



The power behind competitiveness

DELTA BX6.3_AC

Operation and Installation Manual

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1 Safety

1.1 Information of the Battery Storage System

1.1.1 Disclaimer

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This manual accompanies our product for use by the end users. The technical instructions and illustrations contained in this manual are to be treated as confidential and no part may be reproduced without the prior written permission of DELTA ELECTRONICS, INC. Service engineers and end users may not divulge the information contained herein or use this manual for purpose other than those strictly connected with correct use of the product. All information and specifications are subject to change without notice.

DELTA ELECTRONICS, INC. shall have no obligation to both personal injury and property damage hereinafter with respect to any actions -- (a) the product has been installed and repaired improperly; (b) the product has been misuse without following the instructions on this user manual; (c) the product has failed due to incorrect unpacking.

1.1.2 Target Group

This user manual of the battery storage system is prepared for a person who is well-trained for installing, commissioning, using, and doing maintenance. The well-trained person must have the following basic and advanced skills:

- The fundamentals of electricity, wiring, electrical components and electrical schematic symbols.
- Knowledge of how a battery storage system works and is operated.
- Training in the installation and commissioning of electrical devices and installations.
- Training in how to deal with the dangers and risks associated with installing and using electrical devices and installations.
- Compliance with this manual and all safety information.

Please read the user manual before working on the product.

1.2 General Safety

IMPORTANT SAFETY INSTRUCTIONS : SAVE THESE INSTRUCTIONS !



- Please read these instructions carefully and keep them for later use.

To prevent any personal injury and any property damage, also ensure long-term operation of the battery storage system, you must read this section carefully and review all the safety instructions at all times before using this battery storage system.

This user manual provides important instructions for DELTA BX6.3_AC Battery storage system. The product is designed, tested, verified, and certified according to international safety requirements, regulations, and standards but precautions must be observed when installing and operating the product.

1.2.1 Condition of Use

The DELTA BX6.3_AC is a battery storage system designed with two battery modules. In order to prolong Lithium-based batteries' life, 100% state of charge (SOC) shown on the device is actually within the range of 95%~100%.

The battery storage system can be charged/discharged from grid, and provides electricity to household loads and electricity supply backup is available.

The DELTA BX6.3_AC Battery storage system is NOT to be used as a backup for any medical uses or life supporting uses.

Before battery module running one cycle, there might be some error in the SOC accuracy.

If DELTA BX6.3_AC has not used for more than six months, please connect to grid and check the SOC value via APP, if the SOC value is below 30%, please select "Charge first mode" to charge BX6.3_AC, it should be charged to at least 30% SOC.

Utilize a brand new battery with used one may lead to reduction of battery lifetime and increase the safety risk. Therefore, we suggest the evaluation of the battery size have to be made thoroughly before installation.

Extend the battery size from 6.3kwh to 12.6kwh is not allowed.

1.2.2 Symbols

This section describes the definition of the symbols in this manual. In order to prevent both personal injury and property damage, and to ensure long-term operation of the product, please read this section carefully and follow all the safety instructions while you use the product.

DANGER!



- This warning indicates an immediate hazard which will lead to death or serious injury may occur.

WARNING !



- This warning indicates a possible hazard which may lead to death or serious injury may occur.

CAUTION !



- This warning indicates a possible hazard which may lead to minor injury may happen.

ATTENTION



- This warning indicates a possible damage to property and the environment might happen.

INFORMATION



- Additional information is indicated by an exclamation mark enclosed by double circle. This means the following section contains important information and user should follow the instruction to prevent any hazards.

DANGER : ELECTRICAL HAZARD!!



- This warning indicates an immediate electrical hazard which will lead to death or serious injury may occur.



- Equipment grounding conductor (PE)
- (PE) Équipement conducteur de terre

1.2.3 Safety Instructions

The battery storage system should not be installed under direct sunlight or on flammable surfaces. Please make sure the battery storage system is mounted tightly on a solid / smooth surface. The optimal temperature range for the battery storage system to operate is 10 to 30°C . The operating humidity is within the range from 0 to 90%. If the ambient temperature is outside the operating range, the battery storage system stops to protect itself from any unexpected damage.

This battery storage system should be installed by a trained and experienced installer designated by the retailer. Having the product installed by a non-specialized installer is very dangerous and can cause damage or injury. The battery storage system is always installed by 2 or more people. (According to regional regulation, more people may be required.)

Please make sure all the breakers are turned off before connecting cables. Please note that the cable length must within 100 meters.

1.2.3.1 Handling of Prohibitions

The battery module contains flammable materials such as organic solvents. Mishandling the battery module may cause fire, smoke, or an explosion and the battery module's functionality will be seriously damaged. Protection circuits are designed into the battery storage system via BMSS (PCB part inside the battery cabinet) to protect the battery modules.

Please read and check the following prohibited actions.

DANGER!



- This warning indicates an immediate hazard which will lead to death or serious injury may occur.

(1) Electrical Shock

Do not touch the terminals of the battery module without protectors.

Be grounded with the specified conditions.

High voltage may occur between the positive and the negative terminals.

Electric shock impairs health or may cause threat to life.

More than 2,000 meters higher, risks of an electric shock will be increased.

(2) Immersion

Do not immerse the battery module in liquid such as water, beverages, or other fluids.

Do not expose to corrosive substances such as sea breeze, steam or chemicals.

Do not install in the humid places or places to condensation.

Exposure to liquid may damage the battery module or the circuit board.

This may cause a battery module's damage to leak electrolyte, generate heat, smoke, catch fire, or explode.

(3) High Temperature

Do not use or place the battery module near an open flame, heater or high temperature. Subjecting the battery module to high temperature may damage the separator and cause internal short circuit.

This may cause the battery module's damage to leak electrolyte, generate heat, smoke, catch fire, or explode.

(4) Charge Conditions

Only charge the battery module within the specified conditions.

(e.g., temperature range, voltage, current and etc.)

Charging with unspecified conditions (e.g., over charge or abnormal current) may cause the battery module's damage to leak electrolyte, generate heat, smoke, catch fire, or explode.

(5) Reverse Polarity

Check the positive (+) and the negative (-) terminals.

If the battery module is connected with a reversed polarity, unexpected reactions may occur.

This may cause the battery module's damage to leak electrolyte, generate heat, smoke, catch fire, or explode.

(6) Direct Connection

Do not connect the battery module to AC power or unspecified DC power. This may cause the battery module's damage to leak electrolyte, generate heat, smoke, catch fire, or explode.

(7) Use in Other Equipment

Do not use the battery module for any other purposes or connecting unspecified equipment.

If the battery module is used with unapproved applications or systems, the battery module may be damaged, leak electrolyte, generate heat, smoke, catch fire, or explode.

(8) Incineration and Heat

Keep the battery module away from heat and fire.

Heating the battery module and may cause it to be damaged, leak electrolyte, generate heat, smoke, catch fire, or explode.

(9) Short-Circuit

Do not connect between the positive (+) and the negative (-) terminals with a conductive material (e.g., wire, a cable, etc.).

Do not carry or store the battery module with metal objects.

If the battery module is shorted, the battery module may be overheated.

This may cause the battery module's damage to leak electrolyte, generate heat, smoke, catch fire, or explode.

(10) Disassembly

Do not disassemble or modify the battery module.

Disassembly or modification of the battery module may damage the protection circuit.

This may cause the battery module's damage to leak electrolyte, generate heat, smoke, catch fire, or explode.

(11) Charge in High Temperatures

Do not charge the battery module in high temperature environment.

If the battery module is charged with exposing high temperature, the battery module's protection circuit may be activated and stop or fail the charging.

This may cause the battery module's damage to leak electrolyte, generate heat, smoke, catch fire, or explode.

(12) Open BX6.3_AC100 cover

To avoid risk of electrical shock, It is prohibited to open the front door. The unit contains no user-serviceable parts.

It may cause failure.

The warranty is void once the door is opened.

WARNING !



- This warning indicates a possible hazard which may lead to death or serious injury may occur.

(1) Magnetism

Do not place the battery module near strong magnetism. (e.g., electromagnetic cooker, etc.)

This may cause the battery module's damage to leak electrolyte, generate heat, smoke, catch fire, or explode.

(2) Mixed Use

Do not mix with other batteries.

The battery module should not be used with other batteries having a different capacity, chemistry, manufacturing date or manufacturer.

This could cause the battery module's damage to leak electrolyte, generate heat, smoke, catch fire, or explode.

CAUTION !



- This warning indicates a possible hazard which may lead to minor injury may happen.

(1) Exposure to Direct Sunlight

Do not use or leave the battery module in a location exposed to excessive heat, such as in direct sunlight or in a car. It could cause the battery module's damage to leak electrolyte, generate heat, smoke, catch fire, or explode. It may also cause the battery's performance and life to deteriorate.

(2) Charging Temperature Range

Only charge the battery module within operating temperature range.

Charging outside of this temperature range could cause the battery module's damage to leak electrolyte, generate heat.

It may also cause the battery module's performance and life to deteriorate.

(3) Manual

Please read the system manual before use.

Keep the system manual for future reference.

(4) Recycling

When disposing of the battery module, recycle it according to local rules and regulations.

2 Introduction

2.1 About this Manual

The user manual is valid for the following device types :

- DELTA BX6.3_AC
- DELTA BX12.6_AC

The DELTA BX6.3_AC Series have 2 models as shown in **Figure 2-1**. Delta reserves the right to make modifications to the content and technical data in this user manual without prior notice.

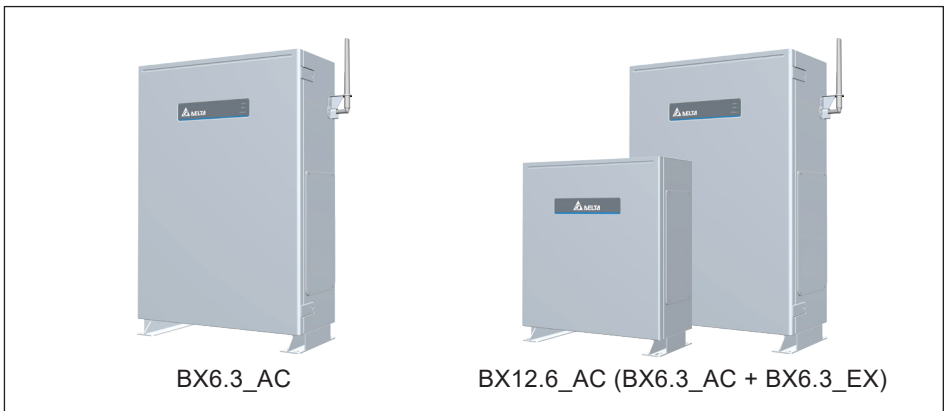


Figure 2-1 : The DELTA BX6.3_AC Series have 2 models

2.2 Product Description

This device is an ac coupling battery system with following features:

- Integrated energy management system
- Integrated charger controller and inverter
- Transformer-less

The system diagram of BX6.3_AC is shown as **Figure 2-2**. Delta's BX6.3/12.6_AC series with high reliability Li-ion battery is a home energy storage solution with 6.3/ 12.6 kWh capacity. It can be integrated with home PV system and can be scalable up to 12kWh for future expansion. With BX6.3/12.6_AC, house owner can maximize the efficiency of home energy management by saving and managing excess solar energy from home PV system. Besides, it can be considered as the backup power during emergency or suffering a power outage.

