



Powerwall 2 AC Installation Manual

With Backup Gateway 2

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

www.tesla.com/support/powerwall.

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

PRODUCT SPECIFICATIONS

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

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

ERRORS OR OMISSIONS

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

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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 used 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 you 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.

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 the Tesla Powerwall 2 AC and Backup Gateway that must be followed during installation and maintenance of the system.

SYMBOLS USED

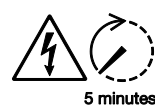
 **WARNING:** indicates a hazardous situation which, if not avoided, could result in injury or death.

 **CAUTION:** indicates a hazardous situation which, if not avoided, could result in minor injury or damage to the equipment.

NOTE: indicates an important step or tip that leads to best results, but is not safety or damage related.

 **REFER TO OPERATING INSTRUCTIONS:** indicates that user should refer to operating or installation instructions before proceeding.

 **RISK OF ELECTRIC SHOCK:** indicates components that present risk of electrical shock.

 **CAUTION, RISK OF ELECTRIC SHOCK, ENERGY STORAGE TIMED DISCHARGE.** Discharge time is 5 minutes from de-energization.

 **BIDIRECTIONAL TERMINAL:** Indicates location of combined input/output connector on the equipment.

 **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.
-  **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 near heating equipment.
-  **WARNING:** Do not immerse Powerwall or its components in water or other fluids.
-  **WARNING:** Install Powerwall and Backup Gateway in a location that prevents damage from flooding.
-  **WARNING:** Operating or storing Powerwall in temperatures outside its specified range might cause damage to Powerwall.
-  **WARNING:** Do not expose Powerwall to ambient temperatures above 60°C (140°F) or below -30°C (-22°F).
-  **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 any part of Powerwall, including any internal or external components such as the exterior shell or casing.
-  **CAUTION:** Do not connect Powerwall directly to photovoltaic (PV) solar wiring.
-  **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:** Avoid installing Powerwall and Backup Gateway in direct sunlight.
-  **CAUTION:** Ensure that no water sources are above or near Powerwall or Backup Gateway, including downspouts, sprinklers, or faucets.
-  **CAUTION:** Ensure that snow does not accumulate around Powerwall or Backup Gateway.
-  **CAUTION:** Avoid installing the Powerwall and Backup Gateway where it will be exposed to direct sunlight or ambient temperatures greater than 35 deg C.
-  **CAUTION:** The Backup Gateway may not be flush mounted in a wall or cavity.

Specifications

Powerwall 2 AC Electrical Specifications

Usable Energy ¹	13.5 kWh
AC Voltage (Nominal)	230 V
Maximum Continuous Current	25 A
Frequency (Nominal)	50 Hz
Real Power, max continuous (charge and discharge)	5 kW
Apparent Power, max continuous (charge and discharge)	5 kVA
Power Factor Output Range	+/- 1.0 adjustable
Overvoltage Category	Category III
Maximum Supply Fault Current	10 kA
Maximum Output Fault Current	32 A
Maximum Inrush Current	0.4 A
Round Trip Efficiency (Beginning of Life) ¹	90%

¹ Values for 25°C, 3.3 kW charge/discharge power

Backup Gateway 2 Electrical Specifications

Maximum Overcurrent Protection Device	100 A (single-phase service) 80 A (2- and 3-phase service)
Rated Frequency (f _n)	50-60 Hz
Overvoltage Category	Category III
AC Meter	Revenue accurate (+/- 0.2%)
Maximum Input Short Circuit Rating ²	10 kA
Distribution boards intended to be operated by ordinary persons (DBO) Type	Type B
Safety	IEC 61439-1, IEC 61439-3

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

	Powerwall 2 AC	Backup Gateway 2
Operating Temperature ⁴	-20°C to 50°C	-20°C to 50°C
Optimum Temperature	0°C to 30°C	N/A
Operating Humidity (RH)	Up to 100%, condensing	Up to 100%, condensing
Storage Conditions (up to 12 months)	-20°C to 30°C Up to 95% RH, non-condensing State of Energy (SoE): 25% initial	N/A
Maximum Altitude	3000 m	3000 m
Noise Level @ 1 m	< 40 dBA at 30°C	N/A
Ingress Rating	IP67 (battery and power electronics) IP56 (wiring)	IP55
Environmental Category	N/A	Outdoor
Wet Location Rating	Yes	Yes
Seismic Rating	AC156, IEEE 693-2005 (high)	N/A
Pollution Degree	N/A	PD2

⁴ Performance may be de-rated in extreme ambient temperatures.

Mechanical Specifications

	Powerwall 2 AC ⁵	Backup Gateway 2
Height	1150 mm	584 mm
Width	753 mm	380 mm
Depth	147 mm	127 mm
Weight	114 kg	11.4 kg

⁵ Powerwalls with part numbers 1092170-XX-H and lower and 2012170-XX-B and lower have the following specifications: 1150 x 755 x 155 mm, 125 kg.

Registering Powerwall

Tesla Powerwall comes with a warranty whose term depends on the connection of Powerwall to the Internet. To secure the full 10-year warranty for Powerwall, 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 commissioning process so that registration information is sent to Tesla.

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

Site Requirements and Pre-Installation Guidance

Powerwall and Backup Gateway 2 Installation Requirements

Powerwall comes with a separate Backup Gateway to enable integration with the electrical grid and generation like solar systems (refer to [Compatibility Matrix](#) for information on what can be connected with Powerwall). The Backup Gateway communicates with the system by means of wireless and wired connections. Wiring and conduit (where required) must be provided by the installer. Where conduit is required, the installation must comply with local codes.

AC disconnect and interconnection requirements between the Powerwall system and the main distribution board are subject to local codes. Ensure that the installation meets local disconnect and interconnection requirements.

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

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

 **WARNING:** Do not connect the Backup Gateway in any way that bypasses or short-circuits its relay.

 **WARNING:** Do not connect the Backup Gateway to the source side only or to the load side only. The Backup Gateway must have both source and load connections, and must be wired in compliance with local codes.

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

 **CAUTION:** The Manual Override switch inside of the product must not be used to simulate a grid outage or take home off-grid. A main isolation switch should be installed upstream of the Backup Gateway for testing the system and for service purposes.

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

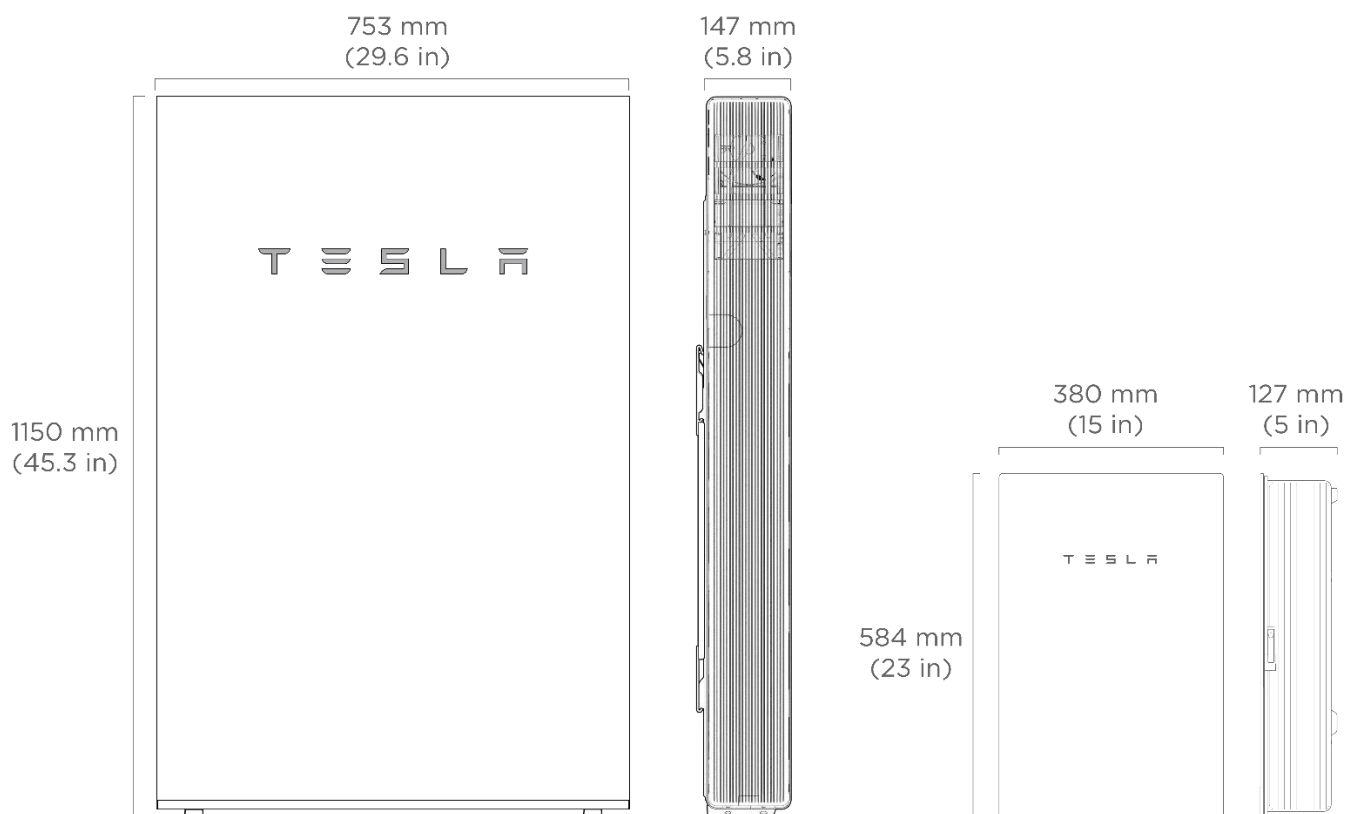


Figure 1: Powerwall 2 AC and Backup Gateway 2 Dimensions

Powerwall Physical Requirements

Powerwall can be mounted on a floor or wall, and includes a mounting bracket to support either configuration. Mounting Powerwall must follow the guidance outlined in this document. Mounting requirements based on wall type are provided in [Appendix A: Powerwall Mounting Details](#)

Powerwall requires adequate clearance for installation, cabling, and airflow. Do not install anything above Powerwall that limits access to the unit or that might fall and damage the unit. Do not mount Powerwall horizontally or upside down.

NOTE: Powerwall has a pump and fan that produce 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 these noise levels when choosing where to install Powerwall.

Powerwall Identification

Newer Powerwalls have slightly different dimensions for mounting-bracket height. Powerwalls may be easily identified by part number and by comparing the back of the Powerwall (see [Figure 2](#)).

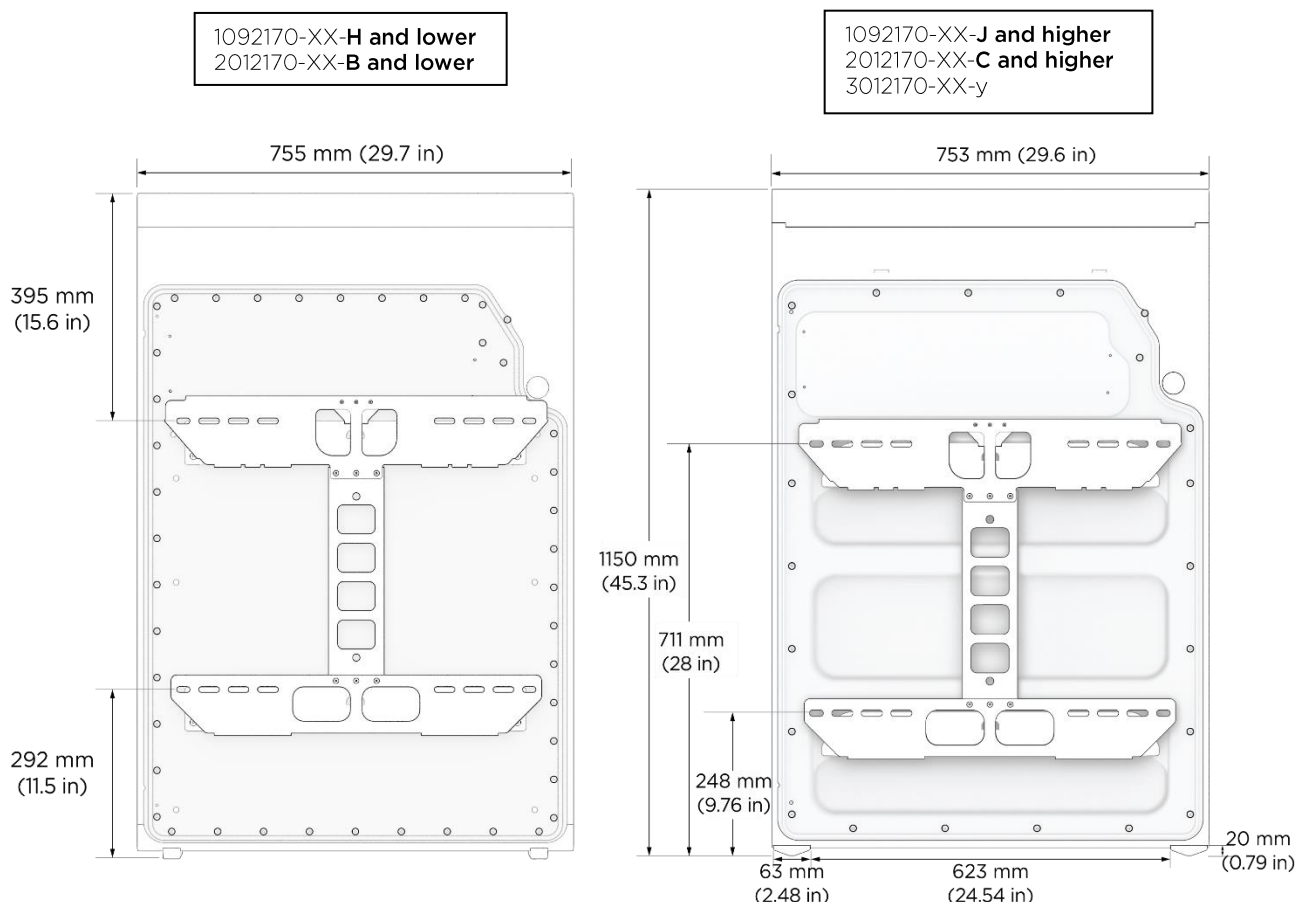


Figure 2: Powerwall 2 Identification by Mounting Bracket Height

Powerwall Optimum Temperature Range

Powerwall is rated to operate in temperatures from -20°C to 50°C (-4°F to 122°F). However, for best performance Tesla recommends installing Powerwall in locations with ambient temperature between 0°C to 30°C (32°F to 86°F) year round. When outside this optimum temperature range, charge/discharge power may be reduced and Powerwall will utilize its thermal control system more frequently to maintain battery cell temperature which will reduce the energy efficiency of the system. Systems operating off-grid for long periods (>4 hours) in cold weather may need to curtail PV, and reduce energy used for pre-conditioning.

- For cold climates Tesla strongly recommends installing Powerwall indoors when possible (particularly when long outages are expected).
- For hot climates Tesla recommends keeping Powerwall out of direct sunlight. Installation in full sun raises the temperature inside the enclosure above ambient temperature. This temperature rise is not a safety risk, but may impact battery performance.

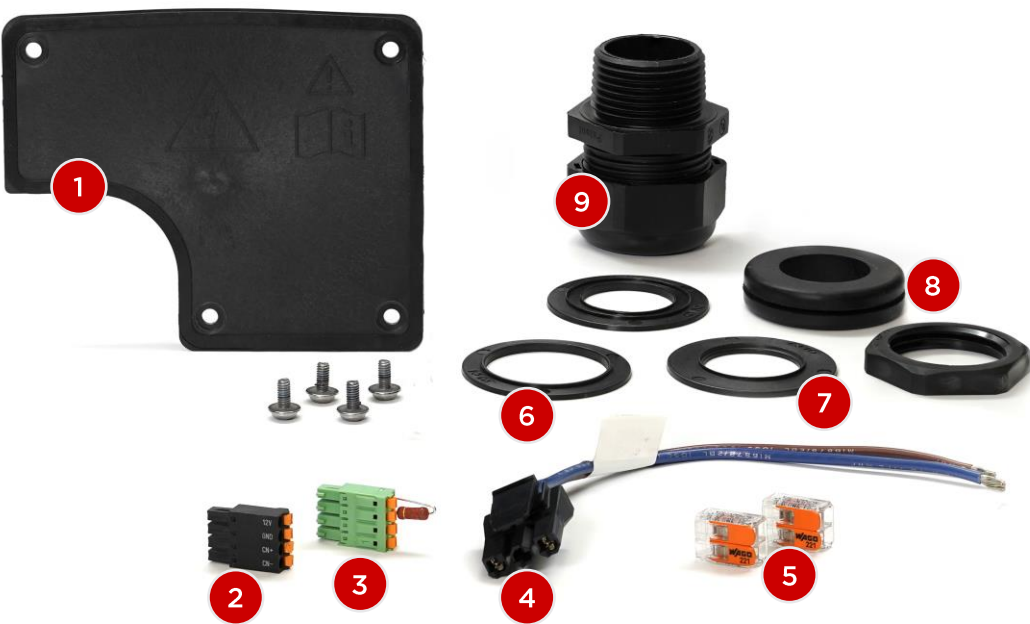
Additionally, if stored in a cold environment (e.g. below 0°C) before installation, it may take several hours for Powerwall to raise its internal temperature using pre-conditioning. Tesla recommends storing Powerwalls in a warm location prior to installation to help efficiently commission and test the system.

Installation Quick Reference

In the Powerwall Box

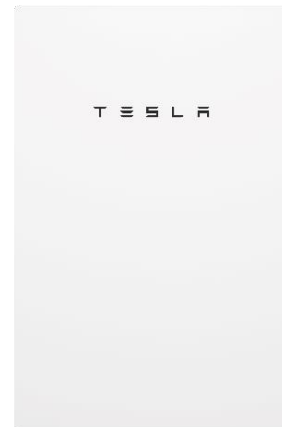
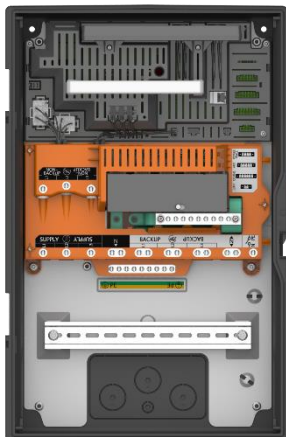


In the Powerwall Accessory Bag



1	2	3	4	
Wiring compartment cover with (4) screws	(1) 4-pin terminal block connector	(1) 4-pin terminal block connector with 120-Ohm terminating resistor	(1) AC power harness	
5	6	7	8	9
(2) Wago 2-position lever nuts	(1) 32-mm reducing washers	(2) 25-mm reducing washers	(1) 35-mm rubber grommet	(1) drillable threaded cable gland

In the Backup Gateway 2 Box



In the Backup Gateway Accessory Bag



1	2	3	4	
(1) Adhesive circuit label	(1) CT extension cable harness (3m)	(3) ¼-inch rubber boned stainless steel washers	(5) 8mm backplate nuts	
5	6	7	8	Not pictured
(1) M25 communication gland and insert	(1) Solar CT (100A, split-core)	(1) Circuit breaker blanking hole filler set	N-N Jumper Bar	(1) Owner's Manual

Required Tools

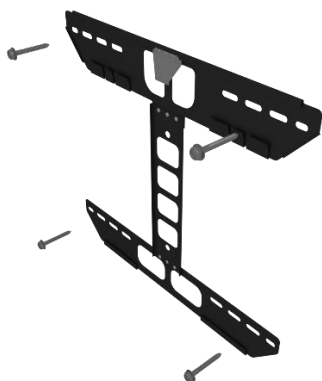
- Personal protective equipment (safety glasses, gloves, protective footwear)
- Drill with the following drill bits:
 - Small bit for drilling pilot holes in Backup Gateway mounting surface
 - Hole saws for drilling cable access holes in Backup Gateway (M12, M20, M25, M32, M40, M50)
- Torque screwdriver with 1/4-inch bit holder and T20 Torx bit
- Large (5 mm) flathead driver bit (for Powerwall Earth terminal)
- Small (2 mm) flathead screwdriver (for wiring connector spring terminals)
- Torque wrench with 3mm Allen bit (for Backup Gateway power connections)
- Socket wrench with 8mm hex socket
- Wire strippers/cutters for 0.2 mm² to 35 mm² wires
- Installation tools (level, stud sensor, tape measure, pencil, painter's tape, flashlight)
- Multimeter and Loop Impedance Tester
- Lift equipment capable of lifting and supporting 125 kg up to 1.5 m
- Ratcheting strap to secure Powerwall to lift equipment
- Digital camera or smartphone for documenting the installation

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

Required Supplies

- Powerwall mounting bracket hardware (see [Appendix A](#))
- Backup Gateway mounting hardware
- Conduit fitting or cable gland (depending on local electrical requirements)
- Conduit or raceway (depending on local electrical requirements)
- Earthing rod (if local earthing is not present on site)
- Minimum 600 V rated 4-conductor or double-insulated (with one twisted pair) shielded copper (Cu) cable (for communication connection between Powerwall and the Backup Gateway)
- Minimum 600 V rated copper (Cu) cable (for power connections to Powerwall and the Backup Gateway)

