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Franklin Home Power Installation Guide

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Please visit <u>FranklinWH Support</u> for the latest Franklin Home Power documents.

All brands and trademarks mentioned in this document are the property of their respective owners, and their use in this document does not imply the sponsorship or recognition of their products or services.

Please read this document carefully to ensure the best reliability of the product and your warranty eligibility. For further information about warranty, please refer to the *Franklin Home Power Limited Warranty*.

This document is intended for use by professional installation and maintenance service providers only and no statements, information or recommendations in this document constitute any express or implied warranty.

Only for connecting AC coupled PV inverter systems and if installed without any other energy sources, then this is outside the scope of the manufacturer warranty.



Please read this document carefully before installing or using the Franklin Home Power equipment. Failure to follow any instructions or warnings in this document may result in damage to the equipment, personal electric shock, severe injury, or even death.

Product Information

Franklin Home Power (FHP) is composed of aGate X-01-AU (aGate) and aPower X-01-AU (aPower) and other electrical components, and this document applies only to the following products: aPower and aGate.

FranklinWH Australia Pty Ltd. ("FranklinWH") reserves the right to make any improvements to the product, and the contents in this document shall be subject to updates without further notification.

All images and pictures provided in this Manual are only for demonstration purposes and may differ in detail from the product, based on the product version.

Feedback

If you have any questions or comments, please send us an email at: service-au@franklinwh.com

Disposal of Scrapped Products

Scrapped products (including their internal chemicals and electrical materials) should not be disposed of with household wastes. Please refer to your local laws and regulations regarding disposal. These certification labels are for information only. The final label shall be subject to the product certification label.

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Safety Statements

WARNING: This Guide includes important information about the Franklin Home Power (FHP) system.

Please read this Guide carefully before installation, maintenance or use. Failure to follow any instruction in this Guide may lead to risks of equipment damage, electric shock, severe personal injury and even death. Using FHP improperly may also void your warranty (<u>FranklinWH Support</u>).

The DANGER, WARNING, and NOTE alerts are supplemental to the safety instructions and are not exhaustive.

Safety Symbols

4	DANGER: This indicates a hazardous situation, which if not avoided, could result in serious injury or death.
	DANGER: There are fire risks in the battery packs.
<u>!</u>	WARNING: This indicates a situation where failure to follow instructions may be a safety hazard or cause equipment malfunction. Use extreme caution and follow instructions carefully.
0	NOTE: This indicates information important for optimal system operation. Follow instructions carefully.
(-))	PROTECTIVE GROUNDING TERMINAL: This indicates the position of grounding connection on the equipment.
5 Minutes	WAIT TIME: It means there are electric shock risks inside the equipment, please wait 5 minutes before proceeding.
X	ELECTRONIC DEVICE: DO NOT THROW AWAY. Scrapped electronic products and batteries cannot be disposed of together with household wastes. Please consult your local laws and regulations for further information.

Safety Instructions for Operation

A	DANGER: The installation, wiring, maintenance, transportation, and handling of each aGate and aPower should follow local laws, regulations and standards, and the Safety Instructions in this Guide serve as supplementation to the laws, regulations and standards.
A	DANGER: Both aPower and aGate are electrical equipment, and improper operation may lead to electric shock, energy hazards, or chemical hazards. Please do NOT open the cabinet or disassemble without express direction from the FranklinWH service team.
A	DANGER: Only FranklinWH certified and qualified technicians should install, maintain or replace aGate and aPower equipment or wiring. They must wear personal protective equipment (PPE) during operation.
	DANGER: It is strictly forbidden to work on or operate the FHP alone. For safety, make sure that there is someone around you who can help.
A	DANGER: It is strictly forbidden to install, maintain, or handle FHP equipment outdoors during bad weather conditions, such as lightning, thunder, rain, snow, or strong winds.
<u>A</u>	DANGER: In case of a battery fire, please take actions as instructed in the <i>Safety</i> Data Sheet.
	DANGER: The aPower must be carefully handled and installed using lifting equipment to avoid injury to installers or the aPower.
	DANGER: During the transport and handling of aGate and aPower units, extreme care is required to avoid dropping, bumping, stomping, or inverting the equipment. To prevent potential damage, please keep all aPower units in their packaging until ready to install.
A	DANGER: During use, storage, and transport, ensure that the ambient temperature of an aPower does not exceed 50°C, that it is not near flammables, and that the

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cooling system and vents are not blocked.			
DANGER: Do NOT let aPower operate outside of the specified temperature range.			
DANGER: If any equipment failure occurs, please contact your installer or after-sales service provider for support. Do not attempt to take apart, repair and/or modify an aGate or aPower without the authorization of FranklinWH. And it is prohibited to open the battery pack chamber in any situation. Otherwise, it may lead to safety hazards and void your warranty.			
DANGER: To prevent misoperation, ensure that the upstream and downstream switches are disconnected and padlocked during installation or maintenance.			
DANGER: If an aPower or aGate is found damaged (except for minor defects in exterior painting) after it is unboxed or malfunctioning on installation, please do NOT operate it and contact your after-sales service provider for support.			
DANGER: Before any installation and commissioning of an aPower, please keep the round switch button on the right part of aPower off (extended, flush with the case) and prevent the ON/OFF switch from being operated by mistake.			
DANGER: If the aPower battery is leaking electrolyte, smoking, or catching fire, if it is safe to do so, please disconnect the AC power from the Franklin Home Power system, and turn off the switch mounted on the side of the aPower unit to stop charging and discharging the aPower.			
DANGER: Measures should be taken to prevent foreign objects from entering any aPower or aGate.			
DANGER: The installation of Franklin Home Power must comply with all applicable requirements of AS/NZS4777.1 and AS/NZS5139.			
DANGER: Both electric connection and electric isolation need to comply with the local standards and AS/NZS 3000, AS/NZS 4777.1.			
DANGER: aPower have not been tested to AS/NZS 4777.2:2020 for multiple inverter combinations.			

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	DANGER: The installer needs to provide suitable conduits and cables, and complete the installation process in accordance with the local regulations.
	DANGER: aPower units may be installed on the floor or on walls. Mounting brackets will be needed. Since the aPower is very heavy, installation is very difficult and the requirements on walls are rather demanding, a floor installation is recommended.
A	DANGER: Before the installation of Franklin Home Power starts, engineers should check and locate the embedded electric wires and water pipes to avoid potential property damage and personal injury during the installation process.
	WARNING: For maintenance purposes, do NOT use any parts or fittings that are not listed in this Guide or that are purchased from any source other than FranklinWH or its recognized dealers.
<u>^</u>	WARNING: Do NOT use paint on any part of an aPower or aGate, whether internal or external, especially on the protective cover except for exterior paint that has been worn out or damaged in the transportation, installation, or maintenance process. The damaged part can be repaired with paint or topcoat of the same color.
Â	WARNING: Do NOT connect an aPower directly to the inverter of a solar generator.
<u>^</u>	WARNING: Before installation, do not place an aPower on site for more than one month. After installation, do not turn on the aPower before connecting the PV and grid, otherwise the battery will be depleted due to a long period of time without charging.
<u>^</u>	WARNING: FHP is composed of an aGate, and one or more aPower units, and other electrical components which can not be used separately.
<u>^</u>	WARNING: An aPower may only be connected to the aPower breaker on the aGate.
<u>^</u>	WARNING: The inputs from grid and generators may only be connected to the respective reserved terminals on the aGate.

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<u>^</u>	WARNING: The aGate must be connected to both the inputs and output, and the wiring should comply with local regulations.		
<u>^</u>	WARNING: The operation of the Franklin Home Power system requires an Internet connection. Extended offline operation may result in a voided warranty. Please refer to <u>FranklinWH Support</u> for information.		

Safety Instructions for Installation Site

A	DANGER: The installation site of aPower and aGate units should be protected from access by children, or additional protective measures should be taken to protect the FHP from misoperation and contact by children.
	DANGER: The installation site of aPower and aGate units should be kept away from heating devices, or any source of heat and/or fire.
A	DANGER: The ambient temperature at the installation area of aPower and aGate units should be -20°C–50°C with the relative humidity between 5% and 95% and altitude lower than 4,000m.
A	DANGER: The aPower and aGate installation area of should be kept dry, cool and well- ventilated to ensure satisfactory performance. If an aPower or an aGate is to be installed in a confined area, forced ventilation must be in place.
<u>A</u>	DANGER: The aPower and aGate installation area should be protected from flooding and standing water.
4	DANGER: The aPower and aGate installation area should be away from flammable and explosive materials.
	DANGER: The aPower and aGate installation area should be protected from dust and smoke.
	DANGER: The installation site should be properly leveled and hardened if the aPower is floor mounted. If there is grass nearby, a layer of cement or slab stone must be placed on the projection area of the equipment to block grass growth and prevent the equipment from collapsing.

