

HS3-(3K-6K)-S2-(W, G)- (B, P)XQuick Guide

This quick guide provides installation operations. For safety precautions and detailed product information, refer to the *User Manual* on the SAJ Website <u>www.saj-electric.com</u>. You can scan the below QR code to access all the product documentation.



- Before installation, operation, and maintenance, read the product documentation carefully.
- ONLY qualified and trained electricians who have read and fully understood all safety regulations contained in this manual can install, maintain, and repair the equipment. The operation personnel should understand the system, its working principles, and relevant national and regional standards.
- During operations, wear protective equipment and use dedicated tools.

\Box 1. Check the outer packing

- 1. Check the outer packing package for any damage, such as holes and cracks.
- 2. Check the equipment model.

If any serious damage is found or the model is not what you requested, do not unpack the product, and contact your dealer as soon as possible.

2. Check the product packages

Contents in your shipment are order-dependent. Not all packages listed below may be in your shipment.

Place the connectors separately after unpacking to avoid confusion for connection of cables.

HS3 inverter



³ The printed documents include a warranty card, a *Quick Guide*, and a *Configuration Instructions*.



Package of type A BU3 battery pack

Type A battery has two holes on the left and right sides.

Battery pack with a base (BU3-5.0-(TV1, TV2)-BASE or BU3-5.0-(TV1, TV2)-PRO-BASE)



• (Optional) Battery without a base (BU3-5.0-(TV1, TV2) or BU3-5.0-(TV1, TV2)-PRO)



Package of type B BU3 battery pack

Type B battery pack has two mounting ears on the rear cover.

Battery pack with a base (BU3-5.0-(TV1, TV2)-BASE or BU3-5.0-(TV1, TV2)-PRO-BASE)



 M6*50 screw x2

 Battery pack
 Locking bracket x2
 M6*80 expansion bolt x2
 M6*50 screw x2

 Gasket x2
 M5*14 screw x4



Wall-mounting bracket (optional)



 \checkmark

30 cm

6

3

30 cm

0

30 cm

30 cm

X



Depending on the battery pack type (A or B) and mounting manner, choose the following installation procedure:

- Type A battery pack in the ground-mounting manner: Step 4
- Type B battery pack in the ground-mounting manner: Step 5
- Type B battery pack in the wall-mounting manner: Step 6

4. Installing type A battery pack: grounding manner

4.1. Install the base battery (BU3-5.0-(TV1, TV2)-BASE or BU3-5.0-(TV1, TV2)-PRO-BASE)

Place the cardboard on to the wall. Drill six holes (8 mm in diameter and 55 mm in depth) on the marked positions on the cardboard. 1. Install the provided expansion bolts into the drilled holes.



- Use two M5*14 screws to install two locking brackets on both upper sides of the battery. Place the base battery onto the floor. Make 2. sure that:
 - The battery feet are aligned with the vertical black line on the cardboard. •
 - It is recommended to use a gradienter to make sure that the battery is placed horizontally. •
 - The space between the battery back and the wall surface is 50-65 mm.





3. Align the locking brackets to the drill holes and install M6*50 screws to secure the locking brackets to the wall.

Note: If the battery is installed outdoors, it is suggested to remove the cardboard which is not waterproof.



4.2. (Optional) Install other batteries (BU3-5.0-(TV1, TV2) or BU3-5.0-(TV1, TV2)-PRO)

1. Use two M5*14 screws to install two locking brackets on both upper sides of the battery. Place this battery onto the base battery. Push it downwards.







2. On each lower side of the battery: Install two M5*14 screws to secure two batteries.

On each upper side of the battery: Align the locking bracket to the drill hole and install the gasket and M6*50 screw to secure the locking brackets to the wall.



3. (Optional) If needed, repeat steps 1and 2 to install the third battery.





4.3. (Optional) Install the charger (CU2-7.4K-S-I)

- 1. Get the holster from the charger package. Install the holster onto the right side of the charger.
- 2. Place the charger onto the battery. Push it downwards.
- 3. Install M5*14 screws on both lower sides of the charger to secure the charger to the battery.



4. Install the holster on the wall by using three M4*32 screws.

Note: The holster is used to secure the charger cable. You can connect the cable after all installation is completed. It is recommended that you purchase the cable from SAJ.