Mount Powerwall and the Backup Gateway



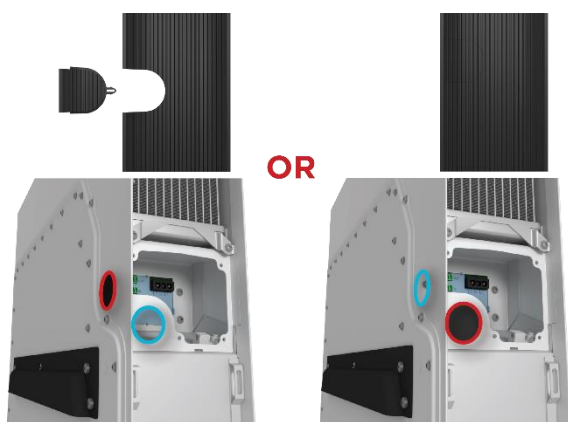
Mount Powerwall Bracket



Switch Powerwall Off



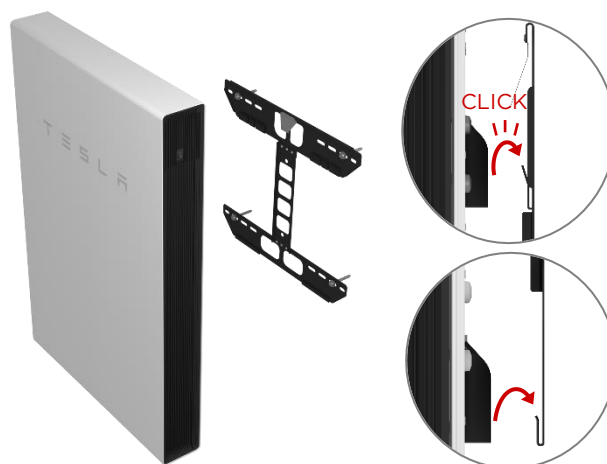
Remove Left Side Cover



Side Cable Entry

Rear Cable Entry

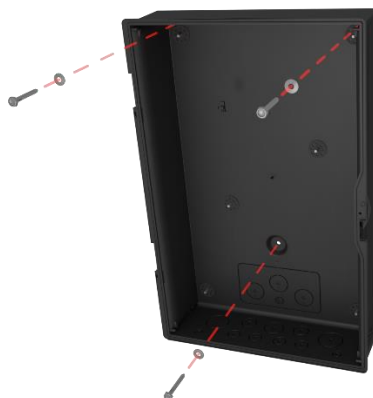
Configure for Side or Back Cable Entry



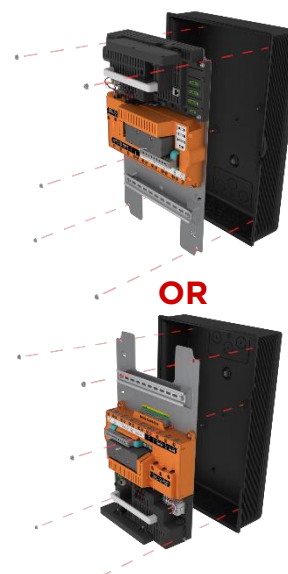
Mount Powerwall



Drill Cable Entry Holes
in Backup Gateway Enclosure

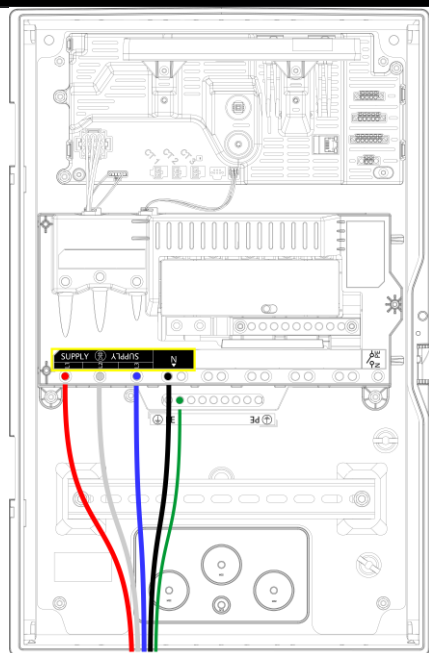


Mount Backup
Gateway Enclosure

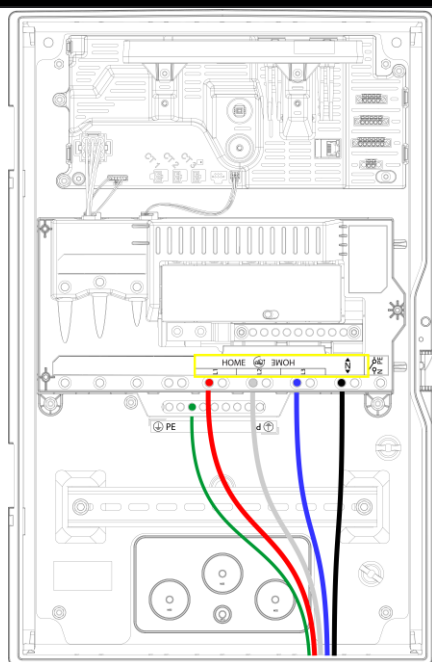


Install Backup Gateway
Backplate Assembly

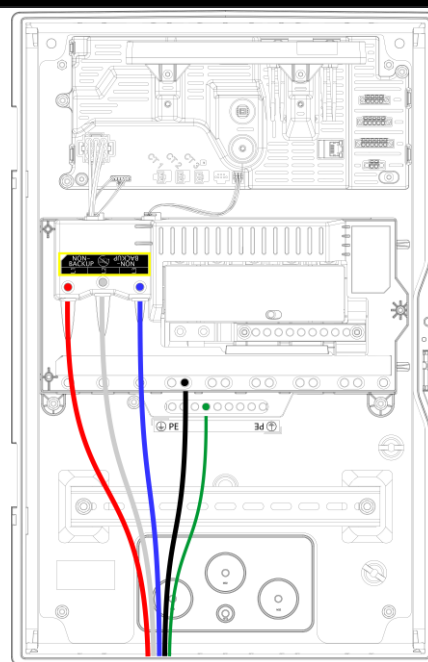
Make AC Power Connections



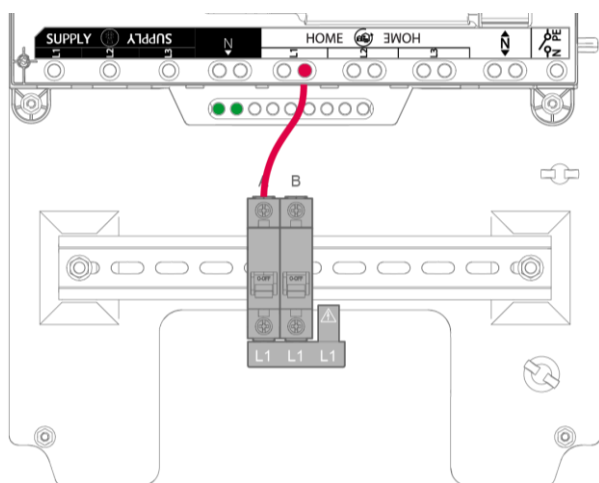
Install Fuse and Connect Main Service Conductors



Connect Home Load Panel Conductors



Connect Non-Backup Panel Conductors



Install Generation Breakers



Connect AC Power to Powerwall

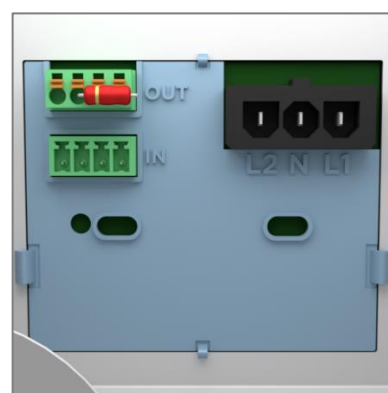
Connect Communication Wiring



Connect Communication Wiring in Backup Gateway

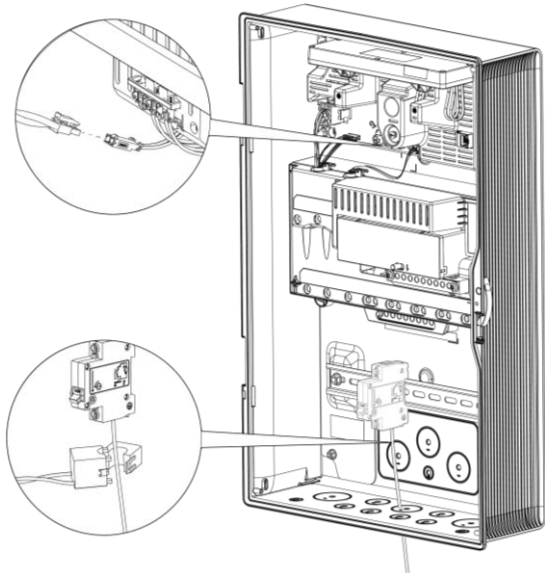


Connect Communication Wiring in Powerwall



Install Terminating Resistor

Install Energy Metering

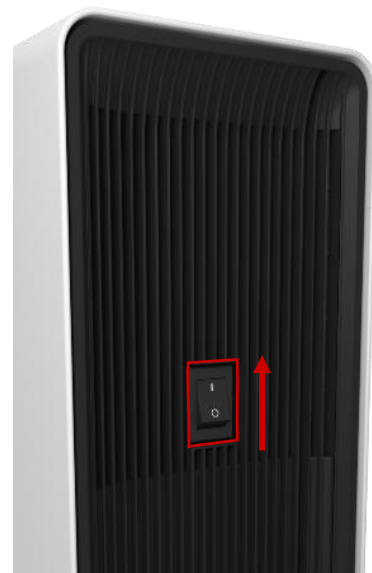


Install Energy Metering for Solar and Site Measurement

Close Wiring Compartments and Turn System On



Replace Dead front and Close Backup Gateway Door



Power On Powerwall and Backup Gateway

Commission the System



Locate the Wi-Fi password on the Backup Gateway dead front

Ethernet Communication

<http://192.168.90.2>

Wi-Fi Communication

<http://192.168.91.1>

Connect to “**TEG-xxx**” network
Wi-Fi password located on Backup Gateway dead front (previous step)

Establish Communication with Backup Gateway and Connect to Internet



Follow the instructions in the Commissioning Wizard to complete Commissioning

Table of Contents

Specifications.....	5
Registering Powerwall	6
Site Requirements and Pre-Installation Guidance	6
Installation Quick Reference	9
Installation Instructions.....	17
Step 1. Plan the Installation Site	17
Step 2. Anchor the Powerwall Mounting Bracket.....	18
Step 3. Mount Powerwall on the Bracket.....	19
Step 4. Mount the Backup Gateway.....	21
Step 5. Verify Neutral-Earth Bonding Scheme	24
Step 6: Make AC Power Connections to Supply and Load Panels.....	25
Step 7. Install Powerwall and Generation Breakers in the Backup Gateway.....	27
Step 8. Connect Powerwall to the Backup Gateway.....	29
Step 9. Install Energy Metering for the System.....	31
Step 10. Plan Internet Connection for Backup Gateway 2.....	32
Step 11. Close the Wiring Compartments and Turn the System On.....	33
Step 12. Commission the System.....	34
Step 13. Finish and Demonstrate the Installation.....	36
Troubleshooting.....	36
Technical Support.....	36
Maintenance.....	36
Appendix A. Powerwall Mounting Details.....	37
Powerwall Space Requirements.....	37
Mounting Bracket Anchoring Details.....	38
Appendix B. Wiring Reference	40
Powerwall Wiring	40
Backup Gateway 2 Wiring	41
Backup Gateway 2 Communication.....	42
Appendix C. System Diagrams.....	43
Appendix D. Configuring Energy Metering	46
Appendix E. Installing a Neurio Energy Meter.....	48
Appendix F. Feature Notes.....	54
Configuring Site Limits.....	54
Load Shedding.....	55
Appendix G. Installation Troubleshooting.....	56
Accessing the Powerwall User Interface.....	56
Updating Firmware	56

Configuring Energy Meters	56
Power Cycle the System.....	57
Appendix H. Multi-Powerwall Installations.....	58
Electrical Equipment Sizing and Overcurrent Protection	58
Multi-Powerwall Installations with the Stack Kit	61
Appendix I. Revision Log.....	73

Installation Instructions

Step 1. Plan the Installation Site



Choose a Location

Choose a wall capable of supporting the full weight of Powerwall, with one of the following characteristics:

- Wood studs at regular intervals
- Plywood sheeting of sufficient thickness
- Solid concrete or masonry
- Metal studs of sufficient gauge

If floor-mounting Powerwall, choose a level surface adjacent to a wall space that meets the above requirements. Make sure the area is isolated from hazards that could damage Powerwall, such as vehicle traffic or flooding. Consider the spacing requirements for Powerwall (see [Appendix A: Powerwall Mounting Details](#)).



Choose Side or Rear Cable Entry for Powerwall

Determine whether cables will be routed into Powerwall from the side or the back of the unit.

- For side cable entry, a conduit fitting or cable gland must be used to seal the entry into the wiring compartment.
- For back cable entry, a rubber grommet or cable gland is used to seal the entry into the wiring compartment.

NOTE: If Powerwall is mounted on a wall with studs spaced 610 mm (24 in) apart, cable entry from the back of Powerwall may be blocked.



Choose Top, Bottom, or Rear Cable Entry for Backup Gateway

Determine whether cables will be routed into the Backup Gateway from the top or bottom of the enclosure. The internal Backplate Assembly can be installed in either orientation to accommodate cable runs.

NOTE: The Backup Gateway does not support cable entry from both the top and bottom of the enclosure. A given backplate orientation supports entry from only one direction.

NOTE: For a Backup Gateway installed outdoors where it may be subjected to weather, top cable entry is not recommended.



Plan the Electrical Service Connection to Backup Gateway

The Backup Gateway is service entrance rated, and can be located between the main switch and the distribution board. A main isolation switch should be installed upstream of the Backup Gateway for testing the system and for service purposes



Plan Distance 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](#) for wire gauge requirements.

	Maximum Cable Length
Backup Gateway to Powerwall(s)*	45 m
Neurio Energy Meter to Backup Gateway (RS485 wired connection)	50 m
Backup Gateway to Internet router (wired Ethernet connection)	100 m

*Total length of communications cable, including daisy-chained connections, through last Powerwall in chain

⚠ 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.

Step 2. Anchor the Powerwall Mounting Bracket

[Return to Quick Guide](#)

NOTE: For detailed instructions on mounting Powerwall, including minimum spacing requirements, refer to [Appendix A](#).

1. Using a drill and level, mount the bracket to the selected wall. See [Powerwall Mounting Details](#) for additional details on the type and number of fasteners to use.

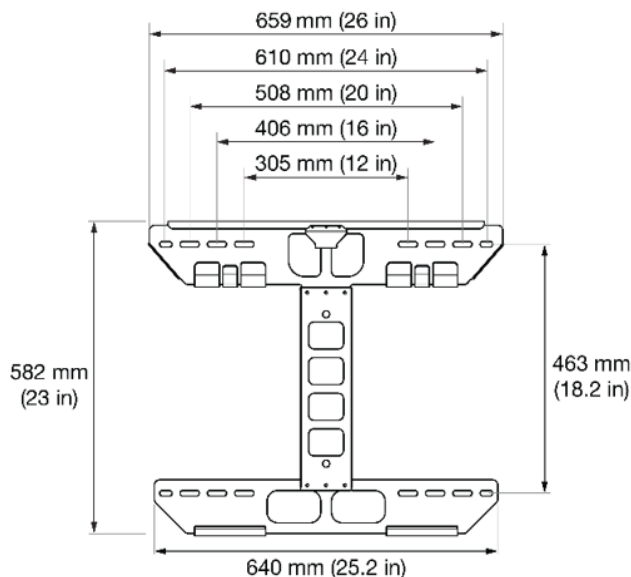


Figure 3: Mounting Bracket Dimensions

2. For back cable entry installations, drill a hole in the wall corresponding to the back cable entry port.

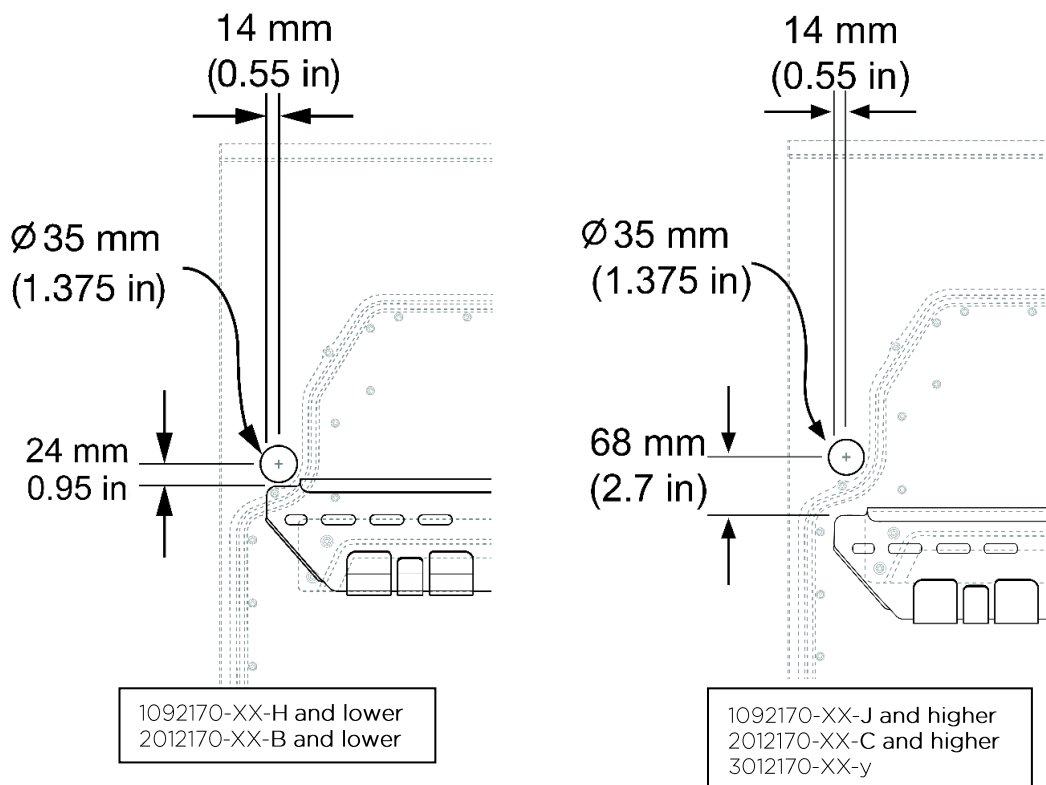


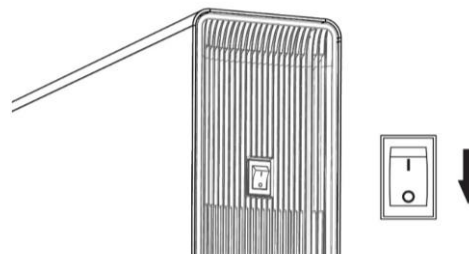
Figure 4: Location of Back Cable Entry Port in Relation to Bracket

Step 3. Mount Powerwall on the Bracket

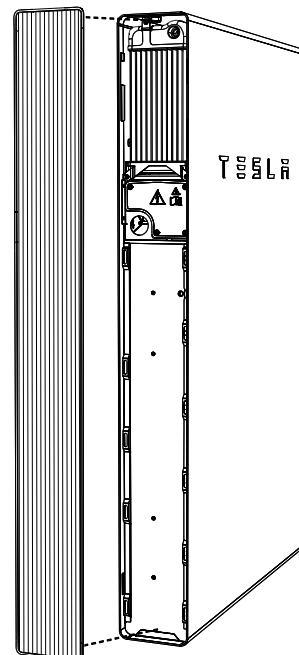
[Return to Quick Guide](#)

1. Switch off Powerwall.

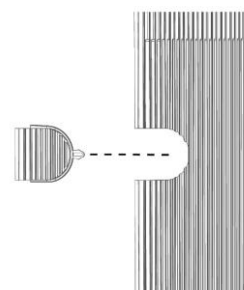
⚠ WARNING: Switching off will ensure Powerwall does not grid form. However, AC voltage may still be present from the grid. Ensure all equipment is safely de-energized before working.



2. Remove the left side cover from Powerwall.

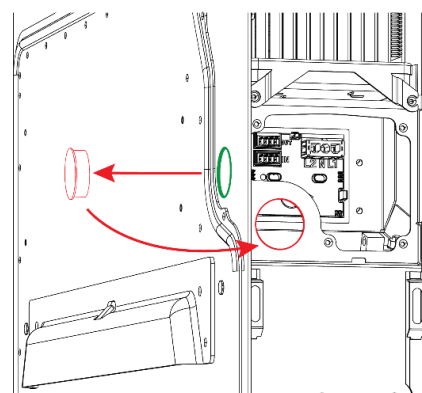


3. For side cable entry installations, remove the side cable entry door from the left side cover.



4. For back cable entry installations, remove the plug from the back cable entry port and place it in the side cable entry port.

Note: The plug must always be placed in either the back or side cable entry port.



5. Using lift equipment, position Powerwall close to the wall and adjust the height of Powerwall until its mounting cleats are just above the flanges on the bracket.
6. Lower Powerwall until the top cleat engages the top flange on the bracket and the bottom cleat aligns with the bottom flange.
7. With both cleats engaged, lower Powerwall onto the bracket. An audible click will be heard when the cleats are seated in the bracket and the locking mechanism at the center of the top flange clicks into place.

NOTE: To remove Powerwall from the mounting bracket, place a thin piece of sheet metal between the Powerwall unit and the bracket to compress the locking mechanism, and lift the Powerwall straight up.

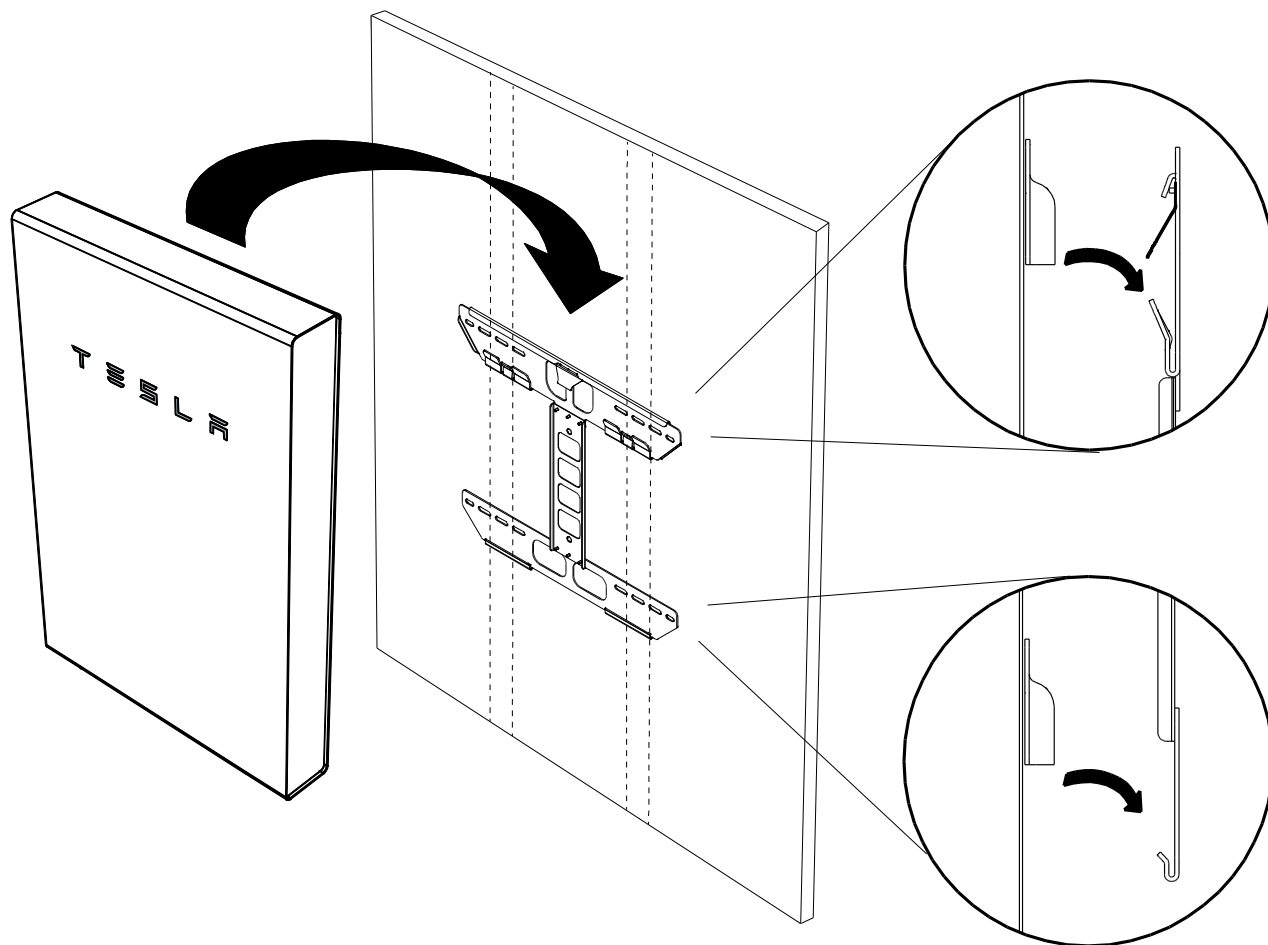


Figure 5: Mounting Powerwall on the Bracket

8. If floor-mounting Powerwall, use shims to ensure that Powerwall is level. The unit should be level within ± 2 degrees side-to-side and within ± 5 degrees front-to-back.
9. If wall-mounting Powerwall, remove the feet from the unit (applicable only to updated versions of Powerwall, see [Figure 2](#)).

Step 4. Mount the Backup Gateway

[Return to Quick Guide](#)

- Using a hole saw, drill out the necessary cable access holes from the Backup Gateway.

