# Integrating Generators with the Franklin Home Power System

## Introduction

This documentation is designed to address most of the generator integration questions as supplemental documentation to the generator module data sheet. For generator installation guide and commissioning guide, please refer to the FranklinWH documentation center.

Please read the Franklin Home Power Installation Guide on the FranklinWH documents center before installing a Franklin Home Power (FHP) system into a home with an existing generator, please contact a certified generator installer or become certified on that specific generator brand. FranklinWH is not responsible for anything on the generator side.

If the concern is with a portable generator, please directly contact FranklinWH engineering.

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.

## General Rules for Generator Integration

Always contact your local generator manufacturer representative or dealer.

Certain generator manufacturers require certified dealers to prep a generator for integration in order to maintain generator warranty. For instance, removing the generator's existing ATS (Automatic Transfer Switch) for integration can risk voiding the warranty.

The best practice is to ask the local generator dealer to prep the generator for 2-wire start ahead of the FHP connection date. This is also a great time to ensure preventative generator maintenance is performed for the best homeowner experience post connection.

## Generator Integration – System Design Guidelines

When sizing a generator for an existing system, it is always recommended to oversize in order to ensure a sufficient generator energy output to both supply home loads and charge the ESS. The sizing applies to all generators, both standby and portable.

Generator sizing rule of thumb:

- Recommended generator sizing is 10 kW of generator output per aPower X.

  Ex: With a 2 aPower X installation, the generator's output should be 10 kW * 2 Units of aPowers = 20 kW.

- If home load demands are minimal, it is acceptable to go below the recommended ratio and keep the generator output at 7.5 kW per aPower X. Portable generators with an inverter or AVR are more likely to be successfully integrated into the FHP due to the higher quality power output.

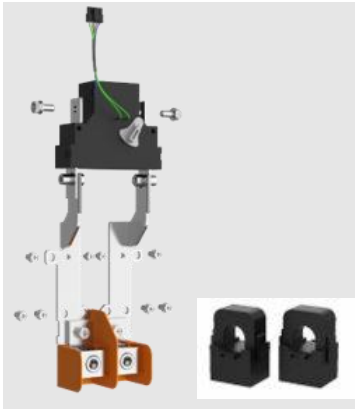
## Generator Module Overview

With a Generator Module in the aGate, the FHP can offer additional convenient and dependable backup power which can be started and stopped automatically based on the battery's state of charge (SOC) threshold. This adds extra energy security for longer outages when PV is not available.

In an emergency situation where power is lost and the aPower batteries' SOC drops to a preset level, the generator will power your home and recharge the batteries, ensuring that you have power when you need it most. This feature is compatible with traditional standby generators. Some portable generators may also be connected and manually controlled via the FranklinWH App.

It is important to note that the Generator Module requires a 240 V / 60 Hz power source to properly function.

The Generator Module is shipped with 2 CTs.



Generator Module CT * 2PCS

Table 1. Generator Module General Information

| | |
|---|---|
| SKU | ACCY-GENV1-US |
| Dimensions (W*H*D) | 11.2 × 4.1 × 2.6 |
| Weight | 3.2 lbs. |

Table 2. Generator Module Electrical Parameters

| | |
|---|---|
| Max. Continuous Current | 160A |
| Max. Over Current Protection Device | 200A |
| AC Voltage | 120V/240V, split |
| Voltage Range | 204 to 276 V @240 V |
| Frequency Range | 60 Hz ± 5 Hz |

## Generator Module Key Functionality

The Generator Module can work with most 240 V / 60 Hz output generators without the need for a specific brand or model.

An integrated generator has the following features: It powers the home loads and recharges the aPower battery with excess power, and it only operates when there is a grid outage.

There are two methods of control.

**Automatic Controlled Standby Generators** – A standby generator will automatically start and stop based on the aPower SOC Lower Limit and SOC Upper Limit. The start and stop state of charge thresholds can be configured through the FranklinWH App.

**Manual Generators** – Generators may also be manually controlled through the Generator Module.

A standby generator may be manually controlled through the FranklinWH App.

Portable generators require manual control due to the lack of control mechanism. The homeowner must connect the portable generator to the external power inlet wired to the FranklinWH Generator Module. After it is connected, the portable generator may be manually operated through the FranklinWH App.

