



# Neostar 2S Mono-Glass Module

## 440W-460W

Second Generation  
Comprehensive Upgrade:

 **Partial Shading Optimisation**

 **Better Temperature Coefficient**

 **High Temperature Restriction**

 **Micro-crack Resistance**

 **Higher Power**

 **Lower BOS**

 **Full Black Design**



Product  
Warranty



Performance  
Warranty



reddot winner 2023



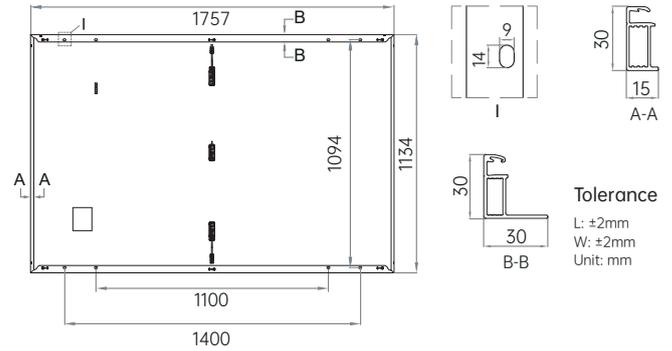
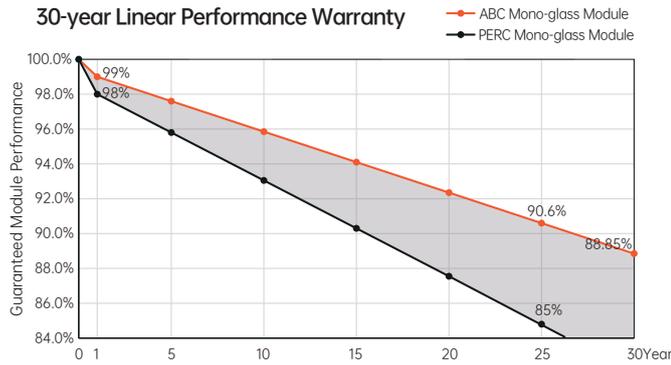
Munich RE 

**460W**  
Output

**23.1%**  
Efficiency

**≤1%**  
First-year Degradation

**≤0.35%**  
Annual Degradation from Year 2-30



Electrical Characteristics (STC: AM1.5 1000W/m <sup>2</sup> 25°C NOCT: AM1.5 800W/m <sup>2</sup> 20°C 1m/s)										Power Tolerance: 0~ + 3%	
Module Type	AIKO-A440-MAH54Mb		AIKO-A445-MAH54Mb		AIKO-A450-MAH54Mb		AIKO-A455-MAH54Mb		AIKO-A460-MAH54Mb		
	STC	NOCT									
P <sub>max</sub> [W]	440	331	445	335	450	339	455	343	460	346	
V <sub>oc</sub> [V]	40.49	38.24	40.59	38.33	40.69	38.43	40.79	38.52	40.89	38.62	
V <sub>mp</sub> [V]	33.50	31.64	33.60	31.73	33.70	31.83	33.80	31.92	33.90	32.02	
I <sub>sc</sub> [A]	13.91	11.25	14.02	11.33	14.12	11.42	14.22	11.50	14.32	11.58	
I <sub>mp</sub> [A]	13.14	10.49	13.25	10.57	13.36	10.66	13.47	10.75	13.57	10.83	
<b>Module Efficiency</b>	<b>22.1%</b>		<b>22.3%</b>		<b>22.6%</b>		<b>22.8%</b>		<b>23.1%</b>		

Mechanical Specification	
Cell Type	N-Type ABC
Front Cover Mono glass	3.2 mm tempered glass
Frame	Black anodized aluminum
Cable	4mm <sup>2</sup> (IEC) 12AWG(UL) 1200mm
No. of Cells	108(6*18)
Junction Box	IP68,3 bypass diodes
Connector	MC4-Evo2
Weight	21.5kg
Dimension	1757*1134*30mm
Package Detail	36pcs per pallet / 216pcs per 20'GP / 936pcs per 40'HC

