Offical Website

GOODWE

User Manual

Rechargeable Lithium Ion Battery system

SECU-A Series

V1.3-2022-10-30

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Contents

1. Statement

This document contains safety information and instructions on installing, connecting and commissioning. Please finish reading this document before taking any actions on the system.

This manual introduces the installation and commissioning of battery. Please read through the manual and follow the instructions to use battery.

This document is valid for the ******* from firmware version ******.

This document only contains brief information and may deviate from the real system.

Any Failure to follow this document instruction will make any manufacturer's warranty, guarantee or liability null and void unless you can prove that the damage was not due to non-compliance.

The battery is used with GoodWe ESA/ES/EM/SBP/BP series products. The battery is designed for indoor use. But in a ESA system, the battery is protected by the ESA enclosure, which could be used outdoors.

The system is not suitable for supplying life-sustaining medical devices. Please ensure that no personal injury would lead due to the power outage of the system.

Alterations to the GoodWe system, e.g., changes or modifications are not allowed unless the written permission of GoodWe is achieved.

The enclosed document is an integral part of this system. Keep the documentation in a convenient, dry place for future reference and observe all instructions contained therein.

The instructions in this document may only be performed by qualified persons who must have the following skills:

- Knowledge of how batteries work and are operated
- Knowledge of how an inverter works and is operated
- Knowledge of, and adherence to the locally applicable connection requirements, standards and directives* (*the local standard for Australia is AS/NZS 5139:2019)
- Knowledge of, and adherence to this document and the associated system documentation, including all safety instructions
- Training in dealing with the hazards associated with the installation and operation of electrical equipment and batteries
- Training in the installation and commissioning of electrical equipment

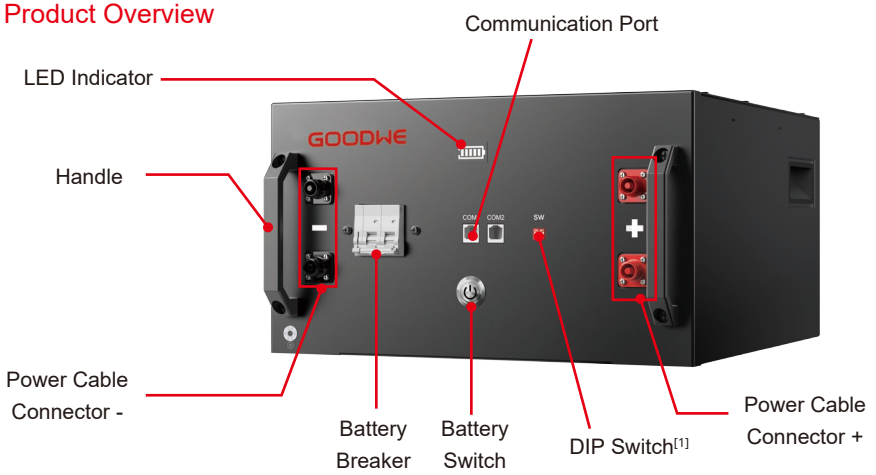
The battery must be stored, installed or operated under secured environment, including:

- Ambient temperature shall be -10℃~ 50℃
- Keep it away from corrosive liquids or environment
- Keep it dry, away from any conductive liquid
- No high flammable or explosive materials nearby

2 Symbols Explanation

	Observe the documents Observe all documents with the system.
	Grounding conductor This symbol indicates the position for connecting a grounding conductor.
	WEEE designation Do not dispose of the system together with household waste but in accrodance with the disposal regulations for electronic waste applicable at the installation site.
	CE mark The system complies with the requirements of the applicable EU directives.
	Please it straight up, without inclination or upside down.
	Handle with care
	Keep it dry
	Keep the battery away from open flame or ignition sources.
	Beware of electrical voltage.
	Beware of a danger zone This symbol indicates that the system must be additionally grounded if additional grounding or equipotential bonding is required at the installation site.
	Keep the battery modules away from children.
	Do not short circuit.
	No more than five (5) identical packages being stacked on each other.

