Letter of Attestation

Document: 80236614 **Master Contract:** 261002

Project: 80236614 **Date Issued:** January 19, 2025

Issued to: Hoymiles Power Electronics Inc.
No.18 Kangjing Road,
Hangzhou, Zhejiang 310015
China
Attention: Longjiao Tao

CSA Group hereby confirms that it has completed an evaluation of:

PV Hazard Control Equipment (PVHCE), PV Micro-inverter Models:

HMS-2000-4T	***HMS-2000B-4T***	***HMS-2000-4T-NA***	***HMS-2000-4WB***
HMS-1800-4T	***HMS-1800B-4T***	***HMS-1800-4T-NA***	***HMS-1800-4WB***
HMS-1600-4T	***HMS-1600B-4T***	***HMS-1600-4T-NA***	***HMS-1600-4WB***

CSA Group hereby attests that the products identified above and described in test report 80236614 dated January 19, 2025 complies with the following standards/tests, to the extent applicable:

ANSI/CAN/UL 3741 (First Edition, Dated December 8, 2020) - Photovoltaic Hazard Control Sections and Clauses:

- ***Sec. 12 Safety Analysis***
- ***Sec. 14.1 Potential damage from FF operations***
- ***Sec. 14.2 Damage from FF tool***
- ***Sec. 15.3.2 Enclosure or other component leakage test (after check for sec. 14.2)***
- ***Sec. 14.3 Damage from falling FF***
- ***Sec. 15.3.2 Enclosure or other component leakage test (after check for sec. 14.3)***
- ***Sec. 14.4 Damage from FF step, walk or crawl***
- ***Sec. 15.3.2 Enclosure or other component leakage test (after check for sec. 14.4)***

Issued by: *Allen Yao* Allen Yao

CSA Group

THIS LETTER OF ATTESTATION DOES NOT AUTHORIZE THE USE OF THE CSA MARK ON THE SUBJECT PRODUCTS.
QUOTATIONS FROM THE TEST REPORT OR THE USE OF THE NAME CSA GROUP OR ITS REGISTERED TRADEMARK, IN ANY WAY, IS NOT PERMITTED WITHOUT PRIOR WRITTEN CONSENT OF CSA GROUP TESTING & CERTIFICATION INC.

Descriptive Report

MASTER CONTRACT: 261002
REPORT: 80236614
PROJECT: 80236614

Edition 1: January 19, 2025; Project 80236614 - Kunshan
Prepared By: Allen Yao
Authorized By: Allen Yao

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PRODUCTS

PV Hazard Control Equipment (PVHCE), PV Micro-inverter Models:

HMS-2000-4T	HMS-2000B-4T	HMS-2000-4T-NA	HMS-2000-4WB
HMS-1800-4T	HMS-1800B-4T	HMS-1800-4T-NA	HMS-1800-4WB
HMS-1600-4T	HMS-1600B-4T	HMS-1600-4T-NA	HMS-1600-4WB

The ratings are as follows:

Model:	HMS-2000-4T	HMS-2000B-4T	HMS-2000-4T-NA	HMS-2000-4WB
INPUT RATINGS:				
Maximum input voltage (dc)	65 Vdc			
Range of MPPT voltage (dc)	16 to 60 Vdc			
Maximum input string channels	4			
Maximum input current (dc)	16 Adc * 4 or 14 Adc * 4			16 Adc * 4
Maximum input short circuit current (dc)	25 Adc * 4 or 20 Adc * 4			25 Adc * 4
OUTPUT RATINGS:				
Number of phases	1Ø (L1L2/PE)			
Nominal output voltage (ac)	240 Vac / 208 Vac			
Normal output frequency	60 Hz			
Maximum continuous output current (ac)	9.62@208Vac 8.33@240Vac	9.62@208Vac 8.33@240Vac	9.22@208Vac 7.99@240Vac	9.62@208Vac 8.33@240Vac
Maximum continuous output power (ac)	2000 VA	2000 VA	1918 VA	2000 VA
Normal operation temperature range	-40ºC to +65ºC			
Enclosure Rating Type	Type 6			

