Powerwall 3 Installation Manual

with Backup Gateway 2

Notices

For the latest Powerwall 3 installation documents in all supported languages, visit:

www.tesla.com/support/powerwall

To secure the full 10-year product warranty, Powerwall 3 must be registered by completing the device setup process and sending system information to Tesla.

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 document, reach out to your Tesla Account Manager.

Electronic Device: Do Not Throw Away

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

For Private Households: Information on Disposal for Users of WEEE

This symbol on the product(s) and / or accompanying documents means that Waste from Electrical and Electronic Equipment (WEEE) should not be mixed with general household waste. For proper treatment, recovery and recycling, please take this product(s) to designated collection points where it will be accepted free of charge. Alternatively, in some countries, you may be able to return your products to your local retailer upon purchase of an equivalent new product.

Disposing of this product correctly will help save valuable resources and prevent any potential negative effects on human health and the environment, which could otherwise arise from inappropriate waste handling.

Please contact your local authority for further details of your nearest designated collection point.

Penalties may be applicable for incorrect disposal of this waste, in accordance with your national legislation.

For Professional Users in the European Union

If you wish to discard electrical and electronic equipment (EEE), please contact your dealer or supplier for further information.

For Disposal in Countries Outside of the European Union

This symbol is only valid in the European Union (EU). If you wish to discard this product please contact your local authorities or dealer and ask for the correct method of disposal.

GENERAL WARNINGS AND INFORMATION

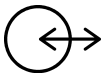
ATTENTION: Read this entire document before installing or using Powerwall. Failure to do so or to follow any of the instructions or warnings in this document can result in electrical shock, serious injury, or death, or can damage Powerwall, potentially rendering it inoperable.

IMPORTANT SAFETY INSTRUCTIONS

This manual contains important instructions for Powerwall 3 and Backup Gateway 2 that must be followed during installation and maintenance of the system.

NOTE: On detection of abnormal condition for voltage or frequency conditions or in response to a detected unintentional island, the Tesla Powerwall system disconnects from the grid to prevent backfeed.

Symbols Used

	**CAUTION:** Indicates a hazardous situation which, if not avoided, could result in minor injury or damage to the equipment.		**RISK OF ELECTRIC SHOCK:** Indicates components that present risk of electrical shock.
	**WARNING:** Indicates a hazardous situation which, if not avoided, could result in injury or death.		**CAUTION, RISK OF ELECTRIC SHOCK, ENERGY STORAGE TIMED DISCHARGE.** Discharge time is 5 minutes from de-energization.
	**NOTE:** Indicates an important step or tip that leads to best results, but is not safety or damage related.		**BIDIRECTIONAL TERMINAL:** Indicates location of combined input/output connector on the equipment.
	**REFER TO OPERATING INSTRUCTIONS:** Indicates that user should refer to operating or installation instructions before proceeding.		**PROTECTIVE CONDUCTOR TERMINAL:** Indicates location of grounding connection on the equipment.

General Information

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 may damage Powerwall, potentially rendering it inoperable.

WARNING: A battery can present a risk of electrical shock, fire, or explosion from vented gases. Observe proper precautions.

WARNING: Powerwall installation must be carried out only by a competent electrician who is certified by Tesla and who has been trained in dealing with low voltage electricity.

GENERAL WARNINGS AND INFORMATION

WARNING: Powerwall is heavy. Use of lift equipment is recommended.

WARNING: Use Powerwall only as directed.

WARNING: Do not use Powerwall if it is defective, appears cracked, broken, or otherwise damaged, or fails to operate.

WARNING: Before beginning the wiring portion of the installation, ensure that Powerwall is switched off, and lock out any associated circuit breakers and disconnect switches (if applicable for the installation).

WARNING: Do not attempt to open, disassemble, repair, tamper with, or modify Powerwall. Powerwall and its components are not user serviceable. Batteries in Powerwall are not replaceable. Contact Tesla Support for guidance on repairs.

WARNING: To protect Powerwall and its components from damage when transporting, handle with care. Do not impact, pull, drag, or step on Powerwall. Do not subject Powerwall to any strong force. To help prevent damage, leave Powerwall in its shipping packaging until it is ready to be installed.

WARNING: Do not insert foreign objects into any part of Powerwall.

WARNING: Do not expose Powerwall or its components to direct flame.

WARNING: Do not install Powerwall within 24 inches (610 mm) of heating vents or radiators. Powerwall can be installed in a mechanical room with HVAC equipment.

WARNING: If installing Powerwall indoors, a detection system for flammable gases must be installed at the site. Example: Smoke or heat detection devices.

WARNING: Ensure that concentrated water sources do not drain onto Powerwall or Backup Gateway, including downspouts, roofs without gutters, or drains.

WARNING: Do not immerse Powerwall or its components in water or other fluids.

CAUTION: Powerwall is not designed nor warrantied for non-stationary applications.

CAUTION: Do not use solvents to clean Powerwall, or expose Powerwall to flammable or harsh chemicals or vapors.

CAUTION: Do not use fluids, parts, or accessories other than those specified in this manual, including use of non-genuine Tesla parts or accessories, or parts or accessories not purchased directly from Tesla or a Tesla-certified party.

CAUTION: Do not place Powerwall in a storage condition for more than one (1) month, or permit the electrical feed on the Powerwall to be severed for more than one (1) month, without placing Powerwall into a storage condition in accordance with Tesla's storage specifications.

CAUTION: Do not paint, coat, or wrap any part of Powerwall, including any internal or external components such as the exterior shell or casing. These may cause Powerwall to overheat, resulting in damage to the product.

SPECIFICATIONS

Powerwall 3 Specifications

System Technical Specifications

Model Number	1707000-xx-y
Nominal Grid Voltage (Input & Output)	230 VAC
Grid Type	Single phase
Frequency	50 Hz
Protection Class	Class I
Overvoltage Category	III
Surge Withstand Voltage on AC Ports	4 kV
Surge Withstand Voltage on Communication Ports	2 kV
Radiated RF Immunity	35 V/m
Solar to Battery to Grid Round Trip Efficiency	89%[1,2]
Solar to Grid Efficiency	97.5%
Supported Islanding Devices	Backup Gateway 2
Connectivity	Wi-Fi (2.4 and 5 GHz), Dual-port switched Ethernet, Cellular (LTE/4G[3])
Hardware Interface	Dry contact relay 60V 2A, Rapid Shutdown (RSD) certified switch and 2-pin connector, RS-485 for meters
AC Metering Accuracy	+/- 0.5%
Protections	Integrated arc fault circuit interrupter (AFCI), Isolation Monitor Interrupter (IMI), Integrated DC Isolator
Customer Interface	Tesla Mobile App
Warranty	10 years

NOTE: The model numbers in this manual call out "-XX-Y" for the suffix of the equipment model number. The wild cards are defined as follows:

- "X" is a number and the one number in the model number representing a style code; form, fit, and function are not changed, and these numbers have no bearing on compliance.
- "Y" is a letter, and the one letter in the model number representing a pedigree; form, fit, and function are not changed, and this letter has no bearing on compliance.

SPECIFICATIONS

Solar Technical Specifications

Maximum Solar STC Input	20 kW
Withstand Voltage	600 V DC
PV DC Input Voltage Range	60 — 550 V DC
PV DC MPPT Voltage Range	60 — 480 V DC
MPPTs	3
Maximum Current per MPPT (I_{MP})	26 A
Maximum Short Circuit Current per MPPT (I_{SC})	30 A

Battery Technical Specifications

Nominal AC Output Power at 230 V (kW)[4]	3.68	5	6	7	8	9	10	11.04
Maximum Apparent Power (kVA)	3.68	5	6	7	8	9	10	11.04
Maximum Continuous Current (A)	16	21.7	26.1	30.4	34.8	39.1	43.5	48
Overcurrent Protection Device (A)	20	32	32	40	50	50	63	63

Nominal Battery Energy[2]		13.5 kWh
Maximum Continuous Charge Power (Powerwall 3 only)	**AC**	5 kW
	DC	5 kW
Maximum Continuous Charge Power (Powerwall 3 with up to (3) Expansions)	**AC**	Configurable up to 8 kW
	DC	8 kW
Output Power Factor Rating		0 - 1 (Grid Code configurable)
Maximum Output Fault Current (1 s)		160 A
Maximum Short-Circuit Current Rating		10 kA
Load Start Capability (1 s)		185 A LRA (Locked Rotor Amps)
Power Scalability		Up to 4 Powerwall 3 units supported
Energy Scalability		Up to 3 Expansion units supported (for a maximum total of 7 units)

[1]Typical use case with energy produced by PV and stored in battery and then released to loads or the grid.

[2]Values provided for 25°C, at beginning of life. 3.3 kW charge/discharge power.

[3]Cellular connectivity subject to network service coverage and signal strength.

[4]Powerwall 3 can output up to 15.4 kW AC power at 64 A and 240 V.

Mechanical Specifications

Dimensions	1105 x 609 x 193 mm
Weight	130 kg

Mounting Options	Floor or wall mount

Environmental Specifications

Operating Temperature	–20°C to 50°C[6]
Operating Humidity (RH)	Up to 100%, condensing
Storage Temperature	–20°C to 30°C, up to 95% RH, non-condensing, State of Energy (SOE): 25% initial
Maximum Elevation	3000 m
Environment	Indoor and outdoor rated
Enclosure Rating	IP55
Ingress Rating	IP67 (Battery & Power Electronics)
	IP55 (Wiring Compartment)[7]
Pollution Rating	PD3
Operating Noise @ 1 m	< 50 db(A) typical, <62 db(A) maximum

[6]Powerwall 3 is designed to operate in all climates from temperatures of -20°C to 50°C. Performance may be de-rated at operating temperatures above 40°C.

[7]All wiring entry ports are DVC Class C.

Compliance Information

Safety

IEC 62477-1: 2022 - Safety requirements for power electronic converter systems and equipment - Part 1: General

IEC 62109-1:2010 - Safety of power converters for use in photovoltaic power systems - Part 1: General requirements

IEC 62109-2: 2011 - Safety of power converters for use in photovoltaic power systems - Part 2: Particular requirements for inverters

IEC 62933-5-2: 2020 - Electrical energy storage (EES) systems - Part 5-2: Safety requirements for grid-integrated EES systems - Electrochemical-based systems

IEC 62619: 2022 - Secondary cells and batteries containing alkaline or other non-acid electrolytes - Safety requirements for secondary lithium cells and batteries, for use in industrial applications

UL9540A: Test Method for Evaluating Thermal Runaway Fire Propagation in Battery Energy Storage Systems

Grid Interoperability

G98 Issue 1 - Amd 7 - Oct 2022 - Requirements for the connection of Fully Type Tested Micro-generators (up to and including 16 A per phase) in parallel with public Low Voltage Distribution Networks on or after 27 April 2019

G99 Issue 1 - Amd 9 - Oct 2022 - Requirements for the connection of generation equipment in parallel with public distribution networks on or after 27 April 2019

G100 Issue 2 - Amd 2 - Technical Requirements for Customer's Export and Import limitation Schemes

EMC

IEC 61000-6-1:2016 - Electromagnetic compatibility (EMC) - Part 6-1: Generic standards - Immunity standard for residential, commercial and light-industrial environments

EN IEC 61000-6-3: 2020 - Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for equipment in residential environments

Powerwall 3 Expansion Specifications

Battery Technical Specifications

Model Number	1807000-xx-y
Nominal Battery Energy	13.5 kWh
Voltage Range[1]	52 - 92 V DC

[1]Expansion units are connected in parallel and are not field serviceable.

Compliance Information

Certifications	IEC 62619, IEC 62933-5-2, IEC 61000-6-1:2016, and EN IEC 61000-6-3: 2020

Environmental Specifications

Operating Temperature[2]	–20°C to 50°C
Operating Humidity (RH)	Up to 100%, condensing
Storage Temperature	–20°C to 30°C, up to 95% RH, non-condensing, State of Energy (SOE): 25% initial
Maximum Elevation	3000 m
Environment	Indoor and outdoor rated
Ingress Rating	IP67
Pollution Rating	PD3

[2]Performance may be de-rated at operating temperatures above 40°C.

Mechanical Specifications

Dimensions [3]	1105 x 609 x 168 mm		
Total Weight of Wall-Mounted Unit (includes cover and bracket)	118.5 kg		
Weight of Powerwall 3 Expansion (no cover or bracket)	110 kg		
Mounting Options	Floor or wall mount		
Stacking Capability (Floor Mount Only)	Up to (3) Expansion units behind a Powerwall 3		
Compatibility with Other Systems	Only compatible with Powerwall 3		
Connection to Powerwall 3 or Expansions	Expansion Harness		
Expansion Harness Options	0.5 m	2 m	4 m
Weight of Glass Front Cover	6.5 kg		
Weight of Wall Bracket	1.9 kg		

Weight of Expansion Unit Accessories	0.7 kg

NOTE: See *Powerwall 3 Center of Mass on page 92* for weights of stacked configurations.

[3]These dimensions include the glass front cover being installed on the Expansion unit.

Backup Gateway 2 Specifications

Backup Gateway 2 Electrical Specifications

AC Voltage (Nominal)[1]	230 V (Line-to-Neutral)
	400 V (Line-to-Line)
Feed-In Type	Single Phase, Three Phase
Grid Frequency	50-60 Hz
Maximum Overcurrent Protection Device	100 A (single-phase service)
	80 A (2- and 3-phase service)
Maximum Input Short Circuit Current[2]	16 kA
Overvoltage Category	Category III
AC Meter	Accuracy (+/– 0.2 %)
Compatible Earthing Systems[3]	TN or TT networks
Distribution boards intended to be operated by ordinary persons (DBO) Type	Type B
[1]230 V (Line-to-Line) is not a supported three-phase configuration.	
[2]16 kA rating when installed with current limiting fuse compliant to BS 88.3; 10 kA rating without fuse.	
[3]TT earthing networks supported for Gateways with part number 1152100-13-H and higher.	

Environmental Specifications

Operating Temperature[4]	–20°C to 50°C
Operating Humidity (RH)	Up to 100%, condensing
Maximum Altitude	3000 m
Ingress Rating	IP55
Environmental Category	Outdoor rated
Wet Location Rating	Yes
Pollution Degree	PD2
[4] Performance may be de-rated in extreme ambient temperatures	

Mechanical Specifications

Dimensions	584 x 380 x 127 mm
Weight	11.4 kg
Breaker space (DIN rail)	Up to nine (9) single pole breakers
Mounting Options	Wall mount

Compliance Information

Safety	IEC 62109-1, IEC 62053-22, IEC 61439-1, IEC 61439-3
Environmental	RoHS Directive 2011/65/EU, WEEE Directive 2012/19/EU, Battery Directive 2006/66/EC REACH Regulation EC 1907/2006

REGISTERING POWERWALL 3

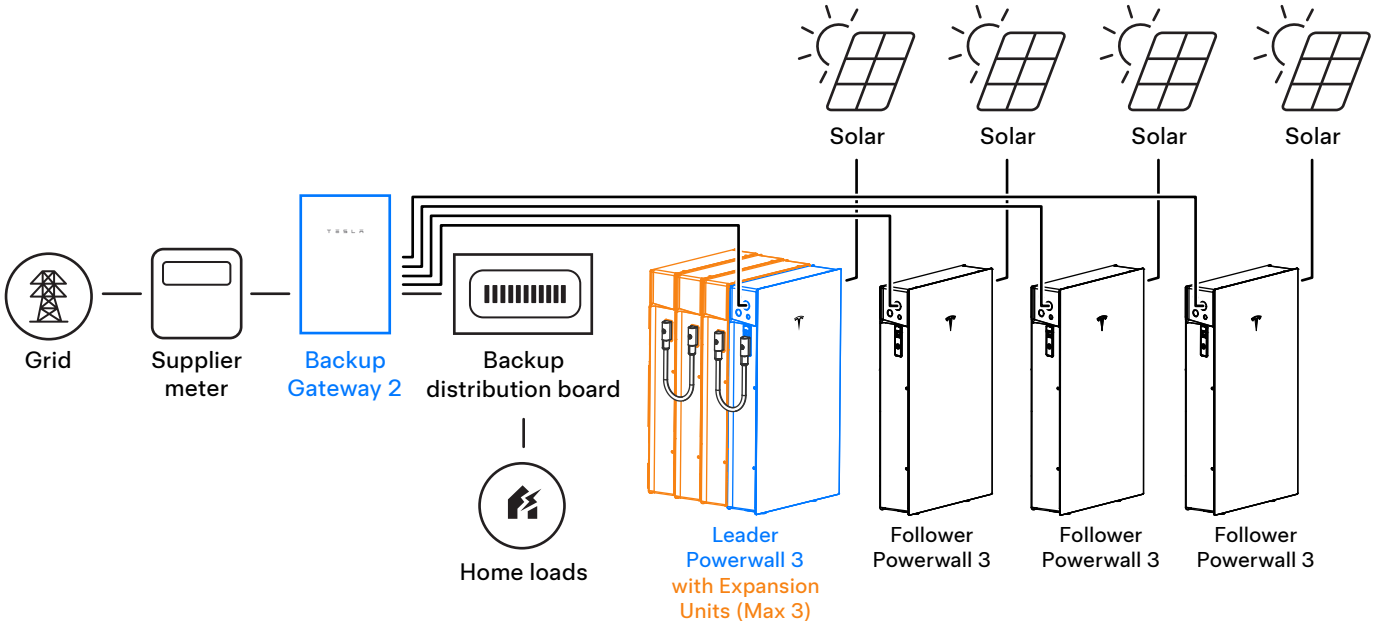
Tesla Powerwall 3 comes with a warranty whose term depends on the connection of Powerwall 3 to the internet. To secure the full 10-year warranty for Powerwall 3, it must be reliably connected to the internet to allow remote firmware upgrades from Tesla. If an internet connection is not established or is interrupted for an extended period, and Tesla is unable to contact the owner, the warranty may be limited to 4 years. To ensure that the owner can receive the full 10-year warranty, be sure to complete the device setup process so that registration information is sent to Tesla.

For more information, refer to the Powerwall 3 Warranty for your region at *www.tesla.com*.

POWERWALL 3 SYSTEM OVERVIEW

Powerwall 3 is a fully integrated solar and battery system. The home's PV array is connected directly to Powerwall 3, which converts solar energy and stores it for future use. Powerwall 3 is installed with Backup Gateway 2 to control the system's connection to the grid and monitor home energy consumption.

Figure 1. Example System Diagram



The following table outlines the key Tesla components in a standard Powerwall 3 system.

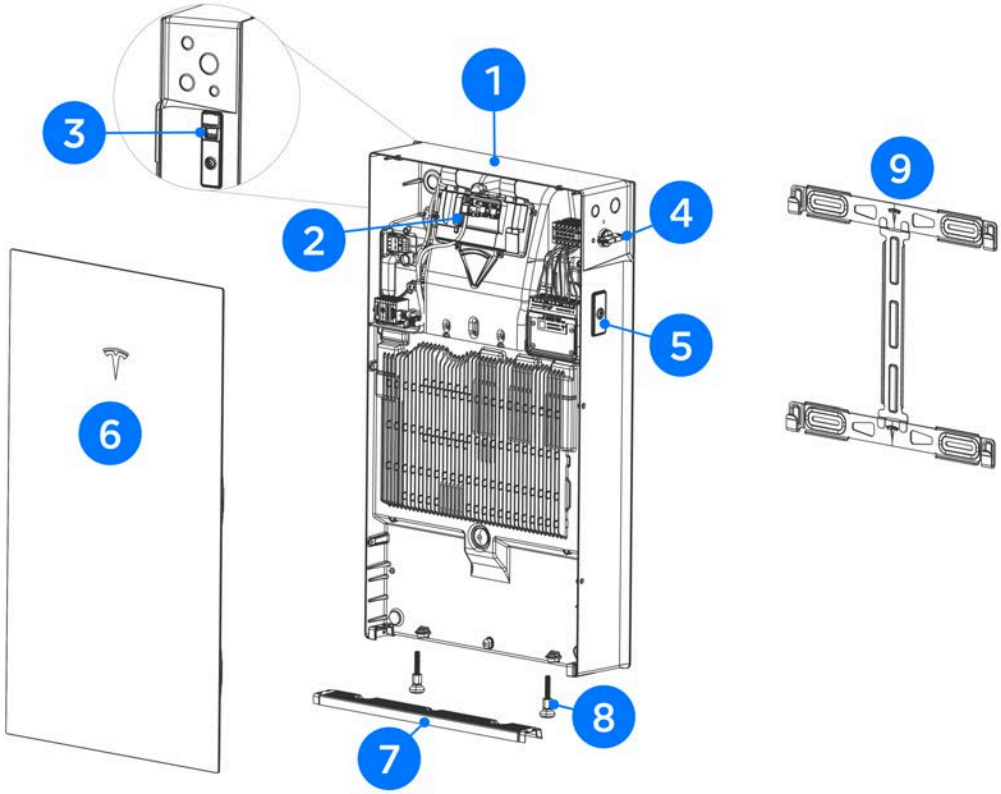
Tesla Components

Tesla Part Numbers	Component	Description
1707000-xx-y		Powerwall 3 is an integrated solar and battery system that converts energy from solar panels to be used by the home, and stores excess energy for future use. Every system contains at least one Powerwall 3, with additional Powerwall 3 units and/or Expansion units installed depending on the home's solar system size and/or energy consumption.
1807000-xx-y	 *Expansion unit is mounted behind Powerwall 3 unit*	Powerwall 3 Expansion is a battery that provides additional storage for a Powerwall 3 system. Because the Expansion does not include an inverter, it cannot be installed without Powerwall 3. Solar cannot be connected to an Expansion unit.
1152100-xx-y		Backup Gateway 2 monitors energy usage and manages the transition to and from backup operation.

Powerwall 3 Overview

Powerwall 3 is a fully integrated solar and battery system that stores energy from solar production. It converts energy from solar panels, and its rechargeable battery pack provides energy storage. Powerwall 3 can operate as a grid-supported or multiple mode inverter; this means having grid-interactive functionality when grid voltage is present, and operating in stand-alone mode when the grid is de-energized or disconnected.

Figure 2. Expanded View of Powerwall 3



1	Powerwall 3
2	Tesla Asset Controller (TACO)
3	On / Off switch
4	Integrated DC Isolator
5	Expansion port cover
6	Glass front cover
7	Air intake screen
8	Leveling feet
9	Wall mounting bracket

NOTE: Do not remove the expansion port covers. These are protective covers and Powerwall 3 will not operate when they are removed.

NOTE: The Powerwall 3 part number and serial number can be found on the left side of the unit.

POWERWALL 3 SYSTEM DESIGN GUIDANCE

Design Considerations

Supported Configurations

- Up to (4) Powerwall 3 units with up to (3) Expansion units can be installed with (1) Backup Gateway 2, with or without AC-coupled solar

  NOTE: Third party MLPE solutions, such as optimizers, are not compatible with Powerwall 3.

- Powerwall 3 is not yet compatible with the following:
  - Neurio remote energy meters (all metering must be performed by Backup Gateway 2; see *Metering Considerations on page 22* for more information)
  - Other batteries (Powerwall 2 or third party batteries)
  - Stacked units (Powerwall 3 must be mounted in a side-by-side configuration)

System Tie-in

- Only Tesla devices are compatible with Powerwall; no third-party equipment in lieu of Backup Gateway 2
- Backup systems must be one of the following:
  - 230 V single phase service
    - 100 A or smaller service, or (in absence of a service rating) maximum 100 A of loads downstream of Backup Gateway 2
  - 230 / 400 V three phase service
    - 80 A or smaller service, or (in absence of a service rating) maximum 80 A of loads downstream of Backup Gateway 2
    - Follow all local requirements for balancing the system equally across the available phases

    NOTE: Regardless of the number of Powerwalls installed, only one phase (L1, L2, or L3) will provide backup during a grid outage.

- A breaker is always utilized for Powerwall 3 tie in; see *Install Powerwall and Generation Breakers in the Backup Gateway on page 54* for breaker size options based on desired power output
- Powerwall 3 must always be connected to the Home terminals downstream of the Backup Gateway 2
- Recommend that total Powerwall supply is able to power the single largest automatic load in the backup circuit (see *Backup Loads Supported per Powerwall Quantity on page 18*)
- Any/all backup load centers are adequately protected with an overcurrent protection device
- All three phase loads or solar must be excluded from the backup phase on the Home terminals
- All single phase loads in the backup circuit must be sized appropriately for the configured power output of the Powerwall (see *Install Powerwall and Generation Breakers in the Backup Gateway on page 54* for power output options)
- Site and solar monitoring must be installed to capture overall power flow to/from the site, as well as all solar production

- Powerwall and Backup Gateway 2 are rated for 10 kA of fault current. If potential fault current onsite is greater than 10 kA:
  - A current limiting fuse upstream of the Backup Gateway 2 can be utilized to make the Backup Gateway 2 rated for 16 kA

Powerwall 3 Solar

Powerwall 3 has an integrated inverter and 3 MPPTs, with a maximum solar input of 20 kW DC.

NOTE: See *AC-Coupled Solar System Sizing on page 21* for information about sizing AC-coupled solar with Powerwall 3.

System Sizing

The following resources explain how to size the Powerwall 3 system to meet customer expectations, as well as how to determine which loads can be included in the backup circuit and what to do with loads that cannot be included.

Backup Loads Supported per Powerwall Quantity

- The largest load in the backup circuit is limited by the quantity of Powerwalls; the largest load/breaker size each Powerwall 3 can support is determined by the selected Powerwall 3 breaker size and configured power output (see *Install Powerwall and Generation Breakers in the Backup Gateway on page 54*)
- See *Appendix G: Installing Multiple Powerwall 3 Units and/or Expansion Units on page 119* for requirements for installing multiple Powerwall units.

AC Units and Large Motor Loads

- Inrush current (largest instantaneous current draw when a motor starts) is limited to 185 A locked rotor amps (LRA) per Powerwall 3.
- For air conditioner units, use locked rotor amps on equipment label as inrush current.
- Design Options if motor locked rotor amps is greater than the number of Powerwall 3 units multiplied by 185A:
  - Increase number of Powerwalls
  - Relocate AC unit/motor load out of backup circuit
- Example:
  - Motor Load unit with 200 A locked rotor amps
  - Required Powerwall(s): (2) Powerwall 3 units required, so that 200 A < 370 A

NOTE: Double-check that the AC breaker follows the Powerwall breaker sizing rules.

EV Charging

Type of Electric Vehicle Charging	Compatibility
Tesla vehicle charging (Wall Connector or Tesla Mobile Connector)	1 Powerwall*
Third-Party Level 1 EV charging	1 Powerwall*
Third-Party Level 2 EV charging	1-2 Powerwalls*

*Ensure the configured power output is great enough to support the charger(s) when off-grid; for instance, if Powerwall 3 has a configured power output of 3.68 kW, (3) Powerwall 3 units would be required to back up a Tesla vehicle charger.

Per the *Vehicle Charging During Outage feature*, the system will adjust the charging power during an outage to ensure Powerwall can continue to support the home without overloading Powerwall, and will only charge the vehicle when the percentage of charge is higher than the limit set by the customer.

Powerwall 3 DC System Sizing

- Powerwall 3 can be configured as up to a 11.04 kW / 48 A AC rated inverter that can support up to a maximum DC system size of 20 kW.
  - 20 kW DC is the absolute maximum solar system size that Powerwall 3 can support.
  - Powerwall 3 has a boosting feature that can send 5 kW of DC power continuously from solar to the battery at the same time that 11.04 kW / 48 A of solar is inverted to AC power, leading to a potential total DC power of 16.04 kW. This helps alleviate clipping concerns and enables sizing the DC system larger, but only if the battery is being used in a way that it will have available charge power during the peak solar production hours of the day.

    NOTE: When a Powerwall 3 is installed with Expansion unit(s), the boosting feature can send 8 kW of DC power continuously from solar to the battery, leading to a potential total DC power of 19.04 kW, of which 11.04 kW / 48 A is inverted to AC power. Adding the Expansion unit(s) will further alleviate clipping concerns and enables sizing the DC system larger.

  - If Powerwall 3 is power / current limited, a larger DC solar system size may experience curtailment. Size the DC solar system appropriately based on the configured power / current output.
  - Where clipping may occur, the amount of clipping depends on the specific scenario.
- Each Powerwall 3 has (3) MPPTs available for Solar.

  NOTE: If there are more than three PV strings, strings can be combined upstream of Powerwall 3 so long as the voltage and current ratings of the system do not exceed the capabilities of Powerwall 3.

- When calculating the minimum and maximum number of modules per string, use the *web version* or *desktop version* (downloads to your system) of the Tesla Solar Stringing Tool available on Partner Portal. For instructions on how to use the tool, see the *User Guide*.
- Total DC circuit distance, from + MPPT terminal to - MPPT terminal (including module wire leads, jumper wires and all wiring within the array boundary for any individual string), shall not exceed 160 m for single strings or paralleled strings
  - Total DC circuit distance refers to the entire round trip wire distance, from inverter to the roof, then back to the inverter
  - Ensure paralleled strings are the same distance, or as close to the same distance as possible
- Powerwall 3 is a string inverter. Individual strings should not be extended over mounting planes with different pitches and/or azimuths to provide peak performance of the system. Series strings must have modules on the same pitch & azimuth, and strings of equal distance can be combined in parallel.
  - Note that a situation where all 20 kW are simultaneously producing at peak may result in solar clipping. Tesla recommends, but does not require, diversifying azimuths when the array is significantly oversized. The (3) MPPTs are particularly suited for sites where the strings may not be on the same azimuth and are therefore not producing at peak simultaneously.
- If installing multiple Powerwall 3 units, it is recommended but not required to distribute the DC PV system across all Powerwall 3 units so that each Powerwall 3 receives the benefits of DC coupling solar

Available Third-Party Solar Design Tools

Powerwall 3 has been added to the following solar design tool databases:

- OpenSolar
- PV*SOL

AC-Coupled Solar System Sizing

DC-coupled solar (connected directly to Powerwall 3) is strongly preferred over AC-coupled solar for the following reasons:

- Less equipment required for DC-coupled solar, resulting in reduced system cost
- Increased efficiency for DC-coupled solar
- Low energy management during a grid outage

In some scenarios, it is difficult or not feasible to avoid systems with AC-coupled solar. Most commonly, this occurs when Powerwall 3 is installed on a system with existing AC-coupled solar. As shown below, solar can be installed alongside Powerwall 3 solar, or with Powerwall 3 as storage only.

Figure 3. Powerwall 3 with AC and DC Coupled Solar

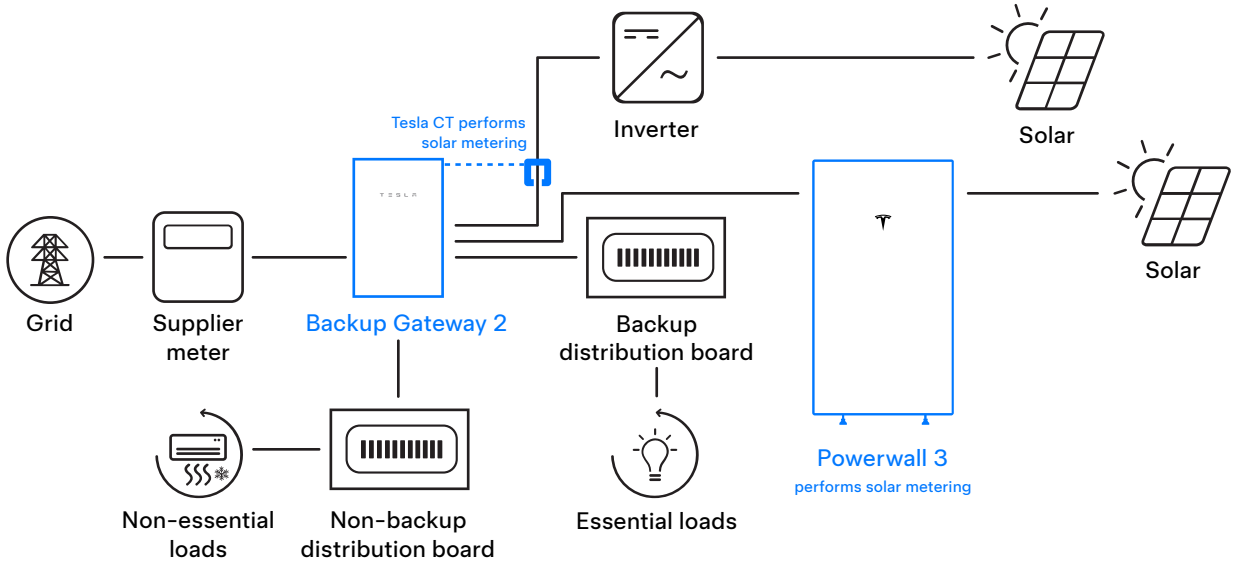
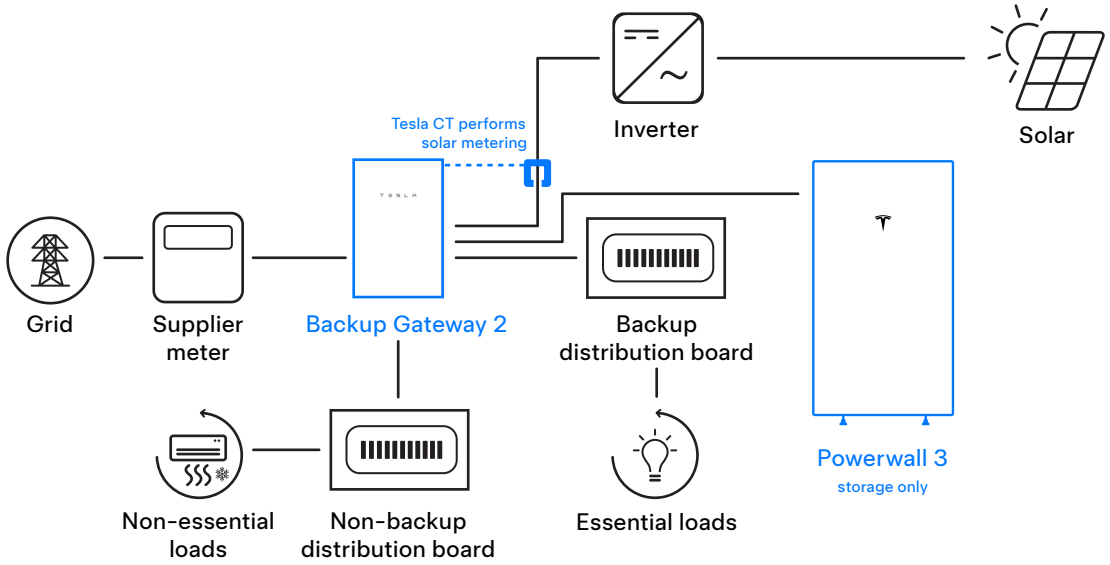


Figure 4. Powerwall 3 with AC Coupled Solar (Storage Only)



For systems with AC-coupled solar only, a maximum of 7.6 kW AC per Powerwall is allowed in the backup circuit (the smaller of AC inverter rating or DC system size[1]).

NOTE: When a Powerwall 3 is installed with Expansion unit(s), a maximum of 10 kW AC is allowed in its backup circuit. This means that a system with (1) Powerwall 3 and up to (3) Expansion units can have up to 10 kW AC-coupled solar in the backup circuit, and a system with (2) Powerwall 3 units and up to (3) Expansion units can have up to 17.6 kW AC-coupled solar in the backup circuit (the increased ratio only applies to the Powerwall 3 unit with Expansion unit(s) connected).

[1]The 7.6 kW PV to Powerwall ratio was put in place to protect the Powerwall system from excessive PV power during a grid outage. 7.6 kW is used because it allows to cover as much installations as possible while being compliant to the local regulation, allowing more PV systems to be fully backed up without needing to be split apart, and inverters don't always produce their maximum power. This ratio does not prevent all issues; Powerwall's maximum charge rate is 5 kW under ideal conditions (notably operating temperature). If there is more than 5 kW of excess PV per Powerwall, the system will frequency shift to try to reduce PV power, and may have to shut PV production down completely.

NOTE: The AC-coupled PV to Powerwall ratio and the maximum DC solar system sizing are independent of each other. See *Powerwall 3 DC System Sizing on page 20* for information about sizing the Powerwall 3 DC system.

CAUTION: Exceeding the PV to Powerwall ratio may result in high fault current during a grid outage, which creates a serious risk of damage to Powerwall and/or the customer's home loads. If a Powerwall is damaged by high fault current due to excess PV during an outage, it will be out of warranty.

Options to avoid exceeding the ratio:

1. Increase number of Powerwalls on site
2. Utilize Powerwall 3 for all PV on site to avoid PV to Powerwall ratio
3. Split PV Inverter Point of Interconnection, In / Out of backup (confirm with local electrical regulator that this practice is accepted)
4. Downsize PV to meet ratio
5. Shed part of the PV system using grid dependent relays/contactors

Undersized Powerwall 3 Systems

If a customer acknowledges that they are willing to back up a large load that violates Tesla's guidance on what can be included in backup, design can proceed as long as the customer provides acknowledgment that they accept an undersized system.

NOTE: Undersized systems cannot be designed if the electrical regulator does not allow oversized loads in the backup circuit.

Metering Considerations

NOTE: Powerwall 3 is not compatible with any remote energy meters, including Neurio remote energy meters.

Site Metering

Backup Gateway 2 has an internal meter (Internal Primary Meter X) for monitoring Site. Please ensure that the Powerwall 3 system can meter the entire site using the meters available, including Meter Y for Non-Backup loads that are upstream of Backup Gateway 2. This means that currently:

- Powerwall 3 can only be used on services up to 100 A.
- Powerwall 3 systems cannot meter more than 100 A of non-backup loads.

> **NOTE:** Backup Gateway 2 can only meter non-backup loads OR AC-coupled solar, not both.

Solar Metering

- **Powerwall 3 Solar**: Powerwall 3 performs its own solar metering. No additional Solar metering needs to be installed or configured for Powerwall 3.
    - Powerwall 3 can also be used without any solar on the site.
- **AC-coupled Solar**: All AC-coupled solar must be monitored; at the time of this document's publication, the only option for metering Solar is using Tesla CTs connected to Backup Gateway 2.

> **CAUTION:** If AC-coupled solar is not metered correctly, Powerwall will not frequency shift to control solar during a grid outage, resulting in a serious risk of damage to the customer's home loads and/or Powerwall.

SITE REQUIREMENTS AND PRE-INSTALLATION GUIDANCE

Ensure Installation Meets All Local Codes and Requirements

Powerwall 3 comes with a Backup Gateway 2 to enable integration with the electrical grid. Powerwall 3 communicates with Backup Gateway 2 by means of a wired connection; wiring and conduit (where required) must be provided by the installer and installed to comply with local codes.

WARNING: When Powerwall 3 is installed in a dwelling unit, fire detection and protection equipment should be installed in accordance with local building and fire codes.

WARNING: Powerwall is not intended for installation in habitable spaces and living spaces in dwelling units.

WARNING: Install Powerwall in a location that prevents damage from flooding.

CAUTION: When installing Powerwall in a garage or near vehicles, keep it out of the driving path. If possible, install Powerwall on a side wall and/or above the height of vehicle bumpers.

CAUTION: Ensure that no water sources are above or near Powerwall, including downspouts, sprinklers, or faucets.

CAUTION: Ensure that snow does not accumulate around Powerwall.

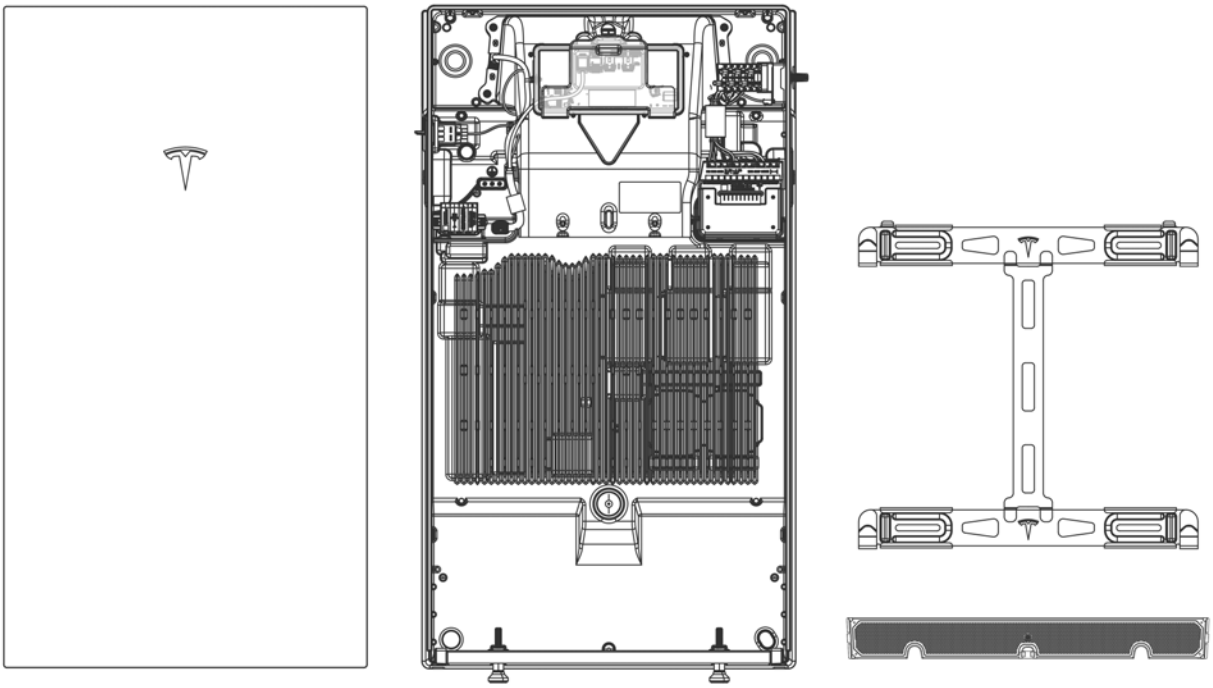
CAUTION: Before installing, disconnecting, and/or adjusting current transformers for metering, ensure the circuits being measured are not energized and the system is completely powered down. Failure to de-energize the system may compromise operator and equipment safety.

CAUTION: The Backup Gateway may not be recessed into a wall or cavity.

NOTE: All installations must conform to the laws, regulations, codes, and standards applicable in the jurisdiction of installation.

PREPARING FOR INSTALLATION

In the Powerwall 3 Box



- Glass front cover
- Powerwall 3
- Wall mounting bracket
- Air intake screen

In the Powerwall 3 Accessory Bag

Powerwall 3 Accessory Bag: Tesla P/N 1857363-30-x

- (8) fasteners for mounting the Powerwall 3 front cover (Tesla P/N 1847553-00-A)

  NOTE: Early revisions of the front cover fasteners are single use; see *STEP 12: Install Powerwall 3 Front Cover on page 83* for instructions to remove the black gasket from these fasteners to reuse them. Only (6) fasteners are required, with (2) extra fasteners included in the accessory bag.

- (7) PV wiring forked terminals
- (1) small square clamp-on ferrite core with cable tie for the Tesla Asset Controller (TACO) low voltage harness
- (2) medium clamp-on ferrite cores with cable ties for the AC conductors
- (2) medium *marked* (with pink sticker) clamp-on ferrite cores with cable ties for the AC conductors
- (1) small clamp-on ferrite core with cable tie for the Protective Earth

In the Backup Gateway 2 Box

In the Backup Gateway 2 Accessory Bag

- (1) Adhesive circuit label
- (1) CT extension cable harness (3 m)
- (3) M6 rubber bonded stainless steel washers
- (5) 8 mm backplate nuts
- (1) M25 communication gland and insert
- (1) Solar CT (100 A, split-core)
- (1) Powerwall 2 Owner's Manual (can be recycled when Backup Gateway 2 is installed with Powerwall 3; the Powerwall 3 owner's manual is available to the customer via their Tesla mobile app)

Powerwall 3 Service Parts, Orderable Parts, and Accessories

NOTE: Some of the parts and kits listed below may not be orderable by Channel Partners; for a list of parts and kits that can be ordered by Channel Partners, please see the *Powerwall Pricing Guide* on Partner Portal.

NOTE: In the part numbers listed below, -xx-y are placeholder values.

Tesla Part Number	Name	Description
1856187-xx-y	Powerwall Dolly	Custom-designed dolly for lifting and transporting Powerwall
1913330-xx-y	Custom Powerwall 3 Ramp	Custom ramp designed to safely unload stacked Powerwall 3 units in packaging from a vehicle
1738120-xx-y	Powerwall 3 Mounting Bracket	(1) Additional Powerwall Wall Mounting Bracket (1 bracket is included with every Powerwall) Only needed if original mounting bracket is lost or damaged
1857363-30-A	Powerwall 3 Accessory Bag	Additional Powerwall 3 accessory bag (1 accessory bag is included with every Powerwall)
1763418-01-y	Powerwall 3 Front Cover Assembly	Service replacement glass front cover and (8) fasteners for Powerwall 3
1899124-xx-y	Powerwall 3 On/Off Switch Cover	Service replacement Powerwall 3 On/Off switch cover
1893723-xx-y	Powerwall 3 Expansion Port Cover	Service replacement Powerwall 3 expansion port cover
1808482-xx-y	Powerwall 3 Foot	Service replacement Powerwall 3 leveling foot (quantity 1)
1775504-xx-y	Powerwall 3 Air Intake Screen	Service replacement Powerwall 3 air intake screen
1857363-02-y	Front Cover Fasteners for Powerwall 3	Additional (8) M6x17 fasteners for securing the Powerwall 3 glass front cover

Required Supplies

- Powerwall 3 Mounting bracket hardware (see *Appendix A: Powerwall 3 Anchoring Details on page 89*)
- Backup Gateway 2 mounting hardware
- Minimum 300 V rated, UV resistant, 70°C rated, copper (Cu) wire, 6 mm² to 25 mm², for AC wiring (see *Powerwall 3 AC and PV Wiring on page 94* for details).
- Minimum 600 V rated, UV resistant, 75°C rated, copper (Cu) wire, 4 mm² to 6 mm², for PV wiring (see *Powerwall 3 AC and PV Wiring on page 94* for details).

  NOTE: AC and PV wiring conductors must be made of solid wire, stranded wire or fine stranded wire. Forked terminals are required for fine stranded wire. The wires must be compliant with local regulations.

- Insulated forked terminals for PV wiring; (7) forked terminals are included in the Powerwall 3 accessory bag. If using other forked terminals, Tesla recommends the following or equivalent:
  - TE Connectivity P/N 165015 (4 - 6 mm^2 wire size)

  NOTE: Follow the manufacturer's guideline to properly crimp the forked terminals.

- Minimum 300 V rated (or equivalent) 4-conductor shielded copper (Cu) communication cable with at least one twisted pair

  NOTE: This cable is used for communication connection between Powerwall and the Backup Gateway; the twisted pair is required for the CN+ and CN- communication conductors (see *STEP 5: Connect Powerwall 3 to Backup Gateway on page 56* for details).

- RJ45 connectors for Ethernet wiring
- Minimum IP65 cable glands or conduit connectors of the following sizes:
  - M20
  - M25
  - M32
  - M40

- Overcurrent protection device (breaker) for the Powerwall 3 circuit: Select the appropriate breaker size depending on the power / current output.

Nominal AC Output Power at 230 V (kW)[4]	3.68	5	6	7	8	9	10	11.04
Maximum Apparent Power (kVA)	3.68	5	6	7	8	9	10	11.04
Maximum Continuous Current (A)	16	21.7	26.1	30.4	34.8	39.1	43.5	48
Overcurrent Protection Device (A)	20	32	32	40	50	50	63	63

- Some regions may require use of an external Residual Current Devices (RCD) / Residual Current Circuit Breakers with Overcurrent Protection (RCBO) on the solar PV inverter and/or Powerwall circuits. Refer to *Residual Current Devices (RCDs) / Residual Current Circuit Breakers with Overcurrent Protection (RCBOs) on page 102* for additional guidance.
- Powerwall 3 doesn't have an integrated DC surge protection device in the unit. If required, use an external one and install in a separate enclosure.
- External DC isolation: To facilitate safe maintenance and testing, some regional electrical codes require a means of isolating the PV array be provided adjacent to a PV inverter. The integrated DC isolator in Powerwall 3 provides a means to switch-off the feed from the PV array, however the PV wires terminated within the Powerwall 3 remain live. To achieve full code compliance, it is necessary to provide a means of PV array isolation external to the Powerwall 3. The following are options to make the installation compliant if the local electrical codes require a means of isolating the PV array (see *Appendix D: Install External DC Isolation on page 107* for details):
    - The use of suitably rated plug and socket connectors (e.g. MC4) on the feed from the PV array. These can be installed directly into the PV array wires before they enter the Powerwall 3, or fitted to an external enclosure adjacent to the Powerwall 3 (e.g. where an enclosure needs to be installed for surge protection devices or fuses).
    - The use of a suitably rated DC isolator adjacent to the Powerwall 3.

  In all cases, local codes should be carefully studied to ensure full compliance of the whole installation.

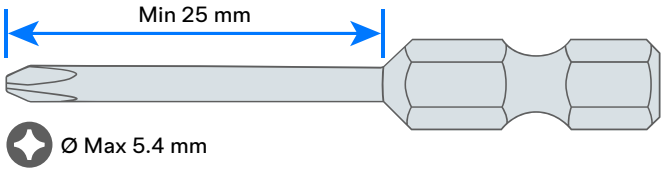
Required Tools

General Tools

- Personal protective equipment (safety glasses, gloves, protective footwear)
- Installation tools (level, stud sensor, tape measure, pencil, painter's tape, flashlight)
- Smart phone with Tesla One app for performing device setup and documenting the installation
- Drill and drill bit for drilling pilot holes in mounting surface
- Torque wrench / screwdriver with T20 Torx bit
- Wire strippers/cutters for 0.2 mm^2 to 120 mm^2 wires
- Up to 3 mm electronics tip slotted screwdriver for AC and communication wiring spring terminals

Powerwall 3 Installation Tools

- Powerwall dolly (preferred, Tesla P/N 1856187-xx-y) OR lift equipment capable of lifting and supporting 287 lb (130 kg)
- ¾-inch hex nut or 19 mm drill socket (if using Powerwall dolly)
- Ratcheting strap to secure Powerwall 3 to lift equipment (if not using Powerwall dolly)
- Ratcheting die crimping tool for crimping forked terminals onto PV wiring; Tesla recommends any of the following or equivalent:
  - TE Connectivity P/N 58433-3
  - TE Connectivity P/N 59824-1
- Phillips #2 (reduced diameter PR2 or PH2R) screwdriver with minimum 25 mm shaft length and maximum 5.4 mm tool diameter for the PV wiring terminals



- Multimeter and Loop Impedance Tester

WARNING: Powerwall 3 is heavy. Wear appropriate personal protective equipment (such as gloves and protective footwear) when handling the unit. Only a sufficient number of trained movers should lift Powerwall 3. Use of lift equipment is recommended.

Powerwall 3 Expansion Installation Tools

- T40 Torx bit

Backup Gateway Installation Tools

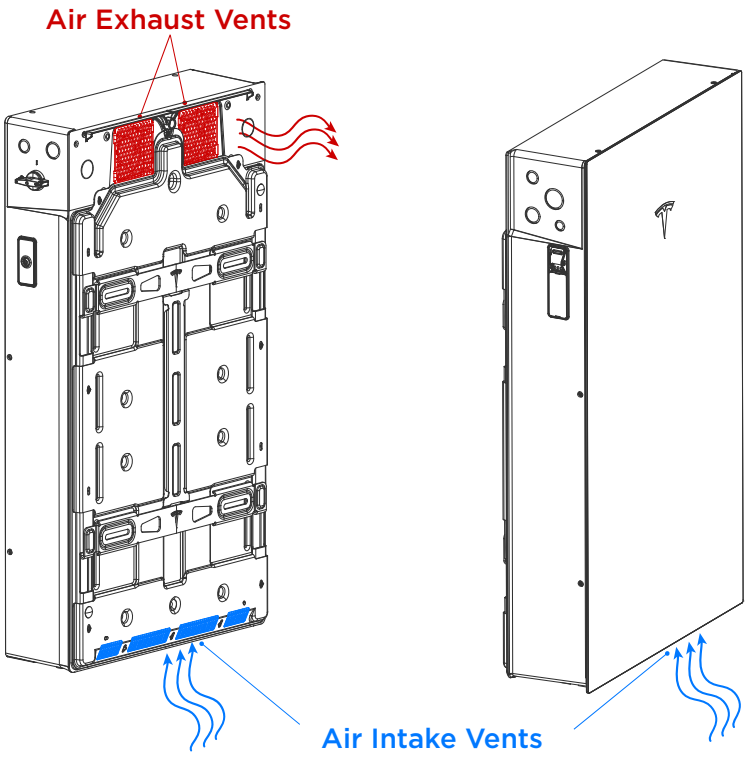
- Small bit for drilling pilot holes in Backup Gateway mounting surface
- Hole saws for drilling cable access holes in Backup Gateway (M12, M20, M25, M32, M40, M50)
- Torque wrench with 3 mm Allen bit (for Backup Gateway power connections)

STEP 1: PLAN THE INSTALLATION SITE

Choose a Location that Meets Powerwall 3 Clearance Requirements

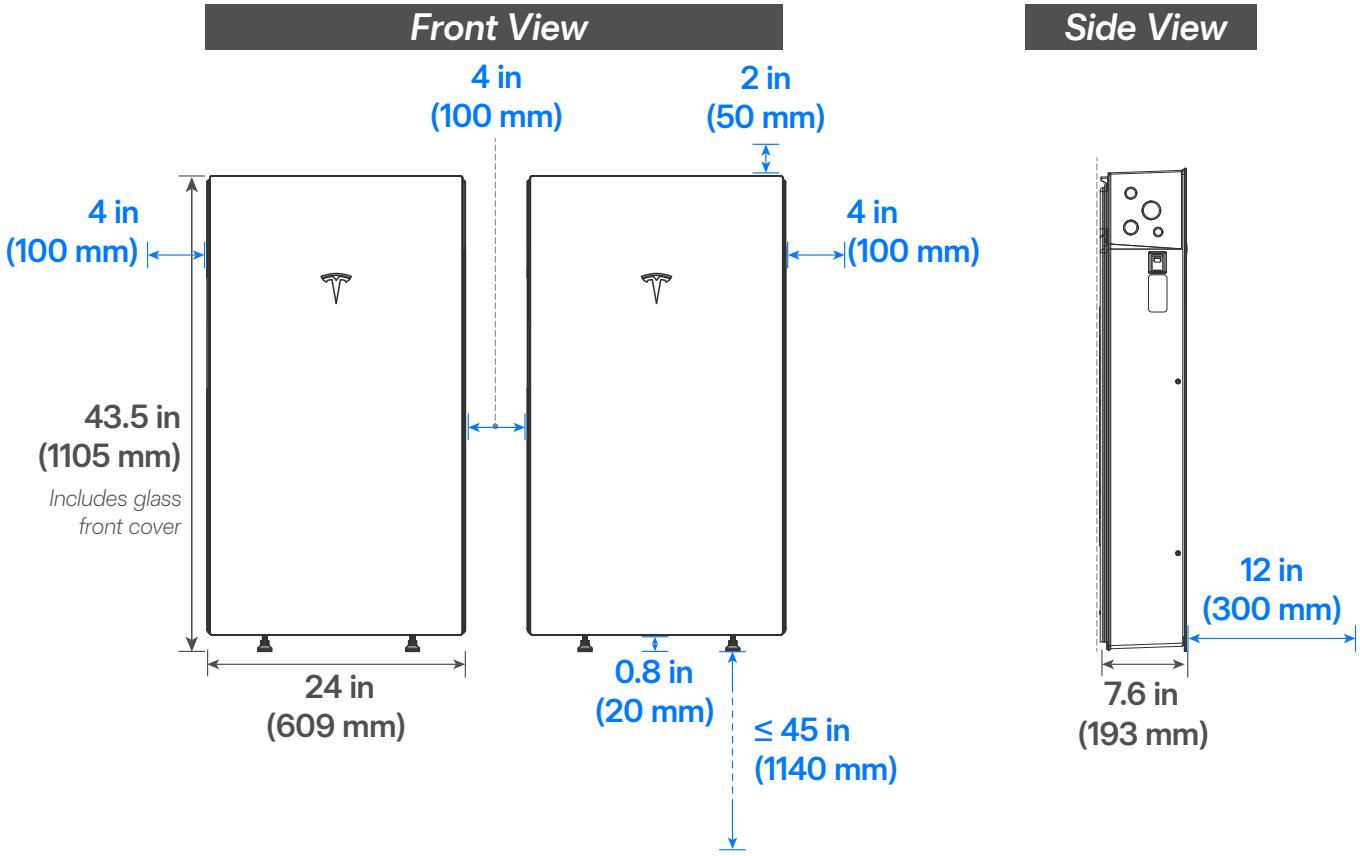
Powerwall 3 requires adequate clearance for installation, cabling, and airflow. The spacing on either side of units and between units is required to ensure there is sufficient clearance for venting and thermal management features. Do not install anything inside the required clearance above Powerwall 3, or anything that might fall and damage the unit. Do not mount Powerwall 3 horizontally or upside down.

Figure 5. Powerwall 3 Air Intake and Exhaust Vents



CAUTION: In addition to meeting all clearance requirements, ensure Powerwall 3 is installed on a flat surface that is clear of obstructions or protrusions that could damage Powerwall or inhibit airflow. The air vents on the rear and lower front of the unit must remain free from obstructions and accumulation of debris (like foliage or dust).

Figure 6. Powerwall 3 Minimum Mounting Clearances



Minimum clearance from left side	100 mm
Minimum clearance from right side	100 mm
Minimum clearance above Powerwall	50 mm
Minimum clearance below Powerwall	20 mm
Minimum clearance between side-by-side Powerwalls	100 mm*
Minimum clearance in front of Powerwall	300 mm**
Maximum height above ground	1140 mm to bottom of unit feet***
Maximum slope	+/– 2° side-to-side

*Tesla recommends a minimum of 150 mm between side-by-side units to allow for adequate space for wiring and On/Off switch access.

**This minimum clearance must be maintained at all times, as it ensures adequate airflow for Powerwall 3. Please note that more space may be required depending on local code and/or site conditions.

***Reference *Powerwall 3 Center of Mass on page 92* when mounting Powerwall 3 above ground or in a stacked configuration with Expansion.

NOTE: Powerwall 3 has a fan that produces a gentle hum during operation, comparable to a typical refrigerator. The noise level depends on the ambient temperature and the power level of operation. Consider this noise level when choosing where to install Powerwall 3.

Plan Powerwall 3 Mounting Configuration

Choose a Wall Capable of Supporting Powerwall 3

Choose a wall capable of supporting the full weight of Powerwall 3. Walls with the following characteristics are acceptable:

- Wood structural members at regular intervals
- Solid concrete, CMU, or select brick masonry

Other wall types are also acceptable depending on mounting configuration; see *Anchoring Details for Ground- or Wall-mounting Powerwall 3 with Wall Bracket on Existing Approved Foundation on page 89* for all acceptable wall types when mounting Powerwall 3 on the mounting bracket.

If ground-mounting Powerwall, choose a level surface adjacent to a wall space that meets the above requirements. Ensure the bearing surface is structurally sound and flat, and supports both Powerwall feet.

Plan Cable Length Between Components

Follow the table below for maximum distances between system components. Wire gauge must meet local codes and in some circumstances wire gauge requirements change based on distance. Refer to *Appendix B on page 94* for wire gauge requirements.

	Maximum Cable Length
CAN communication wiring between Backup Gateway 2 and Leader Powerwall 3	45 m for 1.5 mm^2 wire
	35 m for 1 mm^2 wire
Expansion Harness Length	See *Expansion Harness on page 127*
Wired Ethernet connection between any two devices*	100 m per Ethernet standard
Total PV circuit distance**	160 m

*This measurement refers to the distance between Powerwall 3 and the customer's internet router, or between two Powerwall 3 units.

