

TESLA



Powerwall 2 Stack Kit Installation Manual

For the latest Powerwall installation documents in all supported languages, visit: www.tesla.com/support/powerwall.

To secure the full 10-year product warranty, Powerwall must be registered by completing the commissioning process and sending system information to Tesla.

Warning: Read this entire document before installing or using Powerwall. Failure to do so or to follow any of the instructions or warnings in this document can result in electrical shock, serious injury, or death, or can damage Powerwall, potentially rendering it inoperable.

PRODUCT SPECIFICATIONS

All specifications and descriptions contained in this document are verified to be accurate at the time of printing. However, because continuous improvement is a goal at Tesla, we reserve the right to make product modifications at any time.

The images provided in this document are for demonstration purposes only. Depending on product version and market region, details may appear slightly different.

ERRORS OR OMISSIONS

To communicate any inaccuracies or omissions in this manual, send an email to: energy-pubs@tesla.com.



ELECTRONIC DEVICE: DO NOT THROW AWAY

Proper disposal of batteries is required. Refer to local codes for disposal requirements.



MADE IN THE USA

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Powerwall Stack Kit Contents

- (2) Side clips
- (1) Top cover
- (1) Conduit nipple
- (2) Conduit insulation bushings
- (2) Conduit sealing O-rings
- (1) Bridge piece
- (1) 5-conductor communication cable
- (1) Wiring interface cover
- (4) Magnetic camshaft caps
- (1) 6 mm Allen wrench
- (1) Drill guide (two pieces)

Required Tools

- Personal protective equipment (safety glasses, gloves, protective footwear)
- Drill and 6 mm (1/4-inch) drill bit (for drilling pilot hole in Powerwall chassis)
- 35 mm (1-3/8 inch) hole saw (for drilling conduit hole in Powerwall chassis)
- Small metal file (for removing burrs from Powerwall chassis sheet metal)
- Rubber mallet or small hammer and wood block (for seating side clips in Powerwall)
- Wire strippers/cutters for 1.5 to 8 mm² (24 to 8 AWG) wires
- Small grease applicator (wooden craft stick or cotton swab)
- Water-resistant heavy-duty grease (Dow Corning Molykote BR-2 Plus High Performance Grease or equivalent, for preventing corrosion on side clips)
- Installation tools (level, tape measure, pencil, flashlight)



Site Requirements

Stacked multi-Powerwall systems must be floor-mounted and must be anchored to an adjacent wall. The wall must be capable of supporting the lateral load of the Powerwall stack.

A maximum number of 3 floor-mounted Powerwall units may be joined together with two Powerwall Stack Kits. For systems with more than 3 Powerwalls, separate groups of 3 units should be assembled, with each group of 3 attached to a wall.

For complete Powerwall Mechanical Specifications and Site Requirements, see the *Powerwall 2 AC Installation Manual*.

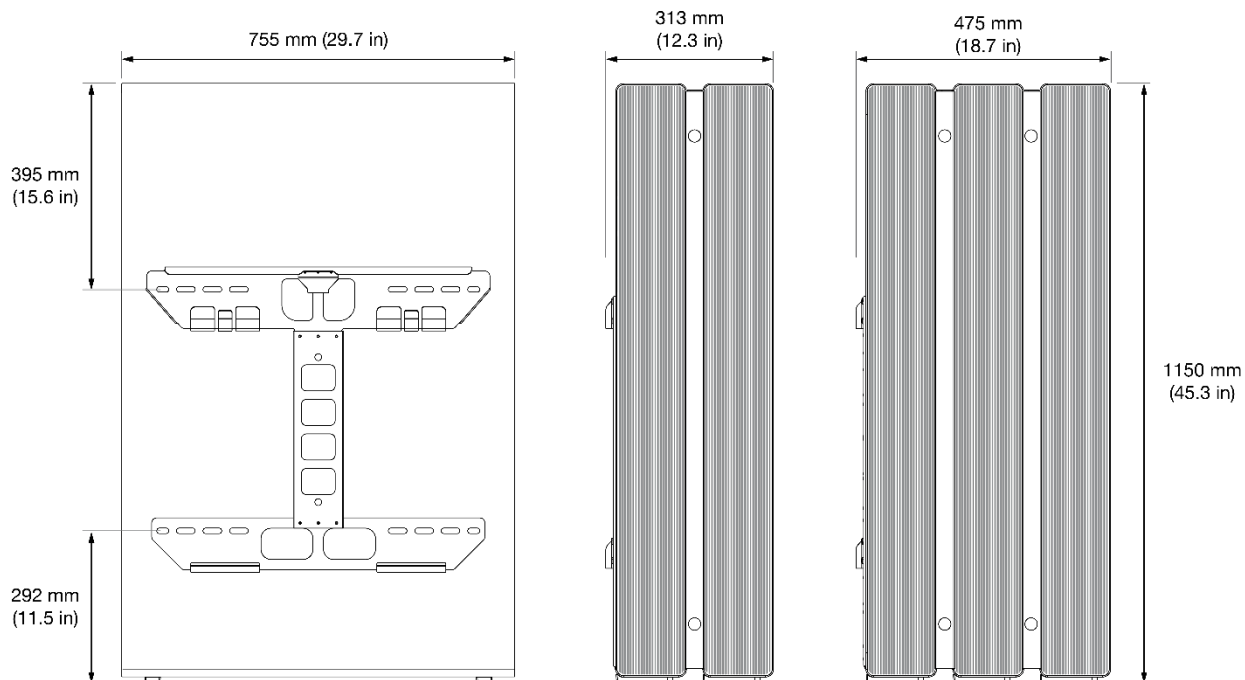


Figure 1: Dimensions for 2-unit and 3-unit Powerwall Stacks



Installation Instructions

These instructions assume that at least one Powerwall has already been installed at the site and that additional Powerwall units are being added. For complete instructions on installing Powerwall, see the *Powerwall 2 AC Installation Manual*.

Step 1. Prepare for Installation

1. Turn off the first (previously installed) Powerwall by setting its On/Off switch to the OFF position.

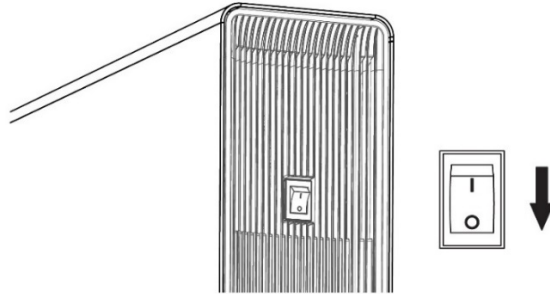


Figure 2: Switching Powerwall Off

2. Turn off the AC circuit breaker for the Powerwall.
3. Ensure that the second Powerwall is turned off by verifying that its On/Off switch is set to the OFF position.
4. Remove both side covers from each Powerwall to be joined:
 - On the first (previously installed) Powerwall, it may be necessary to remove the small plastic insert at the bottom of the covers to help with removal.