Model:	HMS-1800-4T	HMS-1800B-4T	HMS-1800-4T-NA	HMS-1800-4WB
INPUT RATINGS:				
Maximum input voltage (dc)	65 Vdc			

Model:	HMS-1800-4T	HMS-1800B-4T	HMS-1800-4T-NA	HMS-1800-4WB
Range of MPPT voltage (dc)	16 to 60 Vdc			
Maximum input string channels	4			
Maximum input current (dc)	15 Adc * 4 or 13.3 Adc * 4			15 Adc * 4
Maximum input short circuit current (dc)	25 Adc * 4 or 20 Adc * 4			25 Adc * 4
OUTPUT RATINGS:				
Number of phases	1Ø (L1L2/PE)			
Nominal output voltage (ac)	240 Vac / 208 Vac			
Normal output frequency	60 Hz			
Maximum continuous output current (ac)	8.65@208Vac 7.50@240Vac	8.65@208Vac 7.50@240Vac	7.98@208Vac 6.92@240Vac	8.65@208Vac 7.50@240Vac
Maximum continuous output power (ac)	1800 VA	1800 VA	1660 VA	1800 VA
Normal operation temperature range	-40ºC to +65ºC			
Enclosure Rating Type	Type 6			

Model:	HMS-1600-4T	HMS-1600B-4T	HMS-1600-4T-NA	HMS-1600-4WB
INPUT RATINGS:				
Maximum input voltage (dc)	65 Vdc			
Range of MPPT voltage (dc)	16 to 60 Vdc			
Maximum input string channels	4			
Maximum input current (dc)	14 Adc * 4 or 12.5 Adc * 4			14 Adc * 4
Maximum input short circuit current (dc)	25 Adc * 4 or 20 Adc * 4			25 Adc * 4
OUTPUT RATINGS:				
Number of phases	1Ø (L1L2/PE)			
Nominal output voltage (ac)	240 Vac / 208 Vac			
Normal output frequency	60 Hz			
Maximum continuous output current (ac)	7.69@208Vac 6.67@240Vac	7.69@208Vac 6.67@240Vac	6.92@208Vac 6.00@240Vac	7.69@208Vac 6.67@240Vac
Maximum continuous output power (ac)	1600 VA	1600 VA	1440 VA	1600 VA
Normal operation temperature range	-40ºC to +65ºC			
Enclosure Rating Type	Type 6			

APPLICABLE REQUIREMENTS

ANSI/CAN/UL 3741 (First Edition, Dated December 8, 2020) - Photovoltaic Hazard Control

MARKINGS

"WARNING: To Reduce the Risk of Injury, read all instructions"
"AVERTISSEMENT : Pour prévenir les blessures, lire toutes les instructions"

The PVHC system shall be provided with complete instructions for installation, operation, and maintenance of the system. The installation instructions include a detailed description of the installation in accordance with the National Electrical Code (NEC), NFPA 70 and the Canadian Electrical Code (CEC Code), C22.1.

ALTERATIONS

Not Applicable

FACTORY TESTS

The manufacturing and production testing shall be done in accordance with the applicable component or end product standard accounting for the functionality of the PVHCE or PVHCS.