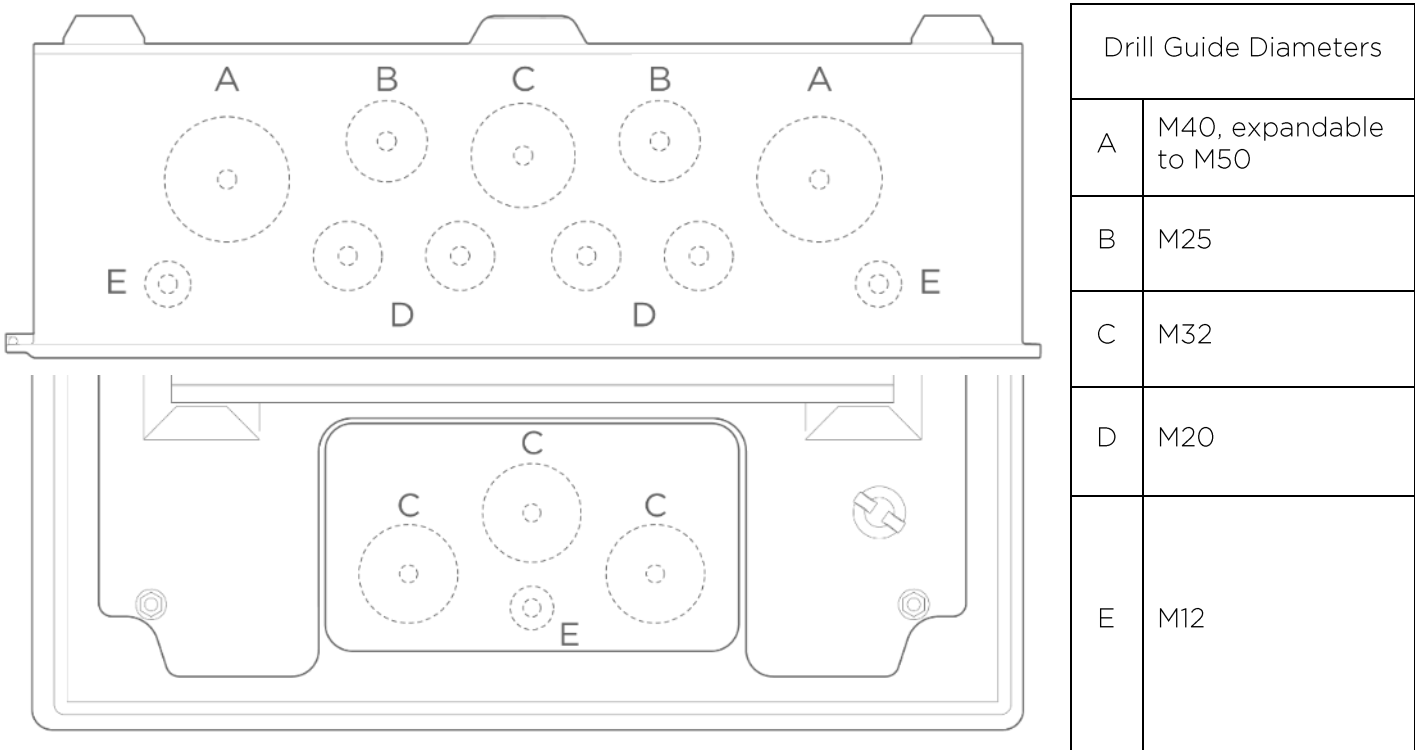
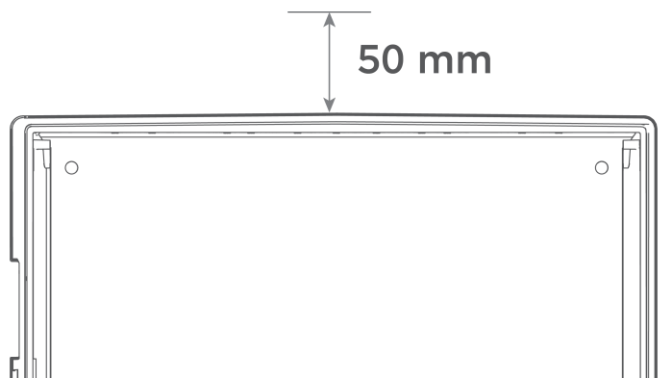


Figure 6: Top / Bottom (above) and Back (below) Cable Access Drill Guides

- 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 install the enclosure upside down or on its side.

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

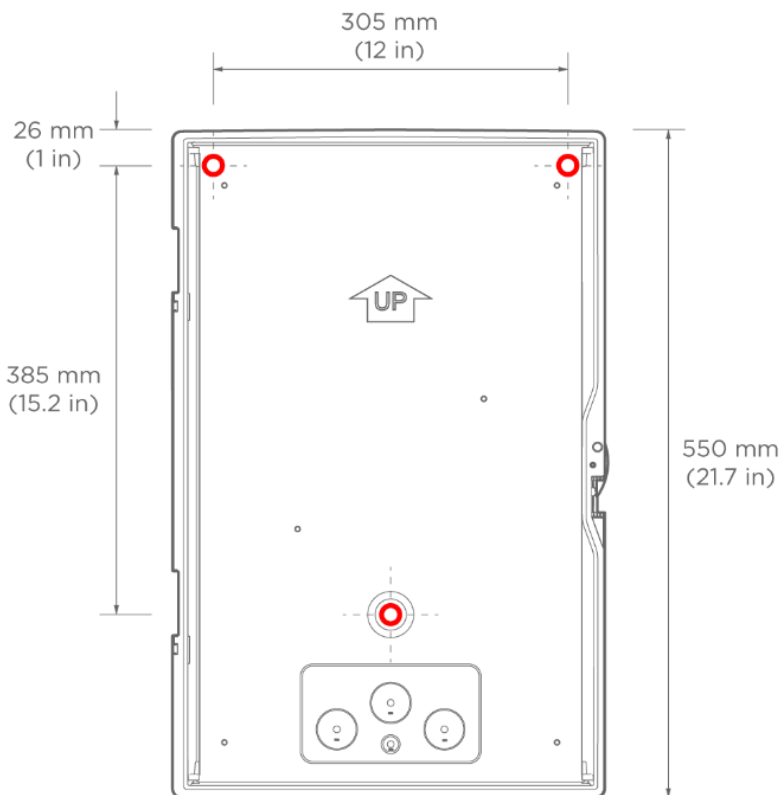


Figure 7: Backup Gateway Enclosure Mounting Holes

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

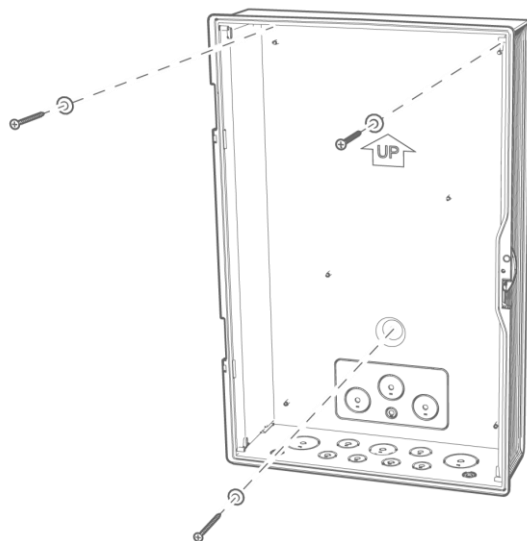


Figure 8: Backup Gateway Mounted with Sealing Washers

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 8mm nuts. Use a torque wrench with 8mm socket to tighten the nuts to 6 Nm.

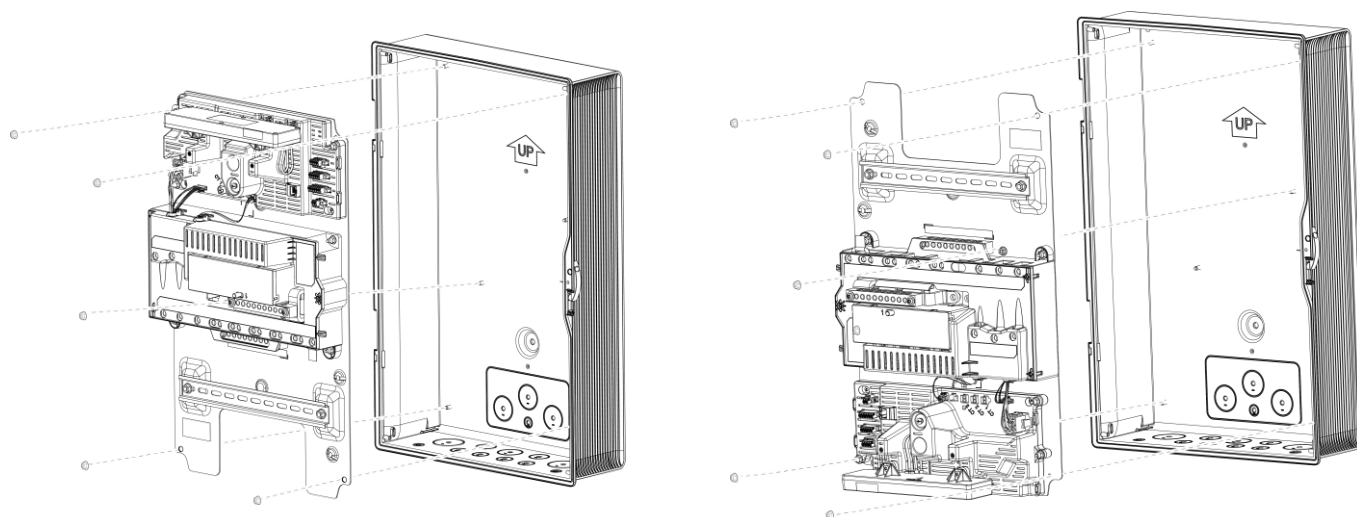


Figure 9: Backplate Orientation for Bottom Cable Entry (left) or Top Cable Entry (right)

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

Step 5. Verify Neutral-Earth Bonding Scheme

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.

The neutral conductors must not be broken Australia and New Zealand on **TN-C-S** networks in off-grid operation. Neutral and Protective Earth (PE) conductors are separated at the main switchboard, and the MEN (Multiple Earthed Neutral) link is maintained at a single point of connection between neutral and protective earth. With the **N-N Jumper Bar** installed, neutral will not be broken during off-grid operation.

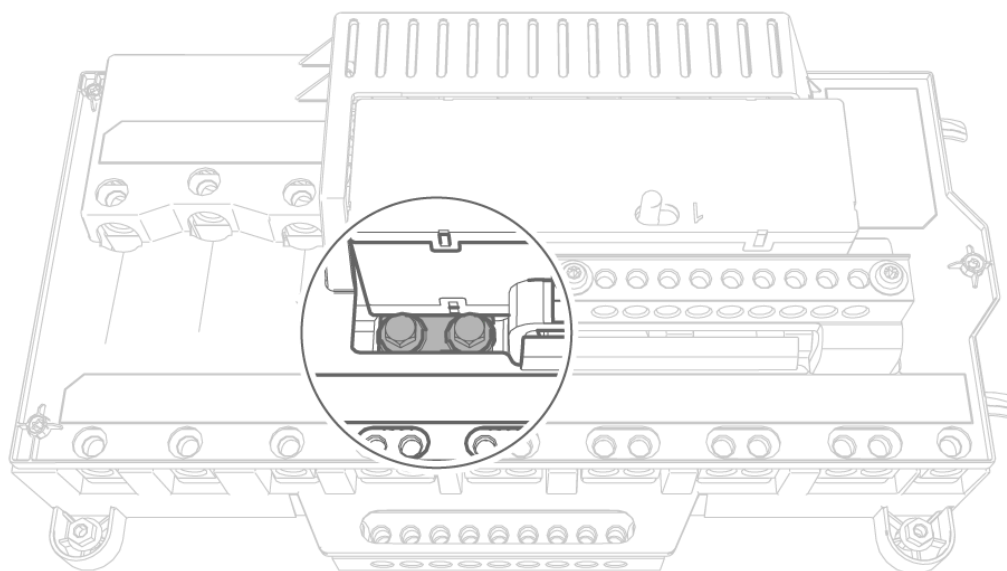


Figure 10: Neutral Conductors are not disconnected in Off-Grid Operation with Factory-Installed N-N Jumper Bar

⚠ 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 [Powerwall 2 AC RCBO and Fault Protection Application Note](#) for additional information on earthing and fault protection.

Step 6: Make AC Power Connections to Supply and Load Panels

[Return to Quick Guide](#)

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. Connect the main service conductors to the Backup Gateway Supply terminals according to [Figure 11](#) and the accompanying table.

2. Connect the home load panel conductors to the Backup Gateway Backup terminals according to [Figure 11](#) and the accompanying table.

3. 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.

4. Connect the non-backup panel conductors to the Backup Gateway Non-Backup terminals according to [Figure 11](#) and the accompanying table. 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.

 **WARNING:** Installing 3-phase equipment on the backup circuit may result in equipment damage.

 **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](#) for all wiring requirements and recommendations, including wire colors and gauges.

Refer to [Appendix C](#) for example system wiring diagrams.

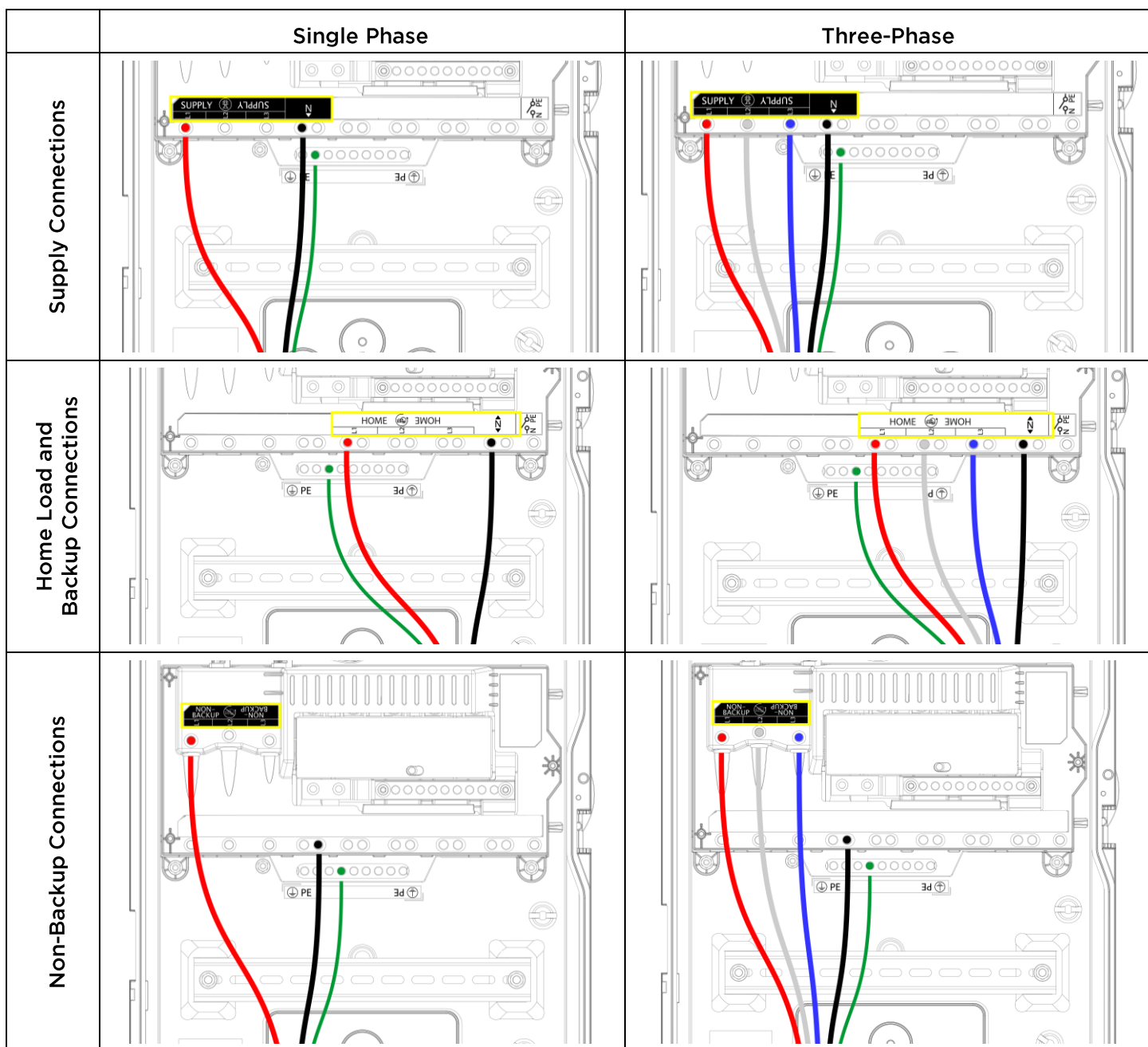


Figure 11: Conductor Connections for Single Phase (left) and Three-Phase (right)

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

Design Considerations

Refer to Appendix F for information on the Backup Gateway load shedding feature, which can be used to interrupt any 60V circuit when operating off-grid.

Step 7. Install Powerwall and Generation Breakers in the Backup Gateway

[Return to Quick Guide](#)

1. Install the Powerwall and generation circuit breakers on the DIN rail, and connect using an appropriately rated DIN rail circuit breaker busbar.
2. Connect the line conductors from the bussed generation circuit breakers to the Backup Gateway's Backup terminals ([Figure 12](#)). These conductors must be appropriately rated to carry the current of the main supply fuse.
3. Connect Neutral and PE conductors from Powerwall and generation circuits to the Neutral and PE wiring bars, respectively.

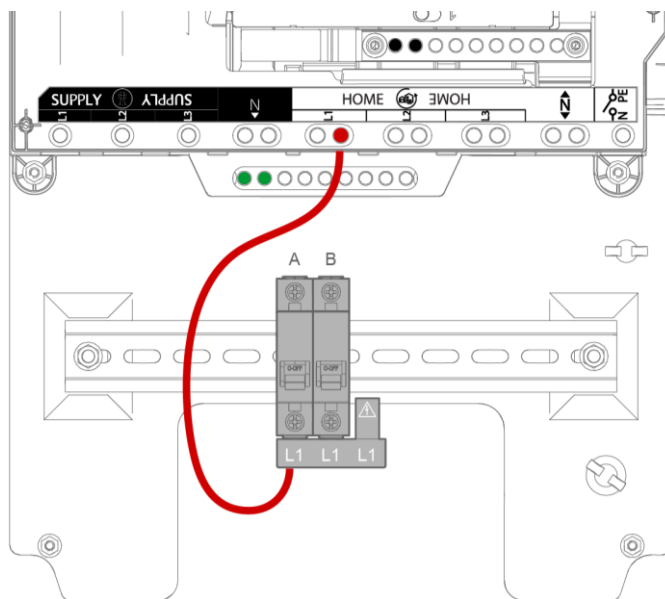


Figure 12: Single Phase Wiring Example

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 32 A circuit breaker. This breaker serves as circuit protection for the Powerwall, and must be wired in accordance with local wiring codes and regulations.

Some regions may require use of an external Residual Current Circuit Breaker with Overcurrent Protection (RCBO) on the solar PV inverter and/or Powerwall circuits. Refer to the [RCBO Application Note](#) for additional guidance on RCBO selection.

Configuring Powerwall(s) on Three-Phase Installations

- When installing multiple Powerwalls, they may be installed in parallel on one phase or 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.

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, AS/NZS 4777. 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 8. Connect Powerwall to the Backup Gateway

[Return to Quick Guide](#)

Note: Refer to [Appendix B](#) for wiring specifications.

Depending on local requirements, Powerwall wiring can be installed through conduit or through a cable gland. Refer to local codes to determine wiring requirements. If necessary, use the included 1 in-to-32 mm or 1 in-to-25 mm reducing washers to adapt the cable gland to the wiring compartment inlet.

1. (Conduit installations only) Run conduit as needed and attach the conduit fitting to the inlet of the wiring compartment. The wiring compartment inlet accepts a standard 1-inch conduit fitting.

2. (Conduit installations only) If the conduit connector does not have an integrated bushing, affix the provided insulation bushing to the conduit opening on the inside of the wiring compartment.

NOTE: Ensure that all conduit joints and outlets have smooth edges so that wiring is not damaged as it is run through the conduit.

3. Run the 4-conductor communication cable, the AC power conductors, and equipment grounding conductor from the Backup Gateway through the conduit or cable gland and pull them into the Powerwall wiring compartment.

4. At the Powerwall, strip the ends of the AC conductors and attach them to the corresponding leads on the AC power harness.

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

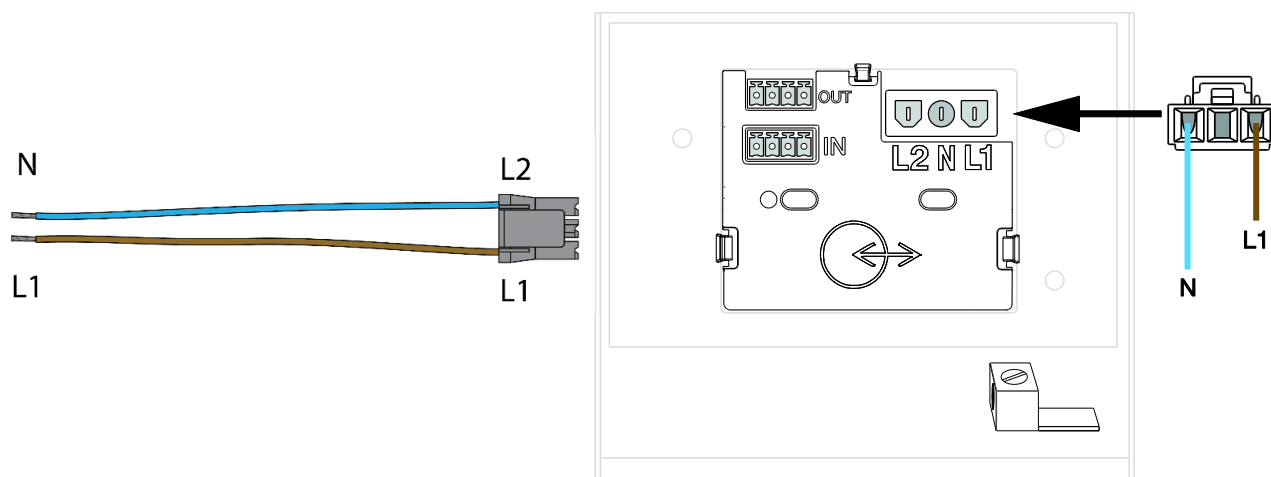


Figure 13: Powerwall 2 AC Power Harness Connection

6. On each end of the 4-conductor communication cable, strip and insert the wires into the provided 4-pin connectors ([Figure 14](#)). On the Powerwall side, use the black connector provided in the accessory bag. On the Backup Gateway side, use the connector that came plugged into the corresponding connector socket in the Backup Gateway.

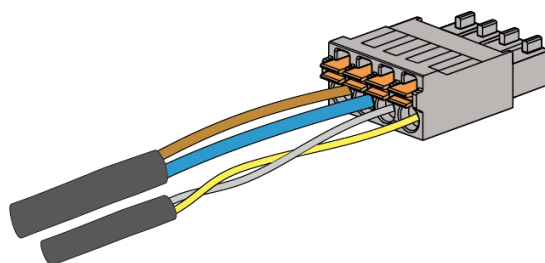


Figure 14: Communication Connector Wiring

7. On the Backup Gateway side of the 4-conductor communication cable, cut back the drain wire. **The drain wire should be terminated at the Powerwall chassis Earth terminal only.**
8. On the Backup Gateway side, plug the 4-pin connector into the 4-pin socket labelled “Powerwall”. Tighten screws on the connector (see [Backup Gateway 2 Communication](#) in [Appendix B](#)).
9. On the Powerwall side, plug the 4-pin connector into the bottom 4-pin socket (labeled “IN”) in the Powerwall wiring compartment.
10. Plug the provided 4-pin connector with the terminating 120-Ohm resistor into the top 4-pin socket (labeled “OUT”) in the Powerwall wiring compartment. (In multi-Powerwall installations, use this connector only in the last Powerwall in the chain.)
11. On the Powerwall side, strip the end of the equipment grounding conductor and wrap the communication cable drain wire around the grounding conductor lead.
12. Insert the grounding conductor and drain wire in the Powerwall chassis Earth terminal. The Earth terminal is identified with the following symbol: . Tighten the screw in the Earth terminal to 4.5 Nm.

