

Tesla Inc.
3500 Deer Creek Road,
Palo Alto, CA 94304
USA

19th Sept 2024

Report Number: 32195439.002
Project Number: 234209021_P01245692
Product(s) tested: Powerwall+ with Backup Gateway 2, Backup Switch & Backup Gateway 3
Model(s): Powerwall+ - 1850000-XX-Y
Backup Gateway 2 - 1232100-XX-Y
Backup Switch - 1624171-XX-Y
Backup Gateway 3 – 1841000-XX-Y
(X = 0-9 or A-Z; Y = 0-9 or A-Z)

Dear Mr. Viraj Andrabadu/Gaurav Joglekar,

Based on the evaluations undertaken, the model(s) of the below product have been found to comply with the requirements of the referenced specifications at the time the tests were carried out.

Nationally Recognized Testing Laboratory (NRTL)	TUV Rheinland of North America, Inc.
NRTL Issuing Office Address	1279 Quarry Lane, Suite A, Pleasanton, CA 94566
Applicant Name	Tesla, Inc.
Applicant Address	3500 Deer Creek Road, Palo Alto, CA 94304, USA
Model Numbers	Powerwall+ (1850000-XX-Y) with Backup Switch • ACPW (1092170-XX-Y, 2012170-XX-Y, 3012170-XX-Y) • PVI (1538000-XX-Y) • Backup Switch (1624171-XX-Y) • Site Master Controller in PVI only. Powerwall+ (1850000-XX-Y) with Backup Gateway 2 • ACPW (1092170-XX-Y, 2012170-XX-Y, 3012170-XX-Y) • PVI (1538000-XX-Y) • Gateway 2 (1232100-XX-Y) • Site Master Controller in PVI or GW2. Powerwall+ (1850000-XX-Y) with Backup Gateway 3 • ACPW (1092170-XX-Y, 2012170-XX-Y, 3012170-XX-Y) • PVI (1538000-XX-Y) • Gateway 3 (1841000-XX-Y) • Site Master Controller in PVI. (X = 0-9 or A-Z; Y = 0-9 or A-Z)

TUV Rheinland of North America, Inc.
Pleasanton Office

1279 Quarry Lane, Suite A, Pleasanton, CA 94566

Tel: (925) 249-9123
Fax: (925) 249-9124
Web: www.us.tuv.com

TUV Rheinland of North America, Inc.
North American Headquarters

12 Commerce Road
Newtown, CT 06470

Tel: +1 (203) 426-0888
Fax: +1 (203) 426-4009
Mail: info@tuv.com
Web: www.tuv.com

Software/Firmware Version	8586a41c49c cd3614dbf44274e567e68aa4efa62da125c08e79 h1:dcq8OiBXbQWYnK9UhCAjvl02
Standard(s) Tested	UL 1741: Standard for Inverters, Converters, Controllers and Interconnection System Equipment for Use with Distributed Energy Resources, April 20, 2010. Edition 2 [(Supplement SA)+R:15Feb2018], Power Control Systems (PCS), Certification Requirement Decision 3/8/2019. PCS limits defined by NFPA 2020 edition section 705.13.
Testing period:	04/21/21 – 05/07/21, 06/22/21 & 01/04/2024 – 01/24/2024
Reference reports:	<u>Powerwall 3 with Backup Gateway 2:</u> 32195440.001, US24VKH0.001 and ETL report no. 104514208CRT-001. <u>Powerwall with Backup Switch:</u> 32195440.001, US24VKH0.001 and ETL Report no. 104338849CRT-001. <u>Powerwall with Gateway 3:</u> 32195440.001, US24VKH0.001 and ETL Report no. 105217933CRT-001.

Powerwall+ ratings

Nominal Battery Energy	13.5 kWh
Nominal Grid Voltage	240 VAC
Voltage range	211.2-264 VAC
Maximum continuous Power On Grid	5 kW input/ 7.6 kW output
BESS Continuous Power	5 kW input/ 5 kW output
Maximum continuous Power Off Grid	5 kW input/ 9.6kW output
Frequency	60 Hz
Phase	240 VAC: 2 wire + neutral + ground
Maximum continuous Power On Grid	32 A output
BESS Continuous Power	24 A input
Maximum continuous Power Off Grid	40 A output
PV Maximum Input Voltage	600 VDC
PV Operating DC Input Voltage range	60-550 VDC
PV DC MPPT Voltage range	60-480 VDC
Maximum Current per MPPT	13 A
Maximum Short Circuit Current per MPPT	15 A
Overcurrent Protection Device	50 A
Software/Firmware version	8586a41c49c
Enclosure Type	Type 3R
Rated ambient temperature [°C]	-20°C to +50°C