4	DANGER: If wall-mounted, the wall should be able to provide sufficient bearing capacity.
	DANGER: The installation site for aPower should have a fire detection and protection systems that meets the local building and fire codes. Temperature detectors and fire detectors must be used in the vicinity of the installation zone and must be connected to the family fire control system.
<u>^</u>	WARNING: The aPower and aGate installation site should be protected from direct exposure to sunshine, rain, and snow.
<u>^</u>	WARNING: The aPower and aGate installation site should have no water source above it or in the vicinity, including water pipes, shower, faucet, and containers of liquids.
<u>`!</u>	WARNING: Do NOT clean aPower and aGate units with cleaning agents or expose them to flammable or irritant chemicals or their vapors.
<u>^</u>	WARNING: The noise factor (< 45dB) must be taken into account when selecting the installation site for each aPower. Selection of the site must involve consent of local residents.
<u>^</u>	WARNING: It is required that internet connectivity is provided at the aGate installation site. A hardwired connection is more reliable but Wifi and 4G connections are possible.

Fire and Other Emergency Situations

Fire:

- Shut off the aPower breaker on the aGate, if it is safe to do so.
- Evacuate to a safe area.
- Contact 000 as soon as it is safe to do so.
- Use approved fire extinguishing devices, if it is safe to do so.

Flood:

- Shut off the aPower breaker on the aGate, if it is safe to do so.
- If the wiring sections of aPower or aGate are submerged, please stay away from the water. Electric leakage may result in electric shock.
- Drain the water to protect the system, if it is safe and possible.
- If water rises to the battery level, please call your installers for inspection. If water level is below the battery chamber, please allow the site to completely dry.

Abnormal noise, odor or smoke:

- Shut off the aPower breaker on the aGate, if it is safe to do so.
- Check and ensure your aPower is well ventilated and not blocked.
- Keep the installation site well ventilated.
- Call your after-sales service for support.

Franklin Home Power System Overview

Franklin Home Power (FHP) is a whole-home energy solution for homes. Its two primary components are the aGate, an intelligent power management panel, and the aPower, a battery storage unit with built in battery management system and inverter. With AC coupling and energy management technologies, the FHP system provides a reliable household backup and load control solution for homes. It provides connections for on-site solar power and generators.

The aPower stores energy from the grid, solar systems and generators, and can power the home during grid outages, during peak rate periods, or at night (for solar self-generation).







Whole-Home Backup System

In the whole-home backup system, all household loads, except for Smart Circuit loads, are connected via the Main Panel to the backup port of the aGate. If the grid fails, the FHP power can support all household energy loads.

Installation Preparations

Site Planning

1) Plan installation position

The selection of installation location must account for the layout of water and electric routes. Avoid water and power conduits as damage by drilling may lead to property loss and/or personal injury.

- The details below are general guidelines for installing space and are not guaranteed to be applicable. Please consult your local AHJ before use.
 - ➤ aGate:

The recommended distance between the bottom of aGate and the ground is 1.22m and should not exceed 1.6m. The maximum distance between the power switch button on aGate and the ground shall not exceed 2.2m. Please finalize the installation height in accordance with the specific site conditions.

> aPower:

There should be a minimum clearance of 0.9m from the top of the aPower to the ceiling.

When an aPower is mounted on the wall, the recommended distance between the bottom of the aPower and the ground is 0.45m but should not exceed 1.25m. The maximum distance between the aPower switch button and the ground should not exceed 2.2m.

> The recommended space distance in front of the wall in the installation area is 1.3m.

1	FRIDAKLIN		↓ ≥ 0.9m
	aGate Recommended 1.22m	Recommended 0.6m At least 0.6m	FRIENKLAN
Recomr 1.3m	mended		aPower
			When the aPower is wall mounted, the recommended distance between the bottom of aPower and the ground is 0.45m to 1.25m.



NOTE:

Notify the customer to clear the installation site and its access roads, to ensure that the equipment can be quickly delivered to the installation site and that the installation process can proceed effectively.

• The FHP system requires an internet connection. All signal transfers between aPower and aGate units, the generator, and the router are realized by a CAN bus, network cables or other signal transmission cables. Long distances will likely adversely affect the quality and speed of communications, negatively impacting equipment operations. The installer or system designer will need to factor in the recommended maximum cable lengths, listed below, when laying out the FWH installation.

Data interchange equipment	Maximum cable length
aPower and aGate	30m

aGate to Generator	30m
aGate to Router	100m
PV CT	3m

2) Plan the positions of equipment inputs and outputs

• aPower

The positions of inputs and outputs on an aPower are as shown below. The following scenarios offer variations on the cable inlets and outlets of an aPower to accommodate variations in the existing residential wiring layout.

Scenario 1: The cables pass through electrical conduits and enter the aPower from the same side as the conduits.



The cable inlets on the wiring compartment of an aPower are 35mm and 28.5mm in diameter, and the conduit adaptor that work with them have thread size of 32mm and 25mm.

Scenario 2: The cables will connect to the aPower from inside the wall or though the electrical conduits through the wall.



Sealing rings must be used. A good seal must be guaranteed between the electrical conduits and the wiring compartment, which can be achieved by using a conduit hub, sealing rings, or caulk. The cable inlets on the wiring compartment of aPower are 35mm and 28.5mm in diameter.

• aGate

The positions of inputs and outputs on an aGate are as shown below. The following scenarios offer variations on the cable inlets and outlets of an aGate to accommodate variations in the existing residential wiring layout.

Scenario 1: Cables pass through the electrical conduits and enter the aGate from the same side of the wall.



If the aGate is installed outdoors, the electrical conduit is connected to aGate through the cable inlet on the upper panel. Water-proof sealant or caulk should be used between the reducing fitting, hub, electrical conduit, and aGate to enhance the watertightness. In other cases, a hub is needed to ensure the IP grade of aGate. The electrical conduit diameter varies by the type of conduits: the knockout holes on the lower panel of aGate are 40mm. If the knockout holes do not match the electrical conduits in hub diameter, additional reducing fittings will be needed to achieve the required IP grade. **Scenario 2:** Cables are run in electrical conduits and enter aGate from inside the wall or through the wall.



In this case, a conduit hub will be needed to ensure the IP grade of aGate. The electrical conduit diameter varies by the types of conduits: the knockout holes on the back and lower panel of aGate are 40mm/20mm in diameter. If the knockout holes do not match the hub diameter, additional reducing fittings will be needed to achieve the required IP grade.

3) Plan protection for aGate's input connections

The aGate serves as the entrance to the FHP system. Installation of proper lightning protection systems are required before the input end of an aGate. Over current protection measures are required before the aGate inputs or inside the aGate. A circuit breaker of 100A may be installed at the grid input connection and the generator input connection. Please refer to **Install the aGate** of this Guide for the requirements on the circuit breaker installed in aGate..

4) Plan the types, sizes and routes of cable and electrical conduits

- Please refer to **Communications Wiring** and **Electrical Conduits** for recommended cable types and wire diameters for electric connections and communication connections.
- As cables run through the electrical conduits, the current-carrying capacity of the cables needs to be reduced. Please refer to the applicable information in AS/NZS 3000 or AS/NZS 3008.1.1.
- The relationship between wire diameters, cable numbers, and inner diameters of conduits should be taken into consideration as cables run through the electrical conduits. Please refer to Appendix C6 of AS/NZS 3000 for the list of maximum numbers of cables of the same size in the electrical conduits and pipelines.
- Electrical conduit is recommended in combination with a medium duty electrical PVC conduit and a corrugated conduit. This type of conduit can be used for home cable installation and can provide effective mechanical protection and good tightness.

5) Plan the Fire Control and Extinguishing System

The selection and installation of fire control and extinguishing systems on power storage systems must comply with the requirements of AS/NZS 5139 and local fire authorities.