Turn off as many loads as possible before manually starting a generator is recommended.

If you have other power sources, such as small wind turbines, or EV 240V AC output-that you want to connect to the FHP, please contact FranklinWH's engineering team for more information.

## Generator Module Integration Automatic Control Methods

The Franklin Home Power system offers three ways to control the generator:

- Two-wire Dry Contact: The recommended integration method, as it allows the simplest wiring configuration as well as more configuration flexibility such as feeding multiple-aGate systems.
- Utility Voltage Sensing: Please contact your local generator dealer for configuring the generator for ESS integration.
- ATS (Auto transfer switch): The existing ATS can be only configured/removed by the certified dealer.

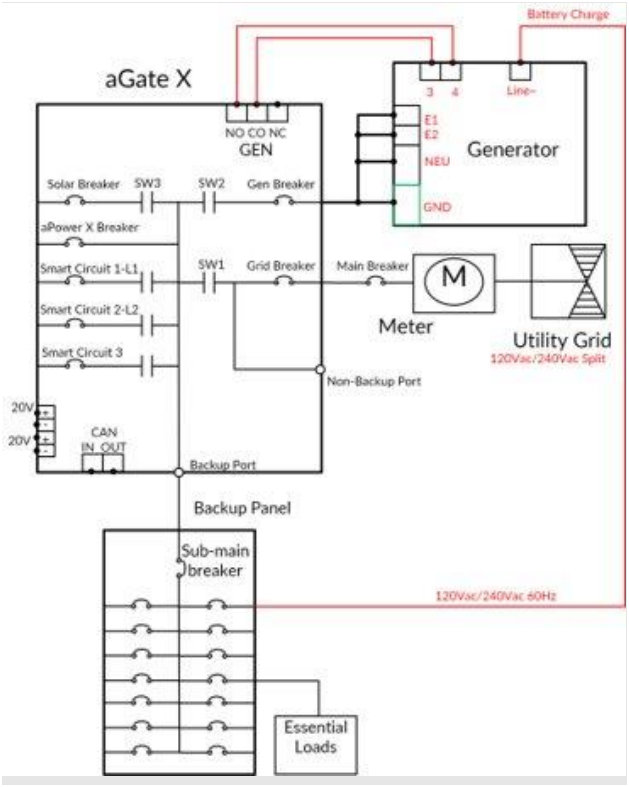
Refer to the manufacture's wiring diagram for reference on all generator Integration methods.

The following three diagrams are wiring examples of the three automatic control methods above.

## Generator Module Wiring – 2 Wire Dry Contact (No Smart Circuits Module required)

Generator wiring for the 2-wire dry contact control is shown to the right.

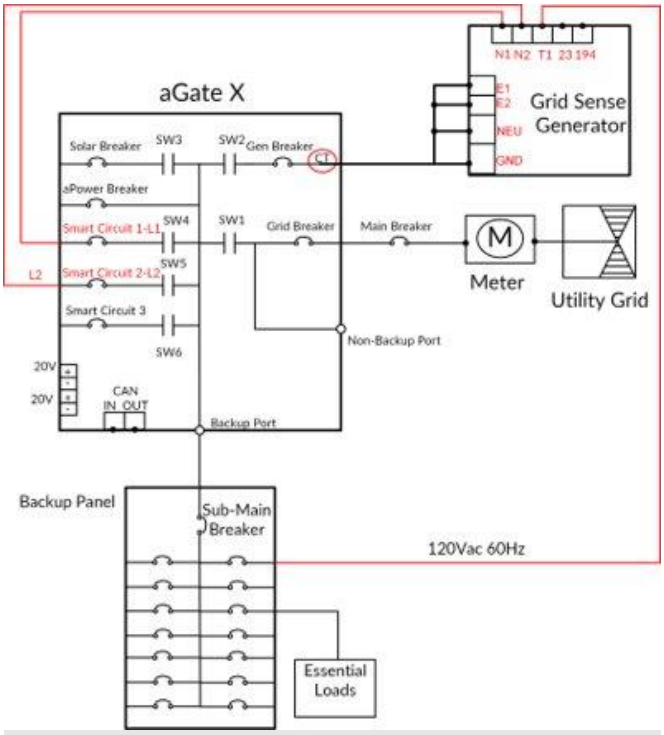
- Simplest integration method, minimizing onsite labor hours.
- Allows the end-user to utilize the entire Smart Circuits Module for shedding heavy home loads.




