

CERTIFICATE OF COMPLIANCE

Certificate Number E210376
Report Reference E210376-2019-08-27
Date 2022-December-15

Issued to: SMA Solar Technology AG
Sonnenallee 1
Niestetal 34266 DE

This is to certify that representative samples of
STATIC INVERTERS, CONVERTERS AND ACCESSORIES FOR USE
IN INDEPENDENT POWER SYSTEMS

See Addendum Pages for Product Designation(s).

Have been investigated by UL in accordance with the Standard(s)
indicated on this Certificate.

Standard(s) for Safety: See Addendum Pages for standards.

Additional Information: See the UL Online Certifications Directory at <https://iq.ulprospector.com>
for additional information

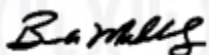
This Certificate of Compliance does not provide authorization to apply the UL Mark. Only the UL Follow-Up Services Procedure provides authorization to apply the UL Mark.

Only those products bearing the UL Mark should be considered as being UL Certified and covered under UL's Follow-Up Services.

Look for the UL Certification Mark on the product.

This is to certify that representative samples of the product as specified on this certificate were tested according to the current UL requirements.

These inverters are Listed individually as "partially compliant DER units" per IEEE 1547-2018 and UL1741 Supplement SB.



Bruce Mahrenholz, Director North American Certification Program

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Standards for Safety: Safety Standard	UL 62109-1, Standard for Safety of power converters for use in photovoltaic power systems – Part 1: General requirements Edition 1, Revision Date April 30, 2019. and chapter 31 and CRD 6 from UL Standard for Inverters, Converters, Controllers And Interconnection System Equipment For Use With Distributed Energy Resources, UL 1741, Edition 2, Revision Date July 10, 2021 CAN/CSA C22.2 NO. 107.1-16 Power Conversion Equipment, Edition 4, Revision Date September 2021 ANSI/UL 1998, Software in Programmable Components., Edition 3, Revision Date September 24, 2018
Grid Interconnection Requirements with corresponding Source Requirement Document (SRD)	UL1741 SA Advanced Inverter Testing According to UL 1741 Standard for Inverters, Converters, Controllers and Interconnection System Equipment for use with Distributed Energy Resources- Edition 2 - Revision Date July 10, 2021 IEEE 1547 Interconnecting Distributed Resources With Electric Power Systems - Edition 1 – Revision Date, June 12, 2003 IEEE 1547.1 Standard Conformance Test Procedures For Equipment Interconnecting Distributed Resources With Electric Power Systems - Edition 1 - Dated June 1, 2005 PG&E Electric Rule 21 section Hh. SCE Rule 21 section Hh. SDG&E Rule 21 section Hh
Grid Interconnection Requirements with corresponding Source Requirement Document (SRD)	UL1741 SB Advanced Inverter Testing According to UL 1741 Standard for Inverters, Converters, Controllers and Interconnection System Equipment for use with Distributed Energy Resources- Edition 3 - Revision Date October 18, 2022 IEEE 1547-2018 IEEE Standard for Interconnection and Interoperability of Distributed Energy Resources with Associated Electric Power Systems Interfaces, Edition 1, Revision Date February 15, 2018 IEEE 1547a-2020 IEEE Standard for Interconnection and Interoperability of Distributed Energy Resources with Associated Electric Power Systems Interfaces - Amendment 1: To Provide More Flexibility for Adoption of Abnormal Operating Performance Category III, Dated 2020-03-09