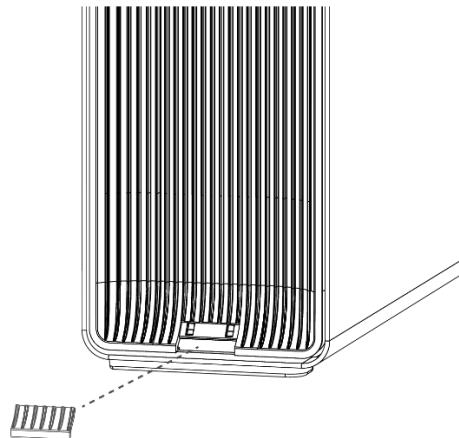


Figure 3: Removing the Bottom Insert



- For the right (LED) side covers, **do not** disconnect the switch and LED leads. Turn the cover to one side and rest it against the Powerwall chassis.

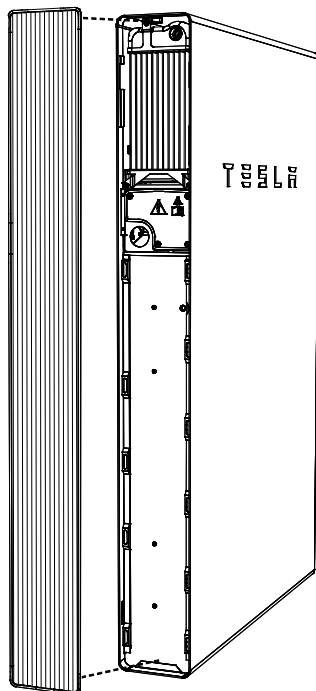


Figure 4: Removing Powerwall Side Covers

5. Using a T20 Torx bit (provided with each Powerwall unit), remove the wiring compartment covers from each Powerwall.

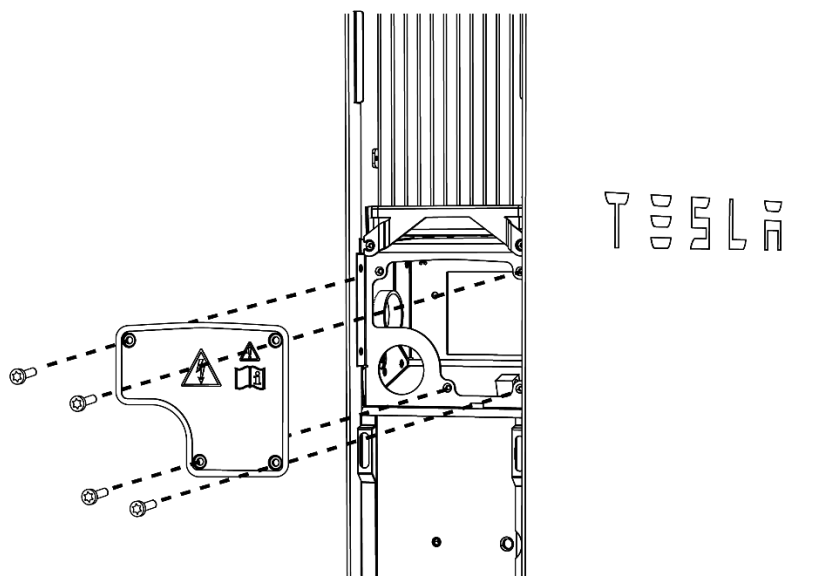


Figure 5: Removing Powerwall Wiring Compartment Covers



Step 2: Choose a Wiring Option

In multi-Powerwall systems, communication wiring is daisy-chained between Powerwall units. Power wiring is direct (home run) from each Powerwall to a dedicated circuit breaker in the electrical panel. Wiring between Powerwalls can be concealed, or run externally.

Concealed Wiring

For concealed wiring, a hole is drilled from the front of the first Powerwall into its wiring compartment and wires are run directly into it from the back port of the second Powerwall. To use this wiring method, proceed to Step 3, “Prepare for Concealed Wiring.”

External Wiring

For external wiring, wires are run through conduit or raceway that spans the wiring compartment ports on the side of each Powerwall. To use this wiring method, skip to Step 4, “Join the Powerwall Units.”

Step 3: Prepare for Concealed Wiring

NOTE: If you are running wires between the wiring compartments through external conduit, skip to Step 4, “Join the Powerwall Units.”

1. Disconnect all wiring from the wiring compartment of the first Powerwall.
2. Locate the wiring interface cover and peel back the film to expose the adhesive on the cover gasket. With the gasket facing inward, place the cover over the interface board at the back of the wiring compartment. The cover is intended to protect the circuit board and its components from metal shavings while drilling into the wiring compartment.

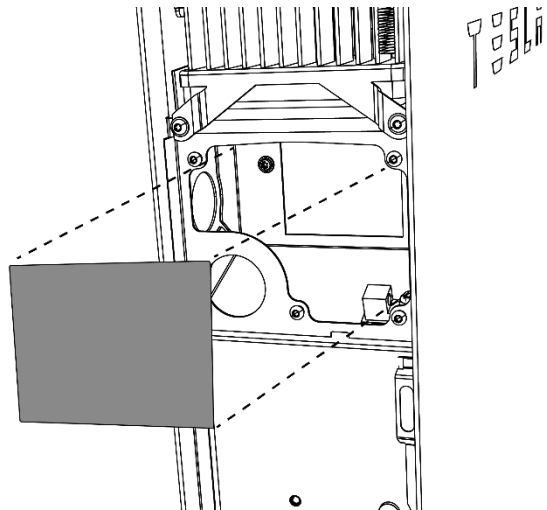


Figure 6: Placing the Wiring Interface Cover in the Wiring Compartment



3. Attach the included drill guide to the front of the first Powerwall by bracing the inside half of the guide against the bottom of its wiring compartment.