PCS ratings with Backup Gateway 2

Maximum PCS controlled current	200 A
Maximum Open loop response time	9.09 seconds
Steady state % power	1% of power stability is achieved in less than 10 seconds
Average Open loop response time	5.01 seconds
Tested for Type of mode	Import Limit and Import only

Maximum PCS controlled current	200 A
Maximum Open loop response time	6.05 seconds
Steady state % power	1% of power stability is achieved in less than 10 seconds
Average Open loop response time	2.516 seconds
Tested for Type of mode	Export Limit and Export only

PCS ratings with Backup Switch & Backup Gateway 3

Maximum PCS controlled current	200 A
Maximum Open loop response time	9.09 seconds
Steady state % power	1% of power stability is achieved in less than 10 seconds
Average Open loop response time	5.01 seconds
Tested for Type of mode	Import Limit and Import only

Maximum PCS controlled current	200 A
Maximum Open loop response time	2.8 seconds
Steady state % power	1% of power stability is achieved in less than 10 seconds
Average Open loop response time	1.716 seconds
Tested for Type of mode	Export Limit and Export only

Test List table

Clause	Test
203.5	Step change in load test
203.6	Step Change in Generation Test
204.1.1	Import limit step change in load
204.1.1	Export limit step change in load
204.1.1	Import limiting Step change in generation
204.1.1	Export limiting Step change in generation
204.4	Export limiting to Energy Storage Systems
204.5	Import limiting to Energy Storage Systems
204.4	Export limiting from other inputs (generation)
204.5	Import limiting from other inputs (generation)
205.5 & 205.6	Startup / Self Check Abnormal Tests & Abnormal Maximum Self-Check Interval Test
205.7	Operating Abnormal Tests

Backup Gateway 2 Specifications**Backup Gateway 2 Specifications****Performance Specifications**

AC Voltage (Nominal)	120/240 V
Feed-In Type	Split Phase
Grid Frequency	60 Hz
Current Rating	200 A
Maximum Input Short Circuit Current	10 kA ¹
Overcurrent Protection Device	100-200A; Service Entrance Rated ¹
Overvoltage Category	Category IV
AC Meter	Revenue accurate (+/- 0.2 %)

¹When protected by Class J fuses, Backup Gateway 2 is suitable for use in circuits capable of delivering not more than 22 kA symmetrical amperes.

Mechanical Specifications

Dimensions	26 x 16 x 6 inches (660 x 411 x 149 mm)
Weight	45 lb (20.4 kg)
Mounting	Wall mount, Semi-flush mount

Environmental Specifications

Operating Temperature	-4°F to 122°F (-20°C to 50°C)
Operating Humidity (RH)	Up to 100%, condensing
Maximum Elevation	9843 ft (3000 m)
Environment	Indoor and outdoor rated
Enclosure Type	NEMA 3R

Backup Switch Specifications

Backup Switch Specifications

Performance Specifications

Continuous Load Rating	200A, 120/240V Split phase
Short Circuit Current Rating	22 kA with breaker ¹
Communication	CAN

¹The breaker size must be equal to or greater than the available fault current and can be installed either upstream or downstream of the Backup Switch. This Backup Switch is rated for use on a circuit delivering not more than 10,000 RMS symmetrical amperes, 300 V maximum. When used in conjunction with a circuit breaker rated not more than 200 A, the Backup Switch is rated for use on a circuit capable of delivering not more than 22,000 RMS symmetrical amperes, 300V maximum, **not in excess of circuit breaker interrupting rating**. Watthour meter not included in short circuit current rating.

Compliance Information

Safety Standards	USA: UL 414, UL 2735, UL 916, CA Prop 65
Emissions	FCC, ICES

Mechanical Specifications

Dimensions	6.9 x 8.1 x 2.9 inches (176 x 205 x 74 mm)
Weight	2.8 lb (1.27 kg)
Meter and Socket Compatibility	ANSI Type 2S, ringless or ring type
External Service Interface	Contact manual override ² , Reset button
Conduit Compatibility	½-inch NPT

²Manually overrides the contactor position during a service event.

