



Franklin Home Power User Manual

Version 1.0

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Please visit www.franklinwh.com/support for the latest Franklin Home Power documents.

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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.



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 aPower, aGate and other electrical components, and this document applies only to the following products: aPower X and aGate X.

FranklinWH Energy Storage Inc. ("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.

FCC Compliance

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

MPE caution (if a FCC certified RF module is inserted in & the separation distance is indicated in the FCC grant of RF module)

To satisfy FCC / IC RF exposure requirements, a separation distance of 20 cm or more should be maintained between the antenna of this device and persons during device operation.

To ensure compliance, operations at closer than this distance is not recommended.

Feedback

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



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Safety Statements

Important Information

Both aGate X and aPower X are electrical devices. Please read this entire document to ensure the proper use of the Franklin Home Power (FHP) system. Failure to follow this may void the warranty. Please strictly follow the safety instructions in this Manual during operation, otherwise it may result in equipment malfunction, electrical shock, serious injury or death.

Safety Symbols











This Manual contains the following safety symbols, as shown below.









	DANGER: This indicates a hazardous situation which if not avoided, may result in death or serious injury.
	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.
	NOTE: This indicates information that is important for optimal system operation. Closely follow instructions.
	ELECTRONIC DEVICE: DO NOT THROW AWAY! All 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.

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













Safety Instructions

General Information

	aGate X and aPower X are electrical equipment that, when used improperly, can present a risk of electrical shock and fire, and misuse may void the warranty. Only FranklinWH certified and qualified electricians should install, maintain or replace aGate X and aPower X equipment or wiring. They must wear personal protective equipment (PPE) during operation.
	If the aPower X battery is leaking electrolyte, smoking, or on fire, if it is safe to do so, disconnect the AC power from the FHP system and turn off the aPower X switch on the side of the aPower X to stop the aPower X from charging and discharging.
	The aGate X and aPower X should be installed away from heating equipment, or any source of heat and/or fire.
	It is strictly forbidden to install, maintain or handle FHP equipment outdoors during bad weather such as thunder, rain, snow and high winds.
	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.
	When installing and maintaining the FHP, avoid any foreign objects being inserted or dropped into an aPower X or aGate X.
	To prevent misoperation, ensure that the upstream and downstream switches are disconnected and padlocked during installation or maintenance.
	During use, storage, and transport, ensure that the ambient temperature of an aPower X does not exceed 122°F (50°C), that it is not near flammables, and that the cooling system and vents are not blocked.
	During the transport and handling of aGate X and aPower X units, extreme care is required to avoid dropping, bumping, stomping, or inverting the equipment.
	Before installation, do not store an aPower X on site for more than one month. After installation, do not turn on the aPower X before connecting the PV and grid, otherwise the battery may be depleted due to a long period of time without charging.

	The aPower X must be carefully handled and installed using lifting equipment to avoid injury to installers or the aPower X.
	To prevent damage, leave the aPower X in its shipping packaging until it is ready to be installed.
	Only use parts or accessories purchased from FranklinWH or a FranklinWH-certified party.
	Do not paint any part of an aPower X or aGate X unless the paint surface of the equipment housing is accidentally damaged during transport, installation or maintenance. The damaged part can be repaired with paint or topcoat of the same color.
	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 X or aPower X without the authorization of FranklinWH. Otherwise, it may lead to safety hazards and void your warranty.
	Do not use the aPower X or aGate X if there is functional or cosmetic damage noticed after unboxing (except for slight paint damage). Contact after-sales service for support.
	The operation of an FHP requires an internet connection. Extended offline operation may result in a voided warranty. Please refer to http://www.franklinwh.com/support for information.
	The installation, wiring, maintenance, transportation, and handling of each aGate X and aPower X should follow local laws, regulations and standards, and the Safety Instructions in this Guide serve as supplementation to the laws, regulations and standards.

During the installation, use, storage, and transport of FHP equipment:

	DANGER: Keep away from flammable and explosive materials.
	DANGER: Additional protective measures should be taken to protect equipment from access by children.
	WARNING: Install in dry, cool and well ventilated location for satisfactory performance.
	WARNING: Install away from standing water or from areas that can pool water.
	WARNING: Keep away from dust and smoke.
	WARNING: Install where there is no direct exposure to sunshine, rain or snow.
	WARNING: Install at an elevation lower than 9843 feet (3000 meters). Contact FranklinWH if an install is needed above 9843 feet.
	WARNING: Keep way from water sources including downspouts, sprinklers, faucets and liquid containers.
	WARNING: Keep away from any vehicle route. If installed near the garage or parking area, ensure that the equipment is well protected from collision and impact.
	WARNING: Install in a location that is properly leveled, hardened, and not soft if floor-mounted. If there is grass nearby, a layer of cement board or slab stone must be placed on the projection area of the equipment to block grass growth or prevent the equipment from collapsing.
	WARNING: If wall-mounted, ensure sufficient bearing capacity.
	WARNING: This product can expose you to lead, which is known to the State of California to cause cancer and birth defects or reproductive harm. (For more information go to www.p65warnings.ca.gov).