Temperature Ratings (STC)	
Temperature Coefficient of I <sub>sc</sub>	+ 0.05%/ °C
Temperature Coefficient of V <sub>oc</sub>	- 0.22%/ °C
Temperature Coefficient of P <sub>max</sub>	- 0.26%/ °C

Installation Guide	
Operation Temperature	-40°C - +85°C
Maximum Series Fuse Rating	25A
Protection Class	Class II
V <sub>oc</sub> and I <sub>sc</sub> Tolerance	±3%
Maximum System Voltage	DC1500V
Maximum Static Loading	Front 5400Pa Back 2400Pa
Hail Test	25 mm diameter hail at 23 m/s
Fire Rating	IEC Class C



# Powerwall 3

## Power Everything



**Powerwall 3** is a fully integrated solar and battery system designed to accelerate the world's transition to sustainable energy. Powerwall 3 can store solar or grid energy for later use when the sun goes down or when the electricity prices are high; lowering their electricity bills, reducing their reliance on the grid, and power their homes during a grid outage. Once installed, customers can manage their home energy system using the Tesla App and customize system behavior to meet their energy goals.

Powerwall 3 achieves this by supporting up to 20 kW DC of solar and providing 11.04 kW AC of continuous power per unit. It has the ability to store up to 13.5 kWh of energy and start heavy loads rated up to 185 A LRA, meaning a single Powerwall 3 can support the power needs of most homes.

Powerwall 3 is designed for fast and efficient installation and modular system expansion. With multiple Powerwall 3 units and/or **Expansions**, it is easier and more affordable to scale up customers' systems to provide 44 kW AC of continuous power and to store up to 94.5 kWh of energy.



# Powerwall 3 Technical Specifications

## System Technical Specifications

Model Number	1707000-xx-y							
Nominal Grid Voltage (Input & Output)	230 VAC							
Grid Type	Single phase							
Frequency	50 Hz							
Nominal Battery Energy <sup>1</sup>	13.5 kWh AC							
Nominal AC Output Power at 230 V (kW) <sup>2</sup>	3.68	5	6	7	8	9	10	11.04
Maximum Apparent Power (kVA)	3.68	5	6	7	8	9	10	11.04
Maximum Continuous Current (A)	16	21.7	26.1	30.4	34.8	39.1	43.5	48
Overcurrent Protection Device (A)	20	32	32	40	50	50	63	63
Maximum Continuous Charge Power (Powerwall 3 only)	AC	Configurable up to 5 kW						
	DC	5 kW						
Maximum Continuous Charge Power (Powerwall 3 with up to (3) Expansions)	AC	Configurable up to 8 kW						
	DC	8 kW						
Output Power Factor Rating	0 - 1 (Grid Code configurable)							
Maximum Output Fault Current (1 s)	160 A							
Maximum Short-Circuit Current Rating	10 kA							
Load Start Capability	185 A LRA (Locked Rotor Amps)							
Solar to Battery to Home/Grid Efficiency <sup>1,3</sup>	89%							
Solar to Home/Grid Efficiency <sup>4</sup>	97.5%							
Power Scalability	Up to 4 Powerwall 3 units supported							
Energy Scalability	Up to 3 Expansion units (for a maximum total of 7 units)							
Supported Islanding Device	Backup Gateway 2							
Connectivity	Wi-Fi (2.4 and 5 GHz), Ethernet, Cellular (LTE/4G <sup>5</sup> )							
Hardware Interface	Dry contact relay 60V 2A, Rapid Shutdown (RSD) certified switch and 2-pin connector, RS-485 for meters							
AC Metering Accuracy	+/- 0.5%							
Protections	Integrated arc fault circuit interrupter (AFCI), Isolation Monitor Interrupter (IMI), Integrated DC Isolator							
Customer Interface	Tesla Mobile App							
Warranty <sup>6</sup>	10 years							

<sup>1</sup> Values provided for 25°C (77°F), at beginning of life. 3.3 kW charge/discharge power.