**Ensure that total DC circuit distance, from + MPPT terminal to - MPPT terminal (including module wire leads, jumper wires and all wiring within the array boundary for any individual string), does not exceed 160 m for single strings

- Total DC circuit distance refers to the entire round trip wire distance, from Powerwall 3 to the roof, then back to Powerwall 3

CAUTION: Failure to follow minimum cable size and length requirements may result in intermittent or unreliable operation of the Powerwall system. In systems that do not meet these minimum requirements, performance issues may arise even after successful commissioning.

Maximum Tesla CT Extension

Tesla 100 A CTs (Remote Metering)	Maximum Extension Length
Using Tesla 100 A CT Extension 3 m (Tesla P/N 1467274-00-x)	Up to 3.8 m
Using 0.5 mm^2 or larger twisted pair conductors	Up to 100 m

Choose Powerwall Cable Entry

Determine whether cables will be routed into Powerwall from either side or the back of the unit. A conduit fitting or cable gland must be used to seal the entry into the wiring compartment.

CAUTION: The Powerwall 3 knockouts are **not** expandable. Do not drill into the Powerwall 3 enclosure or change any metal surface for any reason.

Figure 7. Powerwall 3 Knockout Locations

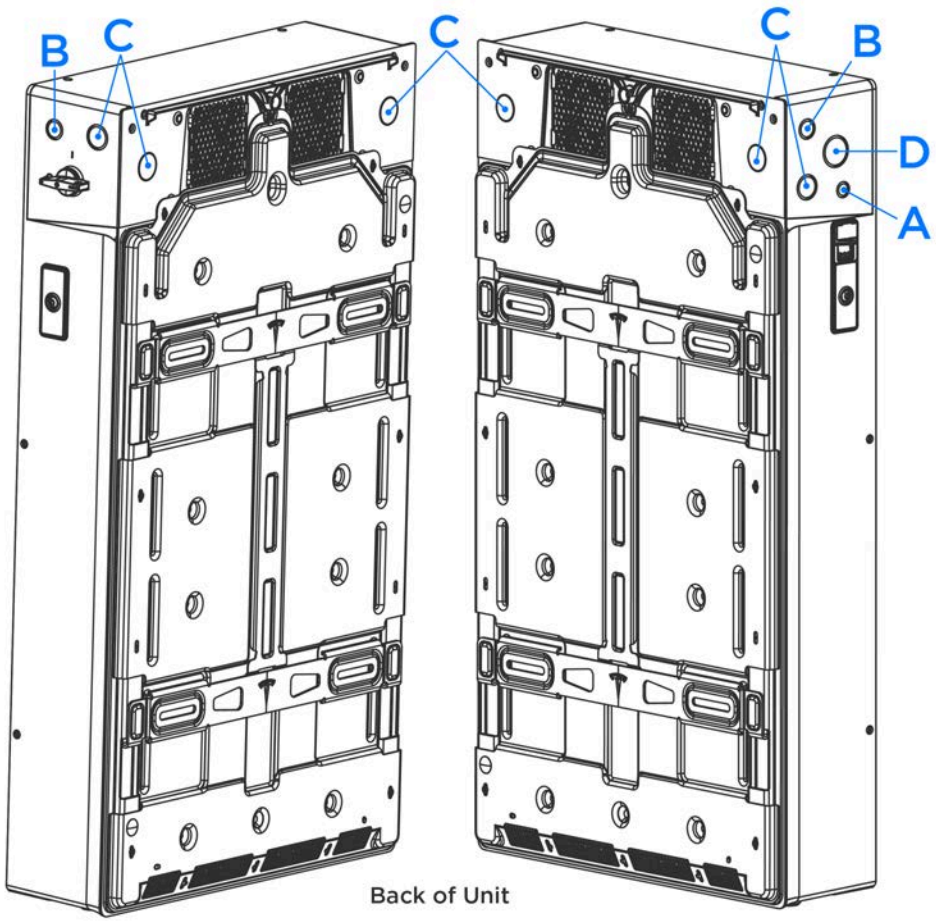


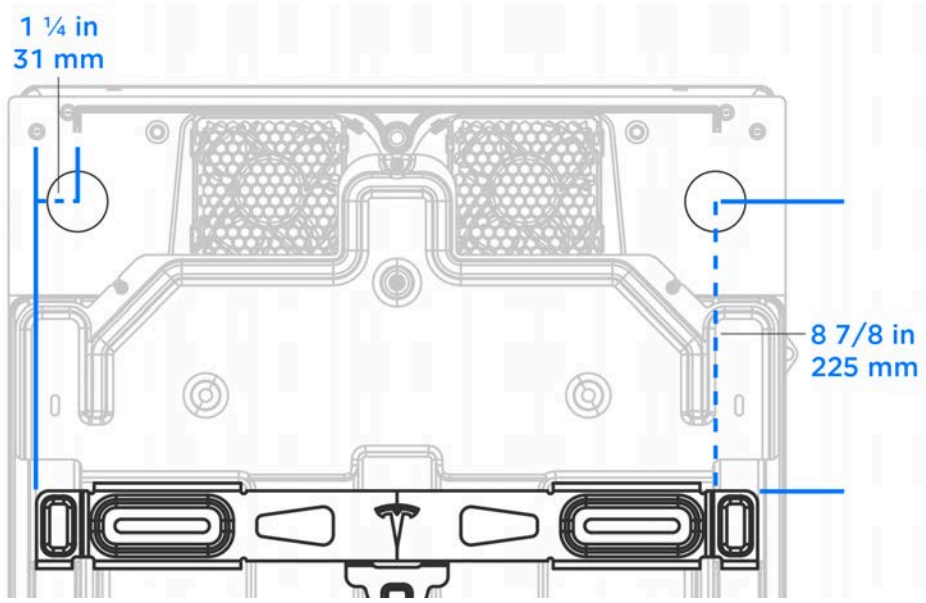
Table 1. Enclosure Knockout Sizes

Knockout	Conduit Size
A	M20
B	M25
C	M32
D	M40

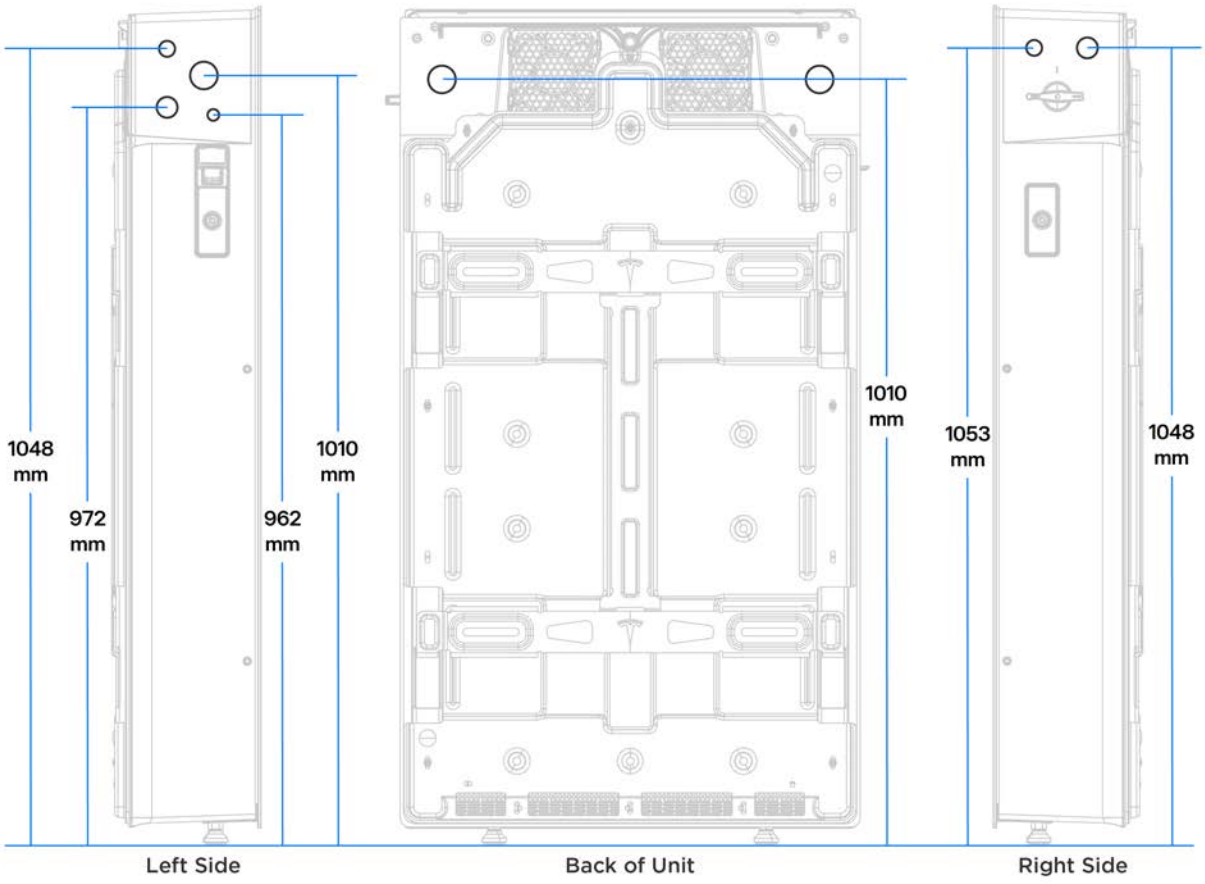
STEP 1: PLAN THE INSTALLATION SITE

The following diagrams provide measurements for:

- Positioning conduit entry holes relative to the Powerwall 3 bracket (the measurements are the same for both knockouts)

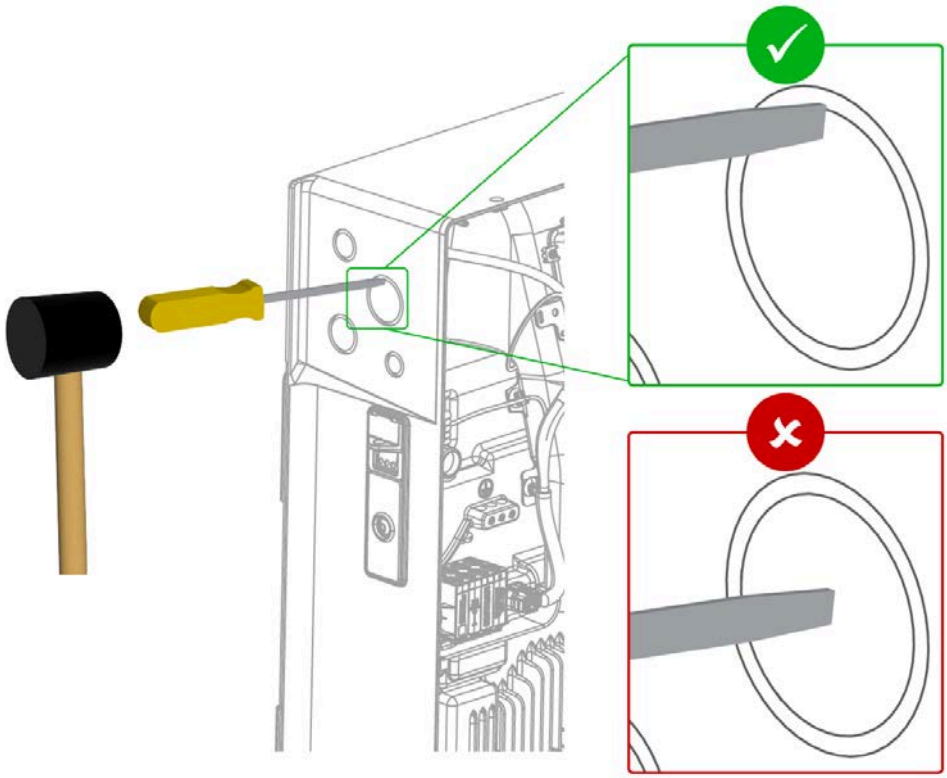


- Positioning conduit entry holes relative to the floor (if mounting Powerwall 3 with its feet at the lowest height setting and touching the floor)



To open a knockout, position the tip of a slotted screwdriver on the inner perimeter of the knockout (on the outside of the enclosure). Hammer the screwdriver to punch out the metal knockout; one well-placed strike is generally sufficient to dislodge the knockout.

NOTE: Placing the screwdriver on the inner perimeter of the knockout rather than the middle allows for the knockout to be opened with significantly less force.



Plan Amount and Size of Conduit or Raceway

Calculate the amount and size of conduit or raceway needed for the installation, based on fill limits and local code requirements. An adapter may be required between the entry into the Powerwall wiring compartment and the conduit.

STEP 2: REMOVE POWERWALL 3 FROM PACKAGING AND TRANSPORT USING THE POWERWALL DOLLY

WARNING: Do not move Powerwall 3 in its packaging while the packaging is standing upright. In this position, the Powerwall 3 unit can shift within the packaging, which may result in Powerwall 3 falling over.

1. Open the Powerwall packaging:
   a. Carefully remove the box containing the glass Powerwall front cover and set it aside on an even surface.

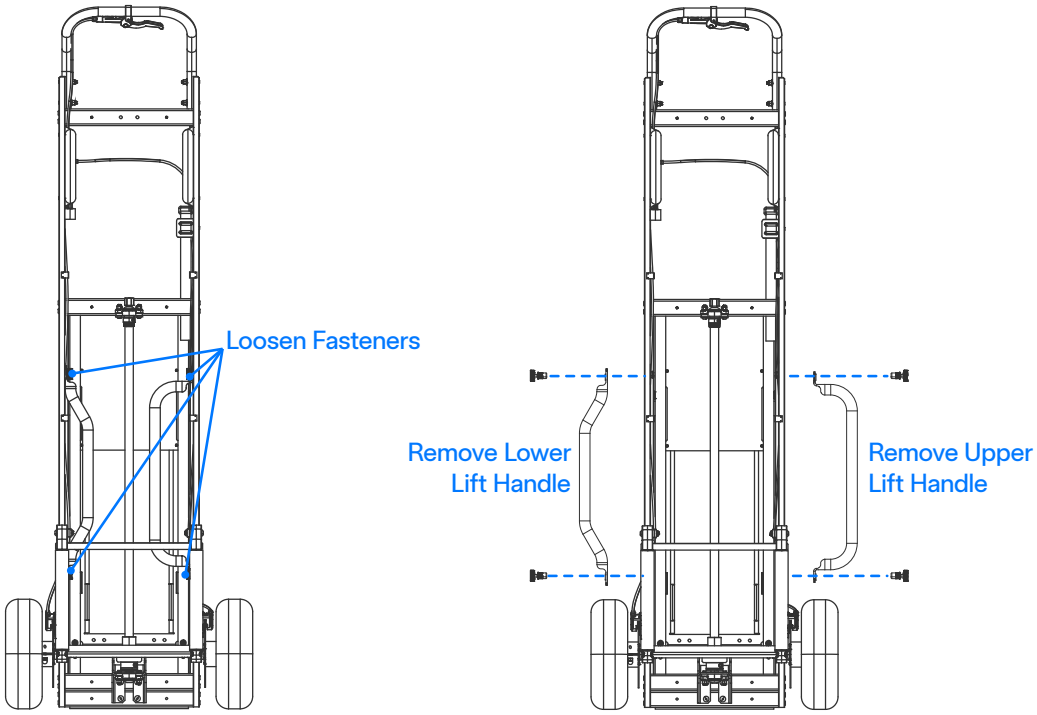
      CAUTION: Handle the glass front cover carefully. Avoid setting the cover on hard, uneven surfaces which could break the glass.

   b. Remove the accessory bag and set it aside.

NOTE: Please return the Powerwall 3 packaging to the warehouse that originally shipped the unit(s). See the for instructions.

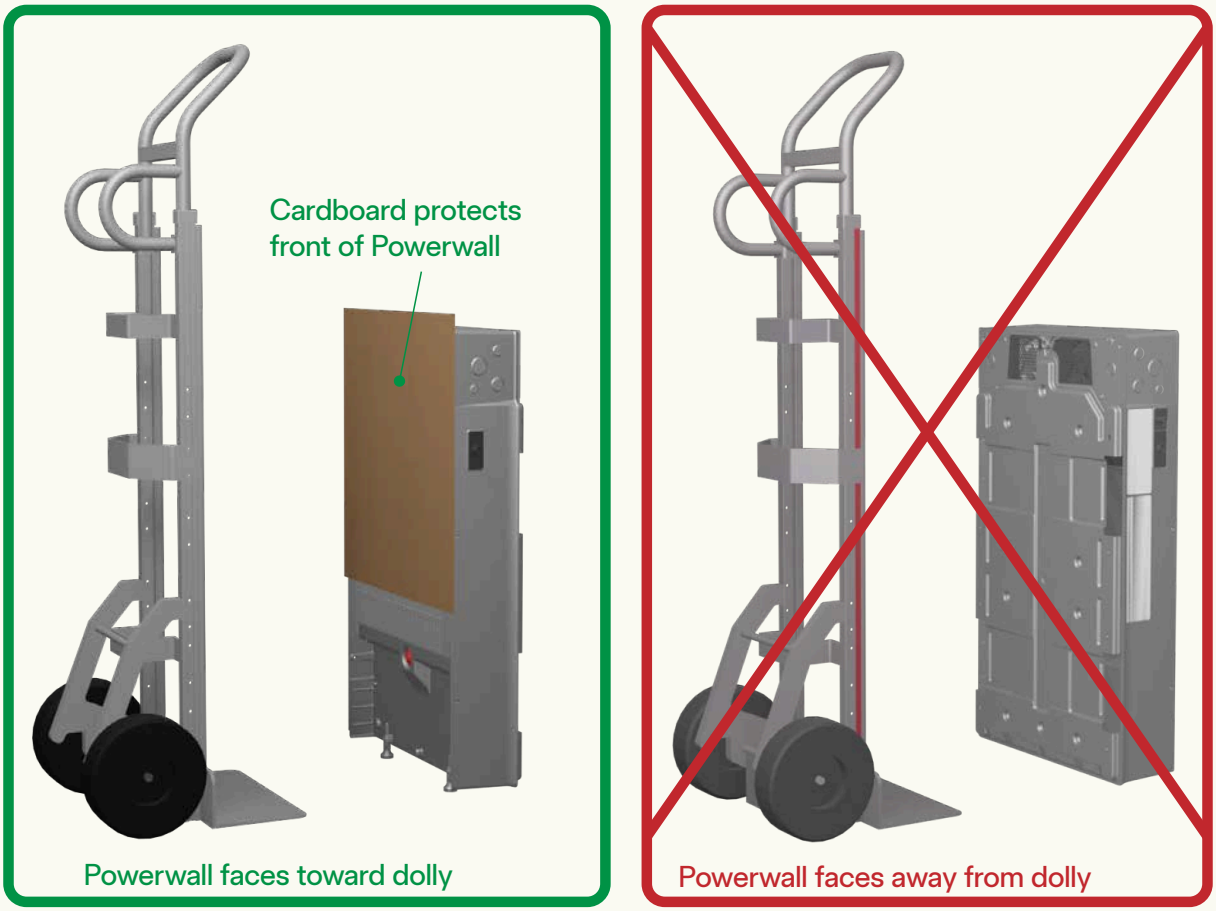
2. To lift Powerwall 3 using the Powerwall dolly, loosen the (2X) fasteners holding each lift handle in place, then detach the handles.

NOTE: Refer to the *Powerwall Dolly User Manual* for instructions on mounting Powerwall 3 using the Powerwall dolly.



STEP 2: REMOVE POWERWALL 3 FROM PACKAGING AND TRANSPORT USING THE POWERWALL DOLLY

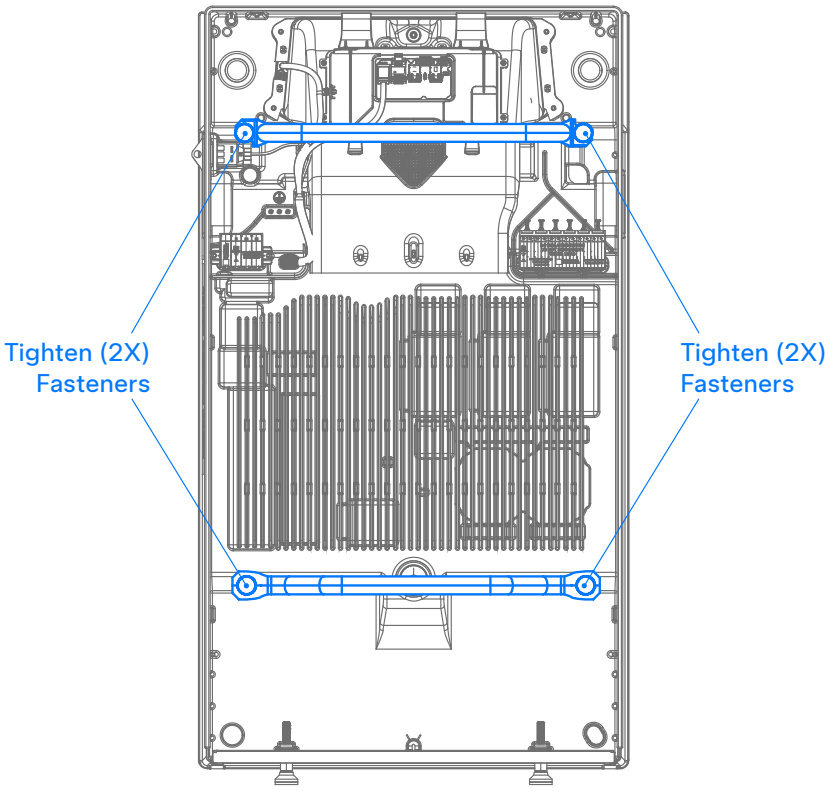
CAUTION: The Powerwall dolly is the recommended tool for transporting Powerwall 3. If using another dolly, ensure Powerwall 3 is facing toward the dolly and the front of the unit is protected by a piece of cardboard (for instance the cardboard box the bracket ships in) or a similar material. Use a strap to secure Powerwall to the dolly.



3. With Powerwall 3 still in the packaging, place the two lift handles on the Powerwall and tighten the (2X) fasteners on each handle to hold them in place. Note that upper handle is the larger, more rounded handle, and the lower handle is the smaller, more angular handle, and they attach to existing threaded mounting points. Perform a pull test to confirm the handles are secure before proceeding.

WARNING: Do not use the handles to manually lift Powerwall 3. These handles are designed to interface with the dolly; they are not designed to be load bearing, and attempting to lift Powerwall 3 with them could result in dropping and damaging the unit.

STEP 2: REMOVE POWERWALL 3 FROM PACKAGING AND TRANSPORT USING THE POWERWALL DOLLY



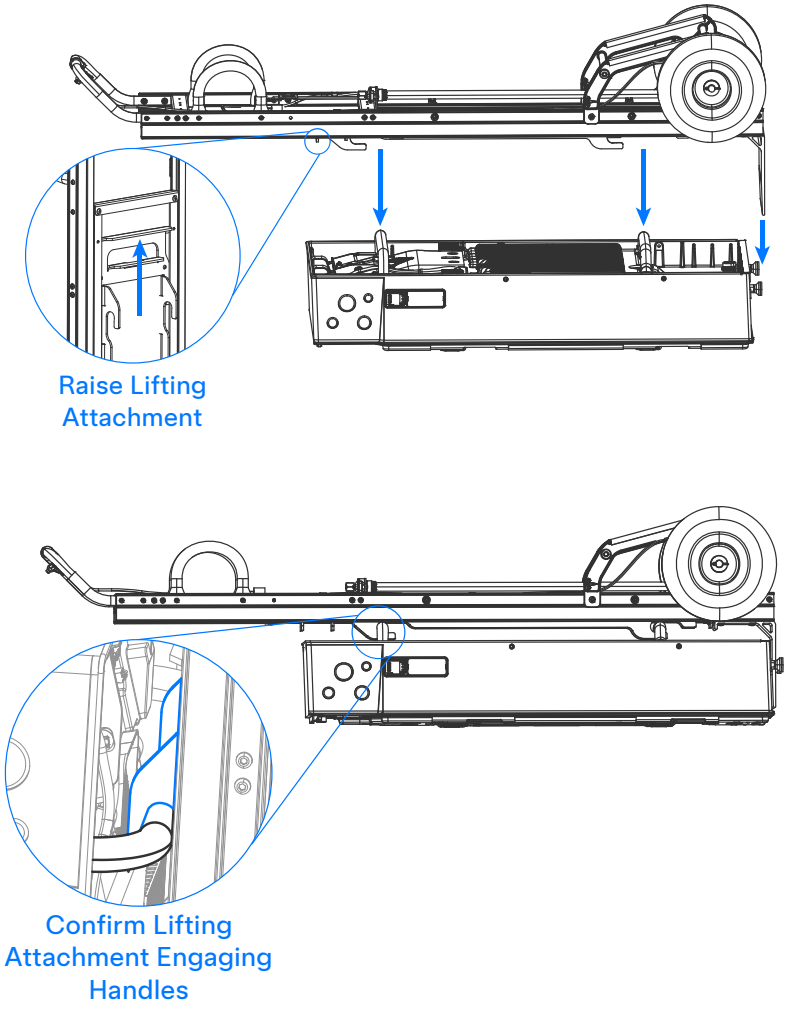
4. Confirm the leveling feet are screwed all the way in to the Powerwall.

   CAUTION: The leveling feet must remain installed on Powerwall 3, regardless of whether it is wall-mounted. The leveling feet ensure the required clearance is maintained between Powerwall 3 and any surface below it.

5. Engage the Powerwall dolly with the lift handles:
   a. Lift the Powerwall dolly, with one person holding either end.
   b. Raise the lifting attachment and lower the Powerwall dolly, inserting the lifting plate between the Powerwall 3 feet as it is lowered, and lowering the lifting attachment so that it engages the handles.

      CAUTION: Confirm the handles are fully engaged with the dolly before proceeding.

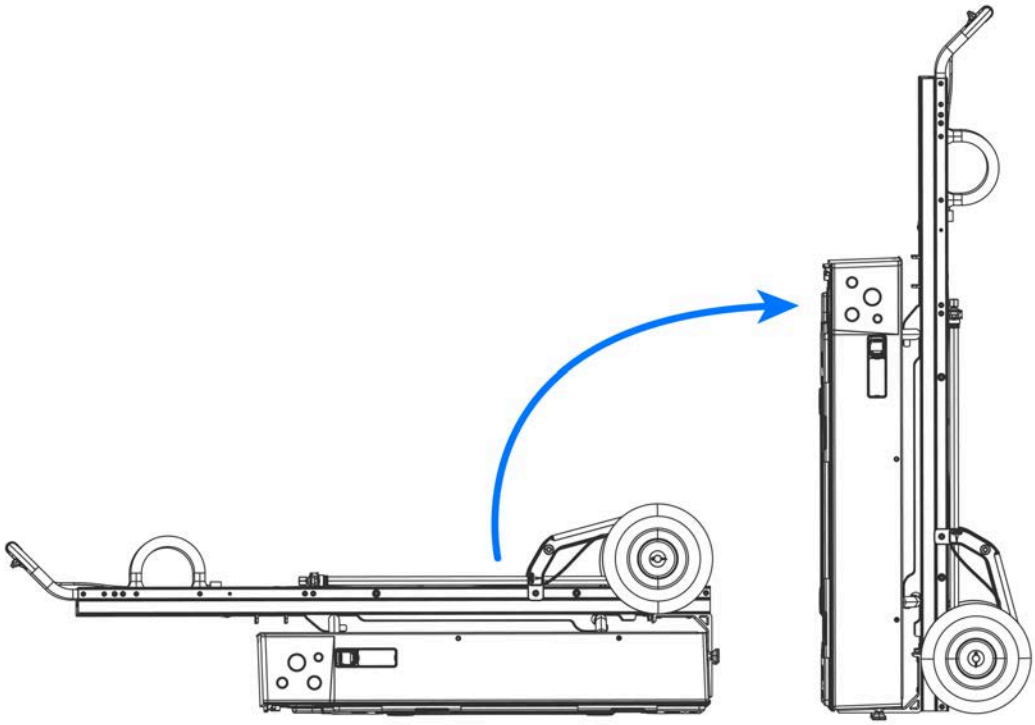
STEP 2: REMOVE POWERWALL 3 FROM PACKAGING AND TRANSPORT USING THE POWERWALL DOLLY



6. Place one foot on the Powerwall packaging as a pivot point, then lift Powerwall and the dolly to a standing position.

> **CAUTION:** Powerwall 3 must be in its packaging when lifting it in this manner; the packaging ensures the corners of the enclosure are protected.

STEP 2: REMOVE POWERWALL 3 FROM PACKAGING AND TRANSPORT USING THE POWERWALL DOLLY



7. Remove the packaging and set it aside.
8. Position Powerwall at the mounting wall.

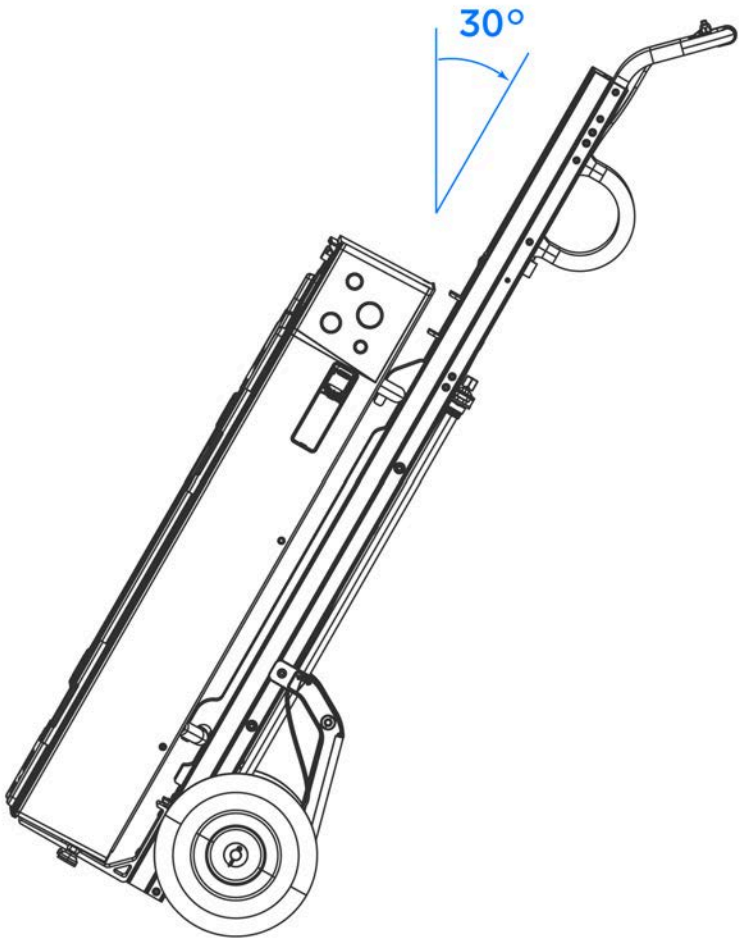
WARNING: Use extreme caution if using the dolly on uneven terrain, such as grass, mud, or loose gravel, or if using on a steep incline.

CAUTION: Always lower the lifting plate to its lowest position before moving the dolly with Powerwall 3 attached.

9. To raise or lower Powerwall 3:

STEP 2: REMOVE POWERWALL 3 FROM PACKAGING AND TRANSPORT USING THE POWERWALL DOLLY

a. Tilt the dolly back 30 degrees to avoid Powerwall tilting forward or catching the wall bracket.

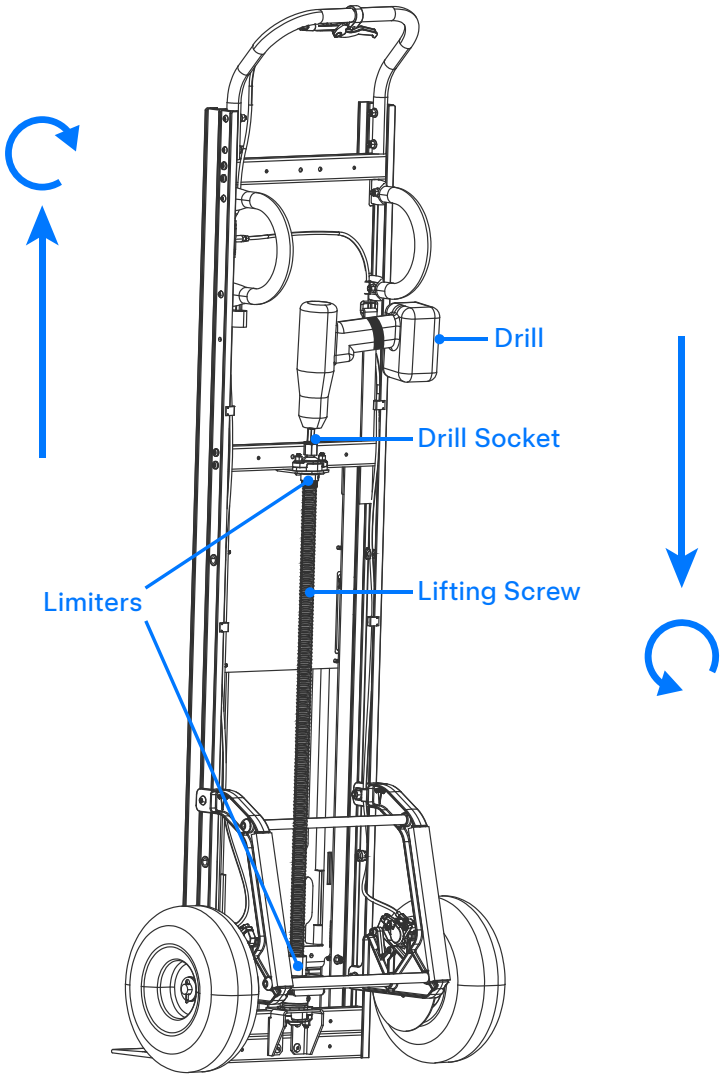


b. Place a ¾-inch hex nut or 19 mm drill socket on the dolly lifting screw.

c. Connect a drill to the hex nut or drill socket, then secure the drill to the side of the dolly using the provided strap.

> ⚠ **CAUTION:** Do not use an impact drill.

d. Ensure the drill is on the high torque setting (or the slowest setting), then run the drill until Powerwall has been lifted to the desired height. Run the drill in reverse to lower.



CAUTION: Be aware of the limiters on the lifting screw, and do not attempt to drive the screw beyond those limiters.

CAUTION: Only lift Powerwall 3 using the Powerwall dolly or a platform lifting tool.

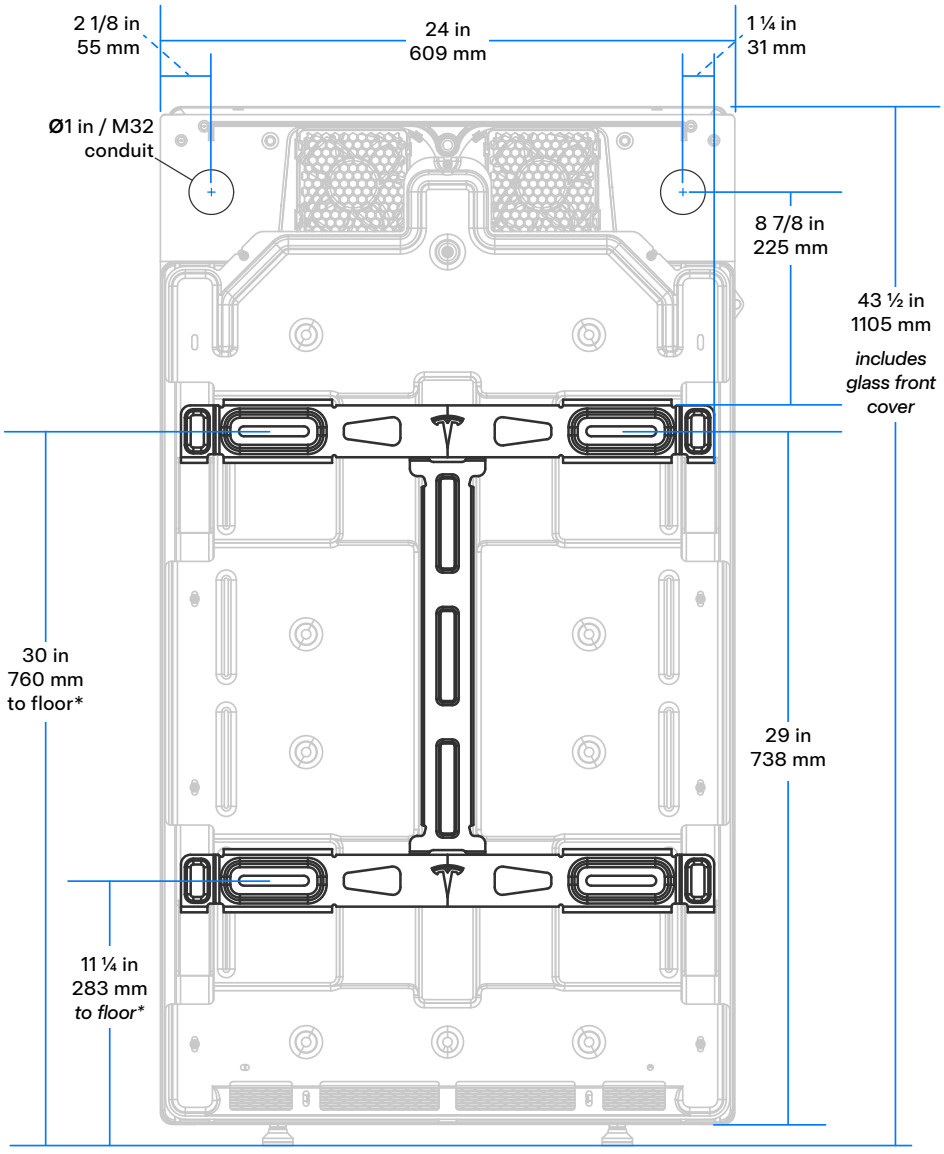
10. To disengage the dolly from Powerwall 3:
    a. Raise the lifting attachment to disengage the dolly from the handles.
    b. Move the dolly away from Powerwall 3.
    c. Using the drill, lower the lifting platform to its lowest position.
    d. Remove the two lifting handles and reattach them to the dolly.

STEP 3: WALL-MOUNT POWERWALL 3 USING WALL BRACKET

WARNING: Powerwall 3 must be mounted using the wall bracket at all times to secure the unit to the supporting structure.

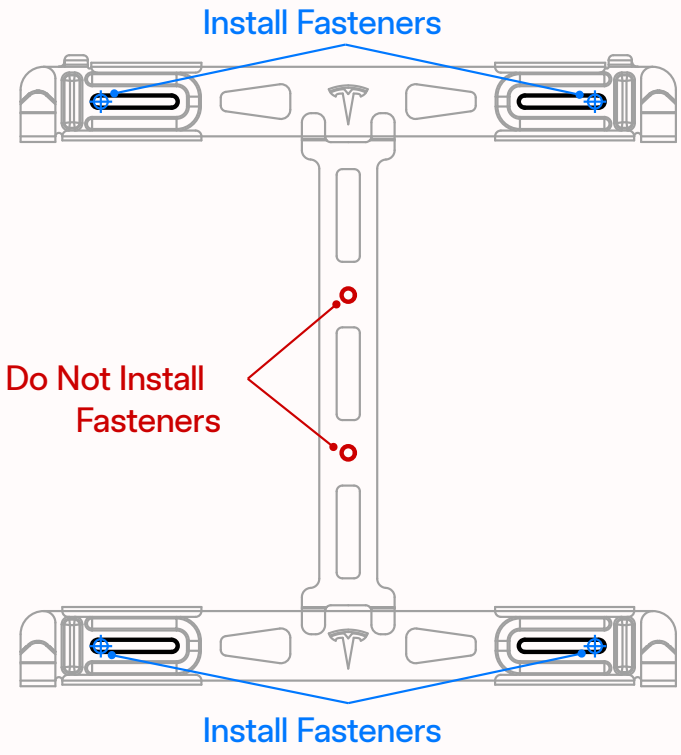
1. Using a drill and level, mount the Powerwall bracket to a wall capable of supporting the full weight of Powerwall 3. See *Anchoring Details for Ground- or Wall-mounting Powerwall 3 with Wall Bracket on Existing Approved Foundation on page 89* for additional details on the type and number of fasteners to use.

   Figure 8. Bracket Measurements Relative to Powerwall and Floor

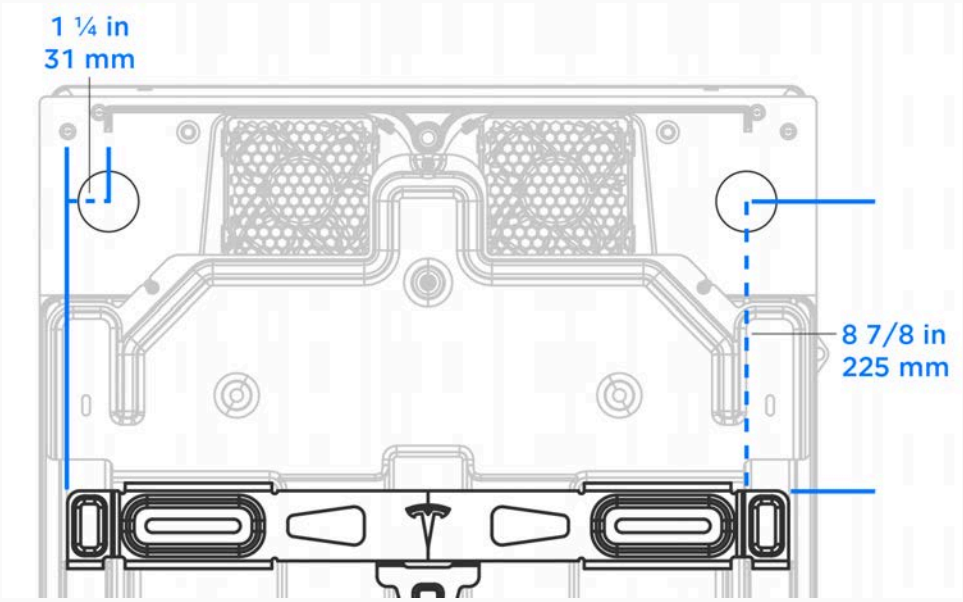


STEP 3: WALL-MOUNT POWERWALL 3 USING WALL BRACKET

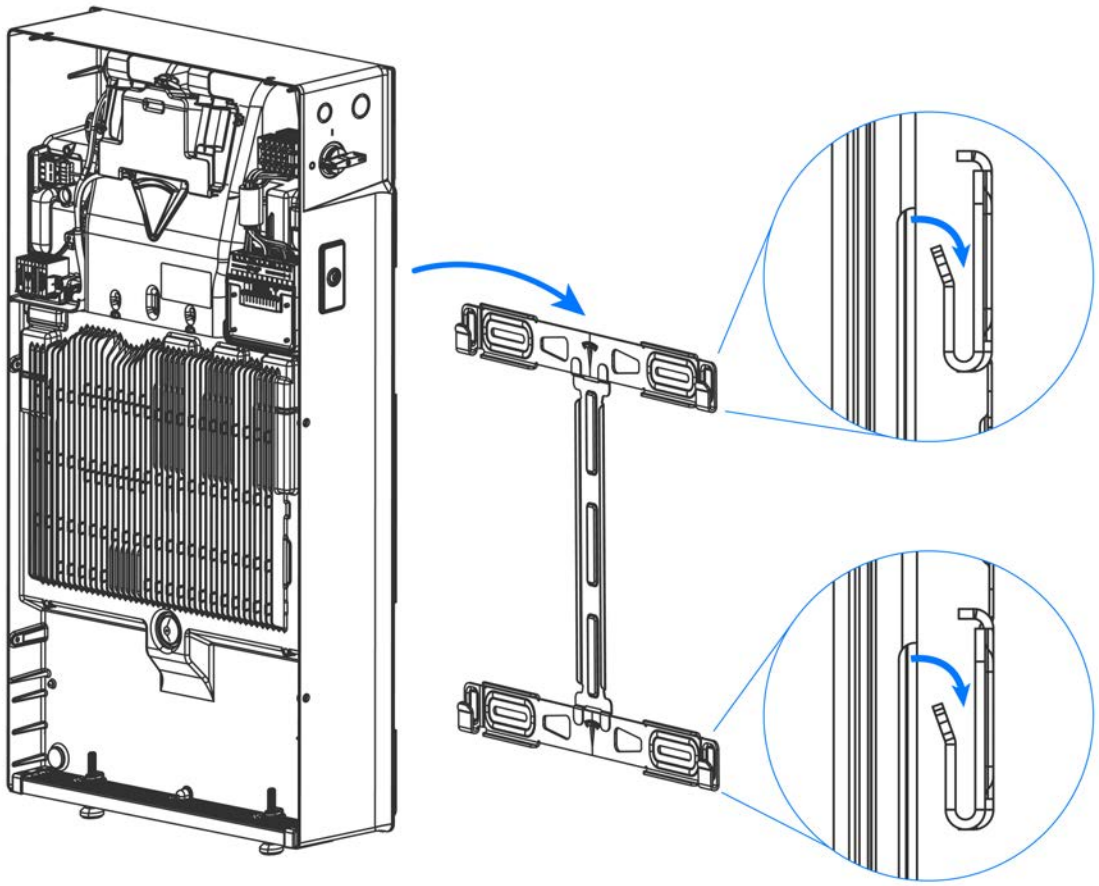
WARNING: Only install fasteners in the (4) slots on the horizontal bracket segments. Do not install fasteners on the vertical (center) segment, as these are not structural mounting holes.



NOTE: The following diagram provides measurements for positioning rear conduit entry holes relative to the Powerwall 3 bracket (the measurements are the same for both knockouts).



2. Move the dolly toward the wall, positioning Powerwall so that the mounting cleats are just above the flanges on the bracket.



3. Lower Powerwall until both the upper and lower sets of cleats engage the flanges on the bracket.

> **CAUTION:** Confirm Powerwall 3 is fully seated on all four cleats before proceeding.

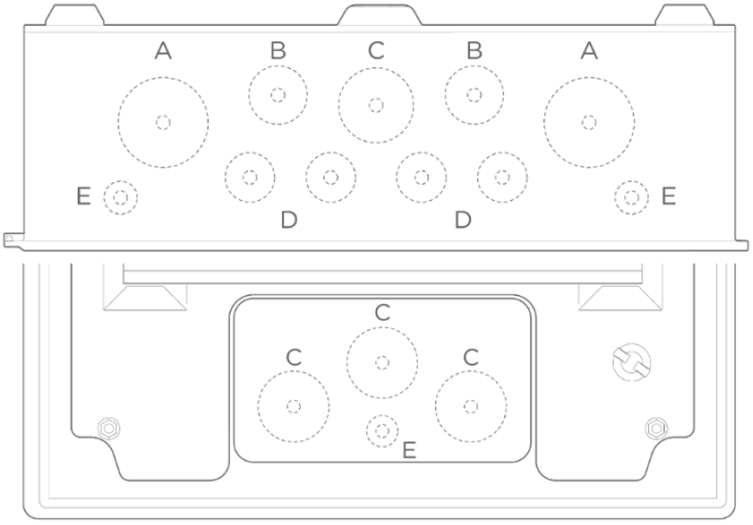
4. If ground-mounting Powerwall, use a 17 mm wrench to adjust the leveling feet until Powerwall is level. The unit should be level within ± 2 degrees side-to-side and within ± 5 degrees front-to-back.

> **NOTE:** The top of each foot must be visible above the threaded boss; do not unscrew the foot so far that the top is no longer visible.

STEP 4: INSTALL BACKUP GATEWAY 2

Mount the Backup Gateway

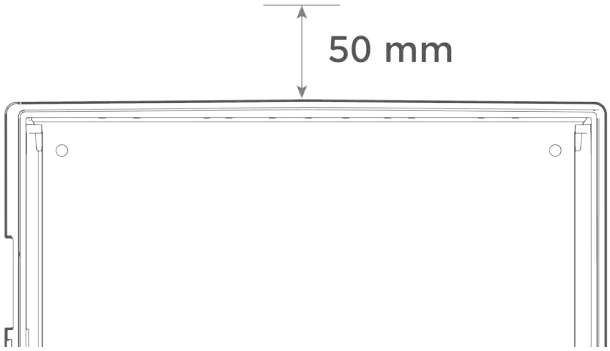
1. Using a hole saw, drill out the necessary cable access holes from the Backup Gateway.
   Figure 9. Top / Bottom (above) and Back (below) Cable Access Drill Guides



Drill Guide Diameters	
A	M40, expandable to M50
B	M25
C	M32
D	M20
E	M12

2. Using a drill and level, mount the Backup Gateway enclosure.

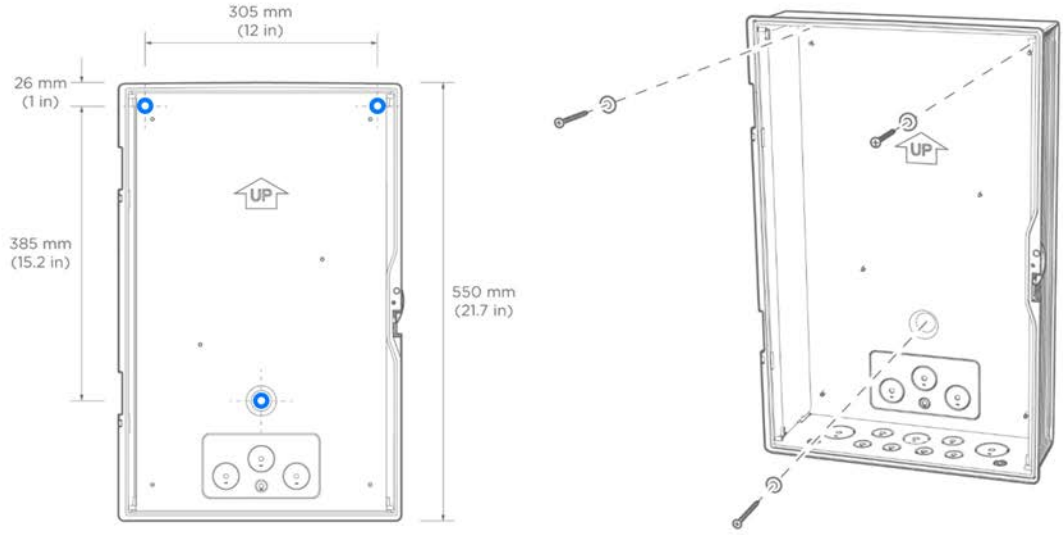
NOTE: Leave a minimum clearance of 50 mm above the Backup Gateway.



NOTE: The enclosure must be installed in the orientation shown below. Do not mount the Backup Gateway enclosure horizontally or upside down.

CAUTION: To ensure IP55 ingress rating is maintained, the enclosure must only be mounted at these three points.

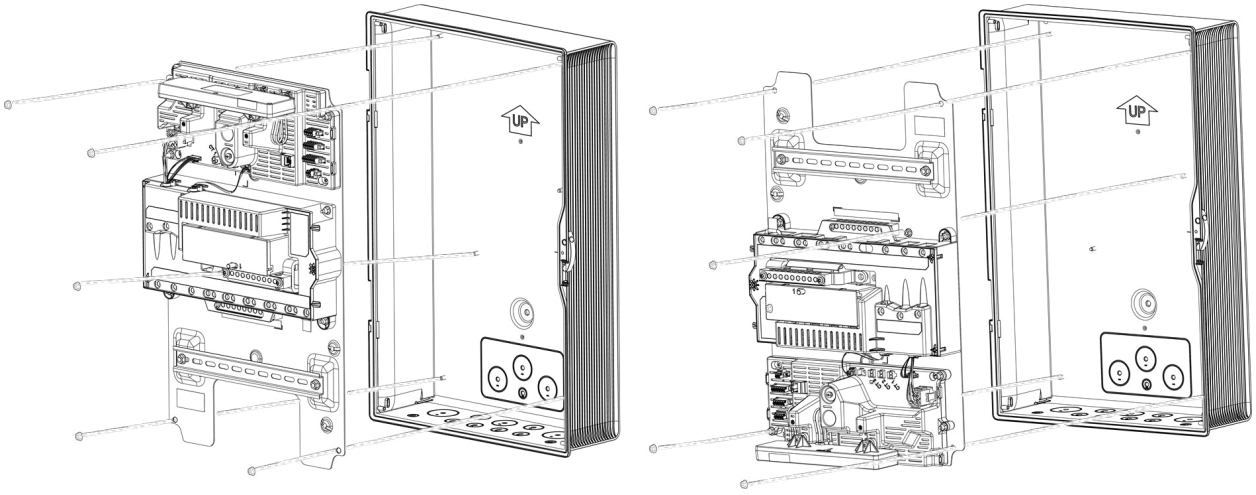
Figure 10. Backup Gateway Enclosure Mounting Holes



CAUTION: The sealing washers must be installed to guarantee IP55 ingress rating.

3. Install the Backplate Assembly in the enclosure, orienting it for bottom or top cable entry. Attach it to the five (5) studs using the five (5) supplied 8 mm nuts. Use a torque wrench with 8 mm socket to tighten the nuts to 6 Nm.

   Figure 11. Backplate Orientation for Bottom Cable Entry (left) or Top Cable Entry (right)



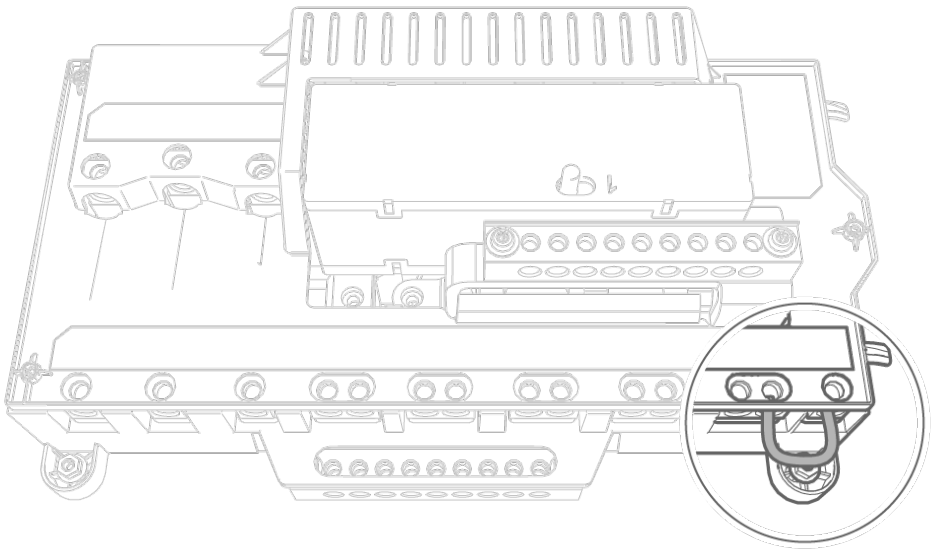
4. Locate the Backup Gateway serial number on the label on the dead front cover. Record the serial number for reference.

Verify Neutral-Earth Bonding Scheme and Install Earthing Rod

Proper earth connection and Neutral-to-Physical Earth (N-PE) bonding is required for safe operation of the Powerwall system and for compliance with local code requirements. The correct Neutral-to-Earth bonding scheme must be maintained even when the system is disconnected from the grid.

To meet local regulations, the Neutral must be disconnected in off-grid operation. For typical supply arrangements, disconnecting the Neutral means that the N-PE bond will be lost when off-grid. With the **Switched Earth (N-PE) Jumper** installed, the Backup Gateway's internal contactor will re-bond Neutral to Earth locally when the Line and Neutral contacts are open.

Figure 12. Neutral Re-bonded to Earth During Off-Grid Operation with Switched Earth (N-PE) Jumper



STEP 4: INSTALL BACKUP GATEWAY 2

WARNING: To ensure safe operation, **a local earth connection must be present** on the site such as by earth rod or ground electrode. During a grid fault it cannot be assumed that the DNO's Earth or Protective Earth Neutral (PEN) conductors are intact. Installation of earth rod must comply with local codes.

WARNING: Incorrect earthing or Neutral-to-Protective Earth (N-PE) bonding presents a risk of electrical shock or damage to equipment. Verify that the system is properly earthed and that the correct Neutral-to-Earth bonding scheme meets regional and local requirements.

See *Situations in Which Powerwall 3 Stops Grid Forming on page 167* for additional information on earthing and fault protection.

Make AC Power Connections to Supply and Load Panels

WARNING: Before making the AC power connections, turn the AC circuit breaker of the main service disconnect OFF and secure it against reconnection.

In each of the following steps:

- Strip the ends of the wires, install ferrules, and insert into the corresponding Backup Gateway terminal lugs.
- Using an M3 Allen bit, tighten the lugs to 4 Nm.

1. If the site short circuit current is between 10 kA and 16 kA, install 22x55mm DIN-mounted fuse holder and 22x58mm **type aM** cartridge fuse on the Backup Gateway's internal DIN rail. The fuse must be replaced in the cable between the Backup Gateway and the grid. See *Grid Supply Fuse and Fuse Holder on page 99* for additional information about fuse requirements.
2. Connect the main service conductors to the Backup Gateway Supply terminals according to the diagrams on the following page.

   CAUTION: Where site-level Residual Current Devices (RCDs) or Residual Current Circuit Breakers with Overcurrent Protection (RCBOs) are required, one of the following methods must be used to avoid risk of upstream RCD / RCBO nuisance tripping:

   - Relocate the site-level RCD / RCBO into the Backup Gateway enclosure after Gateway's contactor
   - Use a Type-S time-delayed RCD / RCBO upstream of Backup Gateway

     See *Residual Current Devices (RCDs) / Residual Current Circuit Breakers with Overcurrent Protection (RCBOs) on page 102* for additional information.
3. Connect the home load panel conductors to the Backup Gateway terminals according to the table on the following page.
4. Depending on the quantity of Non-Backup circuits, a Non-Backup panel will be required. Connect the conductors (Line(s), Neutral, and Protective Earth) from the Non-Backup panel to the Backup Gateway's Non-Backup terminals.

   Non-Backup circuits include: 3-phase PV inverters, 3-phase loads, large single-phase loads.
5. Connect the non-backup panel conductors to the Backup Gateway Non-Backup terminals according to the table on the following page. Any circuits connected here will *not* be powered when disconnected from the grid. During on-grid operation, these circuits are still metered by the internal site metering with no additional metering hardware required.

STEP 4: INSTALL BACKUP GATEWAY 2

WARNING: Installing 3-phase equipment on the backup circuit may result in equipment damage. The only exceptions to this rule are the Tesla Wall Connector or sockets feeding Tesla Mobile Connectors (please see the *Vehicle Charging During Power Outage* page for more information). The Powerwall system's backup phase should be connected to L1 of the Wall Connector or Mobile Connector socket.

WARNING: Always ensure all equipment is safely de-energized and locked out prior to working, to prevent risk of electric shock. To avoid shock hazard, never power on the system without a connection to Earth at the Gateway. The Earth bar and backplate voltage may float when ungrounded. If conducting earth loop impedance testing, ensure the Gateway always has a suitable Earth connection.

