



# Backup Box User Manual

 Version 1.0

**Note:** Before proceeding, ensure you are using the most recent authorised release.

Initial Release: 1/02/2026

[entelarenergy.co.nz](http://entelarenergy.co.nz)



# Thank you for choosing this Device

This manual outlines the essential electrical and mechanical specifications required before installing the Backup Box and includes critical safety information for personnel involved in installation, commissioning, and operation.

**Important:** The warranty is valid only if the unit is installed correctly. Failure to follow the procedures and specifications in this manual may void the warranty.

This document supports the safe and compliant integration of the Backup Box within a photovoltaic (solar) generation system, detailing procedures to protect both equipment and personnel.

It is intended for qualified installers and system owners and includes recommended safety practices, operational guidelines, and maintenance considerations to ensure optimal performance and longevity.



Level 3, 46 Sale Street, PO Box 90314, Auckland Central 1010

Operating hours – 8:30am – 5:00pm

# About this manual



## ⚡ Purpose

This manual introduces the installation, electrical connection, adjustments, usage, maintenance, and troubleshooting of the Backup Box.

Before installing and operating the Backup Box, please read this manual carefully. Be aware of the safety information and familiarise yourself with the functions and characteristics of this device.

## ⚡ Reader

The users of this manual are:

- Backup Box installer
- Backup Box user

## ⚡ Symbol

Definition of the symbols in this manual are as follows:



### DANGER

Indicates a hazard with a **high** level of risk which, if not avoided, will result in death or serious injury.



### WARNING

Indicates a hazard with a **medium** level of risk which, if not avoided, could result in death or serious injury.

### NOTICE

Indicates a potentially hazardous situation which, if not avoided, could result in equipment damage, data loss, performance deterioration, or unanticipated results. **NOTICE** is used to address practices not related to personal injury.