3 Product Overview



[1]: Only for SECU-A5.4L.

Note:

The two COM ports on battery are of the same function.

The two Power Cable Connector + or - on battery are of the same function.

4 Cable Connection

4.1 Power Cable Connection

Note:

· The battery is designed for GoodWe ESA, ES, EM, SBP, BP series energy storage system. Before installation, make sure battery is not damaged and battery breaker is switched OFF. And whole energy storage system is isolated from both AC and DC power.

· Before installation and cable connection, make sure battery is not damaged and battery breaker is switched OFF. And whole ESA cabinet is isolated from both AC and DC power.

· Battery packs shall be connected in parallel.

· Each battery has two sets of Power Cable Connector - and ＋, which functions the same. Any of the two sets could be used for power connection.

· Please make sure the positive and negative pole on both battery and inverter side not reversed, otherwise the inverter or battery could be damaged.

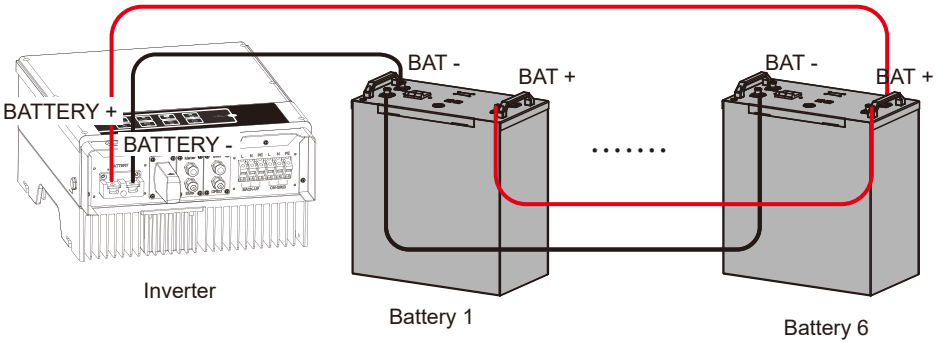
· The unused battery connectors must be sealed with connector cover.

· When replacing or expanding the battery system, it is prohibited to connect the battery to the systerm , please contact the after-sales service for processing.

· Please refer to the inverter user manual for specific connectors on each inverter. We just take SBP and ESA series inverter as example to introduce the connection in this manual.

Power cable connection of battery with ES, EM, SBP and BP inverters

When battery is used with ES, EM, SBP and BP series inverters， the power cable needs to be prepared by the user, the recommended conductor cross-sectional area is 25mm^2.

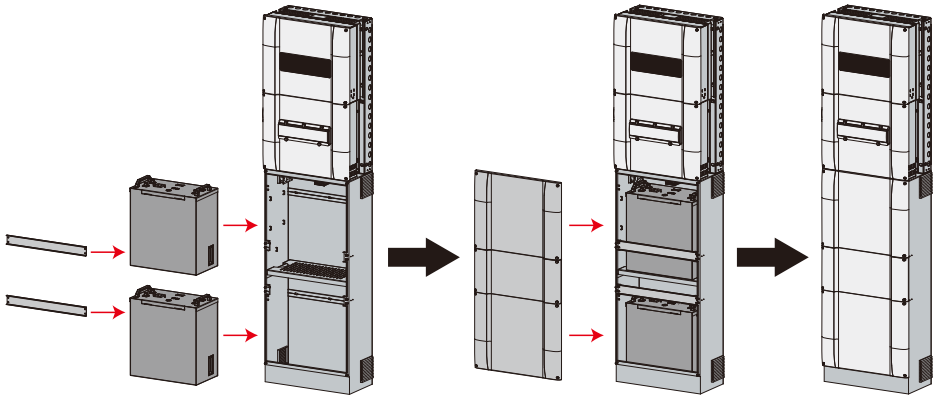


Power cable connection of battery with ESA inverter

· Before installation and cable connection, make sure the whole ESA cabinet is isolated from both AC and DC power.