5. (Optional) Connect the charger cable.

Notes:

- It is recommended that you connect the cable after all device installation is completed.
- It is recommended that you purchase the cable from SAJ.
- For a long cable, you can wrap the cable on the holster.



- 4.4. Install the inverter (HS3-xk-S2-(W, 4G)-(B, P) or HS3-xK-S2-(W, 4G)-(B, P)-(BE, IE)).
- 1. (Optional) If you have installed a charger, loosen the screws on the inverter, and remove the port cover, as shown below:





2. Place the inverter onto the battery or charger (if available). Push it downwards. Install screws on both lower sides of the inverter to secure the inverter to the beneath device (battery or charger; here takes a charger as an example).



Inverter + charger + batteries









\Box 5. Install type B battery pack: grounding manner

- 5.1. Install the base battery (BU3-5.0-(TV1, TV2)-BASE or BU3-5.0-(TV1, TV2)-PRO-BASE)
 - 1. Get the cardboard from the base battery package. Place the cardboard on to the wall. Drill six holes (8mm in diameter and 55mm in depth) on the marked positions on the cardboard. Install the provided expansion bolts into the drilled holes.



- 2. Use two M5*14 screws to install two locking brackets to the mounting ears on the top of the battery pack. On the desired installation site, place the base battery on the floor. Make sure that:
 - The left and right battery bases are aligned with the vertical black lines on the cardboard.
 - The battery pack is placed horizontally. (It is recommended that a gradienter be used.)
 - The space between the battery back and the wall surface is 40–50 mm.





3. On the top of the battery pack, align the locking brackets to the drilled holes and install M6*50 screws to secure the locking brackets to the wall.

Note: If the battery is installed outdoors, it is suggested to remove the cardboard which is not waterproof.



5.2. (Optional) Install other batteries (BU3-5.0-(TV1, TV2) or BU3-5.0-(TV1, TV2)-PRO) Note: In one stack, up to three batteries are supported.

1. Use two M5*14 screws to install two locking brackets to the mounting ears on the top of the battery pack. Place this battery onto the base battery and push it downwards.





2. On the top of the battery pack, align the locking brackets to the drilled holes and install the gaskets and M6*50 screws to secure the battery pack to the wall.

On the left and right bottom sides of the battery pack, install M5*14 screws to secure two batteries.



3. (Optional) If needed, repeat steps 1 and 2 to install the third battery.





5.3. (Optional) Install the charger (CU2-7.4K-S-I)

- 1. Get the holster from the charger package. Install the holster onto the right side of the charger.
- 2. Place the charger onto the battery. Push it downwards.
- 3. On the left and right bottom sides, install M5*14 screws to secure the charger to the battery.





Install the holster on the wall by using three M4*32 screws.
 Note: The holster is used to the charger cable. You can connect the cable after all installation is completed. It is recommended that you purchase the cable from SAJ.





5. Connect the EV charger cable.

Notes:

- It is recommended that you purchase the cable from SAJ.
- It is recommended that you connect the cable after all device installation is completed.
- For a long cable, you can wrap the cable on the holster.



5.4. Install the inverter (HS3-xk-S2-(W, 4G)-(B, P) or HS3-xK-S2-(W, 4G)-(B, P)-(BE, IE))

1. (Optional) If you have installed a charger, loosen the screws on the inverter, and remove the port cover, as shown below:





2. Place the inverter onto the battery or charger (if available). Push it downwards. Install screws on both lower sides of the inverter to secure the inverter to the beneath device (battery or charger; here takes a charger as an example).





Completion View

Example of 3 batteries:







☐ 6. Install type B battery pack: wall-mounting manner

- 6.1. Install the wall-mounting bracket
- 1. Place the mounting bracket onto the wall. Mark six holes. Remove the bracket.



2. Drill six holes according to the marked positions on the wall.



3. Install the mounting bracket on to the wall.





6.2. Install the base battery (BU3-5.0-(TV1, TV2)-BASE or BU3-5.0-(TV1, TV2)-PRO-BASE)

1. Get the cardboard from the base battery package. Place the cardboard on to the wall. Place the cardboard onto the wall by aligning

the vertical lines with the bracket edges.