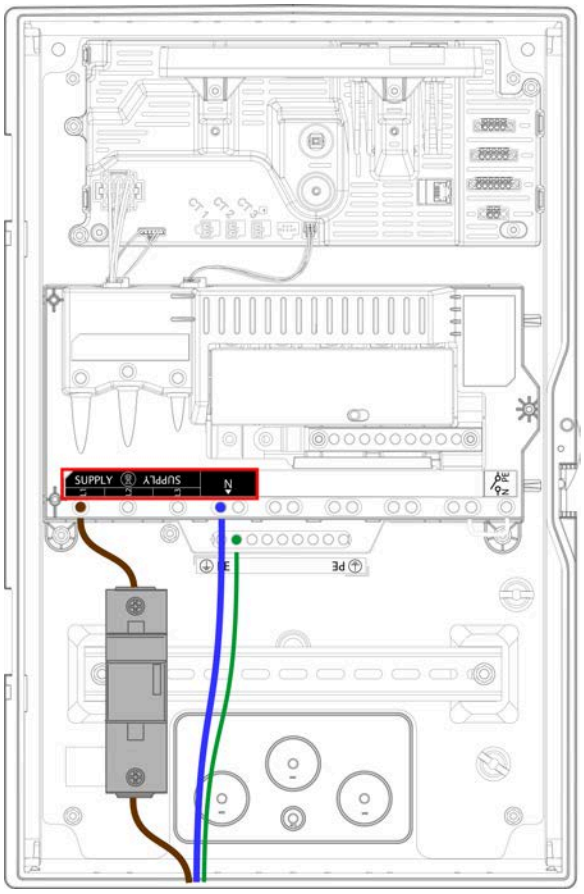
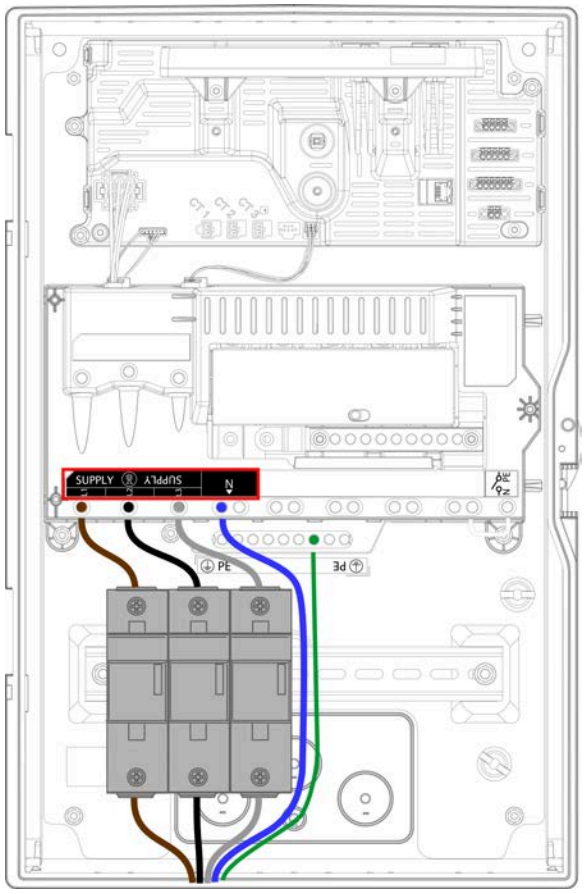
WARNING: Incorrect wiring of AC conductors presents a risk of electrical shock or damage to equipment. Before energizing the system, ensure all connections are made correctly according to the instructions in this document and in accordance with local wiring codes and regulations.

CAUTION: To ensure IP55 ingress protection, appropriate fittings and/or cable glands must be used to secure all cables passing into the enclosure.

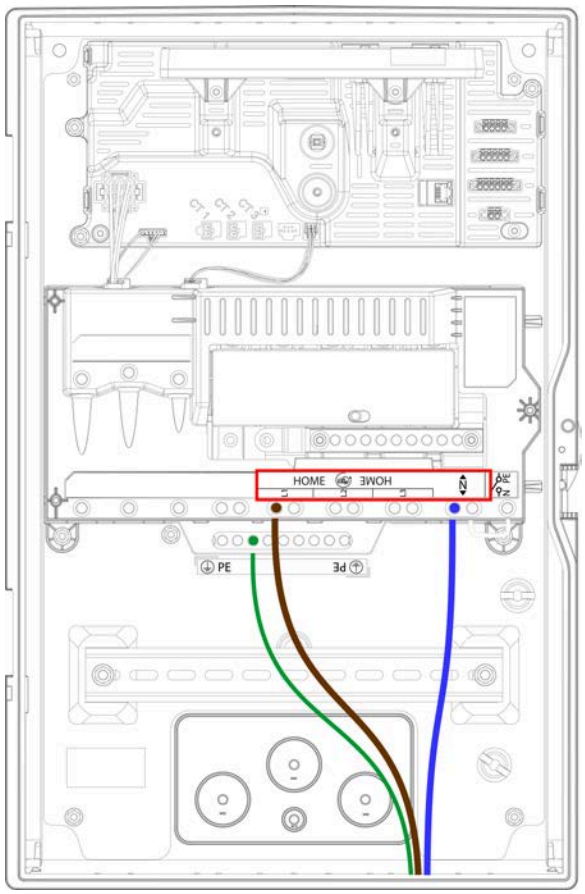
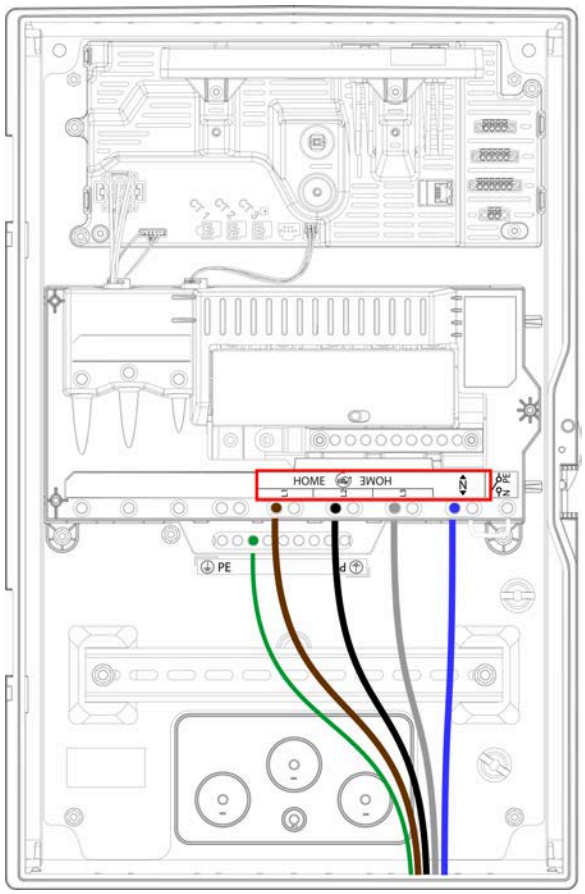
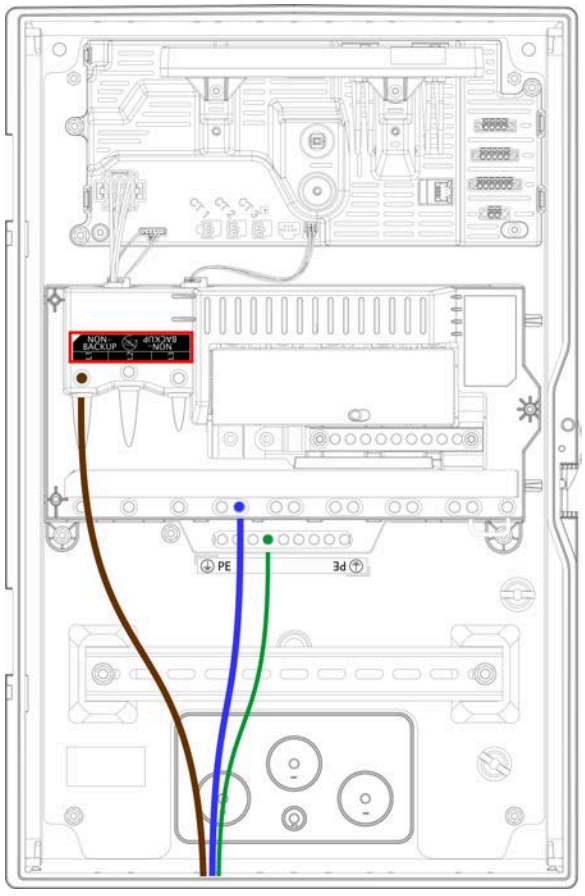
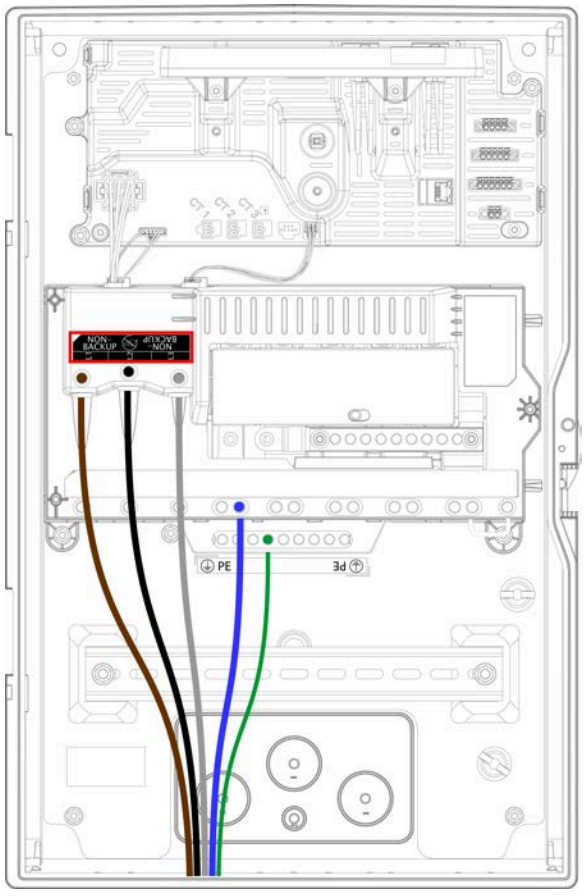
Refer to *Appendix B: Wiring Reference on page 94* for all wiring requirements and recommendations, including wire colors and gauges.

Refer to *Appendix C: System Wiring Diagrams on page 104* for example system wiring diagrams.

Table 2. Conductor Connections for Single Phase (left) and Three-Phase (right)

	Single Phase	**Three-Phase**
Supply Connections		

STEP 4: INSTALL BACKUP GATEWAY 2

Home Load and Backup Connections		
Non-Backup Connections		

Terminal	Maximum Wire Gauge	Strip Length	Torque
Supply	35 mm^2	12.5 mm	4 Nm
Non-Backup	35 mm^2	12.5 mm	4 Nm
Home (Backup)	35 mm^2	12.5 mm	4 Nm
Neutral terminal bar	25 mm^2	12.5 mm	4 Nm
PE terminal bar	25 mm^2	12.5 mm	4 Nm

Install Powerwall and Generation Breakers in the Backup Gateway

1. Install the Powerwall and generation circuit breakers on the DIN rail, and connect using an appropriately rated DIN rail circuit breaker busbar.

   WARNING: All Powerwalls in the system must be installed on the 'Backup' ('Home') side of the Backup Gateway's relay.

2. Connect the line conductors from the bussed generation circuit breakers to the Backup Gateway's Backup terminals (see the figure in *Residual Current Devices (RCDs) / Residual Current Circuit Breakers with Overcurrent Protection (RCBOs) on page 102*). These conductors must be appropriately rated to carry the current of the main supply fuse.
3. Connect Neutral and Protective Earth conductors from Powerwall and generation circuits to the Neutral and Protective Earth wiring bars, respectively.
4. Connect the Powerwall AC power conductors to its breaker in the Backup Gateway.

   Design Considerations

   CAUTION: If installing greater than 100 A of generation, a separate overcurrent protection (such as a generation sub-board) is required to maintain maximum current rating of the Backup Gateway.

   The Backup Gateway 2 can accommodate up to nine (9) 1-pole MCB slots on the DIN rail for generation circuits and fuse carrier(s).

   The Powerwall connection to the Backup Gateway requires a circuit breaker. This breaker serves as circuit protection for the Powerwall, and must be wired in accordance with local wiring codes and regulations. Refer to the *Required Supplies on page 28* section to select the appropriate Powerwall 3 breaker size depending on the desired power output (configured in the Tesla One app during *commissioning on page 81*).

   Some regions may require use of an external Residual Current Devices (RCD) / Residual Current Circuit Breakers with Overcurrent Protection (RCBO) on the solar PV inverter and/or Powerwall circuits. Refer to *Residual Current Devices (RCDs) / Residual Current Circuit Breakers with Overcurrent Protection (RCBOs) on page 102* for additional guidance.

   NOTE: Powerwall is a current-limited device. In event of a fault of negligible impedance between a live conductor and protective conductor or exposed-conductive-part while operating off-grid, Powerwall senses the corresponding voltage change and immediately shuts off. Voltage is reduced to a safe level within the required time per IEC 60364-4-41 / BS EN 7671 section 419. Thus, an RCD / RCBO is not required at the AC output terminals of the Powerwall to meet requirements of automatic disconnection.

Configuring Powerwall(s) on Three-Phase Installations

- When installing multiple Powerwalls, they must be distributed evenly across the three phases. Installation must meet local generation imbalance rules.
- During the commissioning process, the **Backup Phase** will be selected (L1, L2, or L3). During an outage, the system will provide backup power only to loads on this phase, and Powerwalls on other phases will not operate. Ensure that all critical loads in the Home Load Panel are connected on the desired Backup Phase.
- **To ensure Powerwall charges from solar production, the single-phase PV circuit(s) must be installed on the same phase as Powerwall(s).**

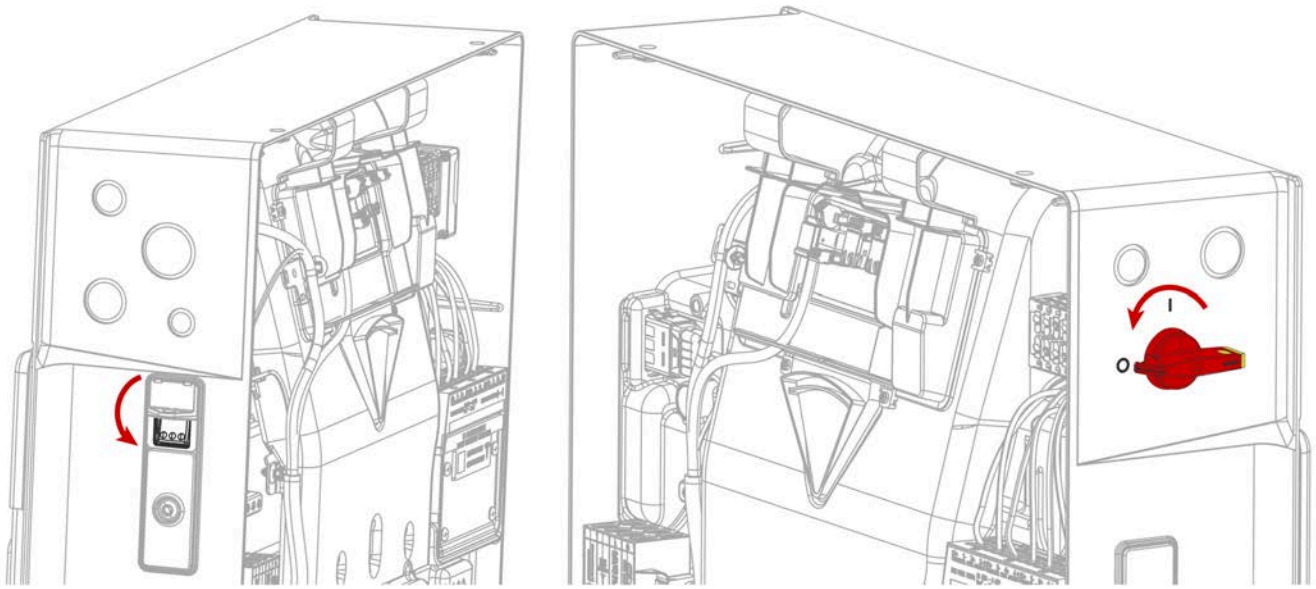
WARNING: Installing 3-phase PV inverters or 3-phase equipment on the Backup side may result in equipment damage during off-grid operation. 3-phase PV inverters and 3-phase equipment should always be installed on the Non-Backup side of the Backup Gateway. The only exceptions to this rule are the Tesla Wall Connector or sockets feeding Tesla Mobile Connectors (please see the *Vehicle Charging During Power Outage* page for more information). The Powerwall system's backup phase should be connected to L1 of the Wall Connector or Mobile Connector socket.

Inverter Configuration

During backup operation, the Gateway will shift the system frequency to control the power output of solar inverters. Therefore, all solar inverters connected to the Backup terminals should be configured for the local grid code. This ensures that the inverter will respond correctly to frequency curtailment efforts. If the inverter is not compliant with the grid code requirements, it might not perform as expected during Backup operation. This could lead to hardware damage due to over-voltage. Please see more information regarding backup operation on our *website*.

STEP 5: CONNECT POWERWALL 3 TO BACKUP GATEWAY

1. Before terminating any conductors inside Powerwall 3, turn the Powerwall 3 switch OFF to shut the system down, then turn the integrated DC isolator OFF.



WARNING: Before proceeding, confirm both switches are OFF and there is a lack of voltage at the AC and PV terminals.

2. Run the 4-conductor communication cable from the Backup Gateway through the conduit or cable gland and pull it into the Powerwall 3 wiring compartment.

CAUTION: At Powerwall 3, Tesla recommends routing the communication wiring into the left side of the enclosure; always use the wire management tabs to ensure wires do not block the Tesla Asset Controller. Do not route loose wires through the front of the enclosure.

NOTE: See *Plan Cable Length Between Components on page 34* for the maximum distance between components.

3. At the Backup Gateway, strip the communication wire jacket about 76 mm and strip each conductor 8 mm.
4. At Powerwall 3, strip the communication wire jacket so that it does not extend past the edge of the fan duct and strip each conductor 8 mm.

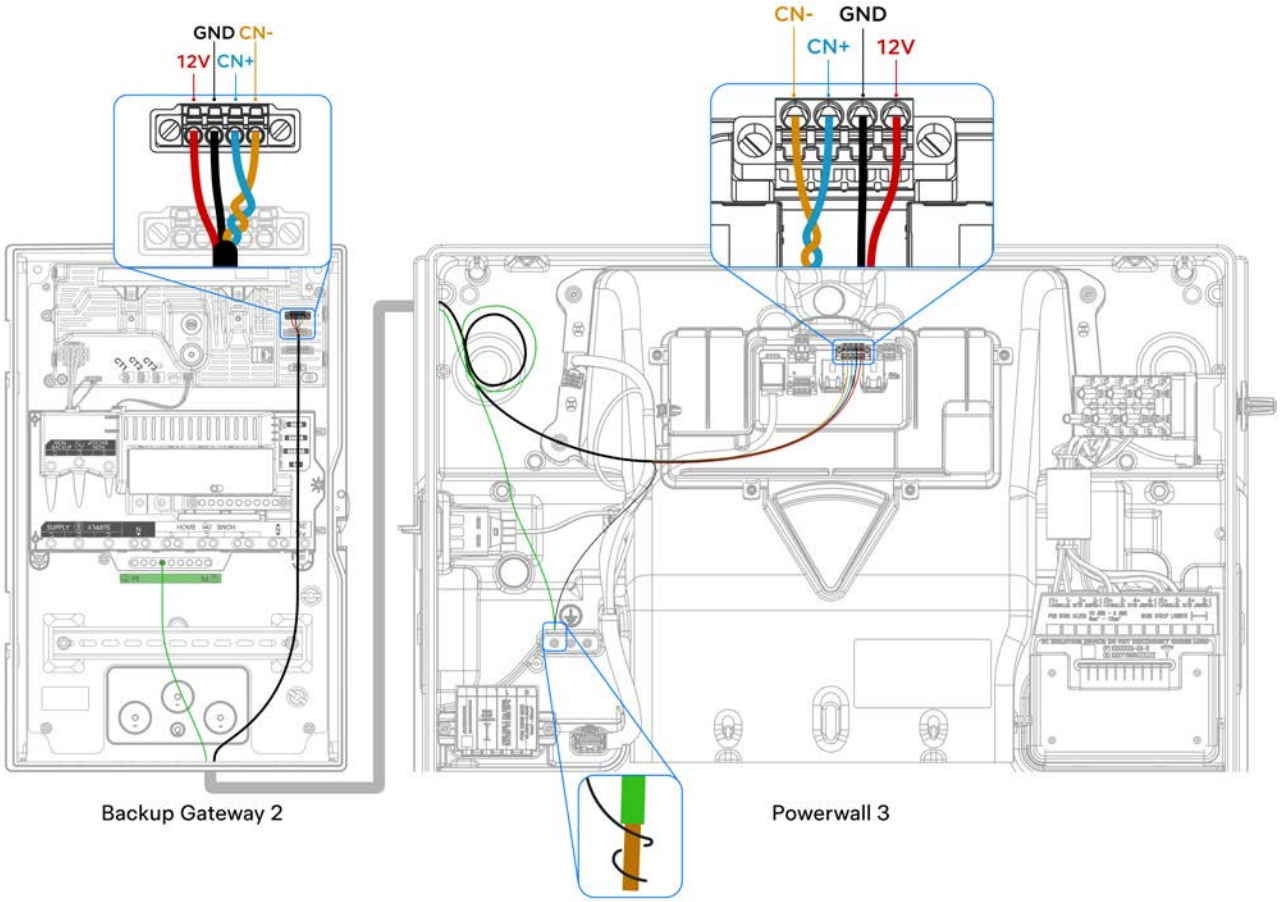
NOTE: Stripping the communication wire jacket past the fan duct ensures the individual conductors lie flat, leaving room for the front cover to be installed.

5. At the Backup Gateway, cut back the drain wire. **The drain wire should be terminated at the Powerwall 3 ground terminal only**
6. For each connector:
    a. Insert a cabinet tip or electronics tip slotted screwdriver (up to 3 mm) to open each connector lever.

b. Insert each conductor as far as possible into the terminal and then release the connector lever to close the connector.

> **CAUTION:** Excessive force may damage the connector; do not apply more force than is necessary to open the terminal and insert the conductor (do not lean on connectors when prying them open).

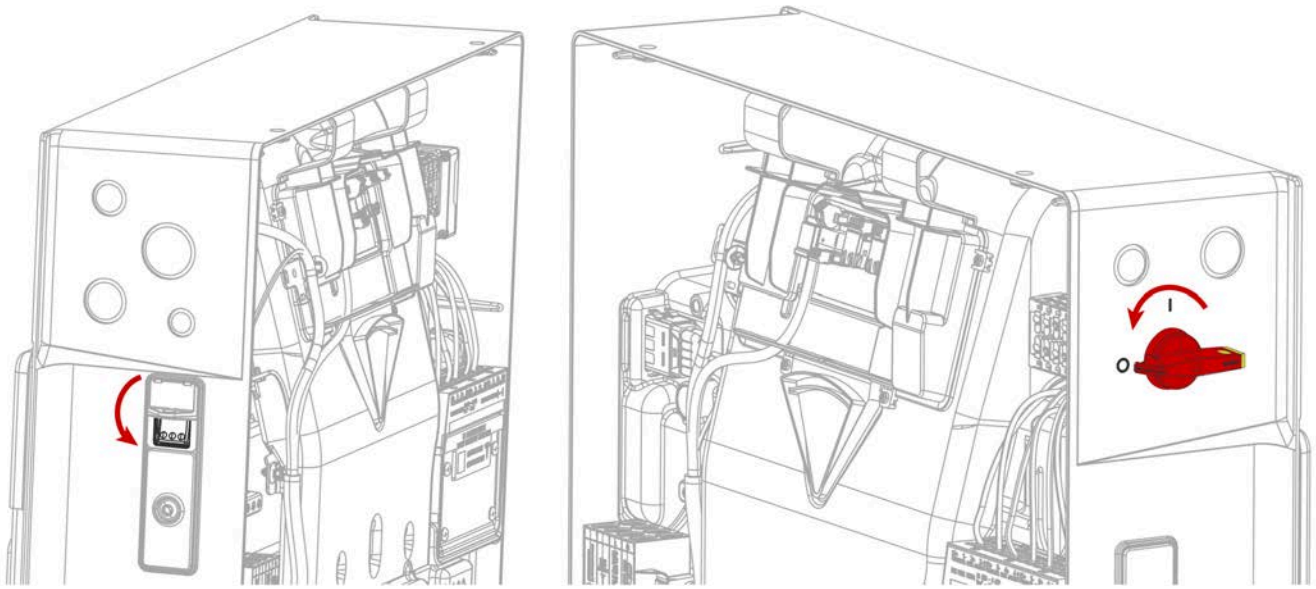
> **NOTE:** Reference *Backup Gateway 2 Wiring on page 99* and *Powerwall 3 AC and PV Wiring on page 94* for the correct wire order in each unit's Communication connector.



7. At the Backup Gateway, plug the 4-pin connector into the 4-pin socket labeled "Powerwall". Tighten the screws on the connector.
8. At Powerwall 3:
   a. Plug the 4-pin connector into the 4-pin socket.
   b. Wrap the communication cable drain wire around the Protective Earth lead and insert the wires in the equipment grounding terminal. Tighten the screw to 4.5 Nm.

STEP 6: MAKE POWERWALL 3 AC CIRCUIT CONNECTIONS

1. Before terminating any conductors inside Powerwall 3, turn the Powerwall 3 switch OFF to shut the system down, then turn the integrated DC isolator OFF.

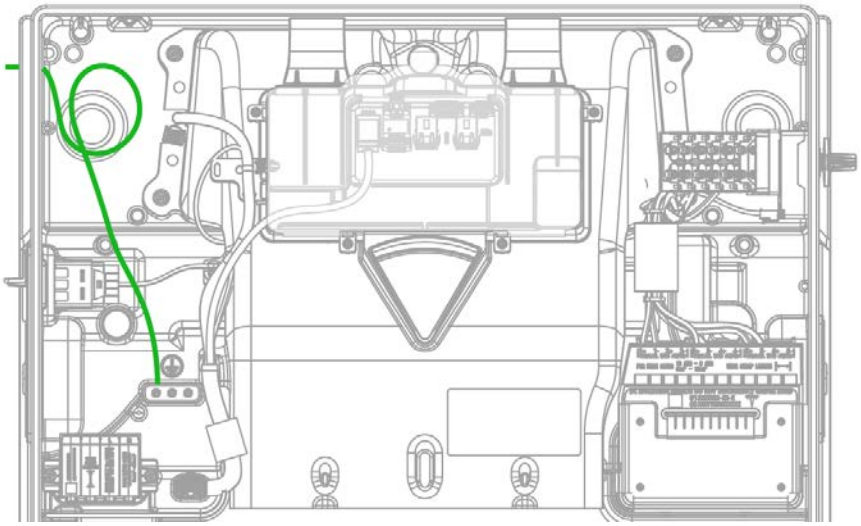


WARNING: Before proceeding, confirm both switches are OFF and there is a lack of voltage at the AC and PV terminals.

2. (Conduit installations only) Run conduit as needed and attach the conduit fitting to the Powerwall 3 AC wiring knockout.
3. Run the AC Line, Neutral, and the Protective Earth conductors through the conduit or cable gland. Route the conductors to the appropriate terminals, creating a service loop with the extra wiring.
4. Clear out any debris that may be present in the AC wiring terminals.

WARNING: Metal debris like loose wires or metal shavings could create a high voltage risk when Powerwall is turned on.

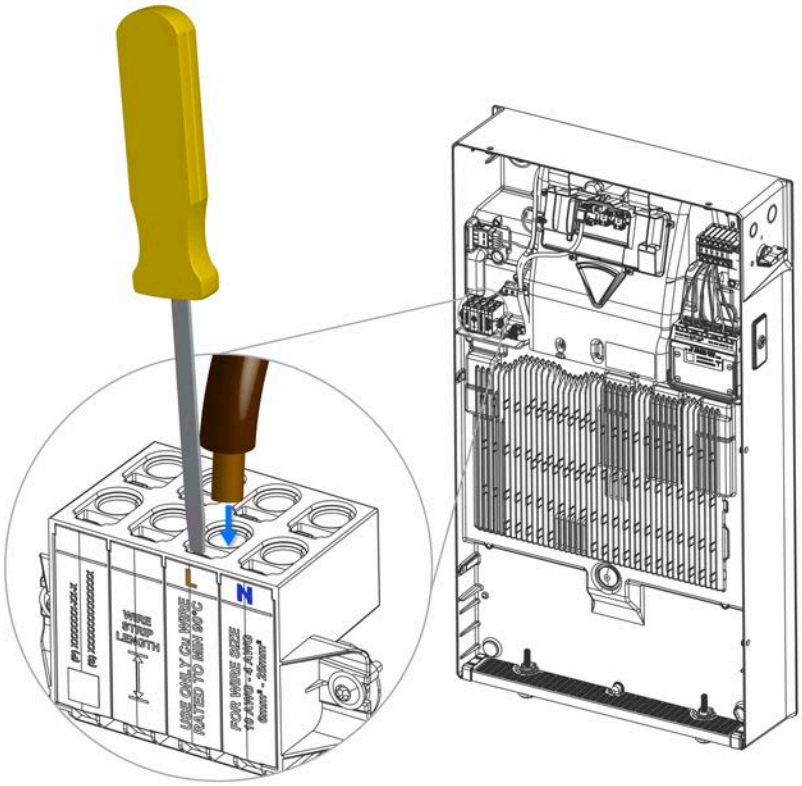
5. Connect the Protective Earth:
    a. Strip the conductor insulation up to 19 mm.
    b. Insert the grounding conductor in an equipment grounding terminal and tighten the screw in the Earth terminal to 4 Nm.



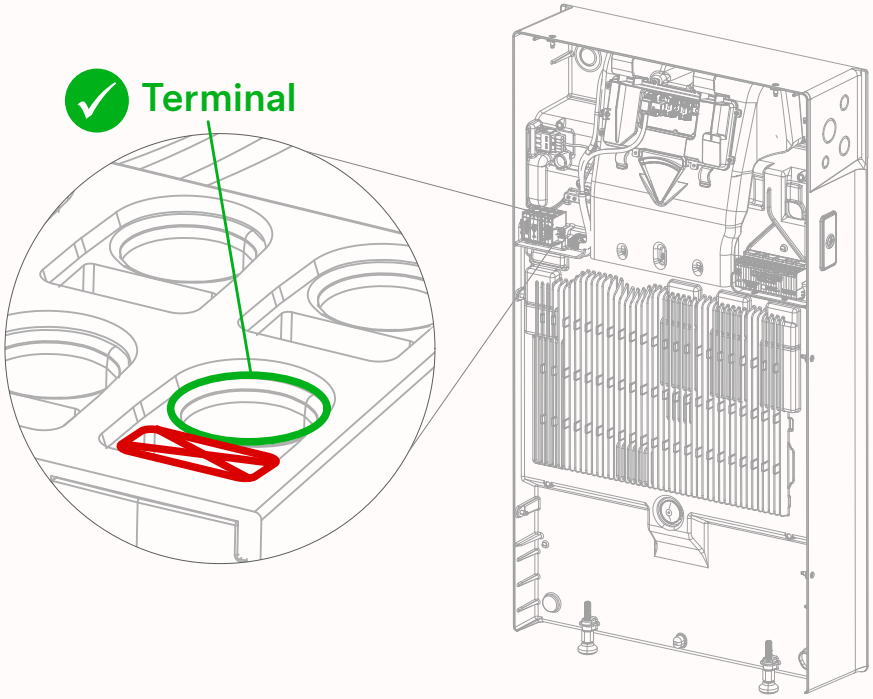
NOTE: It is best practice to connect the ground circuit before making any AC circuit connections.

6. For each AC conductor:
   a. Strip the conductor insulation up to 11 mm. Add a wire ferrule if the conductor is finely stranded.
   b. Insert the conductor as far as possible into the terminal.

Figure 13. Insert Conductor in Terminal



WARNING: Ensure the conductors are inserted into the round terminals and not the rectangular slots. Inserting the conductors anywhere other than the round terminals will result in poor wire termination.



c. Perform a pull test to ensure the conductor is fully seated in the terminal. Push the conductor back in after the pull test.

Figure 14. Powerwall 3 AC Wiring (Entering from Right)

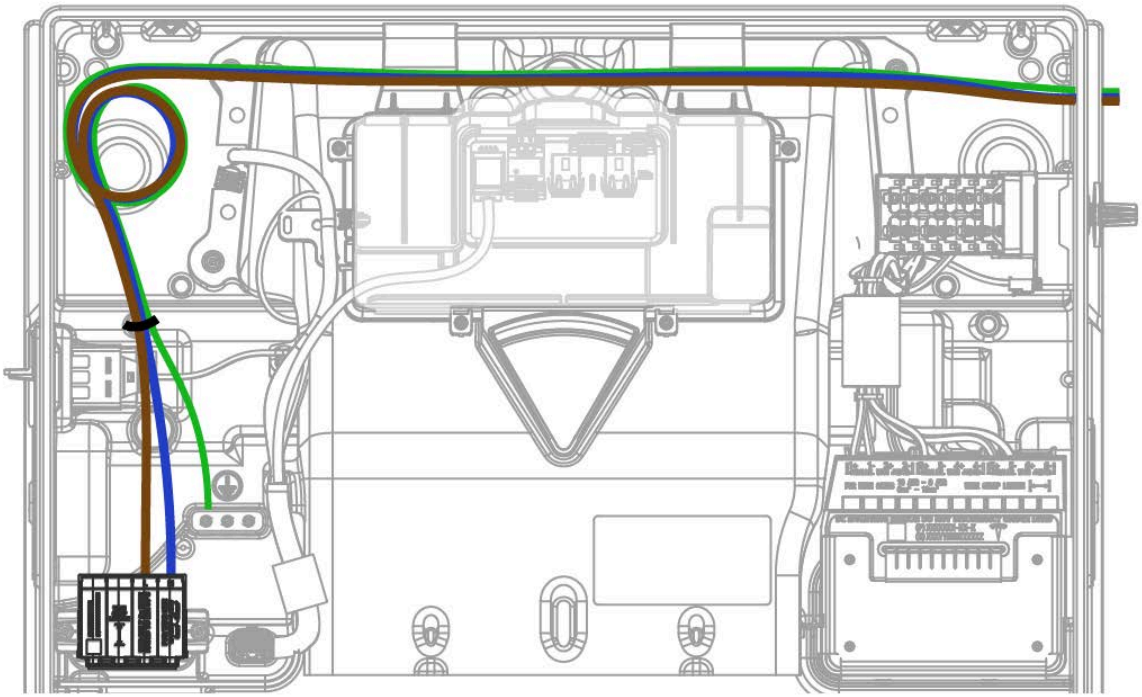
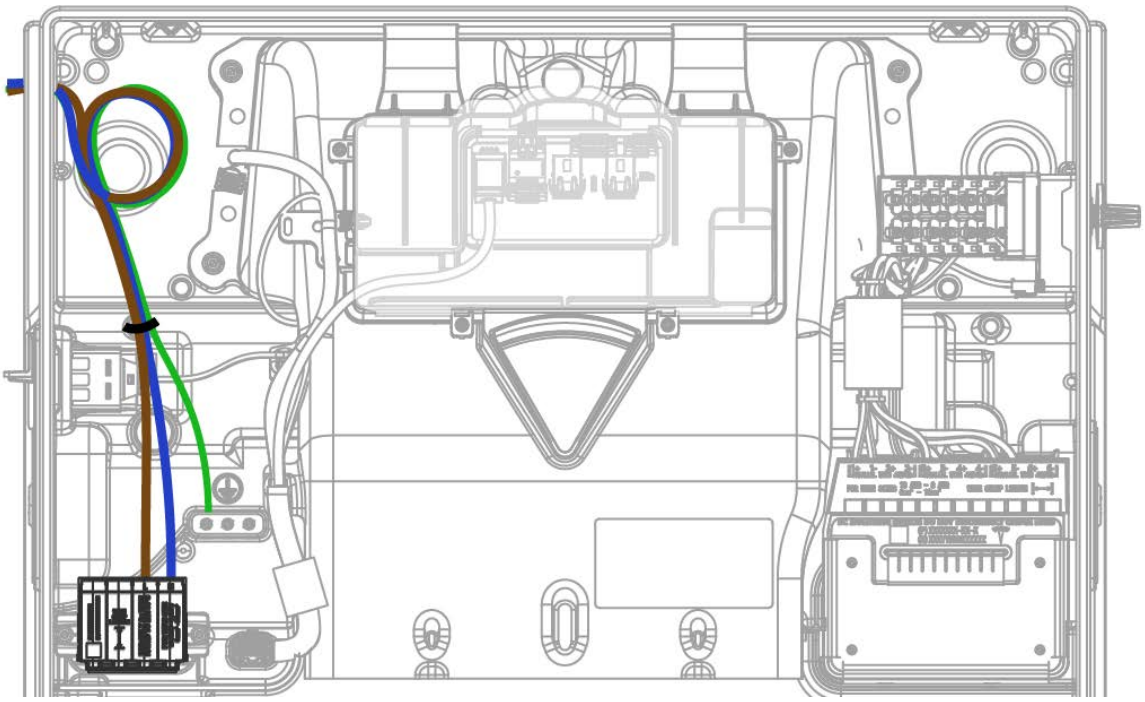


Figure 15. Powerwall 3 AC Wiring (Entering from Left)



CAUTION: Any wire routing must be done through the wire management tabs at the top of the enclosure. Do not route loose wires through the front of the enclosure or over the Tesla Asset Controller.

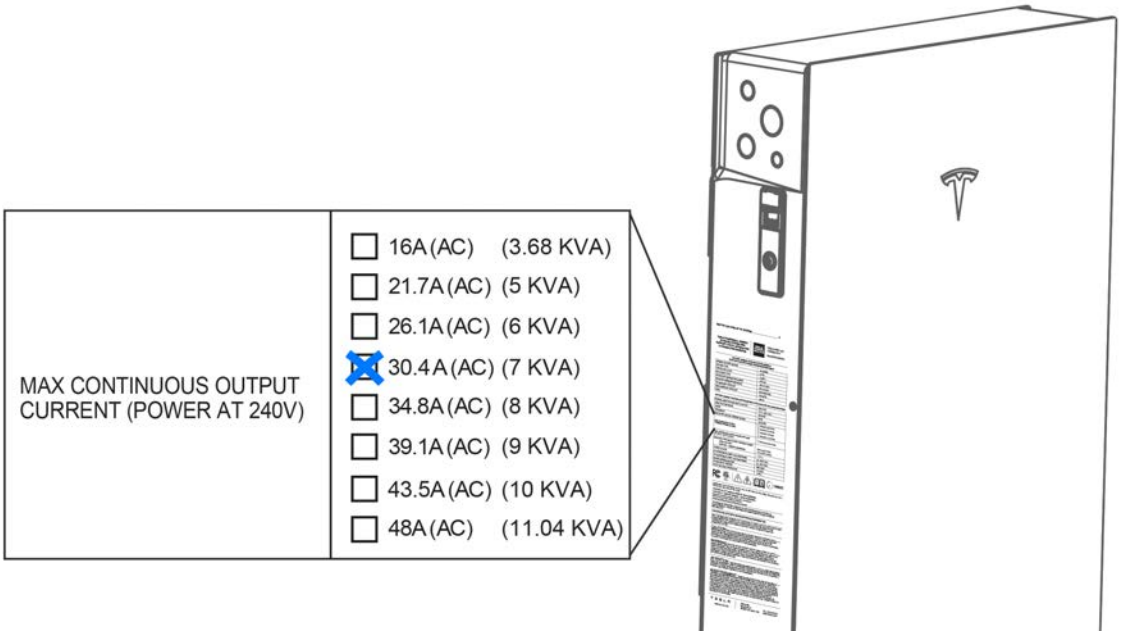
d. After installing the conductors, gather them and secure them with the provided cable tie as shown above.

NOTE: If a conductor must be removed from the connector, insert a cabinet or electronics tip slotted screwdriver (up to 4.5 mm) into the actuation shaft to open the terminal. Pull the conductor free, then remove the screwdriver.

Figure 16. Spring Terminal with Screwdriver and Insert Conductor in Terminal

7. On the Powerwall 3 product label on the left side of the unit, use a paint pen, permanent marker, or similar to mark the configured power / current output (see *Install Powerwall and Generation Breakers in the Backup Gateway on page 54* for breaker size options).

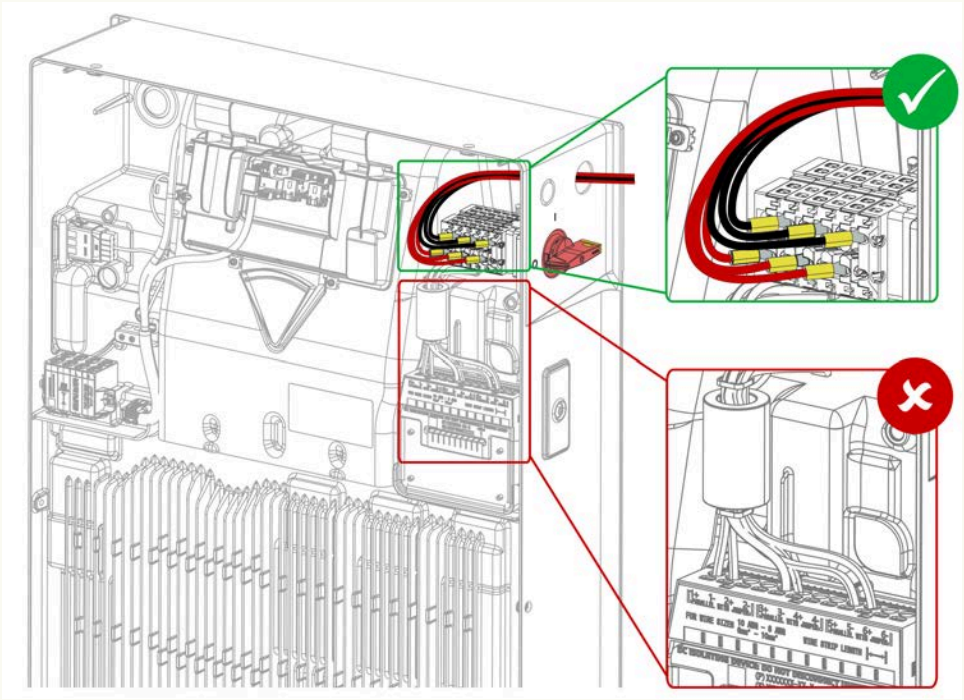
STEP 6: MAKE POWERWALL 3 AC CIRCUIT CONNECTIONS



STEP 7: MAKE SOLAR PV CONNECTIONS

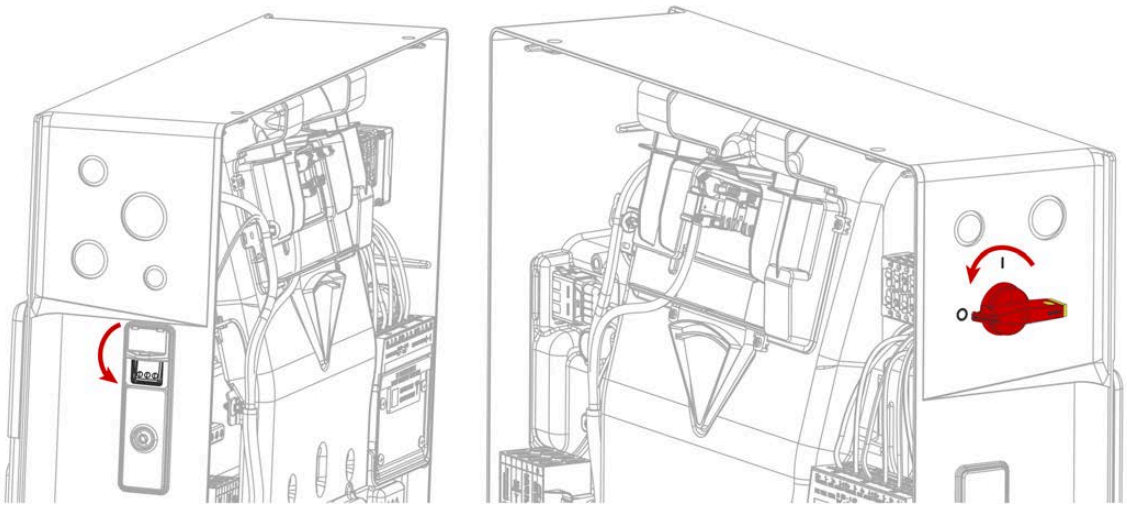
NOTE: See *Powerwall 3 AC and PV Wiring on page 94* for wiring specifications.

CAUTION: Only connect PV wires to the integrated DC isolator as described in this step. Do not attempt to modify factory-installed wiring or connect PV wires to any other terminals.



NOTE: If there are more than three PV strings, strings can be combined upstream of Powerwall 3 so long as the voltage and current ratings of the system do not exceed the capabilities of Powerwall 3.

1. Before terminating any conductors inside Powerwall 3, turn the Powerwall 3 switch OFF to shut the system down, then turn the integrated DC isolator OFF. See *Powerwall 3 Switch Locking Mechanisms on page 114* for instructions to lock the integrated DC isolator in the OFF position.



WARNING: Before proceeding, confirm both switches are OFF and there is a lack of voltage at the PV terminals.

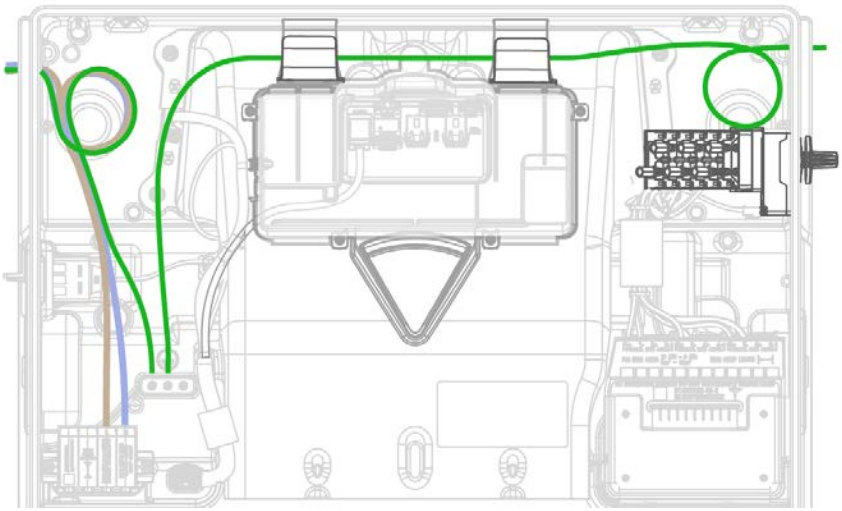
2. Install external DC isolation (see *Appendix D: Install External DC Isolation on page 107* for details).

NOTE: To facilitate safe maintenance and testing, some regional electrical codes require a means of isolating the PV array be provided adjacent to a PV inverter. The integrated DC isolator in Powerwall 3 provides a means to switch-off the feed from the PV array, however the PV wires terminated within the Powerwall 3 remain live. To achieve full code compliance, it is necessary to provide a means of PV array isolation external to the Powerwall 3.

3. Clear out any debris that may be present in the PV wiring terminals.

WARNING: Metal debris like loose wires or metal shavings could create a high voltage risk when Powerwall is turned on.

4. Route the PV conductors and PV array Protective Earth into the enclosure, through the conduit or cable gland. Create a service loop with extra wiring.
5. Connect the PV array Protective Earth to an equipment grounding terminal in Powerwall:
   a. Strip the conductor insulation up to 19 mm.
   b. Insert the grounding conductor in an equipment grounding terminal and tighten the screw in the Earth terminal to 4 Nm.



NOTE: It is best practice to connect the ground circuit before making any PV circuit connections.

6. Starting with MPPT 1:

NOTE: If MPPT 1 is not wired first, it will not be possible to access that wiring terminal once conductors are connected to MPPT 2 or MPPT 3.

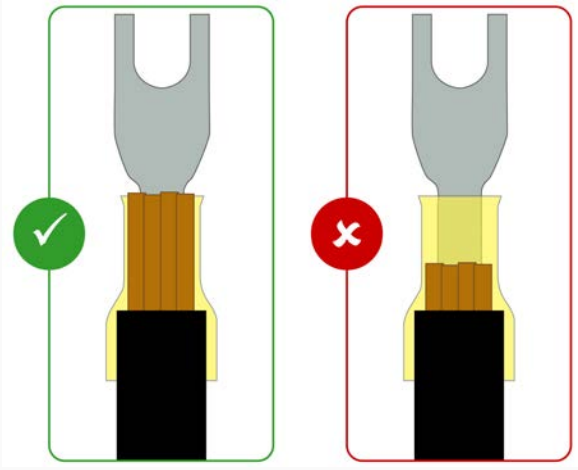
WARNING: Before proceeding, confirm there is a lack of voltage on the PV wires.

   a. Strip the conductor insulation so that the ends of the copper strands are visible.
   b. Crimp the following insulated forked terminal onto the end of the conductor; a ratcheting die crimping tool is strongly recommended.
      - TE Connectivity P/N 165015 (4 - 6 mm^2 wire size)

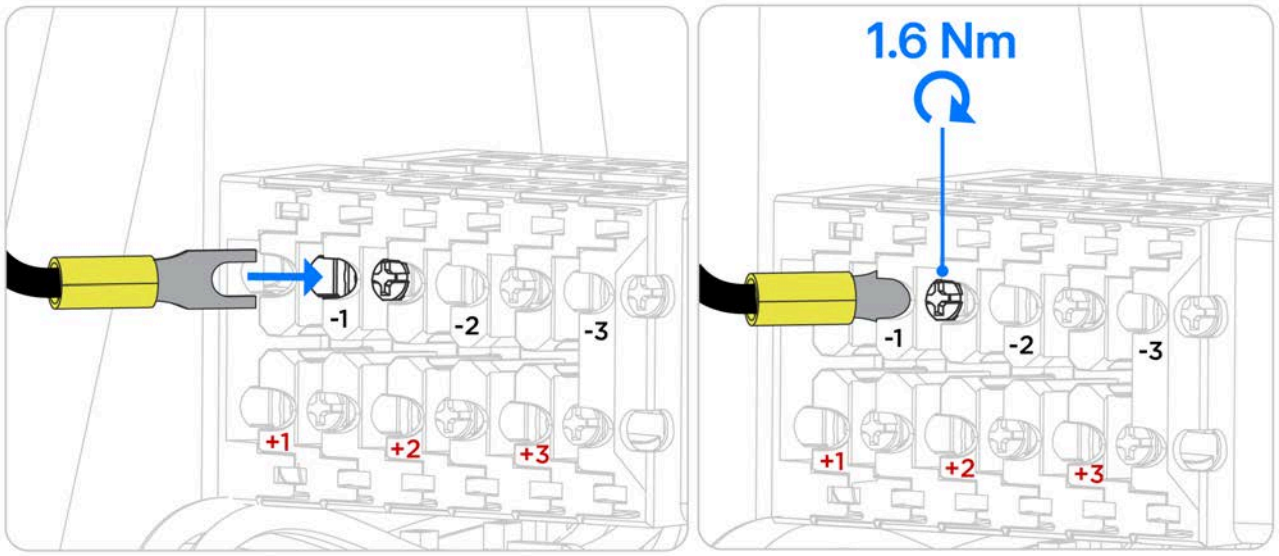
CAUTION: Forked terminals are required for PV wiring. Do not connect bare wires or any type of forked terminal other than those listed above due to increased risk of poor electrical connection.

CAUTION: Do not attempt to connect multiple wires to a single forked terminal. If the system has more than three PV strings, combine strings upstream of Powerwall 3 and connect no more than three strings to the integrated DC isolator.

NOTE: Ensure the ends of the copper strands are visible at the bottom of the fork, indicating the conductor is making strong contact with the forked terminal.



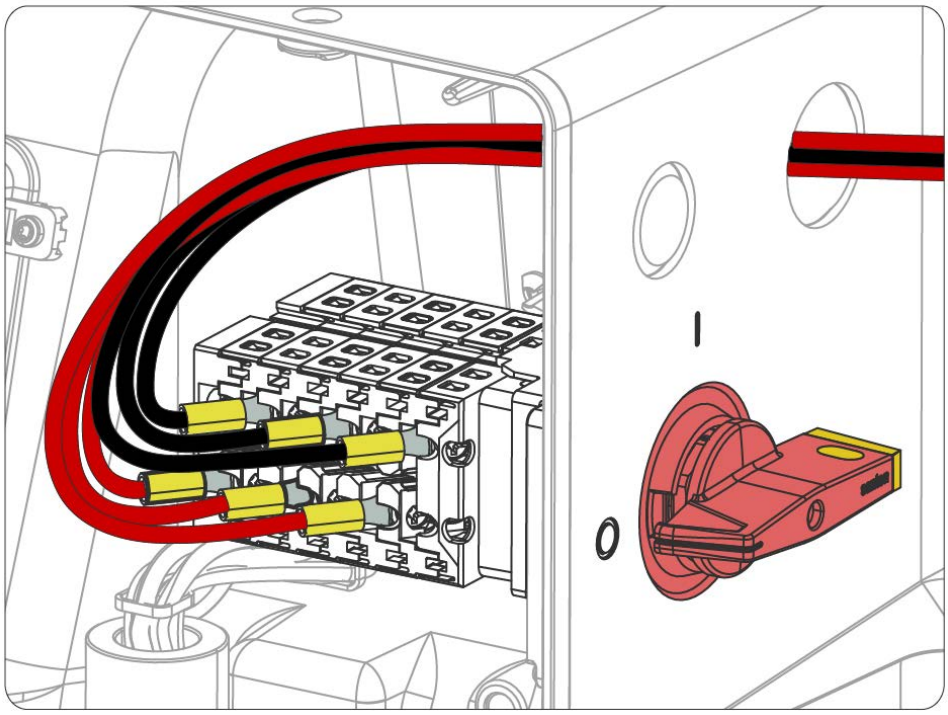
c. Insert the forked terminal into the wiring terminal and, using a Philips PH2 torque screwdriver (see *Required Tools on page 30* for additional details), tighten the screw in the PV wiring terminal to 1.6 Nm.



CAUTION: Confirm the forked terminal is fully inserted before tightening the screw to avoid damaging the connector.

7. Repeat Step 5 for MPPT 2, then MPPT 3.

Figure 17. Powerwall 3 PV Wiring Connected to Integrated DC Isolator



CAUTION: Before energizing the system, use a multimeter to confirm the polarity of the PV strings is as pictured above (positive strings in bottom row of terminals, negative strings in top row of terminals). Reversed polarity of the PV strings may cause damage to the system.

Figure 18. Powerwall 3 PV Wiring and Protective Earth (Entering from Left)

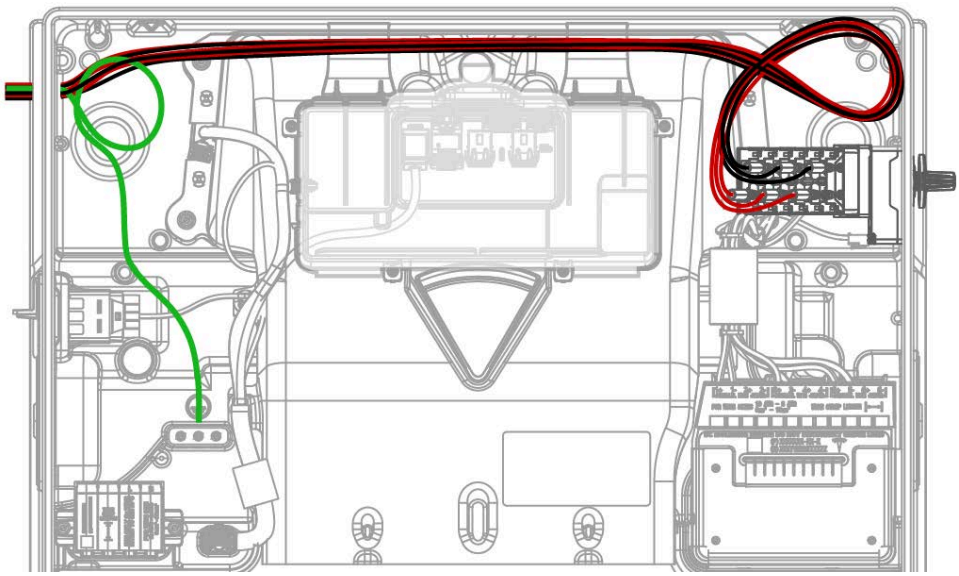
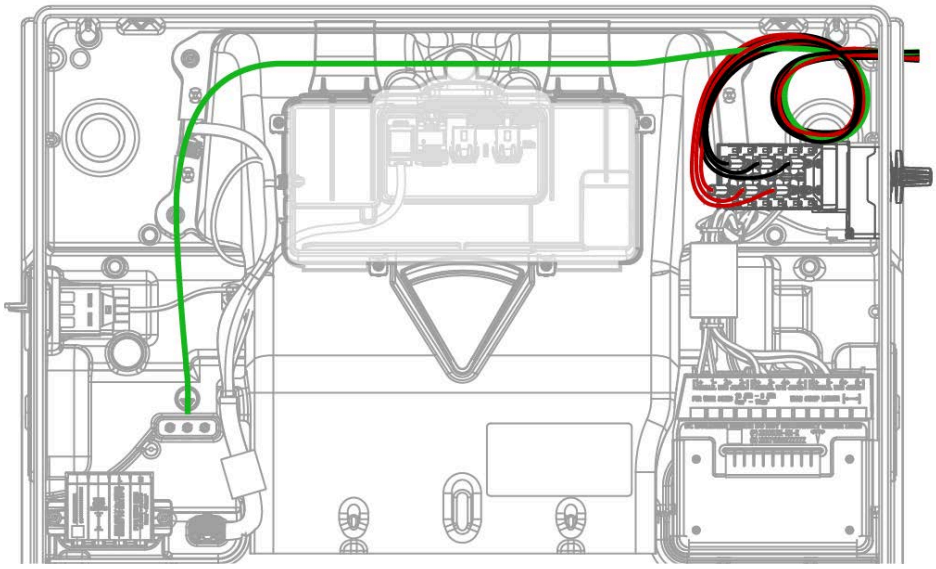


Figure 19. Powerwall 3 PV Wiring and Protective Earth (Entering from Right)



CAUTION: All PV strings must pass through the integrated DC isolator. Do not attempt to connect PV strings via any other terminals. For more information on the integrated DC isolator, see *Appendix H: Shutting Down Powerwall 3 on page 166*.

CAUTION: Any wire routing must be done through the wire management tabs at the top of the enclosure. Do not route loose wires through the front of the enclosure or over the Tesla Asset Controller.

STEP 8: INSTALL CLAMP-ON FERRITE CORES

Powerwall 3 ships with (6) clamp-on ferrite cores for AC wiring and the Powerwall Protective Earth. Additional ferrite cores are factory-installed for the PV wiring and the Tesla Asset Controller (TACO) low voltage harness.

CAUTION: Ferrite cores are fragile; handle with caution.

CAUTION: Ensure all conductors have been stripped properly so that no live conductors come in contact with the ferrite cores.

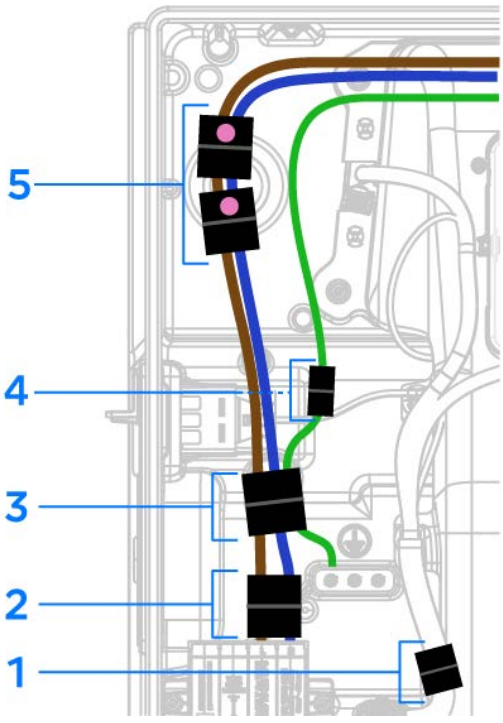
NOTE: All ferrite cores provided with Powerwall 3 are split core; they can be opened to be placed around the conductor(s) rather than threading them over the conductor(s).

1. Install the **small square** clamp-on ferrite core around the TACO factory-installed harness.

   NOTE: If the ferrite core has already been installed by the factory, skip this step. If the accessory bag contains an additional small square ferrite core when there is already one installed on the harness, the extra ferrite core can be recycled or saved as a spare.