· The cables between the battery and the inverter are connected in the same way. Please refer to the "Cable connection of battery with ES, EM, SBP and BP inverters".

· Open battery enclosure and install batteries and other component by sequence as below:

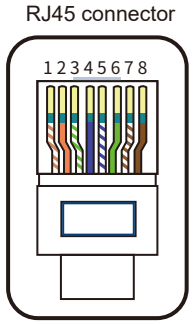


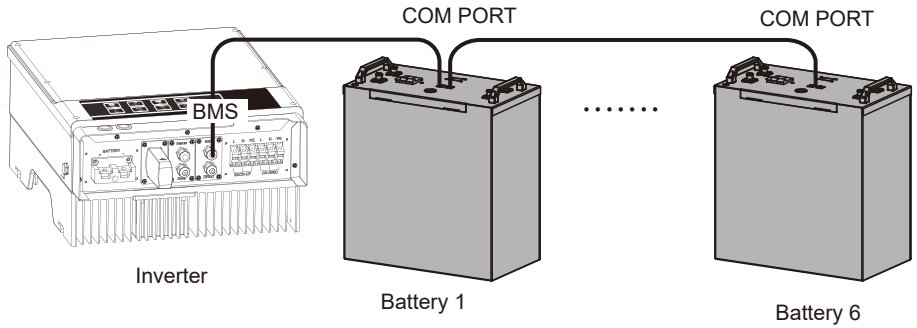
4.2 Communication Cable Connection

Communication cable connection of battery with ES, EM, SBP and BP inverters

When battery is used with ES, EM, SBP and BP series inverters，the network cable needs to be prepared by the user.

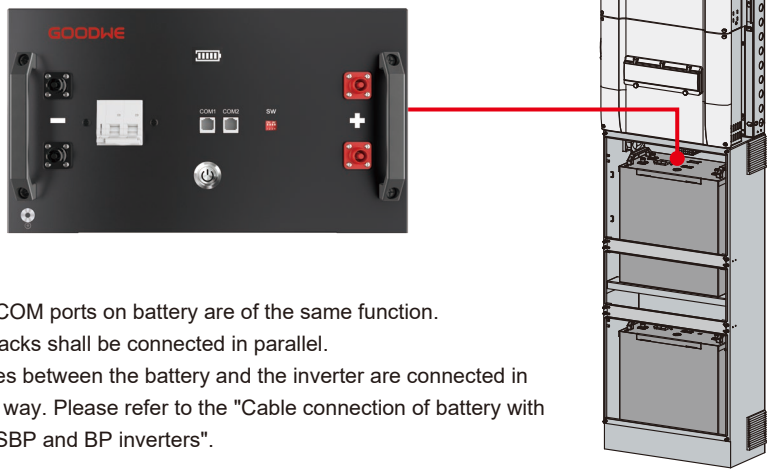
PIN	Colour	SECU-A5.4L	SECU A5.4-20
1	Orange and White	N/A	RS485_A
2	Orange	N/A	RS485_B
3	Green and White	N/A	N/A
4	Blue	CAN_H	CAN_H
5	Blue and White	CAN_L	CAN_L
6	Green	N/A	N/A
7	Brown and White	N/A	N/A
8	Brown	N/A	N/A





Communication cable connection of battery with ESA inverter

In battery enclosure, battery cable and communication cable is preset inside. Connect directly these cables on battery to the right position:



Note:

1. The two COM ports on battery are of the same function.
2. Battery packs shall be connected in parallel.
3. The cables between the battery and the inverter are connected in the same way. Please refer to the "Cable connection of battery with ES, EM, SBP and BP inverters".