<sup>2</sup> Powerwall 3 can output up to 15.4 kW AC power at 64 A and 240 V.

<sup>3</sup> Typical use case with energy produced by PV and stored in battery and then released to loads or the grid.

<sup>4</sup> Tested using CEC weighted efficiency methodology.

<sup>5</sup> The customer is expected to provide internet connectivity for Powerwall 3; cellular should not be used as the primary mode of connectivity. Cellular connectivity subject to network operator service coverage and signal strength.

<sup>6</sup> Powerwall 3 must be reliably connected to the internet to secure the full 10-year warranty.

# Powerwall 3 Technical Specifications

## Solar Technical Specifications

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

## Environmental Specifications

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

## Compliance Information

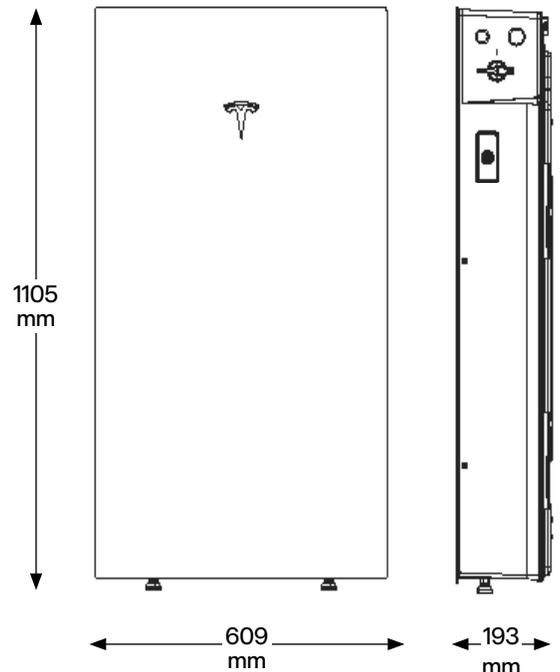
Certifications	IEC 61000-6-1:2016, IEC 61000-6-3:2020, IEC 62477-1:2022, IEC 62109-1:2010, IEC 62109-2:2011, IEC 62933-5-2:2020, IEC 62619:2022, UL 9540A, UN 38.3, Radio Equipment Directive 2014/53/EU, G98 Issue 1 - Amd 7:Oct 2022, G99 Issue 1 - Amd 9:Oct 2022, G100 Issue 2 - Amd 2
----------------	---

Environmental	RoHS Directive 2011/65/EU, REACH Regulation EC 1907/2006
---------------	--

Grid Connection	Single phase
Emissions	FCC Part 15 Class B, ICES 003
Seismic	AC156, IEEE 693-2005 (high)
Fire Testing	Meets the unit level performance criteria of UL 9540A

## Mechanical Specifications

Dimensions	1105 x 609 x 193 mm
Weight	130 kg
Mounting Options	Floor or wall mount



<sup>7</sup> Powerwall 3 is designed to operate in all climates and in direct sunlight, from temperatures of -20°C to 50°C. Performance may be de-rated at operating temperatures above 40°C.

# Powerwall 3 Expansion Technical Specifications

## Battery Specifications

Model Number	1807000-xx-y
Nominal Battery Energy	13.5 kWh
Voltage Range <sup>1</sup>	52 - 92 V DC

