



48V Household Energy Storage System UNIVERSAL 5K3

Product manual HESU Max 5 units in Parallel Max 5 Clusters

Model type HeSU UNIVERSAL STACKABLE UNITS

BMS-CAN V3.0

Version: 5K3_V2.00-November 2019



Battery can explode if heavy object impact on it.



Battery 's Weight Exceed 52 kg, must be handle with mechanical devices



Battery can explode, keep away from free flames or sparks



disconnect any terminal before operating the battery



This battery can accumulate parasite current, disconnect the main breaker and wait 5 minutes before operating. Don't touch the terminal B+ B- check always with a Voltmeter, **“Must be 0V”**



Always wear Individual protection devices and follow the safety plan of the



This Battery must be must be recycled by professional company



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Statement:

The following are related to the product 5K3 HeSU RACK Version

Due to product upgrades or other reasons, this document will make appropriate adjustments. Unless otherwise agreed, this document is intended to be used only as a guide, and all statements, information and advice in the documentation shall not constitute any express or implied.

For more information, please contact us

The official information and the latest datasheet are available on www.weco.uk.com

This battery unit is equipped with the latest firmware version available.

WeCo will release new firmware to improve the functionalities and battery capabilities.

The latest versions of the firmware are always available free of charge, the battery can be updated by your local installer or writing an email to weco@weco.uk.com to know the upgrade procedure.



ATTENTION

This battery model is built to be used indoors

The IP20 degree of protection does not allow installation in outdoor environments even if sheltered from the weather.

The INDOOR definition means literally the internal environment, the room must be closed to unauthorized persons, ventilated, dry, healthy and tempered



1 Preface

Thanks for choosing **WeCo** products. We provide a good, high quality and after sale service.

To protect using staffs and product, please kindly read this manual carefully which provide detailed information for products features, structures, operate standard, maintenance and troubleshooting.

Special announcement:

This manual can't be taken as basis of requirement for the manufacturer

Manufacturer hold the final explanation right of this manual.

2 Information in this Manual

2.1 About this Manual

This is the Manual for the -HeSU, is an Installer/ User manual, the installer and the user must refer to the manual guidance to operate and maintain correctly.

2.2 Use Range

This installation guidance applies only to the -HeSU- LOW VOLTAGE

2.3 Additional Information

Specification of the product can be changed without any notice to customers for the system improvement.

2.4 Symbol Used

Symbols meanings:



CAUTION:

CAUTION represents hazardous situations which can cause light injuries if not avoided.



NOTICE:

NOTICE represents the situations which can cause damage to property if not avoided.



INFORMATION:

INFORMATION provides tips that are valuable for optimum installation and operation of the product.



3 Safety

3.1 Warnings and Notification

Installation environment requirements: -HESU- SERIES is designed for household/commercial purposes. For installation, it must be installed in a location complying with IP20. (IP 55 or 65 are available on request) If the Installation location does not comply with IP20 may cause failure and the product will not be guaranteed for any related accident or damage.

3.2 Safety Guidelines



CAUTION:

Install and use to avoid short-circuit between the anode terminal and a cathode terminal, all electrical connections on the -HESU-SERIES work must be operated by qualified professional personnel, when operated in accordance with the expected design -HESU-SERIES battery will be used as a safe and reliable power supply. In the absence of proper operating conditions, damage, misuse and / or abuse case, battery box there may be security risks such as overheating or electrolyte smoke potential, users are described in this section must comply with the safety precautions and warnings. If any of the following precautions is not fully understood or has any problems, please contact the customer service officer for assistance. The safety part may not include all the regulations in your area. The use of -HESU- SERIES must review applicable local laws and regulations and the industry standards of the product.

Installation personnel shall not wear watches and other metal items to install operations, in order to avoid short circuits and personal injuries.



CAUTION:

Due to high weight of -HESU-SERIES, please use original package and do safety protection when second transport.

Please ensure that the battery box in the process of transportation safety, to avoid damage to the product and personnel injury.

4 Product Overviews

4.1 Product Introduction

HESU- SERIES battery box products as the energy storage parts can be used in off-grid & on-grid energy storage system. It is recommended not to use this device for other than the purpose described in this guidance. The substitute use of this product, random change, and use of components other than sold or recommended by Manufacturer will nullify the product guarantee. Products also support the largest group of five parallel battery box connection.



4.2 Identifying the Product

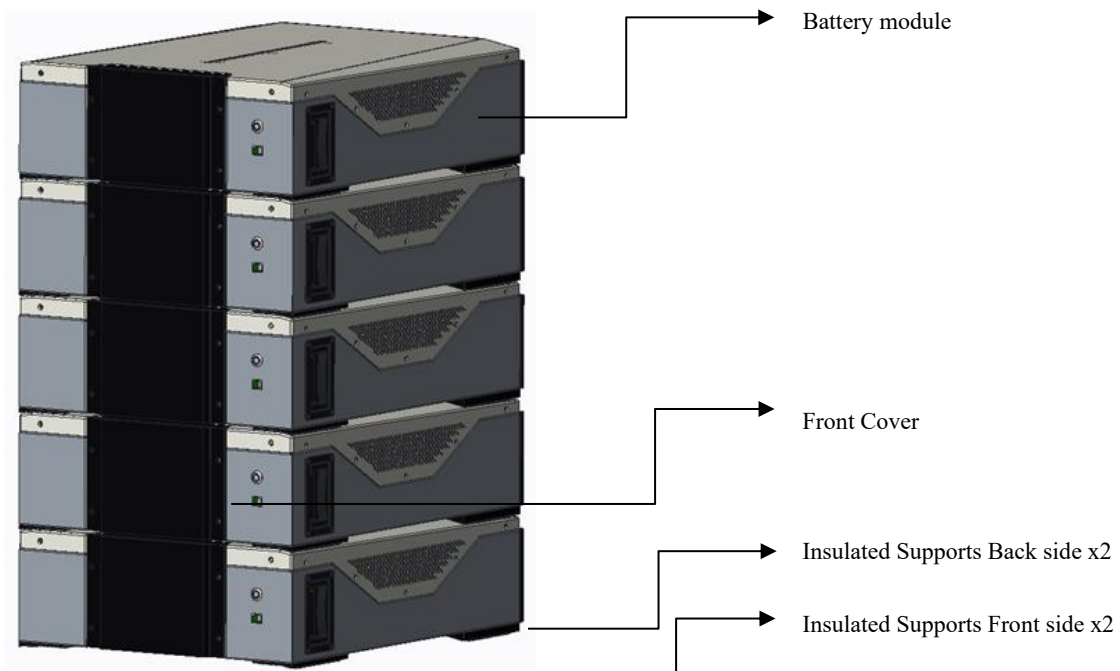
Dimensions	mm	510x550x150
Weight	kg	52
Case material	Type	Steel
Parallel Units	N°	5
Stackable	Type	Yes
Digital Output	N°	2

Dimensions	mm	510x550x150
Weight	kg	52
Case material	Type	Steel
Parallel Units	N°	5
Stackable	Type	Yes
Digital Output	N°	2

Cell Type	ID	LiFePO4
Cells Distribution	P/S	16S
BMS charge Temp.	°C	-10°C +55°C
BMS Disch. Temp.	°C	-25°C +65°C
Storage Time/Temp.	°C	-20°C +45°C 4months
Self Disch Time/Temp.	%	3% month @25°C

4.3 Product identification and labels

The nameplate label describes the product parameters and is attached to the product. For details, please refer to the nameplate label of the product. For safety reasons, the user must have a good understanding of the contents of this manual before install the product





5 System Installation

The battery is packed in a carton box, the total weight exceed 52Kg, is mandatory the presence of two persons during the unpacking operations and preliminary check, and a mechanical lift to carry and handle the modules.

5.1 Installation notice

- a) Before installation, check the battery open circuit voltage, do not install with closed circuit
- b) Battery installation location should be away from heat and avoid produce spark. The safety distance should be above than 20 m.
- c) Battery installing connecting cables should be as short as possible, to prevent excessive line pressure drop.
- d) Batteries with different capacity, different P/N or different manufactures are not allowed for connection.
- e) Before conducting the battery, the battery positive and negative poles need to be carefully checked as well to ensure correct installation.
- f) The mounting floor should be horizontal.

5.2 Package information and system configuration list









The battery box is packed in cartons, and the components assort with the battery case. When you confirm the goods, please read the configuration list carefully to make sure that the battery box and kit are intact.

5.2.1 Configuration list of -HESU- SERIES (BATTERY PARALLEL).

Number	System capacity	-HESU- 5,3
1	Single Battery pack	1
2	Up to 5 units in parallel	5x5.3kWh
3	Up to 5 units per cluster for a total of 25 units	5x5x5,3kWh









5.2.2 Parts list (Standard Kit 120A).

Number	Name	Quantity	Description	Image
1	Power Cable	2	2x25mm ² AWG cable 2.5 (m) each Red/Black	
2	CAN cable RJ45 Parallel Connection	1	100cm	
3	Flat Cover	1	Flat Cover for Bus bar protection in Stackable configuration	
4	Back Side feet Support	2	Steel/Rubber stackable feet Back Side	
5	Front Stackable lid	1	Steel/Rubber Stackable Cover	
6	Earthing Cable Screw	1	M5 Allen key	
7	Screw Kit for feet and front lid	1	8xM8 Allen key Screw, 4xM4 cross Screw	
8	BMS/STD	1	1 BMS std Cable 100cm	



5.2.3 Necessary Installation Tools

 Multimeter + Current clamp	 Screw Driver Set	 Allen Key Set	 Drill + Hammer
 Electrician Scissors	 Wrench set	 Lifting strap + mechanical lifter	 RS 232/USB+screw terminal (insulated)

5.2.4 Personal protective equipment

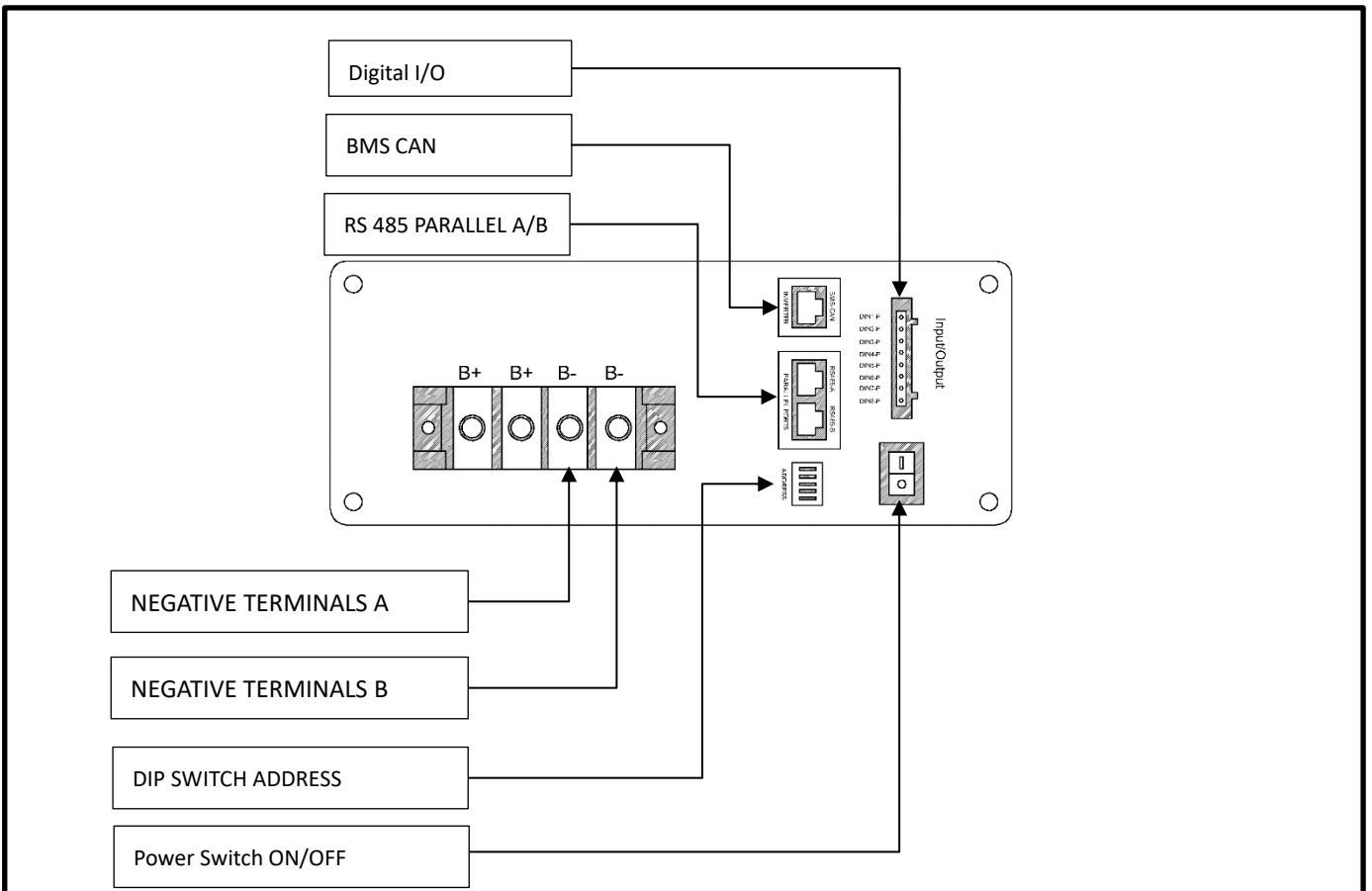
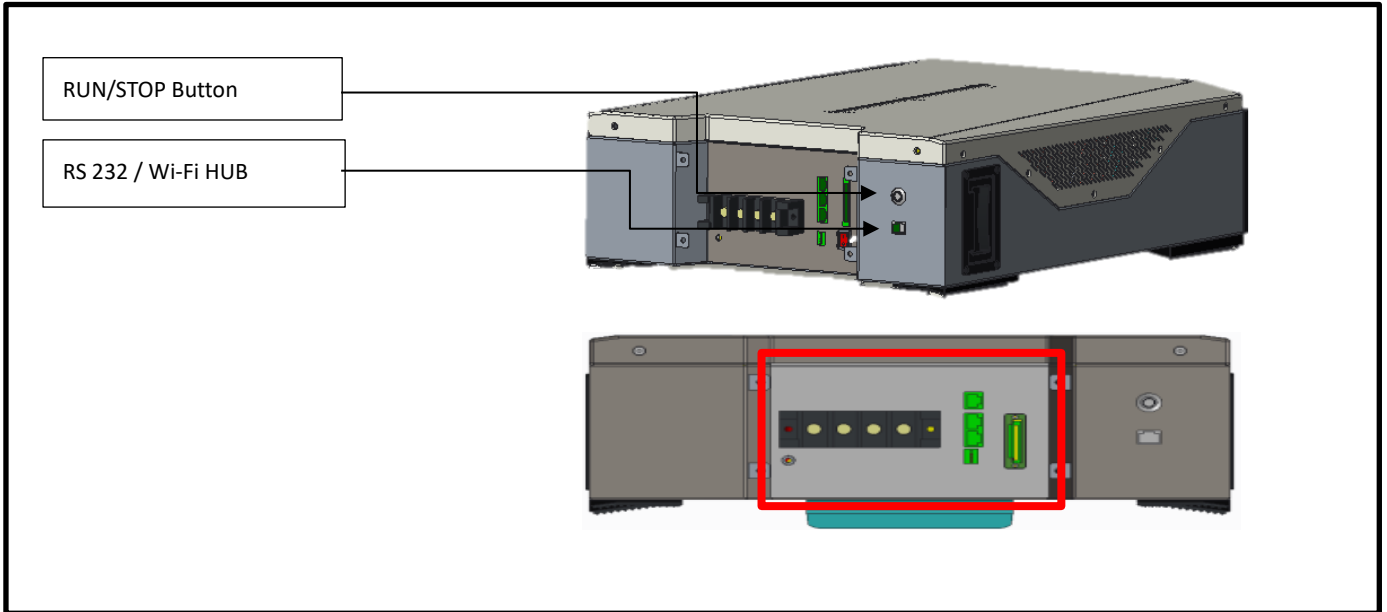




5.3 Installation

5.3.1 Product View

-RACK MOUNTED CONNECTION VIEW





5.3.2 Installation method

5.3.2.1 Installation of accessories and preparatory phases

Phase 1: Choose the support surface, the batteries have a weight of over 52 kg each and can reach 260 kg including the accessories, if stacked in 4 elements.