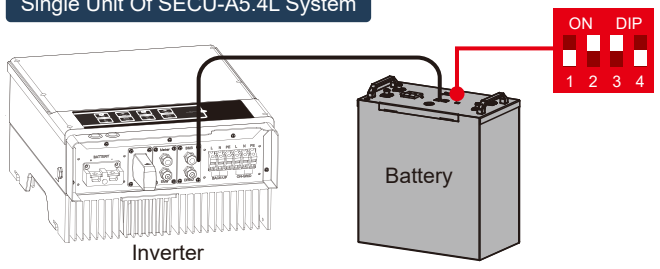
5. Battery Commissioning

5.1 Calibrating the DIP switch(SECU-A5.4L)

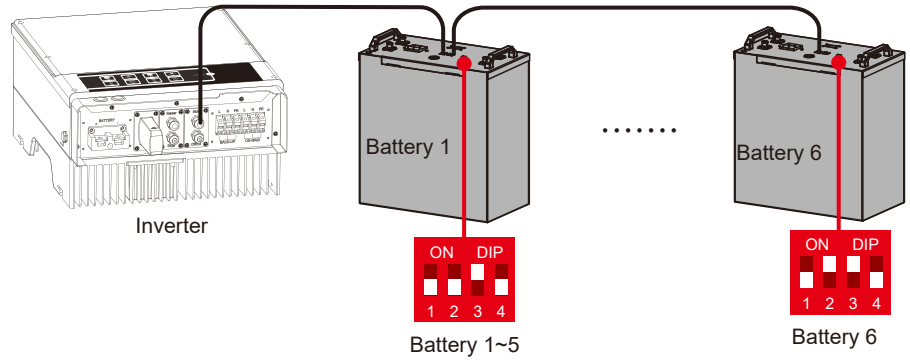
- The DIP switches shall be configured differently between single piece battery and 2 battery paralleling system.
- We just take SBP series inverter systerm as an example, the calibration method of the DIP switch for ESA series inverter systerm is the same.

DIP	Function	Description
2	Dial Switch	To recognize the last battery connected to inverter
3	GoodWe communication protocol Switch	To relize the communication between inverter and inverter unit part

Single Unit Of SECU-A5.4L System

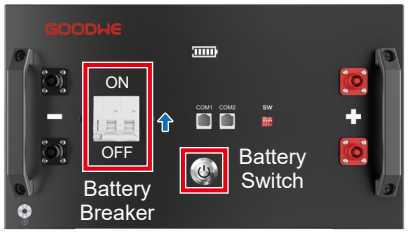


2~6 Units Of SECU-A5.4L System



5.2 Powering on the battery system

1. Check all cables are connected correctly.
2. Turn on the batery break.
3. Turn on all battery switches within 30 seconds in the systerm. If it exceeds 30 seconds, there will be a error alarm.



Battery Switch(SECU-A5.4L)

TURN ON	TURN OFF
Pressing < 1 seconds	Keep Pressing > 5 seconds

Battery Switch(SECU A5.4-20)

TURN ON	TURN OFF
Pressing < 1 seconds	Turn off the battery breaker

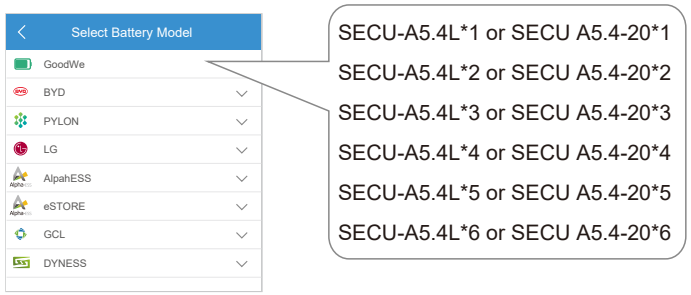
Note: Please follow the instruction to turn on/off battery in case of any damage on battery modules.

