Power	Display Battery charging / discharging power
SOC	State of charge
SOH	State of health
Today Charge Power	Display today's Battery charge power
Today Discharge Power	Display Battery power factor
Total Power Charge	Display the amount of Battery charge power
Total Power Discharge	Display the amount of Battery discharge power
Graph	Display Battery power graph (Daily/Weekly/Monthly/Yearly) (If you want to see the next graph, touch graph screen.)

[Table 6-8 : Battery Information Display Description]

6.7.5 System Information Display



[Figure 6-10 : System Information Display]

Display	Description
Product Model	Name of this product
Product Country	Country using this product
IP Address	IP Address
Software Version	Software version of this product
PMS Version	Software version of PMS
PCS Master Version	Software version of PCS master
PCS Slave Version	Software version of PCS slave
HMI Version	Software version of HMI
BMS Version	Software version of BMS (up to 5 types)

[Table 6-9 : System Information Display Description]

6.7.6 Error Information Display

No.	Date	Time	Error
1	2018-05-11	11:22:27	PV1 RC P
2	2018-05-11	10:55:10	PV1 UV P / PV2 UV P
3	2018-05-10	17:46:10	PV1 OV P / PV1 OVP P
4	2018-05-10	14:55:30	PV1 RC P / PV2 RC P
5	2018-05-10	09:08:29	PV1 RC P / PV2 RC P
6	2018-05-09	12:35:48	BAT1 DCHG OC P / BAT3 DCHG OC P
7	2018-05-07	15:34:28	PV2 OV P / GRID OV P
8	2018-05-05	12:02:58	PV1 Insulation P / PV1 Insulation P
9	2018-05-05	07:11:49	LOAD OV P / LOAD OVP P
10			

[Figure 6-11 : Error Information Display]

Display	Description
Date	The date the fault occurred.
Time	The time the fault occurred.ed.
Error	Type of fault (See Chapter 7.7) If there are more than 10 errors, the first error is cleared.

[Table 6-10 : Error Information Display Description]

6.8 General Events

The general events contain warnings and protection.

The warning level events does not stop the generating process. A displayed warning message automatically disappears as soon as the issue is resolved. When protection level events occur, the product stop the generating process. The process may automatically resume as long as the issue is resolved.

6.8.1 INVERTER General Events (Protection)

Type : PROTECTION			
WEB Display	HMI Display	Description	Measures
D01P	BDC I TZM P	BDC Current Trip Zone Master Protection	The product stops the generating process because a significant protection event has occurred.Wait until the event message disappears. After the event message is removed, it automatically returns to normal. If it is not removed until the time limit is reached, it is converted to a significant event.
D02P	BDC I TZS P	BDC Current Trip Zone Slave Protection	The product stops the generating process because a significant protection event has occurred.Wait until the event message disappears. After the event message is removed, it automatically returns to normal. If it is not removed until the time limit is reached, it is converted to a significant event.
D03P	BDC1 COC P	BDC1 Charge RMS Over Current Protection	The product stops the generating process because a significant protection event has occurred. Wait until the event message disappears. After the event message is removed, it automatically returns to normal. If it is not removed until the time limit is reached, it is converted to a significant event.
D04P	BDC1 COCP P	BDC1 Charge Over Current Peak Protection	The product stops the generating process because a significant protection event has occurred. Wait until the event message disappears. After the event message is removed, it automatically returns to normal. If it is not removed until the time limit is reached, it is converted to a significant event.
D05P	BDC1 DOC P	BDC1 Discharge RMS Over Current Protection	The product stops the generating process because a significant protection event has occurred. Wait until the event message disappears. After the event message is removed, it automatically returns to normal. If it is not removed until the time limit is reached, it is converted to a significant event.

