TESLA

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.

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

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

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

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

ELECTRONIC DEVICE: DO NOT THROW AWAY

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

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.

TABLE OF CONTENTS

IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE 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.

Powerwall and Backup Gateway installation and service require knowledge of low voltage electricity and should only be performed by Tesla Certified Installers. Tesla assumes no liability for injury or property damage due to repairs attempted by unqualified individuals or a failure to properly follow these instructions. These warnings and cautions must be followed when using Powerwall and the Backup Gateway.

Symbols Used

These symbols indicate important safety information in this guide or on the equipment:

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

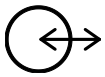
CAUTION: indicates a hazardous situation which, if not avoided, could result in minor injury or damage to the equipment.

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 Tesla Certified Installers who have 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 the Tesla Certified Installer who installed the system for any 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.

⚠ 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.

Environmental Conditions

⚠ 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: 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.

1. 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.

2. 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	5 kW (charge and discharge)
Apparent Power, max continuous, 1.0 pf	5 kVA (charge and discharge)
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
Recommended Residual Current Device (RCD)	Type A
Round Trip Efficiency (Beginning of Life)[1]	90%

[1] Values provided for 25°C (77°F), 3.3 kW charge/discharge power

Powerwall 2 AC Environmental Specifications

Operating Temperature[2]	-20°C to 50°C
Recommended Temperature	0°C to 30°C
Operating Humidity (RH)	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
Maximum Altitude	3000 m
Noise Level @ 1 m	< 40 dBA at 30°C
Ingress Rating	IP67 (battery and power electronics) IP56 (wiring)
Wet Location Rating	Yes
Seismic Rating	AC156, IEEE 693-2005 (high)

[2] Performance may be de-rated in extreme ambient temperatures.

Powerwall 2 AC Mechanical Specifications

Height	1150 mm
Width	753 mm
Depth	147 mm
Weight	114 kg

* 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.

Backup Gateway 2 Electrical Specifications

Maximum Overcurrent Protection Device	100 A (Single Phase) 80 A (Two Phase and Three Phase)
Rated Frequency (f_n)	50-60 Hz
Overvoltage Category	Category III
AC Meter	Revenue accurate (+/– 0.2%)
Maximum Input Short Circuit Rating	10 kA
Compatible Earthing Systems	TN networks
DBO Type	Type B
Safety	IEC 61439-1, IEC 61439-3

Backup Gateway 2 Environmental Specifications

Operating Temperature	-20°C to 50°C
Operating Humidity (RH)	Up to 100%, condensing
Maximum Altitude	3000 m
Ingress Rating	IP55
Environmental Category	Outdoor
Wet Location Rating	Yes
Pollution Degree	PD2
Electromagnetic Compatibility (EMC) Classification	Environment B

Backup Gateway 2 Mechanical Specifications

Height	584 mm
Width	380 mm
Depth	127 mm
Weight	11.4 kg

3. Site Requirements

Powerwall Physical Requirements

Powerwall can be mounted on a floor or wall. When floor-mounted, it must also be anchored to an adjacent wall. In both types of installation, the wall must be capable of supporting the full weight of Powerwall and its mounting hardware. The wall must extend to all edges of the system, allowing no access to the back of the unit once it is mounted.

Powerwall includes a mounting bracket (Figure 2) that supports the unit in both floor- and wall-mount configurations, and includes shims to level the unit in floor-mount configurations. Do not use other hardware to anchor Powerwall to the wall or floor.

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 below).

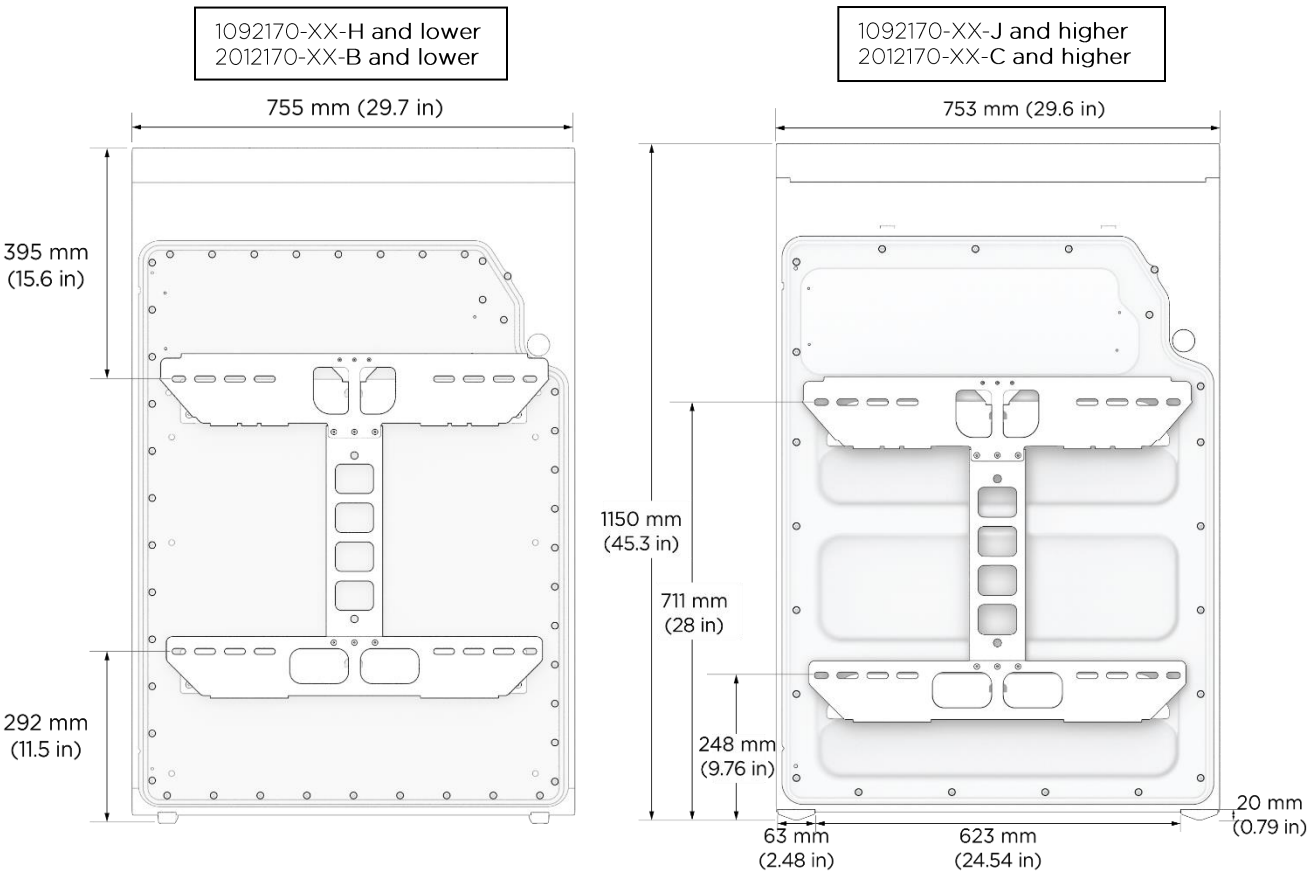


Figure 1: Powerwall 2 Mounting Bracket Dimensions

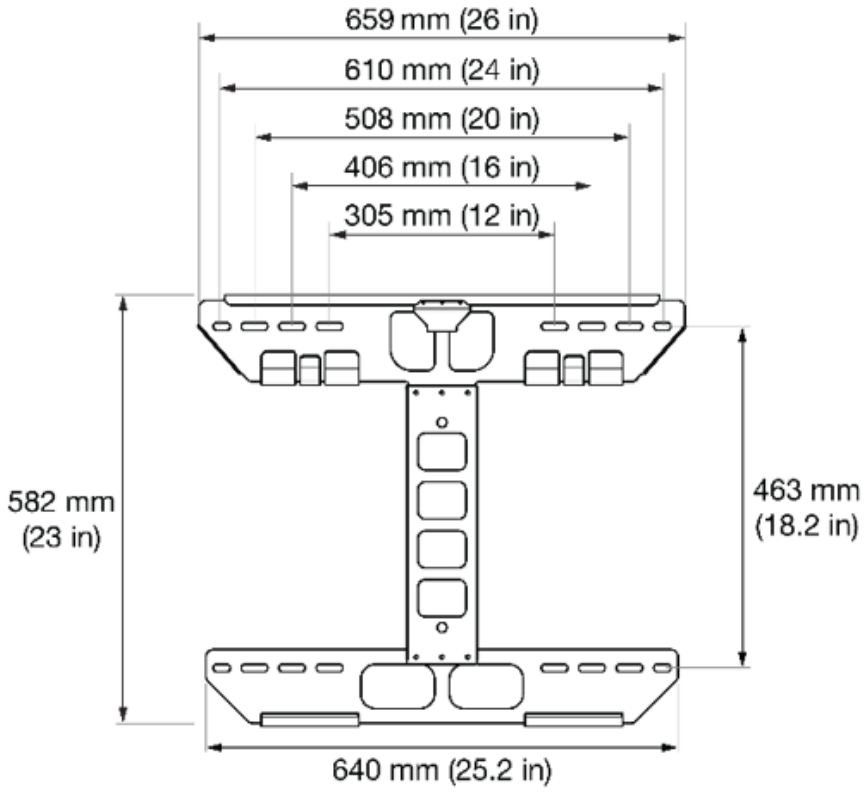


Figure 2: Powerwall 2 Mounting Bracket Dimensions

Powerwall requires adequate clearance for installation, cabling, and airflow. Do not mount any other objects within the clearance space (Figure 3), except those explicitly required by the installation (for example, conduit, a junction box, or an electrical disconnect, depending on local installation codes). 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 enable Powerwall to maintain ideal battery temperature. They 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 Dimensions and Space Requirements

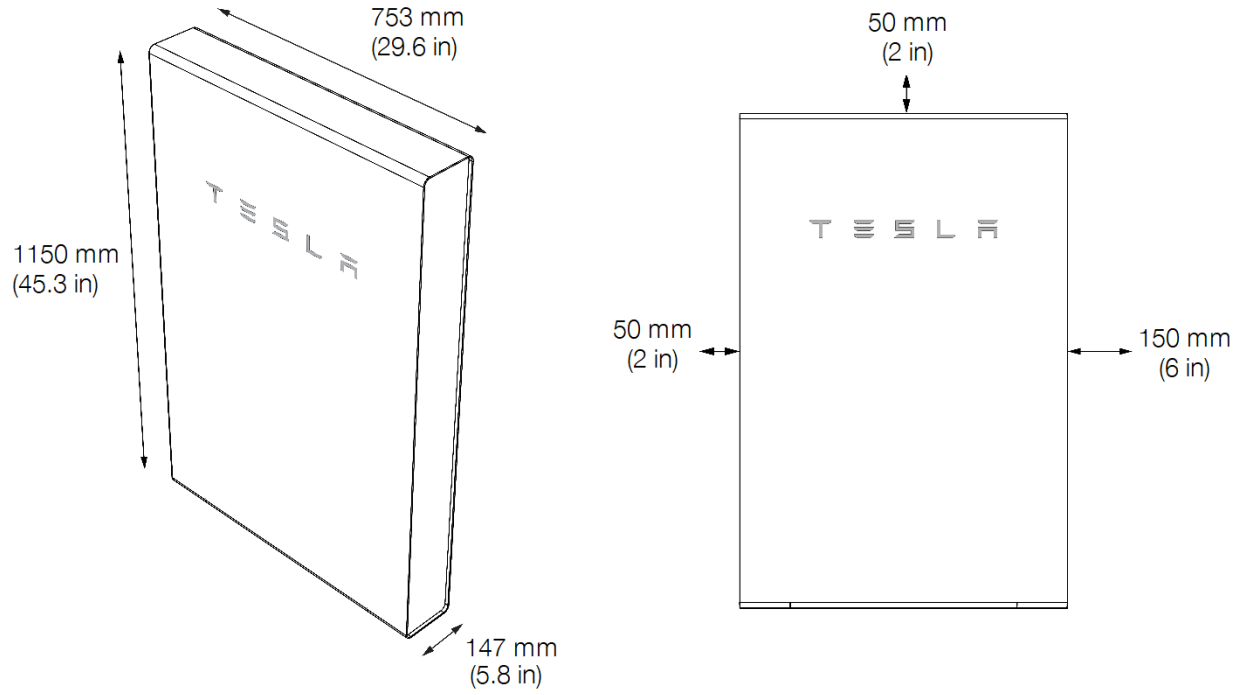


Figure 3: Powerwall 2 Dimensions and Space Requirements

Powerwall 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

Powerwall Recommended Temperature Range

Powerwall is rated to operate in temperatures from –4°F to 122°F (-20°C to 50°C). However, for best performance Tesla recommends installing Powerwall in locations with ambient temperature between 32°F to 86°F (0°C to 30°C) year round. When outside this recommended temperature range, charge 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 that experience long outages (>4 hours) in cold weather systems 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. To optimize performance, avoid installing Powerwall in locations that are exposed to the sun for extended periods.

Additionally, if stored in a cold environment 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.

Powerwall Installation Requirements

Powerwall comes with a separate Backup Gateway to enable integration with solar systems and the electrical grid. 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 switchboard 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’ 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.

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

Backup Gateway 2 Installation Requirements

The Backup Gateway must be wall-mounted and can be configured for cable entry at the rear, and top *or* bottom of the enclosure. It requires adequate clearance for installation and cable routing. Wiring and conduit (where required) must be provided by the installer. Where conduit is required, the installation must comply with local 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: Avoid installing the 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.

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.

Locate the Backup Gateway at an appropriate height and with sufficient clearance so that the glass front cover can be opened to allow for maintenance and access to any circuit breakers installed in the unit. Mount the Backup Gateway vertically and level, in the orientation shown below (Figure 4). Do not mount the Backup Gateway enclosure horizontally or upside down.

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

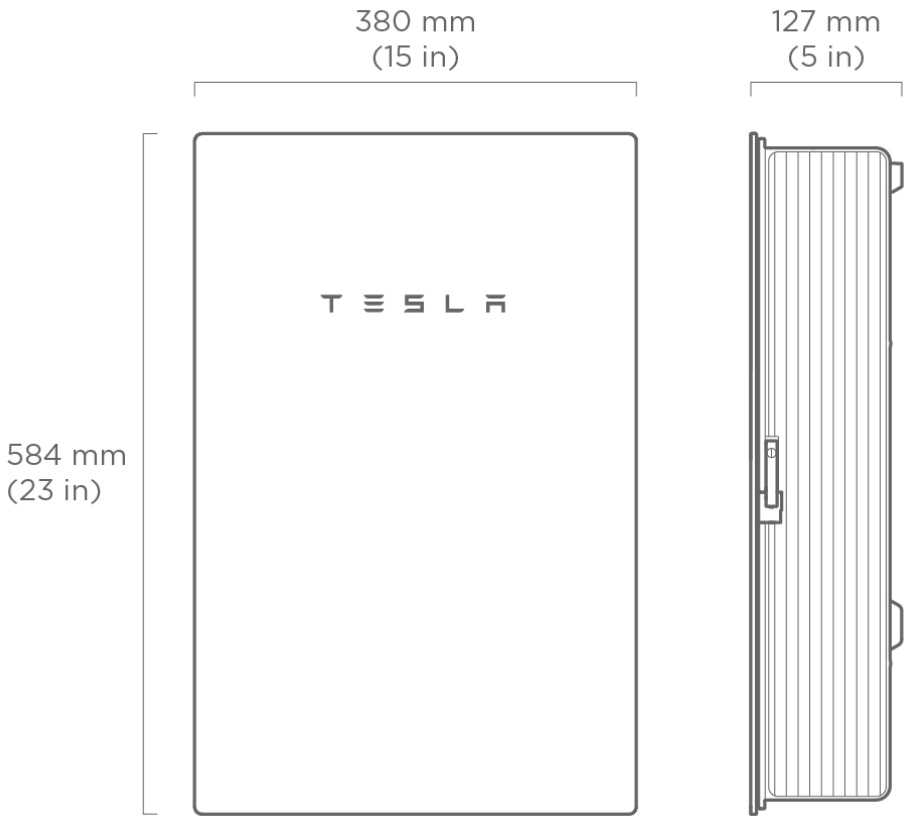


Figure 4: Backup Gateway 2 Dimensions

4. Installation Instructions

Powerwall Box Contents

- (1) Powerwall 2 AC unit
- (1) Mounting bracket
- On the outside of the box: printed Tesla *Battery Emergency Response Guide* (ERG)

Powerwall Accessory Bag Contents

- (1) 3-pin male 2-conductor AC power harness (600 V, 105 deg C)
- (2) Wago 2-position lever nuts for AC connections
- (1) 4-pin terminal block connector (black) for connection to Backup Gateway
- (1) 4-pin terminal block connector (green) with 120-Ohm terminating resistor
- (1) T20 Torx driver bit
- (1) drillable threaded cable gland for side cable entry into Powerwall, with lock washer
- (2) 25 mm reducing washers for side cable entry port into Powerwall
- (1) 32-mm reducing washer for side cable entry port into Powerwall
- (1) 35-mm rubber grommet for back cable entry port into Powerwall
- (2) shims for leveling floor-mounted units
- (1) Safety Instructions document

Backup Gateway 2 Box Contents

- (1) Backup Gateway 2
    - Enclosure
    - Backplate Assembly (stored in enclosure)
    - Deadfront cover
    - Glass front cover (with hinge and latch mechanism)
- (1) *Powerwall 2 AC Owner's Manual*
- (1) Accessory bag containing:
    - (1) Tesla solar CT (100A, split-core)
    - (1) Tesla CT extension cable harness (3 meter)
    - (1) Adhesive circuit label
    - (1) Circuit breaker blanking hole filler set
    - (1) M25 communications cable gland and insert
    - (3) 1/4-inch rubber-bonded stainless steel sealing washers for mounting
    - (5) 8mm backplate nuts

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 (for the provided 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 M3 Allen bit (for Backup Gateway power connections)
- Socket wrench with 8mm hex socket
- Wire strippers/cutters for 0.2 mm^2 to 35 mm^2 wires
- Installation tools (level, stud sensor, tape measure, pencil, painter's tape, flashlight)
- 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 "Step 3: Anchor the Powerwall Mounting Bracket")
- Backup Gateway mounting hardware
- Conduit fitting or cable gland (depending on local electrical requirements)
- Conduit or raceway (depending on local electrical requirements)
- 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)

Step 1. Plan the Installation Site

The installation location for Powerwall must accommodate placement of the Backup Gateway and meet all conditions described above in "Site Requirements." In addition, consider the following points when choosing where to install Powerwall.

Wall mounting: 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, or metal studs of sufficient gauge. Powerwall may be mounted to a max height of 1.5 m to the bottom of the enclosure.

Floor mounting: Choose a level surface adjacent to a wall space that meets all the requirements for wall mounting described above. Make sure the area is isolated from hazards that may damage the unit, such as vehicle traffic or flooding.

Cable entry: Determine whether cables will be routed into Powerwall from the side or from the back of the unit. With side cable entry, a conduit fitting or cable gland must be used to seal the entry into the wiring compartment. With back cable entry, a wire cover is used to seal the entry into the wiring compartment.

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

Backup Gateway configuration: Determine whether cable entry into the Backup Gateway will be 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.

Electrical service connection: 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.

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

Wiring Specifications

Powerwall and the Backup Gateway require power and communication cable connections as shown in the following tables. Position Powerwall, the Backup Gateway, meters, and other electrical components to minimize cable lengths, based on local code requirements.