# Contents

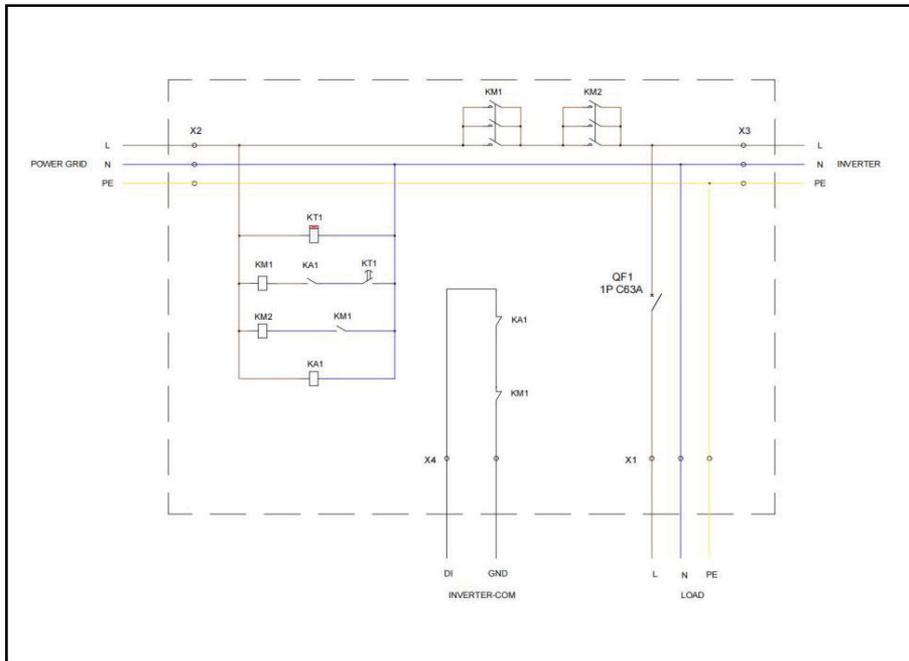
## ⚡ Table of Contents

<b>1. Product Introduction</b>	<b>3</b>
1.1 System Diagram	3
1.2 Packing List of Backup Box	4
<b>2. Safety</b>	<b>5</b>
2.1 Safety Notice	5
2.2 Disclaimers	6
2.3 Operator Requirements	7
2.4 Protecting Labels	7
<b>3. Transportation &amp; Storage</b>	<b>8</b>
3.1 Storage Environment	8
3.2 Stacking Restrictions	8
3.3 Use After Long-Term Storage	8
<b>4. Equipment Installation &amp; Wiring</b>	<b>9</b>
4.1 Checking Before Installing	9
4.2 Installation Tools	10
4.3 Mounting Accessories	11
4.4 Backup Box Installation	12
4.5 Wire Connecting	15
4.6 Check Before Power-On	17
<b>5. Troubleshooting of Backup Box</b>	<b>18</b>
<b>6. Removing &amp; Disposing of Backup Box</b>	<b>19</b>
<b>About Entelar Energy</b>	<b>20</b>

# 1. Product Introduction

## ⚡ 1.1 System Diagram

The Schematic diagram is as follows:



**Figure 1-1**

Schematic diagram for Single Phase Backup Box

## ⚡ 1.2 Packing List of Backup Box

Packing list of Backup Box for single phase.

No.	Item	Specification	Qty	Unit
1	Backup Box	CFHB-S10	1	Pcs
2	Installation Accessories	Mounting plate-A .....1pcs Mounting plate-B .....1pcs Mounting plate-C .....1pcs Screws M6 × 10 .....5pcs Screws ST6.3×60 T30.....4pcs Expansion tube φ6×60 T30 .....4pcs	1	Set
3	Inspection Report	\	1	Pcs
4	Installation Dimensions	\	1	Pcs
5	Quality Certificate	\	1	Pcs

## 2. Safety

### ⚡ 2.1 Safety Notice

The Backup Box is used in a residential rooftop PV plant system to control the inverter grid-tied or off-grid state. When the grid fails, the inverter switches to the off-grid state and supplies power to off-grid loads in backup mode. When the grid recovers, the inverter switches back to the grid-tied state.

Improper use of the Backup Box may cause harm to life and health of personnel as well as damage to the Backup Box and other items. The following points must therefore be observed to comply with the intended use of the system:

- ⚡ Before performing operations, read through this manual and follow all the precautions to prevent accidents. The DANGER, WARNING, CAUTION, and NOTICE statements in the document do not represent all the safety instructions. They are only supplements to the safety instructions.
- ⚡ Only certified electricians are allowed to install, connect cables, commission, maintain, and troubleshoot the product, and they must understand basic safety precautions to avoid hazards.
- ⚡ The transport and storage conditions must be observed.



## ⚡ 2.2 Disclaimers

Entelar Group shall not be liable for any consequence caused by any of the following:

- ⚡ Damage during the transportation by the customer.
- ⚡ Storage conditions that do not meet the requirements specified in this document.
- ⚡ Incorrect storage, installation, or use.
- ⚡ Installation or use by unqualified personnel.
- ⚡ Failure to follow the operation instructions and safety precautions in this document.
- ⚡ Operation in extreme environments which are not covered in this document.
- ⚡ Operation beyond specified ranges.
- ⚡ Unauthorised modifications to the product or software code or removal of the product.
- ⚡ Device damage due to force majeure (such as earthquake, fire, and storm).
- ⚡ Warranty expiration without extension of warranty service.
- ⚡ Installation or use in environments which are not specified in relevant international standards.
- ⚡ This device is designed to operate within standard AC voltage parameters (typically 230V). Variations in supply voltage outside normal operating ranges may affect performance.
- ⚡ Users should ensure that their electrical network meets applicable standards for voltage stability. The manufacturer is not responsible for issues arising from external power supply conditions.

## ⚡ 2.3 Operator Requirements

The installation, electrical connection, commissioning, maintenance, troubleshooting and replacement of the Backup Box must be performed by professional technicians. The operator must meet the following requirements:

- ⚡ Operation personnel should have received professional training and instructions.
- ⚡ Operation personnel should read through this document and follow all the instructions.
- ⚡ Operation personnel should be familiar with the safety standards relevant to electrical systems.
- ⚡ Operation personnel should understand the composition and working principles of the grid-tied PV system and be aware of local regulations.
- ⚡ Operation personnel must wear proper personal protective equipment (PPE).

