

**Certificate of Compliance - Annex A**

Family series (1): A1-Hybrid-US series, models: A1-Hybrid-6.0-US, A1-Hybrid-7.0-US, A1-Hybrid-7.6-US, A1-Hybrid-8.6-US;

Non-isolated permanently-connected Power Conversion System. Single-phase hybrid multiple mode converter with bidirectional function for AC to DC or DC to AC charge controlling function. Battery or PV or Generator or Grid input, which could be used as utility Interactive or Stand-Alone mode or by-pass mode.

The unit has five types of field wiring terminal: PV input terminal, Grid terminal (input and output), Load output terminal, Battery terminal (input and output), Generator input terminal.

Family series (2): A1-Fit-US series, models: A1-Fit-6.0-US, A1-Fit-7.0-US, A1-Fit-7.6-US, A1-Fit-8.6-US;

Non-isolated permanently-connected Power Conversion System. Single-phase hybrid multiple mode converter with bidirectional function for AC to DC or DC to AC charge controlling function. Battery or Generator or Grid input, which could be used as utility Interactive or Stand-Alone mode or by-pass mode.

The unit has four types of field wiring terminal: Grid terminal (input and output), Load output terminal, Battery terminal (input and output), Generator input terminal.

Family series (3): A1-US series, models: A1-6.0-US; A1-7.0-US; A1-7.6-US; A1-8.6-US;

Non-isolated permanently-connected, PV grid-interactive inverter.

Three product family series share one similar physical construction of critical components and firmware.

Each product family has four models, these models share similar physical construction and firmware. The main difference is software settings for output power ratings.

System ratings as follows table:

A1-Hybrid-US				
Model	A1-Hybrid-6.0-US	A1-Hybrid-7.0-US	A1-Hybrid-7.6-US	A1-Hybrid-8.6-US
<b>PV input terminal:</b>				
Max input voltage (Vdc)	600 Vdc			
Range of PV operating voltage (Vdc)	105 - 500 Vdc			
Max. PV input current (Adc)	10 A / per MPPT			
Max input short circuit current (A)	12.5 A			
Max input power per MPPT (W)	3600 W			
Range of PV voltage@ full output (Vdc)	360-500 Vdc	280-500 Vdc	304-500 Vdc	258-500 Vdc
No. of MPPT/Strings per MPPT	2/1	3/1	3/1	4/1
Max. PV input power (W)	7200 W	8400 W	9120 W	10320 W
Max backfeed current (Adc)	39 Arms / 2 ms			
<b>Grid terminal:</b>				
Nominal AC output voltage (Vac)	120/240 Vac split phase			
Operating AC output voltage range (Vac)	211.2 – 264.0 V @ 240V			
Nominal AC output frequency (Hz)	60 Hz			
Operating AC frequency range, reconnect (Hz)	59.3 Hz - 60.5 Hz			
Output power factor rating	Default >0.99 (Adjustable +/-0.8)			
Nominal AC output current (Aac)	25 A	29 A	32 A	36 A
Max. Continuous AC output current (Aac)	28 A	32 A	35 A	41 A
Nominal AC output power (VA)	6000 VA	7000 VA	7600 VA	8600 VA
Max. Continuous AC output power (VA)	6600 VA	7700 VA	8360 VA	9460 VA
Max AC output fault current and duration	765 A <sub>peak</sub> / 5 ms, 46 Arms/ cycle			
Max AC output overcurrent protection (A)	50 A	63 A	63 A	63 A
Utility interconnection voltage and frequency trip limits and trip times	See note 1			
Trip limit and trip time accuracy	Voltage:	+/- 3% V <sub>nom</sub> (L-L, L-N)		
	Frequency:	+/- 0.04 Hz		

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<b>Certificate of Compliance - Annex A</b>
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	Time:	1%, but not less than 100 ms		
Nominal AC input voltage (Vac)	120/240 Vac split phase			
Nominal AC input frequency (Hz)	60 Hz			
Max. Continuous AC input current (Aac)	28 A	32 A	35 A	41 A
Max. Continuous AC input power (VA)	6600 VA	7700 VA	8360 VA	9460 VA
Load output terminal:				
Nominal AC output voltage (Vac)	120 Vac			
Nominal AC output frequency (Hz)	60 Hz			
Max. Continuous AC output current (Aac)	25 A	29 A	32 A	36 A
Max. Continuous AC output power (VA)	3000 VA	3500 VA	3800 VA	4300 VA
Max AC output overcurrent protection (A)	50 A	63 A	63 A	63 A
Max AC output fault current and duration	200 A <sub>peak</sub> / 10 ms, 34 Arms/ cycle			
Battery terminal:				
Battery Type	Li-on			
Nominal voltage (Vdc)	360 Vdc			
Range of DC operating voltage (Vdc)	84-432 Vdc			
Max. charging/discharging current (Adc)	25 A			
Generator input terminal:				
Nominal AC input voltage (Vac)	120 Vac			
Nominal AC input frequency (Hz)	60 Hz			
Max. Continuous AC input current (Aac)	30 A	35 A	39 A	44 A
Normal operation temperature range	-20 °C to +60 °C, no derating below 45 °C,			
Output power temperature derating and maximum full power operating ambient	See note 2			
Enclosure Type	Type 4X			

