

SUNHOPPER[®]-D

Installation Manual



SunHopper-D(US) Installation
Manual

Version 1.6

©2026

1 Contents

1	Contents.....	2
2	This Document	4
3	Cautionary Marks	4
4	IMPORTANT SAFETY INSTRUCTIONS	4
4.1	Intended Installation and Operation	6
4.1.1	Arc Fault Circuit Interrupter (AFCI)	7
4.1.2	Rapid Shutdown	7
5	Symbols and Markings.....	8
6	What's in the box.....	10
7	Installing the SunHopper-D	10
7.1	Finding a suitable location	10
7.2	Mounting the DIN Rail	13
7.3	Hanging the unit	14
7.3.1	Wood Surfaces	15
7.3.2	Drywall.....	15
7.3.3	Masonry.....	15
7.4	Wiring the Unit.....	16
7.4.1	Internal View	17
7.4.2	Electrical Openings	18
7.4.3	AC Input Wiring (if used)	18
7.4.4	Heater 1 and 2 Outputs	21
7.4.5	PV Wiring	24
7.4.6	Multifunction Relay (if used)	28
7.4.7	Installation Completion.....	29
7.5	Water Tank	30
7.5.1	Mixing Valve	30
7.5.2	Thermostat setting	30
8	Commissioning.....	31
8.1	Full Feature Installation.....	31

8.2	Limited Local Installation via Phone App.....	37
8.3	Limited Local Installation via the SunHopper-D	41
8.4	Disable/Enable the AFCI	45
9	Servicing the Inverter	46
10	Decommissioning	46
10.1	Removing installation data	46
10.2	End of Life Removal.....	47
11	Specifications	48
12	Compliance Information	50
12.1	FCC Compliance	50
13	Contact	51

2 This Document

This document reviews the installation of the SunHopper®-D. Physical installation and setup steps are included in various sections of this document.

Find the most up to date document at greenpwr.com.

3 Cautionary Marks

Several warning notes are shown in this document.

⚠ WARNING

A section under this mark must be followed or risk personal injury, shock, or death.

⚠ ADVISORY

A section under this mark must be followed or risk minor personal injury.

① NOTE

A section under this mark notes information important to the installation, but does not entail a safety risk.

4 IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS – This manual contains important instructions for Model SunHopper-D that shall be followed during installation and maintenance of the inverter.

⚠ WARNING

RISK OF ELECTRIC SHOCK. Warning – These servicing instructions are for use by qualified personnel only. To reduce the risk of electric shock, do not perform any servicing other than that specified in the operating instructions unless you are qualified to do so.

⚠ WARNING

THE INVERTER IS NON-ISOLATED. DO NOT connect a grounded PV array to the input of the device.

⚠ WARNING

RISK OF ELECTRIC SHOCK AND FIRE. USE ONLY WITH PV MODULES WITH A MAXIMUM SYSTEM VOLTAGE RATING OF 400V OR HIGHER.

⚠ WARNING

ELECTRIC SHOCK HAZARD. The DC conductors of this photovoltaic system are normally ungrounded but will become intermittently grounded without indication when the inverter measures the PV array isolation. Ensure the inverter is disabled with all voltage sources disabled before servicing.

⚠ WARNING

ELECTRIC SHOCK HAZARD. Both AC and DC sources are terminated inside this equipment. Each circuit must be individually disconnected before servicing. Only open the cover after all energy sources are disabled.

⚠ WARNING

ELECTRIC SHOCK HAZARD. When the photovoltaic array is exposed to light, it supplies a DC voltage to the equipment.

⚠ WARNING

ELECTRIC SHOCK HAZARD. An external DC disconnect switch is required with this product. After disabling the device, wait at least 30 seconds before removing the cover for servicing to reduce the risk of shock.

⚠ WARNING

ELECTRIC SHOCK HAZARD. Before operating the inverter, ensure grounding is connected properly. This product must have an earth connection. The inverter AC output is grounded to the chassis of the product internally.

⚠ WARNING

ELECTRIC SHOCK HAZARD. The inverter AC input, if used, must be connected to a dedicated AC branch with an overcurrent protection device. Follow the installation instructions to determine the rating of the AC input overcurrent protection device.

⚠ WARNING

FIRE HAZARD. The arc fault detection circuitry can be disabled if the installation location and type allow by local code. By disabling this system, faulty or damaged connections may result in a fire risk.

⚠ ADVISORY

RISK OF BURNS. The metal chassis of the product can become hot. Ensure the installation prevents unintentional touching of the unit. Before servicing the unit, ensure the device has been shut down for at least 30 minutes.

⚠ ADVISORY

RISK OF BURNS. The installation requires the addition of a mixing valve to the outlet of the water heater. The water temperature is set to the maximum on the thermostat to ensure adequate hot water is provided to the user. The mixing valve is not provided with the SunHopper-D.

① NOTE

INDOOR USE ONLY. Only install the product indoors to ensure there is no possible ingress of moisture and environmental contaminants. The space can be conditioned or unconditioned.

① NOTE

ELECTRICAL INSTALLATION REQUIREMENTS. The unit is not provided with an installation transformer and is intended to be installed in accordance to 690.35 of the National Electric Code, ANSI/NFPA 70, with an ungrounded PV array.

4.1 Intended Installation and Operation

The SunHopper-D is a specialised solar inverter for domestic hot water production. The inverter is transformerless. No galvanic isolation is provided between the PV input and output of the device. The device is designed for indoor use only in conditioned or unconditioned spaces which are within the operating temperature range (see Section 11).

⚠ WARNING

ELECTRIC SHOCK HAZARD. Before operating the inverter, ensure grounding is connected properly. This product must have an earth connection. The inverter AC output is grounded to the chassis of the product internally.

- The neutral conductor (L2) of the heater output is grounded to the chassis during PV operation. **THE DEVICE CHASSIS MUST BE BONDED TO EARTH.**

① NOTE

ELECTRICAL INSTALLATION REQUIREMENTS. The unit is not provided with an installation transformer and is intended to be installed in accordance to 690.35 of the National Electric Code, ANSI/NFPA 70, with an ungrounded PV array.

- The PV panel frames must be bonded to earth. **DO NOT EARTH THE PV CIRCUIT.**

The array capacitance to earth should not exceed 1µF in all operating conditions. Higher capacitances will result in higher leakage current and nuisance tripping of the RCD system.

The output of the SunHopper-D is intended to drive resistive loads only. **DO NOT CONNECT TO A HEAT PUMP WATER HEATER OR ANY OTHER NON-RESISTIVE LOAD.**

Immersion type water heaters must not have any “smart” features for the device to work properly. Under PV operation, the output of the inverter will vary in voltage.

An external over-current protection device must be installed to the PV input as indicated by the National Electric Code NFPA 70.

An external over-current protection device must be installed to the AC grid input. No internal protection is provided for the grid backup path. Ensure the fuse or circuit breaker is within the SunHopper-D's maximum AC current specification (see Section 11) and is reasonably sized for the hot water immersion heater.

4.1.1 Arc Fault Circuit Interrupter (AFCI)

The SunHopper-D has a built-in DC arc fault circuit interrupter which meets the requirements of UL1699b. A detected arc event will cause the SunHopper-D to enter a fault state and resume operation automatically. Additional information is available in the User Manual.

The AFCI system can be disabled if the installation allows. See Section 8.4.

4.1.2 Rapid Shutdown

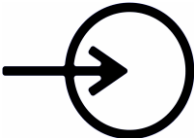
The SunHopper-D is a PVRSE (PV rapid shutdown equipment) and will decrease the voltage of the DC line to under 30V within 30 seconds. This discharge occurs when the input is disconnected from the PV array.

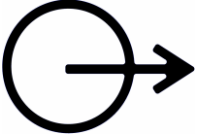
The SunHopper-D **DOES NOT** contain a rapid shutdown transmitter internally. Module level rapid shutdown equipment and a rapid shutdown transmitter are required externally if required by local code.

5 Symbols and Markings

Several symbols and markings are present on the product label and product itself.

Table 5.1

	Caution, hot surface. The product may become hot during operation.
	Caution, risk of danger.
	Caution, risk of electric shock.
	Alternating current (AC). The input or output is an AC circuit. DO NOT wire a DC circuit to these terminals.
	Direct current (DC). The input or output is a DC circuit. DO NOT wire an AC circuit to these terminals.
	Protective conductor terminal. Wire an earthing connection to this terminal for each circuit.
	Input terminal. Power inputs are marked with this symbol.

	Output terminal. Power outputs are marked with this symbol
	Refer to the operating instructions.
	Intertek listed symbol.

6 What's in the box

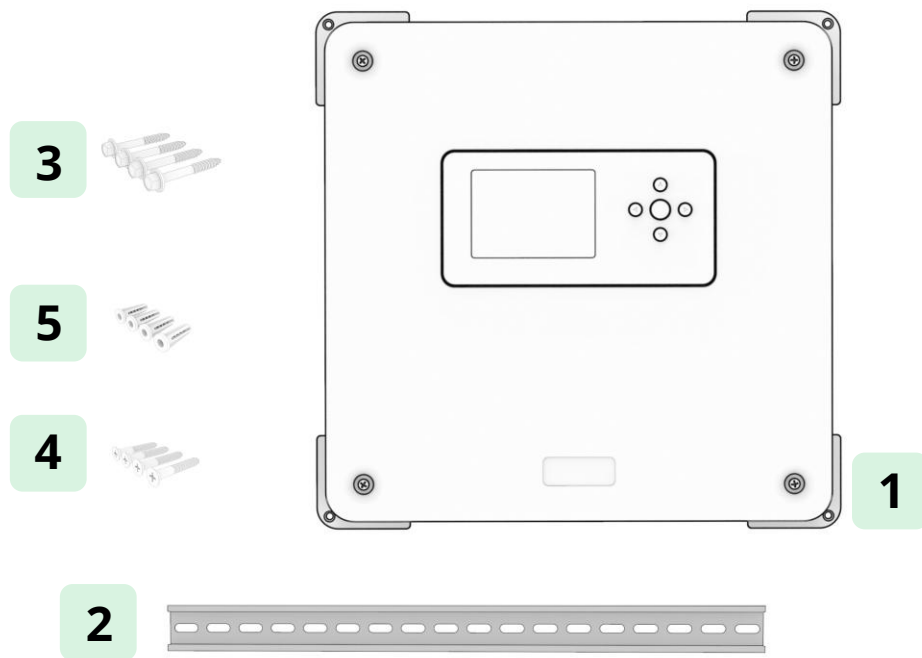


Figure 1

Note	Description
1	SunHopper-D unit
2	DIN mounting rail
3	DIN rail mounting screws
4	Unit mounting screws
5	Drywall anchors

7 Installing the SunHopper-D

7.1 Finding a suitable location

The SunHopper-D should be installed near the hot water heater. The device must be installed indoors in either a conditioned or unconditioned space. Find a wall to install the device to which will allow for proper ventilation.

At least 24" of unrestricted space must be provided above and below the unit. Ensure there are no air obstructions which could interfere with device cooling. The conduit lines should be the only object beneath the inverter. Ensure conduit lines run down at least 24" before bending or entering any raceways if applicable.

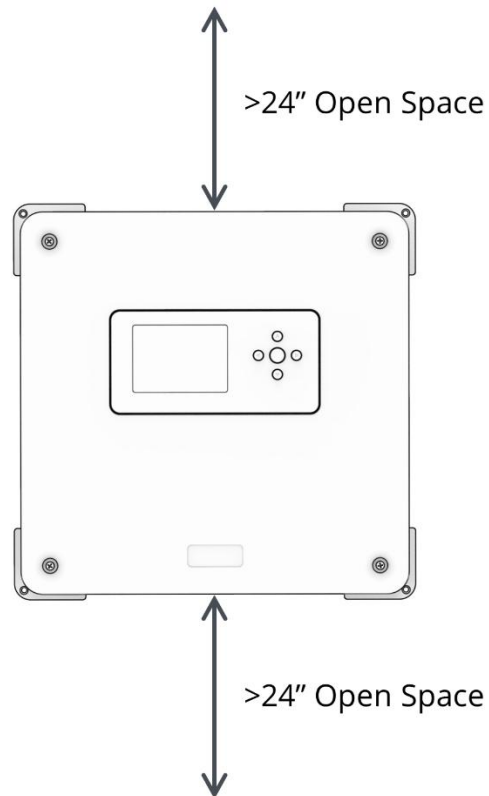


Figure 2

If multiple units are installed, provide a gap of at least 24" between units. Do not install a unit above or below another unit or heat source.



Figure 3

The unit should not be angled more than 10 degrees in any direction. Failure to do so may result in intermittent thermal shutdown of the unit.

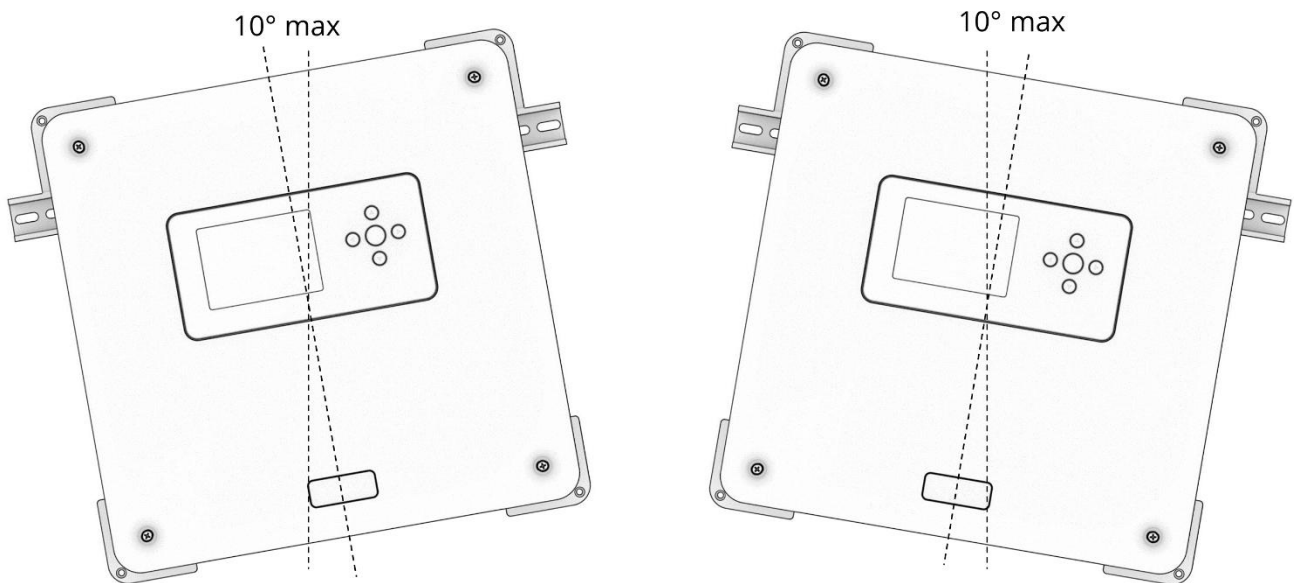


Figure 4

The unit should also not be tilted along the back plane by more than 10 degrees in either direction. Failure to do so may result in intermittent thermal shutdown of the unit.