Tools

- Personal Protection Equipment (goggles, gloves, protective shoes, anti-dust respirator, etc.) to protect the personal safety.
- Drill
 - > Use 4mm Brad Point bits or 4mm Auger bits to drill pilot holes in wooden walls for mounting the equipment.
 - > Use 13mm, 20mm, 25mm, 40mm, 50mm sized wood bits to create holes in wooden walls for running cables.
 - ➤ Use 13mm, 20mm, 25mm, 40mm, 50mm sized hole saw bits to create holes in metal walls for running cables.
- Hammer drill
 - Use 13mm, 10mm Masonry bits to create pilot holes on concrete or brick walls for mounting up the equipment.
 - Use 13mm, 20mm, 25mm, 40mm, 50mm Diamond core bits to create holes in concrete or brick walls for running cables.
- Electric screwdriver and cross screw bits to tighten the fastening screws.
- Torque wrench and bent-handle ratchet wrench, with 8mm, 9mm, 10mm, and 11mm hex sockets, to tighten and check the torque of outer hexagonal bolts.
 - > Use 5mm and 6mm inner hexagon screwdriver bits to fasten cables at circuit breakers and pressure connectors and to check the torque.
 - > Use 5mm, 6mm straight screwdriver bits to fasten cables at circuit breakers and connectors and to check the torque.
 - > Use PH2, PH3 cross screwdriver bits to fasten cables at circuit breakers and to check the torque.
 - > Use 150mm Phillips head extension.
- Flat head screwdriver (3x100mm, 6x100mm) to fasten signal terminals and take wooden boxes apart.
- Phillips head screwdriver (#2x100mm, #3x100mm) to tighten fasteners.
- Claw hammer to break knockout holes and to release locks on wooden box.
- Utility knife to cut open cartons.
- Needle nose, vise grip, wire stripper, wire cutter, utility wire shear, and other cable preparation tools.

- Wire crimper, network cable testers, wire tracker, and other network cable preparation tools.
- 14mm open-end wrench to operate aPower leveling screws and to adjust the height of aPower.
- Induction electroprobe to detect the cables in walls to avoid short circuits when drilling.
- Multimeter to measure voltage, current and other electric parameters.
- Loop resistance tester to measure the wiring resistance and to detect poor connection of cables.
- Task light to illuminate the area when power supply is off.
- Spirit level to check whether the equipment is leveled.
- Steel measuring tape to measure lengths.
- Markers to make drilling marks.
- Camera to record the installation process.
- Deep cut band saw to cut thin-wall steel conduit or PVC conduit.
- Lift. The aPower is heavy. Several well-trained workers are required to maneuver the unit. Use of a fork hand truck is recommended to avoid potential injury. The maximum length of fork hand truck should be less than 1800mm. Fork hand trucks with retractable features are preferred because they are easy to transport and to access the installation site.
- Knockout Tool Kit to drill holes for conduits on the distribution box case.
- Wooden block, size: 44.4mm×680mm×60mm.
- Adjustable wrench, size: 0-50mm.
- 150mm, 250mm, 450mm Pipe Wrenches.



NOTE:

Battery-powered or hand tools are preferred because there may not be any power source at the construction site during the installation process.

Torque Requirements

Screws and their corresponding tightening torques		
Screw Type	Cross head screwdriver	Tightening torque
M4	PH2	1.4 Nm
M5	PH2	3.0 Nm
M6	PH3	6.0 Nm

Materials

• aPower and accessories provided



No.	Item	Quantity
1	aPower	1 PC
2	Mounting bracket	1 PCS
3	Grille	1 Set
4	M5x20 screw	2 PCS
5	Retainer plate	2 PCS

• aGate and accessories provided



No.	Item	Quantity
1	aGate	1 PC
2	Pothook	3 PCS
3	Mounting fastener	1 PCS
4	Hexagon socket screws	10 PCS
5	Switch tag	1 Set
6	The wall pieces above	1 PCS
7	The wall pieces below	1 PCS
8	Large flat pads	4 PCS
9	Cable ties	5 PCS

The list of accessories is for demonstration purposes only. Depending on product version, details may appear slightly different.

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• Materials to be provided by installers



No.	Item
1	Electrical conduit, conduit adaptor and their fittings
2	Copper cables
3	Antioxidant conductive paste
4	Screws and M6 big spacers for wall installation
5	Circuit breakers must be provided by the installer
6	Customer optional external PV CT
7	Conduit fitting washer
8	Sealant (for use on outdoor conduits)
9	15mm Type X plasterboard
10	Network cable and registered jacks

Installation

Moving



• Compare and confirm the equipment delivered against the order information.



• A lift will be needed to unload the aPower from the truck.



• Transport the aPower and aGate to a safe and open area. Please handle with care.



Install the aPower

1) Unboxing



NOTE:

The aPower unit's packaging is large and bulky, making it very hard to move into a confined space. Installers will need to disassemble the external wooden box. A 6x100mm flat head screwdriver and a claw hammer can be used to follow these procedures.

(1) Remove the top wooden board.



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(2) Remove the sides of the wooden box from the aPower.



③Remove the protective carton and top foam from the aPower.



2) Stand up the aPower

Stand up the aPower following the procedures below (logo faces up). Several installers should work together to protect the equipment from falling.



3) Move the aPower to the installation site

A small-sized hand truck (with stair climbing features) may be used to carry aPower to the installation site.



NOTE:

Please use proper protective measures on the hand truck, such as foam or protective cloth, and keep the aPower well fastened during the transportation and handling process to avoid scratches or damage.



- 4) aPower bracket mounting
 - Before mounting
 - A mounting bracket is required for both floor and wall mounting installations. The Mounting bracket should be fastened to the wall at a minimum of 8 points.



Examine the smoothness of wall. If the wall is not smooth and straight to the floor, Type X plasterboards will be needed to fill the gaps to ensure all parts of the mounting bracket are well supported by the wall.



Special Wall/Baseboard Installation

Case 1: Protruding Baseboard Height > 152mm or the thickness of the bulge > 25mm (Floor mount)	Case 2: Concave Baseboard Height > 152mm (Floor mount)	Case 3: Uneven Wall
Solution	Solution	Solution
Solution	Solution	Solution
Use wooden or steel	Use wooden or steel spacers on	Use plywood or gypsum
Solution	Solution	Solution
Use wooden or steel	Use wooden or steel spacers on	Use plywood or gypsum
spacers on the upper part	the indented part of the	board to level the wall.
Solution	Solution	Solution
Use wooden or steel	Use wooden or steel spacers on	Use plywood or gypsum
spacers on the upper part	the indented part of the	board to level the wall.
of the bracket (to keep it	baseboard (to make it flush with	The recommended
Solution	Solution	Solution
Use wooden or steel	Use wooden or steel spacers on	Use plywood or gypsum
spacers on the upper part	the indented part of the	board to level the wall.
of the bracket (to keep it	baseboard (to make it flush with	The recommended
flush with the baseboard).	the wall).	thickness is 13mm.

* **NOTE:** These wooden or steel materials are prepared by the installer.

• Bracket installation procedure



NOTE:

- The installer needs to choose the fasteners and required installation holes depending on the type of wall and the desired installation position. Ensure that the wall bearing capacity meets the load requirements
- When the bracket is attached in the outdoor, windy area, at least 12 M6 screws (3 at each corner) should be used to mount the bracket. The type and length of the screws should match the above requirements according to the type of wall.
- There are two methods for bracket installation position.



Method 1: Use the bracket to mark the mounting points.

Floor mounted installation procedure:

① Place the mounting bracket at the planned installation position and support the mounting bracket using a 169mm thick wood block.

(2) Use the built-in level to adjust the installation angle.

③ Make marks through the mounting holes where the fasteners will be used.

Wall mounted installation procedure:

(1) Two installers will be needed to complete the installation. One installer supports the mounting bracket, keeping the bracket at the desired position on the wall. Adjust the bracket angle using the level.

② The other installer marks the mounting holes where the fasteners will be used.



Method 2: Use the cardboard positioning template to mark the mounting points.

① Place it against the wall in the planned installation position according to the orientation of the cardboard text (the bottom of the cardboard is on the ground when it is installed on the ground).

(2) Use a level to adjust the installation angle.

3 Make marks through the mounting holes where the fasteners will be used.

 \succ Mount on wooden beams

The following are the basic steps for installing the mounting bracket on wooden beams:



Select an appropriate drill bit to drill holes at the marked points. The diameter of the holes should be 4.3mm and the depth of the holes should be at least 64mm. Remove debris from the hole.