Backup Gateway to service entry/electrical panel

Maximum Cable Gauge	Strip Length	Maximum Cable Length
35 mm^2 (2 AWG)	32 mm (1 1/4 in)	[based on local code]

Backup Gateway to Internet router

Cable Gauge	Strip Length	Maximum Cable Length
CAT5 – shielded (24 AWG only)	(RJ-45 connector)	100 m (328 ft)

Powerwall to Backup Gateway Communication / 12V Power

12V power conductors

Cable Gauge	Strip Length	Maximum Cable Length*
1.0 mm^2 (17 AWG)	10 mm (3/8 in)	35 m (115 ft)
1.5 mm^2 (16 AWG)	10 mm (3/8 in)	45 m (147 ft)

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

CAN communication conductors (shielded, twisted pair)

Cable Gauge	Strip Length	Maximum Cable Length*
0.2-1.5 mm^2 (24-16 AWG)	10 mm (3/8 in)	45 m (82 ft)

Powerwall to electrical panel

Cable Gauge	Strip Length	Maximum Cable Length
4-10 mm^2 (10-8 AWG) *	13 mm (1/2 in)	45 m (150 ft)

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

Energy Meter to Backup Gateway communication (RS485 wired connection)

Cable Gauge	Strip Length	Maximum Cable Length
0.2-1.5 mm^2 (24-16 AWG)	10 mm (3/8 in)	50 m (164 ft)
CAT5 – shielded (24 AWG only*)	10 mm (3/8 in)	50 m (164 ft)

* Do not use CAT5 – 26 AWG cable

Energy Meter - current transformer leads

Cable Gauge	Maximum Cable Length
0.25-1.5 mm^2 (24-16 AWG)	15 m (50 ft)
CAT5 - shielded (24 AWG only*)	15 m (50 ft)

* Do not use CAT5 – 26 AWG cable

NOTE: If using a custom cable for the Powerwall to Backup Gateway communications wire, it must be minimum 600V rated, shielded 4-conductor copper (Cu) cable with drain wire, and have at least one twisted pair. Ensure the communications cable selection also complies with local installation codes and regulations.

WARNING: Failure to follow these minimum wire gauge and length requirements may result in intermittent or unreliable operation of the Powerwall system due to voltage drop over the cable run. In systems that do not meet these minimum requirements, performance issues may arise after commissioning is complete.

Step 2. Transport and Unpack Powerwall

CAUTION: 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. For more information, refer to *Powerwall 2 Transportation and Storage Guidelines*.

1. Keep Powerwall in its box until ready for installation. Store the box flat on its back (front facing up) during transport. The box can be carried in any orientation to the job site.

2. Open the box by cutting the packing straps, removing the lid, and setting it aside.

3. Remove the mounting bracket.

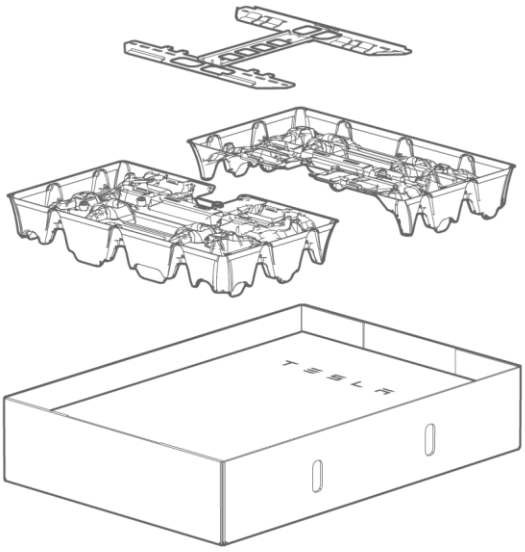


Figure 5: Removing the Mounting Bracket

4. Verify that the contents of the bracket box and accessory bag are complete and undamaged (see “Powerwall Box Contents” and “Powerwall Accessory Bag Contents,” above), and examine Powerwall for any damage. Report damage to Tesla, if found.

5. Find the bottom of Powerwall by identifying the feet at the base of the unit.

6. Open the bottom edge of the box (nearest the bottom of Powerwall) by removing the staples and folding the cardboard back.

7. Move the lift equipment into place next to the bottom of the Powerwall box.

8. Grasp the top of the Powerwall and carefully tilt it upright until it sits vertically in the box, with the front of the unit facing the lift equipment.

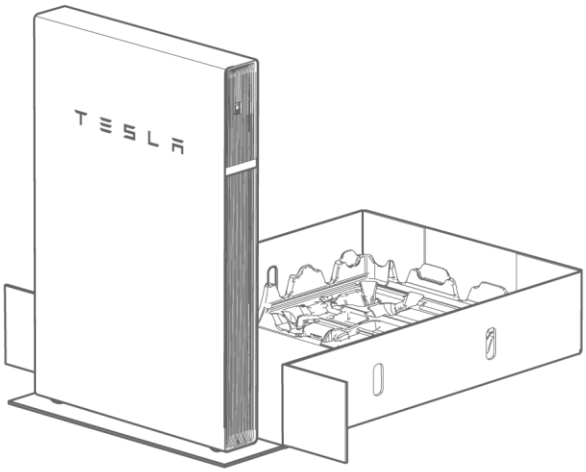


Figure 6: Removing Powerwall from Its Box

9. Position the Powerwall on the lift equipment, with the mounting cleats facing away from the lift equipment.

10. Strap the Powerwall to the lift equipment with a ratcheting tie-down strap.

Step 3. Anchor the Powerwall Mounting Bracket

1. Before mounting the wall bracket, double-check that the mounting location will allow access to the chosen cable entry port (side or back) during installation. If applicable, use a stud sensor to locate and mark the centers of the studs in the wall.

2. Determine the appropriate type and number of fasteners for the mounting bracket location. Be sure to take into account the thickness of the mounting bracket, washers, and wall material when choosing fasteners. The following guidelines apply to both wall- and floor-mount installations.

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.

NOTE: Powerwall may be mounted up to a maximum height of 1.5 m from the bottom of the enclosure.

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.

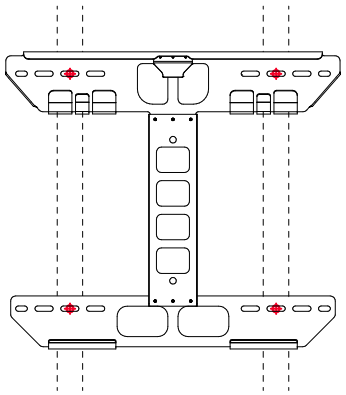


Figure 7: Anchoring the Bracket to Wood Studs

- 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.

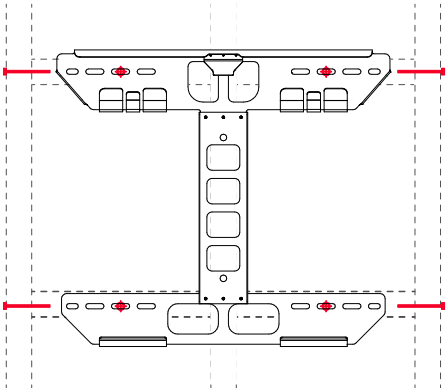


Figure 8: Anchoring the Bracket to Blocking between Wood Studs

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.

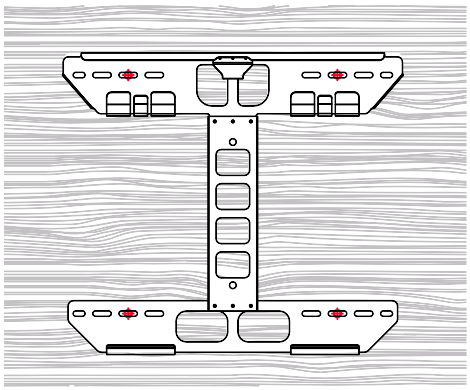


Figure 9: Anchoring the Bracket to Plywood

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.

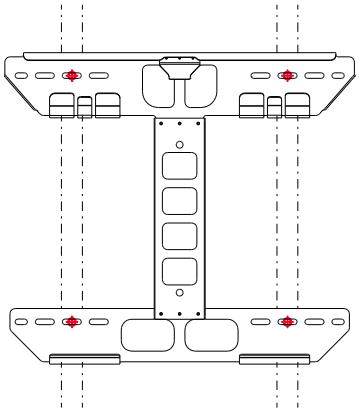


Figure 10: Anchoring the Bracket to Metal Studs

- 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.

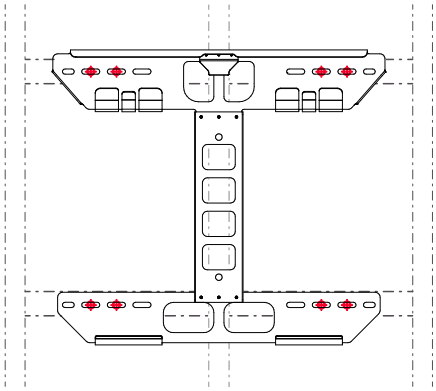


Figure 11: Anchoring the Bracket to Metal Backing

- 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.

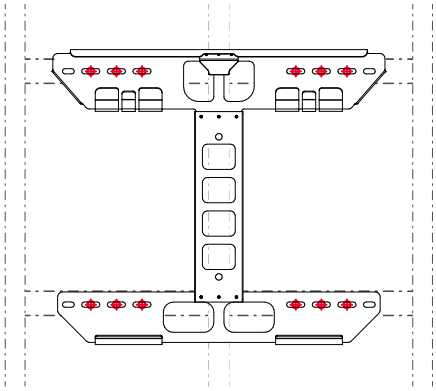


Figure 12: Anchoring the Bracket to Metal Backing – High Wind Area

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.

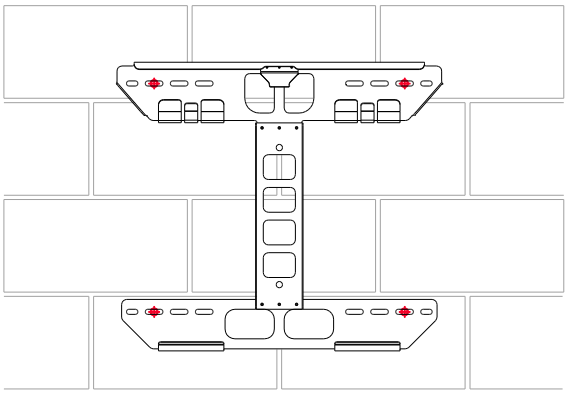


Figure 13: Anchoring the Bracket to Concrete or Masonry

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.

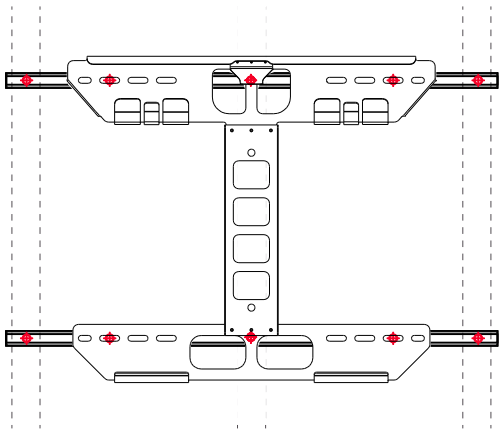


Figure 14: Anchoring the Bracket to Channel Strut

NOTE: Both floor and wall mount installations require the cleats on the back of Powerwall to be fully engaged in the mounting bracket. Consider the floor contour when measuring for floor-mounted installations.

3. Use the bracket as a guide to mark the location of pilot holes for the required fasteners. Use a level tool to ensure that the bracket is level.

4. Drill the pilot holes for the fasteners.

5. Attach the bracket to the mounting surface with the required fasteners as described above.

6. Verify that the bracket is firmly attached to the wall.

7. (Back cable entry installation only) Drill a hole in the wall that corresponds to the location of the back cable entry port on Powerwall. The diameter of the port and location of its center are shown below in relation to the Powerwall chassis (Figure 15) and in relation to the installed mounting bracket (Figure 16).

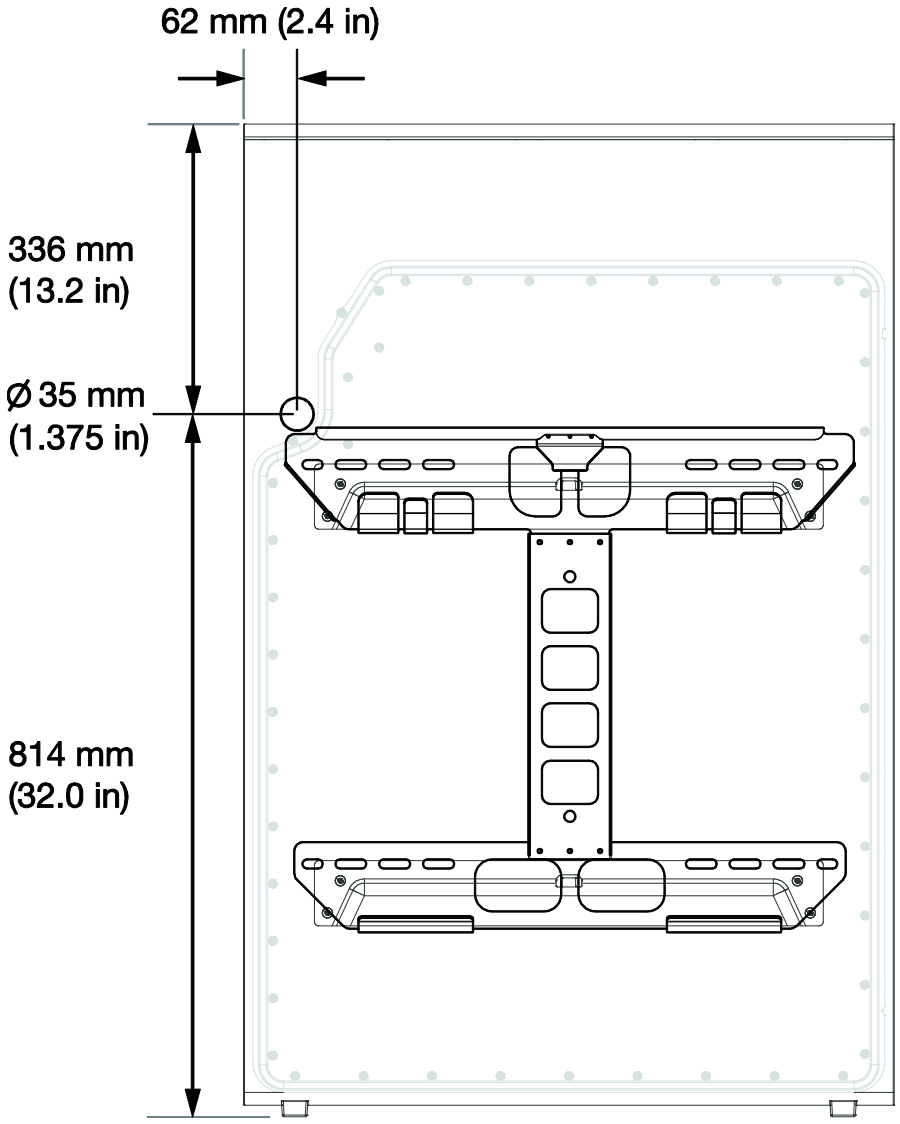


Figure 15: Back Cable Entry Port Location (Viewed from Front of Powerwall)

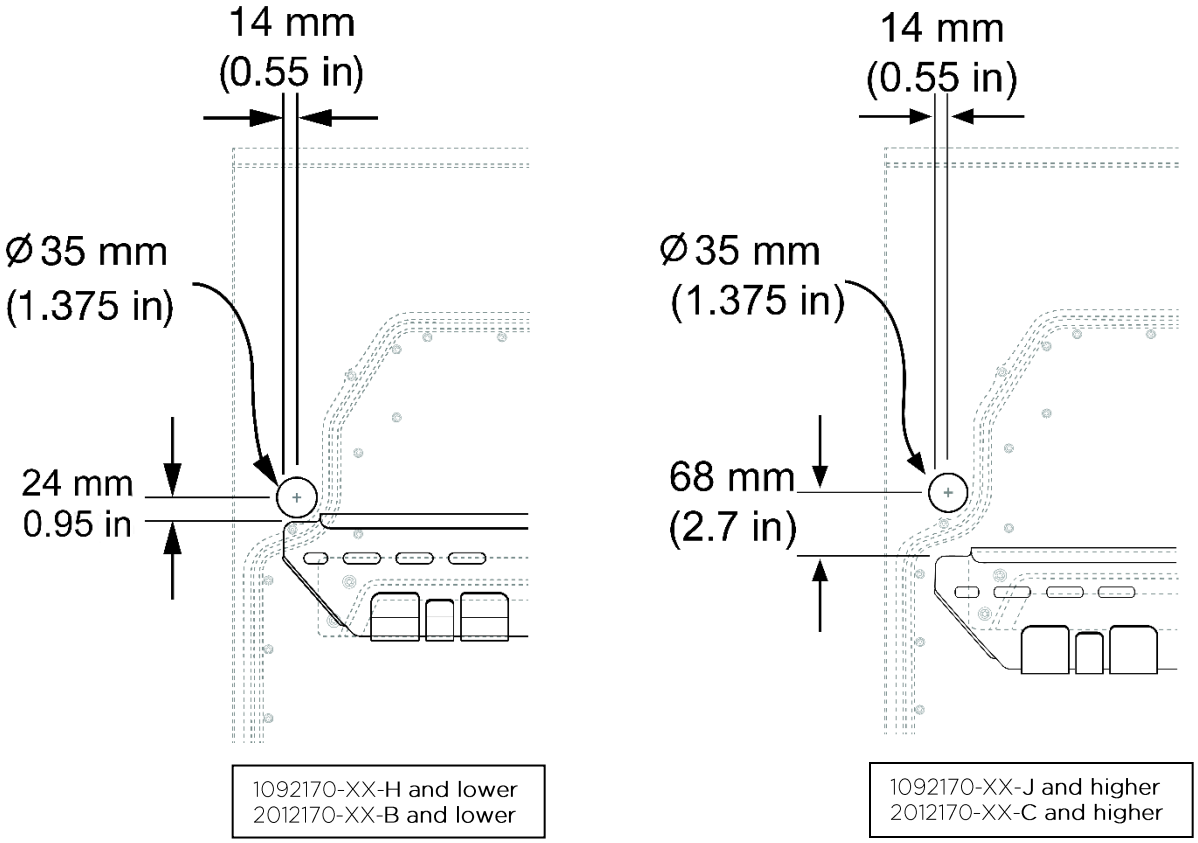


Figure 16: Back Cable Entry Port Location –DETAIL (Viewed from Front of Powerwall)

8. (Optional) Use painter's tape to mark the location of the bracket flanges on the wall, the location of the cleats on the front of the Powerwall, and the center lines of the bracket and chassis to aid in aligning the unit.

Step 4. Prepare Powerwall for Mounting

1. Switch off Powerwall by moving the switch on the right side of the unit to the OFF position.

WARNING: Switching off Powerwall disengages the Enable line but does not disconnect AC voltage. Voltage may be present on the AC connection leads unless the Backup Gateway, any associated circuit breakers, and the AC disconnect (if applicable) are switched off.

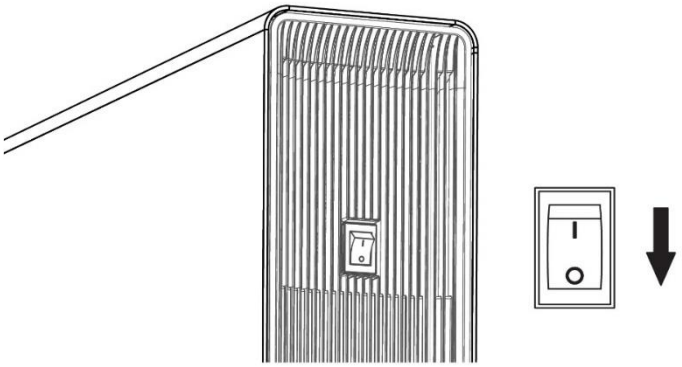


Figure 17: Switching Powerwall Off

2. Remove the left side cover from Powerwall by carefully pulling out on the plastic straps near the top and bottom of the cover, and detaching it from the clips along the length of the unit.