## ⚡ 2.4 Protecting Labels

Do not scrawl on, damage, or block any warning label on the device.

# 3. Transportation & Storage

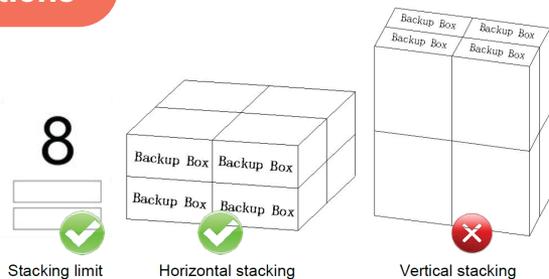
If the Backup Box does not need to be installed straight away, the following should be noted when storing.

## ⚡ 3.1 Storage Environment

The Backup Box should be stored in a cool, dry, water-free, steam-free or corrosive gas-free, dust-free environment with an ambient temperature not exceeding  $-25^{\circ}\text{C}\sim 60^{\circ}\text{C}$ . Design protection grade of Backup Box is IP54, but before installing wiring, the inlet and outlet holes are not locked and may be in open state. At this point, if exposed to rain or water vapour, ingress of water vapour or corrosive gas into the Backup Box may occur, and then affect the electrical performance of the Backup Box and safe use.

## ⚡ 3.2 Stacking Restrictions

Backup Box shall be stacked horizontally, vertical stacking is prohibited. When the boxes are stacked horizontally, there should be no more than 8 layers.



## ⚡ 3.3 Use After Long-Term Storage

If the Backup Box is stored for more than one year, the user should have it checked and tested by a professional person before use, or contact the manufacturer.

# 4. Equipment Installation & Wiring

## ⚡ 4.1 Checking Before Installing

The following cautions should be noted before installing the Backup Box.



### DANGER

Electric shock! Installation and operation by non-professional personnel is prohibited. Make sure the power is off during installation and maintenance/operation.



### DANGER

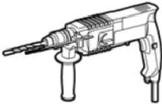
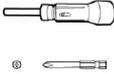
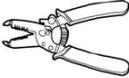
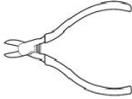
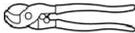
Do not operate BACKUP LOAD or GRID or INVERTER AC plug when the load is on.



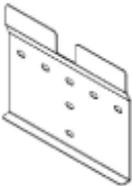
### DANGER

If one of three connectors need to be disconnected, make sure all three plugs (BACKUP LOAD plug or GRID plug for INVERTER AC plug) are disconnected. After disconnecting all the plugs, wait for no less than 5 minutes to make sure no electricity is left in the box.

## ⚡ 4.2 Installation Tools

Type	Tools			
Installation Tools				
	Hammer drill: Drill bit $\phi$ 10 mm	Socket wrench set	Multimeter AC voltage measurement range $\geq$ 600 V AC	Torque screwdriver Phillips head: M6
				
	Removal wrench Model: H4TW0001; manufacturer: Amphenol	Crimping tool Model: H4TC0003/ H4TC0002; manu- facturer; Amphenol	Wire stripper	Diagonal pliers
				
	Utility knife	Cable cutter	OT terminal crimping tool	Hammer
				
	Measuring tape	Bubble or digital level	Vaccum cleaner	Cable tie
				
	Marker	Safety goggles	Anti-dust respirator	Safety shoes
PPE				
	Safety gloves			

## ⚡ 4.3 Mounting Accessories

No.	Item	Picture	Quantity
1	Mounting Plate-A		1pcs
2	Mounting Plate-B		1pcs
3	Mounting Plate-C		1pcs
4	ST6.3 Screws		4pcs
5	Plastic Expansion Tube		4pcs
6	Screws		5pcs

## ⚡ 4.4 Backup Box Installation

- ⚡ Backup Box can only be installed indoors and far from heat sources.
- ⚡ Backup Box should be bolted on the wall with a right angle (see images below).
- ⚡ Backup Box should be installed under the following installation tilts (refer to the images below).