For vertical ground mounted the support surface of the battery is distributed on 4 feet 10x4 cm, make sure to install a distribution plate or make a proper foundation to support the weight.

In case of horizontal installation, the installer must prepare an adequate distribution plate on the floor in order to make a safe and stable support for the pile of batteries.

Make sure the support and or the floor surface is adequate to support the battery load.



Attention

Check the floor maximum permissible load before install the batteries



↓ 260 Kg

↓ 208 Kg

↓ 156 Kg

↓ 104 Kg

↓ 52 Kg



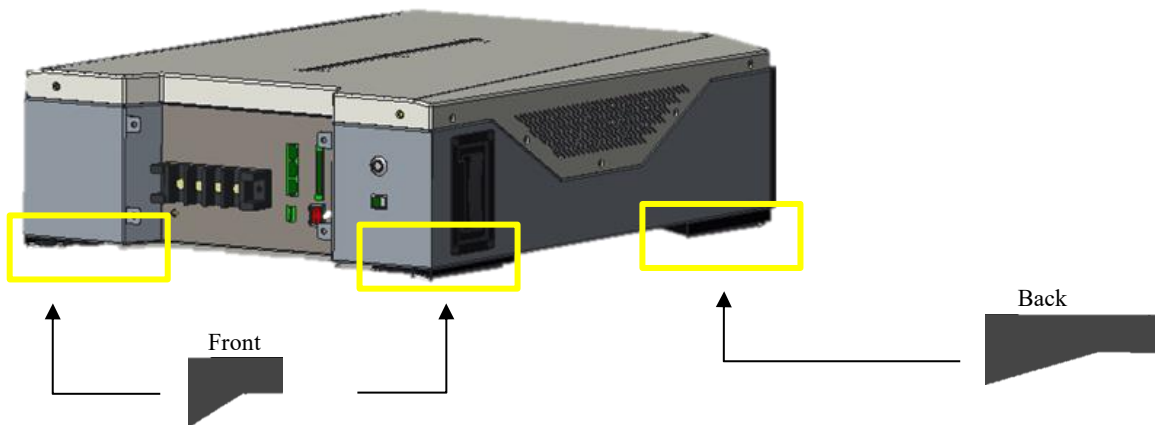


Information :

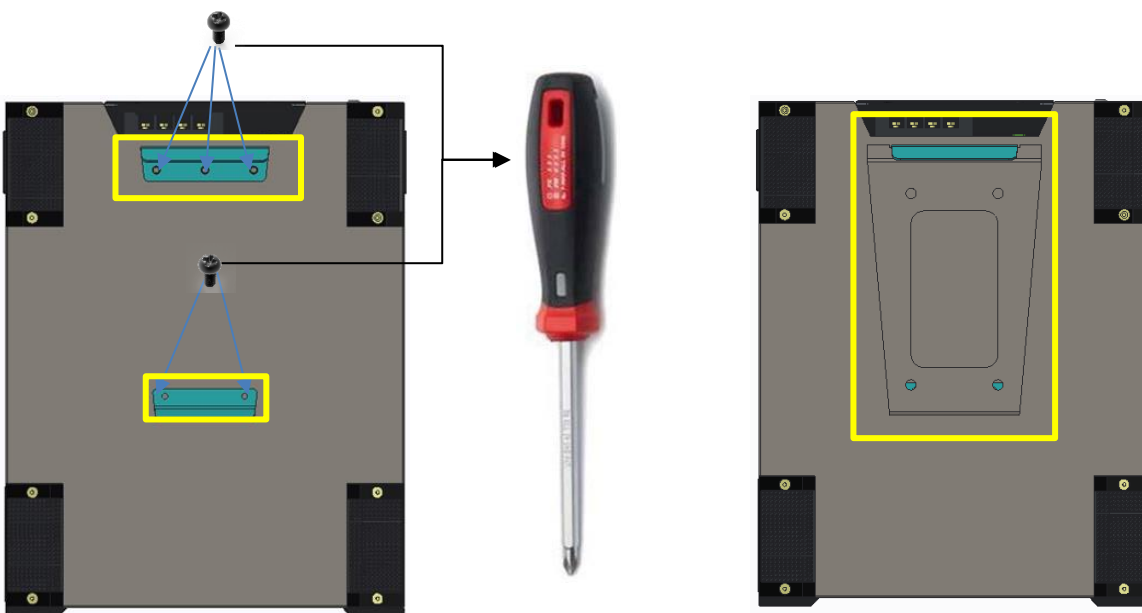
Preparation of the modules

The battery is delivered in WALL mode and it is therefore necessary for the installer to make simple changes to install the STACK kit. Below are the installation phases.

1. Install the feet on the bottom of the battery, each foot has 2 m8 screws and make sure to install each leg in its right position as shown below.

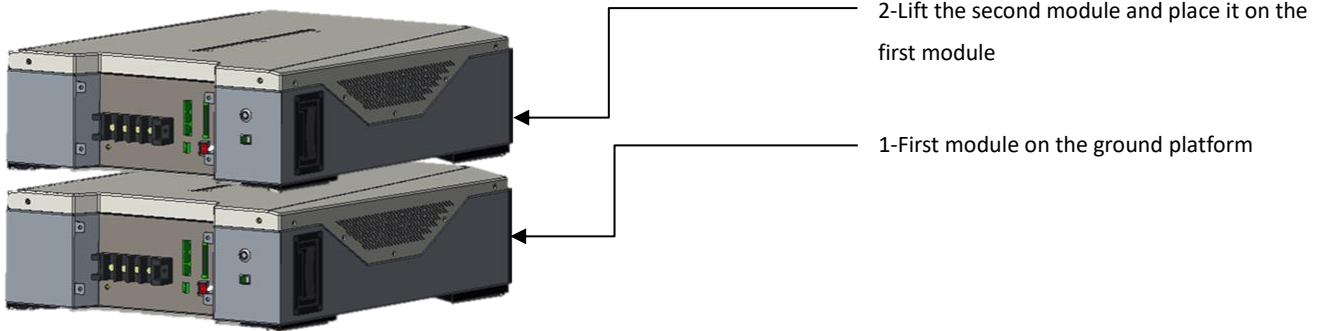


2. Remove the back-side wall support plate using Cross screw driver, plate has 5 screws.



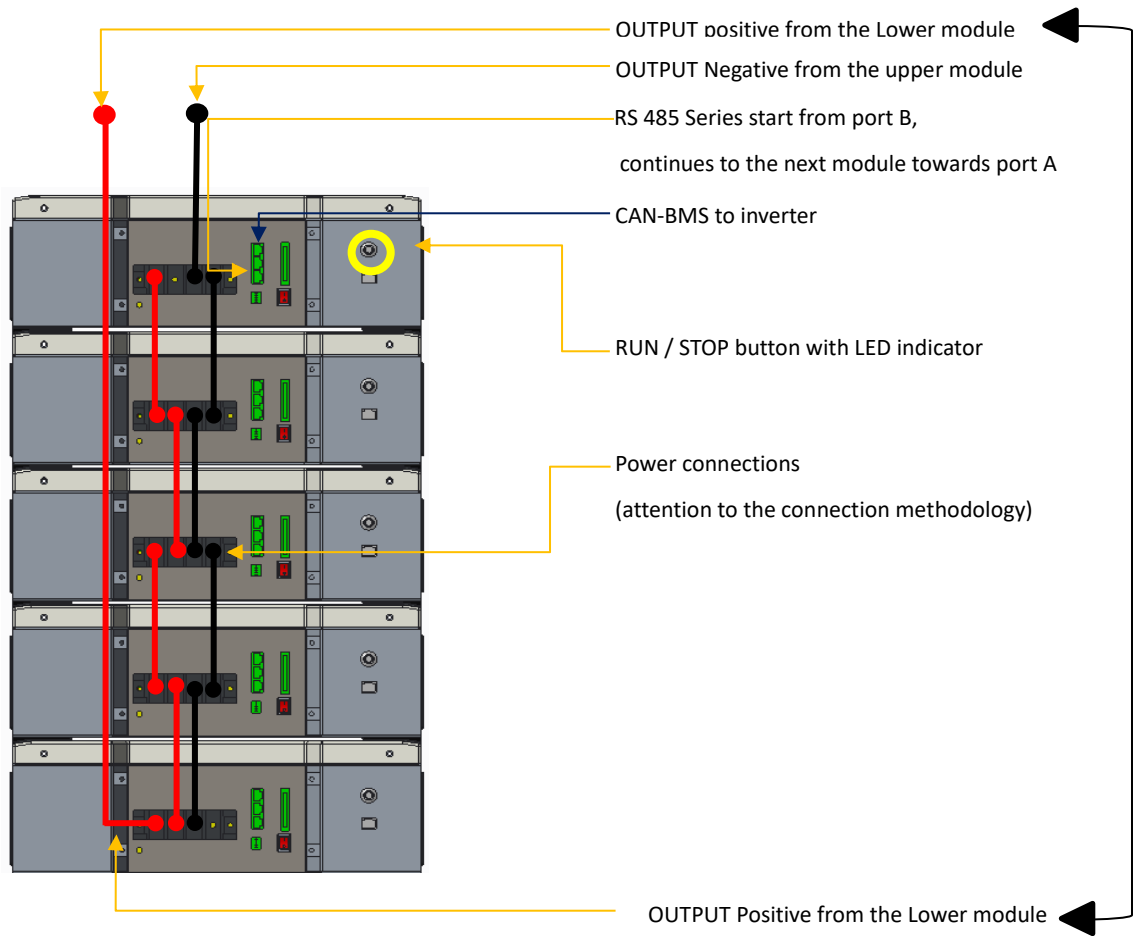


3. Once the wall bracket support has been removed, start stacking the second module in correspondence with the first module laid on the ground.

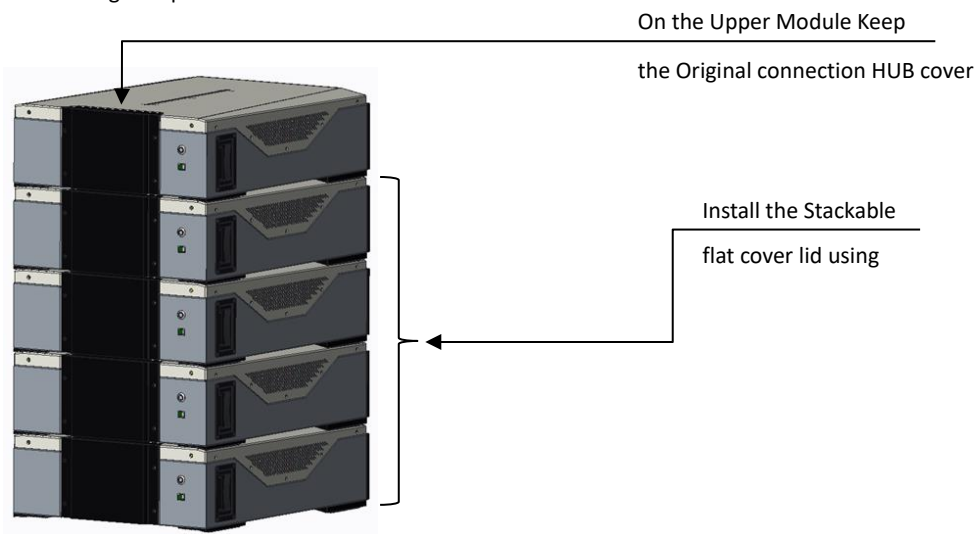


The battery weighs more than 52kg and must be installed with the help of a mechanical lift, and / or with at least two people equipped with suitable suction cups for mechanical lifting or lifting straps

4. Continue the installation with the desired modules following the sequence described in the previous points.
5. Connect the power cables as indicated, making sure that the batteries are **OFF** (check the button LED on the bottom) and always measure the terminals with a multimeter.

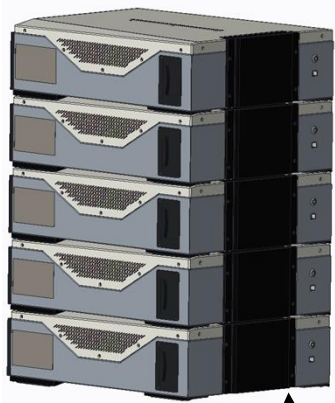


6. Complete the assembly of all the cables and close them with the black flat cover lid. Arrange the cables according to the installation technique, always paying attention to reducing the length of the cables to avoid voltage drops.