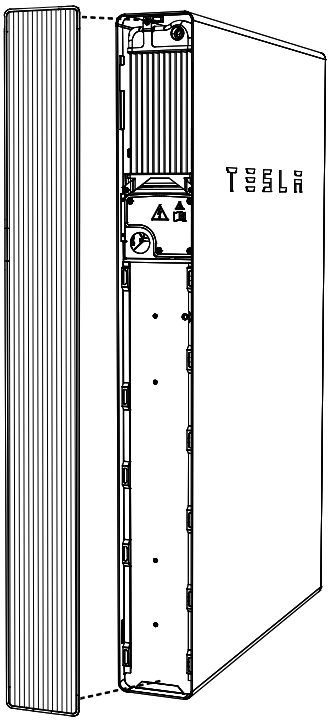


Figure 18: Removing the Left Side Cover

3. (Side cable entry installations only) Remove the side cable entry door from the left side cover by sliding it out of its slot.

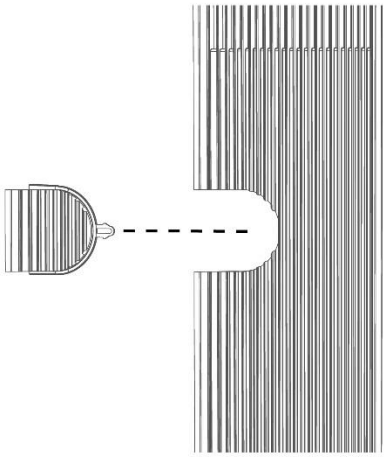


Figure 19: Removing the Side Cable Entry Door

4. (Back cable entry installations only) Remove the plug from the back cable entry port on Powerwall and place it in the side cable entry port.

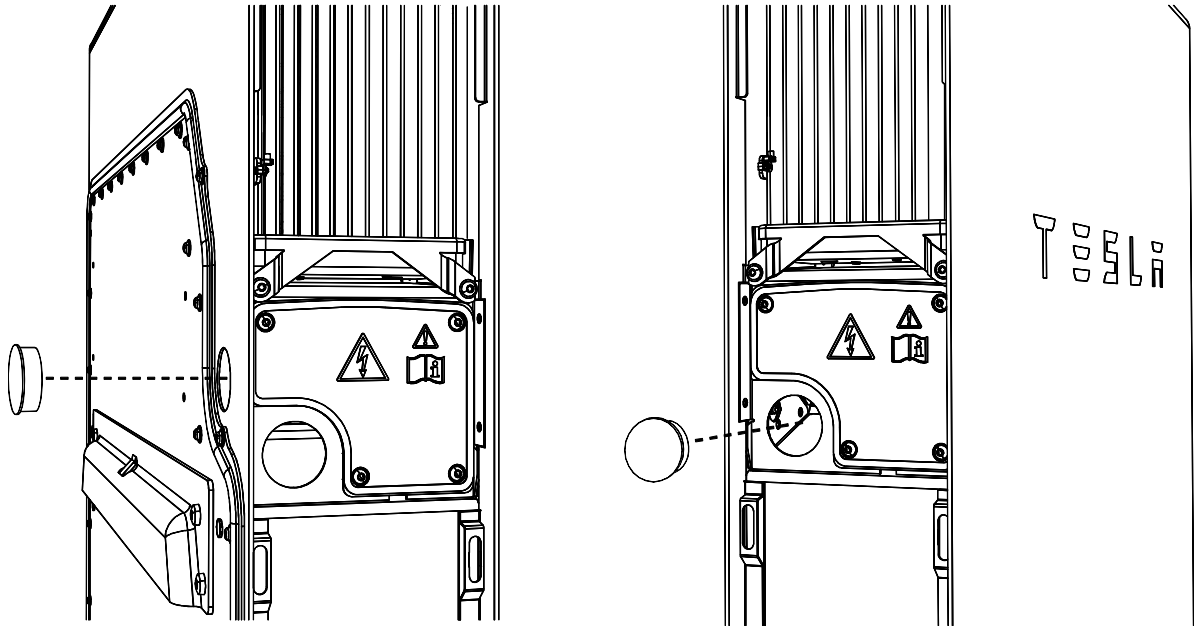


Figure 20: Moving the Back Cable Entry Plug to the Side Cable Entry Port

5. Take a photo and record the serial number of the Powerwall in the back of the Owner's Manual that came with the Backup Gateway. The serial number can be found on a label on the left side of the unit.

Step 5. Mount Powerwall on the Bracket

1. Move the lift equipment close to the wall and remove the tie-down strap securing the Powerwall to the lift equipment.

2. Adjust the height of the Powerwall so that its mounting cleats are just above the flanges on the bracket. (If the bracket and cleat locations are marked with tape, use those marks to gauge the height.)

3. Begin to lower the Powerwall so that the top cleat engages the top flange on the bracket. Ensure that the bottom cleat aligns with the bottom flange of the bracket.

4. With both cleats engaged, lower the Powerwall onto the bracket. When the cleats are seated in the bracket, the locking mechanism at the center of the top flange should click 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.

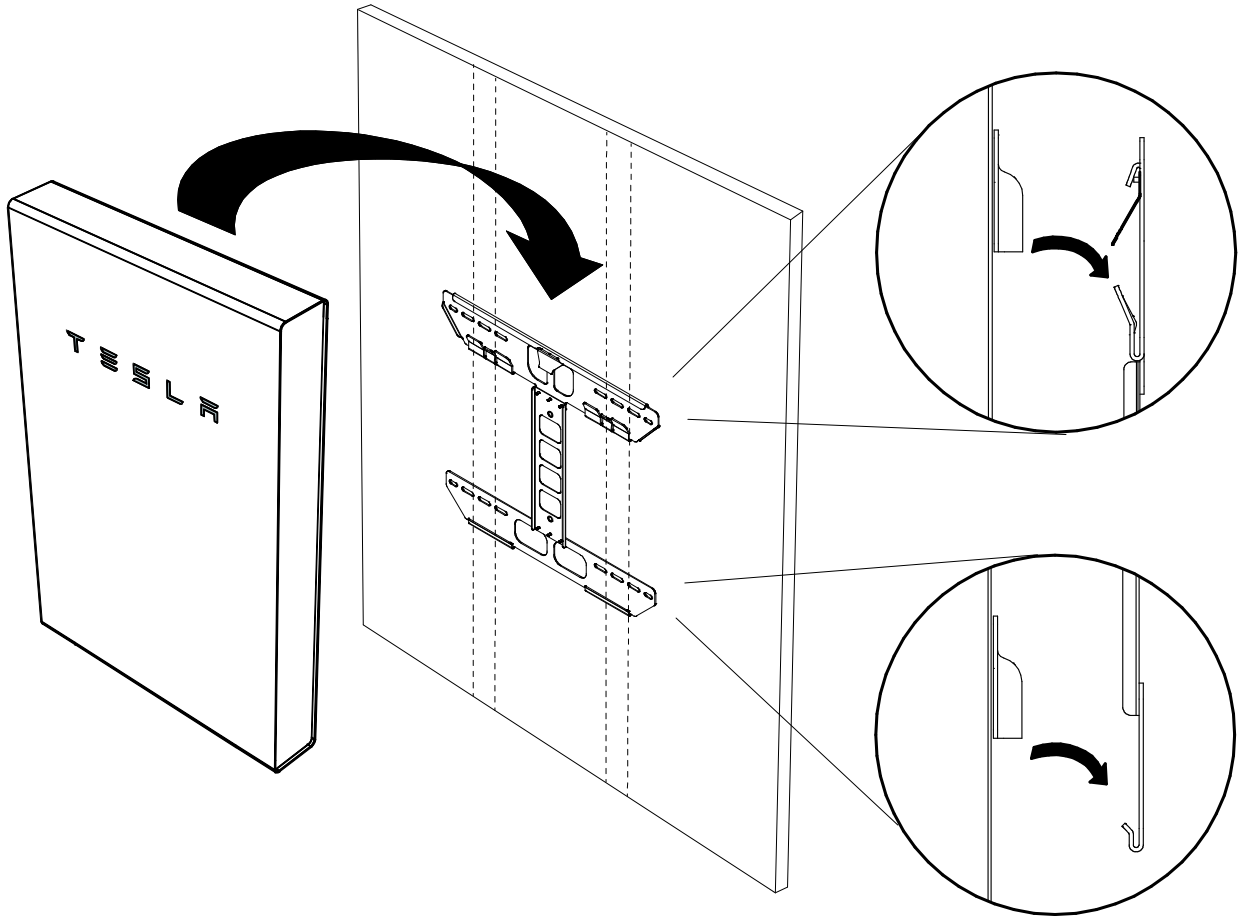


Figure 21: Mounting Powerwall on the Bracket

5. Make sure the unit is centered on the bracket, and ensure that the Powerwall mounting cleats are fully seated in both upper and lower bracket flanges. (If the center lines of the chassis and bracket are marked with tape, use those marks to align the centers.)

6. (Floor mount installations only) Use the provided 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.

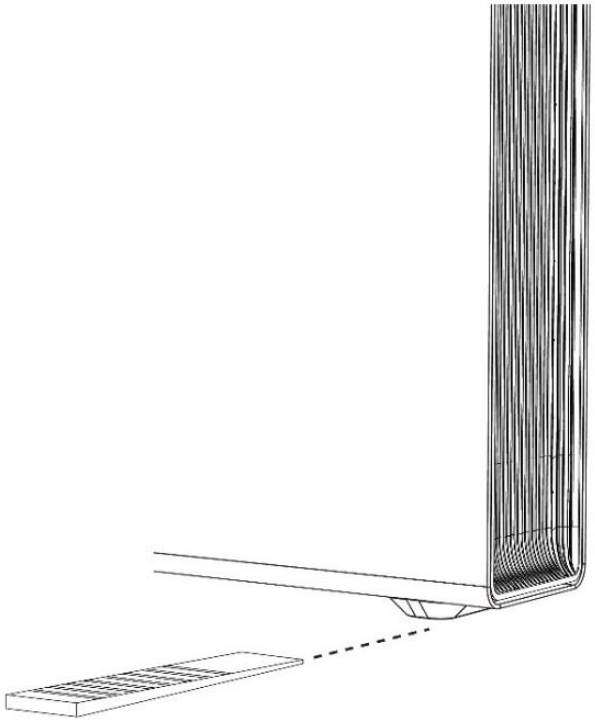


Figure 22: Leveling Powerwall with a Shim

NOTE: Updated versions of Powerwalls (see Figure 1) include ability to remove feet for aesthetics. Remove the feet for any wall-mounted installations. Do not remove if ground-mounted.

Step 6. Unpack and Prepare the Backup Gateway 2 for Mounting

1. Open the Backup Gateway packaging and verify that the contents are complete and undamaged (see "Backup Gateway 2 Box Contents," above).

2. Remove the box containing the Glass Front and Deadfront cover from the packaging and set it aside.

3. Carefully remove the enclosure and backplate assembly from the Backup Gateway packaging.

4. Holding the backplate assembly by the handle and DIN rail (do not lift it by the antenna), lift it out of the enclosure and the packaging.

5. Take a photo and record the serial number of the Backup Gateway in the back of the Owner's Manual that came with the system. The serial number can be found on a label on the Deadfront Cover as well as on the backplate of the unit.

6. Based on whether cable entry to the Backup Gateway will be from the top, bottom or back of the enclosure, use a hole saw to drill out the necessary cable access holes according to the table below, based on the orientation and wiring scheme. This should be done before mounting the enclosure. Do not attempt to use a hammer and driver to knock out the access holes.

NOTE: An M25 2-hole cable gland is provided for communication wiring (for Ethernet connection to a Internet router and for Powerwall communication wiring).

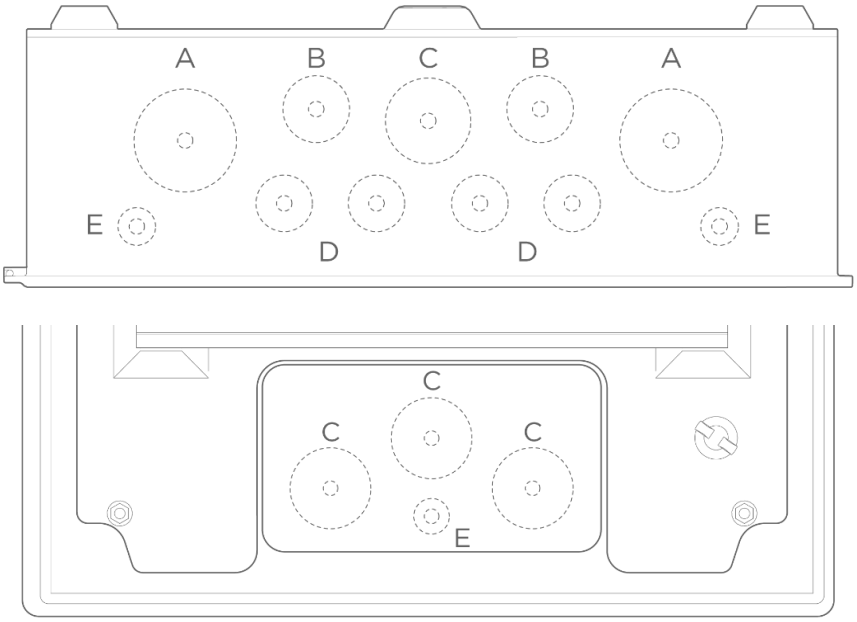


Figure 23: Top/Bottom (above) and Back (below) Cable Access Drill Guides

Drill Guide Diameters	
A	M40 (1.6 in), expandable to M50 (2 in)
B	M25 (1 in)
C	M32 (1.25 in)
D	M20 (0.8 in)
E	M12 (0.5 in)

Step 7. Mount the Backup Gateway 2

1. Determine the mounting location (see Backup Gateway 2 Installation Requirements above). The Backup Gateway enclosure has 3 mounting holes (shown in red below).

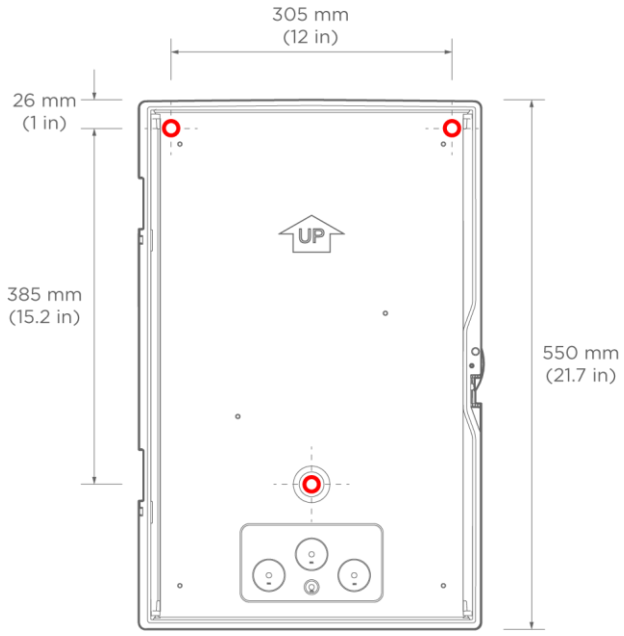


Figure 24: Backup Gateway Mounting Hole Locations (Front View of Enclosure)

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

2. Determine the appropriate type of fastener for the mounting location. The pre-drilled holes accept fasteners up to 6 mm (1/4 in) in diameter. Fasteners should have a flat bearing surface to ensure mounting holes are sealed. Take into account the thickness of the enclosure, washers, and wall material when choosing fasteners.

3. Using the empty enclosure as a guide to locate the mounting points, level the unit and mark the hole locations on the mounting surface.

4. Drill pilot holes in the mounting surface for the fasteners and install appropriate fastener anchors.

5. Attach the Backup Gateway enclosure to the mounting surface, using the supplied washers to seal the mounting holes from the inside of the enclosure.

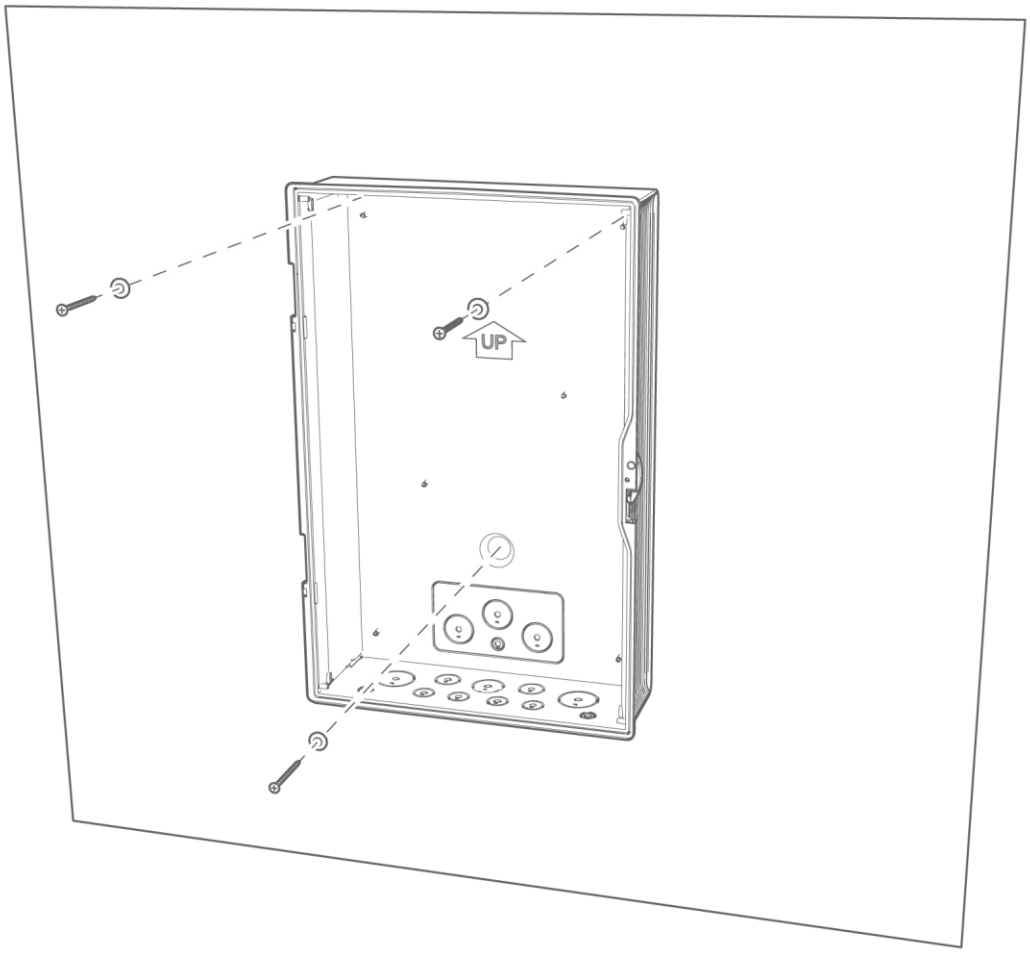


Figure 25: Mounting the Backup Gateway Enclosure

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

6. 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.