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	IEEE 1547-2018 - Errata to IEEE Standard for Interconnection and Interoperability of Distributed Energy Resources with Associated Electric Power Systems Interfaces, IEEE Standards Coordinating Committee 21, IEEE Std 1547-2018, Revision of IEEE Std 1547-2003, Correction Sheet, Dated 2018-06-04 IEEE 1547.1-2020 IEEE Standard Conformance Test Procedures for Equipment Interconnecting Distributed Energy Resources with Electric Power Systems and Associated Interfaces, Edition 1, Revision Date March 5, 2020 HECO SRD 2.0
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- ☒ R21: The evaluation to the Standards above provides evidence of compliance to the intent of the existing California Rule 21 Interconnection (references to the past publication of IEEE 1547 standards) and UL1741 Table SA1.1 option to use the IEEE 1547.1-2020 and UL1741SB test methods in conjunction with using IEEE 1547-2018 as the SRD under which SA11.2 Normal Ramp Rate is not addressed. Additional testing was conducted to confirm compliance to Normal Ramp Rate SA11.2.
- ☒ 14H (SB): The evaluation to the Standards above provides evidence of compliance to HECO Rule 14H, SRD V2.0, Interconnection Application.
- ☒ Hawaiian Electric IEEE 1547.1-2020 Standard Source Requirement Document Version 2.0 (SRD V2.0): Part II - Non-Standardized Requirement; A. Enter Service, B. Frequency ride-through, C. Frequency-droop, Dated 2020-07-01

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Product Designation(s):

Permanently-connected, utility Interactive, multi-mode, 3-phase inverter, distributed resource power system.

Models:

SC 4000 UP-US 600V 3850A
SC 4200 UP-US 630V 3850A
SC 4400 UP-US 660V 3850A
SC 4600 UP-US 690V 3850A
SC 2660 UP-US 600V 2566A
SC 2800 UP-US 630V 2566A
SC 2930 UP-US 660V 2566A
SC 3060 UP-US 690V 2566A

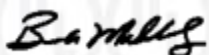
SC xxxx UP-US yyyV zzzzA (+) (++)

(+)

where xxxx = can be any value between 2000 and 4600, representing the power in one kVA steps,
where yyy = representing the AC Voltage in V, is a fix value of 600V, 630V, 660V or 690V in
dependence to inverter class (see (++)),

where zzzz = can be any value between 0 and 3850, representing the AC current,
(++)

SC 4000 UP-US 600V 3850A can support 2000kVA to 4000kVA in one kVA steps
SC 4200 UP-US 630V 3850A can support 2000kVA to 4200kVA in one kVA steps
SC 4400 UP-US 660V 3850A can support 2000kVA to 4400kVA in one kVA steps
SC 4600 UP-US 690V 3850A can support 2000kVA to 4600kVA in one kVA steps
SC 2660 UP-US 600V 2566A can support 2000kVA to 2667kVA in one kVA steps
SC 2800 UP-US 630V 2566A can support 2000kVA to 2800kVA in one kVA steps
SC 2930 UP-US 660V 2566A can support 2000kVA to 2933kVA in one kVA steps
SC 3060 UP-US 690V 2566A can support 2000kVA to 3067kVA in one kVA steps



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SCS 3450 UP-XT-US 4000kVA 600V 3850A
SCS 3600 UP-XT-US 4200kVA 630V 3850A
SCS 3800 UP-XT-US 4400kVA 660V 3850A
SCS 3950 UP-XT-US 4600kVA 690V 3850A
SCS 2300 UP-XT-US 2667kVA 600V 2566A
SCS 2400 UP-XT-US 2800kVA 630V 2566A
SCS 2530 UP-XT-US 2933kVA 660V 2566A
SCS 2630 UP-XT-US 3067kVA 690V 2566A
SCS 3450 UP-US 600V 3320A
SCS 3600 UP-US 630V 3320A
SCS 3800 UP-US 660V 3320A
SCS 3950 UP-US 690V 3320A
SCS xxxx UP-US yyyV zzzzA and SCS xxxx UP-XT-US pppkVA yyyV zzzzA (+++) (++++)

(+++)

where xxxx = can be any value between 2000 and 4600, representing the power in one kVA steps,
where pppp = can be any value between 2000 and 4600, representing the power in one kVA steps,
where yyy = representing the AC Voltage in V, is a fix value of 600V, 630V, 660V or 690V in
dependence to inverter class (see (++++)),
where zzzz = can be any value between 0 and 3850, representing the AC current. Max. AC current is
defined by inverter class (see (++++)),

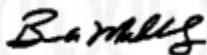
(++++)