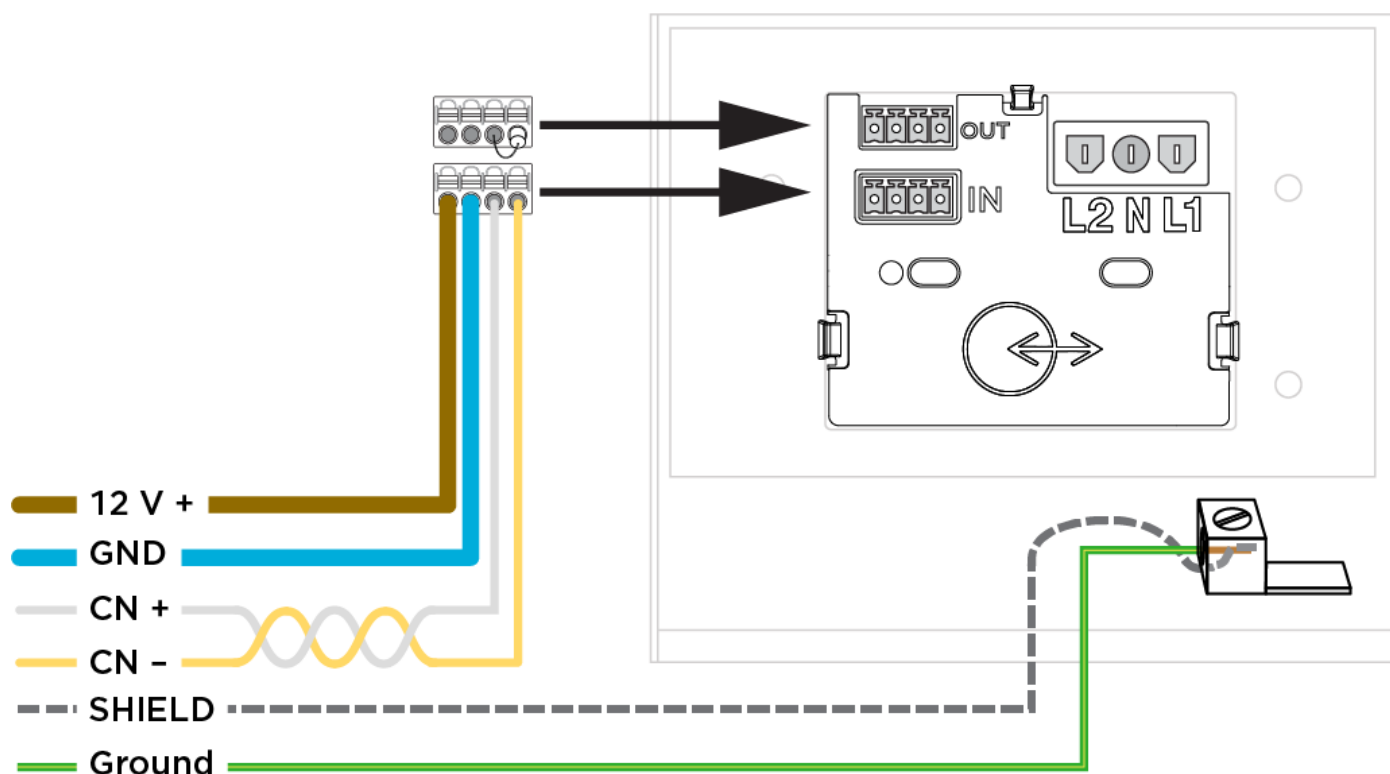


Figure 15: Powerwall Earth/Ground and Communication Connections with Terminating Resistor

Step 9. Install Energy Metering for the System

[Return to Quick Guide](#)

Visibility on power and energy data is needed for the Powerwall 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. Multiple physical Site meters can be installed together where needed, but their sum should capture all of the power flows from load, solar, and Powerwall(s).
- **Metering all 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.

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

- **Internal Site Meter** – This Site meter may be used when the Grid connection is at the *Supply* terminals. No additional steps are needed during install. If there are any loads or solar upstream of the *Supply* terminals, an External Energy Meter must be used to meter the Grid connection point.
- **Internal Auxiliary Meter** – Metering solar circuits inside the Gateway or in adjacent switchboards is simple with the three (3) internal CT connections for use with Tesla 100-amp-rated split-core solar CTs (one included in the Accessory Kit). Additional 100 Amp Tesla CTs (1112477-00-x) may be ordered individually.

The Tesla 100A split-core CTs may be extended a max distance of 100 m by splicing twisted pair or using 3 m CT extension harnesses (1125547-03-x). Use 0.5mm² (20 AWG) conductors or larger to extend CTs up to 100 m. Voltage rating of the extension wire must be equal to or greater than all other adjacent circuits.

NOTE: Neurio meter CTs **cannot** be extended beyond 15 m without significant accuracy loss.

Depending on site layout it may not be possible to use internal Gateway 2 meters, and external Energy Meters is required.

- See [Appendix D](#) for further guidance on metering.
- See the section titled “System Operation on Three-Phase Systems” in [Appendix H](#) for detailed information on the requirements for three-phase metering.
- See [Appendix E](#) for external Energy Meter installation instructions.

TIPS

- See [Appendix D: Configuring Energy Metering](#) for additional diagrams on configuring energy metering
- When metering 3-phase solar inverters, install CTs on the L1, L2, and L3 outputs of the solar inverter AC circuit.
- Ensure CTs are facing the proper direction as indicated on the label. A CT will show negative current if installed backwards.
- When upgrading a Gateway 1 system, the existing Energy Meter(s) may be left in place and re-paired with the new Gateway. The Neurio Meter must be power cycled within one minute prior to re-pairing. If metering Site power with the Neurio Meter, ensure the Backup Gateway 2 internal site meter is de-selected in Commissioning.
- See [Appendix G](#) for CT configuration troubleshooting tips
- The Powerwall installer has the option to set a Site Charge Limit. When used, the Powerwall will dynamically curtail to meet this site-specific programmed threshold. See [Appendix F](#) for more information.

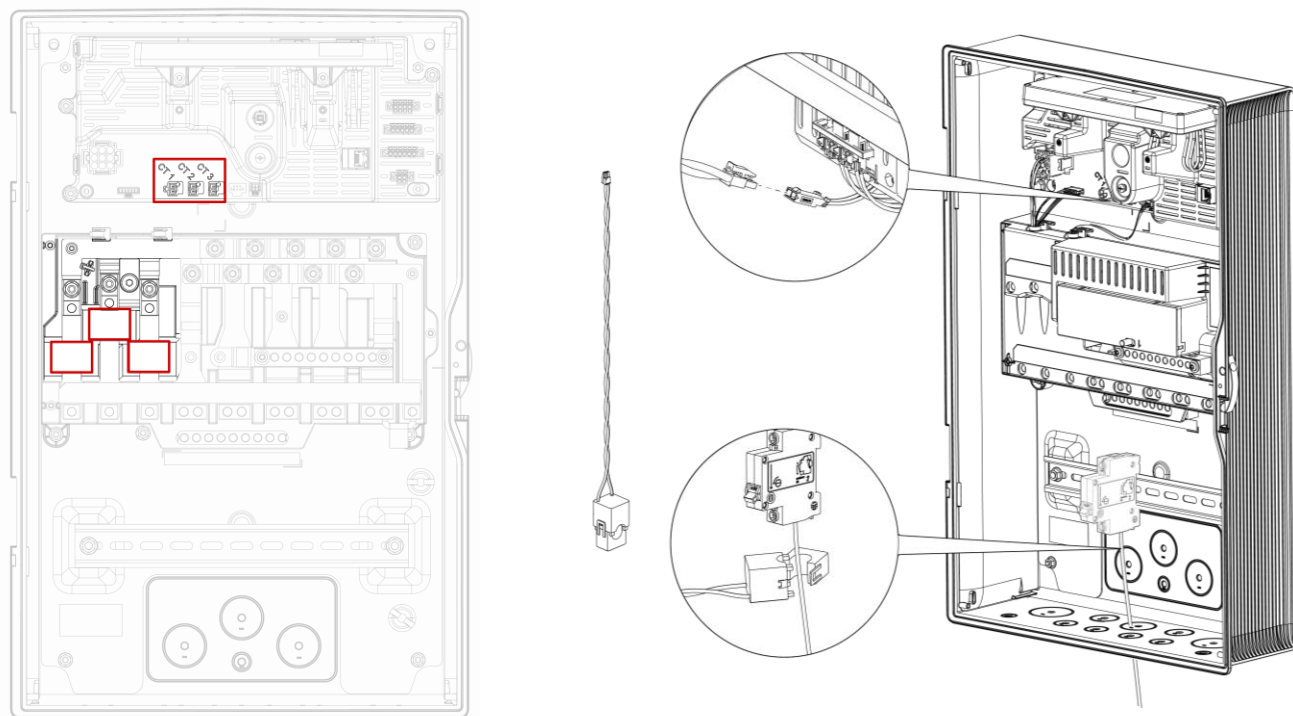


Figure 16: Embedded Site CTs and Solar CT Connectors

⚠ WARNING: Disconnecting CTs under load can cause equipment damage or electric shock. Do not connect/disconnect unterminated CTs from live cables.

Step 10. Plan Internet Connection for Backup Gateway 2

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

For best performance, ensure Ethernet and Wi-Fi connections are both configured during commissioning. The Gateway will automatically select the network option with best connection.

Cellular is available only as a backup connection when Wi-Fi and Ethernet connections are lost. Cellular should not be relied on as the default connection method.

Install Ethernet Connection

- Ethernet cable must be CAT5 (24 AWG) 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.
- An M25 cable gland for communications cables is provided in the Accessory Kit.
- See ([Appendix B](#)) for the position of the Ethernet port

Step 11. Close the Wiring Compartments and Turn the System On

[Return to Quick Guide](#)

1. **Before closing any installed hardware**, take photos of the completed wiring in the Powerwall, Backup Gateway, and main distribution board.
2. Ensure that all conduit or cable gland junctions and cable entry points are secure and properly sealed.
3. Arrange the communication and AC power wires neatly inside the Powerwall wiring compartment.
4. Replace the cover on the Powerwall wiring compartment. Ensure that the cover seats properly on the gasket so that the compartment is sealed. Using a Torx T20 bit, tighten the fasteners to 1.5 Nm.
5. Replace the left side cover on Powerwall by pushing the top into place and working toward the bottom to reattach it to the clips along the length of the unit.
6. Install the Backup Gateway dead front panel and secure it firmly with the original screw. Mount the Backup Gateway door, and latch it shut.

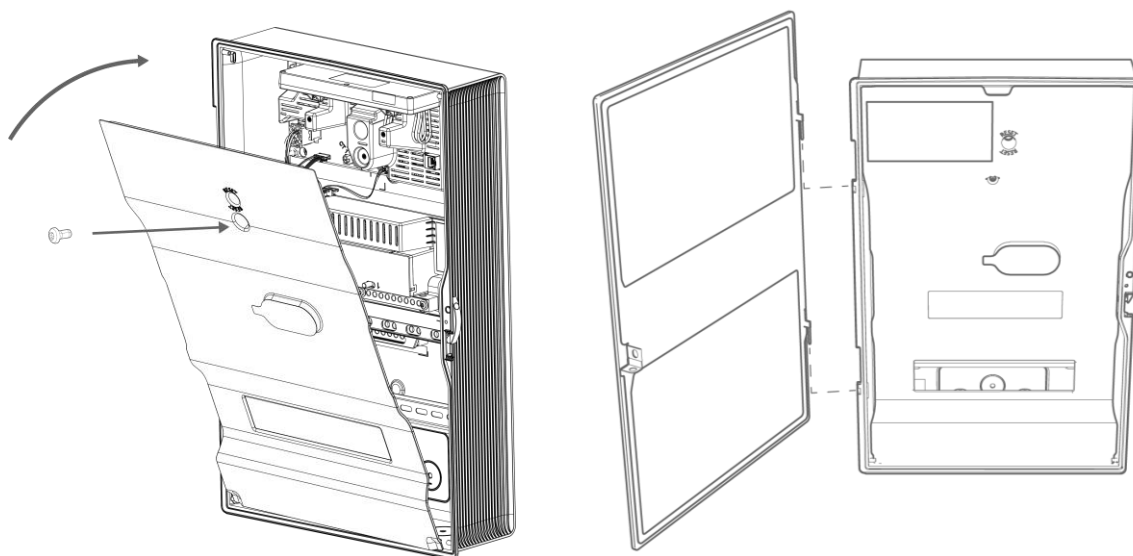


Figure 17: Install the Dead Front Cover and Glass Door

7. Use the provided breaker label sheet to clearly label the circuit breakers.

NOTE: The provided snap-in breaker pole-fillers must be installed to ensure touch safety.

NOTE: Complete any additional labelling requirements per AS3000 and AS4777.

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

8. Switch on the AC circuit breakers for the Backup Gateway and Powerwall.

⚠ WARNING: Upon powering on the Backup Gateway and Powerwall system, allow it to boot up undisturbed for at least one minute. Do not power cycle or reset the Backup Gateway during this time, as the boot sequence must be completed for the software to operate properly.

9. Switch on Powerwall by moving the switch on the right side of the unit to the ON position. When Powerwall establishes communication with the Backup Gateway, the LED on the right side of Powerwall illuminates.

⚠ CAUTION: Always leave site with Powerwall breaker closed for battery to maintain a base level of charge. Leaving the Powerwall disconnected from AC for extended periods increases risk of damage.

Step 12. Commission the System

[Return to Quick Guide](#)

1. Find the Wi-Fi password on the label on the Backup Gateway dead front ([Figure 18](#)).

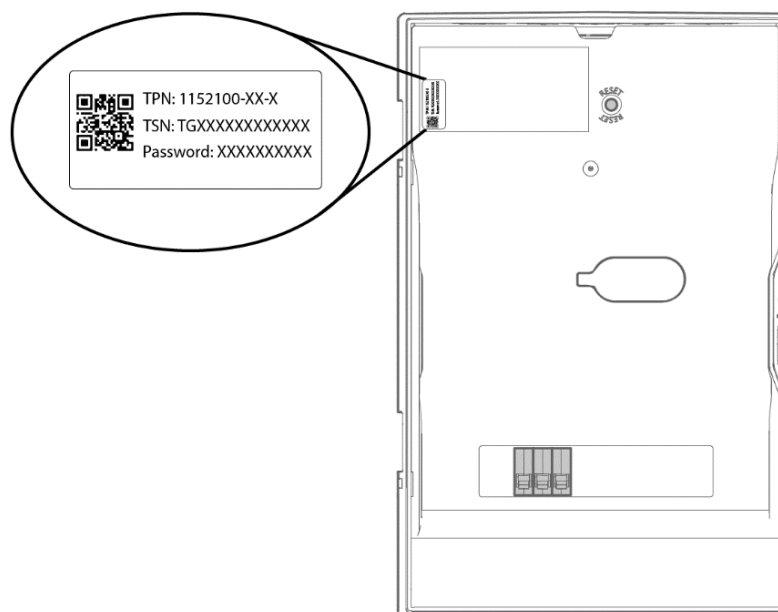
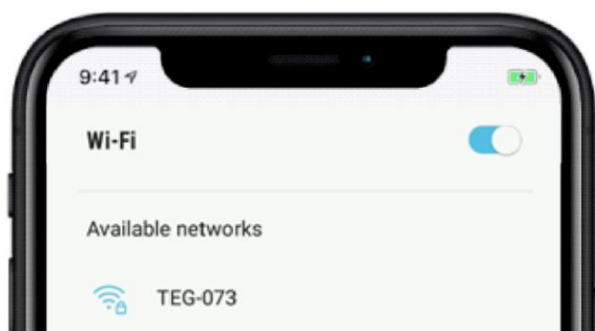


Figure 18: Serial Number and Password Label

2. Using a computer, smartphone, or tablet, establish communication with the Backup Gateway via Wi-Fi or Ethernet:

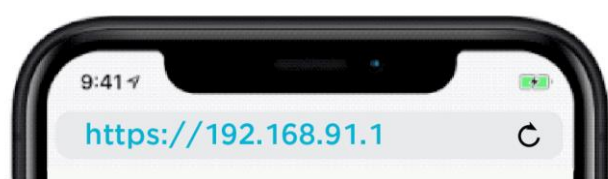
Wi-Fi

Connect to “**TEG-xxx**” network where xxx are the last 3 digits in the Backup Gateway serial number



Enter the Wi-Fi password ([Figure 18](#))

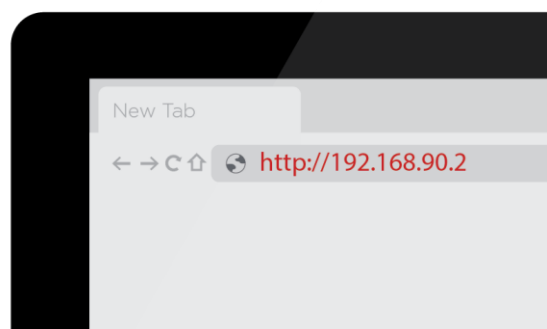
Navigate to IP address <https://192.168.91.1>



Ethernet

Connect a computer to the Ethernet port of the Backup Gateway with a standard CAT5 Ethernet cable

Launch a browser and enter the following IP address: <https://192.168.90.2>



NOTE: If the Backup Gateway Wi-Fi network doesn't appear or the connection to the Backup Gateway fails, power cycle the Backup Gateway using the Reset button, wait 2 minutes, and try connecting again.

3. Once communication is established, the browser may show a Security Warning page. This is normal. To enter the Commissioning Wizard, click **Advanced** and then **Proceed**. The browser should then show the login page to the Commissioning Wizard.

4. Log into the Commissioning Wizard:

- Username: Enter the e-mail address of the installer who is carrying out the work
- Password: Enter the Wi-Fi Password ([Figure 18](#))
- Click **Continue**

NOTE: For systems with firmware version 1.48+, the password will only be required the first time the installer logs in to commission the system. Once the system has been commissioned, the Commissioning Wizard will prompt the installer to log in by toggling the On/Off switch on one connected Powerwall. If the Powerwall(s) are unable to communicate with the gateway, the password will be available as an alternative login.

5. Connect the Backup Gateway to the Internet by the following means:

NOTE: Either an Ethernet or a Wi-Fi connection must be connected. For best reliability, ensure Wi-Fi and Ethernet options are **both** configured.

Wi-Fi (2.4 or 5 GHz)

- In the Commissioning Wizard, click the arrow for **Wi-Fi**
- Scan and locate the home Wi-Fi network name (SSID)
- Enter the homeowner's network password
- Click the blue arrow

Ethernet

- In the Commissioning Wizard, click the arrow for **Ethernet**
- Choose **DHCP** (most common) or **Static** (only if necessary and you know the Network settings)
- Click **Connect**

NOTE: Cellular connection must only be relied on as fallback connection if Wi-Fi and/or Ethernet is lost.

6. Click **Check Connection** to verify that the Internet connection is working. Click **Continue**.

NOTE: See [Appendix G](#) for troubleshooting steps on accessing the Commissioning Wizard.

7. Click **Check for Update** to apply any firmware updates to the Backup Gateway and Powerwall. After the update is staged, click **Update**. After the update is complete, re-establish connection to the Backup Gateway and the Internet, starting with procedure #1 above.

 **WARNING:** Software updates may take several minutes, especially for installations with multiple Powerwalls. Never power down during an update, as it may result in damage to the system.

8. Follow the Commissioning Wizard steps to complete the commissioning process.

Step 13. Finish and Demonstrate the Installation

1. After installation is complete, remove the protective film from Powerwall.
2. Remove the plastic straps from the left and right side covers by cutting them and carefully pulling them through the slots in the covers.
3. If necessary, ask the homeowner to download and install the Tesla mobile app and connect to the system.
4. Demonstrate the capabilities of the Tesla mobile app, such as how to change the operation mode.
5. Simulate an outage by opening the main breaker and show that Powerwall is powering backup loads.
6. Leave the *Powerwall Owner's Manual* with the owner of the newly installed system, with all system serial numbers recorded in the back inside cover.
7. Archive the photos from the installation.

Troubleshooting

See [Appendix G](#) for common installation troubleshooting steps.

Technical Support

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

<https://partners.tesla.com>

If further support is needed, contact the Tesla Service team at the support phone number for your region. Support numbers for all regions are found at:

<https://www.tesla.com/support/powerwall>

This information is useful to have ready when contacting Tesla:

- Owner name
- Best point of contact for Tesla to return contact (name, phone number, email)
- Powerwall part number and serial number
- Backup Gateway part number and serial number
- Brief description of the issue

Maintenance

Powerwall 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.

To clean Powerwall, 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, or expose Powerwall to flammable or harsh chemicals or vapors.

Appendix A. Powerwall Mounting Details

Powerwall Space Requirements

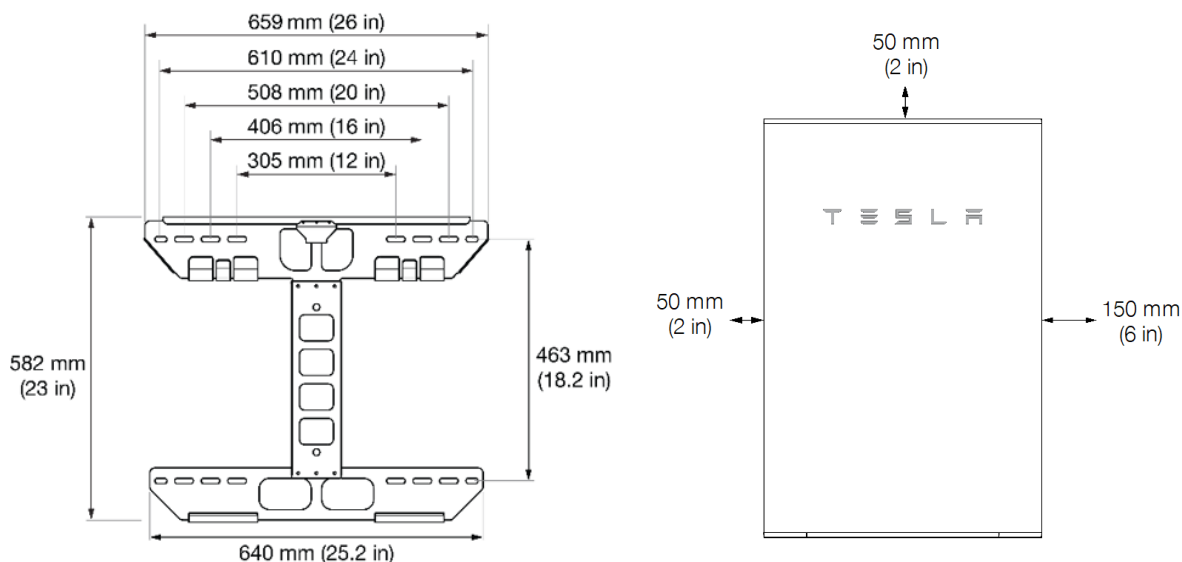


Figure 19: Powerwall 2 Mounting Bracket Dimensions and Space Requirements

Minimum lateral wall space	960 mm
Minimum clearance from left side (air intake)	50 mm
Minimum clearance from right side (air exhaust)	150 mm
Minimum clearance above single Powerwall	50 mm
Minimum clearance above side-by-side Powerwalls	300 mm
Minimum clearance between side-by-side Powerwalls	250 mm
Maximum height above ground	1.5 m to bottom of unit
Maximum slope	+/- 2° side-to-side +/- 5° front-to-back

NOTE: Powerwall has a pump and fan that produce 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 these noise levels when choosing where to install Powerwall.

Mounting Bracket Anchoring Details

NOTE: The details below are minimum guidelines and are not guaranteed to be applicable. Refer to local building codes to ensure the use of appropriate fasteners. Refer to *Powerwall 2 Anchorage Details* for complete mounting information.

Wood Studs (spaced from 300 mm to 600 mm)

If anchoring directly into wood studs, use at least **four (one in each corner)** 10 mm wood screws with washers, of sufficient length for at least 64 mm embedment into the studs.

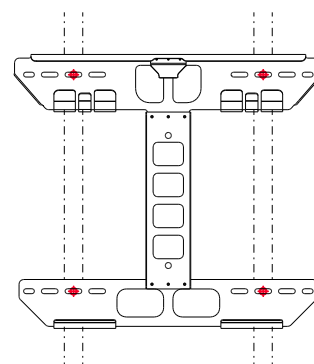
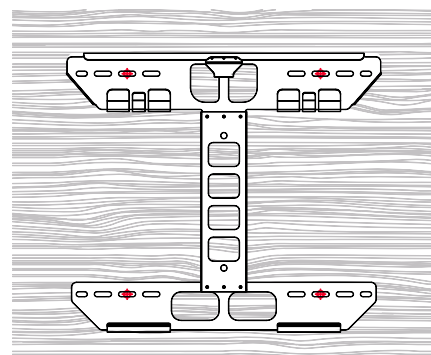
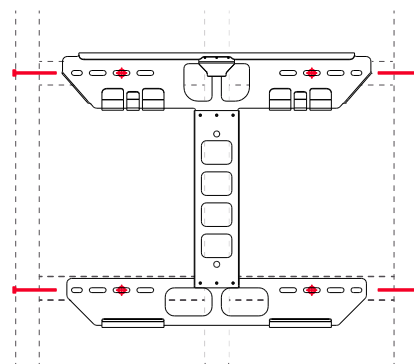
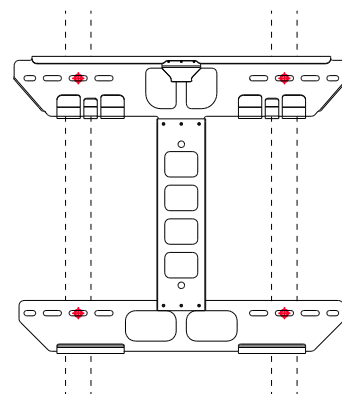
If anchoring to blocking between wood studs, use minimum 50 mm x 100 mm blocks, end-nailed into studs with two 16d (100 mm) nails or toe-nailed into studs with four 8d (75 mm) nails. Use at least **four (one in each corner)** 10 mm wood screws with washers, of sufficient length for at least 64 mm embedment into the blocking.