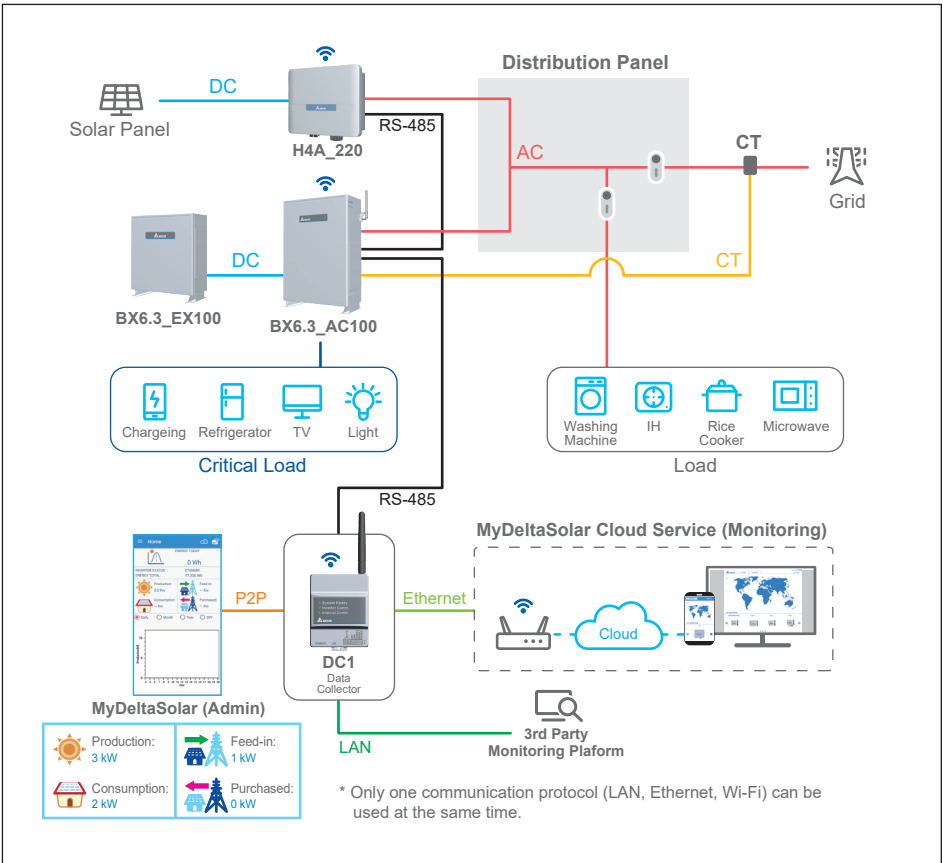


Figure 2-2 : System diagram of BX6.3_AC storage system

2.3 Additional Information

More details or related product information, please visit: <http://www.deltaww.com>

2.4 Product Overview

The shipping components of DELTA BX6.3_AC are shown as **Figure 2-3**.

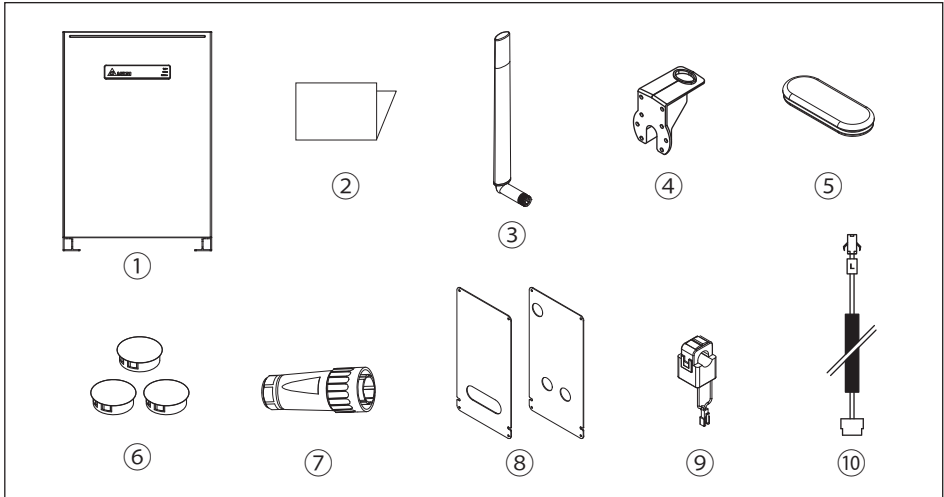


Figure 2-3 : Shipping Components of DELTA BX6.3_AC

	Object	Qty	Description
1	Delta BX6.3_AC	1 pc	Residential AC ESS
2	Quick Installation Guide	1 pc	The Instruction to provide the information of safety, Installation and specification.
3	WiFi antenna	1 set	2.4Ghz Wi-Fi Antenna (IPX7)
4	Antenna Bracket	1 pc	To support Wi-Fi antenna on BX6.3_AC
5	Rubber cover	1 pc	Protective cover for non-critical waterproof and dust prevent
6	Plastic cover	3 pcs	Protective cover for non-critical waterproof and dust prevent
7	AC Plug	1 set	Connector for AC connection
8	Wiring Cover	2 sets	Protective cover to prevent users from touching the power cable
9	Current sensor	1 pc	120A current transformer
10	CT cable	1 pc	Cable for CT connection

Table 2-1 : Packing list of DELTA BX6.3_AC

Figure 2-4 shows the dimensions of DELTA BX6.3_AC.
Figure 2-5 shows the details of interface.

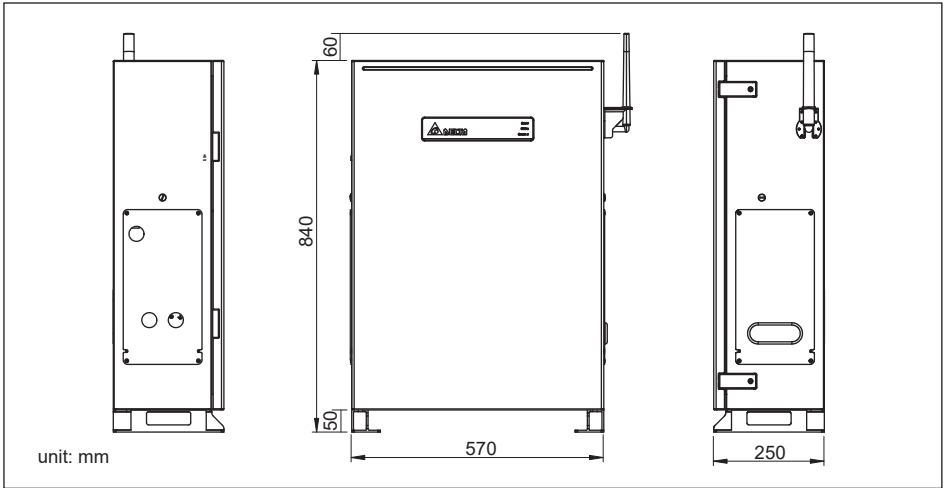


Figure 2-4 : Dimensions of DELTA BX6.3_AC

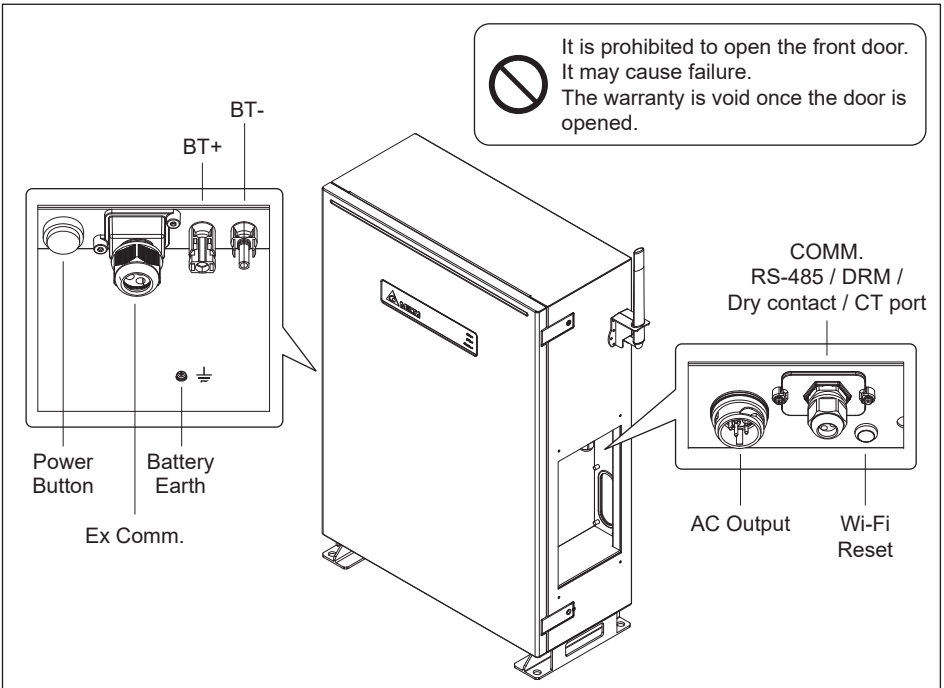


Figure 2-5 : Overview of DELTA BX6.3_AC interface

Please refer to **Figure 2-6** for the location of product label. You can identify the model number and the specifications by the information on the product label. In Australia and New Zealand, users can also identify the supported Demand Response Modes (DRMs) of BX6.3_AC here. The table (**Table 2-2**) along with these labels explains the definition of the specific mark.

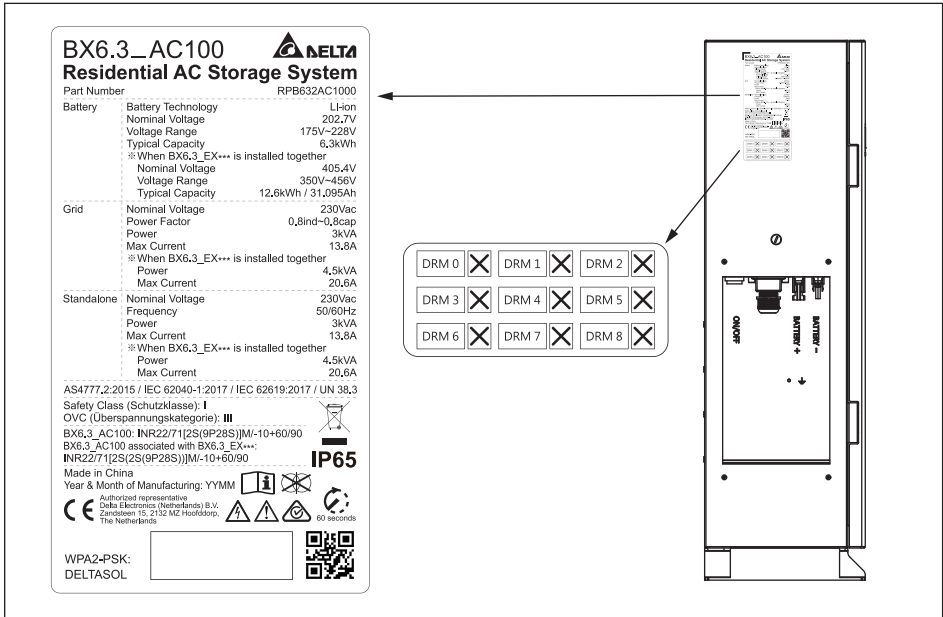


Figure 2-6 : Rating labels of DELTA BX6.3_AC

Symbol	Definition
	Before working with the Battery Pack, you must read the supplied manual and follow the instructions contained therein.
	The housing of the Battery Pack must be grounded if this is required by local regulations.
	WEEE marking The Battery Pack must not be disposed of as standard household waste, but in accordance with the applicable electronic waste disposal regulations of your country or region.
	BX6.3_AC is not separated from the grid with a transformer.
	Danger to life through electric shock Potentially fatal voltage is applied to the unit during operation. This voltage persists even 60 seconds after disconnection of the power supply. Never open the unit. The unit contains no components that must be maintained or repaired by the operator or installer. Opening the housing will void the warranty.

Table 2-2 : Rating label explanation of DELTA BX6.3_AC

2.5 LED Indicators

The DELTA BX6.3_AC has three different color LED notification on the front cover of the case that signal various system statuses:

LED	LED Status	Definition
Grid	GREEN ON	On Grid mode
	GREEN FLASH	On Grid count down
	RED ON	PCS Error
	RED FLASH	Inverter standby
SPS	GREEN ON	Standalone mode
	GREEN FLASH	Standalone count down
	RED ON	Battery Error
	RED FLASH	Battery Power OFF
Comm.	GREEN FLASH	Communicating
	OFF	No communication

Table 2-3 : LED Indicators



Figure 2-7 : LED indicators of DELTA BX6.3_AC

2.6 Push Button

Use Push button to turn ON/OFF the unit, or start-up BX6.3_AC with AC supply.

Status	Operation	Action
BX6.3_AC power OFF	Grid supplied	Power ON the unit (AC start-up)
BX6.3_AC power OFF	Power button push > 20 sec (until grid green LED flash)	Power ON the unit (Cold start-up)
BX6.3_AC power ON already	Power button push > 1 sec	Power OFF the unit

3 Installation

WARNING !



- Do not install BX6.3_AC near or on flammable surfaces.
- Please mount BX6.3_AC tightly on a solid / smooth surface.
- Install BX6.3_AC in a location that prevents damage from flooding.
- Do not expose BX6.3_AC to ambient temperatures above 60°C or below -20°C.
- Operating or storing BX6.3_AC at the temperatures out of its specified range might cause damage to BX6.3_AC.

The chapter contains instructions for (1) Installation environment
(2) Mechanical installation; (3) Electrical Installation; (4) Communication setup.

