Certificate of Compliance - Annex A

Grid Support Utility Interactive PV Microinverter, high frequency isolated, Models: SPZ-M1000-S, SPZ-M1000-W, SPZ-M800-S and SPZ-M800-W, Rack mounted, ratings as follows:

Model:		SPZ-M800-S and SPZ-M800-W	SPZ-M1000-S and SPZ-M1000-W
INPUT RATINGS:			
Maximum input voltage (dc)		65 V	65 V
Range of input MPPT operating voltage (dc)		16 to 60 V	16 to 60 V
Range of input MPPT operating voltage with full power (dc)		35 to 50 V	35 to 50 V
Maximum input string (channel)		2	2
Maximum input current (dc)		16 A *2	16 A *2
Maximum input short circuit current (dc)		20 A *2	20 A *2
Maximum input source backfeed current to input source (peak)		3.67 Apk, 0.903Arms @0.224s	3.67 Apk, 0.903Arms @0.224s
OUTPUT RATINGS:			
Output power factor rating		>0.99 default (0.8 leading to 0.8 lagging)	>0.99 default (0.8 leading to 0.8 lagging)
Operating voltage range (ac)		211.2 to 264.0 @ 240 V 183.0 to 228.8 @ 208 V	211.2 to 264.0 @ 240 V 183.0 to 228.8 @ 208 V
Operating frequency range or single frequency		57.0 to 63.0 Hz	57.0 to 63.0 Hz
Number of phases		1Ø, (L1/L2/G)	1Ø, (L1/L2/G)
Nominal output voltage (ac)		240 V or 208 V	240 V or 208 V
Normal output frequency		60 Hz	60 Hz
Maximum continuous output current (ac) *(only for grid voltage less than Un)*		3.66 A @ 240 V 4.24 A @ 208 V	4.40 A @ 240 V 5.08 A @ 208 V
Rated continuous output current (ac)		3.33 A @ 240 V 3.85 A @ 208 V	4.00 A @ 240 V 4.62 A @ 208 V
Maximum continuous output active power (ac)		800 W	960 W
Maximum continuous output Apparent power (ac)		800 VA	960 VA
Maximum output fault current (ac) and duration		99.7 Apk, 5.21 Arms @ 0.41 ms 68.15 Arms @ 1cycle 45.15 Arms @ 3cycles 13.25 Arms @ 5cycles	99.7 Apk, 5.21 Arms @ 0.41 ms 68.15 Arms @ 1cycle 45.15 Arms @ 3cycles 13.25 Arms @ 5cycles
Maximum output overcurrent protection		10 Aac	10 Aac
Line Synchronization Characteristics / In-rush current		0.38 Arms @ 5cycles	0.38 Arms @ 5cycles
Normal operating performance		Category B	Category B
Abnormal operating performance		Category III	Category III
Utility interconnection voltage and frequency trip limits and trip times		See Note 1 below	See Note 1 below
Trip limit and trip time accuracy	Voltage:	± 1%Vnom	± 1%Vnom
	Frequency:	± 0.01Hz	± 0.01Hz
	Alternate Trip Time	±1%setting, but not less than 34 ms	±1%setting, but not less than 34 ms
Normal operation temperature range		-40˚C to 65˚C	-40˚C to 65˚C

Certificate of Compliance - Annex A

Model:	SPZ-M800-S and SPZ-M800-W	SPZ-M1000-S and SPZ-M1000-W
	(> 47˚C derating)	(> 47˚C derating)
Output power temperature derating and maximum full power operating ambient	See Note 2 below	See Note 2 below
Enclosure Rating Type	Type 6	Type 6
Cooling group	Heatsink	Heatsink
Communication Protocol	IEEE Std 2030.5™	IEEE Std 2030.5™

Notes:

1. Utility Interconnection Voltage and Frequency Trip Limits and Trip Times:

Mandatory voltage tripping requirements:

Shall trip function	Default settings		Ranges of allowable settings	
	Voltage (p.u.)	Clearing time (s)	Voltage (p.u.)	Clearing time (s)
OV2	1.20	0.16	fixed at 1.20	fixed at 0.16
OV1	1.10	13.0	1.10 ~ 1.20	1.0 ~ 13.0
UV1	0.88	21.0	0.0 ~ 0.88	2.0 ~ 50.0
UV2	0.50	2.0	0.0~0.50	0.16 ~ 21.0

Mandatory frequency tripping requirements:

Shall trip function	Default settings		Ranges of allowable settings	
	Frequency (Hz)	Clearing time (s)	Frequency (Hz)	Clearing time (s)
OF2	62.0	0.16	61.8~66.0	0.16~1000.0
OF1	61.2	300.0	61.0~66.0	180.0~1000.0
UF1	58.5	300.0	50.0~59.0	180.0~1000.0
UF2	56.5	0.16	50.0~57.0	0.16~1000.0

2. Operating power envelope as a function of ambient temperature:

Model	DC Input	-40 ˚C	47 ˚C	51 ˚C	55 ˚C	65 ˚C
SPZ-M1000-S and SPZ-M1000-W	35 Vdc	960 W	960 W	780 W	600 W	600 W
	48 Vdc	960 W	960 W	780 W	600 W	600 W
	50 Vdc	960 W	960 W	780 W	600 W	600 W
SPZ-M800-S and SPZ-M800-W	35 Vdc	720 W	720 W	660 W	600 W	600 W
	48 Vdc	720 W	720 W	660 W	600 W	600 W
	50 Vdc	720 W	720 W	660 W	600 W	600 W

3. Utility interactive evaluations were conducted with firmware flashed into a single IC, checksum, hardware was indicated by following:

Inverter Model	HARDWARE	MICROPROCESSOR / FPGA	FIRMWARE	CHECKSUM
SPZ-M1000-S and SPZ-M1000-W	V1.0	TMS320F28002X	V1.0	DAE9108E
SPZ-M800-S and SPZ-M800-W	V1.0	TMS320F28002X	V1.0	DAE9108E

Certificate of Compliance - Annex A

4. Models listed in this report are all evaluated to meet the grid support functions according to UL 1741 Supplement SB and IEEE 1547.1-2020 with the SRDs of IEEE 1547-2018, IEEE 1547a-2020, California Electric Rule 21, and Hawaiian Electric Co. SRD-V2.0.

5. The inverter models listed in this report are not provided with an internal GFDI, external GFDI shall be provided at ending use. (Maximum ground-fault current detecting setting 1 A)