## Environmental Specifications

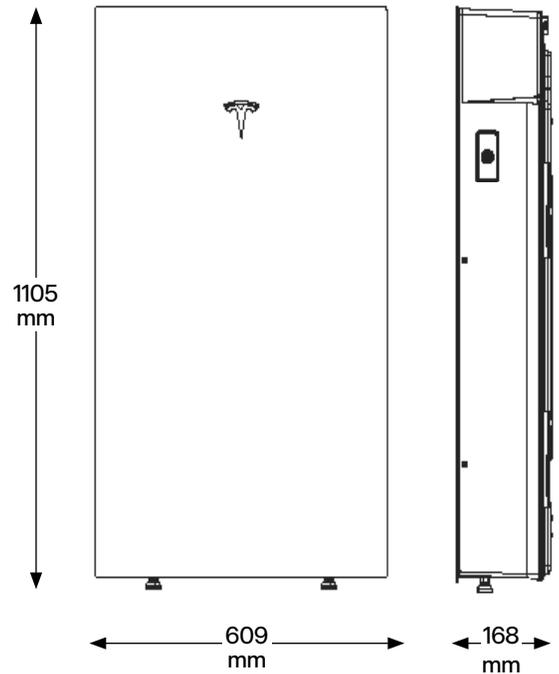
Operating Temperature <sup>2</sup>	-20°C to 50°C
Operating Humidity (RH)	Up to 100%, condensing
Storage Temperature	-20°C to 30°C, up to 95% RH, non-condensing, State of Energy (SOE): 25% initial
Maximum Elevation	3000 m
Environment	Indoor and outdoor rated
Ingress Rating	IP67
Pollution Rating	PD3

## Compliance Information

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

## Mechanical Specifications

Dimensions <sup>3</sup>	1105 x 609 x 168 mm		
Total Weight	118.5 kg (wall-mounted unit with glass front cover and bracket)		
Weight of Expansion Unit	110 kg (without glass front cover and bracket)		
Mounting Options	Floor or wall mount		
Stacking Capability	Up to (3) Expansion units behind a Powerwall 3 (floor mount only)		
Compatibility with Other Systems	Only compatible with Powerwall 3		
Connection to Powerwall 3 or Expansions	Expansion harness		
Expansion Harness Options	0.5 m	2 m	4 m



<sup>1</sup> Powerwall 3 Expansion units are connected in parallel and are not field serviceable.

<sup>2</sup> Performance may be de-rated at operating temperatures above 40°C.

<sup>3</sup> These dimensions include the glass front cover being installed on the Expansion unit.

# Backup Gateway 2 Specifications

Backup Gateway 2 provides energy management and monitoring for solar self-consumption, time-based control, and backup operation. When Powerwall 3 is in Backup mode, Backup Gateway 2 controls connection to the grid, detects outage, and provides backup power.

## Electrical Specifications

AC Voltage (Nominal) <sup>1</sup>	230 V (Line-to-Neutral) 400 V (Line-to-Line)
Feed-In Type	Single phase, Three phase
Grid Frequency	50-60 Hz
Maximum Overcurrent Protection Device	100 A (single-phase service) 80 A (2- and 3-phase service)
Maximum Input Short Circuit Current <sup>2</sup>	16 kA
Overvoltage Category	Category III
AC Metering Accuracy	+/- 0.2 %
Compatible Earthing Systems <sup>3</sup>	TN or TT networks
Distribution boards intended to be operated by ordinary persons (DBO) Type	Type B

## Environmental Specifications

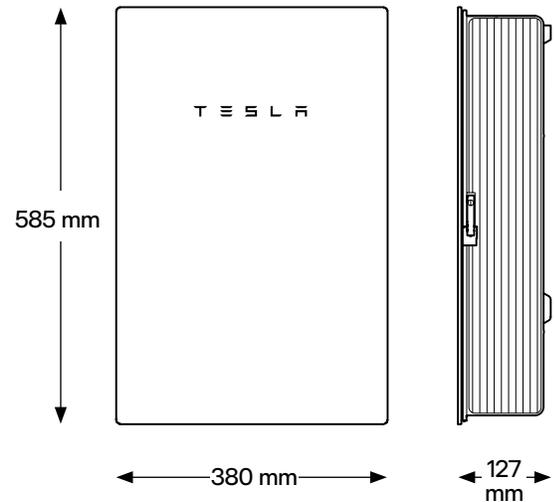
Operating Temperature <sup>4</sup>	-20°C to 50°C
Operating Humidity (RH)	Up to 100%, condensing
Maximum Altitude	3000 m
Ingress Rating	IP55
Environmental Category	Outdoor rated
Wet Location Rating	Yes
Pollution Degree	PD2