SCS 3450 UP-US 600V 3320A can support 2000kVA to 3450kVA in one kVA steps
SCS 3600 UP-US 630V 3320A can support 2000kVA to 3600kVA in one kVA steps
SCS 3800 UP-US 660V 3320A can support 2000kVA to 3800kVA in one kVA steps
SCS 3950 UP-US 690V 3320A can support 2000kVA to 3950kVA in one kVA steps
SCS 3450 UP-XT-US 4000kVA 600V 3850A can support 2000kVA to 4000kVA in one kVA steps
SCS 3600 UP-XT-US 4200kVA 630V 3850A can support 2000kVA to 4200kVA in one kVA steps
SCS 3800 UP-XT-US 4400kVA 660V 3850A can support 2000kVA to 4400kVA in one kVA steps

SCS 3950 UP-XT-US 4600kVA 690V 3850A can support 2000kVA to 4600kVA in one kVA steps
SCS 2300 UP-XT-US 2667kVA 600V 2566A can support 2000kVA to 2667kVA in one kVA steps
SCS 2400 UP-XT-US 2800kVA 630V 2566A can support 2000kVA to 2800kVA in one kVA steps
SCS 2530 UP-XT-US 2933kVA 660V 2566A can support 2000kVA to 2933kVA in one kVA steps
SCS 2630 UP-XT-US 3067kVA 690V 2566A can support 2000kVA to 3067kVA in one kVA steps

SC xxxx UP-US yyyV zzzzA inverters, which are intended for DC input from photovoltaic modules
and models SCS xxxx UP-US yyyV zzzzA and SCS xxxx UP-XT-US pppkVA yyyV zzzzA intended
to be connected to a Battery (No PV Input).

The input source may be either Grounded or Un-Grounded. System grounding may be implemented
either on Negative or Positive rail.



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USL, CNL - Listed Accessory for use with model inverters SC xxxx UP-US yyyV zzzzA, SCS xxxx UP-US yyyV zzzzA and SCS xxxx UP-XT-US ppppkVA yyyV zzzzA.

Sound absorber - Sound absorber for air inlet and outlet for noise reduction.

USL, CNL - Listed Accessory for use with model inverters SC xxxx UP-US yyyV zzzzA.

DPS-500 DC/DC converter.

Where xxxx = can be any value between 2000 and 4600, representing the power in one kVA steps.

Where yyy = representing the AC Voltage in V, is a fix value of 600V, 630V, 660V or 690V in dependence to inverter class.

Where zzzz = can be any value between 0 and 3850, representing the AC current.

The option key nomenclature consists of a 23 digit word:

model key	x	x	x	x	z	x	y	y	z	x	z	x	z	z	z	z	z	z	x	z	z	z	x	x
digit	1	2	3	4	5	6	7	8	10	11	12	13	14	15	16	17	19	33	36	38	40	43	44	47

x = numbers, y = 2 digit letters not controlled by UL, z = digits not controlled by UL.

Option code digits 9, 18, 20-32,34,35,37,39,41,42, 45, 46 (numbers) not controlled by UL.

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digit	1(+)	2(++)	3	4
values	0, 1, 2, 3, 4, 5	0, 1, 2	0, 1, 2, 3, 4, 5, 6, 7, 8	0, 5, 6, 7, 8, 9, A, B, C, D, E, F, G H
correlated to	DC-Grounding	DC Input	DC Fuses	DC Input Configuration
0	isolated (ungrounded)	busbar	non-fused (combined busbar)	non-fused (busbar)
1	DC- grounded with GFDI	fuses single pole	200A	-
2	DC- grounded with Remote GFDI	fuses both poles	250A	-
3	DC+ grounded with GFDI	-	315A	-
4	DC+ grounded with Remote GFDI	-	350A	-
5	DC- grounded (+++)	-	400A	24 fused inputs
6	-	-	450A	24 fused inputs with disco.
7	-	-	500A	28 fused inputs with disco.
8	-	-	UPSys-DC-Fuse	32 fused inputs with disco.
9	-	-	-	20 fused inputs with disco.
A	-	-	-	28 fused inputs
B	-	-	-	32 fused inputs
C	-	-	-	36 photovoltaic inputs plus 6 battery inputs
D	-	-	-	18 photovoltaic inputs plus 6 battery inputs
E	-	-	-	24 photovoltaic inputs with disco. plus 6 battery inputs
F	-	-	-	non-fused (3 busbars)
G	-	-	-	non-fused (2 busbars)
H	-	-	-	single fused busbar

- 1 (+) This model code specifies the DC grounding option.
2 (++) 2 Options for the DC inputs available one with and one without fuses.
3 (+++) not relevant for SC or SCS only required for Electrolysis Converter (EC).