Plywood

If anchoring to plywood wall material, the plywood must be minimum 38 mm thick. Use at least **four (one in each corner)** 10 mm wood screws with washers, of sufficient length to penetrate at least 7 mm beyond the backside of the plywood.

Metal Studs (spaced from 300 mm to 600 mm)

If anchoring directly to metal studs, studs must be minimum 1.2 mm thick. Use at least **four (one in each corner)** 10 mm sheet metal screws with washers, of sufficient length to penetrate at least 3 threads beyond the stud.



If anchoring to backing between metal studs, studs must be minimum 0.5 mm thick, and backing must be minimum 0.7 mm thick. Use at least **eight (two in each corner)** 10 mm sheet metal screws with washers, of sufficient length to penetrate at least 3 threads beyond the backing.

If anchoring to backing between metal studs in an outdoor high wind area, studs must be minimum 0.5 mm thick, and backing must be minimum 0.7 mm thick. Use at least **twelve (three in each corner)** 10 mm hexhead sheet metal screws with washers, of sufficient length to penetrate at least 3 threads beyond the backing.

Concrete or Masonry

Minimum strength must be 18 MPa (concrete), 12 MPa (clay brick), or 11 MPa (masonry).

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

NOTE: Avoid weak compositions and always inspect the surface prior to mounting.

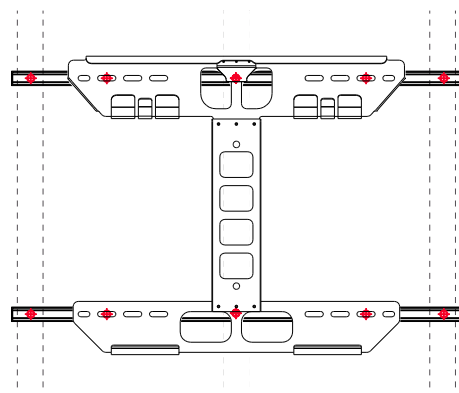
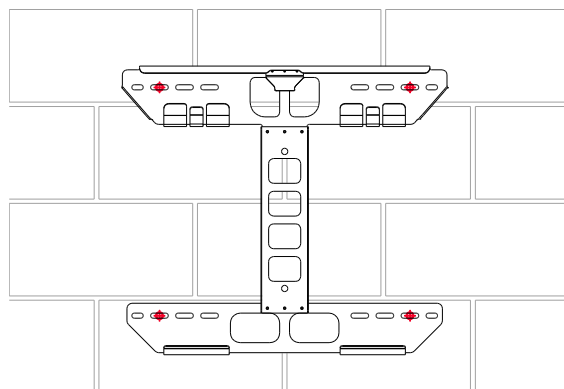
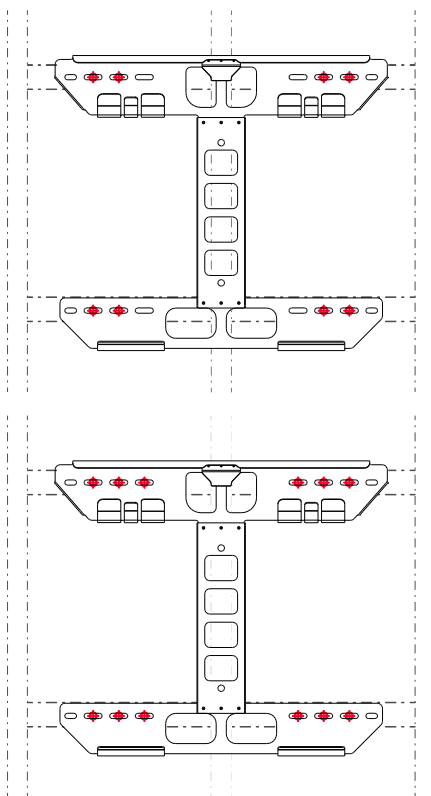
Channel Strut (Unistrut)

Struts must be minimum 42 mm x 42 mm x 2.5 mm thick.

If mounting on wood studs, attach the strut to at least three studs, using at least one 10 mm wood screw with washer per stud, of sufficient length for at least 64 mm embedment into the studs.

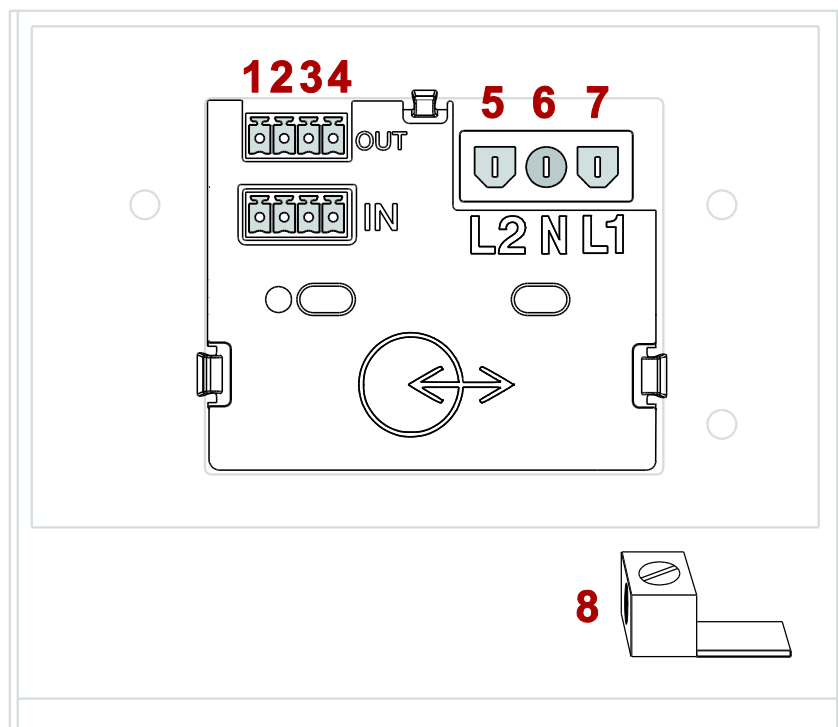
If mounting on metal studs, attach the strut to at least three studs, using at least two 10 mm sheet metal screws with washers per stud, of sufficient length to penetrate at least 3 threads beyond the studs.

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



Appendix B. Wiring Reference

Powerwall Wiring



Powerwall Wiring			
	Powerwall Terminal	Recommended Wire Color	Wire Gauge
	Communication		
1	12V + (Logic +)	Brown	1.0 mm² (max 35 m)
2	GND (Earth)	Blue	1.5 mm² (max 45 m)
3	CN + (CAN HI)	White	0.2-1.5 mm²
4	CN - (CAN LO)	Yellow	
	Power*		
5	L2 (Line 2) - to Neutral	Blue	4-10 mm²
6	N (Neutral) [Unused]		
7	L1 (Line 1)	Brown	4-10 mm²
8	Chassis Earth Terminal	Green/Yellow	2.5-10 mm²

* Depending on local code for installation methods and cable sizing calculations.

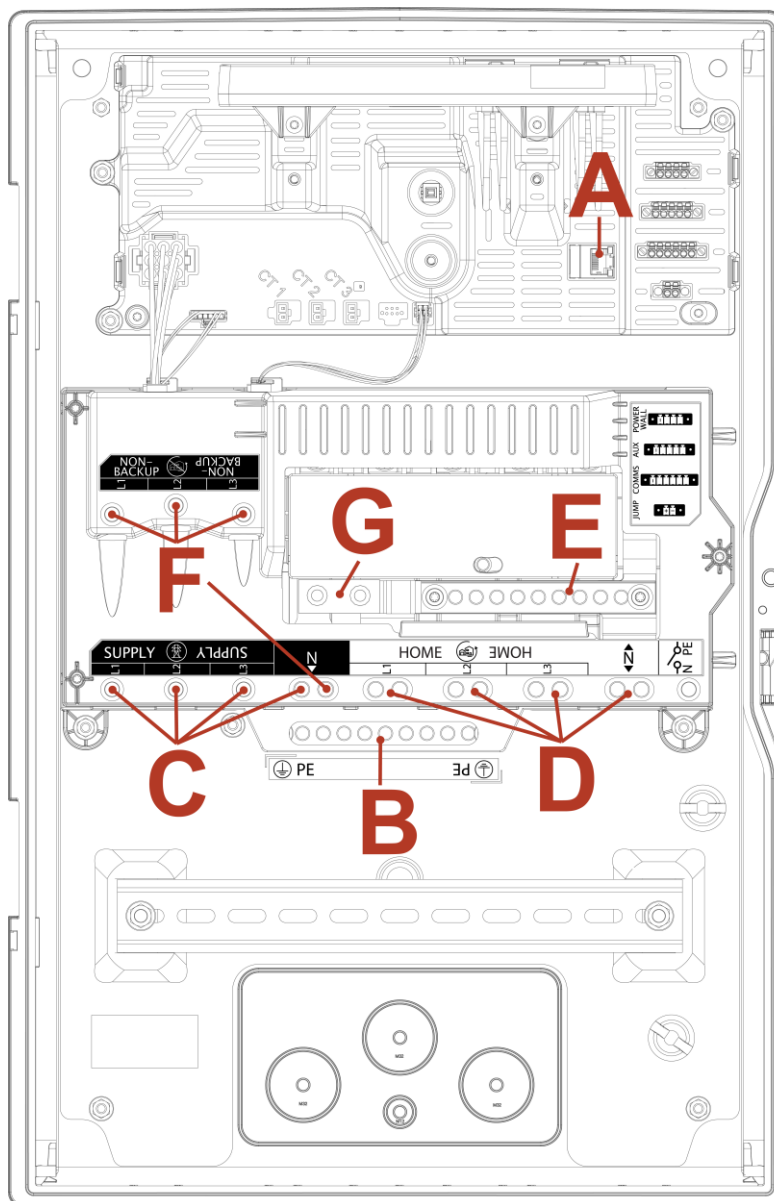
NOTE: Refer to local codes and standards for correct wiring practices and wire colors.

(2) Wago lever nuts are provided for use with up to 6 mm² cable. If 10 mm² cables are required per wiring methods, other appropriate connectors may be used, or a junction box near the Powerwall can be used to convert from 10 to 6 mm² cables. **Follow all code wiring requirements.**

NOTE: Suitable wire ferrules may be used with Wago connectors, but are not required.

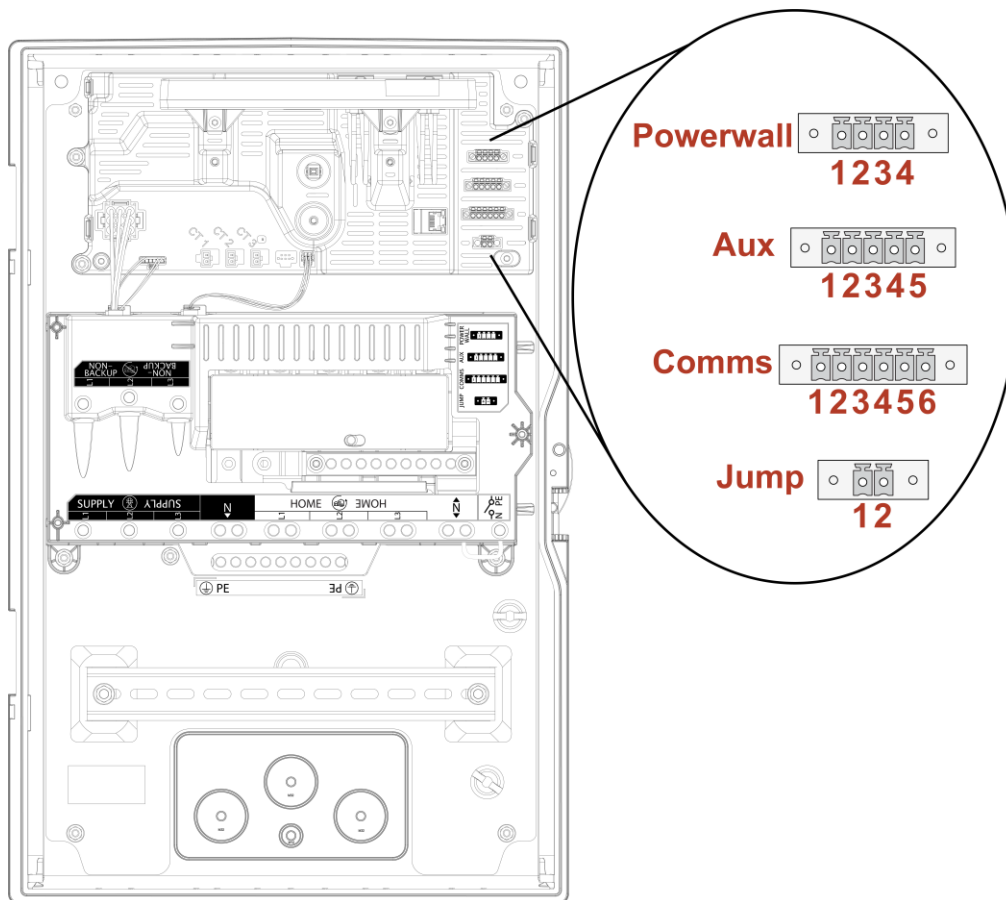
⚠ CAUTION: For single-phase service, Neutral is **not** connected to the Powerwall N terminal. It is instead connected to the Powerwall L2 terminal.

Backup Gateway 2 Wiring



Backup Gateway 2 Wiring			
	Terminal Name	Recommended Wire Color	Wire Gauge
A	Ethernet	-	24 AWG CAT5 or better
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 Generation (L1, L2, L3, N)	Brown, Black, Grey, Blue	2.5-35 mm ²
G	Neutral-Neutral jumper	-	16 mm ²

Backup Gateway 2 Communication



	Backup Gateway 2 Communication Wiring		
	Terminal Name	Recommended Wire Color	Wire Gauge
	Powerwall Communication		
1	12V + (Logic +)	Brown	1.0 mm ² (max 35 m) 1.5 mm ² (max 45 m)
2	GND (Earth)	Blue	
3	CN + (CAN HI)	White	0.2-1.5 mm ²
4	CN - (CAN LO)	Yellow	
	Aux		
1	Site Shutdown (IN)		0.2-1.5 mm ²
2	Site Shutdown (OUT)		0.2-1.5 mm ²
3	Generator / Load Control (+)	Red	0.8-1.5 mm ²
4	Generator / Load Control (-)	Black	0.8-1.5 mm ²
5	(reserved for future use)		0.2-1.5 mm ²
	Communication (External Meter)		
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
	Jump Start		
1	12V	Red	0.2-1.5 mm ²
2	GND	Black	0.2-1.5 mm ²