## Compliance Information

Safety	IEC 61439-1, IEC 61439-3
Environmental	ROHS DIRECTIVE 2011/65/EU WEEE Directive 2012/19/EU Battery Directive 2006/66/EC REACH Regulation EC 1907/2006

## Mechanical Specifications

Dimensions	585 x 380 x 127 mm
Weight	11.4 kg
Breaker Space (DIN rail)	Up to 9 single pole breakers
Mounting Options	Wall mount



<sup>1</sup> 230 V (Line-to-Line) is not a supported three-phase configuration.

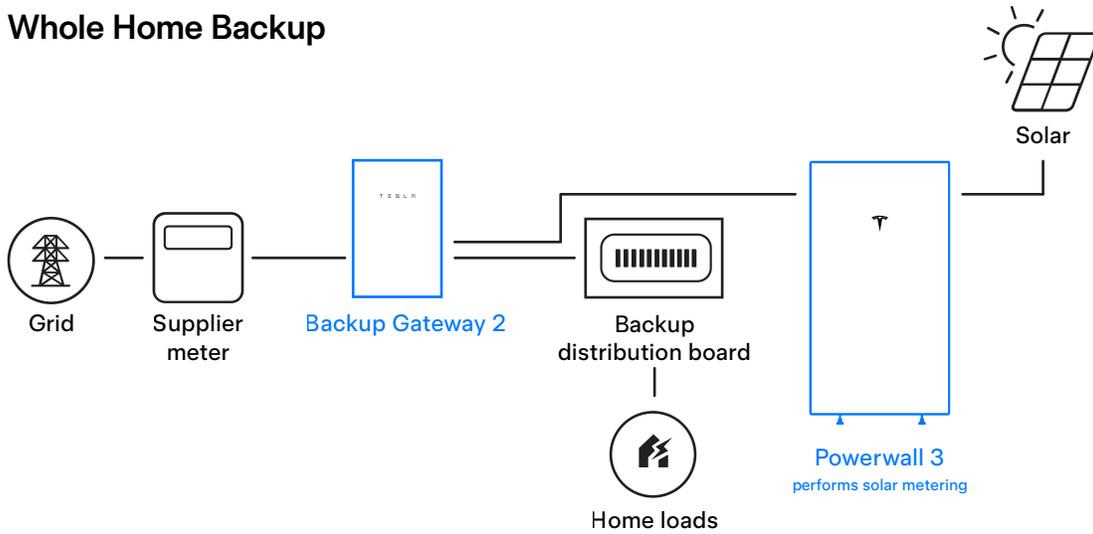
<sup>2</sup> 16 kA rating when installed with current limiting fuse compliant to BS 88.3; 10 kA rating without fuse.

<sup>3</sup> TT earthing networks supported for Gateways with part number 1152100-13-H and higher.