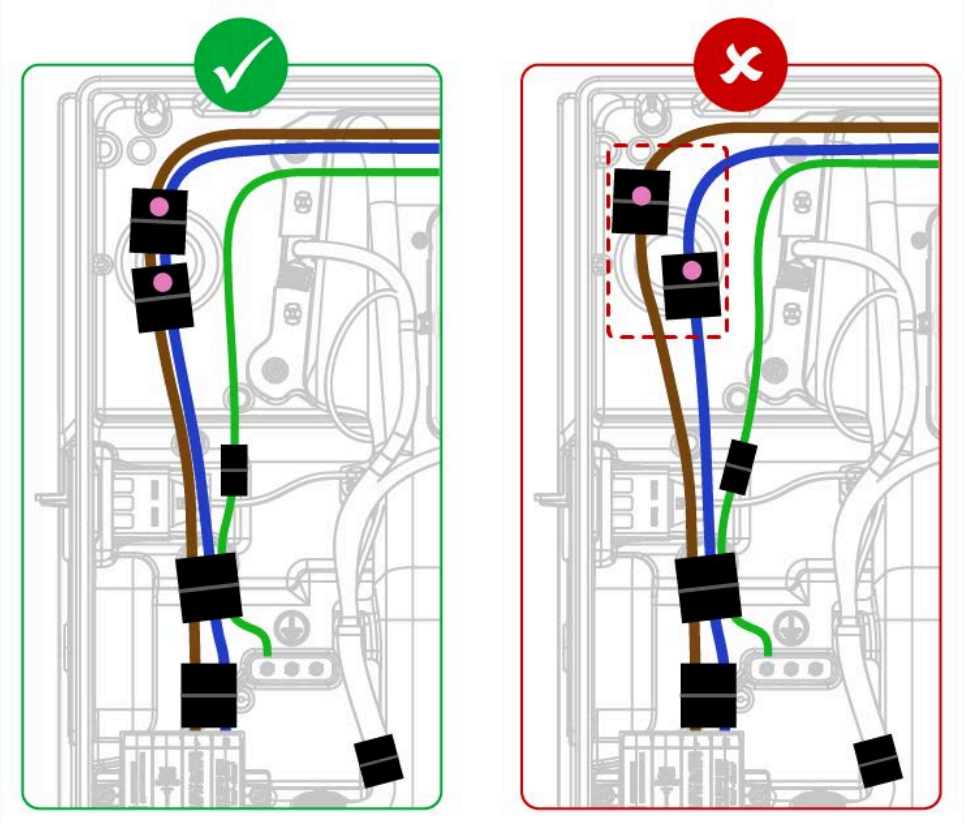
2. Install (1) of the **medium** clamp-on ferrite cores around L1 and N. Ensure the ferrite core is as close to the AC connector as possible without bending or deforming the wires.
3. Install (1) of the **medium** clamp-on ferrite cores around L1, N, and the Protective Earth.
4. Install the (1) **small** clamp-on ferrite core around the Protective Earth.
5. Install the (2) **marked (with pink sticker) medium** clamp-on ferrite cores around L1 and N in the top of the wiring compartment.
6. Secure all ferrite cores closed with the provided cable ties.

Figure 20. Ferrite Core Around AC Conductors and Protective Earth



STEP 8: INSTALL CLAMP-ON FERRITE CORES

NOTE: Ensure the ferrite cores are installed as described here; for instance, do not clamp a ferrite core around only L1 or N when it is required to be clamped around both L1 *and* N:



STEP 9: INSTALL ENERGY METERING FOR THE SYSTEM

Visibility on power and energy data is needed for the Powerwall 3 system to operate properly. An energy meter accomplishes this by measuring voltage (by voltage tap) and current (by Current Transformer, CT) at certain points in the system.

There are many possible configurations for installing metering depending on system design. However, there are two goals:

- **Metering the Site** – Site meters show the overall power flow to/from a site from the Grid's perspective. Thus, Site meter(s) must be installed upstream of all solar production, Powerwalls, and loads.
- **Metering Solar** – Solar meters capture production from PV inverter(s). There must not be any loads or Powerwalls behind the Solar CTs. This would result in under- or over-estimation of solar production. In this system, Powerwall 3 performs its own Solar metering. Standalone (AC-coupled) solar inverters must be metered by Backup Gateway 2 Meter Y.

Figure 21. Example Whole Home Backup Metering Diagram

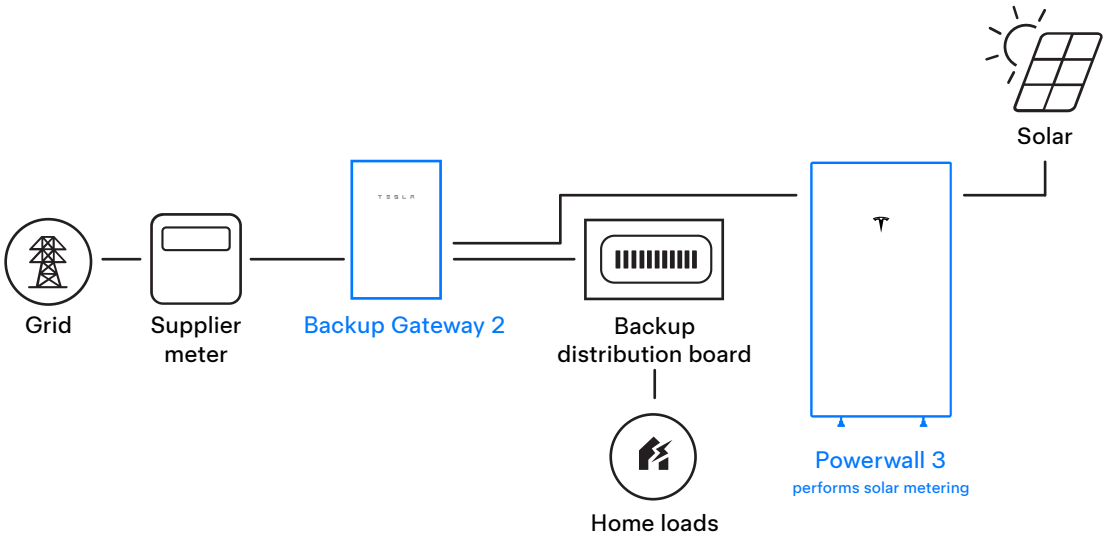
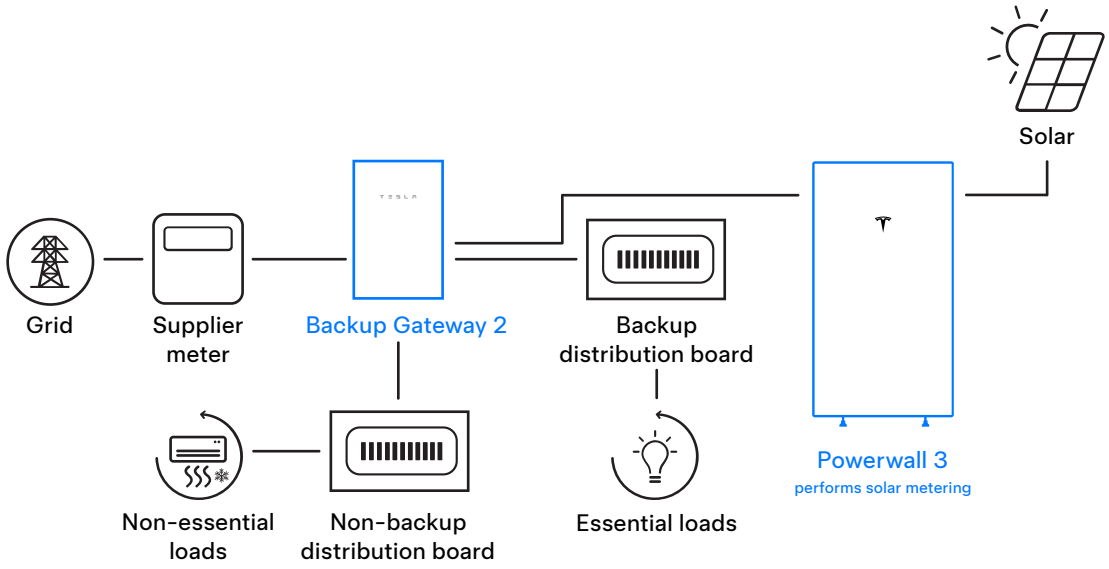
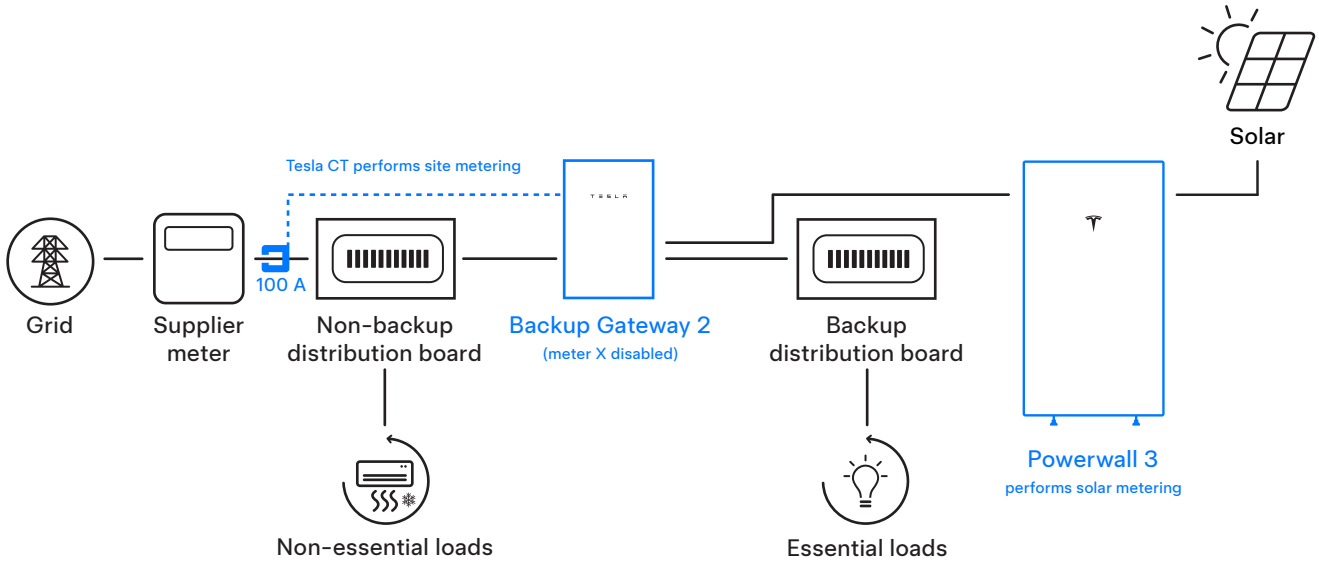


Figure 22. Example Partial Home Backup Metering Diagram: Non-Backup Distribution Board Connected to Non-Backup Lugs



NOTE: See *Conductor Connections for Single Phase (left) and Three-Phase (right) on page 52* for the location of the Non-Backup lugs.

Figure 23. Example Partial Home Backup Metering Diagram: Meter Y Measures Upstream Non-Backup Loads



Site Metering for Backup Gateway 2

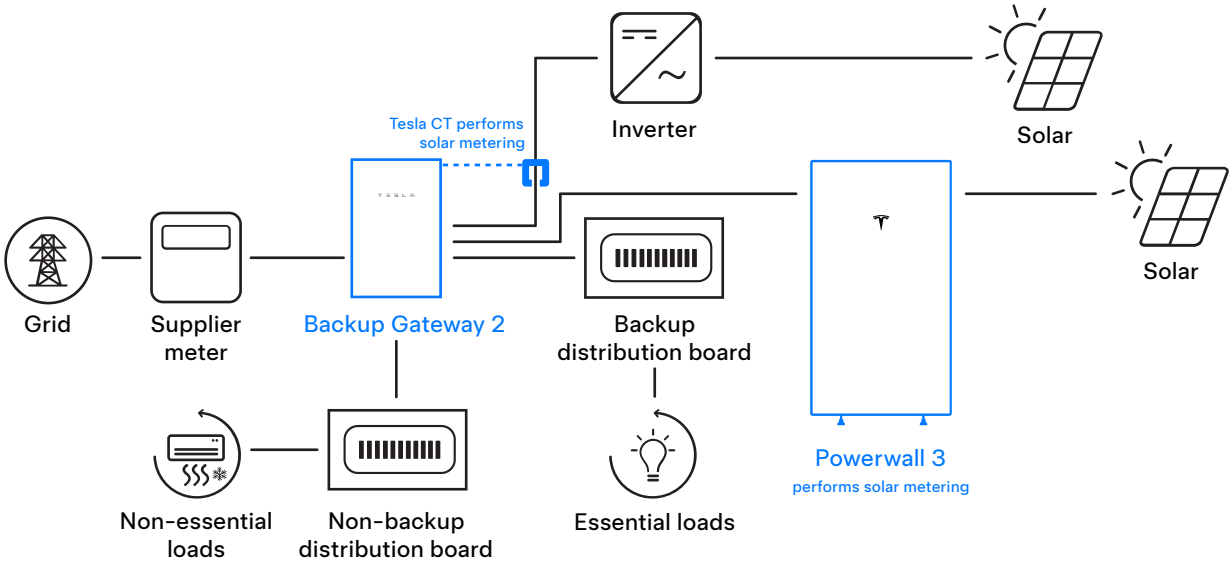
Backup Gateway 2 makes metering simple with built-in options for Site metering:

- **Internal Primary Meter (Meter X)** – This Site meter may be used when the Grid connection is at the *Supply* terminals. No additional steps are needed during install.
- **Internal Auxiliary Meter (Meter Y)** – If there are any loads or solar upstream of the Supply terminals, or if the system includes standalone (AC-coupled) solar, Tesla 100 A CTs connected to the Internal Auxiliary Meter can be used to measure loads / solar less than 100 A. One Tesla 100 A CT is included in the Accessory Kit, and additional CTs (Tesla P/N 1467316-00-x) may be ordered individually.

The Tesla 100 A CTs may be extended a max distance of 330 ft (100 m) by splicing twisted pair or using the Tesla 100A CT Extension (10 ft/3 m) (Tesla P/N 1467274-00-x). Use minimum 600V 0.5 mm^2 conductors or larger to extend CTs up to 330 ft (100 m). Voltage rating of the extension wire must be equal to or greater than all other adjacent circuits.

Solar Metering for Standalone Solar

Solar must be monitored using Backup Gateway Meter Y and Tesla 100 A CTs. The CT is connected to the Backup Gateway Internal Auxiliary Meter (Meter Y). Meter Y has three (3) CT ports, and one Tesla 100 A CT is included in the Backup Gateway accessory kit. Additional Tesla 100 A CTs (Tesla P/N 1467316-00-x) may be ordered individually. See *Install Tesla 100 A CTs on page 73* for instructions.

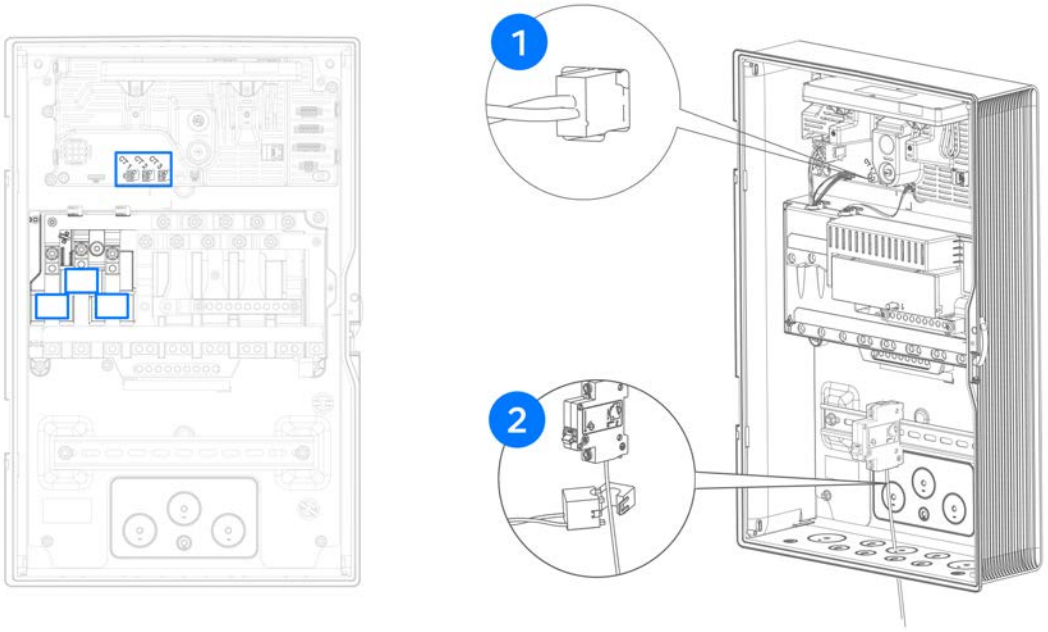


Install Tesla 100 A CTs

WARNING: Before installing, disconnecting, and/or adjusting CTs, ensure the circuits being measured are not energized and the system is completely powered down. Failure to de-energize the system may compromise operator and equipment safety.

1. Plug the Tesla 100 A CT into the terminal in the Backup Gateway. Ensure the connector is fully seated in the terminal.
2. Clamp the CT around the conductor to be measured.

Figure 24. Embedded Site CTs and Solar CT Connectors



Tips

- When metering 3-phase solar inverters, install CTs on L1, L2, and L3 output of the solar inverter AC circuit.

  NOTE: A single CT can be installed on L1 and connected to CT1 port to measure the solar power from a 3-phase solar inverter. Make sure to toggle **1CTx3** button to the ON position when configuring the CT during commissioning; the software triples the power measured by the CT. To ensure that the total power output calculated by software is correct, the solar power must be converted by a balanced 3-phase solar inverter, which distributes power evenly between the three phases.

- Ensure CTs are facing the proper direction as indicated on the label. A CT will show negative current if installed backwards.

STEP 10: COMPLETE THE INSTALLATION

Plan Internet Connection for Powerwall

Internet connectivity is required to receive the full 10-year Powerwall warranty, and for the customer to see their system in the Tesla App.

Cellular is available for commissioning and as a backup connection when Wi-Fi or Ethernet connections are lost. Once Powerwall has been registered to the customer, they can configure a Wi-Fi connection using the Tesla app. For customers without a strong Wi-Fi connection, install an Ethernet connection as follows.

NOTE: If the customer Wi-Fi network is available during the installation, the Wi-Fi connection can be configured during Device Setup.

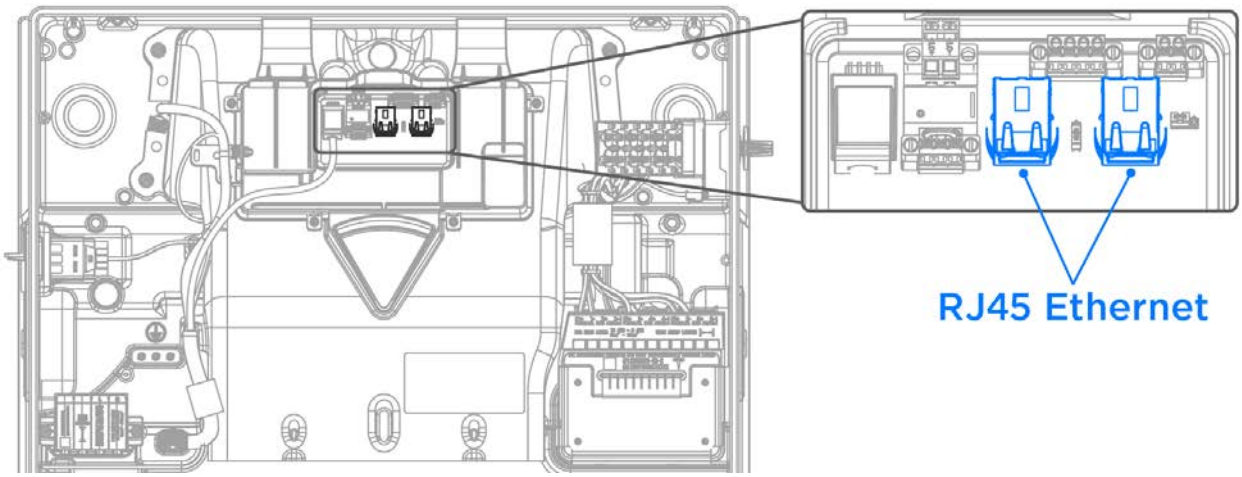
Install Ethernet Connection

- Ethernet cable must be CAT5 cable at minimum.
- If not possible to run an Ethernet cable directly to the customer's network router, Powerline Ethernet socket adapters may be used.

  NOTE: If installing Powerline Ethernet socket adapters, ensure they are installed in the backup circuit.

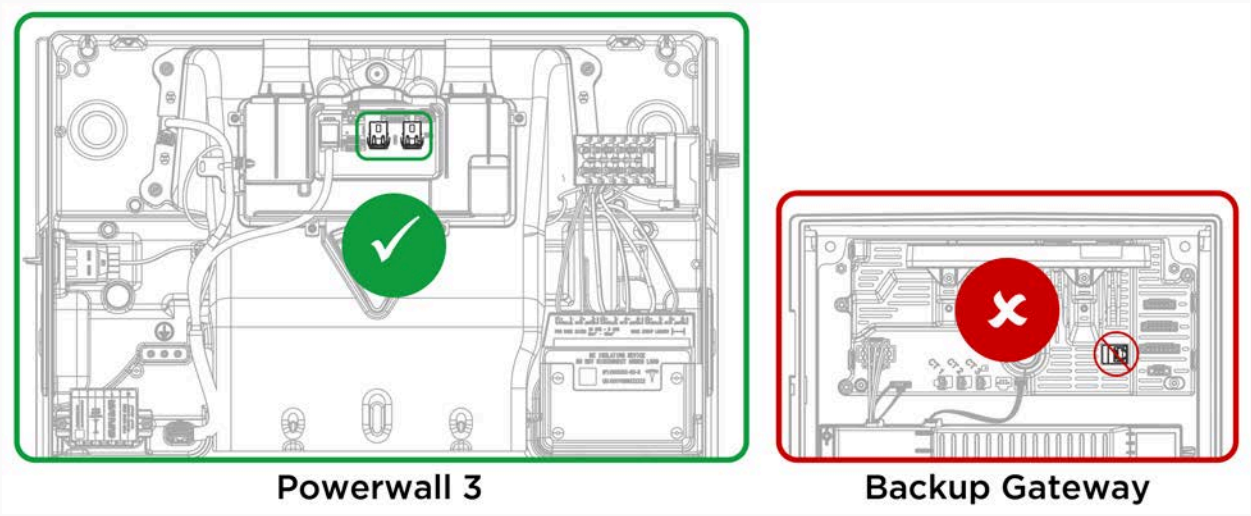
- Connect the Ethernet cable to one of the RJ45 Ethernet terminals in the Powerwall 3. The LED on the Ethernet terminal will illuminate green to indicate Ethernet is connected.

  NOTE: The amber LED on the Ethernet terminal will not illuminate. This is expected behavior.



NOTE: See *Prepare Ethernet Wiring with RJ45 Connectors on page 98* for instructions to crimp RJ45 connectors on CAT5 or CAT6 cable.

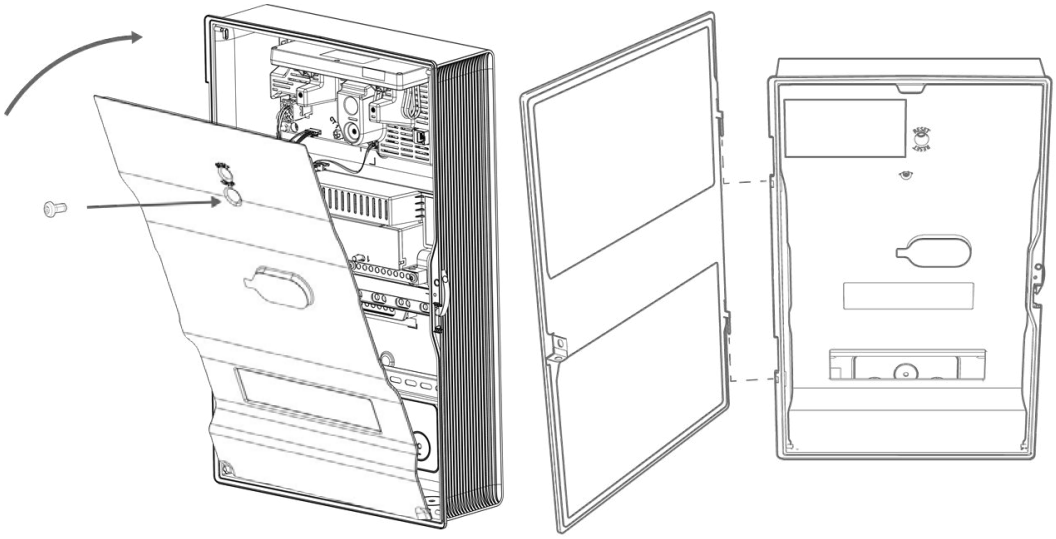
NOTE: Only connect Ethernet wiring to the Powerwall 3 Ethernet ports. The Tesla Asset Controller in Powerwall 3 controls system operation, so these Ethernet ports are the only functional ports in the system. **Do not** connect Ethernet to the Backup Gateway Ethernet port.



Close Backup Gateway 2 Wiring Compartment

1. **Before closing any installed hardware**, take photos of the completed wiring in the Powerwall, Backup Gateway 2, and main distribution board.
2. Inspect the AC and PV wiring terminals to ensure all wire strands are properly inserted.
3. Ensure that all conduit junctions and cable entry points are secure and properly sealed.
4. Install the Backup Gateway deadfront panel and secure it firmly with the original screw. Mount the Backup Gateway door, and latch it shut.

   Figure 25. Install the Backup Gateway Deadfront Cover and Glass Door



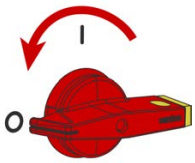
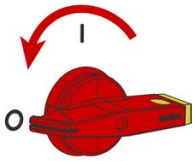
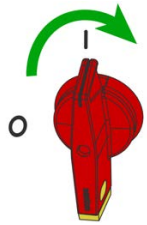
NOTE: If the Backup Gateway is installed outdoors or in a high-traffic area, the latch can be locked shut.

5. Clearly label all circuit breakers.

STEP 11: TURN ON AND COMMISSION THE SYSTEM

WARNING: Before terminating any conductors inside Powerwall 3, ensure that the integrated DC isolator and Powerwall 3 On/Off switch are both turned OFF to de-energize the system. Confirm lack of voltage at the AC and PV terminals before proceeding.

Prepare the System for Commissioning

Powerwall Installation Complete?	Solar Installed?	Powerwall 3 On / Off Switch	Integrated DC Isolator	Powerwall 3 Breaker	Commissioning
No (no AC service, install crew unable to complete, etc.)	No	Leave the Powerwall 3 switch **OFF** 	Leave the integrated DC isolator **OFF** 	Leave the Powerwall 3 breaker **OPEN** (OFF)	Commissioning cannot be completed at this time
Yes	No	Leave the Powerwall 3 switch **ON** 	Leave the integrated DC isolator **OFF** 	Leave the Powerwall 3 breaker **CLOSED** (ON)	See *Commission the System Ahead of Solar Installation on page 77* **WARNING:** Turn the Powerwall 3 switch OFF to de-energize the system terminating any conductors inside Powerwall 3. Confirm lack of voltage at the AC and PV terminals before proceeding.
Yes	Yes	Leave the Powerwall 3 switch **ON** 	Leave the integrated DC isolator **ON** 	Leave the Powerwall 3 breaker **CLOSED** (ON)	See *Commission the System After Powerwall and Solar Installation on page 81*

Commission the System Ahead of Solar Installation

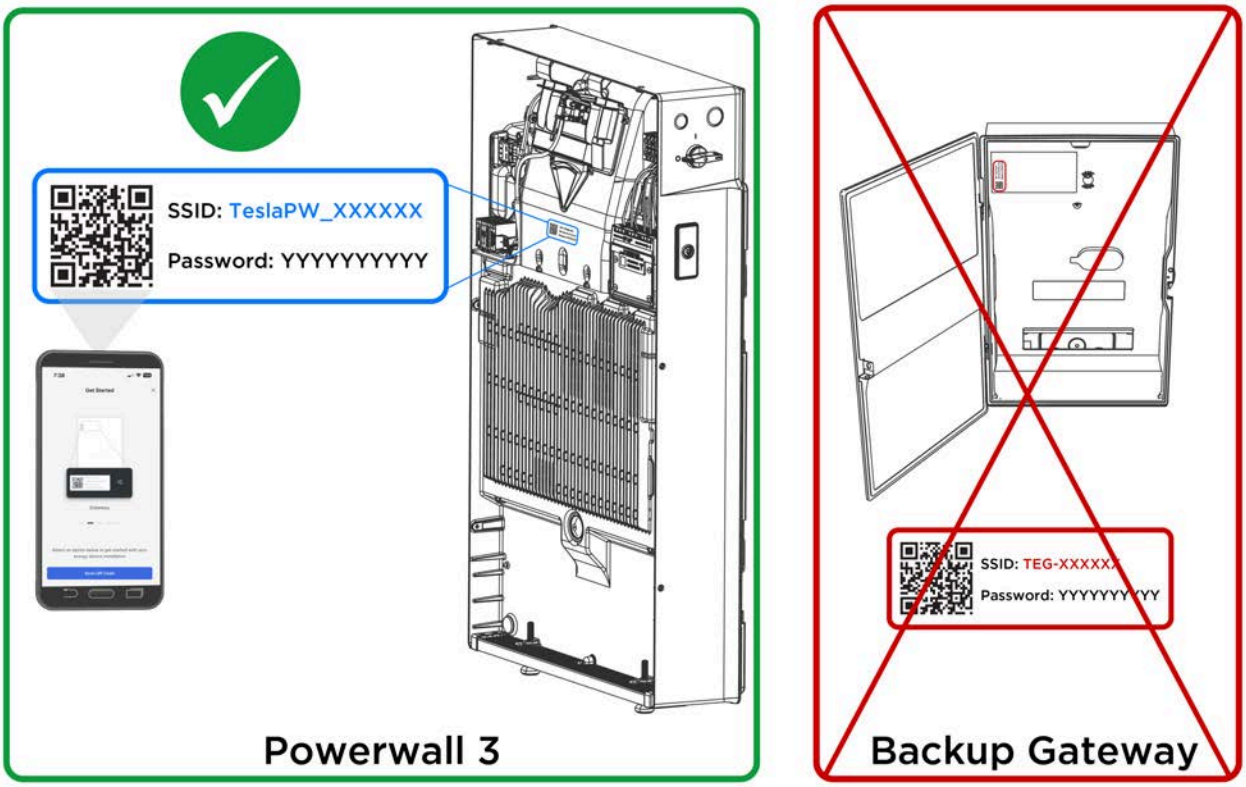
Powerwall Installation Crew Instructions

1. Close the AC circuit breaker for Powerwall 3 and the Backup Gateway.
2. Turn the Powerwall 3 switch **ON**.
3. Launch the **Tesla One** app.

   NOTE: Ensure Tesla One is updated to version 7.9.1 or greater, or *install Tesla One* if using for the first time.

4. Navigate to **Device Setup** to begin commissioning.
5. Select **Scan** and scan the Powerwall 3 QR label to connect to the TeslaPW Wi-Fi network.

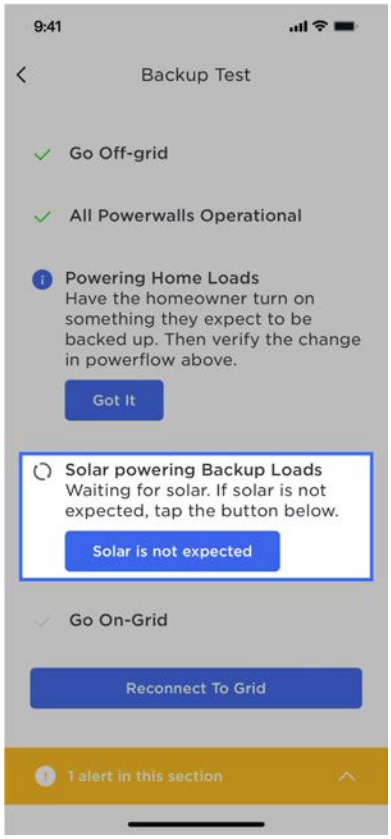
   NOTE: Connect to Powerwall 3 to commission the system. **Do not attempt to connect to Backup Gateway to commission**.



6. Address any alerts to complete commissioning, skipping PV commissioning steps.

   NOTE: When commissioning a system with no solar, Powerwall will charge from grid until State of Energy (SOE) is 20%. This is expected behavior.

7. Perform the Backup Test, selecting **Solar is not expected**.



NOTE: The Backup Test can be performed during the Backup Gateway 2 device update. There is no need to wait for the update to complete before performing the Backup Test.

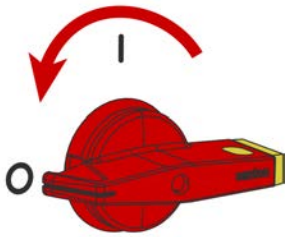
8. Leave the system running in Tesla One.
9. Leave the Powerwall 3 switch **ON** and the breaker **CLOSED** to enable charging.
10. Leave the Powerwall 3 integrated DC isolator **OFF**.
11. Leave the following accessories with the customer, for use by the Solar installation crew:
    - Extra T20 fasteners for front cover
    - Installation quick guide (for guidance on correctly installing PV wiring)

NOTE: See the *Powerwall 3 Commissioning Guide* for instructions.

Solar Installation Crew Instructions

1. Retrieve the Powerwall 3 accessories from the customer. These should have been left by the Powerwall crew.
2. Turn the Powerwall 3 switch OFF to de-energize the system; see *Appendix H: Shutting Down Powerwall 3 on page 166* for complete de-energization instructions.

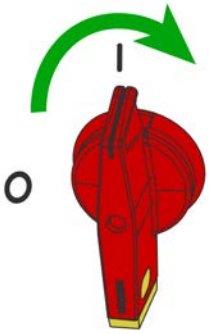
3. Confirm the Powerwall 3 integrated DC isolator is OFF.



WARNING: Confirm lack of voltage at the AC and PV terminals before proceeding.

4. See *STEP 7: Make Solar PV Connections on page 63* for instructions to complete the solar installation.
5. Re-energize Powerwall 3:
   a. Remove the lock / tag and breaker hasp from the Powerwall 3 breaker, then turn the breaker ON.
   b. Turn the Powerwall 3 switch ON.

6. Turn the Powerwall 3 integrated DC isolator **ON**.



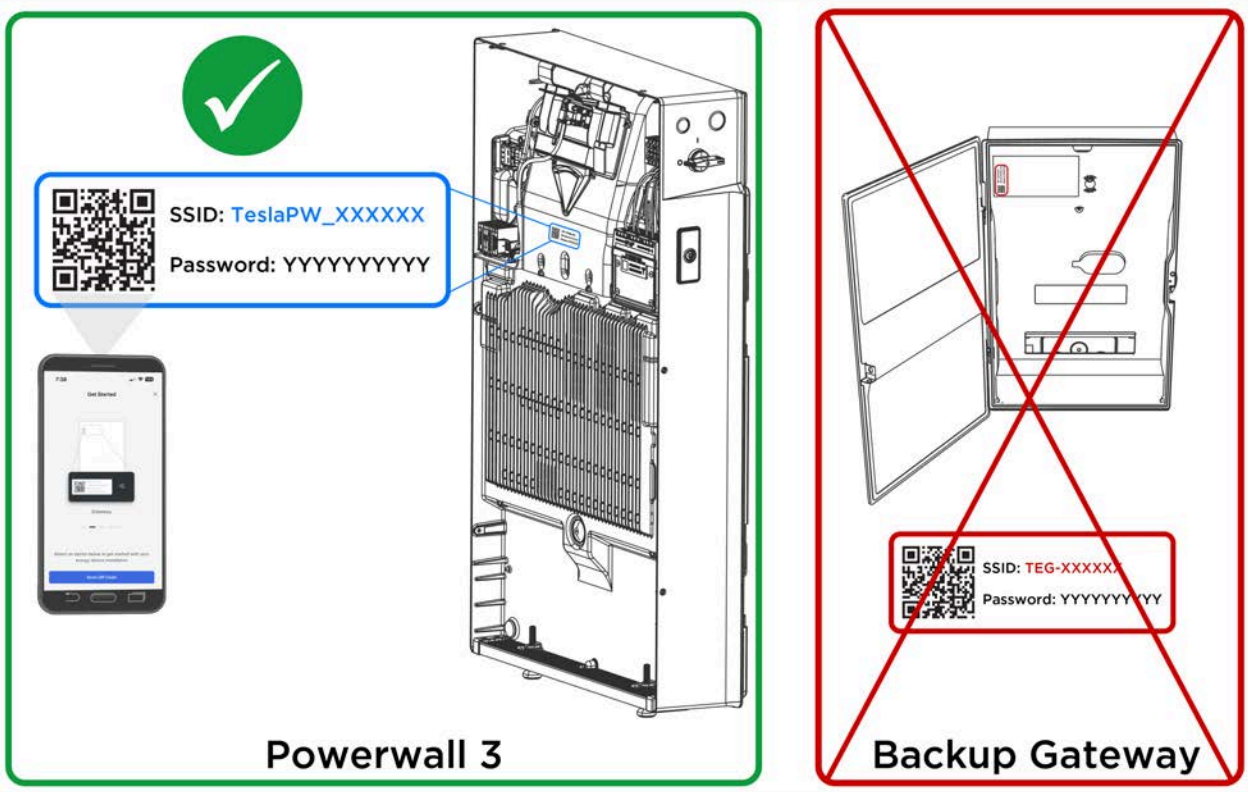
7. Launch the **Tesla One** app.

NOTE: Ensure Tesla One is updated to version 7.9.1 or greater, or *install Tesla One* if using for the first time.

8. Navigate to **Device Setup** to begin commissioning.
9. Select **Scan** and scan the Powerwall 3 QR label to connect to the TeslaPW Wi-Fi network.

STEP 11: TURN ON AND COMMISSION THE SYSTEM

NOTE: Connect to Powerwall 3 to commission the system. **Do not attempt to connect to Backup Gateway to commission**.



10. Address any alerts to complete commissioning.
11. On the Powerwall 3 *Device* page, compare the MPPT voltages with those listed on the planset to confirm the installation matches what is expected for the strings.
12. Perform the Backup Test with solar.
13. Install the Powerwall 3 front cover, fastening with the new T20 fasteners that were left with the customer.
14. Leave the system running in Tesla One.
15. Leave the Powerwall switch **ON** and the breaker **CLOSED** to enable charging.

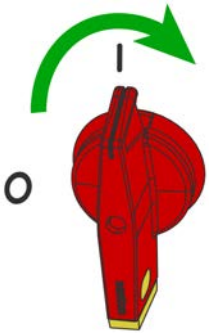
NOTE: See the *Powerwall 3 Commissioning Guide* for instructions.

NOTE: The Powerwall 3 On / Off switch has a locking mechanism. When the switch is locked it cannot be turned on. See *Powerwall 3 Switch Locking Mechanisms on page 114* for more information.

Commission the System After Powerwall and Solar Installation

1. Close the AC circuit breaker for Powerwall 3 and the Backup Gateway.
2. Turn the Powerwall 3 switch **ON**.

3. Turn the Powerwall 3 Integrated DC Isolator **ON**.



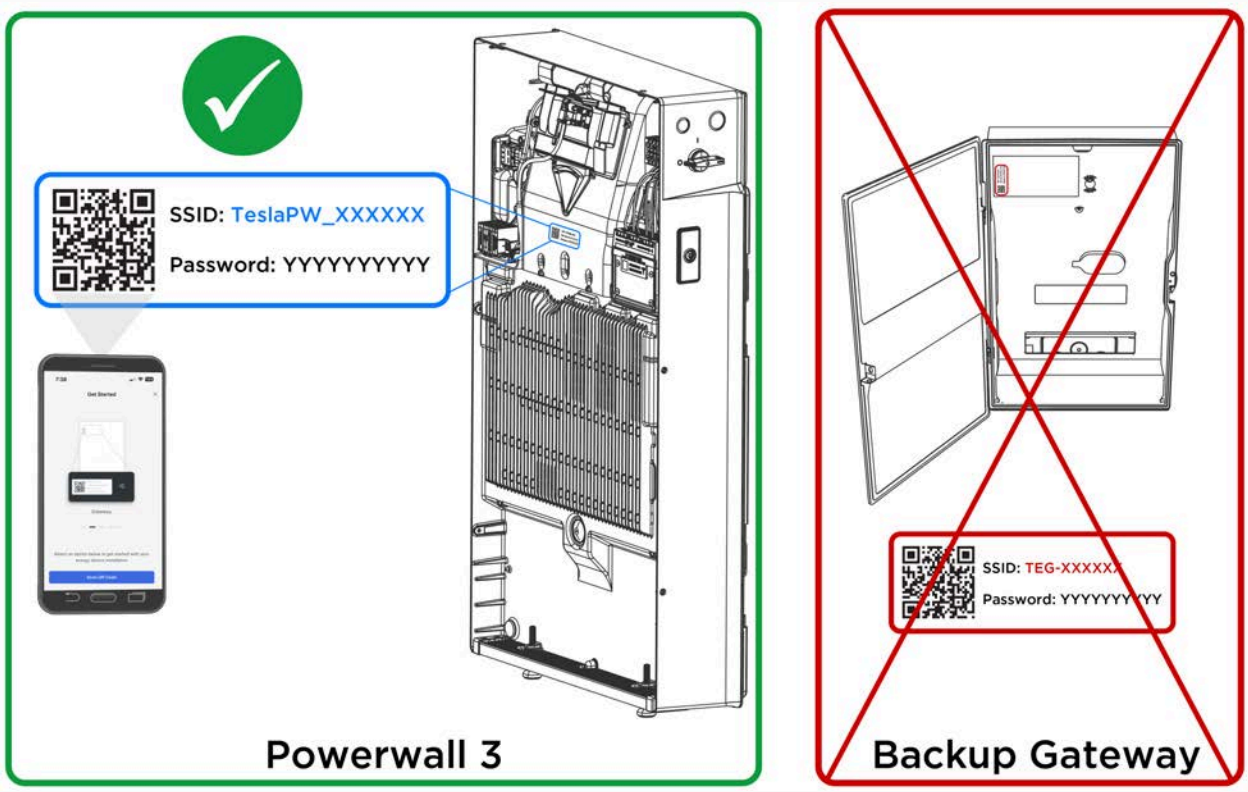
4. Launch the **Tesla One** app.

> **NOTE:** Ensure Tesla One is updated to version 7.9.1 or greater, or *install Tesla One* if using for the first time.

5. Navigate to **Device Setup** to begin commissioning.
6. Select **Scan** and scan the Powerwall 3 QR label to connect to the TeslaPW Wi-Fi network.

STEP 11: TURN ON AND COMMISSION THE SYSTEM

NOTE: Connect to Powerwall 3 to commission the system. **Do not attempt to connect to Backup Gateway to commission**.



7. Address any alerts to complete commissioning.

NOTE:

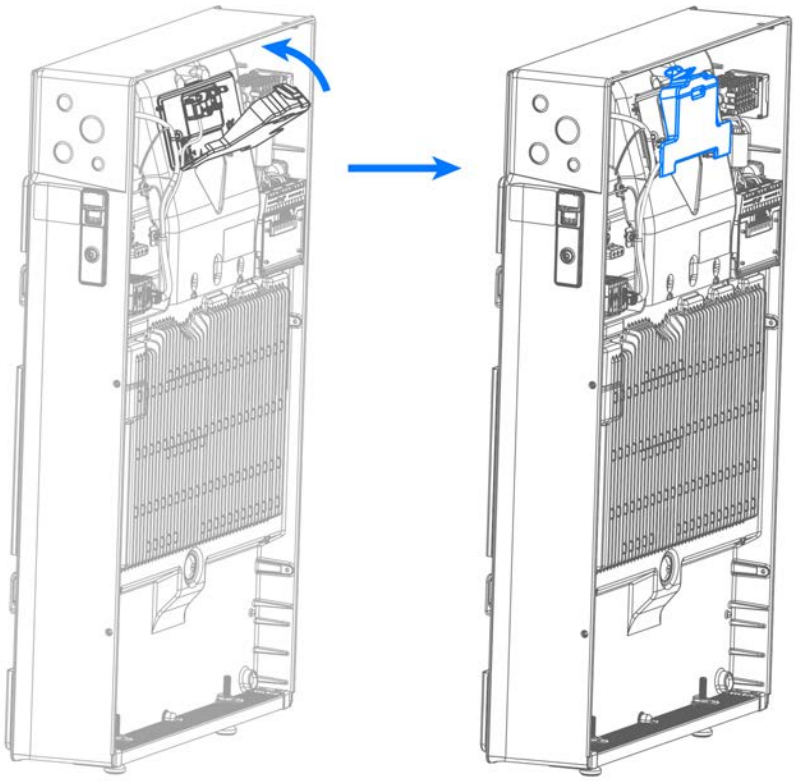
- See the *Powerwall 3 Commissioning Guide* for instructions.
- The Backup Test can be performed during the Backup Gateway 2 device update. There is no need to wait for the update to complete before performing the Backup Test.

8. Leave the system running in Tesla One.
9. Leave the Powerwall switch **ON** and the breaker **CLOSED** to enable charging.

NOTE: The Powerwall 3 On / Off switch has a locking mechanism. When the switch is locked it cannot be turned on. See *Powerwall 3 Switch Locking Mechanisms on page 114* for more information.

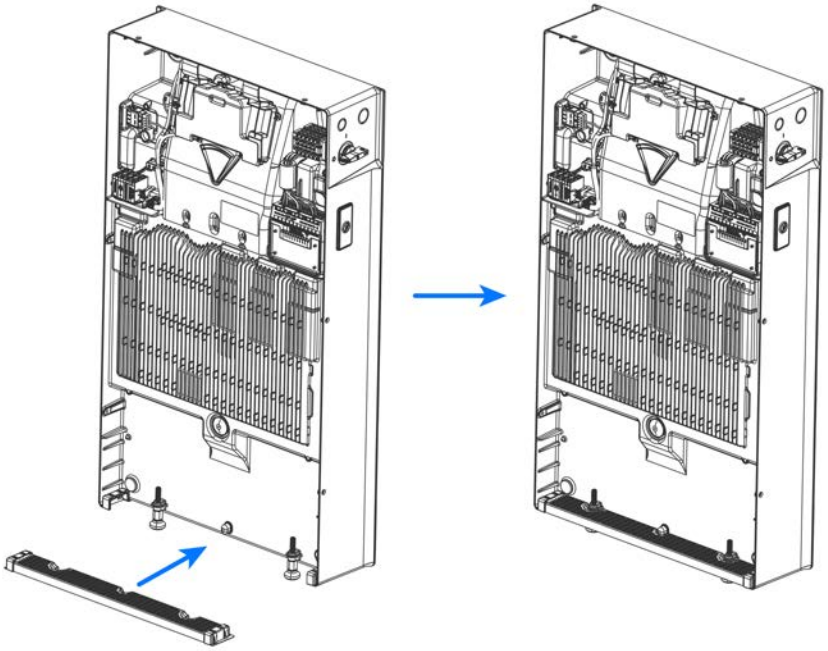
STEP 12: INSTALL POWERWALL 3 FRONT COVER

1. Inspect the AC and PV wiring terminals to ensure all wire strands are properly inserted.
2. Ensure that all conduit junctions and cable entry points are secure and properly sealed.
3. Arrange all communication wires inside the Tesla Asset Controller cover, then close the cover.



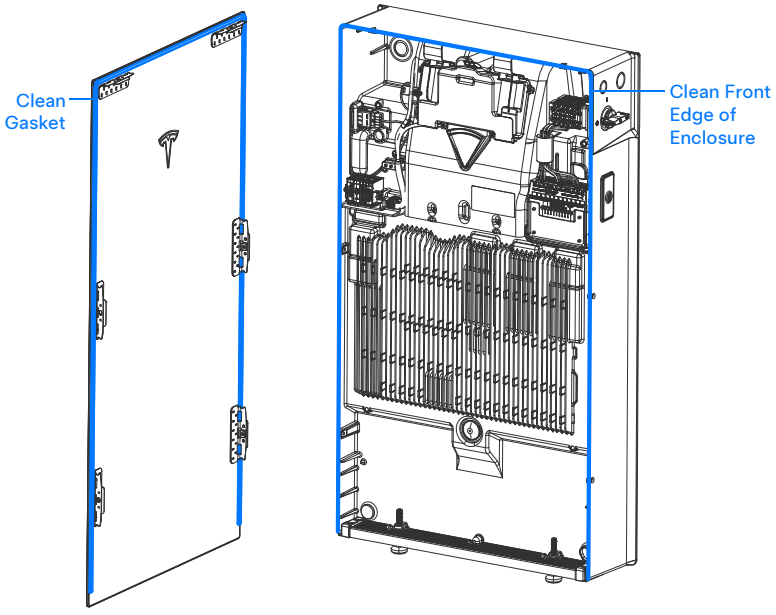
4. Arrange all wires neatly inside the Powerwall wiring compartment.

5. Install the air intake screen over the opening at the bottom of Powerwall, ensuring it snaps into place.



6. Clean the front edge of the Powerwall enclosure with a microfiber cloth to remove any debris that might interfere with the seal.
7. Carefully remove the glass front cover from its packaging and, using a microfiber cloth, clean the sealing gasket around the edge of the front cover to remove any debris that might interfere with the seal.

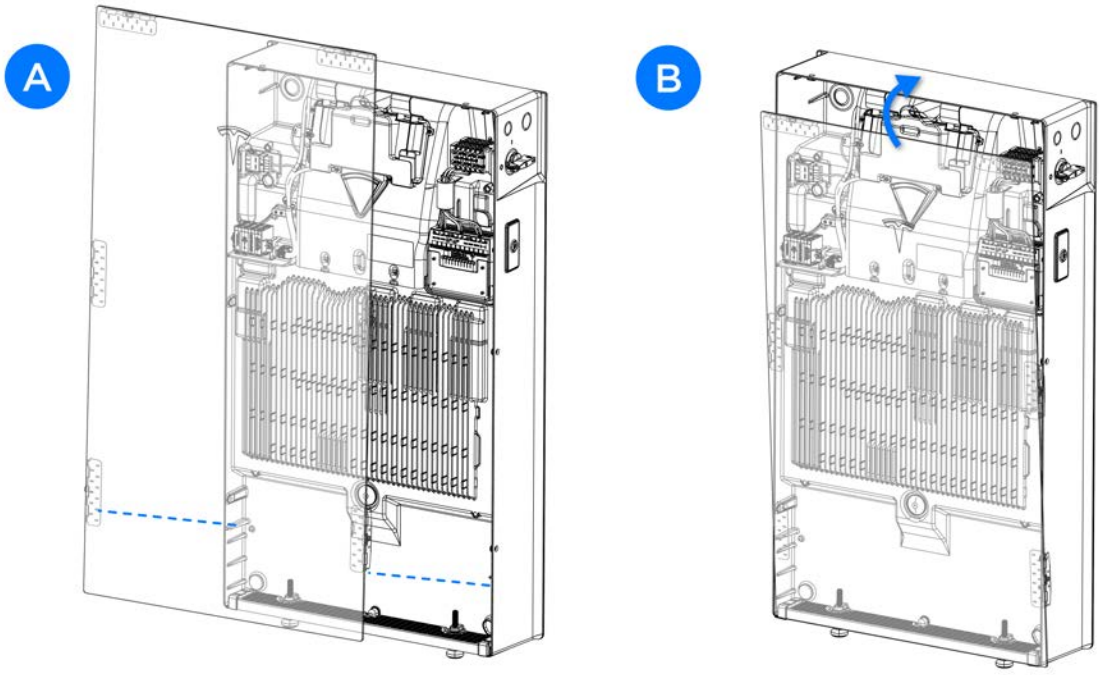
> **CAUTION:** Take extreme care when handling the sealing gasket. Damage to or contamination of the gasket or its mating surface could compromise Powerwall's ingress protection, resulting in product damage.



8. Carefully install the glass front cover:
    a. Align the lower mounting tabs with the two alignment shelves in the enclosure (**A**).

b. Rotate the front cover toward the enclosure to engage the top mounting tabs with the enclosure (**B**). Maintain pressure (approximately 2 Nm) on the front of the cover to compress the sealing gasket.

> ⚠ **CAUTION:** Maintain pressure to keep the sealing gasket compressed until all fasteners are installed and tightened. If the sealing gasket is not compressed, the fasteners may thread form in the enclosure, breaking the front cover mounting tabs.



c. Install and tighten the top (2X) T20 fasteners in the fastener slots (**C**).

NOTE: T20 fasteners (Tesla P/N 1847553-00-A) are included in the accessory bag:

- Early revisions of the fasteners (left, below) include a black gasket and are single use; remove the gasket to reuse these fasteners to reinstall the glass front cover
- Later revisions of the fasteners (right, below) do not include a gasket and can be reused to reinstall the glass front cover

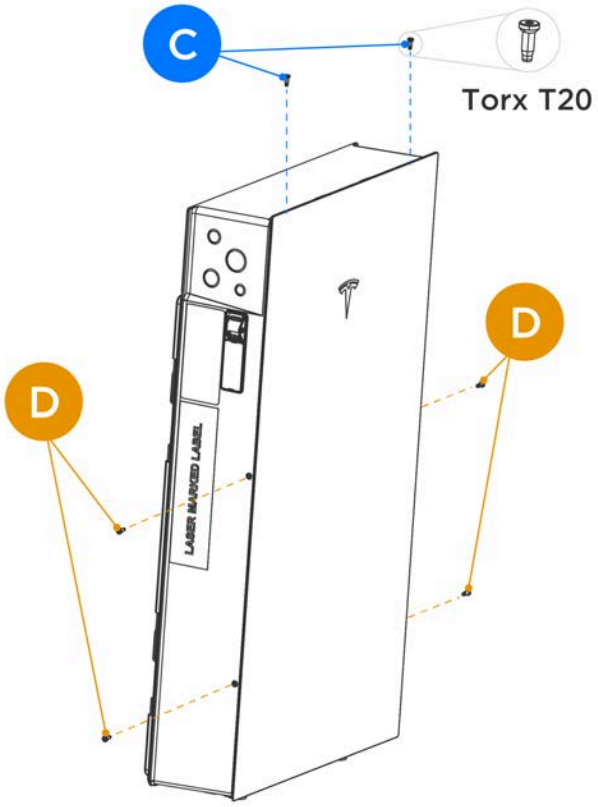
The gasket is not required and does not impact the enclosure rating of Powerwall 3.

d. Install and tighten the remaining (4X) T20 fasteners in the fastener slots on the sides of the unit (**D**).

e. Tighten each fastener to approximately (2.8 Nm) or hand-tight.

CAUTION: Do not use an impact driver to torque the fasteners.

STEP 12: INSTALL POWERWALL 3 FRONT COVER



STEP 13: DEMONSTRATE THE INSTALLATION

1. Ask the homeowner to download and install the Tesla mobile app, log in or create a new Tesla account, and assist them with registering their product.
2. Show the homeowner the location of the serial number sticker on the left side of Powerwall, below the On/Off switch.
3. Demonstrate the capabilities of the Tesla mobile app, such as how to change the operation mode.
4. Simulate an outage by opening the main breaker and show that Powerwall is powering backup loads.
5. Archive the photos from the installation.

Technical Support

Resources for Certified Installers, including the latest versions of installation manuals, are available within the Tesla Partner Portal:

https://partners.tesla.com

Maintenance

Powerwall 3 does not require pre-scheduled preventative maintenance. The only maintenance required by an owner is to keep the unit connected to the internet and free and clear of debris, especially around the air intake and exhaust. When needed, the air intake vent can be removed and hosed off.

To clean Powerwall 3, use a soft, lint-free cloth. If needed, the cloth can be dampened with mild soap and water only. Do not use cleaning solvents to clean Powerwall 3, or expose Powerwall 3 to flammable or harsh chemicals or vapors.

APPENDIX A: POWERWALL 3 ANCHORING DETAILS

General Anchoring Notes

NOTE: The details below are minimum guidelines and are not guaranteed to be applicable.

NOTE: All fasteners shall be galvanized or stainless steel for exterior applications.

NOTE: All wall framing referenced in the details must be part of the home's main permitted bearing wall and/or lateral force resisting system. The contractor and their licensed design professional are responsible for ensuring the walls, and their load transfer connections, are structurally sound to support all code-specified vertical and lateral loading imposed by the equipment. Improper mounting or the use of a wall that is not structurally sound could result in serious injury and/or product damage.

NOTE: At the contractor's expense and with no liability to Tesla, the homeowner and contractor can work with a third party licensed engineer and building department to develop alternative supports.

NOTE: Do not mount below or above windows of the same story wall. Mounting equipment on fences, half walls, retaining walls, or other non-structural construction is not allowed. Supporting framing must be part of a permitted structure and any unusual framing near the mounting area that may compromise the wall's integrity shall be evaluated by the contractor and their licensed design professional.

Anchoring Details for Ground- or Wall-mounting Powerwall 3 with Wall Bracket on Existing Approved Foundation

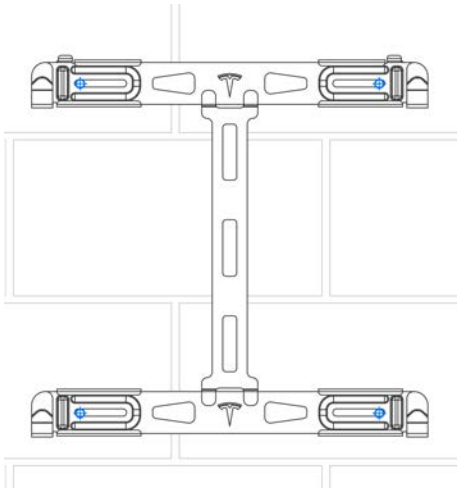
Reference these anchoring details when mounting Powerwall 3 to the provided mounting bracket.

Concrete Masonry Unit Wall

Minimum strength must be 11 MPa.

Use at least four (one in each corner, in any available anchor slot) 10 mm concrete anchors of sufficient length for 50 mm embedment into the material.

Anchors shall not be installed within 305 mm of wall edges or 38 mm of masonry block edges.

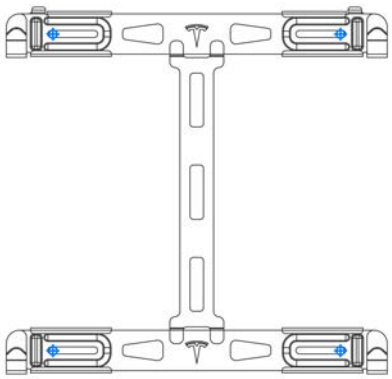


APPENDIX A: POWERWALL 3 ANCHORING DETAILS

Solid Concrete Wall

Minimum strength must be 18 MPa.

Use at least four (one in each corner, in any available anchor slot) 10 mm concrete anchors of sufficient length for at least 64 mm embedment into the wall.



Brick Wall

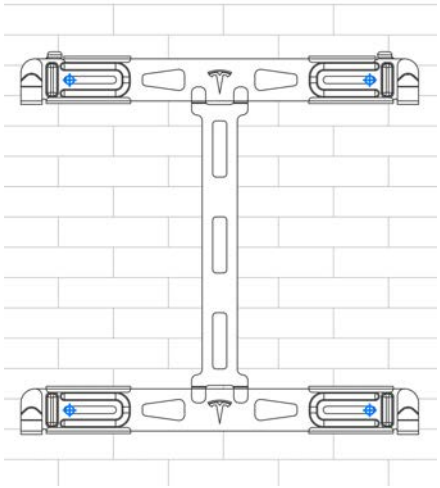
(Double and Single Layer of Brick Masonry)

Minimum strength must be 12 MPa.

Use at least four (one in each corner, in any available anchor slot) 6 mm masonry anchors of sufficient length for 79 mm embedment.

NOTE: Faux brick veneer is not a supported wall type for Powerwall installations.

NOTE: Fasteners shall not be installed in mortar joints.



Channel Strut (Unistrut)

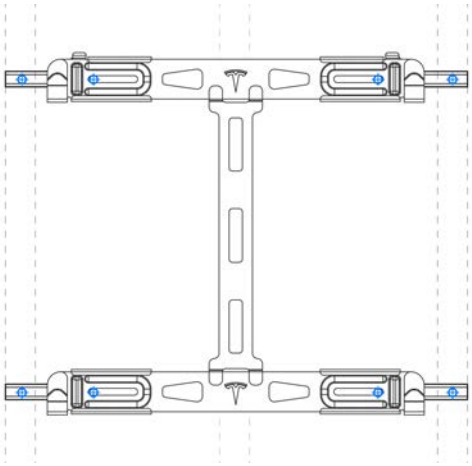
Struts must be minimum 12 gauge, and either 22 mm or 41 mm.