Use a wood screw with a large flat pad to ensure secure installation.

Mount on steel beams

The following are the basic steps for installing brackets on steel beams:



Use at least 8 M6 stainless steel hexagon screws (2 at each corner) with spring washers, large flat washers and nuts to secure the bracket to the steel beam.





Select a suitable drill bit to drill holes at the marked points. The diameter of the holes should be 8mm and the depth of the holes should be through the steel beam. Remove debris from the hole. Use M6 stainless steel hexagon screws with spring washer and large flat washer and hexagon nuts to fix the support to the steel beam holes. Tighten to 6.0 Nm. Mount on concrete or brick walls

The following are the steps to use the mounting bracket on concrete or brick:



Use at least 8 M6 stainless steel expansion screws (2 at each corner) with spring washers and large flat washers and at least 40mm length embedded in the wall. Place screws at least 40mm away from brick edge



(1) Using an appropriate drill bit for the type of wall, drill holes the same diameter as the anchor diameter, and at least 40mm deeper than the expected embedment. Ensure that all fasteners are at least 40mm away from the edges of masonry blocks or bricks. Remove debris from the holes.



(2) Set the nut flush with the top of the sleeve anchor. Use a hammer to drive the sleeve anchor into the hole in the base material until the washer and nut are tight against the fixture. Turn the nut until finger tight. Use an 11mm wrench to set the anchor by turning the nut three to four full turns.



③ Use an 11mm wrench to turn the nut in the opposite direction, and remove the nut, spring washer, and flat washer from the sleeve anchor. Set the mounting bracket at the sleeve anchor points.

6.0 Nm 6.0 Nm Torque Wrench

④ Use an 11mm wrench to attach the mounting bracket by turning the nut until the torque is 6.0 Nm.

5) Drill cable inlet holes on the wall (applies only when connecting cables through the wall)

As shown below, the sizes of holes in the wall depend on the relative positions of the mounting bracket. If there is any metal or wooden supporting structure in the drilling area, necessary adjustments are required to avoid it.



*NOTE: The size of holes depends on the size of the electrical conduits.

DANGER:

- Avoid drilling holes in water pipes and cables in the wall.
- PPE must be used in the operation.



WARNING:

Cover the aPower top heat dissipation hole to protect from gravel dust during drilling.





Electric drill and 25mm, 40mm wood bits are recommended to create holes for running cable through wooden walls.

It is important that the drill bit be kept perpendicular to the wall when drilling.

Concrete or brick wall



Hammer drill and 25mm, 40mm diamond tipped core bits are recommended to create holes for running cables through concrete or brick walls. Wet the wall and HEPA vacuum the dust, to protect the drill bits from overheating.

It is important that the drill bit should be kept perpendicular to the wall when drilling.

Metal wall or metallic studs

Electric drill and 25mm, 40mm hole saw are recommended to create holes for running cables through metal plate and metallic studs.

It is important that the drill bit should be kept perpendicular to the installation surface when drilling.



6) Lifting the aPower

	DANGER:	
	Special care must be taken to protect personal safety.	
	Reinforced toe shoes must be used to protect the installers from	
	tilting and falling equipment.	
<u>^</u>	WARNING:	
	Please use proper protective measures on the lift, such as foam or protective	
	cloth, and take effective protection measures to avoid scratching or damaging	
	the aPower during the installation process.	
Ø	NOTE:	
	For easy installation, before wall-mounting the aPower, refer to Electrical	
	Conduits to remove the aPower wiring compartment cover, 2 external charging	
	cables and cable conduit hole-plug 25mm, then pre-install the conduit adaptor	
	(Protect the wiring compartment well to prevent damage to the interface	
	board).	

(1) A lift is needed to raise the aPower for mounting. Raise the unit so that installation top mounting cleats on the unit back is higher than the top of the mounting bracket.



② Adjust the position of the lift until the mounting bracket is completely aligned to the back clips on the aPower and the mounting bracket is within locking position of the back joint on the rear of the aPower.


(3) Lock the wheels of the lift to prevent it from moving.



(4) Lower the fork arm until the top and bottom mounting cleats are firmly locked by the mounting bracket. During this process, the installer needs to push on the front of the aPower to ensure that the back side locks securely into the mounting bracket.





(5) After the aPower is firmly set on the mounting bracket, attach the two retainer plates to both sides of the upper bracket. The larger hole fits over the post on the side of the top bar of the mounting bracket. The smaller hole on the retainer plates should be attached to the aPower at the nut with the M5*20 screws. Tighten to a torque of 3 Nm.



7) aPower floor mounted leveling adjustment

If the aPower is to be installed on an uneven floor, the leveling screws on the bottom of aPower cabinet can be adjusted until the screw directly contacts the floor.



is finished.

Install the aGate

<u>!</u>	WARNING: Add lightning protection measures to the FHP according to AS/NZS 3000 and AS/NZS 4777.1.		
	NOTE:		
	•	The drill template guide board will be used for drilling mounting holed. Keep it in good condition prior to use.	
Ø	•	The film wrapped around the aGate will be used to protect the internal components of the aGate when drilling mounting holes. Do not tear the film until the drilling is complete.	

• During the handling and installation process, keep the aGate well protected from hard objects that may damage its exterior appearance and body.

1) aGate unboxing

- Visual inspection for damages, collision, or scratches, etc.
- Unboxing: Adjust the utility knife until the blade is less than 7mm long (it may damage aGate if too long). Cut open the adhesive tape on the upper surface of the aGate carton.



- Open the aGate carton, take out the template guide board and accessories, and then take the aGate out of the box.
- > Remove the packing foam from both sides of the aGate and remove the PE bag.

2) Remove the inner panel and door from the aGate

Grasp the small notch on the right panel of the aGate. Lift it slowly until the door of aGate is completely open.





WARNING:

The door may only be opened to a maximum of 100°. Violent operation may lead to cracking of the panel.

• Remove the inner panel: Use a #3 Phillips head screwdriver or an electric screwdriver with a Phillips head screw bit. Turn the 2 combination screws fastening the inner panel counterclockwise to remove the screws. Remove the aGate inner panel and properly store it.



• Remove the door: Use a #2x4" Phillips head screwdriver. Turn the 4 countersunk screws fastening the hinges on aGate door counterclockwise to remove the screws. Remove the aGate door and properly store it.



3) Prepare aGate cable inlets

Based on the preplanned installation position and electrical conduit arrangement, the installer remove the appropriate knockouts or plugs in the aGate. The aGate has four 40mm diameter knockouts on its back and four 40mm diameter knockouts on its bottom.

• How to remove the Knockouts?



① Put a 6x100mm flathead screwdriver against the black spot printed on the knockout hole, and then knock it with a claw hammer.





 Keep knocking until the knockout angled out.



③ Use needle nose pliers, twist the knockout back and forth until the attachment points snap.

(4) Remove the knockout. If burrs remain, remove them with a deburring tool.



NOTE:

If the conduit diameter is larger than the aGate knockout hole, or if any new hole needs to be drilled, appropriate tools should be used to expand the hole or to drill new holes.

4) Enlarging or Drilling New Holes (if necessary)

The home's power distribution should be made using appropriate cables and conduits in accordance with NFPA70 and local AHJ requirements. If the conduit diameter is larger than the aGate knockout hole, or if any new hole needs to be drilled, appropriate tools should be used to expand the hole or to drill new holes. If there is no requirement to enlarge or drill, please skip this step.





To avoid damage to equipment, completely shield all aGate interior electrical boards and components before you drill or punch holes, to avoid debris falling into the aGate.

The aGate is shipped in a protective film. When enlarging or drilling new holes on the aGate, unwrap the outer film and use it to protect the components inside the aGate, as shown below. Keep the film in place while drilling and punching holes. Remove all dust and debris before unwrapping the aGate for mounting.



White film wrapped on delivery



Site protection diagram

5) Install optional module(s)

The Smart Circuits Module and Generator Module are optional parts. If the user did not purchase them, please skip this step.

1 Install the Smart Circuits Module

The Smart Circuits Module can remotely control the on/off status of two (2) Smart Circuits, which may be set and controlled separately.