Warranty Statement

To meet warranty requirements, the FHP system must be installed and operated properly according to the instructions in related FranklinWH documents.

To secure the full 12-year warranty, the FHP system must be reliably connected to the internet to access remote services provided by FranklinWH. If an internet connection is not established or is interrupted for an extended period, and FranklinWH is unable to contact you, the warranty may be limited to be less than 5 years.

Please visit us at www.franklinwh.com/support to learn more about the warranty.

Service and Maintenance

Service

- Keep the aPower X away from leaves or other foreign materials, especially keep them from the top and between the unit and the back wall.
- Keep the aPower X away from direct sunlight.
- Keep all FHP equipment in an environment with acceptable temperature and humidity.
- Clean the equipment surface using a soft cloth. If water is needed, please make sure the cloth is slightly damp (water only) and the equipment is completely de-energized.
- Don't block the vents.
- Keep all units away from flammable, explosive, and/or poisonous materials.
- Keep the equipment operating within the allowed power range and avoid overloading.
- Make sure all cables are wired reliably and all connectors are free of stress.
- Keep the equipment away from hazardous zones and potential risks.
- A nearby smoke detector is recommended if the equipment is installed indoors.

Maintenance

- Please check the running status of your equipment on your mobile app. If any alarm is found, please contact the qualified service group.
- Please regularly check that the aPower X button status is consistent with the app setting.
- Never attempt to repair the system by yourself. Contact the professionals qualified by FranklinWH.

System Overview

The Franklin Home Power (FHP) system is a whole home energy solution for residential users. The two key components are the aGate X, an energy management unit for whole-home power control, and the aPower X, an energy storage battery with a built-in inverter. Users can monitor and operate their FHP systems remotely via the FranklinWH mobile phone app.

System Components

aGate X



The aGate X controls system operations with a built-in Energy Management System (EMS), a power distribution module, Smart Circuits, and a communications module, providing power management and backup power for household loads.

The appearance of the aGate X is shown to the left.

Parameters of the aGate X are described in the following table.

Environmental Specifications	
Operation Temperature Range	-4°F ~122°F (-20°C~50°C)
Storage Temperature Range	-22°F ~140°F (-30°C~60°C)
Altitude maximum	
9843 feet (3000m)	
Environment	
Indoor and Outdoor Shielded	
Physical parameters	
Dimensions (W x H x D)	21.7 in. x 31.5 in. x 6.3 in. (550 mm x 800 mm x 160 mm)
Weight	50 lbs. (23 kg)

aPower X



The aPower X batteries store a charge provided by photovoltaic systems, the grid, or generators. They use the integrated inverter to convert AC power into stored DC, then convert the energy back to AC for use in a two-way energy flow. aPower X batteries are modular, and can be scaled from a single battery to fifteen batteries controlled by a single aGate X.

The appearance of the aPower X is shown to the left.

Parameters of the aPower X are described in the following table.