If mounting on wood structural members, attach each strut to at least two structural members, using at least one 6 mm wood screw with washer per structural member, of sufficient length for at least 64 mm embedment into the structural members.

If mounting on metal structural members, attach each strut to at least three structural members, using at least one #14 (6 mm) sheet metal screw with washer per structural member, of sufficient length to penetrate at least 3 threads beyond the structural members.

NOTE: For either wood or metal structural members, these requirements are per Powerwall (e.g. two structural members per Powerwall on wood structural members, or three structural members per Powerwall on metal structural members).

To attach the bracket to the struts, use at least four (one in each corner) 10 mm hex head screws with washers and strut nuts.

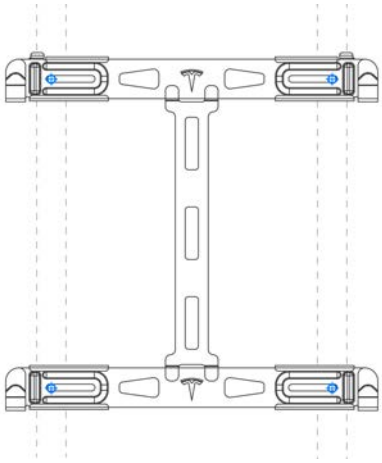


Channel strut shall have a maximum unsupported span of 610 mm and shall not be cantilevered.

Wood Structural Members 305 mm to 432 mm

If anchoring directly into wood structural members, use at least four (one in each corner) 6 mm wood screws with washers, of sufficient length for at least 64 mm embedment into the structural members.

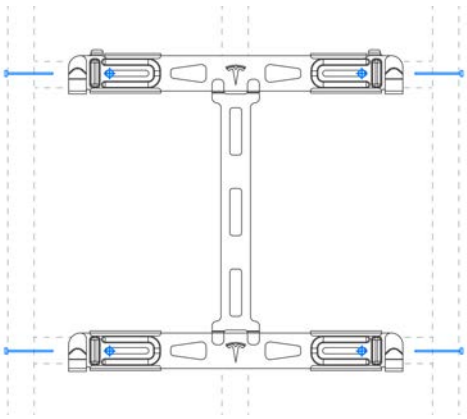
NOTE: See *Channel Strut (Unistrut) on page 90* for structural member spacing greater than 432 mm, up to 610 mm.



Wood Structural Members 305 mm to 432 mm

If anchoring to blocking between wood structural members, use minimum 38 x 89 mm blocks, end-nailed into structural members with two 16d (89 x 4 mm) nails or toe-nailed into structural members with four 8d (64 x 3 mm) nails. Use at least four (one in each corner) 6 mm wood screws with washers, of sufficient length for at least 64 mm embedment into the blocking.

NOTE: See *Channel Strut (Unistrut) on page 90* for structural member spacing greater than 432 mm, up to 610 mm.

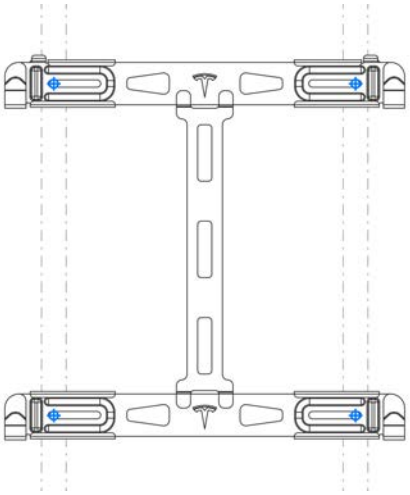


Metal Structural Members 305 mm to 432 mm

If anchoring directly to metal structural members, structural members must be minimum 18 gauge. Use at least four (one in each corner) #14 (6 mm) sheet metal screws with washers, of sufficient length to penetrate at least 3 threads beyond the structural member.

If backing is needed between the structural members, the backing must be minimum 18 gauge. Attach backing to metal structural members with 12 gauge 76 x 76 mm angle clip or Simpson SFC2.25 clips with two #10 sheet metal screws in each leg.

NOTE: See *Channel Strut (Unistrut) on page 90* for structural member spacing greater than 432 mm, up to 610 mm.



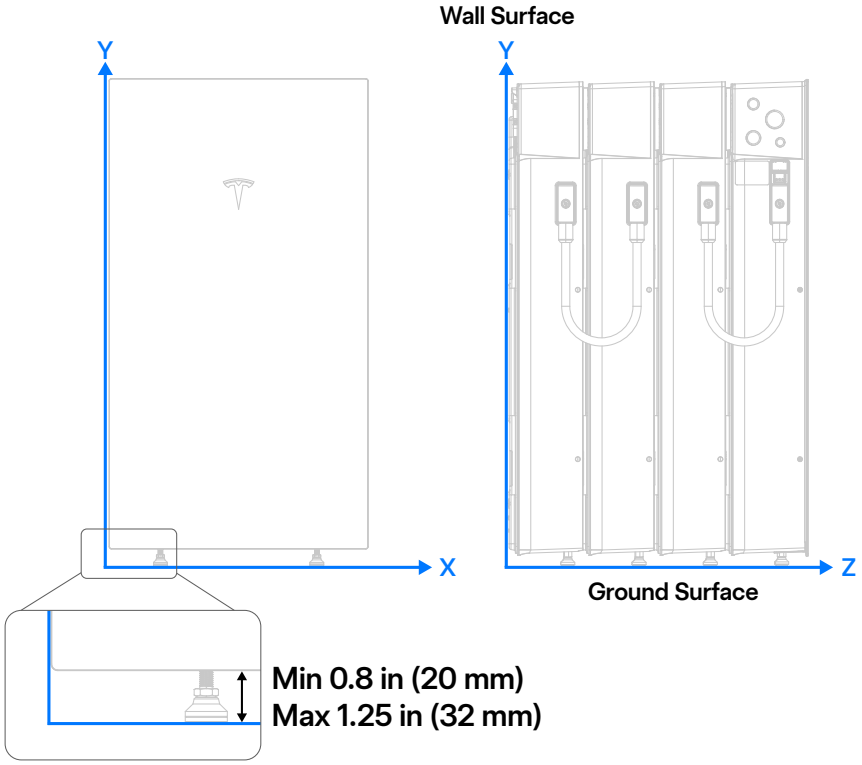
Powerwall 3 Center of Mass

Table 3. Center of Mass for Powerwall 3 and/or Expansion Unit(s)

Configuration	Includes	Total Weight	Center of Mass (mm) (+/- 4 mm)		
			X	Y*	Z
(1) Powerwall 3	(1) front cover, (1) wall bracket	291.2 lb (132 kg)	304	506	84
(1) Powerwall 3 and (1) Expansion (stacked)	(1) front cover, (2) wall brackets, (1) set of Expansion stacking accessories, (1) Expansion harness	541.4 lb (245.6 kg)	304	487	168
(1) Powerwall 3 and (2) Expansions (stacked)	(1) front cover, (3) wall brackets, (2) set of Expansion stacking accessories, (2) Expansion harnesses	791.6 lb (359.1 kg)	304	479	251
(1) Powerwall 3 and (3) Expansions (stacked)	(1) front cover, (4) wall brackets, (3) set of Expansion stacking accessories, (3) Expansion harnesses	1041.8 lb (472.6 kg)	304	476	333
(1) Expansion unit	(1) front cover, (1) wall bracket	261.2 lb (118.5 kg)	304	464	75
(2) Expansions (stacked)	(1) front cover, (2) wall brackets, (1) set of Expansion stacking accessories, (1) Expansion harness	511.4 lb (232 kg)	304	464	159
(3) Expansions (stacked)	(1) front cover, (3) wall brackets, (2) set of Expansion stacking accessories, (2) Expansion harnesses	761.6 lb (345.5 kg)	304	464	241

*In these measurements, the Powerwall 3 / Expansion feet are at the lowest height setting. The feet can be adjusted up to 12 mm in height.

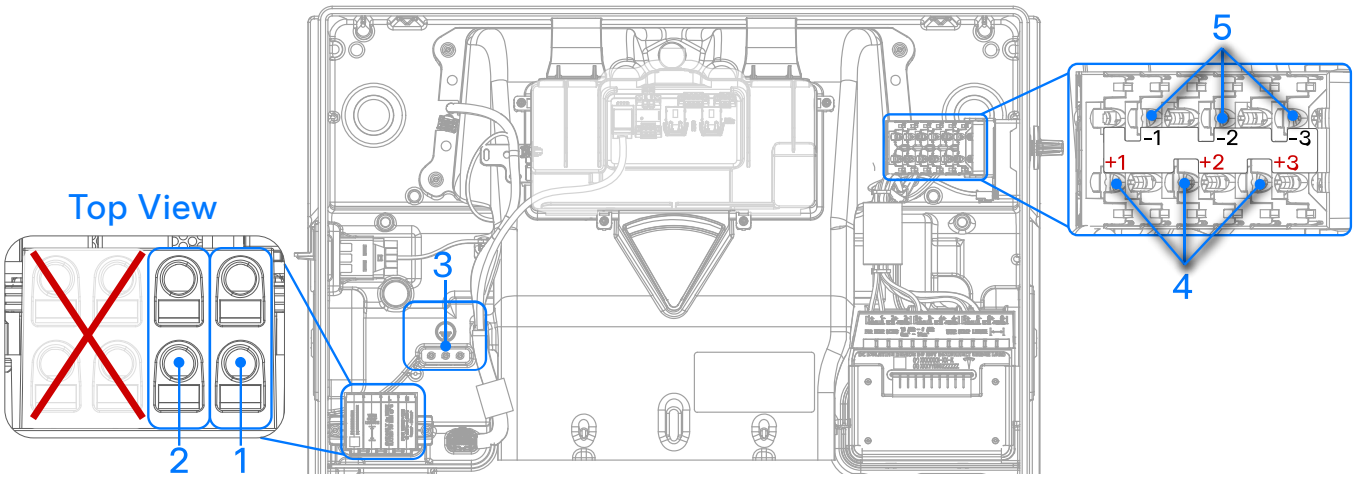
Figure 26. Measuring Center of Mass from Bottom Left Corner of Front Cover and Surface of Supporting Structure



NOTE: A structural designer or other qualified person acceptable to the local authority may use the total weight and center of mass information for the individual or stacked assembly to calculate the applicable building code design forces acting on the supporting structure.

APPENDIX B: WIRING REFERENCE

Powerwall 3 AC and PV Wiring



	Terminal Name	Recommended Wire Color	Wire Size
1	N (Neutral)	Blue	6 - 25 mm^2
2	L1 (Line 1) **NOTE:** The two terminals to the left of L1 are not used.	Brown	
3	Protective Earth terminals	Green	2.5 - 25 mm^2
4	Integrated DC Isolator Positive inputs (PV 1+, 2+, 3+)	Red	Use forked terminals; Tesla recommends the following or equivalent: • TE Connectivity P/N 165015 (4 - 6 mm^2 wire size)
5	Integrated DC Isolator Negative inputs (PV 1-, 2-, 3-)	Black	

NOTE: The two leftmost terminals in the AC connector are not used.

NOTE: AC power output terminals are rated to a minimum of 90°C.

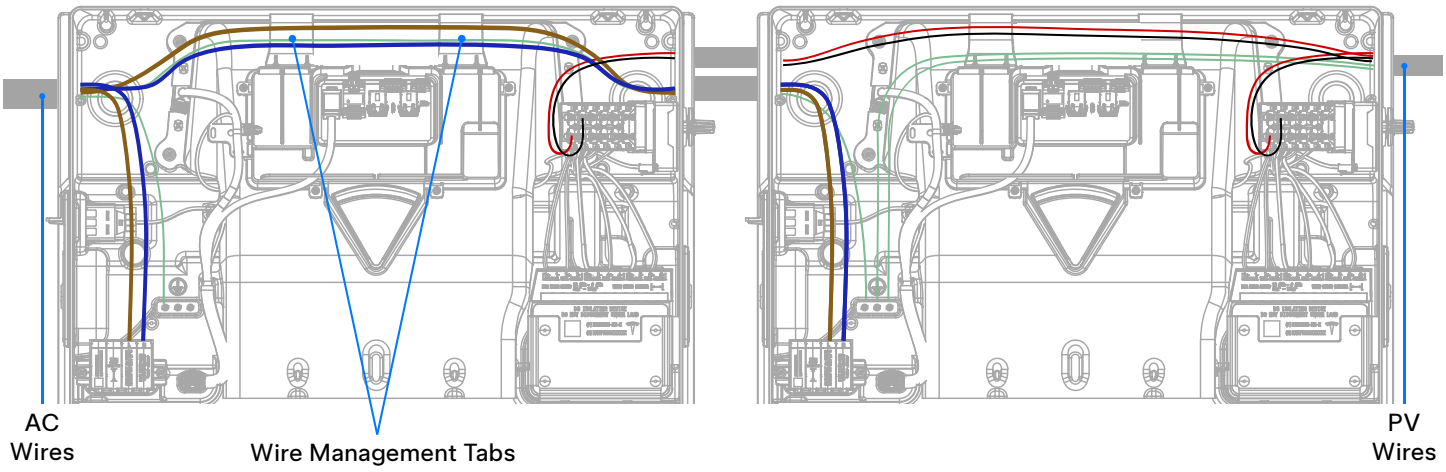
NOTE: Use only copper conductors in the PV connector and GND terminals.

NOTE: PV input terminals (MPPT DC inputs) are rated to a minimum of 75°C.

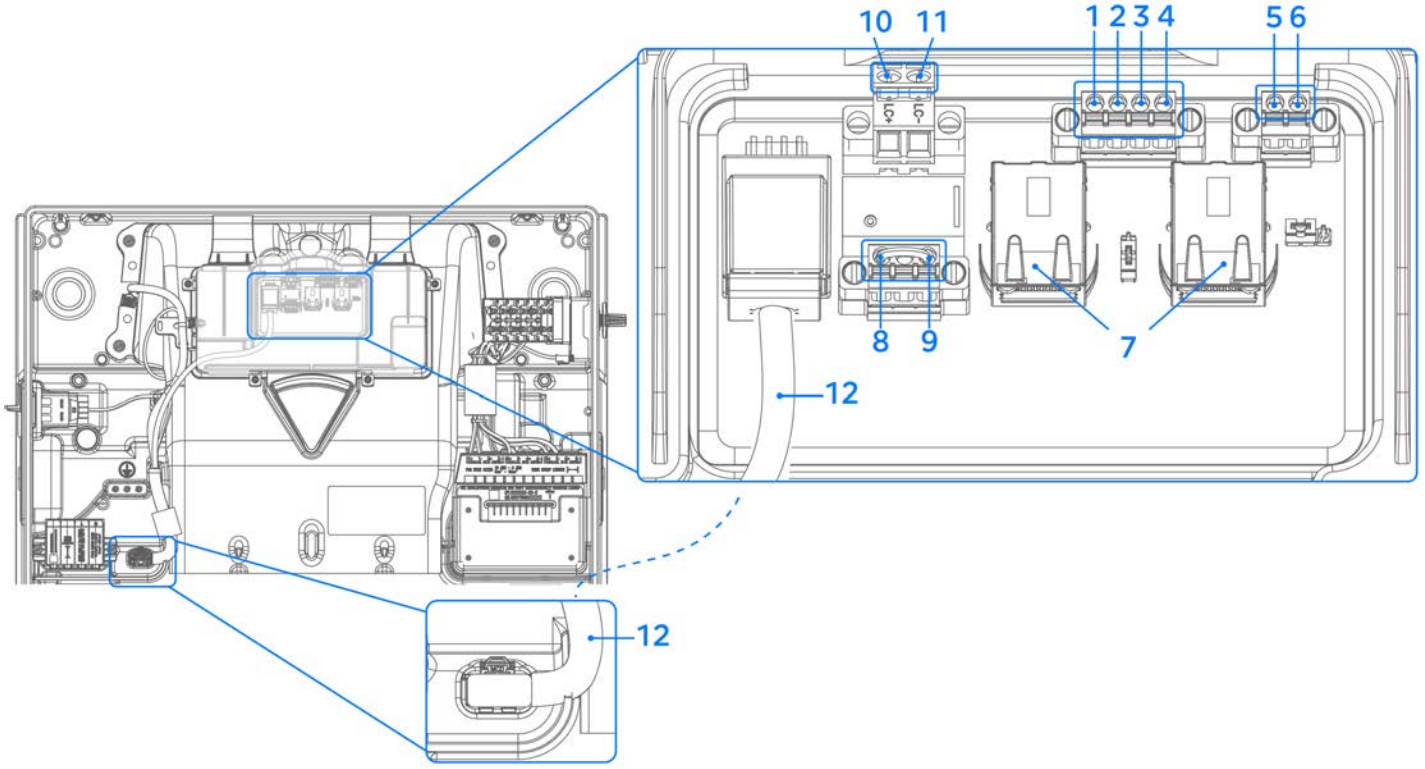
Powerwall 3 as a Wiring Raceway (Multi-Unit Installations Only)

Wiring can be passed through one Powerwall 3 unit to another if the wires are routed properly through the dedicated wiring space. The number of wires shall not take up so much space that the wire management tabs are strained and/or pushed outward.

Figure 27. AC Wiring for Both Units Routed from Left, PV Wiring for Both Units Routed from Right



Tesla Asset Controller (TACO) Low Voltage and Communication Wiring



Communication Wiring to Backup Gateway 2

NOTE: Refer to local codes and standards for correct wiring practices and wire colors.

	Terminal Name	Recommended Wire Color	Wire Gauge
1	CN- (CAN LO)	Orange	0.2 - 1.5 mm^2
2	CN+ (CAN HI)	Blue	0.2 - 1.5 mm^2
3	GND (Earth)	Black	1 - 1.5 mm^2
4	12V+ (Logic+)	Red	1 - 1.5 mm^2

Remote Energy Meter Wiring (Not Yet Available)

NOTE: The remote energy metering via an external meter is not yet supported.

	Terminal Name	Recommended Wire Color	Wire Gauge
5	RS-485 +	Red	0.2 - 1.5 mm^2
6	RS-485 -	Black	0.2 - 1.5 mm^2

Ethernet Jacks

	Terminal Name	Recommended Wire Color	Wire Requirements
7	RJ45 Ethernet jacks	-	CAT5 or CAT6 Ethernet wiring (see *Prepare Ethernet Wiring with RJ45 Connectors on page 98*)

(Optional) System Shutdown Switch Wiring

	Terminal Name	Recommended Wire Color	Wire Gauge
8	System Shutdown +	Red	0.2 - 1.5 mm^2
9	System Shutdown -	Black	0.2 - 1.5 mm^2

NOTE: The terminal between the two System Shutdown terminals is not used.

Aux Wiring (Not Yet Available)

NOTE: The load control functionality is not yet available.

	Terminal Name	Recommended Wire Color	Wire Gauge
10	Load Control +	-	0.2 - 1.5 mm^2
11	Load Control -	-	0.2 - 1.5 mm^2

TACO Low Voltage Harness

	Terminal Name	Recommended Wire Color	Wire Gauge
12	TACO low voltage harness (provides 12V power to TACO)	-	-

Prepare Ethernet Wiring with RJ45 Connectors

Recommended Tools

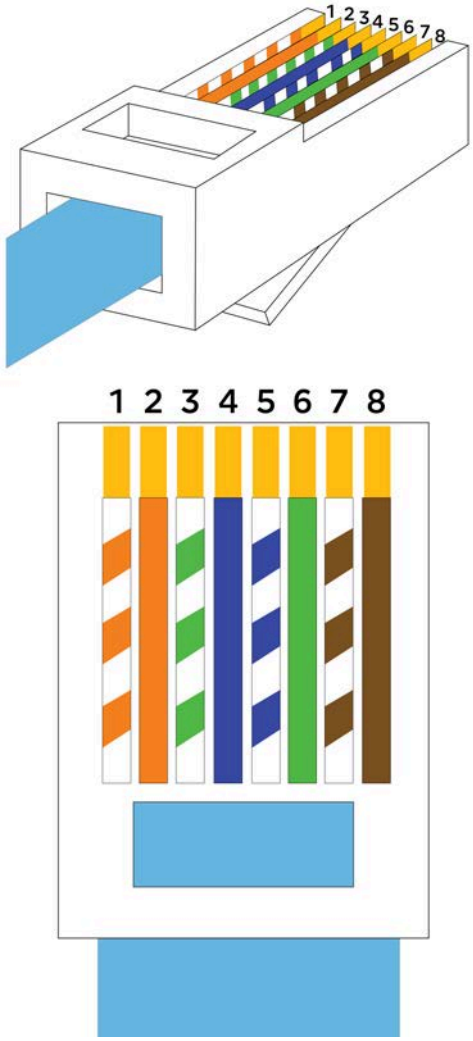
- RJ45 Ethernet crimping tool
- Ethernet tester

Prepare Ethernet Wiring

1. Cut the desired length of CAT5 wire.

   NOTE: See *Plan Cable Length Between Components on page 34* for maximum wire length between components.

2. Using an RJ45 Ethernet crimping tool, crimp the RJ45 connectors to the T-568B wire color standard as shown below:



Pin-out	Wire Color
1	Orange striped
2	Orange
3	Green striped
4	Blue
5	Blue striped
6	Green
7	Brown striped
8	Brown

3. Test the Ethernet cable using an Ethernet tester. Ensure the readings from either end of the cable match, 1-8 in ascending order.

Backup Gateway 2 Wiring

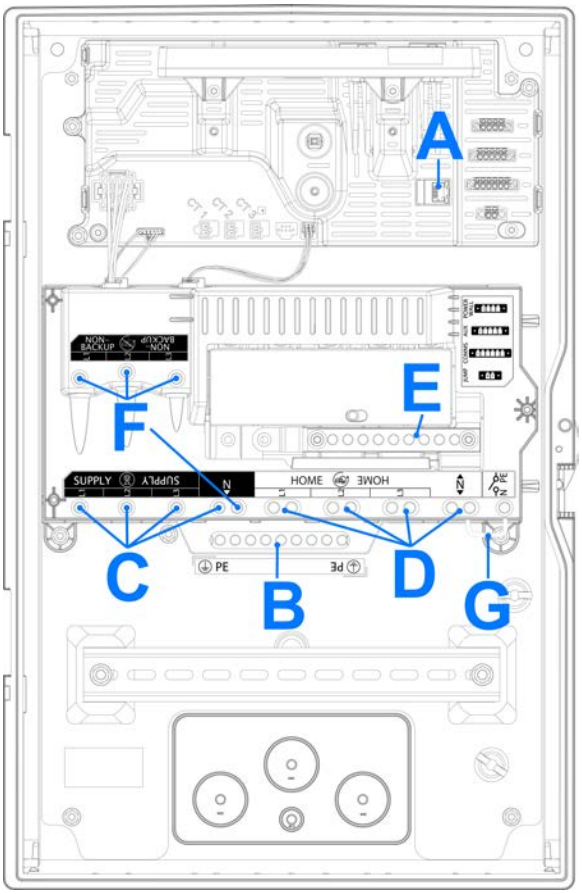


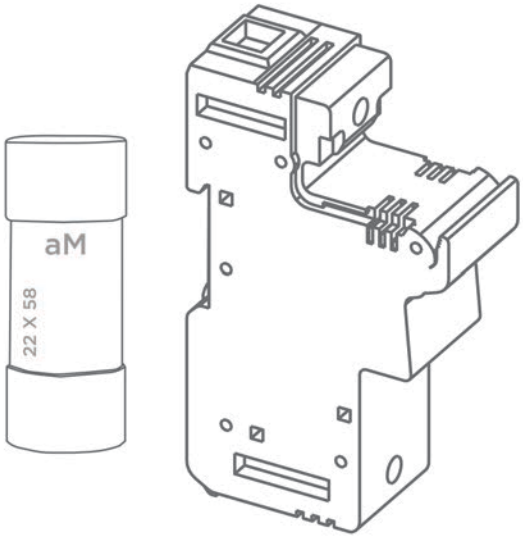
Table 4. Backup Gateway 2 Wiring: Power

	Terminal Name	Recommended Wire Color	Wire Size
A	Ethernet terminal - not used, see *Ethernet Jacks on page 97*		
B	Earth Bar	Green or Green/Yellow	2.5 – 25 mm^2
C	Grid Supply (L1, L2, L3, N)	Brown, Black, Grey, Blue	2.5 – 35 mm^2
D	Backup Loads and Generation (L1, L2, L3, N)	Brown, Black, Grey	2.5 – 35 mm^2
E	Generation Neutral Bar (N)	Blue	2.5 – 25 mm^2
F	Non-Backup Loads and Non-Backup Generation (L1, L2, L3, N)	Brown, Black, Grey, Blue	2.5 – 35 mm^2
G	Switched Neutral-Earth link	-	16 mm^2

Grid Supply Fuse and Fuse Holder

The grid supply fuse and fuse holder are installed during *Make AC Power Connections to Supply and Load Panels on page 51*.

Figure 28. Grid Supply Fuse and Fuse Holder for 16kA protection



NOTE: The 'type aM' fuse ensures 16 kA short circuit current protection per DNO requirements. Without this fuse, the Gateway is rated to a 10 kA short circuit current. If replacing fuses or breakers, they must be of equivalent trip/open and short circuit ratings and CE marked.

NOTE: For single-phase sites, a single 100 A fuse is required and for 3-phase sites three (3) 80 A fuses are required. Fuses should comply with BS 88.3, type aM, 22x58mm cartridge fuse.

Backup Gateway 2 Communication Wiring

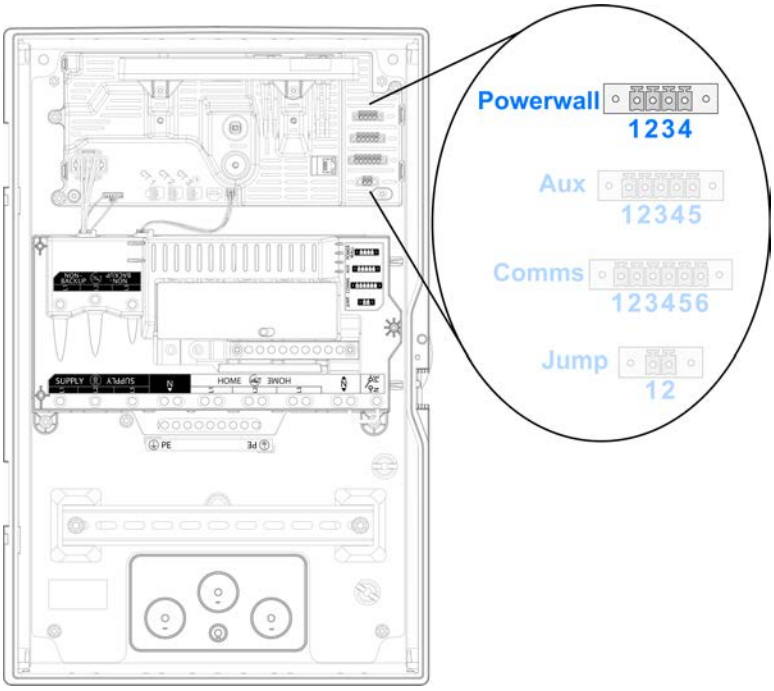


Table 5. Powerwall Communication Wiring

	Terminal Name	Recommended Wire Color	Wire Size
1	12V + (Logic +)	Red	1.0 mm^2 (max 35 m) 1.5 mm^2 (max 45 m)
2	GND (Earth)	Black	
3	CN + (CAN HI)	Blue	0.2 - 1.5 mm^2
4	CN – (CAN LO)	Orange	

NOTE: 4-conductor communication cable must be 300 V rated or double insulated with one twisted pair shielded copper cable.

Table 6. Aux Wiring (Not Used with Powerwall 3)

	Terminal Name	Recommended Wire Color	Wire Size
1	Site Shutdown (OUT)	-	0.2 - 1.5 mm^2
2	Site Shutdown (IN)	-	0.2 - 1.5 mm^2
3	Generator / Load Control (+)	Red	0.2 - 1.5 mm^2
4	Generator / Load Control (-)	Black	0.2 - 1.5 mm^2
5	Interlock pin	-	0.2 - 1.5 mm^2

Table 7. External Meter Communication Wiring (Not Used with Powerwall 3)

	Terminal Name	Recommended Wire Color	Wire Size
1	GND (Earth)/Shield	-	0.2 - 1.5 mm^2
2	RS485 HI #1	Red	0.2 - 1.5 mm^2
3	RS485 LO #1	Black	0.2 - 1.5 mm^2
4	GND (Earth)/Shield	-	0.2 - 1.5 mm^2
5	RS485 HI #2	Red	0.2 - 1.5 mm^2
6	RS485 LO #2	Black	0.2 - 1.5 mm^2

Table 8. Jump Start (Not Used with Powerwall 3)

	Terminal Name	Recommended Wire Color	Wire Size
1	12V	Red	0.2 - 1.5 mm^2
2	GND	Black	0.2 - 1.5 mm^2

Residual Current Devices (RCDs) / Residual Current Circuit Breakers with Overcurrent Protection (RCBOs)

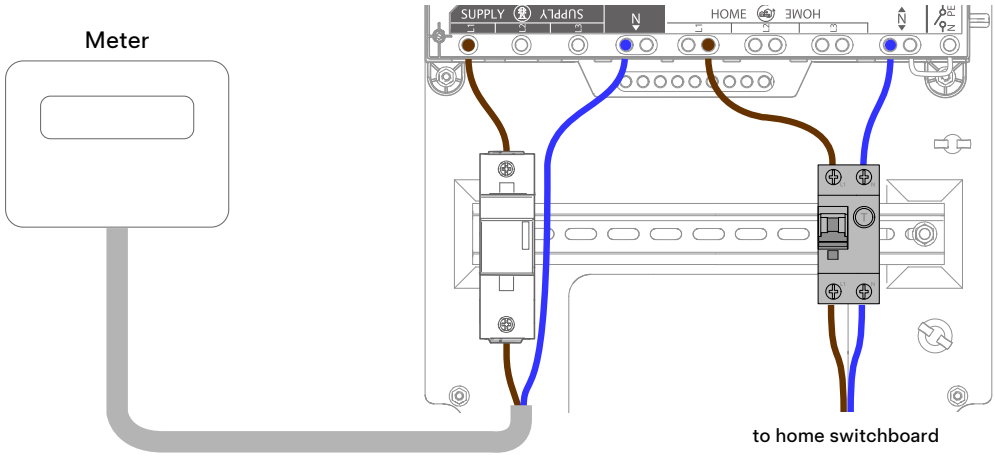
Residual Current Devices (RCDs) and Residual Current Circuit Breakers with Overcurrent Protection (RCBOs) are electrical devices for protection against electrocution or fire risk caused by an earth fault. This section provides basic guidance on selection and installation of RCDs / RCBOs with Powerwall systems when mandated by local code.

RCDs / RCBOs on Site-Level Circuits

Site-level RCDs / RCBOs may be required on TT earthing networks to ensure disconnect time per regulation or to protect cabling on site. It is well known that switching Neutral and Line conductors may occasionally cause nuisance tripping on upstream RCDs / RCBOs. One of the following two methods must be used to avoid risk of site-level RCD / RCBO nuisance tripping:

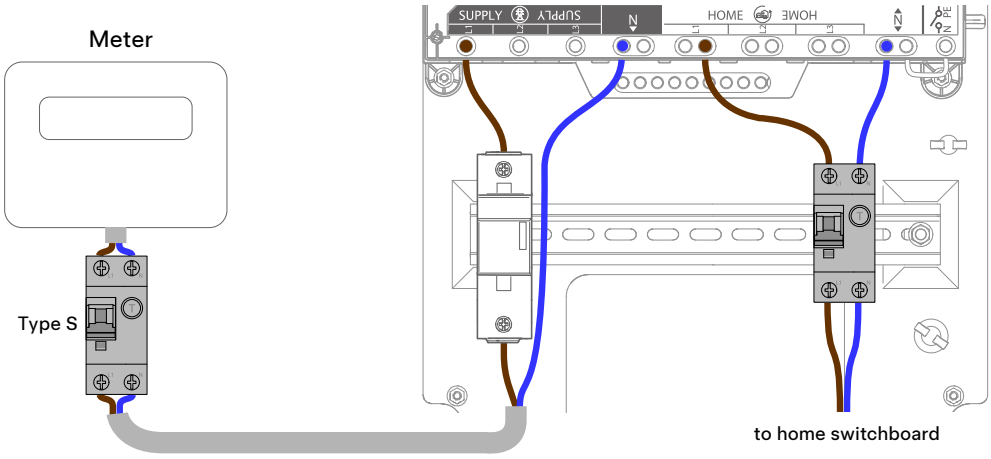
- **Option 1**: Relocate site-level RCD / RCBO into the Backup Gateway enclosure after Gateway's contactor (see figure below)
  - If the Backup Gateway is installed near the service entrance and DNO meter, relocate the site RCD / RCBO after the internal contactor by connecting to the 'Home' terminals.
  - In this configuration, all downstream home wiring remains protected by the site-level RCD / RCBO.
  - Incoming mains cables must be double-insulated.

Figure 29. Relocating Site-Level RCD / RCBO into Backup Gateway after the Contactor



- **Option 2:** Use Type-S time-delayed RCD / RCBO upstream of Backup Gateway
  - Type-S RCD / RCBOs are used for site-level protection to provide selectivity by introducing a time delay, ensuring any downstream RCDs / RCBOs trip first.
  - The delay provided by a Type-S RCD / RCBO is an effective mitigation of nuisance tripping.

Figure 30. Using Type S Time-delayed RCD / RCBO Upstream of Backup Gateway



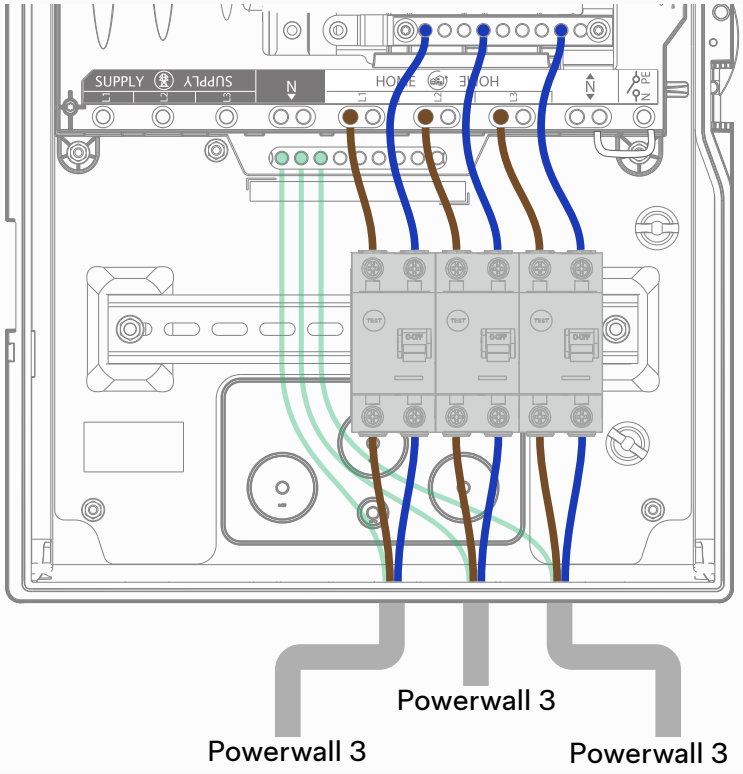
RCDs / RCBOs on Circuits Supplying Powerwall

Where required by local regulations, the installer may select an RCD or RCBO with an appropriate residual current rating for the circuit supply of Powerwall 3. However, to minimize the risk of nuisance trips, a 300 mA Type AC or A RCD / RCBO is recommended.

Powerwall 3 does not require a Type B RCD / RCBO, as it is not capable of feeding DC fault current into the electrical installation as per IEC 60364-7-712:2002.

NOTE: For systems with multiple Powerwall 3 units and or Powerwall 3 with additional solar inverter(s) installed, each device must be installed with its own RCD / RCBO.

Figure 31. (3) Powerwall 3 Units, Each with Its Own RCBO in Backup Gateway 2



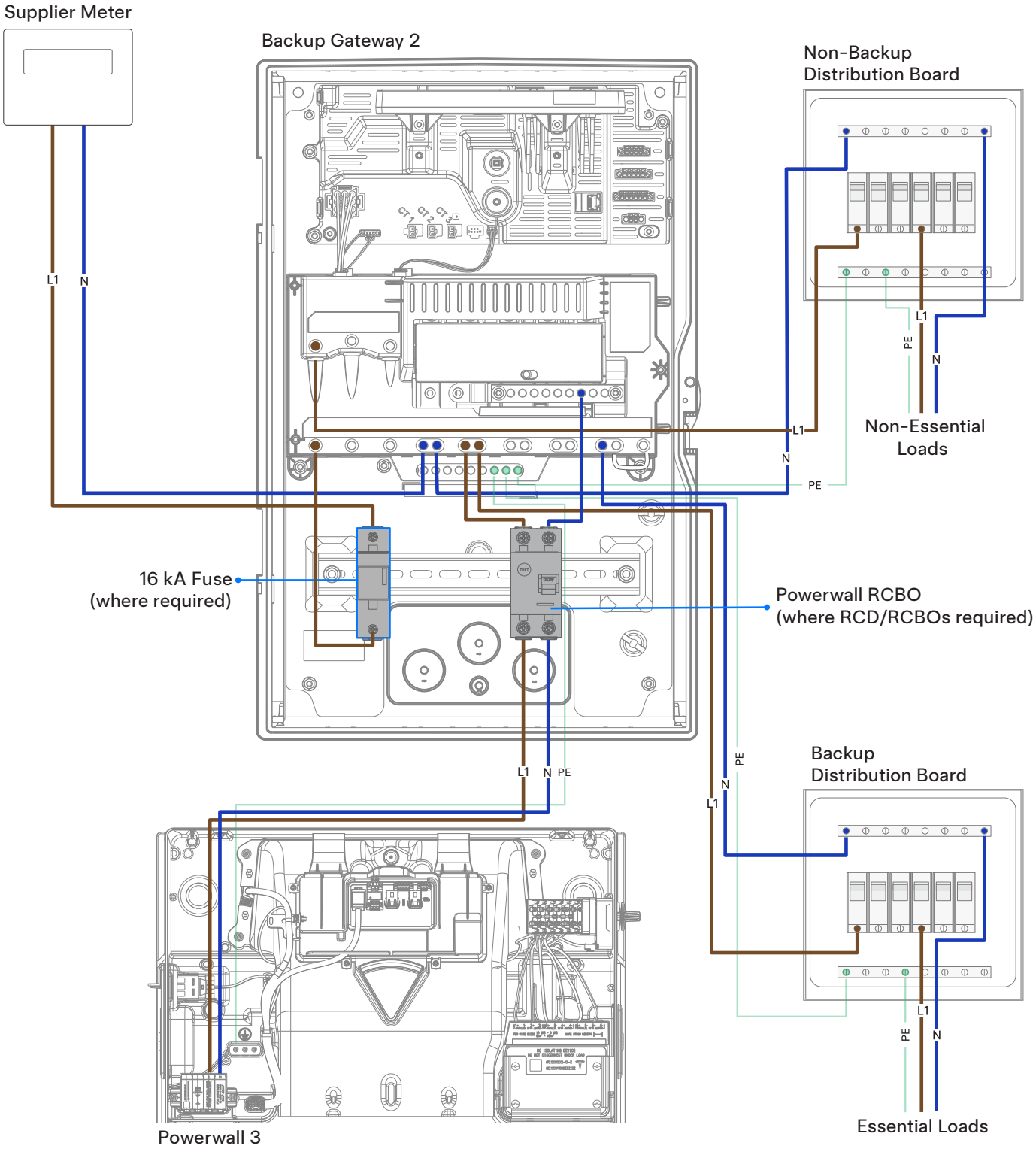
APPENDIX C: SYSTEM WIRING DIAGRAMS

Overview

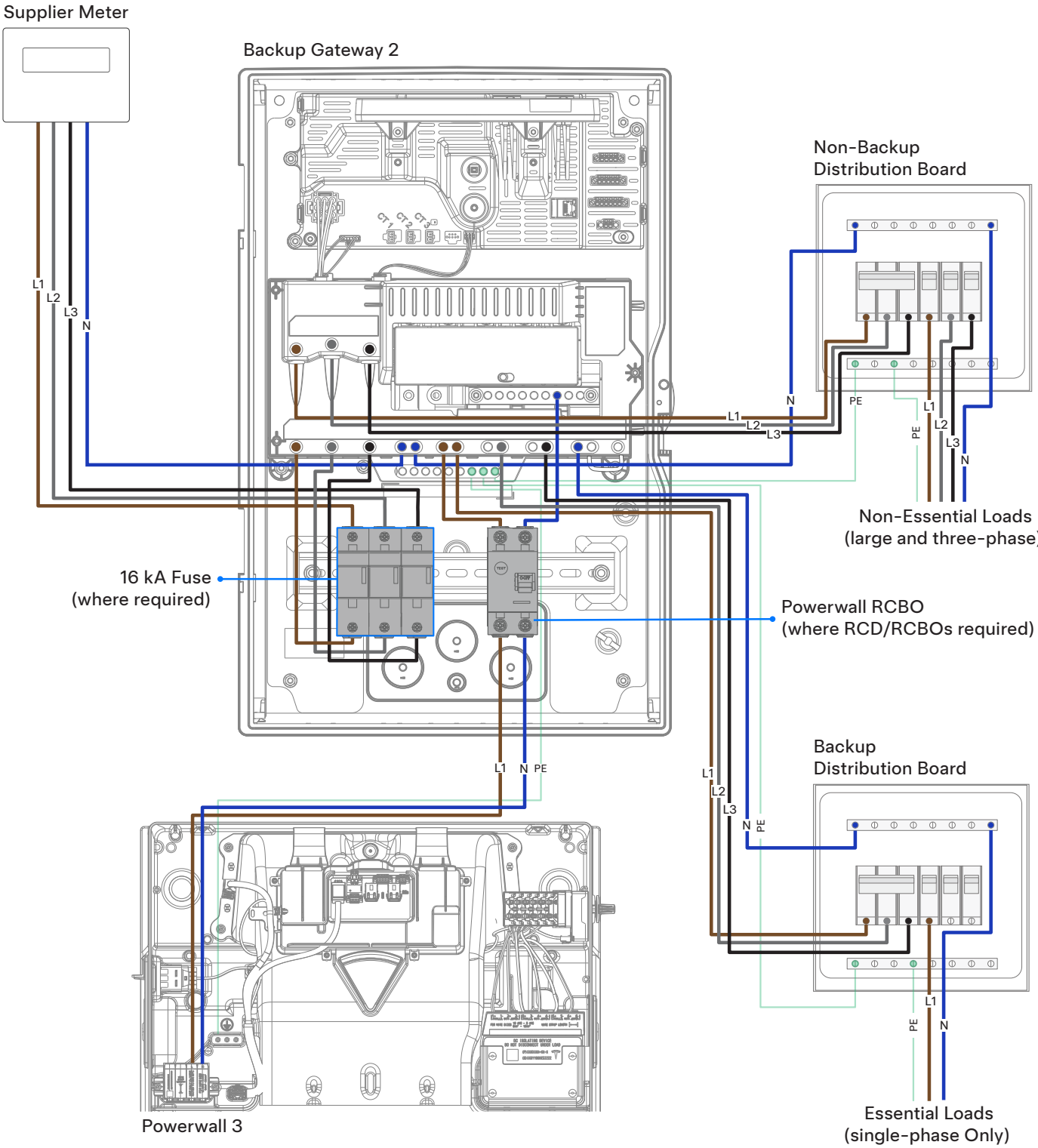
The following diagrams are intended for illustration purposes only. Drawings represent sample site layouts to show example system layout and metering. These diagrams should not be considered complete plan sets.

1. Single-phase supply, single-phase solar, partial backup
2. Three-phase supply, three-phase solar, single-phase partial backup

Single-Phase Service (TN Network)



Three-Phase Service (TN Network)



APPENDIX D: INSTALL EXTERNAL DC ISOLATION

To facilitate safe maintenance and testing, some regional electrical codes may require a means of isolating the PV array be provided adjacent to a PV inverter. The integrated DC isolator in Powerwall 3 provides a means to switch-off the feed from the PV array, however the PV wires terminated within the Powerwall 3 remain live. To achieve full code compliance, it is necessary to provide a means of PV array isolation external to the Powerwall 3.

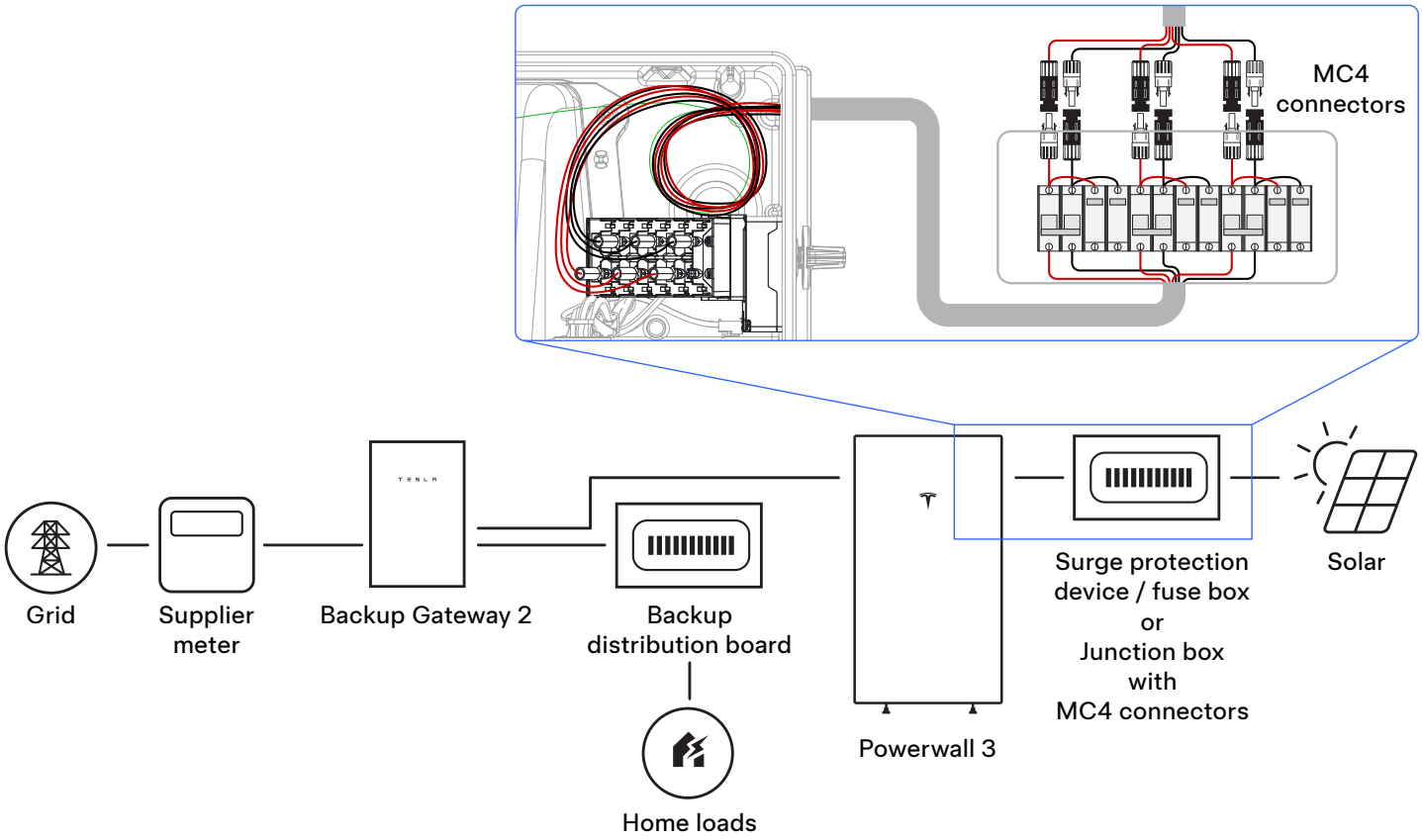
Installation Options

The following are options to make the installation compliant if the local electrical codes require a means of isolating the PV array:

- The use of suitably rated plug and socket connectors (e.g. MC4) on the feed from the PV array. These can be installed *directly into the PV array wires on page 109* using a harness with connectors before they enter the Powerwall 3, or *fitted to an external enclosure on page 108* adjacent to the Powerwall 3 (e.g. where an enclosure needs to be installed for surge protection devices or fuses).
- The use of a suitably rated *DC isolator on page 110* adjacent to the Powerwall 3.

In all cases, local codes should be carefully studied to ensure full compliance of the whole installation.

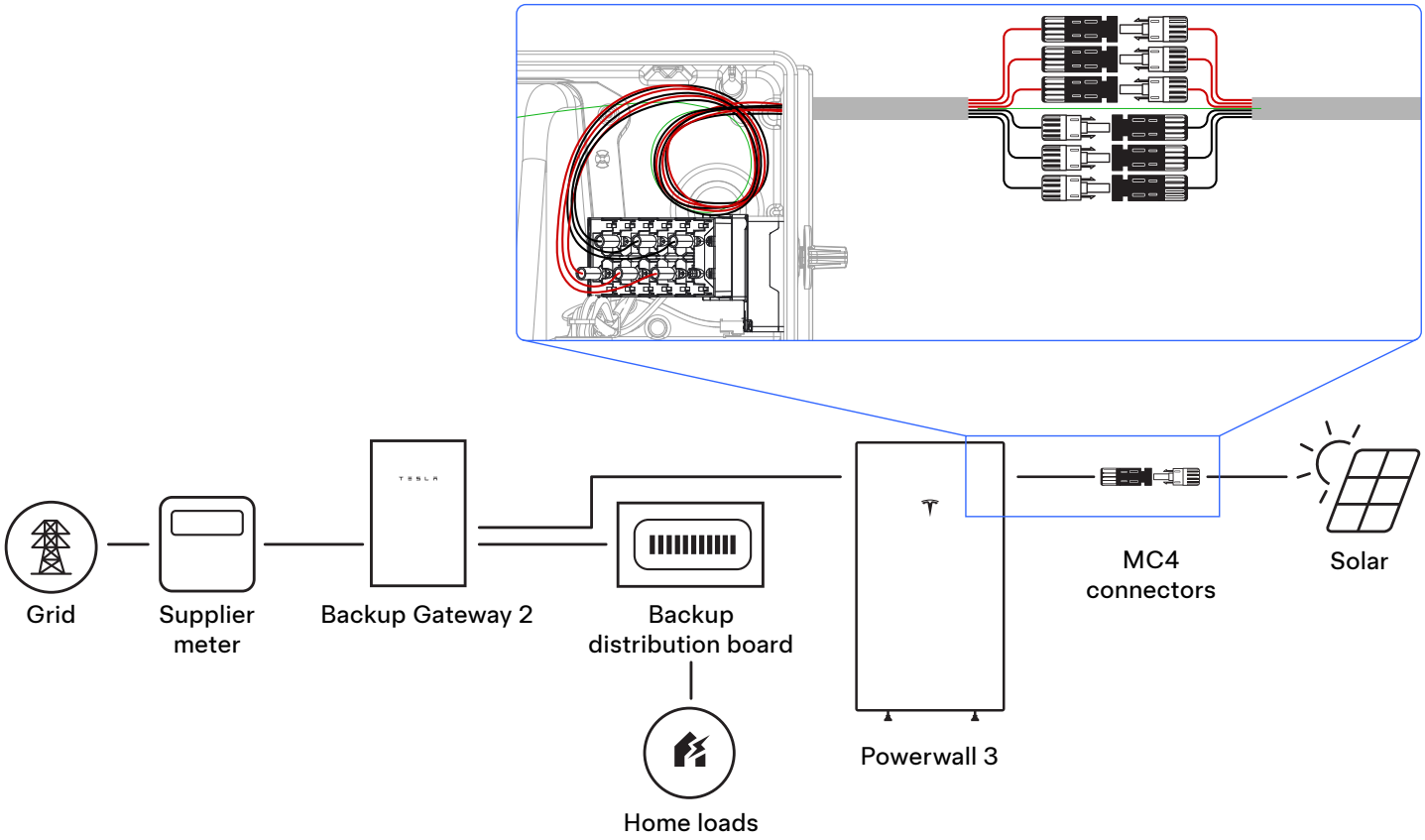
Installing Connectors (e.g. MC4) on an External Enclosure



If an external enclosure needs to be installed adjacent to the Powerwall 3 for surge protection devices or fuses, the connectors can be installed on the external enclosure.

To isolate the Powerwall 3 from the DC side, the Powerwall 3 integrated DC isolator must be turned OFF and the connectors must be disconnected. The connectors also provide a convenient testing point for string tests.

Installing a Harness with Connectors (e.g. MC4) Directly into the PV Array Wires

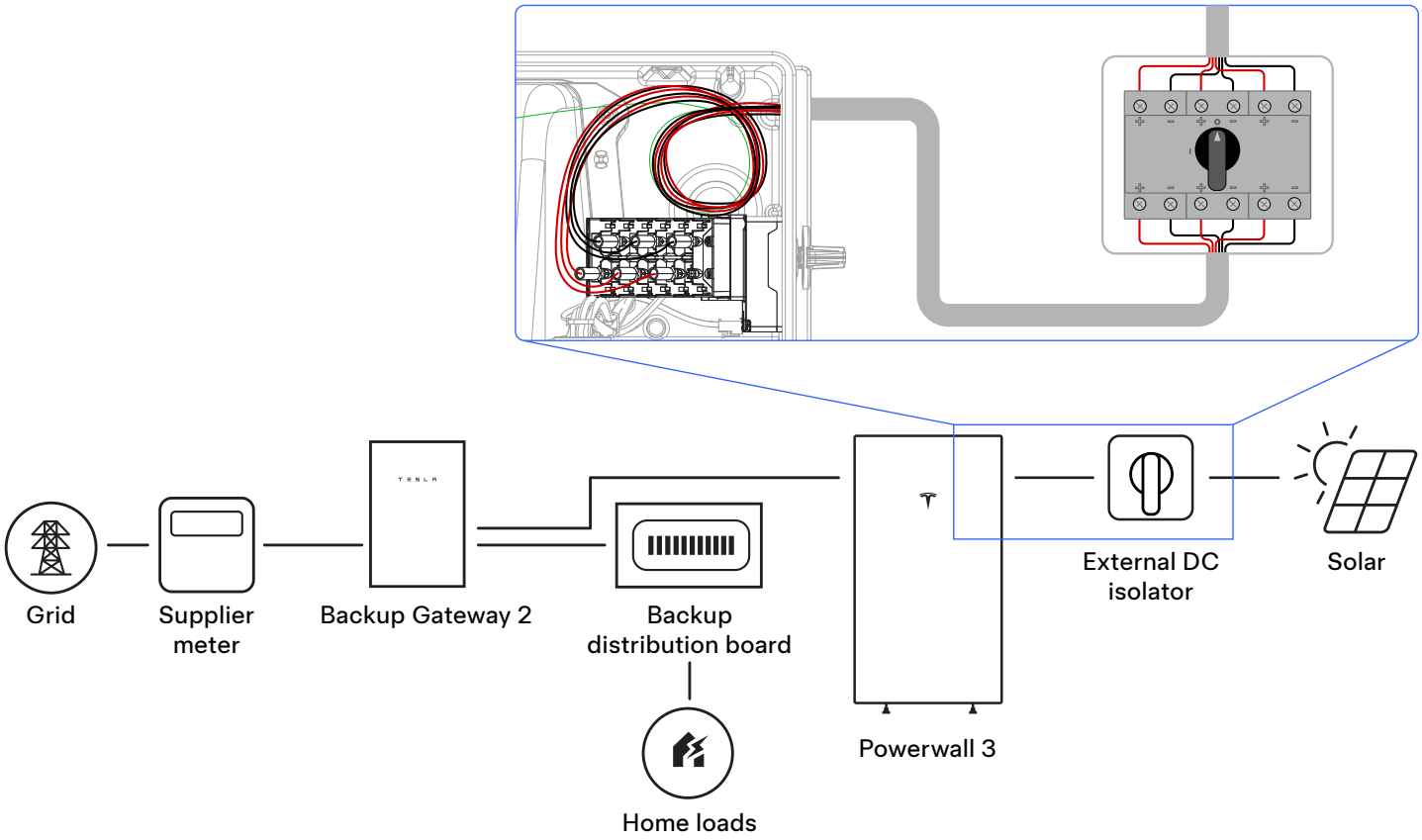


If an external enclosure doesn't need to be installed, the connectors can be installed directly into the PV array wires using a harness with connectors.

To isolate the Powerwall 3 from the DC side, the Powerwall 3 integrated DC isolator must be turned OFF and the connectors must be disconnected. The connectors also provide a convenient testing point for string tests.

NOTE: This option can cause cable management issues with a bundle of connectors.

Installing an External DC Isolator



If the connectors are not a suitable option for any reason, an external DC isolator can be installed adjacent to the Powerwall 3.

To isolate the Powerwall 3 from the DC side, the external DC isolator must be turned OFF. This option does not require connectors (e.g. MC4), but using such connectors may simplify string testing.

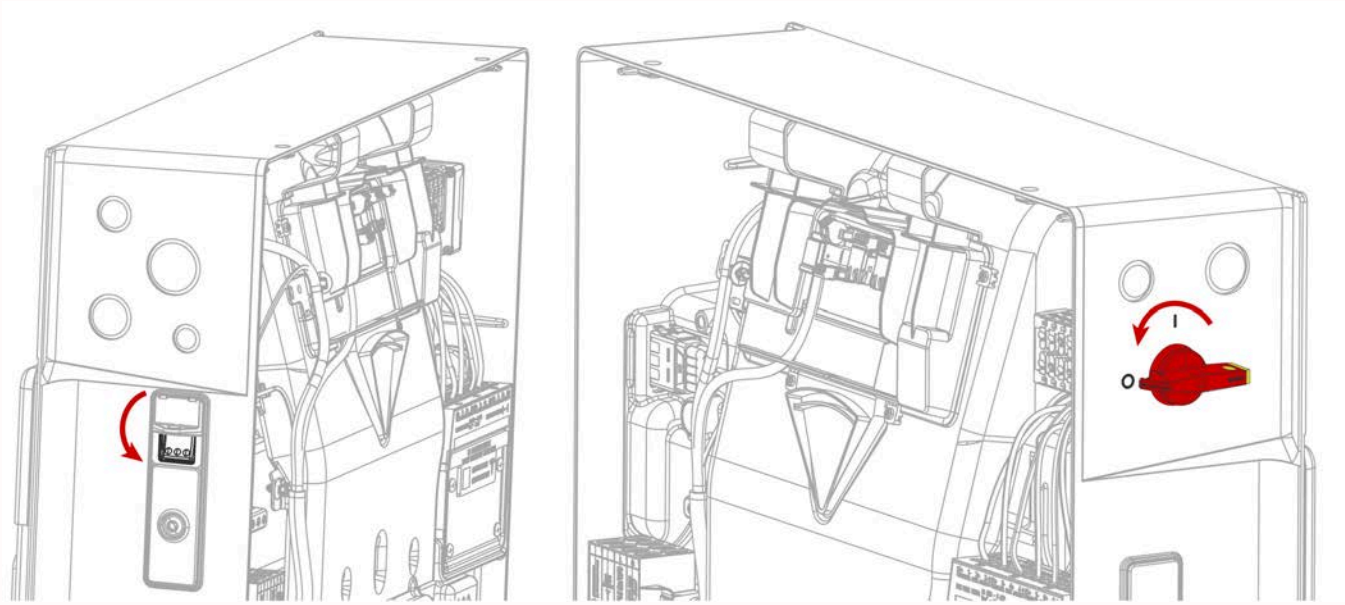
APPENDIX E: (OPTIONAL) INSTALL SYSTEM SHUTDOWN SWITCH

The Powerwall 3 On/Off switch is also a means of shutting the system down.