DANGER:

- Despite that the Smart Circuits may be controlled remotely on the FranklinWH App, the remote **OFF** status does not mean the circuit has been physically disconnected. It is important to test the circuit status during the installation process.
- Do not touch the output ports of the Smart Circuits Module directly or indirectly through conductive material, before disconnecting the circuit breakers.

- a) If it's the initial installation and the FHP device is not powered on, please skip this step. Disconnect all breakers in the aGate and all switches connecting the aGate to any external equipment. Use a multimeter to measure and check that the voltages at both input and output terminals of aGate are 0, to ensure that all electrical equipment have been disconnected from the aGate.
- b) Put the Smart Circuits Module in the position as shown in the figure and check that all installation holes 1 to 2 have been properly aligned.



c) Tighten (clockwise) the one M6 combination screws at positions 1 to 6.0 Nm using a #3x100mm Phillips head screwdriver. Tighten (clockwise) the one M5 combination screws at positions 2 to 3 Nm, using a torque batch.



d) Insert the cables into the SMART RELAY connection port. Fix the cables with cable ties and remove the excess tie. Insert the relay drives cables into the SMT RLY connection port. Insert the CT sampling cables into the SMT CT connection port. Connect the reserved intelligent load voltage sampling line on the aGate to the voltage sampling port on the intelligent load module using M4 screw assemblies.



② Install Generator Module

The Franklin Home Power (FHP) system can connect to a household backup power generator (generator). This connection is an optional component of the aGate.

a) If it's the initial installation and the aGate is not powered on, please skip this step. Disconnect all breakers in the aGate (including the solar, aPower, Smart Circuits, and grid breakers), the aGate power switch, and all switches connecting external devices to the aGate. Use a multimeter to measure and check that the AC voltages at both input and output terminals of the aGate (as shown below) are zero (0), to ensure that all electrical equipment have been disconnected.



b) Remove the Protective Cover. Use a #3x100mm Phillips head screwdriver to loosen the four M5 captive screws on the protective cover, remove the protective cover and keep it in good condition.



c) Install the Module Assembly. Please complete the installation following 1 to 4 as shown below.





d) Install the Protective Cover. Re-install the protective cover and fasten the four M5 captive screws using an electric screwdriver, and then tighten them to the recommended torque using a Phillips head screwdriver.



e) Install the Generator Breaker (optional, to be provided by the installer). Install the breaker according to local laws, regulations, standards, and AS/NZS 3000. The generator breakers are to be purchased and prepared by the installer. Skip this step if they are not ready.

Install the generator breakers following steps 1 to 3 below.



As shown in the figure, connect the cable to the upper inlet line of the breaker through the Generator(L) and Generator(N) of the aGate terminal. The recommended cable length is 25mm².





Use a hexagon screwdriver matching M4 screws to tighten the screws to a torque of 5.65 Nm.

The torque on the circuit breaker side refers to the requirements of the circuit breaker.

6) Install aGate Breakers (optional)

The circuit breaker are	optional parts and	l must be provided l	ov the installer.
The circuit breaker are	. Optional parts and	i must be provided i	Jy the motaner.

Name	MCB Max Rated current	Rated Short-Circuit Capacity	Recommended brand
Grid	100A	10kA	ABB/Clipsal/Hager
Generator	100A	6kA/10kA	ABB/Clipsal/Hager
Backup load	100A	6kA/10kA	ABB/Clipsal/Hager
Non-backup load	80A	6kA/10kA	ABB/Clipsal/Hager
aPower	32A	6kA/10kA	ABB/Clipsal/Hager
Solar	63A	6kA/10kA	ABB/Clipsal/Hager
Smart circuit	63A	6kA/10kA	ABB/Clipsal/Hager



NOTE:

- The recommended brand of the breaker is for reference only. The breaker should meet the requirements of AS/NZS 60898 and local regulations.
- The PV has two inputs, but the total power should not exceed 15kW.
- Smart circuit has two outputs, but the total power should not exceed 15kW.
- The short-circuit breaking capacity of the grid MCB should not exceed 10kA.

① Install the breaker



After the installation is complete, remove the baffle plate from the corresponding circuit breaker position on the inner door panel, and affix the circuit breaker label of the corresponding branch, as shown in below.



7) aGate wall installation

Follow the procedures below to install the aGate on the wall.



Avoid drilling holes in water pipes and cables in the wall.

WARNING:

DANGER:



Cover any nearby aPower top heat dissipation hole during drilling to protect from gravel dust.

• The following are basic steps for installing the aGate on concrete or brick structures:



(1) Place the aGate guide board template at the planned installation position (refer to the local laws, regulations and codes in relation to building construction for the minimum mounting height for the aGate). Use a level to adjust the guide board to level, and then make marks at the four holes on the guide board.



(2) Using an appropriate drill bit for the type of wall (reference below), drill holes the same diameter as the anchor diameter, and at least 40mm deeper than the expected embedment. Ensure that all fasteners are at least 40mm away from the edges of masonry blocks or bricks. Clean debris out of the holes.



③ Use a 11mm wrench to turn the nut in the opposite direction, and remove the nut, spring washer, and flat washer from the sleeve anchor.



(5) Remove the pothooks (3PCS) and fastener (1PC) from the shipping attachment, and attach them to the back of the aGate with M6 hex socket screws as shown in the figure.

4	•
$\bigcirc - \bigcirc$	600
0-0	M6 M6 M6 Large spring nut flat pad washer

Fasten the aGate to the wall using the aGate fittings: M6 large flat pad, spring washer and nuts.
Check that the tightening torque is 6.0 Nm.



(6)

(6) After attaching the pothooks, the aGate shall be hung on the wall hanger as shown in the figure (all three pothooks should be firmly connected to the hangers).

7



⑦ After hanging the aGate, secure the fastener and the bottom wall hanger from the side using M6 hexagon socket screws. The following are the steps for installing the aGate on wooden beams:



Select an appropriate drill bit to drill holes at the marked points. The diameter of the holes should be 4.3mm and the depth of the holes should be at least 64mm. Remove debris from the holes. Use a wood screw with a large flat pad to ensure secure installation.

• The following are the steps for installing the aGate on steel beams:



Select a suitable drill bit to drill holes at the marked points. The diameter of the holes should be 8mm and the depth of the holes should be through the steel beam. Remove debris from the holes. Use M6 stainless steel hexagon screws with spring washer and large flat washer and hexagon nuts to fix the support to the steel beam holes. Tighten to with a force of 6.0 Nm.

Electrical Conduits

1) Open the wiring compartment cover on the aPower



(1) Use a 6x100mm flat head screwdriver and insert it into the snap joints, press and pull the cover out.



(2) Lift the cover upward.





③ Remove screws fastening the internal panel. Turn them counterclockwise using a #3x100mm Phillips head screwdriver. (4) Remove the cover.



2) Remove some aPower accessories

• Unplug the 2 external charging cables.



- Remove the protective ring from the inside out.
- If a signal cable hole is needed, remove the cable conduit hole-plug. Turn the plug counterclockwise using a bent-handle ratchet wrench with a Phillps head, while keeping the interior fastening nut in position. When loosening, rotate by hand until the plug is removed.



Run signal cable through here

3) Install conduit adaptor behind aPower cable hole



(1) Select an appropriate conduit adaptor.

- Select a 32mm diameter plug for 35mm holes
- Select a 25mm diameter plug for the 28.5mm holes

(The figure below is for reference.)

(2) Install the corresponding plug into the corresponding hole, and the direction of the plug should be toward the back of the aPower.



Communications Wiring

1) Connect a Wifi Com Kit cable to activate the aGate commissioning functions

Ensure that the WIFI Com Kit connects the WIFI module to the EMS properly. If a 4G module is configured, please refer to *FranklinWH 4G Data Plan Operating Manual*.



- 2) Establish communications between the FranklinWH application and the aGate
 - Connect the mobile device to the built-in Wifi access point in the aGate to establish a local connection.

The built-in Wifi access point (AP) provided by each aGate may be used to establish local communications between the FranklinWH App and the aGate.

> Account: AP_last 9 digits of serial number, Password: last 12 digits of serial number.



The account and password can be modified through the FranklinWH App.

• Connect the aGate to the home network for remote connection

Method 1 (Recommended): Connect the aGate to the household network using a communications cable (Not provided).

To ensure the reliability of remote communications, it is recommended to connect the household network cable with internet connection to the **Eth1** port of EMS module, in order to enable the remote communication function.



