

Training Plans

Shenzhen ATESS Power Technology co,. ltd

04

PART FOUR

PCS SYSTEM TRAINING

PCS SYSTEM



1、 PCS System Introduce

2、 PCS System Installation

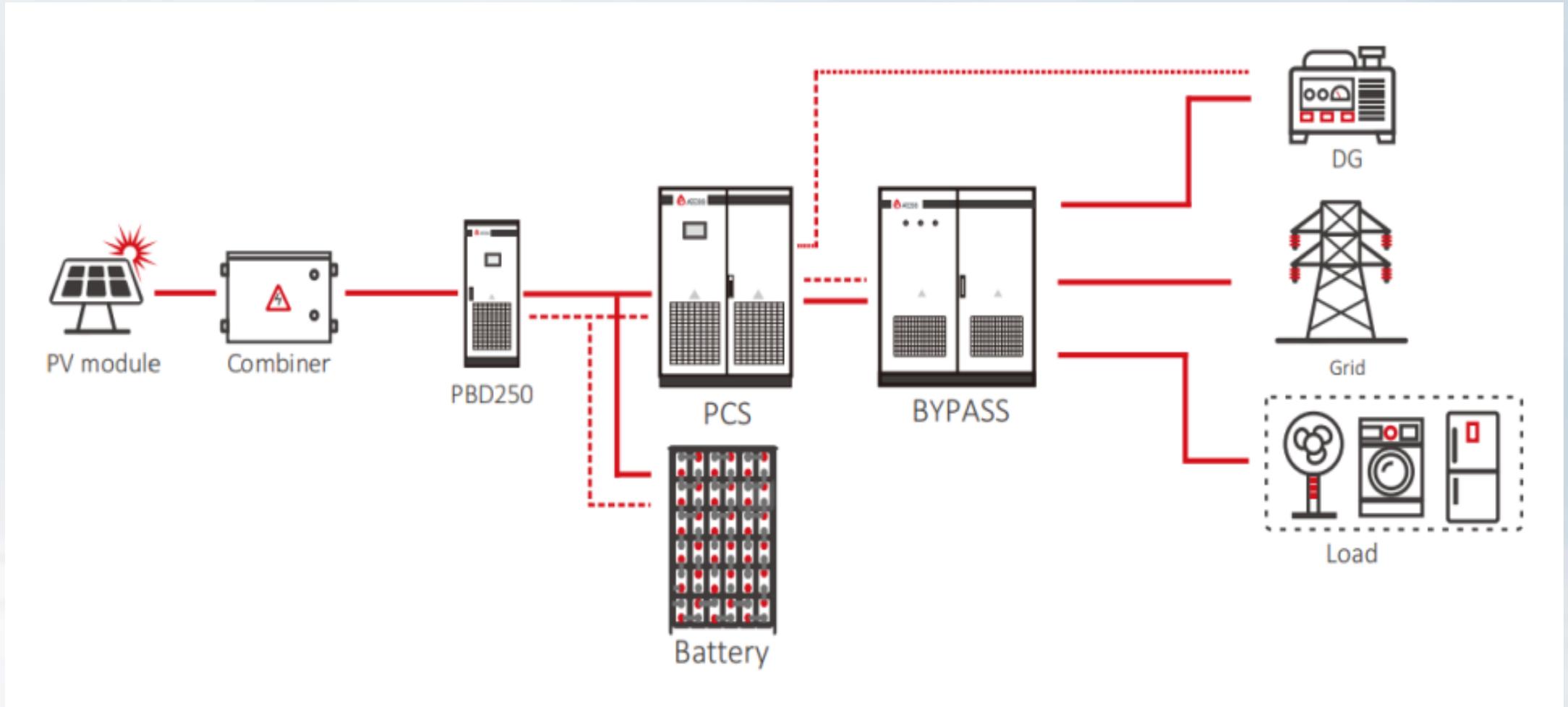
3、 PCS System Commissioning

4、 PCS System Troubleshooting

5、 PCS System Tools

PPT & SPEAKER: Tatenda

Basic composition of energy storage system



PBD

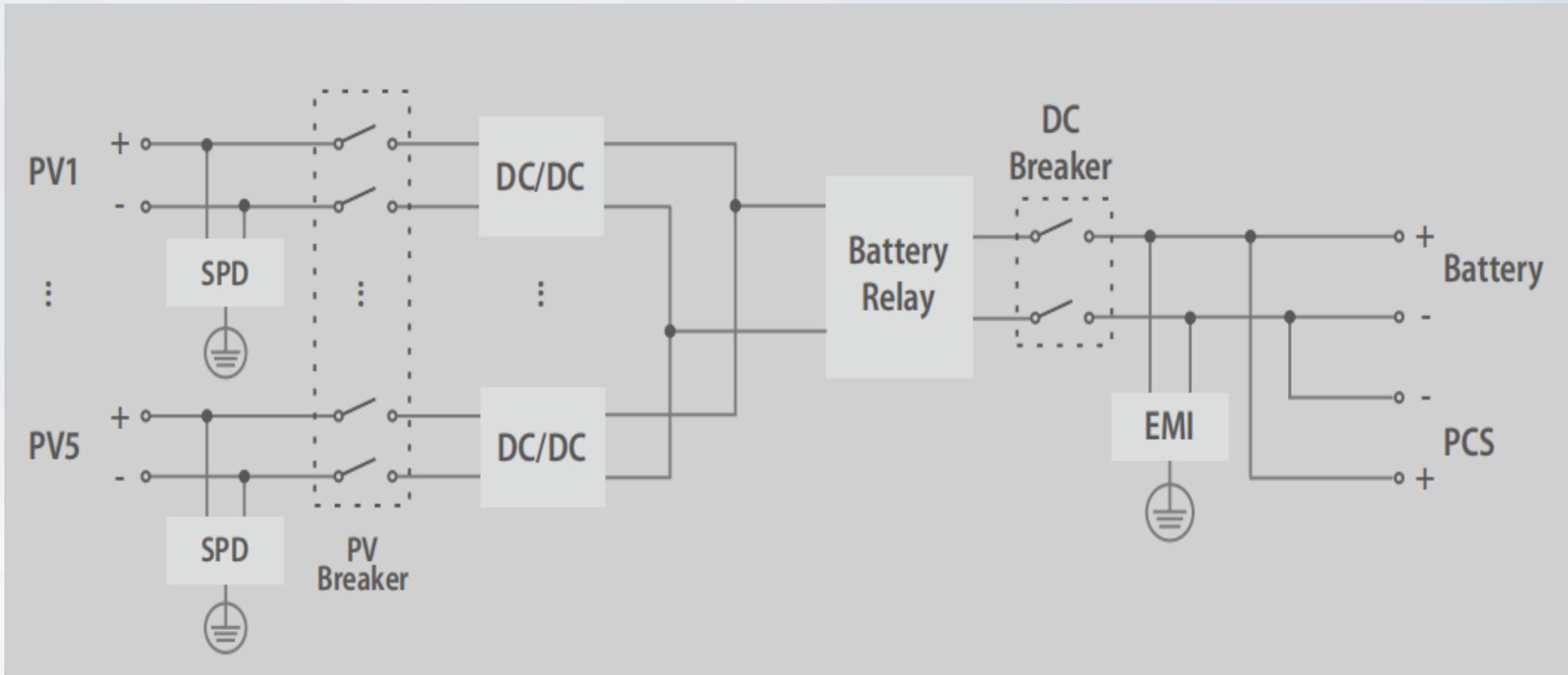
product description



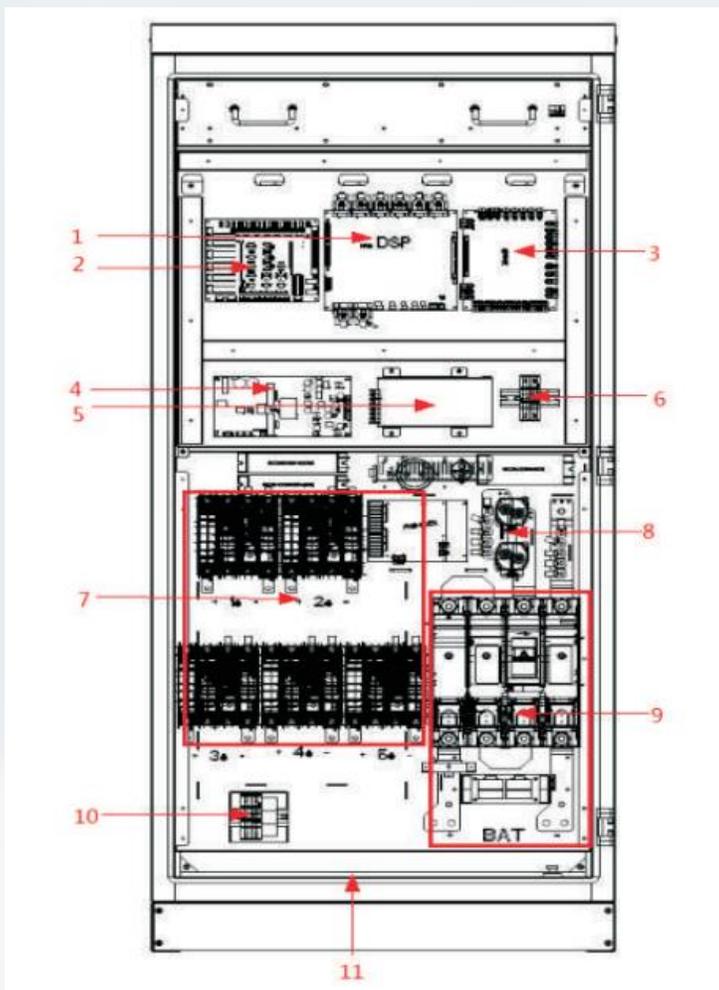
PBD series is a solar charging controller system, the main function is to distribute photovoltaic direct current to the energy storage battery. At present, PBD is mostly used with PCS energy storage systems

PBD250 is a first-level BOOST circuit, the output with the battery, the use of boost voltage, to achieve battery charging

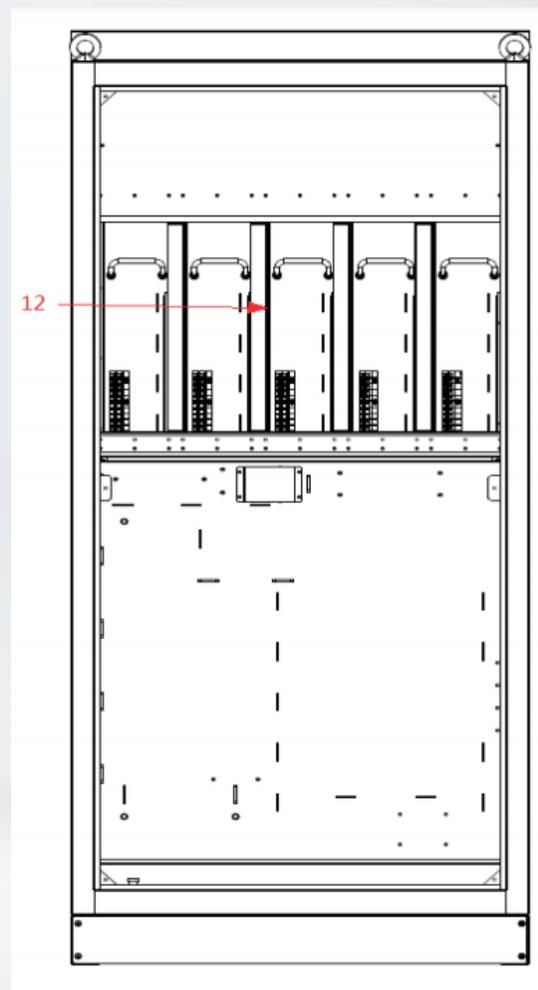
PBD250 Controller Electrical Principles



The front structural drawing of PBD250

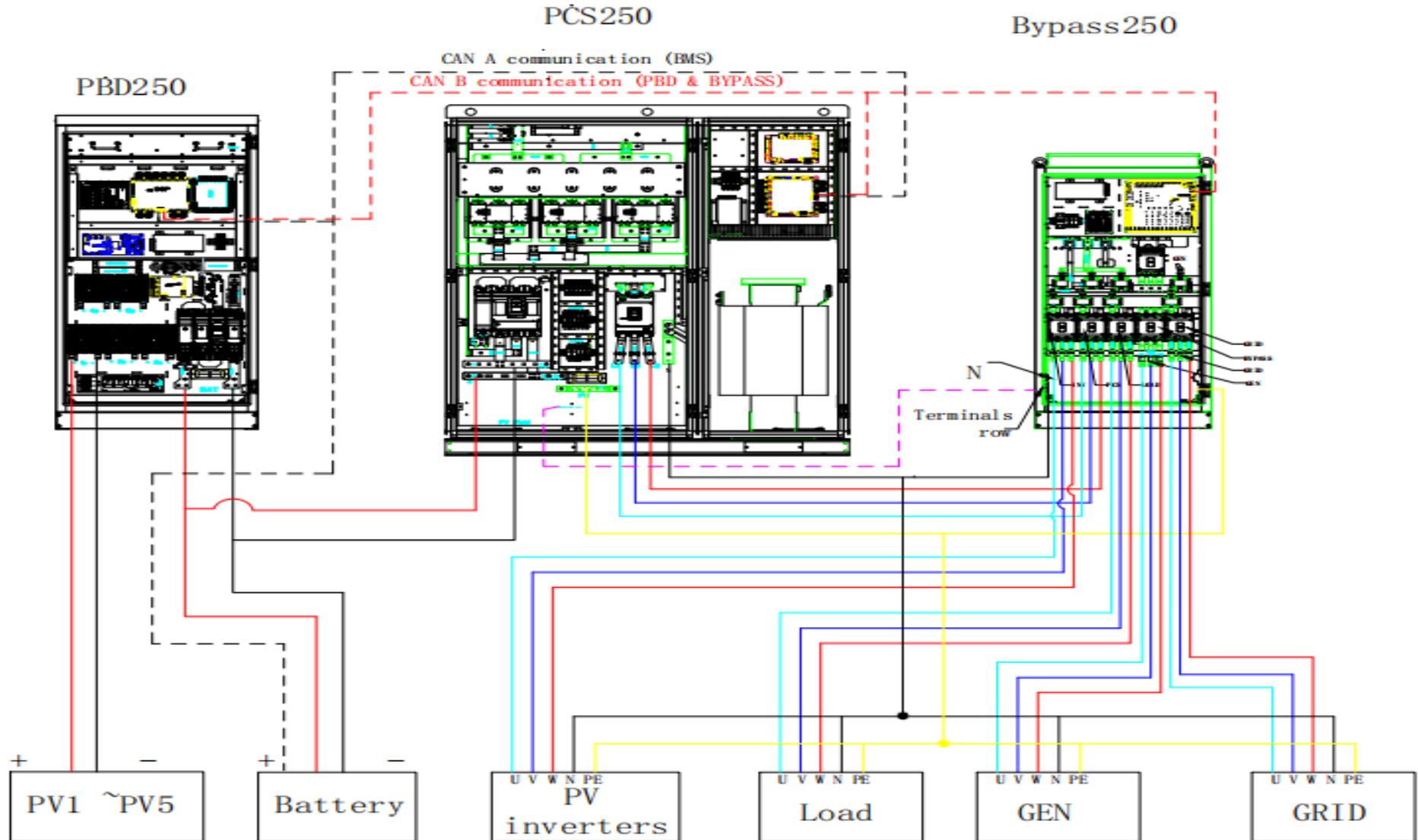


The back structural drawing of PBD250

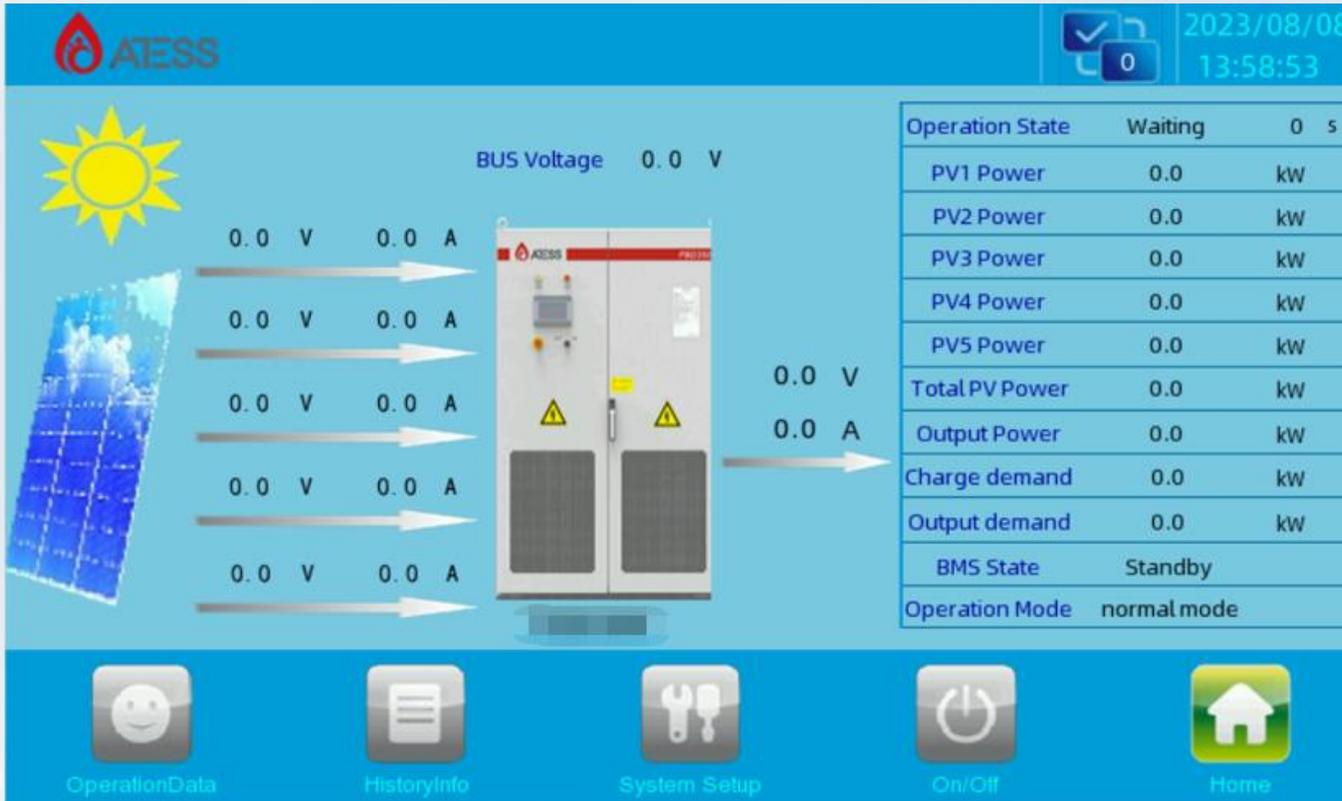


Model	PBD250	
NO	Name	Description
1	Control board	Main board includes communication interface
2	Sampling board	Voltage current temperature sampling PCB
3	Interface board	Power supply conversion PCB
4	BUCK board	Depressurize DC high voltage to supply power to PCB
5	Power source	Power supply for control board
6	Power supply micro break	Control board power supply switch
7	PV circuit breaker	Control the disconnection of PV with PBD
8	Main relay of battery	Pull in main relay after soft start
9	Battery circuit breaker	Control the connection between battery and PBD
10	AC fan switch	Control the connection of AC220
11	Earth terminals	Grounding bronze terminals
12	Module	5 modules including IGBT, capacitance, inductance, etc.

