ENERGY TECHNOLOGIES
BUILD LIFE BETTER

RESIDENTIAL
BATTERY

MANA 16-D

Product Description

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01 TECHNICAL DATA

NOTE

Operating current derating according to cell voltage and battery temperature.

More Usable Energy
Deep cycle DOD control

Flexible Investment
Up to 15 units in parallel

Safe & Reliable
Premium Lithium Iron Phosphate (LFP)

Easy Installation
Four wheels easy movement Floor stand

Quick Commissioning
One button ON/OFF Automatic ID assignment

Perfect Compatibility
Compatible with major PCS brands

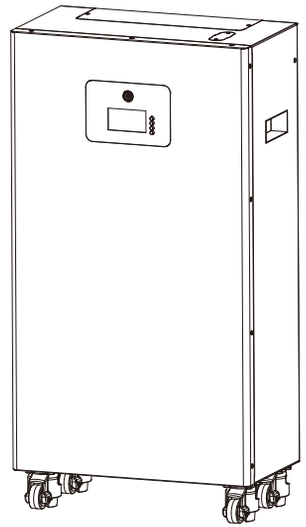
Datasheet

Model	MANA 16-D
Performance	
Cell technology	LFP ($LiFePO_4$), Lithium Iron Phosphate
Nominal Voltage	51.2 Vdc
Nominal Capacity	314 Ah
Battery Energy [1]	16076.8 Wh
Operating Voltage	44.8 - 56.16 Vdc
Max. Charge And Discharge Current	200 A
Communication	
Display	LCD display
Communication	CAN / RS485 / RS232 / Wi-Fi
General Specification	
Dimension (W×D×H)	450×245×790 mm
	17.7×9.6×31.1 inch
Weight (kg)	120 kg (264.55 lbs)
Installation	Floor stand
Operating Temperature [2]	Charge: 0 to 55°C (32 to 131°F) Discharge: -20 to 55°C (-4 to 131°F)
Operating / Storage / Humidity	≤ 95%RH (No condensation)
Ingress Protection Rating	IP 20
Scalability	Max 15 batteries in parallel
Standard Compliance	
Compliance	UN38.3 / IEC62619 / IEC61000 (More available upon request)
Ordering and Deliverable Part	
Part	MANA 16-D Battery
	MANA 16-D Parallel cable
	MANA 16-D to PCS cable

[1] Test conditions: 100% depth of discharge (DOD), 0.2C rate charge & discharge at 25°C.
[2] Charge/discharge derating occurs when the operating temperature is below 0°C or above 45°C.

02 PRODUCT OVERVIEW

2.1 Brief Introduction



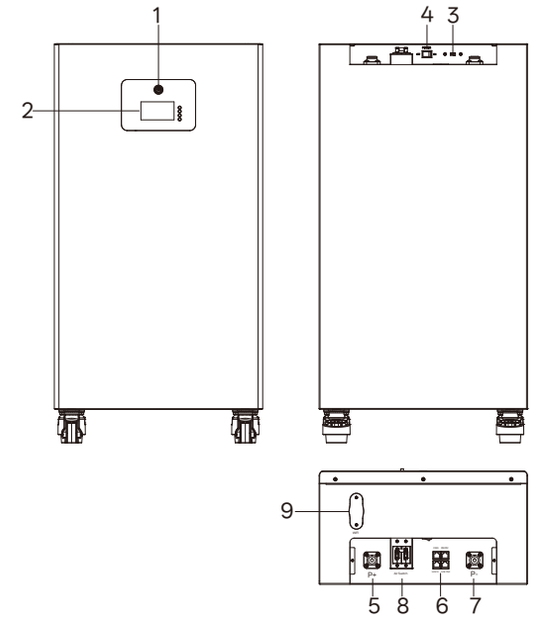
PRODUCT OVERVIEW

MANA 16-D is a lithium battery with an operating voltage range between 44.8~56.16V. It is designed for residential energy storage applications and works together with a 48v battery hybrid inverter. MANA 16-D is not suitable for supporting life-sustaining medical devices.

MANA 16-D has built-in BMS (Battery Management System), which can manage and monitor cells information including voltage, current and temperature. Besides that, BMS can balance cells charging to extend cycle life. BMS has protection functions including over-discharge, over-charge, over-current and high / low temperature; the system can automatically manage the charge state, discharge state, and balance state.