WEB Display	HMI Display	Description	Measures
D06P	BDC1 DOCP P	BDC1 Discharge Over Current Peak Protection	The product stops the generating process because a significant protection event has occurred. Wait until the event message disappears. After the event message is removed, it automatically returns to normal. If it is not removed until the time limit is reached, it is converted to a significant event.
D13P	BDC2 COC P	BDC2 Charge RMS Over Current Protection	The product stops the generating process because a significant protection event has occurred. Wait until the event message disappears. After the event message is removed, it automatically returns to normal. If it is not removed until the time limit is reached, it is converted to a significant event.
D14P	BDC2 COCP P	BDC2 Charge Over Current Peak Protection	The product stops the generating process because a significant protection event has occurred. Wait until the event message disappears. After the event message is removed, it automatically returns to normal. If it is not removed until the time limit is reached, it is converted to a significant event.
D15P	BDC2 DOC P	BDC2 Discharge RMS Over Current Protection	The product stops the generating process because a significant protection event has occurred. Wait until the event message disappears. After the event message is removed, it automatically returns to normal. If it is not removed until the time limit is reached, it is converted to a significant event.
D16P	BDC2 DOCP P	BDC2 Discharge Over Current Peak Protection	The product stops the generating process because a significant protection event has occurred. Wait until the event message disappears. After the event message is removed, it automatically returns to normal. If it is not removed until the time limit is reached, it is converted to a significant event.
D21P	BDC UV P	BDC RMS Under Voltage Protection	The product stops the generating process because a significant protection event has occurred. Wait until the event message disappears. After the event message is removed, it automatically returns to normal. If it is not removed until the time limit is reached, it is converted to a significant event.
D22P	BDC OV P	BDC RMS Over Voltage Protection	The product stops the generating process because a significant protection event has occurred. Wait until the event message disappears. After the event message is removed, it automatically returns to normal. If it is not removed until the time limit is reached, it is converted to a significant event.

WEB Display	HMI Display	Description	Measures
D23P	BDC OVP P	BDC Over Voltage Peak Protection	The product stops the generating process because a significant protection event has occurred. Wait until the event message disappears. After the event message is removed, it automatically returns to normal. If it is not removed until the time limit is reached, it is converted to a significant event.
D24P	BDC OW P	BDC RMS Over Watt Protection	The product stops the generating process because a significant protection event has occurred. Wait until the event message disappears. After the event message is removed, it automatically returns to normal. If it is not removed until the time limit is reached, it is converted to a significant event.
D25P	BDCM OT P	BDC Module Over Temp Protection	When the switch temperature is high. Wait until the event message disappears. After the event message is removed, it automatically returns to normal. If it is not removed until the time limit is reached, it is converted to a significant event.
D26P	BDCM UT P	BDC Module Under Temp Protection	When the switch temperature is low. Wait until the event message disappears. After the event message is removed, it automatically returns to normal. If it is not removed until the time limit is reached, it is converted to a significant event.
G01P	INV I TZM P	INV Current Trip Zone Master Protection	The product stops the generating process because a significant protection event has occurred. Wait until the event message disappears. After the event message is removed, it automatically returns to normal. If it is not removed until the time limit is reached, it is converted to a significant event.
G02P	INV I TZS P	INV Current Trip Zone Slave Protection	The product stops the generating process because a significant protection event has occurred. Wait until the event message disappears. After the event message is removed, it automatically returns to normal. If it is not removed until the time limit is reached, it is converted to a significant event.
G03P	INV OW P	INV Over Watt Protection	The product stops the generating process because a significant protection event has occurred. Wait until the event message disappears. After the event message is removed, it automatically returns to normal. If it is not removed until the time limit is reached, it is converted to a significant event.

WEB Display	HMI Display	Description	Measures
G04P	INV OC P	INV RMS Over Current Protection	The product stops the generating process because a significant protection event has occurred. Wait until the event message disappears. After the event message is removed, it automatically returns to normal. If it is not removed until the time limit is reached, it is converted to a significant event.
G05P	INV OCP P	INV Over Current Peak Protection	The product stops the generating process because a significant protection event has occurred. Wait until the event message disappears. After the event message is removed, it automatically returns to normal. If it is not removed until the time limit is reached, it is converted to a significant event.
G06P	INV OT P	INV Module Temp Over Temp Protection	When the switch temperature is high. Wait until the event message disappears. After the event message is removed, it automatically returns to normal. If it is not removed until the time limit is reached, it is converted to a significant event.
G07P	INV UT P	INV Module Temp Under Temp Protection	When the switch temperature is low. Wait until the event message disappears. After the event message is removed, it automatically returns to normal. If it is not removed until the time limit is reached, it is converted to a significant event.
G11P	GRID OW P	Grid Over Watt Protection	The product stops the generating process because a significant protection event has occurred. Wait until the event message disappears. After the event message is removed, it automatically returns to normal. If it is not removed until the time limit is reached, it is converted to a significant event.
G12P	GRID UV P	Grid RMS Under Voltage Protection	Check the connection of Grid Voltage cable.
G13P	GRID OV P	Grid RMS Over Voltage Protection	The product stops the generating process because a significant protection event has occurred. Wait until the event message disappears. After the event message is removed, it automatically returns to normal. If it is not removed until the time limit is reached, it is converted to a significant event.