5.3 Setting the parameters of battery On PV Master app

To make sure the battery communicates to inverter unit successfully, users have to use PV Master to choose the right battery option on PV Master:

APP Installation And Connection:

Select Battery on PV master



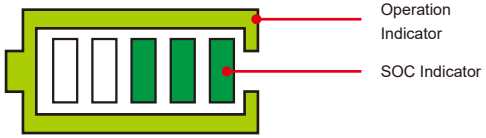
Select “SECU-A5.4L” or “SECU A5.4-20”on battery page in PV Master Application

Notes:

1. Select wrong battery will lead to BMS communication failure
2. Select wrong number of batteries the input and output current will be limited and the parameter indicated by the inverter is inconsistent with the actual value of the battery.
3. For the complete commissioning of the whole ESA system, please go to ESA instruction.

5.4 Observing the indicator status

LED Indication



Operation Indicator(SECU-A5.4L)	
Green, Blink 1s	Standby
Green, Blink 10s	Working
Green, Blink 3s	Alert
Red, Blink 3s	Faulty

Operation Indicator(SECU A5.4-20)	
Green light blink 1 time in 1second	Standby
Steady green	Working
Red light blink 1 time in 1second	Alert
Steady red or Red light blink 1 time in 1second	Faulty

Operation Indicator	
	SOC < 5%
	5%≤ SOC ≤25%
	25%≤ SOC ≤50%
	50%≤ SOC ≤75%
	75%≤ SOC ≤95%
	95%≤ SOC ≤100%

6. Error Code and Warning Code

SECU-A5.4L

Warning Status

Operation LED	SOC LED	Warning Description
Green Blink 3 seconds		Cell Temperature Difference
		Battery High Temperature
		Discharge Under Low Temperature
		Charge Overcurrent
		Discharge Overcurrent
		Battery Over Voltage
		Battery Under Voltage
		Charge Under Low Temperature

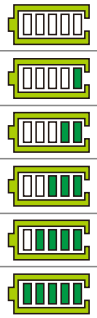
Note: If Battery Under Voltage happens during working status, by pressing battery switch for 5 times in 10 seconds, BMS will compulsively close MOS, so that inverter will detect battery open circuit voltage to charge battery.

Error Status

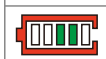
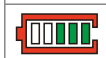
Operation LED	SOC LED	Error Description	Solution
Red Blink 3 seconds		Temperature Sensor Failure	Reboot battery or contact aftersales
		MOS Fault	
		Breaker Open	Turn Off battery and contact aftersales
		DIP Switch Status difference	Keep same of DIP switch status and reboot battery
		Slave Communication Loss	Reconnect communicatioin cable
		No Series Number	Contact aftersales
		Master Communication Loss	Reconnect communication cable
		Firmware Inconsistency	Contact aftersales
		Multi Master Unit	Turn off and reboot all batteries in 30s
		MOS Over temperature	Turn off battery for 2 hours

SECU A5.4-20

Warning Status

Operation LED	SOC LED	Warning Description
Red light blink 1 time in 1 second		The alerting is dealt by the battery system itself. For more detailed information, you can check via PV Master App.

Error Status

Operation LED	SOC LED	Error Description	Solution
Steady red		Overvoltage	Power off for 2 hours.If the problem persists, please contact GoodWe.
Red light blink 1 time in 1 second		Under voltage	Contact GoodWe for help.
Steady red		Cell High Temperature	Power off for 2 hours.If the problem persists, please contact GoodWe.
		Low Temperature Charging	Power off the equipment and wait until the temperature recovers. If the problem persists after restarting, please contact GoodWe.
		Low Temperature Discharging	
		Overcurrent When Charging	Restart the battery. If the problem persists, please contact GoodWe for help.
		Overcurrent When Discharging	
		Temperature Exception	Power off for 2 hours.If the problem persists, please contact GoodWe.
		The cell voltage difference is extremely high	Power off for 12 hours.If the problem persists, please contact GoodWe.
		Harness Abnormal	Restart the battery. If the problem persists, please contact GoodWe for help.
		MOS Open-Circuit Fault	
		MOS Short-Circuit Fault	
		Parallized Connection Fault	Check the battery model. If the battery model is not correct, please contact GoodWe.
		BMU Communication Fault	Restart the battery. If the problem persists, please contact GoodWe for help.
		MCU Internal Communication Fault	