7. Battery installed correctly, see image below.

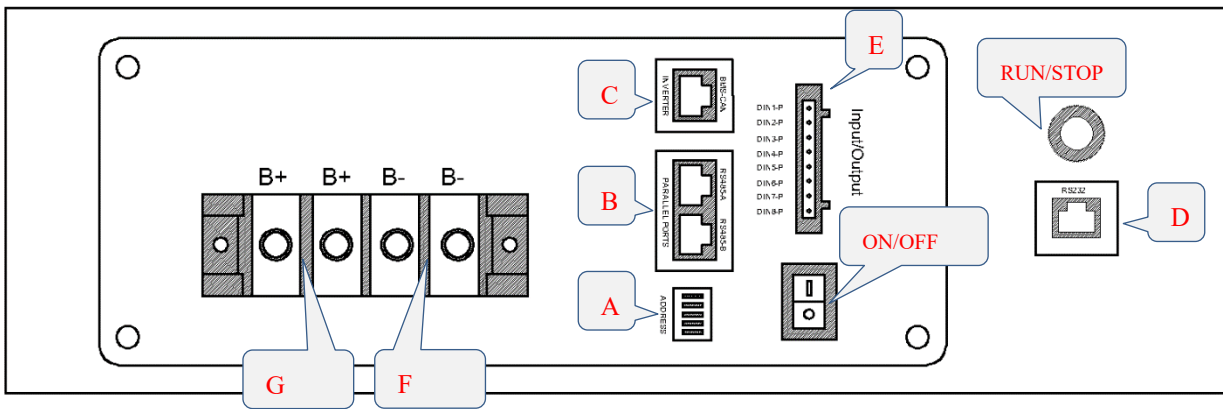


Suggested Cable Output from the Bottom Side.

5.4 Wiring definition

5.4.1 Terminal function and definition

The terminal layout is shown in the following figure:

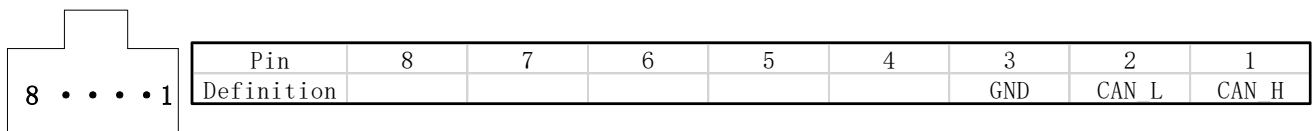


Wiring definition table		
Interface	Name	Function
A	ADD	DIP switch, set the RS485 address and terminal resistance.
B	RS485-A RS485-B	When the battery box is used independently, it can communicate with the inverter via RS485 interface. When the battery box is used in parallel, the RS485 interface is used for synchronous communication between battery packs.
C	CAN	CAN bus interface communicate with the inverter.
D	RS232	RS232 interface for monitoring battery box real-time data and troubleshooting.
E1	DIN1-P	
E2	DIN1-N	



E3	DIN2-P	IO port, interacts with a diesel engine, a photovoltaic device, or other external device.
E4	DIN2-N	
E5	DO1-P	
E6	DO1-N	
E7	SDO1-P	
E8	SDO1-N	
F	B+/B+	Battery positive
G	B-/B-	Battery negative

Attention: C interface RJ45 port corresponding to the CAN bus pin definition



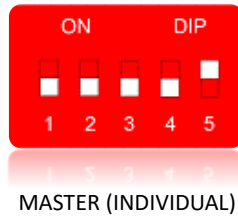
5.5 DIP SWITCH SETTINGS for single battery box is connected to the inverter

Attention: the drawing is for reference only, please take the real product as the standard, if the manual does not match the product please stop any action, remove any connection and store the battery in a safe place, call the product assistance for support.



CAUTION: Set the DIP switch after the need to restart the battery box, restart the settings will take effect.

A single battery box through the CAN communication connection inverter when the DIP switch is defined as follows:



ATTENTION: THE POWER PARALLEL MUST FOLLOW THE WIRING CONNECTION, A WRONG POWER CONNECTION CAN DAMAGE THE BATTERY AND PROVOCATE INJURIES

5.6 A plurality of batteries are connected in parallel with the inverter

When users need to use more than one battery box in parallel, first repeat the installation of a single battery, and then in accordance with the following methods for parallel installation and use.

The maximum current allowance are described in the next paragraphs

5.6.1 Communication line connection



Information: When multiple battery boxes are connected together is possible to choose between "capacity" chain series or parallel to increase capacity and peak (in case of parallel the parallel battery and inverter can only communicate through CAN interface, and the communication between the batteries will be through RS485)



5.6.2 PARALLEL POWER CONNECTION FOR 3 BATTERIES (1 MASTER + SLAVE 1 + SLAVE 2)

Attention: The following figure is only the communication line connection diagram. Specific interfaces must be compared to physical objects. PIN DEFINITION FOR MASTER and 1 SLAVE BATTERY



CAUTION: Set the DIP switch after the need to restart the battery box, restart the settings will take effect.

5.6.3 PARALLEL POWER CONNECTION FOR 3 BATTERIES (1 MASTER + SLAVE 1 + SLAVE 2)



CAUTION: Set the DIP switch after the need to restart the battery box, restart the settings will take effect.

5.6.4 PARALLEL POWER CONNECTION FOR 4 BATTERIES (1 MASTER + SLAVE 1 + SLAVE 2 + SLAVE 3)



CAUTION: Set the DIP switch after the need to restart the battery box, restart the settings will take effect.

5.6.5 PARALLEL POWER CONNECTION FOR 4 BATTERIES (1 MASTER + SLAVE 1 + SLAVE 2 + SLAVE 3 + SLAVE 4)



CAUTION: Set the DIP switch after the need to restart the battery box, restart the settings will take effect



Attention: Power cable connection For High current connection diagram please refer to the specific section, charging current limitation is mandatory as per this manual instruction.

Screws, cables and Bus Bar must be installed with diligence and the tighten of the connection terminal must respect the torque mentioned in the manual which is 40Nm and the inspection must be performed every 3 months



40 Nm Power cable Tighten

DIAMETER 25mm CABLE PARALLEL CONNECTION DIAGRAM OVERVIEW

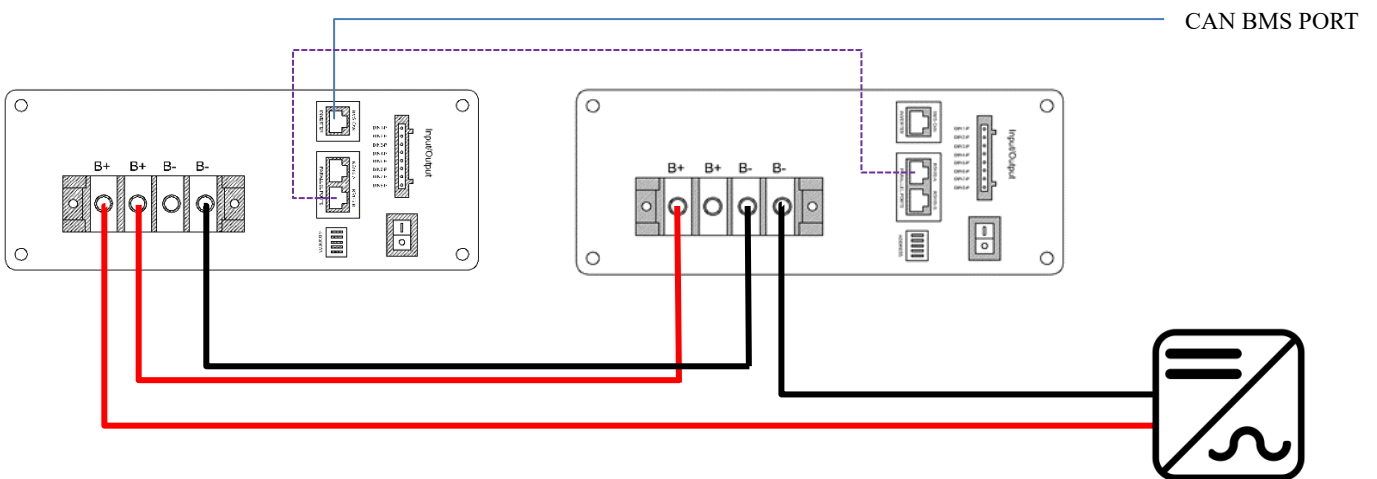
SINGLE CLUSTER -5 UNITS



ATTENTION:

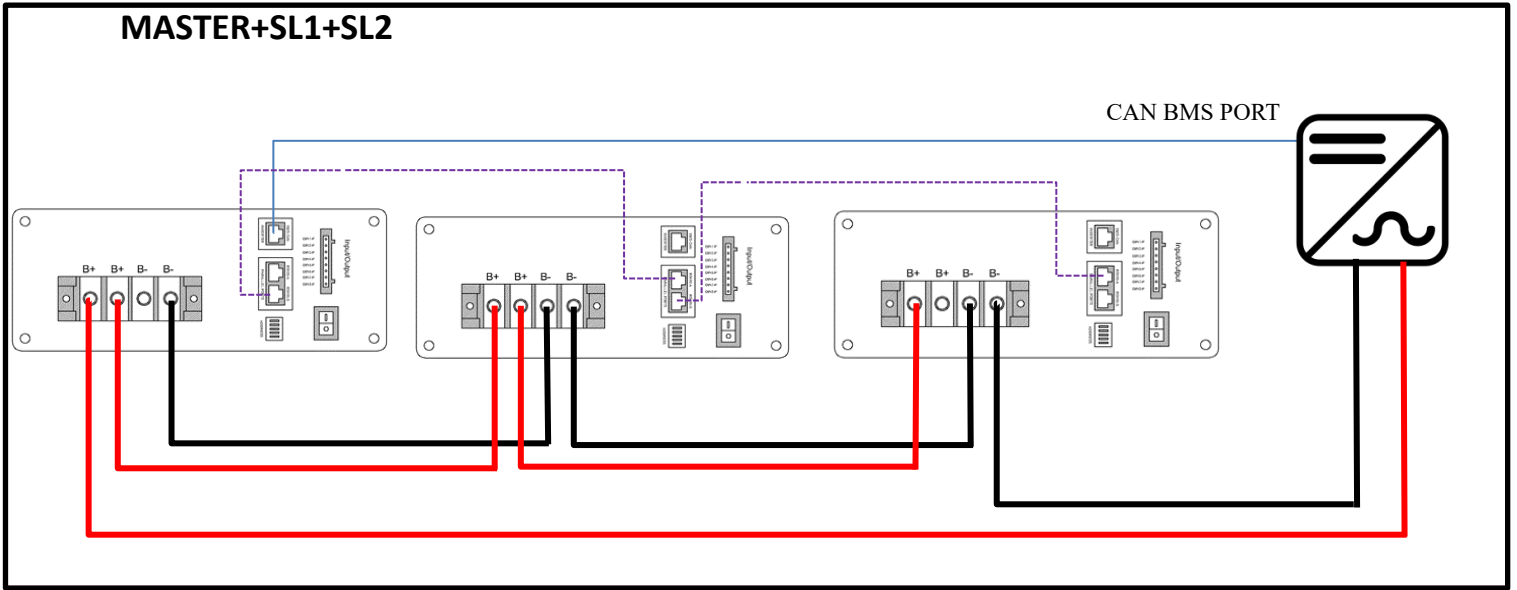
Strictly follow the below scheme to connect the communication ports between unit's master and Slave RS 485 A port and B port Connection

