Solar Panel
Product Information

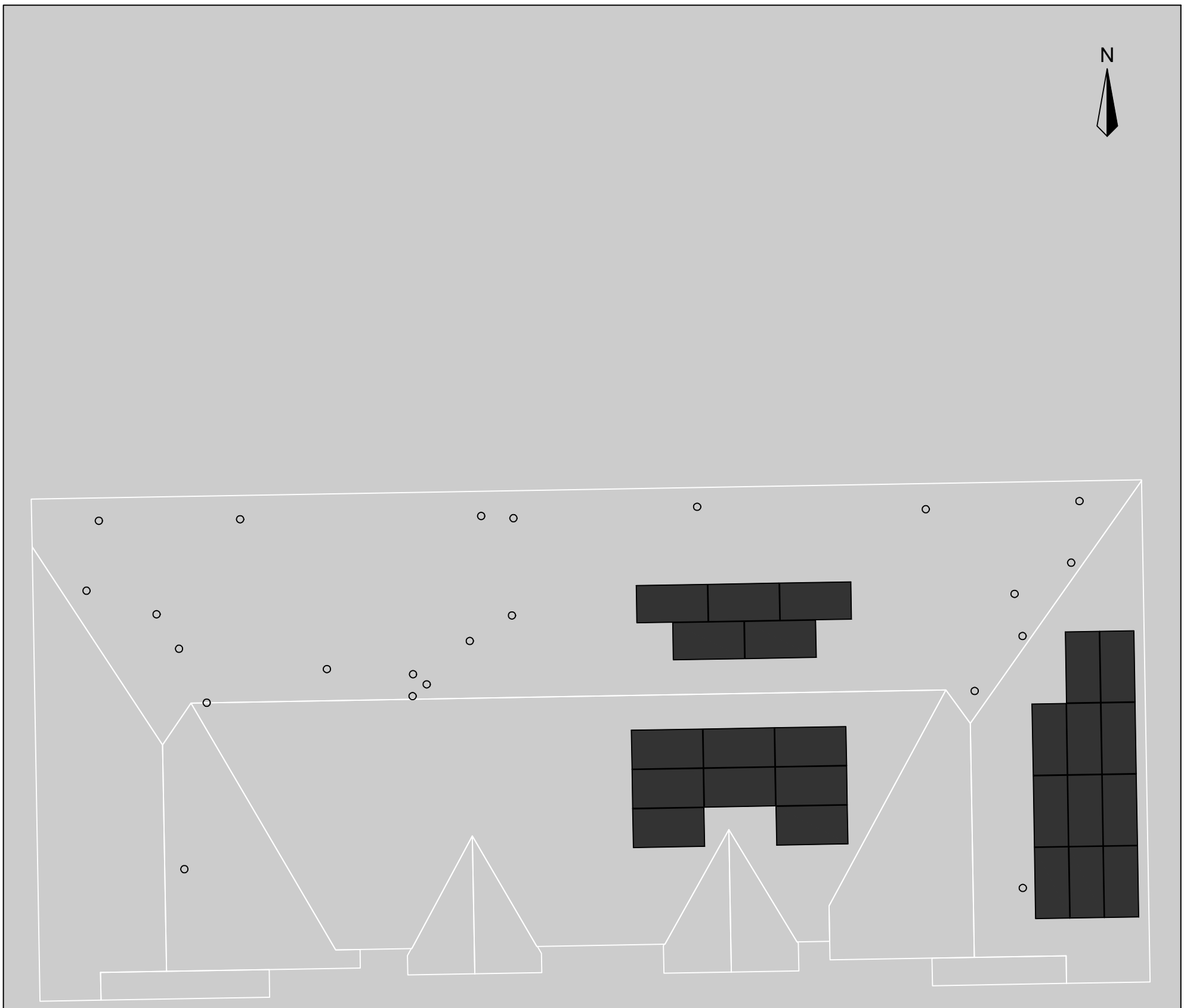
Produce Clean Energy

Sleek and Durable
With a low a profile and simple design, panels stay close to your roof and close to each other for a minimal aesthetic.

