Backup Box (Keno)

Quick Guide

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NOTICE

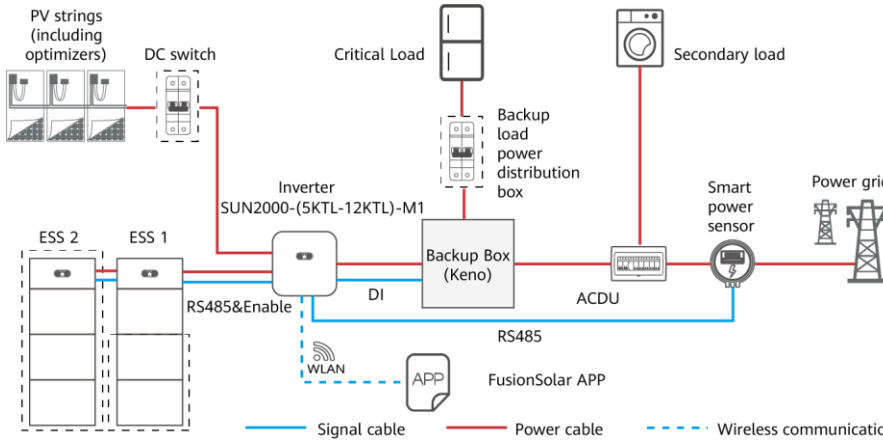
1. The information in this document is subject to change without notice. Every effort has been made in the preparation of this document to ensure accuracy of the contents, but all statements, information, and recommendations in this document do not constitute a warranty of any kind, express or implied.
2. This document describes only the cable connection and commissioning of the Backup Box (Keno) in the system. For details about the product, installation methods, and precautions, see the manuals provided by the manufacturer.
3. Only certified electricians are allowed to operate the device. Operation personnel must wear proper personal protective equipment (PPE).
4. Before installing the device, check that the package contents are intact and complete against the packing list. If any item is missing or damaged, contact your dealer.
5. The device damage caused by the violation of instructions in this document is not covered under warranty.
6. The cable colors involved in this document are for reference only. Select cables in accordance with local cable specifications.

1 Product Introduction

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.
The grid-tied system of a rooftop PV plant consists of PV strings, an energy storage system (ESS), an inverter, a Backup Box, a management system, an AC switch, and a power distribution unit.

NOTICE

1. The Backup Box (KENO) is compatible with the SUN2000-(5KTL-12KTL)-M1.
2. The Backup Box (KENO) cannot be used together with the Backup Box-B0/B1 in parallel.