Operation LED	SOC LED	Error Description	Solution
Steady red		Air Switch Short Circuit Fault	Contact GoodWe for help.
		Precharge Failure	Restart the battery. If the problem persists, please contact GoodWe for help.
		MOS Overtemperature Fault	Power off for 2 hours.If the problem persists, please contact GoodWe.
		Current Sensor Overtemperature Fault	
		Microelectronic Fault	Contact GoodWe for help.

7. Battery Parameters

Physical Parameters	
Model	SECU-A5.4L
Battery Type	$LiFePO_4$
System Weight	49kg
Dimensions(W x D x H)	400x226.2x484.2mm
Protection	IP20 (indoor)
Installed Capacity	5.4 kWh
Usable Energy	4.8 kWh
DOD	90%
Nominal Voltage	51.2 V
Operating Voltage Range	48 ~ 57.6 V
Internal Resistance	≤ 20 mΩ
Electrical Parameters	
Max. Charge current	50 A
Max. Discharge current	50 A
Operating Temperature Range	-10 °C ~ 50 °C [1]
Humidity	15% ~ 85%
System Configuration	
Module Connect	6 Parallels
Capacity Range	5.4/10.8/16.2/21.6/27/32.4 kWh
Usable Energy Range	4.8/9.6/14.4/19.2/24/28.8 kWh
Max. Charge Current	50A (1 Module) / 100A (2~6 Modules)
Max. Discharge Current	50A (1 Module) / 100A (2~6 Modules)
Monitoring Parameters	system voltage, current, cell voltage, cell temperature, PCBA temperature
Communication	CAN
Certification	CE, UN38.3

[1] When the temperature is below zero, the battery are not allowed to charge. When above 40℃, the power output decreased.

Technical Data		SECU A5.4-20	2*SECU A5.4-20	3*SECU A5.4-20
Usable Energy (kWh)*1		5.4	10.8	16.2
Battery Module		SECU A5.4-20		
Number of Module		1	2	3
Cell Type		LFP （LiFePO4）		
Cell Configuration		16S1P	16S2P	16S3P
Nominal Voltage (V)		51.2		
Operating Voltage Range (V)		47.5~57.6		
Nominal Dis-/Charge Current (A)*2		50	100	
Nominal Power (kW)*2		2.56	5.12	
Short-Circuit Current		2.323kA@1.0ms		
Operating Temperature Range (℃)		Charge: 0 ~ +50 / Discharge: -10 ~ +50		
Relative Humidity		0~95%		
Max. Operating Altitude (m)		2000		
Communication		CAN、 RS485		
Weight (kg)		49	98	147
Dimensions (W×H×D mm)		403x227x455 (SECU A5.4-20)		
Ingress Protection Rating		IP 20		
Storage Temperature (℃)		-20 ~ +40 (≤One Month) / 0 ~ +35 (≤One Year)		
Mounting Method		Grounded/ Cabinet		
Round-trip Efficiency		95.0%		
Cycle Life*3		≥ 4000 @0.5C/0.5C		
Standard and Certification	Safety	IEC62619， IEC63056，CEC		
	EMC	CE， RCM		
	Transportation	UN38.3		

*1: Test conditions， 100% DOD， 0.2C charge & discharge at +25±2 °C for battery system at beginning life. System Usable Energy may vary with different Inverter.
*2： Nominal Dis-/Charge Current and power derating will occur related to Temperature and SOC.
*3： Based on Cell under 0.5C/0.5C @ 25±2℃ test condition and 80% EOL.