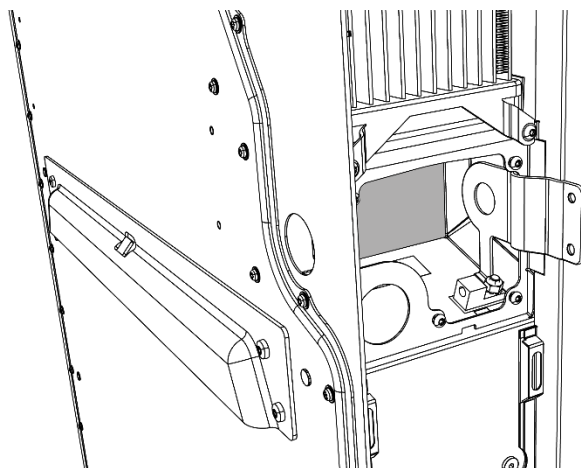


Figure 7: Attaching the Inside Half of the Drill Guide

4. Clip the outside half of the drill guide to the inside half so that the guide engages the hem of the Powerwall enclosure.

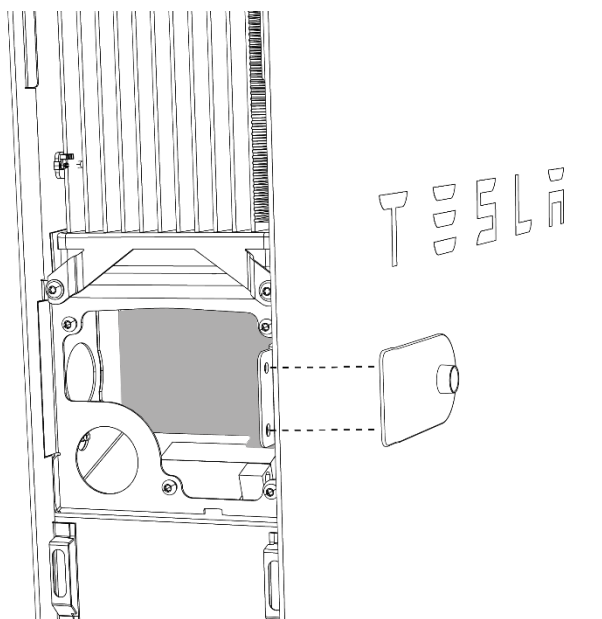


Figure 8: Attaching the Outside Half of the Drill Guide



5. While holding the drill guide to make sure it conforms to the edge of the Powerwall chassis, drill a 6 mm (1/4-inch) pilot hole using the small hole in the drill guide.

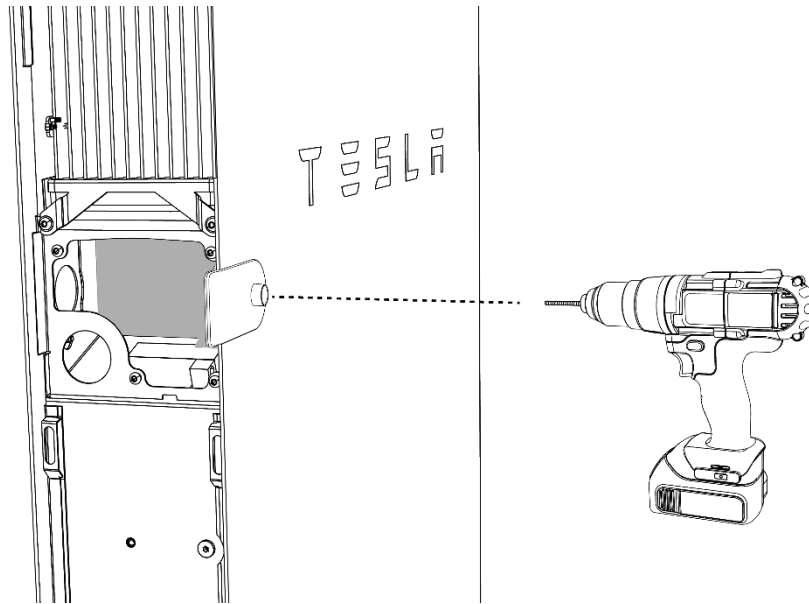


Figure 9: Drilling the Pilot Hole

6. Remove the drill guide.

7. Drill the full-size 35 mm (1-3/8 in) hole with a hole saw, using the pilot hole as a guide.

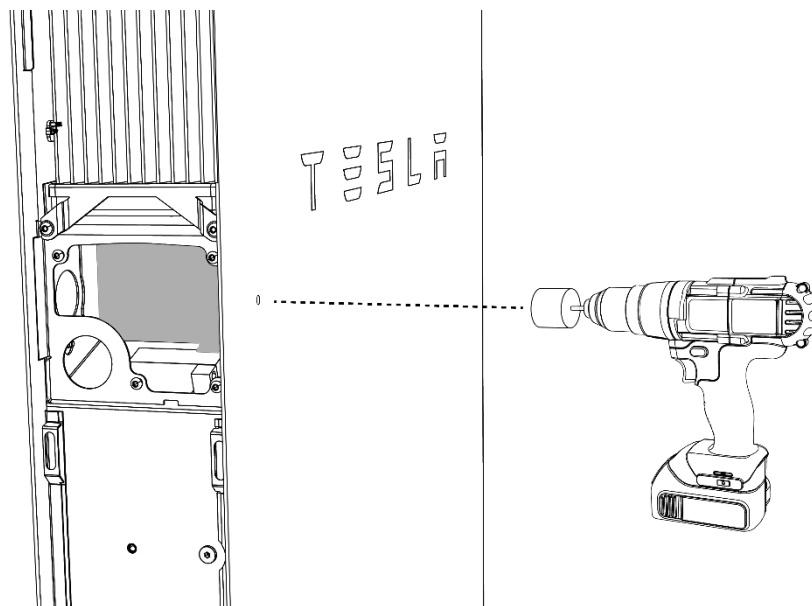


Figure 10: Drilling the Conduit Hole



8. File the edges of the hole to remove any burrs.
9. Clear the wiring compartment of all metal shavings and debris.
10. Remove the protective cover from the wiring compartment.
11. If the first Powerwall still has its protective film, remove the film.
12. Peel back the protective film from the feet of the second Powerwall before moving it into place.
13. Remove the plug from the back cable entry port of the second Powerwall and place it in the side cable entry port of the same Powerwall.