PBD+PCS+Bypass



PBD



Main page

Click the "Home" button under any other interface to access this page. The following information is displayed: Device operating status, input and output voltage, current, and so on. You can switch to other pages by using common function keys at the bottom of the LCD.

PBD

Operation data: Displays the current energy storage power generation parameters and real-time data, including photovoltaic voltage and current, battery voltage and current, output voltage and current, current power, battery or photovoltaic daily, monthly and annual electricity statistics, chassis temperature, and total power generation time (real-time update)



The screenshot shows the 'Operation Data' screen in the AESS interface. The top bar includes the AESS logo, a status icon with a '0', and the date/time '2023/08/08 13:57:10'. The main content area displays a table of parameters:

PV1 Voltage	0.0	V	PV1 Current	0.0	A
PV2 Voltage	0.0	V	PV2 Current	0.0	A
PV3 Voltage	0.0	V	PV3 Current	0.0	A
PV4 Voltage	0.0	V	PV4 Current	0.0	A
PV5 Voltage	0.0	V	PV5 Current	0.0	A
PV1 Inductor Current	0.0	A	PV1 Power	0.0	KW
PV2 Inductor Current	0.0	A	PV2 Power	0.0	KW
PV3 Inductor Current	0.0	A	PV3 Power	0.0	KW
PV4 Inductor Current	0.0	A	PV4 Power	0.0	KW
PV5 Inductor Current	0.0	A	PV5 Power	0.0	KW
Total PV Power	0.0	KW	Battery Unit Volt	0.00	V

The bottom navigation bar contains icons for 'OperationData', 'HistoryInfo', 'System Setup', 'On/Off', and 'Home'.

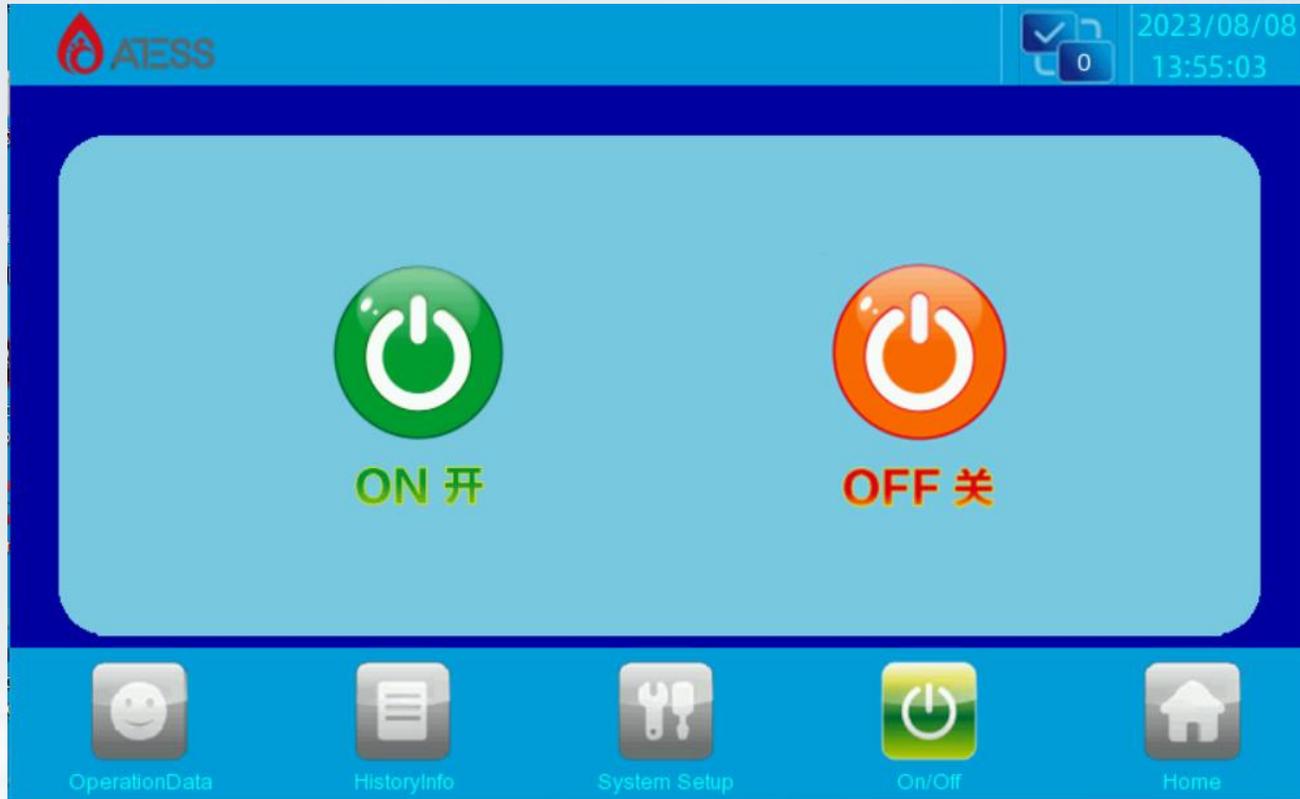


The screenshot shows the 'Operation Data' screen in the AESS interface. The top bar includes the AESS logo, a status icon with a '0', and the date/time '2023/08/08 13:57:45'. The main content area displays a table of parameters:

Output Power	0.0	KW	Check Time	0	S
Output Volt	0.0	V	PV_RISO_P	0.0	kΩ
Output Current	0.0	A	PV_RISO_N	0.0	kΩ
BUS Voltage	0.0	V	BUS_RISO1 R_P	0.0	kΩ
Ambient Temp	0.0	°C	BUS_RISO1 R_N	0.0	kΩ
Temp_PV module	0.0	°C			
Temp_OUT module	0.0	°C			

The bottom navigation bar contains icons for 'OperationData', 'HistoryInfo', 'System Setup', 'On/Off', and 'Home'.

PBD



ON/OFF interface

Clicking "ON/OFF" button in any interface will enter into this interface. There are "ON and OFF" button which is used to turn on and turn off the PBD. Start up: turn the start knob to on and click "on" to start up successfully. Shut down: shut down by clicking "off", or turn the start / stop knob to off directly.

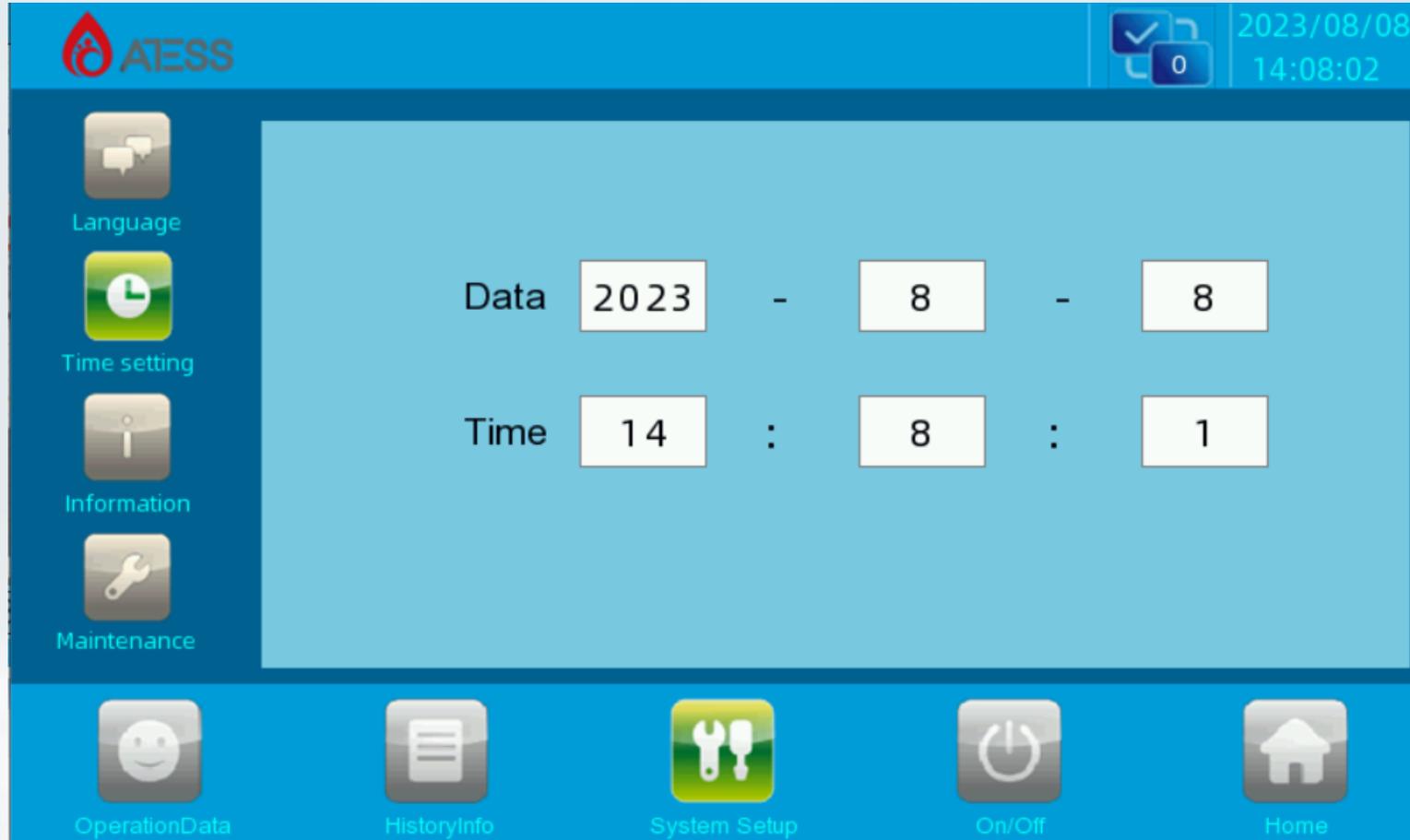
English and Chinese Settings



System setting

Clicking “System setting” button in any interface will enter into this interface. Submenu: language settings, time settings, PBD information, maintenance. Pressing the left button can enter into the corresponding submenu interface. The default one is language setting interface. Language Settings: Select language, currently it only supports Chinese, English.

Time settings

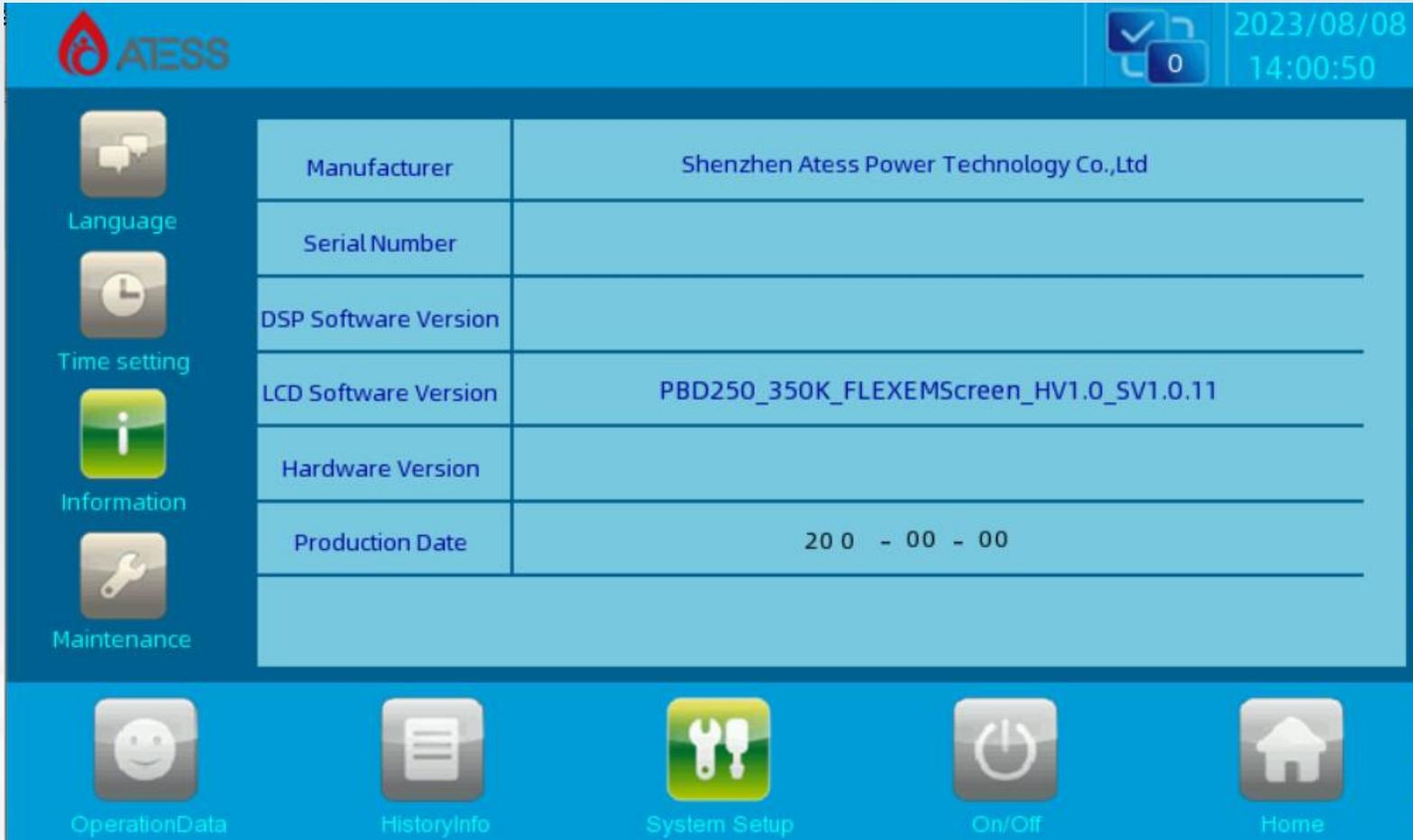


The screenshot displays the 'Time settings' screen in the ATESS system. The top right corner shows the current date and time: 2023/08/08 14:08:02. The main area contains two rows of input fields for date and time. The date is set to 2023-08-08, and the time is set to 14:08:01. The interface includes a sidebar with menu items: Language, Time setting, Information, and Maintenance. The bottom bar contains navigation icons for OperationData, HistoryInfo, System Setup, On/Off, and Home.

Field	Value
Date	2023 - 8 - 8
Time	14 : 8 : 1

system time setting (if the date and time displayed on LCD is not inconsistent with the actual date and time, they can be modified here).