MANA 16-D can be connected in parallel to expand capacity and power, and 15 MANA 16-D can be connected in parallel at most.

2.2 Interface Introduction



Operation interface description:

Serial Number	Name	Description
1	ON/OFF button	Start-up switch
2	LCD display	Display battery information
3	Slide switch	BMS power supply switch
4	Rocker switch	BMS switch
5	Positive terminal	Total positive terminal
6	Communication port	Communication interface
7	Negative terminal	Total negative terminal
8	Air Switch	Output switch
9	WiFi interface	Port for WiFi

2.2.1 Switch ON / OFF

1. Turn on battery:

For single MANA 16-D, switch on the red rocker switch first.Press the silver ON/OFF button the button will blinking in blue and red led during start up. LCD display will be on and display the “Welcome”page. When battery starts up successfully without error, the silver ON/OFF button will blink in blue led.

For multiple MANA 16-D in parallel, switch on the red rocker switch of all batteries first.
Just press the silver ON/OFF button of MASTER battery, MASTER battery will turn on all the slave batteries via parallel communication cable automatically. LCD display will be on and display the “Welcome”page. When battery starts up successfully without error, the silver ON/OFF button will blink in blue led, then parallel battery system will operate normally.

2. Turn off:

For single MANA 16-D,hold pressing the silver on/off button for 3-5s, the silver ON/OFF button will blink in blue led, then release silver ON/OFF button , battery and LCD will be off automatically after 1min standby. Then switch off the red rocker switch.
For multiple MANA 16-D in parallel, just hold pressing the silver ON/OFF button of MASTER battery for 3-5s, MASTER battery will turn off all the slave batteries automatically after 1min standby. Then switch off all red rocker switch of all batteries.

2.2.2 CAN / RS485 Port

CAN / RS485 Communication Terminal (RJ45 port), connect to inverter, follow CAN / RS485 protocol.

PIN	Definition
Pin 1, Pin 8	RS485-B (to Inverter, reserved)
Pin 2, Pin 7	RS485-A (to Inverter, reserved)
Pin 3	NC
Pin 4	CANH (to Inverter)
Pin 5	CANL (to Inverter)
Pin 6	GND

2.2.3 RS232 Port

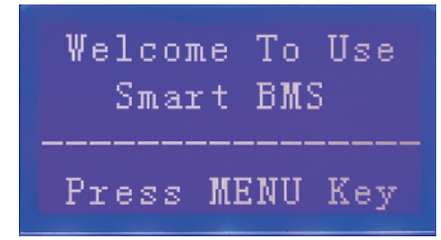
RS232 Communication Terminal (RJ45 port) follow RS232 protocol, for manufacturer or professional engineer to debug or service.

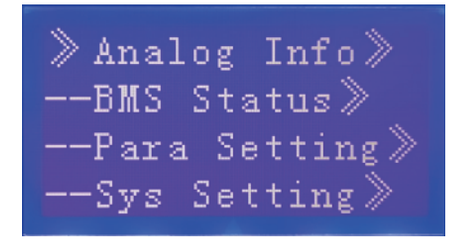
PIN	Definition
Pin 1, Pin 8	GND
Pin 2, Pin 7	RS232_TX
Pin 3, Pin 6	RS232 _RX
Pin 4, Pin 5	NC

2.2.4 Function Description Of The LCD Display

Main menu page

After power on / sleep activation, the welcome screen will be displayed, press MENU key to enter the main menu Page.As shown below:





Key Description

1) SW1----MENU，SW2----ENTER，SW3----DOWN，SW4------ESC.
2) Each item begins with "》" or "--", where "》" represents the current cursor position, press the DOWN key to move the cursor position downwards; Items ending with "》", indicates that the item has content that is not shown, press the ENTER key to enter the corresponding page.
3) Press the ESC key to return to the previous directory; from any location, press the MENU key to return to the main menu page.
4) In the dormant state, press any button to activate the display.

Sleep mode

Under normal operating conditions, the system will enter sleep mode after one minute of no key operation.
In the sleep mode state, the display will activate when any button is pressed.