Built to Last
Solar panels maintain their production levels at high temperatures with minimal degradation for decades to come.

Clean Energy Generation
Solar panels can reduce your carbon emissions and lower your reliance on the grid with clean renewable energy.

Backup Protection
Combine with Powerwall to store the energy you produce, making it available anytime—at night or during an outage.



LEGEND

Solar Panels

Rooftop vents, skylights, chimneys, and HVAC

TESLA

Design Summary

Vandenberg Residence
1613 W 15th St
Houston, TX 77008

Solar Size

Ordered	Designed
8.16 kW	8.16 kW

Number of Solar Panels: 24

Estimated Year 1 Production: 9776.26 kWh
Estimated Year 1 Offset: 49%

No Change: Design matches the ordered system size.

Powerwall

Ordered	Designed
2 Powerwall(s)	2 Powerwall(s)

Backup Type: Partial Home
AC Unit TBD on site, Dryer not backed up.

Visit tesla.com/support/energy/powerwall/learn/what-does-powerwall-back-up for more information.

Roof & Site Repairs

We always attempt to quote one inclusive price whenever possible.

As with all construction projects, in some cases there may be additional work that can affect the project cost. If we discover items that are beyond the scope already quoted to you, a new price will be presented with no obligation to move forward.

Electrical Upgrades

Your main electrical panel provides the connection to the electrical grid and distributes power to your home.

There may be electrical upgrades required to your home. This can include a replacement of your existing electrical panel, an upgrade to your utility service or trenching to run new connections between detached structures.

This is determined from the photos provided during your home assessment. The price of electrical upgrades, when necessary, typically range between $2,000 and $5,000.

Installation Overview

Your solar agreement includes all hardware and installation costs, including a step-by-step guide of what you can expect.

Installation Day Checklist

- Obtain approval from your Homeowner's Association (HOA) if necessary.
- Ensure no other contractors or workers are on site during your solar installation.
- Ensure driveway is clear and your electrical panel is accessible.
- Contact Tesla if work has been done to your home since you ordered your system.
- Ensure someone 18 years or older is home for the first hour of installation.
- Please keep any pets away from the installation area for their safety.
- Keep your Wi-Fi network and password on hand.

Arrival & Preparation

- Crew leads greet you and discuss where equipment will be located based on preference and feasibility.
- Cones and caution tape are placed around your home.
- Ladders are placed in key areas.

Installation

- Solar panels are installed quickly.
- If installing Powerwall, you might lose power for a few hours.

Power On

- Crew lead walks you through your new system, including the Tesla app.
- The team cleans up and departs

Next Steps

Step 1

Order Online
We recommend a solar system that maximizes your savings based on your average electricity usage.

Step 2

Virtual Home Assessment (Optional)
Log into your Tesla Account to answer questions about your home, finalize your design and track your installation progress.

You Are Here →

Design
We create your design from aerial imaging and 3D modeling along with your feedback.

Permit
We work with your city to file permits for your system. Depending on your location, this may take one to five weeks.