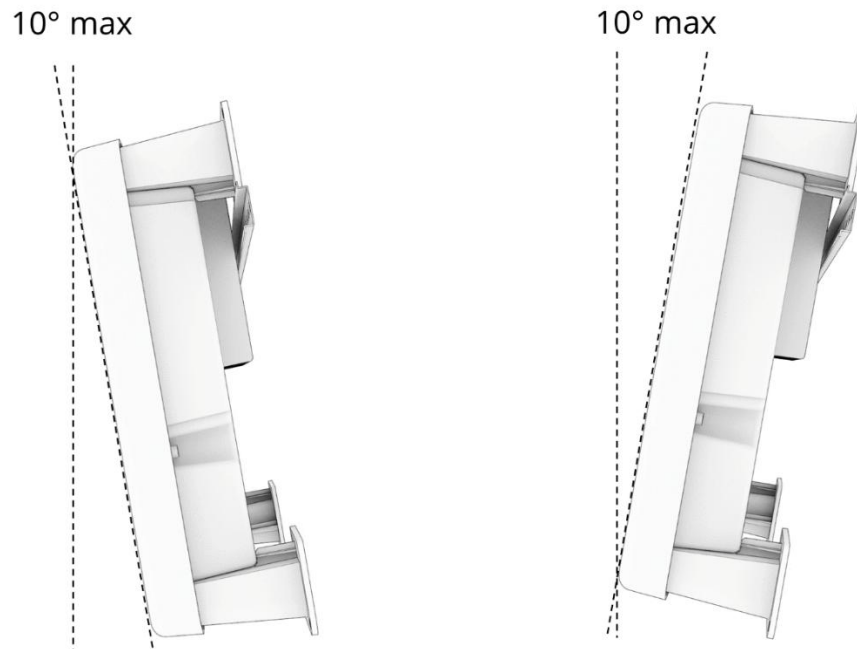


Figure 5

7.2 Mounting the DIN Rail

Find the wall studs and drive the two provided screws through the DIN rail and into the wall studs. If the wall is masonry or concrete, purchase masonry screws and install the DIN rail to the wall. Ensure the DIN rail is level and secured before hanging the unit.

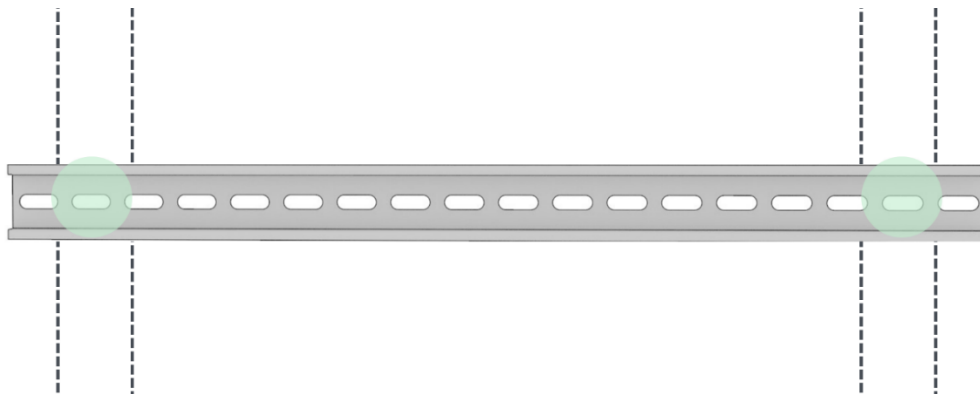


Figure 6

7.3 Hanging the unit

Temporarily hang the SunHopper-D onto the DIN rail. Hold the unit just above the DIN rail on the wall and gently lower until the two upper mounts rest on the DIN rail.

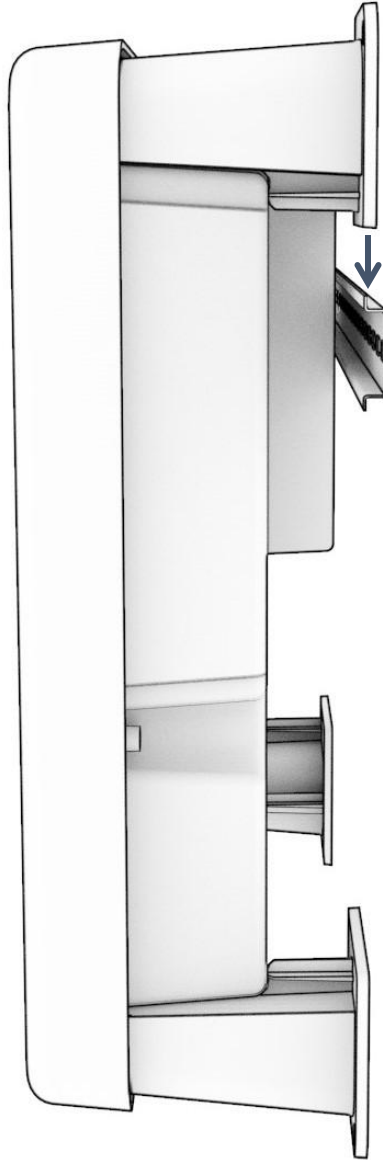


Figure 7

After placing the SunHopper-D on the wall, mark the 4 corner mounting holes.

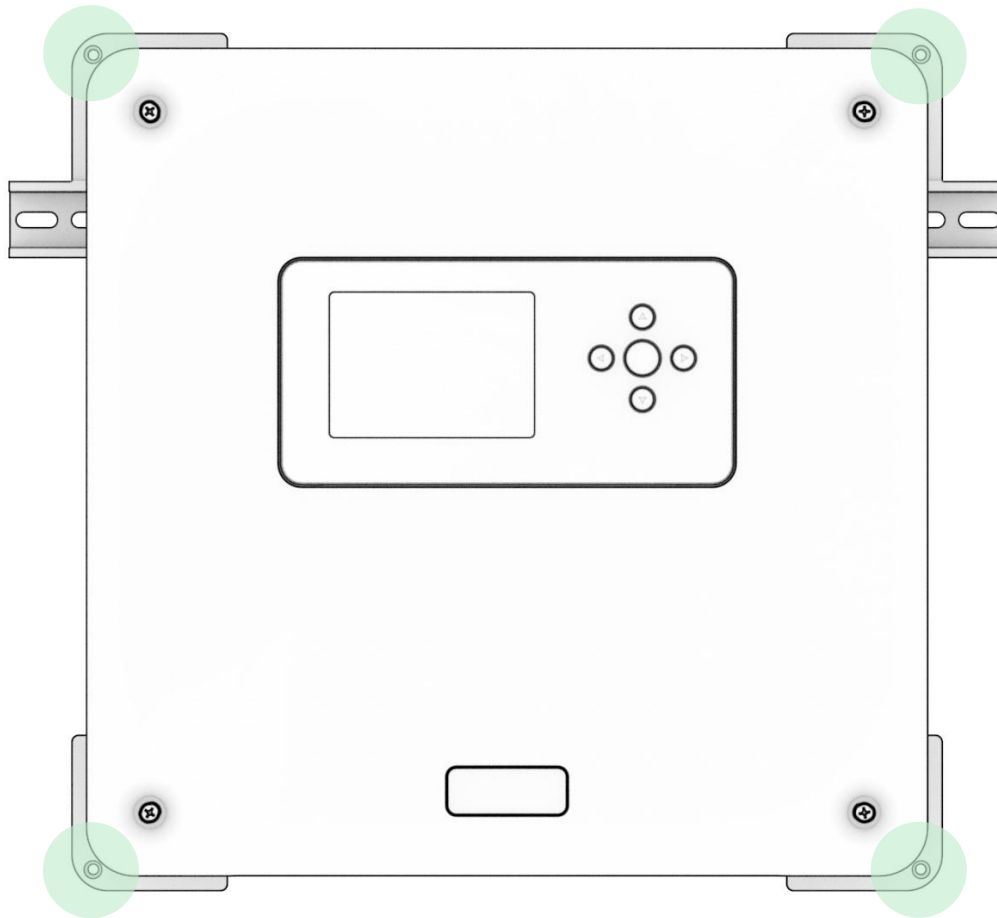


Figure 8

Depending on the wall material, complete one of the next steps below:

7.3.1 Wood Surfaces

Install the 4 corner screws into the unit.

7.3.2 Drywall

Remove the SunHopper-D. Drill at the 4 markings with a 3/16" drill bit. Install the provided drywall anchors. Attach the SunHopper-D to the DIN rail and align the 4 corners holes with the anchors. Install the 4 corner screws.

7.3.3 Masonry

Remove the SunHopper-D. Drill using a 3/16" masonry bit at the 4 markings. Install masonry screw anchors to the drilled holes. Attach the SunHopper-D to the DIN rail and align the 4 corners holes with the anchors. Install the 4 corner screws.

7.4 Wiring the Unit

Remove the front cover for all wiring steps using a #2 Phillips screwdriver. Set the front cover aside.

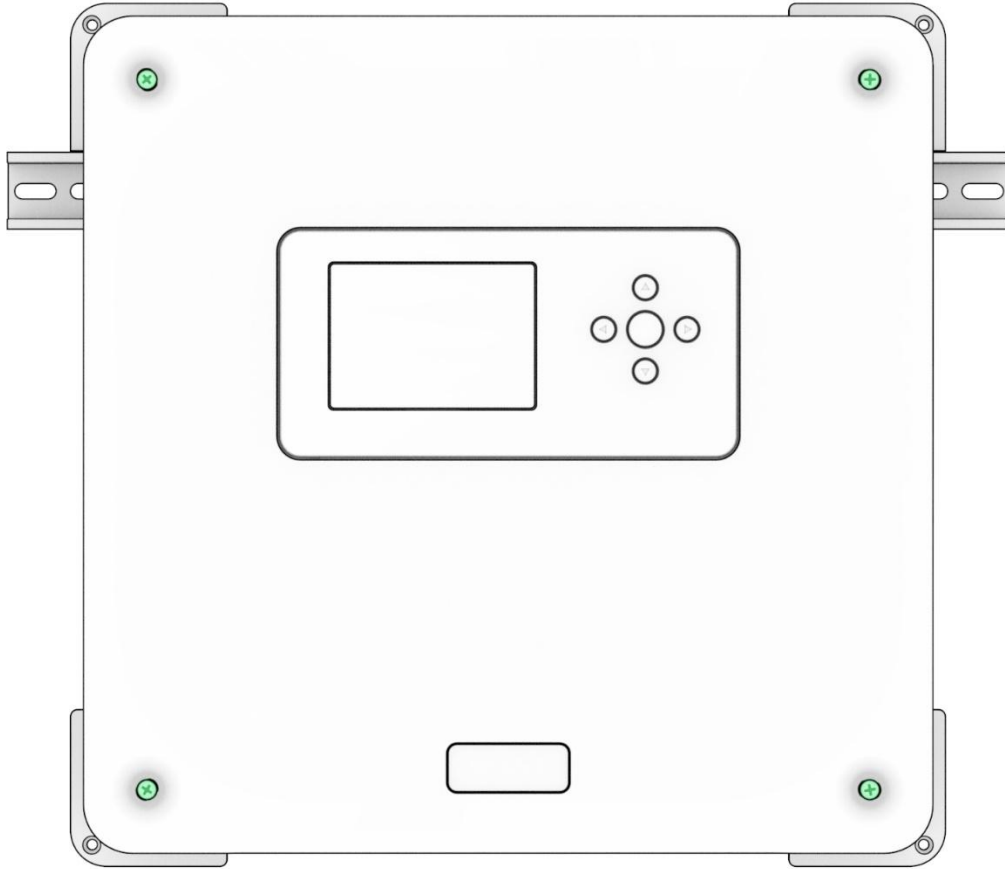


Figure 9

7.4.1 Internal View

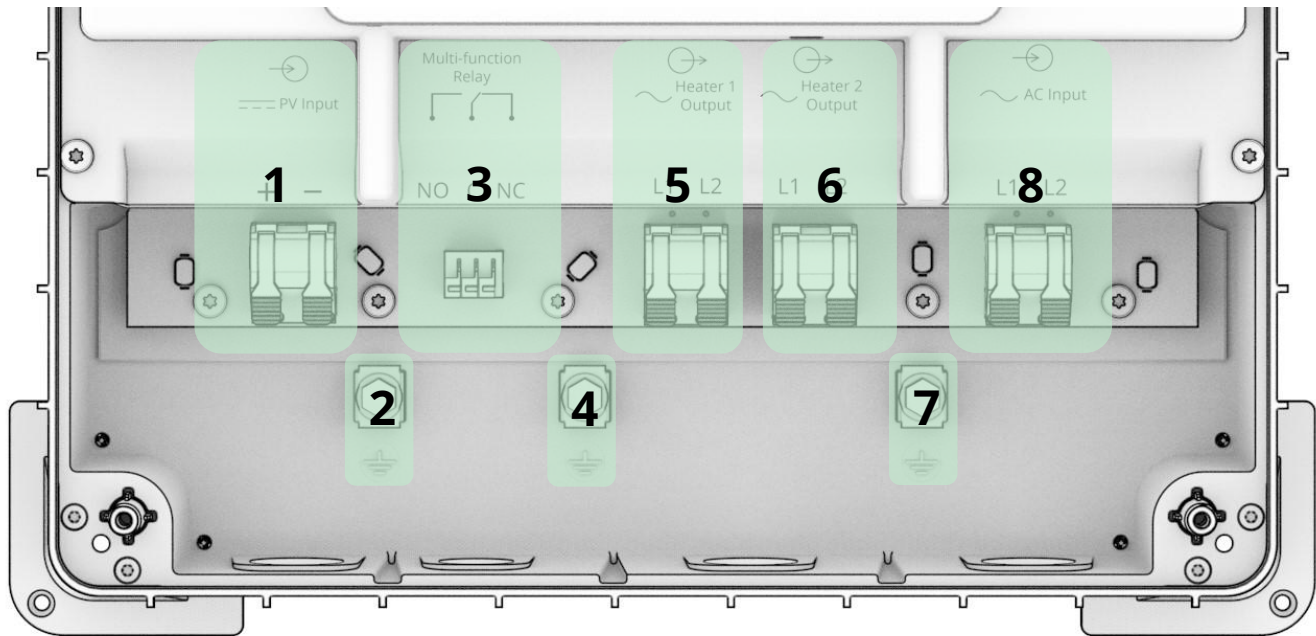


Figure 10

Note	Description
1	PV Input Terminal
2	PV Grounding Lug
3	Multi-function Relay
4	Heater Output Grounding Lug
5	Heater 1 Output Terminal
6	Heater 2 Output Terminal
7	AC Grounding Lug
8	AC Input Terminal