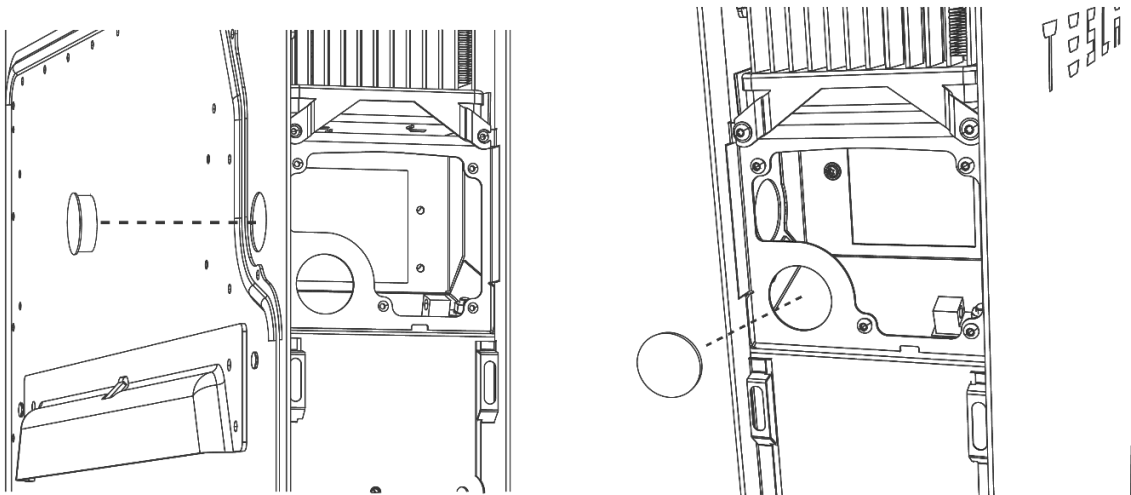


Figure 11: Moving the Back Cable Entry Plug to the Side Cable Entry Port



Step 4. Join the Powerwall Units

1. Orient the second Powerwall about 2 cm (1 in) in front of the first, with its back cable entry port facing the hole you drilled in the front of the first Powerwall.

2. (Concealed wiring installations only) Do the following to bridge the gap between the Powerwall wiring compartments:

- Locate the bridge piece, conduit nipple, two O-rings, and two insulation bushings.

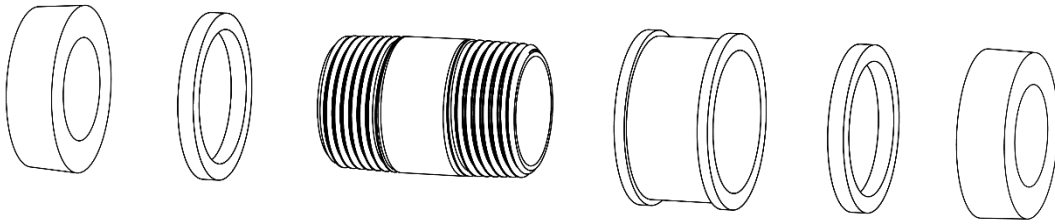


Figure 12: Powerwall Bridge Assembly (Exploded View)

- Assemble the conduit nipple, bridge piece and O-rings. Center the bridge and O-rings on the nipple.

NOTE: Orient the O-rings so that the sides with greater surface area (marked “Box Side”) point to the outside, toward the Powerwall chassis.

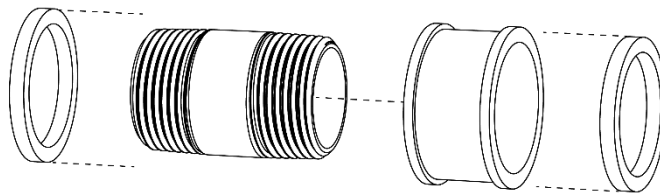


Figure 13: Assembling the Conduit Nipple, Bridge and O-rings



- Install the assembly between the two Powerwalls so it spans the two wiring compartments.

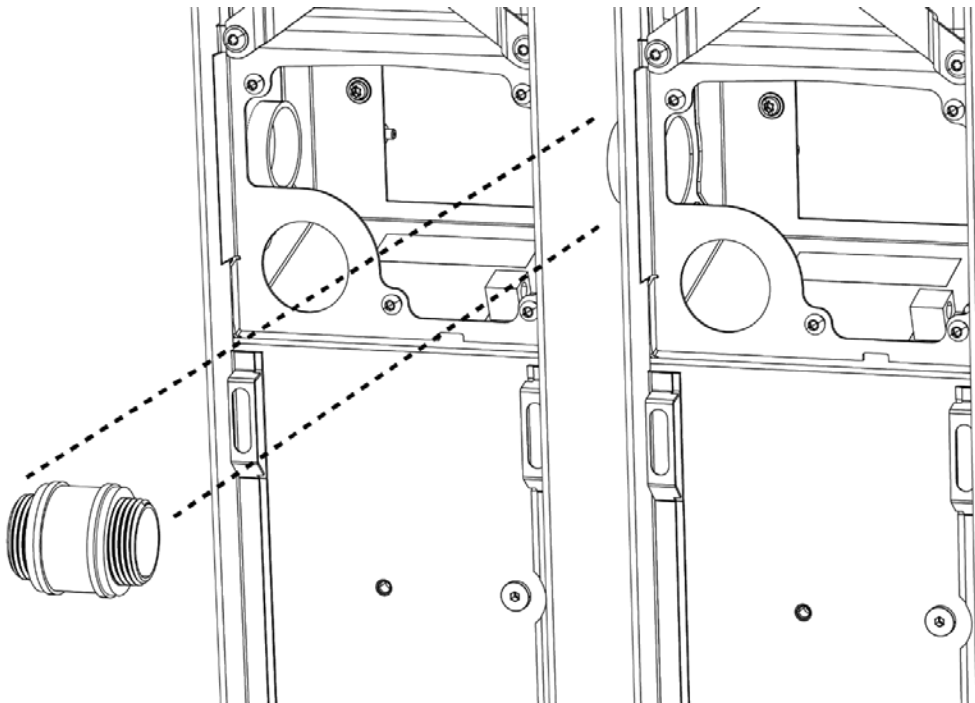


Figure 14: Installing the Conduit Nipple, Bridge, and O-rings between the Powerwalls

- Thread an insulation bushing onto each end of the conduit nipple, but do not fully tighten the bushings.