3.1 Installation Environment

CAUTION !



- The optimal operation temperature for BX6.3_AC is between 10 to 30°C.
- If the ambient temperature is out of the optimal operating range, BX6.3_AC will be de-rating.
- The operating humidity is within the range from 0 to 90%.
- BX6.3_AC may limit charge or discharge power based on battery cell temperature to improve battery lifespan.
- If the ambient temperature is out of the operating range, BX6.3_AC will stop operating to avoid any unexpected damage.

BX6.3_AC is designed to be waterproof and can be installed both indoors and outdoors. However, please avoid exposure to direct sunlight, high temperature and high humidity if installed outdoors.

Please avoid using BX6.3_AC under the following condition, otherwise the device may malfunction.

- Locations where IP65 isn't satisfied.
- Locations where temperature changes severely.
- Locations where the device is directly exposed to saltwater, sea breezes and high humidity.
- Locations that are or might be affected by explosive, combustible, corrosive and other poisonous gases.
- Location exposed dust and dirt.
- Location with poor ventilation.
- Locations with other special conditions.
- At altitude above 2000m.

3.2 Unboxing and Review

The unpacking procedure of BX6.3_AC is shown as **Figure 3-1**.

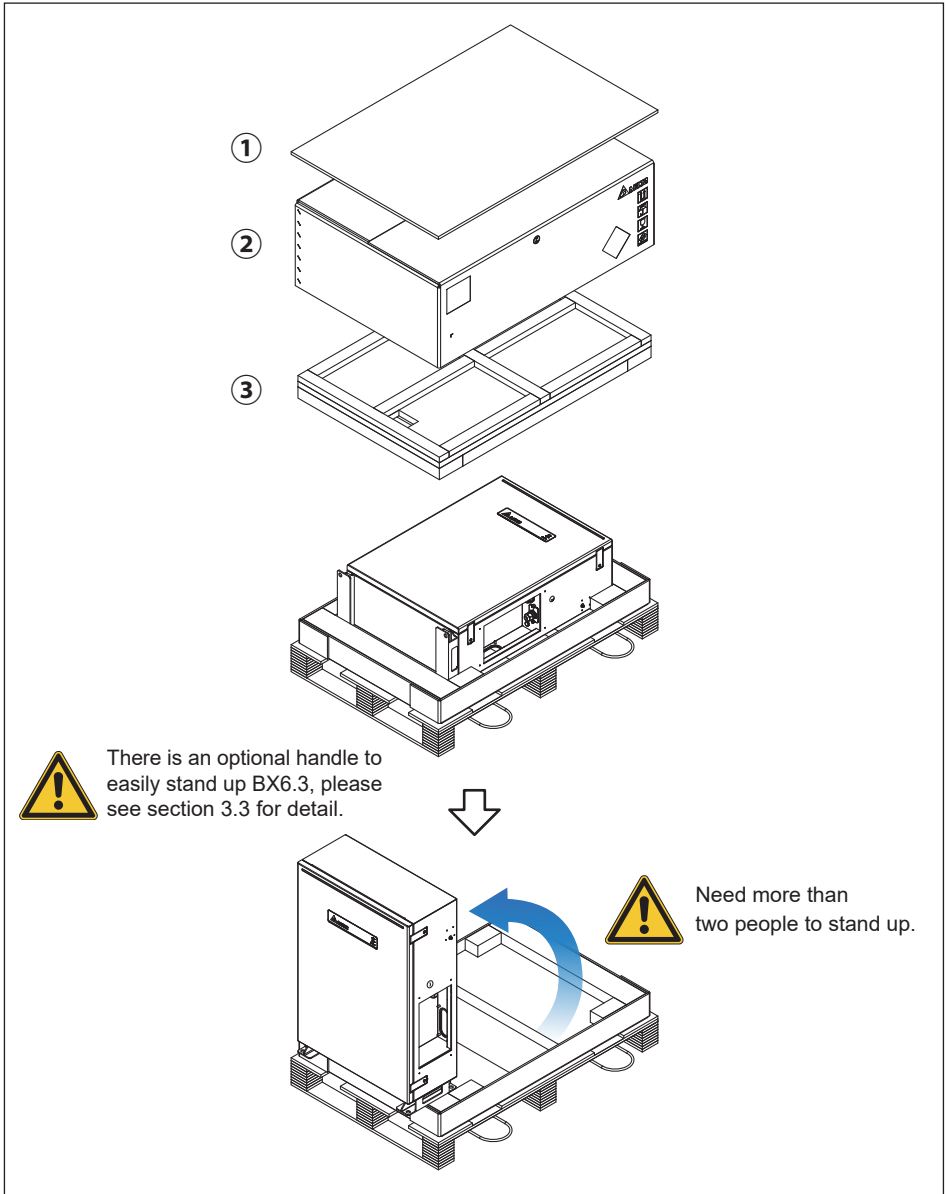


Figure 3-1 : Unpack

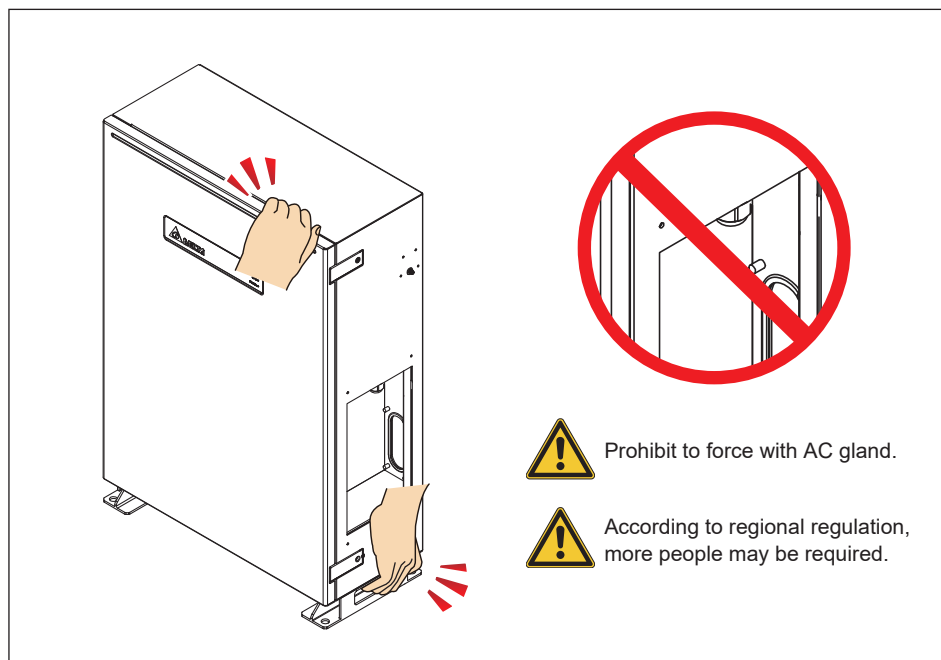
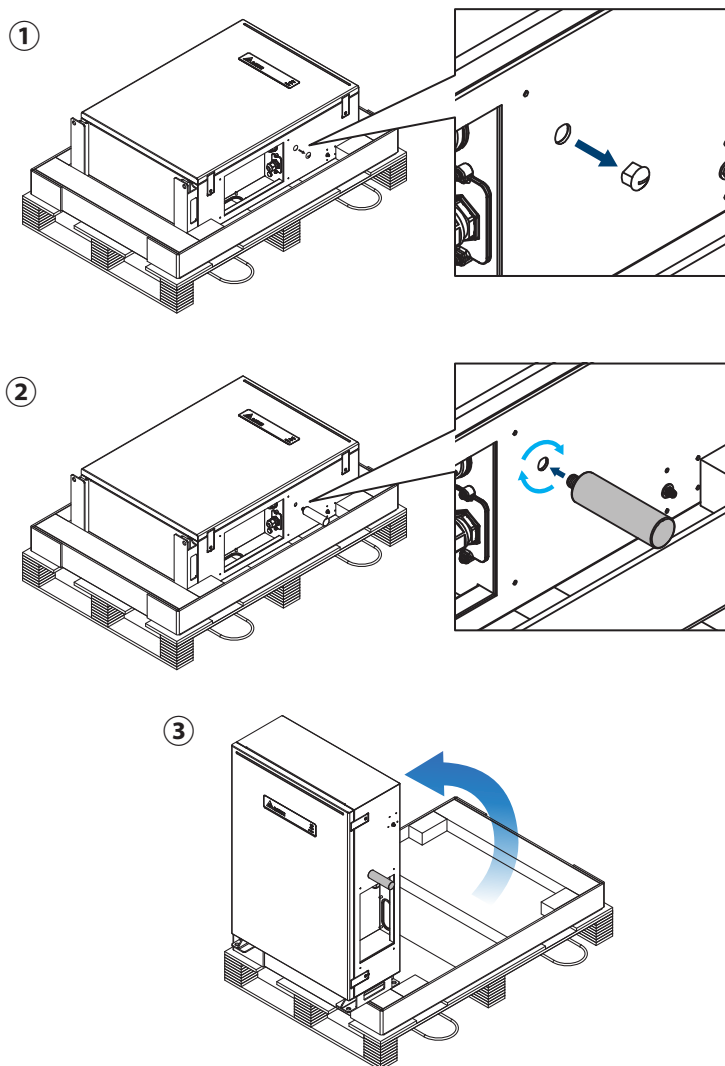


Figure 3-2 : Correct position for handing

3.3 Handle (option)



- Please lock screw (0.5N·m) plugs on the case after installation to avoid water inflow.

Figure 3-3 : Installation for optional handle

3.4 Mechanical Installation

WARNING !



- BX6.3_AC should be installed by a trained and experienced installer designated by the retailer.
- Having the product installed by a non-specialized installer is very dangerous and can cause damage or injury.

ATTENTION



- Please check the space for installation which meets the recommended location.
- Remember that DELTA will in not responsible for damage resulting from BX6.3_AC falling due to insufficient mounting strength.

This battery storage system is designed for ground-mounted.

Please ensure that the installation is perpendicular to the floor.

Please follow the instructions as shown from **Figure 3-4** through **3-7**.

Please make sure there is enough space for the battery storage system, especially the reverse side of the battery storage system (heatsink requirement).