WEB Display	HMI Display	Description	Measures
G14P	GRID OVP P	Grid Over Voltage Peak Protection	The product stops the generating process because a significant protection event has occurred. Wait until the event message disappears. After the event message is removed, it automatically returns to normal. If it is not removed until the time limit is reached, it is converted to a significant event.
G15P	GRID OF P	Grid Over Frequency Protection	The operation mode is terminated when a power system event occurs. Restart 1 minute after the electric power system event is settled
G16P	GRID UF P	Grid Under Frequency Protection	The operation mode is terminated when a power system event occurs. Restart 1 minute after the electric power system event is settled
G21P	DC Injection P	DC Injection Protection	The product stops the generating process because a significant protection event has occurred. Wait until the event message disappears. After the event message is removed, it automatically returns to normal. If it is not removed until the time limit is reached, it is converted to a significant event.
G22P	RCMU N P	Residual Current Monitoring Unit Normal Protection	Turn off system power when the leakage current level is above standard level. Check the leakage current level, then restart or turn off to get back to the below standard level.
G23P	RCMU SD P	Residual Current Monitoring Unit Sudden Protection	Turn off system power when the leakage current level is above standard level. Check the leakage current level, then restart or turn off to get back to the below standard level.
G24P	GRID OV 10Min P	Grid 10 Minute Average Protection	The product stops the generating process because a significant protection event has occurred. Wait until the event message disappears. After the event message is removed, it automatically returns to normal. If it is not removed until the time limit is reached, it is converted to a significant event.

WEB Display	HMI Display	Description	Measures
G25P	ANTI ISLANDING P	Anti-Islanding Protection	If the electric power system blacks out, it automatically detects the state and turns off the Q.HOME+ ESS HYB-G2. (shifting the frequency of the inverter away from nominal conditions in the absence of a reference frequency. (frequency shift))
G31P	GRID AD P	Grid V AD Measurement Protection	The error of Master & slave AD value is more than 2%. A/S is required.
G32P	Relay L1 P	Relay L1 Abnormal Operation Protection	Relay L1 is burned out. A / S is required.
G33P	Relay L2 P	Relay L2 Abnormal Operation Protection	Relay L2 is burned out. A / S is required.
G34P	Relay L3 P	Relay L3 Abnormal Operation Protection	Relay L3 is burned out. A / S is required.
G35P	Relay L4 P	Relay L4 Abnormal Operation Protection	Relay L4 is burned out. A / S is required.
L01P	Load OC P	Load RMS Over Current Protection	The product stops the generating process because a significant protection event has occurred. Wait until the event message disappears. After the event message is removed, it automatically returns to normal. If it is not removed until the time limit is reached, it is converted to a significant event.
L02P	Load OCP P	Load Over Current Peak Protection	The product stops the generating process because a significant protection event has occurred. Wait until the event message disappears. After the event message is removed, it automatically returns to normal. If it is not removed until the time limit is reached, it is converted to a significant event.
L03P	Load UV P	Load RMS Under Voltage Protection	The product stops the generating process because a significant protection event has occurred. Wait until the event message disappears. After the event message is removed, it automatically returns to normal. If it is not removed until the time limit is reached, it is converted to a significant event.
L04P	Load OV P	Load RMS Over Voltage Protection	The product stops the generating process because a significant protection event has occurred. Wait until the event message disappears. After the event message is removed, it automatically returns to normal. If it is not removed until the time limit is reached, it is converted to a significant event.