## Generator Module Wiring – Utility Voltage Sensing (Smart Circuits Module is required for models previous to aGate 1.3)

Generator wiring for Utility Voltage Sensing control is shown to the right.

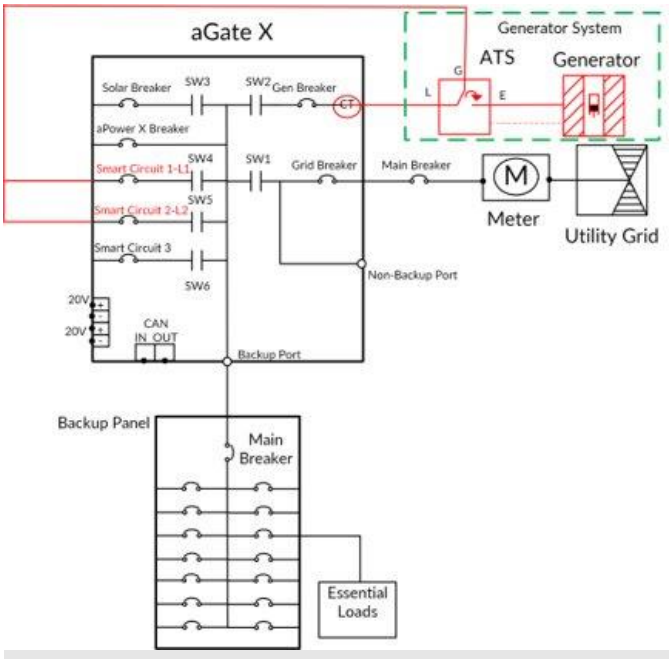
- Utility Sense integration requires collaboration with generator authorized dealer for configuration.
- Verify with the generator manufacture on warranty viability regarding re-configuring existing generator.



## Generator Module Wiring – Existing ATS (Smart Circuits Module is required for models previous to aGate 1.3)

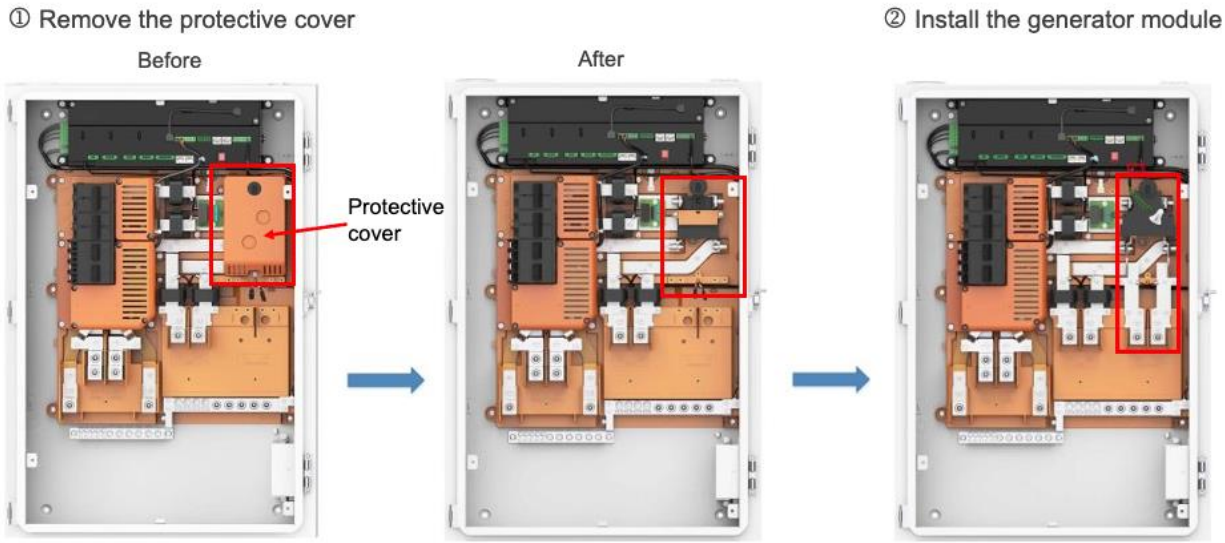
Generator wiring for ATS control is shown to the right.