Step 3

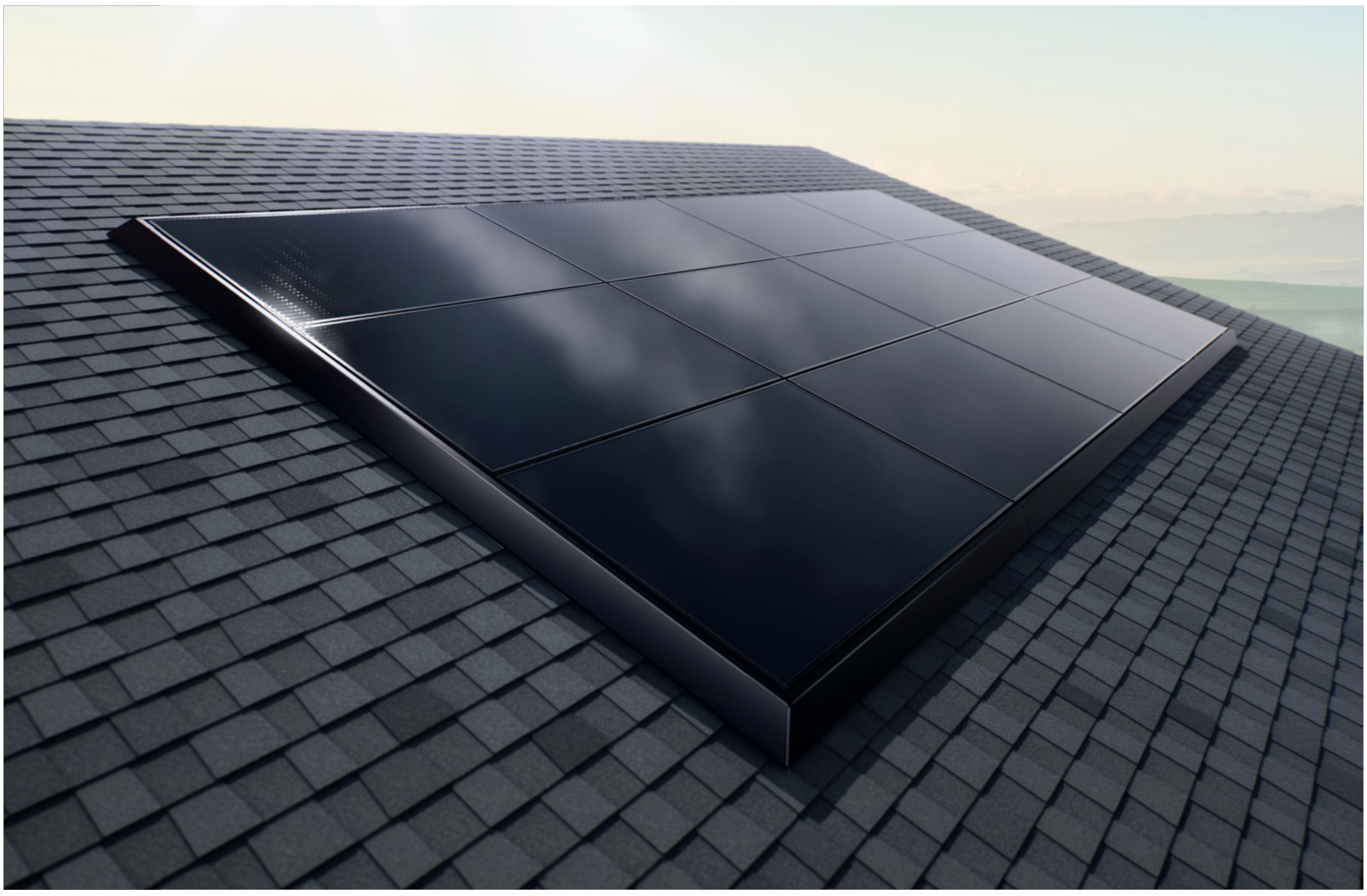
Installation
When your system is ready, you can select a date. Installation is typically finished in one day.

Inspection
We work with your local city to arrange for an inspection after installation is complete.

Utility Approval
We work with your local utility company to get permission to operate your system. Depending on your location, this may take one to six weeks.

Step 4

Power On
Most utilities require an interconnection agreement before you can turn on the system. We let you know when you have permission to activate your system.



Service & Warranty

With Tesla, your home and energy products are covered by a comprehensive warranty. For full details and exclusions, please refer to your purchase agreement in the Tesla Account.

Solar Panel
25 yrs.

Inverter
10 yrs.