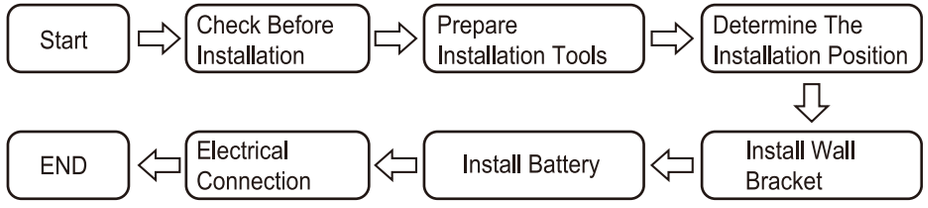
2.2.5 Function Description Of The ON/OFF Button

Protect: Blinking in red led.

Fault: Red led ON.

03 INSTALLATION GUIDE

Installation flow chart



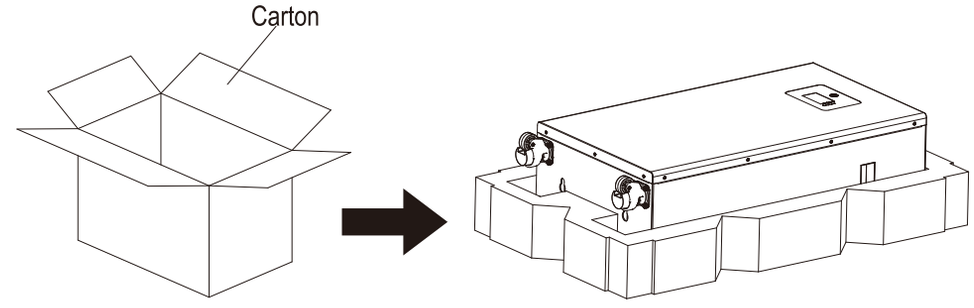
3.1 Checking Before Installation

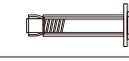
3.1.1 Checking Outer Packing Materials

Packing materials and components may be damaged during transportation. Therefore, check the outer packing materials before installing the battery. Checking the surface of packing materials for damage, such as holes and cracks. If any damage is found, do not unpack the battery and contact the dealer as soon as possible. You are advised to remove the packing materials within 24 hours before installing the battery.

3.1.2 Checking Deliverables

After unpacking the battery, check whether deliverables are intact and complete. If any damage is found or any component is missed, contact the dealer.
The below table shows the components and mechanical parts that should be delivered.



NO.	Pictures	Quantity	Description
1		1PCS	Battery
2		1PCS	Communication cable
3		1PCS	Parallel communication cable
4		2PCS	Power cable
5		1PCS	Green-yellow PE
6		2PCS	M6*60 Expansion bolts
7		2PCS	M6*12 bolts
8		2PCS	Wall lock fittings
9		1PCS	Test report
10		1PCS	QA certificate
11		1PCS	Top cover
12		4PCS	M4*8 Countersunk screw

3.2 Tools

Model	Tools		
Installation	Knife 	Measuring tape 	Socket wrench (10/16mm) 
	Rubber mallet 	Cross screwdriver 	Hammer drill（8mm） 
Protection	ESD gloves 	Safety goggles 	Anti-dust respirator 
	Safety shoes 		

3.3 Installation Requirements

3.3.1 Installation Environment Requirements

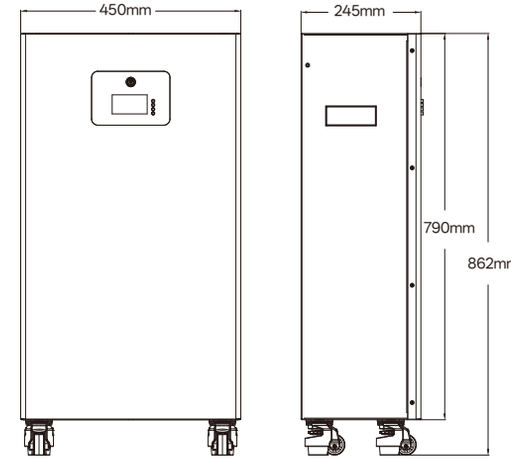
- Install the battery in the indoor environment.
- Place battery in secure location away from children and animals.
- Do not place the battery near any heat sources and avoid sparks.
- Do not expose the battery to moisture or liquids.
- Do not expose the battery to direct sunlight.