2 Electrical Connection

2.1 Preparing Cables

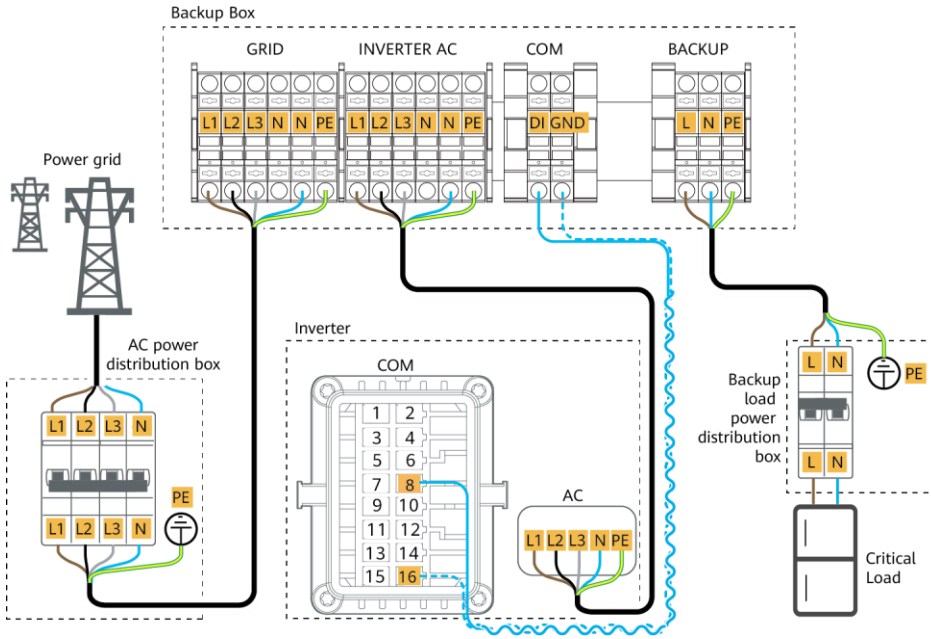
NOTICE

- Connect cables in accordance with local installation laws and regulations.
- Before connecting cables, ensure that the circuit breaker on the Backup Box and all the switches connecting to the Backup Box are set to OFF position. Otherwise, the high voltage of the Backup Box may result in electric shocks.
- If the external AC switch can perform earth leakage protection, the rated leakage action current should be greater than or equal to 100 mA.
- If multiple SUN2000s connect to the general residual current device (RCD) through their respective external AC switches, the rated leakage action current of the general RCD should be greater than or equal to the number of SUN2000s multiplied by 100 mA.

Prepare cables based on site requirements.

No.	Cable	Type	Conductor Cross-Sectional Area Range	Outer Diameter
1	Off-grid load output power cable	Outdoor copper cable	4–6 mm^2	10–21 mm
2	Grid AC output power cable	Outdoor copper cable	4–6 mm^2	10–21 mm
3	Inverter AC input power cable	Outdoor copper cable	4–6 mm^2	10–21 mm
4	Signal cable	Two-core outdoor shielded twisted pair cable	0.20–1 mm^2	4–8 mm

2.2 Connecting Cables



3 Verifying the Installation

No.	Acceptance Criteria
1	The installation is correct and reliable.
2	Cables are routed properly as required by the customer.
3	Cable ties are secured evenly and no burr exists.
4	The PE cable is connected correctly, securely, and reliably.
5	The switch of the Backup Box and all the switches connected to it are OFF.
6	Cables are connected correctly and securely. Use a phase sequence meter to check whether the cables on the grid side are connected correctly.
7	Unused terminals and ports are locked by watertight caps.
8	The installation space is proper, and the installation environment is clean and tidy.

4 Powering On the System

1. Use a multimeter to check whether the AC voltage in the power distribution box (PDB) is within the allowed range and whether cables are correctly connected.
2. Turn on the PDB AC switch between the Backup Box and the power grid. (Ensure that the load switch of the Backup Box is OFF.)
3. Check whether the cable connection of the grid AC terminals is correct.
4. (Optional) Remove the locking screw beside the DC switch on the inverter.
5. Turn on the DC switch (if any) between the PV strings and the inverter.
6. Turn on the DC switch at the bottom of the inverter.
7. Check that the off-grid load power does not exceed the off-grid output power allowed by the inverter.
8. After ensuring that the load circuit is normal, turn on the AC switch of the Backup Box.
9. Observe the LED indicators on the front of the inverter to check the running status of the inverter.

Category	Status (Blinking orange at long intervals , On for 1s and then Off for 1s)		Definition
Running indication			N/A
	Steady green	Steady green	On-grid
	Steady orange	Steady orange	Backup
	Blinking orange at long intervals	Off	Standby in backup mode
	Blinking orange at long intervals	Blinking orange at long intervals	Overload in backup mode

NOTE

If the off-grid load is overloaded, indicators and on the inverter blink orange slowly. Reduce the off-grid load power and manually clear the alarm or until the inverter is recovered. The inverter attempts to restart at an interval of 5 minutes. If the inverter fails to restart for three times, the interval changes to 2 hours. If the inverter is standby in off-grid mode, check the inverter alarms and rectify the fault.

5 System Commissioning

NOTE

During system deployment, the AC power supply needs to be connected to ensure that the off-grid/grid-tied switching function of the Backup Box can be verified.