MASTER+SL1

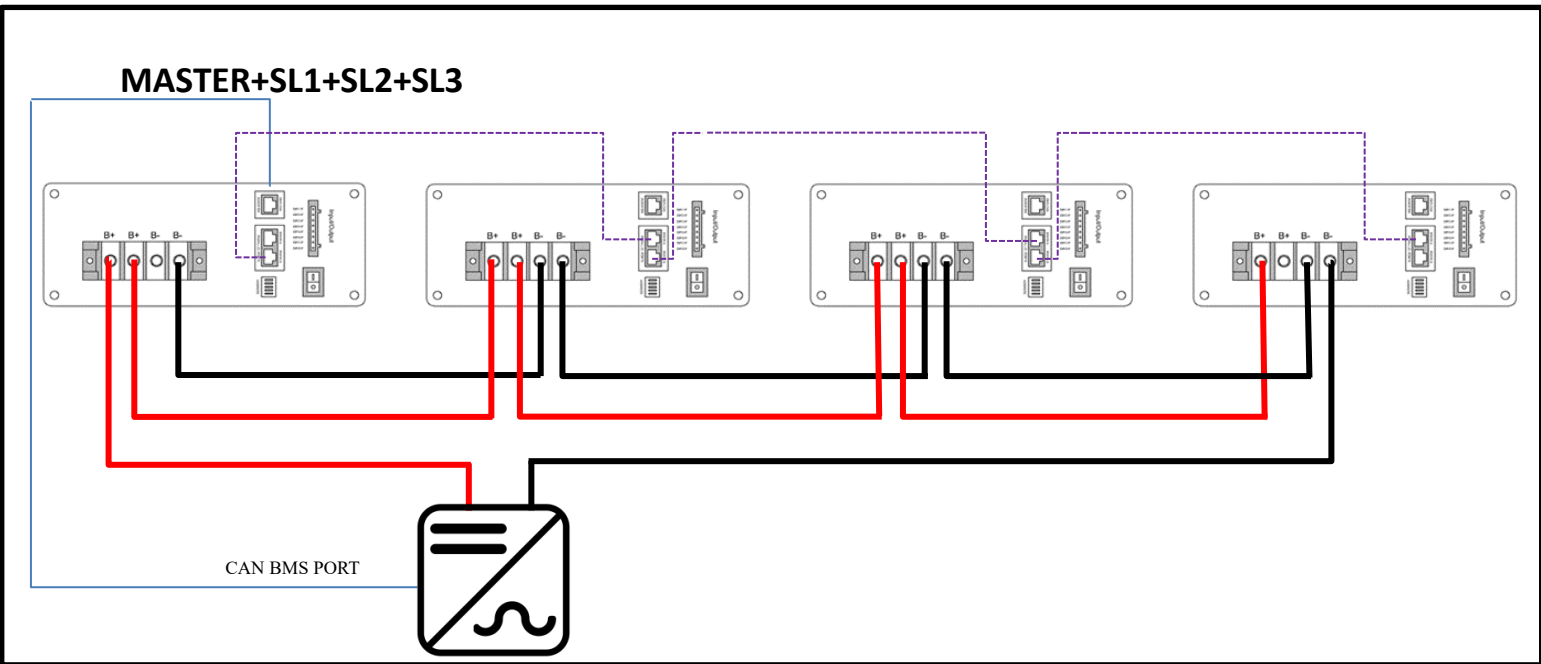


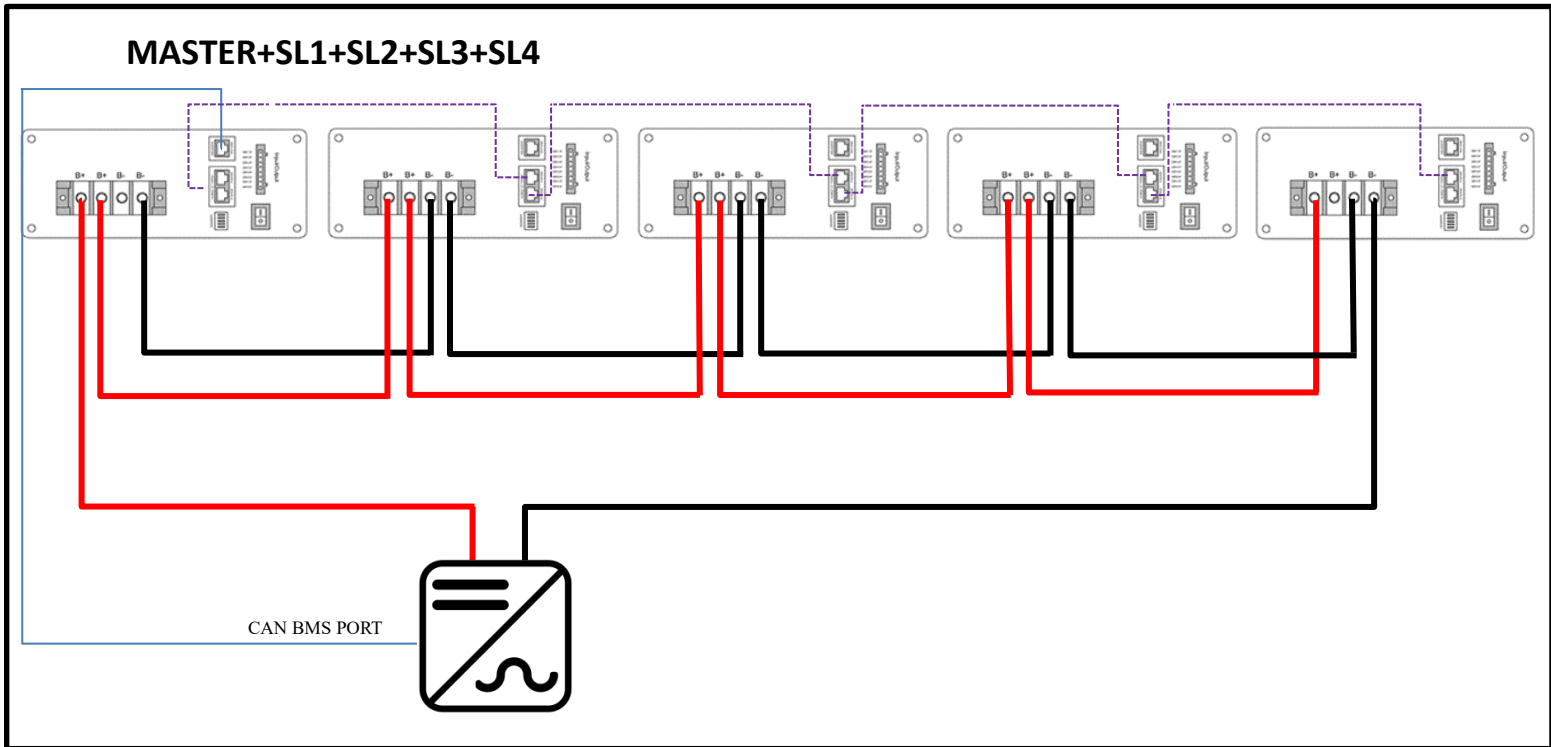


MASTER+SL1+SL2



MASTER+SL1+SL2+SL3





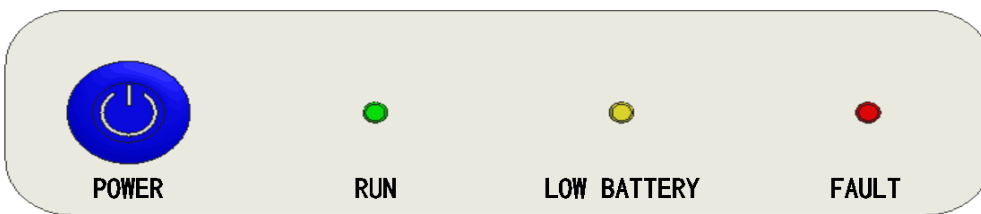
CAUTION:

B + interface is parallel to the battery pack is always positive, B- interface for the parallel battery total negative, GND for the parallel battery grounding port.

6. Battery box activate and shutdown

6.1 Panel buttons and LEDs meaning

Attention: the drawing is for reference only, please take the material as the standard



Name	Meaning	Function or indication status
POWER	Turn on or off button	Control battery box on or off
RUN	Running indicator light (green)	When the battery box is running normally, it always bright
LOW BATTERY	Low battery indicator (yellow)	When the battery is low (SOC<0-10%), it is always bright.
FAULT	Fault indicator light (red)	Flashing alarm when the battery box is faulty



6.2 Stand Alone Battery Front Panel Control

6.2.1 Start Battery

Short press the power button for one second. The GREEN RUN light should come on. The battery has been activated normally.

6.2.2 Shut Down Battery

Long press the power button for five seconds. The GREEN RUN light should go off. The battery has been shut down normally.

6.2.3 Low Battery – Force Charge

Prerequisite: The **VOLTAGE** between the battery B + and B- terminals is **ZERO** and the **PANEL LIGHTS ARE OFF**. Battery is in “Shutdown State”.

Preparation condition before forced charging: Connect the charger or the inverter with charging capability to the B+ and B- of the battery box to ensure charging capacity.

Forced charging approach: Short press the battery power button, the battery RUN light will flash green, which means that the battery is entering the compulsory charging mode. If the battery receives an adequate charging power (above 10 Amps/58V) within 90 seconds from pressing the button, the battery will continue to charge normally until a stable state is reached.

If the battery does not receive adequate charging power within 90 seconds after pressing the button, the battery will enter the shutdown mode once again.

During the forced charging period the low battery LED will be steady orange up to an SOC of 10% at which point the low battery LED will go out.

6.3 Parallel Battery Configuration

1. The voltage difference between any of the batteries in the stack must not be greater than 2V. Otherwise, the BMS will not allow the batteries to be activated in a parallel connection.
2. SOC of each battery in the stack must be the same (check SOC as individual battery before parallel connection)
3. The power cabling between the batteries is in accordance with section 5.6 of this manual.
4. All DIP switches are configured in accordance with section 5.5 of this manual.
5. The RS 485 inter battery data connections are properly connected as per section 5.6 of this manual. The data connection “daisy chain” must start from port-B of the master battery (do not install the RS485 on the port-A of the master battery, it will occur in a fault)
6. Connect the CAN port of the master battery with the CAN port of the inverter and make sure that the communication is working properly by checking the inverter display
7. Before activating the system, the operator should check the cable connection carefully and make sure that all safety procedures are respected. Check the inverter settings and connection before turning on. In case of an inverter without communication make sure to set the voltage and current value as per the charge/discharge parameters provided in this manual.

6.3.1 Activation of Parallel Batteries (From Master to Slave#4)

Short press the Master power button for one second. The GREEN RUN light should come on. The battery has been activated normally.

Short press the Slave#1 power button for one second. The GREEN RUN light should come on. The battery has been activated normally.

Short press the Slave#2 power button for one second. The GREEN RUN light should come on. The battery has been activated normally.

Short press the Slave#3 power button for one second. The GREEN RUN light should come on. The battery has been activated normally.



Short press the Slave#4 power button for one second. The GREEN RUN light should come on. The battery has been activated normally. Now all parallel batteries are activated normally and the parallel system is properly powered on.

6.3.2 Shutdown of Parallel Batteries

Long press the Master Power button for five seconds. The GREEN RUN light should go off immediately.

The GREEN RUN lights on the slave batteries will not be extinguished immediately.

The RED FAULT lights on the slave batteries will start flashing after ten seconds and the GREEN RUN lights will remain on.

After one minute the RED Fault lights and the GREEN RUN lights on all slave batteries will go off.

The parallel battery system has shutdown properly.



NOTICE:



In a parallel battery system, we strongly advise not to switch off individual slave batteries. If there is a reason to switch off a slave battery, we recommend that the procedure described in 6.3.2 of this manual is followed.

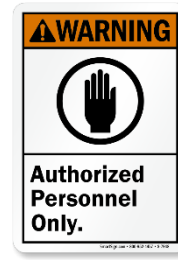
Switching off an individual slave battery in a parallel system is possible in an adverse situation, but only as a last resort.

7.Troubleshooting via WeCo monitor PC software

No.	Abnormal description	Phenomenon	Solution	The alarm status of the monitor software (When there is an alarm, the status of the green becomes red.)
1	Over current alarm	The battery box relay is disconnected during charging or discharging, and the battery box fault light flashing.	Reduce charge or discharge current	Disch_Ov_Cur warn: Ch_Ov_Cur warn:
2	Over temperature alarm	The battery box relay is disconnected during charging or discharging, and the battery box fault light flashing.	Stop charging or discharging, wait until the battery temperature drops and then reuse	Ch_Ov_Temp alarm: Disch_Ov_Temp alarm:
3	low temperature alarm	The battery box is unable to charge or discharge normally	Waiting for the temperature of the battery box to rise to a suitable temperature before charging or discharging	Ch_Low_Temp alarm: Disch_Low_Temp alarm:
4	Over voltage alarm	The battery box relay is disconnected when charging, and the battery box fault light flashing.	Stop charging	Over Vol alarm:
5	Low voltage alarm	The battery box relay is disconnected when discharging, and the battery box fault light flashing.	Stop discharging from battery box, and charge the battery box in time	Low Vol alarm:



6	Relay damage	No alarm when power-on, no voltage output in the battery box. Monitoring software without any alarm and display relay in "on" state.	Please contact the after-sales service, replace relay	When this sign is disconnected and green, the relay is disconnected; When this sign is connected and red, the relay is connected; Main Relay(Magnetic retention): 																																				
7	Protection board damage	The PC and the battery box's RS232 connection is reliable, but the monitoring software cannot read the battery information and status.	Please contact the after-sales service, replace protection board.																																					
8	Cell damage	Battery box in the state of no charge and no discharge, a cell voltage and most of the other cells voltage difference greater than 200mV.	Please contact the after-sales service.	The real-time display of the cell voltage on the monitoring software is as follows: <table border="1" data-bbox="1149 840 1436 974"> <thead> <tr> <th colspan="6">Voltage</th> </tr> <tr> <th>Cell Vol(V)</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> <th>5</th> </tr> </thead> <tbody> <tr> <td>1-5</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>6-10</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>11-15</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>16-20</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Voltage						Cell Vol(V)	1	2	3	4	5	1-5						6-10						11-15						16-20					
Voltage																																								
Cell Vol(V)	1	2	3	4	5																																			
1-5																																								
6-10																																								
11-15																																								
16-20																																								
9	First parallel connection failure of battery boxes	When the battery boxes are first paralleled, start the system, slave battery box fault light flashing. No sound from the slave battery box relay action, no voltage output.	Measure the positive and negative voltage of each battery box, if the voltage difference between the battery boxes is greater than 2V, please reduce the voltage difference to less than 2V to try parallel connection	Pack Vol Imbalance: 																																				
10	Master-slave machine communication exceptions	Slave battery box's fault light flashes, the master machine cannot control slave machine	Check that the communication cable between the master machine and the slave machine is securely connected	slave1 online 																																				
11	Battery box or parallel battery box system shutdown cannot start	There is no alarm information in the battery box, but the batteries are not working properly	Please contact the after-sales service																																					
12	Other exceptions	Humidity, cell expansion, frost-Defrost, unbalances etc..	Please contact the after-sales service	FAULT RED																																				



FOR AUTHORIZED TECHNICIANS ONLY

7.1 SOFTWARE WECO OLP RS232

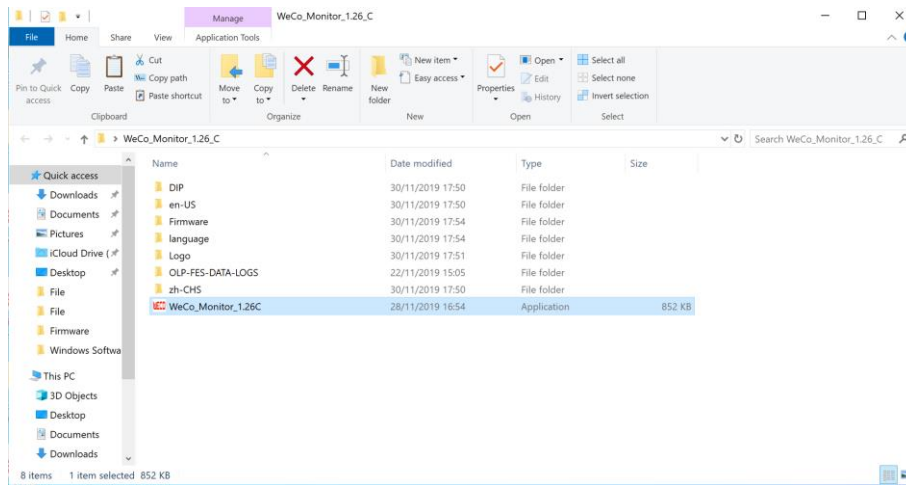
- (USB / RS232 converter is necessary to communicate with the battery).

8 SOFTWARE GUIDE

WECO OLP RS232 (USB / RS232 converter is necessary to communicate with the battery)

**_PC -Battery communication and set up for 232-USB device is available for auth. Installers.*

1. Launch the exe file WeCo_Monitor and wait for self installation



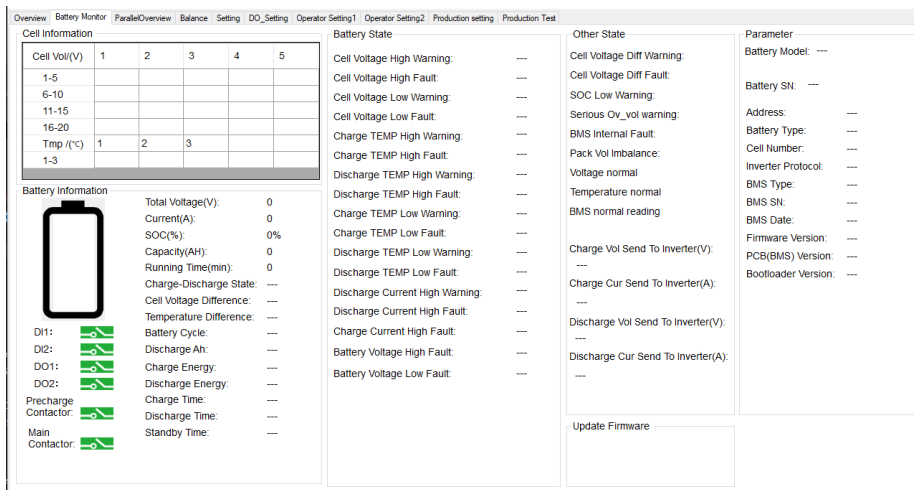
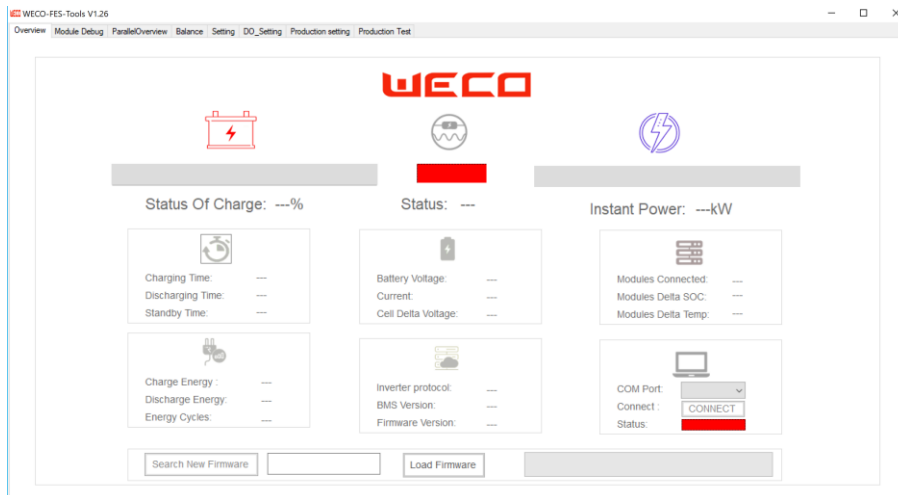
2. From the main page select USER FREE if you are not an authorized installer, if you have a 1st level password click on the RESTRICTED ACCESS windows and follow the 'Authorized Installer Guide'
If in possession of a valid password the authorised installer will be able to access more detailed windows within the software.