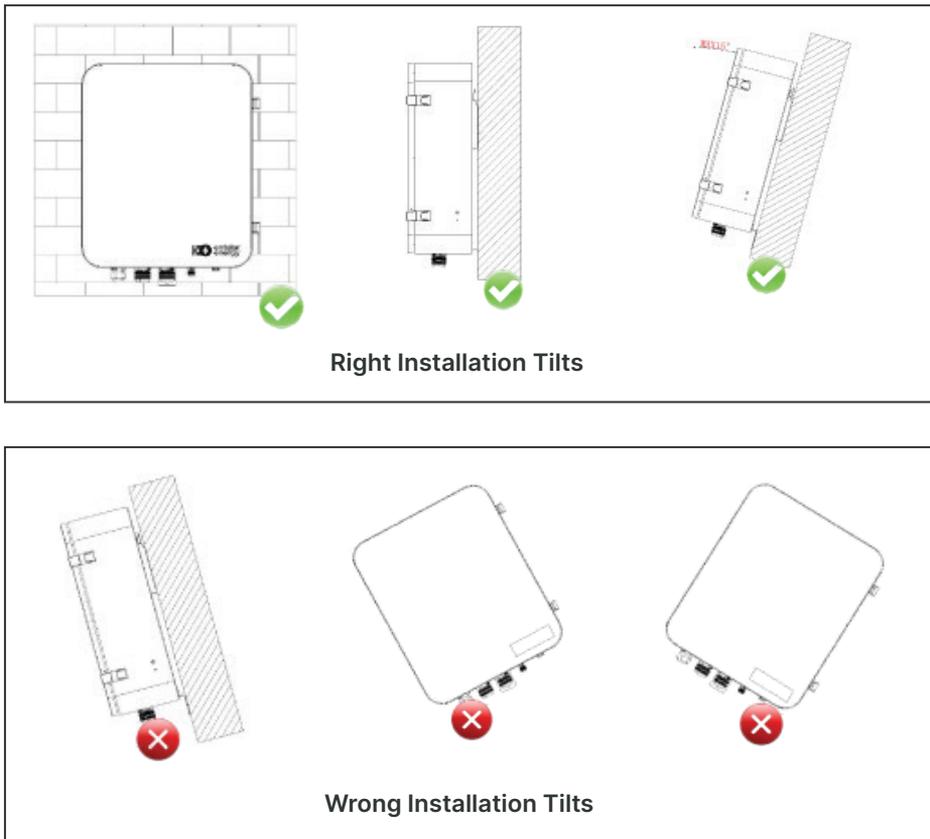
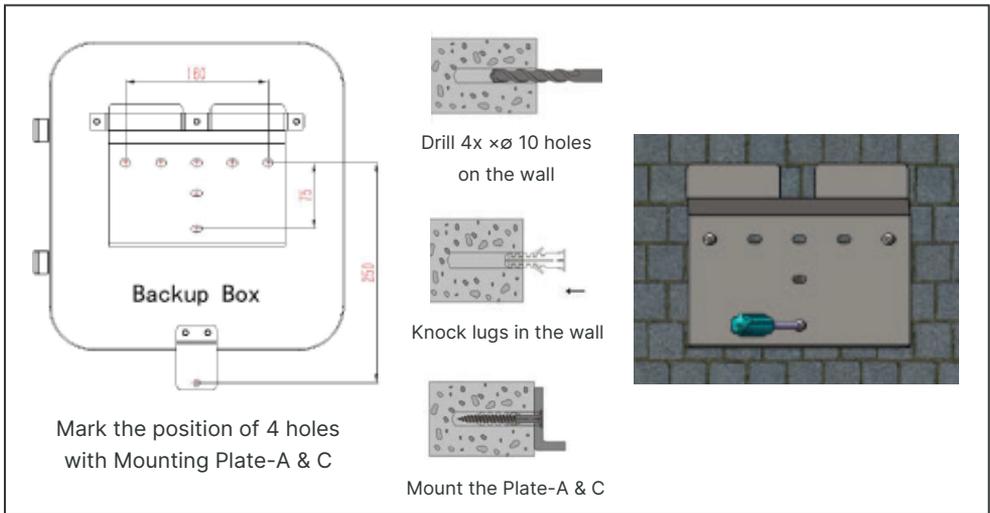