<b>A1-Fit-US</b>				
Model	A1-Fit-6.0-US	A1-Fit-7.0-US	A1-Fit-7.6-US	A1-Fit-8.6-US
Grid terminal:				
Nominal AC output voltage (Vac)	120/240 Vac split phase			
Operating AC output voltage range (Vac)	211.2 – 264.0 V @ 240V			
Nominal AC output frequency (Hz)	60 Hz			
Operating AC frequency range, reconnect (Hz)	59.3 Hz - 60.5 Hz			
Output power factor rating	Default >0.99 (Adjustable +/-0.8)			
Nominal AC output current (Aac)	25 A	29 A	32 A	36 A
Max. Continuous AC output current (Aac)	28 A	32 A	35 A	41 A
Nominal AC output power (VA)	6000 VA	7000 VA	7600 VA	8600 VA
Max. Continuous AC output power (VA)	6600 VA	7700 VA	8360 VA	9460 VA
Max AC output fault current and duration	765 A <sub>peak</sub> / 5 ms, 46 Arms/ cycle			
Max AC output overcurrent protection (A)	50 A	63 A	63 A	63 A
Utility interconnection voltage and frequency trip limits and trip times	See note 1			
Trip limit and trip time accuracy	Voltage:	+/- 3% Vnom (L-L, L-N)		
	Frequency:	+/- 0.04 Hz		
	Time:	1%, but not less than 100 ms		
Nominal AC input voltage (Vac)	120/240 Vac split phase			
Nominal AC input frequency (Hz)	60 Hz			
Max. Continuous AC input current (Aac)	28 A	32 A	35 A	41 A
Max. Continuous AC input power (VA)	6600 VA	7700 VA	8360 VA	9460 VA
Load output terminal:				

<b>Certificate of Compliance - Annex A</b>
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Nominal AC output voltage (Vac)	120 Vac			
Nominal AC output frequency (Hz)	60 Hz			
Max. Continuous AC output current (Aac)	25 A	29 A	32 A	36 A
Max. Continuous AC output power (VA)	3000 VA	3500 VA	3800 VA	4300 VA
Max AC output overcurrent protection (A)	50 A	63 A	63 A	63 A
Max AC output fault current and duration	200 A <sub>peak</sub> / 10 ms, 34 Arms/ cycle			
<b>Battery terminal:</b>				
Battery Type	Li-on			
Nominal voltage (Vdc)	360 Vdc			
Range of DC operating voltage (Vdc)	84-432 Vdc			
Max. charging/discharging current (Adc)	25 A			
<b>Generator input terminal:</b>				
Nominal AC input voltage (Vac)	120 Vac			
Nominal AC input frequency (Hz)	60 Hz			
Max. Continuous AC input current (Aac)	30 A	35 A	39 A	44 A
Normal operation temperature range	-20 °C to +60 °C, no derating below 45 °C			
Output power temperature derating and maximum full power operating ambient	See note 2			
Enclosure Type	Type 4X			

<b>A1-US</b>				
Model	A1-6.0-US	A1-7.0-US	A1-7.6-US	A1-8.6-US
<b>PV input terminal:</b>				
Max input voltage (Vdc)	600 Vdc			
Range of PV operating voltage (Vdc)	105 - 500 Vdc			
Max. PV input current (Adc)	10 A / per MPPT			
Max input short circuit current (A)	12.5 A			
Max input power per MPPT (W)	3600 W			
Range of PV voltage@ full output (Vdc)	360-500 Vdc	280-500 Vdc	304-500 Vdc	258-500 Vdc
No. of MPPT/Strings per MPPT	2/1	3/1	3/1	4/1
Max. PV input power (W)	7200 W	8400 W	9120 W	10320 W
Max backfeed current (Adc)	39 Arms / 2 ms			
<b>Grid output terminal:</b>				
Nominal AC output voltage (Vac)	208Y/120 Vac; 120/240 Vac split phase			
Operating AC output voltage range (Vac)	183.0 – 228.8 V @ 208V 211.2 – 264.0 V @ 240V			
Nominal AC output frequency (Hz)	60 Hz			
Operating AC frequency range, reconnect (Hz)	59.3 Hz - 60.5 Hz			
Output power factor rating	Default >0.99 (Adjustable +/-0.8)			
Nominal AC output current (Aac)	25A(@240V), 29A(@208V)	29A(@240V), 34A(@208V)	32A(@240V), 37A(@208V)	36A(@240V), 41.5A(@208V)
Max. Continuous AC output current (Aac)	28A(@240V), 32A(@208V)	32A(@240V), 37A(@208V)	35A(@240V), 40A(@208V)	41A(@240V), 41.5A(@208V)
Nominal AC output power (VA)	6000VA	7000VA	7600VA	8600VA
Max. Continuous AC output power (VA)	6600VA	7700VA	8360VA	9460VA(240V), 8600VA(208V)
Max AC output fault current and duration	765 A <sub>peak</sub> / 5 ms, 46 Arms/ cycle			