3.3.2 Installation Carrier Requirements

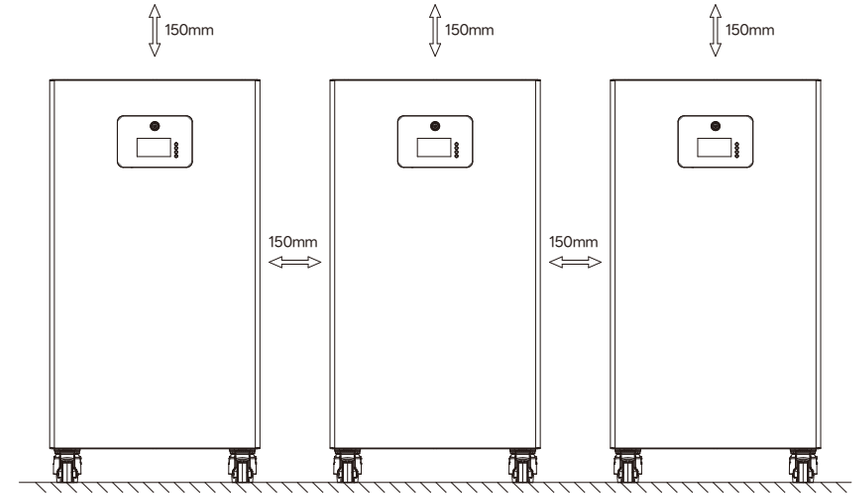
- Only mount battery on fire resistant building. Do not install batteries on flammable buildings.
- Battery is quite heavy, make sure the wall/ground can meet the load bearing requirements.

3.4 Installation Instructions

3.4.1 Dimensions



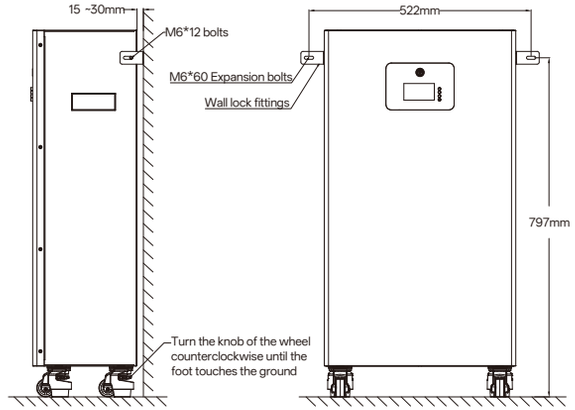
Minimum mounting distance between battery pack and equipment:



3.4.2 Installation Procedure

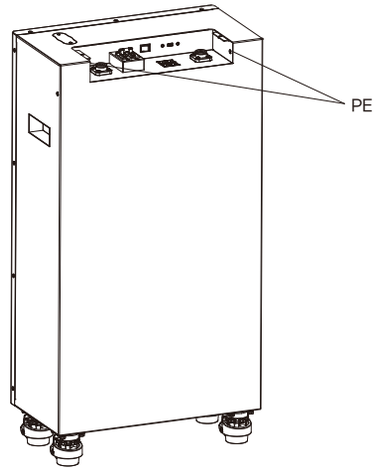
STEP 1

Drill the hall with a 10mm drill bit according to the size showm in the following figure, then install the lock wall fittings.Finally,the battery box is fixed to the wall and the supporting feet of the wheel are supported.



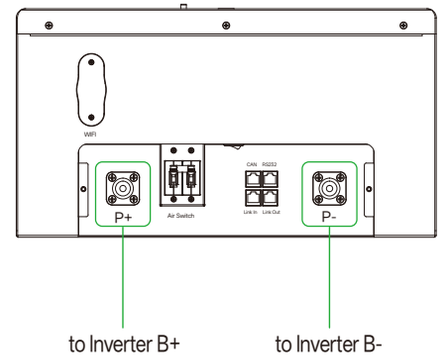
STEP 2

Connect to ground.