If you need to make a claim under these warranties, we will process your claim and perform any related labor at our cost.

www.tesla.com/solarpanels

TESLA

powered by Q.ANTUM DUO

Q.PEAK DUO BLK-G6+ / SC

330-345

ENDURING HIGH PERFORMANCE

ZEP COMPATIBLE

EUPD RESEARCH TOP BRAND PV MODULES EUROPE 2019

Q CELLS YIELD SECURITY
- ANTI PID TECHNOLOGY (APT)
- HOT-SPOT PROTECT (HSP)
- TRACEABLE QUALITY (TRA.Q™)
- ANTI LID TECHNOLOGY (ALT)

25 YEAR Product and Performance Warranty Q CELLS

Q.ANTUM TECHNOLOGY: LOW LEVELIZED COST OF ELECTRICITY
Higher yield per surface area, lower BOS costs, higher power classes, and an efficiency rate of up to 19.5%.

INNOVATIVE ALL-WEATHER TECHNOLOGY
Optimal yields, whatever the weather with excellent low-light and temperature behavior.

ENDURING HIGH PERFORMANCE
Long-term yield security with Anti LID and Anti PID Technology[1], Hot-Spot Protect and Traceable Quality Tra.Q™.

ZEP COMPATIBLE™ FRAME DESIGN
High-tech black Zep Compatible™ frame, for improved aesthetics, easy installation and increased safety.

A RELIABLE INVESTMENT
Inclusive 25-year product warranty and 25-year linear performance warranty[2].

STATE OF THE ART MODULE TECHNOLOGY
Q.ANTUM DUO combines cutting edge cell separation and innovative wiring with Q.ANTUM Technology.

[1] APT test conditions according to IEC/TS 62804-1:2015, method B (–1500 V, 168 h)
[2] See data sheet on rear for further information

THE IDEAL SOLUTION FOR:

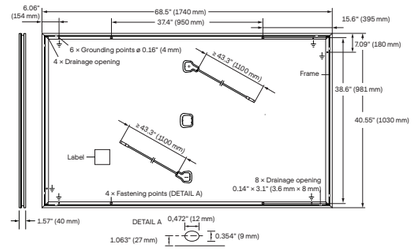
Rooftop arrays on commercial and industrial buildings

Engineered in Germany

Q CELLS

MECHANICAL SPECIFICATION

Format	68.5 × 40.6 × 1.57 in (including frame) (1740 × 1030 × 40 mm)
Weight	47.4 lbs (21.5 kg)
Front Cover	0.13 in (3.2 mm) thermally pre-stressed glass with anti-reflection technology
Back Cover	Composite film
Frame	Black anodized aluminum
Cell	6 × 20 monocrystalline Q.ANTUM solar half cells
Junction Box	2.09–3.98 × 1.26–2.36 × 0.59–0.71 in (53–101 × 32–60 × 15–18 mm), Protection class IP67, with bypass diodes
Cable	4 mm² Solar cable; (+) ≥ 43.3 in (1100 mm), (–) ≥ 43.3 in (1100 mm)
Connector	Stäubli MC4; IP68

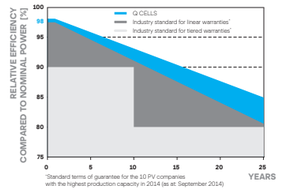


ELECTRICAL CHARACTERISTICS

POWER CLASS				330	335	340	345
MINIMUM PERFORMANCE AT STANDARD TEST CONDITIONS, STC[1] (POWER TOLERANCE +5 W / –0 W)							
Minimum	Power at MPP[1]	P_{MPP}	[W]	330	335	340	345
	Short Circuit Current[1]	I_{SC}	[A]	10.41	10.47	10.52	10.58
	Open Circuit Voltage[1]	V_{OC}	[V]	40.15	40.41	40.66	40.92
	Current at MPP	I_{MPP}	[A]	9.91	9.97	10.02	10.07
	Voltage at MPP	V_{MPP}	[V]	33.29	33.62	33.94	34.25
	Efficiency[1]	η	[%]	≥18.4	≥18.7	≥19.0	≥19.3
MINIMUM PERFORMANCE AT NORMAL OPERATING CONDITIONS, NMOT[2]							
Minimum	Power at MPP	P_{MPP}	[W]	247.0	250.7	254.5	258.2
	Short Circuit Current	I_{SC}	[A]	8.39	8.43	8.48	8.52
	Open Circuit Voltage	V_{OC}	[V]	37.86	38.10	38.34	38.59
	Current at MPP	I_{MPP}	[A]	7.80	7.84	7.89	7.93
	Voltage at MPP	V_{MPP}	[V]	31.66	31.97	32.27	32.57