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digit	6 (+)	13	36	44 (++)
values	0, 1, 2	0, 1, 2	0, 1, 2, 4, 5	0, 1, 2
correlated to	Isolation monitoring	Auxiliary Supply for external Loads	Power Supply	Remote service
0	no	no	400V internal	no
1	yes	2.5 kVA / 230 V	400V external	yes
2	yes (with float controller preparation)	2.5 kVA / 120 V	Internal with overvoltage protection	yes, with gateway
3	-	-	-	-
4	-	-	external (1-Ph)120V	-
5	-	-	external (1-Ph)230V	-
6	-	-	external (3-ph)400V + (1-ph) 230V	-
7	-	-	-	-
8	-	-	120V / 240V external, 230V internal	-
9	-	-	24V external, 400V internal	-

6 (+) For the value of 0, no insulation monitoring device is provided the unit is intended for grounded systems only. For option 1 an insulation monitoring device is installed in the unit. This device measures the insulation resistance between DC+ and DC- to ground when the unit is connected to an ungrounded PV array.

44 (++) For the value of 0, no remote service tool in the inverter. For the value of 1, same as value of 0. For the value of 2, additional remote service tool integrated in the inverter.

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Detailed Testing Summary			
Test Name	IEEE 1547.1-2020 (UL1741SB) Section	Fixed / Adjustable	Pass / Fail
PRIORITY OF RESPONSES	5.2	Adjustable	Pass
TEMPERATURE STABILITY	5.3	Adjustable	Pass
TEST FOR OVERVOLTAGE TRIP	5.4.2	Adjustable	Pass
TEST FOR UNDERVOLTAGE TRIP	5.4.3	Adjustable	Pass
LOW-VOLTAGE RIDE-THROUGH TESTS	5.4.4	Adjustable	Pass
TEST FOR VOLTAGE DISTURBANCES WITHIN CONTINUOUS OPERATING REGION	5.4.5	Adjustable	Pass
HIGH-VOLTAGE RIDE-THROUGH TESTS	5.4.7	Adjustable	Pass
TEST FOR OVERFREQUENCY TRIP	5.5.1	Adjustable	Pass
TEST FOR UNDERFREQUENCY TRIP	5.5.2	Adjustable	Pass
TEST FOR LOW-FREQUENCY RIDE-THROUGH	5.5.3	Adjustable	Pass
TEST FOR HIGH-FREQUENCY RIDE-THROUGH	5.5.4	Adjustable	Pass
TEST FOR RATE OF CHANGE OF FREQUENCY (ROCOF)	5.5.5	Adjustable	Pass
TEST FOR VOLTAGE PHASE-ANGLE CHANGE RIDE-THROUGH	5.5.6	Adjustable	Pass
NORMAL RAMP RATE	N/A	Adjustable	Pass
ENTER SERVICE	5.6	Adjustable	Pass
SYNCHRONIZATION CONTROL FUNCTION TEST FOR EQUIPMENT WITH NO SYNCHRONIZING DISABLE CAPABILITY	5.7.4	Adjustable	Pass
PROTECTION FROM ELECTROMAGNETIC INTERFERENCE (EMI)	5.8.1	Adjustable	Pass
SURGE WITHSTAND PERFORMANCE TEST	5.8.2	Adjustable	Pass
LIMITATION OF DC INJECTION FOR INVERTERS	5.9	Fixed	Pass