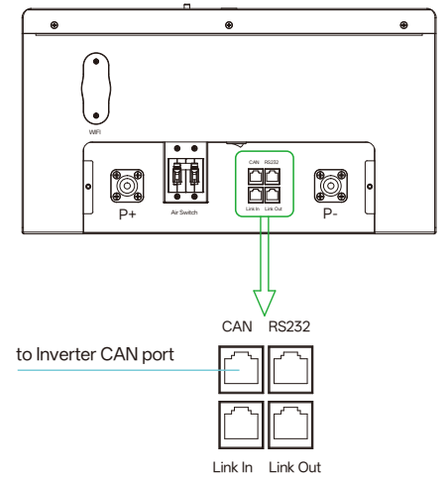
STEP 3

Connect power cable.



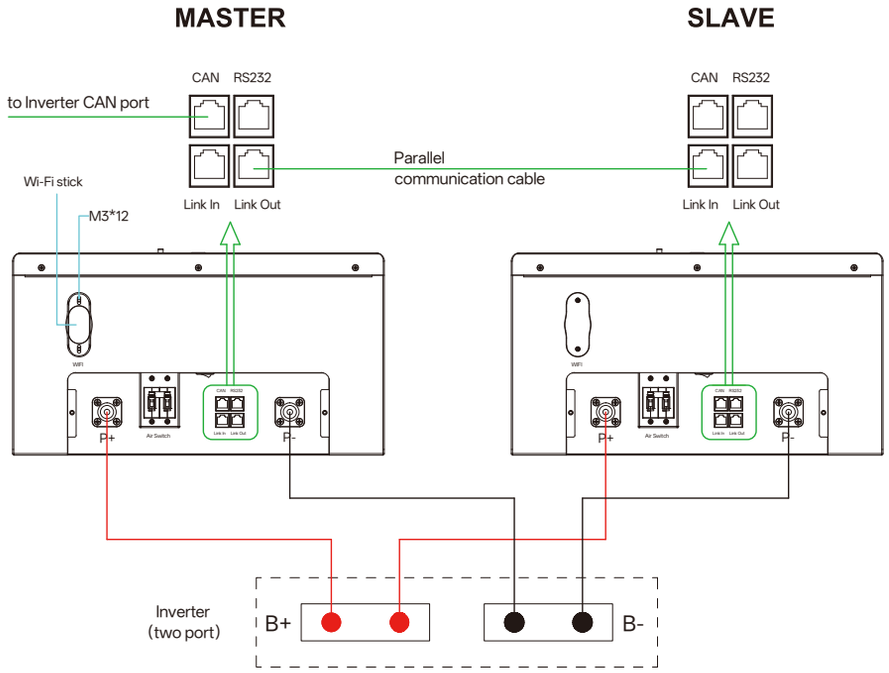
STEP 4

Connect communication cable.



STEP 5

When multiple batteries are connected in parallel, follow the following wiring mode, then install a Wi-Fi stick on the host.



04 MAINTENANCE

4.1 Recharge Requirements During Normal Storage

Battery should be stored in an environment with temperature range between -10°C ~ +45°C, and maintained regularly according to following table with 0.5C (157A) current till 40% SOC after long storage time.

Recharge Conditions When in Storage

Storage Environment Temperature	Relative Humidity of Storage Environment	Storage Time	SOC
Below-10°C	/	Prohibit	/
-10~25°C	5%~70%	≤12 months	30% ≤SOC≤60%
25~35°C	5%~70%	≤6 months	30% ≤SOC≤60%
35~45°C	5%~70%	≤3 months	30%≤SOC≤60%
Above 45°C	/	Prohibit	/

4.2 Recharge Requirements When Over Discharged

The over-discharged (90% DOD) battery should be recharged according to the following table, otherwise the over-discharged battery will be damaged.

Recharge Conditions When Battery is Over Discharged

Storage Environment Temperature	Storage Time	Note
-10~25°C	≤15 days	Battery Pack disconnected from Inverter
25~35°C	≤7 days	
-10~45°C	<12 hours	Battery Pack connected to Inverter

05 DISPOSAL OF THE BATTERY SYSTEM

Disposal of the battery must comply with the local applicable disposal regulations for electronic waste and used batteries.

- Do not dispose of the battery system with your household waste.
- Avoid exposing the batteries to high temperatures or direct sunlight.
- Avoid exposing the batteries to high humidity or corrosive atmospheres.