Technical Data		4*SECU A5.4-20	5*SECU A5.4-20	6*SECU A5.4-20
Usable Energy (kWh)*1		21.6	27.0	32.4
Battery Module		SECU A5.4-20		
Number of Module		4	5	6
Cell Type		LFP（LiFePO4）		
Cell Configuration		16S4P	16S5P	16S6P
Nominal Voltage (V)		51.2		
Operating Voltage Range (V)		47.5~57.6		
Nominal Dis-/Charge Current (A)*2		50	100	
Nominal Power (kW)*2		2.56	5.12	
Short-Circuit Current		2.323kA@1.0ms		
Operating Temperature Range (℃)		Charge: 0 ~ +50 / Discharge: -10 ~ +50		
Relative Humidity		0~95%		
Max. Operating Altitude (m)		2000		
Communication		CAN、 RS485		
Weight (kg)		196	245	294
Dimensions (W×H×D mm)		403x227x455 (SECU A5.4-20)		
Ingress Protection Rating		IP 20		
Storage Temperature (℃)		-20 ~ +40 (≤One Month) / 0 ~ +35 (≤One Year)		
Mounting Method		Grounded/ Cabinet		
Round-trip Efficiency		95.0%		
Cycle Life*3		≥ 4000 @0.5C/0.5C		
Standard and Certification	Safety	IEC62619， IEC63056，CEC		
	EMC	CE， RCM		
	Transportation	UN38.3		

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8. Safety Instructions

The system has been designed and tested under international safety requirements. However, to prevent personal injury and property damage and ensure long-term operation of the system, do read this section carefully and observe all safety information at all times.

Battery Module Leakage

If the battery modules leak electrolyte, please avoid contact the leaking liquid or gas. If one is exposed to the leaked substance, do these actions:

Inhalation: Evacuate the contaminated area, and seek for medical help immediately.

Eye contact: Rinse your eyes with clean water for at least 15 minutes and seek for medical help immediately.

Skin contact: Wash the affected area thoroughly with soap and clean water, and seek for medical help immediately.

Ingestion: Induce vomiting, and seek for medical help immediately.

Firefighting Measures

- In case of a fire, please make sure that a carbon dioxide extinguisher or Novac1230 or FM-200 is nearby. Water cannot be used to extinguish the fire. (ABC is not effective for this battery firefighting)
- Full protective clothing and self-contained breathing apparatus are required for the firefighters to extinguish the fire.

Warning: Under >150℃ environment, there is possibility that battery could explode

Handling and Storage Guide

- The battery modules and its components shall be protected from damage when it is in transporting and handling
- Please take the weight of the battery module system into account during transportation and battery module shall be lifted carefully
- Do not impact, pull, drag or step on the battery modules, either insert unrelated objects into any part of the battery modules
- The battery module shall be kept away from a fire, water, strong oxidizers or solvents
- The battery modules cannot be stored in high temperature (> 60℃) or stored directly under the sun, or in any high humidity environment.
- Do not use the battery modules if it is defective, or appears cracked, broken.
- Do not attempt to open, disassemble, repair, tamper with, or modify the battery modules without official permission from GoodWe.

Warning: battery module damage may lead to electrolyte leakage, please contact technical support immediately.

Warning of Electric Shock

It is danger to get electric shock when live components or DC cables are touched.

Disconnect the battery from voltage source before working on the device. Make sure of no any manual operation under load. And do not touch non-insulated parts or cables. And wear suitable protective equipment for all work on the system.

> Warning: If battery is wetted, make sure it is not touched by hand, and contact technical support

Surge Protection

Over voltages can be further conducted into the building or other connected devices in the same network via network cables or other cables if there is no surge protection.

Ensure that the system is integrated into the existing surge protection.

9. Disclamer

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