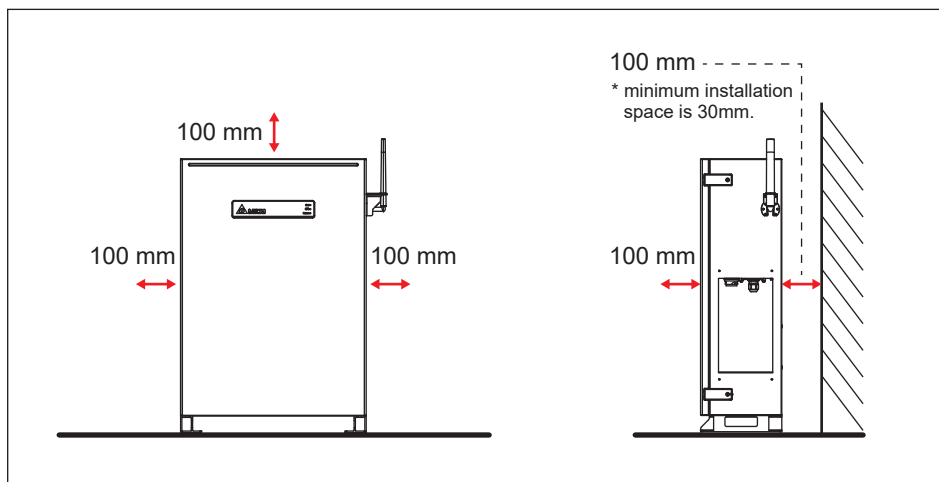


Figure 3-4 : Recommended Space for Installation

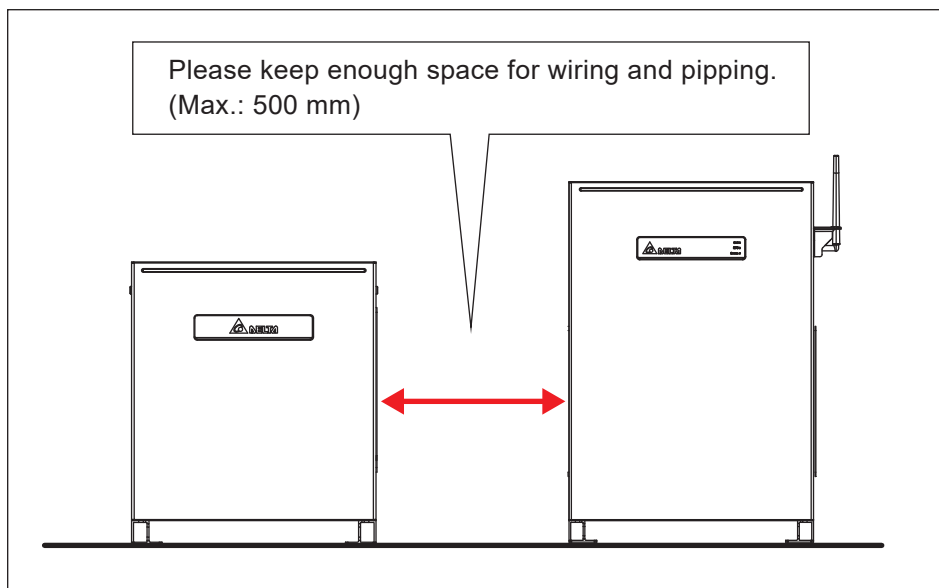


Figure 3-5 : Recommended Space for Installation BX12.6_AC

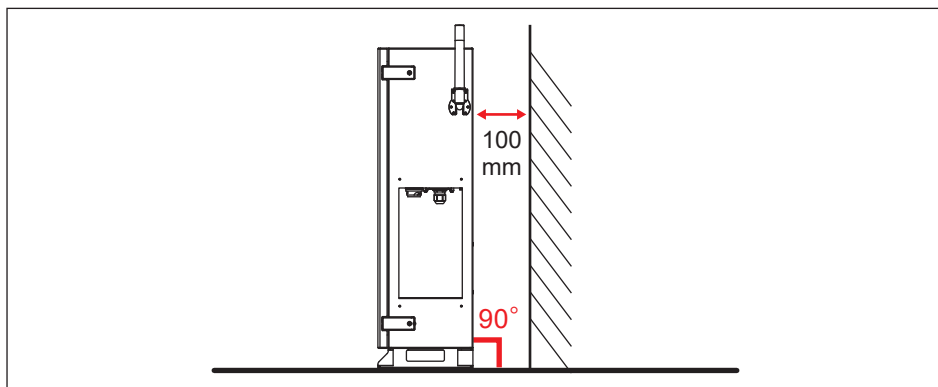
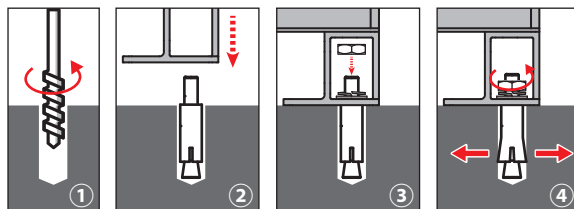


Figure 3-6 : Permitted mounting positions

The recommended spacing to wall is 100mm, please be sure the minimum space should more than 30mm. Be sure to select the flat floor surface for installation and strength can afford storage system weight.

The Power ON/OFF button is located at the left side of BX6.3_AC, please make sure enough space is reserved to access this button.



1. Drill 4 holes with $\Phi 16$ mm diameter in dimension 540 mm x 220 mm
2. Insert Rawlplug into these hole
3. Put on and fix BX6.3_AC firmly

CAUTION !



- Please do not install the battery pack on uneven floor surfaces.
- Holes size is 16 mm diameter for attaching the battery pack.

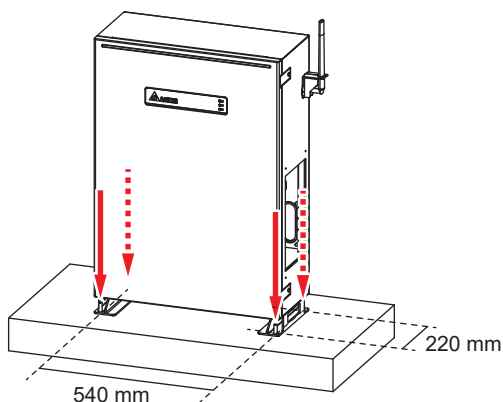


Figure 3-7 : Insert rawlplug

To install the wiring cover on BX6.3_AC, please follow the procedure below:

- BX6.3_AC has a $\Phi 38 \times 76$ backward hole for AC and COMM wiring, use 4 screws to fix side cover after wiring.
- For BX12.6_AC model installation, please remove the plastic cover, pass the DC and COMM cables through pipe and attach the pipe to the wiring cover.
- Recommend screw type/ PF pipe/ conduit are shown in **figure 3-8**.
- It is recommended to install the wiring cover as it is used to prevent users from touching the electric cable.

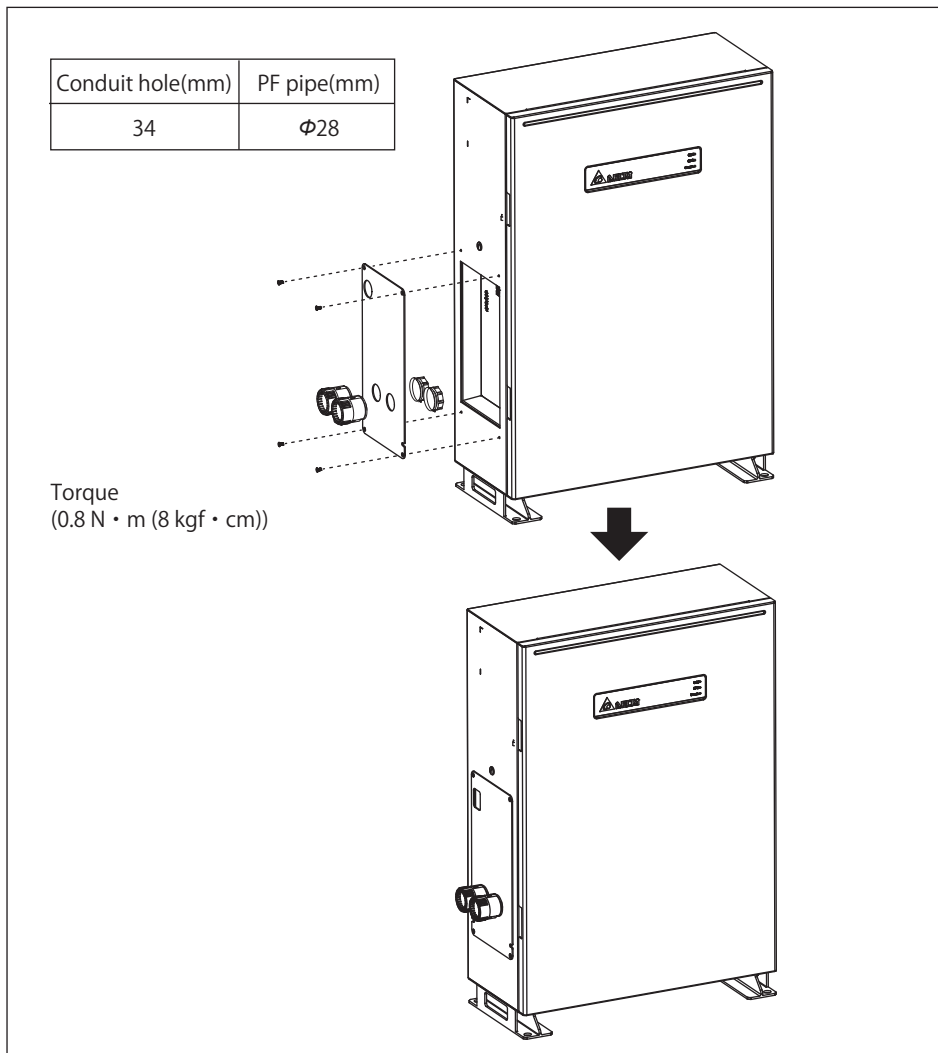


Figure 3-8 : Install the wiring cover on BX6.3_AC

3.5 Electrical Installation for AC

Important information regarding safety

- Always follow the specific regulations of your country or region.
- Always follow the specific regulations of your energy provider.
- Install all stipulated safety and protective devices (e.g. automatic circuit breakers and/or surge protection devices).

3.5.1 Required Protective Devices and Cable Cross-sections

It is recommended to install a 30A circuit breaker between AC side and inverter side for over current protection. The AC cable must be jacked and meet the specifications in **Table 3-1**.

Model	Current Rating	Wire Size	Recommended Torque
BX6.3/12.6_AC	25 A	5 - 8mm ²	0.7 N·m

Table 3-1 : AC input cable requirement

Please use the proper upstream circuit breaker to protect the unit.

Model	Current Rating
BX6.3_AC	16 A
BX12.6_AC	25 A

Table 3-2 : Upstream circuit breaker

3.5.2 AC Connection

Areas outside Australia and New Zealand, it recommended to connect AC wiring as shown in **Figure 3-9**. The connection between Grid N and Load N is used to eliminate the floating voltage between Load N and PE.

However, BX6.3_AC can still works without the Grid N and Load N connection.

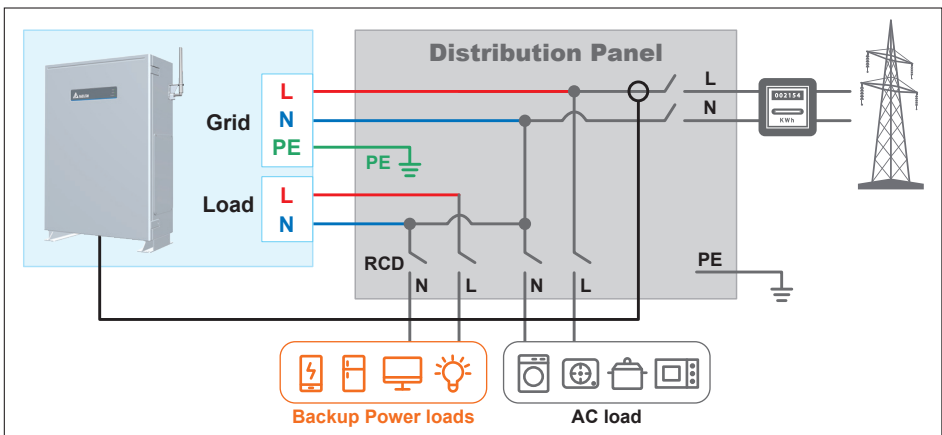


Figure 3-9 : Storage system operation illustration

In Australia and New Zealand, please connect the AC wiring as shown in **Figure 3-10**. The connection between Grid N and Load N is necessary due to the grid code requirement to ensure the continuity of the neutral conductor when inverter is in standalone mode.

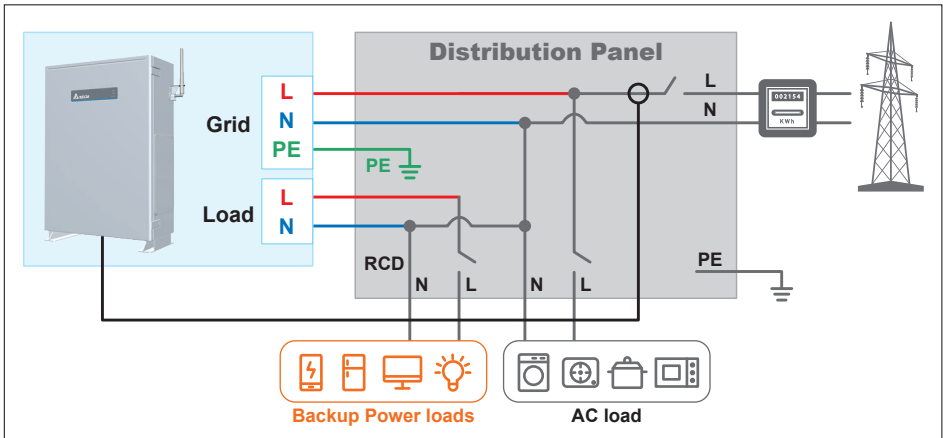


Figure 3-10 : AC connection in AU & NZ

The integrated all-pole sensitive RCMU provides additional safety. RCD Type A can be used for this unit. Minimum tripping current 30mA of the type A RCD is recommended for Load connection.

ATTENTION



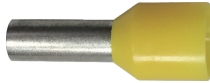
- Short circuit occurred at the backup power load may cause damage to the unit.
- Motor and half-wave rectification Load is not suitable for backup power load, it will lead to error and cause unit shut down.

3.5.3 AC Plug Assembly

CAUTION: Machine And Equipment Damage May Occur!



- Please make sure to use the proper size AC cable.
- Please choose the terminals as shown below for wires crimping.
- Failed to follow these instructions may cause AC plug damage.