Device Information



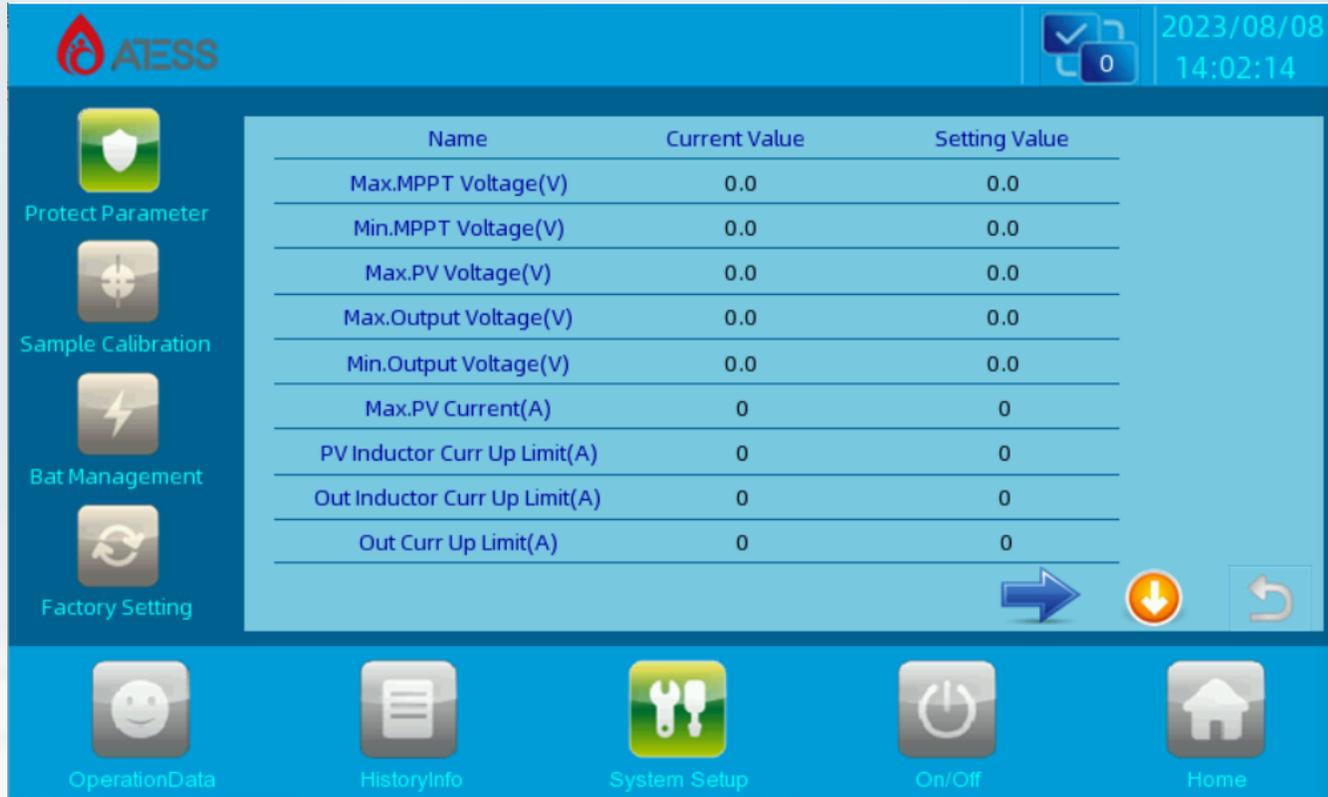
The screenshot shows the ATESS Device Information page. At the top left is the ATESS logo. At the top right, there is a date and time display: 2023/08/08 14:00:50. Below the header is a table with the following data:

Manufacturer	Shenzhen Ateess Power Technology Co.,Ltd
Serial Number	
DSP Software Version	
LCD Software Version	PBD250_350K_FLEXEMScreen_HV1.0_SV1.0.11
Hardware Version	
Production Date	20 0 - 00 - 00

On the left side of the page, there are five menu items: Language, Time setting, Information, and Maintenance. At the bottom, there are five navigation buttons: OperationData, HistoryInfo, System Setup, On/Off, and Home.

This page shows the manufacturer, PBD serial number, hardware and software version information, and the date of manufacturing, data in this page cannot be changed

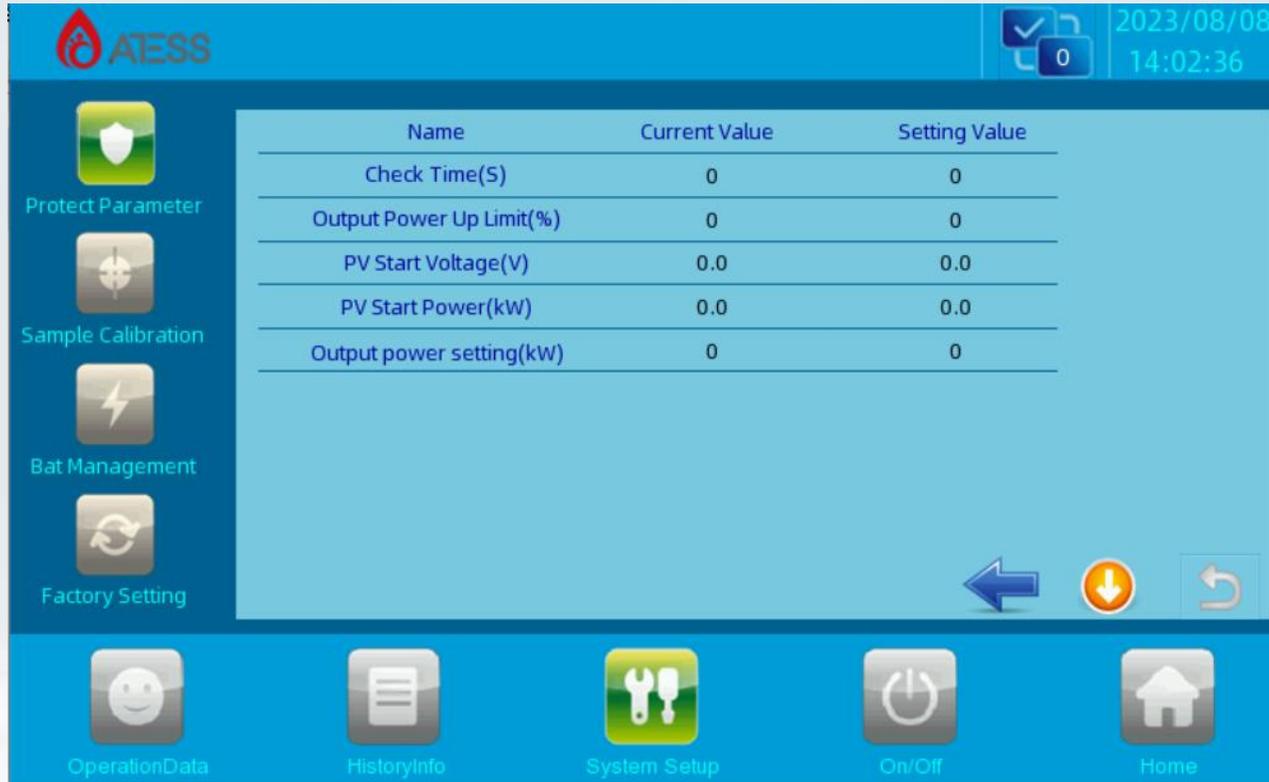
Protection parameters



Name	Current Value	Setting Value
Max.MPPT Voltage(V)	0.0	0.0
Min.MPPT Voltage(V)	0.0	0.0
Max.PV Voltage(V)	0.0	0.0
Min.Output Voltage(V)	0.0	0.0
Max.PV Current(A)	0	0
PV Inductor Curr Up Limit(A)	0	0
Out Inductor Curr Up Limit(A)	0	0
Out Curr Up Limit(A)	0	0

This page for the machine protection parameters Settings, such parameters will be set in the machine factory, need to change, to confirm with the professional can be changed. Output voltage upper and lower limits: If the output voltage is higher than the upper and lower limits, a fault will be reported and the operation will stop. PV current upper limit, PV inductor current upper limit, output inductor current upper limit, output current upper limit: If the current exceeds the set value, the corresponding fault information will be reported and the machine will stop running.

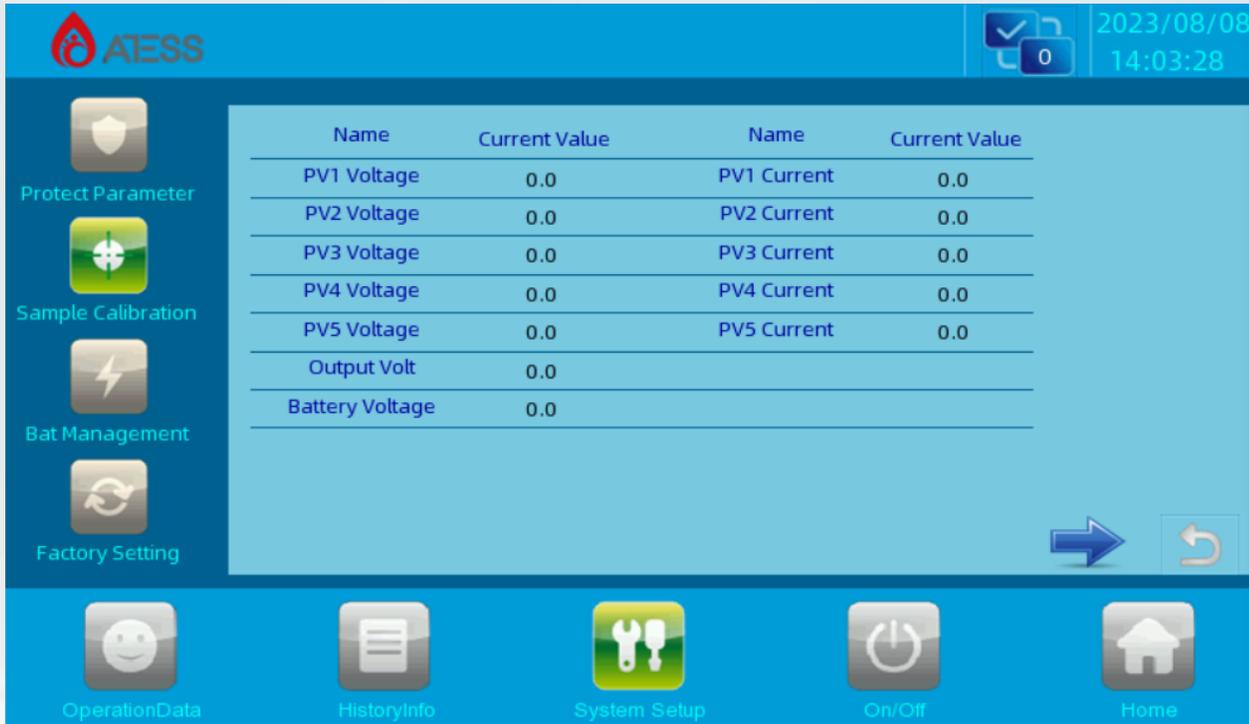
Protection parameters



Name	Current Value	Setting Value
Check Time(S)	0	0
Output Power Up Limit(%)	0	0
PV Start Voltage(V)	0.0	0.0
PV Start Power(kW)	0.0	0.0
Output power setting(kW)	0	0

This page for the machine protection parameters Settings, such parameters will be set in the machine factory, need to change, to confirm with the professional can be changed. Detection time: When the machine is turned on, it needs to detect the time, which determines whether the machine is successfully soft. After the inspection time is over, the contactor is sucked, the machine is successfully turned on, and it enters the normal working state. Output power upper limit: the upper limit of the external output power of the machine, the maximum output power is the set upper limit. PV starting voltage: The minimum voltage value for MPPT to track. PV starting power: If PV is less than this power, restart MPPT for tracking. Battery charging current: Set this value. During normal charging, the charging current will reach this value.

PBD



ATESS

2023/08/08
14:03:28

Name	Current Value	Name	Current Value
PV1 Voltage	0.0	PV1 Current	0.0
PV2 Voltage	0.0	PV2 Current	0.0
PV3 Voltage	0.0	PV3 Current	0.0
PV4 Voltage	0.0	PV4 Current	0.0
PV5 Voltage	0.0	PV5 Current	0.0
Output Volt	0.0		
Battery Voltage	0.0		

Protect Parameter

Sample Calibration

Bat Management

Factory Setting

OperationData

HistoryInfo

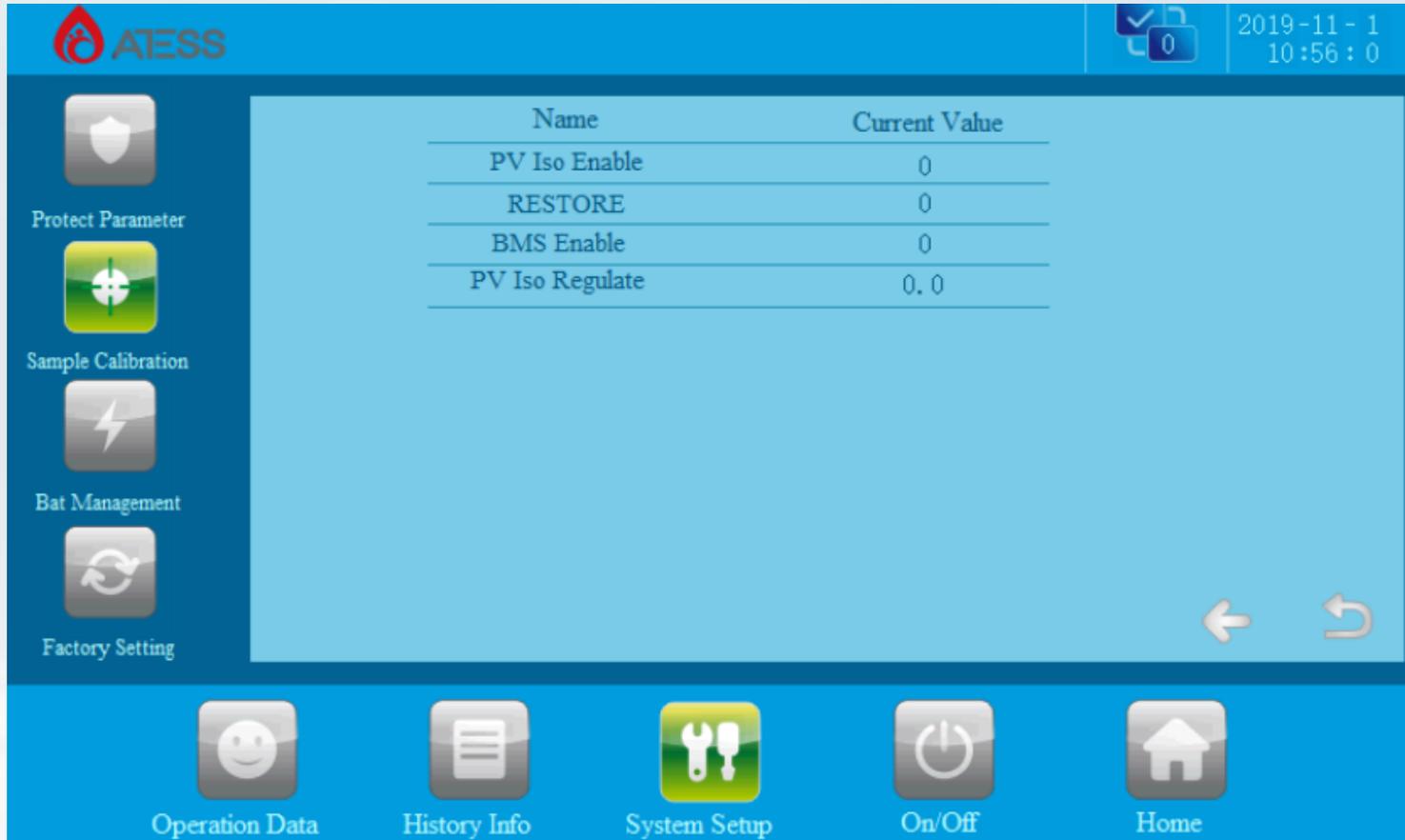
System Setup

On/Off

Home

This page is the calibration value of sampling coefficient, If the sampling is not accurate, it can be calibrated through this value. It is strictly forbidden for customers to calibrate this coefficient. If the sampling is not accurate, it needs to contact professional personnel to operate.