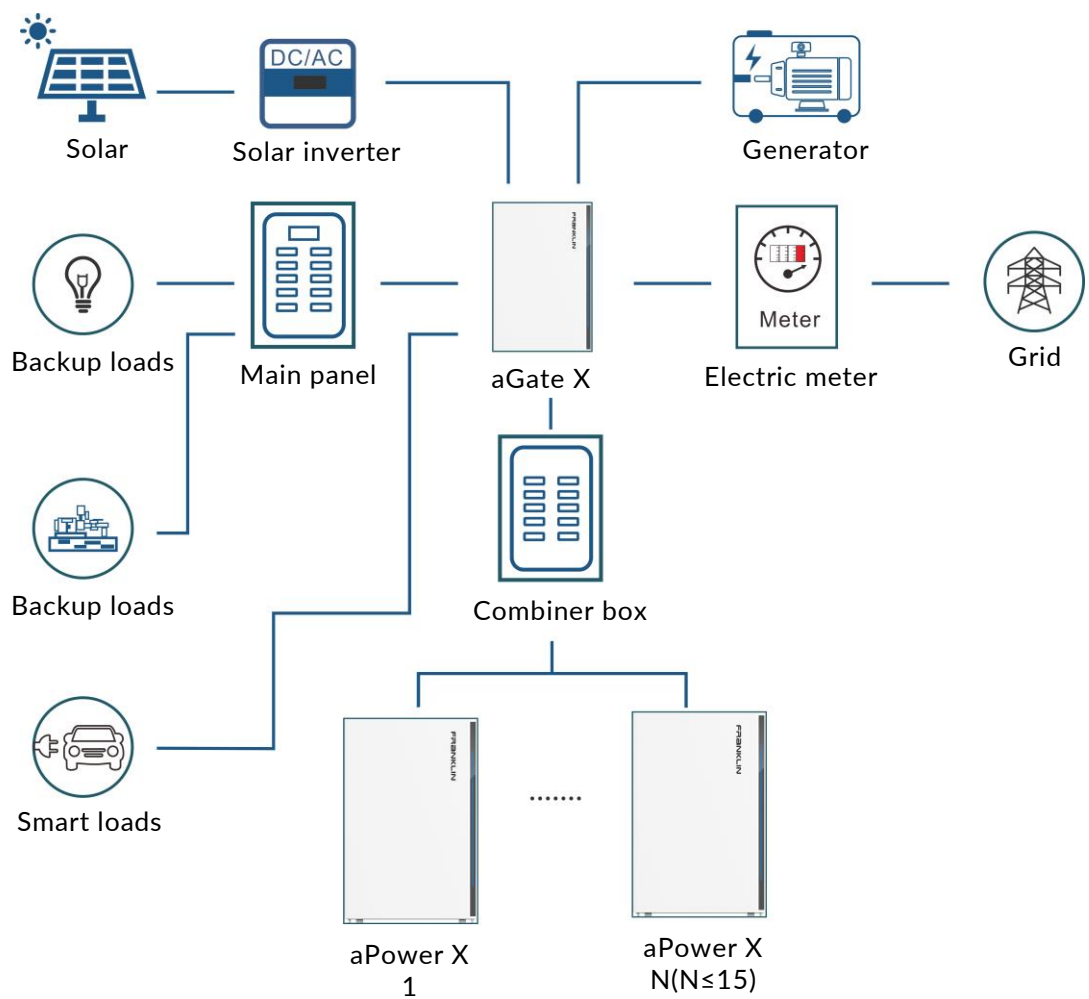
Environmental Specifications		
Operation Temperature Range		-4°F~122°F (-20°C~50°C)
Derated Temperature Range		113°F~122°F (45°C~50°C)
Recommended Temperature		32°F~86°F (0°C~30°C)
Storage Duration		
Allowable Temperature Range	-22°F~14°F (-30°C~-10°C)	≤24 hours
	113°F~140°F (45°C~60°C)	
	14°F~113°F (-10°C~45°C)	≤9 months
Altitude (maximum)		
9843 feet (3000m)		
Physical parameters		
Dimensions (W x H x D)		29.5 in. x 45.3 in. x 11.4 in. (750 mm x 1150 mm x 290 mm)
Weight		408 lbs. (185 kg)

Backup Options

The FHP backup options include whole-home backup and partial backup. Load selection for different options must be completed during the system design phase.