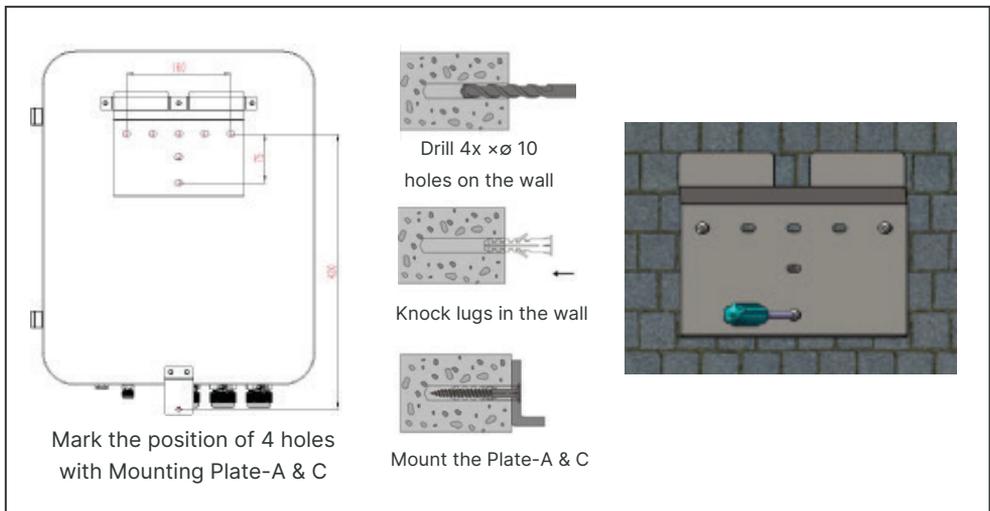
Figure 4-1  
Installation Tilts of the Backup Box

**Step 1:**

Determine the installation positions for drilling holes, and mark the positions using a marker. Drill installation holes on the wall, knock in the wall lugs, mount the Mounting Plate-A. Four installation holes are needed and the distance between the holes should replicate the images below.

**Figure 4-2**

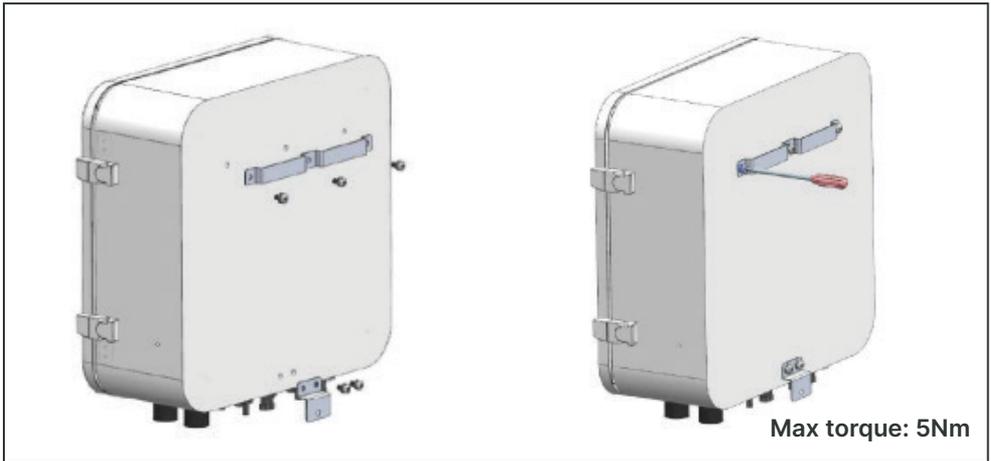
Drill holes on the wall and mount the Mounting Plate-A (single phase)

**Figure 4-3**

Drill holes on the wall and mount the Mounting Plate-A (single phase)

**Step 2:**

Install the Mounting Plate B&C onto the Backup Box enclosure.