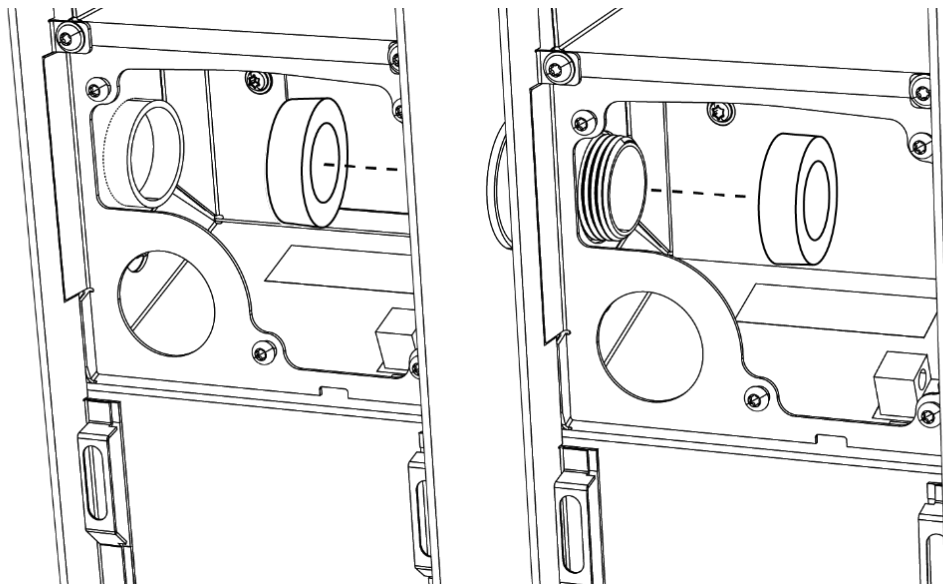


Figure 15: Placing Insulation Bushings on the Conduit Nipple



3. (All installations) Locate a side clip, making sure the flange (with magnet) is positioned at the top and that the cams are rotated vertically in relation to the clip.

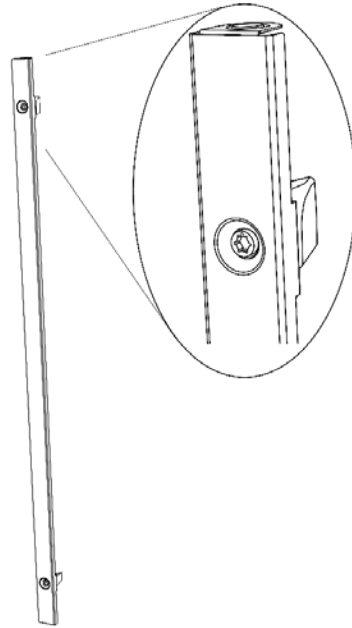


Figure 16: Side Clip with Flange at Top and Cams Rotated Vertically

4. Slide the side clip into the gap between the two Powerwalls so that its flanges engage the side hem of each enclosure.

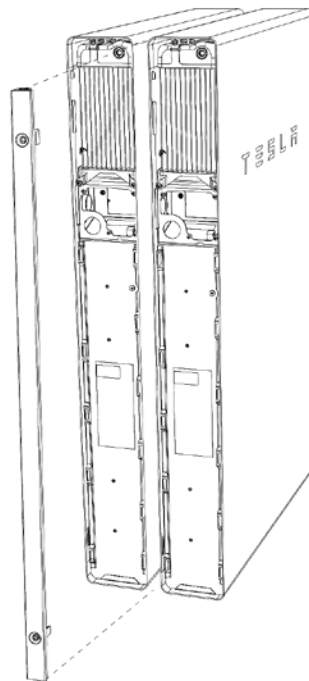


Figure 17: Installing a Side Clip



NOTE: The Powerwall enclosure hems have cutouts that mate with tabs in the clip.

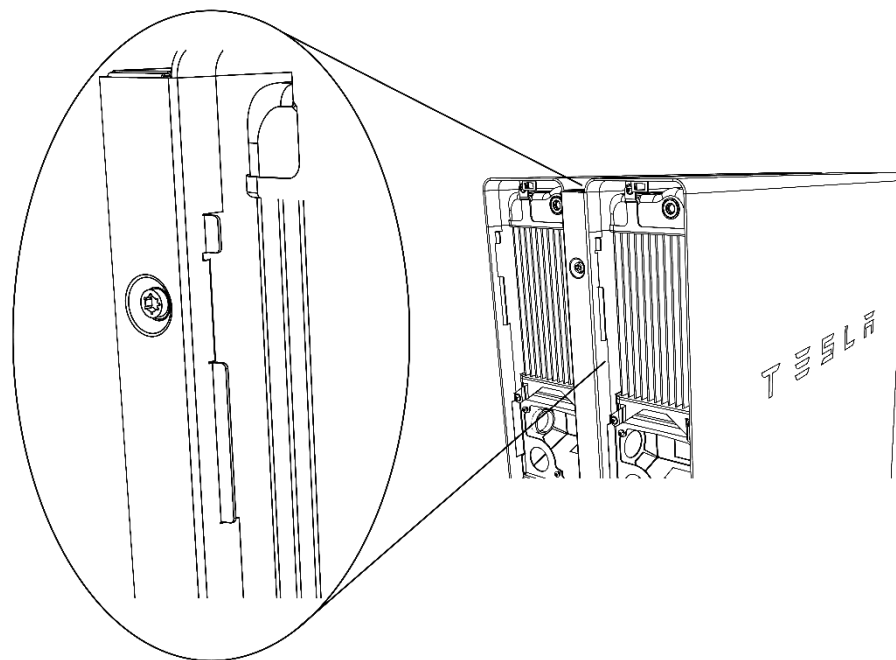


Figure 18: Side Clip Tab Mated to Powerwall Enclosure Hem

5. Press the clip until it is flush with the sides of the Powerwalls.
6. Using the provided 6 mm Allen hex wrench, do the following:
 - Turn the top cam 90 degrees clockwise until it clicks into place and stops rotating.

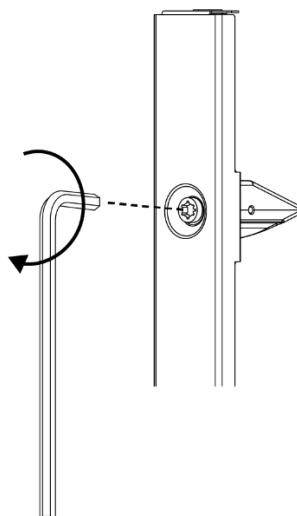


Figure 19: Turning the Top Cam



- Turn the bottom cam toward the wall (toward the first Powerwall) so that the cam indicator notch on the hex camshaft head points toward the wall, until the cam clicks into place.