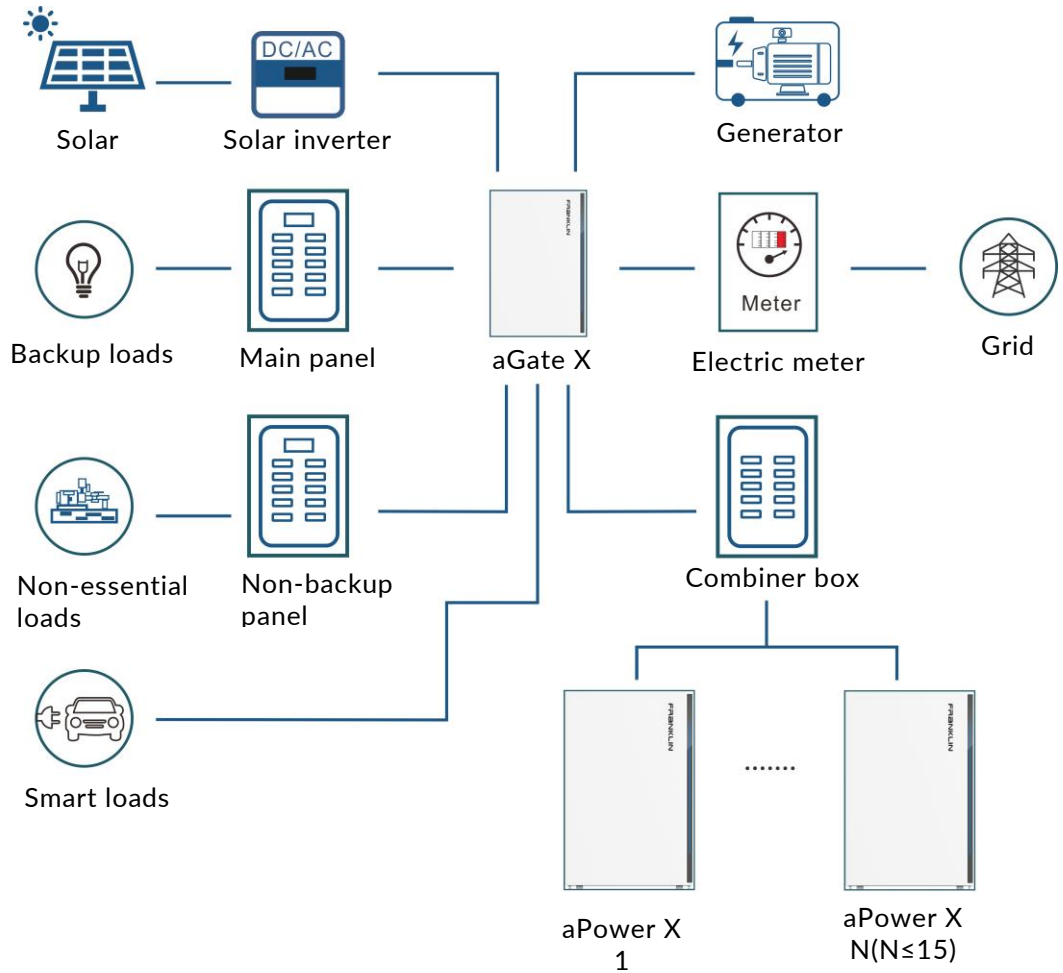
Whole-home Backup

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



Partial Backup

If you select a partial backup configuration, you need to identify backup loads during system configuration. Connect the backup loads (except for the Smart Circuit loads) to the backup port of the aGate X, and connect the non-backup loads to the non-backup ports of the aGate X. If the grid fails, the FHP system will only power the backup loads during the outage.



Operating Mode

The FHP system supports several operating modes, including self-consumption, backup, and the load shifting.

Self-consumption Mode

In self-consumption mode, the FHP system stores the excess electricity generated by the solar system in real-time. If the solar production is insufficient to power all the household loads, the FHP system will discharge as a supportive power source, thus reducing the amount of electricity imported from the grid.

Backup Mode

In backup mode, the FHP system will charge to full power (SOC=100%). In the event of a grid failure, the FHP will power the household loads.

Load Shifting Mode

If the electricity rate in the homeowner's area changes throughout the day, based on demand, the homeowner can select the load shifting mode to customize the peak and valley times according to the electricity rate. The FHP will select solar and aPower X battery power during peak rate periods. During the valley periods, the system will use power from the grid, the PV system, and the batteries in balance according to household loads.

Key Functions

Emergency Backup

When the emergency backup function is enabled, the FranklinWH app will receive a weather forecast from the local authority about a serious weather event, send a warning message via the app, and then the FHP will automatically enter backup mode to power household loads during the weather event. When the extreme weather passes, the FHP system will automatically revert to the previous settings.



NOTE

The Emergency Backup function may be enabled under both the Self-Consumption and Load Shifting modes.

Emergency Stop

In an emergency, manually turn off the external Emergency Power Off (EPO) switch, if installed. Otherwise remove the EPO plug. The FHP system shuts down after the EPO is triggered.



NOTE

After the emergency shutdown, the home will lose power.

On-grid to Off-grid

When the grid fails or is abnormal (for example, under-voltage (Brownout), overvoltage, or abnormal frequency), the FHP system automatically switches to the off-grid mode. When off-grid, the solar, generator (if connected) and FHP system will power the household loads.

Off-grid to On-grid

The FHP system automatically switches to the on-grid mode when the grid is restored. The grid, solar system, generator (if connected) and FHP system will power the household loads.

Photovoltaic Over-Generation Protection

If the FHP system is connected to the grid but is not allowed to export solar production to the grid, or when the home is off-grid, the photovoltaic over-generation protection function will be enabled when the photovoltaic output power is greater than the sum of the absorbable and load power of the FHP system. The photovoltaic system will automatically be disconnected. When the photovoltaic output power is lower than the sum of the recharging power and load power of the FHP system, the photovoltaic system will automatically be reconnected to the FHP system.

Full Charge Protection

When the FHP system is off-grid, the solar system will automatically disconnect as soon as one aPower X battery in series is full (SOC=100%). After the FHP system meets the recovery conditions, the solar system automatically connects to it and outputs power.

Black Start

When solar power is insufficient, the grid power is abnormal, the FHP system is off-grid, and the available power is exhausted, the smart loads will be automatically disconnected and the system enters sleep mode, waiting for a black start attempt.

Automatic Black Startup

The system will automatically start at specified times every day. If the solar energy supply is sufficient, the electricity generated by the photovoltaic system will charge the aPower X battery. If the solar power is insufficient, the system will re-enter sleep mode, waiting for the next automatic startup.

Manual Black Startup

When the solar energy supply is sufficient, you can manually start the system instead of waiting for the automatic black startup. Manually turn off the round button switch on the side of the aPower X, turn it back on 20 seconds later, and the system will be started.