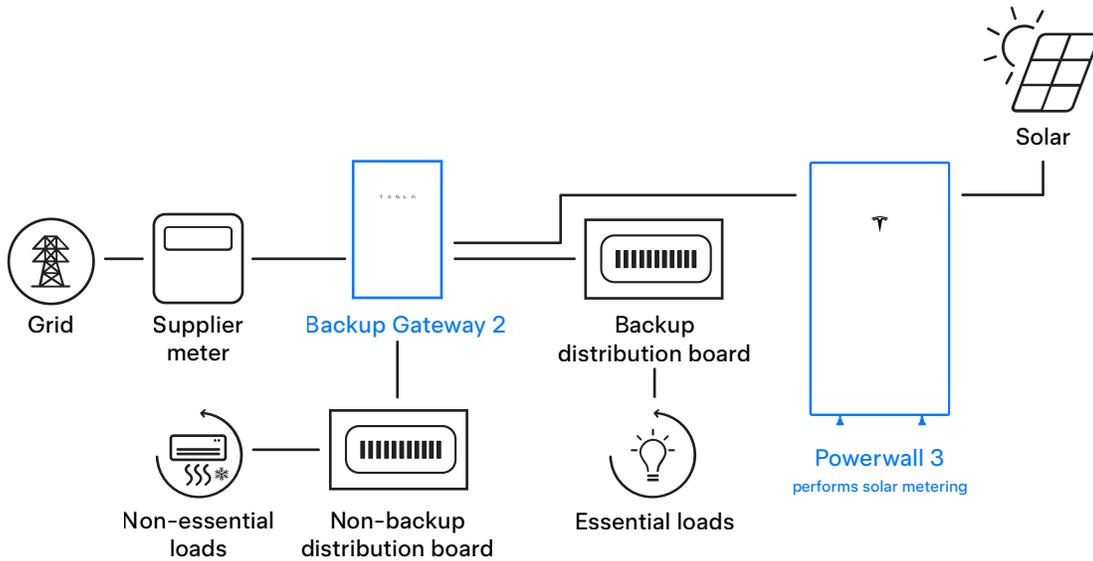
<sup>4</sup> Performance may be de-rated in extreme ambient temperatures.