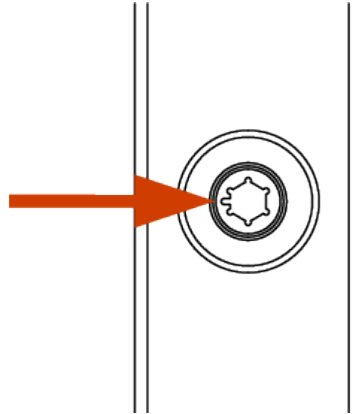


Figure 20: Cam Indicator Notch on Bottom Camshaft

NOTE: The top cam is symmetrical and can be rotated in either direction to secure the side clip. **The bottom cam must be rotated toward the first Powerwall** so that its stepped side (indicated by the notch on the hex camshaft head) engages the housing of one of the Powerwalls.

7. Repeat steps 3-6 to install a side clip on the other side of the Powerwalls.

NOTE: If necessary, use a small rubber mallet or a hammer and wood block to gently tap the side clips so that they are fully seated in the hem of the Powerwall.



8. Position the top cover across the gap between the Powerwalls so that its flanges engage the tops of each side clip. The cover is held in place by the magnets on the tops of the side clips.

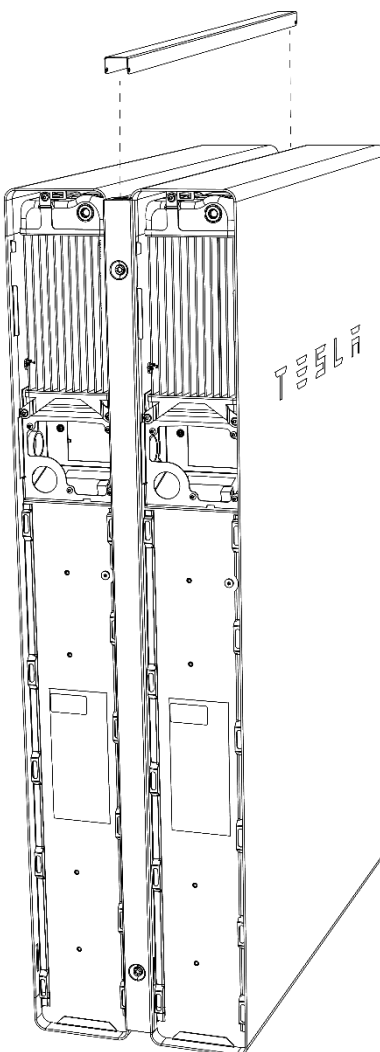


Figure 21: Installing the Top Cover

9. (Concealed wiring installations only) Tighten the insulation bushing on each side of the conduit nipple to secure the bridge between the two Powerwall wiring compartments.



10. Use the provided shims to ensure that the Powerwalls are level.

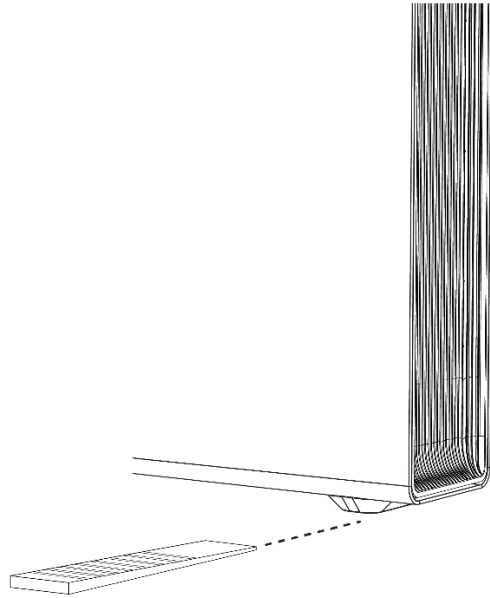


Figure 22: Leveling Powerwall with a Shim

NOTE: When joined, the units should be level within +/- 2 degrees side-to-side and within +/- 5 degrees front-to-back.



Step 5. Wire the Powerwall Units

1. Connect the communication ports of the two Powerwalls by doing the following:

- Run the provided 5-conductor communication harness between the Powerwall wiring compartments. The end with the shield/drain wire should be in the second Powerwall.

NOTE: The orange conductor is unused in Powerwall 2 AC installations.

- Attach the provided Phoenix connector to one end of the harness, and attach the extra Phoenix connector that came with the Powerwall to the other end of the harness, according to the following table and diagram.

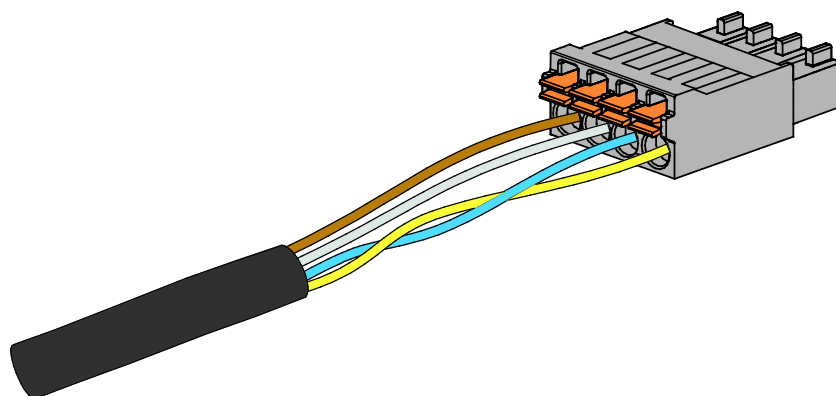



Figure 23: Communication Connector Wiring

| Communication Connector Wiring | | | |
|--------------------------------|-------------------------|--|-------------------------------------|
| Terminal | Connector Terminal Name | Recommended Wire Color | Wire Gauge |
| 1 | 12V + (Logic +) | Brown | 0.2-1.5 mm ² (24-16 AWG) |
| 2 | GND (Logic -) | White | 0.2-1.5 mm ² (24-16 AWG) |
| 3 | CAN HI | Blue | 0.2-1.5 mm ² (24-16 AWG) |
| 4 | CAN LO | Yellow | 0.2-1.5 mm ² (24-16 AWG) |
| Cable Shield/Drain Wire | | (Terminate at second Powerwall chassis ground lug) | |



- Connect the communication OUT connector of the first Powerwall to the communication IN connector of the second Powerwall.
- Insert the shield/drain wire in the second Powerwall chassis ground lug (Fig 24). The ground lug is identified with the following symbol: . Tighten the screw in the ground lug to 4.5 Nm (40 lb-in).