NOTE

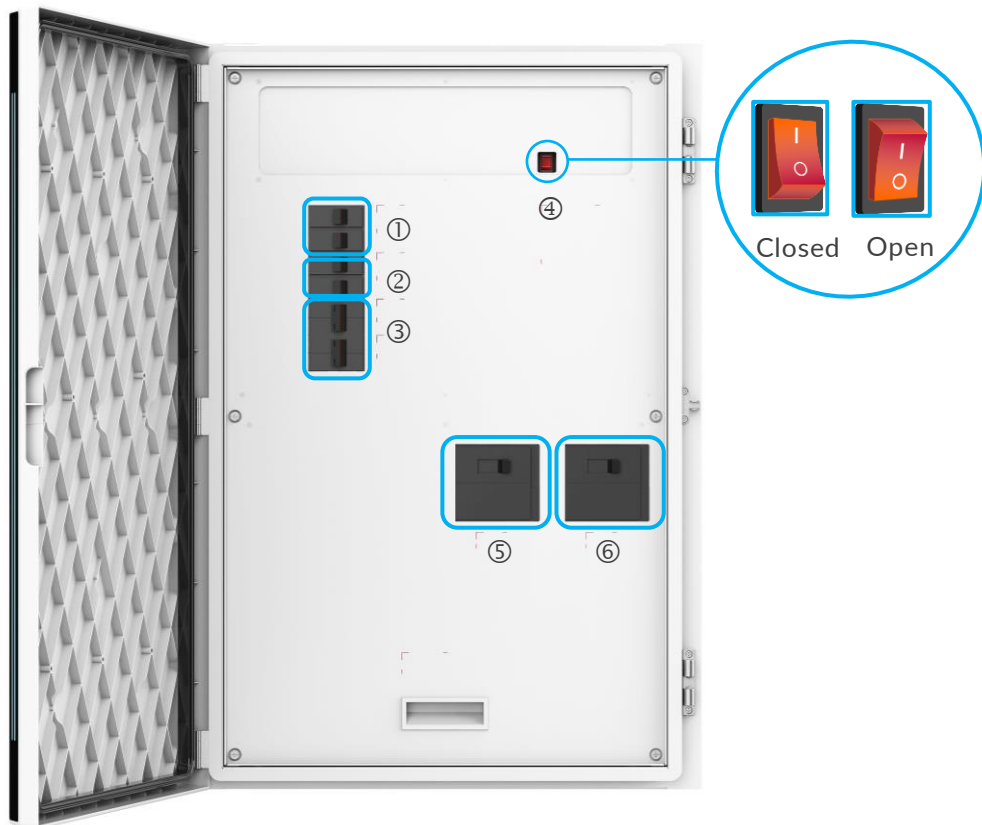
- Repeated startup attempts may result in system lockdown. In order to increase the success rate of black startup, please make sure that the heavy electrical loads have been turned off, until the aPower X is charged to 20% SOC or higher.
 - If the grid is restored when the system is in sleep mode, the system will start immediately.
-

System Operation

The FHP system can be operated locally or remotely, but local operation is preferred for maintenance and inspection. It is recommended that the FHP system be restarted and maintained locally. During maintenance or inspection, local operation must be used to ensure circuit safety.

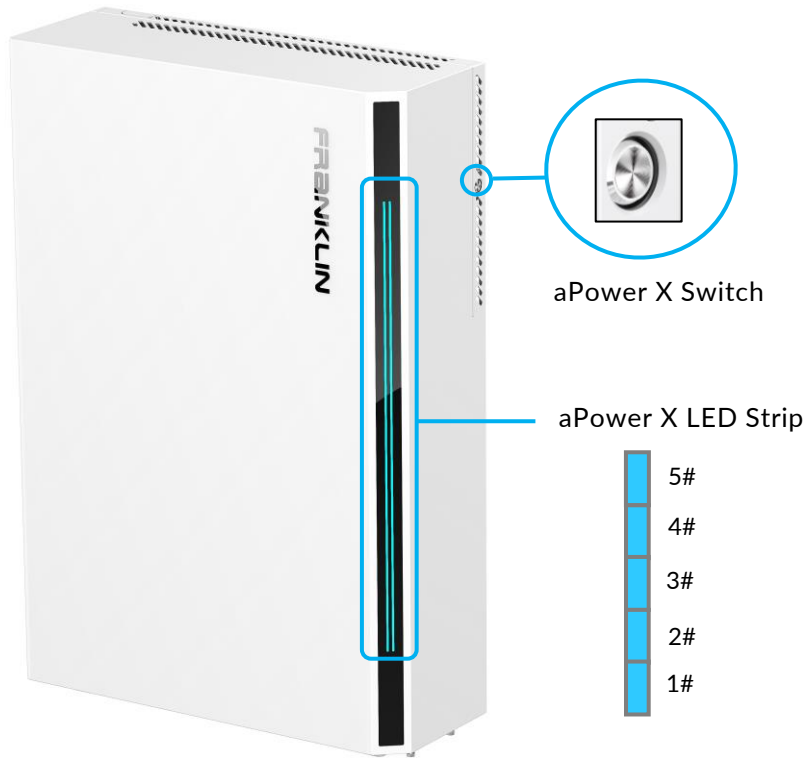
Startup and Shutdown Steps

Switch/breakers on aGate X







- ① Solar Breaker
- ② aPower X Breaker
- ③ Smart Circuit Breakers (optional)
- ④ aGate X Power Switch
- ⑤ Grid Breaker
- ⑥ Generator Breaker (optional)

The aPower X power switch and LED strip



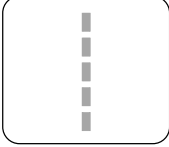
aPower X LED Strip lighting descriptions

LED state

-  OFF
-  Solid
-  Pulsing
-  Flash

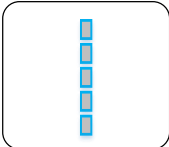
Pulsing: 10 second cycle from off, brightening to fully lit.
 Flash: Alternating ON/OFF, once per second for aPower X failure, ON for 400ms and OFF for 2100ms during discharging, standby and on-grid shut-down.