Download the latest version of the FusionSolar app by referring to the quick guide of the corresponding inverter model or the *FusionSolar App Quick Guide*. Register an installer account, create a plant, and perform owner-related operations on the app. (Skip this step if you have completed related tasks.)

You can scan the QR code on the right to obtain the *FusionSolar App Quick Guide*.

NOTICE

You can set grid-tied/off-grid control parameters on the FusionSolar app locally (recommended) or remotely, or on the WebUI.
Before setting parameters, upgrade the related software:

- The inverter must be SUN2000MA V100R001C00SPC147 or later.
- The FusionSolar app must be 6.23.00.155 or later.

Setting Parameters on the App Locally

1. Open the FusionSolar app, log in to intl.fusionsolar.huawei.com using the installer account.
2. Choose **My** > **Device Commissioning** and connect to the WLAN hotspot of the inverter.
3. On the home screen, choose **Settings** > **Feature parameters** and set **Off-grid mode**, **Reserved backup capacity**, **Grid-tied/Off-grid mode switching**, and **Backup Box model**.

Setting Parameters on the App Remotely

1. Open the FusionSolar app, log in to intl.fusionsolar.huawei.com using the installer account.
2. Select the target plant from the plant list and select the inverter connected to the Backup Box on the plant screen.
3. Tap ... in the upper right corner of the inverter screen and choose **Parameter Settings**.
4. On the **Parameter Settings** screen, set **Off-grid mode**, **Reserved backup capacity**, and **Backup Box model**.

Setting Parameters on the WebUI

1. Open the FusionSolar WubUI, log in to intl.fusionsolar.huawei.com using the installer account.
2. On the **Monitoring** page, select the inverter connected to the Backup Box.
3. In the **Configuration** area on the right, set **Off-grid mode**, **Reserved backup capacity**, **Grid-tied/Off-grid mode switching**, and **Backup Box model**.

Parameter	Settings	Value
Off-grid mode	If this parameter is enabled, the Backup Box switches to the off-grid mode when the grid fails. This parameter can be set only when the Backup Box is configured. If the Backup Box is not configured, this parameter cannot be enabled. Otherwise, an alarm is generated.	• Enable • Disabled (default)
Reserved backup capacity	Sets the backup power SOC. In grid-tied mode, the battery does not discharge when it is discharged to the backup power SOC. When the grid fails, the battery supplies power to loads in off-grid mode until it reaches the end-of-discharge capacity.	[20%, 100%] Default value: N/A
Grid-tied/Off-grid mode switching	If this parameter is set to Automatic switching, the system switches to the off-grid mode when the grid fails, and switches to the grid-tied mode when the grid recovers. If this parameter is set to Manual switching, you need to log in to the app and connect the inverter to enable the off-grid mode when the grid fails.	• Automatic switching (default) • Manual switching
Backup Box model	For Backup Box-B0 or Backup Box-B1, set this parameter to **Backup Box-B0/B1**. For other models, set this parameter to **Compatible Third Party Backup Box**.	• Backup Box-B0/B1 (default) • Compatible Third Party Backup Box

Verifying the Off-grid/Grid-tied Switching Function

1. Power on the Backup Box according to the power-on procedure, wait for the inverter to connect to the power grid, and log in to the app to enable **Off-grid mode**.
2. Turn off the AC switch in the PDB between the Backup Box and the power grid, and check whether the off-grid output is normal. The inverter indicators and are steady orange. (If the AC switch between the inverter and the Backup Box is turned off, the off-grid switching is not triggered and the inverter is in off-grid standby mode.)
3. Turn on the AC switch in the PDB between the Backup Box and the power grid. The inverter indicators and blink green slowly until the inverter is connected to the power grid.

6 FAQ

When the power grid supply is available, if the and indicators on the inverter are steady amber or there is no power supply to the critical loads connected to the Backup Box, the Backup Box may be damaged. In this case, contact your installer.

7 Customer Service Contact

For details, visit solar.huawei.com.