7.4.2 Electrical Openings

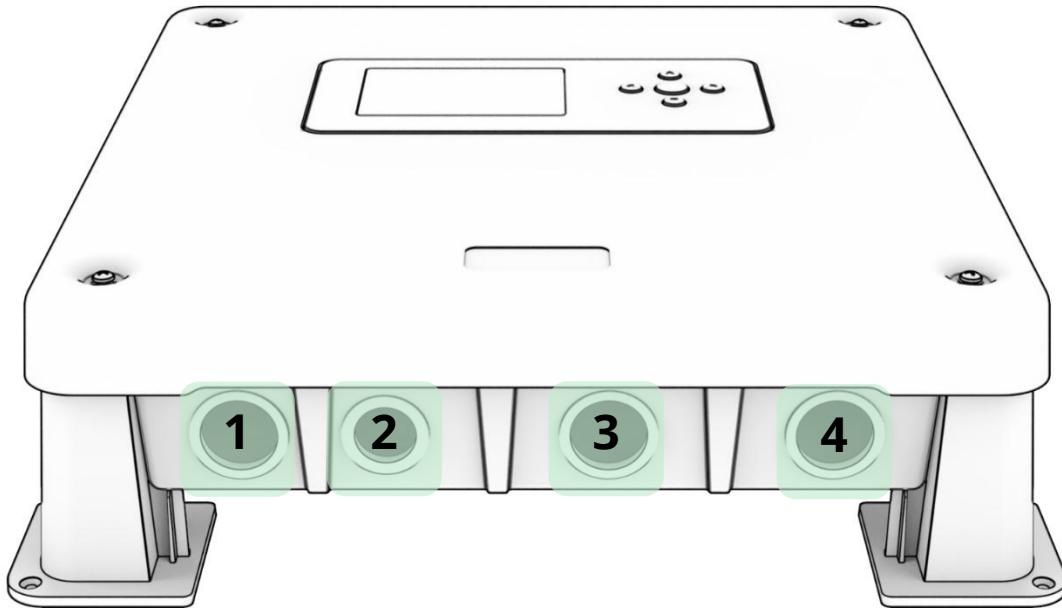


Figure 11

Note	Description
1	¾" PV Conduit Opening
2	½" Multifunction Relay Conduit Opening
3	¾" Heater Output Conduit Opening
4	¾" AC Input Conduit Opening

7.4.3 AC Input Wiring (if used)

The SunHopper-D allows for a backup energy source using the AC grid connection. This can be used to either provide a backup power source to the heater, or can be used to ensure the SunHopper-D always has power to keep the WiFi/BLE connection active for monitoring. The AC backup option can be enabled or disabled during the commissioning procedure.

Requirements

- AC entry is through a ¾" conduit opening. Only route AC wiring through the AC conduit opening
- Use the required wire gauge for the installation as indicated by the National Electric Code NFPA 70

- Terminal block temperature rating: 115°C
- Copper wire only
- Either stranded or solid wire can be used
- Wire gauge: 14AWG to 6AWG, 75°C or greater insulation temperature rating
- Strip Length: ½"

Procedure

⚠ WARNING

ELECTRIC SHOCK HAZARD. Ensure the AC mains is switched off at the breaker before wiring or servicing.

1. Remove the factory installed conduit plug using a Philips screwdriver.
2. Attach the AC input conduit to the conduit fitting. Tighten the conduit nut to the housing.
3. Route the AC wires through the conduit into the SunHopper-D.
4. Strip the ground wire to ⅝" (16mm). Loosen the grounding screw and place the grounding wire between the grounding post and grounding saddle washer. Tighten the screw to approximately 50 in-lb (6Nm) and ensure the ground cable extends past the saddle washer by ⅛" as highlighted in Figure 12. **DO NOT OVERTIGHTEN THE GROUND SCREW.**

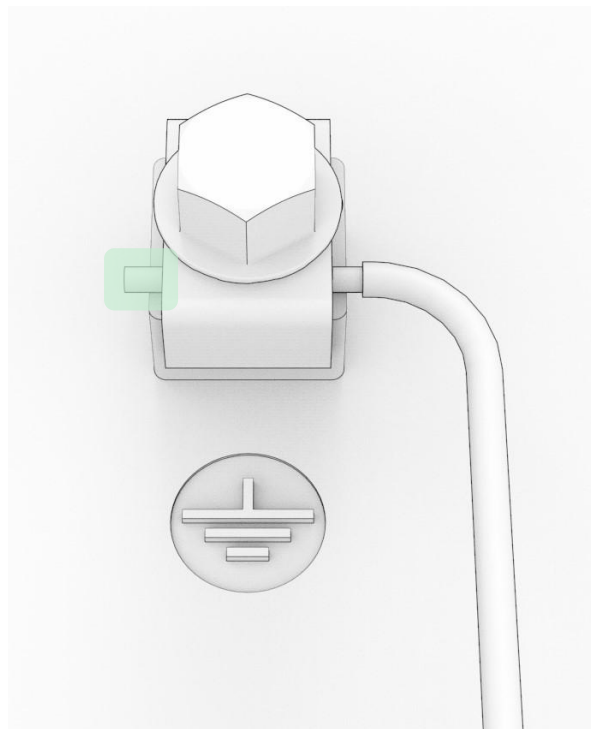


Figure 12

5. Strip the AC L1 and AC L2 wires to $\frac{1}{2}$ " (12.5mm). Install the wires one at a time by raising the white lever on the terminal block, inserting the wire, then pressing down on the white lever until it clicks into place. Gently pull the wire to ensure this made contact in the connector. For 240V installations, L1 and L2 note the two phases of the AC connection. For 120V installations, install the line voltage to L1 and neutral to L2.

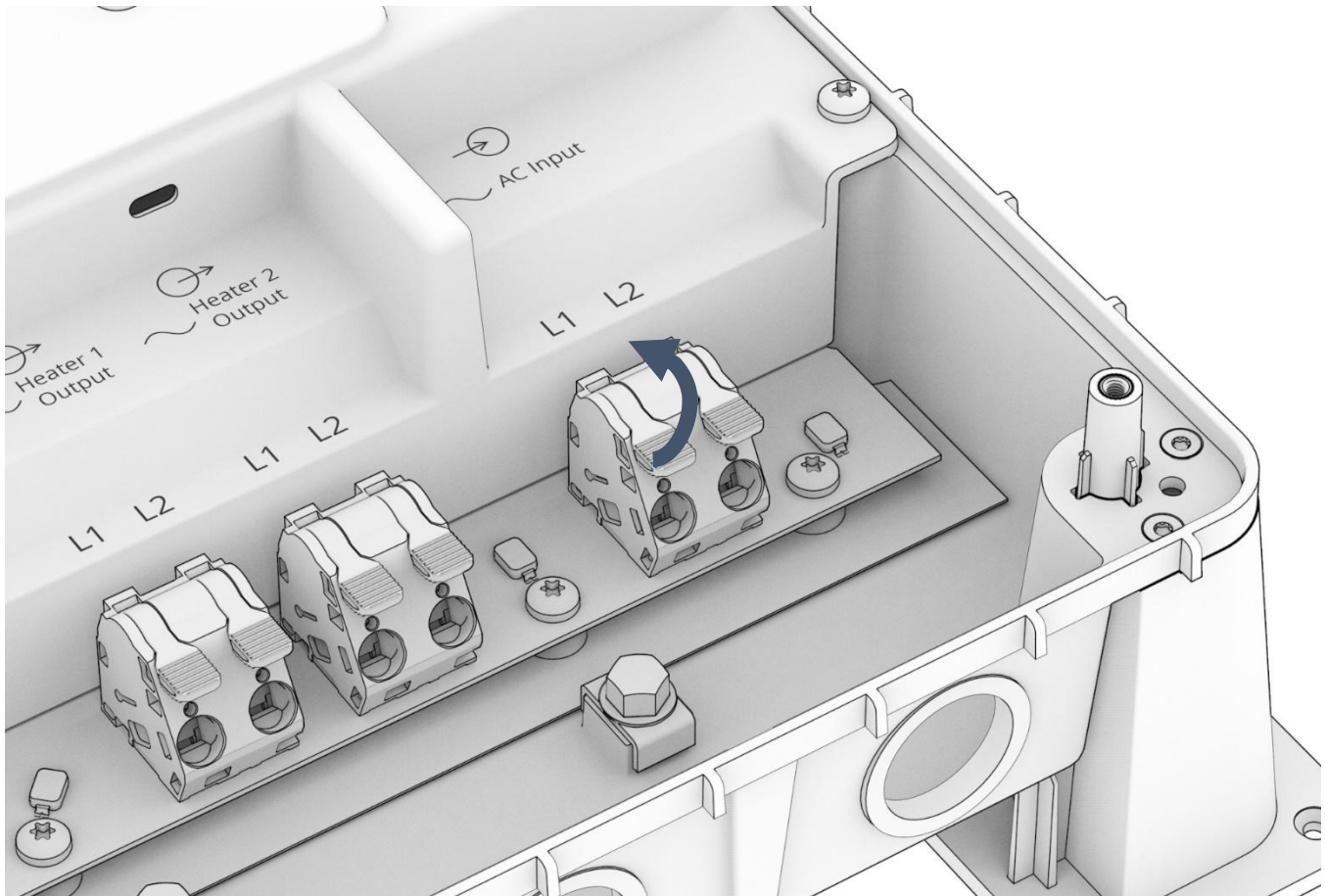


Figure 13

6. Verify no loose strands are visible on the wires. Correct if necessary.
7. If the AC connection is not used ensure the plug is installed in the conduit opening.

7.4.4 Heater 1 and 2 Outputs

The heater outputs connect to electric immersion water heaters.

① NOTE

RISK OF INVERTER DAMAGE. The inverter output is only intended to drive resistive load immersion heating elements. DO NOT wire the output to a heat-pump water heater or any other load. The warranty does not cover damage to the inverter output caused by inappropriate loads applied.

① NOTE

RISK OF INVERTER DAMAGE. DO NOT DRIVE MULTIPLE HEATERS WITH ONE OUTPUT. The SunHopper-D has protections internally but will not be able to drive the heaters correctly. Only wire one heater to one output. This does not apply to a single tank with a non-simultaneous thermostat.

Several installation types are supported to cover most scenarios.

7.4.4.1 Single Water Tank Installation

Single water tanks may have one or two heating elements. The tank may also have a non-simultaneous thermostat which automatically switches between the upper and lower heating elements.

7.4.4.1.1 Single Heater Installation

The immersion heater is installed to the Heater 1 output.

7.4.4.1.2 Dual Heater with non-simultaneous thermostat

The water heater is installed to the Heater 1 output.

7.4.4.1.3 Two Independent Heater Installation

The upper heater is connected to heater output 1 and the lower heater is connected to heater output 2.

7.4.4.2 Dual Tank Installation

Dual tank installations are also supported. The tank sizes do not need to be matched and will follow a time-slicing algorithm to provide equal energy between the two tanks, automatically switching when the tanks are at temperature. If the tank sizes or usage profiles are extremely different, the system will continue heating the most used tank and periodically provide energy to the lesser used tank. **BOTH HEATERS MUST BE THE SAME VOLTAGE RATING.**

The dual tank installation only allows for a single connection to each tank. The tanks can either have a single heating element or have a non-simultaneous thermostat to automatically

switch between two heating elements. The most used or largest tank should be wired to the Heater 1 output.

Requirements

- Heater 1 and 2 outputs are wired through a $\frac{3}{4}$ " conduit opening. Only route the heater outputs through this opening
- Use the required wire gauge for the installation as indicated by the National Electric Code NFPA 70
- Use metal conduit or flexible metal conduit to ensure compliance with FCC part 15b requirements
- Terminal block temperature rating: 115°C
- Copper wire only
- Either stranded or solid wire can be used
- Wire gauge: 14AWG to 8AWG, 75°C or greater insulation temperature rating
- Strip Length: $\frac{1}{2}$ "

Procedure

⚠ WARNING

ELECTRIC SHOCK HAZARD. Ensure the AC mains is switched off at the breaker before wiring or servicing.

1. Attach the heater output conduit to the conduit fitting. Tighten the conduit nut to the housing.
2. Route the heater wires through the conduit into the SunHopper-D.
3. Strip the ground wire to $\frac{5}{8}$ " (16mm). Loosen the grounding screw and place the grounding wire between the grounding post and grounding saddle washer. If two grounding wires are used, place one on each side of the grounding screw as shown. Tighten the screw to 50 in-lb (roughly 6Nm) and ensure the ground cable extends past the saddle washer by $\frac{1}{8}$ " as highlighted in Figure 14. **DO NOT OVERTIGHTEN THE GROUND SCREW.**

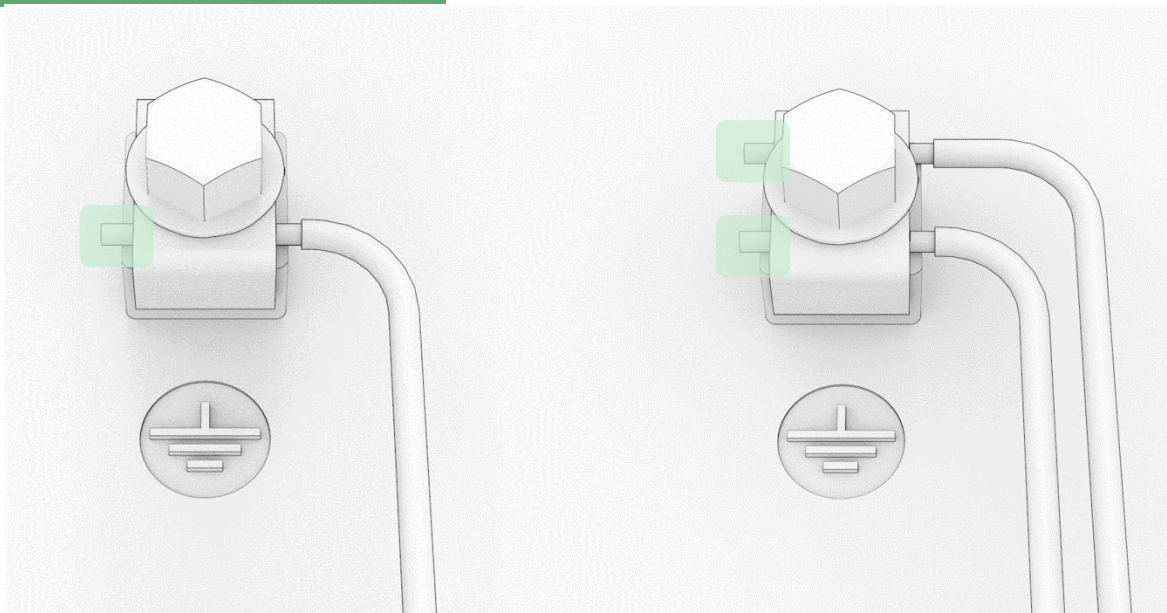


Figure 14

4. Strip the heater L1 and L2 wires to $\frac{1}{2}$ " (12.5mm). Install the wires one at a time by raising the white lever on the terminal block, inserting the wire, then pressing down on the white lever until it clicks into place. Gently pull the wire to ensure this made contact in the connector.