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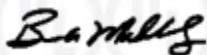
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Detailed Testing Summary (continued)			
Test Name	IEEE 1547.1-2020 (UL1741SB) Section	Fixed / Adjustable	Pass / Fail
UNINTENTIONAL ISLANDING	5.10	Adjustable	Not fully evaluated
OPEN PHASE TEST	5.11	Fixed	Pass
CURRENT DISTORTION	5.12	Adjustable	Not fully evaluated
LIMIT ACTIVE POWER	5.13	Adjustable	Pass
TEST FOR CONSTANT POWER FACTOR (P.F.) MODE	5.14.3	Adjustable	Pass
TEST FOR VOLTAGE-REACTIVE POWER (VOLT-VAR) MODE	5.14.4	Adjustable	Pass
TEST FOR VOLTAGE-REACTIVE POWER (VOLT-VAR) MODE (VREF TEST)	5.14.5	Adjustable	Pass
TEST FOR VOLTAGE—REACTIVE POWER (VOLT-VAR) MODE WITH AN IMBALANCED GRID	5.14.6	Adjustable	Pass
TEST FOR ACTIVE POWER-REACTIVE POWER MODE (WATT-VAR)	5.14.7	Adjustable	Pass
TEST FOR CONSTANT REACTIVE POWER (VAR) MODE	5.14.8	Adjustable	Pass
TEST FOR VOLTAGE-ACTIVE POWER (VOLT-WATT) MODE	5.14.9	Adjustable	Pass
TEST FOR VOLTAGE-ACTIVE POWER (VOLT-WATT) MODE WITH AN IMBALANCED GRID	5.14.10	Adjustable	Pass
TEST FOR FREQUENCY-DROOP (FREQUENCY-POWER OR FREQUENCY-WATT) CAPABILITY—ABOVE NOMINAL FREQUENCY	5.15.2	Adjustable	Pass
TEST FOR FREQUENCY-DROOP (FREQUENCY-POWER OR FREQUENCY-WATT) CAPABILITY—BELOW NOMINAL FREQUENCY	5.15.3	Adjustable	Pass
TEST FOR PRIORITIZATION OF DER RESPONSES	5.16.1	Adjustable	Pass
GROUND FAULT OVERVOLTAGE (GFOV) TEST	5.17.1	Adjustable	N / A (optional)
LOAD REJECTION OVERVOLTAGE (LROV) TEST	5.17.2	Adjustable	Pass



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Detailed Testing Summary (continued)			
Test Name	IEEE 1547.1-2020 (UL1741SB) Section	Fixed / Adjustable	Pass / Fail
FAULT CURRENT TESTS FOR INVERTERS	5.18.1	Adjustable	Pass
PERSISTENCE OF DER PARAMETER SETTINGS	5.19	Adjustable	Pass
INTEROPERABILITY	6	Adjustable	Pass



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Detailed Testing Summary	Test Standard(s) and Section(s)	Fixed / Adjustable	Pass / Fail
UNINTENTIONAL ISLANDING WITH GRID SUPPORT FUNCTIONS ENABLED	UL 1741 SA 8	Adjustable	Evaluated in separate Letter Report
HIGH VOLTAGE RIDE-THROUGH DURATION	UL 1741 SA 9.1	Adjustable	Pass
HIGH VOLTAGE RIDE-THROUGH / MUST TRIP MAGNITUDES	UL 1741 SA 9.2	Adjustable	Pass
HIGH VOLTAGE MUST TRIP CLEARING TIMES	UL 1741 SA 9.2	Adjustable	Pass
LOW VOLTAGE RIDE-THROUGH DURATION	UL 1741 SA 9.1	Adjustable	Pass
LOW VOLTAGE RIDE-THROUGH / MUST TRIP MAGNITUDES	UL 1741 SA 9.2	Adjustable	Pass
LOW VOLTAGE MUST TRIP CLEARING TIMES	UL 1741 SA 9.2	Adjustable	Pass
HIGH FREQUENCY RIDE-THROUGH DURATION	UL 1741 SA10.1	Adjustable	Pass
HIGH FREQUENCY RIDE-THROUGH / MUST TRIP MAGNITUDES	UL 1741 SA10.2	Adjustable	Pass
HIGH FREQUENCY MUST TRIP CLEARING TIMES	UL 1741 SA10.2	Adjustable	Pass
LOW FREQUENCY RIDE-THROUGH DURATION	UL 1741 SA10.1	Adjustable	Pass
LOW FREQUENCY RIDE-THROUGH / MUST TRIP MAGNITUDES	UL 1741 SA10.2	Adjustable	Pass
LOW FREQUENCY MUST TRIP CLEARING TIMES	UL 1741 SA10.2	Adjustable	Pass
NORMAL RAMP RATE	UL 1741 SA 11.2	Adjustable	Pass
"SOFT START" RAMP RATE	UL 1741 SA 11.4	Adjustable	Pass
SPECIFIED POWER FACTOR	UL 1741 SA 12	Adjustable	Pass
VOLT/VAR MODE (Q(V))	UL 1741 SA 13	Adjustable	Pass
FREQUENCY-WATT (FW)	UL 1741 SA 14	Adjustable	Pass
VOLT-WATT (VW)	UL 1741 SA 15	Adjustable	Pass