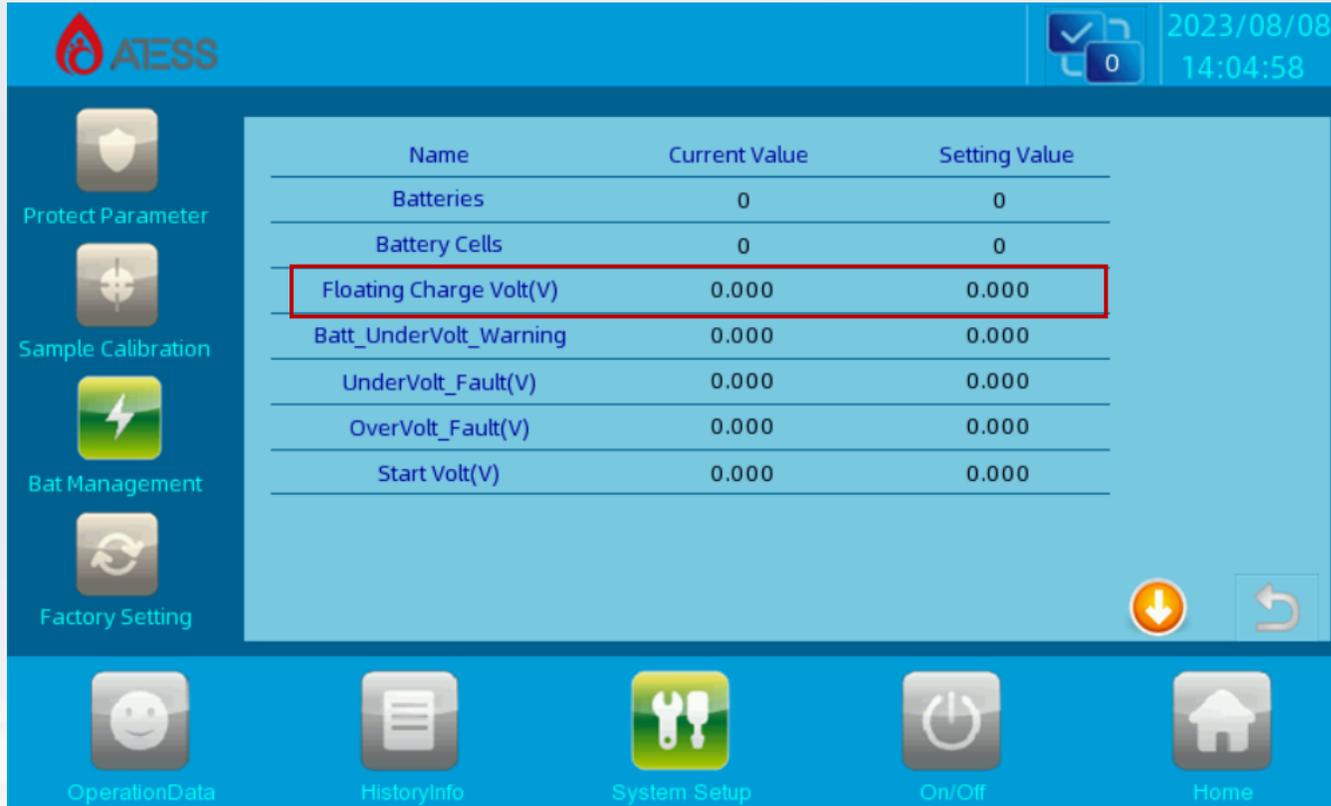
PBD



Name	Current Value
PV Iso Enable	0
RESTORE	0
BMS Enable	0
PV Iso Regulate	0.0

Allowed modification points:
 “BMS communication enable” ,
 The enabling model: PBD250, this
 requires the battery to have a
 battery management system.
 When the battery is with BMS
 communication, please set to 1;
 otherwise, set to 0

PBD

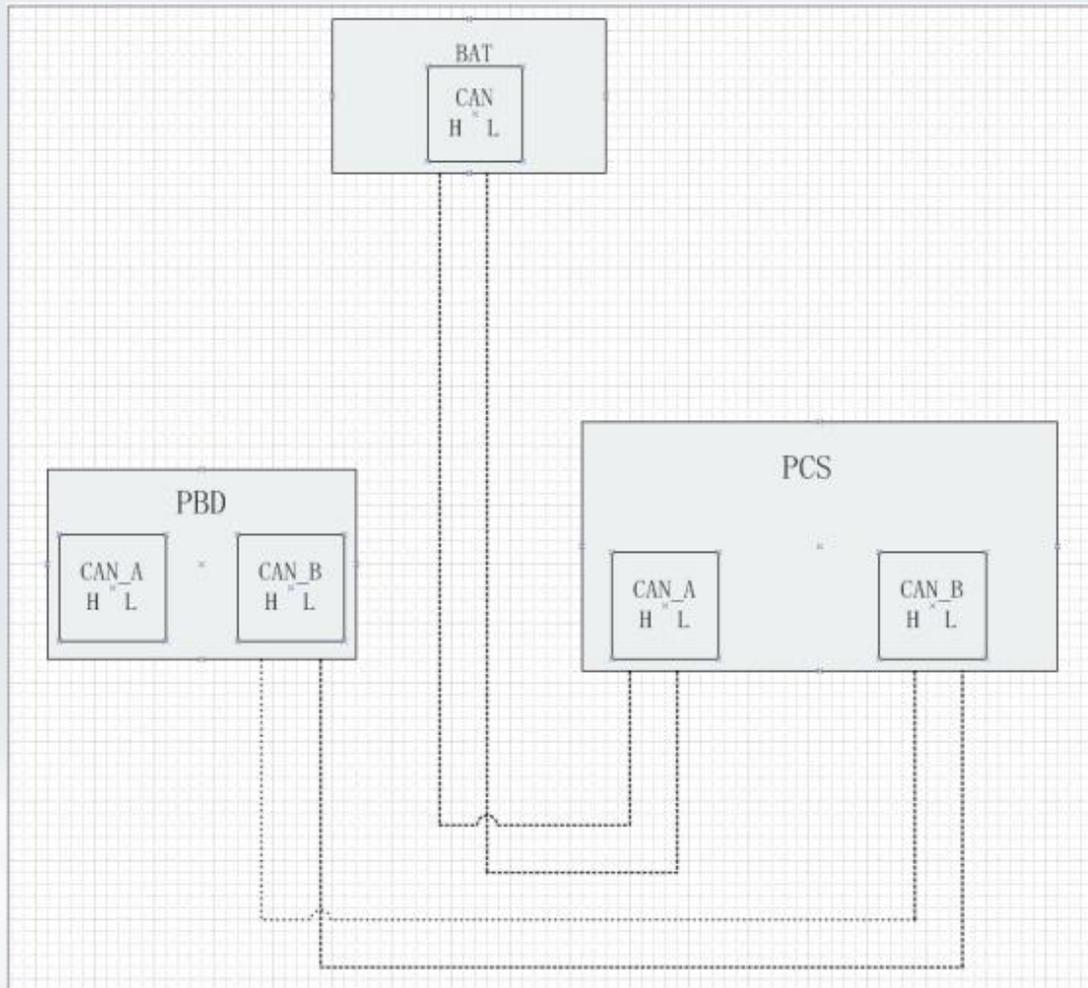


The screenshot shows the ATESS PBD interface. At the top right, the date and time are 2023/08/08 14:04:58. The main content is a table with three columns: Name, Current Value, and Setting Value. The 'Floating Charge Volt(V)' row is highlighted with a red box. The bottom navigation bar includes icons for OperationData, HistoryInfo, System Setup, On/Off, and Home.

Name	Current Value	Setting Value
Batteries	0	0
Battery Cells	0	0
Floating Charge Volt(V)	0.000	0.000
Batt_UnderVolt_Warning	0.000	0.000
UnderVolt_Fault(V)	0.000	0.000
OverVolt_Fault(V)	0.000	0.000
Start Volt(V)	0.000	0.000

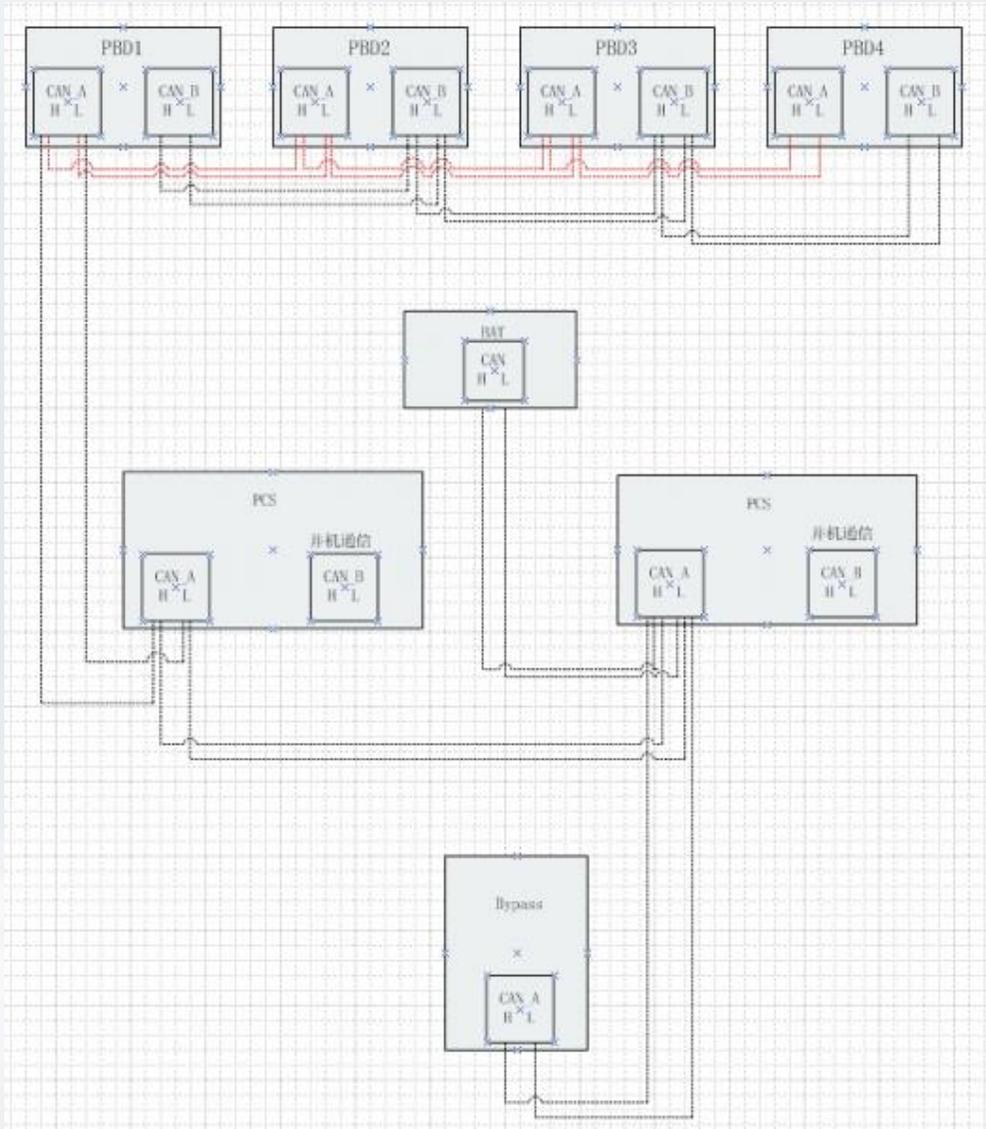
This page parameter has the same meaning as PCS,
 Note: The floating charge voltage setting value needs to be about 30mv higher than the PCS setting value

PBD and PCS Communications



The following is the system CAN communication wiring diagram of single PBD connected to PCS.

Note: the wiring marked on the manual is for normal use. If the actual wiring is adjusted, the wiring provided by professionals shall prevail.

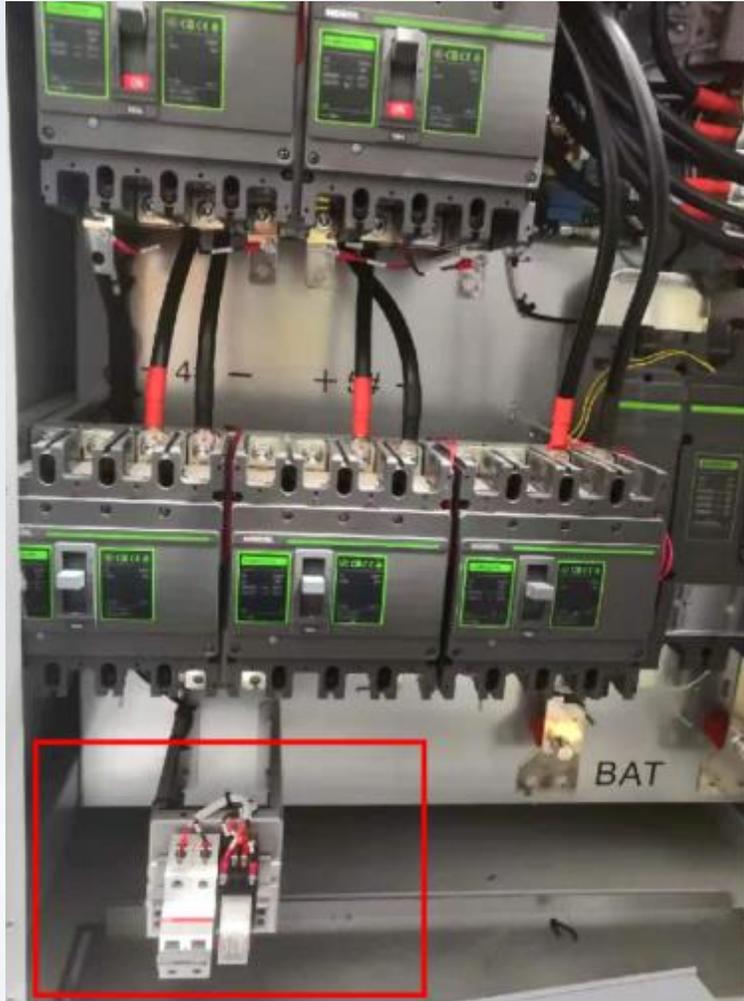


Parallel communication (special for customized parallel function) Parallel communication is required when multiple PBD models are used in parallel. CAN A communication is adopted for parallel communication, and hand-held connection through CAN A between PBDs is required to realize mutual communication.

The following figure is the wiring diagram between the CAN communication of the above system, including the connection mode and port of CAN communication when multiple PBDs are parallel. If there are only one or multiple PBDs, the CAN connection port remains the same and the port connected to the PCs remains the same.

Note: the wiring marked on the manual is for normal use. If the actual wiring needs to be adjusted, the wiring provided by professionals shall prevail.

Fan power wiring



The top fan of PBD250 needs AC-220v for power supply, and AC-220 needs to be connected to the position of the relay below. After the connection is completed, the relay switch needs to be turned on.

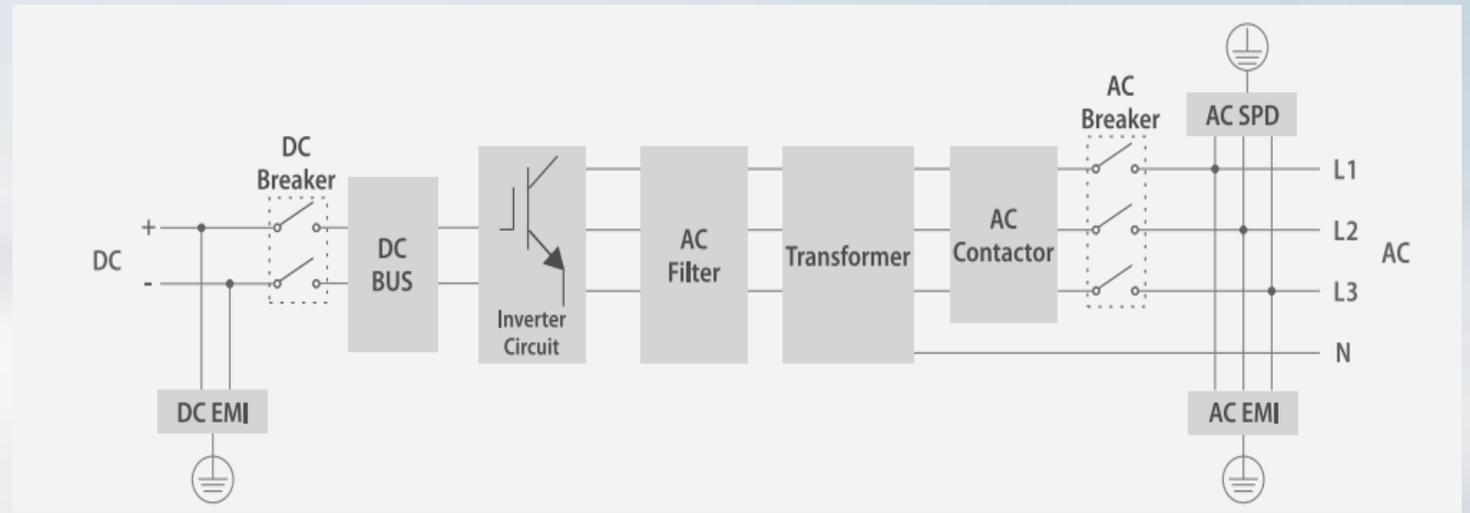
PCS500



PCS series energy storage controller is a two-way battery inverter, the main function is to store the energy of the grid/diesel generator to the battery, but also to release the stored energy to the grid or supply load.

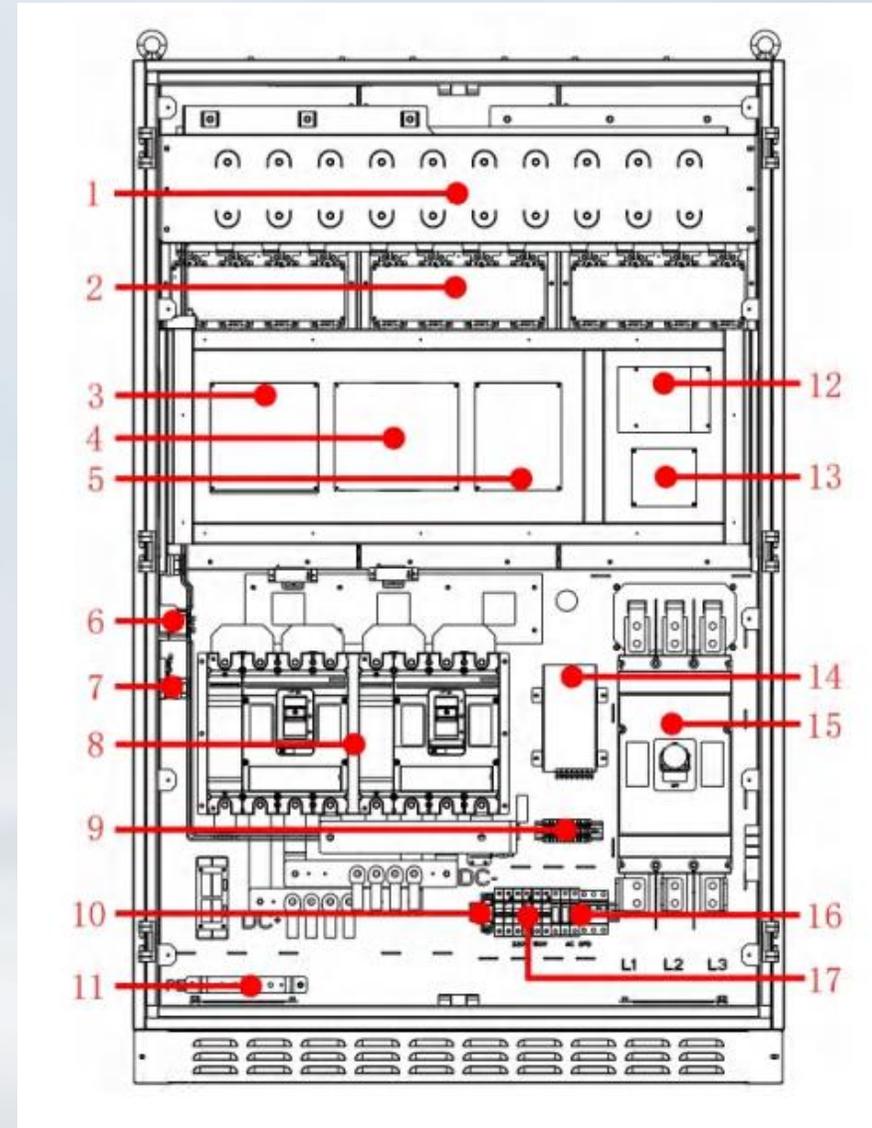
The energy storage controller with the bypass cabinet can realize seamless switching and off-grid, ensuring uninterrupted load supply. If the bypass cabinet is not configured, seamless switchover cannot be performed in parallel off-grid mode, and only pure grid-connected or pure off-grid mode can be run.