- The cable from the household network may only be connected to the Eth1 port, as Debug (Eth1) port serves for debugging.
 - The communications cable needs to be made on site using a crimping tool, a ready-made network cable should not be used. Otherwise, the bending of cable inside the aGate may prevent the internal cover from closing. Test with a network cable tester to ensure that the cable contact is error-free.

Communications cable preparation:



① Remove the insulation jacket from the cable.

(2) Fan the wires in the order of 568B (See wiring scheme diagram).

- ③ Insert the wires into the connector.
- (4) Crimp the connector using a crimping tool.
- 5 The cable is ready.

(6) Test with a network cable tester to ensure that the communications cable contact is error-free. Before testing the cable, ensure that both ends of the cable are disconnected from the FHP.

Wiring scheme:



Method 2: Connect via Wifi

The Wifi connection between the aGate and household wireless network should be done during the installer commissioning process. Please refer to the *FHP Commissioning and Acceptance Guide*.



***NOTE**: The aGate supports only 2.4Ghz Wifi connection to the family router.

> Method 3: Connect via telecommunication 4G network (only as backup).

Please make sure that there is a good 4G LTE signal in the local area and that a SIM card has been inserted into the slot on the wireless module.



3) Communications connection between the aGate and the aPower

Before connecting the communications cable to the FHP, test it with a network cable tester to ensure that the cable contact is error-free.



NOTE:

It is recommended to install the communications cable in the conduit to avoid accidental damage and equipment failure. If the network cable and the power cable share the same conduit, use the shielded network cable (RJ45 cable end with metal). • When distance between the aGate and the first aPower is shorter than 30m

Only a network cable is required to connect the aGate and aPower when the distance is less than 30m.



*NOTE: For network cable production, please refer to **Communications cable preparation** above or **Communications Cables**.

• When the distance between the aGate and the first aPower is longer than 30m

Both a network cable and a 20V power supply cable must be used in conjunction when the distance between the aGate and the first aPower is longer than 30m.



When the system needs to be connected to the 20V power supply, the terminal does not need to be removed. Just press the orange switch on the port, insert the prepared wire, and then release the switch to complete the wiring.

The 20V power cable preparation:



(1) Run the $1mm^2 \sim 1.5mm^2$ 20V power cable through the electrical conduit. Refer to the local regulations for the cable colors.

- (2) Remove the insulation jacket on both ends by 11mm.
- ③ Connect the wires to the corresponding terminals.

4) RS485 communication and DRM0 signal control



If you need to pull out the 485 communication to check the power supply of the grid, please connect to A3 and B3 ports. If you need to force the system to stop running, please short the DRMO port. The above operations are only performed by qualified professionals.

Electrical Wiring

aGate terminal information



NOTE:

- The wiring should comply with AS3000, local laws and regulations, and site application.
- Use 2-poles or 1-pole MCB depend on the local laws and regulations and site application.
- The wiring of breakers should follow the specific breaker instructions.
- The power sources must be connected to the aGate at the corresponding ports.
- The Non-Backup port of this device is only used to connect to non-common household loads. When the grid goes down, the loads connected to the Non-Backup port will lose power supply, maximizing the use of the device's stored energy to supply power to household basic loads connected to the Backup port (common household loads include lighting, refrigerators, freezers, and computer). Non-Backup port is not applicable for the Australian market. For AU market, the non-back loads can be supplied via the bi-directional grid port which is intended to connect to the Main Switchboard.
- Solar 1 and Solar 2 are intended for connecting to AC coupled PV systems.
- Only for connecting AC coupled PV inverter systems and if installed without any other energy sources, then this is outside the scope of the manufacturer warranty.
- The Reserve port is reserved for subsequent product upgrades to connect to aPower.



Location	Applicable Cable	Wiring Torque	Stripping Length
Grid	$25mm^2$	5.6 Nm	12mm
Generator	$25mm^2$	5.6 Nm	12mm
Backup	$25mm^2$	5.6 Nm	12mm
Non-Backup	$16mm^2$	5.0 Nm	12mm
Smart circuit	$2.5-10mm^2$	3.9~4.5 Nm	12mm
aPower	6mm ²	3.9 Nm	12mm
Solar	6-16 <i>mm</i> ²	3.9~5.0 Nm	12mm



NOTE:

- Secure the terminals on the aGate using a 4mm hex wrench.
- Stripping Length is only for the aGate terminals. The stripping length of the circuit breaker side terminal, the installation torque, and the tool used are determined by the brand and model of the circuit breaker used onsite.
- The internal ground terminal of the aGate is connected to the ground bar, and the ground bar is connected from the inside of the aGate to the main distribution board through the ground wire for ground connection.

Neutral continuity is maintained at the Main Switchboard for the backup loads, wiring reference figure below.

RCD's differential residential current should be 30mA,type B or A.

MCB in distribution box should match the mcb in the aGate.



aGate terminal information and wiring requirements are as follow:


General

- The cable conductor sizes and current capacity rating are listed in the standard AS/NZS 3008.1.1 for connection L, N, Ground.
- Conductors, relied upon for the protective grounding and bonding system, will be sized to handle the intended fault currents and, if insulated, the insulation will be green or green with yellow stripes.
- Grounding conductors are sized following section 5 of AS3000.
- A field wiring terminal or lead shall be rated for the connection of a conductor or conductors having a minimum carrying capacity rating of 125% of the rating of the unit.
- The distance between the end of the connection point of a field-installed wire and the wall of the enclosure to ward which the wire is to be directed, shall be following AS3000.
- Cables selection will consider metal compatibility.

A	DANGER: The installation, maintenance and replacement operations on aPower and aGate equipment must be done by FranklinWH Certified Installers.
A	DANGER: Before starting any electrical work, please ensure that the aPower is powered OFF to reduce the risks of electric shock.
A	DANGER: The installation, wiring, maintenance, transportation and handling of aGate and aPower units should only be done by qualified personnel wearing personal protective equipment (PPE).
	DANGER: Before any electrical operation starts, please turn off the grid power supply switch, generator input switch, the solar input switch, the load switch, and lock the switches. If the switches cannot be locked, please lock the distribution box where the switches are installed. A warning sign Out of Operation , Do NOT Turn On should be hung.
A	DANGER: It is strictly prohibited to perform any installation, maintenance, or handling operation outdoors during adverse weather conditions such as lightning, rain, snow, or strong wind.
	DANGER: Please follow your local laws, regulations and standards in installation, wiring, maintenance, transportation and handling operations. The safety instructions in this Guide are supplemental to all pertinent laws and regulations.

DANGER: The power cables should be wired in a sequence of the load side, the backup power supply side, and the non-backup power supply side. If the other end of a cable cannot be wired at the same time, a warning sign Out of Operation, Do NOT Turn On should be hung.
DANGER: aGate and aPower units do not have any indoor-level lightning protection feature, so customers should configure lightning protection equipment where the grid power runs into the house.
DANGER: Please follow the Local Precedence rule. Remote control does not mean that the local circuits are safe. Please decide whether your circuit is safe based only on a circuit test.
DANGER: Electrical connections require that the wires are connected in correct order, where L and N cannot be misconnected. Incorrect wiring may cause equipment damage or even personal injury or death.

Connecting the external EPO switch (optional)

When an emergency situation occurs, such as fire or a smoking battery, the user may manually press the EPO (Emergency Power Off) button to power off the system, where it is safe to do so. The external EPO is an optional component. The homeowner should consult with the installer to have an EPO installed. If an EPO is not needed, skip this step.

Please note the following when choosing the external EPO:

- Must be labeled as "Emergency Stop Button," "Emergency Stop Device," "Emergency Stop Unit."
- Must have an ON/OFF switch that maintains its position after being manually set to either status.
- Must have a clear indication of the ON/OFF positions.
- Must be outdoor rated (NEMA 3R or higher).
- The maximum low voltage wire running between the EPO switch and the aGate should not exceed 453m.
- The EPO shall have a rated voltage of 5V or higher.



NOTE

If the external EPO is not connected to the Franklin Home Power (FHP) system, please keep the factory default settings (the EPO module is short connected on the EMS module as shown in the figure).



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 If it's the initial installation and the aGate is not powered on, please skip this step. Disconnect the aGate power switch and all breakers and switches in the aGate that are connecting external devices. Wait at least five (5) minutes, and then loosen and remove the six M5×12 screws using a Phillips head screwdriver, and remove the inner panel from the aGate. Use a multimeter to measure and check that the AC voltages at both input and output terminals of the aGate (as shown below) are zero (0), to ensure that all electrical equipment has been disconnected from the aGate.