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UL1741 SA Boundary	IEEE 1547.1-2020 Shall Trip
High Voltage 3 (HV3)	Not applicable
High Voltage 2 (HV2)	Over Voltage 2 (OV2)
High Voltage 1 (HV1)	Over Voltage 1 (OV1)
Low Voltage 1 (LV1)	Under Voltage 1 (UV1)
Low Voltage 2 (LV2)	Under Voltage 2 (UV2)
Low Voltage 3 (LV3)	Not applicable
Low Voltage 4 (LV4)	Not applicable

Frequency regions comparison between UL1741SA and IEEE1547.1-2020:

UL1741 SA Boundary	IEEE 1547.1-2020 Shall Trip
High Frequency 3 (HF3)	Not applicable
High Frequency 2 (HF2)	Over Frequency 2 (OF2)
High Frequency 1 (HF1)	Over Frequency 1 (OF1)
Low Frequency 1 (LF1)	Under Frequency 1 (UF1)
Low Frequency 2 (LF2)	Under Frequency 2 (UF2)
Low Frequency 3 (LF3)	Not applicable

Inverter Firmware Version:		
UL 1998	Date	Version
Compliant	2022-06-30	09.00.35.R



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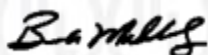
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Inverter Ratings - Output	
Sunny Central UP-US, Sunny Central Storage UP-US and Sunny Central Storage UP-XT-US	
Output phase configuration	3-Phase Delta With no N connection
Nominal (line to line) output voltage V ac	600 - 690
Operating voltage range V ac	480 - 759
Line Synchronization Characteristics	Method 2
Normal out frequency Hz	60
Rated output current (A ac)	2120 - 3850 (+)
Rated output current (A ac)	1530 - 3850 (++)
Rated output power (kVA)	2000 - 4600
Max. Branch Circuit overcurrent protection (A ac)	3850
Maximum Air Ambient (°C)	60

1. (+) Sunny Central UP-US
2. (++) Sunny Central Storage UP-US and Sunny Central Storage UP-XT-US

Other ratings:	
Max. output fault current (A) / duration (ms)	3525Arms / 178ms
Max. utility backfeed current to PV input (A)	0
Line Synchronization Characteristics / In-rush current	Method 2 / 282A
Limits of accuracy of voltage measurement	+/- 5 V
Limits of accuracy of frequency measurement	+/- 0.01 Hz
Manufacturers stated accuracy of time response for voltage trips	0.1 %
Manufacturers stated accuracy of time response for frequency trips	0.1 %
Enclosure Ratings	3R
Normal operating performance Category	B
Abnormal operating performance Category	III

INTERCONNECTION INTEGRITY TEST CATEGORIES:	
C62.42.2 Ring Wave Surge Category	B: 6 kV
C62.42.2 Combination Wave Surge Category	6.0 kV @ 3.0 kA
C37.90.1 RF Immunity - compliance	YES
C37.90.2 Communication circuit - compliance	YES