CAUTION: The System Shutdown Switch must be connected to Powerwall 3. Do not connect it to the Backup Gateway 2, as it will not work.

Install the System Shutdown Switch

WARNING: Before terminating any conductors inside Powerwall 3, ensure that the integrated DC isolator and Powerwall 3 On/Off switch are both turned OFF to de-energize the system. Confirm lack of voltage at the AC and PV terminals before proceeding.



1. Remove the factory-installed jumper from the System Shutdown + / - terminals on the Powerwall 3 System Shutdown connector. See *Appendix B: Wiring Reference on page 94* for a detailed wiring reference.
2. Wire the 2-conductor communication wire (minimum 0.25 mm^2 conductors) to the System Shutdown terminals:
   a. Strip the communication wire jacket so that it does not extend past the edge of the fan duct. This ensures the individual conductors lie flat, leaving room for the front cover to be installed.
   b. Strip each conductor 5/16 inch (8 mm).
   c. Route the two conductors to the connector as shown below, using the wire management tab to prevent them from blocking the Tesla Asset Controller.

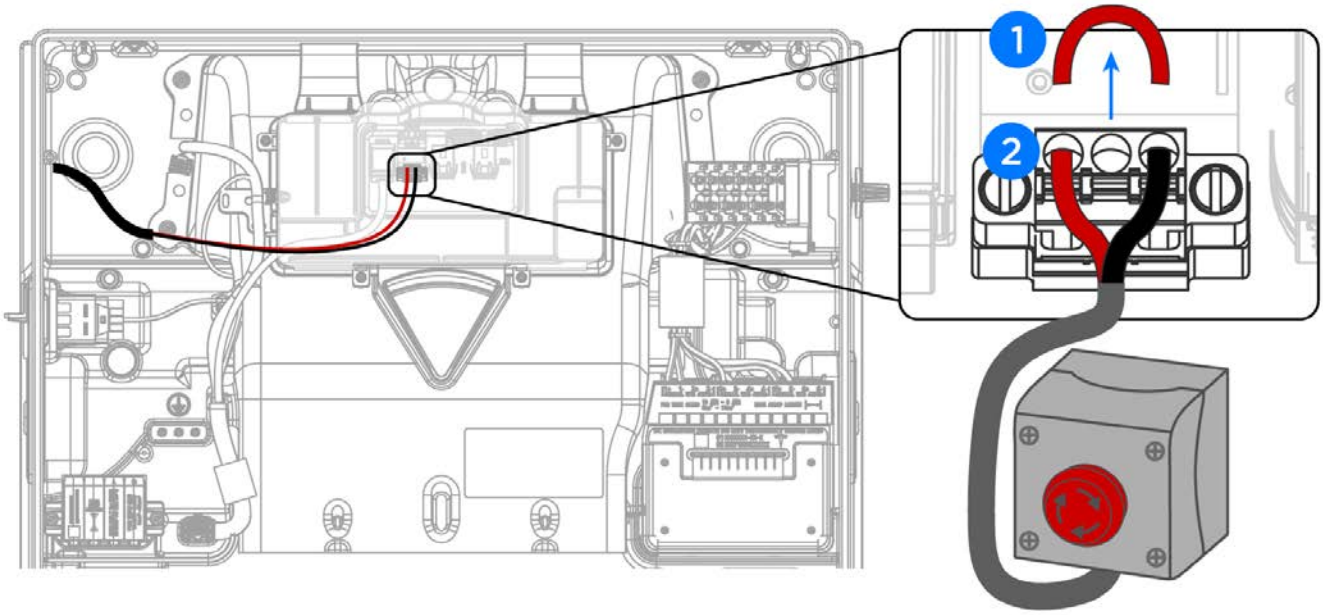
      CAUTION: Tesla recommends routing the communication wiring into the left side of the enclosure; always use the wire management tabs to ensure wires do not block the Tesla Asset Controller. Do not route loose wires through the front of the enclosure.

   d. Insert a cabinet tip or electronics tip slotted screwdriver (up to 3/32-inch or 3 mm) into each screwdriver slot to open the terminal.

e. Insert each conductor as far as possible into the terminal and remove the screwdriver from the screwdriver slot to close the terminal.

> ⚠ **CAUTION:** Excessive force may damage the connector; do not apply more force than is necessary to open the terminal and insert the conductor.

3. Connect the 2-conductor communication wire to a suitable DC switch (requirements below).



Switch Requirements

System Shutdown Switches shall meet the following requirements.

- Listed or Recognized as "Emergency Stop Button", "Emergency Stop Device", "Emergency Stop Unit", meeting one of the following standards:
  - IEC 60947-1:2020 and IEC 60947-5-1
  - BS EN ISO 13850:2015 - TC
- Rated for at least 12 V, 1 A
- Outdoor rated (IP 14 or higher)
- Terminals must accept 0.25 mm^2 wire or larger

APPENDIX E: (OPTIONAL) INSTALL SYSTEM SHUTDOWN SWITCH

Recommended Switch Components

The following product (composed of all parts listed below) meets all above requirements for this application:

Emergency Stop Button Option 1: Eaton	Eaton M22-PVT	Emergency Stop Button
	Eaton M22-I1-PG	Emergency Stop Enclosure
	Eaton M22-K01PV6	Emergency Stop Contactor Block (240V, 6A)
Emergency Stop Button Option 2: Schneider	Schneider XALD01H7	Emergency Stop Enclosure
	Schneider ZB5AT84	Emergency Stop Button
	Schneider ZB5AZ009	Emergency Stop Collar
	Schneider ZBE102	Emergency Stop Contact Block
	Schneider ZBZ1605	Emergency Stop Guard Yellow
	Schneider ZBZ1602	Emergency Stop Guard Black
Low voltage communication wire (Powerwall 3 communication cable preferred)		

Installation Guidelines for the System Shutdown Switch

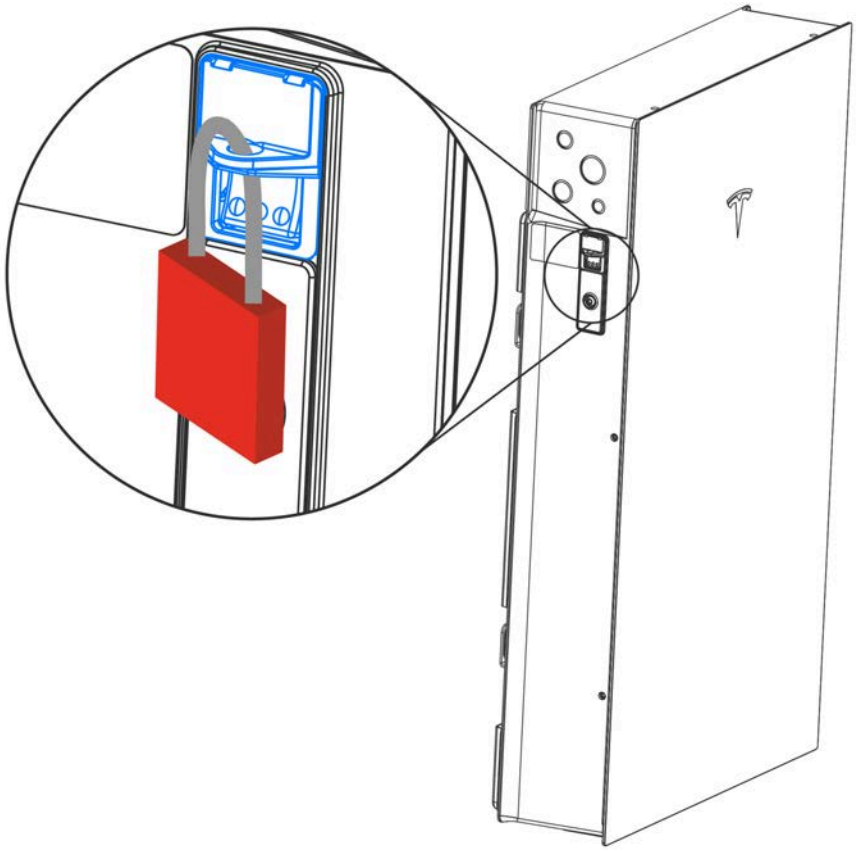
- Up to three Powerwall 3 units can be connected to a single System Shutdown Switch
- Installed externally in a readily accessible location, preferably near utility meter
- Maximum low voltage wire run from switch does not exceed 150 ft (45 m)
- Control circuit must be installed as Type TC-ER or within an appropriate raceway

APPENDIX F: SAFETY FEATURES

Powerwall 3 Switch Locking Mechanisms

On / Off Switch Locking Mechanism

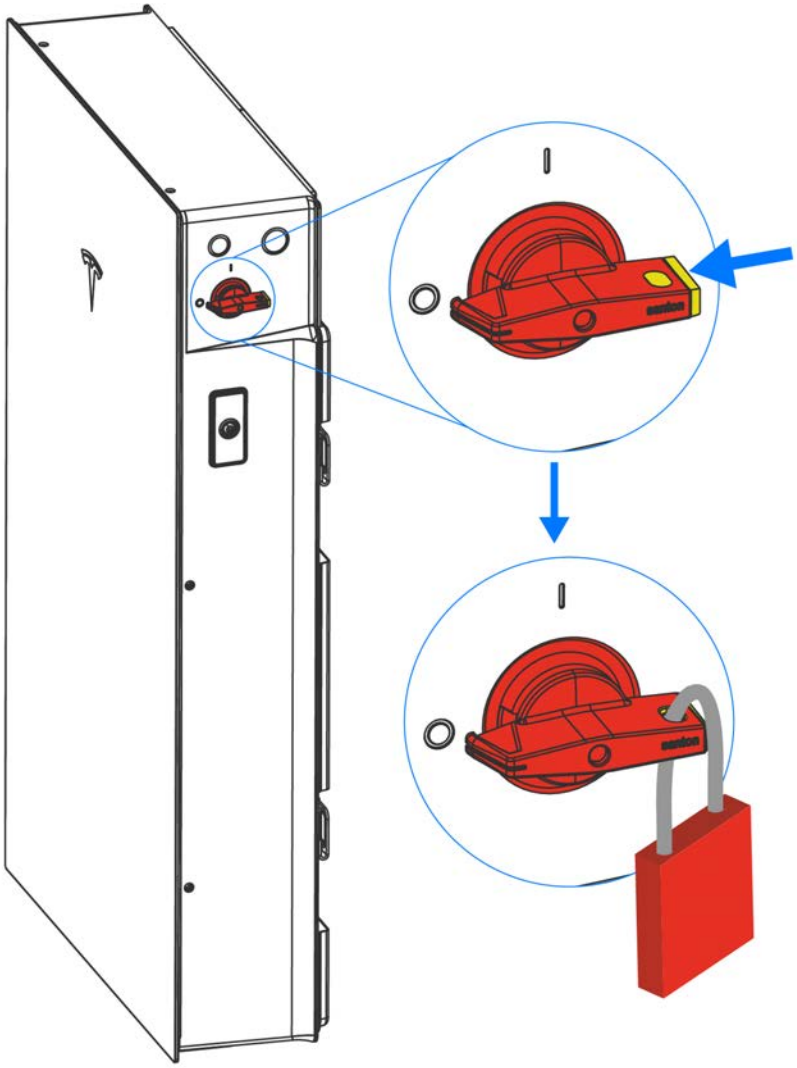
The Powerwall 3 On / Off switch has a locking mechanism. When the switch is locked it cannot be turned on.



Integrated DC Isolator Locking Mechanism

The Powerwall 3 integrated DC isolator has a locking mechanism. When locked, it cannot be turned on. To use the locking mechanism:

1. Push in the yellow tab on the end of the switch to make the keyhole accessible.
2. Place a 4 mm shackle lock through the keyhole.



Arc Fault Detection and Protection

The Arc-Fault Circuit Interrupter (AFCI) mechanism detects series arcs within the PV array.

The detection algorithms work based on both voltage and current. When an arc fault is detected, Powerwall 3 stops converting power and disconnects from the grid. Once a fault has been detected, it can only be reset manually on-site using the mobile app via remote command. The reset cannot be automatically cleared. The fault is displayed with an LED visual indicator, which cannot be reset automatically.

To activate the AFCI self-test feature, power cycle the unit.

Protective Earth Impedance Check

The protective earth (PE) connection is checked for sufficiently low impedance at least once per day.

The scheduled time for the PE impedance test is every morning before closing the inverter side AC relays.

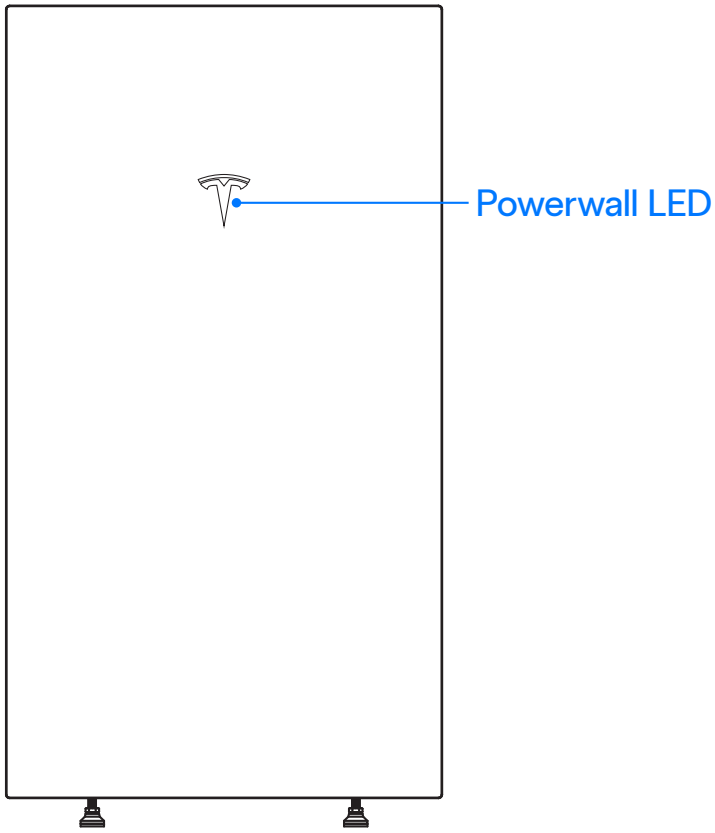
Upon detected loss of PE or identification of a high impedance value Powerwall 3 does not connect to the grid until the fault is cleared manually or a repeated PE impedance test demonstrates a sufficiently low impedance.

System LED Behavior

Powerwall 3 LED Behavior

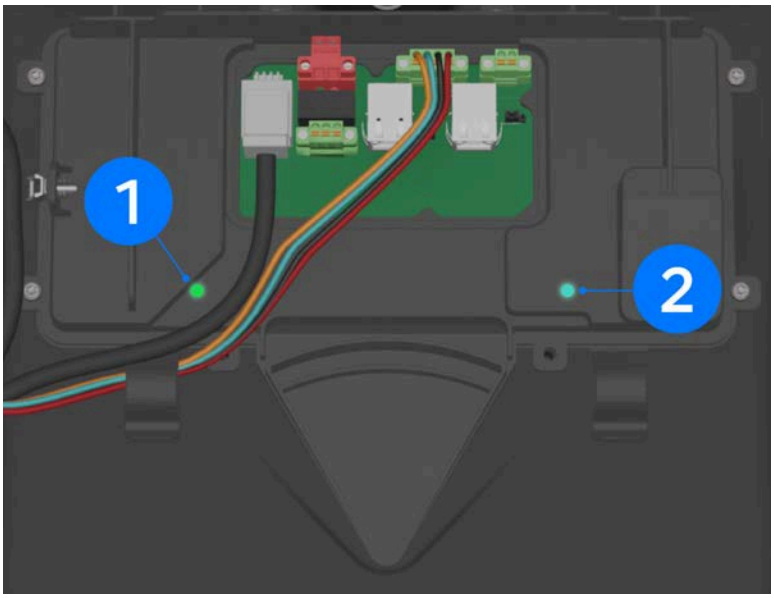
Tesla Logo LED

Powerwall 3 has an illuminated logo LED. Expansion units do not have an LED and therefore the logo is not illuminated. The following diagram and table are relevant only for Powerwall 3 units (not Expansion units).



LED State	Indication
Solid white	Normal operation
Flashing white	Powerwall 3 is idle. Will enter sleep state if no actions in progress
Off	Powerwall 3 is off or in sleep state
Flashing Red	Inverter (PWS) fault, e.g. AFCI or GFCI, etc.

Tesla Asset Controller (TACO) LEDs



(1) Power LED	(2) Status LED	Status	Details
Solid green	Solid light blue	Ready to commission	TACO is powered and the config application is running. TeslaPW network should be broadcasting
Solid Green	Solid Green	Not ready to commission	TACO is powered but the config application is not yet running. If Powerwall 3 remains in this state permanently, contact Install Support
Solid Green	Red	Not ready to commission	TACO is powered but the unit is still booting up. If Powerwall 3 remains in this state permanently, contact Install Support
OFF	OFF	No power (12V) to TACO	Note that power can be provided by either the Backup Gateway 2 12V or internal 12V. 1. Turn the Powerwall 3 switch ON and wait at least 5 minutes 2. Confirm the TACO low voltage harness is plugged all the way in (see *TACO Low Voltage Harness on page 97*) 3. Confirm the 12V wiring from Backup Gateway 2 to Powerwall 3 (TACO terminals 1-4 in *Communication Wiring to Backup Gateway 2 on page 96*) is correct If Powerwall 3 remains in this state, contact Install Support

NOTE: During a firmware update, LED 2 may flash red. This is expected behavior, and the flashing will stop once the firmware update is complete.

NOTE: The Tesla Asset Controller LEDs are not visible when the Powerwall 3 front cover is installed.

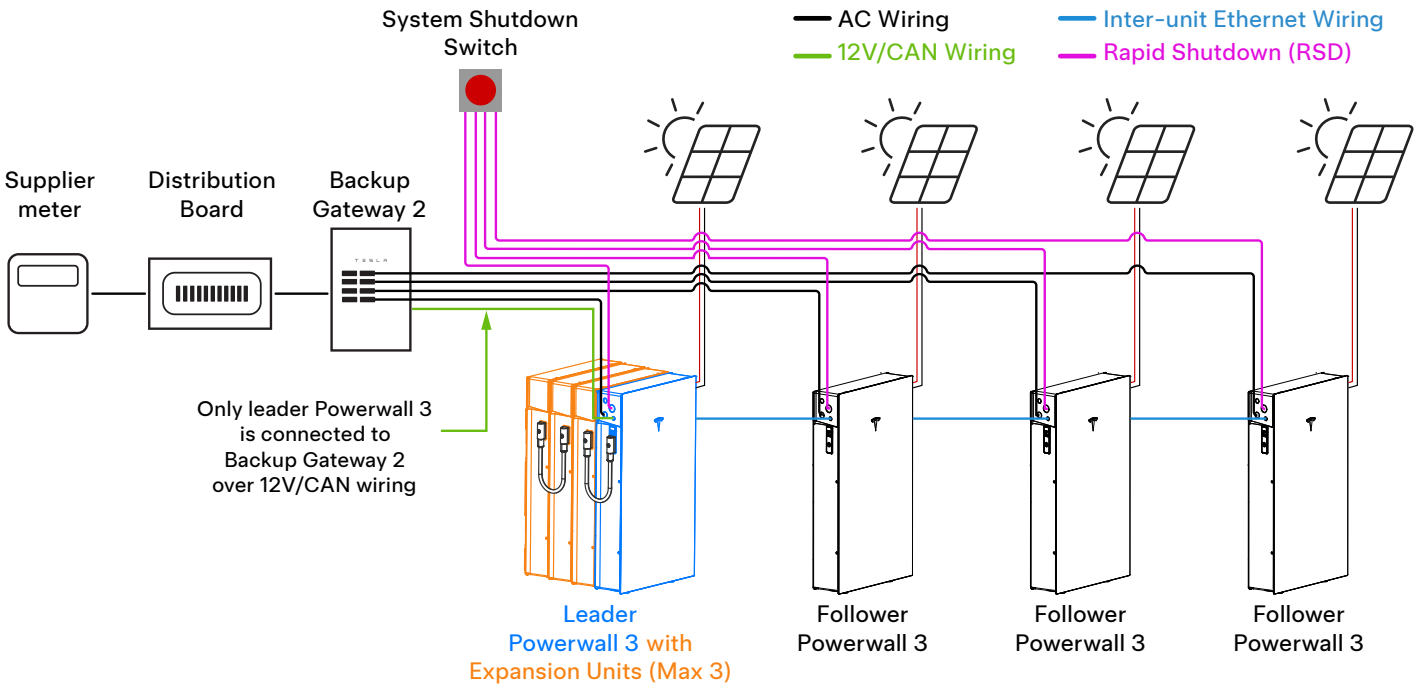
APPENDIX G: INSTALLING MULTIPLE POWERWALL 3 UNITS AND/OR EXPANSION UNITS

Multi-Unit Installation Overview

Powerwall 3 can be installed with additional Powerwall 3 units for additional solar and storage capabilities, and/or with Powerwall 3 Expansion units for additional storage (kWh).

Maximum Number of Powerwall 3 Units	Up to (4) Powerwall 3 units
Leader Powerwall 3	The Powerwall 3 connected to the Backup Gateway 2 via 12V / CAN communication wiring is designated as the **Leader Powerwall 3** **NOTE:** The system is commissioned by connecting to the Leader Powerwall 3.
Follower Powerwall 3	Any Powerwall 3 other than the Leader is connected via inter-Powerwall Ethernet wiring and is designated as a **Follower** unit
Maximum Number of Expansion Units	Up to (3) Expansion units (for a maximum total of (7) units) **NOTE:** Expansion units must be connected to the **Leader Powerwall 3**; they will not function if connected to a **Follower** unit.
Powerwall 3 Compatibility with Expansion Units	Powerwall 3 units with Tesla P/N 1707000-xx-**J or greater** are compatible with Expansions

Figure 32. Multi-Powerwall 3 System with up to Four Powerwall 3 Units and up to Three Expansion Units



APPENDIX G: INSTALLING MULTIPLE POWERWALL 3 UNITS AND/OR EXPANSION UNITS

Install Multiple Powerwall 3 Units

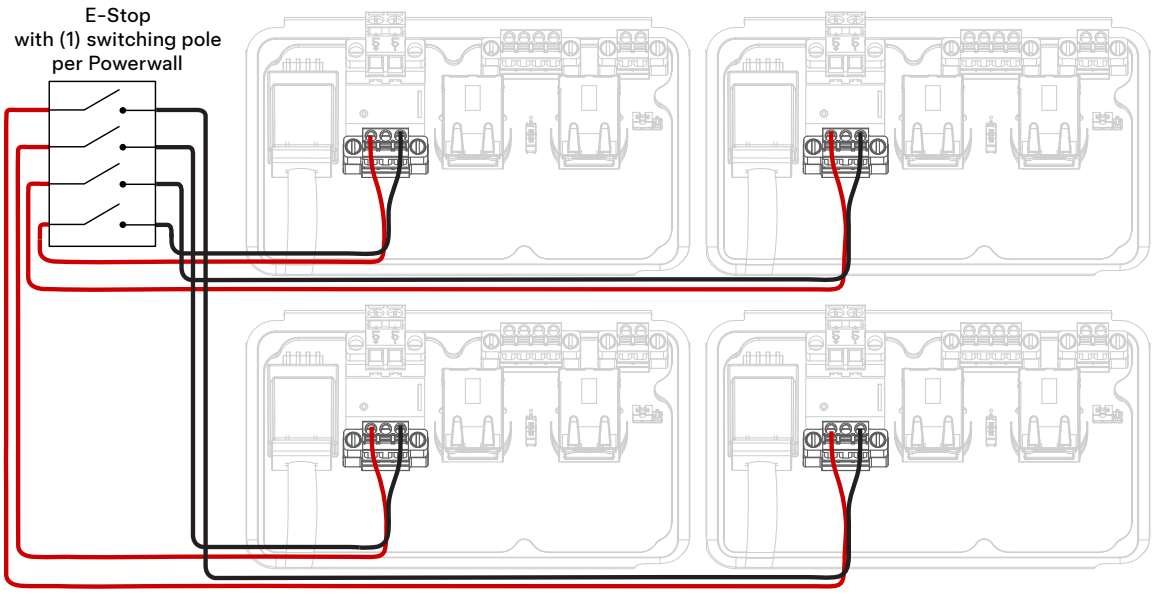
Leader to Follower Communication	Ethernet (see *Prepare Ethernet Wiring with RJ45 Connectors on page 98*)
Internet Connection for Multiple Units	**Option 1**: The Leader Powerwall 3 is connected to customer router over Wi-Fi
	Option 2: Either the first or last Powerwall 3 (can be Leader or Follower) in the chain is connected to customer router via Ethernet **NOTE:** Only connect the router to a Powerwall 3 at either end of the chain; do not connect it in the middle of the chain (see *Connecting Powerwall 3 Units via Ethernet on page 122* for example diagrams).
Maximum Wire Length Between Units	See *Plan Cable Length Between Components on page 34*
Overcurrent Protection Devices	Each Powerwall 3 requires its own circuit breaker
Splitting PV Production Between Multiple Powerwall 3 Units	Splitting PV production (strings) equally between the Powerwall 3 units is preferred but not required
System Shutdown Switch with Multiple Units	Where a System Shutdown Switch is required, each Powerwall 3 unit must be wired to a dedicated switching pole of the switch. Ensure the installed System Shutdown Switch has enough switching poles for the number of units installed. See *Appendix E: (Optional) Install System Shutdown Switch on page 111* for switch requirements and additional information **NOTE:** For Expansion units, all wiring terminations (including the System Shutdown Switch) are made by the Expansion Harness.

Optional System Shutdown Switch with Multiple Powerwall 3 Units

Where a System Shutdown Switch is installed, each Powerwall 3 must be wired to a dedicated switching pole of the switch. Ensure the installed System Shutdown Switch has enough switching poles for the number of units installed.

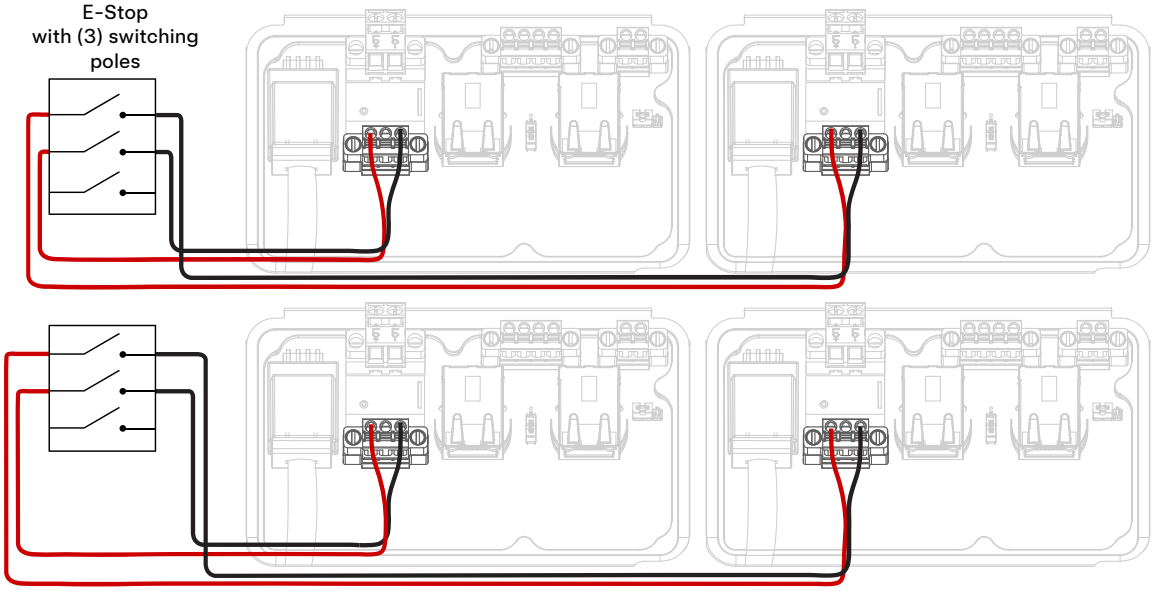
NOTE: As depicted in the system diagram above, Expansion units are not connected to the System Shutdown Switch. They are connected to Powerwall 3 via the Expansion Harness, and they will also shut down when the System Shutdown Switch is pushed.

Figure 33. 4-Pole System Shutdown Switch with Four Powerwall 3 Units



In the event multiple System Shutdown Switches are required to accommodate the number of Powerwall 3 units installed, simply install multiple switches, placing them physically near each other and following all local codes and requirements.

Figure 34. Two 3-Pole System Shutdown Switches with Four Powerwall 3 Units



Connecting Powerwall 3 Units via Ethernet

All Powerwall 3 units must be connected via Ethernet. The units can be connected in any order, so long as each unit is connected to at least one other unit.

Figure 35. Option 1: Leader Powerwall 3 Connected to Customer Router via Wi-Fi (Leader at Start of Chain)

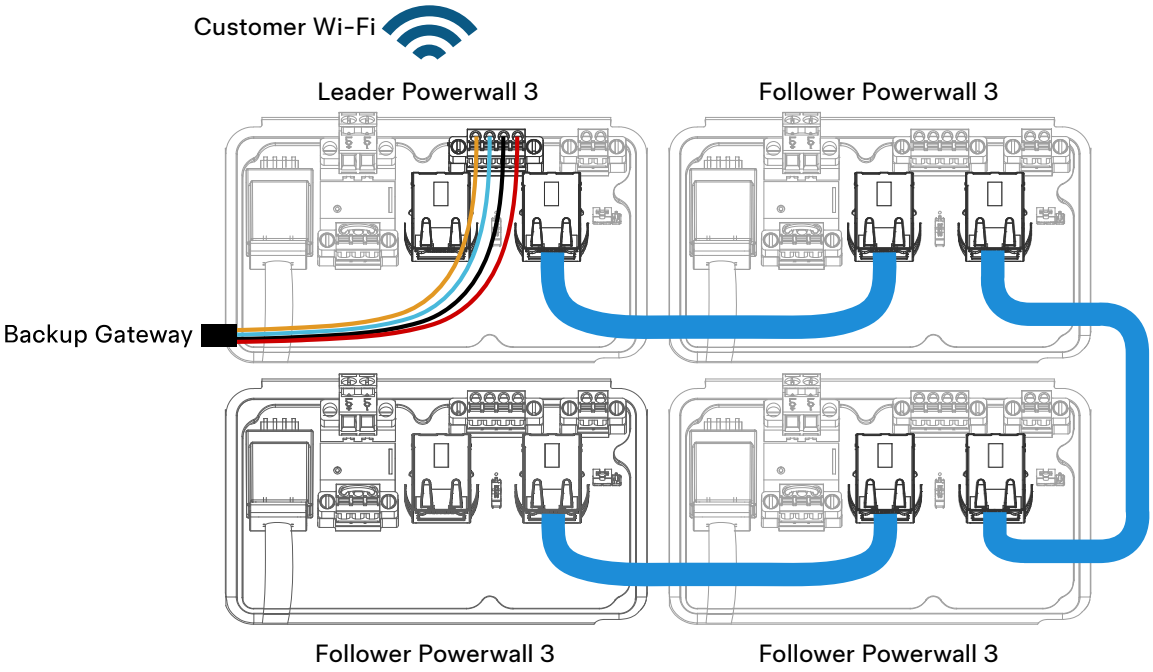


Figure 36. Option 2: Leader Powerwall 3 Connected to Customer Router via Wi-Fi (Leader in Middle of Chain)

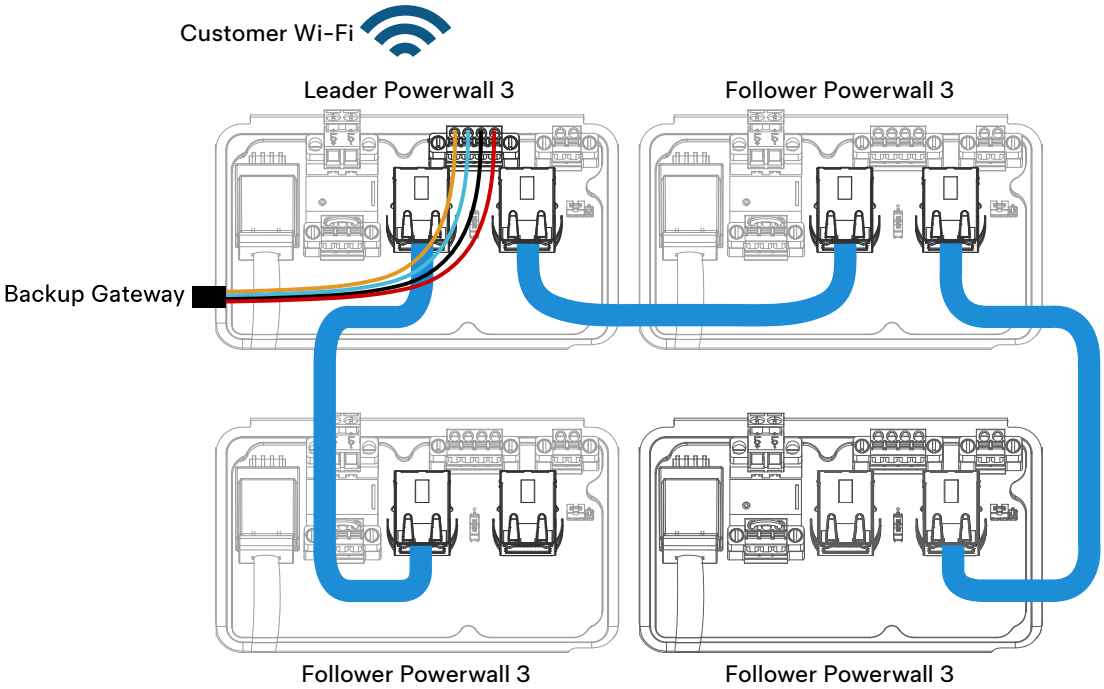
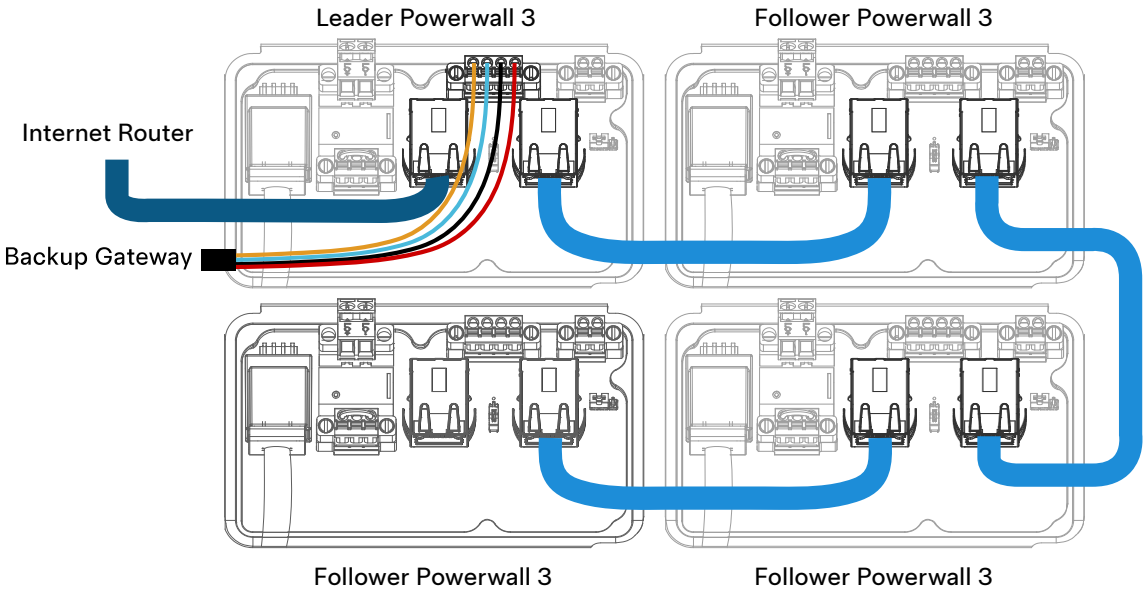
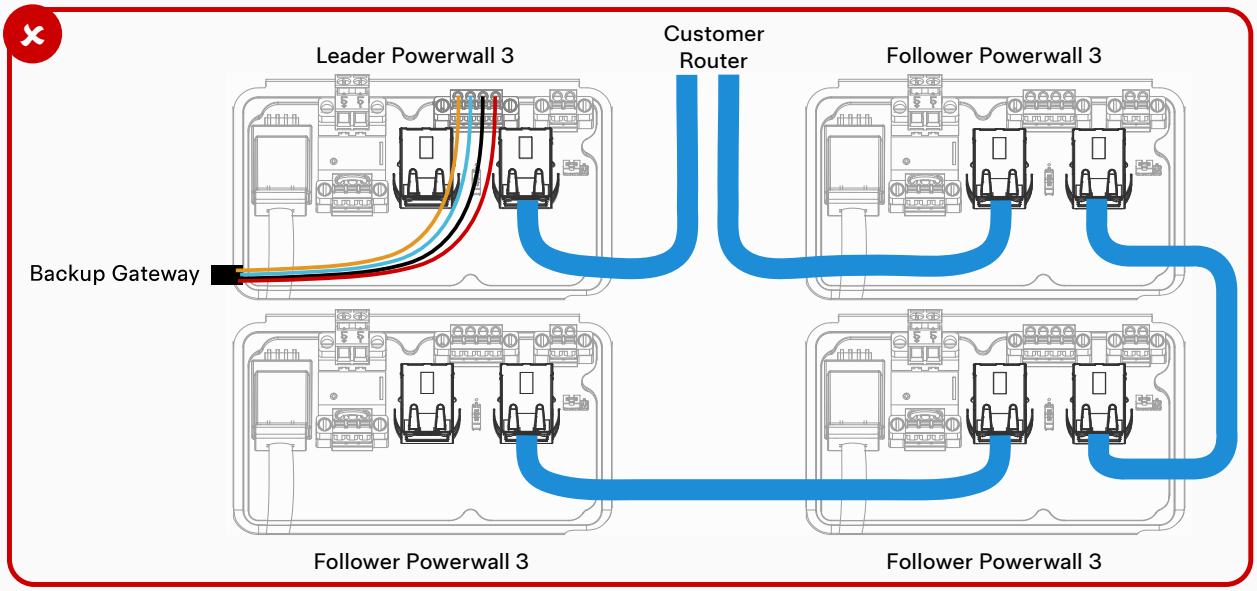


Figure 37. Option 3: Leader Powerwall 3 Connected to Customer Router via Ethernet



NOTE: If connecting the system to the customer router via Ethernet, connect the router to either the first or last Powerwall 3 in the chain. Do NOT connect the router in the middle of the chain.

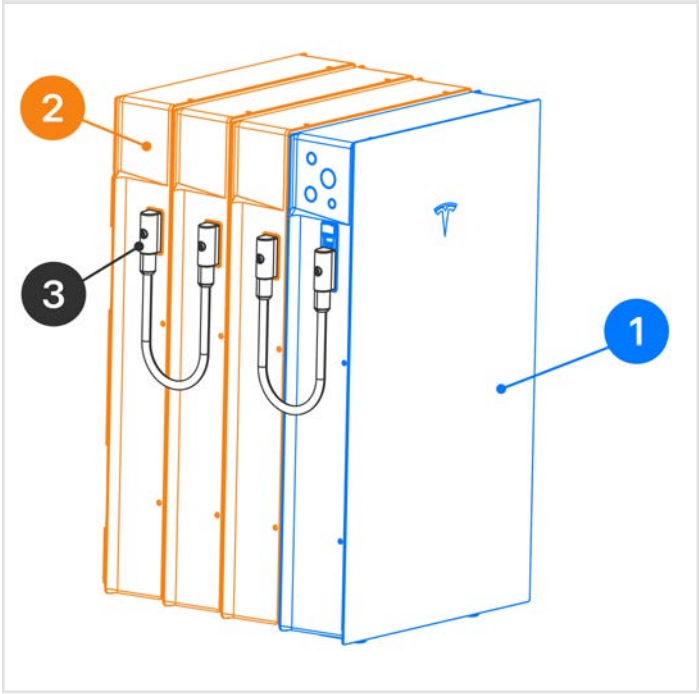
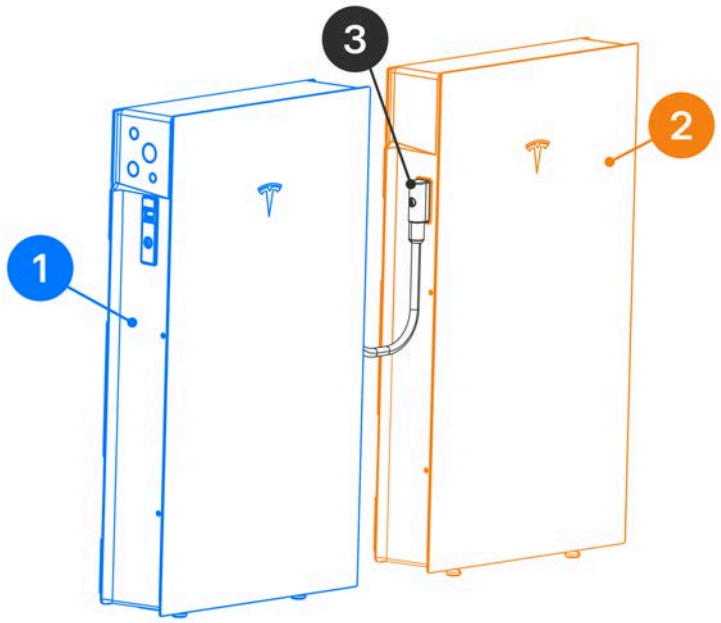


Commissioning Multi-Powerwall 3 Systems

For instructions to commission a multi-Powerwall 3 system, see the *Powerwall 3 Commissioning Guide*.

APPENDIX G: INSTALLING MULTIPLE POWERWALL 3 UNITS AND/OR EXPANSION UNITS

Install Expansion Units with Powerwall 3

Powerwall 3 with Stacked Expansion Units	Powerwall 3 with Wall-Mounted Expansion
	

1	Powerwall 3
2	Powerwall 3 Expansion
3	Expansion Harness

Expansion units offer additional storage for Powerwall 3 systems. Key points about Expansion units include:

- **Function**: An Expansion unit does not include an inverter; it is only additional storage (kWh)

  NOTE: Expansion units do not have an LED. Wall-mounted Expansion units are installed with the same glass front cover as Powerwall 3, but the logo on the front will never light because there is no LED in the unit.

  NOTE: Expansion units are not field serviceable.

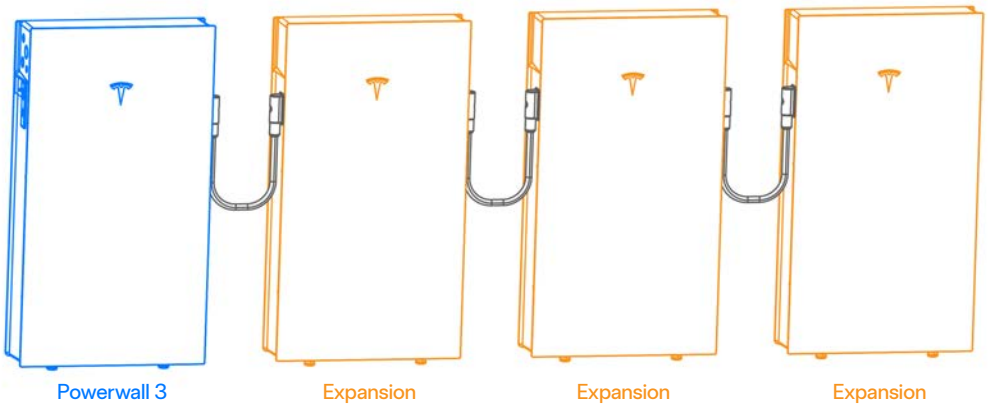
- **Dimensions**: The Expansion enclosure is the same height and width as Powerwall 3, but is 1 inch (25 mm) slimmer than Powerwall 3 (*see diagram on page 126*)
- **Mounting**: Expansion units can be mounted individually, or ground-mounted in a stacked configuration behind a Powerwall 3
- **Expansion Connection**: Expansion units can only be connected to Powerwall 3 or other Expansion units via the Expansion Harness (see *Expansion Harness on page 127*). Each unit (Powerwall 3 and Expansion) has (2) Expansion ports, one on each side of the enclosure

  NOTE: The Expansion units are electrically paralleled with a Powerwall 3.

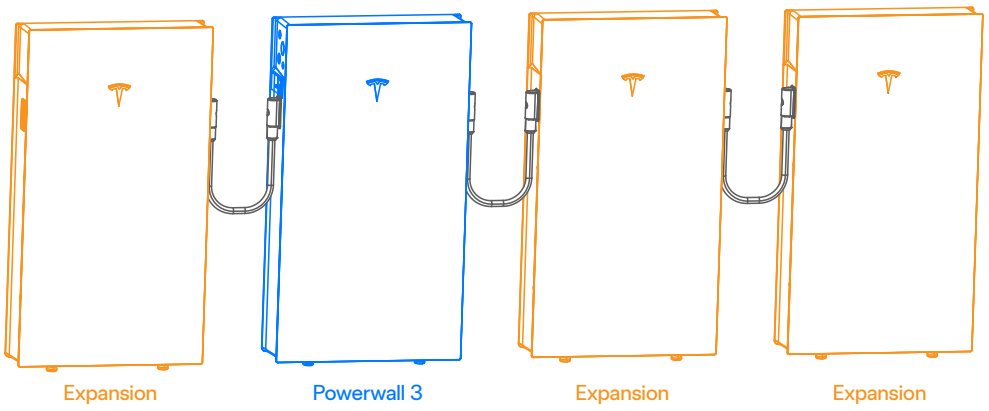
- **System Size**: Up to (3) Expansion units can be connected to the Leader Powerwall 3
- **Compatible Powerwall 3 Versions**: Powerwall 3 units with Tesla P/N 1707000-xx-**J or greater** are compatible with Expansion units

APPENDIX G: INSTALLING MULTIPLE POWERWALL 3 UNITS AND/OR EXPANSION UNITS

- **Flexibility**:
  - The Expansion Harness can be plugged in on either side of a Powerwall 3 or an Expansion unit
  - Powerwall 3 can be installed at either end of a chain of Expansion units

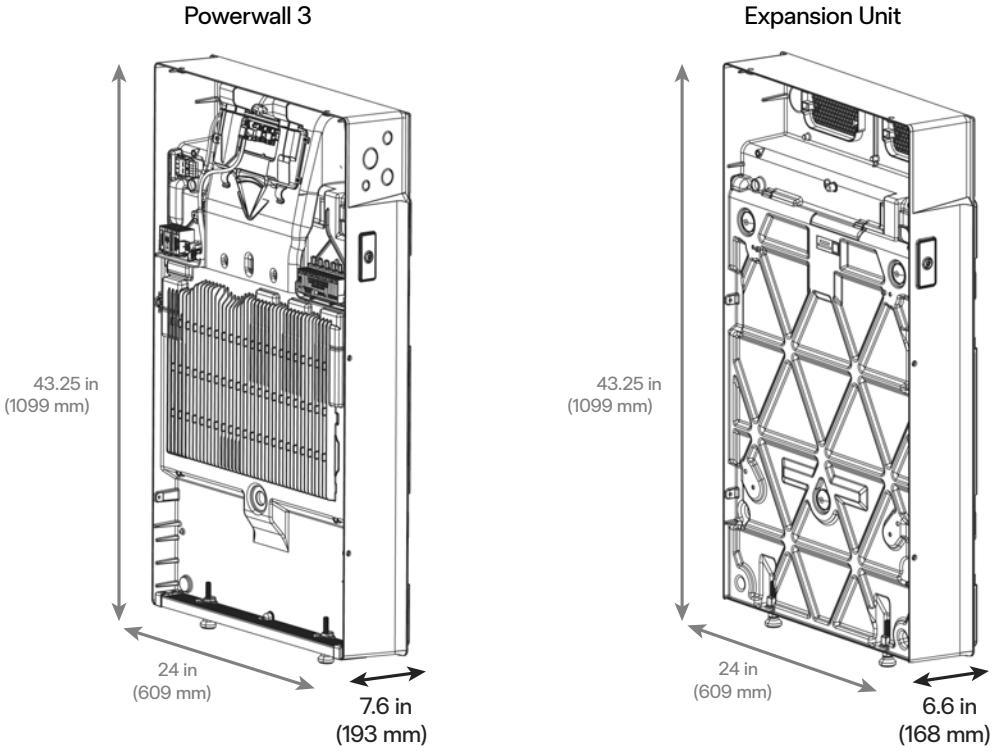


  - Powerwall 3 can be installed in the middle of a chain of Expansion units



APPENDIX G: INSTALLING MULTIPLE POWERWALL 3 UNITS AND/OR EXPANSION UNITS

Figure 38. Powerwall 3 Dimensions Compared with Expansion Unit Dimensions



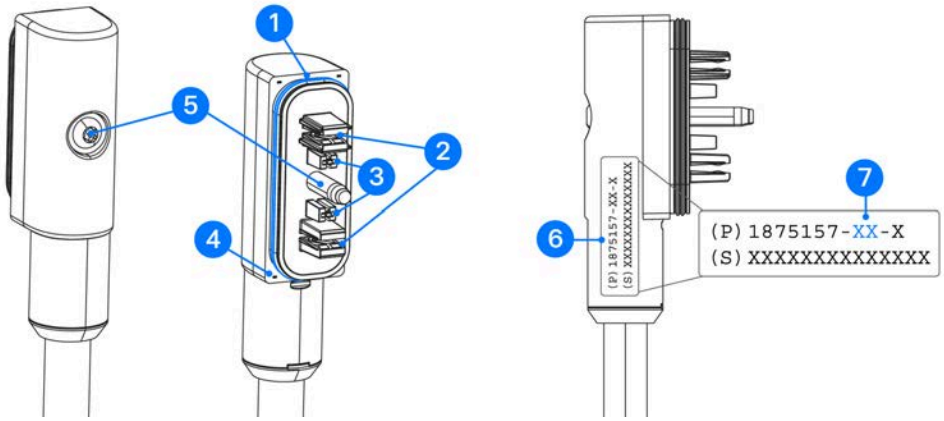
NOTE: Powerwall 3 and the Expansion unit are both 43.5 in (1105 mm) tall when the glass front cover is installed.

APPENDIX G: INSTALLING MULTIPLE POWERWALL 3 UNITS AND/OR EXPANSION UNITS

Expansion Harness

The Tesla Expansion Harness is a non-metallic sheathed hard-use appliance cable assembly rated for indoor or outdoor installations. The cable uses an extruded TPE jacket, is moisture, flame and UV resistant, and has a temperature rating of -40°C to 105°C. The harness is required for electrical connection between the Powerwall 3 and the Expansion units. Field wiring of the Expansion unit, alteration of the Expansion Harness (e.g. splicing), and/or routing the Expansion Harness through a wall or partition are prohibited.

WARNING: Do not modify the Expansion Harness in any way. Doing so would result in product damage that could void the product warranty.



1	Sealing gasket
2	DC jaws
3	Communication ports
4	Grounding spikes (4)
5	Harness screw (T40)
6	Etched part number
7	Harness length identifier in part number

Table 9. Expansion Harness Options

Expansion Harness Part Number	Expansion Harness Length*
Tesla P/N 1875157-**05**-x	0.5 m (20 in)
Tesla P/N 1875157-**20**-x	2 m (6.5 ft)
Tesla P/N 1875157-**40**-x	4 m (13 ft)

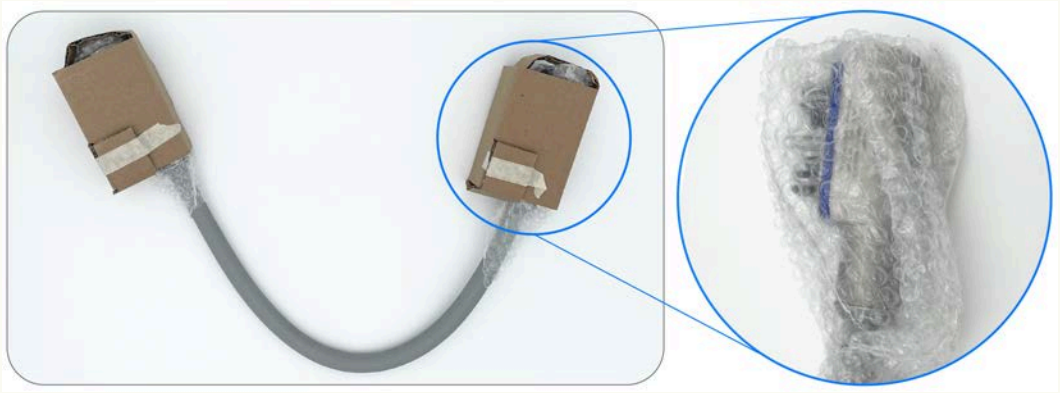
*See *Expansion Harness to Use Depending on Distance Between Units on page 149* for the maximum distance between units for each harness.

NOTE: Expansion harnesses can be plugged into both the left and right ports on the Leader Powerwall 3. See *Wall Mount an Expansion Unit on page 147* for a table of all allowable harness combinations.

APPENDIX G: INSTALLING MULTIPLE POWERWALL 3 UNITS AND/OR EXPANSION UNITS

CAUTION: The Expansion Harness ships in protective packaging from the factory.

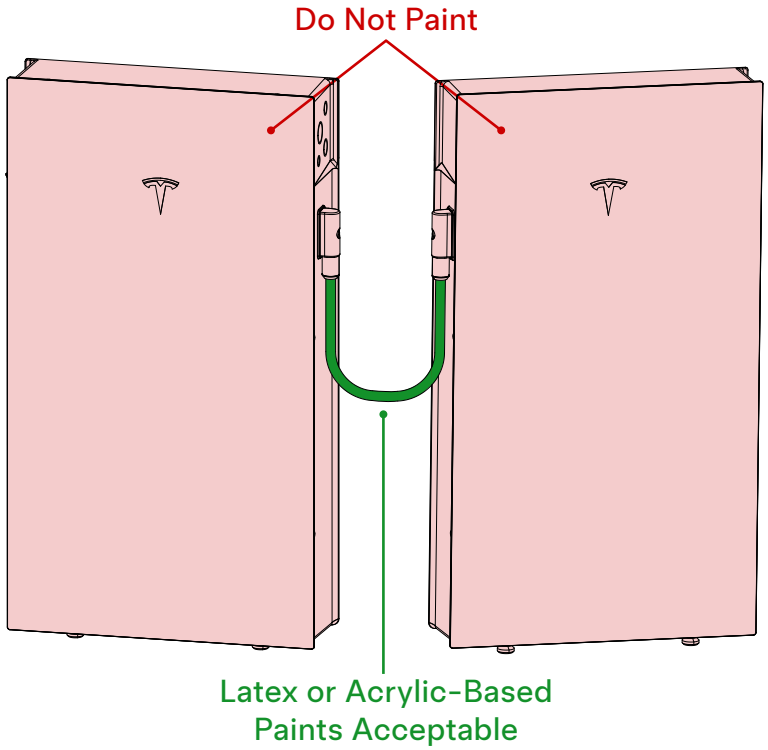
- Do not remove the protective packaging until ready to plug the Expansion Harness into the Expansion port
- If the Expansion Harness is unplugged and needs to be set aside, place it back in the protective packaging
- If the Expansion Harness is dropped or otherwise damaged, or if dust / debris enter its DC jaws and/or communication ports, **do not use that Expansion Harness**. Recycle it and use a new Expansion Harness



NOTE: The Expansion Harness can be painted under the following conditions:

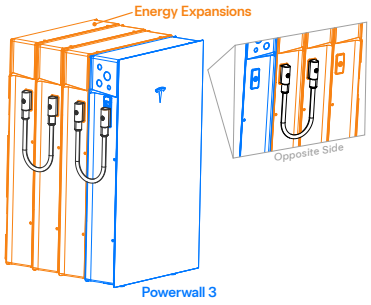
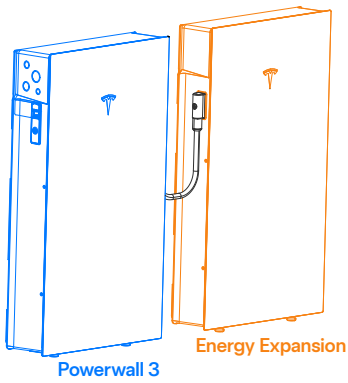
- The paint is latex or acrylic-based (do not use an oil-based paint)
- Only the harness cable is painted; do not paint the connectors, or any part of Powerwall 3 or Expansion

A primer coat prior to painting is recommended to help with adhesion and bonding.



APPENDIX G: INSTALLING MULTIPLE POWERWALL 3 UNITS AND/OR EXPANSION UNITS

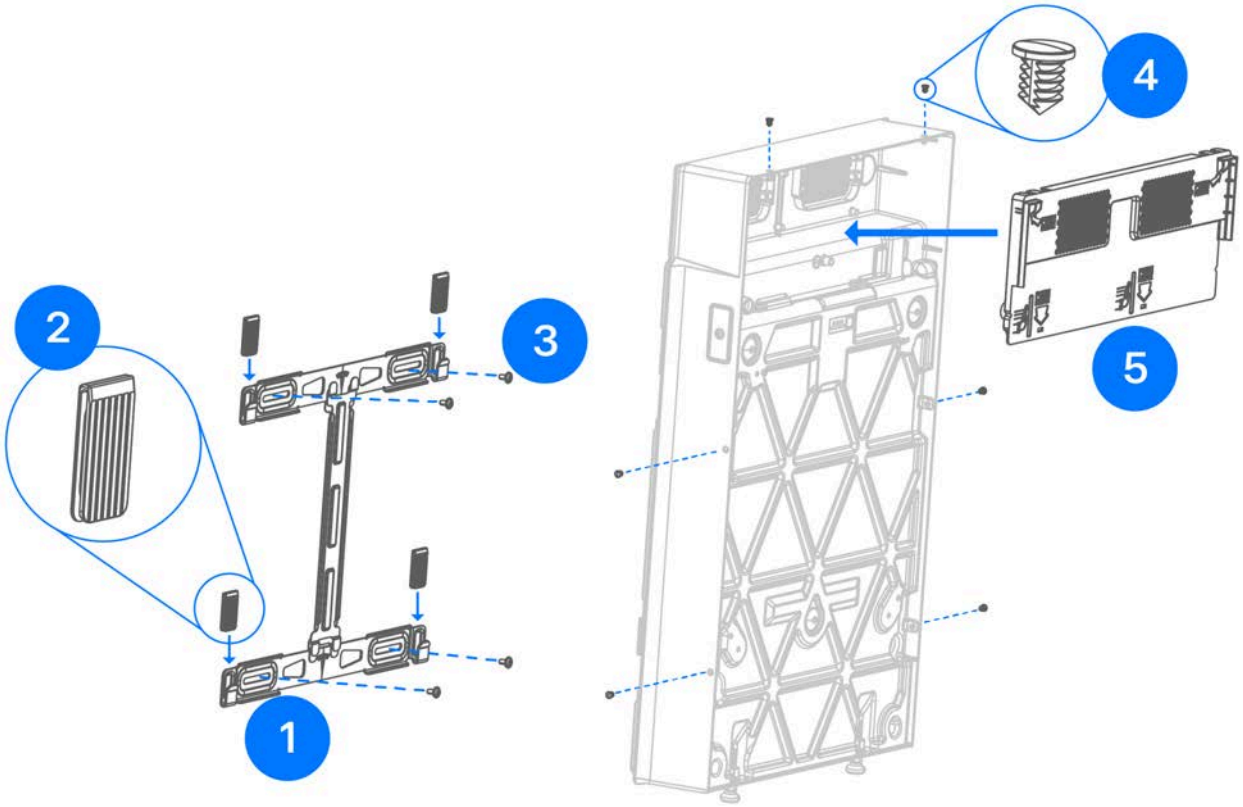
Expansion Mounting Configurations

	Stacked Configuration	Wall-Mounted Configuration
		
Kit P/N	Tesla P/N 1978070-00-x	Tesla P/N 1978069-00-x
Included Accessories	See *Powerwall 3 Stacking Expansion Kit on page 130*	See *Powerwall 3 Wall-Mount Expansion Kit on page 131*
Expansion Harness (ordered separately, see *Expansion Harness on page 127* for part number location)*	Tesla P/N 1875157-05-x	Tesla P/N 1875157-**05**-x
		Tesla P/N 1875157-**20**-x
		Tesla P/N 1875157-**40**-x
Expansion Harness Straps	Not required	Tesla P/N 1730711-00-A, some are included in accessory bag but additional straps can be ordered (Bridgeport US-6171 strap)
Installation Instructions	*Install Stacked Expansion Units on page 132*	*Wall Mount an Expansion Unit on page 147*

*Expansion harnesses can be plugged into both the left and right ports on the Leader Powerwall 3. See *Wall Mount an Expansion Unit on page 147* for a table of all allowable harness combinations.