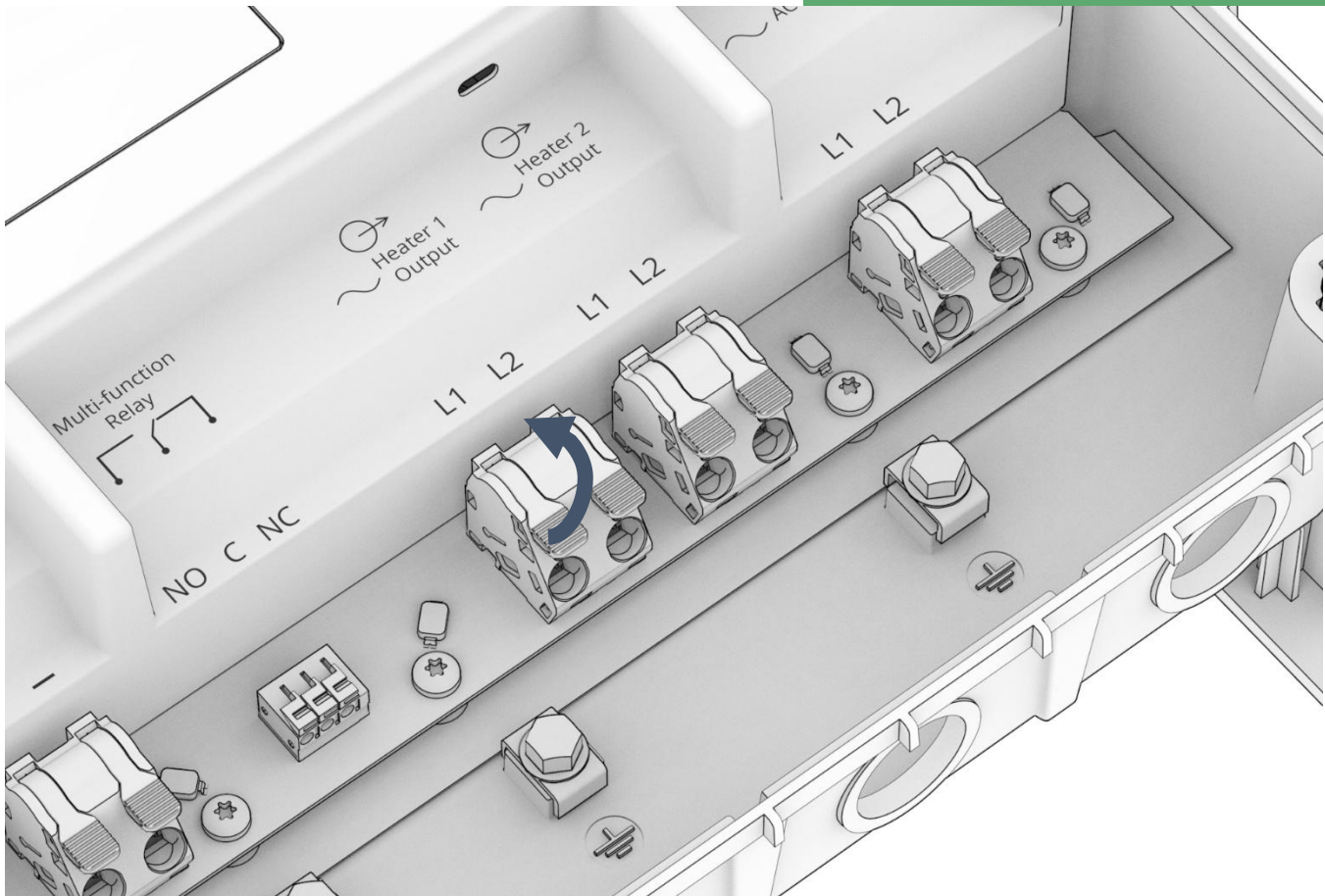


Figure 15

5. Verify no loose strands are visible on the wires. Correct if necessary.

7.4.5 PV Wiring

The SunHopper-D uses a single MPPT string.

NOTE

RISK OF INVERTER DAMAGE. Ground faults at the input of the inverter may cause irreparable damage. The inverter contains circuitry to verify no ground fault exists before starting the inverter, however no protection is present to measure ground impedance when the inverter is active. Ensure the PV wiring has no loose strands coming out of the wiring connector which could short to the metal chassis or other lines. The warranty does not cover damage to the inverter caused by ground faults.

Requirements

- PV entry is through a $\frac{3}{4}$ " conduit opening. Only route PV wiring through the PV conduit opening
- Use the required wire gauge for the PV installation as indicated by the National Electric Code NFPA 70
- Use metal conduit or flexible metal conduit to ensure compliance with FCC part 15b requirements
- Terminal block temperature rating: 115°C
- Copper wire only
- Either stranded or solid wire can be used
- Wire gauge: 14AWG to 6AWG, 75°C or greater insulation temperature rating
- Strip Length: $\frac{1}{2}$ "

Procedure

⚠ WARNING

ELECTRIC SHOCK HAZARD. When the photovoltaic array is exposed to light, it supplies a DC voltage to the equipment. The SunHopper-D does not contain a DC disconnect switch. Before wiring the PV connections, ensure the PV system is disconnected using an external disconnect switch.

1. Attach the PV input conduit to the conduit fitting. Tighten the nut to the housing.
2. Route the PV wires through the conduit into the SunHopper-D.
3. Strip the ground wire to $\frac{5}{8}$ " (16mm). Loosen the grounding screw and place the grounding wire between the grounding post and grounding saddle washer. Tighten the screw to 50 in-lb (roughly 6Nm) and ensure the ground cable extends past the saddle washer by $\frac{1}{8}$ " as highlighted in Figure 16. **DO NOT OVERTIGHTEN THE GROUND SCREW.**

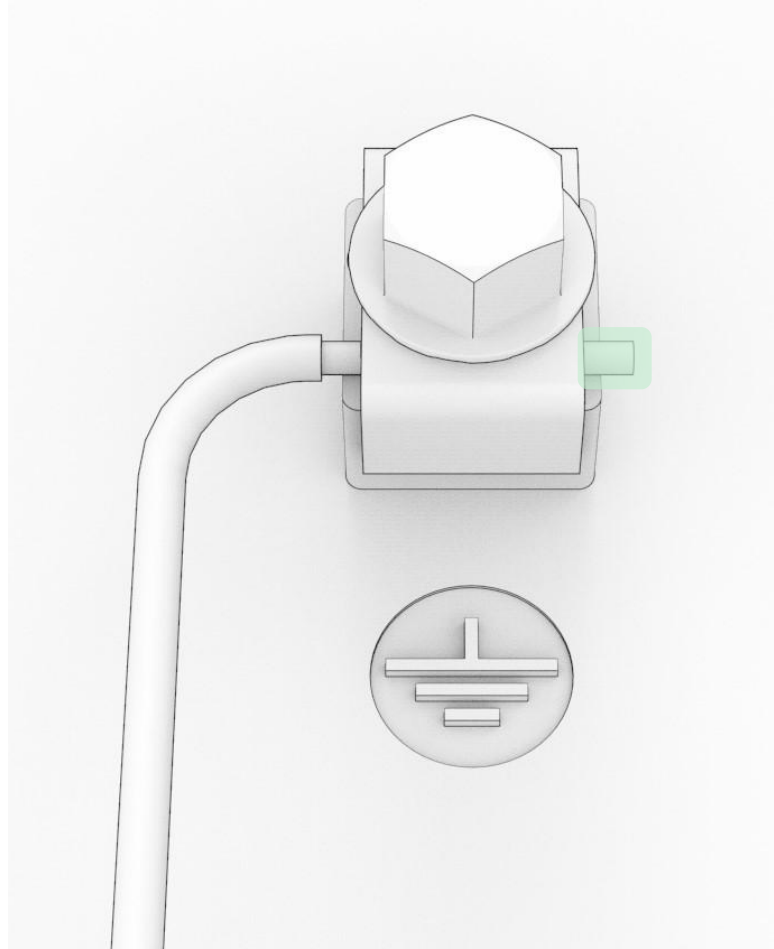


Figure 16

4. Strip the PV positive and negative wires to $\frac{1}{2}$ " (12.5mm). Install the wires one at a time by raising the white lever on the terminal block, inserting the wire, then pressing down on the white lever until it clicks into place. Gently pull the wire to ensure this made contact in the connector.

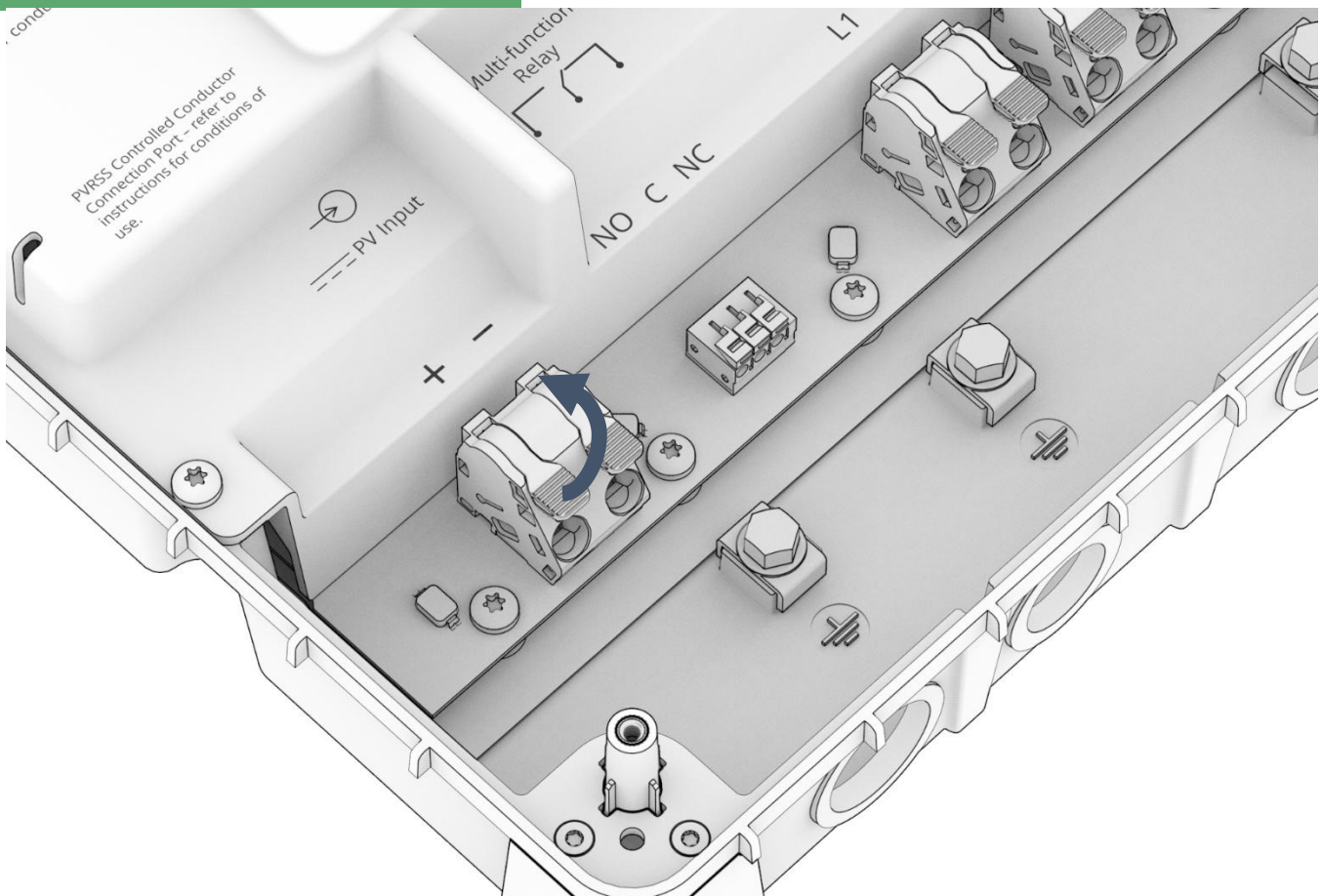


Figure 17

5. Verify no loose strands are visible on the PV wires. Correct if necessary.

7.4.6 Multifunction Relay (if used)

A relay is provided internal to the product. This enables remote fault monitoring or a gas control valve operation. Either of these functions can be enabled during the commissioning process.

Multi-Function Relay Operating Mode	Description
Fault Output	The multi-function relay will change states when a fault state is entered. This can be wired to a warning lamp to signify a fault has occurred.
Gas Control	The multi-function relay turns on/off to control an external gas control valve for natural gas or propane installations. The relay will only turn off when the system is in vacation mode. See the User's Manual for more information.

NOTE

RISK OF DAMAGE. The multifunction relay does not have internal protection mechanisms. Protection must be provided externally via a fuse or breaker. The warranty does not cover damage to the multifunction relay due to excessive current.

Requirements

- The Multifunction relay entry is through a ½" conduit opening. Only route multifunction relay wiring through this conduit opening
- Follow all requirements from the National Electric Code NFPA 70.
- Terminal block temperature rating: 115°C
- Copper wire only
- Either stranded or solid wire can be used
- Wire gauge: 24AWG to 14AWG, 75°C or greater insulation temperature rating
- Strip Length: 3/8"
- External Fuse Rating: 3A
- Voltage Rating: Up to 30VDC, or up to 250VAC

Procedure

WARNING

ELECTRIC SHOCK HAZARD. Ensure all external power sources are disabled before connecting to the multifunction relay.