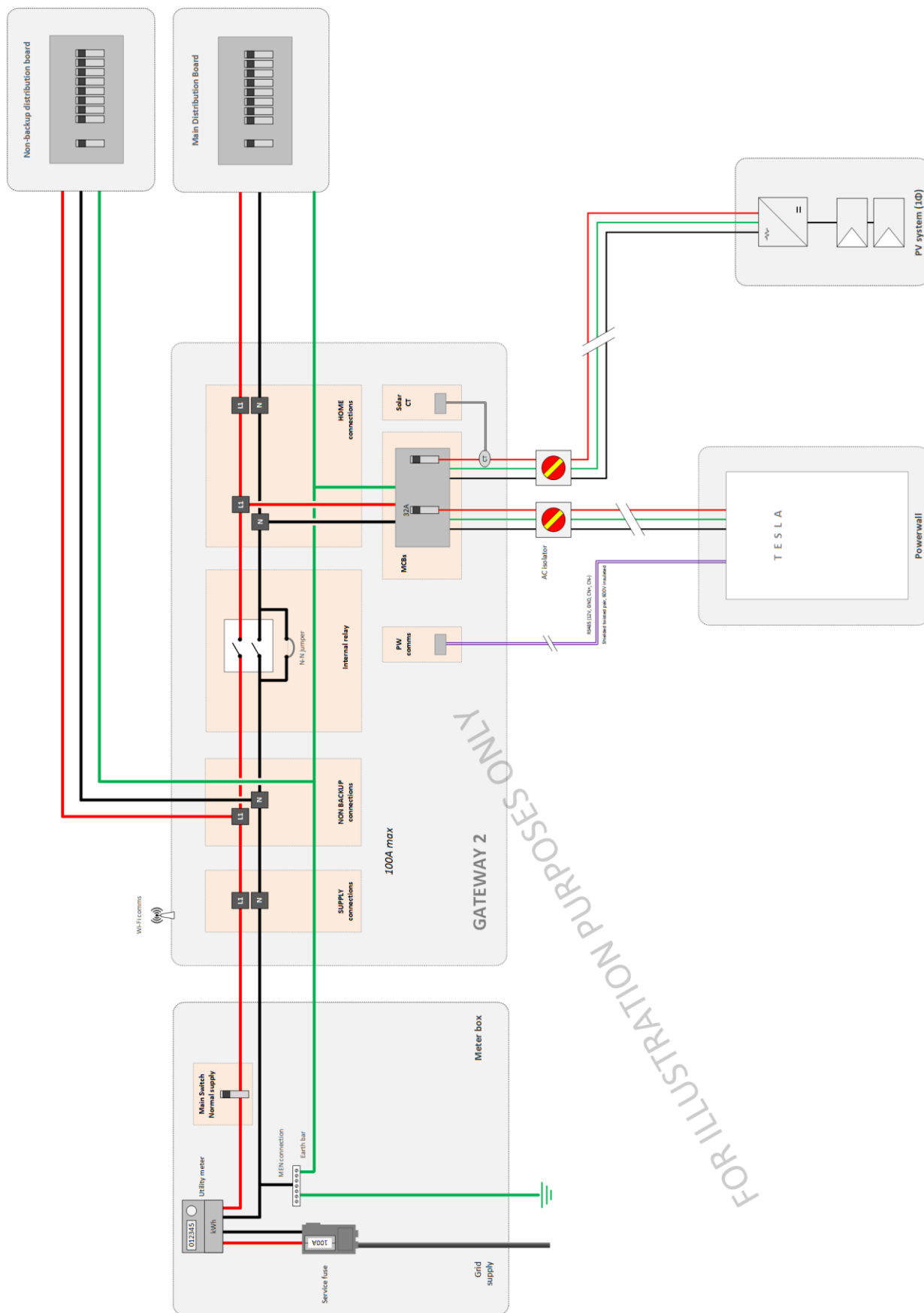
Appendix C. System Diagrams

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

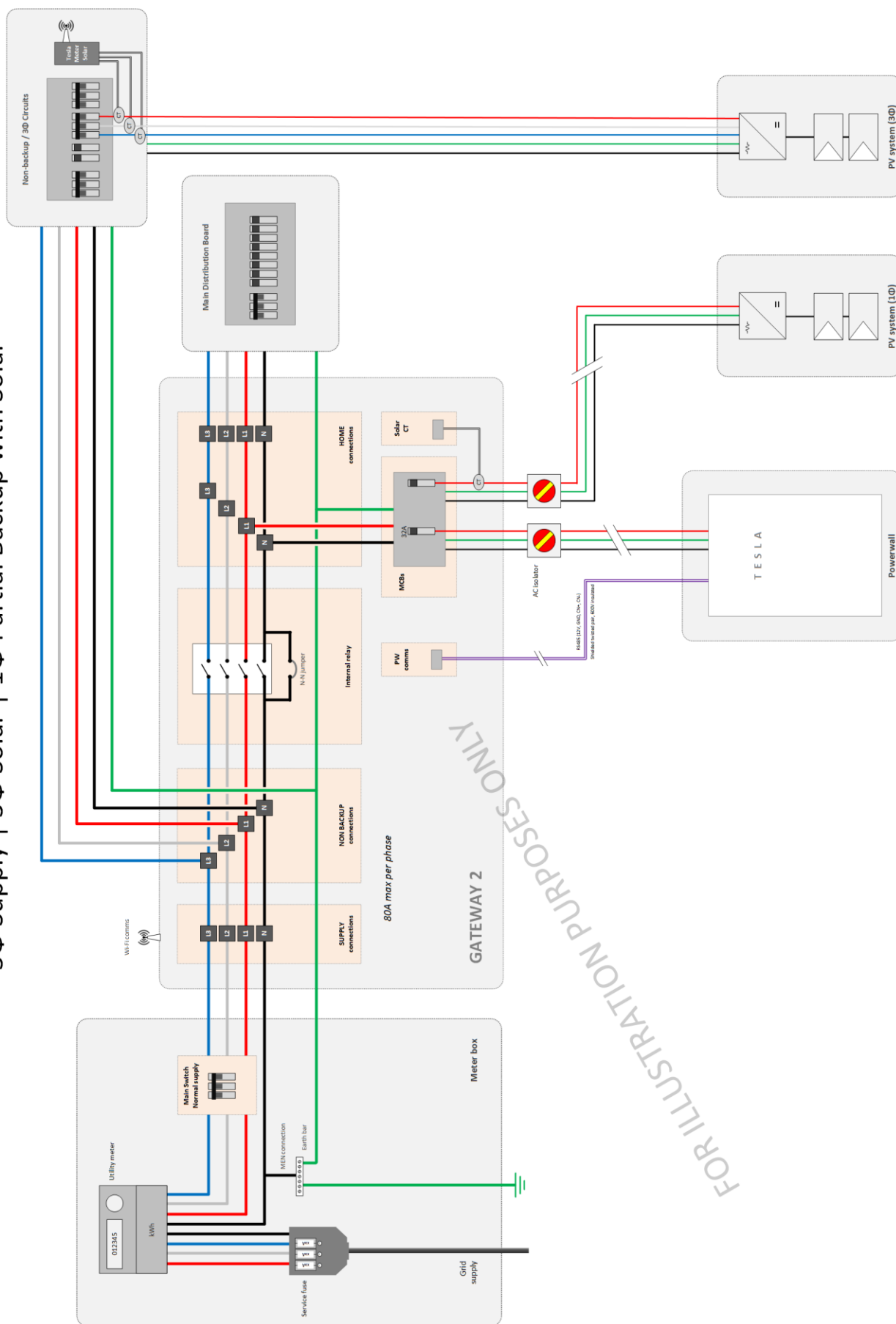
Single-Phase Service

1Φ Supply | 1Φ Solar | Partial Backup



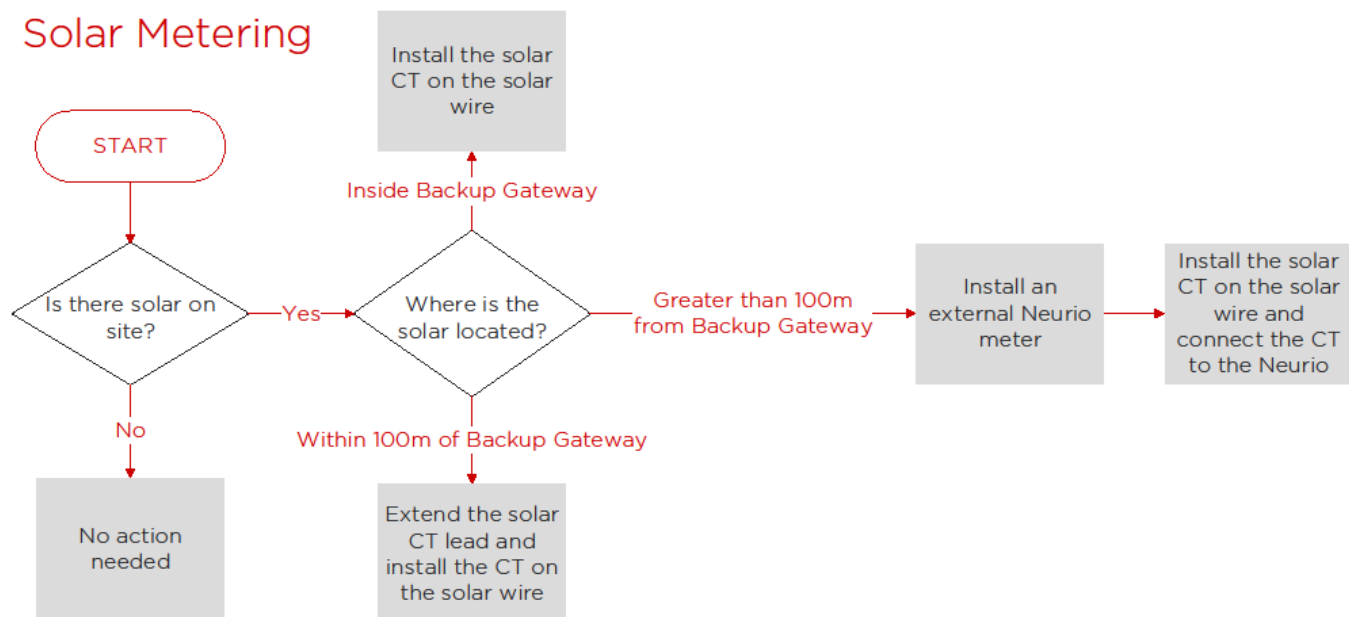
Three Phase Service

3Φ Supply | 3Φ Solar | 1Φ Partial Backup with Solar

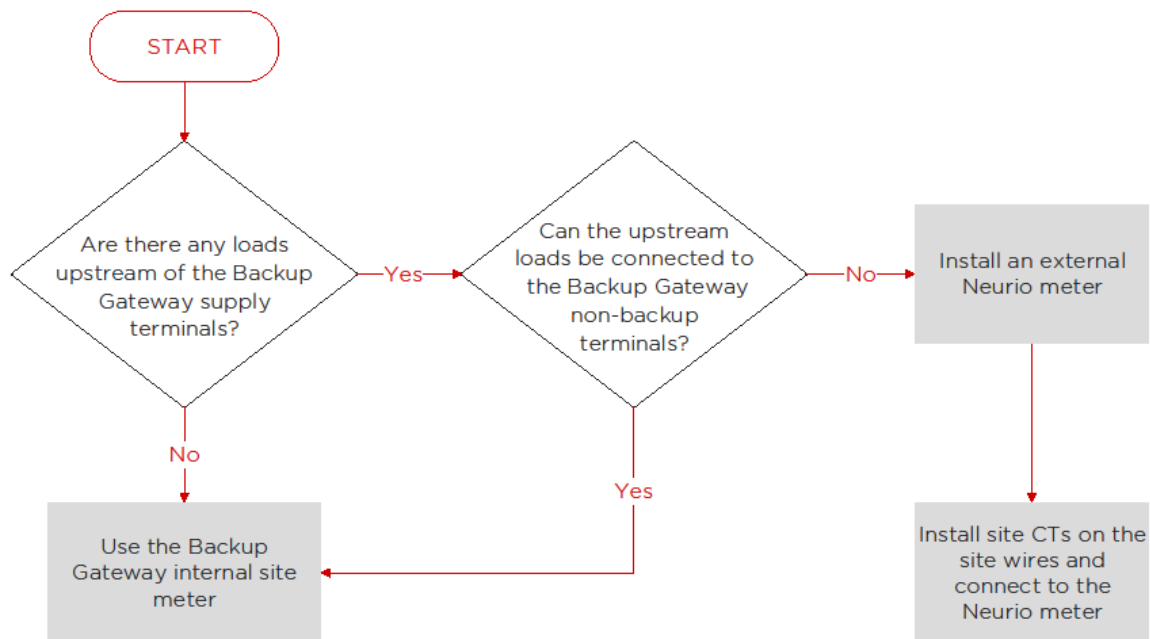


Appendix D. Configuring Energy Metering

Solar Metering



Site Metering



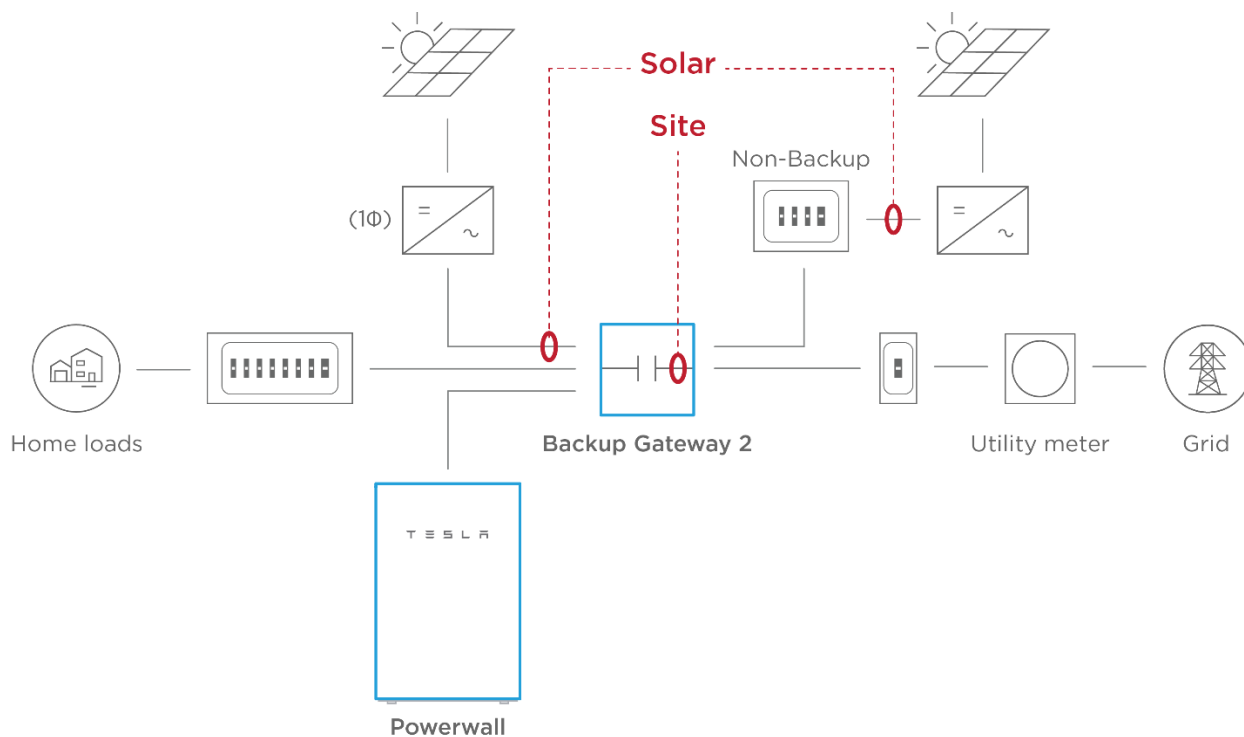


Figure 20: CT Installation Using Built-in CTs

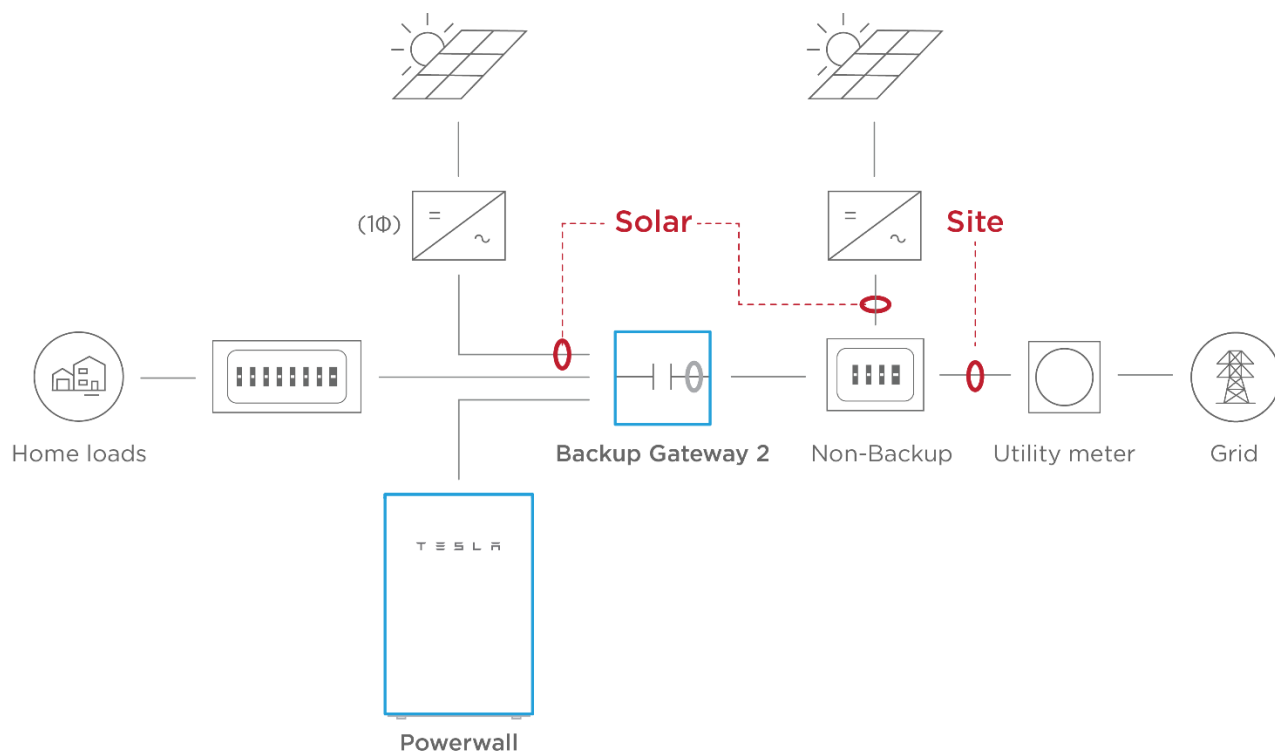


Figure 21: CT Installation with Upstream Loads or Generation

Appendix E. Installing a Neurio Energy Meter

If energy metering in addition to the built-in Site and Solar metering is required, Neurio Energy Meter(s) may be paired with Backup Gateway.

The Neurio Meter(s) connect to Backup Gateway 2 by wireless connection, or wired communication between the meter and the Backup Gateway using an optional 2-conductor meter communication harness (Tesla P/N 1133339-00-A). The Backup Gateway can support wired communication for up to two meters.

NOTE: When upgrading a Gateway 1 system with Gateway 2, the existing Neurio Energy Meter(s) may be left in place in the main distribution board and re-paired. The Neurio Meter must be power cycled within one minute prior to re-pairing. If metering Site power with the Neurio Meter, ensure the Gateway 2's internal site meter is deselected in Commissioning.

Wireless Communication to Backup Gateway 2

The Neurio Energy Meter may be wirelessly paired with Backup Gateway as part of the normal Powerwall commissioning process within the Commissioning Wizard.

Wired Communication to Backup Gateway 2

As an alternative to wireless communication, it is possible to establish wired communication between the meter and the Gateway using an optional 2-conductor meter communication harness (Tesla P/N 1133339-00-A). Up to two meters can be wired directly to the Gateway.

If the meter is located outside the Gateway, the harness leads can be extended by splicing additional wire to the harness, as follows:

- Shielded twisted pair with drain wire (such as CAT5)
- Terminate the harness shield/drain wire in the corresponding Gateway earth terminal
- Total extended length of up to **50 m**

The meter antenna is always required, even if the meter is located inside the Gateway enclosure or connected to the Gateway using the optional wired communication harness.

NOTE: When possible, Tesla recommends connecting the Neurio Energy Meter via wireless Wi-Fi rather than using a wired connection. This will enable firmware updating the Energy Meter. If using a wired connection, first connect the meter to the gateway wirelessly to update the meter firmware, then re-pair via a wired connection.

1. Plug the 2-conductor harness into the port on the top of the meter.
2. Connect the harness leads to the Backup Gateway Meter Communication ports by inserting them into the corresponding connector, according to the following table and diagram ([Figure 22](#)).

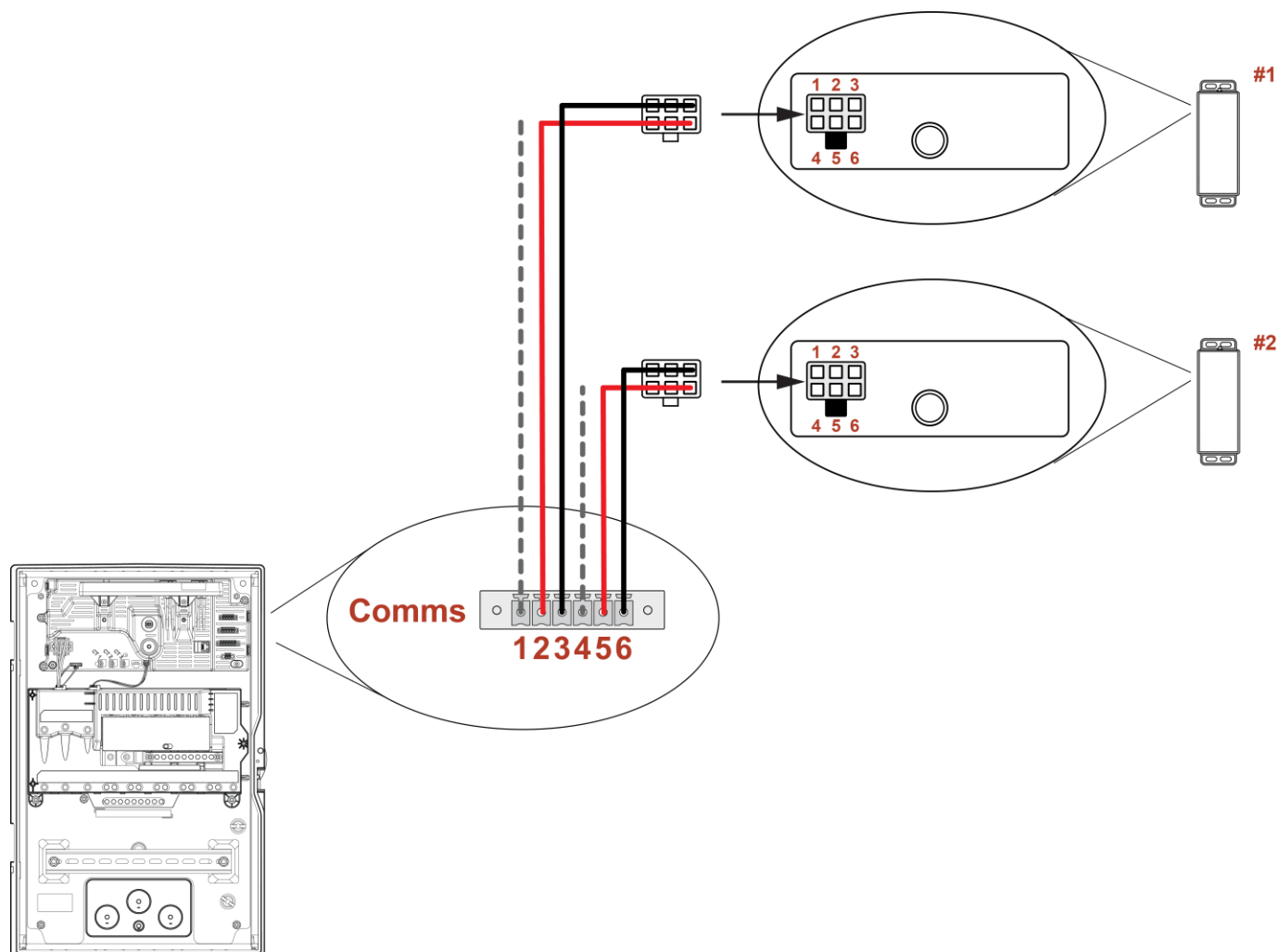


Figure 22: Meter Communication Wiring

Meter #1 Communication Port Pin	Meter Terminal	Backup Gateway Meter Communication Pin	Wire Gauge
3	RS485 LO	3	0.2-1.5 mm ²
6	RS485 HI	2	0.2-1.5 mm ²
(Harness shield)	(Earth/Shield)	1	0.2-1.5 mm ²

Meter #2 Communication Port Pin	Meter Terminal	Backup Gateway Meter Communication Pin	Wire Gauge
3	RS485 LO	6	0.2-1.5 mm ²
6	RS485 HI	5	0.2-1.5 mm ²
(Harness shield)	(Earth/Shield)	4	0.2-1.5 mm ²

Meter Voltage Taps – Single-Phase Electrical Service

If the site has single-phase electrical service, before installing the meter, modify the provided voltage line harness by capping the black and grey leads. (Single-phase systems only require the brown and blue leads.)

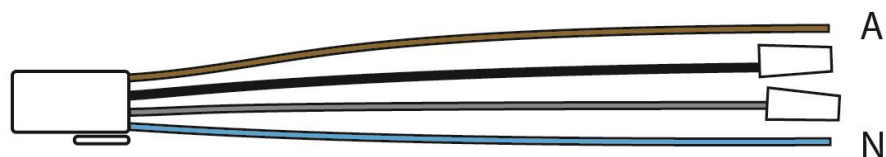


Figure 23: Voltage Line Harness with Capped Leads for Single-Phase Service

Meter Voltage Taps – Three-Phase Electrical Service

If the site has three-phase electrical service, all leads on the voltage line harness are used.

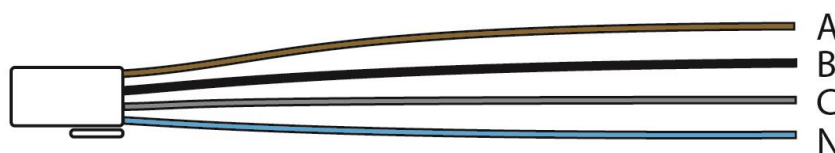


Figure 24: Voltage Line Harness for Three-Phase Service

Voltage Line Harness Wire Colors

The voltage line harness provided in the meter kit uses EU wire colors. These EU wire colors correspond to standard AUS wire colors as shown in the following table and diagram (Figure 25). Use these wire color equivalents when connecting or extending the voltage line harness.

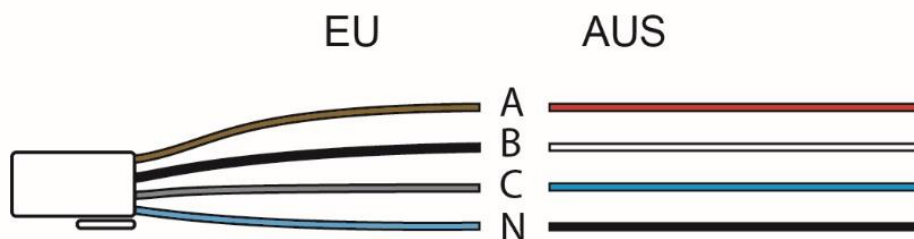


Figure 25: Voltage Line Harness EU to AUS Conversion

Meter Phase	EU Wire Color	AUS Wire Color
A	Brown	Red
B	Black	White
C	Gray	Blue
N	Blue	Black

Current Transformer Placement

CT placement locations include the following:

Site (Grid) A CT is placed between the utility meter and main switch to measure both load and generation. See [Appendix E](#) for information on implementing a Site Limit to curtail Powerwall charging from the grid.

Solar If the site includes solar equipment, a CT is placed after the solar inverter to measure the solar output.

Load Site and solar metering are preferred. However, in configurations where it is not possible to locate CTs between the utility meter and the main switch, load metering can substitute for site metering.

See [Appendix C](#) for system wiring diagrams depicting CT placement for various wiring configurations.

Voltage Tap and Current Transformer Connections

Voltage taps and current transformers must be connected so they are measuring the same phase. They must correspond according to the following table and diagram:

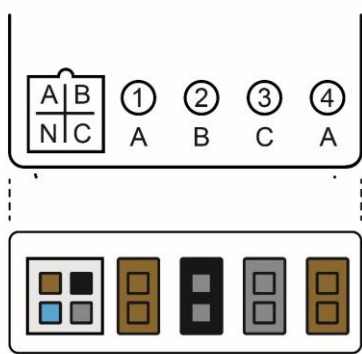


Figure 26: Voltage Tap Port (left) and four CT Ports (right) on Bottom of Meter

Phase	Meter Voltage Tap Port	Meter CT Port
Site L1	A	1/A
Site L2	B	2/B
Site L3	C	3/C
Solar L1	(A)	4/A

Meter Placement and CT Wire Lengths

CT leads are 1.5 m long and can be extended to a maximum length of 15 m, as follows:

- For a total extended length of **up to 4.5 m**: CT wiring can be extended with up to one 3 m (10 ft) CT extension kit (Tesla P/N 1125547-03-x)
- For a total extended length of **up to 15 m**: CT wiring can be extended by using wire with the following properties:
 - Shielded, twisted pair with drain wire
 - Wire gauge of 0.2–1.5 mm²
 - Voltage rating equal to or greater than all other circuits in shared enclosures or raceways
- If the distance between the meter and the CT is **greater than 15 m**, the meter can be relocated, or a second meter can be used. When the meter is relocated into the main distribution board, use the antenna extension to place the antenna on the outside of the distribution board.

Current Transformer Orientation

CTs must be installed with the label on the CT housing pointing toward the power source, according to the following table and diagram ([Figure 27](#)). Always verify CTs are in the correct orientation by observing power flow in the Commissioning Wizard.

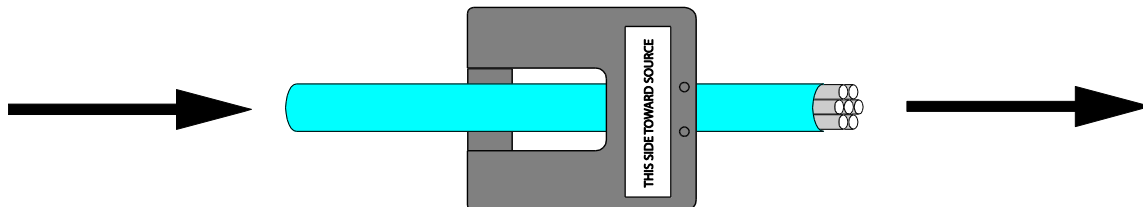


Figure 27: CT Orientation in Relation to Power Flow

CT Usage	CT Orientation
Site CTs	CT label facing <i>toward</i> the service entrance/grid
Solar CTs	CT label facing <i>toward</i> the solar inverter
Load CTs	CT label facing <i>away</i> from the loads

Current Transformer Capacity

Each CT that can be connected to a Neurio energy meter a capacity of 200 A.

If the wiring configuration allows, it is possible to pass multiple conductors of the same type through a single CT, provided the sum of the conductor's current ratings does not exceed the CT current handling capacity. This is especially useful for systems with multiple solar inverters.

NOTE: Multiple conductors through a single CT is only possible if all conductors are on the same phase

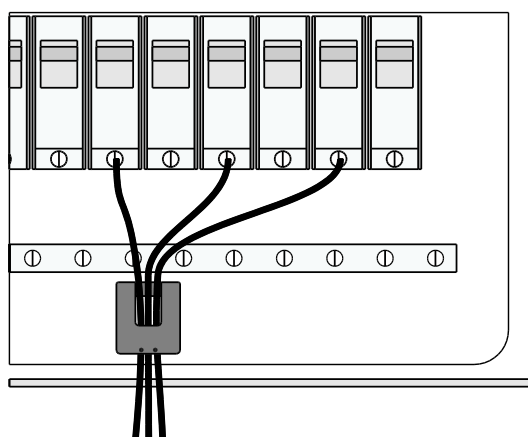


Figure 28: Multiple Conductors Passing Through a Single CT

If a site has multiple solar inverters spaced far apart, or if a distribution board has two main breakers, a Y-splitter cable (Tesla P/N 1129625-00-x) can be used to connect two CTs on the same phase to a single meter port.