At the same time, it can be equipped with PBD (photovoltaic DC converter) to charge photovoltaic energy to the battery or through the energy storage controller inverter output.

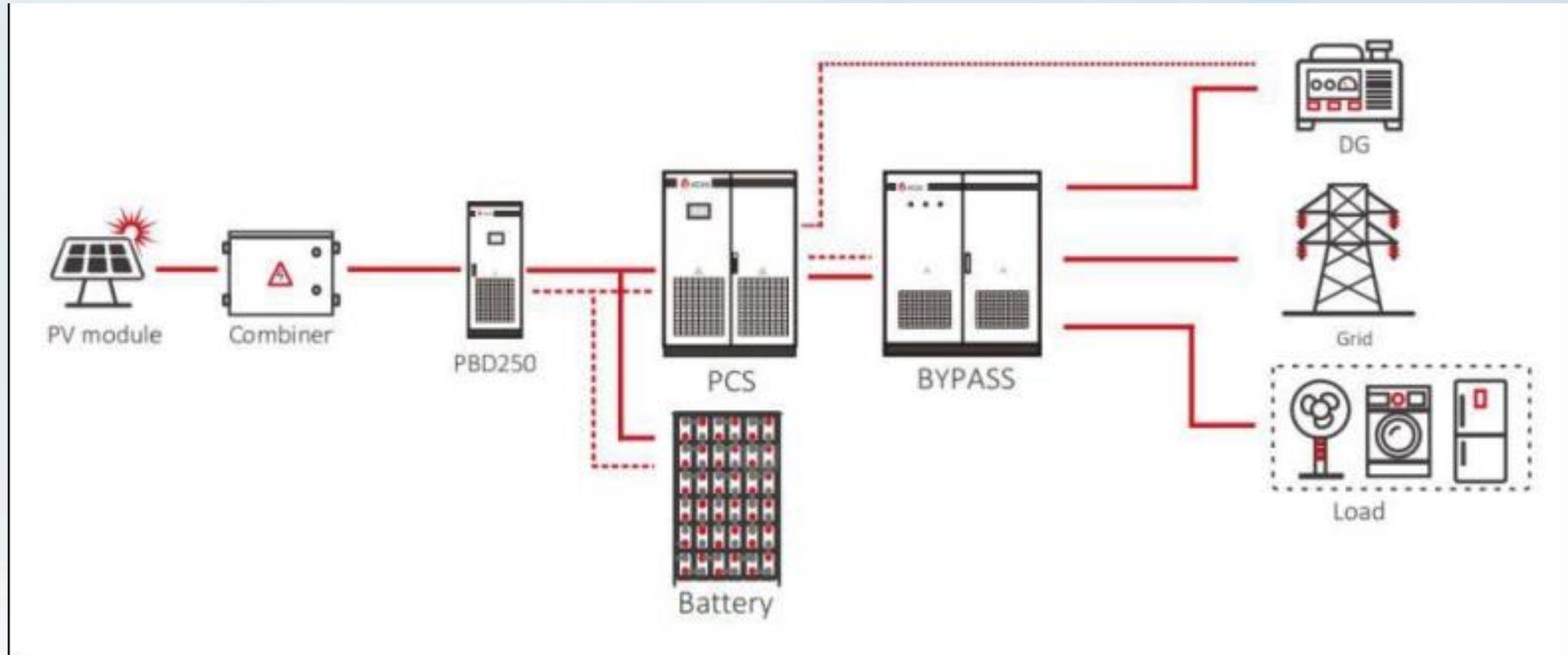


Position of PCS50 front components

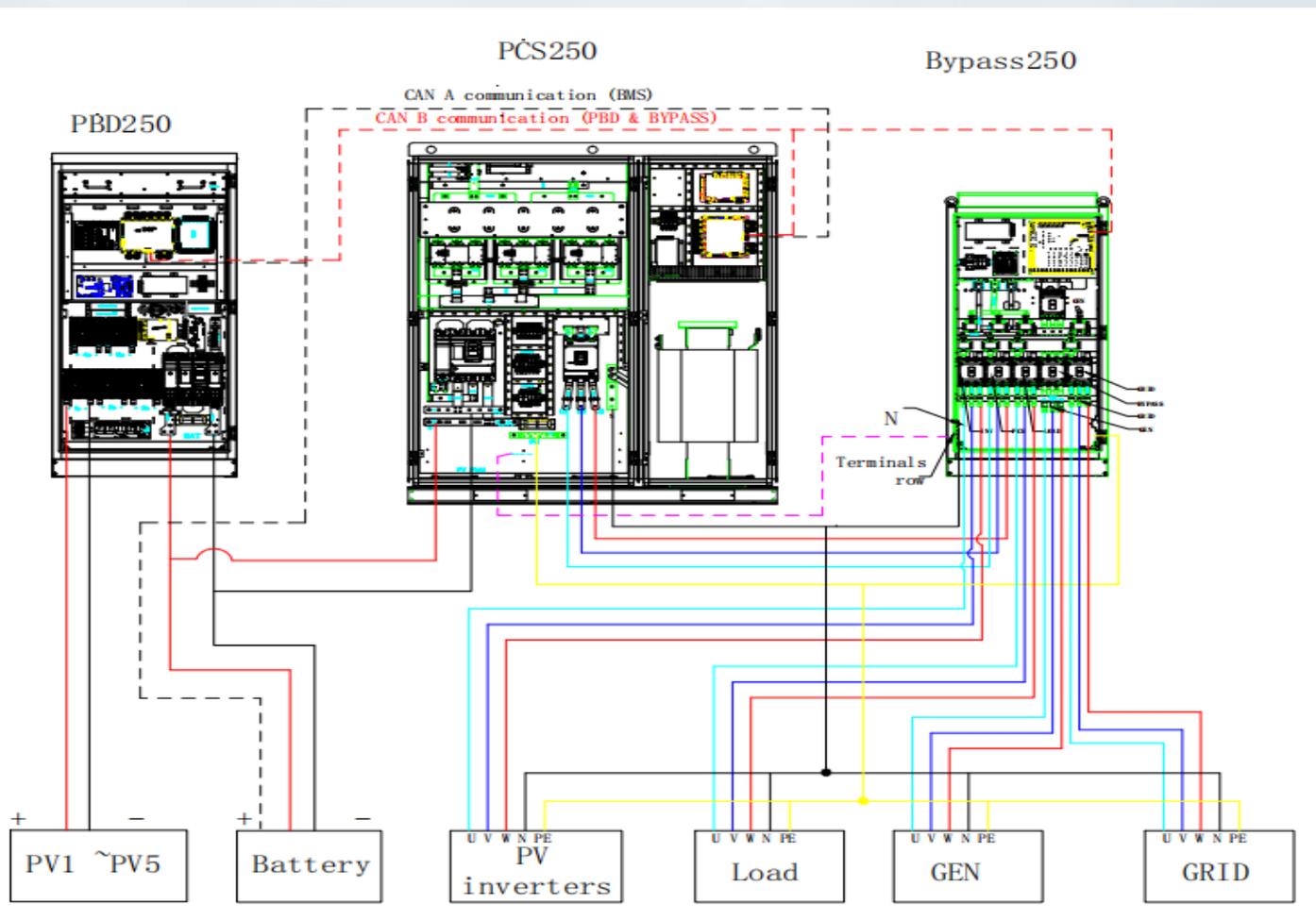
NO	Name	Description
1	Capacitance	DC bus capacitance
2	IGBT module	Power module
3	Sampling board	PCB that samples voltage, current and temperature
4	Control board	Control board
5	Interface board	Power supply convert PCB
6	DC main relay	DC main relay
7	DC auxiliary relay	DC auxiliary relay
8	Battery circuit breaker	Control the connection of battery and PCS
9	Terminal block	Terminal block connecting with bypass cabinet
10	DG dry contact	Control running of DG
11	PE terminal	Grounding copper bar
12	BUCK board	DC Power supply PCB
13	Rectifying board	DC power supply and AC/DC power supply PCB
14	Mingwei power	Power supply module
15	AC circuit breaker	Control AC connection with PCS
16	AC lightning protection and lightning protection switch	AC lightning protection and lightning protection switch
17	AC power supply microbreaker	AC power supply microbreaker



PBD+PCS+bypass system diagram

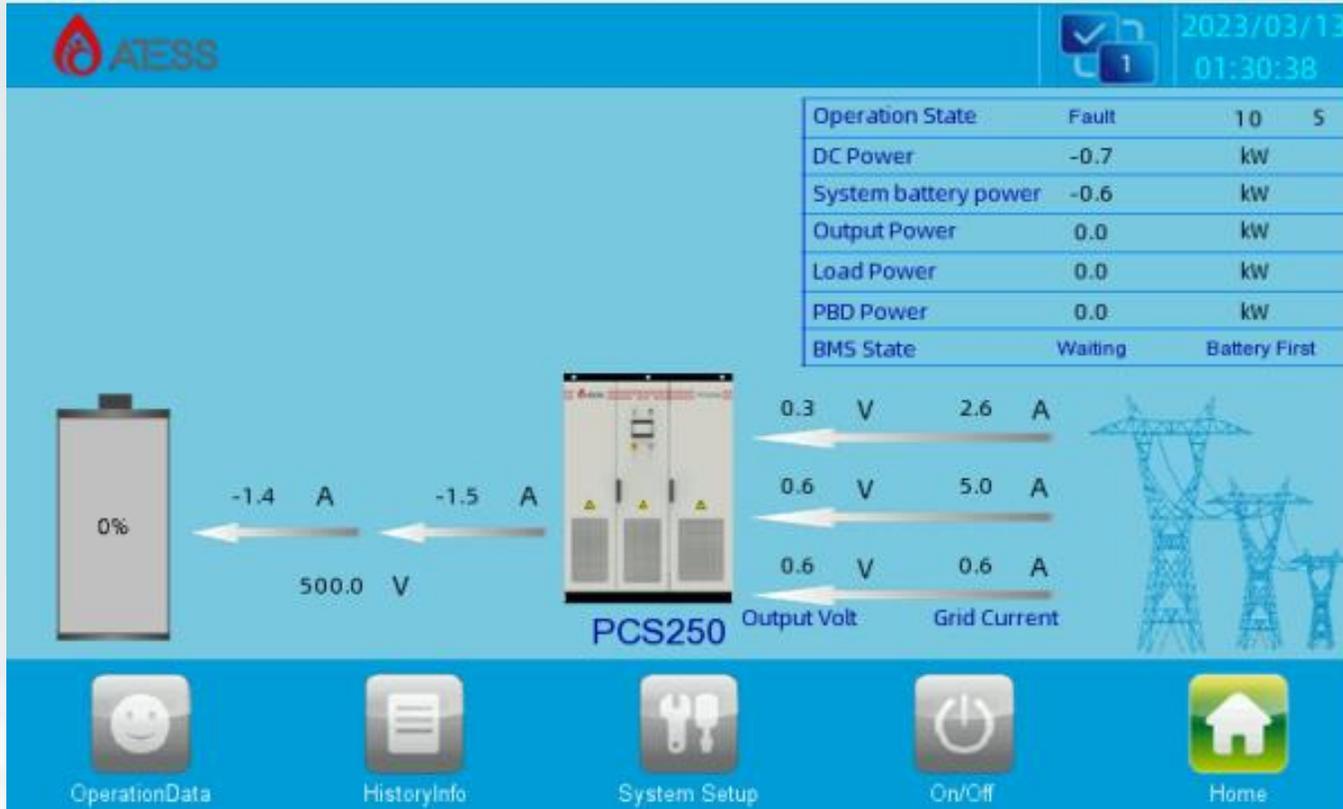


PBD+PCS+bypass system



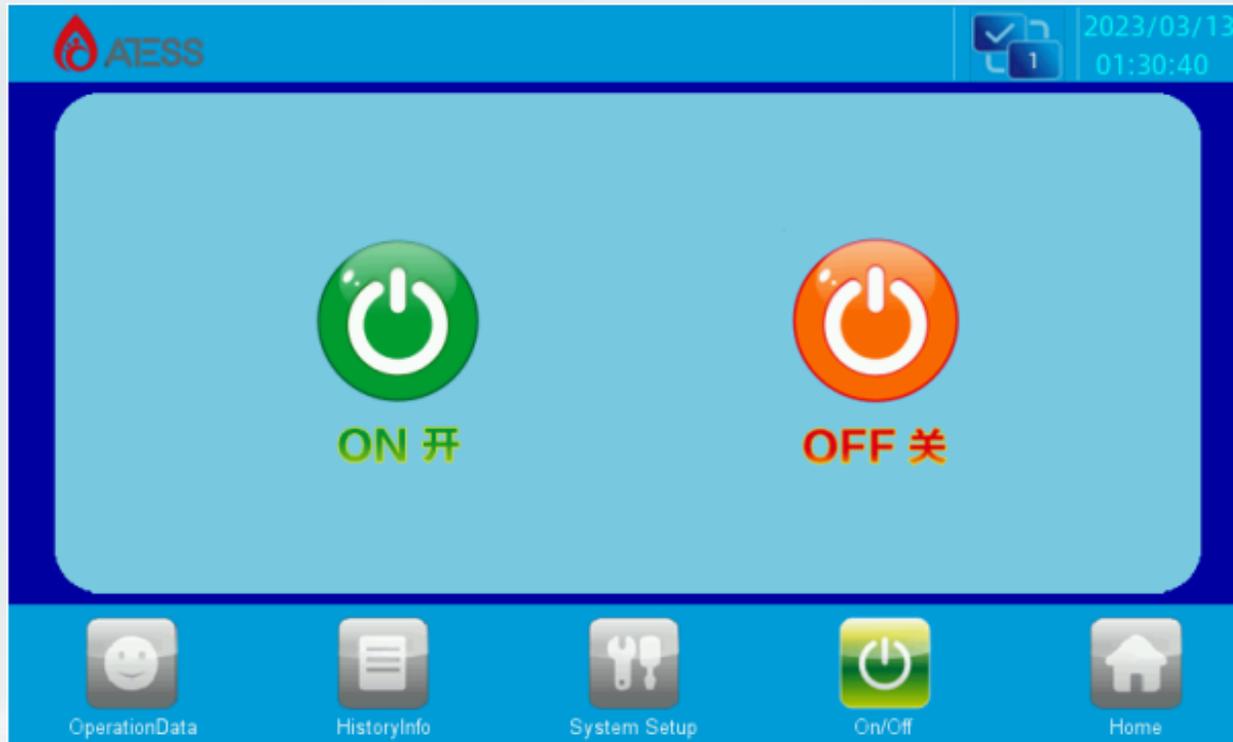
Cable	Requirements for bus diameter			
Model	PCS100	PCS250	PCS500	PCS630
Battery	70mm ²	95mm ² *2	95mm ² *3	95mm ² *4
AC output	70mm ²	70mm ² *2	95mm ² *3	95mm ² *4
N line	70mm ²	70mm ² *2	95mm ² *3	95mm ² *4
Ground line	The diameter of the ground cable should not be less than half of the cross-sectional area of the AC output cable			
Communication line	Shielding wire: $\geq 0.75\text{mm}$			

PCS Home page



When powered or clicking “Home” button in any interface will enter into the Home page.

The operating status of the inverter output power, safety standard, model, input and output voltage, current information can be viewed in the page. Pressing the following key can switch to other pages.



ON/OFF interface

Clicking "ON/OFF" button in any interface will enter into this interface.

There are "ON" and "OFF" button which is used to turn on and turn off the inverter. Start up: turn the start knob to on and click "on" to start up successfully.

Shut down: shut down by clicking "off", or turn the start / stop knob to off directly.

If the machine will be turned off for a long time, use the off-on knob to shut it down.

Operation data



Operation data

Click [operation data] at the bottom of any other interface to enter the submenu of "operation data".

The submenu includes: operation data, power curve, charge and discharge capacity. The corresponding submenu interface can be accessed through the left button. The default one is "operation data" interface.

Operation data: display the current parameters and real-time data of energy storage power generation, including grid voltage, grid frequency, grid current, DC input voltage, DC input current, temperature in the case and total generation time (real-time update).

System setting



Clicking “System setting” button in any interface will enter into this interface. Submenu: language settings, time settings, inverter information, maintenance. Pressing the left button can enter into the corresponding submenu interface. The default one is language setting interface. Language Settings: Select language, currently it only supports Chinese, English.

Time settings



system time setting (if the date and time displayed on LCD is not inconsistent with the actual date and time, they can be modified here).

Please note that if the time is incorrect, it can cause problems with the time scheduling mode

Device Information



The screenshot shows the ATESS Device Information page. The top bar includes the ATESS logo, a checkmark icon, and the date and time: 2022-3-28 14:11:12. The main content area displays a table with the following information:

Manufacturer	Shenzhen Ateess Power Technology Co.,Ltd
Serial Number	
DSP Software Version	
LCD Software Version	PCS50-630K_WEINVIEWScreen_HV1.0_SV1.1.13
Hardware Version	
Production Date	20 0 - 0 - 0

The page also features a left sidebar with icons for Language, Time setting, Information, and Maintenance. At the bottom, there is a navigation bar with icons for Operation Data, History Info, System Setup, On/Off, and Home.