WARNING:

When the EPO button is pressed, the EPO is in the OFF state. That means the EPO function has been activated to protect the system. At this time, aPower will be shut off and all relays inside aGate (including the Supply Relay, the Generator Relay, the Smart Circuits Relay, Backup Relay, and the Solar Relay) will be disconnected. And disconnects the connection between the Utility grid and backup port on aGate. Auxiliary power remains ON. Do not use the EPO for maintenance operations or in any condition other than an emergency.

2) Remove the short connector on the EPO of the EMS module.



3) Connect pins 3 and 4 (labeled EPO) on the EMS to the C (common) and NC (normal close) of the EPO. Use wire 0.5-1.5mm².



NOTE

The cable diameter should be between $0.5mm^2$ and $1.5mm^2$.



- 4) Install the aGate inner panel and tighten the M5x12 screws using a Phillips screwdriver, and then tighten the screws to the recommended torque using a Phillips torque screwdriver.
- 5) Paste "Note of EPO" label.



Connecting the solar inverter



Connecting the Smart Circuits (optional)



• Refer to the breaker specifications for the tightening torque value for the breaker output cable screws.

• The ground cable does not pass through the circuit breaker.



Connecting the Grid AC power





Connecting aPower

• Connecting a single aPower



The cable stripping length at the aPower is 15mm. The cable stripping length at the aGate is based on the circuit breaker requirements.



Re-Install the aPower Cover and Install Grilles

(1) Install the internal cover for the wiring compartment. Please check to make sure the cover label's S/N corresponds with the equipment S/N.

(2) Tighten the four (4)
(3) Install screws by turning clockwise using a #3x100mm Phillips head screwdriver.

 (\mathfrak{I}) Install the external panel.

Close

④ Use a diagonal cutting plier to remove the knockout holes on the grille. (According to the installation direction of the conduit adaptor, wiring and **conduit**, remove the knockout holes in the corresponding positions).



(5) Install the three grilles.



aGate Panel Re-Installation

• Two installers will be needed to re-install the aGate door. One installer lifts the aGate door up and adjusts it to the correct position. The other installer fastens the (4) M4X8 sunk screws.



• Install the inner panel and fasten it by tightening the 2 M5x12 combination bolts.



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• After the breaker is installed, stick the labels from the literature kit (bag with labels and accessories) on the inner panel of aGate according to the position of the breaker, as shown in the diagram below.



Labels

Label positions

Startup and Shutdown Steps



Startup Steps:

- Step 1. Ensure that the grid breaker, the generator breaker, the smart circuit breakers, the backup breaker and the solar breaker are all in the OFF position (for initial use).
- Step 2. Ensure that the aGate power switch is in the ON position.
- Step 3. Turn on the aPower breaker.
- Step 4. Press the aPower switch to ensure that it is on. Wait until the bottom of the LED strips on the aPower lights up, which indicates that the aGate has successfully started without connecting to the grid.
- Step 5. After about 60 seconds, if the aPower has power output, that indicates that the aPower has successfully started without connecting to the grid.
- Step 6. If the grid is normal, turn on the aGate grid breaker. After the grid relay is turned on, the grid icon on the FranklinWH App home screen will light up, indicating that the aPower is successfully connected to the grid.
- Step 7. Turn the generator breaker (if the Generator Module is installed) and solar breaker to the ON position.
- Step 8. Turn on the Smart Circuit breakers (if the Smart Circuit Module is installed), the backup breaker and the breakers in the load panel.



The initial startup process includes steps 1 to 8, while the general restart process is as follows: turn off the aGate power switch and the aPower switch, wait for 5 seconds after the LED strips on the aPower go out, then turn on the aGate power switch, and follow the instructions in steps 3 to 8.

Shutdown Steps:

- Step 1. Turn off the grid breaker if connected to the grid.
- Step 2. Turn off the solar breaker.
- Step 3. Turn off the generator breaker if connected to a generator.
- Step 4. Turn off the aPower breaker.
- Step 5. Press the aPower switch on all aPower units to the off position in turn (extended, flush with the case). The LED strips will go out.
- Step 6. Turn off the Smart Circuits breakers and backup breakers if applicable.
- Step 7. Turn off the aGate power switch inside the aGate.



Commissioning

After the FHP device is installed, the FranklinWH app is required to configure the FHP's parameters. When the installer is local, physically present at the FHP, and connects to the system's Wifi, the full set of parameters are accessible.

Preparation before commissioning

- 1. Ensure that the grid breaker, generator breaker (optional), solar breaker, Smart Circuit breakers (optional), backup breaker (optional), and aPower breaker on aGate are all in the OFF position.
- 2. Ensure that the aGate power switch is in the ON position.
- 3. Ensure that the external EPO switch (if installed) is OFF or the EPO plug is disconnected.
- 4. Press the aPower switch on the right side of aPower to confirm that the switch is mechanically ON, and the power indicator on the aGate turns ON.



NOTE

During the debugging and acceptance process, the app will receive device fault information due to abnormal system operation, which can be ignored. After debugging and acceptance is completed, if there is no problem with the system, it will work normally, and the app will not receive any fault information.

Initial Parameter Setting

Step 1. Enter the installer account and password, click Login. The device list page is displayed.



If you wish to see a demonstration system rather than the actual local parameter configuration of the FHP, click **Demo**, then select **Installer/ Service** in the option box, and click **New** to access the sample homeowner parameter configurations.



Step 2. Click the Network Settings.



Step 3. Enter Commission to connect the app to the aGate Wifi hotspot.



Step 4. Network Settings.



An Ethernet or Wifi connection is preferred to the 4G cellular network, as 4G is easily affected by the carrier services and weather conditions.

Currently, only 2.4Ghz Wifi connections are supported between the aGate and the router.

Because of cellular network coverage issues, sometimes the phone will drop the connection with the aGate after the Wifi connection has been successfully established. The mobile application will prompt to reconnect. Please follow the instructions and reconnect your mobile phone to the aGate.





Step 6. Set other system parameters.



Step 7. Switch to the emote configuration tools.

Step 8. Latitude & Longitude.





NOTE

During the initial configuration of the FHP system, the time, latitude and longitude in **Device information** are unavailable. The **Location information** of the user must be synchronized to the device information.

Step 9. Access the grid package settings page.



Step 10. Set grid parameters (refer to the customer's utility rate plan).

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	< Grid Con	npliance		C User Defin	ned
Grid Compliance	Australia			Permit Service	Enabled 📏
page settings.	AS 4777.2 - A				
	AS 4777.2 - B			Soft-Start Ramp	>
	AS 4777.2 - C		User defined.	Unintentional Islanding Mo	ode Enabled >
For compliance	User Defined			Trip and Ride Through	>
with AS/NZS	User Defined			mp and Kide milough	
4777.2:2020				Constant Power Factor	Disabled 🗲
please select					
from Region				Constant Reactive Power	Disabled 💙
A/B/C. Please					
contact your				Voltage-Active Power	Enabled 💙
local grid				Voltage-Reactive Power	Enabled 📏
	Ne	xt Screenshot		Next	Screenshot

Step 11. Bind the customer account to the aGate.

There are two ways to bind the customer account to the aGate.

- Method 1: Enter the customer's email account address, select the financer of this project, select the distributor from which the Franklin Home Power system was purchased, and click Next to bind user.
- Method 2: Scan the QR code (The QR code may be found on the aGate inner panel and the EMS module). Enter the customer's email account, the unique serial number and key of the device, select the financer of this project and select the distributor from which the Franklin Home Power system was purchased, then click Bind.



NOTE

If there is not a contractual requirement to select financer and distributor, then select **others** in each field.

Method 1 is recommended. If the binding fails in method 1, you may try method 2.



After the FHP system is installed, the initial configuration is completed.



View the Software version info

- Step 1. Sign in to the FranklinWH App on the installer account.
- Step 2. Click the **New**. Locate the aGate by its serial number (SN) and click into the FHP system.



Step 3. Click Setting -> Device info -> Software version info.