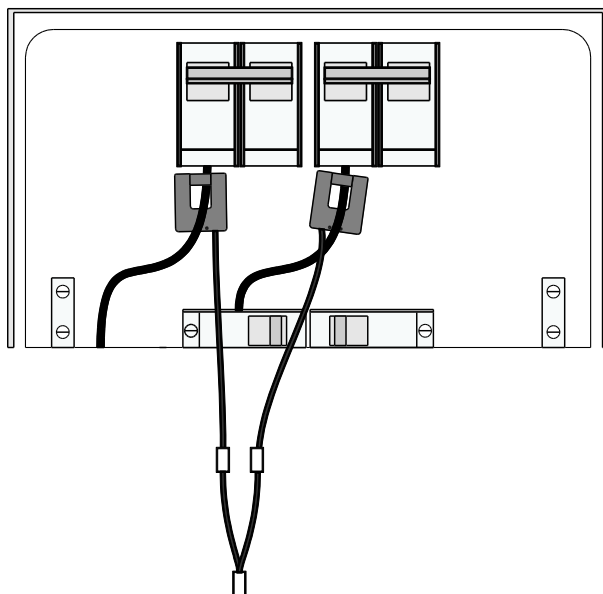


Figure 29: Y-Cable Connecting CTs

800 A CTs are also available for larger service sizes (Tesla P/N 1447689-00-x). The 800 A CTs do not require a special Neurio Energy Meter, but must be selected in the Commissioning Wizard.

NOTE: When 200 A CTs are used in parallel, each CT can measure current on an input channel up to 400 A. When 800 A CTs are used in parallel, each CT can measure current on an input channel up to 1100 A.

Installing the Meter

Using the self-drilling screws provided in the meter kit, attach the meter to the inside of the main distribution board or to another surface. Choose a location that takes into account the voltage line harness and CT cable lengths.

To wire the voltage taps:

1. Plug the voltage line harness into the meter in its new location.
2. Connect the voltage line harness leads to a dedicated circuit breaker (not exceeding 16 A) of corresponding phase inside the distribution board:

Voltage Harness Port/Wire Color	Distribution Board Connection
A / Brown	L1 breaker terminal
B / Black	L2 breaker terminal
C / Gray	L3 breaker terminal
N / Blue	Neutral bus bar

To locate the CTs:

- Place a CT on the corresponding power wire in the main distribution board, after the utility meter and ahead of any loads.
- If the site includes solar equipment, place an additional CT on the solar wire in the main distribution board.

Appendix F. Feature Notes

Configuring Site Limits

The Backup Gateway can be configured to limit Powerwall charge power from the grid. When Site Limits are programmed by the installer during commissioning, the Powerwall charge power is dynamically adjusted based on the net measured site power and the programmed site limit threshold.

Site Limits are configured in the Commissioning Wizard; select **Site Import Limit** from the *Settings* page. At the conclusion of the commissioning process, a summary of the settings will be displayed.

The net site power measurement can be a virtual aggregated meter; therefore, abide by all prior guidance on meters and CTs.

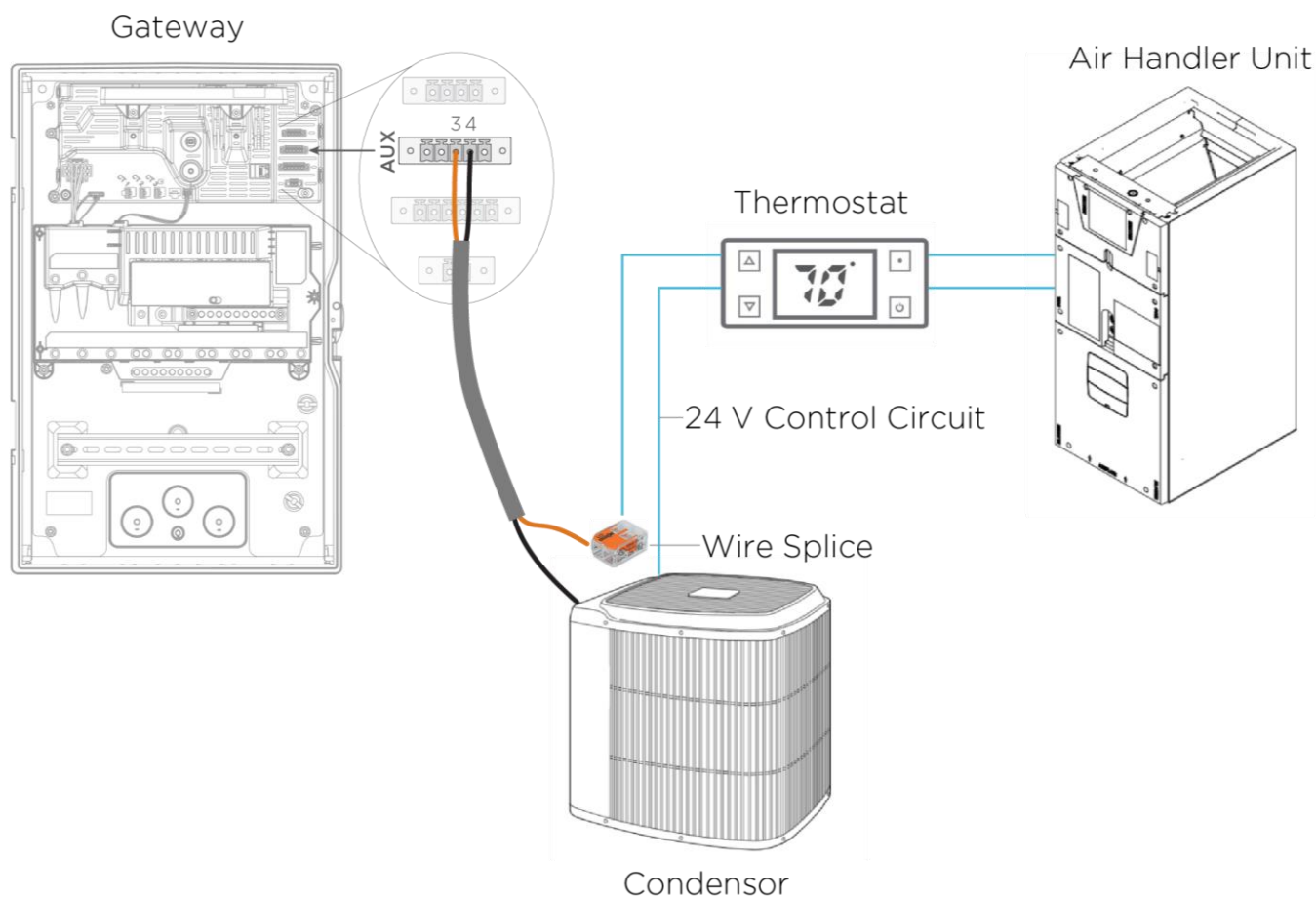
Load Shedding

Overview

The Backup Gateway allows for load shedding, meaning a low voltage control circuit can be wired to control a specific load. For instance, an air conditioning load controlled by a thermostat can be wired to the low voltage control circuit in the Backup Gateway so that the load can be shed when Powerwall is off-grid.

When commissioned for load shedding and the Powerwall system is on-grid, the low voltage control circuit is closed and the load is powered. When commissioned for load shedding and the system is operating off-grid, the low voltage control circuit is open and the load is OFF.

When the system is wired for load shedding, the controlled load breaker can remain on the backup loads panel.



NOTE: Refer to [Appendix B](#) for wiring specifications.

NOTE: The load shedding feature is not applicable to permanently off-grid Powerwall systems. Permanently off-grid systems use the Backup Gateway Aux terminals for generator control rather than for load shedding.

NOTE: To activate this feature in the Commissioning Wizard, make the appropriate selection to the “Gateway Low Voltage Relay” within the *Installation* page. This feature can be activated in firmware version 1.47 or later.

NOTE: See the [Load Shedding with the Backup Gateway application note](#) for an example installation which uses the load shedding feature to control a condenser for a central air conditioning system.

NOTE: The low voltage control circuit will be opened briefly during firmware updates and under abnormal fault conditions.

NOTE: The load shed relay is rated up to 60V (DC or AC) and 2A.

Appendix G. Installation Troubleshooting

Accessing the Powerwall User Interface

Use Chrome: Incognito mode or Safari: Private Browsing mode .
Work in one browser tab only.
For security message Your connection is not private , select Advanced and Proceed to 192.168.xx.x (unsafe) .
For Error: Bad Credentials , select FORGOT PASSWORD to reset password.
For Error: Login Error (Cannot Start Wizard) , select Click for More and tick the Force Launch Wizard option. Try again.
If experiencing other issues in the Commissioning Wizard, refresh the web page.
If issues persist, reboot Gateway using RESET button.

Updating Firmware

CHECK INTERNET CONNECTION to verify Gateway network connection.
Check for Update to verify you are on the latest firmware. Factory firmware ending in GF must be updated.
Never power down or modify wiring during an update.
During the update, the Gateway will reboot which will cause the “TEG-xxx” Wi-Fi to disconnect. When reconnected, refresh the web page.

Configuring Energy Meters

Conduct all CT tests with at least 1 kW of power flowing.
Ensure all solar inverters are monitored with CTs.
When using only 1 CT for solar, select Solar (1CT x2) on the Current Transformers screen in the Commissioning Wizard.
For each CT, select the applicable function on the Current Transformers screen and perform the following steps to ensure it is in the correct location and orientation: Adjust the Amps/kW slider to see what the CTs are reading.

- Verify the on-screen values for the CT against the applicable meter (such as the solar inverter meter or utility meter).
- Ensure that:
 - Site CTs are positive for import, negative for export.
 - Solar CTs are positive when the PV array is producing power (Solar is NEVER negative during daytime).

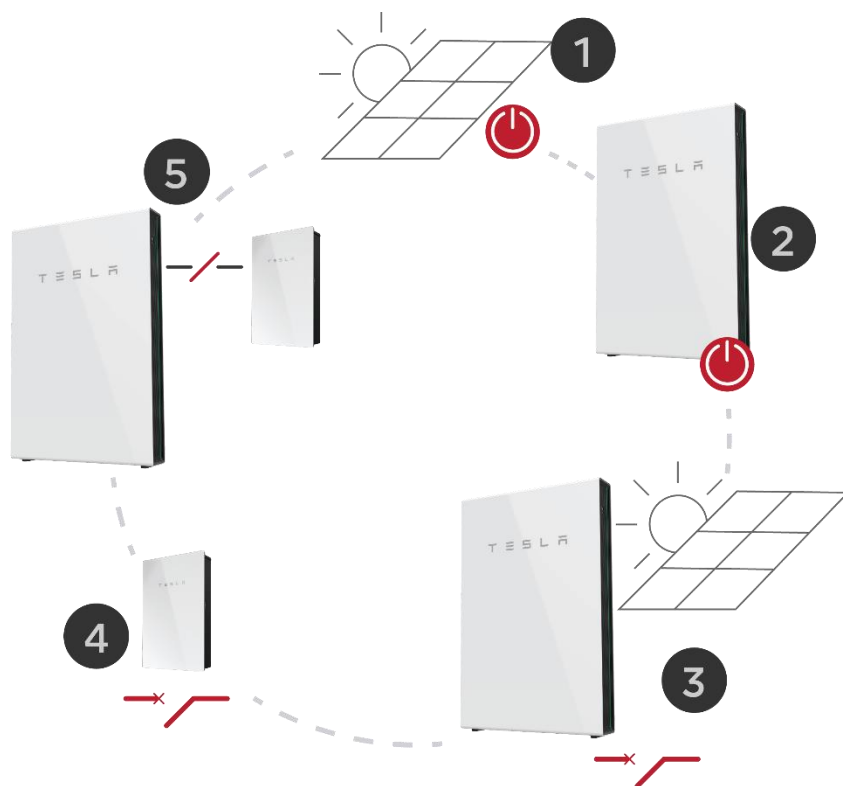
Negative power flow may indicate CT is installed on the wrong phase!

- If the “toward source” CT label is correctly facing the solar inverter but power flow is negative, a voltage-current mismatch is likely.
- Physically move the CT to the correct phase with the label facing the correct direction. Do not use the Flip checkbox in this case.

Solar CTs should only meter generation sources. It is never recommended to meter both generation and loads using the Solar (1 CT x2) option. If it is absolutely necessary to install solar and a small amount of loads together without independent metering, you must install the solar CT on the phase without any downstream loads.

Use a handheld clamp or fork meter to verify CT readings.

Power Cycle the System



To power the system off:

1. Turn off solar equipment.
2. Turn off all Powerwalls.
3. Open breakers feeding Powerwall and solar.
4. Open breaker feeding Gateway.
5. Disconnect communication wiring.

Reverse steps to power the system on.

Appendix H. Multi-Powerwall Installations

Electrical Equipment Sizing and Overcurrent Protection

Pre-Requisites for Design

Before designing a Powerwall system with more than 3 Powerwalls per phase:

- AC line impedance must be measured at the installation site to ensure the utility grid connection is able to support the desired quantity of Powerwalls. See Table 1 below for required minimum impedance values.
- Minimize Impedance:
 - Install the Powerwalls as close as possible to the point of interconnection with the grid. The recommended maximum wire length is 10 m.
 - Install wires larger than required by code between the Powerwall generation panel and the point of interconnection with the grid. Example, if the design requires 95 mm² wire, use 120 mm² wire.
- Multi Powerwall installations may require larger Powerwall communication wire between the Backup Gateway and the Powerwall units. Please refer to Tesla application note on Powerwall communication wire size based on distance as your install may require up to 1.5 mm² wire.

Pre-Requisites for Installation

Before installing and commissioning a multi Powerwall system:

- Plan for the commissioning process to take longer. Each Powerwall can take up to 3 minutes to complete during the commissioning scan and verify process, so a 10-Powerwall system can take up to 45 minutes during this stage of commissioning.

NOTE: Do not interrupt a commissioning step, turn off the system, or unplug the communication wiring at any time during the commissioning process.

Service Capacity Requirements

The Backup Gateway supports systems of up to 10 Powerwall units, but the actual maximum number of Powerwalls may be limited by the electrical service size or local requirements.

Line Impedance Requirements

The sensitivity of the system to line impedance increases with the number of Powerwalls in the system. (See **Table 1** for the maximum allowable impedance as it relates to number of Powerwalls.)

If grid impedance at a site exceeds the maximum allowable value, do either of the following:

- Decrease the impedance of the site grid connection. This may require coordinating with the local electrical utility. See “To minimize impedance in a multi-Powerwall system” above for suggestions.
- Decrease the number of Powerwalls installed at the site to meet the maximum allowable impedance value.

Measuring Line Impedance

To determine the line impedance at a site, measure between Line and Neutral at the main meter service panel with testing equipment such as the following:

- Fluke 1660 Series Installation Tester (1662, 1663, or 1664)
- Metrel-MI3000 Multifunction Tester
- Megger LTW315 Loop Impedance Tester

Example Line Impedance Test Instructions

For details on line impedance testing, refer to the test equipment manufacturer’s instructions. The steps below are general guidelines only.

 **WARNING:** Impedance tests must be performed on an energized electrical system. Impedance tests should be carried out only by trained electricians using appropriate safety equipment and safety practices.

1. Follow manufacturer instructions to calibrate and zero the impedance tester before taking measurements.
2. If the site has a 3-phase electrical system, complete the test on L1 first, then move to L2 and L3 in sequence.
3. Connect all three voltage test leads – Line, Neutral, and Ground
4. Follow manufacturer instructions to verify that the correct voltage is present. Switch the tester to a voltage measurement mode and check Line-to-Neutral and Line-to-Ground voltages.
5. Follow manufacturer instructions to take an impedance measurement at the entrance to the main panel ([Figure 30](#)). Switch the tester to the appropriate impedance measurement mode and take the following readings:
 - Line-Neutral
 - Line-Ground

NOTE: The Line-Neutral impedance measurement is the value referenced in Table 1.

6. Record the impedance measurements.
7. On 3-phase systems, repeat steps 3-6 for each remaining phase.

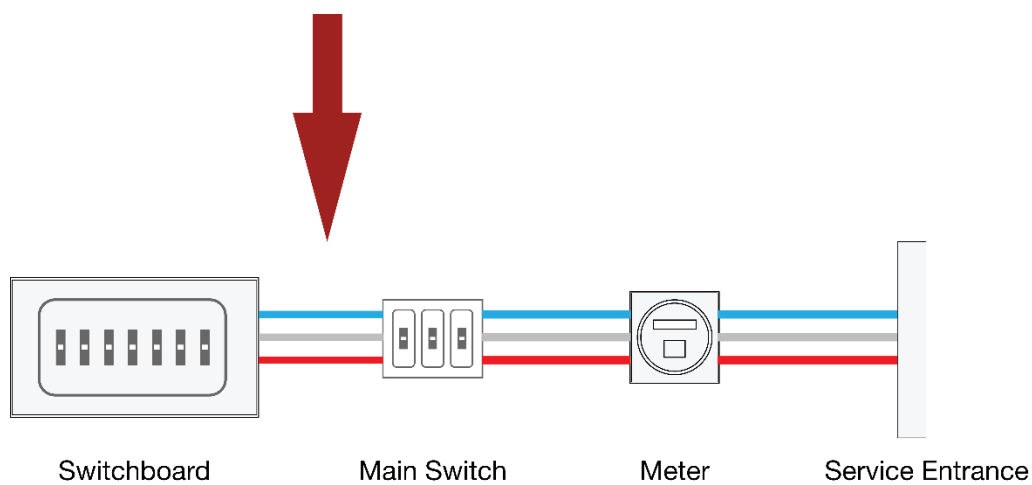


Figure 30: Impedance Measurement Location

# of Powerwalls per phase	Maximum Grid Impedance, Line - Neutral
1	0.80 Ohms
2	0.40 Ohms
3	0.27 Ohms
4	0.20 Ohms
5	0.16 Ohms
6	0.13 Ohms
7	0.11 Ohms
8	0.10 Ohms
9	0.09 Ohms
10	0.08 Ohms

Table 1: Impedance Requirements for Multi-Powerwall Systems

Multi-Powerwall Installations with the Stack Kit

In the Powerwall Stack Kit



1	2	3	4
(2) Side clips	(1) Top cover	(1) Conduit nipple	(2) Conduit insulation bushings
5	6	7	8
(2) Conduit sealing O-rings	(1) Bridge piece	(1) 5-conductor communication cable	(1) Wiring interface cover
9	10	11	12
(4) Magnetic camshaft caps	(1) 6 mm Allen wrench	(1) Drill guide (two pieces)	(2) Shims

Required Tools

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

Site Requirements

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

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

For complete Powerwall Mechanical Specifications and Site Requirements, see [Site Requirements and Pre-Installation Guidance](#).

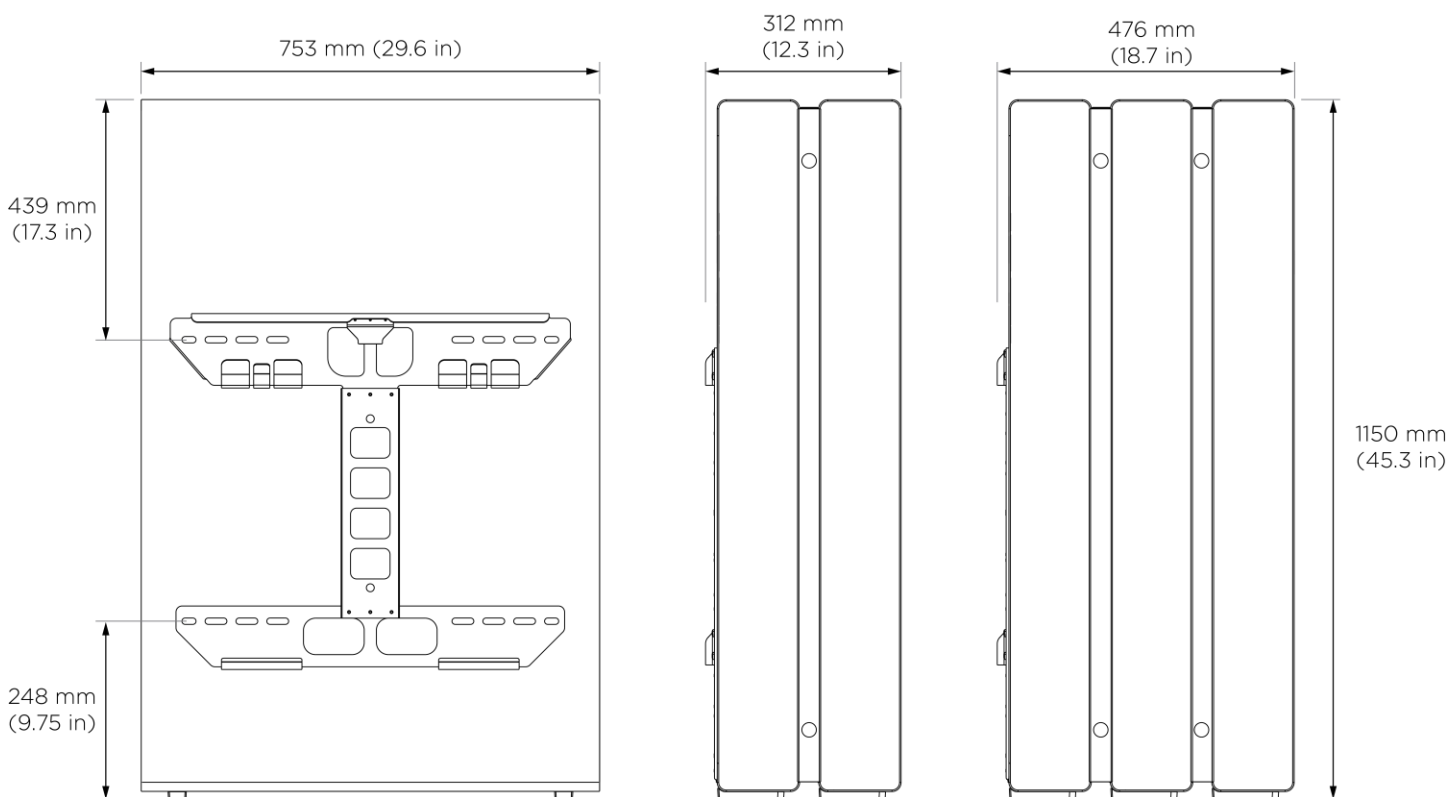


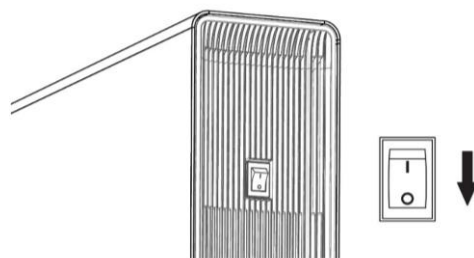
Figure 31: Dimensions for 2-unit and 3-unit Powerwall Stacks

Installation Instructions

These instructions assume that at least one Powerwall has been installed and additional Powerwall units are being installed using the stack kit. Complete installation instructions begin on page 17 of this manual.

Step 1. Prepare for Installation

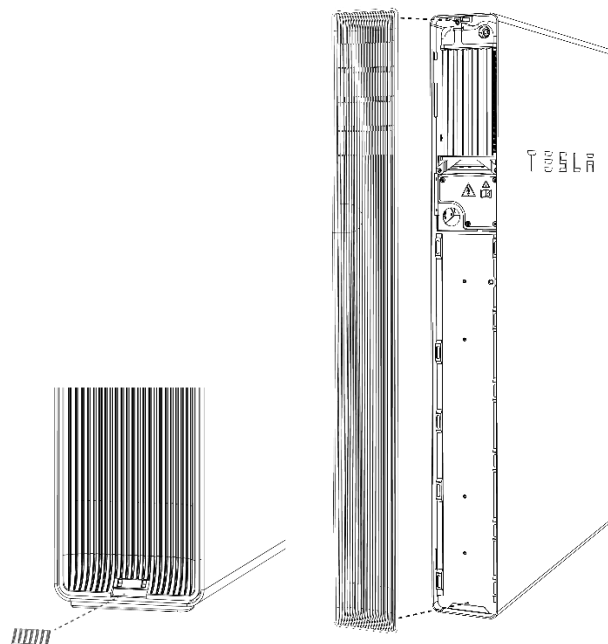
1. Turn off the first (previously installed) Powerwall by setting its On/Off switch to the OFF position.
2. Turn off the AC circuit breaker for the Powerwall.
3. Ensure that the second Powerwall is turned off by verifying that its On/Off switch is set to the OFF position.