Device Information: This page shows the manufacturer, inverter serial number, hardware and software version information, and the date of manufacturing.

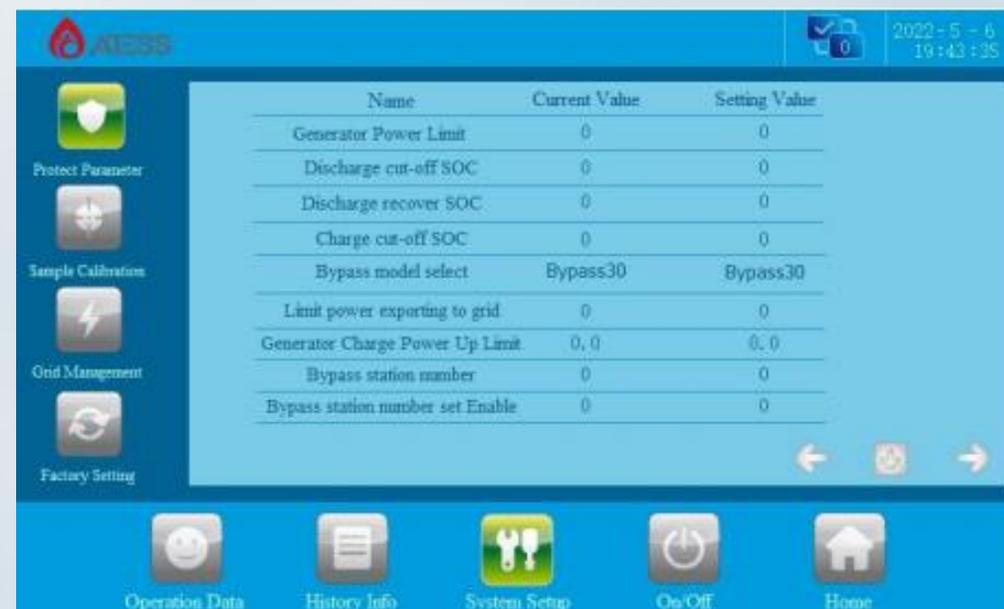
This page parameter is a system protection parameter, which can be set with reference to the user manual instructions



2022-3-28 14:15:18

Name	Current Value	Setting Value
Grid Max Voltage(V)	0.0	0.0
Grid Min Voltage(V)	0.0	0.0
Grid Max Frequency(Hz)	0.00	0.00
Grid Min Frequency(Hz)	0.00	0.00
Check Time(S)	0	0
Output Power Limit(%)	0	0
Output voltage setting(V)	0	0
Output Frequency Setting(HZ)	0	0
Charge_Curr(A)	0	0

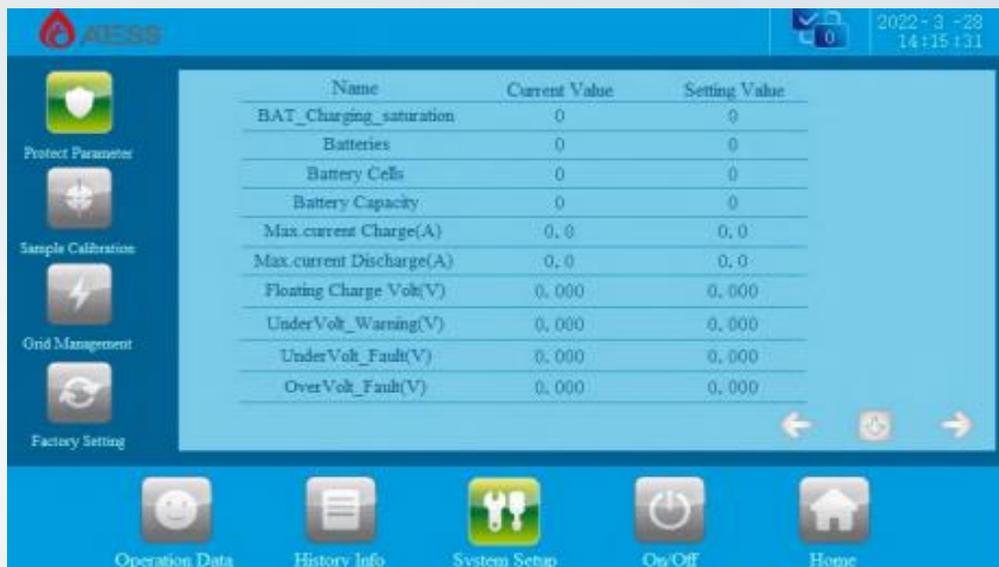
Navigation: Operation Data, History Info, System Setup, On/Off, Home



2022-5-6 19:43:25

Name	Current Value	Setting Value
Generator Power Limit	0	0
Discharge cut-off SOC	0	0
Discharge recover SOC	0	0
Charge cut-off SOC	0	0
Bypass model select	Bypass30	Bypass30
Limit power exporting to grid	0	0
Generator Charge Power Up Limit	0.0	0.0
Bypass station number	0	0
Bypass station number set Enable	0	0

Navigation: Operation Data, History Info, System Setup, On/Off, Home



2022-3-28 14:15:31

Name	Current Value	Setting Value
BAT_Charging_saturation	0	0
Batteries	0	0
Battery Cells	0	0
Battery Capacity	0	0
Max.current Charge(A)	0.0	0.0
Max.current Discharge(A)	0.0	0.0
Floating Charge Volt(V)	0.000	0.000
UnderVolt_Warning(V)	0.000	0.000
UnderVolt_Fault(V)	0.000	0.000
OverVolt_Fault(V)	0.000	0.000

Navigation: Operation Data, History Info, System Setup, On/Off, Home

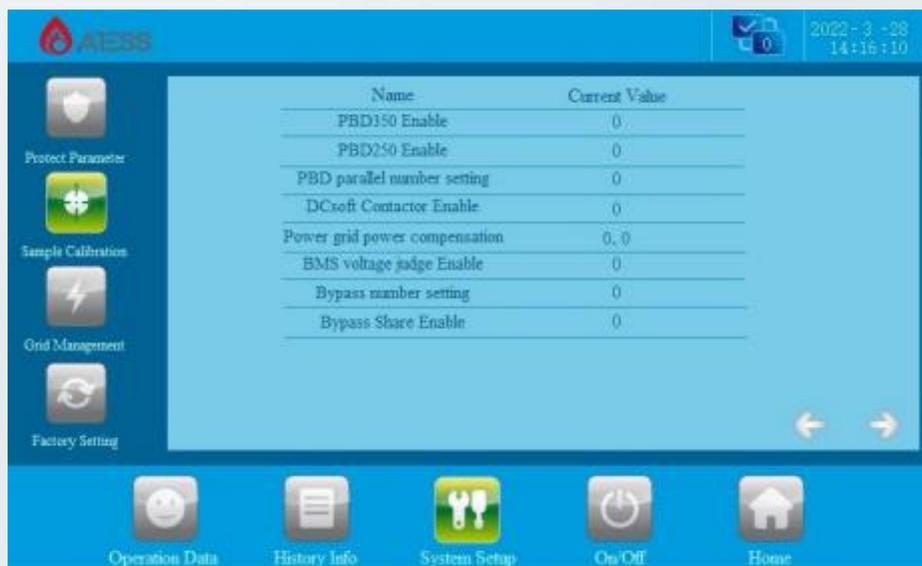


2022-3-28 14:15:43

	Peak Time	Valley Time	Flat Time
No.1	0:0 — 0:0	0:0 — 0:0	0:0 — 0:0
No.2	0:0 — 0:0	0:0 — 0:0	0:0 — 0:0
No.3	0:0 — 0:0	0:0 — 0:0	0:0 — 0:0
No.4	0:0 — 0:0	0:0 — 0:0	0:0 — 0:0
No.5	0:0 — 0:0	0:0 — 0:0	0:0 — 0:0
Peak setting power 1	0 KW	Valley setting power 1	0 KW
Peak setting power 2	0 KW	Valley setting power 2	0 KW
Peak setting power 3	0 KW	Valley setting power 3	0 KW
Peak setting power 4	0 KW	Valley setting power 4	0 KW
Peak setting power 5	0 KW	Valley setting power 5	0 KW
Flat setting power 1	0 KW		
Flat setting power 2	0 KW		
Flat setting power 3	0 KW		
Flat setting power 4	0 KW		
Flat setting power 5	0 KW		

Navigation: Operation Data, History Info, System Setup, On/Off, Home

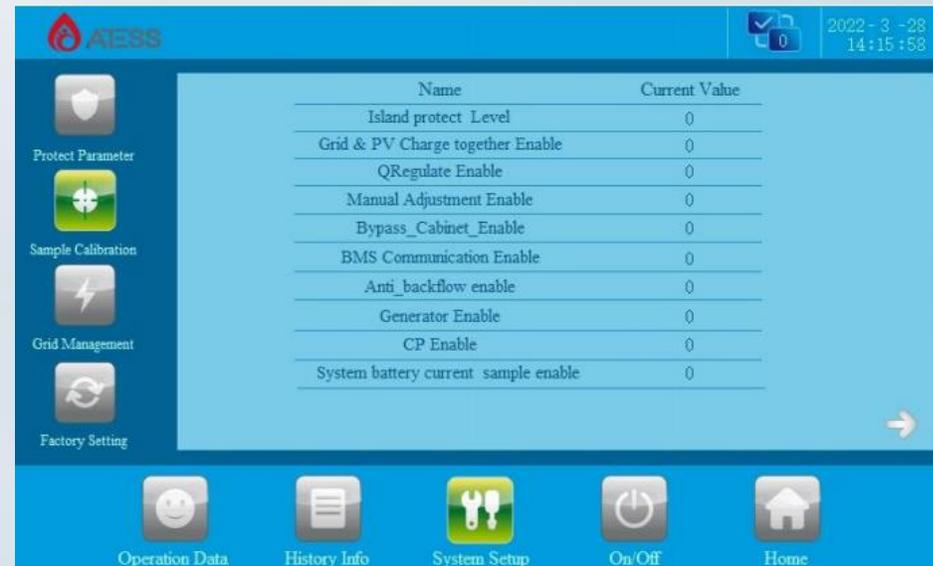
This page parameter is a system protection parameter, which can be set with reference to the user manual instructions



2022-3-28 14:16:10

Name	Current Value
PBD150 Enable	0
PBD250 Enable	0
PBD parallel number setting	0
DCsoft Contactor Enable	0
Power grid power compensation	0, 0
BMS voltage judge Enable	0
Bypass number setting	0
Bypass Share Enable	0

Navigation: Operation Data, History Info, System Setup, On/Off, Home



2022-3-28 14:15:58

Name	Current Value
Island protect Level	0
Grid & PV Charge together Enable	0
QRegulate Enable	0
Manual Adjustment Enable	0
Bypass_Cabinet_Enable	0
BMS Communication Enable	0
Anti_backflow enable	0
Generator Enable	0
CP Enable	0
System battery current sample enable	0

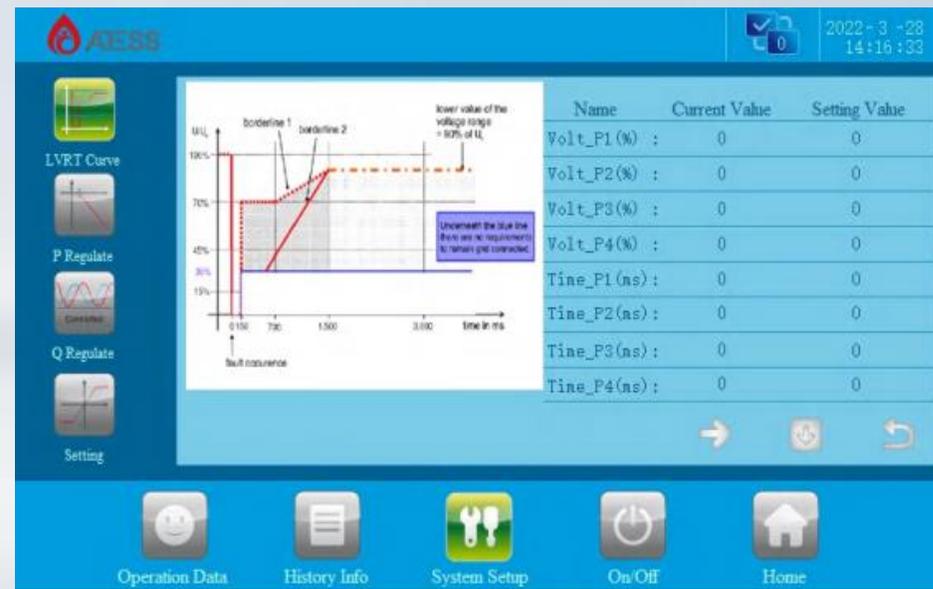
Navigation: Operation Data, History Info, System Setup, On/Off, Home



2022-3-28 14:16:24

Operation Mode	Current Value
0. Load First	0
1. Battery First	0
2. Time shifting	0
4. Time Schedule	0

Navigation: Operation Data, History Info, System Setup, On/Off, Home



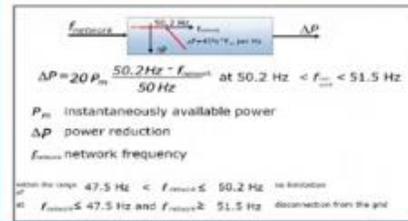
2022-3-28 14:16:33

Navigation: Operation Data, History Info, System Setup, On/Off, Home

Name	Current Value	Setting Value
Volt_P1(V)	0	0
Volt_P2(V)	0	0
Volt_P3(V)	0	0
Volt_P4(V)	0	0
Time_P1(ms)	0	0
Time_P2(ms)	0	0
Time_P3(ms)	0	0
Time_P4(ms)	0	0

The LVRT Curve graph shows voltage (V) on the y-axis (0% to 100% of ULL) and time (ms) on the x-axis (0 to 3000). It features a red curve with 'borderline 1' and 'borderline 2' markers. A blue box notes: 'Underneath the blue line there are no requirements to return grid connected'. A 'fault occurrence' is indicated at the start of the curve.

2022-3-28 14:16:45



$\Delta P = 20 P_m \frac{50.2 \text{ Hz} - f_{nom}}{50 \text{ Hz}}$ at $50.2 \text{ Hz} < f_{net} < 51.5 \text{ Hz}$
 P_m : Instantaneously available power
 ΔP : power reduction
 f_{nom} : network frequency

When the range $47.5 \text{ Hz} < f_{net} < 50.2 \text{ Hz}$ is detected
 at $f_{min1} = 47.5 \text{ Hz}$ and $f_{min2} = 51.5 \text{ Hz}$ disconnection from the grid

Name	Current Value	Setting Value
RegIdByFreq_StepPerHz (%/Hz)	0	0
RegIdByFreq_Freq_Start (Hz)	0.00	0.00
RegIdByFreq_Freq_Recover (Hz)	0.00	0.00

Operation Data | History Info | System Setup | On/Off | Home

2022-3-28 14:16:52

Name	Current Value	Setting Value
Mode_Opt: RegIq_Mode_Select	0	0
Mode1: RegIq_FF_Sign (0 lag 1 lead)	0	0
RegIq_FF_Ref :	0.000	0.000
Mode3: RegIq_Q_Ref_Sign (0 lag 1 lead)	0	0
RegIq_Q_Ref (kVar) :	0	0

Operation Data | History Info | System Setup | On/Off | Home

2022-3-28 14:17:21

Name	Setting Value
Impact load Current_Kp	0.000
Impact load Current_Ki	0.0000
Impact load Voltage_Kp	0.000
Impact load Voltage_Ki	0.0000

Note: These date are only used for impact load when starting up.

Operation Data | History Info | System Setup | On/Off | Home

2022-3-28 14:17:27

Name	Setting Value
Init load Current_Kp	0.000
Init load Current_Ki	0.0000
Init load Voltage_Kp	0.000
Init load Voltage_Ki	0.0000

Operation Data | History Info | System Setup | On/Off | Home

In case of inductive load problem, it can be set according to the documentation provided by R&D

Factory setting



Serial Number	<input type="text"/>
Safety Select	UL
Model Select	PCS50
Station	0
Production Date	000000

Save RESTORE

Serial number: Equipment serial number, generally recorded in the machine nameplate. Safety Select, default parameter, do not modify.

Model setting: Select the model of the energy storage controller, please choose according to the actual model, do not modify at will. Due to slight differences in the design of different models, model errors can lead to failure to start and clear parameter Settings, causing unnecessary losses. If you need to modify it for special reasons, please modify it under the guidance of ATESS after-sales personnel. The modification takes effect after the device is restarted.

Communication station number setting: RS485 communication address setting, if it is a parallel system, be sure to set from 1.