**Certificate of Compliance - Annex A**

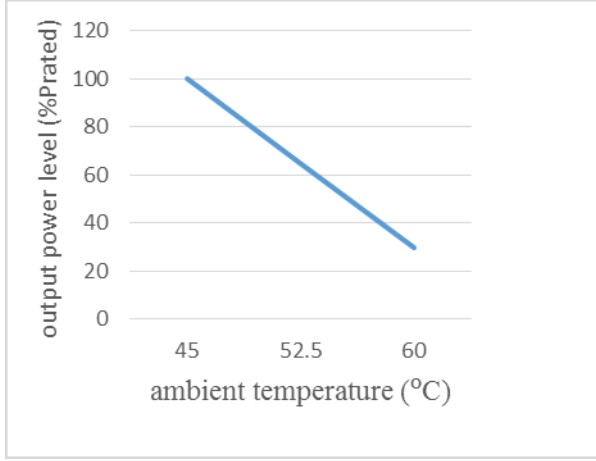
Max AC output overcurrent protection (A)	50 A	63 A	63 A	63 A
Utility interconnection voltage and frequency trip limits and trip times	See note 1			
Trip limit and trip time accuracy	Voltage:	+/- 3% Vnom (L-L, L-N)		
	Frequency:	+/- 0.04 Hz		
	Time:	1%, but not less than 100 ms		
Normal operation temperature range	-20 °C to +60 °C, no derating below 45 °C			
Output power temperature derating and maximum full power operating ambient	See note 2			
Enclosure Type	Type 4X			

Notes:

- Utility Interconnection Voltage and Frequency Trip Limits and Trip Times:  
(1) Voltage and frequency limits for utility interaction according to Table 1 and Table 2 per IEEE 1547-2003 (R2008)

Region	Voltage range (%Vnom)	Frequency range (Hz)	Clearing time (s)
A	V < 50%	Rated (60 Hz)	0.16
B	50% <= V < 88%	Rated (60 Hz)	2.0
C	110% < V < 120%	Rated (60 Hz)	1.0
D	120% <= V	Rated (60 Hz)	0.16
E	Rated (Vnom)	F > 60.5	0.16
F	Rated (Vnom)	F < 59.3	0.16

- Curve of output power level (%Prated) VS ambient temperature:



ambient temperature (°C)	output power level (%Prated)
45.0	100
52.5	65
60.0	30

- All models meet the surge requirements of IEEE C62.41.2-2002, Location Category B. Tests were performed using standard 0.5 μs - 100 kHz Ring Wave (6 kV/ 0.5 kA) and standard 1.2/50 μs-8/20 μs Combination Wave (6 kV/ 3 kA), both positive and negative pulses, for common mode and differential mode coupling, 20 pulses each test. After surge test, the unit's interconnection functions did not fail with verified by frequency and voltage trip tests.

- The unit's Functional Safety for Insulation Resistance Detection (ISO), Isolation Monitor Interrupter (IMI) and Photovoltaic (PV) dc arc-fault circuit-interrupter (PV AFCI) have been evaluated to the requirements of UL Standard No. 1998 under Class 1 per CSA Report No.:70184220. This evaluation has been carried out on a specified version of the electronic controller hardware and software as below table:

MCU object/part	MCU	type/model	Checksum	Software

**Certificate of Compliance - Annex A**

No.	manufacturer / trademark			Version
Microcontrollers, Master DSP, (U7)	Texas Instruments	TMS320F28075 PTPT	54B04F5D623CCC44B2BBEBF0973DB620	V1.06
Microcontrollers, Slave DSP, (U9)	Texas Instruments	TMS320F28030 PAGT	EE0DBD897669BC04214343774A820917	V1.02