WeCo - HeSU UNIVERSAL MODEL 5K3 UNIVERSAL STACKABLE



3. Connect the RS232 converter and search the relative com on the PC settings (device manager of Windows_)
Select the COM port from the Main page of the WeCo Monitor, then pres CONNECT
Follow the instruction and wait for the data on the screen.

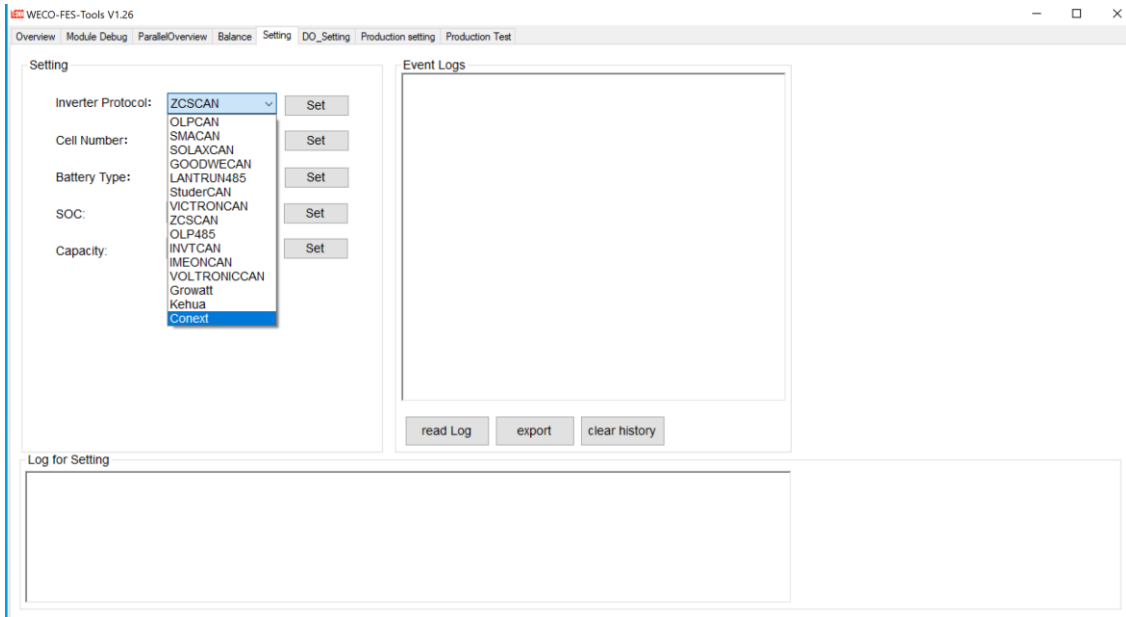




- 4. If more than one module is connected, select Parallel Overview and check the single unit data.



- 5. CAN protocol Setting, to match the inverter communication, select and press SET, wait for the positive feedback after the first communication with the inverter





- 6. For manual adjustment to change the batteries set limits select the Operator Setting 1 TAB and change the setting in the permitted values (This operation is possible only with batteries connected to the WeCo Server (Wifi or LAN))

Setting	Setting Value	Current Value	Setting Value	Current Value
Battery Voltage High Cutoff:	52.8-60.8V	---	---	V
Battery Voltage High Cutoff Time:	---	---	---	S
Battery Voltage High Recovery:	---	---	---	V
Battery Voltage High Recovery Time:	---	---	---	S
Battery Voltage Low Cutoff:	---	---	---	V
Battery Voltage Low Cutoff Time:	---	---	---	S
Cell Voltage High Cutoff:	---	---	---	V
Cell Voltage High Cutoff Time:	---	---	---	S
Cell Voltage High Recovery:	---	---	---	V
Cell Voltage High Recovery Time:	---	---	---	S
Cell Voltage Low Cutoff:	---	---	---	V
Cell Voltage Low Cutoff Time:	---	---	---	S
Discharge TEMP High Cutoff:	---	---	---	°C
Discharge TEMP High Recovery:	---	---	---	°C
Discharge TEMP High Cutoff Time:	---	---	---	S
Discharge TEMP Low Cutoff:	---	---	---	°C
Discharge TEMP Low Recovery:	---	---	---	°C
Discharge TEMP Low Cutoff Time:	---	---	---	S
Charge TEMP High Cutoff:	---	---	---	°C
Charge TEMP High Recovery:	---	---	---	°C
Charge TEMP High Cutoff Time:	---	---	---	S
Charge TEMP Low Cutoff:	---	---	---	°C
Charge TEMP Low Recovery:	---	---	---	°C
Charge TEMP Low Cutoff Time:	---	---	---	S
Discharge Current High Limit Level1:	---	---	---	A
Discharge Current High Time Level1:	---	---	---	S
Discharge Current High Recovery Time Level1:	---	---	---	S
Discharge Current High Limit Level2:	---	---	---	A
Discharge Current High Time Level2:	---	---	---	S
Discharge Current High Recovery Time Level2:	---	---	---	S
Charge Current High Limit:	---	---	---	A
Charge Current High Time:	---	---	---	S
Charge Current High Recovery Time:	---	---	---	S

- 7. Equalization ACTIVE PASSIVE and MANUAL, if a manual equalization is necessary after a failure, please refer to the CELL EQUALIZATION MANUAL (not public) and activate the manual procedure. IMPORTANT> After the first Manual/Forced Equalization the single cell equalizer will return in Auto mode within 24h

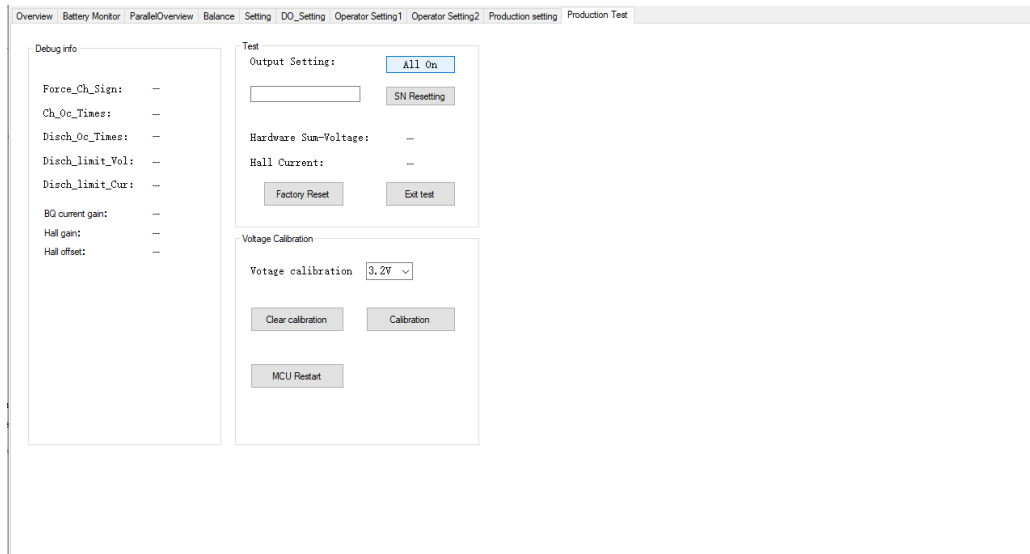
Balance Model

Cell_1	open	---	Balanced Opening	
Cell_2	open	---	Balanced Closing	
Cell_3	open	---		
Cell_4	open	---		
Cell_5	open	---		
Cell_6	open	---		
Cell_7	open	---		
Cell_8	open	---		
Cell_9	open	---		
Cell_10	open	---		
Cell_11	open	---		
Cell_12	open	---		
Cell_13	open	---		
Cell_14	open	---		
Cell_15	open	---		
Cell_16	open	---		

Cell voltage difference: ---



8. Factory reset. (this must be authorized from the WECO Tech Department) follow the instruction of the FACTORY RESET PROCEDURE





8.0 Product compatibility list + Maximum Parallel modules Admitted per cluster

DIRECT PARALLEL WITH CAN COMMUNICATION

Number	Inverter brand	Inverter model	Parallel Units	HeSU 5.3 LFP
01	SoFar / ZCS Azzurro**	SP3000/HYD	5	5x5.3=26.5kWh x5 -- 132.5kWh
02	SMA **	Sunny Island	5	5x5.3=26.5kWh x5 -- 132.5kWh
03	Must Solar**	PH PV	5	5x5.3=26.5kWh x5 -- 132.5kWh
04	GOODWE**	S-ALL LV Hybrid	5	5x5.3=26.5kWh x5 -- 132.5kWh
05	STUDER INNOTECH**	Extender	5	5x5.3=26.5kWh x5 -- 132.5kWh
06	OUTBACK no BMS / Alpha CAN	ALL	5	5x5.3=26.5kWh x5 -- 132.5kWh
07	VOLTRONIC**	LV ALL	5	5x5.3=26.5kWh x5 -- 132.5kWh
08	IMEON**	ALL	5	5x5.3=26.5kWh x5 -- 132.5kWh
09	VICTRON*	Via Color Control	5	5x5.3=26.5kWh x5 -- 132.5kWh
10	INVT-MEGA**	LV ALL	5	5x5.3=26.5kWh x5 -- 132.5kWh
11	Schneider ConExt**	XW	5	5x5.3=26.5kWh x5 -- 132.5kWh
12	Kehua tech**	Hibrid LV	5	5x5.3=26.5kWh x5 -- 132.5kWh
13	Growatt**	SPH LV	5	5x5.3=26.5kWh x5 -- 132.5kWh

-*Protocols developed by WeCo

-**Protocols provided by the Inverter Manufacturer



DIRECT PARALLEL WITHOUT COMMUNICATION BMS INVERTER

Any inverter can be used with WeCo Batteries by setting the voltage and Current Value as per Battery datasheet.

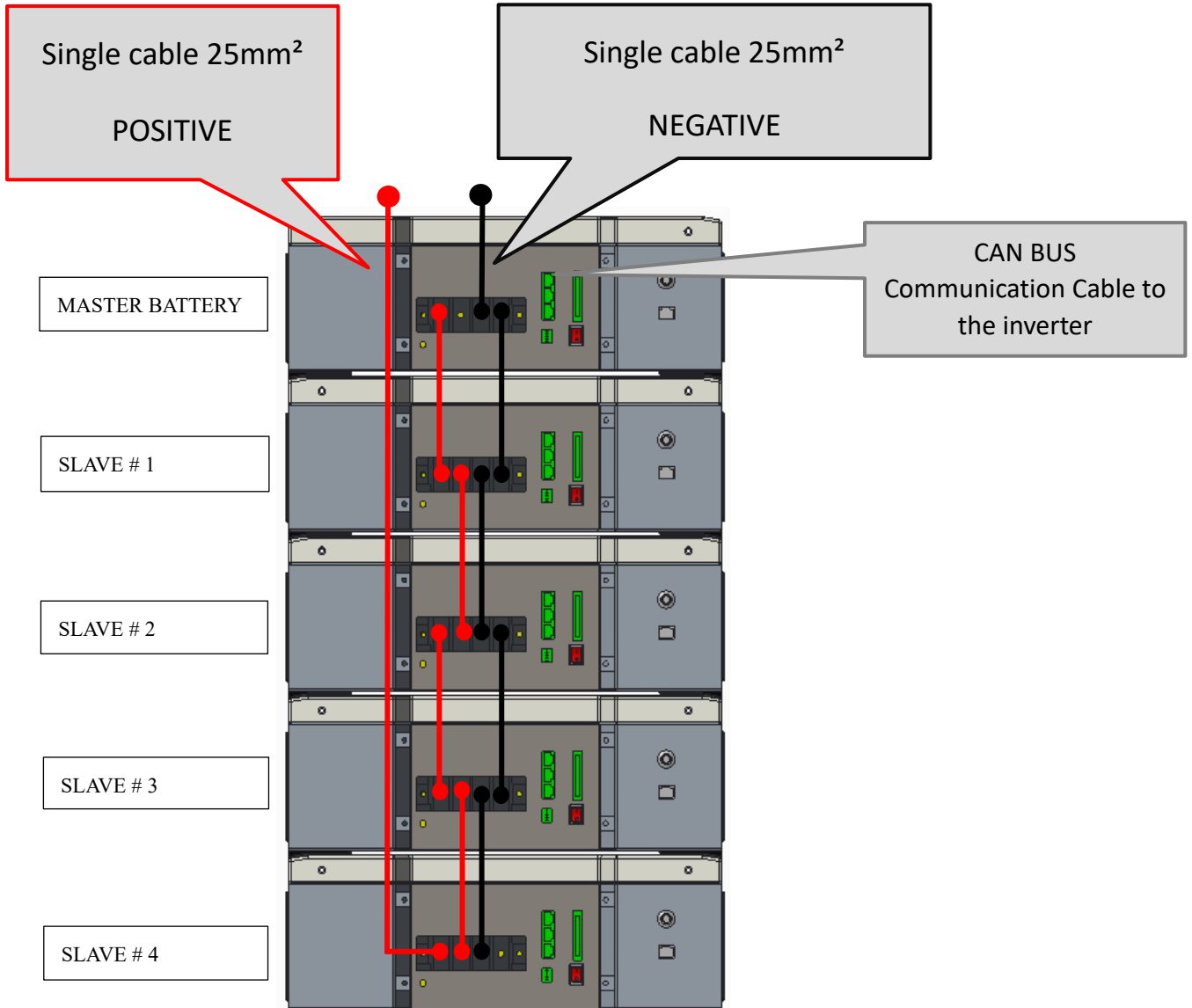
Description	Inverter Low Voltage CUT OFF	Inverter High Voltage CUT OFF	STD Charging Current (max 130A)	STD Discharging current (Max 200A)
Single Battery	47.5 =SOC 0% Suggested 50,3 =SOC 10% if OFF GRID	58,4 Suggested 54,0 =Absortion 10A	90A	90A
Master + Slave1				
Master+SL1+SL2				
Master+SL1+SL2+SL3				
Master+SL1+SL2+SL3+SL4				