Follow the steps below to strip the wires before assembling the AC plug as shown in **Figure 3-11** :

- (1) Remove 55 mm (2.2 inch) of AC cable outer jacket.
- (2) Trim the L-N(Grid), L-N(Load) wire to 52.5 mm (2.0 inch).
- (3) Strip 12 mm (0.5 inch) of insulation from all wires ends.
- (4) Crimp terminals for all wires.

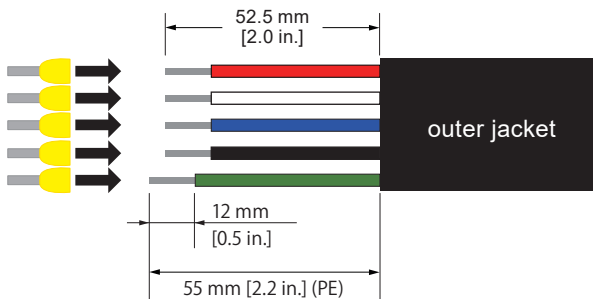


Figure 3-11 : Stripping the wires

DANGER: ELECTRICAL HARZARD!!



- Any electric power connected to the battery pack during cabling is prohibited.
- Please make sure any breaker is turned off before connecting cables.

Assemble the AC plug and wires as the procedures shown in **Figure 3-12**.
The AC wire must be connected to the AC plug according to the correct sequence.
The AC voltage should be L-N 230 Vac $\pm$ 10%.

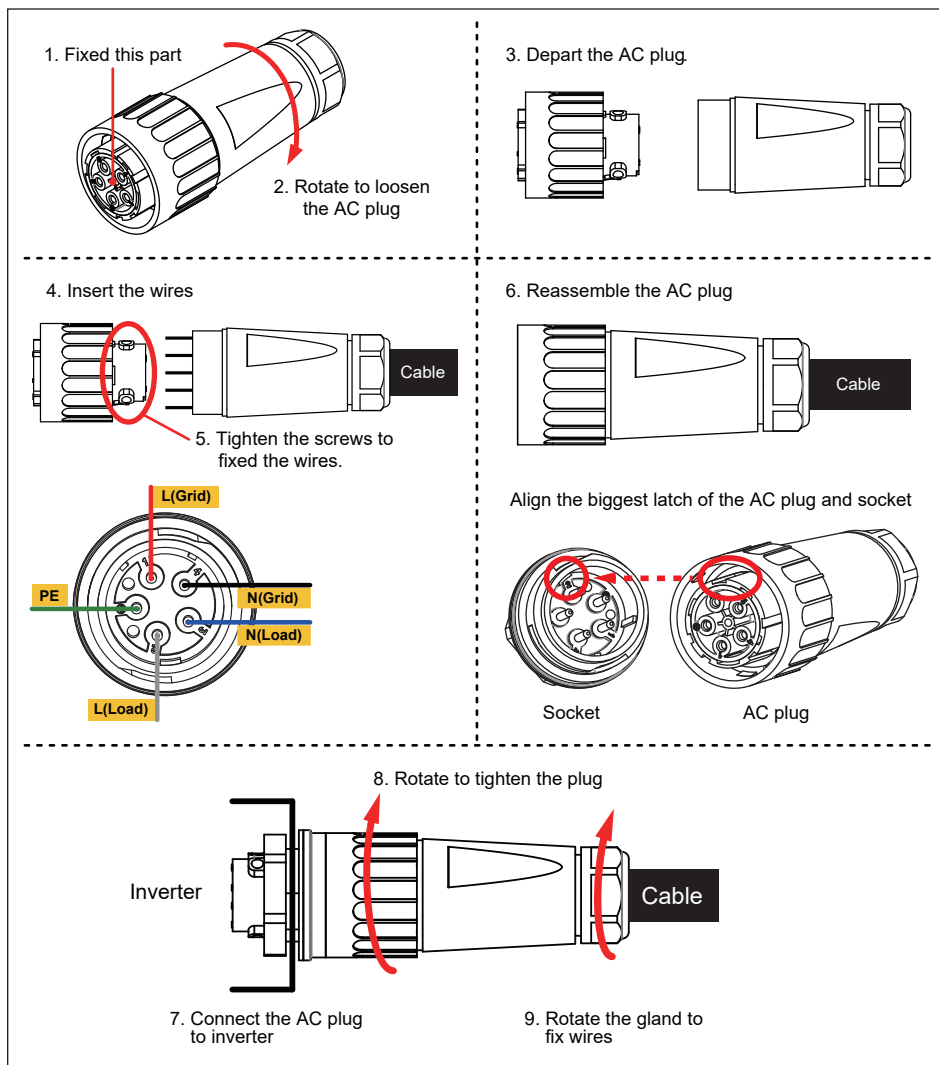


Figure 3-12 : AC plug illustration for BX6.3_AC

3.6 Communication Module Connections

Please refer to **Figure 3-13** for the Communication Module illustration.

The module provides VCC, RS-485, dry contact, and EPO terminals for different use. The maximum supply current of VCC(16V) is 0.8A. The maximum input rating of dry contact connector is 250Vac/ 30Vdc/ 9A.

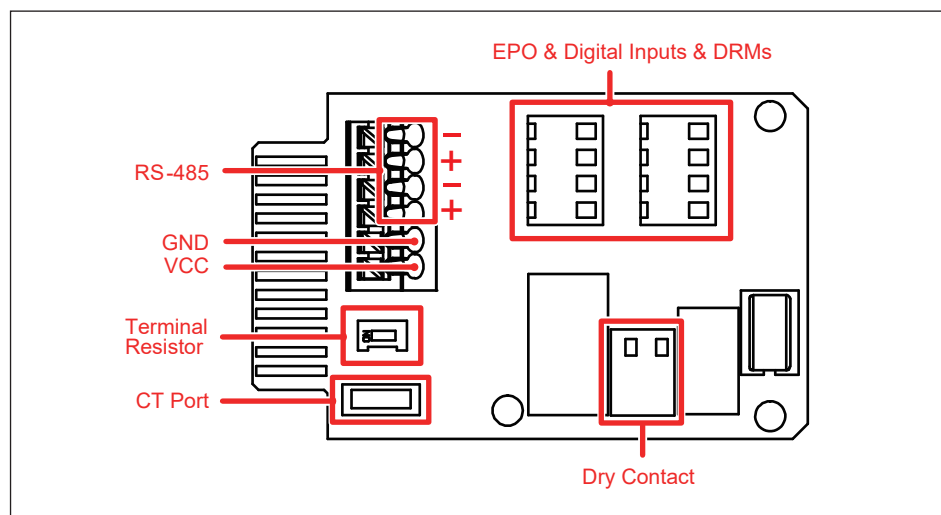


Figure 3-13 : Communication module

3.7 RS-485 Connection

The pin definition and data format of RS-485 is shown in **Table 3-2**.

Installers should switch ON the terminal resistor when single inverter is installed.

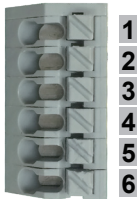
PIN	Function		Data Format
1	VCC(+16V)		Baud rate: 19200 Data bits: 8 Stop bit: 1 Parity: N/A
2	GND		
3	DATA+		
4	DATA-		
5	DATA+		
6	DATA-		
Maximum supply current of VCC(+16V): 0.8A			

Table 3-3 : Pin definition and data format of RS-485

3.8 Digital Input / DRM & EPO Functions

Communication Module has 1 set of emergency power off function (EPO). When the VCC and INV OFF pins are short-circuited, inverter will shut down immediately. The module also provides 6 sets of digital input function (K1~K6). Please refer to **Table 3-3** for the digital input definition. The suitable wire size is 30-16 AWG.

Short	Inverter's action
VCC & INV OFF	Emergency power off (EPO)
VCC & K1	0% active power
VCC & K2	Maximum 30% active power
VCC & K3	Maximum 60% active power
VCC & K4	Maximum 100% active power
VCC & K5	Reserved
VCC & K6	Reserved

Table 3-4 : Definition of digital input & EPO functions

In Australia and New Zealand, the Demand Response Modes (DRMs) are also use digital input function to assert. The definition is different from normal digital input function; please refer to **Table 3-4** for the DRMs pin definitions.

Short	Inverter's action	
VCC & INV OFF	DRM 0 (Disconnect from grid)	Charge/Discharge mode
VCC & K1 & K5	DRM 1 (0%)	Charge mode
VCC & K2 & K5	DRM 2 (50%)	
VCC & K3 & K5	DRM 3 (75%)	
VCC & K4 & K5	DRM 4 (100%)	
VCC & K1	DRM 5 (0%)	Discharge mode
VCC & K2	DRM 6 (50%)	
VCC & K3	DRM 7 (75%)	
VCC & K4	DRM 8 (100%)	

Table 3-5 : Definition of digital input & EPO functions

3.9 Dry Contact Connection

Communication Module has 1 set of Dry Contact. The maximum input rating of dry contact connector is 250Vac/ 30Vdc/ 9A. The trigger condition of this function can be customized by Installer. When the function is triggered, the output two ports will be short-circuited.

It allows following configuration:

- Fault indicator or Grid status indicator
- Power production
- Control of external loads
- Fan control

3.10 CT Connection

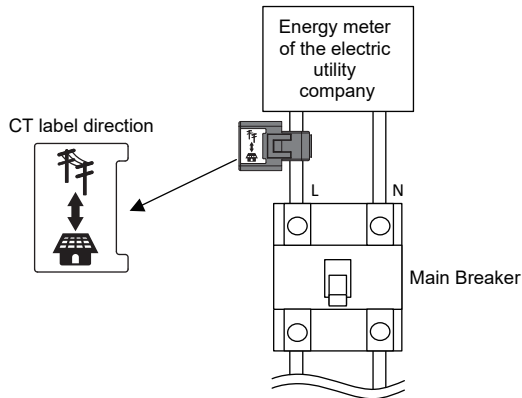
BX6.3_AC has internal meter, which can measure household power usage. Please refer to **figure 3-14** to install Current Transformer inside the main distribution panel for the current flow sensing.

DANGER : ELECTRICAL HAZARD!!



- When installing this product you must adhere to the following instructions:
 - The product is intended to be installed and operated by qualified personnel or service personnel only.
 - Do not power up the device before installation is complete.
 - All circuit breakers must be in the OFF position before commencing installation.

1. The CT can be opened.
2. Take the CT clip on the Line conductor wire.
3. Take note of the direction of CT installation. Arrow symbol means utility grid.



4. Connect the CT wires to the device.
5. Put in the CT wire into the CT port.

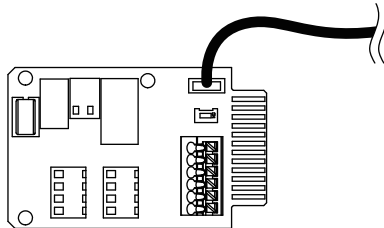


Figure 3-14 : Current Transformer installation

3.11 Battery Pack Expansion

WARNING !



- Before to expansion battery pack, please power OFF the unit entirely to avoid risk of electrical shock.
- Please check the battery pack regularly. If there are any impaired or loose parts, please contact your installer. Ensure that there are no fallen objects.

DELTA BX6.3_AC can be extended to maximum one extra battery pack to become BX12.6_AC.

The battery expansion can be achieved by

1. Connect positive/negative cable to BX6.3_EX
2. Connect Communication cable (3 wires) to BX6.3_EX
3. Connect grounding cable to BX_6.3_EX grounding conductor

The battery pack expansion is shown in Figure 3-14

Please make sure the polarity is connected correctly.