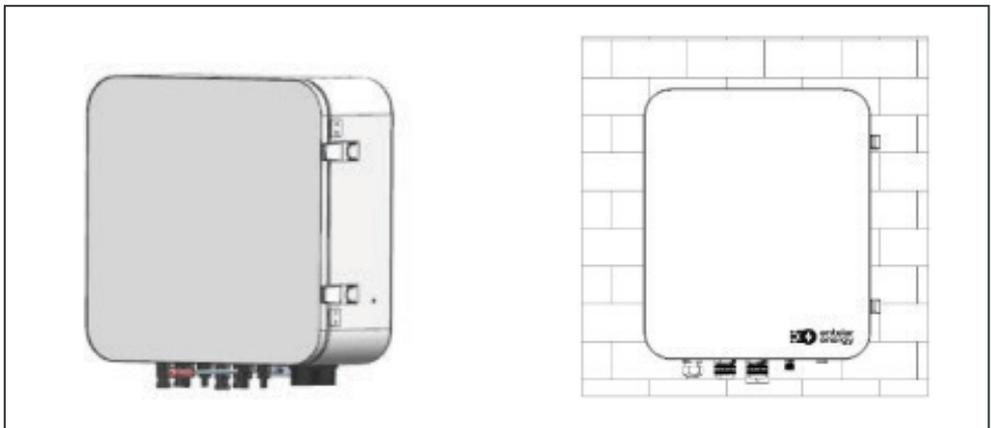


**Figure 4-4**

Install mounting plate on the Backup Box.

**Step 3:**

Hang the Backup Box on the back plate, and fasten the plate on the bottom.