WEB Display	HMI Display	Description	Measures
L05P	Load OVP P	Load Over Voltage Peak Protection	The product stops the generating process because a significant protection event has occurred. Wait until the event message disappears. After the event message is removed, it automatically returns to normal. If it is not removed until the time limit is reached, it is converted to a significant event.
L06P	Load OF P	Load Over Frequency Protection	The product stops the generating process because a significant protection event has occurred. Wait until the event message disappears. After the event message is removed, it automatically returns to normal. If it is not removed until the time limit is reached, it is converted to a significant event.
L07P	Load UF P	Load Under Frequency Protection	The product stops the generating process because a significant protection event has occurred. Wait until the event message disappears. After the event message is removed, it automatically returns to normal. If it is not removed until the time limit is reached, it is converted to a significant event.
L08P	Load OW P	Load Over Watt Protection	The product stops the generating process because a significant protection event has occurred. Wait until the event message disappears. After the event message is removed, it automatically returns to normal. If it is not removed until the time limit is reached, it is converted to a significant event.
S01P	PV1 RC P	PV1 String Reverse Connection Protection	Please check PV1 (+) and (-) wiring. If the connection is successful, wait until the event message disappears. When the event message is removed, it automatically returns to the normal state. If it is not removed until the time limit is reached, it is converted to a significant event.
S04P	PV1 OVP P	PV1 RMS Over Voltage Protection	The product stops the generating process because a significant protection event has occurred. Wait until the event message disappears. After the event message is removed, it automatically returns to normal. If it is not removed until the time limit is reached, it is converted to a significant event.
S05P	PV1 OVP P	PV1 Over Voltage Peak Protection	The product stops the generating process because a significant protection event has occurred. Wait until the event message disappears. After the event message is removed, it automatically returns to normal. If it is not removed until the time limit is reached, it is converted to a significant event.

WEB Display	HMI Display	Description	Measures
S06P	PV1 OC P	PV1 RMS Over Current Protection	The product stops the generating process because a significant protection event has occurred. Wait until the event message disappears. After the event message is removed, it automatically returns to normal. If it is not removed until the time limit is reached, it is converted to a significant event.
S07P	PV1 OCP P	PV1 Over Current Peak Protection	The product stops the generating process because a significant protection event has occurred. Wait until the event message disappears. After the event message is removed, it automatically returns to normal. If it is not removed until the time limit is reached, it is converted to a significant event.
S08P	PV1 OW P	PV1 RMS Over Watt Protection	The product stops the generating process because a significant protection event has occurred. Wait until the event message disappears. After the event message is removed, it automatically returns to normal. If it is not removed until the time limit is reached, it is converted to a significant event.
S11P	PV2 RC P	PV2 String Reverse Connection Protection	Please check PV2 (+) and (-) wiring. If the connection is successful, wait until the event message disappears. When the event message is removed, it automatically returns to the normal state. If it is not removed until the time limit is reached, it is converted to a significant event.
S14P	PV2 OV P	PV2 RMS Over Voltage Protection	The product stops the generating process because a significant protection event has occurred. Wait until the event message disappears. After the event message is removed, it automatically returns to normal. If it is not removed until the time limit is reached, it is converted to a significant event.
S15P	PV2 OVP P	PV2 Over Voltage Peak Protection	The product stops the generating process because a significant protection event has occurred. Wait until the event message disappears. After the event message is removed, it automatically returns to normal. If it is not removed until the time limit is reached, it is converted to a significant event.
S16P	PV2 OC P	PV2 RMS Over Current Protection	The product stops the generating process because a significant protection event has occurred. Wait until the event message disappears. After the event message is removed, it automatically returns to normal. If it is not removed until the time limit is reached, it is converted to a significant event.

WEB Display	HMI Display	Description	Measures
S17P	PV2 OCP P	PV2 Over Current Peak Protection	The product stops the generating process because a significant protection event has occurred. Wait until the event message disappears. After the event message is removed, it automatically returns to normal. If it is not removed until the time limit is reached, it is converted to a significant event.
S18P	PV2 OW P	PV2 RMS Over Watt Protection	The product stops the generating process because a significant protection event has occurred. Wait until the event message disappears. After the event message is removed, it automatically returns to normal. If it is not removed until the time limit is reached, it is converted to a significant event.
S21P	PVM OT P	PV Module Over Temp Protection	When the switch temperature is high. Wait until the event message disappears. After the event message is removed, it automatically returns to normal. If it is not removed until the time limit is reached, it is converted to a significant event.
S22P	PVM UT P	PV Module Under Temp Protection	When the switch temperature is low. Wait until the event message disappears. After the event message is removed, it automatically returns to normal. If it is not removed until the time limit is reached, it is converted to a significant event.
S23P	PV1 INSULATION P	PV1 Insulation Protection	Turn off system power if PV1 insulation resistance is at the standard level.
S24P	PV2 INSULATION P	PV2 Insulation Protection	Turn off system power if PV2 insulation resistance is at the standard level.
S31P	DCLINK V TZM P	DCLINK Voltage Trip Zone Master Protection	The product stops the generating process because a significant protection event has occurred. Wait until the event message disappears. After the event message is removed, it automatically returns to normal. If it is not removed until the time limit is reached, it is converted to a significant event.
S32P	DCLINK UV P	DCLINK RMS Under Voltage Protection	The product stops the generating process because a significant protection event has occurred. Wait until the event message disappears. After the event message is removed, it automatically returns to normal. If it is not removed until the time limit is reached, it is converted to a significant event.