TEMPERATURE/ C-RATE	1C + Overload	0.5C
CHARGE	-8°C +55°C	-9°C - 15°C
DISCHARGE	-20°C +55°C	+56°C +65°C



SINGLE CLUSTER CONFIGURATION 120A -CABLES

NO HUB IS REQUIRED FOR SINGLE CLUSTER



ATTENTION

Connect two 25 mm² AWG Wire of the same length on each terminal as shown above

Strictly respect the below chart for the cluster configuration with standard kit 25 mm cables

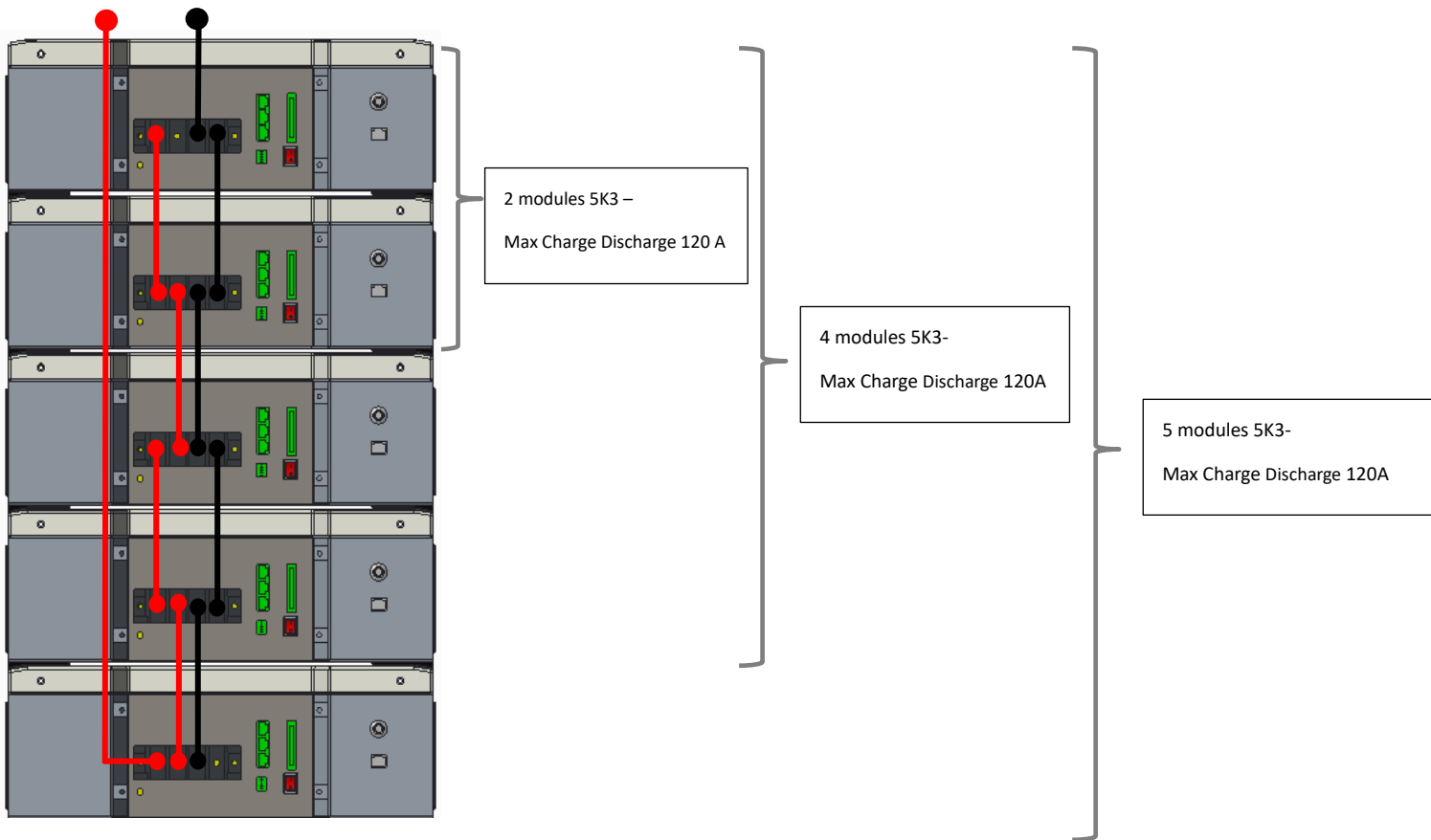
If more power/current is required must refer to the next paragraph



SINGLE CLUSTER CURRENT ALLOWANCE

(Standard CABLES kit connection 120A).

SINGLE CLUSTER Batteries in parallel with 25mm2 parallel connection cable	Charge/ Discharge Amp
2	120
3	
4	
5	

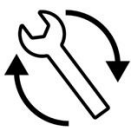
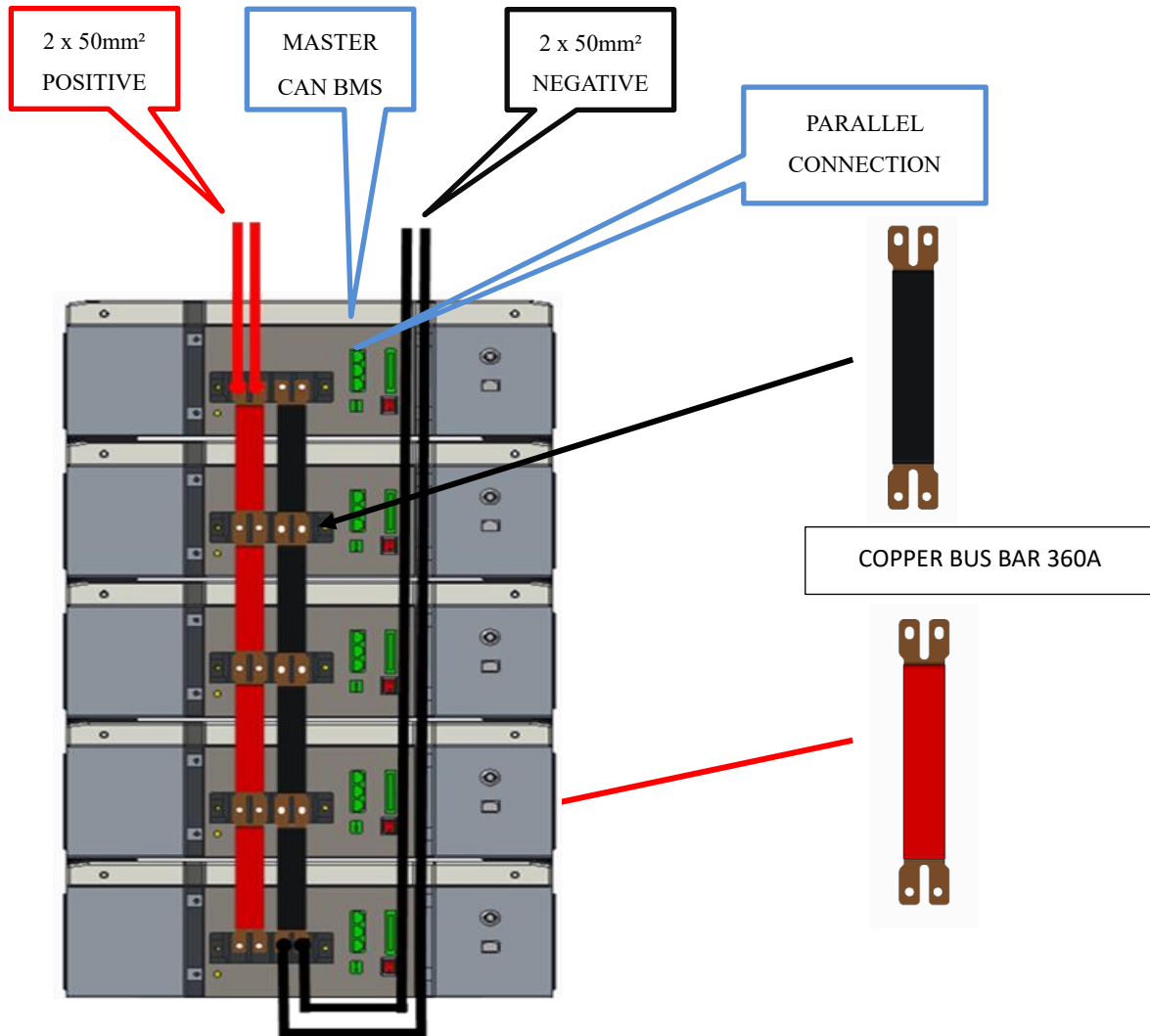


40 Nm Parallel Screw Terminal must be checked every 3 months



OVERVIEW MULTI CLUSTER SYSTEM

-Double BUS BAR-



40 Nm Parallel Screw Terminal must be checked every 3 months



MULTI CLUSTER CAN HUB FOR HIGH CAPACITY AND HIGH CURRENT CONFIGURATION

REQUIRED IF MORE THAN 1 CLUSTER



BMU BMS COMBINER

We-HUB



SEE THE POWER/CURRENT CONFIGURATION BELOW

EACH BATTERY PACK AND EACH CLUSTER MUST HAVE THE SAME SOC %

ABOVE 120A MUST USE THE BUS BAR PROVIDED BY WECO (**Order Ref. -STK 5K3-300**)

EACH CLUSTER MUST HAVE THE SAME NUMBER OF BATTERY PACKS



This BMS BMU Master Hub is mandatory when more than one cluster is connected on a common bus bar.



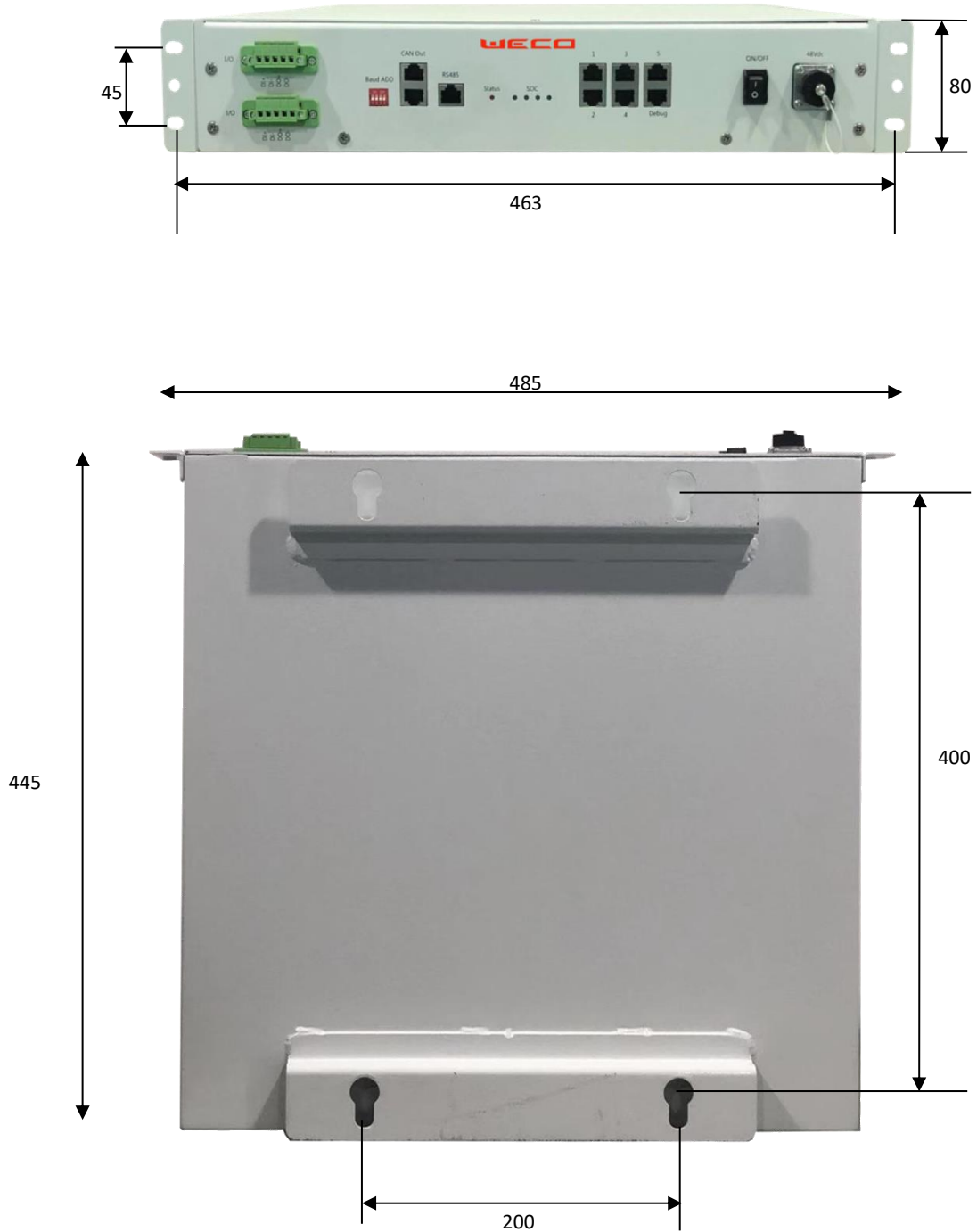
WeHUB can manage a maximum of 5 clusters composed by a maximum of 5 modules each
TO BE USED WITH BUS BAR CONNECTION ONLY



Interface description and connector		
A	I/O CONTACT 2X	Programmable closure/ contact
B	DIP SWITCH	Baud Rate Selection
C	CAN BUS PORTS 2X	CAN Bus port for external solar – grid charger
D	RS 485 port	RS 485 communication port (MODBUS)
E	CLUSTER CAN PORTS 5X	Master Cluster CAN port
F	ON OFF SWITCH	Internal Power supply switch
G	INLET 48Vdc	Connector for power input to connect to the bus bar (1A fuse protected)
H	RS232 PORT	External Port for programming and Debug
I	LED LIGHTS 4X	25% SOC status each LED
L	POWER INDICATOR	Power Supply LED Status



HUB CAN Dimensions



Fix on the wall with 4 x 6mm screw + washer

Weight: 8kg



CONTROL LOGIC AND PROTECTION LIMIT

The inverter, if has the functions must be set with the below restrictions in addition to the BMS control logic