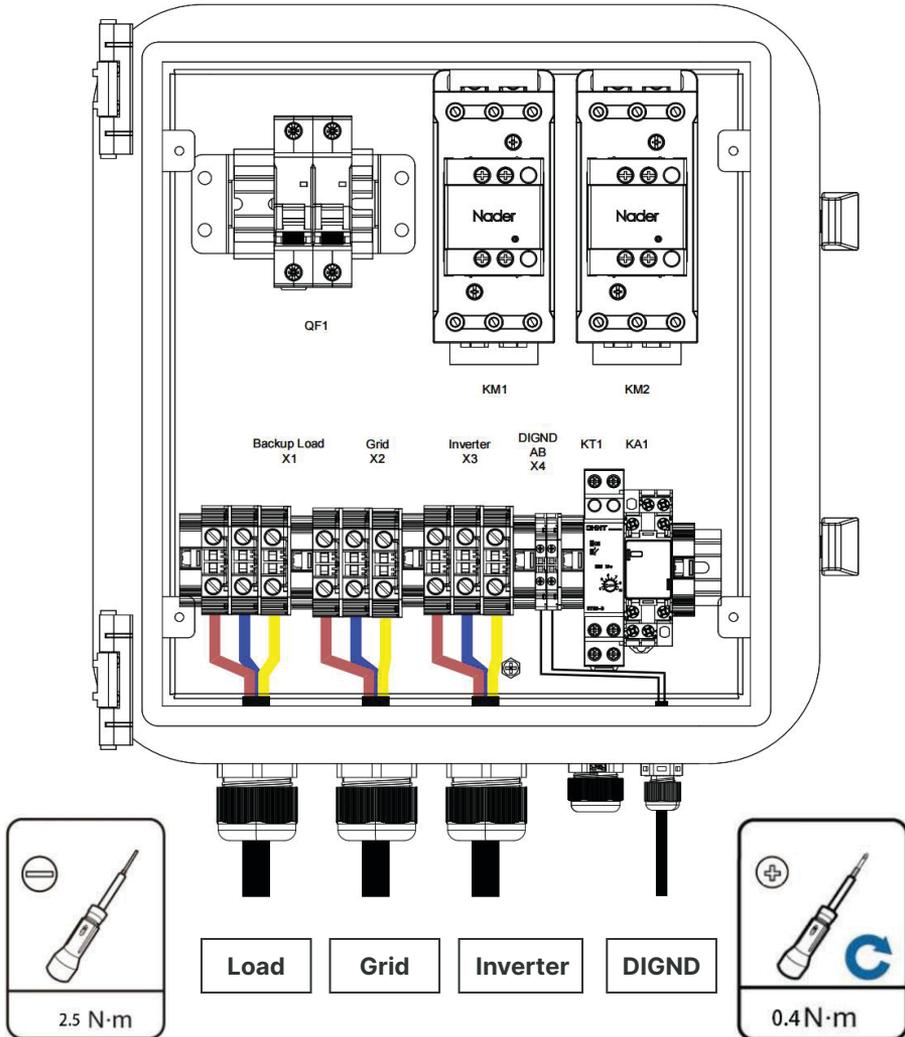
**Figure 4-5**

Install the Backup Box, fasten the bottom ears.

## ⚡ 4.5 Wire Connecting

### 4.5.1

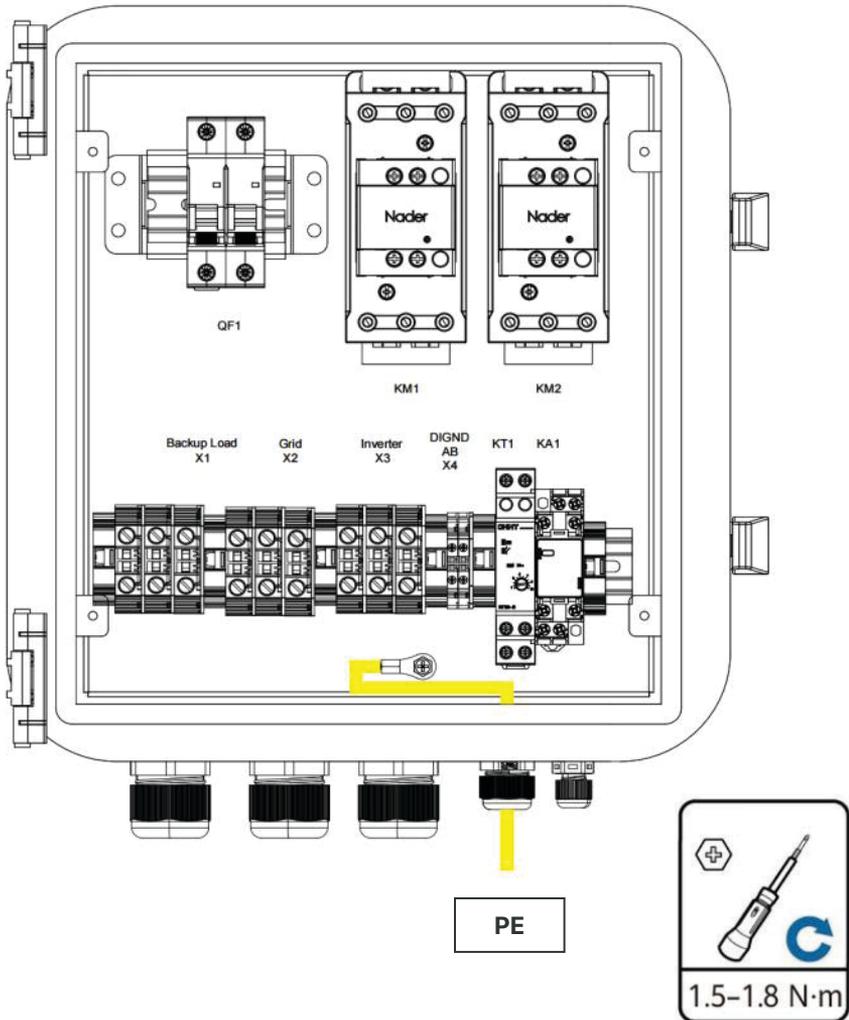
Wire connecting for Backup Box (single phase).