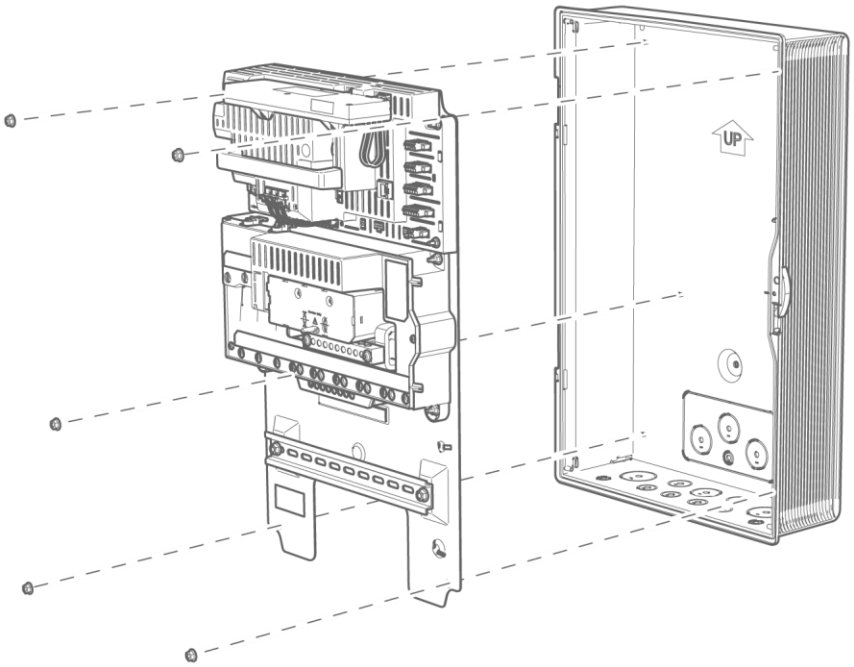


Figure 26: Installing the Backplate for Bottom Cable Entry

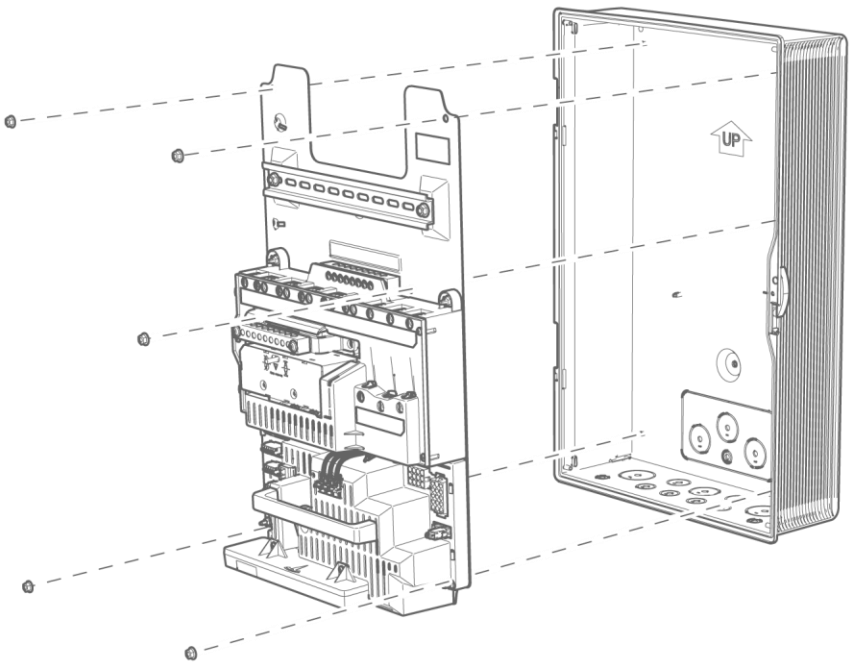


Figure 27: Installing the Backplate for Top Cable Entry

Step 8. Verify the Earthing and 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 Backup Gateway supports two Neutral-to-Earth connection schemes:

- *All-Pole Disconnection*
- *Line Conductor Disconnection Only*

Earthing Scheme in Australia and New Zealand

Installations in Australia and New Zealand on TN-C-S Networks use a ***Line Conductor Disconnection Only*** scheme. Neutral and Protective Earth are separated at the main switchboard, and the MEN (Multiple Earthed Neutral) link is maintained a single point of connection between Neutral and Protective Earth even when the system is disconnected from the grid.

Line Conductor Disconnection Only is the factory default configuration. It is enabled with the N-N Jumper Bar in place (Figure 28) and Switched Earth Jumper (Figure 29) ***not in place***.

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 is in place according to regional and local requirements.

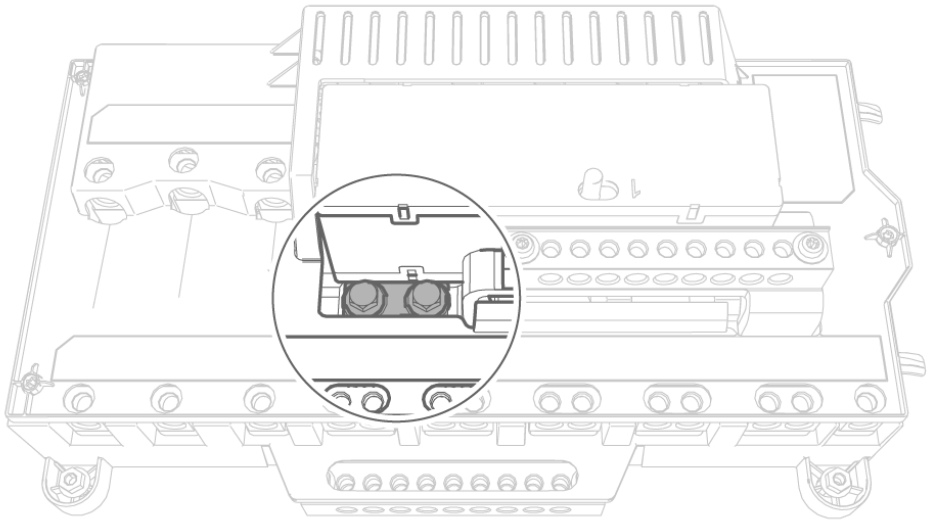


Figure 28: Line Conductor Disconnection Only is enabled with the factory-installed N-N Jumper Bar

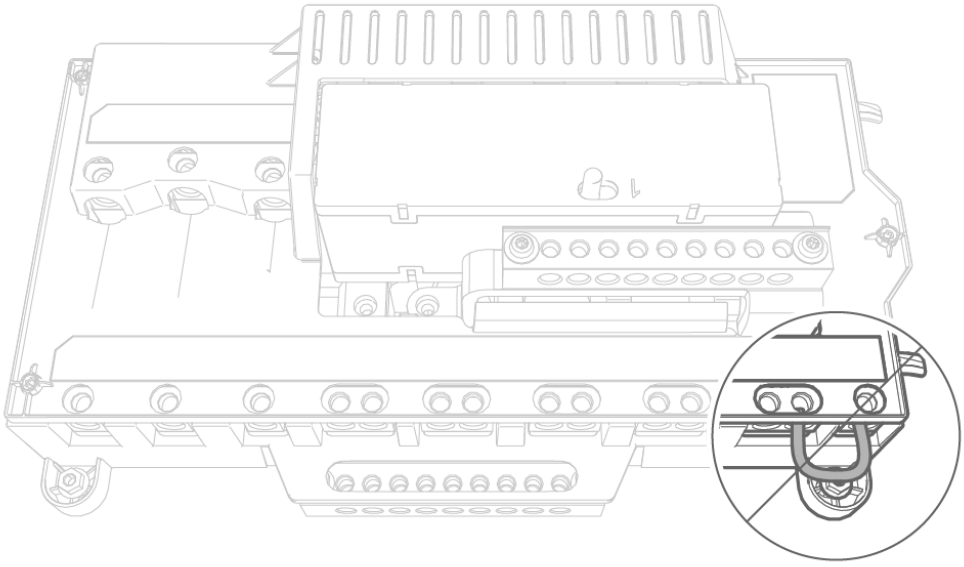


Figure 29: Neutral to Switched Earth (N-PE) Jumper should not be in place

Step 9: Make AC Power Connections to Supply and Load Panels

Backup Gateway 2 serves as the central energy hub for the home, connecting the various components of the system. This section details the AC power connections inside the Backup Gateway:

- Mains supply
- Home load switchboard
- Non-Backup home load switchboard (for 3-phase loads and/or partial home backup)
- Powerwall and Solar generation circuit breakers

During a power outage, connections on the Home/Backup side are electrically isolated from connections on the Supply and Non-Backup side of the Backup Gateway's relay.

In each of the following steps,

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

Refer to **Appendix B** for example system wiring diagrams.

NOTE: For single-phase service, the line conductor must be connected to terminals marked L1. For three-phase service L1, L2, and L3 are used for line conductors.

WARNING: 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.

WARNING: Always ensure all equipment is safely de-energized and locked out prior to working, to prevent risk of electric shock.

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

1. Connect the mains service conductors (Line(s), Neutral, and Protective Earth) from after the DNO fuse or main switchboard (depending on the backup configuration) to the Backup Gateway's Supply terminals according to the following table and diagram.

NOTE: If there is no main breaker or switch upstream of the Backup Gateway, it is recommend that a switch or circuit breaker may be installed inside the Backup Gateway on the DIN rail, for isolating the system from mains conductors during service.

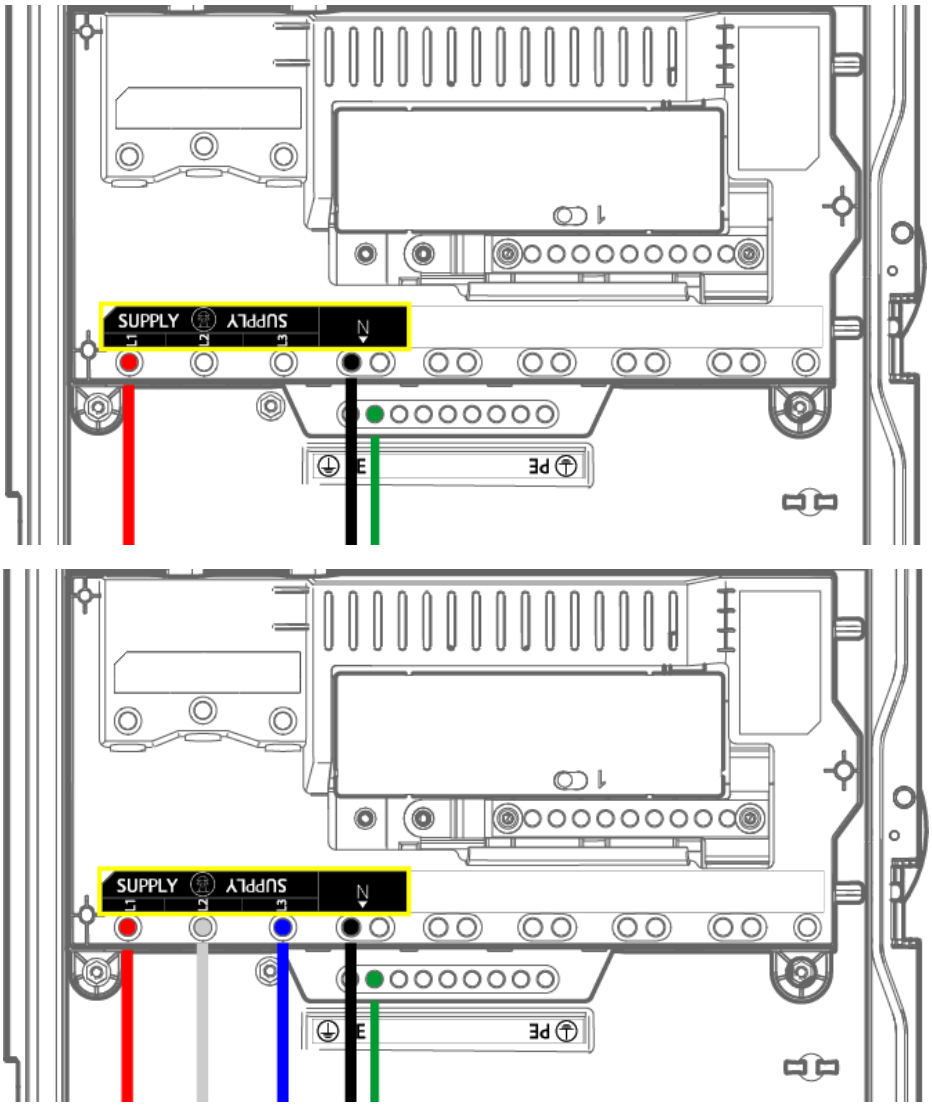


Figure 30: Connecting Supply Conductors, single phase (above) or 3-phase (below)

Supply Conductor	Backup Gateway Terminal	Max Wire Gauge
Line 1	Supply L1	35 mm²
*Line 2**	*Supply L2*	*35 mm²*
*Line 3**	*Supply L3*	*35 mm²*
Neutral	Supply N	35 mm²
PE	Earthing Bar (Ground)	25 mm²

* *Three-phase sites only*

2. Connect the conductors (Line(s), Neutral, and Protective Earth) from the downstream home load panel to the Backup Gateway's Backup terminals.

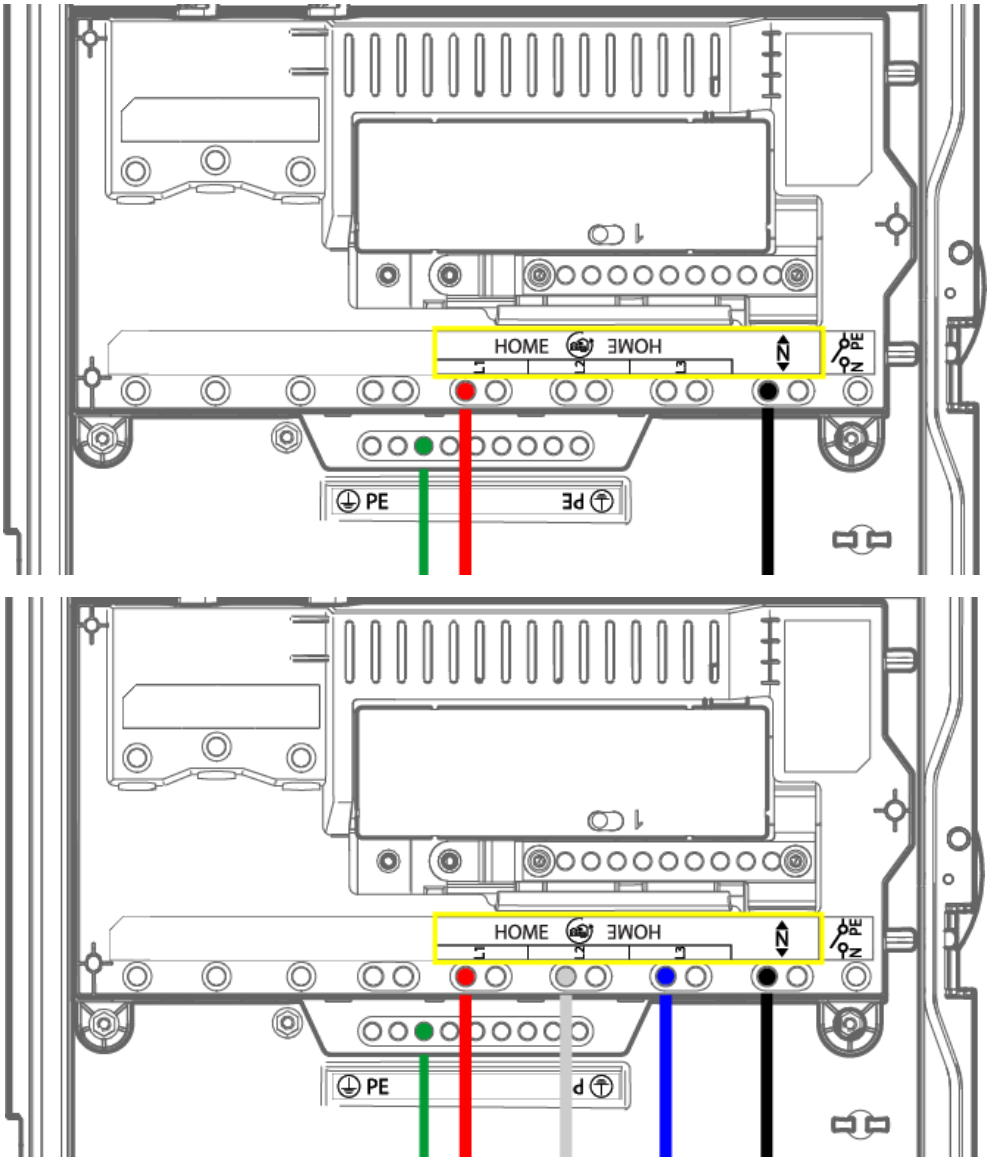


Figure 31: Connecting Home Load Panel, single-phase (above) or 3-phase (below)

Home Load Panel Conductor	Backup Gateway Terminal	Max Wire Gauge
Line 1	Backup L1	35 mm^2
*Line 2**	*Backup L2*	*35 mm^2*
*Line 3**	*Backup L3*	*35 mm^2*
Neutral	Backup N	35 mm^2
PE	Earthing Bar (Ground)	25 mm^2

* *Three-phase sites only*

3. The Backup Gateway includes a set of Non-Backup terminals. Any circuits connected here will *not* be powered when disconnected from the grid. During on-grid operation, these circuits are metered by internal site metering (see "Step 12. Install Energy Metering for the System").

Non-Backup circuits include: 3-phase PV inverters, 3-phase loads, Large single-phase loads.

Connect the conductors (Line(s), Neutral, and Protective Earth) from the Non-Backup panel to the Backup Gateway's Non-Backup terminals.

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

CAUTION: Non-Backup terminals should not exceed 80 A per phase. Site design should not attempt to install additional loads beyond what the grid connection can support.