MAX CURRENT WITH BUS BAR

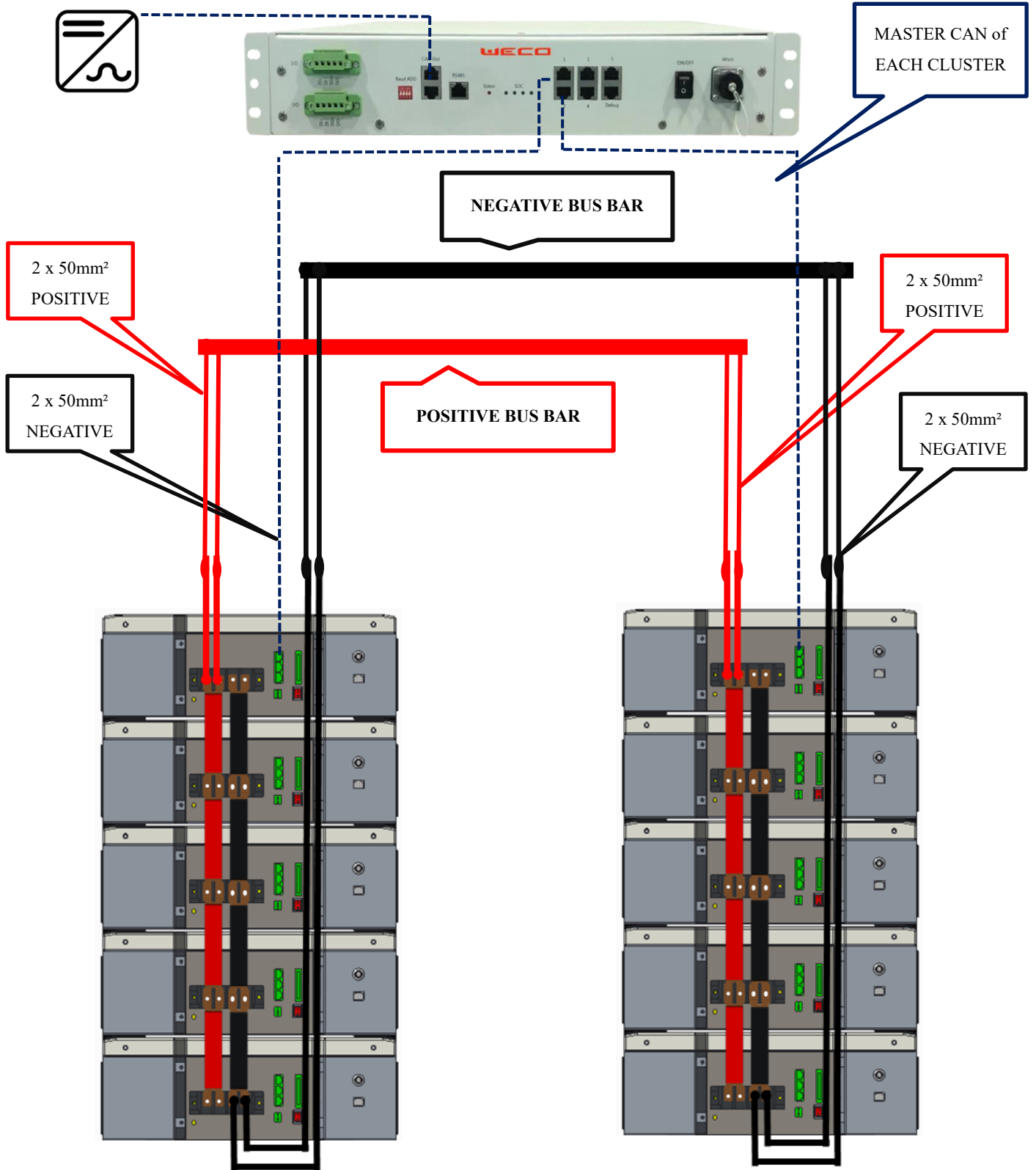
CURRENT SETTING / BMS CURRENT LIMIT					
Batteries \ Clusters	1	2	3	4	5
1	---	189	252	336	420
2	189	340	454	605	680
3	252	454	544	645	800
4	294	529	564	753	800
5	367.5	595	800	800	800
INVERTER LIMITS CURRENT: as per this chart	HIGH VOLTAGE 57,7 Vdc LOW VOLTAGE 50,5 Vdc				

- The charge current will be limited to 0A when the single module voltage has been reached 57.8V.
- The discharge current will be limited to 0A when the single module voltage has been discharged to 50.4V.
- The battery system will communicate with the inverter to limit the current.
- Each battery will be protected by the same logic separately as per single module protection concept.
- If some modules, individually will reach any fault status the single module will protect and disconnect from the system in less than 3 seconds.
- The current limit must be adjusted according to the real active batteries in system in order to restore the normal function.
- If the cluster is not balanced, the current limitation set from the HUB to the inverter will be sent in order to manage the rest of active modules and clusters, in the same time the imbalanced modules or cluster will equalize in standby mode and will reconnect once in the normal range.
- If there is more than 2 batteries in one cluster are in protection mode, the entire cluster will protect by shutting down.
- If there is more than 2 cluster in protection mode, the full system will protect.
- The battery sends information to the inverter to limit the charge/discharge current to zero Amps if the battery is detecting an over current.
- Current limit protection cycle allows an automatic reconnection for three times, above that is necessary a manual restart check, a prior a full system control is mandatory.
- If the current of one cluster is larger than the current limit, the battery system send a warning according with the single module BMS logic
- If the warning does not recover in 5 minutes, the cluster will shut down and a manual reconnection is required prior a full system control.



GENERAL SYSTEM DESCRIPTION

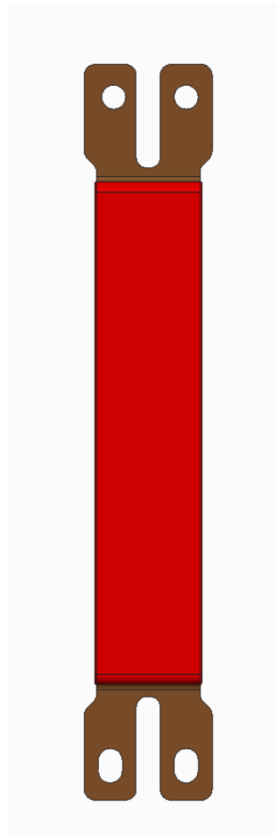
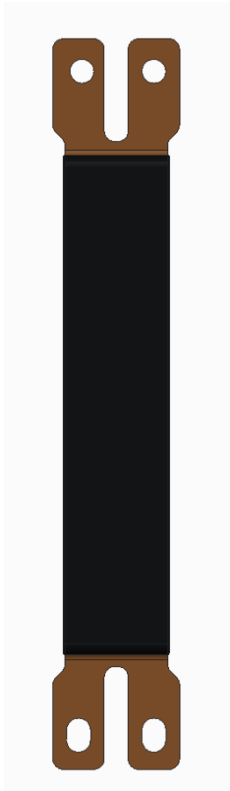
WE-HUB IS MANDATORY WHEN MORE CLUSTER ARE CONNECTED IN PARALLE





SPECIAL BUS BAR FOR PARALLEL CONNECTION ABOVE 120A UP TO MAX 360A

(BUS BAR MODEL -STK 5K3-360)



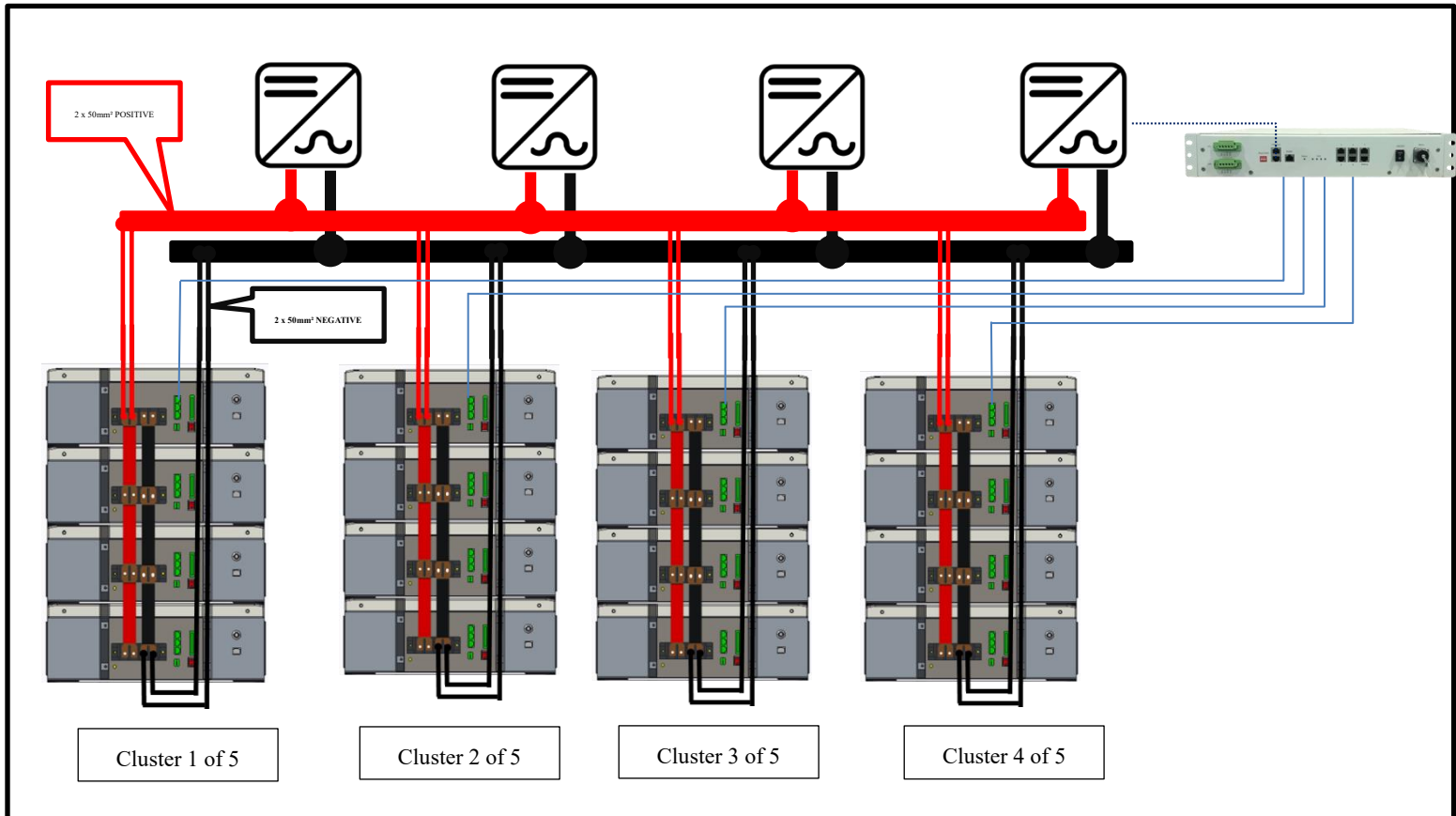
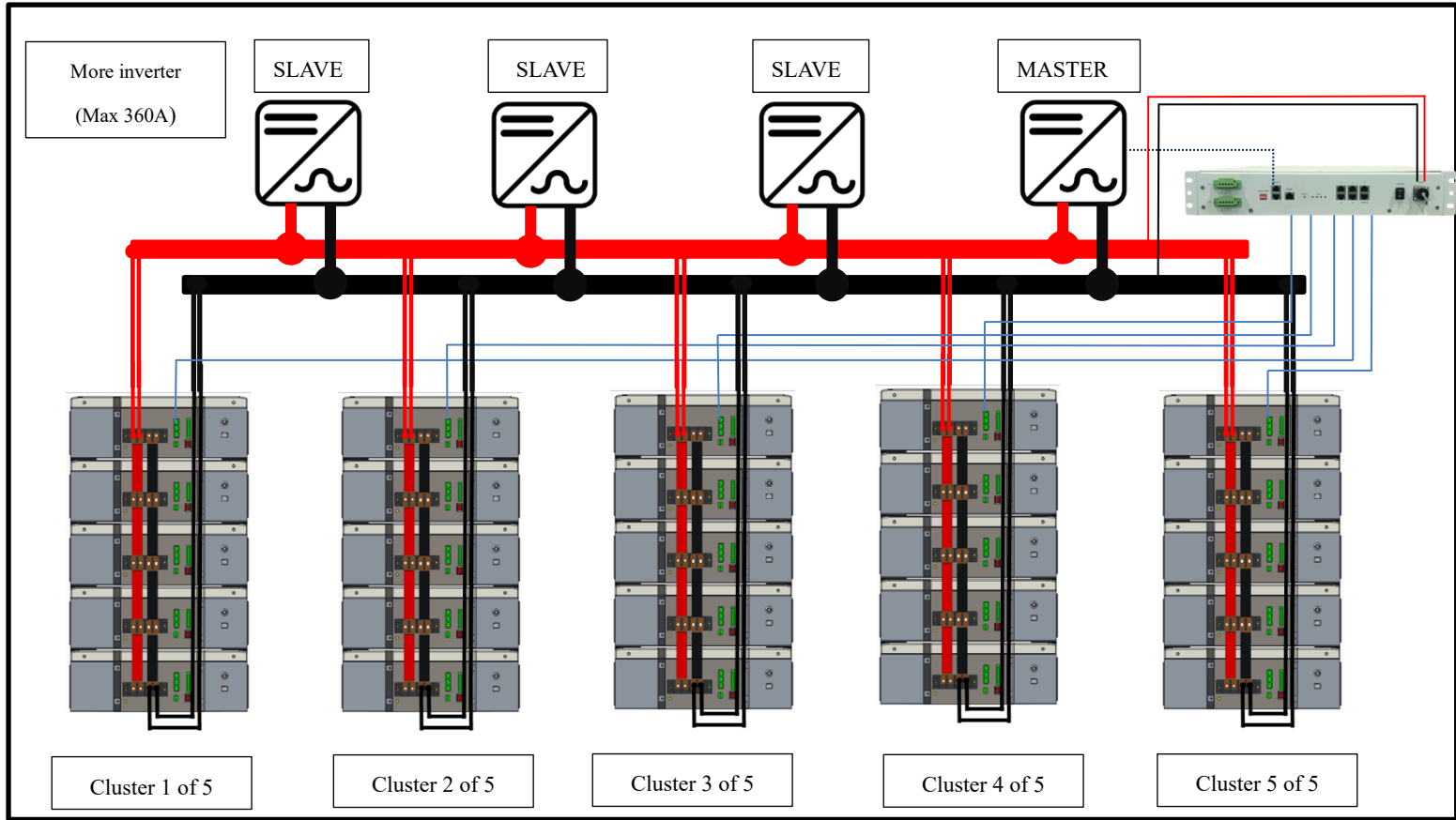
ATTENTION: BUS BAR ARE MANDATORY FOR SYSTEMS ABOVE 120A.