2. Drill six holes (8mm in diameter and 55mm in depth) on the marked positions on the cardboard. Install the provided expansion bolts into the drilled holes.





- 3. Use two M5*14 screws to install two locking brackets to the mounting ears on the top of the battery pack. Place the base battery onto the floor. Make sure that:
 - The battery feet are aligned with the vertical black line on the cardboard.
 - It is recommended to use a gradienter to make sure that the battery is placed horizontally.
 - The space between the battery back and the wall surface is 40–50 mm.



4. On the top of the battery pack, align the locking brackets to the drilled holes and install M6*50 screws to secure the locking brackets to the wall. Secure battery to the bracket by tightening two M6*14 screws.

Note: If the battery is installed outdoors, it is suggested to remove the cardboard which is not waterproof.





6.3. Install other required devices

For details, refer to same procedure (steps 5.2 to 5.4) in the ground mounting manner.

- (Optional) Battery without a base (BU3-5.0-(TV1, TV2) or BU3-5.0-(TV1, TV2)-PRO): Step 5.2
- (Optional) Charger (CU2-7.4K-S-I): Step 5.3
- Inverter (HS3-xk-S2-W-B, HS3-xK-S2-W-P, HS3-xk-S2-4G-B, or HS3-xK-S2-4G-P): Step 5.4
- (Optional) Battery junction box (BC3-TV): Step 7

□ 7. (Optional) Install a battery junction box (BC3-TV)

One inverter supports up to eight batteries; however, for safety reason, a maximum of three batteries can be installed vertically in one stack. Therefore, extra batteries must be installed in other stack(s) and the extra battery stack must be installed with a battery junction box (BC3-TV). Due to the cable length limitations, the distance between each battery stack is 0.5 meter.

It is recommended that the batteries be assembled in different stacks as follows:

Quantity of batteries supported by one inverter	Quantity of battery stacks	Quantity of batteries in each stack
1, 2, or 3 batteries	1 stack	1, 2, or 3
4 batteries	2 stacks	2, 2
5 batteries	2 stacks	3, 2
6 batteries	2 stacks	3, 3
7 batteries	3 stacks	3, 2, 2
8 batteries	3 stacks	3, 3, 2

1. Place the junction box onto the battery. Push it downwards.

On a type A battery pack



On a type B battery pack





- 2. Depending on the battery type, perform as follows:
 - Type A battery pack: Install screws on both lower sides of the junction box to secure the junction box to the beneath battery.



• Type B battery pack: Install screws on both lower sides of the junction box to secure the junction box to the beneath battery.





Completion View

Example of 8 batteries:



□ 8. Assemble the AC-side connection

1. Open the AC-side Cover.



2. Connect the grounding cable, by taking AC-side grounding as an example.

The cable needs to be prepared by the user. It is recommended that a 6-mm² conductor cross-sectional area of cable be used.

a. Assemble the cable and OT/DT terminal.





b. Remove the M4*10 screw from the grounding port. Connect and secure the grounding cable, as shown below:



3. (4G model only) Install the SIM card: Loosen the cover of the SIM card slot. Then, insert the SIM card to the slot.



- 4. (W model only) Install the LAN cable, if you choose to use the Ethernet connection manner.
 - a. Remove the RJ45 cable fastener from the LAN port.
 - b. Use a standard RJ45 cable. Insert the cable through the cable fastener as shown below. Assemble the cable fastener.
 - c. Connect the LAN cable from the LAN port on the inverter to the router.





- 5. Install the EMS cable.
 - a. Connect the cable from the EMS port on the inverter to the LAN port on SAJ eManager (EMS). Remove the RJ45 cable fastener from the EMS port.
 - b. Use a standard RJ45 cable. Insert the cable through the cable fastener as shown below. Assemble the cable fastener.
 - c. Connect the cable from the EMS port on the inverter to the LAN port on SAJ eManager (EMS).



6. Install a circuit breaker.

For safety operation and regulation compliance, install a 63 A or higher air circuit breaker between the grid and the inverter.

7. (Optional) Install an RCD.

If the external RCD must be installed according to the local regulations, either type A or type B RCD can be installed with the action current 300 mA or higher.