Booting



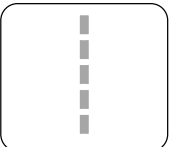
After the aPower X is powered on for five seconds, the five strips flash every second. After one minute, the aPower X is initialized and enters the standby mode.

aPower X failure



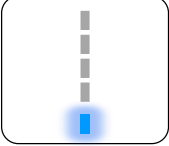
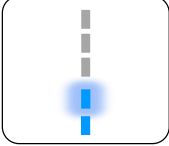
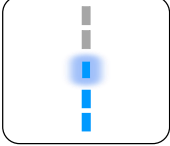
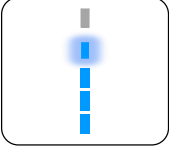
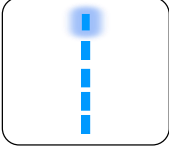

All five strips flash synchronously once per second, indicating the aPower X failure.

Off-grid shut-down

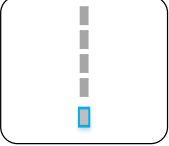
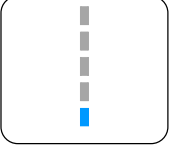
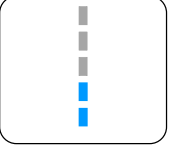

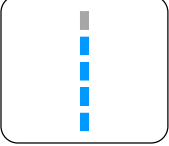
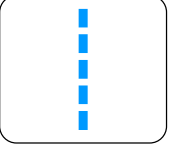


When the aPower X is turned off while disconnected from the grid, all five strips will go out.


Charging

SOC < 20%	20% ≤ SOC < 40%	40% ≤ SOC < 60%
		
60% ≤ SOC < 80%	80% ≤ SOC < 100%	SOC = 100%
		

**Discharging/Standby/
On-grid shut-down**

SOC ≤ 5%	5% < SOC < 20%	20% ≤ SOC < 40%
		
40% ≤ SOC < 60%	60% ≤ SOC < 80%	80% ≤ SOC ≤ 100%
		

Startup Steps

1. Ensure that the grid breaker, the generator breaker, and the solar breaker are all in the OFF-position (for initial use).
2. Ensure that the aGate X power switch on aGate X is in the closed position.
3. Flip on the aPower X breaker.
4. Press the aPower X switch to ensure that the switch is on. When the aGate X power switch indicator on the aGate X lights up, wait until the bottom of the LED strip on the aPower X lights up, which indicates that the aGate X is successfully powered without connecting to the grid.
5. After about 60 seconds, the photovoltaic relay closes automatically. If the aPower X has power output, that indicates that the aPower X has successfully started without connecting to the grid.
6. If the grid is normal, turn on the aGate X grid breaker. After the grid relay is closed, the grid icon  on the user app home screen will light up, indicating that the aPower X is successfully connected to the grid.
7. Turn the generator breaker (if installed) and solar breaker to the ON position.
8. Turn on the smart circuit breakers (if installed) and the breakers in the load center.



NOTE

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

Shutdown Steps

1. Shut down all the household electrical loads and disconnect the smart circuit breakers and the breakers in the load center.
 2. Press the aPower X switch on aPower X to the OFF position (extended, flush with the case), and the LED strip will go out.
 3. Flip off the aPower X breaker on the aGate X.
 4. Turn the aGate X power switch to the open position.
-



NOTE

If the family plans to be gone for a long time, please keep the grid power and aPower X on. Otherwise, the energy stored in aPower X will eventually be depleted, resulting in a startup failure.

FHP Remote Operation and Monitoring

The FranklinWH app provides remote operation and monitoring of the whole house energy system at anytime from anywhere. It allows personalized household electricity plans to make your life easier.

The home screen of FranklinWH app displays the real-time data from the FHP to help you understand the working status of your home power system.



The working status of each energy source in the home.

FHP system current status and remaining energy.