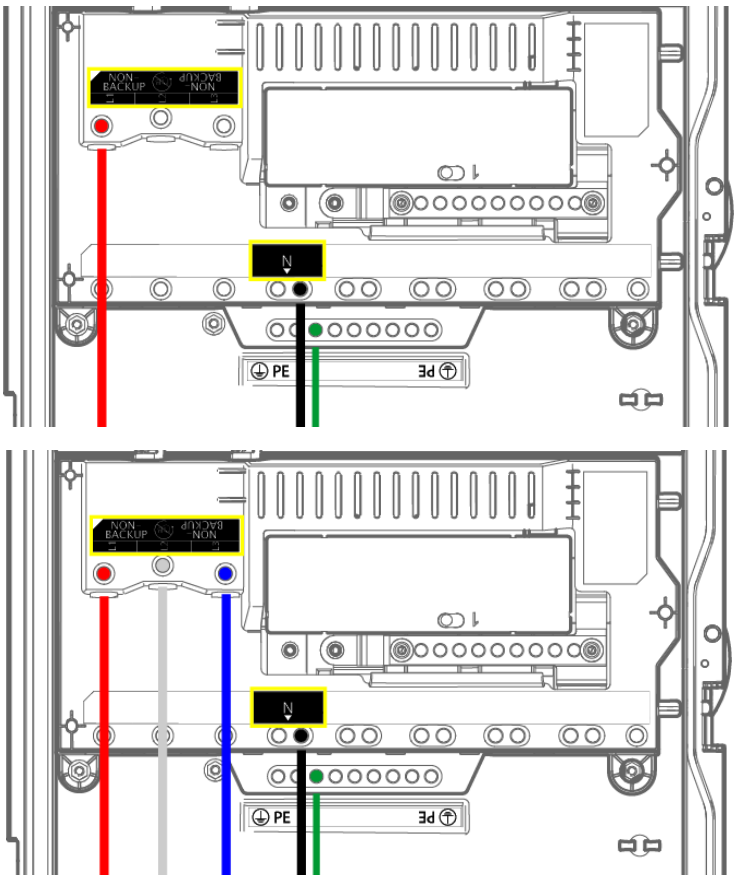


Figure 32: Connecting Non-Backup Panel, single-phase (above) or 3-phase (below)

Non-Backup Panel Conductor	Backup Gateway Terminal	Max Wire Gauge
Line 1	Non-Backup L1	35 mm^2
*Line 2**	*Non-Backup L2*	*35 mm^2*
*Line 3**	*Non-Backup L3*	*35 mm^2*
Neutral	Supply N	35 mm^2
PE	Earthing Bar (Ground)	25 mm^2

* *Three-phase sites only*

Step 10. Install Powerwall and Single-Phase Generation Breakers in the Backup Gateway

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

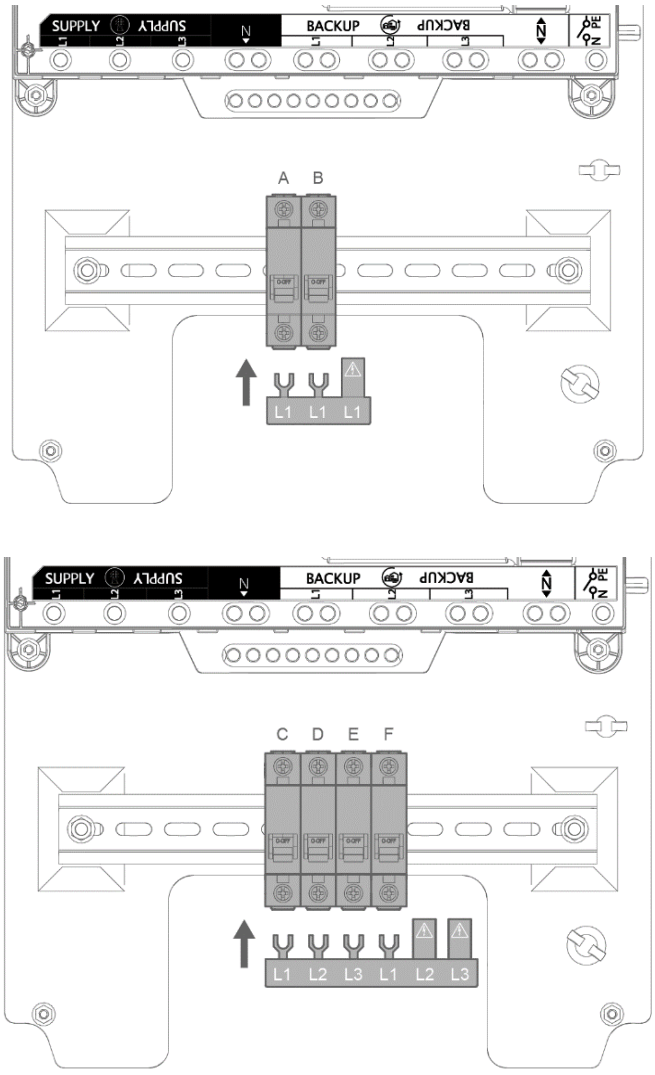


Figure 33: Installing Breaker Busbar,
Example for single-phase (above) or 3-phase (below)

Example Generation Circuit Breaker Configurations	
A	Powerwall #1, single-phase
B	1-phase PV inverter, single-phase
C	Powerwall #1, phase A*
D	Powerwall #2 phase B
E	Powerwall #3, phase C
F	1-phase PV inverter, phase A*

**where phase A is the selected Backup Phase (3-phase installation)*

NOTE: The Backup Gateway 2 can accommodate up to nine (9) 1-pole spaces on the DIN rail (generation circuits and/or main switch).

NOTE: The Powerwall connection to the Backup Gateway requires a 32 A circuit breaker. This breaker serves as the disconnect for the Powerwall, and must be wired in accordance with local wiring codes and regulations.

2. Connect the line conductors from the bussed generation circuit breakers to the Backup Gateway's Backup terminals (Figure 34). These conductors must be appropriately rated to carry the current of the main overcurrent protection device.

3. Connect Neutral and PE conductors from Powerwall and generation circuits to the Neutral and PE wiring bars, respectively.

NOTE: For AC power connections to Powerwall, use 6–10 mm^2 copper (Cu) wire

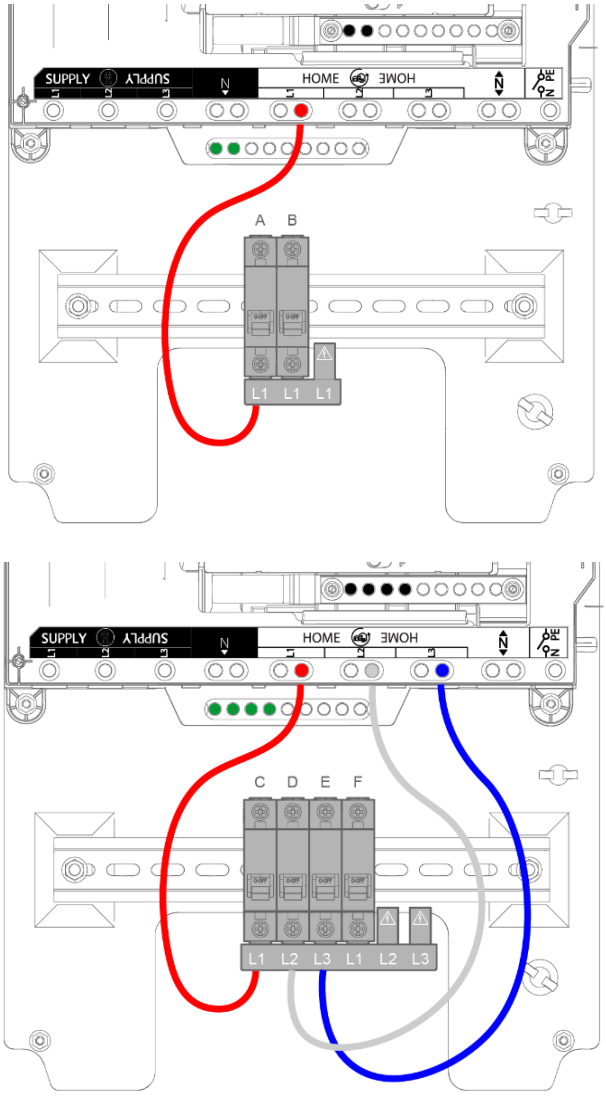


Figure 34: Wiring single-phase generation breakers,
Example for single-phase (above) or 3-phase (below)

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

CAUTION: The Backup Gateway 2 is rated to 10 kA maximum supply fault current. Where local regulation requires a 10 kA rating, Powerwall and solar circuit breakers installed inside the Backup Gateway 2 should also be rated to 10 kA.

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.

Step 11. Connect Powerwall to Backup Gateway

1. Using the provided Torx T20 bit, remove the cover from the wiring compartment on the left side of Powerwall.

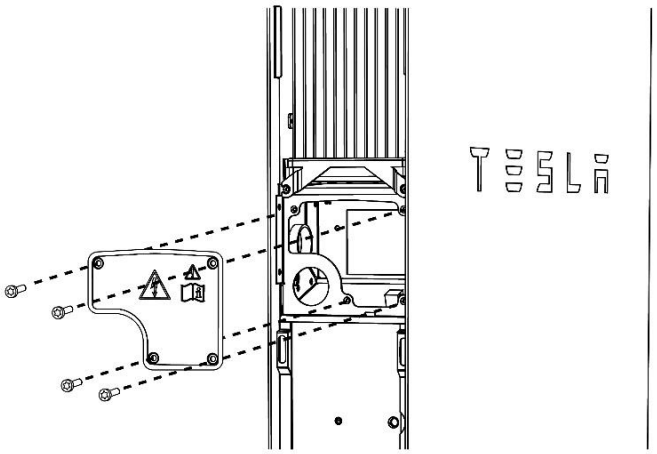


Figure 35: Removing the Wiring Compartment Cover

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.

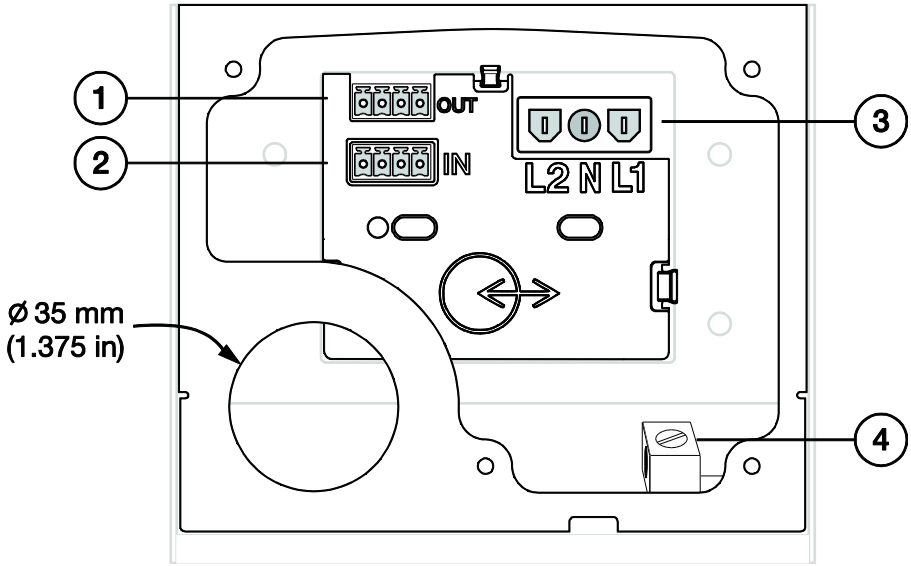


Figure 36: Powerwall 2 AC Wiring Compartment Inlet and Connectors

1	Communication OUT Connector (for daisy-chaining multiple Powerwalls)
2	Communication IN Connector (for single Powerwall or each Powerwall in a chain)
3	AC Connector
4	Earth Terminal

2. (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.

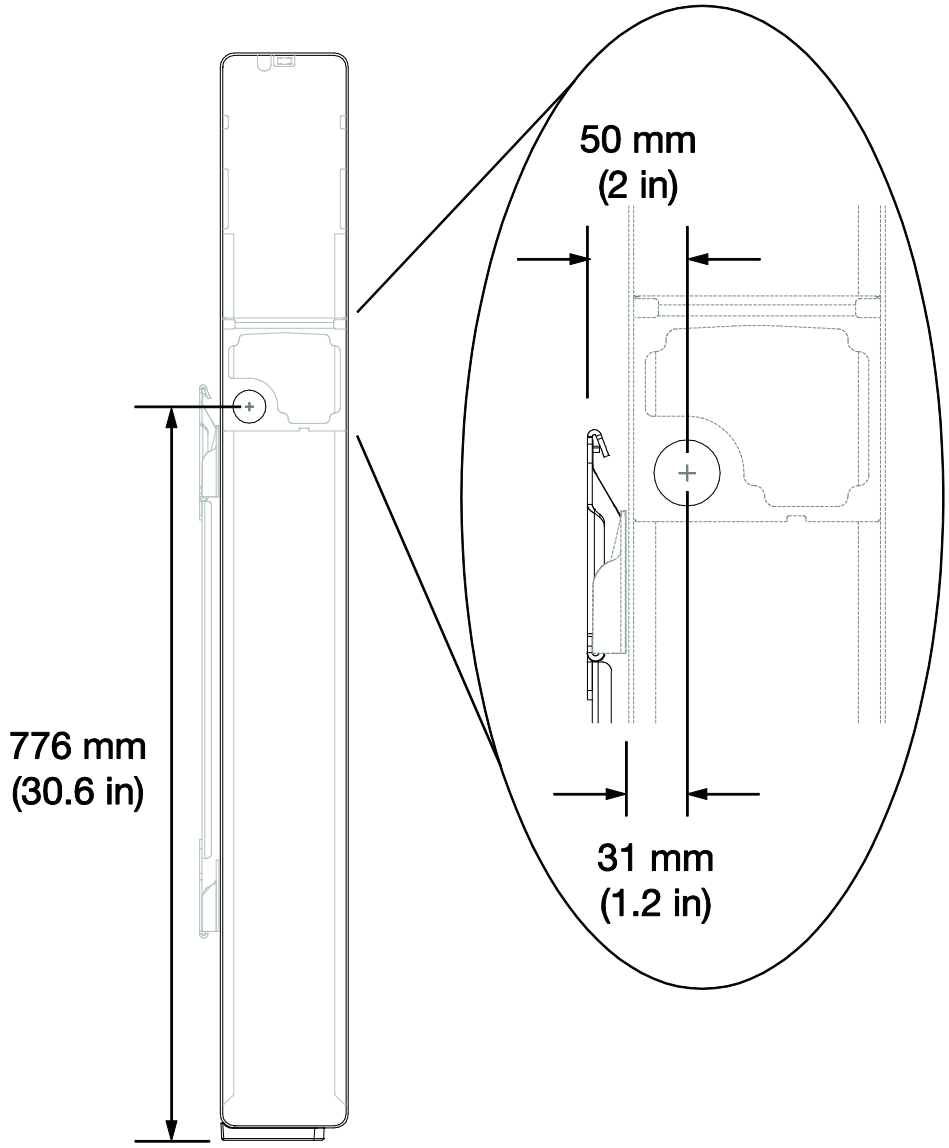


Figure 37: Powerwall 2 AC Side Cable Port Entry location

3. (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.

4. 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.

5. At the Powerwall, strip the ends of the AC and attach them to the corresponding leads on the AC power harness (Figure 38) according to the following table:

230 V Single-Phase Service		
Circuit Breaker in Backup Gateway	**Powerwall Terminal Name**	**Wire Gauge***
Line 1	L1	4–10 mm^2
Neutral	L2	4–10 mm^2

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

(2) Wago lever nuts are provided for use with up to 6 mm^2 cable. If 10 mm^2 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 mm^2 cables. **Follow all code wiring requirements.**

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

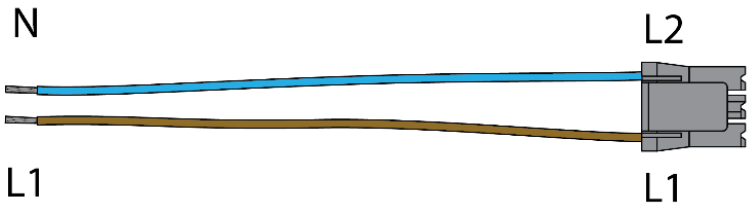


Figure 38: AC Power Harness

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

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

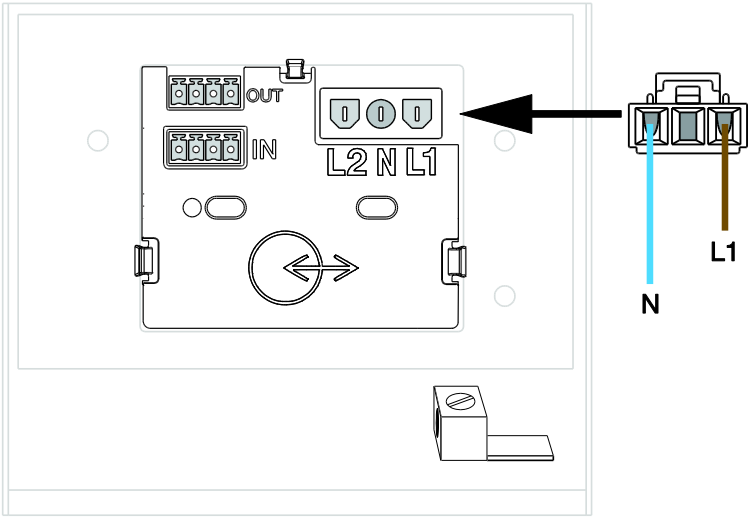


Figure 39: Powerwall 2 AC Power Harness Connection

7. On each end of the 4-conductor communication cable, strip and insert the wires into the provided 4-pin Phoenix connectors according to the following table and diagram (Figure 40). On the Powerwall side, use the black Phoenix 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.

8. On the Backup Gateway side of the 4-conductor communication cable, cut the cable shield. *The shield should be terminated at the Powerwall chassis Earth terminal only.*

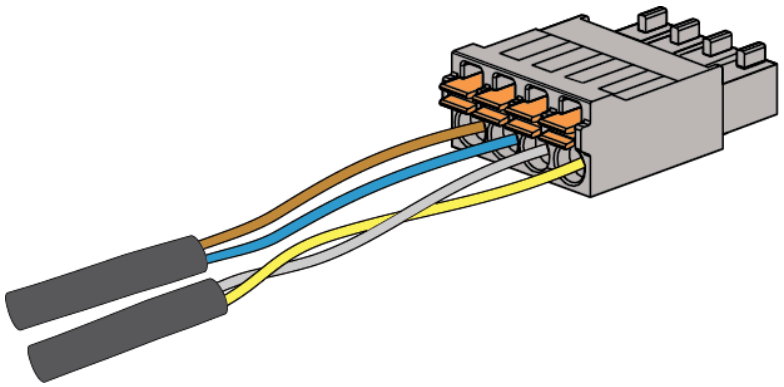


Figure 40: Communication Connector Wiring

Communication Connector Wiring		
Terminal	**Connector Terminal Name**	**Recommended Wire Color**
1	12V + (Logic +)	Brown
2	GND (Logic –)	White
3	CAN HI	Blue
4	CAN LO	Yellow
Cable Shield/Drain Wire		(Terminate at Powerwall chassis Earth terminal only)

12V power conductors

Cable Gauge	**Strip Length**	**Maximum Cable Length***
1.0 mm^2 (17 AWG)	10 mm (3/8 in)	35 m (115 ft)
1.5 mm^2 (16 AWG)	10 mm (3/8 in)	45 m (147 ft)

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

CAN communication conductors (shielded, twisted pair)

Cable Gauge	**Strip Length**	**Maximum Cable Length***
0.2-1.5 mm^2 (24-16 AWG)	10 mm (3/8 in)	45 m (82 ft)

NOTE: The twisted pair is used for the CAN HI and CAN LO conductors.

NOTE: Failure to follow these minimum wire gauge and length requirements may result in intermittent or unreliable operation of the Powerwall system due to voltage drop over the cable run. In systems that do not meet these minimum requirements, performance issues may arise after commissioning is complete.

9. On the Backup Gateway side, plug the 4-pin Phoenix connector into the 4-pin socket labelled “Powerwall”. Tighten screws on the connector.

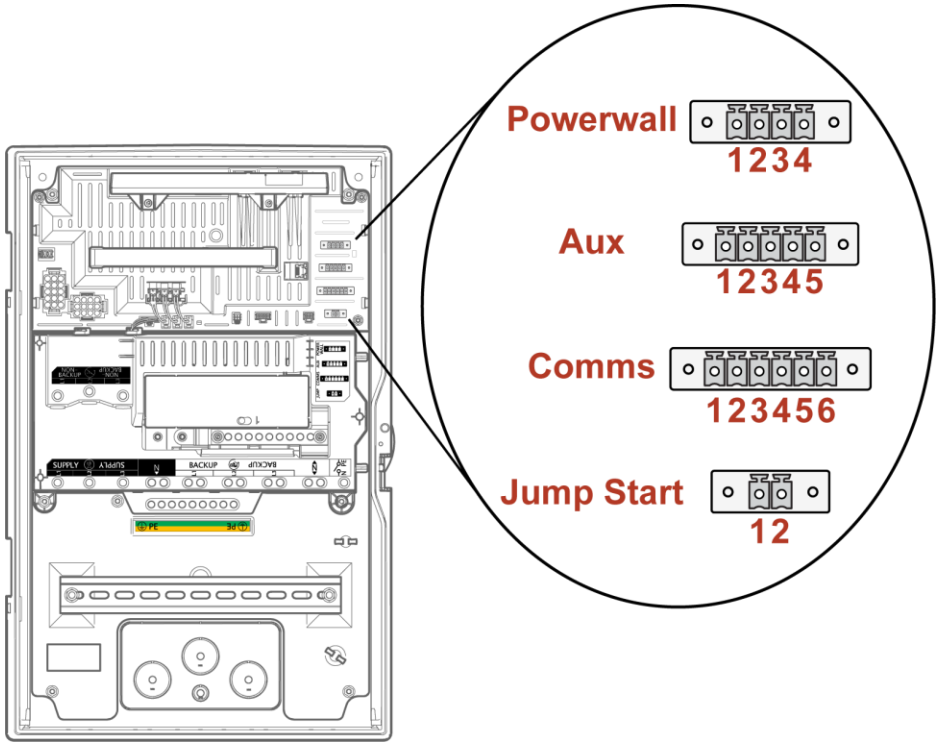


Figure 41: Backup Gateway Communication Connections

10. On the Powerwall side, plug the 4-pin Phoenix connector into the bottom 4-pin socket (labeled “IN”) in the Powerwall wiring compartment.