1. Remove the factory installed conduit plug using a Philips screwdriver.

2. Attach the multifunction relay conduit to the conduit fitting. Tighten the nut to the housing.
3. Route the multifunction relay wires through the conduit into the SunHopper-D.
4. Strip the wires to 3/8" (9.5mm). Install the wires one at a time by using a small flat-head screwdriver to move the orange lever up and installing the wire into the connector. Repeat this for the number of connections needed.

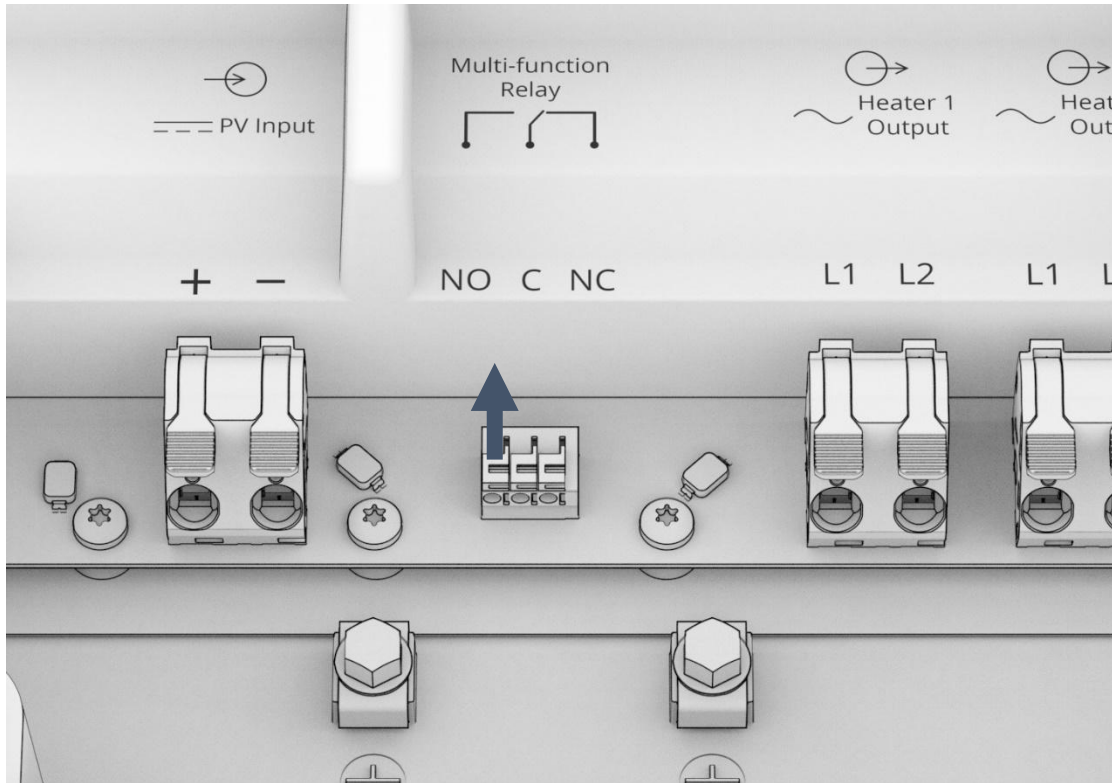


Figure 18

5. Verify no loose strands are visible on the wires. Correct if necessary.
6. If unused, ensure the conduit opening plug is installed.

7.4.7 Installation Completion

Press the cover in place and install the 4 Phillips screws. Do not overtighten the cover screws.

7.5 Water Tank

Depending on the installation, a mixing valve may be required and is recommended. The tank temperature will vary across the day as the PV power varies. Follow the recommended settings below:

Table 7.1

Installation Type	Recommendation
AC grid backup	Install a mixing valve to the water heater outlet and set to the recommended temperature for the hot water line (typically 120 °F). Increase the thermostat setting to 150°F. The adaptive algorithm requires a mixing valve and an increased water tank temperature to function correctly.
Natural gas or Propane Backup	A mixing valve is not required. Set the electric tank temperature to the desired setting (typically 120 °F).
Off-grid	A mixing valve will ensure a much more stable water outlet temperature and is recommended. Install a mixing valve to the water heater outlet and set to the recommended temperature for the hot water line (typically 120 °F). Increase the thermostat setting to 150°F. If the outlet temperature is not critical (e.g. the setup is used for sinks), a mixing valve is not required but more fluctuation in tank temperature will be present. Set the electric tank temperature to the desired setting (typically 120 °F).

7.5.1 Mixing Valve

The hot water tank must have a mixing valve installed at the outlet. This ensures the output water temperature is regulated. The mixing valve is not included with the SunHopper-D and must be procured separately.

7.5.2 Thermostat setting

The learning algorithm requires the water tank to be set to a higher temperature than typical. For all thermostats in the system, set the water temperature to maximum (typically 65°C, or about 150°F). This setting in addition to the mixing valve ensure the hot water outlet temperature is regulated to a constant temperature over the day. As the PV output varies across the day, so does the temperature of the water tank.

8 Commissioning

The SunHopper-D can be installed via several methods depending on the installation requirements. This section reviews the installation methods of the SunHopper-D.

	Full Featured Installation*	Limited Installation	Local Installation
SunHopper-D learning algorithm for electric backup	✓	✗	✗
Remote Monitoring	✓	✗	✗
Local Monitoring	✓	✓ Limited to 1 unit	✗
Timer based electric backup	✗	✓	✓

* The full featured installation requires a subscription to the GreenPWR cloud service. 1 year is included with the unit.

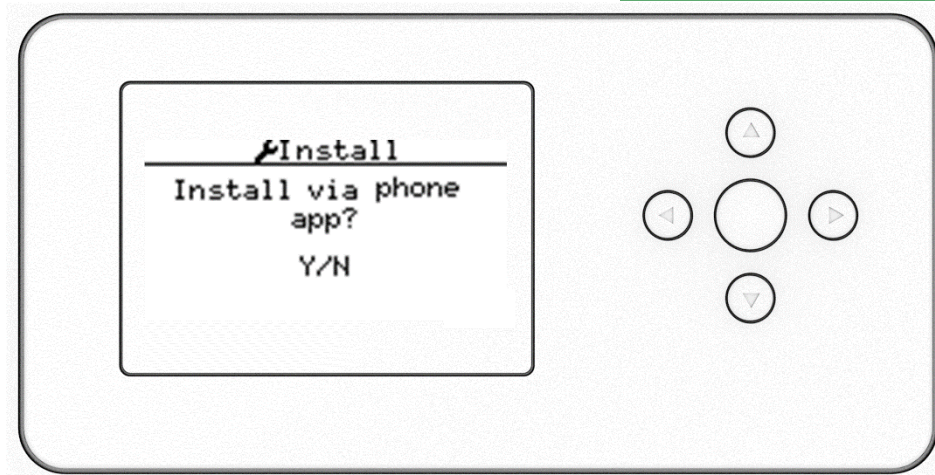
The SunHopper-D learning algorithm is only available for installations which use the electricity grid as the backup energy source and a full-featured installation is complete on the unit. A WiFi connection is required for this installation type.

8.1 Full Feature Installation

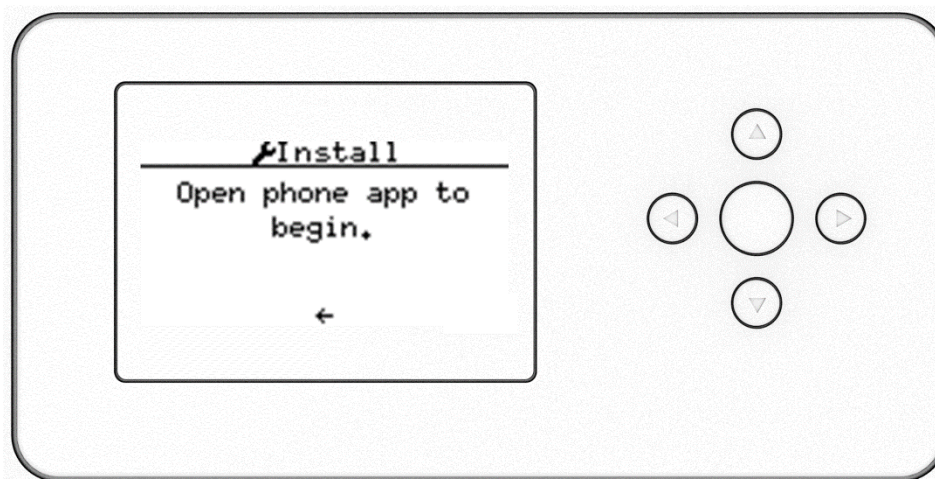
The full feature installation uses WiFi connection to enable the SunHopper-D learning and adaptive algorithm. This installation type requires a 2.4GHz WiFi connection and a mobile phone to install the unit. Remote monitoring is also available for this installation type with an unlimited number of SunHopper devices attached to the account.

Procedure- SunHopper-D

1. Download and install the GreenPWR app via the Play Store for Android devices or the App Store for iOS devices.
2. Power on the SunHopper-D. The installation screen will ask to use the phone to install. Select "Y" via the user interface buttons and press the large centre enter key.



3. The UI will then enable the installation to begin via the phone app.

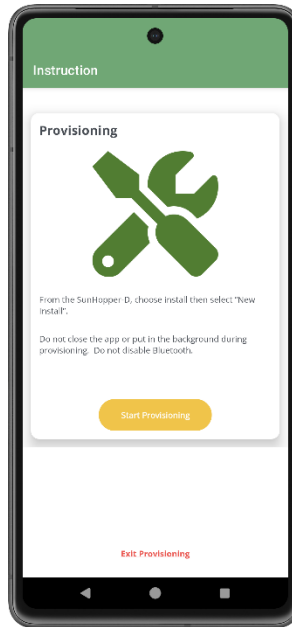


Procedure- Phone App

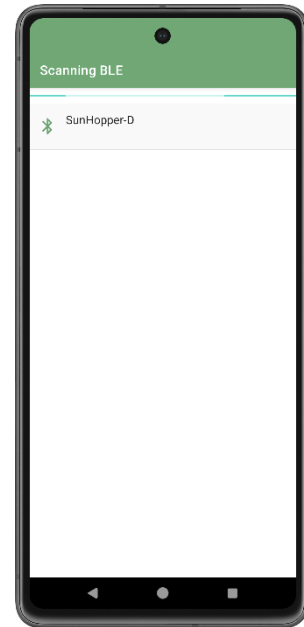
1 Select the “Install” button on the lower left.



2 Start the provisioning process by pressing the button.



3 Locate the SunHopper-D on the list and tap.



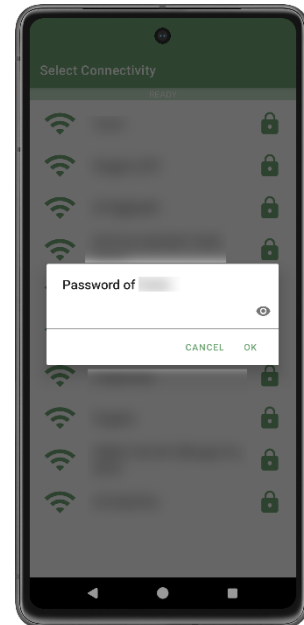
4 Name the device.



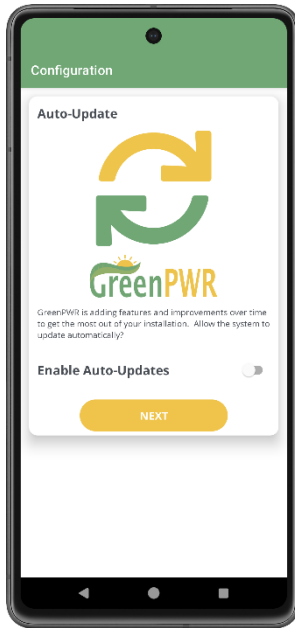
5 Enable WiFi by tapping the slider. Allow location use when alerted.



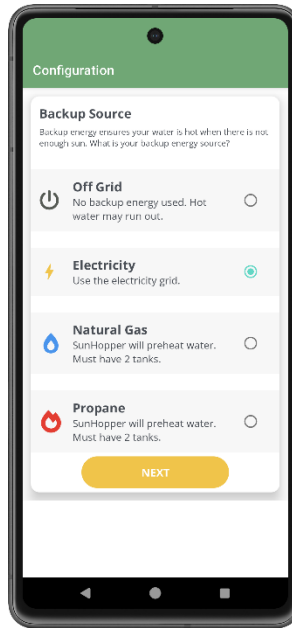
6 Find your WiFi network and enter your password.



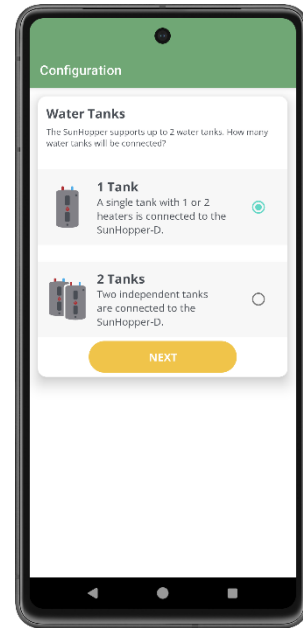
7 Enable auto-updates to allow the unit to automatically update firmware.



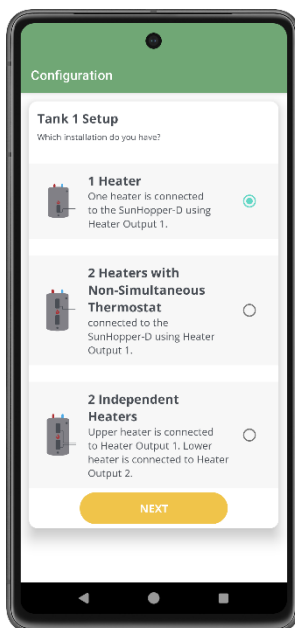
8 Select the backup energy source.



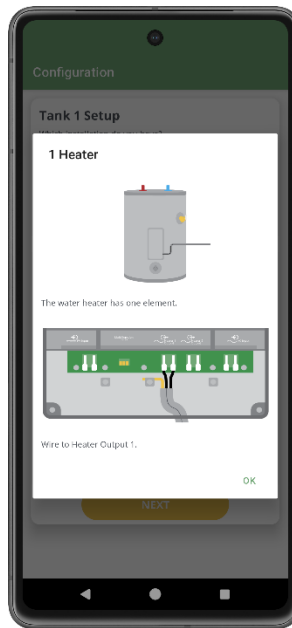
9 Select the number of tanks in the installation.