[1] Measurement tolerances P_{MPP} ±3%; I_{SC}; V_{OC} ±5% at STC: 1000 W/m², 25±2 °C, AM 1.5 according to IEC 60904-3 • [2] 800 W/m², NMOT, spectrum AM 1.5

Q CELLS PERFORMANCE WARRANTY

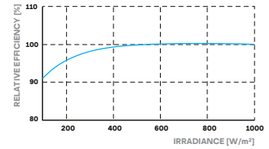


*Standard terms of guarantee for the 10 PV companies with the highest production capacity in 2014 (as at September 2014)

At least 98% of nominal power during first year. Thereafter max. 0.54% degradation per year. At least 93.1% of nominal power up to 10 years. At least 85% of nominal power up to 25 years.

All data within measurement tolerances. Full warranties in accordance with the warranty terms of the Q CELLS sales organization of your respective country.

PERFORMANCE AT LOW IRRADIANCE



Typical module performance under low irradiance conditions in comparison to STC conditions (25 °C, 1000 W/m²)

TEMPERATURE COEFFICIENTS							
Temperature Coefficient of I_{SC}	α	[%/K]	+0.04	Temperature Coefficient of V_{OC}	β	[%/K]	–0.27
Temperature Coefficient of P_{MPP}	γ	[%/K]	–0.36	Normal Module Operating Temperature	NMOT	[°F]	109±5.4 (43±3 °C)

PROPERTIES FOR SYSTEM DESIGN

Maximum System Voltage V_{SYS}	[V]	1000 (IEC) / 1000 (UL)	Protection Class	II
Maximum Series Fuse Rating	[A DC]	20	Fire Rating based on ANSI / UL 1703	C (IEC) / TYPE 2 (UL)
Max. Design Load, Push / Pull (UL)[3]	[lbs / ft²]	50 (2400 Pa) / 50 (2400 Pa)	Permitted Module Temperature on Continuous Duty	–40 °F up to +185 °F (–40 °C up to +85 °C)
Max. Test Load, Push / Pull (UL)[3]	[lbs / ft²]	75 (3600 Pa) / 75 (3600 Pa)		

[3] See Installation Manual

QUALIFICATIONS AND CERTIFICATES

UL 1703, CE-compliant, IEC 61215:2016, IEC 61730:2016, Application Class II, U.S. Patent No. 9,893,215 (solar cells)

Note: Installation instructions must be followed. See the installation and operating manual or contact our technical service department for further information on approved installation and use of this product.

Hanwha Q CELLS America Inc.
400 Spectrum Center Drive, Suite 1400, Irvine, CA 92618, USA | **TEL** +1 949 748 59 96 | **EMAIL** inquiry@us.q-cells.com | **WEB** www.q-cells.us

Specifications subject to technical changes © **Q CELLS** Q.PEAK DUO BLK-G6+/SC_330-345_2019-11_Rev01_NA

POWERWALL

Tesla Powerwall is a fully-integrated AC battery system for residential or light commercial use. Its rechargeable lithium-ion battery pack provides energy storage for solar self-consumption, time-based control, and backup.

Powerwall's electrical interface provides a simple connection to any home or building. Its revolutionary compact design achieves market-leading energy density and is easy to install, enabling owners to quickly realize the benefits of reliable, clean power.