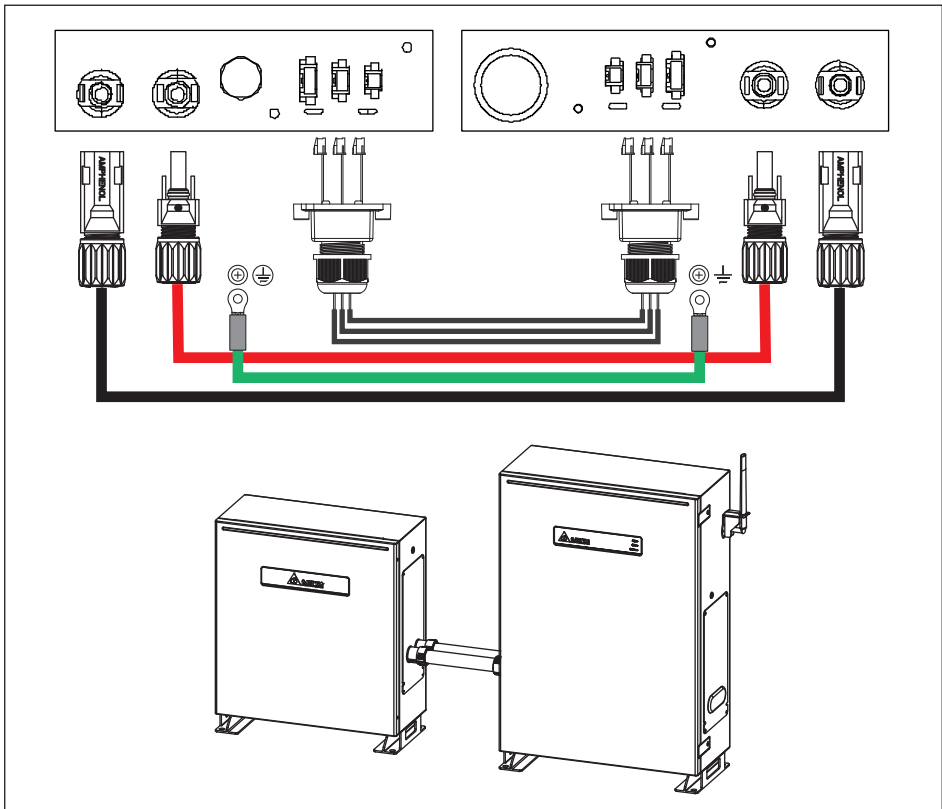


Figure 3-15 : Expanding the Battery Pack with DC(BT+/-) cables

4 Startup

To startup BX6.3_AC, please follow the steps below:

1. Turn ON the AC grid breaker.
2. Ensure the LED light-on, follow the "MyDeltaSolar" APP user's guide to operate the APP.
3. When DC1 is also in the system, please ensure the connection between DC1 and BX6.3_AC and check if DC1 is powered correctly.

How to make Wi-Fi communication with BX6.3_AC:

1. Turn on the device's Wi-Fi function.
2. Select the Wi-Fi SSID: Delta-[serial number]
(e.g. Delta-O9J20500001W0; See **Figure 2-5** "Rating labels of DELTA BX6.3_AC")
3. Enter the Wi-Fi password: DELTASOL
(The Default password is also printed on the Rating label)
4. Use the "MyDeltaSolar" APP (You can download the APP via google play or App Store)

Please note :

- (1) The product only support one device communicating at the same time.
- (2) If the Wi-Fi password is forgotten, press and hold the Reset Button more than 20s to return the Default password to "DELTASOL"

Due to the variety of installation environments, installation of the unit and start-up procedures must be carried out by an accredited technician. Incorrect settings may cause the inverter to malfunction.

4.1 Operation Mode

BX6.3_AC has 6 normal operation modes for users to choose.

Each mode has different behavior between battery, grid, and home load.

The following are the description of these modes.

In some area, the detail behavior of each operation mode may be different due to the local electricity regulations.

4.1.1 Self-consumption mode

Self-consumption mode is standard mode when BX6.3_AC installed with another PV system.

In this mode, BX6.3_AC is operated in following priority :

1. Charge the battery with the excess PV energy which feed-in to the grid until the battery is fully charged.
2. Discharge the battery when the PV energy is insufficient to provide the home load consumption until the battery is fully discharged.

When there is no PV power, battery starts to discharge and supply home load until it's empty.

If the time setting function is enabled, the behavior of the BX6.3_AC will according to the time setting in priority. The detail operation of time setting function is described in Chapter 4.2.

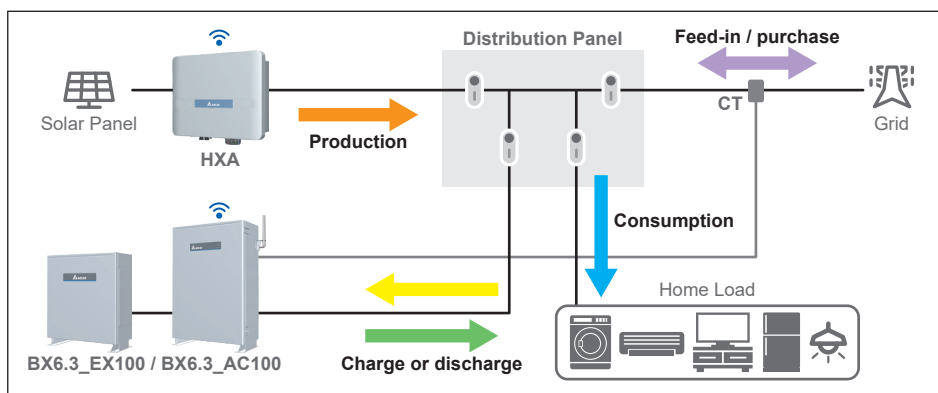


Figure 4-1 : Self-consumption mode current flows

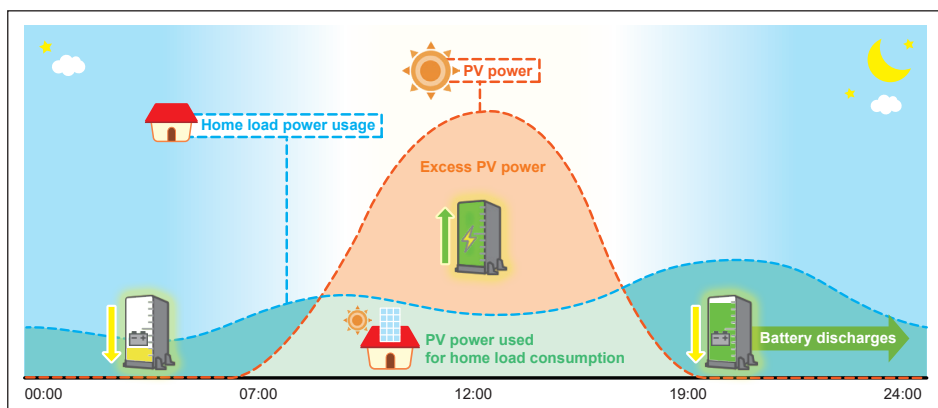


Figure 4-2 : Self-consumption mode behavior

4.1.2 Peak cut mode

Under this mode, the home load will consume the power from the grid within the setting value in priority . When the home load consumption exceeds the setting value, battery will be discharged to supply the extra load. Peak cut power can be assigned in the function setting page.

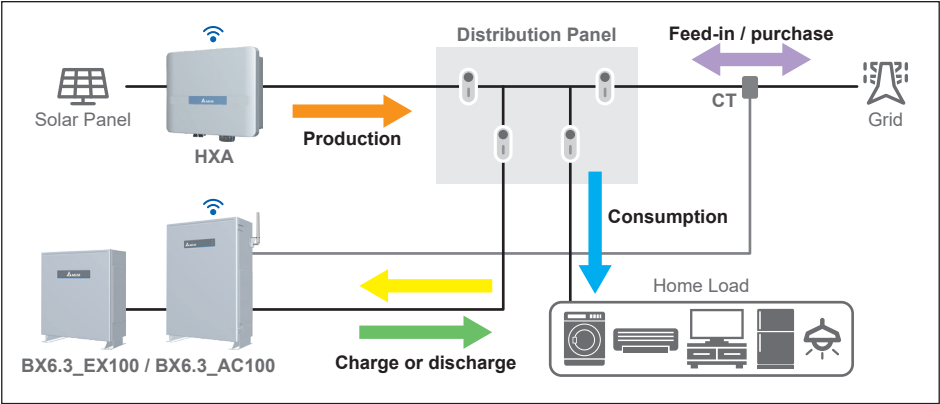


Figure 4-3 : Peak cut mode current flows

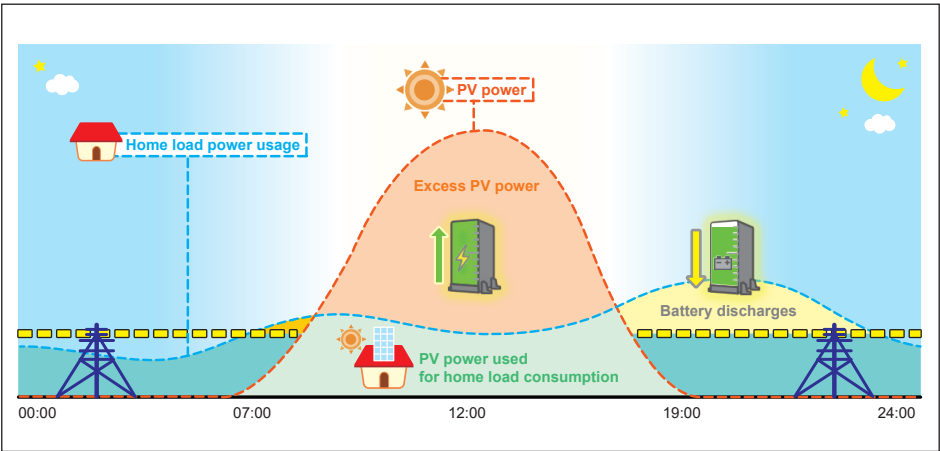


Figure 4-4 : Peak cut mode behavior

4.1.3 Selling first mode

Selling first mode is a standard mode combining with 6 time settings. In this mode, BX6.3_AC is operated in following priority:

1. If users have set the time settings, inverter will change behavior in these time intervals
2. Discharge the battery when purchased power from grid is detected until battery empty.

Please refer to 4.2 Function Setting chapter for more detail about time settings.

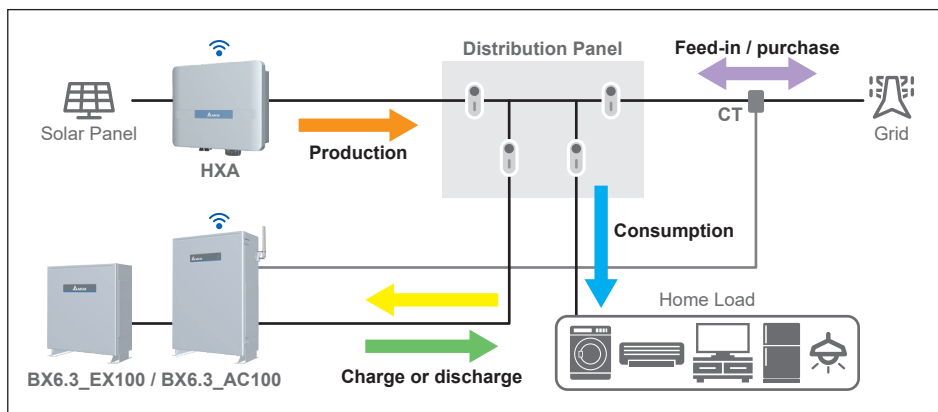


Figure 4-5 : Selling first mode current flows

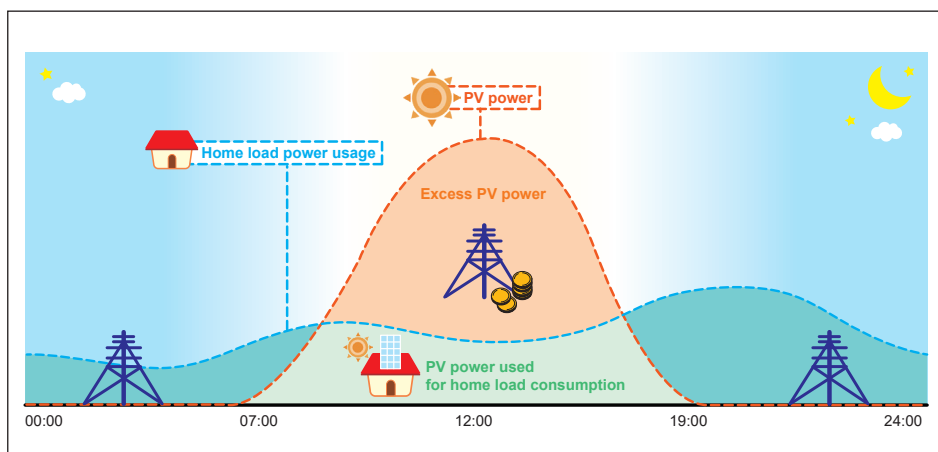


Figure 4-6 : Selling first mode behavior

4.1.4 Charge mode

In this mode, battery will be charged by PV or grid in priority, after battery is fully charged, the remaining PV power then feed-in to home load and grid. Battery will not be discharged in this mode even there is demand in the home load.