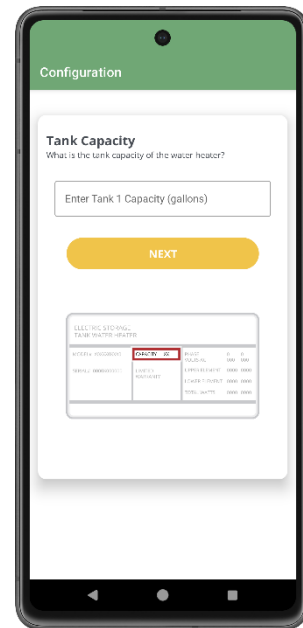
10 Select the heater configuration.



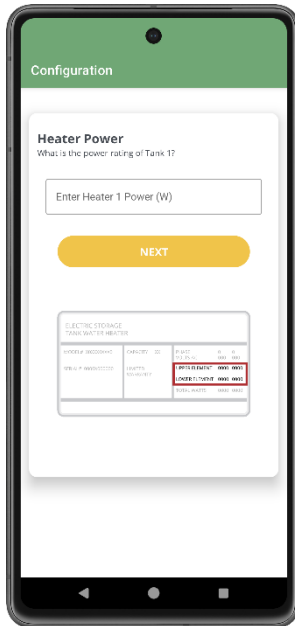
11 Tapping any heater configuration shows further description.



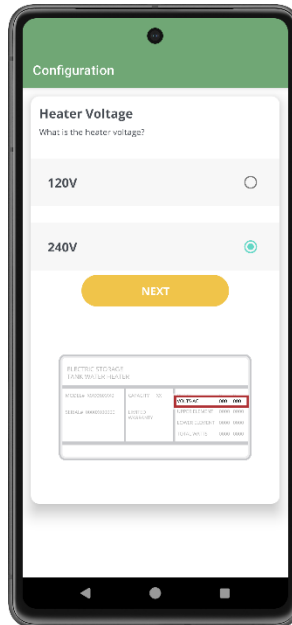
12 Enter the capacity of the tank, in US gallons.



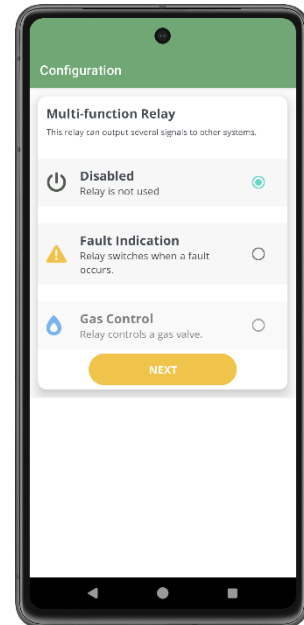
13 Enter the heater power rating. **THIS MUST BE CORRECT TO AVOID HEATER AND INVERTER DAMAGE.**



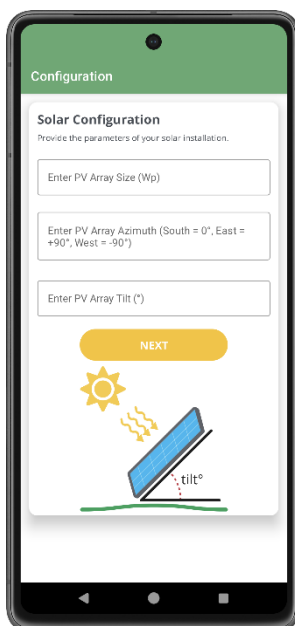
14 Enter the heater voltage rating. **THIS MUST BE CORRECT TO AVOID HEATER AND INVERTER DAMAGE.**



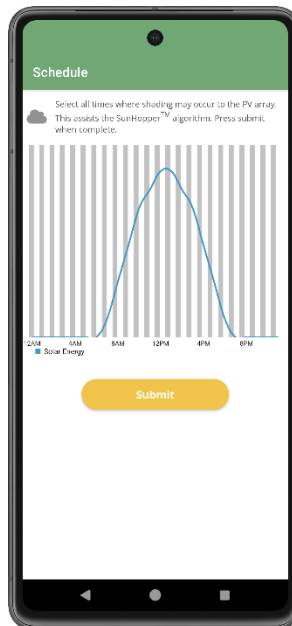
15 Select the multi-function relay mode desired.



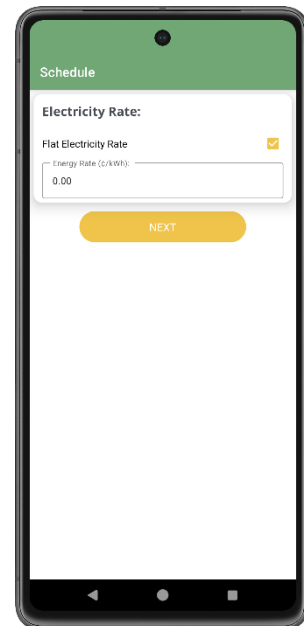
16 Enter the PV array installation details.



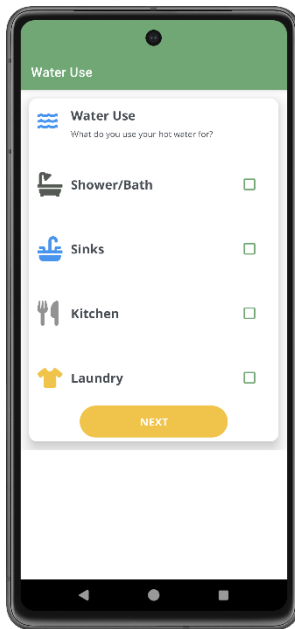
17 Select any hour which may have panel shading. This assists the learning algorithm.



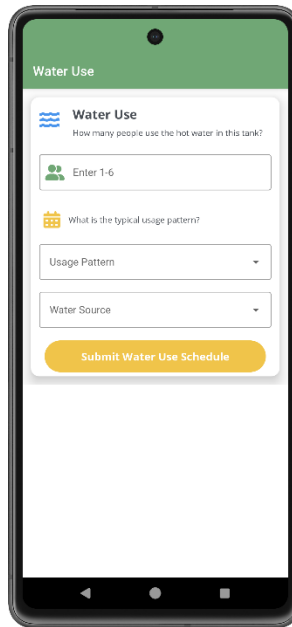
18 If the backup source is electricity, enter the electricity rate and any time of use costs.



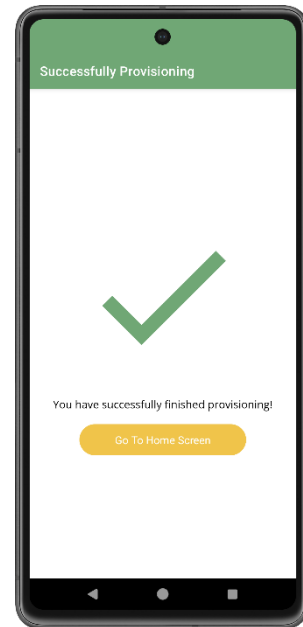
19 Enter how the water is used at the location.



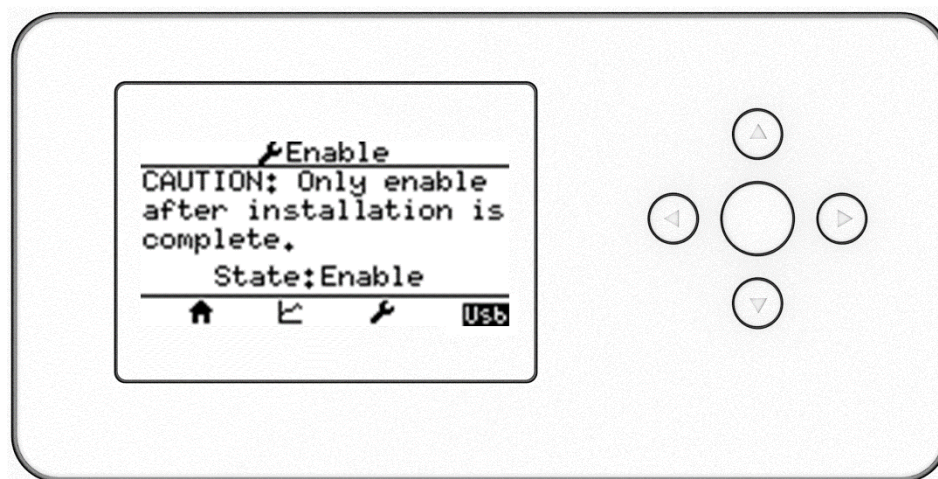
20 Enter additional water use parameters.



21 Success!



After the phone app provisioning completes, the unit is disabled and will now show the enable screen. Use either the left or right arrow key to enable the SunHopper. Move the cursor down to the home icon and press the centre select button to return home and allow inverter operation to begin.



8.2 Limited Local Installation via Phone App

Limited installations can be completed using the GreenPWR phone app where local monitoring is desired. Note that the installation is limited to one device per user account.

1. Download and install the GreenPWR app via the Play Store for Android devices or the App Store for iOS devices.
2. Power on the SunHopper-D. The installation screen will ask to use the phone to install. Select "Y" via the user interface buttons and press the large centre enter key.



3. The UI will then enable the installation to begin via the phone app.

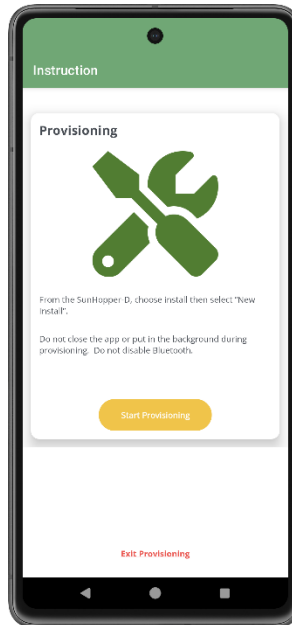


Procedure- Phone App

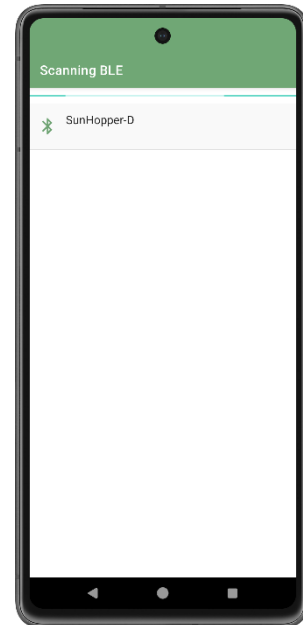
1 Select the “Install” button on the lower left.



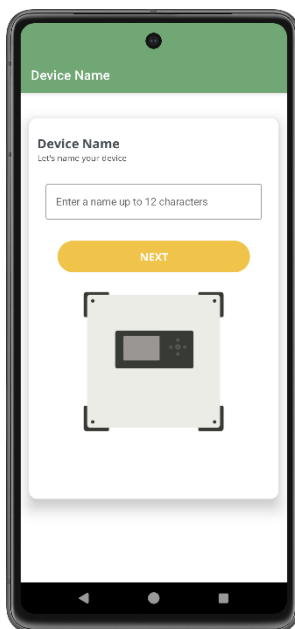
2 Start the provisioning process by pressing the button.



3 Locate the SunHopper-D on the list and tap.



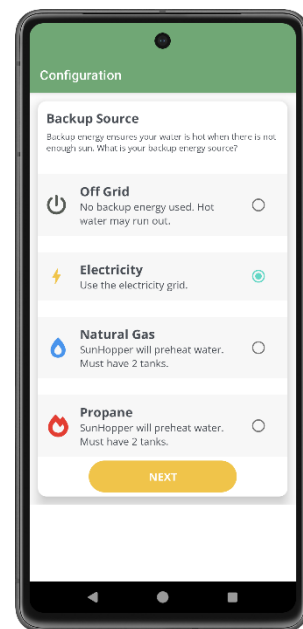
4 Name the device.



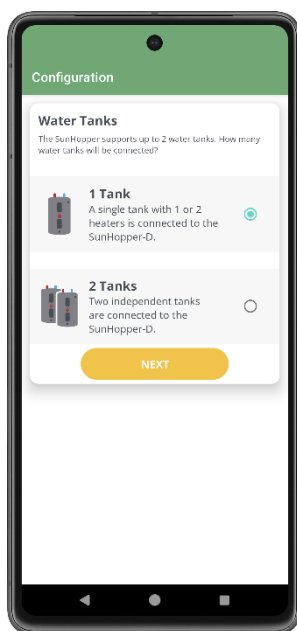
5 Disable WiFi by tapping the slider.



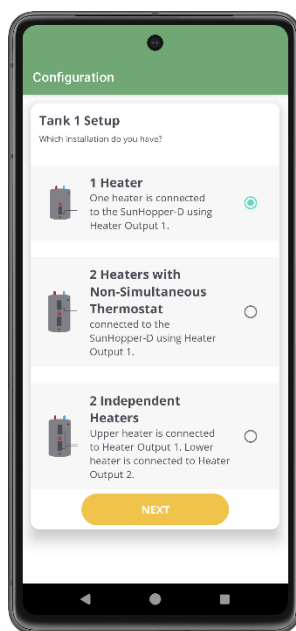
6 Select the backup energy source.



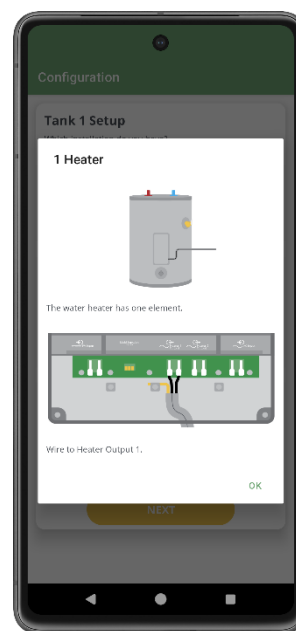
7 Select the number of tanks in the installation.



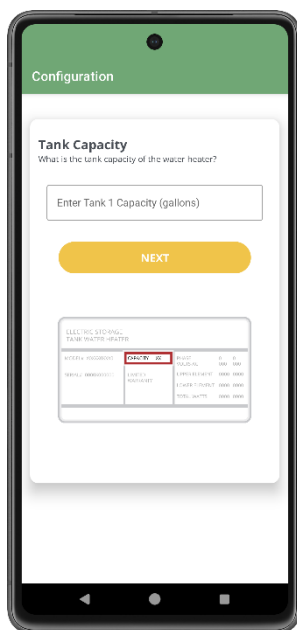
8 Select the heater configuration.