WEB Display	HMI Display	Description	Measures
S33P	DCLINK OV P	DCLINK RMS Over Voltage Protection	The product stops the generating process because a significant protection event has occurred. Wait until the event message disappears. After the event message is removed, it automatically returns to normal. If it is not removed until the time limit is reached, it is converted to a significant event.
S34P	DCLINK OVP P	DCLINK Over Voltage Peak Protection	The product stops the generating process because a significant protection event has occurred. Wait until the event message disappears. After the event message is removed, it automatically returns to normal. If it is not removed until the time limit is reached, it is converted to a significant event.

[Table 6-11 : INVERTER General Events Warning List]

6.8.2 Battery General Events (Protection)

Type : PROTECTION			
WEB Display	HMI Display	Description	Measures
B01P	BAT1 CHG OC P	BAT1 Charge Over Current Protection	The product stops the generating process because a significant protection event has occurred. Wait until the event message disappears. After the event message is removed, it automatically returns to normal. If it is not removed until the time limit is reached, it is converted to a significant event.
B02P	BAT1 DCHG OC P	BAT1 Discharge Over Current Protection	The product stops the generating process because a significant protection event has occurred. Wait until the event message disappears. After the event message is removed, it automatically returns to normal. If it is not removed until the time limit is reached, it is converted to a significant event.
B03P	BAT1 CEL V HOLD P	BAT1 Cell Voltage Sensing Data Hold Protection	Power reset of the system is required. If the symptom still occurs after reset, repair of BMS or PCS Control Board is necessary.
B04P	BAT1 CEL OV P	BAT1 Cell or Rack Over Voltage Protection	When the maximum cell or rack voltage is above protection level, thus terminating the system. Automatically returns to normal when the maximum cell or rack voltage goes below the limit value.
B05P	BAT1 CEL UV P	BAT1 Cell or Rack Under Voltage Protection	When the minimum cell or rack voltage is below protection level, thus terminating the system. Automatically returns to normal when the minimum cell or rack voltage goes above the limit value.
B06P	BAT1 CEL OT P	BAT1 Cell Over Temp Protection	When the maximum cell temperature is above protection level, thus terminating the system. Automatically returns to normal when the maximum cell temperature goes below the limit value.

WEB Display	HMI Display	Description	Measures
B07P	BAT1 COM P	BAT1 Communication Protection	Power reset of the system is required. If the symptom persists after reset, replace the cable connecting the Battery pack and the INVERTER. After replacement, repair of BMS or PCS Control Board is necessary.
B08P	BAT1 ADD P	BAT1 Additional Protection	Power reset of the system is required. If the symptom still occurs after reset, repair of BMS or PCS Control Board is necessary.
B11P	BAT2 CHG OC P	BAT2 Charge Over Current Protection	The product stops the generating process because a significant protection event has occurred. Wait until the event message disappears. After the event message is removed, it automatically returns to normal. If it is not removed until the time limit is reached, it is converted to a significant event.
B12P	BAT2 DCHG OC P	BAT2 Discharge Over Current Protection	The product stops the generating process because a significant protection event has occurred. Wait until the event message disappears. After the event message is removed, it automatically returns to normal. If it is not removed until the time limit is reached, it is converted to a significant event.
B13P	BAT2 CEL V HOLD P	BAT2 Cell Voltage Sensing Data Hold Protection	Power reset of the system is required. If the symptom still occurs after reset, repair of BMS or PCS Control Board is necessary.
B14P	BAT2 CEL OV P	BAT2 Cell or Rack Over Voltage Protection	When the maximum cell or rack voltage is above protection level, thus terminating the system. Automatically returns to normal when the maximum cell or rack voltage goes below the limit value.
B15P	BAT2 CEL UV P	BAT2 Cell or Rack Under Voltage Protection	When the minimum cell or rack voltage is below protection level, thus terminating the system. Automatically returns to normal when the minimum cell or rack voltage goes above the limit value.