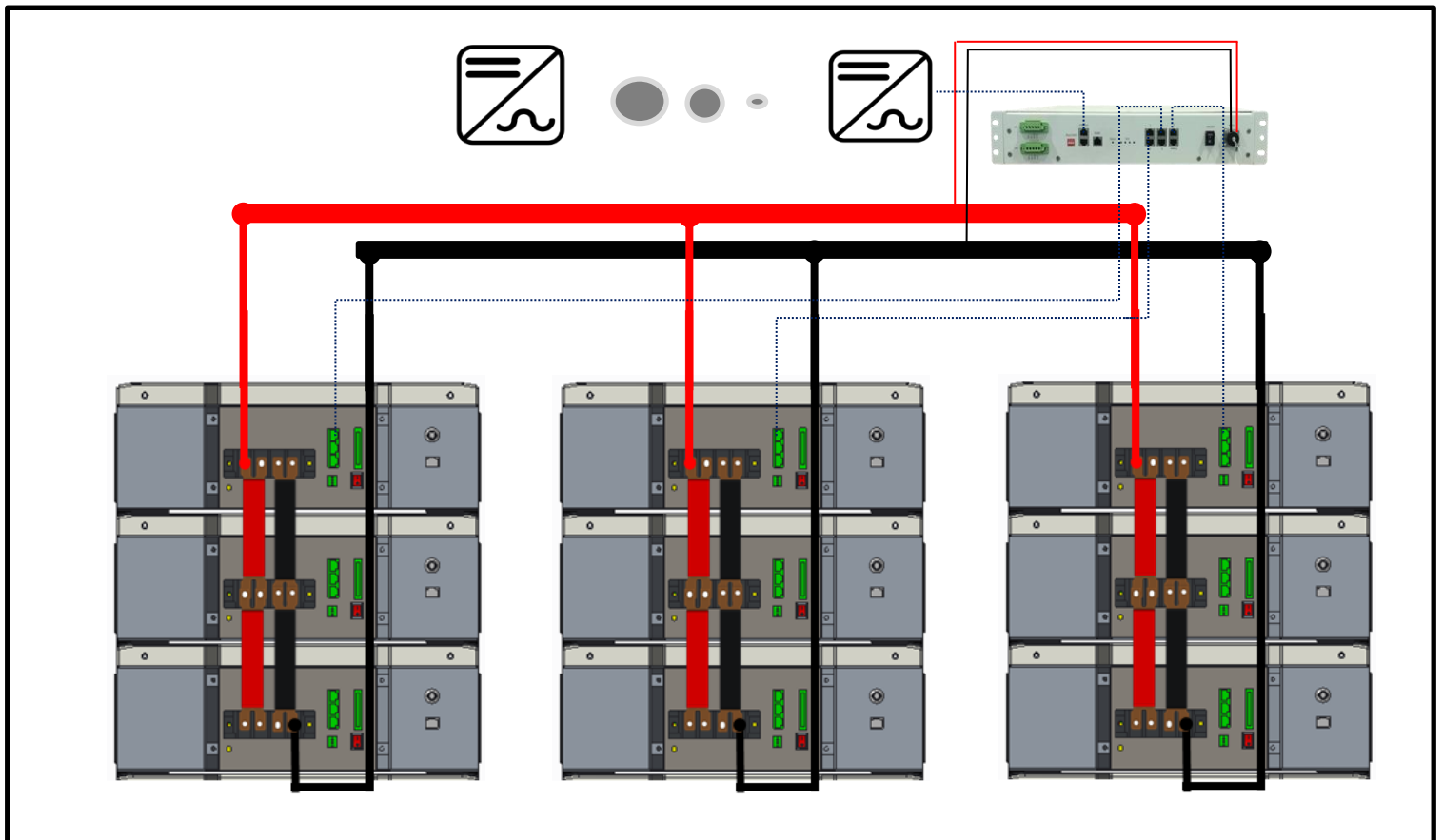
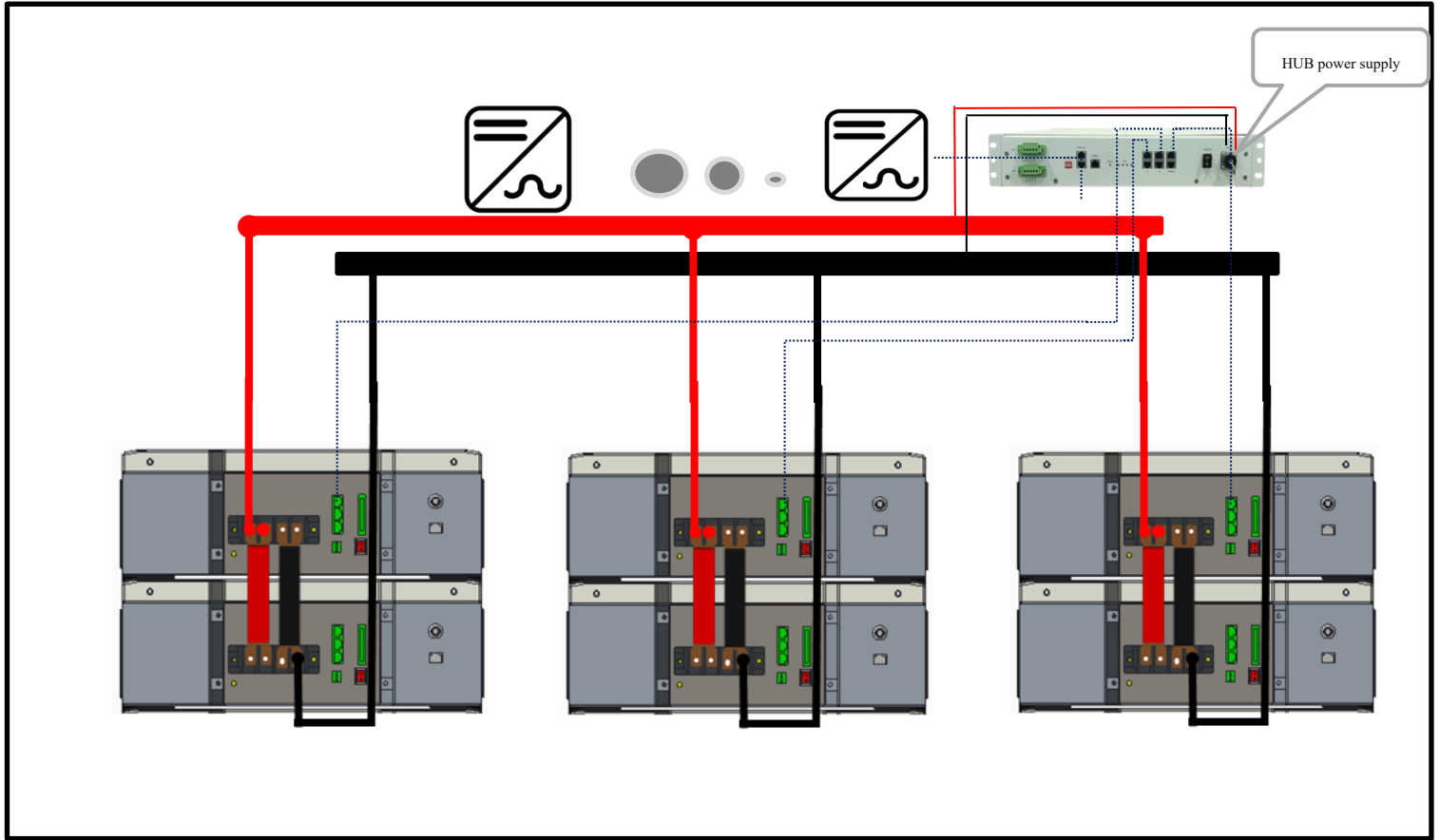


DO NOT USE DIFFERENT BUS BAR TYPES OR CABLES

EACH BATTERY AND EACH CLUSTER MUST HAVE THE SAME SOC% and VOLTAGE

ALL THE BATTERY MODULES MUST HAVE THE SAME FIRMWARE









360A single Cluster configuration Kit



KIT ORDER CODE -STK 5K3-360

STANDARD KIT (Order Ref. -STK 5K3-360-)		
1 x Custom BUS BAR Insulated RED module connection 1 x Custom BUS BAR Insulated BLACK module connection		Packed in single box
2 x cable 50 mm² ring terminal 2 mt RED 2 x cable 50 mm² ring terminal 2 mt RED		

NoteMAIN PARALLEL BUS BAR ARE NOT PROVIDED BY WECO**

MULTI CLUSTER HUB DEVICE

KIT ORDER CODE MASTER HUB 300 LV-5

HIGH CURRENT KIT (MASTER HUB 300 LV-5) Accessory to ordered separately		
1 x WeHUB parallel Controller		Packed in carton box
1 x WeHUB cable power supply		



BATTERY INSTALLATION -

NO COMMUNICATION INVERTERS NEEDS A STRICTLY SETTING IN ACCORDANCE WITH WECO' s DESIGN, THE BELOW CHART IS REFERRED ONLY FOR A SINGLE CLUSTER SETTING

HeSU ESS - 5K3 – R20	
Nominal DC Voltages	51.2
Amp Hours	105
Rated kWh Capacity	5.3 kWh
Max Output Capacity	105 Ah
Standard Charge Current	100 Adc
Max Charge Current	150 Adc
Standard discharging Current	100 Adc
Max discharging Current	200 Adc
DC Voltage (extreme)	44.5 58.7
Depth of Discharge	Up to 100%
Operating Efficiency	98%
Operating Temp	-25° to 65°C
Charging Temp	-10° to 55°C
Self-Discharge Rate	<1% self-discharge per month
Memory Effect	None
Warranty Period	10 Years
Dimensions	51x55x15 cm
Weight	52 kg



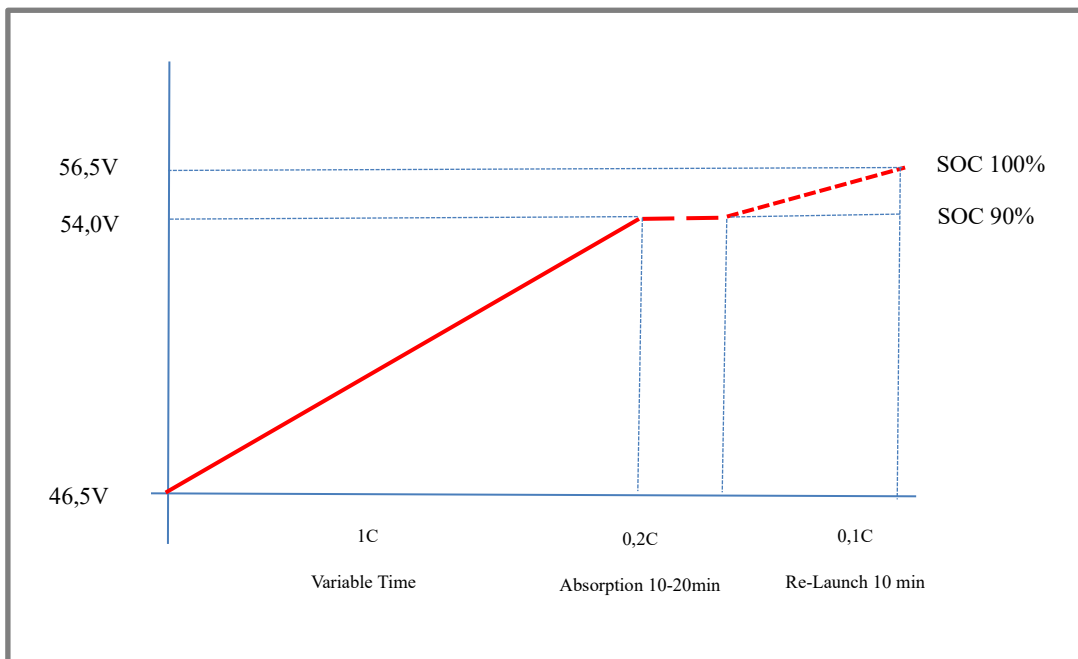
WeCO HeSU has special Chemical Lithium Iron Phosphate.

After the charging period the total voltage may drop from 54/55 V to 53/52V, this is a normal behavior.

Do not insist with continuous recharge once the High Voltage Cut Off (SOC 100%) has been reached

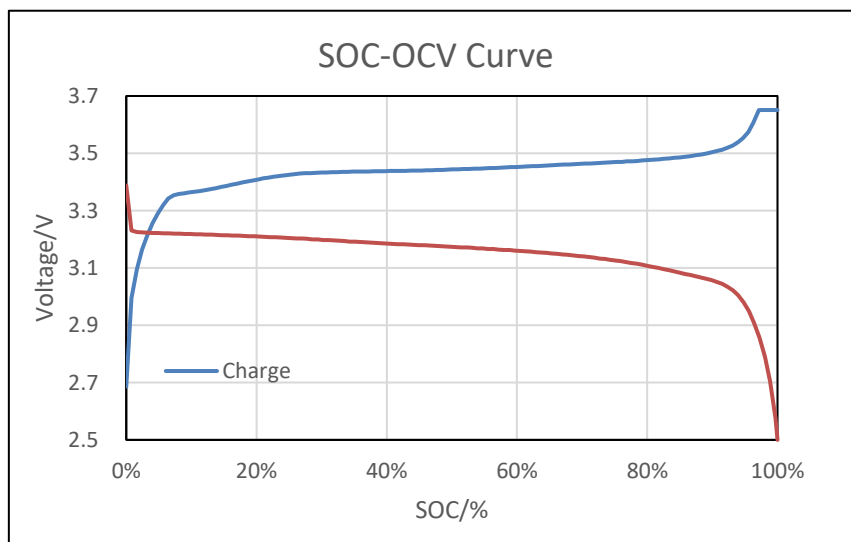
In case of single cell overvoltage, the relay will open the circuit and the OUTBACK inverter will shut down

In this case press the RUN button and shut down the battery, wait 30 minutes, press run once again and wait for the contactor reconnection.



Please contact weco@weco.uk.com, do not install inverter without BMS-CAN interface without prior approval of WeCo technical team

Single Cell Curve





The charge and discharge current of the inverter MUST be limited according with the maximum current allowed by each cluster configuration

The charge and discharge Voltage range of the inverter MUST be limited as per the module maximum value

NOTE:

This manual is subjected to continuous implementation.

Before install your WeCo batteries please contact our assistance team in order to have the latest manual and any additional support.

Safety improvement is our priority, please cooperate with us to improve the system, any suggestion is well accepted.

WeCo Italia Srl

WeCo FZE United Arab Emirates