15:21	š40
C Software	version info
aGate:	
Local main version	
From the dsp version	
Local app version	
Local AWS version	
aPower:	~
PE_FPGA	
PE_DCDC	
PE_INV	
BMS_MAIN	
BMS_BL	
BMS_TH	

View or set by user

Sign in to the FranklinWH App on the homeower's account, homeower can do the following:

- Change password: select **Forgot password** to reset password on **Login** page.
- The home page of the FranklinWH App displays the real-time data of your FHP system under the **Now** option, where you can view the running status of various energy devices in your household.
- Click the menu in the upper left corner of the **home** page, and then Click **Mode** -> setting sign in the upper right corner -> **Grid Package**.

Maintenance

The aPower fan air ducts, cabinet air ducts, radiator fin spacing, etc., are free of obstruction and accumulated dust The FHP system should be installed in a dry, well-ventilated room without any corrosive gases; it is recommended that the indoor temperature does not exceed 30°C.

Appendix 1: Electrical parameters Table 1: aGate

FRAN	KLINWH			
Smart Energy Management System				
Model	aGate X-01-AU			
Compliance	IEC/EN 62109-1, IEC/EN 62109-2, IEC/EN 62040-1, IEC/EN 62477-1, IEC/EN 62619, AS/NZS 4777.2, IEC/EN 61000-6-1, IEC/EN 61000-6-3, IEC 61439-3, IEC 61439-1			
Ele	ectrical			
AC Input/Output (Grid)				
Rated Voltage	230/240VAC L/N/PE			
Rated Current	80A			
Power Factor Range	-1 leading ~ 1 lagging			
Frequency	50Hz			
Rated Active/Apparent Power (230V)	18.4kW/18.4kVA			
Rated Active/Apparent Power (240V)	19.2kW/19.2kVA			
AC Input (Generator)				
Rated Voltage	230/240VAC L/N/PE			
Rated Current	80A			
Frequency	50Hz			
Power Factor Range	-1 leading ~ 1 lagging			
Rated Active/Apparent Power (230V)	18.4kW/18.4kVA			
Rated Active/Apparent Power (240V)	19.2kW/19.2kVA			
AC coupled PV system*2				
Rated Voltage	230/240VAC L/N/PE			
Rated Current (Single or Two)	50A or 31.5A			
Powr factor range	-1 leading ~ 1 lagging			
Frequency	50Hz			
Rated Active (Single or Two)(230V)	11.5kW/7.245kW			
Apparent Power (Single or Two)(230V)	11.5kVA/7.245kVA			
Rated Active (Single or Two)(240V)	12kW/7.56kW			
Apparent Power (Single or Two)(240V)	12kVA/7.56kVA			
Backup Output *1				
Rated Voltage/Frequency	230/240VAC L/N/PE			
Rated Outputput Current	80A			
Powr factor range	-1 leading ~ 1 lagging			
Frequency	50Hz			
Rated Active/Apparent Power (230V)	18.4kW/18.4kVA			
Rated Active/Apparent Power (240V)	19.2kW/19.2kVA			
Smart Load*2				
Rated Voltage	230/240VAC L/N/PE			
Rated Current (Single or Two)	50A or 31.5A			

Power Factor Range	-1 leading ~ 1 lagging	
Frequency	50Hz	
Rated Active (Single or Two)(230V)	11.5kW/7.245kW	
Apparent Power (Single or Two)(230V)	11.5kVA/7.245kVA	
Rated Active (Single or Two)(240V)	12kW/7.56kW	
Apparent Power (Single or Two)(240V)	12kVA/7.56kVA	
Non-Backup Output*1		
Rated Voltage/Frequency	230/240VAC L/N/PE	
Rated Outputput Current	63A	
Powr factor range	-1 leading ~ 1 lagging	
Frequency	50Hz	
Rated Active/Apparent Power (230V)	14.49kW/14.49kVA	
Rated Active/Apparent Power (240V)	15.12kW/15.12kVA	
AC Input/Output (aPower)		
Coupling	AC Coupled	
Rated Voltage	230/240VAC L/N/PE	
Rated Current	21.7A	
Max Continuous Input/Output Current	24.5A	
Rated Input/Output Power	5kW	
Rated Apparent power	5kVA	
Max Grid Output Power	5.8kVA	
Power Factor Range	0.8 leading ~ 0.8 lagging	
Battery		
Battery Type	Rechargeable Lithium-ion	
Battery voltage range	42VDC~58VDC	
Battery Max Short Circuit Current/Duration	550A/1ms	
Max charging and discharging current	118A	
Battery Nominal Voltage/Rated Capacity	51.2VDC/280Ah	
Battery Rated Energy	14.336kWh	
Battery Usable Energy	13.6kWh	
Battery designation	IFpP73/175/206[1P16S]E/-10+50/95	
System parameters		
Operation Temperature Range	-20°C to 50°C	
Ingress Protection	IP 55	
Protective Class	Class I	
Pollution degree	PD 3	
Environment	Indoor/Outdoor	
Weight	13.5kg	
Max.Elevation	4000m	
Overvoltage Category		

Table 2: aPower

FRANKLINWH AC Coupled BESS				
Model	aPower X-01-AU			
Compliance	IEC/EN62109-1, IEC/EN62109-2, IEC/EN62040-1, IEC/EN62477-1, IEC/EN62619, AS/NZS4777.2, IEC/EN61000-6-1, IEC/EN61000-6-3			
Electrical				
Coupling	AC Coupled			
Rated Input/Output Voltage	230VAC/240VAC L/N/PE			
Operating Voltage Range	180~260VAC			
Rated Input/Output Current	21.7A			
Max.Continuous Input/Output Current	24.5A			
Rated Input/Output Power	5kW			
Rated Apparent Power	5kVA			
Rated Frequency	50Hz			
Power Factor Range	0.8Leading to 0.8 Lagging			
Battery Type	Rechargeable Lithiumion-ion			
Battery Voltage Range	42VDC~58VDC			
Max Charging and Discharging Current	118A			
Battery Max Short Circuit Current/Duration	550A/1ms			
Battery Nominal Voltage/Rated Capacity	51.2VDC/280Ah			
Battery Rated Energy	14.336kWh			
Battery Usable Energy	13.6kWh			
Battery Designation	IFpP73/175/206[1P16S]E/-10+50/95			
System Parameters	_			
Operation Temperature Range	-20°C to 50°C			
Ingress Protection	IP 67(Battery Pack&Inverter) IP 56(Wiring)			
Protective Class	Class I			
Pollution degree	PD 3			
Environment	Indoor/Outdoor			
Max Elevation	4000m			
Inverter Topology	None Isolated			
Overvoltage Category	AC:III DC:II			
Weight	185kg			

Appendix 2: Feeding power limit function

Export limit

The export limit is used to limit the active power output from the batteries and PV to the grid. In our system, the charge and discharge power of the battery is adjustable while the power of the PV is not adjustable, so when the PV generates more power and the battery is not able to absorb the PV power completely, then the remaining PV power will flow to the grid. The export power limit is realized by the following two aspects.

Soft limit: When the export power exceeds the soft limit power, the system will adjust the battery power, such as decreasing the discharge power or increasing the charge power, so that the export power is lower than the soft limit power. When the adjustment fails, the PV will cut off to reduce the export power.

Hard limit: When the export power exceeds the hard limit power, the system cuts off the PV and shuts down the inverter. When the PV relay control fails, or when it is not possible to control the power to the inverter, the soft limit function fails, so the system needs to be shut down for protection. The hard limit power needs to be slightly larger than the soft limit power to prevent the hard limit from being accidentally triggered and shutting down the system.

Generation limit

The generation limiti is used to limit the active power output from batteries and PV to the grid and loads. In our system, the power from PV and batteries will only flow to the loads and the grid. The limiting principle is the same as export limit and is also realized by soft and hard limiti.

Soft limit: When the generated power exceeds the soft limit power, the system will adjust the battery power, such as decreasing the discharge power or increasing the charge power, so that the generated power is lower than the soft limit power. When the adjustment fails, the PV will cut off to reduce the generation power.

Hard limit: When the generated power exceeds the hard limit power, the system cuts off the PV and shuts down the inverter. When the PV relay control fails, or when it is not possible to control the power of the inverter, the soft limit function fails, so the system needs to be shut down for protection. The hard limit power needs to be slightly larger than the soft limit power to prevent the hard limit from being accidentally triggered and shutting down the system.

* **NOTE:** The principles of export limit and generation limit are the same; generation limit can be realized when the power collection point is in front of the load, and export limit can be realized when the power collection point is behind the load.