PERFORMANCE SPECIFICATIONS

AC Voltage (Nominal)	120/240 V
Feed-In Type	Split Phase
Grid Frequency	60 Hz
Total Energy[1]	14 kWh
Usable Energy[1]	13.5 kWh
Real Power, max continuous[2]	5 kW (charge and discharge)
Real Power, peak (10s, off-grid/backup)[2]	7 kW (charge and discharge)
Apparent Power, max continuous	5.8 kVA (charge and discharge)
Apparent Power, peak (10s, off-grid/backup)	7.2 kVA (charge and discharge)
Maximum Supply Fault Current	10 kA
Maximum Output Fault Current	32 A
Overcurrent Protection Device	30 A
Imbalance for Split-Phase Loads	100%
Power Factor Output Range	+/– 1.0 adjustable
Power Factor Range (full-rated power)	+/– 0.85
Internal Battery DC Voltage	50 V
Round Trip Efficiency[1,3]	90%
Warranty	10 years

[1] Values provided for 25°C (77°F), 3.3 kW charge/discharge power.
[2] In Backup mode, grid charge power is limited to 3.3 kW.
[3] AC to battery to AC, at beginning of life.

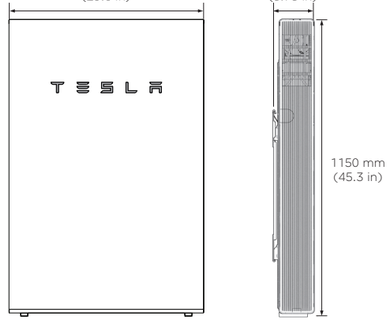
COMPLIANCE INFORMATION

Certifications	UL 1642, UL 1741, UL 1973, UL 9540, IEEE 1547, UN 38.3
Grid Connection	Worldwide Compatibility
Emissions	FCC Part 15 Class B, ICES 003
Environmental	RoHS Directive 2011/65/EU
Seismic	AC156, IEEE 693-2005 (high)

MECHANICAL SPECIFICATIONS

Dimensions[1]	1150 mm x 753 mm x 147 mm (45.3 in x 29.6 in x 5.75 in)
Weight[1]	114 kg (251.3 lbs)
Mounting options	Floor or wall mount

[1] Dimensions and weight differ slightly if manufactured before March 2019. Contact Tesla for additional information.