- When retrofitting, the existing generator ATS can be utilized; the load panel previously powered by the generator ATS will be relocated downstream of the aGate's backup bus.
- Verify with the generator manufacture about warranty viability regarding re-configuring an existing generator.

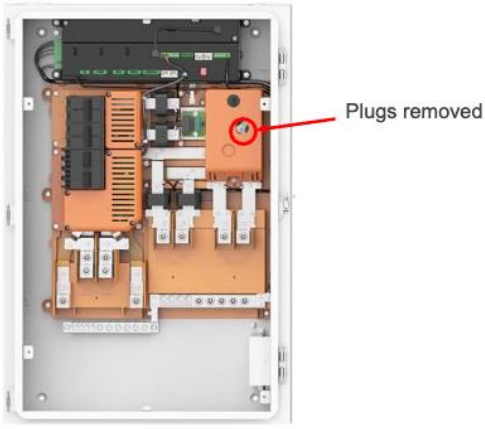



## Generator Module Installation

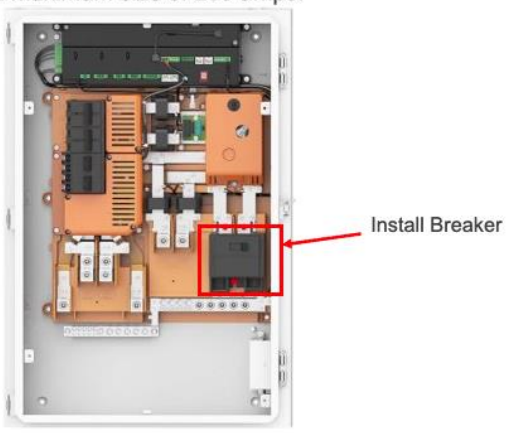
Simply install the Generator Module into the designated position inside the aGate, as shown below.



③Replace the protective cover after removing the plugs from the knock-out hole.




④ Install the Eaton CSR breaker of the appropriate size for your generator's amperage, with a maximum size of 200 amps.




For more information, review the Franklin Home Power Generator Module Installation Guide.

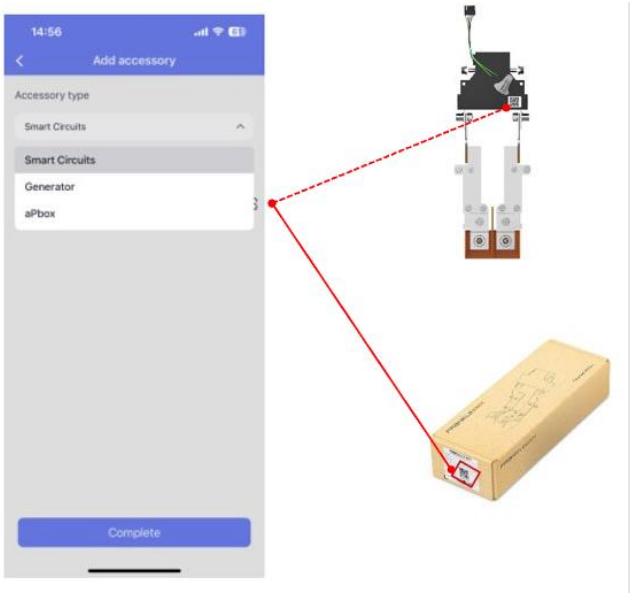
## Generator Installation Best Practices

For a successful generator installation, follow these best practices:

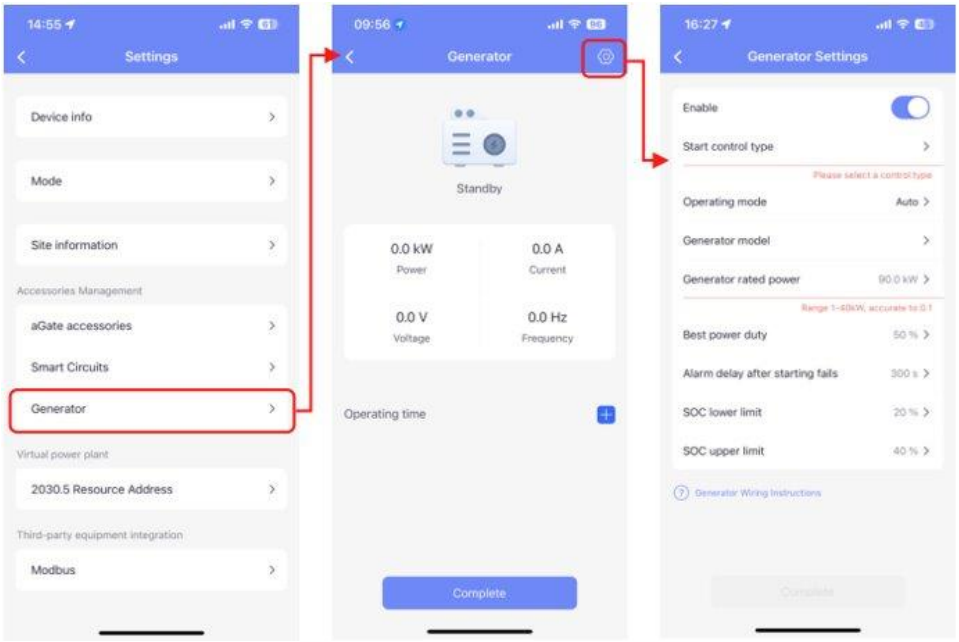
- Plan the installation with safety in mind.
- Keep the nameplate information of the generator on hand, including information on any portable generators.
- If using a portable generator, ensure that you have the correct sized power inlet box.
- Educate the homeowner on the expectations and operations of generator usage. The generator is only to be used during emergencies when there is no PV-Solar production and no grid power available.
- Check the single line diagram to verify that the generator type is compatible with the plans.
- If an Emergency Power Off (EPO) is required by the fire department for the generator, you will need to purchase and wire the EPO according to the Generator manufacturer's instructions.

## Generator Module Commissioning

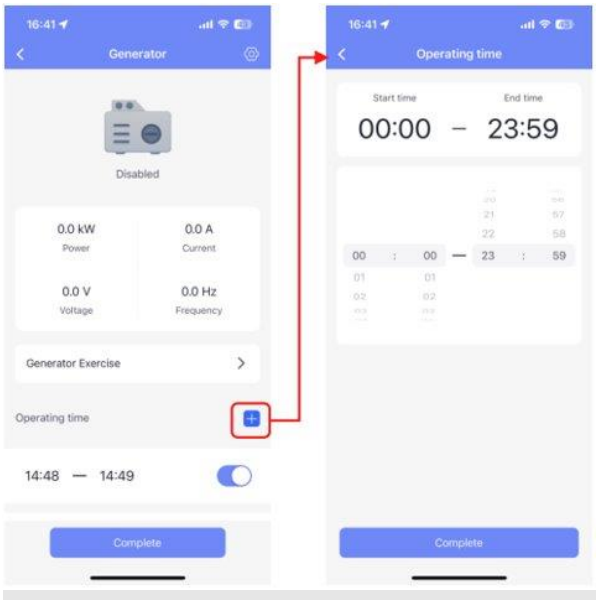
Scan the QR code or manually input the serial number (SN).




To set up the generator parameters, you will need the generator nameplate information, which can be found on the generator or its user manual. Note that if you are using a portable generator, it will need to be manually started via the FranklinWH App



Set the generator's operating schedule according to your needs.




For detailed generator commissioning, please refer to System Commissioning on the FranklinWH documents center.

## Generator FAQs

**How to size a standby generator for a project?**

- Recommended generator sizing is 10 kW of generator output per aPower X.
  - Ex: With a 2 aPower X installation, the generator's output should be 10 kW * 2 aPowers Units = 20 kW.
- If home load demands are minimal, it is acceptable to go below the recommended ratio and keep the generator output at 7.5 kW per aPower X.
- It's recommended to oversize the generator power output to ensure there will be sufficient power to supporting the home loads and battery charging.

**Can the aGate X control the generator to charge the batteries?**

During generator operation, aGate will direct the generator to supplying to the home loads first then if there is any surplus energy which will charge the batteries.

**At what rate does the battery charge?**

Each aPower X charges at 5 kW, so size the generator accordingly to the generator sizing rule of thumb.

**Does the EPO (Emergency Power Off) also disconnect generator power when activated?**

Yes, once EPO is activated, the aGate disconnects all relays inside of the aGate including generator relay.