APPENDIX G: INSTALLING MULTIPLE POWERWALL 3 UNITS AND/OR EXPANSION UNITS

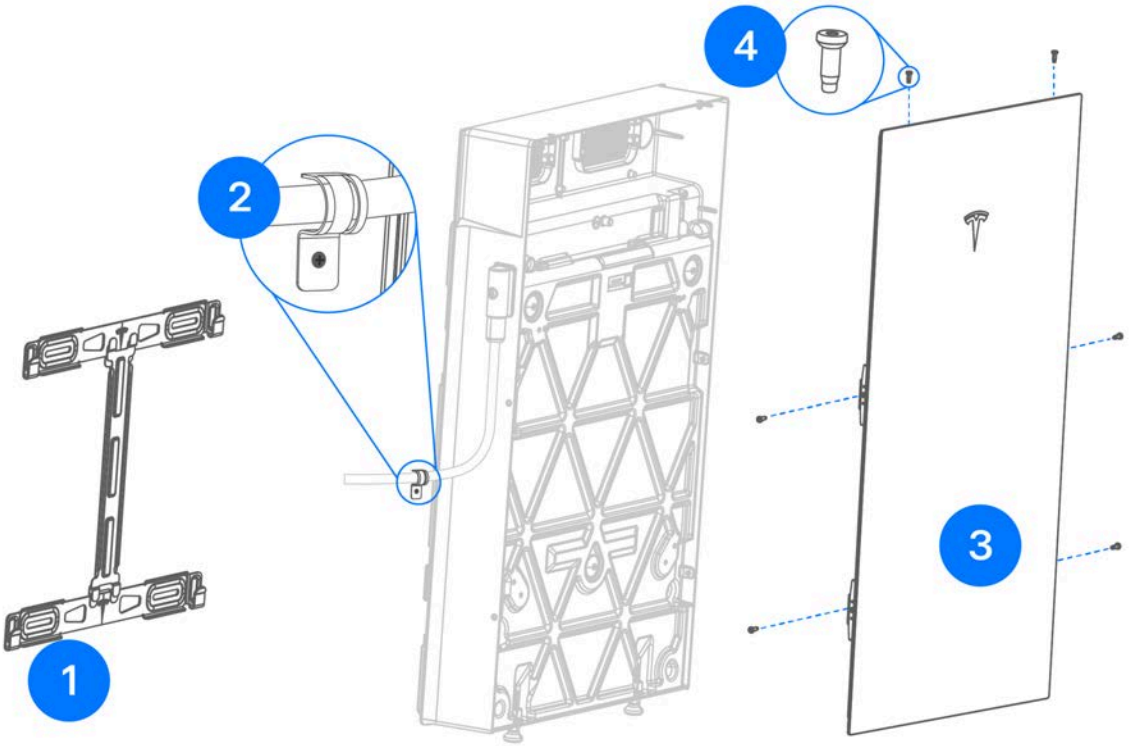
Powerwall 3 Stacking Expansion Kit



1	1738120-xx-y	Wall bracket
2	1983307-xx-y	(4) mounting bracket shims
3	1978075-xx-y	(4) Torx T40 mounting bracket bolts
4	1978071-xx-y	(6) fir tree plugs, used to fill in the fastener holes on the top and sides of the enclosure
5	1978068-xx-y	Fan front cover

APPENDIX G: INSTALLING MULTIPLE POWERWALL 3 UNITS AND/OR EXPANSION UNITS

Powerwall 3 Wall-Mount Expansion Kit



1	1738120-xx-y	Wall bracket
2	1730711-00-A	(9) Straps for Expansion Harness cable management (Bridgeport US-6171 strap)
3	1763418-xx-y	Glass front cover
4	1857363-00-A	(6) M6 fasteners for front cover

APPENDIX G: INSTALLING MULTIPLE POWERWALL 3 UNITS AND/OR EXPANSION UNITS

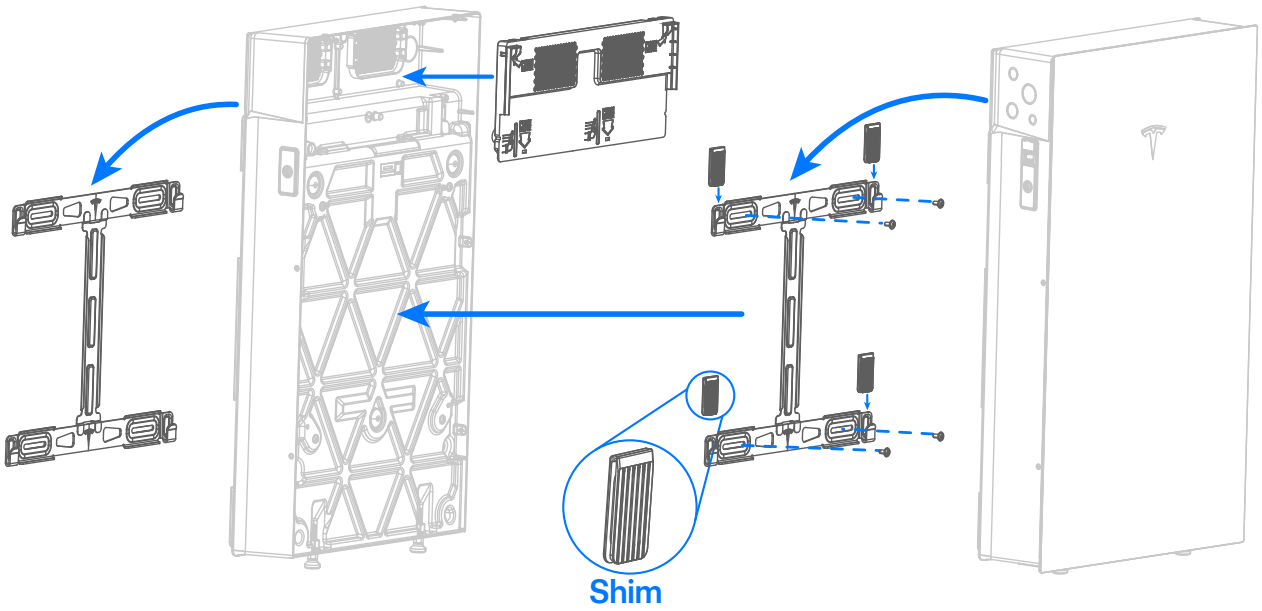
Install Stacked Expansion Units

WARNING: Stacked Expansion units must be ground mounted. Do not attempt to install stacked units above ground on a bracket, or in any configuration other than ground-mounted.

NOTE: Follow all Powerwall 3 guidance for choosing a location to install Expansion units, clearance requirements, and instructions to remove the units from packaging and transport them with the Powerwall dolly.

1. Determine where the Expansion units and Powerwall 3 will be installed based on the number of units:

   Figure 39. Expanded View of (2) Stacked Expansion Units

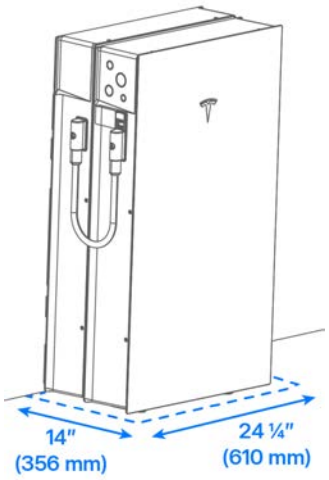
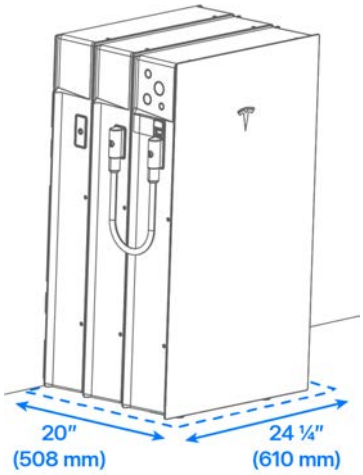
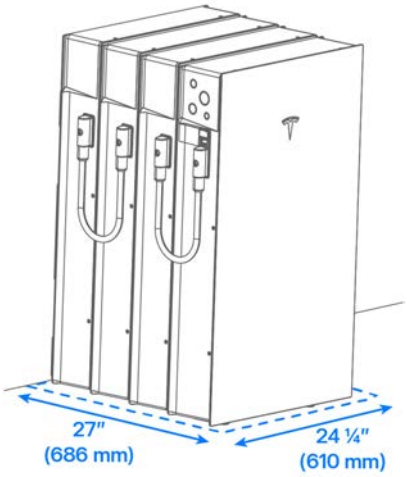


NOTE: When installing the wall bracket shims:

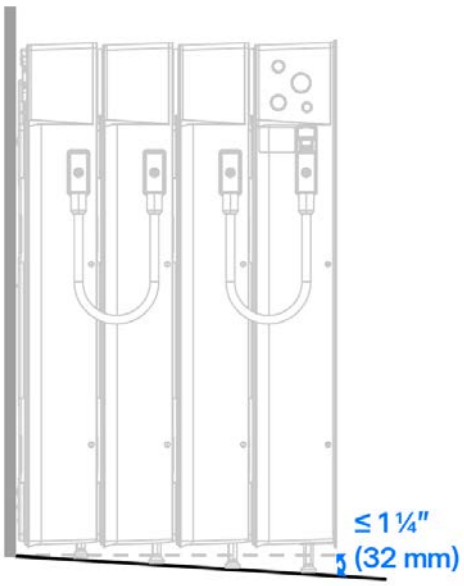
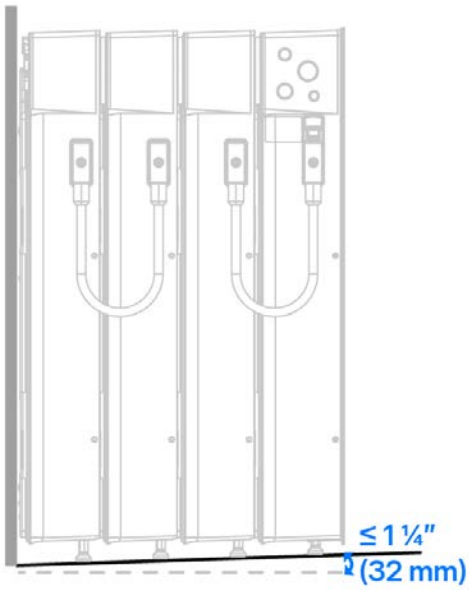
- Do not install shims if the wall bracket is mounted directly to the wall
- Install shims if the wall bracket is fastened to an Expansion unit

APPENDIX G: INSTALLING MULTIPLE POWERWALL 3 UNITS AND/OR EXPANSION UNITS

a. Depending on how many units will be stacked, confirm the minimum footprint area is available in front of where the bracket will be installed:

(2) Units	(3) Units	(4) Units
		
14 x 24 ¼ in (356 x 610 mm)	20 x 24 ¼ in (508 x 610 mm)	27 x 24 ¼ in (686 x 610 mm)

b. Using a level, confirm the ground slope within the required footprint area (in any direction) is less than or equal to 1 ¼ inches (32 mm). If the ground slope is greater than this value, the ground slope must be corrected or the stacked configuration must be mounted in another location.

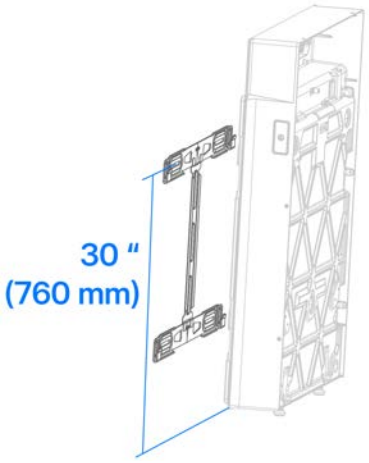
Ground Slopes Away From Wall	Ground Slopes Toward Wall
	

2. Determine the height at which the wall bracket will be mounted:
   a. Identify the highest point within the required footprint area; this will be the starting reference point for mounting the wall bracket. Determine the difference between this point and the base of the wall.

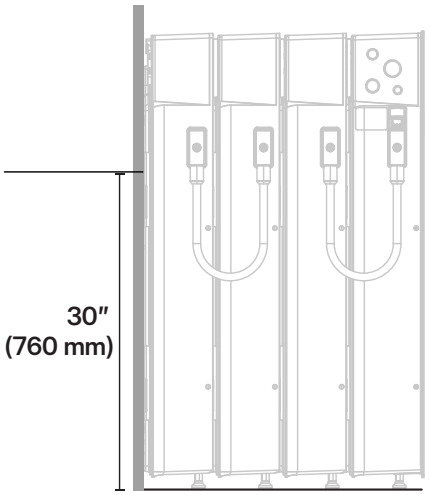
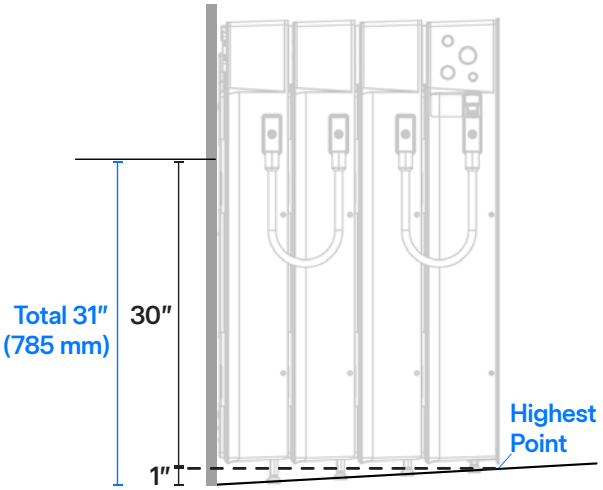
> **NOTE:** For a flat surface or a surface that slopes *away* from the wall, the base of the wall is the highest point.

NOTE: As noted in the previous step, the difference between this point and the base of the wall must be less than or equal to 1 ¼ inches (32 mm).

b. For a flat surface or a surface that slopes *away* from the wall, the wall bracket is mounted with the upper row of fastener slots 30 inches (760 mm) from the base of the wall (see *Bracket Measurements Relative to Expansion Unit and Floor on page*).



c. For a surface that slopes *toward* the wall, add the difference in slope (determined in step *2.a on page 133*) to the baseline 30 inches (760 mm). For instance, if the difference between the highest point in the footprint area and the base of the wall is 1 inch (25 mm), mount the wall bracket with the upper row of fastener slots 31 inches (785 mm) from the base of the wall.

Wall Bracket Height for Flat Surface or Ground Sloping Away from Wall	Wall Bracket Height for Ground Sloping Toward Wall
	

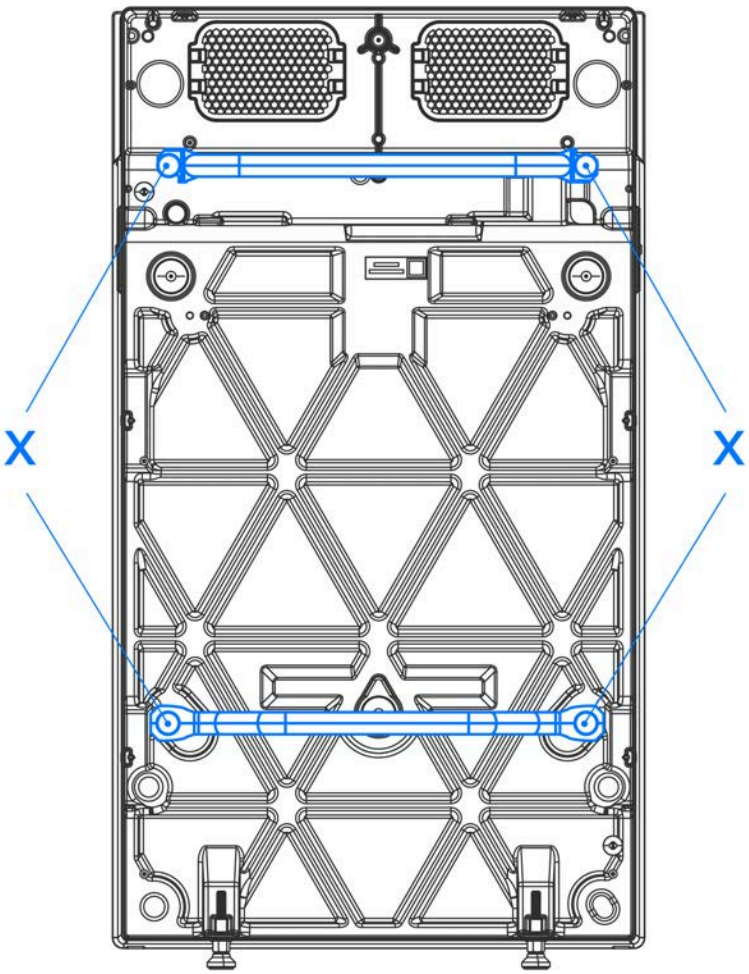
WARNING: It is critical that the slope of the installation area is accurately measured and the wall bracket is installed at the correct height to ensure the units can be leveled and the stacked assembly shall retain its structural integrity.

- If the wall bracket is mounted too low, the units will not properly engage with the wall bracket
- If the wall bracket is mounted too high, the units will not be supported by their feet

3. Safely shut the system down:
   a. If a System Shutdown Switch is present, push it to initiate Rapid Shutdown. If there is no System Shutdown Switch, turn the Enable switch on the Powerwall 3 to OFF.
   b. Open the Powerwall 3 AC circuit breaker.
   c. Wait 30 seconds before proceeding with any work.

WARNING: Risk of electric shock from stored energy. Wait 30 seconds after disconnecting all sources of supply before proceeding.

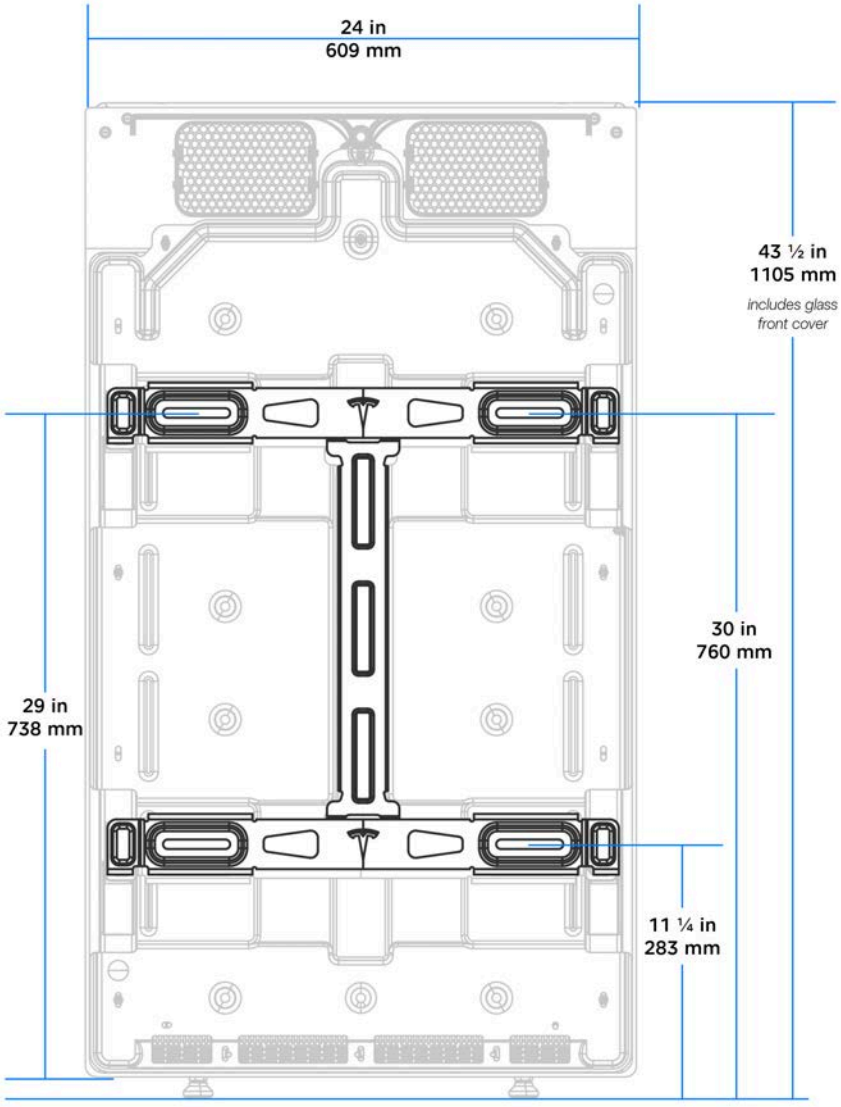
4. To lift and transport the Expansion unit, follow all instructions in *STEP 2: Remove Powerwall 3 from Packaging and Transport Using the Powerwall Dolly on page 38* to use the Powerwall dolly, noting where the two lift handles are connected on the Expansion (**X**):



5. Using a drill and level, mount the Expansion unit bracket to the selected wall. See *Anchoring Details for Ground- or Wall-mounting Powerwall 3 with Wall Bracket on Existing Approved Foundation on page 89* for additional details on the type and number of fasteners to use.

WARNING: Ensure the Powerwall 3 wall bracket is level and plumb, especially when mounting units in a stacked configuration. Failure to do so may compromise the structural integrity of the stacked assembly.

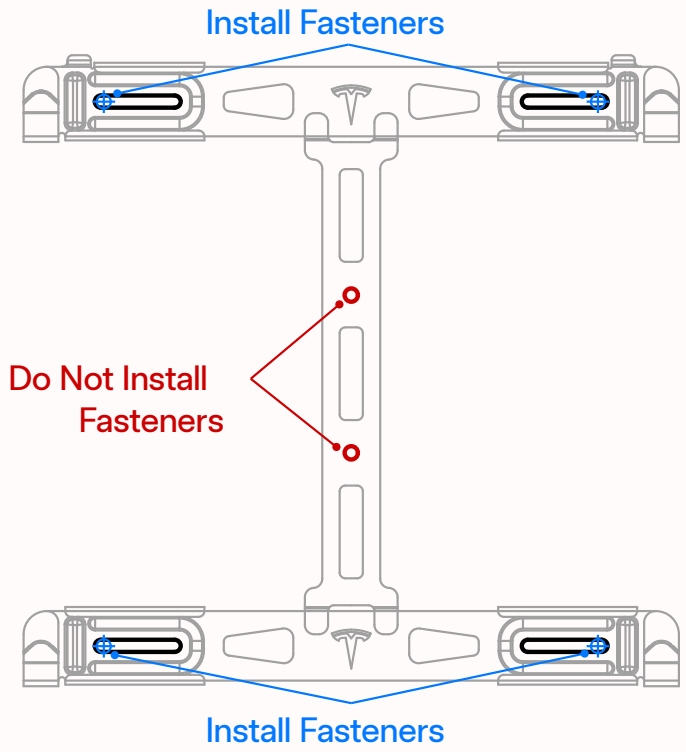
Figure 40. Bracket Measurements Relative to Expansion Unit and Floor



NOTE: These bracket measurements are the same for both Expansion and Powerwall 3 units.

APPENDIX G: INSTALLING MULTIPLE POWERWALL 3 UNITS AND/OR EXPANSION UNITS

WARNING: Only install fasteners in the (4) slots on the horizontal bracket segments, and **ensure they are installed on the outside edges of each slot**. Do not install fasteners on the vertical (center) segment, as these are not structural mounting holes.



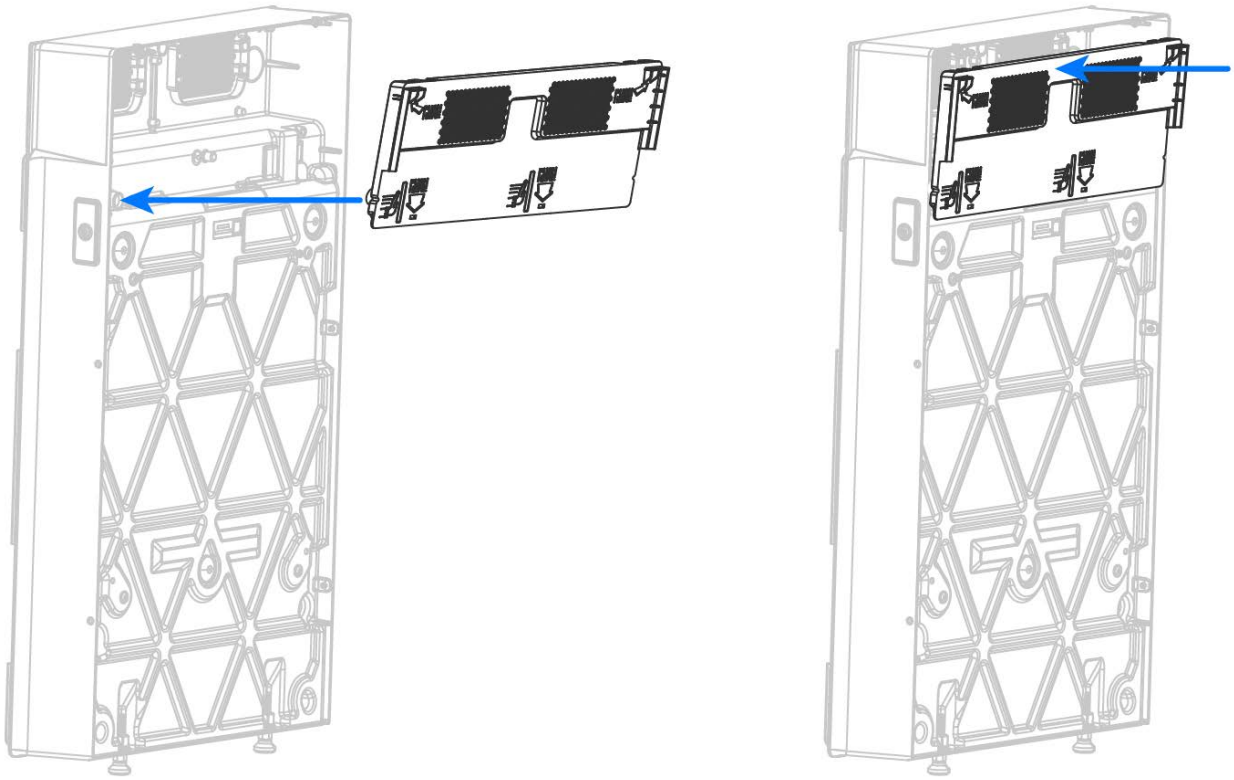
NOTE: The mounting bracket shims included in the Expansion stacking kit are not used for the unit mounted directly to the wall. The shims are only required to secure the bracket when it is being mounted to the front of an Expansion unit.

6. Confirm the leveling feet are screwed all the way in to the Expansion unit. This is required to ensure the unit can be adjusted once the remaining units in the stack have been installed.
7. Move the dolly toward the wall, positioning the Expansion unit so that the mounting cleats are just above the flanges on the bracket.
8. Lower the Expansion unit until both the upper and lower sets of cleats engage the flanges on the bracket.

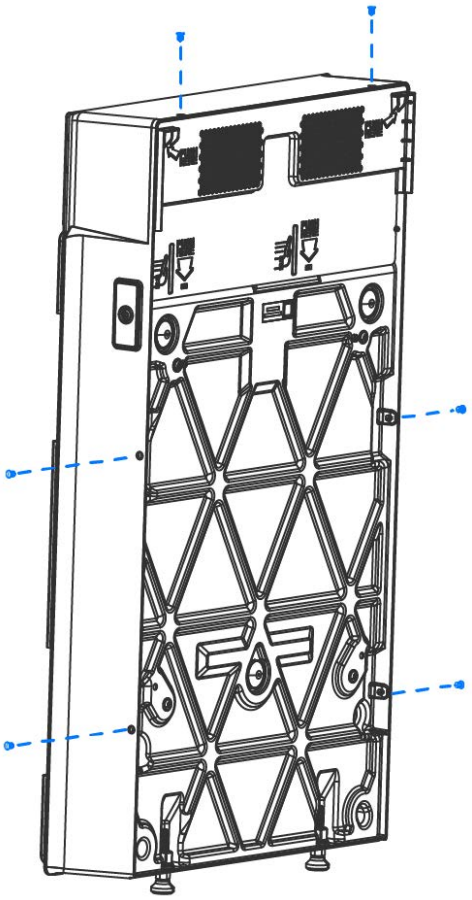
CAUTION: Confirm the unit is fully seated on all four cleats before proceeding.

NOTE: The mounting bracket shims included in the Expansion stacking kit are not used for the unit mounted directly to the wall. The shims are only required to secure the bracket when it is being mounted to the front of an Expansion unit.

9. To install the fan front cover in the open space at the top of the enclosure, first align the bottom of the cover with the enclosure and push it into place. With the bottom of the cover secured, push in the top of the cover, ensuring it snaps into place.



10. Install the (6X) fir tree plugs in the fastener holes on the top and sides of the enclosure.



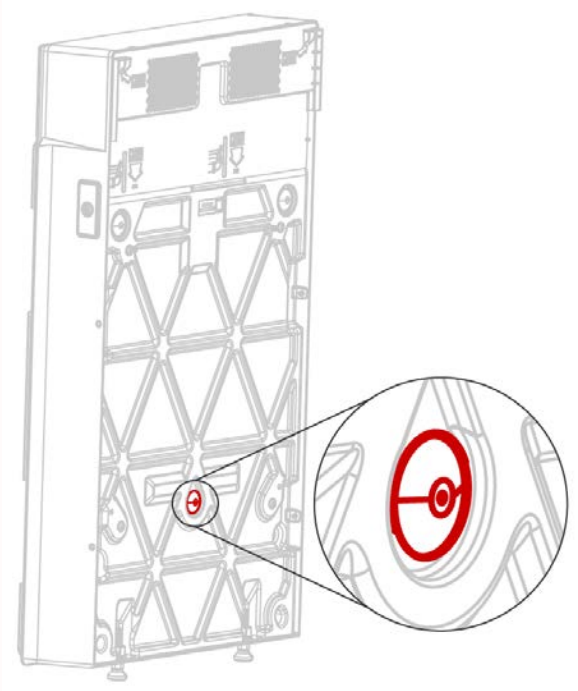
11. Use an 11/16 inch (or 17 mm) wrench to adjust the leveling feet until the unit is level. The unit should be within +/- 2 degrees in any direction.

> **NOTE:** The top of each foot must be visible above the threaded boss; do not unscrew the foot so far that the top is no longer visible.

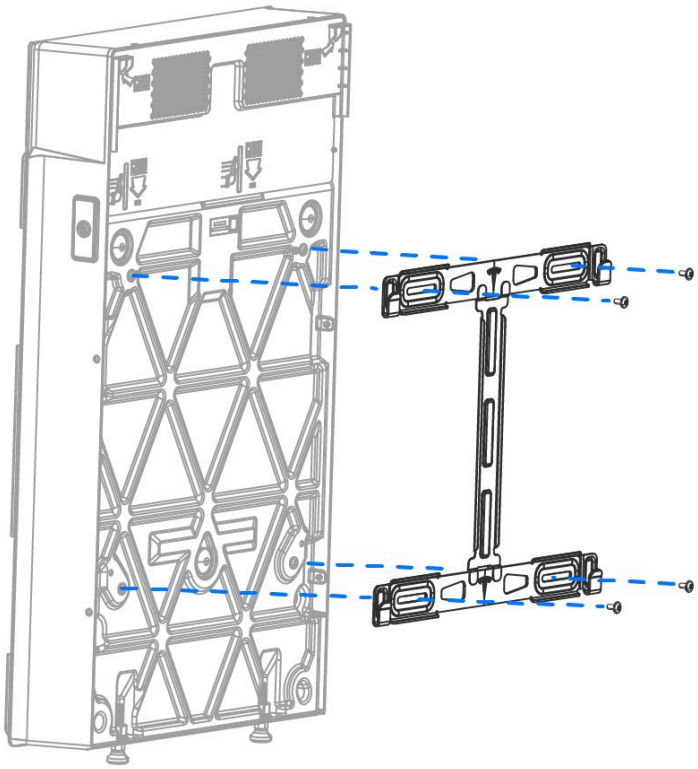
12. Mount another Expansion unit to the front of the installed Expansion unit enclosure:

APPENDIX G: INSTALLING MULTIPLE POWERWALL 3 UNITS AND/OR EXPANSION UNITS

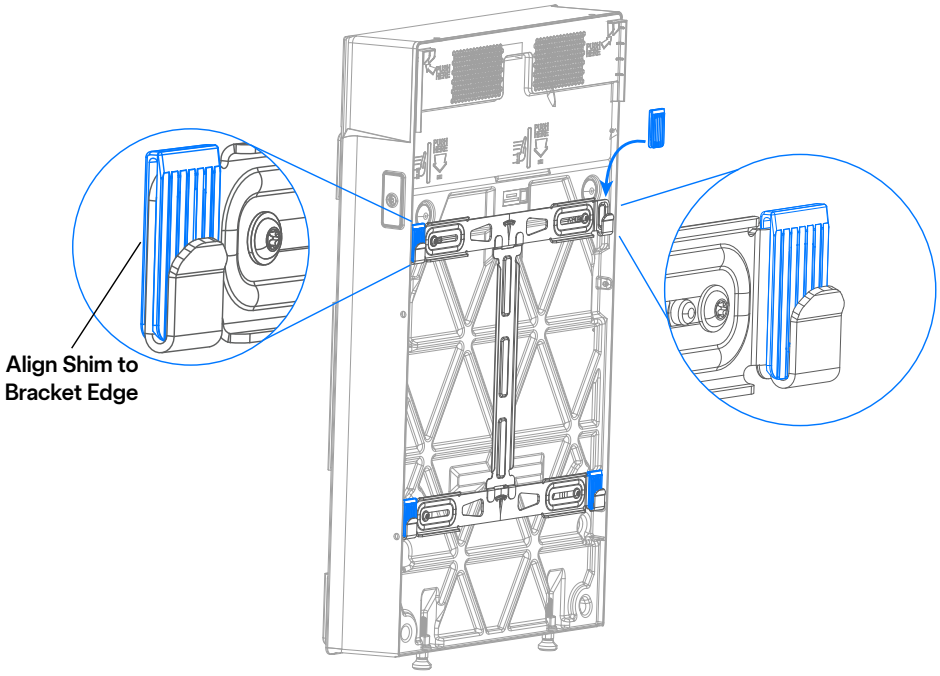
WARNING: Ensure the Expansion unit safety valve is not removed or damaged in any way when preparing to install another unit on the front of Expansion.



a. Using the (4X) provided Torx T40 fasteners, mount the next Expansion unit bracket to the front of the installed Expansion unit enclosure. Torque the fasteners to 26 Nm (230 in-lb).



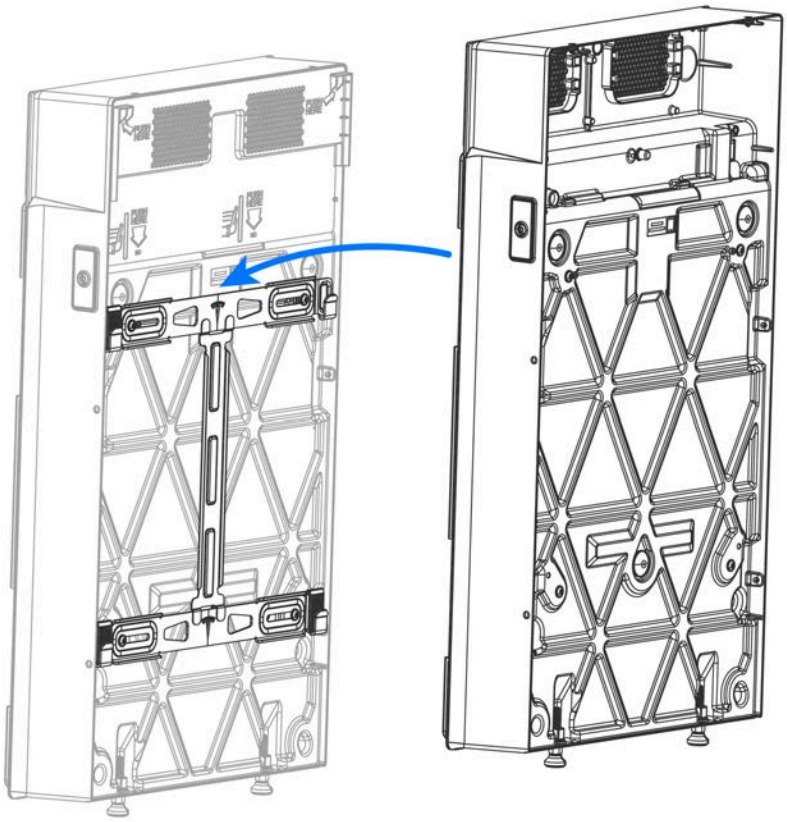
b. Install the (4X) bracket shims to secure the bracket against the Expansion enclosure.



NOTE: Ensure each shim is aligned with the edge of the bracket and is fully seated.

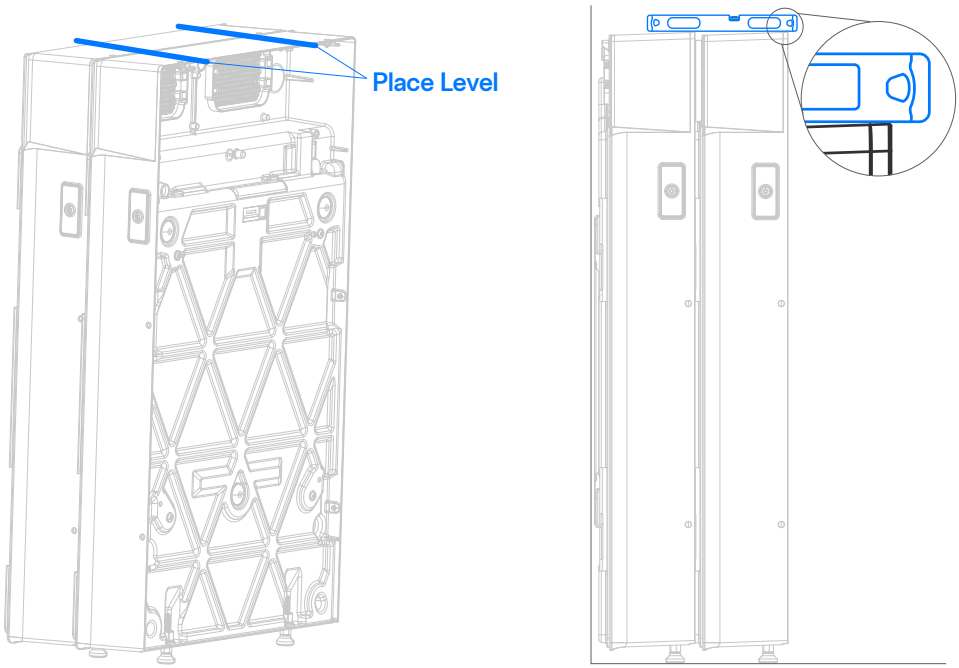
c. With the next Expansion unit on the dolly, move the dolly toward the wall, positioning the unit so that the mounting cleats are just above the flanges on the bracket.

d. Lower the Expansion unit until both the upper and lower sets of cleats engage the flanges on the bracket.



e. Install the fan front cover and the (6) fir tree plugs in the fastener holes as described in steps *9 on page 138* and *10 on page 139*.

f. Use an 11/16 inch (or 17 mm) wrench to adjust the leveling feet until the unit is level. The unit should be within +/- 2 degrees in any direction. When confirming the units are level with each other, place the level on either side of the unit and balance the level on the front edge of each unit.

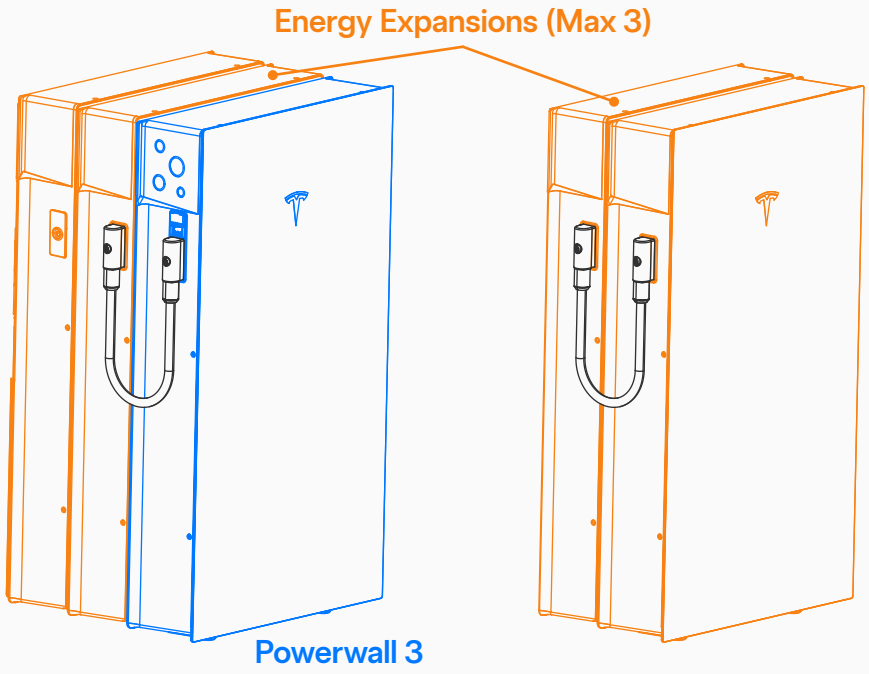


NOTE: The top of each foot must be visible above the threaded boss; do not unscrew the foot so far that the top is no longer visible.

13. Repeat step *12 on page 139* for a third Expansion if present.
14. Once all Expansion units have been installed, repeat step *12 on page 139* to mount the Powerwall 3 to the front of the stack.
15. Begin with *STEP 7: Make Solar PV Connections on page 63* to complete all Powerwall 3 wiring, finishing by installing the front cover.

NOTE: Powerwall 3 must always be installed at the front of an Expansion unit stack. If the Powerwall 3 was previously installed, it must be uninstalled so that it can be moved to the front of the new stack.

NOTE: Alternatively, another Expansion with the Wall-Mount kit (Tesla P/N 1978069-00-A) can be mounted to the front of the stack.



16. Connect the Expansion unit to the Powerwall 3 (or to another Expansion unit):
    a. Using a Torx T40 bit, loosen the fastener holding the Expansion port cover.

APPENDIX G: INSTALLING MULTIPLE POWERWALL 3 UNITS AND/OR EXPANSION UNITS

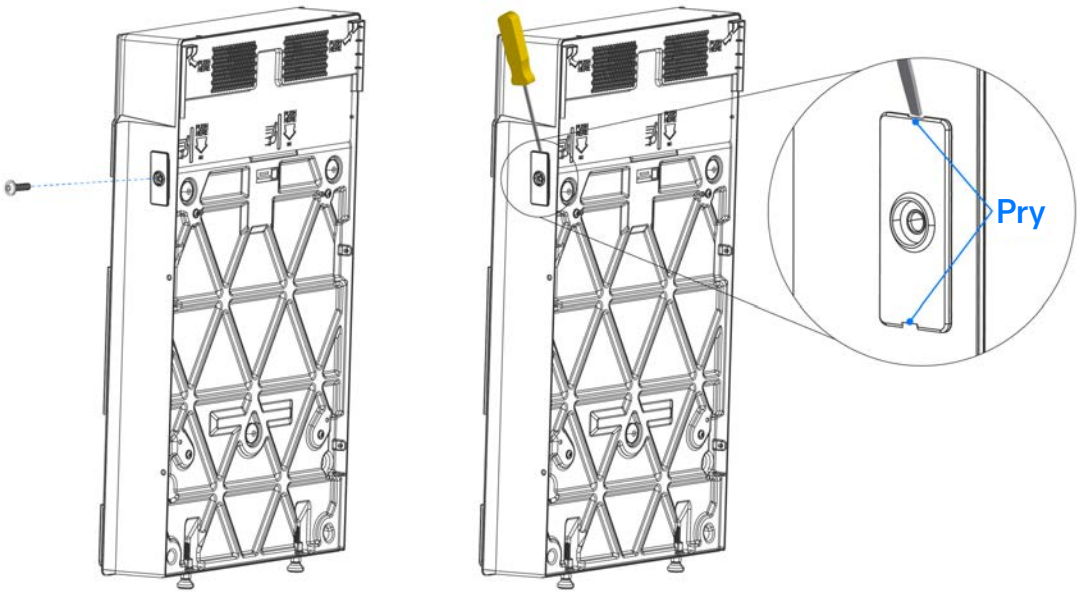
WARNING: STOP. Before opening Expansion port covers:

- Do not open the Expansion Port cover if Expansion / Powerwall 3 is **directly exposed** to any of the following conditions:
  - Rain
  - Snow
  - High winds (>48 kph)

- Do not leave the Expansion Port open for extended periods or in high debris/dust conditions

Doing so may allow water and/or debris to contact the sensitive internal components of Powerwall 3 / Expansion. This may lead to product damage and could potentially void the product warranty.

b. Insert a cabinet tip screwdriver in the small slots at the top and bottom of the port cover to pry it loose. Remove the cover.



NOTE: Keep the Expansion port cover in case the Expansion port needs to be covered again for any reason. Store the cover in the protective packaging from the harness to keep it clean.

NOTE: If replacing the Expansion port cover, torque the port cover screw to 100 in-lb (11 Nm).

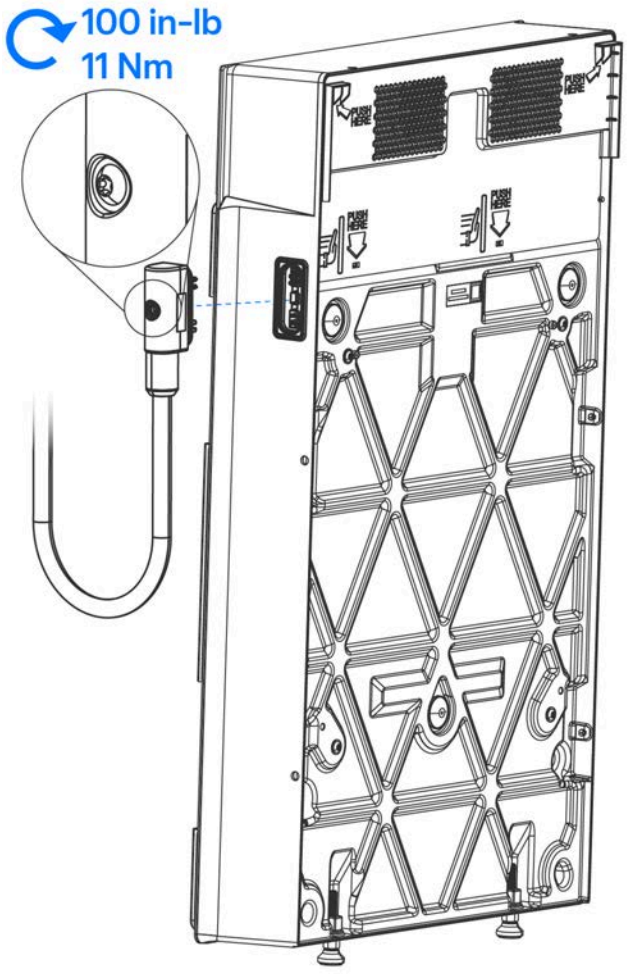
c. Visually inspect the Expansion port and confirm there is no debris in the port.

d. Remove the protective packaging from the end of the Expansion Harness being plugged in.

NOTE: The Expansion harness with Tesla P/N 1875157-**05**-x must be used when connecting Expansion units in a stacked configuration.

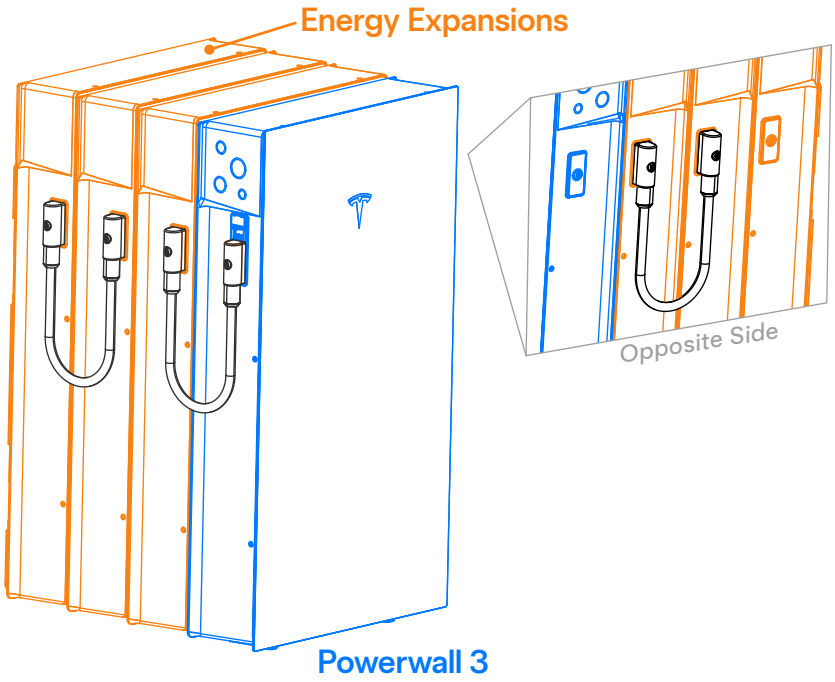
e. Visually inspect the Expansion Harness connector and confirm there is no dirt or debris on the connector. If there is dirt / debris on the connector:
   - Clean the dirt / debris from the connector
   - If it is not possible to adequately clean the connector, use a new Expansion Harness

f. Plug one end of the Expansion Harness into the Expansion unit. Torque the T40 harness screw on the connector to 100 in-lb (11 Nm).

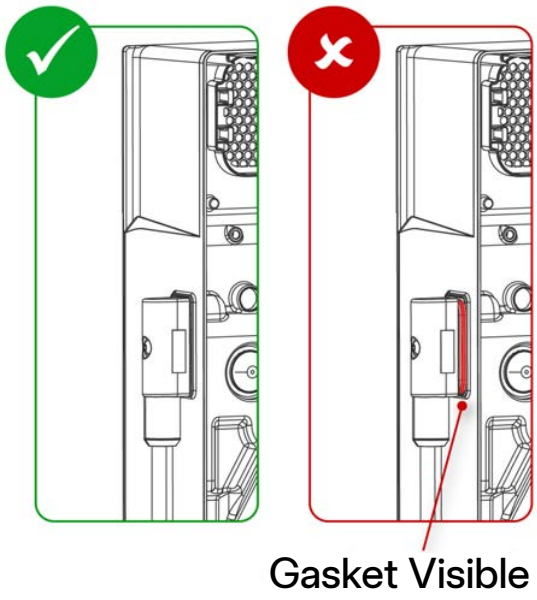


g. Route the Expansion Harness to the Powerwall 3 (or other Expansion unit).

h. Remove the Expansion port cover from the Powerwall 3 (or other Expansion unit) and plug the Expansion Harness in. Torque the T40 harness screw on the connector to 100 in-lb (11 Nm).



i. Ensure each end of the Expansion Harness is fully seated in its port; it will be possible to confirm the harness is fully seated when there is no gasket exposed.



APPENDIX G: INSTALLING MULTIPLE POWERWALL 3 UNITS AND/OR EXPANSION UNITS

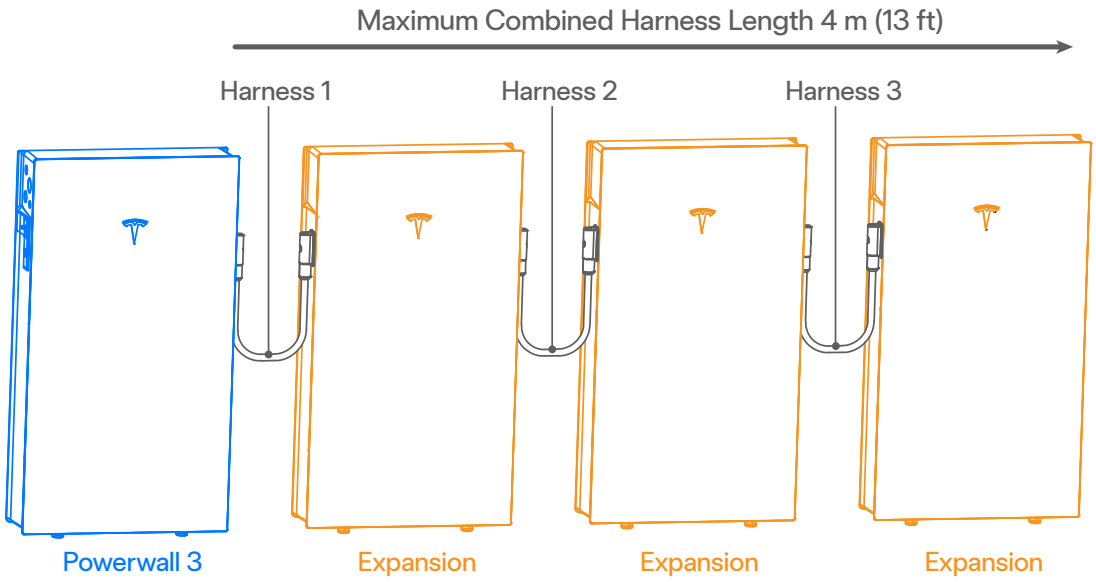
Wall Mount an Expansion Unit

NOTE: Follow all Powerwall 3 guidance for choosing a location to install Expansion units, clearance requirements, and instructions to remove the units from packaging and transport them with the Powerwall dolly.

1. Determine whether Expansion units will be connected on only one side of Powerwall 3, or on both sides:
   - When Expansion units will be connected **on only one side** of Powerwall 3, the maximum combined harness length is 4 m (13 ft). The following table provides all allowable harness combinations for this configuration:

Harness 1		Harness 2		Harness 3	
4 m (13 ft)	1875157-**40**-x	-		-	
2 m (6.5 ft)	1875157-**20**-x	2 m (6.5 ft)	1875157-**20**-x	-	
2 m (6.5 ft)	1875157-**20**-x	0.5 m (20 in)	1875157-**05**-x	0.5 m (20 in)	1875157-**05**-x
0.5 m (20 in)	1875157-**05**-x	0.5 m (20 in)	1875157-**05**-x	0.5 m (20 in)	1875157-**05**-x

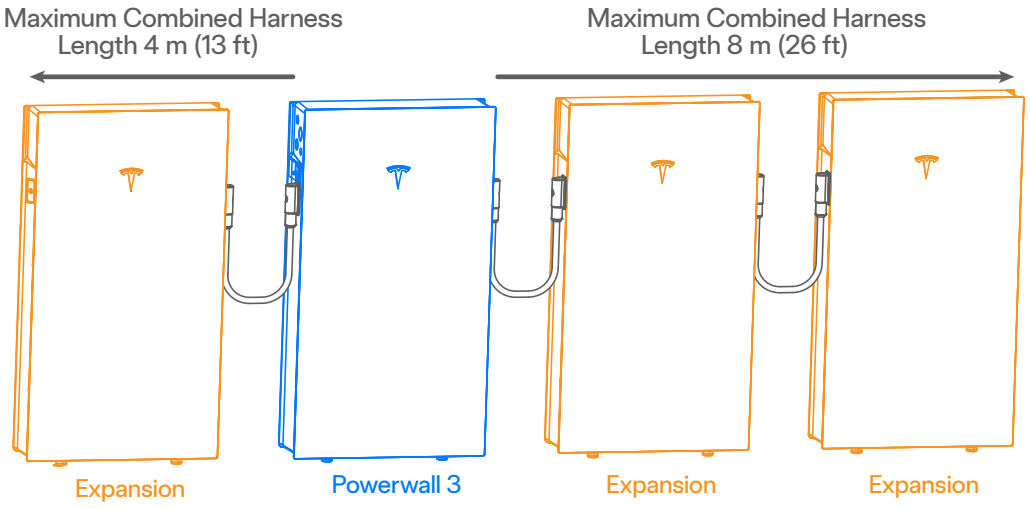
CAUTION: Using any other harness combination will result in excessive wire length, impacting product performance.

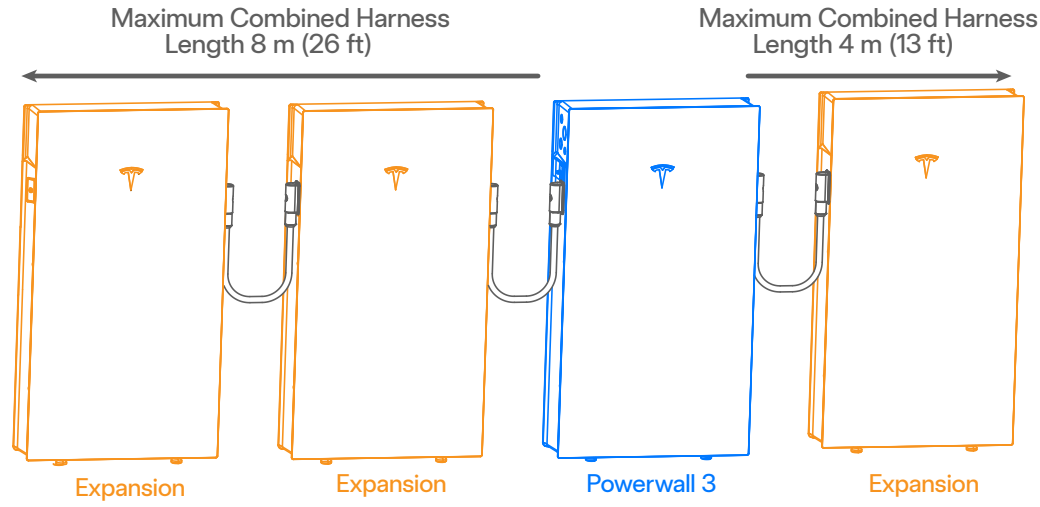


APPENDIX G: INSTALLING MULTIPLE POWERWALL 3 UNITS AND/OR EXPANSION UNITS

- When Expansion units are connected **on both sides** of Powerwall 3, there is **no limit** on the maximum combined harness length. However, there is *effectively* a maximum combined harness length of 8 m (26 ft)* on each side of Powerwall 3 because:
  - Only (2) Expansion units can be connected on one side of Powerwall 3 (with (1) Expansion connected on the other side for a maximum total of (3) Expansion units)
  - The longest available harness is 4 m (13 ft) long. While any combination of harnesses can be used on either side of Powerwall 3 in this configuration, using the longest available harness results in a maximum combined length of 8 m (26 ft)

*Only (3) Expansion units can be connected to the Leader Powerwall 3. With Expansion units connected to both sides of Powerwall 3, there will always be one side with only (1) Expansion unit connected; by default, the maximum harness length on this side is 4 m (13 ft), which is the longest available harness length.