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Certificate Number E210376
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Magnitude and time Limits - Utility interconnection voltage magnitude limits, Ride Through time limits and trip times:						
UL 1741 SA9:	Magnitudes (% of nominal)		Ride Through (Seconds)		Must Trip (Seconds)	
Boundary designation	Min	Max	Min	Max	Min	Max
HV2	112	120	0.05	0.05	0.16	0.16
HV1	112	120	0.15	12	0.2	12.5
LV1	49	86	0.15	20	0.2	20.5
LV2	49	86	0.15	10	0.2	10.5
LV3	49	86	0.15	1	0.2	1.25

Magnitude and time Limits - Utility interconnection Frequency magnitude limits, Ride Through time limits and trip times:						
Nominal Frequency:			60 Hz			
UL 1741 SA10:	Magnitudes (Frequency)		Ride Through (Seconds)		Must Trip (Seconds)	
Boundary designation	Min	Max	Min	Max	Min	Max
HF2	60.6	62.1	0.05	0.05	0.16	0.16
HF1	60.1	62.1	0.13	299	1.00	299.6
LF1	57	58.5	0.13	299	1.00	299.6
LF2	57	58.5	0.05	0.05	0.16	0.16

SA11 Ramp Rate test ratings (RR/SSRR)		
Minimum normal ramp-up rate	0.17	%I _{rated} /SEC
Maximum normal ramp-up rate	100	%I _{rated} /SEC
Minimum soft start ramp-up rate	0.17	%I _{rated} /SEC
Maximum soft start ramp-up rate	100	%I _{rated} /SEC

SA12 SPF Specified Power Factor (INV3)		
Minimum Inductive (Underexcited) Power Factor (<0)		-0.8
Minimum Capacitive (Overexcited) Power Factor (>0)		+0.8

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SA13 Volt/Var Mode (VV) extent of curve range settings				
Settings		Qmax Values - Maximums	Qmin Values - Minimums	Units
Reactive power production setting	Q1	60	0	%Sac_rtg
Reactive power absorption setting at the left edge of the deadband	Q2	0	0	%Sac_rtg
Reactive power absorption setting at the right edge of the deadband	Q3	0	0	%Sac_rtg
Reactive power absorption setting	Q4	0	-60	%Sac_rtg

Settings		Maximum	Minimum	Units
The voltage at Q1	V1	98	85	%Vnom
The voltage at Q2	V2	100	87	%Vnom
The voltage at Q3	V3	113	100	%Vnom
The voltage at Q4	V4	115	102	%Vnom

Functional in the following priority modes: [] active power priority [x] reactive power priority (RPP)

SA14 Frequency-Watt (FW) extent of curve range settings (OF)				
Settings	Frequency		Power level	
Low end of the adjustment range of the start of the curtailment function	Fstart_min	60	100	%Pac_rtg
High end of the adjustment range of the start of the curtailment function	Fstart_max	62	100	%Pac_rtg
Low end of the adjustment range of the endpoint of the curtailment function	Fstop_min	60.5	0	%Pac_rtg
High end of the adjustment range of the endpoint of the curtailment function	Fstop_max	63	0	%Pac_rtg

SA14 Frequency-Watt (FW) extent of curve range settings (UF)				
Settings	Frequency		Power level	
Low end of the adjustment range of the start of the curtailment function	Fstart_min	58	17	%Pac_rtg
High end of the adjustment range of the start of the curtailment function	Fstart_max	60	50	%Pac_rtg
Low end of the adjustment range of the endpoint of the curtailment function	Fstop_min	57	100	%Pac_rtg
High end of the adjustment range of the endpoint of the curtailment function	Fstop_max	59.5	100	%Pac_rtg

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SA15 Volt-Watt (VW) extent of curve range settings				
Settings	Volts		Power level	
Low end of the adjustment range of the start of the curtailment function	Vstart_min	100%Vnom	100	%Pac_rtg
High end of the adjustment range of the start of the curtailment function	Vstart_max	110%Vnom	100	%Pac_rtg
Low end of the adjustment range of the endpoint of the curtailment function	Vstop_min	108%Vnom	0	%Pac_rtg
High end of the adjustment range of the endpoint of the curtailment function	Vstop_max	115%Vnom	0	%Pac_rtg



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