Environmental Specifications

Operating Temperature	-40°F to 122°F (-40°C to 50°C)
Storage Temperature	-40°F to 185°F (-40°C to 85°C)
Enclosure Rating	NEMA 3R
Pollution Rating	PD3

Backup Gateway 3 Specifications

BACKUP GATEWAY 3 SPECIFICATIONS

Performance Specifications

Model Number	1841000-xx-y
Nominal Grid Voltage	120/240 V AC
Grid Configuration	Split phase
Grid Frequency	60 Hz
Continuous Current Rating	200 A
Maximum Supply Short Circuit Current	22 kA with Square D or Eaton main breaker and allowable branch breakers 25 kA with Eaton main breaker and allowable branch breakers ¹
IEC Protective Class	Class I
Overvoltage Category	Category IV
AC Meter	Revenue accurate (+/- 0.5 %)
Overcurrent Protection Device	100-200A; Service Entrance Rated ² ; Eaton CSR, BWH, or BW or Square D QOM breakers
Internal Panelboard	200 A, 8-space / 16 circuit breakers; Eaton BR, Siemens QP, or Square D HOM breakers rated to 10 - 125A

¹See [Acceptable Circuit Breakers on page 21](#) for all allowable main and branch breaker combinations.

² Not to be used as service entrance equipment in Canada.

Mechanical Specifications

Dimensions	26 x 16 x 6 inches (660 x 411 x 149 mm)
Weight	36 lb (16.4 kg)
Mounting	Wall mount

Environmental Specifications

Operating Temperature	-4°F to 122°F (-20°C to 50°C) ³
Operating Humidity (RH)	Up to 100%, condensing
Maximum Elevation	9843 ft (3000 m)
Environment	Indoor and outdoor rated
Enclosure Type	NEMA 3R

Attachments:

- a. System Label for PCS – PW+

TESLA POWERWALL+ BATTERY ENERGY STORAGE SYSTEM GRID SUPPORT UTILITY INTERACTIVE INVERTER		
PLACE PN / BARCODE LABEL HERE		
		
Photovoltaic (PV) and Battery Energy Storage System (BESS) Power Conversion Equipment		
Protective Class	Class I	
Enclosure Type	Type 3R	
Operating Temperature Range	-20°C to 50°C	
Derated Temperature Range	43°C to 50°C	
PV Inverter Topology	Non-Isolated	
BESS Inverter Topology	Isolated	
Nominal Battery Energy	13.5 kW-hr	
Battery Type	Li-Ion	
Mass	156 kg	
Photovoltaic (PV) and Battery Energy Storage System (BESS) Specifications		
Nominal Grid Voltage (Input / Output)	208 VAC	240 VAC
Grid Voltage Range	183-228.8 VAC	211.2-264 VAC
Maximum Continuous Output Power On-Grid	6.6 kVA	7.6 kVA
Maximum Continuous Output Power Off-Grid	---	9.6 kVA
BESS Maximum Continuous Input Power	5 kVA	5.8 kVA
Frequency	60 Hz	
Maximum Continuous Output Current On-Grid	32 AAC	
Maximum Continuous Output Current Off-Grid	40 AAC	
BESS Maximum Continuous Input Current	24 AAC	
PV Maximum Input Current	13 ADC	
PV Operating DC Input Voltage Range	60 - 550 VDC	
Phase	208 VAC / 240 VAC: 2W+N+PE	
Maximum Supply Fault Current	10 kA AC	
Conforms to:	UL Std 9540	
The maximum operating current of this system may be controlled electronically. Refer to the manufacturer's instructions for more information.		
 5 Minutes		
PHOTOVOLTAIC (PV) RAPID SHUTDOWN SYSTEM EQUIPMENT		
ONLY THE INDICATED TERMINALS OF THIS PRODUCT COMPLY WITH PV RAPID SHUTDOWN REQUIREMENTS FOR CONTROLLED CONDUCTORS OUTSIDE THE ARRAY PERMITTED CONDUCTOR CONNECTION PORT - REFER TO INSTRUCTIONS FOR CONDITIONS OF USE.		
CAUTION: RISK OF ELECTRIC SHOCK. DO NOT REMOVE COVER NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL. CAUTION: BOTH AC AND DC VOLTAGE SOURCES ARE TERMINATED INSIDE THIS EQUIPMENT. EACH CIRCUIT MUST BE INDIVIDUALLY DISCONNECTED BEFORE SERVICING. CAUTION: WHEN THE PV ARRAY IS EXPOSED TO LIGHT, IT SUPPLIES A DC VOLTAGE TO THIS EQUIPMENT. WARNING: ELECTRIC SHOCK HAZARD. THE DC CONDUCTORS OF THIS PV SYSTEM ARE NORMALLY UNGROUNDED BUT WILL BECOME INTERMITTENTLY GROUNDED WITHOUT INDICATION WHEN THE INVERTER MEASURES THE PV ARRAY ISOLATION. ENERGY STORED IN CAPACITOR. DO NOT REMOVE COVER UNTIL 5 MINUTES AFTER DISCONNECTING THE EQUIPMENT. POWER FED FROM MORE THAN ONE SOURCE. DISCONNECT ALL SOURCES OF SUPPLY BEFORE SERVICING.		
		Tesla, Inc. Electric Ave., Sparks, NV, 89437, USA Tel: 1 (877) 798-3752 www.tesla.com
Made in the USA		