Historical Information

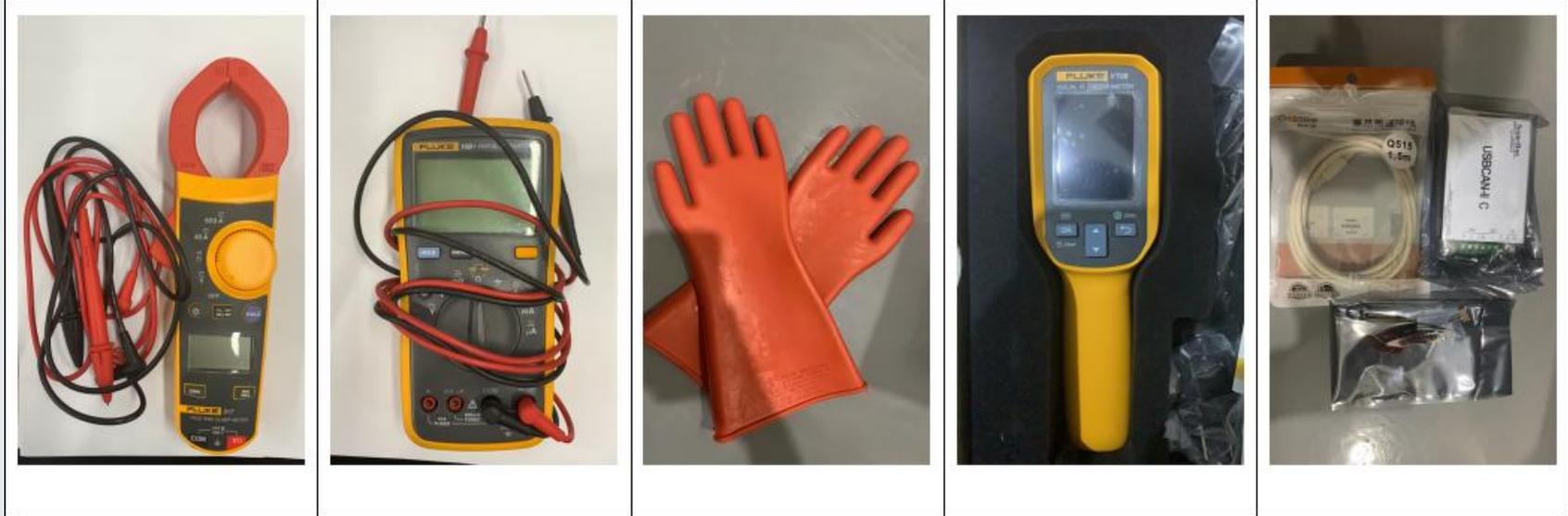


The "Historical Information" button will enter the "Historical data" submenu.

The sub-menu includes Common historical faults and Major historical faults. Through the left button can

The corresponding submenu is displayed.

The Common Historical Faults page is displayed by default.



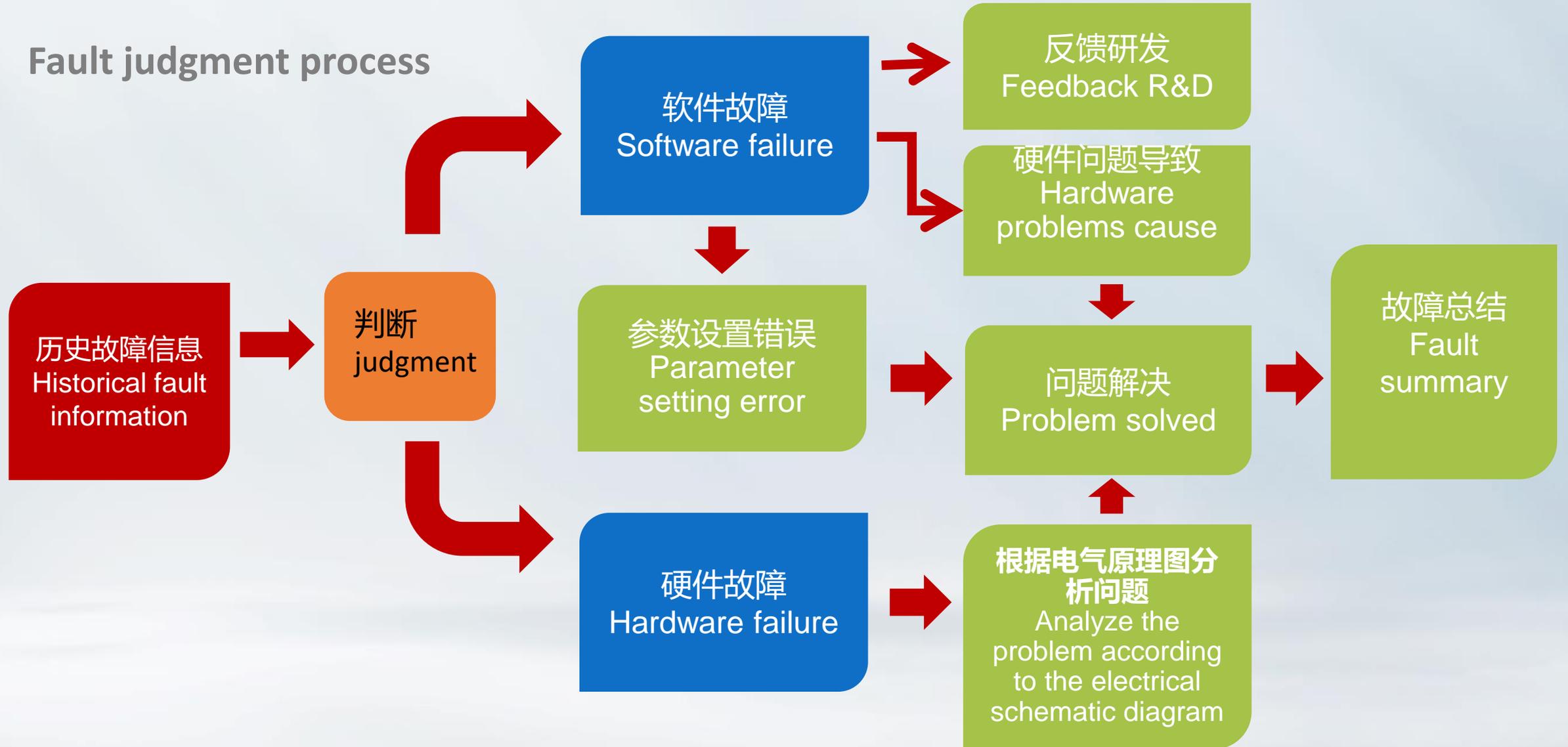
1.The hardware tools shown in the figure are commonly used.
 2.We also have some related software tools, including DSP tool 、 CANtest、 J Flash、 CCS UniFlash 2.0.0、 EasyConverter、 anydesk、 teamviewer etc.
 Multifunctional wrench



- 1 Clamp flow meter
- 2 multimeter
- 3 insulating gloves
- 4 Temperature detection gun
- 5 CAN BOX
- 6 RS232 cable
- 7 485-RS232 cable
- 8 emulator
- 9 J-link



Fault judgment process

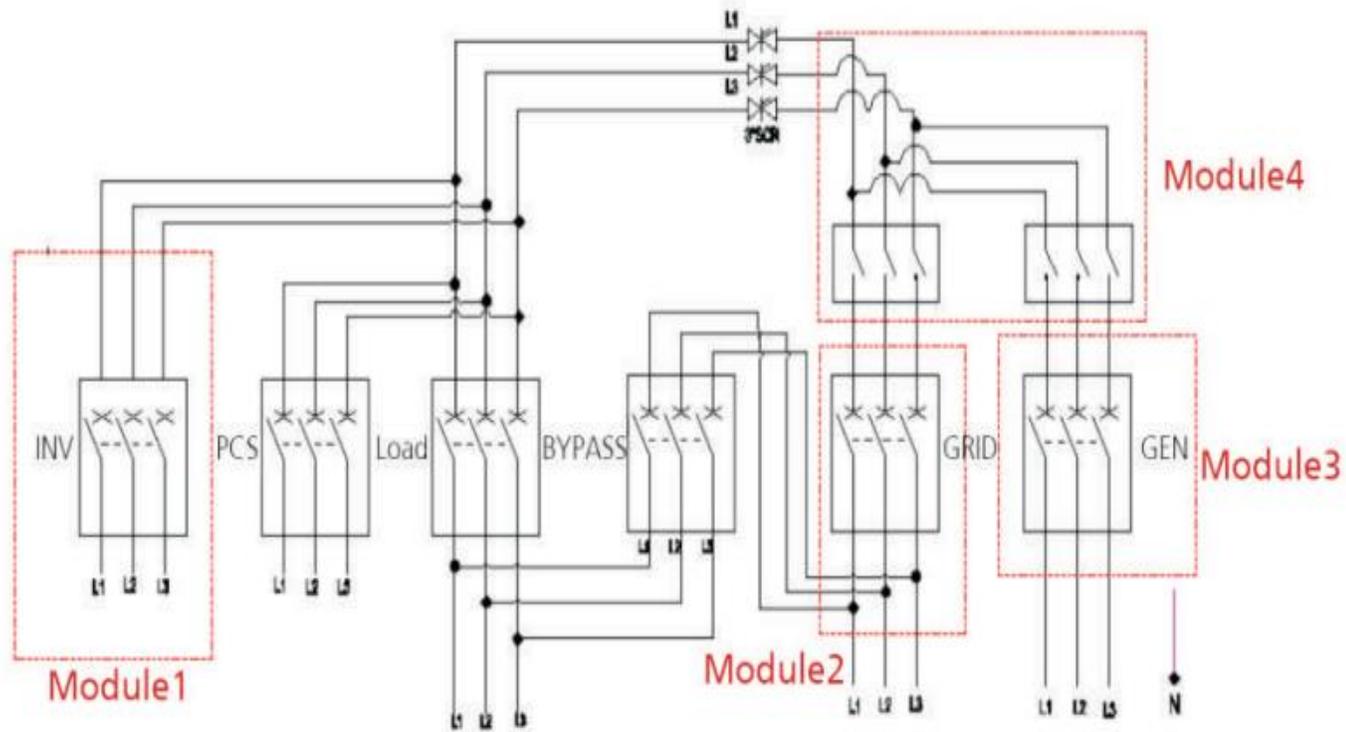


BYPASS500

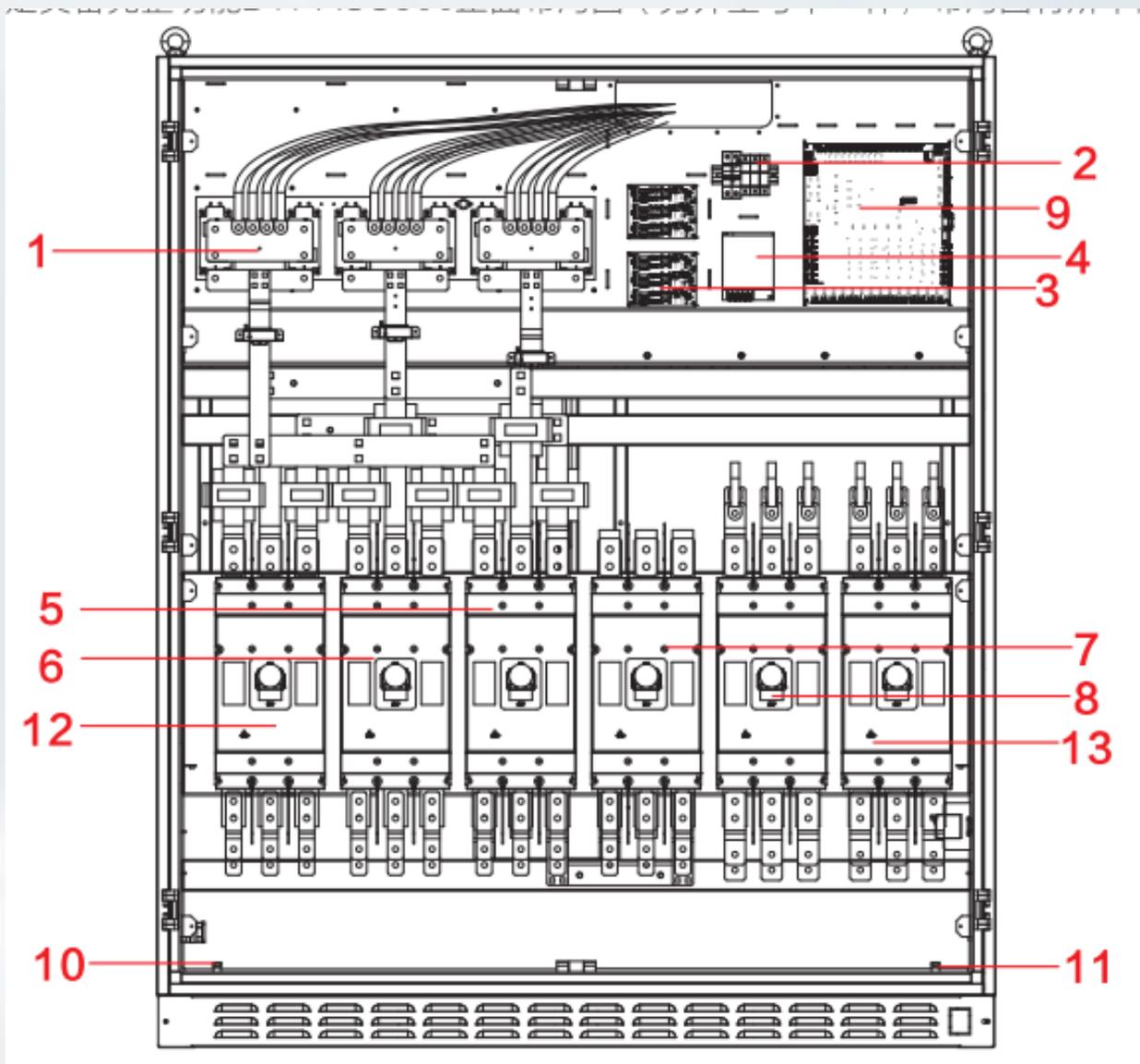


The BYPASS is a machine that is compatible with PCS of our company. Its main functions are as follows :1. It enables PCS to realize fast switching and off the network to ensure uninterrupted supply load. 2. PCS system can be connected to power grid and oil machine at the same time. 3, so that the system can be used with photovoltaic inverters (to use with inverters, you need to confirm with our company's pre-sales personnel whether the inverter can be compatible with the PCS system)

BYPASS electrical schematic diagram



Module 1	PV input	This module can realize the access function of PV inverter, only the inverter produced by ATESS is recommended. Confirm with R & D in advance if other inverters are selected on whether the PV inverter can be connected.
Module 2	Grid input	The module is connected to realize the on/off grid switching function between PCS and grid.
Module 3	DG input	The module is connected to realize the on/off grid switching function between PCS and DG.
Module 4	To realize connection of DG or grid	This module is only needed when connecting DG and grid at the same time, the module won't be consisted if the system is connected to either one.



The front structure drawing of BYPASS

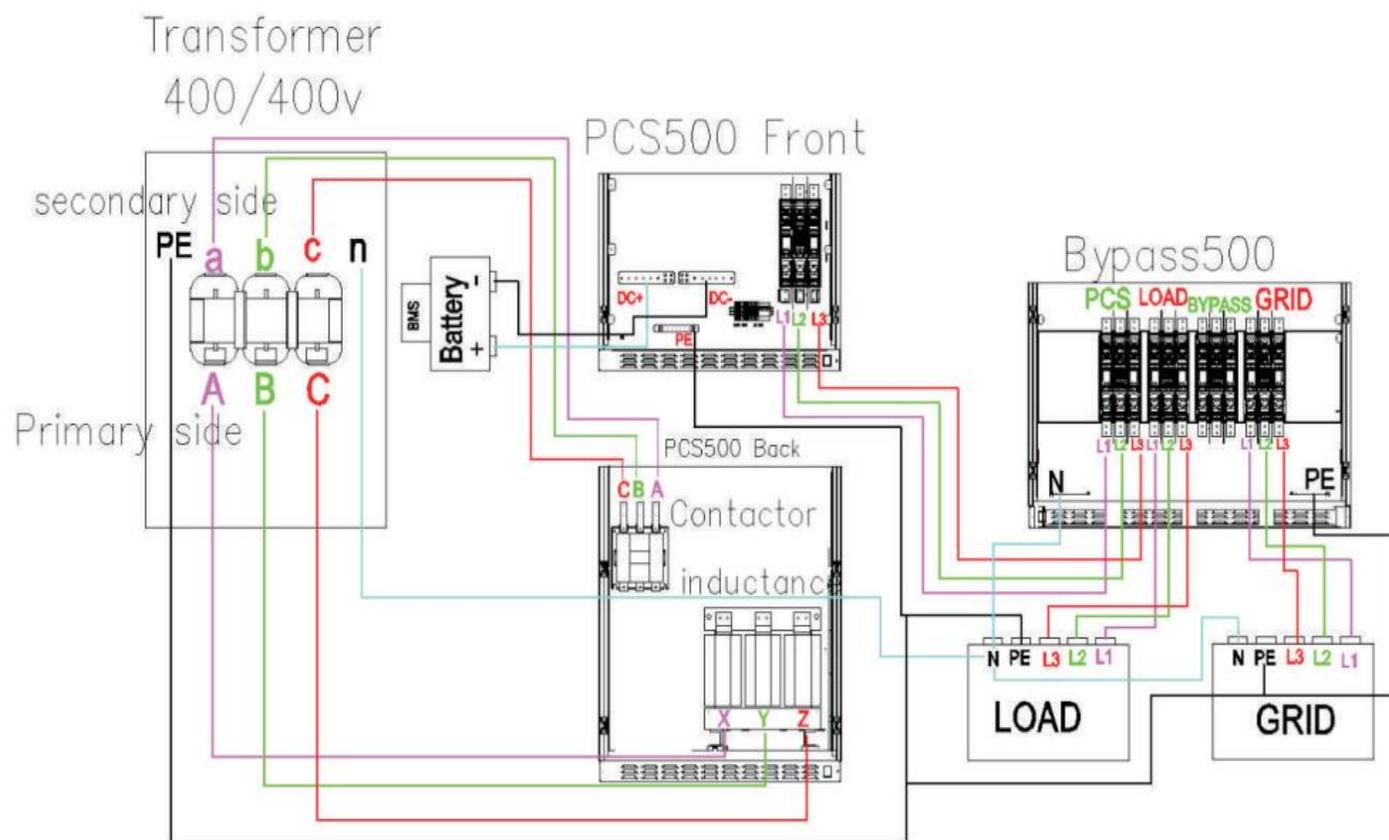
No.	Item name	Description
1	Thyristor	On/off grid switch
2	Power supply micro break	Control connection of control board power
3	Driving board	Drive circuit board of thyristor
4	Mingwei power supply	Supply power to control board
5	Load breaker	Control connection with load
6	PCS breaker	Control connection with PCS
7	Maintenance breaker	Maintenance switch
8	Grid breaker	Control connection with grid
9	Control board	Control logic of BYPASS and communication with PCS
10	N bar	Load, grid n-wire terminal
11	Ground bar	Machine grounding copper bar
12	Inverter breaker	Control connection with PV inverter
13	Ground breaker	Control connection with DG