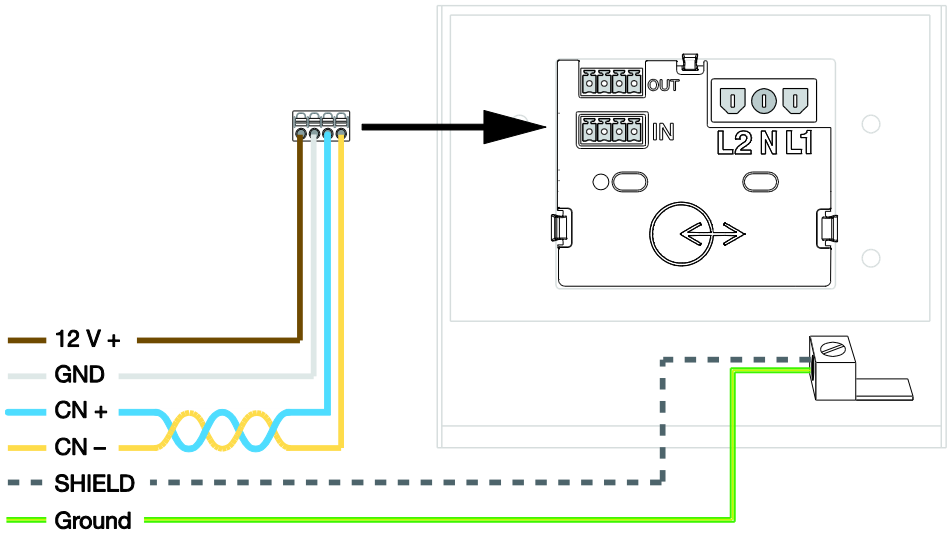


Figure 42: Powerwall Earth/Ground and Communication Connections

11. Plug the provided 4-pin Phoenix 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.)

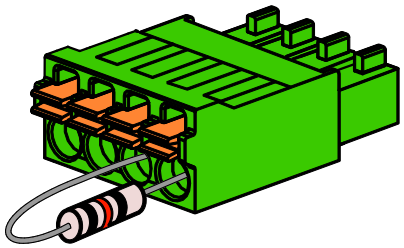


Figure 43: Connector with Terminating Resistor

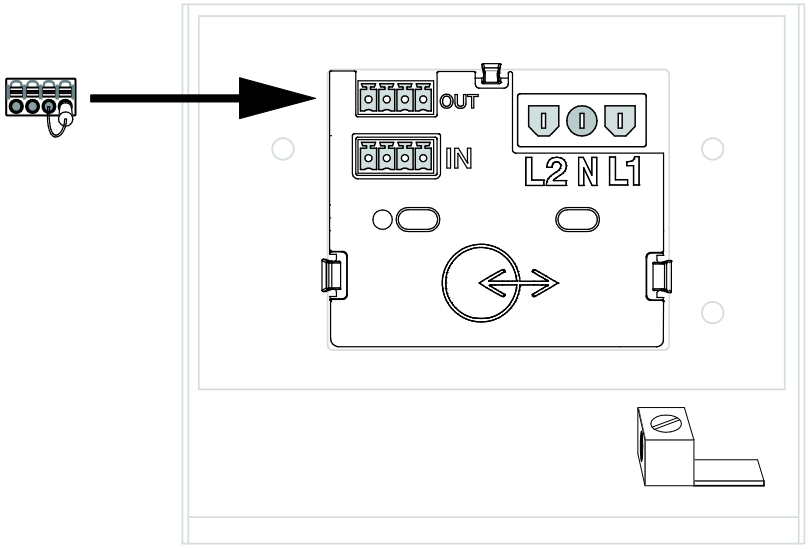


Figure 44: Powerwall Communication Termination

12. On the Powerwall side, strip the end of the equipment grounding conductor and wrap the communication cable drain wire around the grounding conductor lead.

13. Insert the grounding conductor and drain wire in the Powerwall chassis Earth terminal (Fig 43). The Earth terminal is identified with the following symbol: ⏚. Tighten the screw in the Earth terminal to 4.5 Nm.

Step 12. Install Energy Metering for the System

Metering and current transformers (CTs) installation depends on the backup configuration of the system (whole home or partial home) and presence of PV inverter(s).

The Backup Gateway 2 includes embedded voltage measurement, site CTs, and connections for solar CTs.

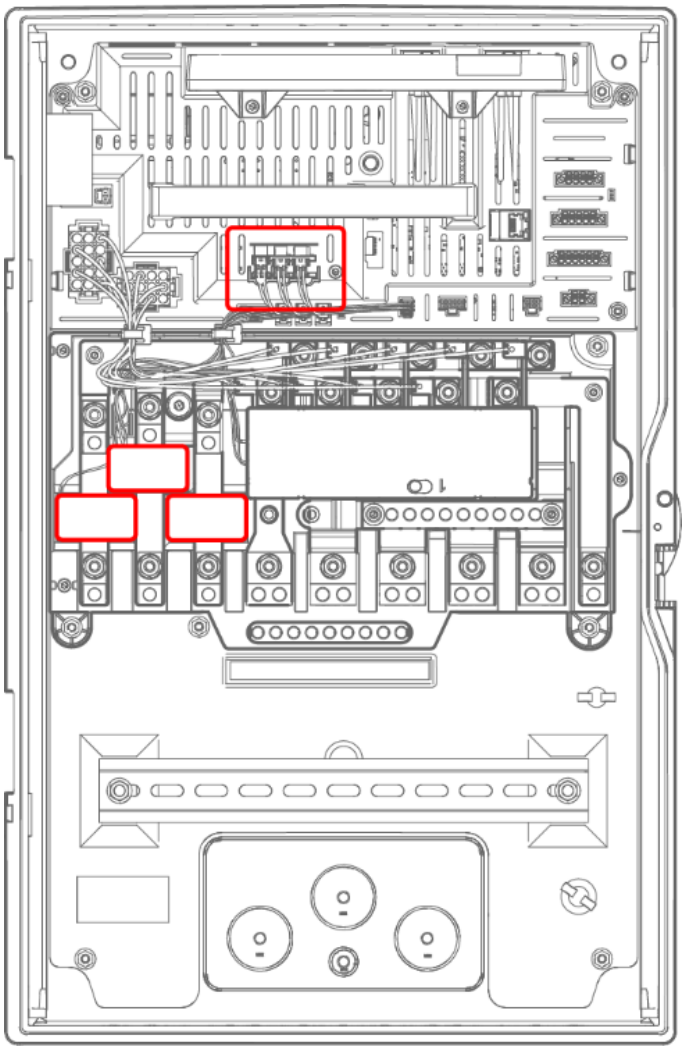


Figure 45: Embedded Site CTs and Solar CT Connectors

Site Metering using Built-In CTs

If the built-in site metering functionality is used, no additional metering hardware is required for measuring site-level energy.

NOTE: To ensure proper function of the system, the site metering must always be installed **upstream of all loads and generation** (including Non-Backup 3-phase generation) near the service entry of the site. This may require an external Energy Meter.

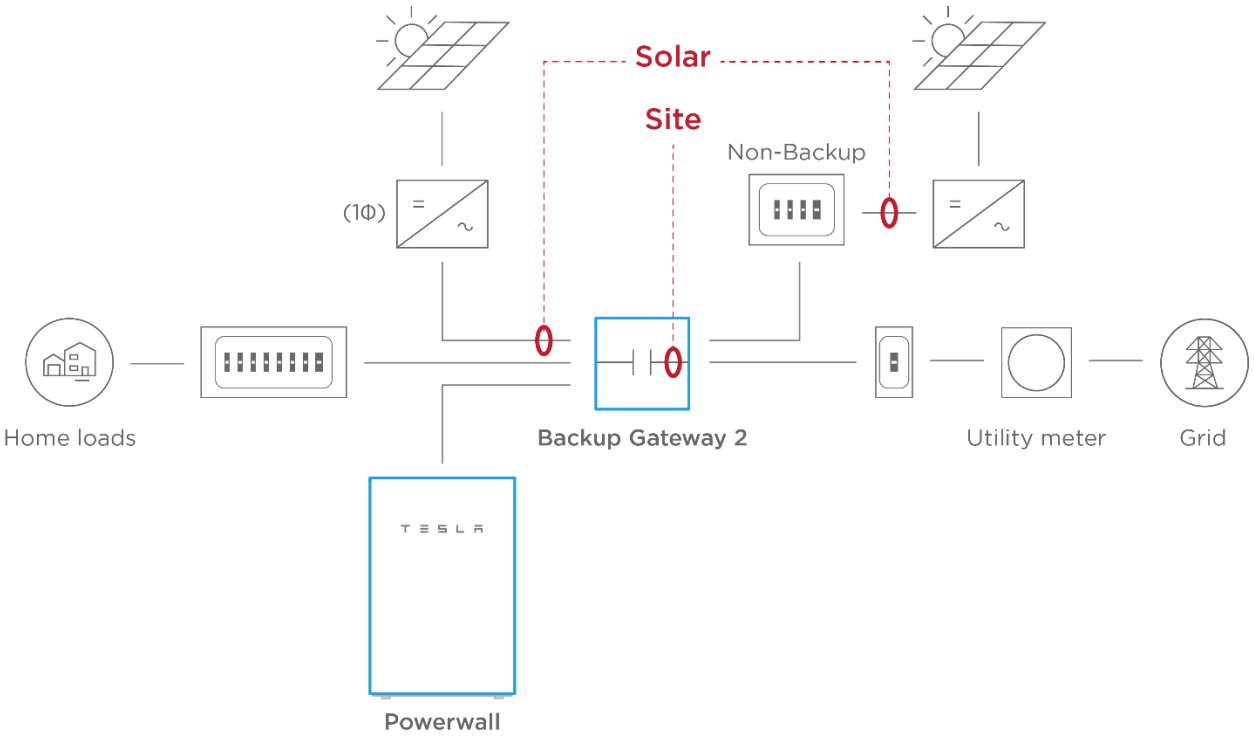


Figure 46: CT Installation using Built-in Site CTs

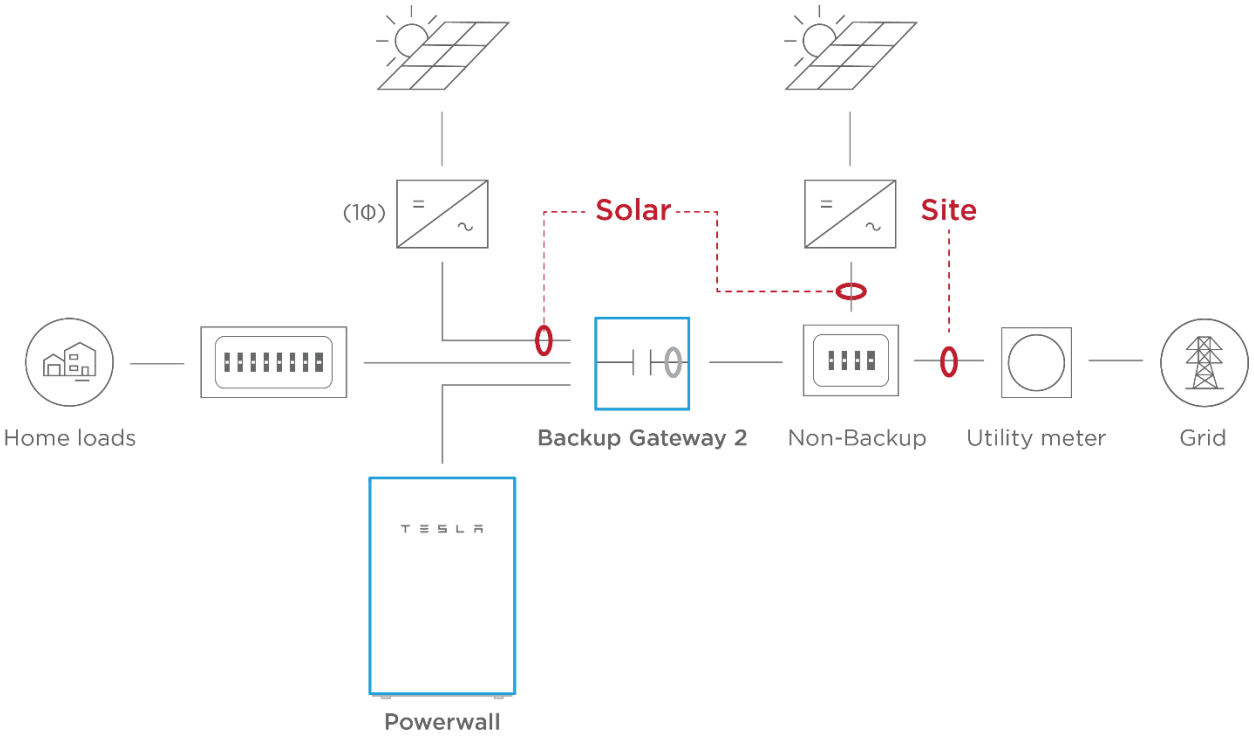


Figure 47: CT Installation with Upstream Loads or Generation

Solar Metering using Tesla Split-Core CTs

The Accessory Kit included with the Backup Gateway contains one (1) 100-amp-rated split-core solar CT.

1. Remove the solar CT connector on the Backup Gateway from its hold-down point in the Backup Gateway and plug in the solar CT harness (Figure 48).

NOTE: CTs may be extended up to 15 m.

2. Clamp the Tesla solar CT around the line conductor of the PV inverter circuit (Voltage measurements are taken at the Backup Gateway. No additional voltage taps are required).

3. Ensure solar CTs are installed in the proper orientation as indicated by the label on the CT body.

⚠ CAUTION: To avoid shock or damage to equipment, ensure CTs are connected before clamping onto live cables.

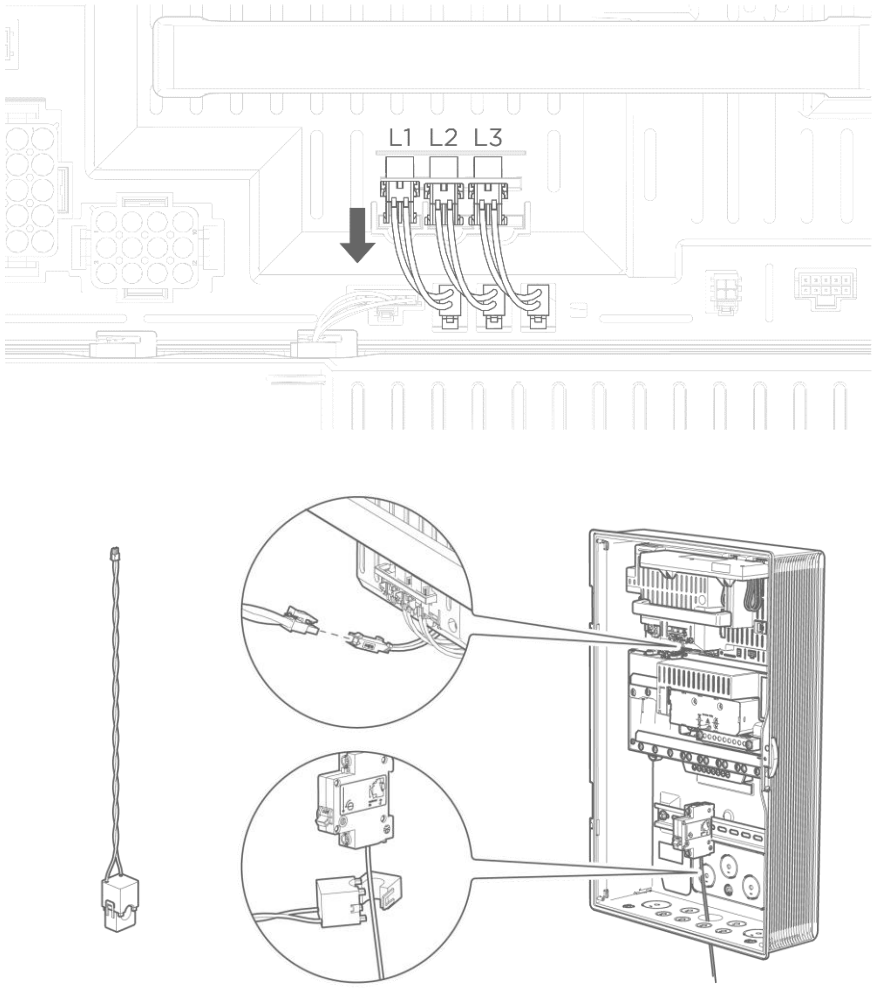


Figure 48: Installing Tesla Solar CTs

NOTE: If the wiring configuration allows, it is possible to pass multiple conductors **on the same phase** 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: For metering 3-phase PV inverters, install Tesla solar CTs on L1, L2, and L3 output of the PV inverter circuit. Additional 100 Amp Tesla CTs (1112477-00-x) and extension harnesses (1125547-03-x) for 3-phase installations may be ordered individually.

External Metering

A Neurio Energy Meter may be used where necessary:

- *For Site Metering:* If the point of supply is distant and/or not directly landed at the Supply terminals within the Backup Gateway (e.g. Partial home backup)
- *For Solar Metering:* If the PV inverter breaker is installed >3 meters from the Backup Gateway and/or if there are multiple PV inverter circuits (>1 for 3-phase sites, or >3 for single-phase sites)

NOTE: When upgrading a Gateway 1 system with Gateway 2, the existing Neurio Energy Meter(s) may be left in place in the main switchboard 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.

Refer to **Appendix C** for instructions on installing and pairing a Neurio Energy Meter.

Step 13. Installing Ethernet Connection at Backup Gateway 2

For best connection performance, a wired network connection should be made via Ethernet cable to the home's Internet router.

NOTE: At minimum, Ethernet cable should be CAT5 (24 AWG) cable.

1. Pass the Ethernet connector (RJ-45) through the provided M25 cable gland, and wrap the 2-hole rubber insert around the cable.
2. Install the Ethernet connector (RJ-45) into the Backup Gateway 2's Ethernet port.
3. Assemble and install the M25 cable gland, using the provided plastic hole stopper to fill the second hole, if unused.
4. Connect the other end of the Ethernet cable to the customer's network router.

Network connection may be verified during commissioning in later steps.

NOTE: Ensure Wi-Fi and Ethernet connections are **both** configured for best performance. Cellular is available only as a backup connection when Wi-Fi and Ethernet connections are lost.

Step 14. Close the Wiring Compartments and Turn the System On

1. **Before closing any installed hardware**, take photos of the completed wiring in the Powerwall, Backup Gateway, and main switchboard.

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 the provided 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.