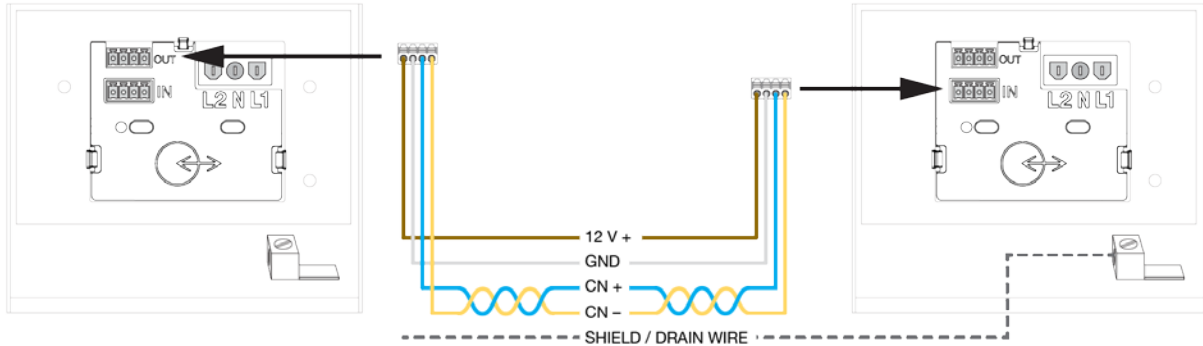


Figure 24: Connecting Powerwall Communication Ports

- In the last Powerwall in the communication chain, plug the 4-pin Phoenix connector with the terminating 120-Ohm resistor into the top 4-pin socket (labeled “OUT”).

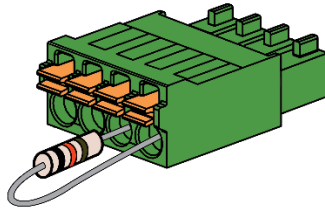


Figure 25: Connector with Terminating Resistor

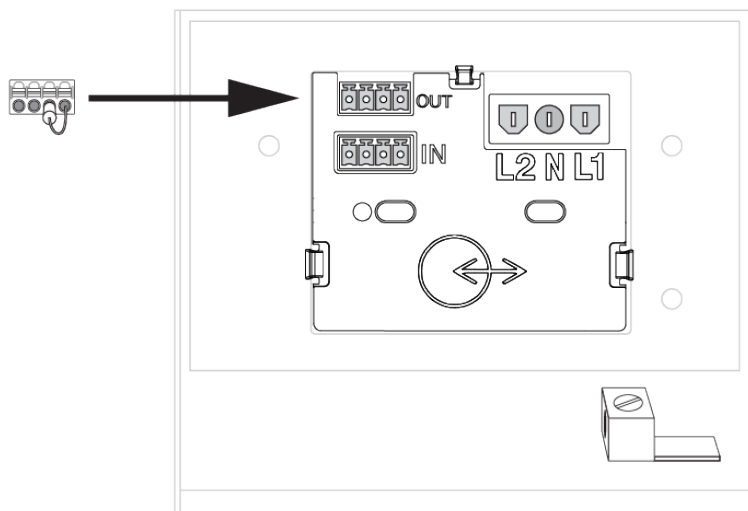


Figure 26: Powerwall Communication Termination



2. Connect each AC Powerwall to the main or sub electrical panel of the installation (depending on the system configuration) according to the electrical service type.

NOTE: For AC power connections to Powerwall, use 6–10 mm² (10-8 AWG) 90 deg C minimum copper (Cu) wire.

3. On the Powerwall side, strip the ends of the wires and attach them to the corresponding leads on the 3-pin AC power harness.

4. Plug the AC power harness into the AC connector in the Powerwall wiring compartment. Ensure that the connector clicks into place.

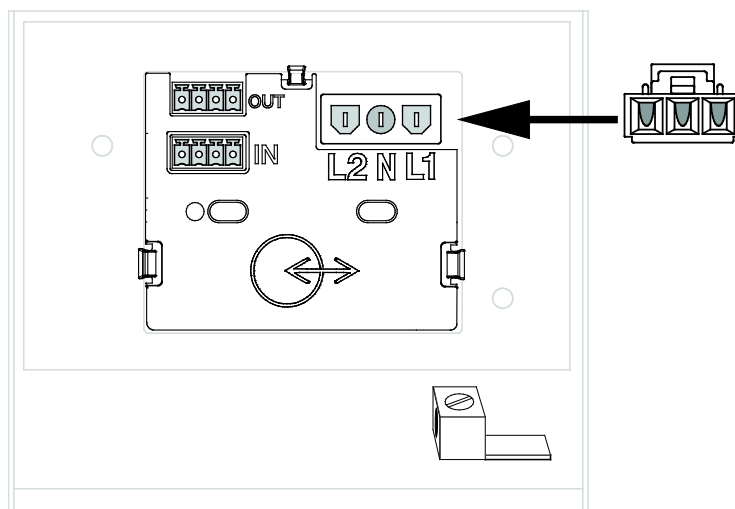


Figure 27: Powerwall 2 AC Power Harness Connection

NOTE: Each Powerwall connection to the main electrical panel requires an independent 30 A (US) or 32 A (AUS/EU) circuit breaker with a short circuit current rating of 10 kA. This breaker serves as the disconnect for the Powerwall, and must be wired in accordance with local wiring codes and regulations.

5. Reconnect the power and communications leads that you disconnected from the first Powerwall at the beginning of the installation.

Step 6. Close the Wiring Compartments and Replace the Covers

1. Arrange the communication and AC power wires inside the Powerwall wiring compartments.

2. Ensure that all conduit junctions and cable entry points are secure and properly sealed.

3. Replace the wiring compartment cover on each Powerwall. Ensure that the cover seats properly on the gasket so that the compartment is sealed. Tighten the fasteners using the Torx T20 bit. Torque to 1.5 Nm (13 lb-in).

4. Replace each of the side covers on the Powerwalls by pushing the center into place, then working outward toward the top and bottom to reattach it to the clips along the length of the unit.



5. (Optional) In humid or rainy climates, or in locations where the installation may be exposed to salt fog or other corrosive elements, do the following to help prevent rust:

Using a small applicator (such as a wooden craft stick or cotton swab), apply a generous bead of heavy duty water-resistant grease around the outside edge of each camshaft head where it contacts the side clip.