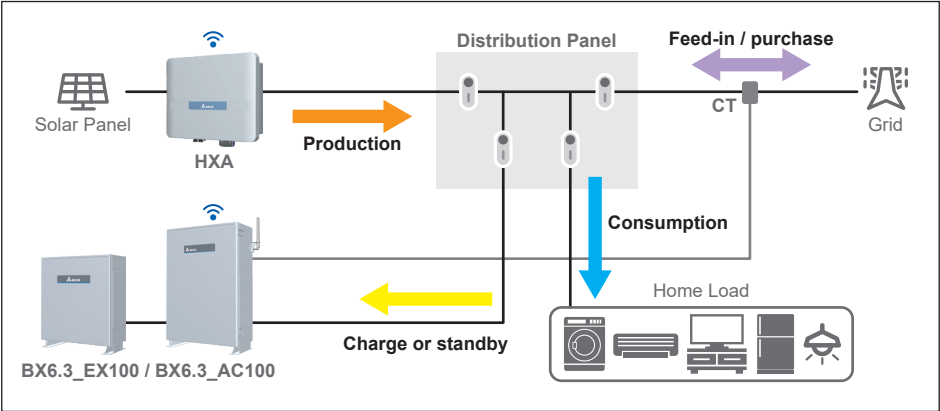


Figure 4-7 : Charge first mode current flows

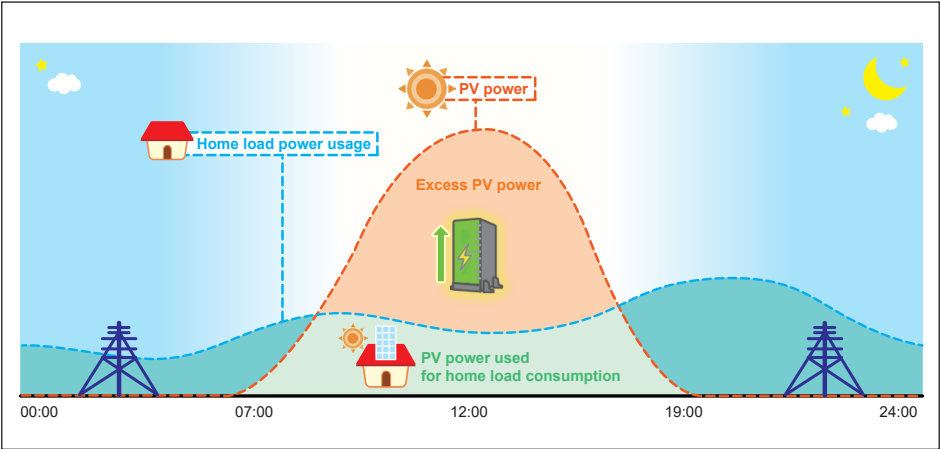


Figure 4-8 : Charge first mode behavior (general)

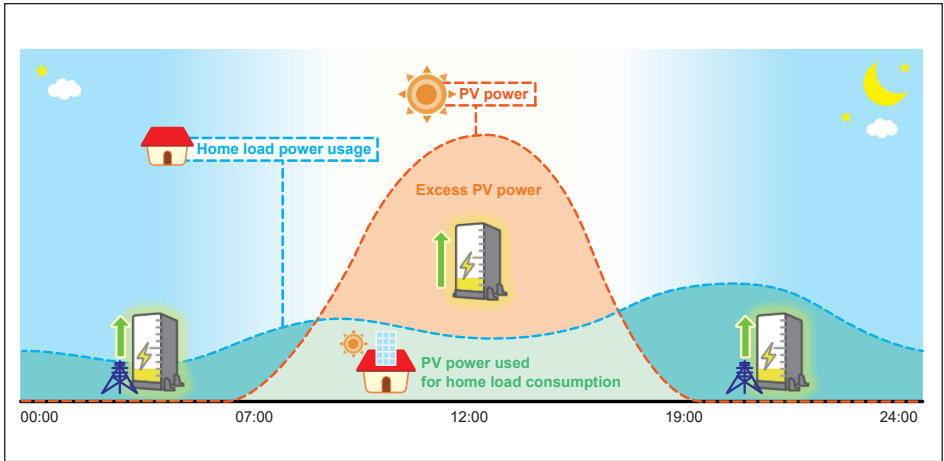


Figure 4-9 : Charge first mode behavior (for AU & NZ)

4.1.5 Discharge first mode

In this mode, the battery will only be discharged depends on the load consumption. It will not be charged even there is excess PV power. All the PV power is feed-in to home load and grid. Battery will keep discharging when there is demand in the home load until it fully discharged.

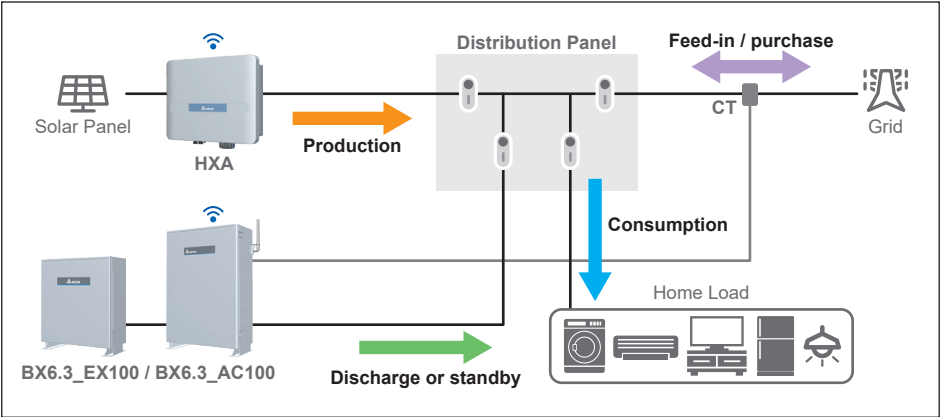


Figure 4-10 : Discharge first mode current flows

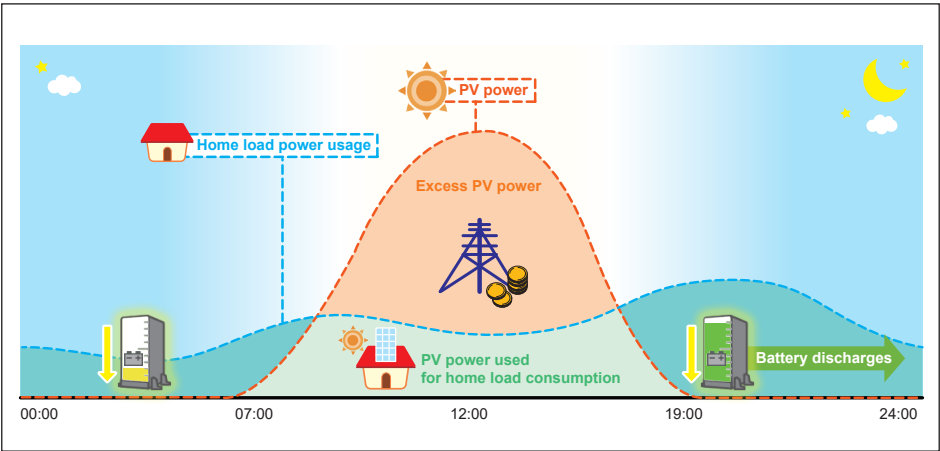


Figure 4-10 : Discharge first mode behavior

4.1.6 Special Modes

In addition to the above mentioned modes, there are 1 special modes in BX 6.3_AC. These modes are passive modes, they will be enabled automatically under special condition.

• Standalone mode

BX6.3_AC changes to standalone mode automatically during a power outage occur. At this time, grid side is disconnected and home load are supported by battery power as much as possible.

BX6.3_AC can be micro-grid under this mode, to provide simulated grid for load and PV inverter.

Model	Max charge / discharge load current
BX6.3_AC	13 A
BX12.6_AC	19.6 A

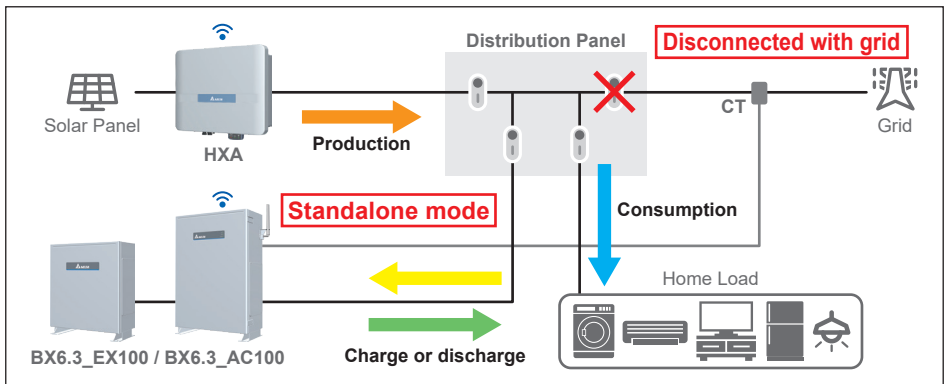


Figure 4-12 : Standalone mode current flows

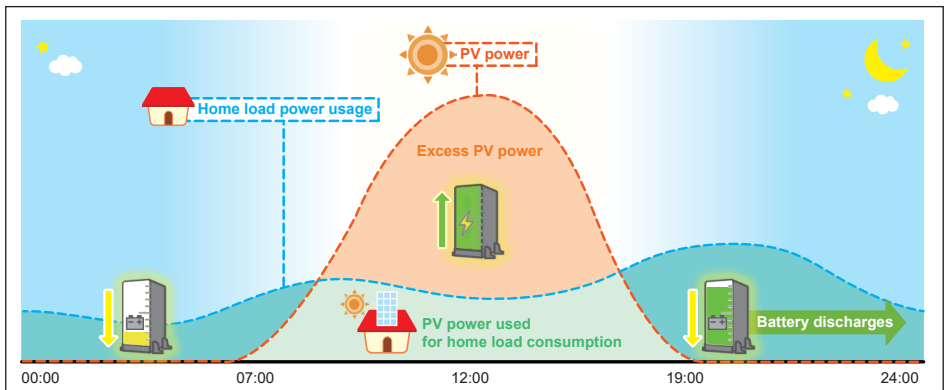


Figure 4-13 : Standalone mode behavior

• Forced charge mode

Although battery stops any action when SOC (state of charge) reach 0%, the self-discharge phenomenon may still causing SOC lower than 0%.

At this time, BX6.3_AC will force battery charging from PV power and grid power until the battery SOC reaching SOC limit setting (default is 30%).

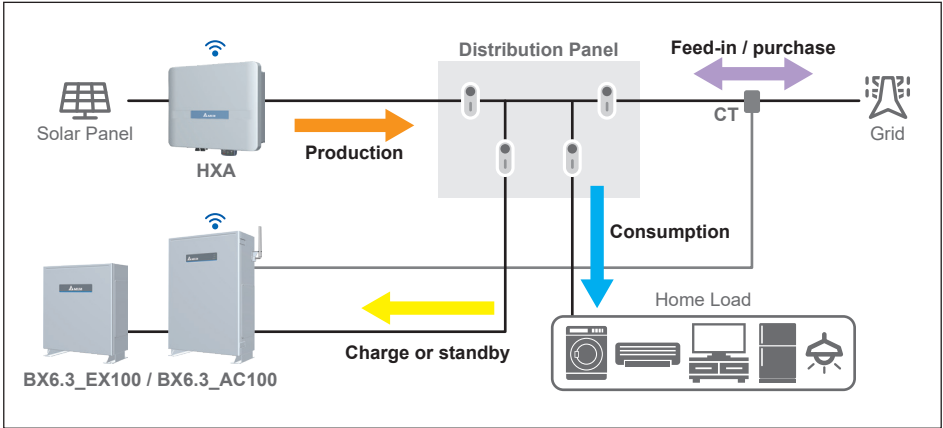


Figure 4-14 : Forced charge mode current flows

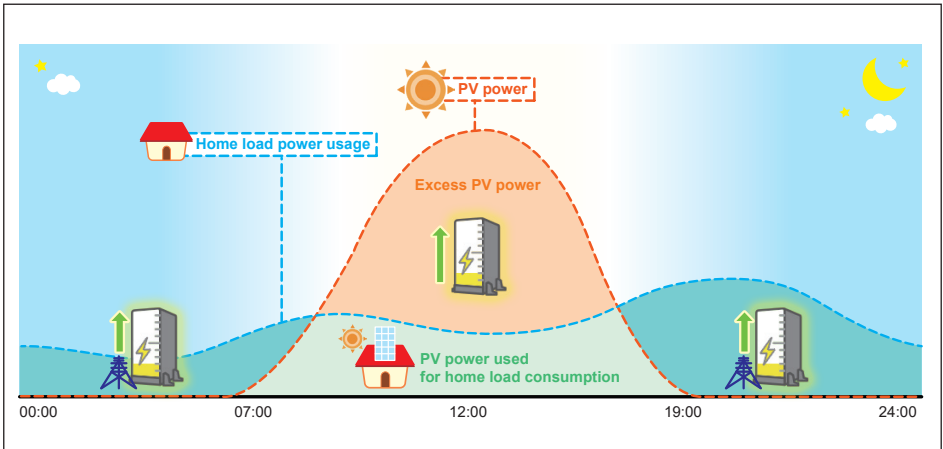


Figure 4-15 : Forced charge mode behavior

4.2 Function Setting

In function settings page, you can assign SOC limit, peak cut power, and BT charge / discharge time interval.