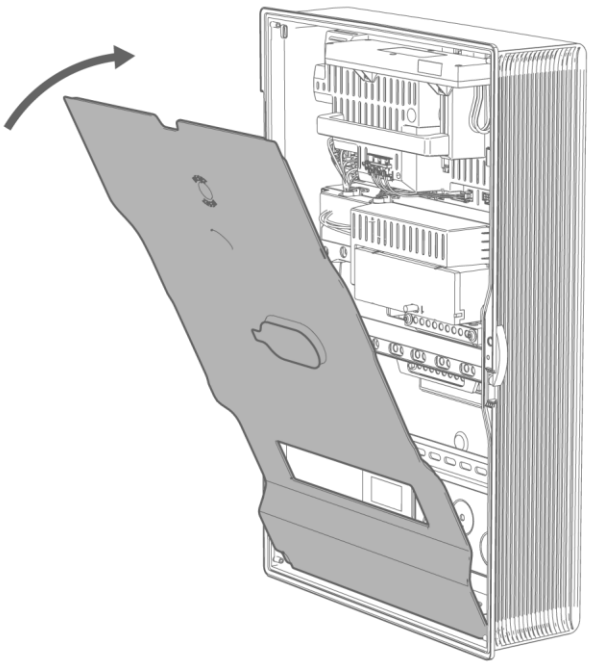


Figure 49: Install the Deadfront Cover

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

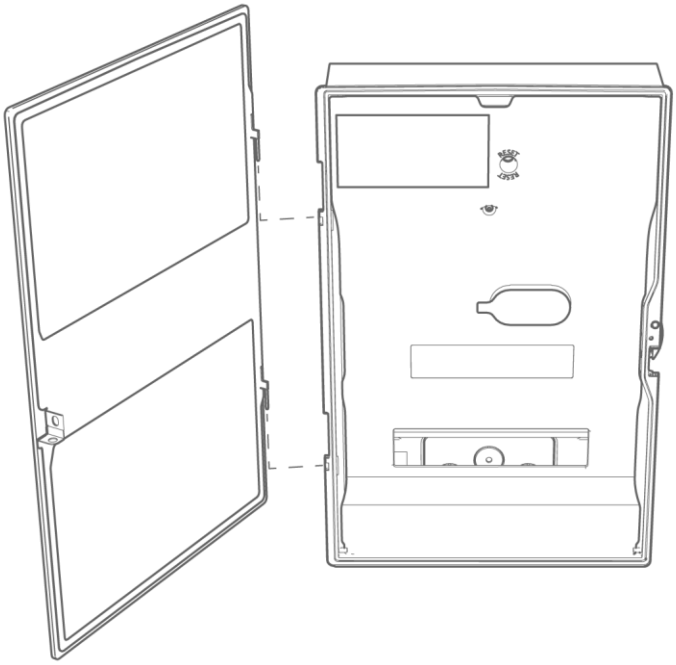


Figure 50: Install the Glass Door

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

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.

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.

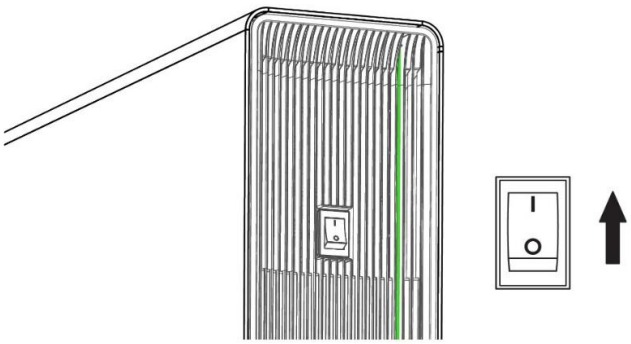


Figure 51: Switching Powerwall On

⚠ 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 15. Commission the System

Commissioning Overview

Connect to the Backup Gateway 2: The first step in commissioning is to connect to the Backup Gateway, which then allows you to set up Internet connectivity and configure the system.

Establish the system Internet connection: Powerwall must be connected to the Internet in order to receive firmware updates and transmit performance data. Internet connectivity is handled by the Backup Gateway, and can be established over an Ethernet and Wi-Fi networks. Cellular is available as a backup when Ethernet and/or Wi-Fi are disconnected.

Configure system settings: The Backup Gateway has a browser-based Commissioning Wizard that guides you through system configuration.

Commissioning Procedure

1. Using a computer, smartphone, or tablet, establish communication with the Backup Gateway in one of following ways:

Wi-Fi

- Using a Wi-Fi capable computer, tablet, or phone, connect to the Backup Gateway Wi-Fi network, which appears as "TEG-xxx," where xxx are the last 3 digits of the Backup Gateway's serial number
- Wi-Fi Password: Enter the Wi-Fi password as it appears on the Serial Number label (Fig 49). Launch a browser and enter the following 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**

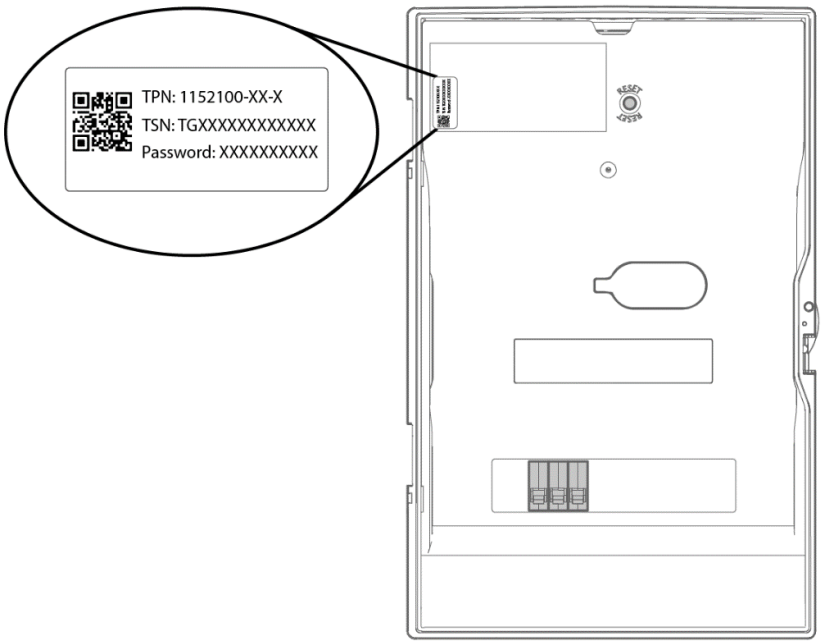


Figure 52: Serial Number and Password Label

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.

2. 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. If it does not, click *Run Wizard*.

3. 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 as displayed on the Serial Number label
- Click Continue

4. Connect the Backup Gateway to the Internet by the following means (listed in order of preference):

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

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

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 network password
- Click the blue arrow

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

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

NOTE: If the Commissioning Wizard stalls or fails, refresh the browser to ensure that the Wizard page shows the current state of the system, and try connecting again by repeating steps in procedure #4 above. If refreshing the browser doesn't work, check the connection to the Backup Gateway network. (You may need to repeat procedure #1 above to reconnect to the Backup Gateway network.)

6. 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.

7. Select the time zone for the installation and click Continue.

8. On the Powerwall screen, click Scan, and ensure that the correct number of Powerwalls appears. The Synchronizer (Backup Capability) and Synchrometers (Internal Meters) should also appear. Click Verify Powerwall to verify communication with the Powerwall units. Click Continue.

9. The Backup Gateway automatically detects the grid and selects a grid code. If the system is off-grid, select Off-Grid and choose the appropriate grid code for the installation. Confirm that the selected code is correct, and click Continue.

10. On the Generation screen, do the following:

If the system has solar, do the following:

- Choose the solar inverter brand
- Choose the solar inverter model
- Enter the lower value of the PV array's power ratings (DC or AC)

If there are additional solar inverters, click Add Solar and enter the corresponding information for each inverter.

If the system includes a generator, click Add Generator.

- Select the disconnect type for the generator.
- Enter the generator manufacturer, model, and serial number.
- Enter the generator power rating (in Watts).

When you are finished entering generation information, click Continue.

11. The system automatically displays internal meters:

- SynchrometerX refers to the embedded Site CTs
- SynchrometerY: refers to the auxiliary Tesla CT connections (e.g. for Solar)

If necessary, you can manually establish connections to additional Energy Meters by doing the following. (After each meter is added, you may need to reconnect to the network with your mobile device.)

- If pairing an Energy Meter over Wi-Fi,
    - Turn off the power to the energy meter by removing the 4-pin voltage connection from the meter.
    - Enter the Meter short ID
    - Enter the Meter Serial Number (Starts with "OBB") and click Connect
    - Turn the energy meter back on by reconnecting the 4-pin voltage connection to the meter. Once the meter is turned on, you will have 60 seconds to connect to the meter.
    - Click Connect
- If pairing an Energy Meter over wired connection,
    - Click Detect Wired Meters
    - Note: If the energy meter is connected with a wired connection to the gateway, the meter will not be able to receive firmware updates for new features and improvements. A Wi-Fi connection is recommended whenever possible.

When you are finished entering meter information, click Continue.

12. Confirm that each meter shows “Successfully Connected.” If it does not, refresh the browser, verify that the ID and serial number were entered correctly, and click Check Meter Connection.

13. On the Current Transformers screen, do the following for each CT in the system to ensure that it is in the correct location and orientation:

- Select the applicable function (Site, Solar, Generator or Load)
- Verify the on-screen values for the CT against the applicable meter (such as the solar inverter meter or utility meter)
- If necessary, select the Flip checkbox to invert the polarity of the CT reading so that:
    - Site CTs are positive when importing, negative when exporting
    - Solar CTs are **positive** when the PV array is producing power
    - Generator CTs are **positive** when the generator is running
    - Load CTs are **positive** when power is being consumed

NOTE: Sliding the toggle to *Advanced* will display additional information such as Power Factor.

14. On the Operation Settings screen, name the installation site, set the operation mode and any required export limitations (depends on region), and click Continue.

15. On the System Test screen, click Start.

16. On the Installation Information screen, choose or enter the installer Company Name, Tesla Account Number, and Phone Number.

17. On the Customer Privacy Policy screen, have the homeowner review and complete the form. Click Continue.

18. On the Customer Information screen, have the homeowner enter the requested information. Click Continue.

19. Verify the information in the Registration Email screen and record the issued password.

20. Verify that Powerwall is capable of charging and discharging correctly. The Powerwall LED should be pulsing (changing brightness slowly).

Step 16. 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

If Powerwall is not working correctly, perform the following steps:

- Check the status of the green LED light bar on the right side of Powerwall.

The LED indicates status as follows:

LED State	Indication
On (solid)	Powerwall enabled/Communication with Backup Gateway; Voltage may be present on Powerwall AC connectors
On (flashing)	Powerwall enabled/No communication with Backup Gateway; Voltage may be present on Powerwall AC connectors
On (pulsing)	Powerwall enabled and charging or discharging Rate of pulsing proportional to power flow
Off	Powerwall not enabled or switched off

- If it is not possible to communicate with the Backup Gateway through the Tesla mobile app, ensure that the home Internet connection is working.
- Ensure that Powerwall is correctly connected to the Backup Gateway, based on the wiring diagrams above and site design information.

  WARNING: Before opening the Powerwall wiring compartment, make sure to switch off the AC breakers for Powerwall and the Backup Gateway, switch off the AC disconnect (if applicable), and switch off Powerwall.

  WARNING: Switching off Powerwall disengages the Enable line but does not disconnect AC voltage. Voltage may be present on the AC connection leads unless the Backup Gateway, any associated circuit breakers, and the AC disconnect (if applicable) are switched off.

- If a brownout or blackout is experienced during backup operation: reduce the loads and check that the breakers have not opened.
- If Powerwall does not operate and the ambient temperature is high, increase ventilation if needed.
- If the Backup Gateway and Powerwall are both unresponsive:

  1. Press and hold the Gateway Reset Button for 3 seconds.

  2. Turn off Powerwall by setting its On/Off switch to the OFF position.

  3. Wait at least one minute.

  4. Turn on Powerwall.

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.teslamotors.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

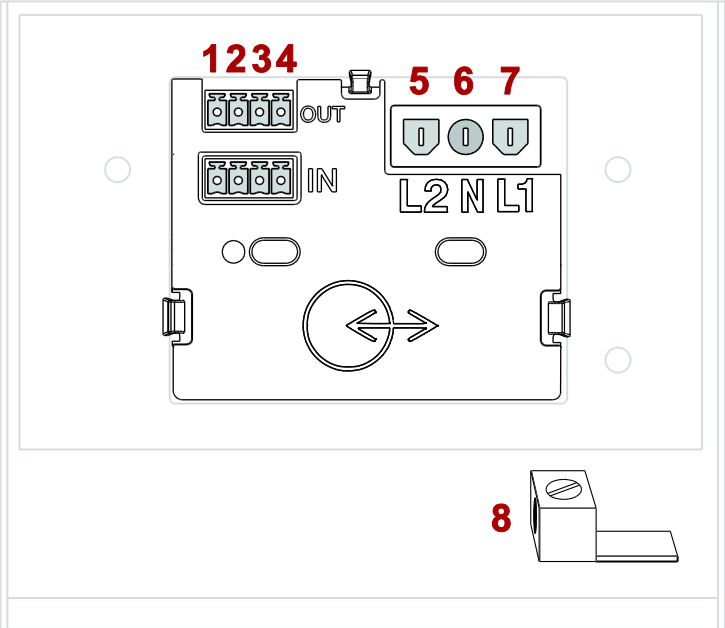
Maintenance

Powerwall does not require pre-scheduled preventative maintenance. The only maintenance required by an owner is to keep the unit 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. Wiring Reference

Powerwall

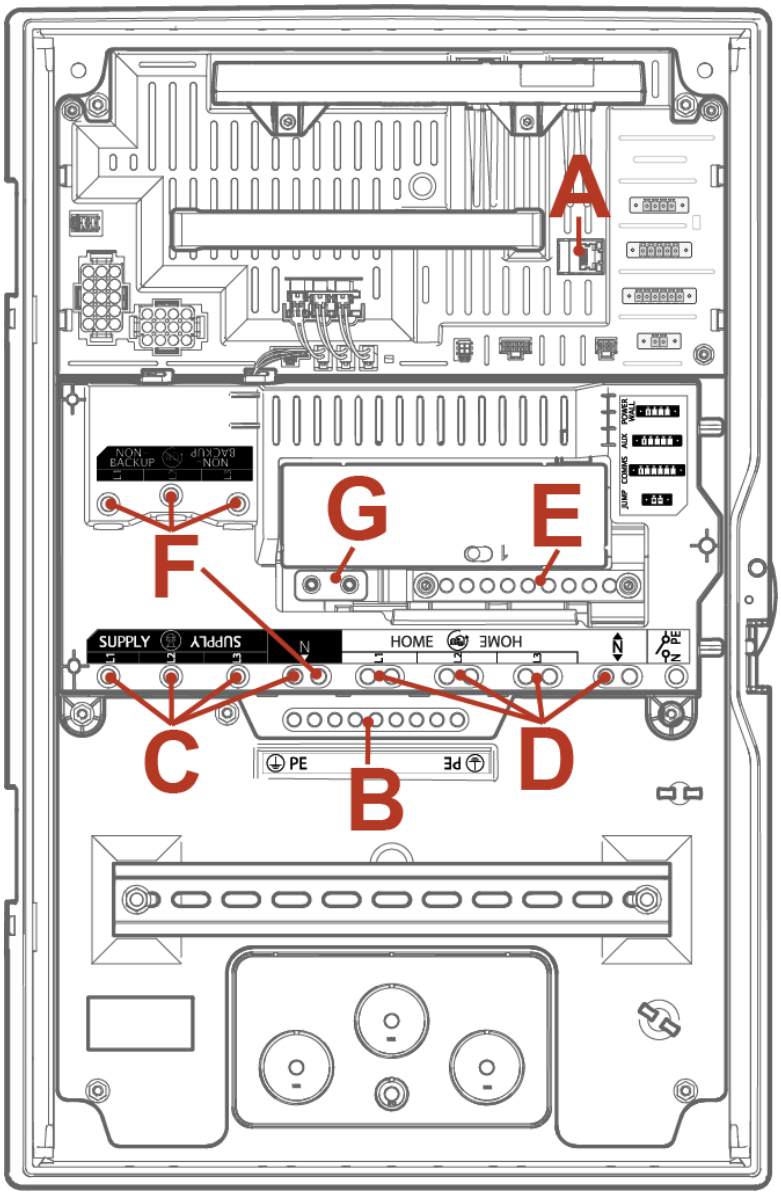


Powerwall Wiring			
	Powerwall Terminal	**Recommended Wire Color**	**Wire Gauge**
	Communication		
1	12V + (Logic +)	Brown	1.0 mm² (max 35 m) 1.5 mm² (max 45 m)
2	GND (Earth)	White	
3	CN + (CAN HI)	Blue	0.2–1.5 mm²
4	CN – (CAN LO)	Yellow	
	Power*		
5	L2 (Line 2) – to Neutral	Blue	4–10 mm²
6	N (Neutral) [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.

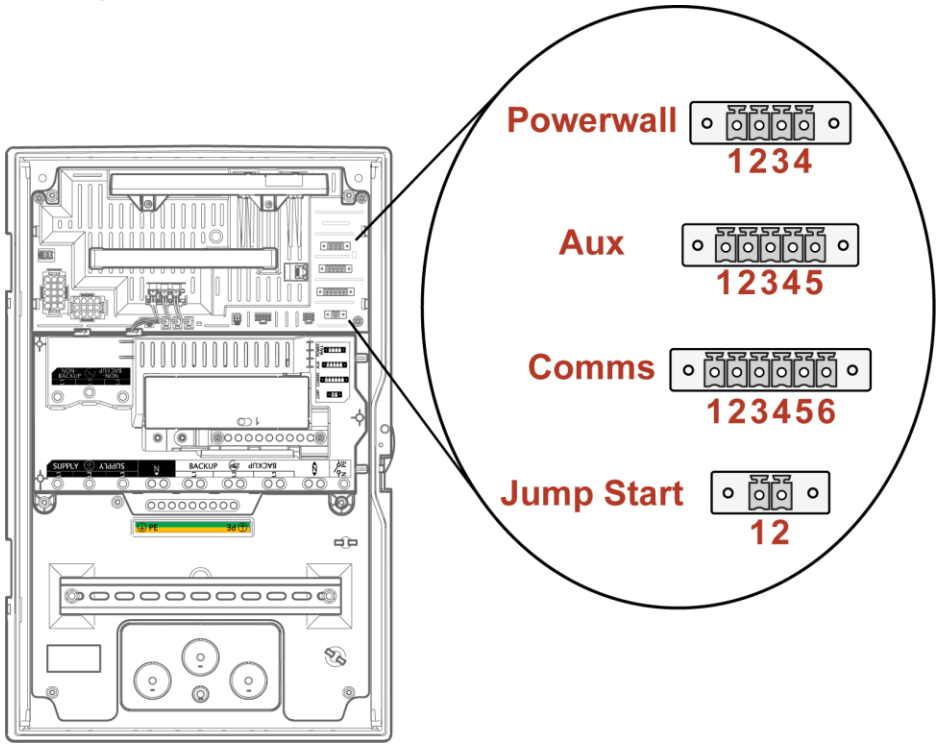
NOTE: Refer to local codes and standards for correct wiring practices and wire colors.