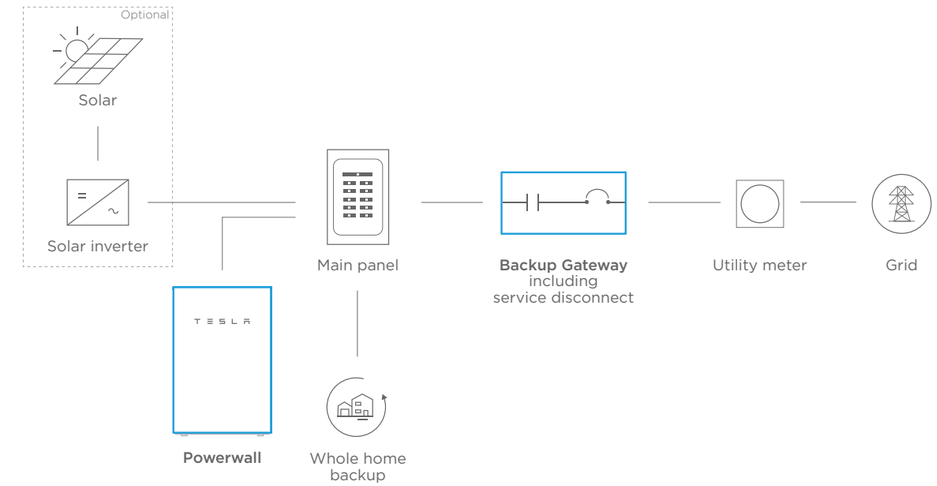


ENVIRONMENTAL SPECIFICATIONS

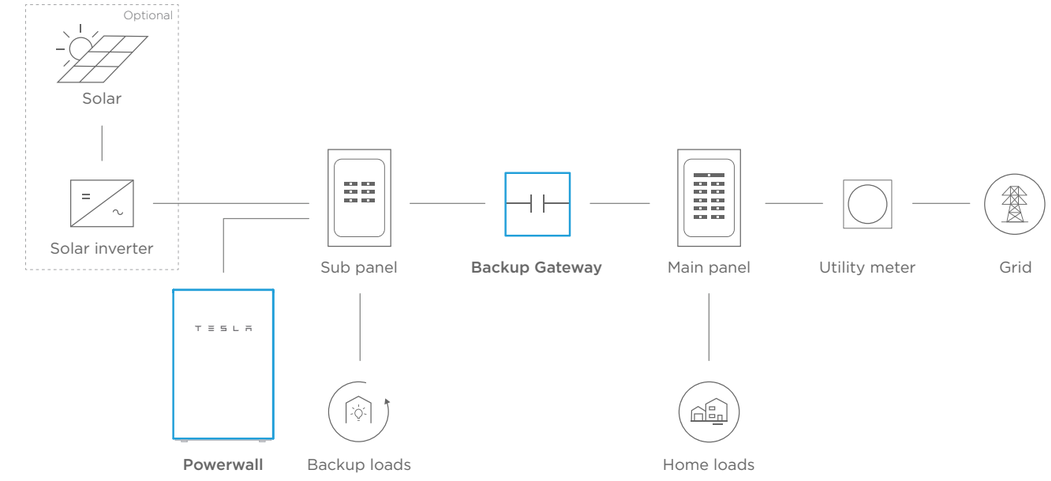
Operating Temperature	–20°C to 50°C (–4°F to 122°F)
Recommended Temperature	0°C to 30°C (32°F to 86°F)
Operating Humidity (RH)	Up to 100%, condensing
Storage Conditions	–20°C to 30°C (–4°F to 86°F) Up to 95% RH, non-condensing State of Energy (SoE): 25% initial
Maximum Elevation	3000 m (9843 ft)
Environment	Indoor and outdoor rated
Enclosure Type	NEMA 3R
Ingress Rating	IP67 (Battery & Power Electronics) IP56 (Wiring Compartment)
Wet Location Rating	Yes
Noise Level @ 1m	< 40 dBA at 30°C (86°F)

TYPICAL SYSTEM LAYOUTS

WHOLE HOME BACKUP



PARTIAL HOME BACKUP



Customer Layout

Final Audit Report 2021-04-22

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Energy Purchase Price Sheet
(Home Improvement)

Your information and installation location

Teddy Vandenberg
1613 W 15th St
Houston, TX 77008-3731
8322865952

Tesla Notice Information

Tesla, Inc. of 3500 Deer Creek Road, Palo Alto, CA, 94304
888-765-2489
TECL 33769

Installer

Tesla Energy Operations, Inc. of 901 Page Avenue, Fremont, CA 94538
TX TECL33536

System and Purchase Price

Description of the Project and Description of the Significant Materials to be Used and Equipment to be Installed

Solar System		**$16,421.68**
8.4000 kW DC Solar Panels	$3,882.94	
Installation, Permitting, and Other Fees	$9,960.58	
Inverter(s) & Balance of System	$2,025.89	
Mounting Hardware	$1,012.94	
Price Reduction	($460.67)	
Powerwall		**$19,476.40**
2 x Powerwalls	$16,000.00	
(Includes integrated or separate System communication device)		
Powerwall Installation	$3,000.00	
Conduit Run	$2,476.40	
Powerwall + Solar Discount	($2,000.00)	
Pre-construction Costs		**$6,800.00**
Main Panel Upgrade	$6,800.00	
Taxes		**$1,688.04**
Contract Price		**$44,386.12**
Credit for Order Payment	($100.00)	
Amount Due		**$44,286.12**

Schedule of Payments

Paid at Order	**$100.00**
Loan Amount	**$44,286.12**

The schedule of progress payments must specifically describe each phase of work, including the type and amount of work or services scheduled to be supplied in each phase, along with the amount of each proposed progress payment.

IT IS AGAINST THE LAW FOR A CONTRACTOR TO COLLECT PAYMENT FOR WORK NOT YET COMPLETED, OR FOR MATERIALS NOT YET DELIVERED. HOWEVER, A CONTRACTOR MAY