System wiring



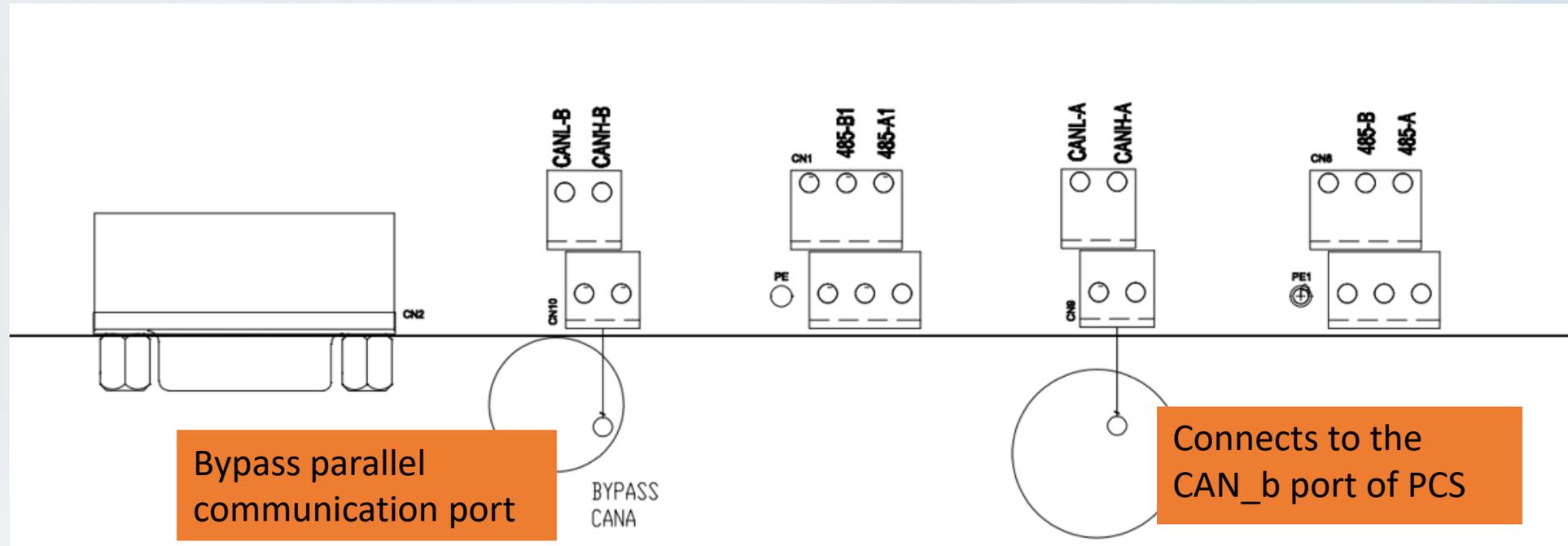
1. Several wires inside the BYPASS500 cabinet need to be connected to the PCS side by the customer. These wire terminals are marked with Arabic numerals (convenient for customers to connect). The customer only needs to connect the wire marked with Arabic numerals to the PCS transfer terminal board. The PCS connection terminal locations are shown below. Please note that: It must be double checked that the connecting wire is correct, otherwise the machine may not be able to get started

The power wire connection diagram of BYPASS500 system is as follows

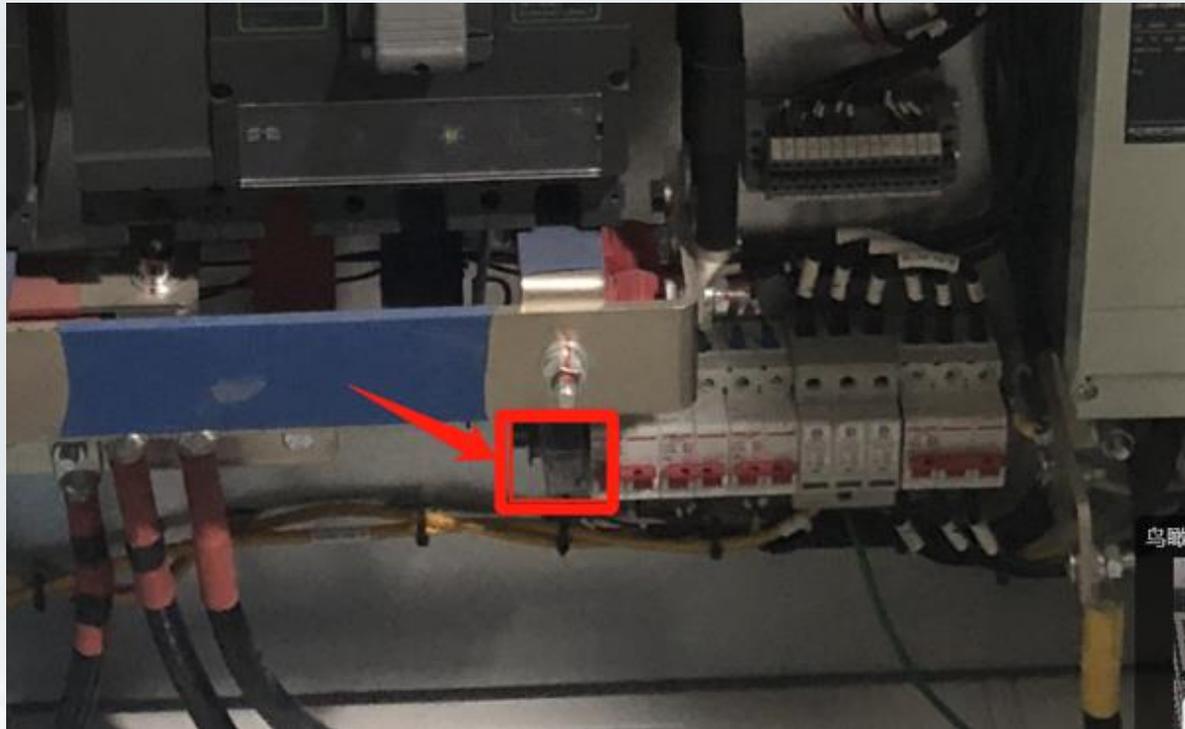


There are four circuit breakers inside the BYPASS500. From left to right are PCS switch (PCS), load switch (load), bypass switch (bypass), grid switch (grid). Pay attention to the screen printing distinction of the cabinet, and do not connect the wrong position and three-phase phase sequence, otherwise the system cannot operate normally

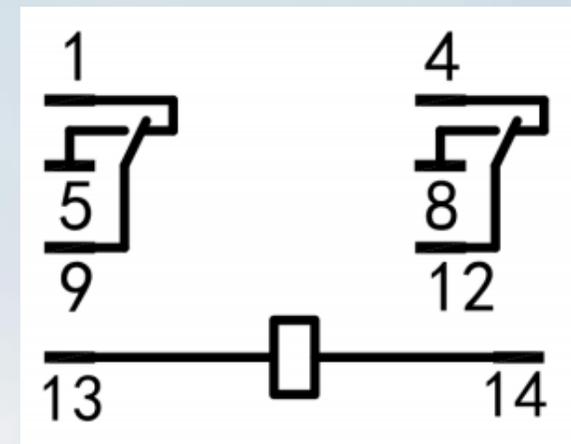
The following figure is a schematic diagram of the bypass communication port



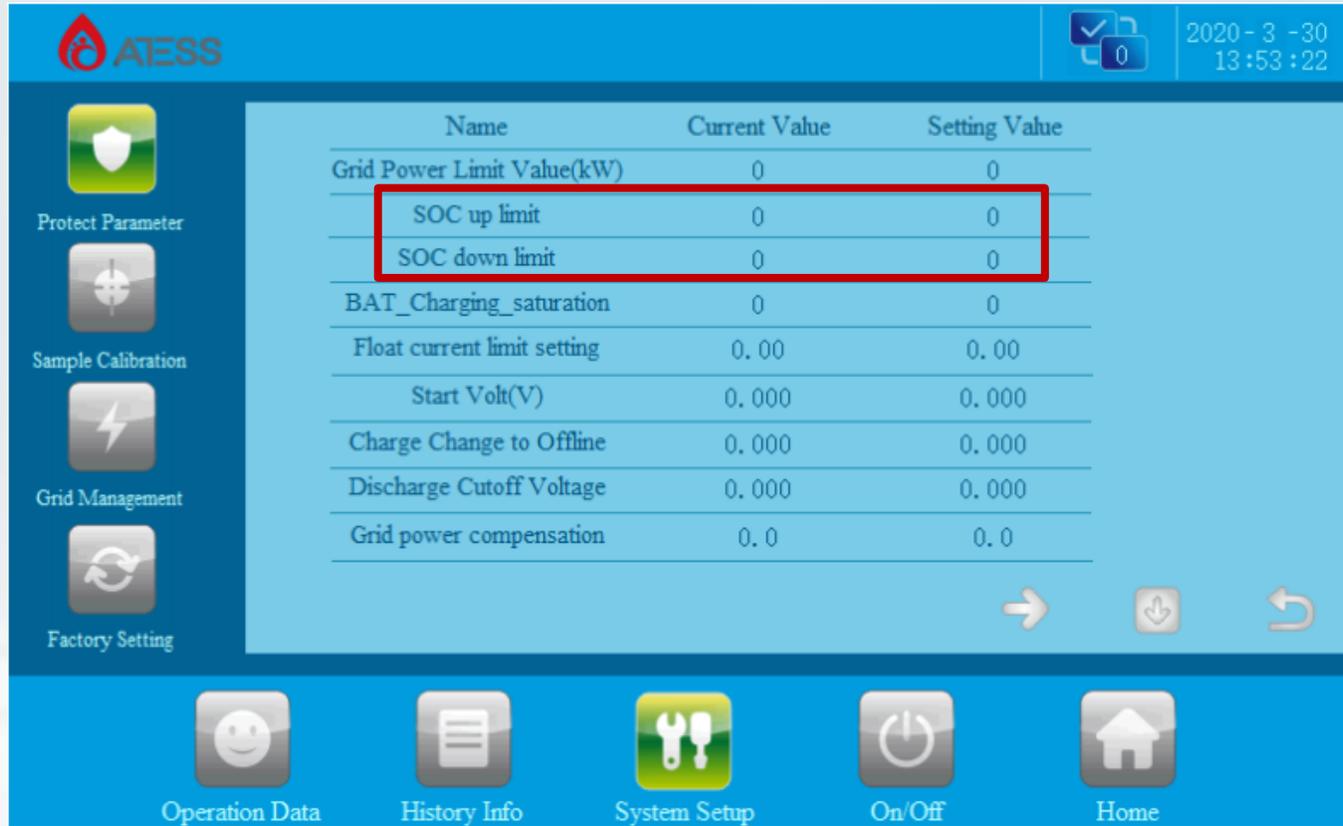
Diesel generator dry contact wiring



The inverter has a passive dry contact contactor to control the diesel generator, and the following is the dry contact structure diagram (initial state).



Diesel generator start and stop settings

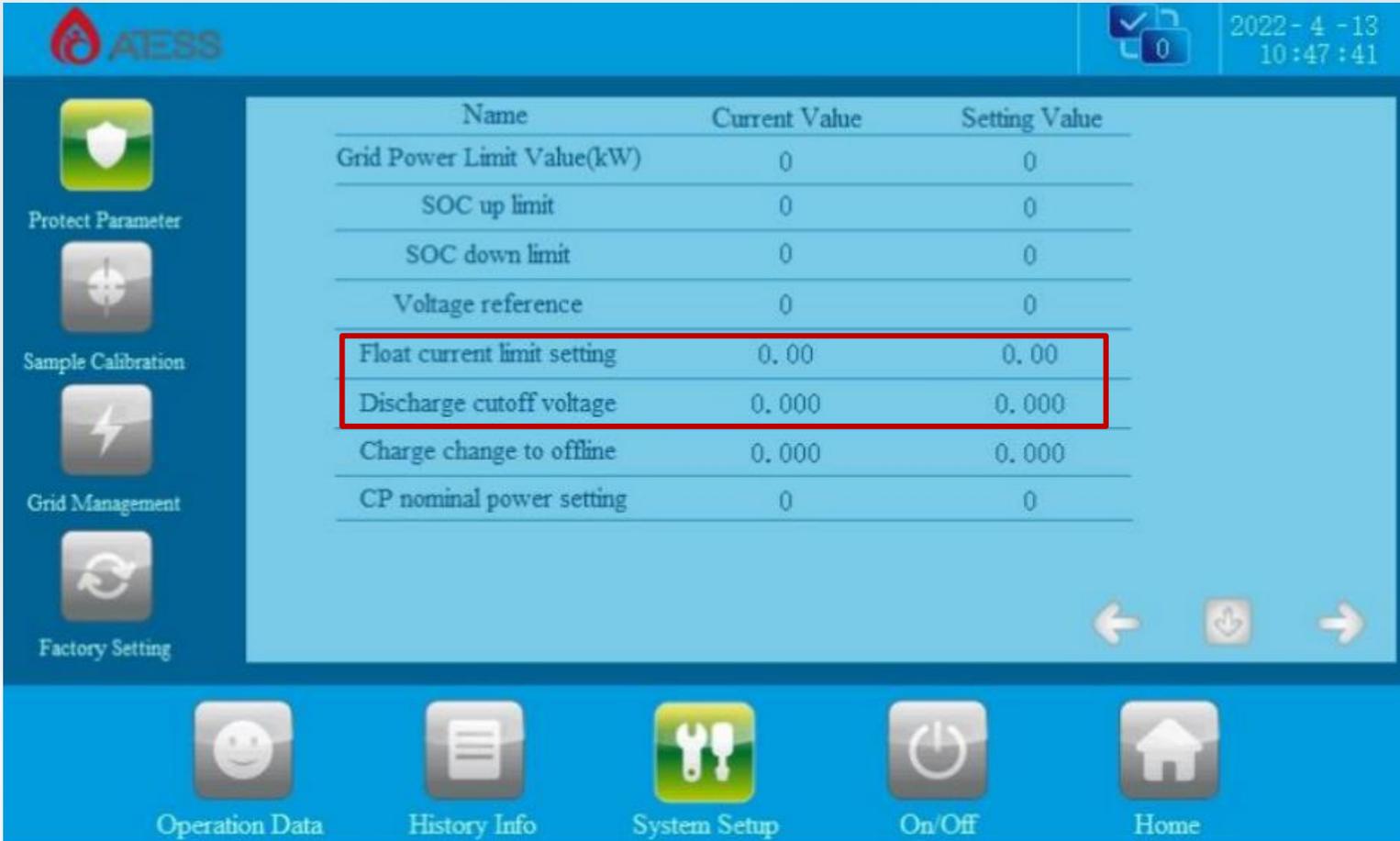


The screenshot shows the ATESS control interface. The top bar displays the ATESS logo, a checkmark icon, and the date/time: 2020-3-30 13:53:22. The left sidebar contains navigation icons for Protect Parameter, Sample Calibration, Grid Management, and Factory Setting. The main area displays a table of system parameters. The 'SOC up limit' and 'SOC down limit' rows are highlighted with a red box. The bottom bar contains icons for Operation Data, History Info, System Setup (active), On/Off, and Home.

Name	Current Value	Setting Value
Grid Power Limit Value(kW)	0	0
SOC up limit	0	0
SOC down limit	0	0
BAT_Charging_saturation	0	0
Float current limit setting	0.00	0.00
Start Volt(V)	0.000	0.000
Charge Change to Offline	0.000	0.000
Discharge Cutoff Voltage	0.000	0.000
Grid power compensation	0.0	0.0

Maximum and minimum SOC: only valid in diesel generator mode and when the battery has BMS. When off grid and the current SOC is lower than the Min. SOC, the inverter sends the diesel generator starting command; in diesel generator mode, the current SOC is higher than the upper SOC limit, and the inverter sends the diesel generator closing command.

Diesel generator start and stop settings



The screenshot displays the ATESS control interface. At the top right, the date and time are shown as 2022-4-13 10:47:41. The main content area contains a table of settings:

Name	Current Value	Setting Value
Grid Power Limit Value(kW)	0	0
SOC up limit	0	0
SOC down limit	0	0
Voltage reference	0	0
Float current limit setting	0.00	0.00
Discharge cutoff voltage	0.000	0.000
Charge change to offline	0.000	0.000
CP nominal power setting	0	0

The interface also includes a left sidebar with icons for Protect Parameter, Sample Calibration, Grid Management, and Factory Setting. At the bottom, there are five main navigation buttons: Operation Data, History Info, System Setup, On/Off, and Home.

In the case of no BMS in the battery, the following two values are the start and stop setting values of the diesel generator

When the battery voltage is set to the discharge cutoff voltage, the diesel generator will start. When the battery voltage reaches the float charging voltage setting, the generator will stop.

Thank you