WEB Display	HMI Display	Description	Measures
B16P	BAT2 CEL OT P	BAT2 Cell Over Temp Protection	When the maximum cell temperature is above protection level, thus terminating the system. Automatically returns to normal when the maximum cell temperature goes below the limit value.
B17P	BAT2 COM P	BAT2 Communication Protection	Power reset of the system is required. If the symptom persists after reset, replace the cable connecting the Battery pack and the INVERTER. After replacement, repair of BMS or PCS Control Board is necessary.
B18P	BAT2 ADD P	BAT2 Additional Protection	Power reset of the system is required. If the symptom still occurs after reset, repair of BMS or PCS Control Board is necessary.
B21P	DC Injection P	DC Injection Protection	The product stops the generating process because a significant protection event has occurred. Wait until the event message disappears. After the event message is removed, it automatically returns to normal. If it is not removed until the time limit is reached, it is converted to a significant event.
B22P	BAT3 DCHG OC P	BAT3 Discharge Over Current Protection	The product stops the generating process because a significant protection event has occurred. Wait until the event message disappears. After the event message is removed, it automatically returns to normal. If it is not removed until the time limit is reached, it is converted to a significant event.
B23P	BAT3 CEL V HOLD P	BAT3 Cell Voltage Sensing Data Hold Protection	Power reset of the system is required. If the symptom still occurs after reset, repair of BMS or PCS Control Board is necessary.
B24P	BAT3 CEL OV P	BAT3 Cell or Rack Over Voltage Protection	When the maximum cell or rack voltage is above protection level, thus terminating the system. Automatically returns to normal when the maximum cell or rack voltage goes below the limit value.
B25P	BAT3 CEL UV P	BAT3 Cell or Rack Under Voltage Protection	When the minimum cell or rack voltage is below protection level, thus terminating the system. Automatically returns to normal when the minimum cell or rack voltage goes above the limit value.

WEB Display	HMI Display	Description	Measures
B26P	BAT3 CEL OT P	BAT3 Cell Over Temp Protection	When the maximum cell temperature is above protection level, thus terminating the system. Automatically returns to normal when the maximum cell temperature goes below the limit value.
B27P	BAT3 COM P	BAT3 Communication Protection	Power reset of the system is required. If the symptom persists after reset, replace the cable connecting the Battery pack and the INVERTER. After replacement, repair of BMS or PCS Control Board is necessary.
B28P	BAT3 ADD P	BAT3 Additional Protection	Power reset of the system is required. If the symptom still occurs after reset, repair of BMS or PCS Control Board is necessary.
B31P	BAT4 CHG OC P	BAT4 Charge Over Current Protection	The product stops the generating process because a significant protection event has occurred. Wait until the event message disappears. After the event message is removed, it automatically returns to normal. If it is not removed until the time limit is reached, it is converted to a significant event.
B32P	BAT4 DCHG OC P	BAT4 Discharge Over Current Protection	The product stops the generating process because a significant protection event has occurred. Wait until the event message disappears. After the event message is removed, it automatically returns to normal. If it is not removed until the time limit is reached, it is converted to a significant event.
B33P	BAT4 CEL V HOLD P	BAT4 Cell Voltage Sensing Data Hold Protection	Power reset of the system is required. If the symptom still occurs after reset, repair of BMS or PCS Control Board is necessary.
B34P	BAT4 CEL OV P	BAT4 Cell or Rack Over Voltage Protection	When the maximum cell or rack voltage is above protection level, thus terminating the system. Automatically returns to normal when the maximum cell or rack voltage goes below the limit value.
B35P	BAT4 CEL UV P	BAT4 Cell or Rack Under Voltage Protection	When the minimum cell or rack voltage is below protection level, thus terminating the system. Automatically returns to normal when the minimum cell or rack voltage goes above the limit value.