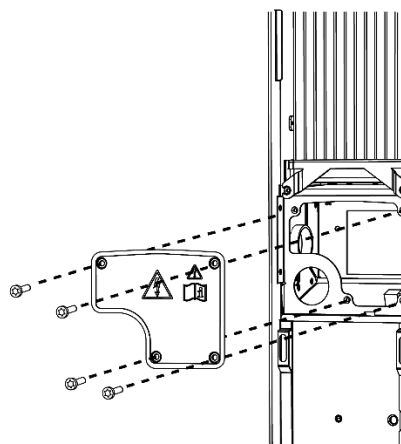
4. Remove both side covers from each Powerwall to be joined.

NOTE: On the first (previously installed) Powerwall, it may be necessary to remove the small plastic insert at the bottom of the covers to help with removal.

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



5. Using a T20 Torx bit, remove the wiring compartment covers from the previously installed Powerwall.



Step 2: Choose a Wiring Option

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

Concealed Wiring

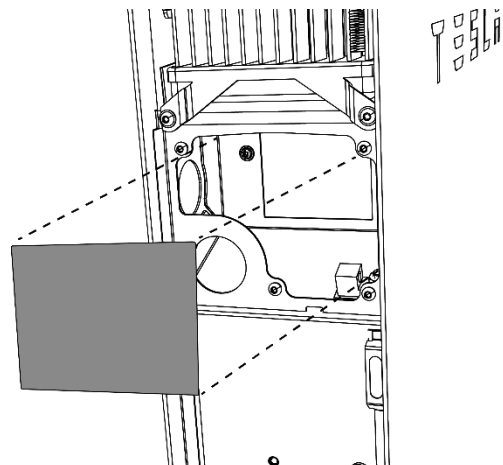
For concealed wiring, a hole is drilled from the front of the first Powerwall into its wiring compartment and wires are run directly into it from the back port of the second Powerwall. To use this wiring method, proceed to Step 3, "Prepare for Concealed Wiring."

External Wiring

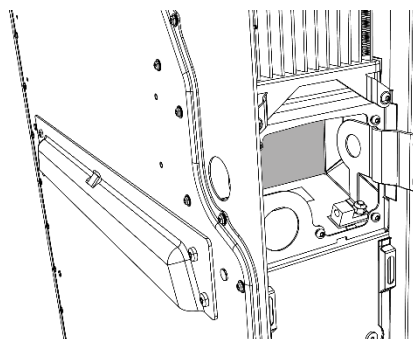
For external wiring, wires are run through conduit or raceway that spans the wiring compartment ports on the side of each Powerwall. To use this wiring method, skip to Step 4, "Join the Powerwall Units."

Step 3: Prepare for Concealed Wiring

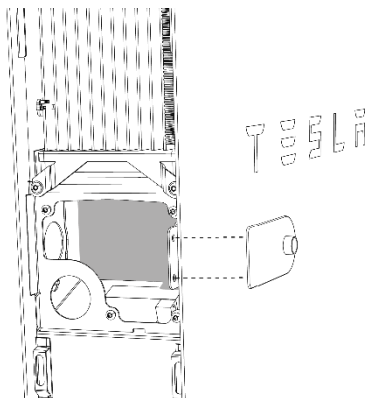
1. Disconnect all wiring from the wiring compartment of the first Powerwall.
2. Locate the wiring interface cover and peel back the film to expose the adhesive on the cover gasket. With the gasket facing inward, place the cover over the interface board at the back of the wiring compartment. The cover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



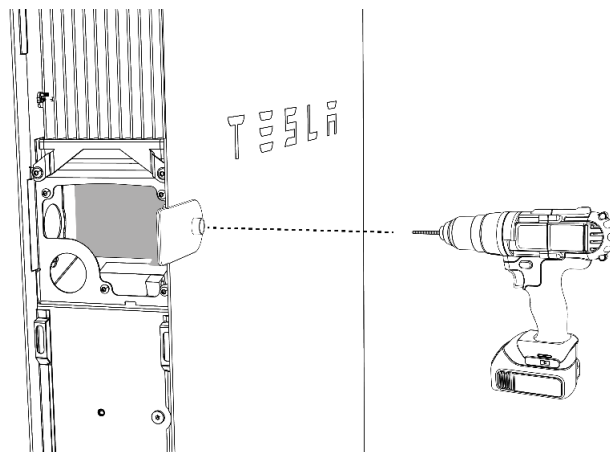
3. Attach the included drill guide to the front of the first Powerwall by bracing the inside half of the guide against the bottom of its wiring compartment.



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

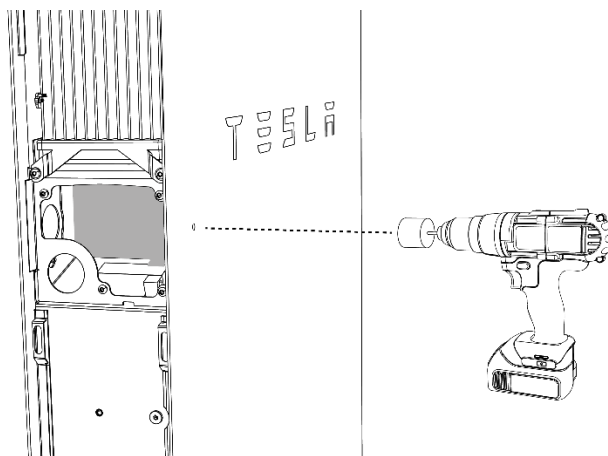


5. While holding the drill guide to make sure it conforms to the edge of the Powerwall chassis, drill a 6 mm (1/4-inch) pilot hole using the small hole in the drill guide.



6. Remove the drill guide.

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



8. File the edges of the hole to remove any burrs.

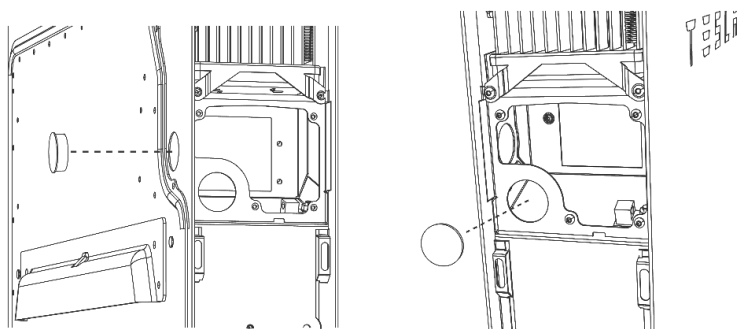
9. Clear the wiring compartment of all metal shavings and debris.

10. Remove the protective cover from the wiring compartment.

11. If the first Powerwall still has its protective film, remove the film.

12. Peel back the protective film from the feet of the second Powerwall before moving it into place.

13. Remove the plug from the back cable entry port of the second Powerwall and place it in the side cable entry port of the same Powerwall.



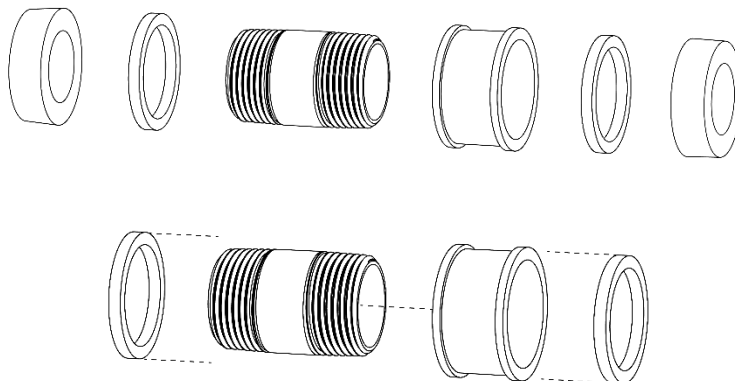
Step 4. Join the Powerwall Units

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

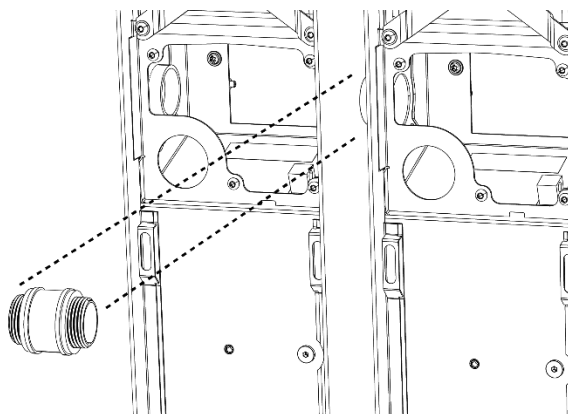
2. (Concealed wiring installations only) Do the following to bridge the gap between the Powerwall wiring compartments:

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

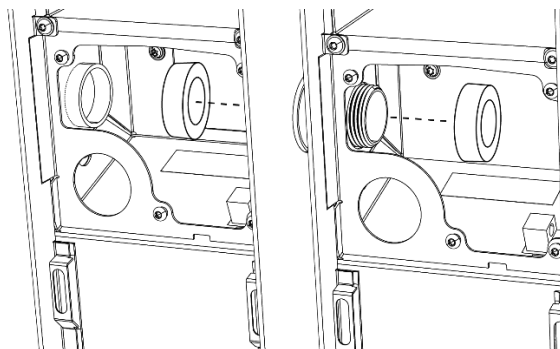
NOTE: Orient the O-rings so that the sides with greater surface area (marked "Box Side") point to the outside, toward the Powerwall chassis.



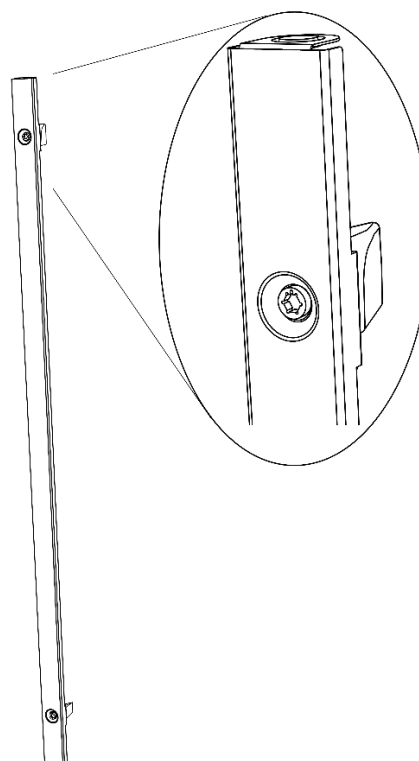
- Install the assembly between the two Powerwalls so it spans the two wiring compartments.



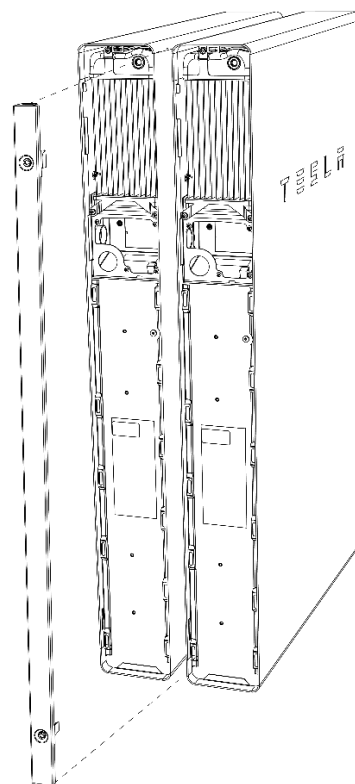
- Thread an insulation bushing onto each end of the conduit nipple, but do not fully tighten the bushings.



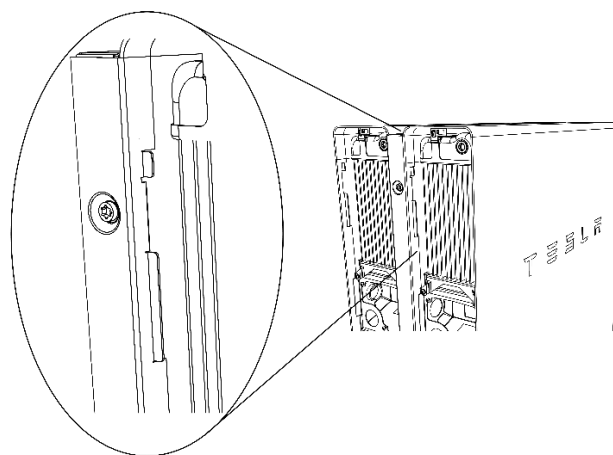
3. (All installations) Locate a side clip, making sure the flange (with magnet) is positioned at the top and that the cams are rotated vertically in relation to the clip.



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



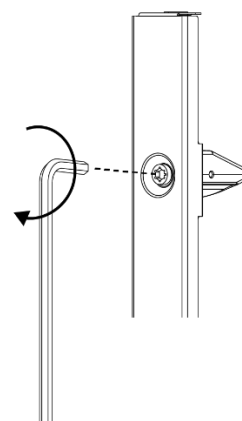
NOTE: The Powerwall enclosure hems have cutouts that mate with tabs in the clip.



5. Press the clip until it is flush with the sides of the Powerwalls.

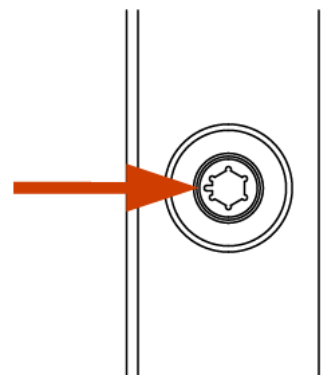
6. Using the provided 6 mm Allen hex wrench, do the following:

- Turn the top cam 90 degrees clockwise until it clicks into place and stops rotating.



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

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

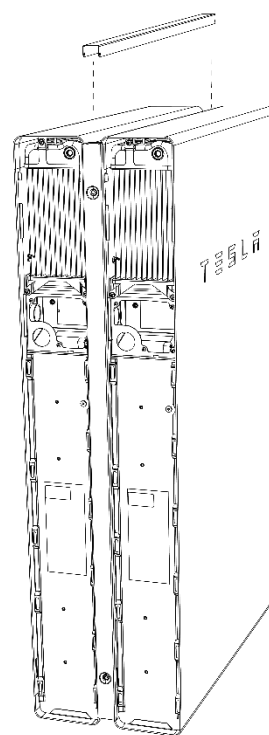


7. Repeat steps 3-6 to install a side clip on the other side of the Powerwalls.

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

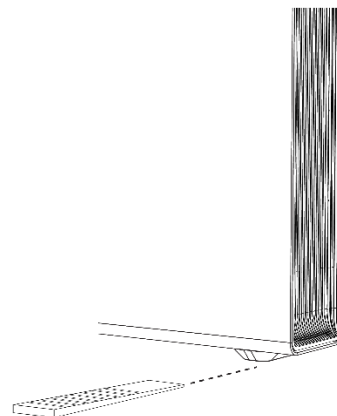
8. Position the top cover across the gap between the Powerwalls so that its flanges engage the tops of each side clip. The cover is held in place by the magnets on the tops of the side clips.

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



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

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

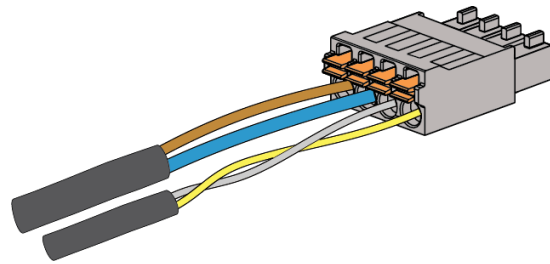


Step 5. Wire the Powerwall Units

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

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

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



- Attach the provided Phoenix connector to one end of the harness, and attach the extra Phoenix connector that came with the Powerwall to the other end of the harness. See [Appendix B](#) for additional wiring information.
- Connect the communication OUT connector of the first Powerwall to the communication IN connector of the second Powerwall.
- To ground the drain wire:
 - Strip the end of the equipment grounding conductor lead and wrap the communication drain wire around the grounding conductor lead.
 - Insert the drain wire and grounding conductor lead into the second Powerwall chassis ground lug. The ground lug is identified with the following symbol: .
 - Tighten the screw in the ground lug to 4.5 Nm (40 lb-in).

NOTE: There will be a drain wire grounded in each Powerwall in the chain. For each pair of components (Gateway and first Powerwall, first Powerwall and second Powerwall, etc.), the drain wire is cut at the first component and grounded at the second.

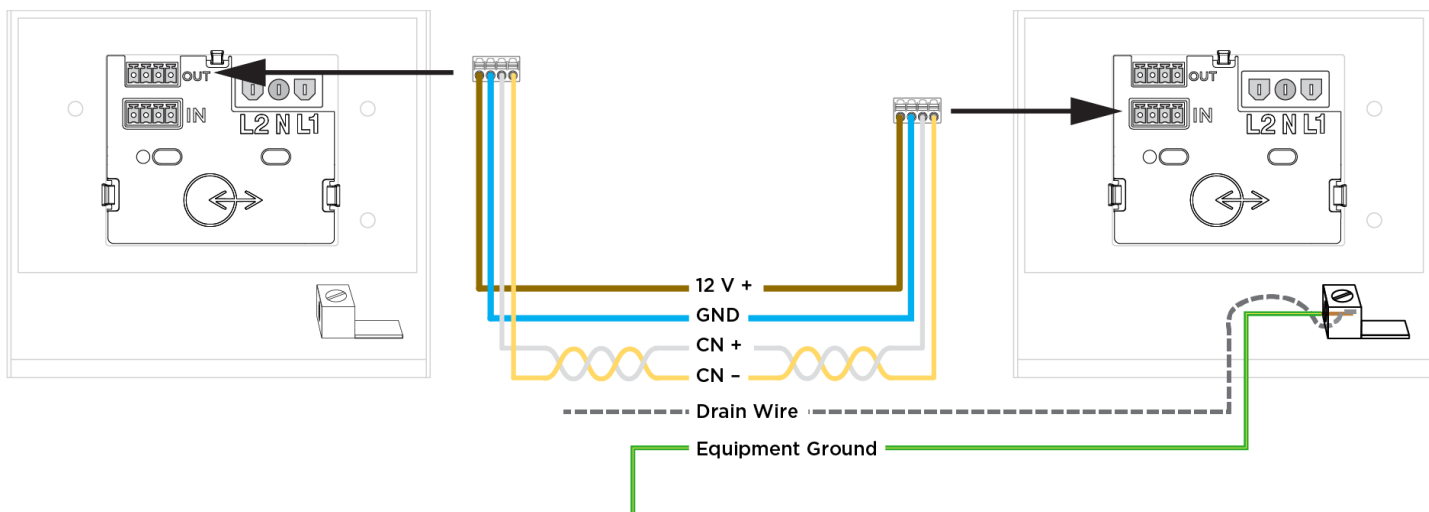


Figure 32: Connecting Powerwall Communication Ports

- In the last Powerwall in the communication chain, plug the 4-pin Phoenix connector with the terminating 120-Ohm resistor into the top 4-pin socket (labeled “OUT”). See Figure 15.

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

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

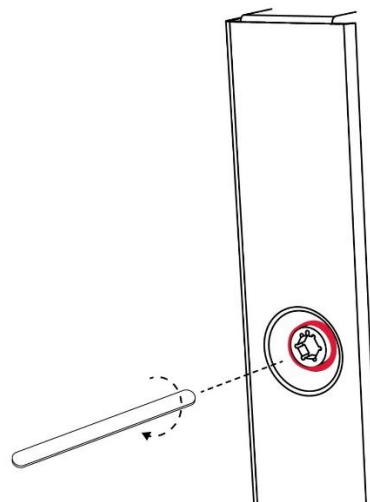
4. Plug the AC power harness into the AC connector in the Powerwall wiring compartment. Ensure that the connector clicks into place (see [Figure 13](#)).

NOTE: Each Powerwall connection to the main electrical panel requires an independent 32 A circuit breaker (20 A circuit breaker for CH). This breaker serves as the disconnect for the Powerwall, and must be wired in accordance with local wiring codes and regulations.

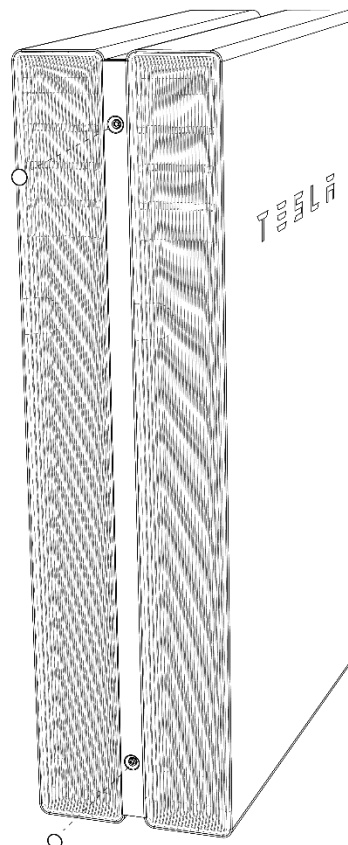
5. Reconnect the power and communications leads that were disconnected from the first Powerwall at the beginning of the installation.

Step 6. Close the Wiring Compartments and Replace the Covers

1. Arrange the communication and AC power wires inside the Powerwall wiring compartments.
2. Ensure that all conduit junctions and cable entry points are secure and properly sealed.
3. Replace the wiring compartment cover on each Powerwall. Ensure that the cover seats properly on the gasket so that the compartment is sealed. Tighten the fasteners using a Torx T20 bit. Torque to 1.5 Nm.
4. Replace each of the side covers on the Powerwalls by pushing the top into place and working toward the bottom to reattach it to the clips along the length of the unit.
5. (Optional) In humid or rainy climates, or in locations where the installation may be exposed to salt, fog, or other corrosive elements use a small applicator (such as a wooden craft stick or cotton swab) to apply a generous bead of heavy duty water-resistant grease around the outside edge of each camshaft head where it contacts the side clip.



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



Step 7. Turn On and Commission the System

1. Switch on the AC circuit breakers for the Gateway and each Powerwall.
 2. Switch on each Powerwall by moving the switch on the right (LED) side of the unit to the ON position. When each Powerwall establishes communication with the Gateway, the LED on the right side of Powerwall illuminates.
 3. See the [Commissioning step](#) for instructions on updating system firmware and commissioning the system.
- NOTE: During commissioning, ensure that when scanning for Powerwalls, the Commissioning Wizard shows all Powerwalls in the system.
4. After installation is complete, remove the protective film from the second Powerwall.

Appendix I. Revision Log

Revision	Date	Description
1.0	2019-02-20	Initial Release
1.1	2019-04-18	- Updated wire colors in figures - Updated communication cable requirements - Included note on leaving Powerwall breaker closed for maintenance charging - Updated Powerwall mechanical specifications - Included instructions for 800 A CTs with the Neurio Energy Meter - Included Gateway Reset Button in troubleshooting steps - Included warning statement regarding electrical shock safety and earthing at Gateway
1.2	2019-06-06	- Included additional graphics for clarity in Energy Metering section - Updated AC wiring requirements with note on following local code - Updated Neurio meter Wi-Fi pairing details for firmware updates - Added location of back and side cable entry ports in updated mounting layout
1.3	2019-06-07	- Included N-N Jumper Bar reference in Wiring Reference Appendix - Included note regarding metering when upgrading a Gateway 1 installation - Updated recommended temperature range for Powerwall installation
1.4	2019-09-11	Added recommended RCD to electrical specifications (moved to application note)
1.5	2020-04-20	- Updated and simplified Installation Manual format - Updated maximum Tesla CT distance - Added Multi-Powerwall Installation content as an appendix - Add Feature Notes appendix with Site Limit feature overview - Updated Powerwall accessory bag list
1.6	2020-06-03	Added Load Shedding to Feature Notes appendix
1.7	2020-09-30	Corrected stack kit dimensions
1.8	2020-12-15	- Added warning to allow the Backup Gateway a full minute to complete its boot sequence before power cycling or resetting it (page 33) - Added minimum clearance above Backup Gateway
1.9	2021-02-01	- Added Inverter Configuration to explain how to configure a solar inverter during installation - Updated to include new Powerwall part number (3012170-xx-y) - Added note on maximum input channel current that can be measured by each CT when two CTs are used in parallel (see Current Transformer Capacity)



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