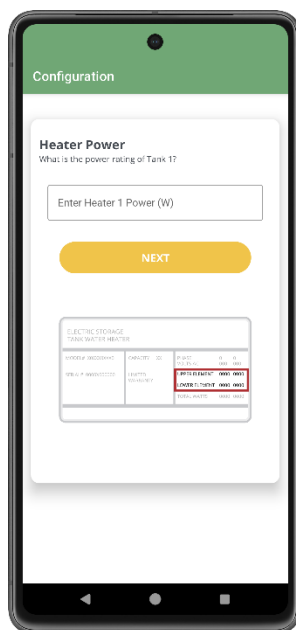
9 Tapping any heater configuration shows further



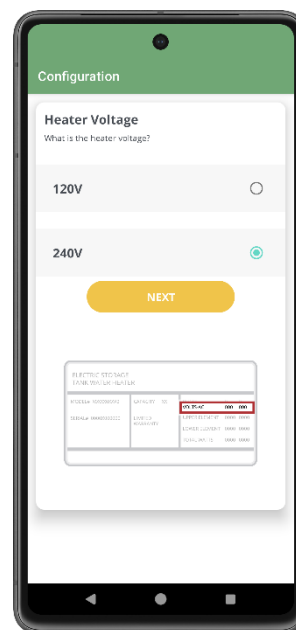
10 Enter the capacity of the tank, in US gallons.



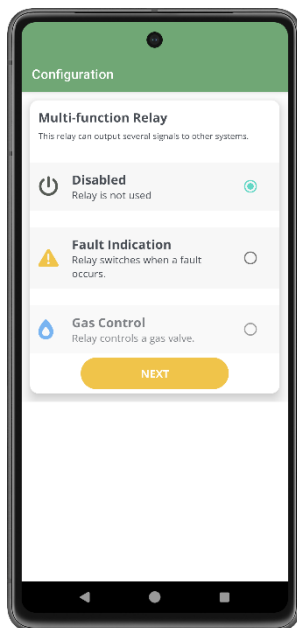
11 Enter the heater power rating. **THIS MUST BE CORRECT TO AVOID HEATER AND INVERTER DAMAGE.**



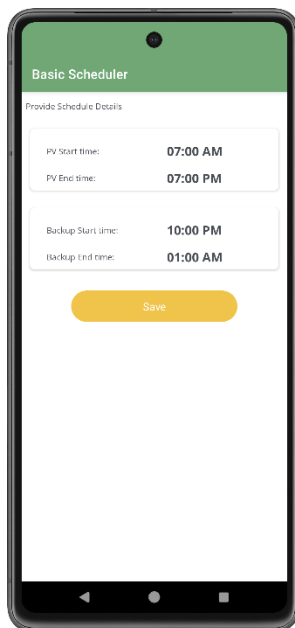
12 Enter the heater voltage rating. **THIS MUST BE CORRECT TO AVOID HEATER AND INVERTER DAMAGE.**



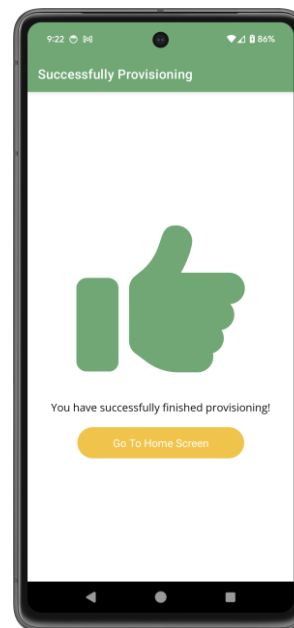
13 Select the multi-function relay mode desired.



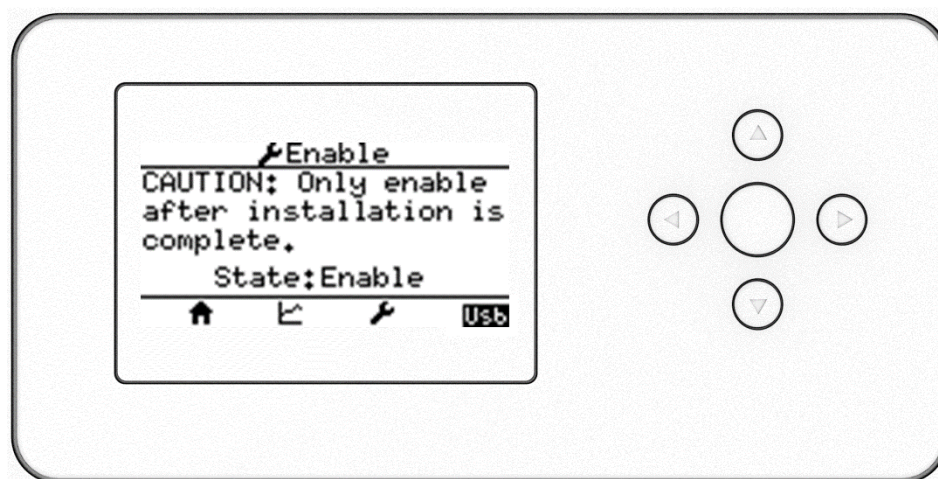
14 If the backup mode is electricity, enter the schedule for the unit to follow.



15 Success! Press the "Go To Home Screen" button.



After the phone app provisioning completes, the unit is shut off and will now show the enable screen. Use either the left or right arrow key to enable the SunHopper. Move the cursor down to the home icon and press the centre select button to return home and allow inverter operation to begin.

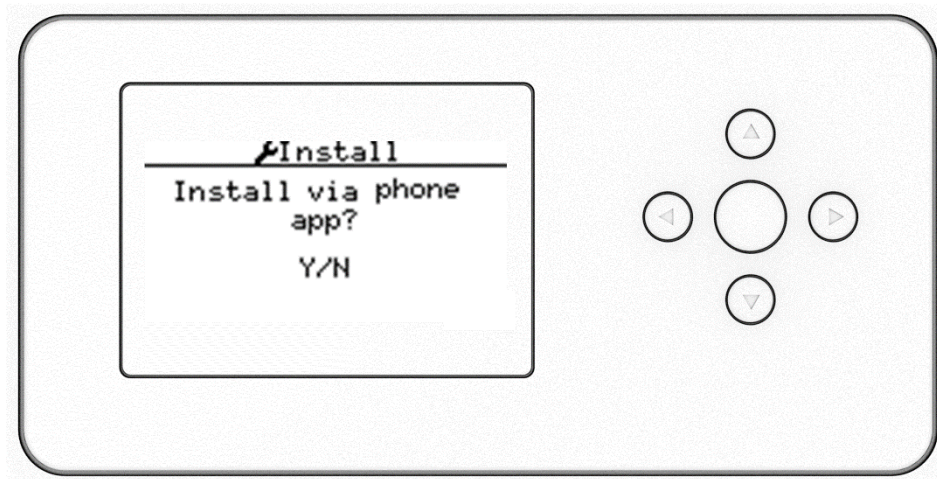


8.3 Limited Local Installation via the SunHopper-D

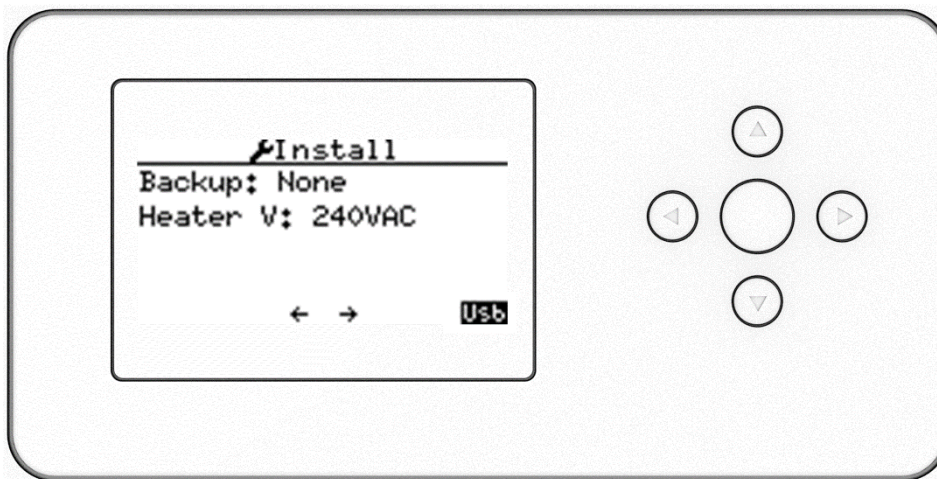
The final installation type uses the SunHopper-D user interface to provide a basic installation. This method is used for installations where no monitoring is desired and where the SunHopper-D algorithm is not used. Installation uses the device user interface (UI). A backup electricity mode is available where a programmable timer is used to select between PV and grid usage times.

Procedure- SunHopper-D

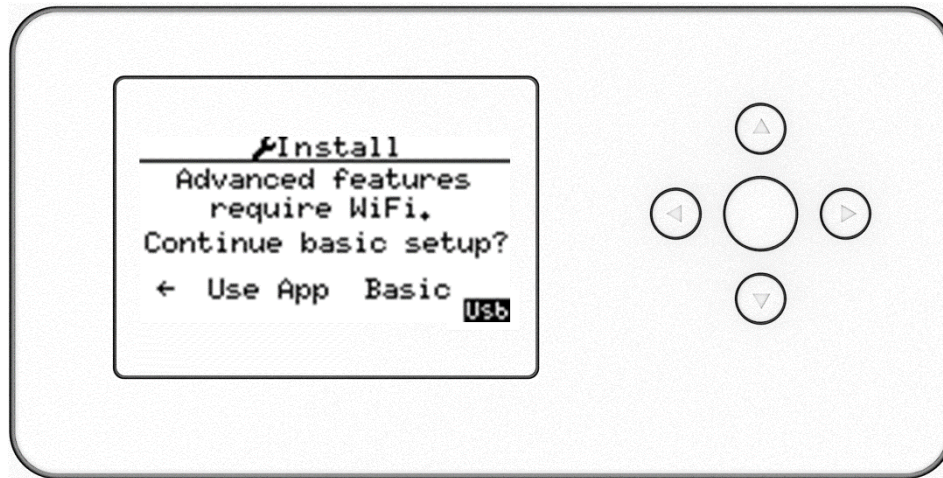
1. Power on the SunHopper-D. The installation screen will ask to use the phone to install. Select "N" via the user interface buttons and press the large centre enter key.



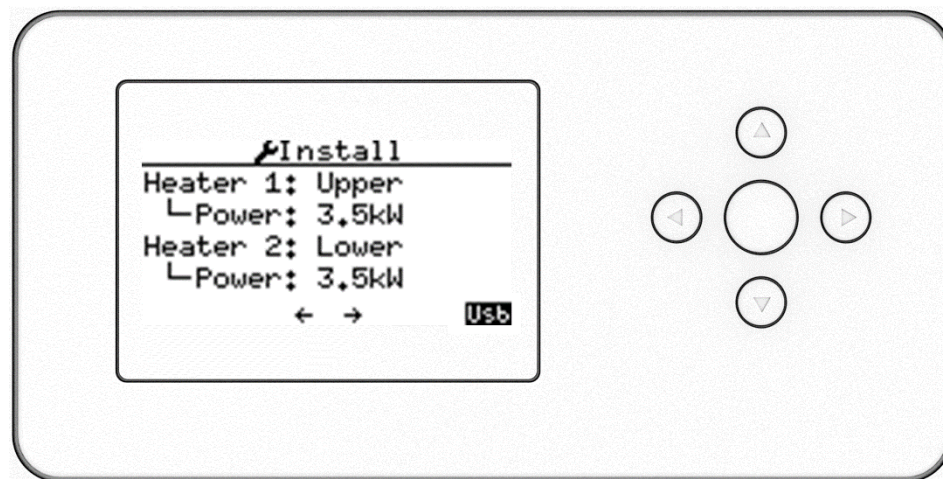
2. Select the backup source and heater voltage.



3. If electric is selected as the backup source, the UI will warn that the learning algorithm will not be active for this installation. Proceed by selecting “Basic” setup.

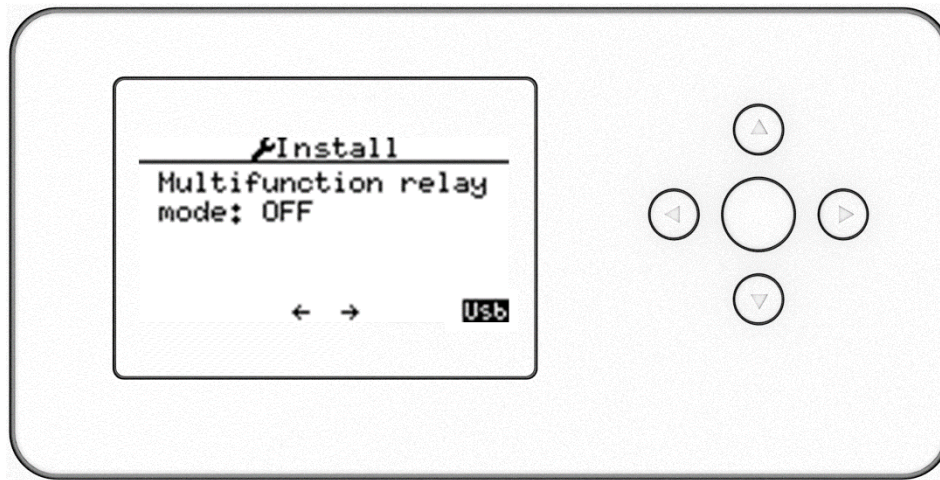


4. Select the heater configuration and power settings. See Section 7.4.4 for further details.



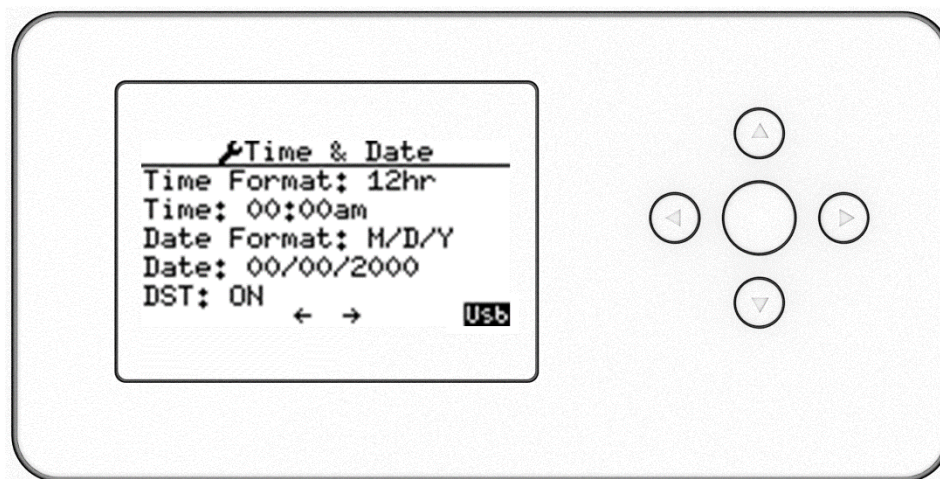
Mode	Description
Single Tank, 2 Heating Elements (default)	Two separate heating elements are wired to a single tank. Heater 1 is connected to the lower element; Heater 2 is connected to the upper element. The heaters can have different power ratings but must have the same voltage.
Single Tank, 1 Heating Element	Either a single heater or dual heater arrangement using a non-simultaneous thermostat is used.
Two Tanks	Two separate tanks are connected to the SunHopper-D. These must have the same heater voltage but can vary in heater power. Wire the most used or largest tank to Heater 1.