8. Connect the grid and backup loads.

Recommended cable specification:

Cable type	Conductor cross-sectional area of cables			Cable diameter range
	Range	Recommended value	Conductor material	(with insulation)
Three-wire cable	10–13.3 mm² or 7–6 AWG	10 mm ² or 6 AWG		15–19 mm
	1	10 mm^2	Copper	6.5-8.5 mm
Three cables	/	io mm		Double-layer insulation

The following takes a three-wire cable as an example. However, if you choose to use three separated cables for grid or backup load connection, to ensure sealing safety, use the three-hole rubber plug provided in the accessory bag, instead of the original one-hole rubber plug in the connector.

- a. Strip the insulation (13-mm length) off the wires.
- b. Connect the cable to the grid or backup load connector.
 Note: Depending on the configurations, the waterproof gland nut (callout 4 in the following illustration) may not be provided.





c. Secure the cable to the connector. Then, assemble the connector.



Remove the dustproof covers from the GRID and BACK-UP ports.
 Use a flathead screwdriver to press down the tab in the cover.
 Rotate the cover anti-clockwise and pull it upwards.



e. Connect the cables to the GRID and BACKUP ports on the inverter.





- 9. Assemble the communication connection.
 - a. Disassemble the communication cable connector.
 - ① Press the tabs on two sides of the connector by one hand and press the front ends of the terminal by another hand. Pull the connection terminal block outwards.
 - ② Rotate the nut anti-clockwise and remove it from the connector body.
 - ③ Remove the rubber plugs out of the seals.



- b. Connect all communication cables to the communication cable connector.
 - ① Prepare cables.
 - Meter communication: Use the provided communication cable kit. It contains a communication cable with an RJ45 port and two assembled terminals and cable fastener parts.



- Other terminal connection: Prepare cables per you needs. Strip the insulation around 7.5 mm on cable ends and if needed, use provided insulated crimp terminals on the cable ends. Suggested cable specifications:
 - DO: 0.5-0.75 mm²
 - Others: 0.2–0.5 mm²







③ Locate the ports and terminals on the connection terminal block according to their silkscreens.

Name	Number	Pin definition	Description	
PORT (RJ45 port)	1	1: CAN-H	For parallelling connection	
		(with a 120 Ω resistor)	scenario	
		2: CAN-L		
		3: GND_W		
		4: SYN		
		5: GND_W		
		6: HOST		
		7: GND_W		
		8: TRF		
DRMs (RJ45 port)	1	1: DRM1/5	For RCR	
		2: DRM2/6	For RCR	
		3: DRM3/7	For RCR	
		4: DRM4/8	For RCR	
		5: REF D/0	/	
		6: COM D/0	/	
		7: NC	/	
		8: NC	1	
Terminals	4	DO1+	Dry output 1	
	5	DO1-	Dry output 1	
	6	DO2+	Dry output 2	
	7	DO2-	Dry output 2	
	11	RS485-A	For external RS485	
		(with a 120 Ω resistor)	communication	
	12	RS485-B		
	13	MET-A	For meter communication	
		(with a 120 Ω resistor)		
	14	MET-B		
	15	DI1+	Dry input 1	
	16	DI1-	Dry input 1	
	17	DI2+	Dry input 2	
	18	DI2-	Dry input 2	
	19	CAN_H	For external CAN	
		(with a 120 Ω resistor)	communication	
	20	CAN_L		



- c. Connect and secure the cables to the connection terminal block. Then, assemble the communication cable connector.
 - ① Connect cables to corresponding terminals and RJ45 ports based on your needs.
 - (2) Use a screwdriver to secure the cables connected to the terminals. **Note:** If any terminal that has been equipped with a 120 Ω resistor, such as METER-A, needs to be connected by a cable with the length longer than 20 meters, switch the resistor to ON status.
 - ③ Insert the connection terminal block back to the connector body until you hear a click sound.
 - ④ Insert the seals and nut back to the connector body.
 - (5) Rotate the nut clockwise until it is secured to the connector body.



d. Connect the assembled communication terminal connector to the COMM port on the inverter.



- e. Connect the other end of the cables to external devices, such as the meter. Meter connection:
 - a. Take the communication cable (A) and smart meter out of the meter kit. For details, refer to the inverter package in step 2 "Check the product packages".
 - b. Connect the RJ45 connector of the cable to the RJ45 port of the meter communication cable (B).
 - c. Connect the two crimped cable ends of the cable to ports 24 and 25 on the meter.