b. Backup Gateway 2 Label

BACKUP GATEWAY 2

PLACE TESLA
PN / BARCODE
LABEL HERE

Conforms to:
UL STDs 67, 916, & 969A



Certified to:
CSA STDs C22.2 # 205 & 0.19

PROTECTIVE CLASS	CLASS I
ENCLOSURE TYPE (UL 50)	NEMA TYPE 3R, RAIN-TIGHT
OPERATING TEMPERATURE RANGE	-4°F TO 122°F

AC INPUT / OUTPUT

VOLTAGE RANGE	110-240VAC
MAX CURRENT	200A
MAX INPUT SHORT CIRCUIT CURRENT	10kA*
FREQUENCY	60Hz
MAXIMUM POWER	48kW

*WHEN PROTECTED BY CLASS J FUSES, THIS PANELBOARD IS SUITABLE FOR USE IN CIRCUITS CAPABLE OF DELIVERING NOT MORE THAN 22kA SYMMETRICAL AMPERES.





SEE DOCUMENTATION
FOR ADDITIONAL
SAFETY INFORMATION

CAUTION:
RISK OF ELECTRIC SHOCK. MULTIPLE VOLTAGE SOURCES TERMINATED WITHIN. REFER SERVICING TO QUALIFIED PERSONNEL. DISCONNECT EACH CIRCUIT BEFORE SERVICING.

COMPARTMENT FOR SUPPLY AUTHORITY USE ONLY
WARNING: ISOLATE AT SUPPLY AUTHORITY SOURCE BEFORE ENTERING THIS COMPARTMENT

RISQUE DE CHOC ÉLECTRIQUE. PLUSIEURS SOURCES DE TENSION SONT CONNECTÉES À L'INTÉRIEUR DE CET ÉQUIPEMENT. CHAQUE CIRCUIT DOIT ÊTRE DÉCONNECTÉ INDIVIDUELLEMENT AVANT INTERVENTION. LA MAINTENANCE DOIT ÊTRE EFFECTUÉE PAR DU PERSONNEL QUALIFIÉ.

COMPARTIMENT RÉSERVÉ AU DISTRIBUTEUR D'ÉLECTRICITÉ
AVERTISSEMENT : ISOLER À LA SOURCE D'ALIMENTATION DU DISTRIBUTEUR AVANT D'OUVRIR CE COMPARTIMENT