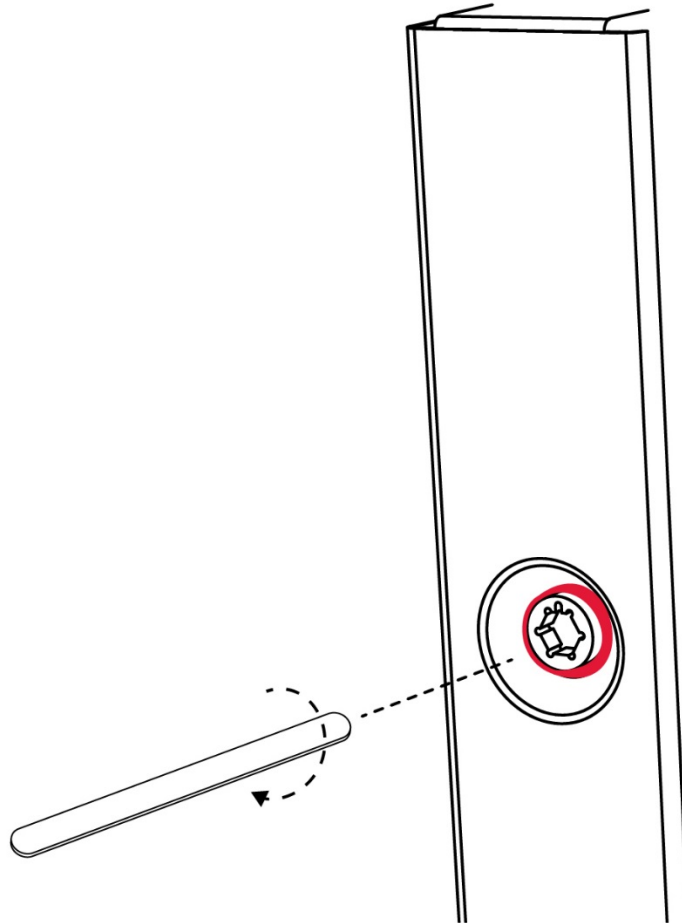


Figure 28: Applying Grease to the Outside Edge of a Camshaft Head



6. Place a magnetic camshaft cap on each of the four hex camshaft heads.

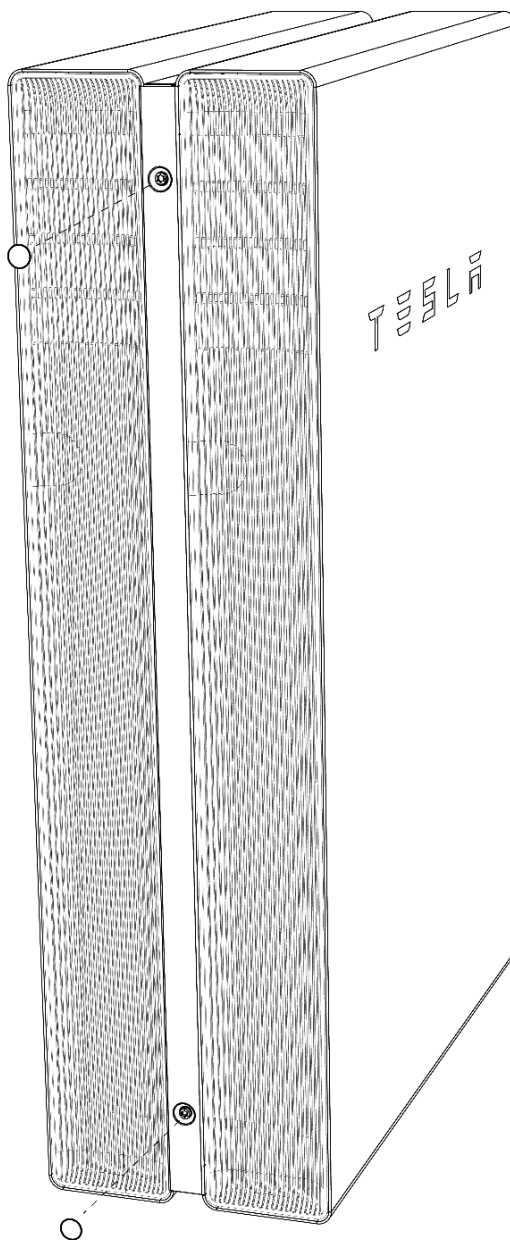


Figure 29: Installing the Camshaft Caps



Step 7. Turn On and Commission the System

1. Switch on the AC circuit breakers for the Gateway and each Powerwall.
2. Switch on each Powerwall by moving the switch on the right (LED) side of the unit to the ON position. When each Powerwall establishes communication with the Gateway, the LED on the right side of Powerwall illuminates.

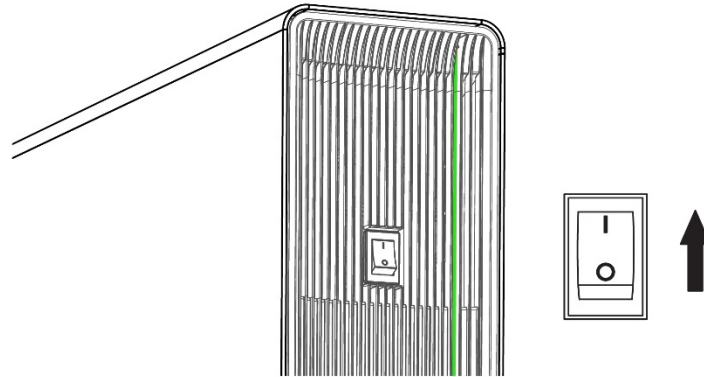


Figure 30: Switching Powerwall On

3. Refer to the *Powerwall 2 AC Installation Manual* for instructions on updating system firmware and commissioning the system.

NOTE: During commissioning, ensure that when scanning for Powerwalls, the Commissioning Wizard shows all Powerwalls in the system.

4. After installation is complete, remove the protective film from the second Powerwall.



Appendix A. Revision Log

| Revision | Date | Description |
|----------|------------|--|
| 1.0 | 2017-06-05 | Initial Release |
| 1.1 | 2017-08-07 | <ul style="list-style-type: none">Added optional step to prevent corrosion around camshaft heads |
| 1.2 | 2017-09-08 | <ul style="list-style-type: none">Changed pilot hole drill size to 6mm (1/4-inch) |



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