24-pin terminal	Meter cable connection	Smart meter
MET_A		Port 24
MET_B		Port 25



Callout	Description	RJ45 pin definition
Α	Communication cable with an RJ45 connector	• Pin 1: A1
		• Pin 2: B1
		 Pins 3 to 8: NC
В	Communication cable kit	Pin 1: For MET-A
		Pin 2: For MET-B
		 Pins 3 to 8: NC

10. Close the AC-side cover.



9. Assemble the DC-side connection

1. Open the DC-side cover.

Loosen the screw that locks the cover. Then, lift the cover upwards.



2. Connect the PV cables.

\cdot Dangerous to life due to electric shock when live components or DC cables are touched.			
• The PV panel string will produce lethal high voltage when exposed to sunlight. Touching live DC			
cables results in death or lethal injures.			
• DO NOT touch non-insulated parts or cables.			
Disconnect the inverter from voltage sources.			

- · DO NOT disconnect DC connectors under load.
- $\cdot\;$ Wear suitable personal protective equipment for all work.



Recommended cable specification:

Conductor cross-sectional area of cables (mm²)		Conductor material
Scope	Recommended value	
5.0-6.0	6.0	Outdoor copper wire cable, complying with 600 V DC

Before you start, make sure that:

- The PV array is properly insulated to ground before it is connected to the inverter. The inverter cannot be used with functionally earthed PV arrays.
- The DC switch on the inverter is in OFF position to avoid short circuit caused by maloperations.



a. Use a 3-mm wide-bladed screwdriver to strip the insulation layer around 8 to 10 mm length from one end of each cable. 8 - 10 mm



b. Insert the cable ends to the sleeves. Use a crimping plier to assembly the cable ends.



c. Insert the assembled cable ends into the blue positive and negative PV connectors. Gently pull the cables backwards to ensure firm connection.





d. Tighten the lock screws on the positive and negative cable connectors.



e. Insert the positive and negative cable connectors into the positive and negative PV ports on the inverter until you hear a "click" sound to ensure firm connection.



- 3. (Optional) Connect the battery cables between multiple stacks.
 - a. Prepare and connect the grounding cable to the battery junction box.





b. Use the positive and negative power cables and the communication cable that are shipped with the battery junction box. Connect the cables from the junction box to the inverter, as listed below:

Cable	From the junction box	To the inverter
Positive and negative power cables	BAT+ and BAT- ports	BAT+ and BAT- ports
Communication cable	BMS/CAN port	BMS CAN port

Notes:

- The BMS CAN port on the inverter has been installed with an RJ45 connector plug. In this case, remove this plug and insert it into the BMS CAN port on the battery junction box on the left stack.
- The BAT+ and BAT- ports on the inverter and battery junction box are protected by waterproof covers. To remove the cover, prepare the following tool and perform as follows:
 The positive connector is used as an example:



• The provided cables have been assembled with connectors. In some special cases, if you need to use your own cables, contact SAJ for technical support.

Example of 8 batteries connecting to one inverter:





4. Close the DC-side cover.

Push the cover downwards. Use a screwdriver to tighten the screw to lock the cover securely.



□10. Start the system

- 1. Open the AC distribution box. Turn on the circuit breakers of the backup loads and grid.
- 2. (Optional) If there are multiple battery stacks, turn on the battery switch on the right side of the battery junction box.
- 3. On the left side of the inverter, perform as follows:
 - a. Turn on DC SWITCH.
 - b. Turn on BATTERY SWITCH.
 - c. Press and hold the START button for five seconds until the LED indicator on the front panel is on \bigcirc .
- 4. Check the LED indicator status on the inverter panel to ensure that the inverter is running properly.

Note: The LED indicator status label is on the left side of the inverter.

- 5. Configure the system on the SAJ App named Elekeeper. For details, refer to the section "System Commissioning" in the *SAJ Configuration Instructions.*
- 6. If any error occurs, check the error code displayed on the App. For detailed error messages, refer to the section "Troubleshooting" in the *User Manual*.

---End

Installer: _____