WEB Display	HMI Display	Description	Measures
B36P	BAT4 CEL OT P	BAT4 Cell Over Temp Protection	When the maximum cell temperature is above protection level, thus terminating the system. Automatically returns to normal when the maximum cell temperature goes below the limit value.
B37P	BAT4 COM P	BAT4 Communication Protection	Power reset of the system is required. If the symptom persists after reset, replace the cable connecting the Battery pack and the INVERTER. After replacement, repair of BMS or PCS Control Board is necessary.
B38P	BAT4 ADD P	BAT4 Additional Protection	Power reset of the system is required. If the symptom still occurs after reset, repair of BMS or PCS Control Board is necessary.
B41P	BAT5 CHG OC P	BAT5 Charge Over Current Protection	The product stops the generating process because a significant protection event has occurred. Wait until the event message disappears. After the event message is removed, it automatically returns to normal. If it is not removed until the time limit is reached, it is converted to a significant event.
B42P	BAT5 DCHG OC P	BAT5 Discharge Over Current Protection	The product stops the generating process because a significant protection event has occurred. Wait until the event message disappears. After the event message is removed, it automatically returns to normal. If it is not removed until the time limit is reached, it is converted to a significant event.
B43P	BAT5 CEL V HOLD P	BAT5 Cell Voltage Sensing Data Hold Protection	Power reset of the system is required. If the symptom still occurs after reset, repair of BMS or PCS Control Board is necessary.
B44P	BAT5 CEL OV P	BAT5 Cell or Rack Over Voltage Protection	When the maximum cell or rack voltage is above protection level, thus terminating the system. Automatically returns to normal when the maximum cell or rack voltage goes below the limit value.
B45P	BAT5 CEL UV P	BAT5 Cell or Rack Under Voltage Protection	When the minimum cell or rack voltage is below protection level, thus terminating the system. Automatically returns to normal when the minimum cell or rack voltage goes above the limit value.

WEB Display	HMI Display	Description	Measures
B46P	BAT5 CEL OT P	BAT5 Cell Over Temp Protection	When the maximum cell temperature is above protection level, thus terminating the system. Automatically returns to normal when the maximum cell temperature goes below the limit value.
B47P	BAT5 COM P	BAT5 Communication Protection	Power reset of the system is required. If the symptom persists after reset, replace the cable connecting the Battery pack and the INVERTER. After replacement, repair of BMS or PCS Control Board is necessary.
B48P	BAT5 ADD P	BAT5 Additional Protection	Power reset of the system is required. If the symptom still occurs after reset, repair of BMS or PCS Control Board is necessary.

[Table 6-12 : Battery Operation General Events List]

6.7.3 System General Events (Protection)

Type : PROTECTION			
WEB Display	HMI Display	Description	Measures
P01P	Unknown	Unregistered Failure	It is an unregistered fault. Turn off and restart the system. Please contact the Q CELLS Service –Hotline, if an error occurs continuously.
P03P	DSP-EMG TRIP P	DSP-Emergency Trip Protection	Please check emergency switch.
P11P	ADC P	ADC Measure Error Protection	Please turn off and restart the system. If an error occurs repeatedly, it is necessary to replace the Control Board.
P12P	DSPM UPDATE P	DSP Master Remote Update Fail Protection	Please update DSP Master software again.
P13P	DSPS UPDATE P	DSP Slave Remote Update Fail Protection	Please update DSP Slave software again.
P14P	PMS UPDATE P	PMS Remote Update Fail Protection	Please update PMS software again.
P15P	DSP VER P	DSP Firmware Version Error Protection	DSP and PMS versions are different. Please re-install the DSP software.
P16P	PMS VER P	PMS Firmware Version Error Protection	Please update DSP Slave software again.
P21P	DSPM FRAM P	DSP Master FRAM Communication Error Protection	Please turn off and restart the system. If an error occurs repeatedly, it is necessary to replace the Control Board.
P22P	DSPS FRAM P	DSP Slave FRAM Communication Error Protection	Please turn off and restart the system. If an error occurs repeatedly, it is necessary to replace the Control Board.
P23P	DSP COM P	DSPM-DSPS Communication Error Protection	It is an unregistered fault. Turn off and restart the system. Please contact the Q CELLS Service–Hotline, if an error occurs continuously.

[Table 6-13 : System General Events Protection List]

7. Arrangement of Terms

Chapter 1	
Q.HOME	Residential Energy Storage
Chapter 2	
Li-Ion Battery	Li-Ion Battery
PV	Photo Voltaic
Distribution Box	A box containing AC, DC ON-OFF switches for electricity distribution
AC	Alternating Current
DC	Direct Current
LCD	Liquid Crystal Display
INVERTER	An electric circuit that converts DC to AC and vice versa
Converter	An electric circuit that converts DC to DC
PV String	Describes series connected photovoltaic modules
Load	Power Load
Chapter 3	
EMS	Energy Management System
Chapter 7	
CELL	Battery Individual Cell

8. Contact

■ **Hanwha Q CELLS Corporation**

: Q CELLS, 86 Cheonggyecheon-ro, Jung-gu, Seoul Korea 04541 (+82(0)2-729-3163)

■ **Q.HOME+ ESS Service for Europe, Germany**

: E-Service Haberkorn GmbH, Augustenhöhe 7, 06493 Harzgerode, Germany
 (Technical Support, +49(0)39484-9763-85, q.home@e-service48.com)

■ **Hanwha Q CELLS Australia Pty Ltd**

: Suite 1, Level 1, 15 Blue Street North Sydney, NSW 2060 Australia
 (+61 (0)2 9016 3033, qhome.au@q-cells.com)

■ **For technical problems or inquiries for use, please contact the installation company.**

To receive customer support, the following information is required.