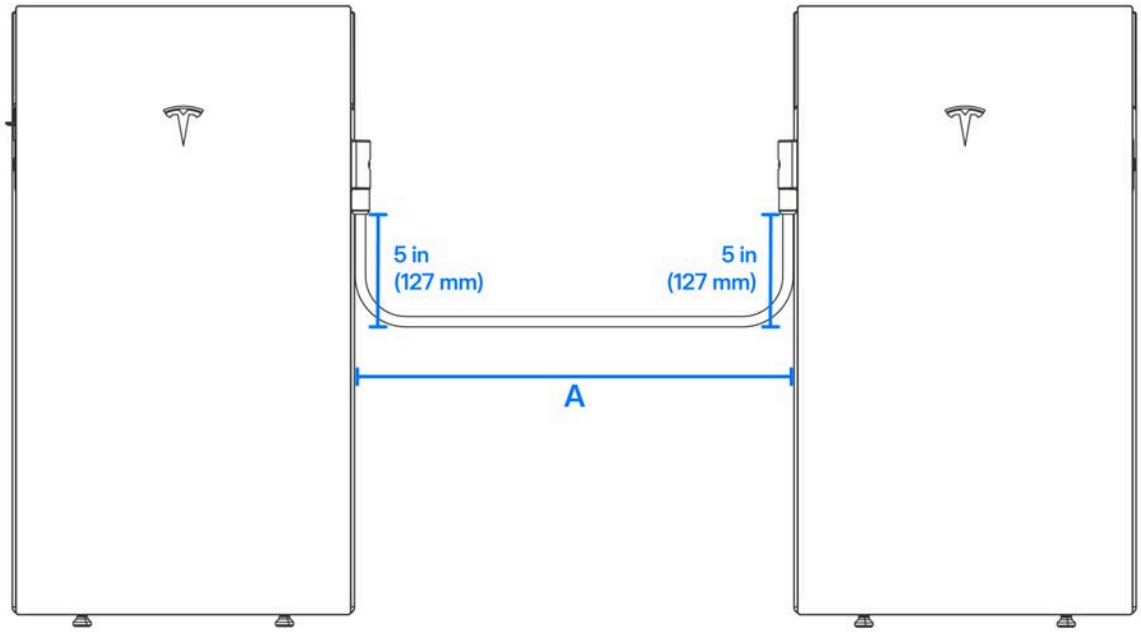




NOTE: The Expansion harnesses plugged in to the left and right ports on Powerwall 3 can be different harness models (e.g. the 4 m (13 ft) harness on one side and the 2 m (6.5 ft) harness on the other).

2. Determine which Expansion Harness length will be used based on the planned distance between the units:
   a. Measure the distance between the units where they will be installed (**A** in the figure below).
   b. Calculate the **Maximum Distance Between Units**: Distance between units (measured in step *2.a on page 149*) + 254 mm (10 in)

> **NOTE:** This accounts for the required minimum 127 mm (5 in) from the connector to the back of the bend on each end of the Expansion Harness.



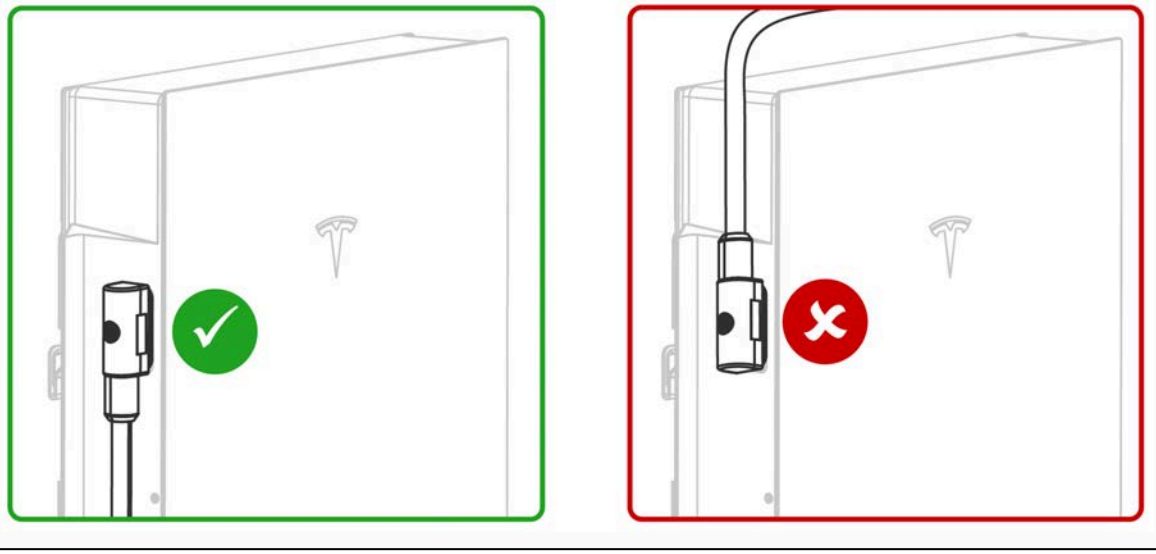
> **NOTE:** As displayed in this diagram, the Expansion Harness can be plugged into the Expansion port (on Expansion or Powerwall 3) on either side of the unit.

   c. Use the table below to determine which Expansion Harness to use (must be equal to or longer than the *Maximum Distance Between Units* calculated above)

Table 10. Expansion Harness to Use Depending on Distance Between Units

Expansion Harness Part Number	(A) Maximum Distance Between Units, Accounting for Bend Radius
Tesla P/N 1875157-**05**-x	0.25 m (10 in)
Tesla P/N 1875157-**20**-x	1.75 m (5 ft 9 in)
Tesla P/N 1875157-**40**-x	3.75 m (12 ft 3 in)

NOTE: The Expansion Harness connector can only be oriented with the cable at the bottom of the connector. **Do not attempt to plug the connector in upside down**.

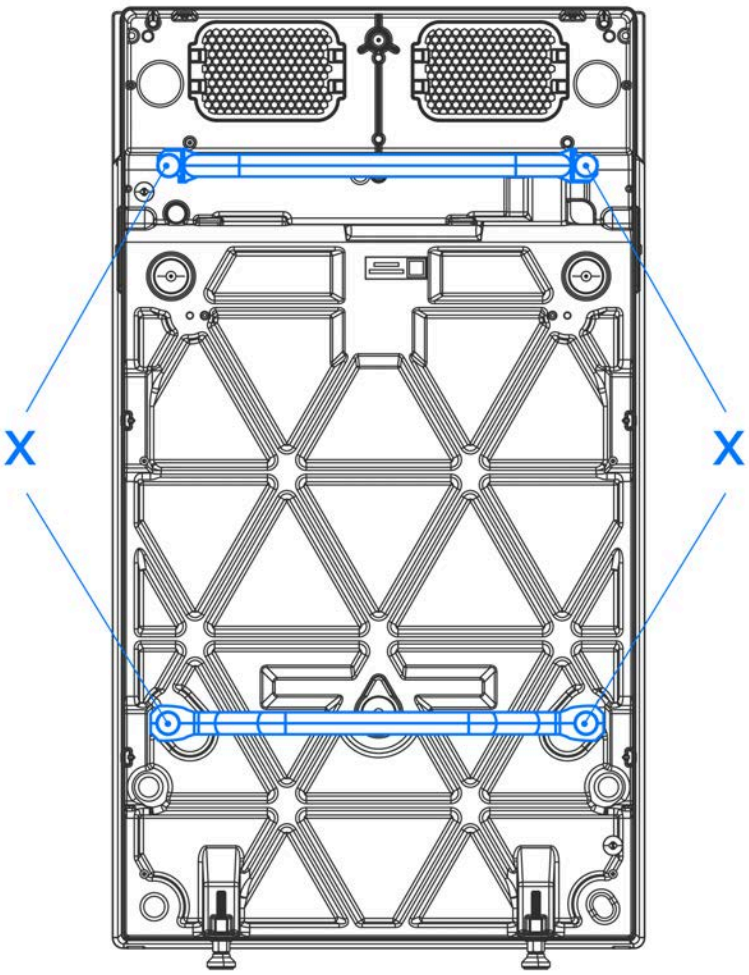


WARNING: Do not modify the Expansion Harness in any way. Doing so would result in product damage that could void the product warranty.

3. Safely shut the system down:
   a. If a System Shutdown Switch is present, push it to initiate Rapid Shutdown. If there is no System Shutdown Switch, turn the Enable switch on the Powerwall 3 to OFF.
   b. Open the Powerwall 3 AC circuit breaker.
   c. Wait 30 seconds before proceeding with any work.

   WARNING: Risk of electric shock from stored energy. Wait 30 seconds after disconnecting all sources of supply before proceeding.

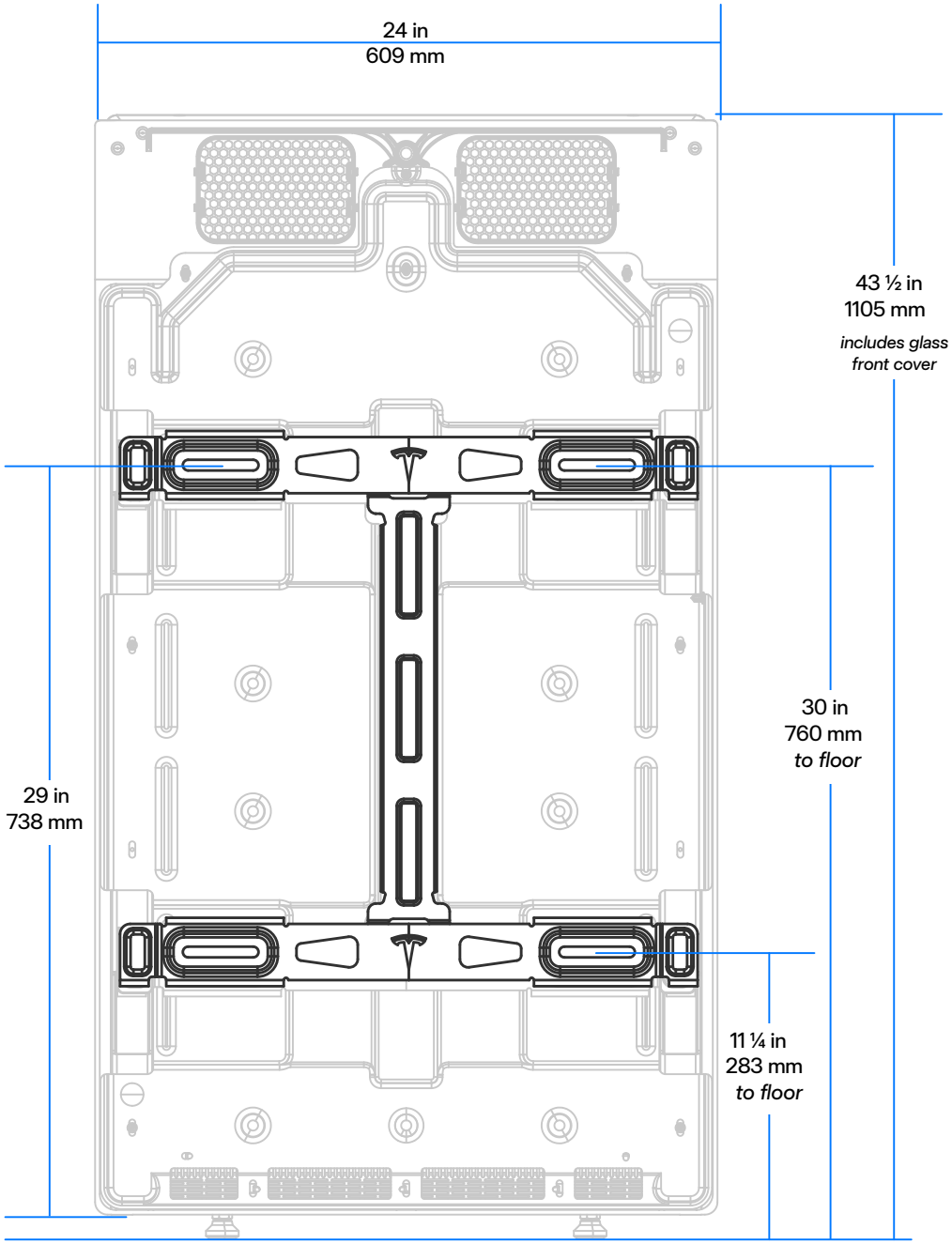
4. To lift and transport the Expansion unit, follow all instructions in *STEP 2: Remove Powerwall 3 from Packaging and Transport Using the Powerwall Dolly on page 38* to use the Powerwall dolly, noting where the two lift handles are connected on the Expansion (**X**):



5. Using a drill and level, mount the Expansion unit bracket to the selected wall. See *Anchoring Details for Ground- or Wall-mounting Powerwall 3 with Wall Bracket on Existing Approved Foundation on page 89* for additional details on the type and number of fasteners to use.

APPENDIX G: INSTALLING MULTIPLE POWERWALL 3 UNITS AND/OR EXPANSION UNITS

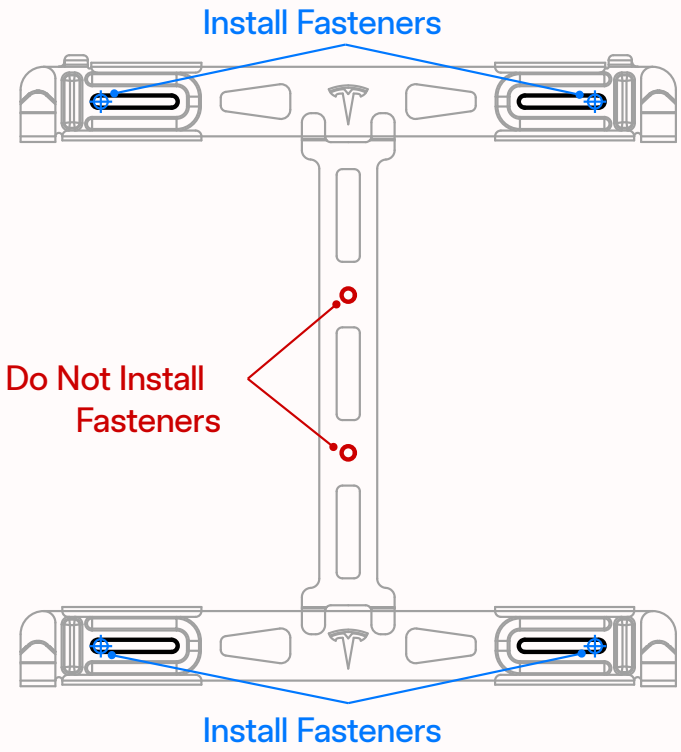
Figure 41. Bracket Measurements Relative to Expansion Unit and Floor



NOTE: These bracket measurements are the same for both Expansion and Powerwall 3 units.

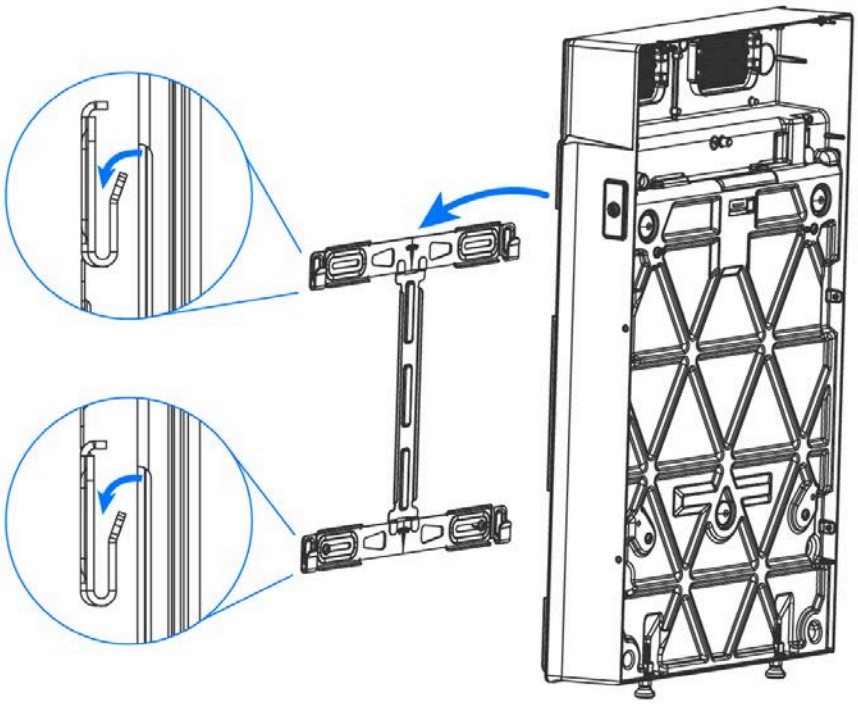
APPENDIX G: INSTALLING MULTIPLE POWERWALL 3 UNITS AND/OR EXPANSION UNITS

WARNING: Only install fasteners in the (4) slots on the horizontal bracket segments, and **ensure they are installed on the outside edges of each slot**. Do not install fasteners on the vertical (center) segment, as these are not structural mounting holes.

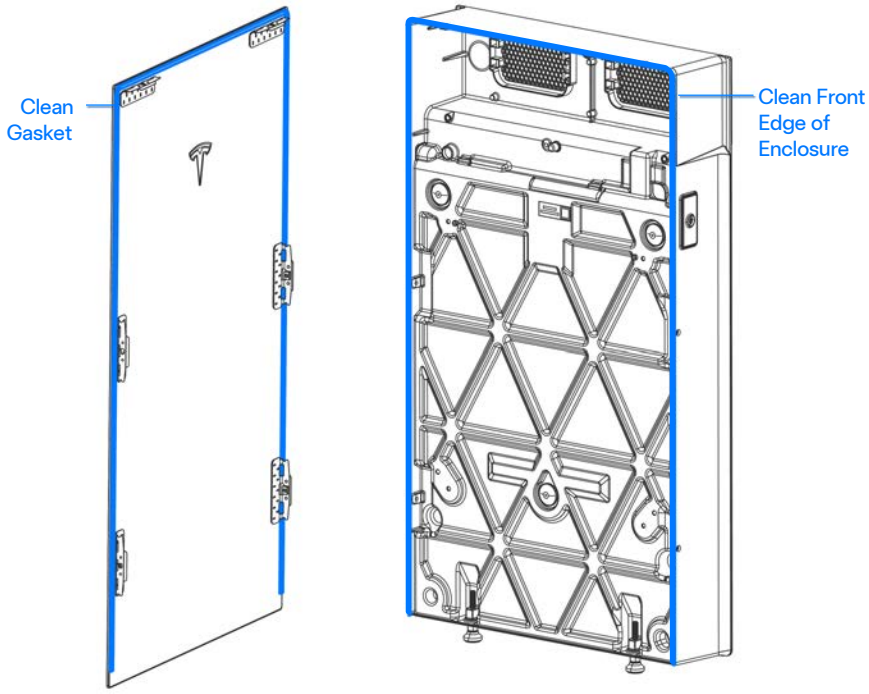


6. Move the dolly toward the wall, positioning the Expansion unit so that the mounting cleats are just above the flanges on the bracket.
7. Lower the Expansion unit until both the upper and lower sets of cleats engage the flanges on the bracket.

CAUTION: Confirm the unit is fully seated on all four cleats before proceeding.



8. Clean the front edge of the Expansion unit enclosure with a microfiber cloth to remove any debris that might interfere with the seal.
9. Carefully remove the glass front cover from its packaging and, using a microfiber cloth, clean the sealing gasket around the edge of the front cover to remove any debris that might interfere with the seal.

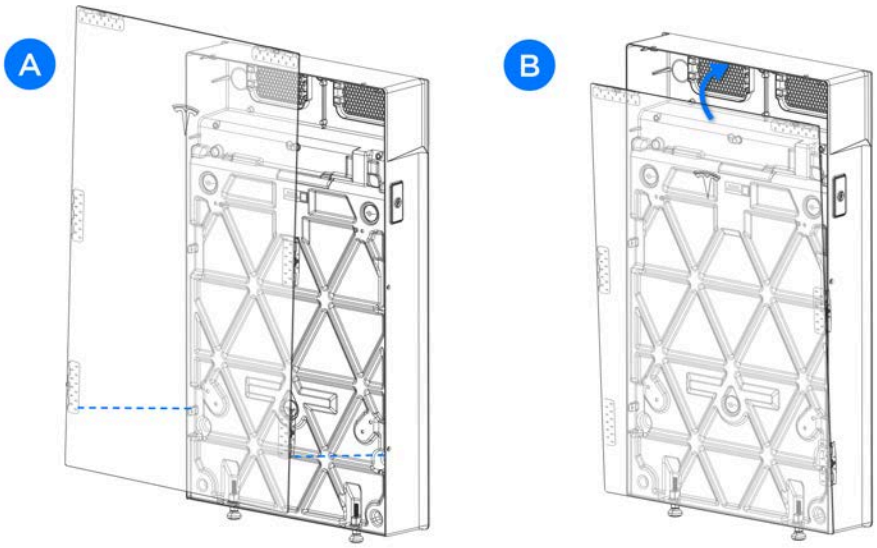


CAUTION: Take extreme care when handling the sealing gasket. Damage to or contamination of the gasket or its mating surface could compromise Powerwall's ingress protection, resulting in product damage.

10. Carefully install the glass front cover:

a. Align the lower mounting tabs with the two alignment shelves in the enclosure (**A**).

b. Rotate the front cover toward the enclosure to engage the top mounting tabs with the enclosure (**B**). Maintain pressure (approximately 2 Nm) on the front of the cover to compress the sealing gasket.



CAUTION: Maintain pressure to keep the sealing gasket compressed until all fasteners are installed and tightened. If the sealing gasket is not compressed, the fasteners may thread form in the enclosure, breaking the front cover mounting tabs.

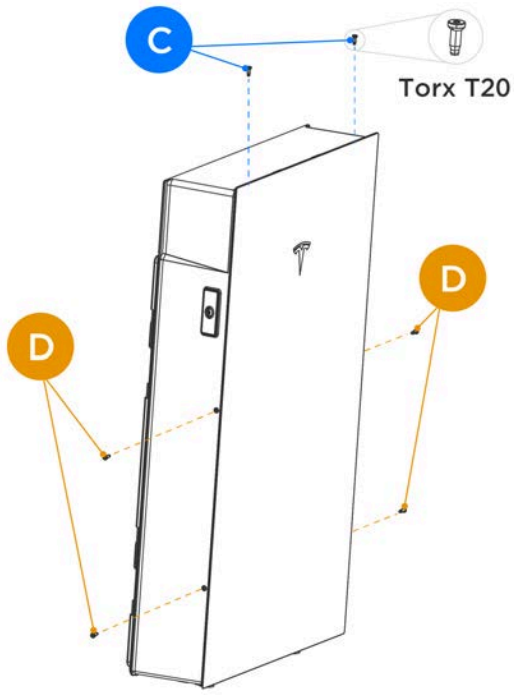
c. Install and tighten the top (2) T20 fasteners in the fastener slots.

NOTE: T20 fasteners (Tesla P/N 1847553-00-A) are included in the accessory bag:

- Early revisions of the fasteners (left, below) are single use; to reuse these fasteners, remove the black gasket from the fastener
- Later revisions of the fasteners (right, below) do not include a gasket and can be reused without any alteration

The gasket is not required and does not impact the enclosure rating of Powerwall 3.

d. Install the remaining (4) T20 fasteners in the side fastener slots.



e. Tighten all (6) fasteners to approximately 25 in-lb (2.8 Nm) or hand-tight.

> **CAUTION:** Do not use an impact driver to torque the fasteners.

11. **Before** removing the Expansion Harness protective packaging, mock up the cable routing by holding the Expansion Harness against the wall, confirming each connector reaches its Expansion port. If either or both connectors do not reach the Expansion port, use a longer Expansion Harness.
12. Connect the Expansion unit to the Powerwall 3 (or to another Expansion unit):
    a. Using a Torx T40 bit, loosen the fastener holding the Expansion port cover.

APPENDIX G: INSTALLING MULTIPLE POWERWALL 3 UNITS AND/OR EXPANSION UNITS

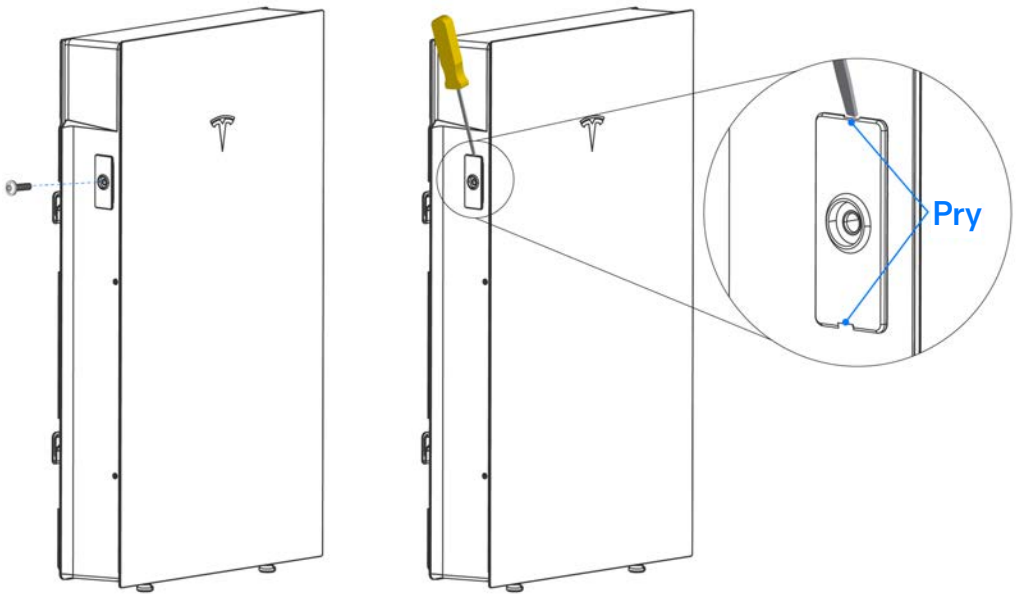
WARNING: STOP. Before opening Expansion port covers:

- Do not open the Expansion Port cover if Expansion / Powerwall 3 is **directly exposed** to any of the following conditions:
  - Rain
  - Snow
  - High winds (>48 kph)

- Do not leave the Expansion Port open for extended periods or in high debris/dust conditions

Doing so may allow water and/or debris to contact the sensitive internal components of Powerwall 3 / Expansion. This may lead to product damage and could potentially void the product warranty.

b. Insert a cabinet tip screwdriver in the small slots at the top and bottom of the port cover to pry it loose. Remove the cover.



NOTE: When the Expansion port cover bolt is loosened, depending on site conditions such as elevation, it is normal to hear a hissing sound until the air pressure has equalized.

NOTE: Keep the Expansion port cover in case the Expansion port needs to be covered again for any reason. Store the cover in the protective packaging from the harness to keep it clean.

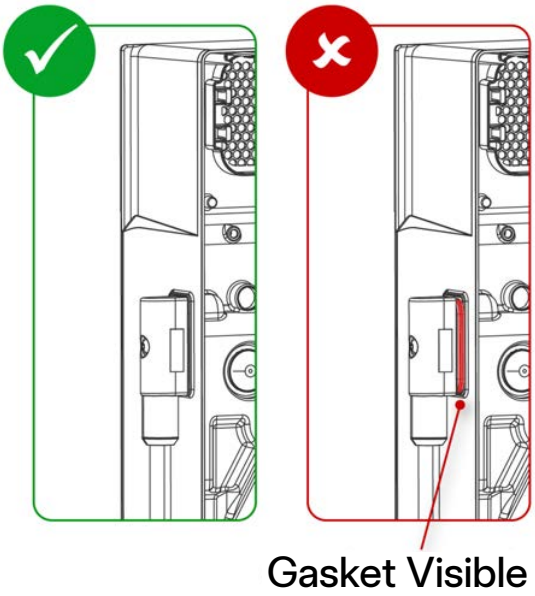
NOTE: If replacing the Expansion port cover, torque the port cover screw to 100 in-lb (11 Nm).

c. Visually inspect the Expansion port and confirm there is no debris in the port.

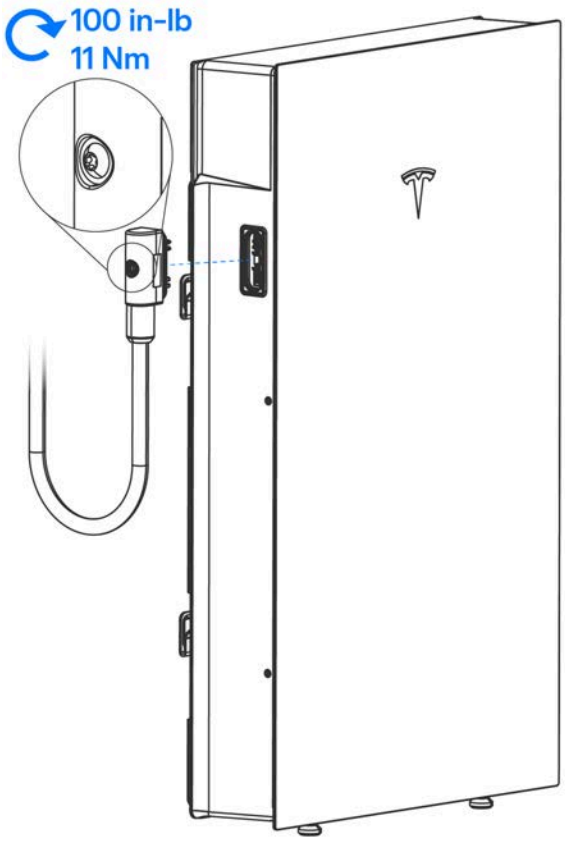
d. Remove the protective packaging from the end of the Expansion Harness being plugged in.

e. Visually inspect the Expansion Harness connector and confirm there is no dirt or debris on the connector. If there is dirt / debris on the connector:
   - Clean the dirt / debris from the connector
   - If it is not possible to adequately clean the connector, recycle the Expansion Harness and use a new one

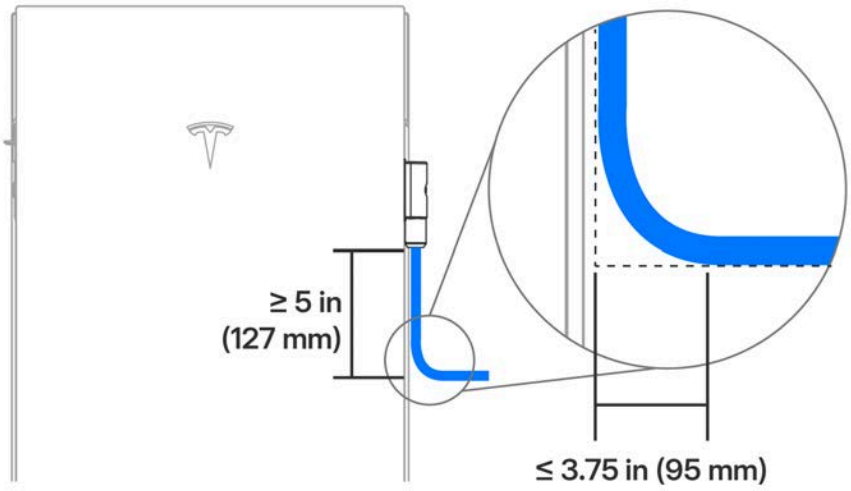
f. Plug one end of the Expansion Harness into the Expansion unit. Ensure the connector is fully seated in its port; it will be possible to confirm the connector is fully seated when there is no gasket exposed.



g. Torque the T40 harness screw on the connector to 100 in-lb (11 Nm).

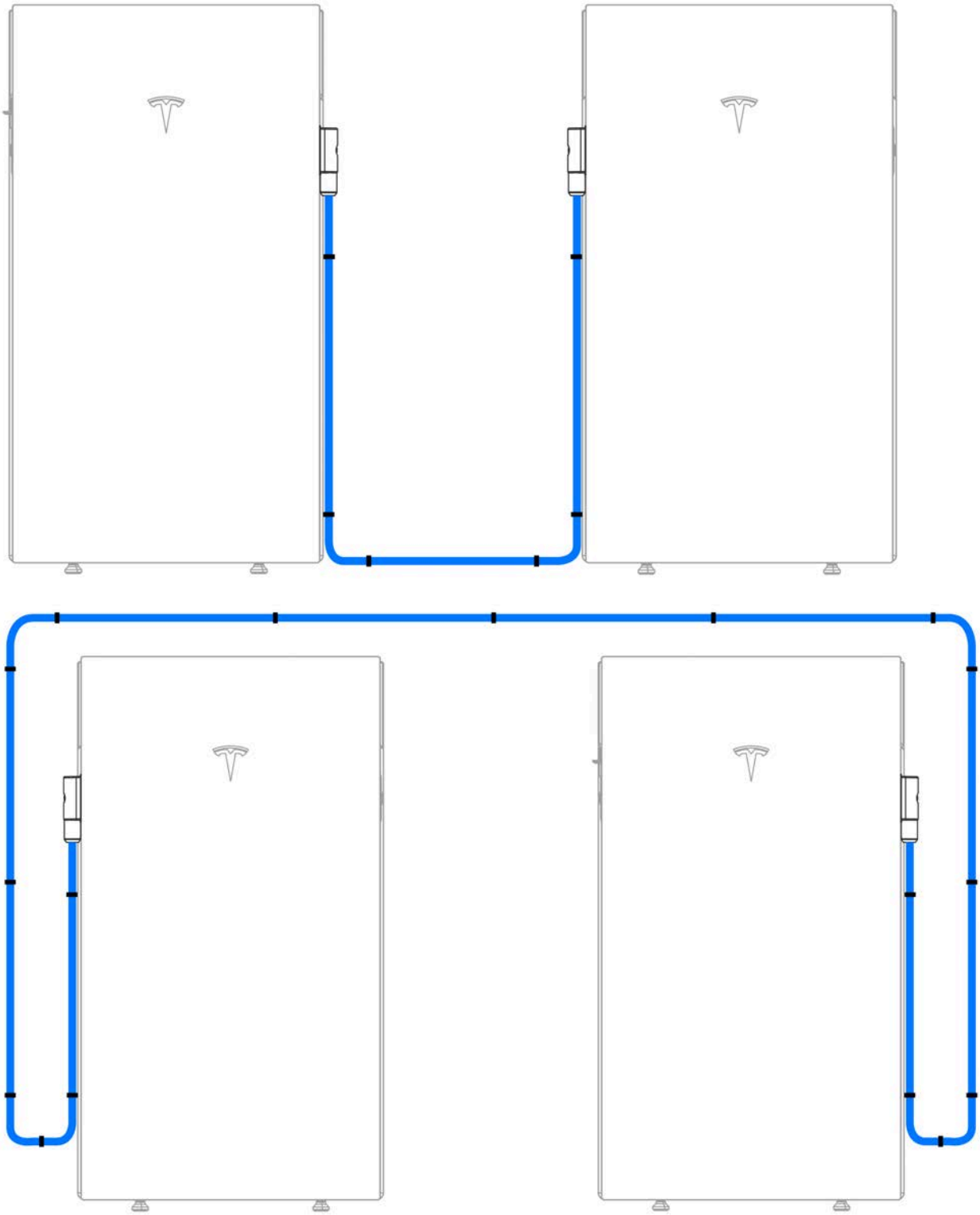


13. Plan the Expansion Harness cable routing, noting the following:
    - The minimum bend radius of the cable is 95 mm (3.75 in). Bending the cable to a lesser radius may result in damage to the Expansion Harness

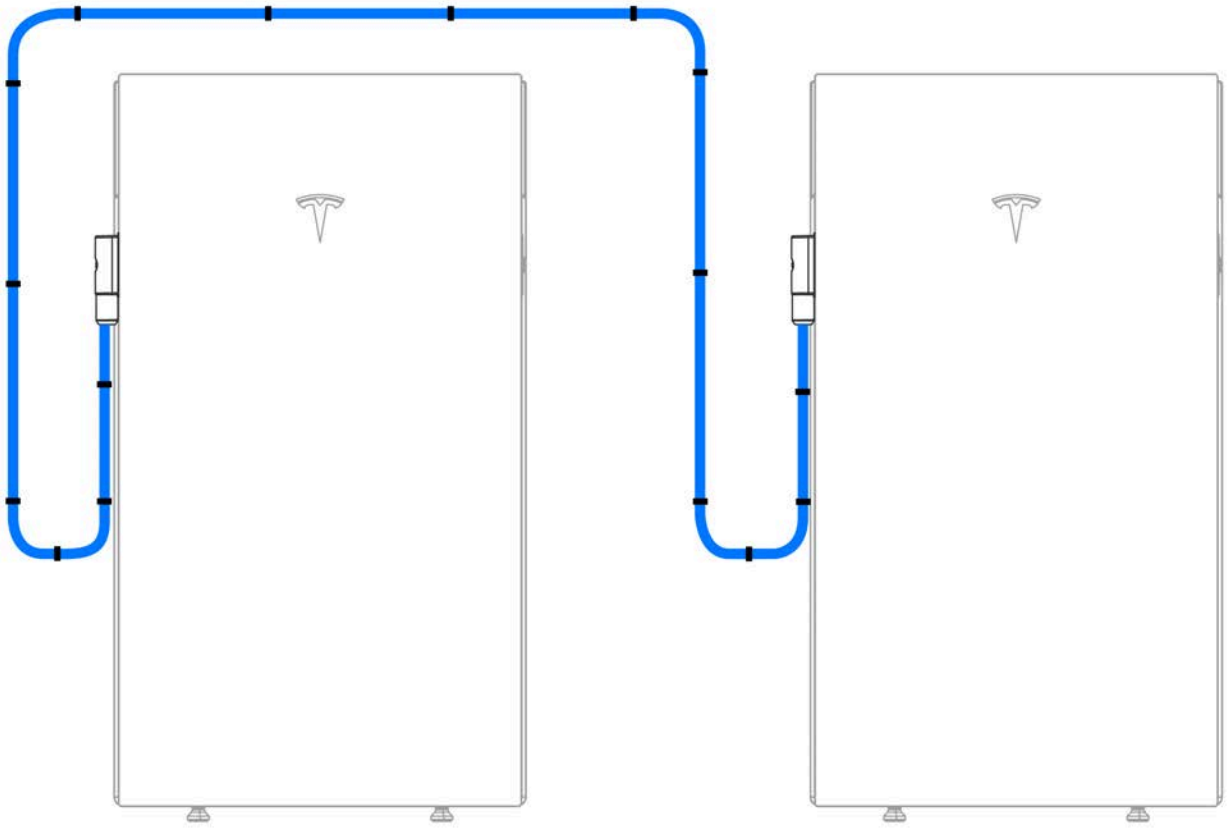


    - When a long Expansion Harness must be used, route and secure the cable so that there is no slack; the following examples illustrate some of the ways cable slack can be consumed (note the Bridgeport US-6171 straps (Tesla P/N 1730711-00-A) represented in black):

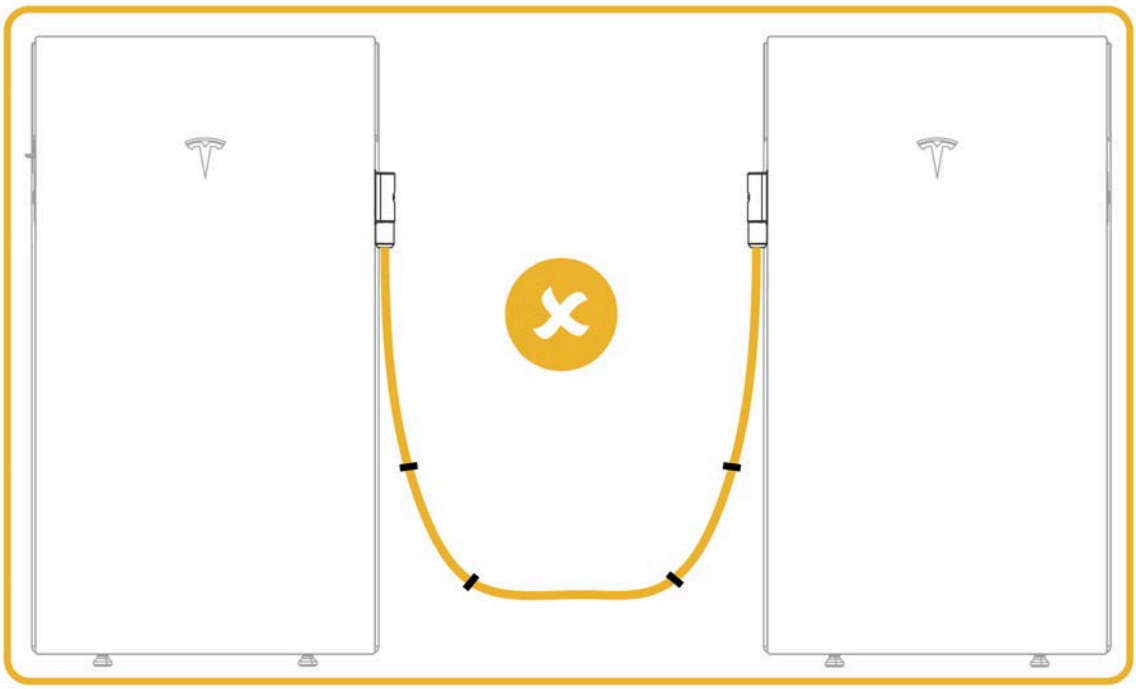
APPENDIX G: INSTALLING MULTIPLE POWERWALL 3 UNITS AND/OR EXPANSION UNITS



APPENDIX G: INSTALLING MULTIPLE POWERWALL 3 UNITS AND/OR EXPANSION UNITS

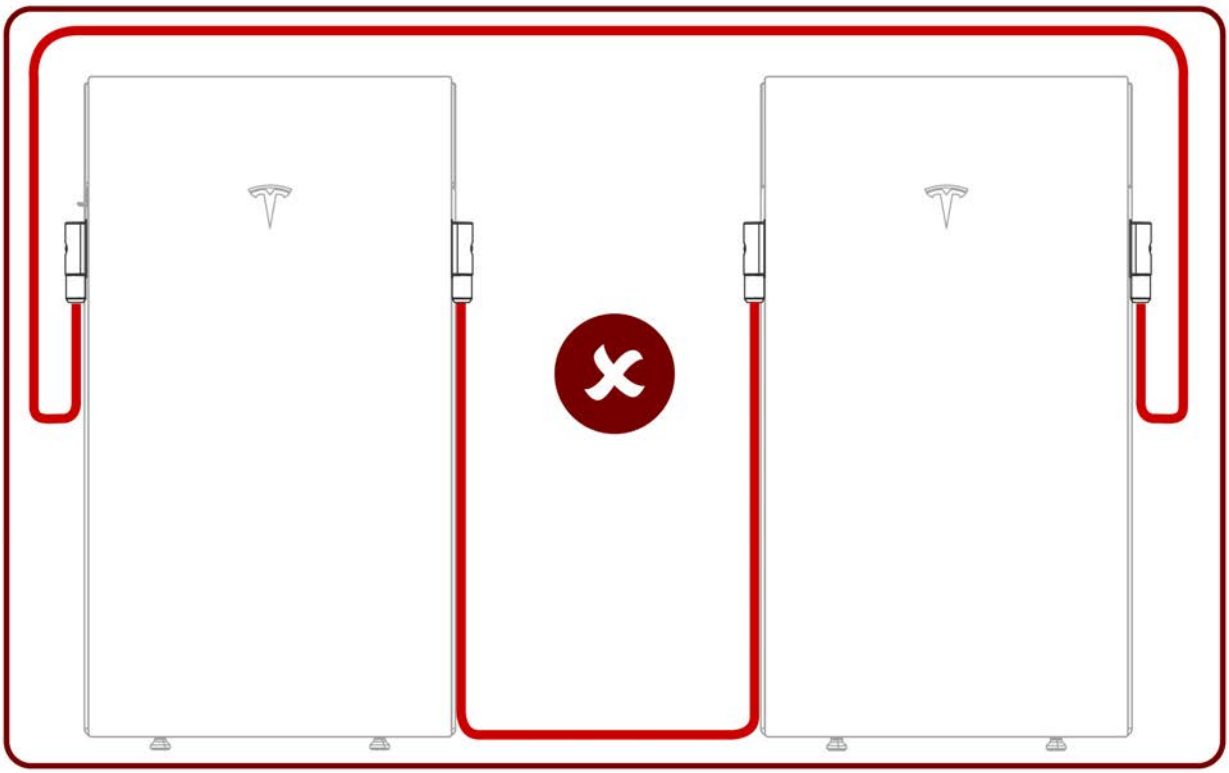


NOTE: Take care to route and strap the Expansion Harness so that it forms right angles and generally looks as neat as possible. Do not leave the Expansion Harness drooping or otherwise routed sloppily.



APPENDIX G: INSTALLING MULTIPLE POWERWALL 3 UNITS AND/OR EXPANSION UNITS

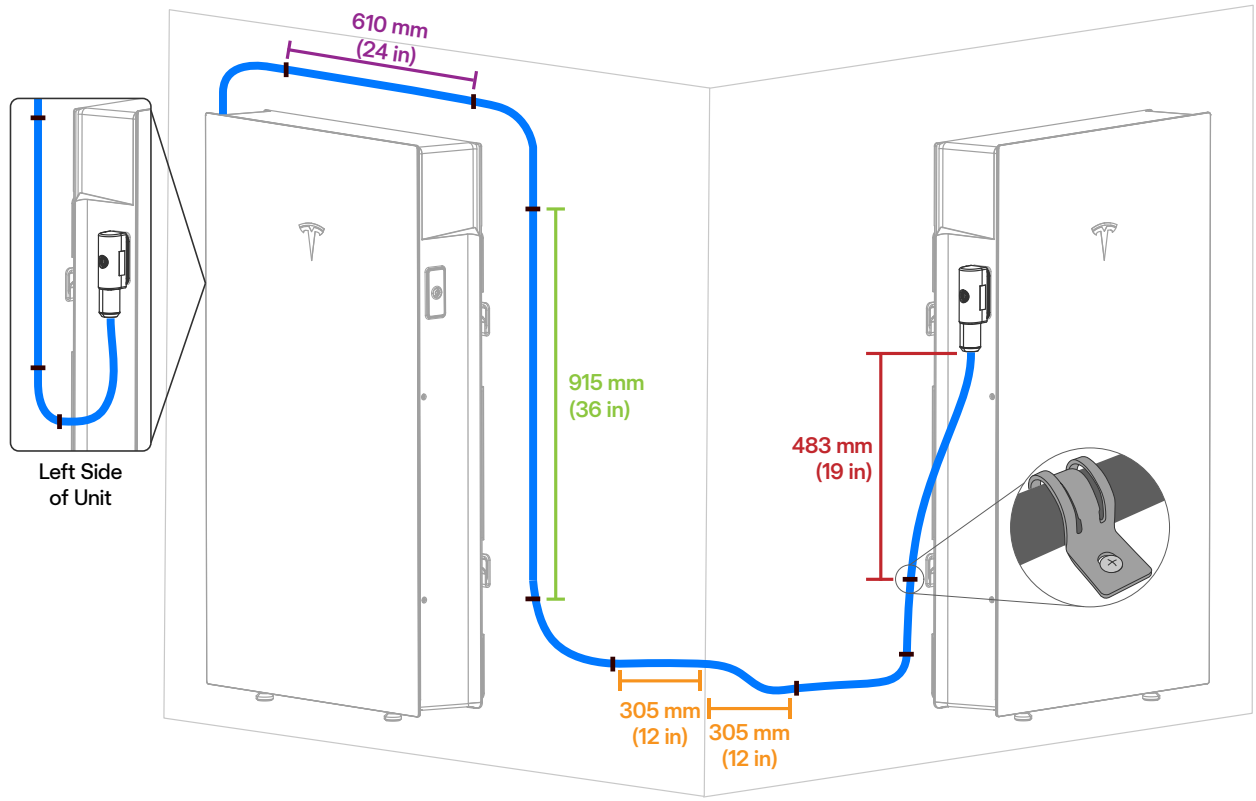
- Each unit (Powerwall 3 or Expansion) must only be connected to another unit via one harness. **Do not connect two units using two separate harnesses**



14. Secure the Expansion Harness cable using Bridgeport US-6171 straps (Tesla P/N 1730711-00-A), noting the following requirements for strap placement:

Strap Placement	Maximum Distance	Measurement Color in Diagram
Each end of Expansion Harness	483 mm (19 in) from connector	Red
Horizontal Run	610 mm (24 in) between straps	Purple
Vertical Run	915 mm (36 in) between straps	Green
Inside or Outside Corner	305 mm (12 in) from corner (recommended but not required)	Orange

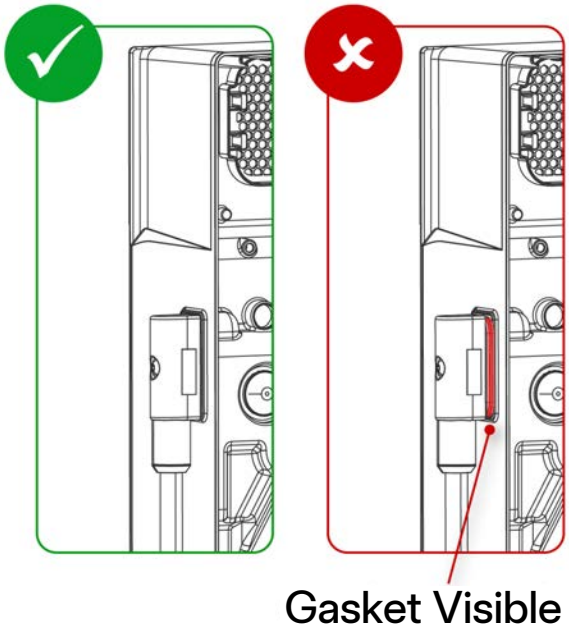
Figure 42. Maximum Distance Between Expansion Harness Cable Straps



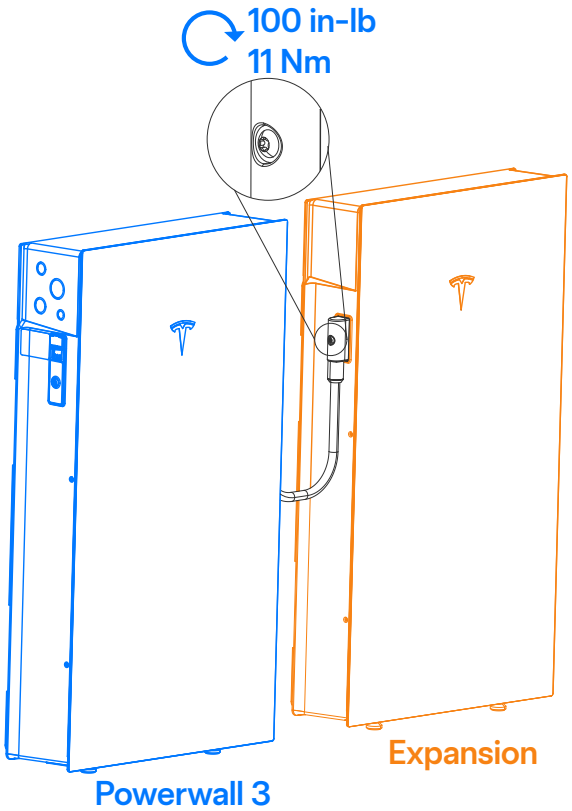
NOTE: Keep the Expansion Harness cable flat and as close to the wall as possible when routing it.

NOTE: When routing around an outside corner, the Expansion Harness cable may need to be routed with an offset to ensure the cable stays flat and as close as possible to the surface of the wall.

15. Plug the remaining Expansion Harness connector into the other Expansion or Powerwall 3. Ensure the connector is fully seated in its port; it will be possible to confirm the connector is fully seated when there is no gasket exposed.



16. Torque the T40 harness screw on the connector to 100 in-lb (11 Nm).



APPENDIX H: SHUTTING DOWN POWERWALL 3

Powerwall 3 system shutdown for emergency response or maintenance requires system shutdown and disabling solar output.

CAUTION: Open all third party solar inverter breakers or handled disconnects before shutting down the Powerwall 3 system.

Safely Shut Down Powerwall 3 for Maintenance or Service

1. Turn the Powerwall 3 On/Off switch OFF.
2. Turn the Powerwall 3 integrated DC isolator switch OFF.
3. Open the Powerwall 3 AC circuit breaker.
4. Wait 30 seconds before proceeding with any work.

   WARNING: Risk of electric shock from stored energy. Wait 30 seconds after disconnecting all sources of supply before proceeding.

5. Use a lock-out device on the disconnecting means listed in the table below whenever performing work on equipment that is not within sight of the switch.

Disabling Solar, System Shutdown, and Disconnecting Means for Powerwall 3

Action	Powerwall 3				AC-coupled Solar Inverter
	On/Off Switch OR Optional System Shutdown Switch	Integrated DC Isolator	AC Breaker / Isolator	External DC Isolator	AC Breaker / Isolator
Disables DC-coupled Solar	Yes	Yes	No	Yes	No
Disables AC-coupled Solar	No	No	No	No	Yes
Disables AC Inverter (Input and Output)	Yes	No	Yes	No	No
Isolates DC side for maintenance	No	No	No	Yes	Yes
Isolates AC side for maintenance	No	No	Yes	No	No

APPENDIX I: TROUBLESHOOTING

Situations in Which Powerwall 3 Stops Grid Forming

Some situations in which the Powerwall will not be allowed to grid-form are:

- The Powerwall 3 **On/Off switch is switched OFF**.
- An **open circuit** between any Powerwall and the Backup Gateway. *Example: an open Powerwall AC breaker*.
- **Excessive voltage drop** between any Powerwall and Backup Gateway. *Example: poor connections at AC wire terminals or wiring damage between Powerwall and Gateway*.
- **Loss of communications** between any internal system or meter (for instance loss of communication with Backup Gateway 2).

Earthing

When operating off-grid, the Backup Gateway 2 forms a local **TN-S supply** to the connected distribution board(s):

- *Relationship of power system to earth*: **T** – Direct connection of one point to Earth – this is provided by the local earth, connected into the main earthing terminal
- *Relationship of the exposed conductive parts to Earth*: **N** – Direct connection to the earthed point (neutral) of the power supply system - this is facilitated by the local N-PE bond created within the Gateway during off-grid operation
- *Arrangement of neutral and protective conductors*: **S** - Separate conductors - separate neutral and protective conductors are connected between the Gateway and downstream distribution board(s)

Proper earth connection and Neutral-to-Earth (N-PE) bonding during on-grid and off-grid operation is required for safe operation of the Powerwall system and for compliance with local code requirements. For instruction regarding the switched earth connection, refer to *Verify Neutral-Earth Bonding Scheme and Install Earthing Rod on page 50*.

WARNING: To ensure safe operation when operating off-grid, **a local earth must be present on the site**, such as by earth rod or ground electrode. During a grid fault it cannot be assumed that the DNO's Earth or PEN conductors are intact. Installation of earth rod must comply with local codes.

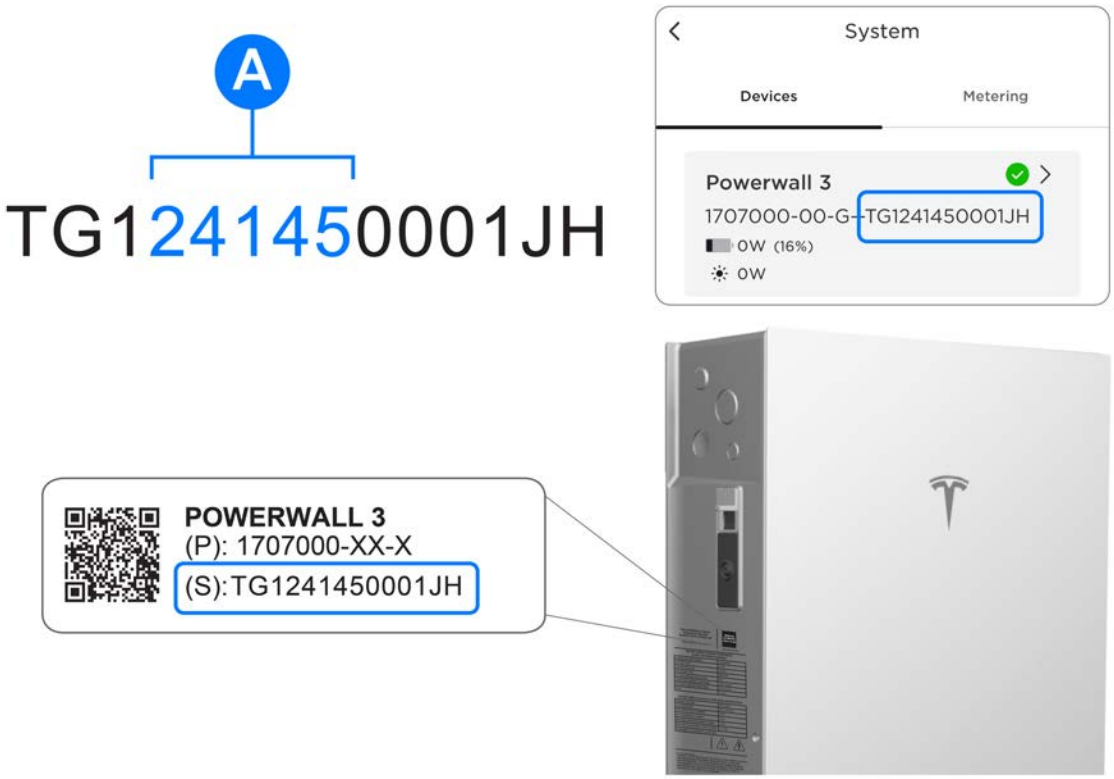
Identifying Powerwall 3 Manufacture Date

If needed, the Powerwall 3 manufacturing date can be identified from the serial number printed on the side of the unit. The serial number can also be found in Tesla One when connected to the Powerwall 3.

From the serial number, the manufacturing date (**A** below) is the manufacturing year (digits 4 and 5) followed by the Julian date (digits 6-8). In the following example: **TG1241450001JH**:

- "24" is the manufacturing year, or 2024
- "145" is the Julian date, or May 25

This unit was manufactured on May 25, 2024.



NOTE: At 50% State of Charge (SOC), 20°C, Powerwall 3 is expected to have 0% power fade throughout the life of the product.

NOTE: At 50% State of Charge (SOC), 20°C, Powerwall 3 Internal Resistance shall be 36 mOhms. Over 10 years of operation, for an average user, the Internal Resistance is expected to grow by 60%.

NOTE: Powerwall 3 is expected to have 20% fade after 10 years. Please review the *Application* and *Operating Limitation* considerations in Tesla's *Powerwall Warranty*.

APPENDIX J: REVISION HISTORY

Revision	Date	Description
1.3	01-09-2025	• Updated *Powerwall 3 Specifications on page 5*, *Powerwall 3 System Overview on page 13*, *Design Considerations on page 17*, *Powerwall 3 DC System Sizing on page 20*, and *AC-Coupled Solar System Sizing on page 21*, and added *Powerwall 3 Expansion Specifications on page 8*, to include Powerwall 3 Expansion • Added *Powerwall 3 Center of Mass on page 92* • Added Powerwall 3 Expansion installation instructions to *Appendix G: Installing Multiple Powerwall 3 Units and/or Expansion Units on page 119*
1.2	06-09-2024	• Corrected wire gauge range for GND and 12V+ in *Communication Wiring to Backup Gateway 2 on page 96* • Updated *Residual Current Devices (RCDs) / Residual Current Circuit Breakers with Overcurrent Protection (RCBOs) on page 102* to reflect that, for multi-Powerwall 3 systems, each Powerwall 3 requires its own RCD / RCBO • Corrected the wiring diagrams in *Appendix C: System Wiring Diagrams on page 104*: Included the N-PE bond and updated them with RCBO • Removed PV Manager and Solergo from *Available Third-Party Solar Design Tools on page 20* • Added breaker size information for various power / current output levels in section *Powerwall 3 Specifications on page 5* and *Required Supplies on page 28* • Added a note about DC isolation requirements in section *Required Supplies on page 28* and *STEP 7: Make Solar PV Connections on page 63* • Updated the PV wire required size to 4 - 6 mm^2in section *Required Supplies on page 28* • Updated the wiring instructions to connect PV ground before PV circuit connections and AC ground before AC circuit connections in sections *STEP 7: Make Solar PV Connections on page 63* and *STEP 6: Make Powerwall 3 AC Circuit Connections on page 58* • Powerwall 3 front glass cover fasteners are not single-use, they can be reused to reinstall the cover, see step *8.c on page 86* in *STEP 12: Install Powerwall 3 Front Cover on page 83*
1.1	17-07-2024	Added *Identifying Powerwall 3 Manufacture Date on page 168*
1.0	19-06-2024	Initial publication