5. Select the mode for the multi-function relay.



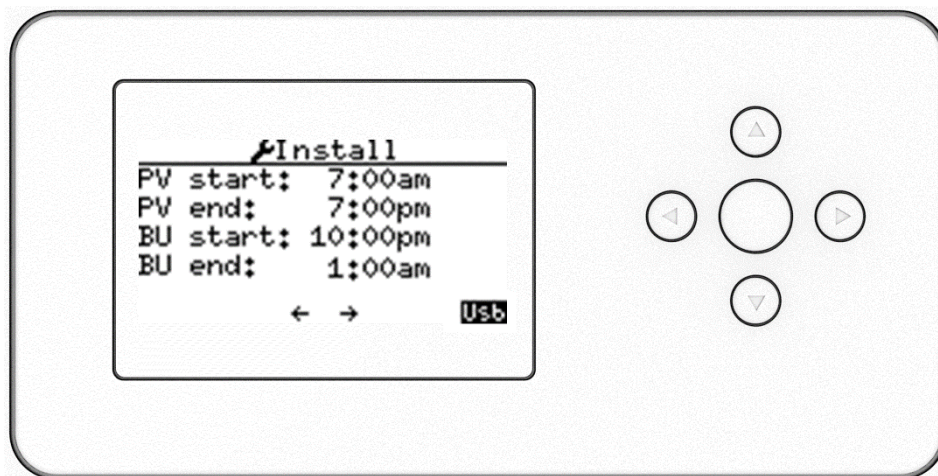
Mode	Description
Fault Output	Changes the relay state if a fault is detected.
Gas Control	Current firmware has no action on the gas control setting in limited local mode.

6. Enter the time and date.

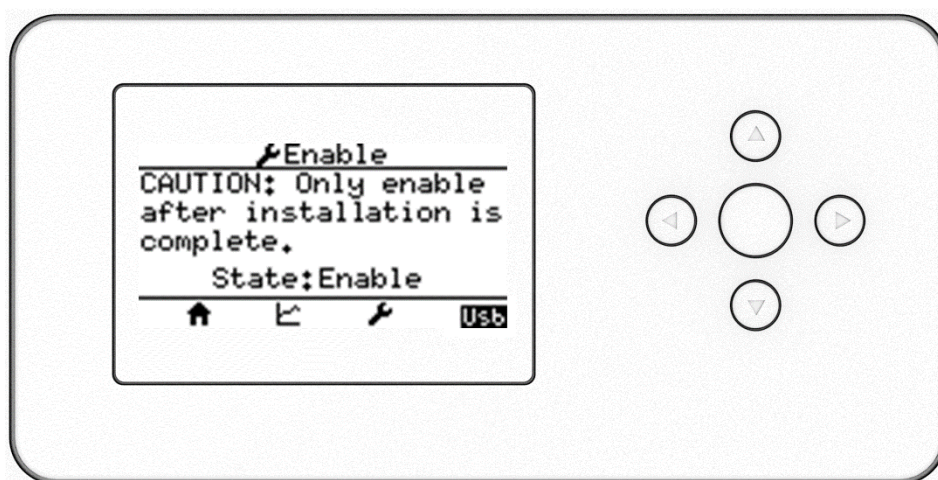


- The time format can be changed from 12-hour to 24-hour format. This is done by using the left and right keys on the keypad. Pressing the down key moves the cursor to the next line.
- The time can be changed. The hour will first be selected. This can be incremented and decremented by using the right and left keys, respectively. Pressing the centre key moves the cursor to the minute setting. The minute is changed using the left and right keys. Pressing the centre key moves the cursor to the 'am'/'pm' portion of the date if in 12-hour mode. Again, using the right and left keys change the entry. Pressing the down key moves the cursor to the Date Format entry.
- The date format can be changed from Month/Day/Year to Day/Month/Year if desired.

- d) The date can then be changed. Similar to the time setting, the highlighted entry is changed using the left and right key. Pressing the centre button moves the cursor to the next date parameter.
- e) The Daylight Savings Timer setting is then set. "ON" means daylight savings time applies to the installation location, "OFF" disables daylight savings time adjustments.
- 7. If the backup mode is electric, the basic schedule will show the basic schedule settings.



- 8. The unit is shut off and will now show the enable screen. Use either the left or right arrow key to enable the SunHopper. Move the cursor down to the home icon and press the centre select button to return home and allow inverter operation to begin.



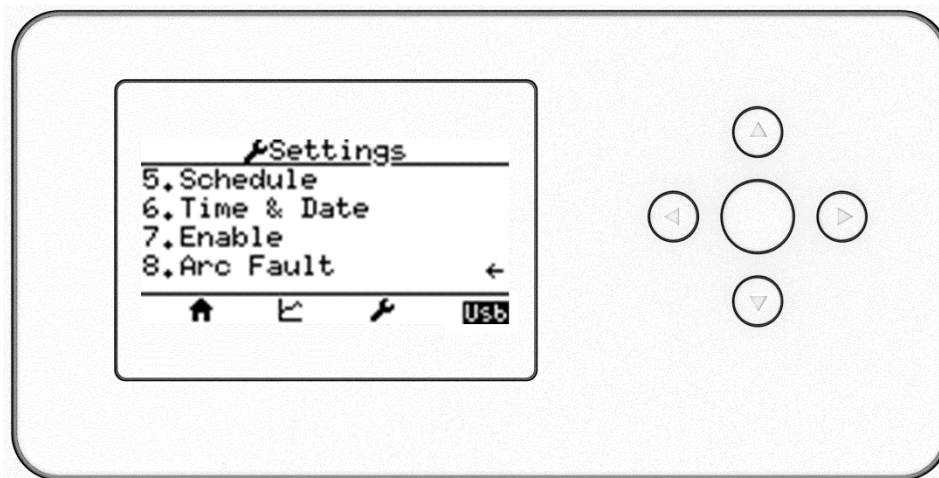
8.4 Disable/Enable the AFCI

⚠ WARNING

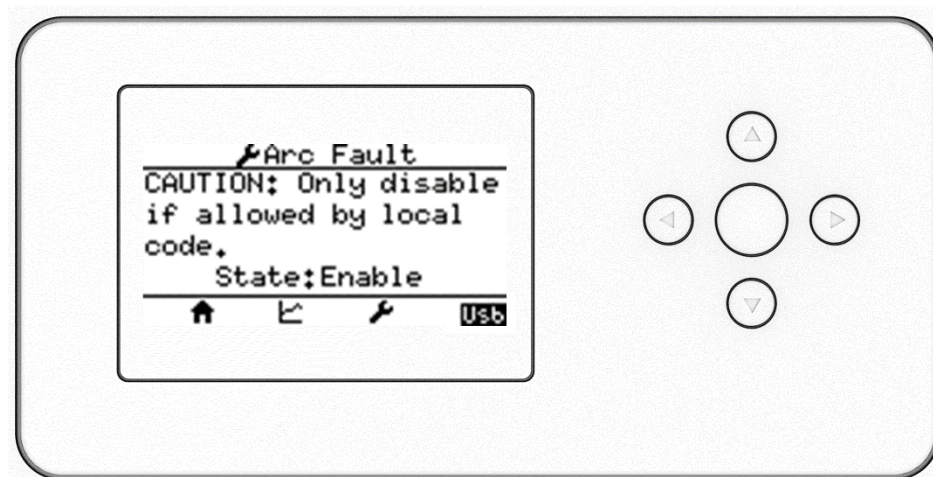
FIRE HAZARD. The arc fault detection circuitry can be disabled if the installation location and type allow by local code. By disabling this system, faulty or damaged connections may result in a fire risk.

Some installations do not require the arc-fault circuitry to be enabled. The arc-fault detector can cause nuisance tripping in some limited installation scenarios. This section will review how to change the state of the AFCI system. This must be completed on the unit's user interface.

1. Navigate to the settings menu and press the right arrow key to get to additional settings.
2. Select the Arc Fault settings and press the centre selection key.



3. Use the left or right keys to enable/disable the AFCI detector. When complete, navigate to the home screen.



9 Servicing the Inverter

⚠ WARNING

ELECTRIC SHOCK HAZARD. Both AC and DC sources are terminated inside this equipment. Each circuit must be individually disconnected before servicing. Only open the cover after all energy sources are disabled.

Before servicing the inverter, the input voltage sources must be disconnected. This section must be followed to reduce risk of electrical shock.

1. Turn off the DC disconnect switch
2. Turn off the AC circuit breaker to the unit (if used)
3. Turn off any power sources which are feeding the multi-function relay circuit (if used)
4. Wait until the user interface on the unit is blank and unresponsive
5. Unscrew the four lid cover screws using a P2 Phillips driver or flat screwdriver
6. Verify there is no PV voltage on the input connector using a multi-meter
7. Verify there is no AC voltage on the AC input connector using a multi-meter

The SunHopper-D can now be serviced.

10 Decommissioning

⚠ WARNING

ELECTRIC SHOCK HAZARD. Both AC and DC sources are terminated inside this equipment. Each circuit must be individually disconnected before servicing. Only open the cover after all energy sources are disabled.

Decommissioning is described in two main scenarios in this section.

10.1 Removing installation data

Installation data can be removed if the user is moving or if the system is updated and installation parameters must be updated (for instance, a new water heater is installed with a different heater power or configuration).

1. On the device UI, go to the settings screen.
2. Move the cursor down to "3. Install" and press the centre key.
3. Move the cursor down to "3. Factory Reset" and press the centre key.
4. The device will verify the request to erase all user data. Move the cursor to "Y" and press the centre key.

10.2 End of Life Removal

Removing the product at the end of its life is described in this section.

1. Remove all power sourced to the inverter following the procedure described in Section 0.
2. Remove the wiring from the PV terminal by lifting the latching mechanism and removing the wires.
3. Remove the wiring from the multi-function relay (if used) by using a flat-headed screwdriver and removing the wires entering the connector.
4. Remove the heater output wires by lifting the latching mechanism and removing the wires.
5. Remove the AC wiring (if fitted) by lifting the latching mechanism and removing the wires.
6. Remove all conduit nuts from the unit.
7. Remove the four corner screws holding the unit to the wall. Be careful not to let the unit slide when removing the screws.
8. Lift the unit up to remove from the wall.
9. Remove the DIN rail from the wall if the unit is not being replaced.
10. If the SunHopper will be disposed of, follow local disposal regulations for electronic waste.

11 Specifications

PV Input	Maximum Input Voltage	350V
	PV Input Range	70V - 300V
	MPP Range	70V - 300V
	Starting Voltage	75V
	Maximum MPPT Input Current	10A
	Maximum Input Short Circuit Current	16A
	Conductor AWG Range	14AWG to 6AWG

AC Input	AC Input Range	100V - 240V
	AC Input Idle Power at 120V (night mode)	<1W
	AC Input Idle Power at 240V (night mode)	<1W
	Maximum AC Input Current	23A
	Operating Frequency	60Hz
	Conductor AWG Range	14AWG to 6AWG

Efficiency	Efficiency, 240V 1kW Heating element, 140V in	94.2%
	Efficiency, 240V 3.5kW Heating element, 200V in	95.9%
	Efficiency, 240V 5.5kW Heating element, 200V in	93.5%
	Efficiency, 120V 2kW Heating element, 140V in	93.5%

Heater Output	Supported 120VAC Heater Power Range	500W - 2kW
	Supported 240VAC Heater Power Range	500W - 5.5kW
	Supported Heater Impedance Range	7Ω - 120Ω
	AC Output Voltage	10V - 120V or 240V (limited to heater maximum current)
	Inverter Mode Output Waveform	Sinusoidal
	Inverter Mode Output THD	< 5%
	Output Frequency	60Hz
	Output Power Factor Rating	1
	Maximum Continuous Output Current from Inverter	12A
	Maximum Continuous Output Current from Grid Bypass	23A
	Maximum Continuous Output Power from Inverter	1.5kW
	Maximum Continuous Output Power from Grid Bypass	5.5kW

Specifications

Maximum Output Overcurrent Protection	25A
Maximum Output Fault Current	25A
Maximum Output Fault Current Duration	20ms
Conductor AWG Range	14AWG to 8 AWG

Multi-function Relay	Maximum DC Switching Voltage	30V
	Maximum AC Switching Voltage	250V
	Maximum Current	3A
	Minimum Load	100mW
	Conductor AWG Range	24AWG to 14 AWG

General	Length x Width x Height	15.25" x 15.43" x 4.72" (387mm x 392mm x 120mm)
	Weight	12.5lb (5.7kg)
	Operating Temperature Range	-5°F - 120°F (-20°C - 50°C)
	Maximum Operating Altitude	4000m
	Enclosure Rating	Type 1 Indoor Use Only
	Wireless Communication	BLE 2.4GHz WiFi

12 Compliance Information

12.1 FCC Compliance

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

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.

Additional safety compliance is located at the <https://greenpwr.com/> website.

13 Contact

For support or technical queries please contact GreenPWR support. Please provide the following details:

1. Unit serial number
2. Firmware version
3. Installation parameters including:
 - Heater connection and configuration
 - PV panel parameters including number of panels and type
 - Location of the installation in the country
 - Method and home location of the SunHopper-D
4. Any error message from the SunHopper-D or app

The GreenPWR support team can be contacted via email message and will respond as quickly as possible.

GreenPWR, Inc
2401 Plum Grove Rd Suite 201A
Palatine, IL 60067
support@greenpwr.com