1. Product type : Q.VOLT-G2 HYB-4.6kW.1.1 (Germany), Q.VOLT-G2 HYB-5.0kW.1.1 (Australia)
2. Serial Number :
3. PV module type and configuration
4. Option equipment : Energy Meter Model Name

※ **Serial Number**

: Serial number (18 digit)

Q CELLS Hanwha Solutions Corporation
 86 Cheonggyecheon-ro, Jung-gu, Seoul Korea 04541

Product Name : Q.HOME+ ESS Service for Europe, Germany
Hybrid Inverter : Q.VOLT-G2 HYB-5kW1.1

DC (PhotoVoc. Module Input)	Max. Voltage	550 V
	Rated Input Voltage	400 V
AC (Input)	MPPPT Range	125 V - 500 V
	Max. PV Current Per String / MPP / Isc	18 A / 20 A
AC (Output)	AC Nominal Voltage / Frequency	230 V / 50 Hz
	Max. Continuous / Rated Current	25 A / 13 A
LCAD (Output)	AC Nominal Power	5000 W / 5000 VA
	AC Nominal Voltage / Frequency	230 V / 50 Hz
DC (Battery Module Input)	Max. Continuous / Rated Current	25 A / 13 A
	Power Factor	0.8 lagging to 0.8 leading
Battery Type	AC Nominal Active power P ₁ / Max.	3000 W / 4500 W (10 Min)
	AC Nominal Voltage / Frequency	230 V / 50 Hz
Inverter topology	Max. Continuous / Rated Current	25 A / 13 A
	Q.SAVE G2 4kWh Max. DC Current	203.84 V
Operating Temperature	Q.SAVE G2 6.3kWh Max. DC Current	17 A
	Q.SAVE G2 6.3kWh Max. DC Current	202.70 V
Ingress Protection	Q.SAVE G2 6.3kWh Max. DC Current	15.8 A
	Protection Class	IP 65

IEC 62109-1/2, AS 62040.1.1, AS/NZS 4777.2, IEC 62116, IEC 60068-2-62

CE, RoHS, WEEE, REACH, GHS, UN38.3, UN3090, UN3480, UN3077, UN3499, UN3091, UN3092, UN3093, UN3094, UN3095, UN3096, UN3097, UN3098, UN3099, UN3100, UN3101, UN3102, UN3103, UN3104, UN3105, UN3106, UN3107, UN3108, UN3109, UN3110, UN3111, UN3112, UN3113, UN3114, UN3115, UN3116, UN3117, UN3118, UN3119, UN3120, UN3121, UN3122, UN3123, UN3124, UN3125, UN3126, UN3127, UN3128, UN3129, UN3130, UN3131, UN3132, UN3133, UN3134, UN3135, UN3136, UN3137, UN3138, UN3139, UN3140, UN3141, UN3142, UN3143, UN3144, UN3145, UN3146, UN3147, UN3148, UN3149, UN3150, UN3151, UN3152, UN3153, UN3154, UN3155, UN3156, UN3157, UN3158, UN3159, UN3160, UN3161, UN3162, UN3163, UN3164, UN3165, UN3166, UN3167, UN3168, UN3169, UN3170, UN3171, UN3172, UN3173, UN3174, UN3175, UN3176, UN3177, UN3178, UN3179, UN3180, UN3181, UN3182, UN3183, UN3184, UN3185, UN3186, UN3187, UN3188, UN3189, UN3190, UN3191, UN3192, UN3193, UN3194, UN3195, UN3196, UN3197, UN3198, UN3199, UN3200

Mfg Date & No.

XXXXAAABCCDEFGHIGKLN

Hanwha Q CELLS GmbH
 Sonnenallee 17-21, Bitterfeld-Wolfen
 04714 Bitterfeld-Wolfen, Germany

Manufacturer & Warranty Provider:
[Hanwha Solutions Corporation](#)
86 Cheonggyecheon-ro, Jung-gu,
Seoul Korea 04541