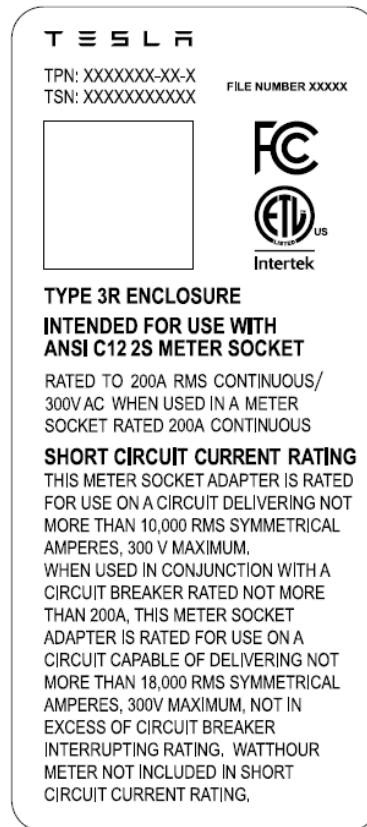
SUITABLE FOR USE AS SERVICE EQUIPMENT

CLASS CTL PANELBOARD



(877) 798-3752 | www.tesla.com

c. Backup Switch Label



d. Backup Gateway 3 Label

GATEWAY 3

PLACE TESLA
PN / BARCODE
LABEL HERE

Conforms to:
UL STDs 67, 916, 869A, 1741

Certified to:
CAN/CSA 22.2 No. 205, 29, 107.1




IEC PROTECTIVE CLASS	CLASS I
ENCLOSURE TYPE	TYPE 3R, RAINPROOF
OPERATING TEMPERATURE RANGE	-20°C TO 50°C (-4°F TO 122°F)
AC INPUT / OUTPUT	
NOMINAL VOLTAGE	120/240VAC
PHASE	2W + N + PE
MAX CONTINUOUS CURRENT	200A
MAX SUPPLY SHORT CIRCUIT CURRENT	25kA*
GRID FREQUENCY	60Hz

*SEE INSTALLATION MANUAL FOR ALLOWABLE MAIN AND BRANCH BREAKER COMBINATIONS





SEE DOCUMENTATION
FOR ADDITIONAL
SAFETY INFORMATION

CAUTION: RISK OF ELECTRIC SHOCK. MULTIPLE VOLTAGE SOURCES TERMINATED WITHIN. DISCONNECT EACH CIRCUIT BEFORE SERVICING. REFER SERVICING TO QUALIFIED PERSONNEL.

WARNING: ISOLATE AT SUPPLY AUTHORITY SOURCE BEFORE ENTERING THIS COMPARTMENT

ATTENTION: RISQUE DE CHOC ÉLECTRIQUE. PLUSIEURS SOURCES DE TENSION SONT CONNECTÉES À L'INTÉRIEUR DE CET ÉQUIPEMENT. CHAQUE CIRCUIT DOIT ÊTRE DÉCONNECTÉ INDIVIDUELLEMENT AVANT INTERVENTION. LA MAINTENANCE DOIT ÊTRE EFFECTUÉE PAR DU PERSONNEL QUALIFIÉ.

AVERTISSEMENT: ISOLER À LA SOURCE D'ALIMENTATION DU DISTRIBUTEUR AVANT D'OUVRIER CE COMPARTIMENT

SUITABLE FOR USE WITH INTERCONNECTED PARALLEL ELECTRIC POWER PRODUCTION SOURCES

SUITABLE FOR USE AS SERVICE EQUIPMENT

CLASS CTL PANELBOARD

TESLA

TESLA, INC
 SOUTH PARK AVENUE
 BUFFALO, NY 14220, USA
 TEL: 1/877/798-3752
 WWW.TESLA.COM

Thank you for the opportunity to service your product testing needs. Please do not hesitate to contact our engineering or sales team for any questions you may have.

Evaluated by:

Reviewed by:

Himanshu Vaidya

Howard Liu

Test Engineer

*Manager, Power Electronics Segment
– Americas*

Email: hvaidya@us.tuv.com

Email: hliu@us.tuv.com

Report History	
Original Letter	Job 234171546
6/22/21 – Himanshu Vaidya	Job 234173937 - Project to test and evaluate Overcurrent limitation feature as per UL 1741 PCS standard Clause 208.1, A with respect to NFPA 70 2020 edition section 705.13. - Added testing period date 6/22/21 - Added row in Description table for above feature mentioned.
8/25/21 – Himanshu Vaidya	Job 234175961 - Added "Site Master Controller in PVI only" in model numbers - Added "Site Master Controller in PVI or GW2" in model numbers
10/7/21 – Himanshu Vaidya	- Add Type of mode tested for – "Import only"
03/24/22 – Himanshu Vaidya	Job 234187613 - Added "Steady state %Power" row under PCS ratings table as per Option 10: A new <10 sec non-export option for systems <1 MVA, Page 205 of the Rule 21 Tariff covers the requirements
6/19/23 – Himanshu Vaidya	Job 234204661 - Added test list and type of mode tested.
1/29/2024 – Himanshu Vaidya – 32195439.002	Job 234209021 - Added Backup Gateway 3 configuration information to support PCS functionality with Powerwall 3. - Added Export only mode details for all combination. - Added test list table - Added ESS operating modes.