Common Problems and Solutions

No.	Problems	Solutions
1	Power LED on the aPower X keeps flashing once per second.	<p>Check if the aGate X EMS module is working normally:</p> <ul style="list-style-type: none"> i. Check that the aGate X power switch is ON (closed) and the indicator is lit. ii. Check if the aGate X is connected to an external EPO (Emergency Power Off) switch. If yes, check that the EPO switch is closed. iii. Check that the aPower X breaker on the aGate X is in the ON position.
2	aPower X starts off-grid and fails to discharge.	<p>Check whether the aPower X breaker on the aGate X is in the ON position. If not, flip it on and then check the aPower X status after 1 minute. If aPower X discharges properly, the equipment is back to normal.</p>
3	After startup, the aGate X failed to activate the wifi access point (AP).	<p>Turn off the aGate X power switch and turn it on after 30 seconds. Scan for network broadcast by the aGate X on your mobile phone. If your mobile phone is connected to it, the wifi access point has returned to normal.</p>
4	"Device offline" is displayed on mobile app.	<p>Check whether the aGate X communication network is normal:</p> <ul style="list-style-type: none"> i. If the aGate X is communicating via hard-wired ethernet, please check the network connectivity. ii. If the aGate X is communicating via wifi, please check the signal strength. The aGate X does not currently support 5GHz wifi network connection. Please ensure that a 2.4GHz wifi network is available. iii. If a 4G cellular network is used, please check the network conditions at the aGate X location. If the signal strength is poor, contact your installer to purchase a 4G cellular network enhancement option.

No.	Problems	Solutions
5	A prompt of “Low battery, black start attempts” is displayed on the mobile app.	<p>Check whether the grid power is down and whether the solar system is out of operation or there is insufficient sunlight.</p> <ul style="list-style-type: none"> i. Low battery and black start indicate that the battery capacity is very low, the backup power and auxiliary power will be disconnected, and the system will enter sleep mode. Once the system enters sleep mode, it will automatically recover and charge the batteries the next day if there is sufficient sunlight. ii. By default, the system black start times are approximate 10:00, 12:00 and 14:00. There may be some deviations in time in sleep mode. iii. During black start, please turn off all household loads to ensure that FHP can be started normally. iv. Manual black start is also an alternative to automatic. Manual Start: Turn off the aPower X switch on the side of aPower X (extended, flush with case), and turn it back on (depressed) 20 seconds later. The system will start up. v. Black start will consume the reserve capacity, it is recommended to attempt a manual start only when there is enough solar production. Otherwise, the system may lock.
6	A prompt message of “Black start failed” is displayed on the mobile app.	<ul style="list-style-type: none"> i. Check if there are household electrical devices running when the system attempts to start. Ensure that all the household electrical devices are shut down, to help the system successfully start. ii. Check whether the solar system is operating normally and whether there is sufficient sunlight.

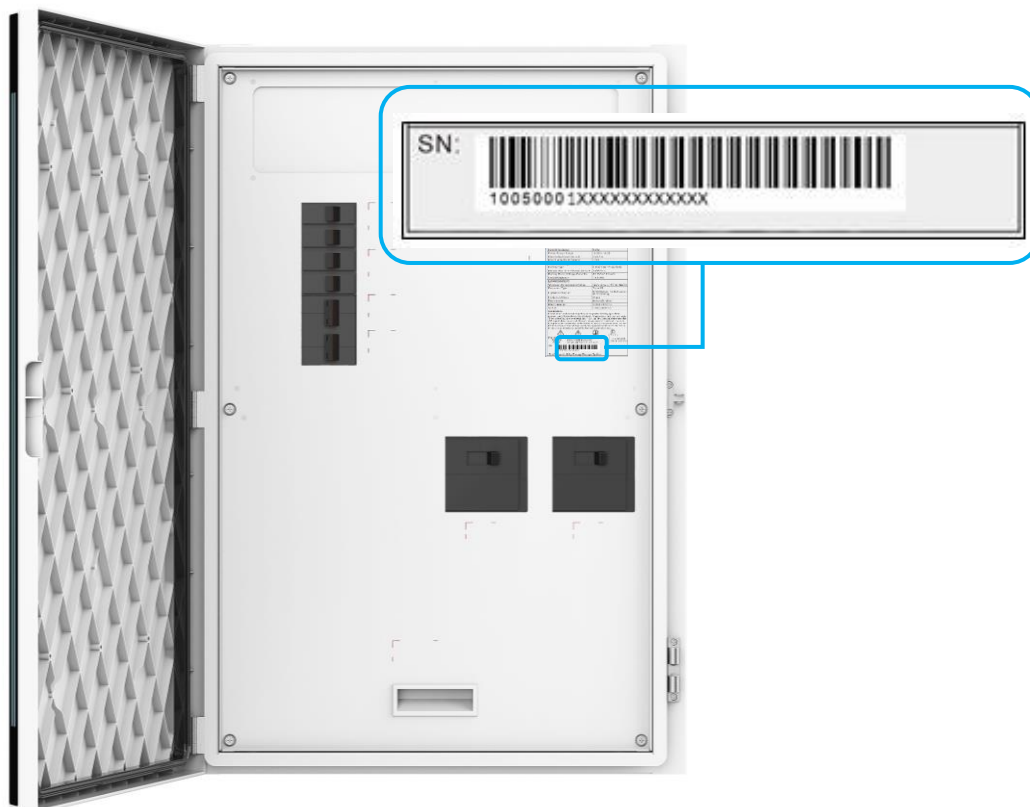
No.	Problems	Solutions
7	<p>“Off-grid overload” is displayed on the mobile app.</p>	<ul style="list-style-type: none"> i. Check if the grid is available. ii. Check if there are large electrical devices running. If yes, shut down the unessential devices to allow the system to operate normally. iii. Due to the special characteristics of the battery, the system power is slightly reduced at temperatures below 50°F (10°C) to guarantee the service life of the battery. If an off-grid overload occurs in this case, shut down the large electrical devices to allow the system to operate normally. iv. If the system experienced an off-grid overload during multiple aPower X units starting, turn off all electrical devices and turn them back on in sequence after the aPower X units have been successfully started.
8	<p>The system shuts down after an air conditioner or a pump is started.</p>	<ul style="list-style-type: none"> i. Check if the grid is available. ii. During a grid outage, due to the power required to start the air conditioner or pump, the system may shut down while other large electrical devices are running when trying to start the air conditioner or pump. Because of this, it is recommended that you shut off other large electrical devices and restart them after the air conditioner or pump has been successfully started.