- **SOC Limit**

You can assign the lower limit of battery SOC. Battery will stop discharging when its SOC reach this limit.

- **Peak Cut Power**

Peak cut power is used in peak cut mode. You can assign the peak power of home load usage from grid. When the home load consumption exceeds this value, battery will discharge to supply remaining power.

- **Time Settings**

Time settings can be separated into BT charge time and BT discharge time. Each setting has 3 time setting intervals. The time setting of all the intervals cannot overlap with each other.

Time setting function is only available under self-consumption mode and selling first mode. Under either mode, BX6.3_AC will automatically switched to charge first/discharge first mode according to the time setting function and switched back to the original mode when the time is out of the setting interval.

5 Maintenance

Warning ! Electric Shock



- Before any maintenance, please make sure you are well insulated to avoid risk of electric shock.

In order to ensure the normal operation of inverter, please check and clean the unit regularly. Once there are any impaired or loose parts, please contact your inverter installer.

6 Error message and Trouble Shooting

ERROR			
Code	Message	Cause	Action
E01	AC Freq High	Grid frequency over the limit of electricity regulation.	Check the grid frequency. If grid frequency is not in acceptable range, contact the utility operator to modify it. If grid frequency lies in acceptable range but the error still exist, please contact your inverter supplier.
E02	AC Freq Low	Grid frequency under the limit of electricity regulation.	Check the grid frequency. If grid frequency is not in acceptable range, ask the utility operator to modify it. If grid frequency lies in acceptable range but the error still exist, please contact your inverter supplier.
E07	Grid Quality	Grid harmonic distortion >8.5% and >2.2s	Check AC wiring; keep the wire short and straight. Contact the utility operator to improve the grid quality. If the grid quality is good but the error still exist, please contact your inverter supplier.
E09	No Grid	Grid voltage <20V or voltage half-cycle > 50ms	Check the triggering of upstream circuit breaker. Check the wire connection between inverter side and grid side. Contact the utility operator for the information about power failure.
E10	AC Volt Low	Grid voltage under the limit of electricity regulation.	Check the grid voltage. If grid voltage is not in acceptable range, ask the utility operator to modify it. If grid voltage lies in acceptable range but the error still exist, please contact your inverter supplier.
E11	AC Volt High	Grid voltage over the limit of electricity regulation.	Check the grid voltage. If grid voltage is not in acceptable range, ask the utility operator to modify it. If grid voltage lies in acceptable range but the error still exist, please contact your inverter supplier.
E12	AC Volt High	Grid voltage over the limit of electricity regulation.	Check the grid voltage. If grid voltage is not in acceptable range, ask the utility operator to modify it. If grid voltage lies in acceptable range but the error still exist, please contact your inverter supplier.

ERROR			
Code	Message	Cause	Action
E13	AC Volt High	Grid voltage over the limit of electricity regulation.	Check the grid voltage. If grid voltage is not in acceptable range, ask the utility operator to modify it. If grid voltage lies in acceptable range but the error still exist, please contact your inverter supplier.
E34	Insulation (Insulation Fault)	BT to ground Impedance in either input < 550 kohm	Check the insulation of DC wiring. For Delta cloud registered user, system will send alarm message to your e-mail when this Error code occurred.

Table 6-1 : Error Message

Fault			
Code	Message	Cause	Action
F01	DC Injection	DC component in grid current over the limit	Check the power supply line for direct current. Contact the utility operator to improve the grid quality.
F05	Temp High (Temperature High)	Internal temperature too high to cause power output < 5%	Check the temperature of installation environment. Contact your inverter supplier.
F06	HW NTC1 Fail (Amb Temp Fault)	Internal fault	Contact your inverter supplier.
F07	Temp Low (Temperature Low)	Internal temperature < -25°C	Check the temperature of installation environment. Contact your inverter supplier.
F08	HW NTC2 Fail (Boost Temp Fault)	Internal fault	Contact your inverter supplier.
F09	HW NTC3 Fail (Bidir. Temp Fault)	Internal fault	Contact your inverter supplier.
F10	HW NTC4 Fail (Inverter Temp Fault)	Internal fault	Contact your inverter supplier.
F13	HW RLY (AC RLY Fault)	Internal device fault	Contact your inverter supplier.
F15	HW DSP ADC1 (AC Sensor Fault)	Internal fault	Contact your inverter supplier.
F16	HW DSP ADC2 (Vdc Sensor Fault)	Internal fault	Contact your inverter supplier.
F17	HW DSP ADC3 (Idc Sensor Fault)	Internal fault	Contact your inverter supplier.
F18	HW Red ADC1 (AC Sensor Fault)	Internal fault	Contact your inverter supplier.
F19	HW Red ADC2 (Idc Sensor Fault)	Internal fault	Contact your inverter supplier.

Fault			
Code	Message	Cause	Action
F22	HW COMM2 (Red COMM Fault)	Internal fault	Contact your inverter supplier.
F23	HW COMM1 (DSP COMM Fault)	Internal fault	Contact your inverter supplier.
F24	Ground Cur. (Ground Cur. High)	Residual current over the limit DC > 150mA	Check the insulation of DC wiring.
F27	RCMU Fail (RCMU Fault)	Internal device fault	Contact your inverter supplier.
F28	RLY Short (AC RLY Short)	Internal device fault	Contact your inverter supplier.
F29	RLY Open (AC RLY Open)	Internal device fault	Contact your inverter supplier.
F30	Bus Unbal. (Bus Unbalance)	Internal fault	Contact your inverter supplier.
F31	HW Bus OVR (Bus Voltage High)	Internal fault	Contact your inverter supplier.
F33	HW Bus OVR (Bus Voltage High)	Internal fault	Contact your inverter supplier.
F35	HW Bus OVR (Bus Voltage High)	Internal fault	Contact your inverter supplier.
F36	AC Cur. High (AC Current High)	Grid current >135% rated and keep over 50ms	Contact your inverter supplier.
F37	AC Cur. High (AC Current High)	Grid current >125% rated and keep over 5s	Contact your inverter supplier.
F42	HW CT (AC CT Fault)	Internal device fault	Contact your inverter supplier.
F45	HW AC OCR (AC Current High)	AC current over the limit 20 times within 2s	Check AC and DC wiring for ground faults. Inverter may be struck by the lightning. Check the whole wiring of hybrid system. If this fault occurs often, please contact your inverter supplier.
F48	SA OPP (SA Over Load)	System overload	In standalone mode, PV and BT power is insufficient to supply the home load. Please reduce the load.

Fault			
Code	Message	Cause	Action
F50	HW ZC Fail (ZC Circuit Fault)	Internal fault	Contact your inverter supplier.
F97	BT OVP	Battery system internal fault	Contact your inverter supplier.
F98	BT UVP	Battery system internal fault	Contact your inverter supplier.
F99	BT OTP	Battery system internal fault	Contact your inverter supplier.
F100	BT UTP	Battery system internal fault	Contact your inverter supplier.
F101	BT OCP	Battery system internal fault	Contact your inverter supplier.
F102	BT CVI	Battery system internal fault	Contact your inverter supplier.
F103	BT TF	Battery system internal fault	Contact your inverter supplier.
F104	BT PF	Battery system internal fault	Contact your inverter supplier.
F112	HW COMM BT	Loss communication between inverter and battery over 10 seconds.	Check CAN connection between inverter and battery.
F113	BT EOL	Battery system SOH < 50%	Contact your inverter supplier.

Table 6-2 : Fault Message

7 De-Commissioning

WARNING !



- To avoid injuries, please follow the procedures to unload the inverter.

If it is necessary to put the device out of operation for maintenance or storage, please follow the procedures below:

At inverter side:

1. Push Power button until BX6.3_AC shutdown, all LED indicators will show "OFF" status.
2. Switch off AC power line breaker to disconnect from grid.
3. Wait for all LED indicator turning off.
4. Remove the AC and battery wiring.
5. Remove the communication module RS-485 connection from the computer connection.

Now you may unload the inverter.

8 Technical Data

Model	BX6.3_AC	BX12.6_AC
GENERAL		
Enclosure	Aluminum with powder coating	
Operating temperature	-10°C ~ 45°C *	
Operating Altitude	0 to 2000m (0 to 6666 ft.)	
Relative humidity	0% – 95% non-condensing.	
Environmental category	Indoor / Outdoor	
Protection degree	IP65 (Electronics)	
Pollution degree	PD 2	
Overvoltage category	AC output :III	
Galvanic isolation	NO	
Safety class	Class I metal enclosure with protective earth	
Weight	77kg	77 kg (BX6.3_AC) + 59 kg (BX6.3_EX)
Dimensions(W*H*D)	570 × 840 × 250 mm	570 × 840 × 250 mm + 520 × 600 × 230 mm
Connectors	Weather resistant connectors	
Audible noise	< 40dB	
BT INPUT		
Type	Li-ion	
Battery Module	Samsung 41J(21700)	
Typical Energy	6.3 kWh	12.6 kWh
Typical Voltage	DC 200 V	DC 400 V
Voltage Range	DC 175 - 228 V	DC 350 - 456 V

* 0 degree for the first time installation.

Model	BX6.3_AC	BX12.6_AC
AC INPUT / OUTPUT		
Nominal power	3000VA	4500VA
Maximum power	3000VA	4500VA
Voltage	According to country setting (Programmable 230Vac $\pm$ 20%)	
On Grid Nominal current	13A	19.6A
Stand-Alone Nominal current	13A	19.6A
Inrush current	16A / 100us	
Maximum output fault current (rms)	25A	25A
Maximum overcurrent protection	25A	25A
Frequency	Rated 50/60 Hz (Programmable 45-65 Hz)	
Active anti-islanding method	Reactive power injection	
Total harmonic distortion	< 3 %	
Power factor	> 0.99 @ full power Output adjustable: 0.80 leading – 0.80 lagging	
Output current DC component	< 0.5% rated current	
Tare loss	< 25W	
Maximum efficiency	96.5%	
EU efficiency	96%	
AC connector	ST port	

Model		BX6.3_AC	BX12.6_AC
SYSTEM INFORMATION / COMMUNICATION			
User interface		Wi-Fi connection	
		365 days data logger and real time clock	
		30 events record	
External communication		2 RS-485 connections	
REGULATIONS & DIRECTIVES			
CE conformity		Yes	
Grid interface		AS/NZS 4777.2 :2015	
Emission		EN 61000-6-3	
Harmonics		EN 61000-3-2	
Variations and flicker		EN 61000-3-3	
Immunity		EN 61000-6-2	
Immunity	ESD	IEC 61000-4-2	
	RS	IEC 61000-4-3	
	EFT	IEC 61000-4-4	
	Surge	IEC 61000-4-5	
	CS	IEC 61000-4-6	
	PFMF	IEC 61000-4-8	
Electrical safety		IEC 62619:2017, IEC 62040-1:2017	

Table 8-1 : Specifications for BX6.3_AC

Model Listing

Model	Inverter	Battery	Wi-Fi
BX6.3_AC100	 (BX6.3_AC100)		 (BX6.3_AC100)
BX12.6_AC100 (BX6.3_AC100 associated with BX6.3_EX100)	 (BX6.3_AC100)	 (BX6.3_EX100)	 (BX6.3_AC100)
BX6.3_AC101	 (BX6.3_AC101)		
BX12.6_AC101 (BX6.3_AC101 associated with BX6.3_EX100)	 (BX6.3_AC101)	 (BX6.3_EX100)	
BX6.3_EX100*		 (BX6.3_EX100)	

* BX6.3_EX100 can only be used with the BX6.3_AC100 / BX6.3_AC101.