# Powerwall 3 Example System Configurations

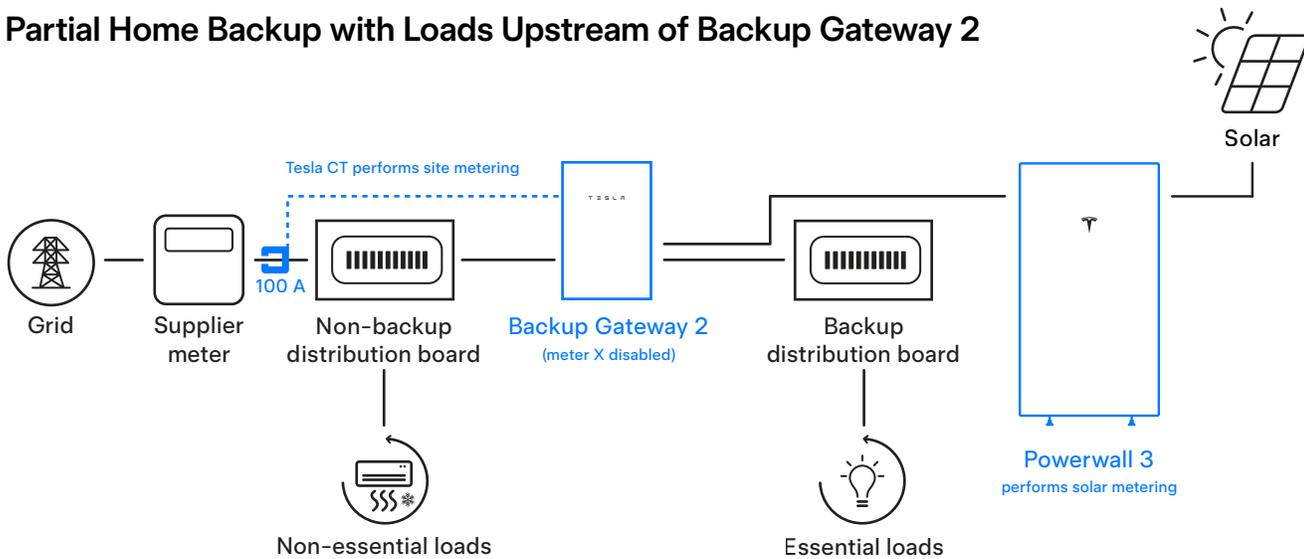
## Whole Home Backup



## Partial Home Backup with Loads Downstream of Backup Gateway 2

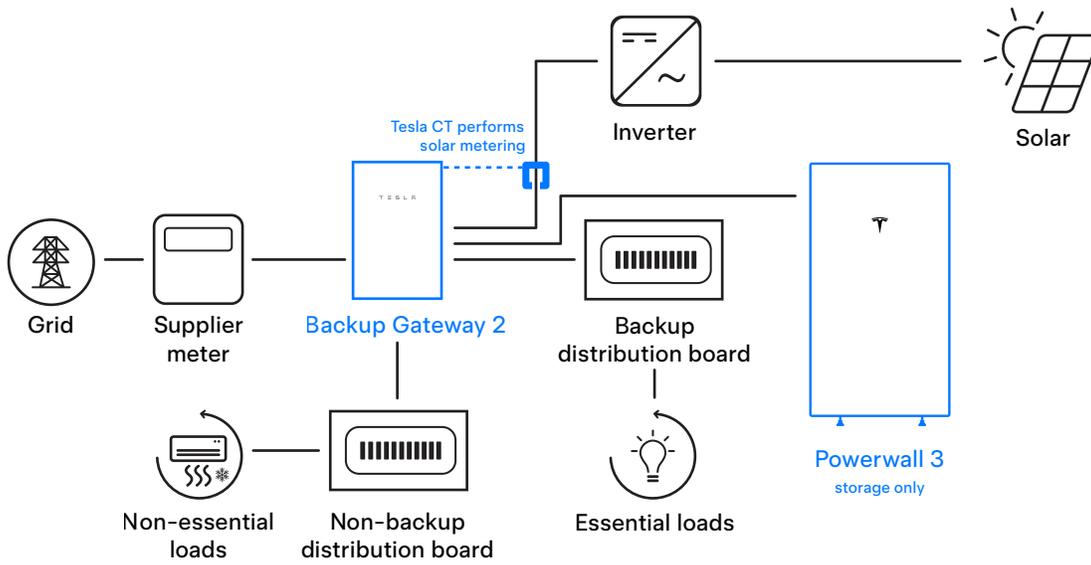


## Partial Home Backup with Loads Upstream of Backup Gateway 2

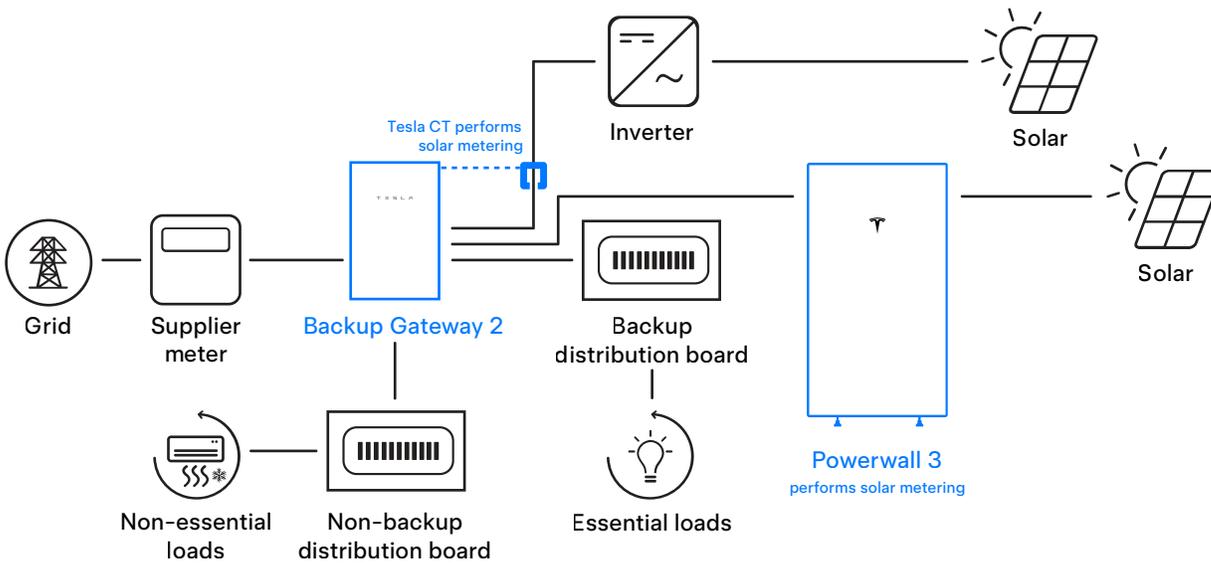


# Powerwall 3 Example System Configurations

## Powerwall 3 with AC Coupled Solar



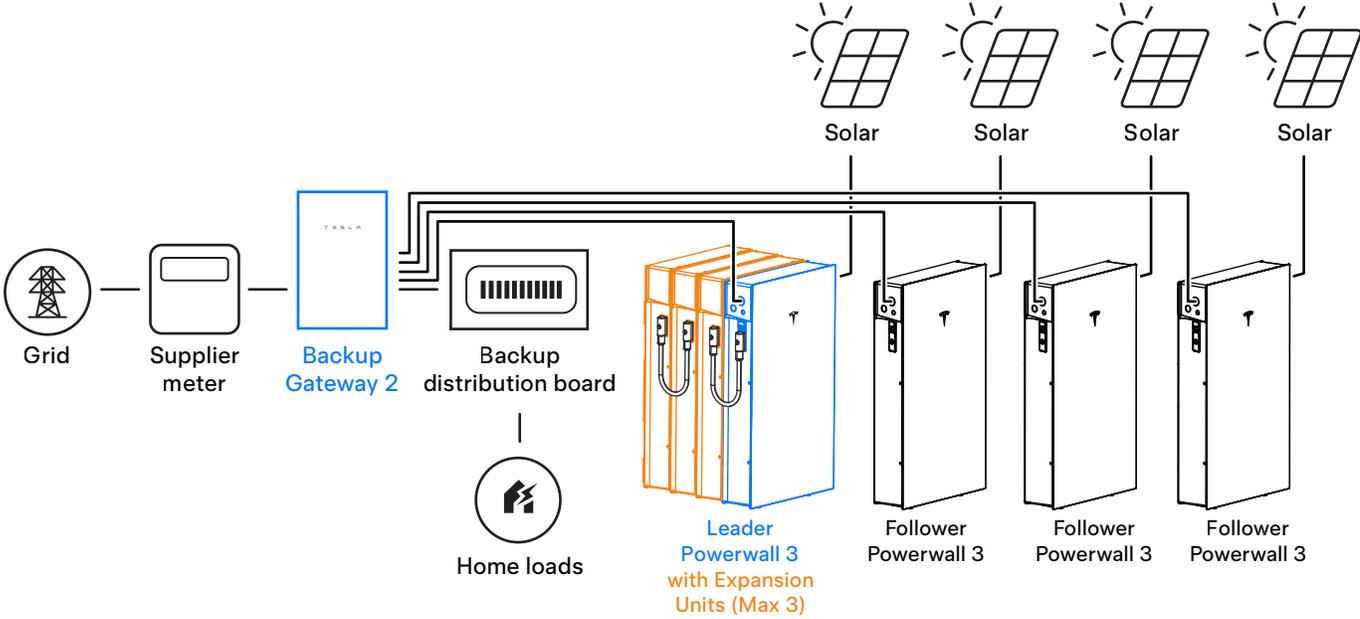
## Powerwall 3 with AC and DC Coupled Solar



# Powerwall 3 Example System Configurations

## Multi-Powerwall 3 System with up to (4) Powerwall 3 Units and up to (3) Expansion Units

Note: This is the current maximum system size and is supported on all of the example system configurations provided above.



# INCLUDES FREE BIRD PROTECTION



MRS BROWN

We already had solar panels installed but we're very troubled with pigeons. Deege installed the netting, the men were efficient extremely polite and tidy workers. Delighted to say we have no constant cooing now. Would highly recommend.



**PROTECT BOTH YOUR INVESTMENT & WILDLIFE**



**ENHANCE THE AESTHETICS OF YOUR SYSTEM**



**MINIMISE CLEANING AND MAINTENANCE COSTS**