Technical Support

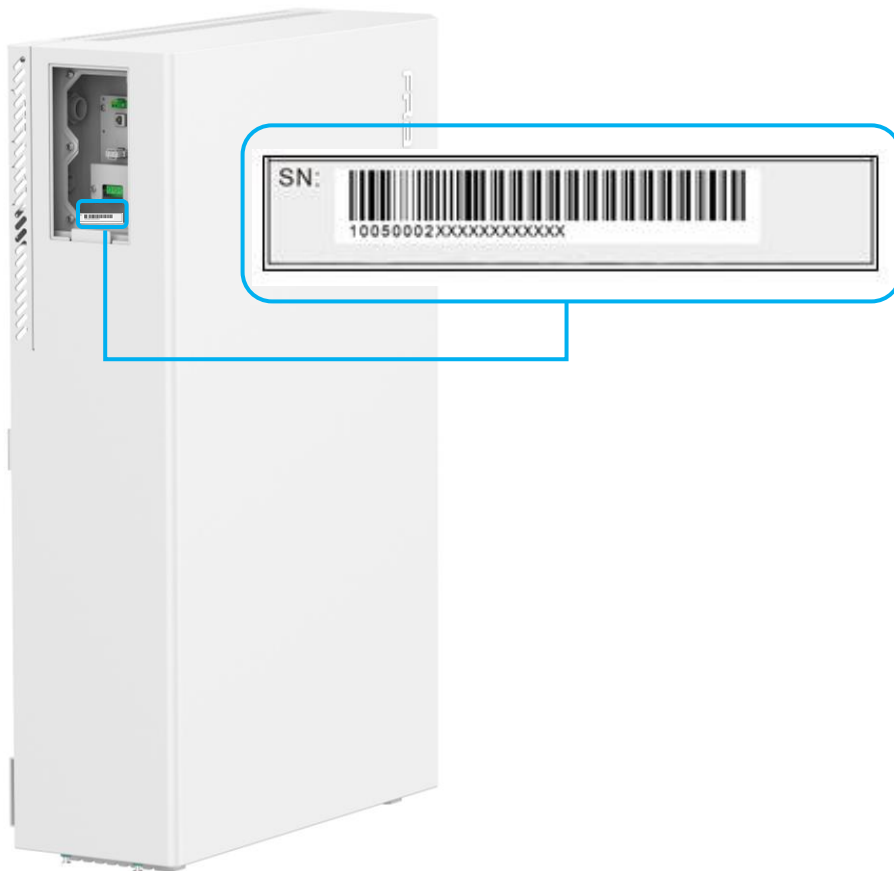
For further support, please contact the installer or FranklinWH service team at: www.franklinwh.com/support. Please be prepared to provide the following information before you contact FranklinWH:

- Owner name
- Your preferred desired contact method (name, phone number, email)
- The serial number of your aGate X and aPower X (as shown in the figure below)
- A brief description of your problem

aGate X serial number



aPower X serial number



Emergency Response

In any hazardous situation that may cause health and serious injury, follow the recommended actions:

- Evacuate to safe area.
- Contact the 911 as soon as it is safe to do so.

In case of fire

- Shut off the aPower X breaker on the aGate X, when it is safe to do so.
- Evacuate to safe area.
- Contact the 911 as soon as it is safe to do so.
- Use approved fire extinguishing devices, if it is safe to do so.

In case of flooding

- If the wiring sections of an aGate X or aPower X is submerged, please keep away from the water. It is an electrocution hazard.
- Drain the water to protect your FHP, if it is safe and possible.
- If water reaches the battery, please call your installers for inspection. If the water level is below the battery, please completely dry the site and your FHP before use.

In case of abnormal noise, odor or smoke

- Check to ensure the air vent of the aPower X is not blocked.
- Keep the installation site well ventilated.
- Call your installer for support.