## ⚡ 4.5.2 PE Wire

### 4.5.2

PE wire in Backup Box (single phase).



## 4.6 Check Before Power-On

**Table 4-1**

Installation checklist.

No.	Check Item	Acceptance Criteria
1	Cable layout	Cables are routed properly as required by the customer.
2	Cable tie	Cable ties are secured evenly, and no burr exists.
3	Grounding	The grounding cable is connected correctly, securely, and reliably.
4	Turn off the switches	All the switches connected to the inverter are set to OFF.
5	Cable connections	The AC output power cable and AC input power cable are connected correctly, securely, and reliably.
6	Unused terminals and ports	Unused terminals and ports are locked by watertight caps.
7	Installation environment	The installation space is proper, the installation environment is clean and tidy, and free of foreign matter.

# 5. Troubleshooting of Backup Box

**Table 5-1**

Troubleshooting of the Backup Box (single phase).

No.	Faults	Possible Cause	Troubleshooting Suggestion
1	QF1 Trip	Faulty connections between Backup Box and inverter, a short-circuit.  Breaker fault.	Check the connection between Backup Box and the inverter. Replace the broken QF1 breaker.
2	Intermediate relay doesn't work	There's no power for intermediate relay.  Intermediate relay fault.	Check the voltage between line L1 and line N at X2.  Replace the broken intermediate relay.
3	Time relay KT1 doesn't work	There's no power for time relay.  Time relay fault.	Check the voltage between line L1 and line N at X2.  Replace the broken time relay.
4	KM1 doesn't work	There's no power for coil in KM1.  KM1 fault.	Check if time relay is working; check the voltage between line L1 and line N at X2.  Replace the broken AC contactor.
5	KM2 doesn't work	There's no power for coil in KM2.  KM2 fault.	Check if KM1 is working; check the voltage between line 1 and line N at X2.  Replace the broken AC contactor.

# 6. Removing & Disposing of Backup Box

## NOTICE

Before disassembling the Backup Box, disconnect the connectors of INVERTER AC, BACKUP LOAD and GRID. After turning off the power supply of Backup Box, wait at least 5 minutes before removing the Backup Box.

### Perform the following operations to remove the Backup Box:

-  Disconnect all cables from the Backup Box, including communications cables, INVERTER AC cables, BACKUP LOAD cables and GRID cables.
-  Remove the Backup Box from the mounting bracket on the wall.

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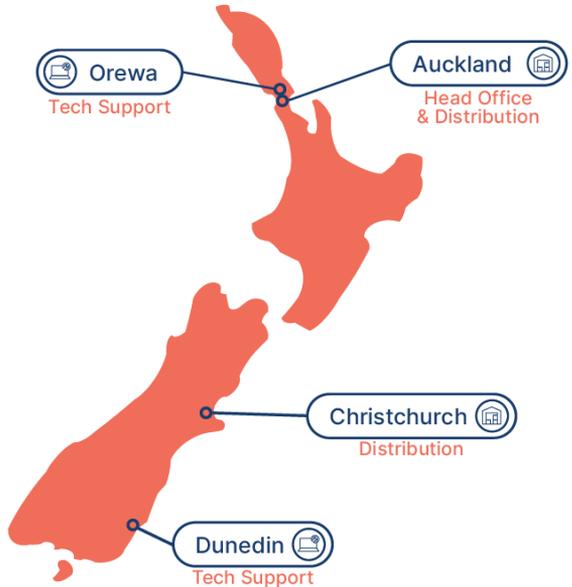
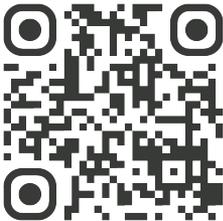
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