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	25 mm^2 (max)
C	Grid Supply (L1, L2, L3, N)	Brown, Black, Grey, Blue	35 mm^2 (max)
D	Backup Loads and Generation (L1, L2, L3, N)	Brown, Black, Grey	35 mm^2 (max)
E	Generation Neutral Bar (N)	Blue	25 mm^2 (max)
F	Non-Backup Loads and Generation (L1, L2, L3, N)	Brown, Black, Grey, Blue	35 mm^2 (max)
G	N-N Jumper Bar	-	-

Backup Gateway 2 Communication

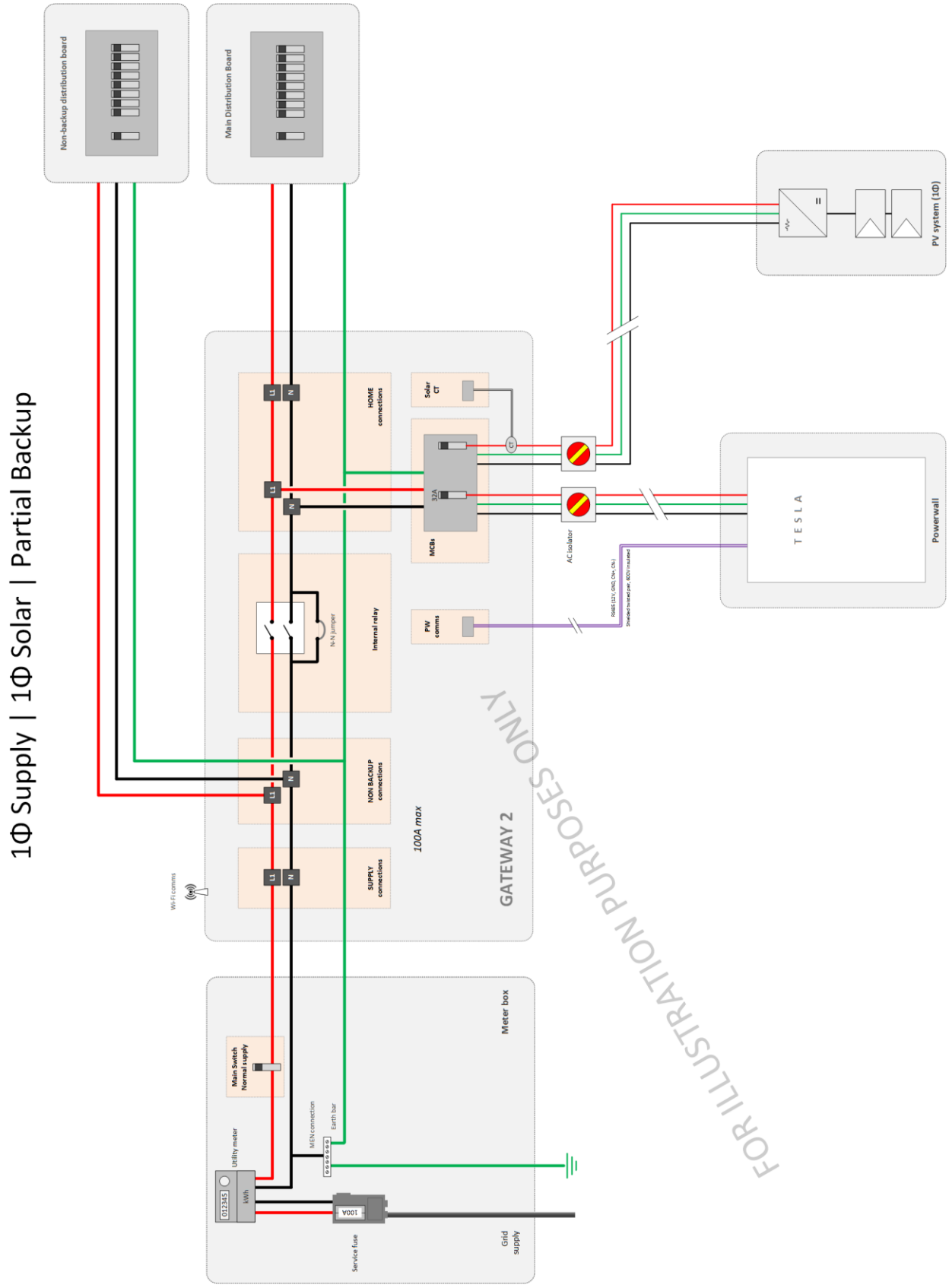


	Backup Gateway 2 Communication Wiring		
	Terminal Name	**Recommended Wire Color**	**Wire Gauge**
	Powerwall Communication		
1	12V + (Logic +)	Brown	1.0 mm² (max 35 m) 1.5 mm² (max 45 m)
2	GND (Earth)	White	
3	CN + (CAN HI)	Blue	0.2–1.5 mm²
4	CN – (CAN LO)	Yellow	0.2–1.5 mm²
	Aux		
1	Site Shutdown (IN)		0.2–1.5 mm²
2	Site Shutdown (OUT)		0.2–1.5 mm²
3	(reserved for future use)		0.2–1.5 mm²
4	(reserved for future use)		0.2–1.5 mm²
5	(reserved for future use)		0.2–1.5 mm²
	Communication (External Meter)		
1	GND (Earth)/Shield		0.2–1.5 mm²
2	RS485 HI #1	Red	0.2–1.5 mm²
3	RS485 LO #1	Black	0.2–1.5 mm²
4	GND (Earth)/Shield		0.2–1.5 mm²
5	RS485 HI #2	Red	0.2–1.5 mm²
6	RS485 LO #2	Black	0.2–1.5 mm²
	Jump Start		
1	12V	Red	0.2–1.5 mm²
2	GND	Black	0.2–1.5 mm²

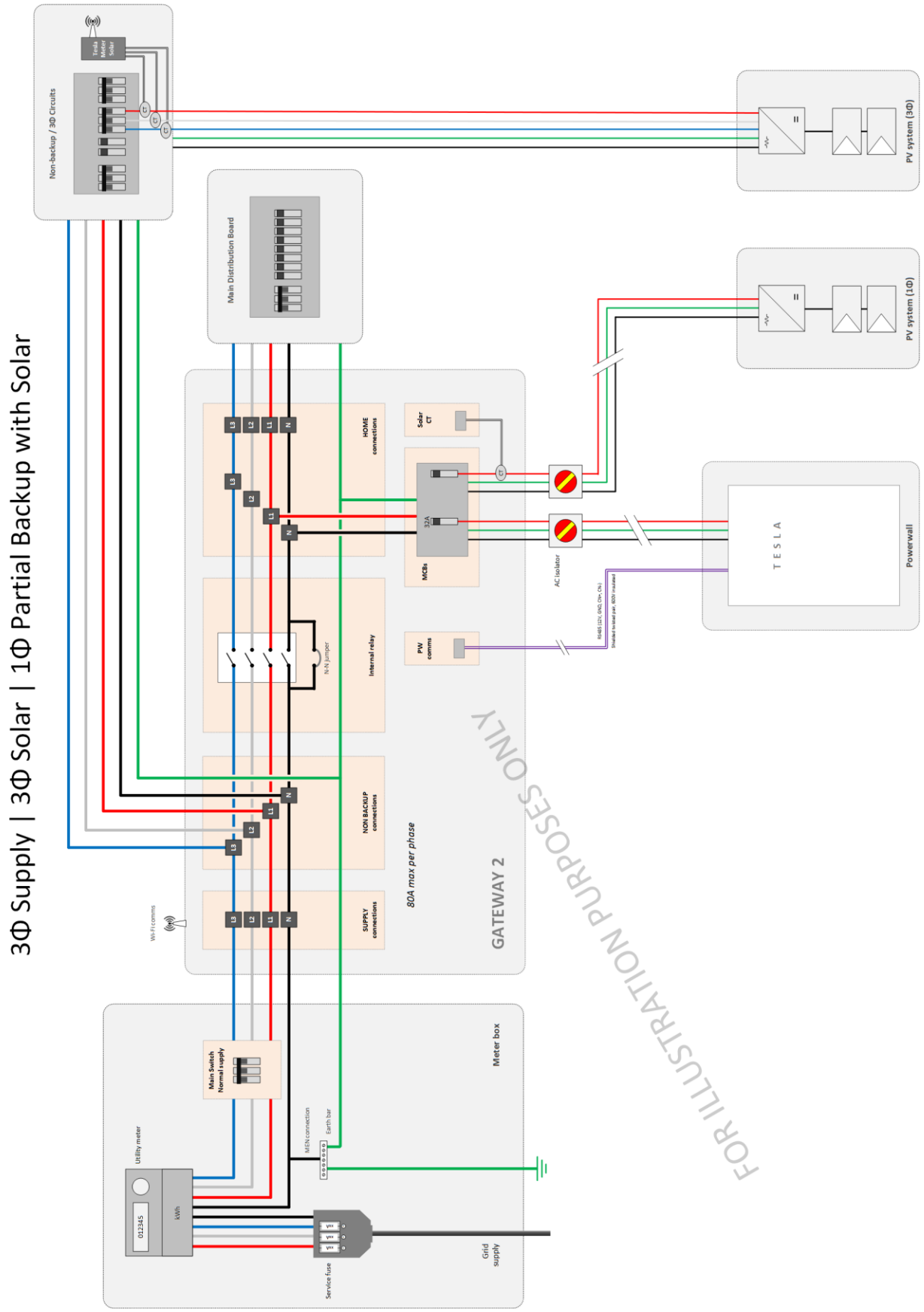
Appendix B. System Diagrams

The following diagrams are meant 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


1Φ Supply | 1Φ Solar | Partial Backup
Non-backup distribution board
Main Distribution Board
PV system (1Φ)
HOME connections
Solar CT
MCBs
32A
AC isolator
Powerwall
T E S L A
Internal relay
N-N jumper
PW comms
NON BACKUP connections
SUPPLY connections
100A max
GATEWAY 2
Wi-Fi comms
Meter box
Main Switch Normal supply
Utility meter
012345
kWh
MEN connection
Earth bar
100A
Service fuse
Grid supply
FOR ILLUSTRATION PURPOSES ONLY

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



Appendix C. 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.

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 53).

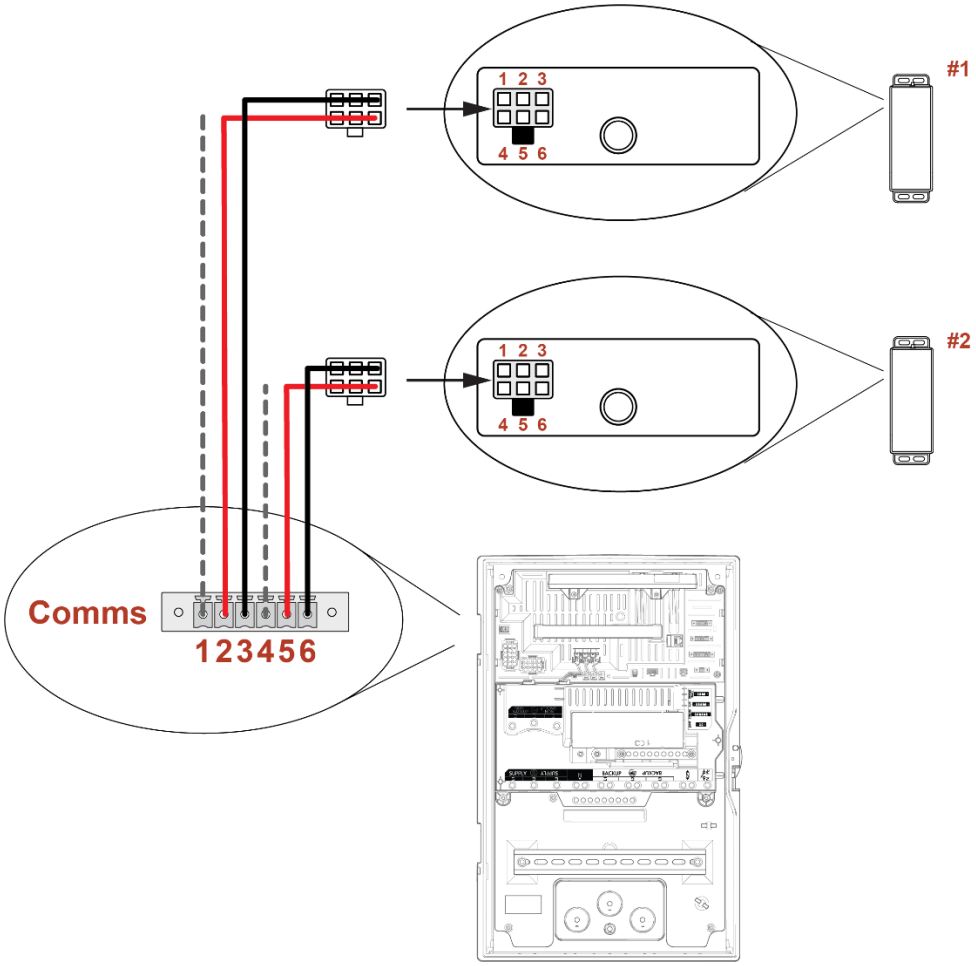


Figure 53: Meter Communication Wiring

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.)

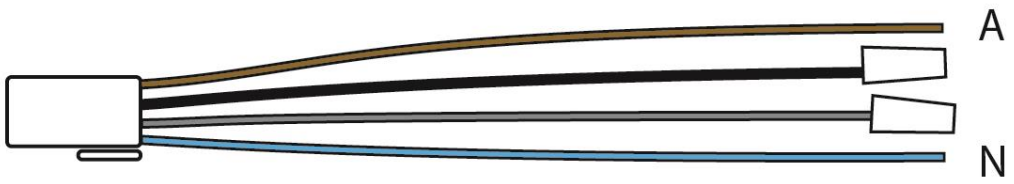


Figure 54: Voltage Line Harness with Capped Leads for Single-Phase Service

Meter Voltage Taps – Three-Phase Electrical Service

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

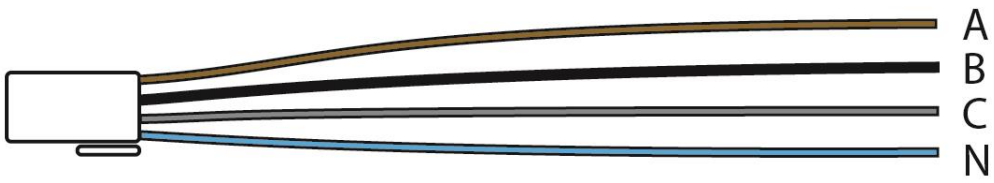


Figure 55: Voltage Line Harness for Three-Phase Service

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 56). Use these wire color equivalents when connecting or extending the voltage line harness.

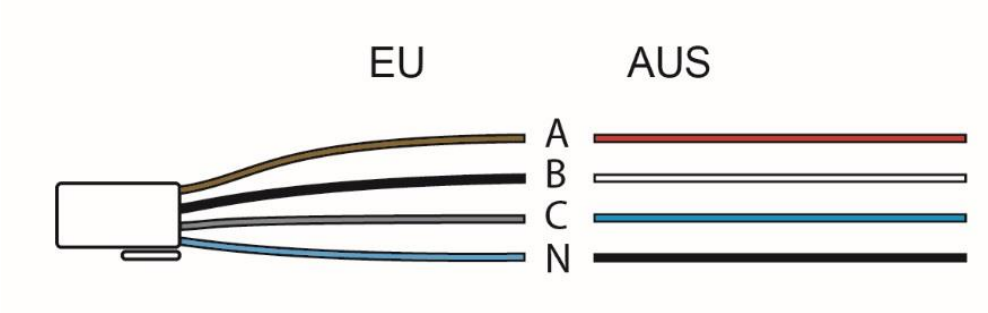


Figure 56: Voltage Line Harness EU to AUS Conversion

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.

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.

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:

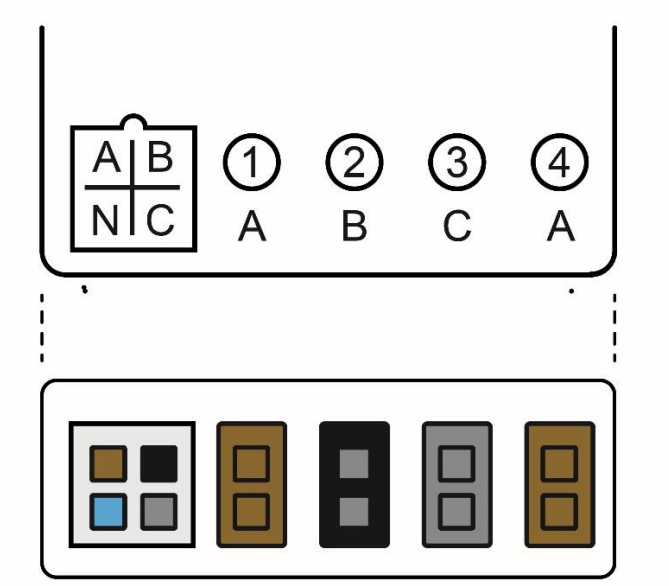


Figure 57: Voltage Tap Port (left) and four CT Ports (right) on Bottom of Meter

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 mm^2
  - 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 switchboard, use the antenna extension to place the antenna on the outside of the switchboard.

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. Always verify CTs are in the correct orientation by observing power flow in the Commissioning Wizard.

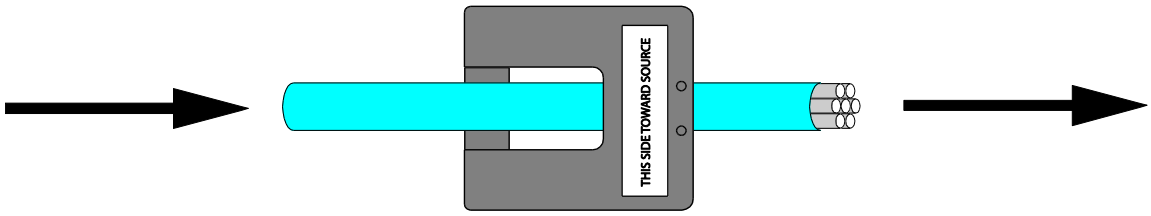


Figure 58: CT Orientation in Relation to Power Flow

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

Current Transformer Capacity

Each CT included with the Backup Gateway and the available accessory kits has a capacity of 200 A.

NOTE: Backup Gateway 2 is rated to 100A max current for single-phase installation, and 80A max current capacity for split-phase and three-phase installation.

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.

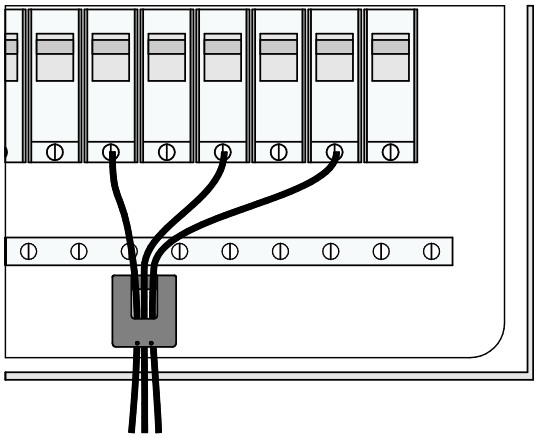


Figure 59: Multiple Conductors Passing Through a Single CT

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.

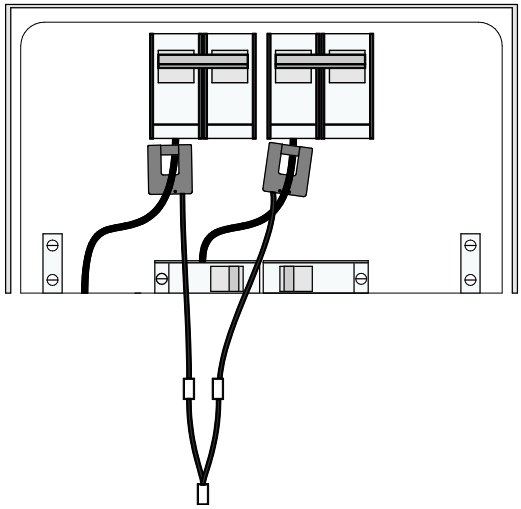


Figure 60: Y-Cable Connecting CTs

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. If using a Y-splitter with 800 A CTs, total current should not exceed 1100 A.

Installing the Meter

Using the self-drilling screws provided in the meter kit, attach the meter to the inside of the main switchboard 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 switchboard:

Voltage Harness Port/Wire Color	Switchboard 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 switchboard, 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 switchboard.

Appendix D. 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

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AUS BU2 Rev 1.4 Sept 11, 2019