DESCRIPTION

PV HAZARD CONTROL EQUIPMENT (SYSTEM) (PVHCE/PVHCS)			
Model			Not defined by the submitter
Max. PV Array System Voltage			65 Vdc
IDENTIFICATION OF COMPONENTS AND MATERIALS			
Description	**Type**	**Model**	**Ratings/Certifications/Notes**
PV Inverter	PVHCE	HMS-2000-4T; HMS-2000B-4T; HMS-2000-4T-NA; HMS-2000-4WB; HMS-1800-4T; HMS-1800B-4T; HMS-1800-4T-NA; HMS-1800-4WB; HMS-1600-4T; HMS-1600B-4T; HMS-1600-4T-NA; HMS-1600-4WB;	CSA Group listed (Certificate: 80107467) Manufacturer: Hoymiles Power Electronics Inc. Certified to CSA-C22.2 No. 107.1-16, UL1741 (Ed.3, Rev.2021-09-28), refer to IEEE 1547-2003(R2008), IEEE 1547.1-2005 (R2011), IEEE 1547-2018, IEEE1547.1-2020, IEEE 1547a-2020, UL 1741 Supplement SB, California Electric Rule 21 and Hawaiian Electric Co. SRD-V2.0. Max. Input Voltage: 65 Vdc Max. Input Channel: 4 Max. Input Current: 16 Adc / 15 Adc / 14 Adc Max System voltage: 65 Vdc and 240 Vac Operation temperature range: -40ºC to +65ºC Enclosure Type: Type 6 PVRSE Type: -- Rapid shutdown time limit: -- *Normal Condition HL = 0 *Fault Condition HL = 0 Communication Protocol: -- Installation Description: - bracket fixed on PV module racking system with two M8 screws (tightening torque 9 N·m), and provide hazard controls for PV arrays mounted on roofs or other locations within array boundary (305 mm (1 ft) from the array in all directions); - under PV module or exposed to Fire fighters (FF); - Installation angle: Any angle, Stepping /Walking / Falling onto / Falling onto with tool in belt considered; - with wire management; - one AC breaker provided as disconnect mean in end application, which shall be disconnected before Fire fighters (FF) performing operations within array boundary.

Important Note:

1) The normal condition and fault condition HL values marked "*" are only applicable to corresponding models listed in this report, future evaluation shall be made for total PV array or other PV array equipment not included in this report.

TEST HISTORY

Project 80236614

The following tests were tested at CCIC-CSA International Certification Co., Ltd. Kunshan Branch and performed under the requirements of ANSI/CAN/UL 3741-2020 (First Edition) with acceptable results:

TEST PERFORMED	REFERENCE		Pass/Fail / N/A
Safety Analysis	ANSI/CAN/UL 3741-2020	12	Pass
Potential damage from FF operations	ANSI/CAN/UL 3741-2020	14.1	Pass
Damage from FF tool	ANSI/CAN/UL 3741-2020	14.2	Pass
Leakage current tests (after check for sec. 14.2)	ANSI/CAN/UL 3741-2020	15.3	Pass
Enclosure or other component leakage test (after check for sec. 14.2)	ANSI/CAN/UL 3741-2020	15.3.2	
Damage from falling FF	ANSI/CAN/UL 3741-2020	14.3	Pass
Leakage current tests (after check for sec. 14.3)	ANSI/CAN/UL 3741-2020	15.3	Pass
Enclosure or other component leakage test (after check for sec. 14.3)	ANSI/CAN/UL 3741-2020	15.3.2	
Damage from FF step, walk or crawl	ANSI/CAN/UL 3741-2020	14.4	Pass
Leakage current tests (after check for sec. 14.4)	ANSI/CAN/UL 3741-2020	15.3	Pass
Enclosure or other component leakage test (after check for sec. 14.4)	ANSI/CAN/UL 3741-2020	15.3.2	

Supplementary information:

1. Equipment under testing: HMS-2000-4T, maximum input voltage rating model in this report.
2. The variants family models: HMS-2000B-4T, HMS-2000-4T-NA, HMS-2000-4WB, HMS-1800-4T, HMS-1800B-4T, HMS-1800-4T-NA, HMS-1800-4WB, HMS-1600-4T, HMS-1600B-4T, HMS-1600-4T-NA and HMS-1600-4WB.
3. The variants models have been included in this test report without tests because the following features do not change regarding to the tested model:
   a) Same connection system and hardware topology
   b) Same control algorithm.

---End of Report---