



# Certificate of Compliance

**Certificate:** 2136947

**Master Contract:** 243897

**Project:** 2136947

**Date Issued:** 2009/08/11

**Issued to:** Cleanfield Energy Corp

774 Gordon Baker Rd  
Toronto, ON M2H 3B4  
Canada

Attention: Mr. David Vandermeer

*The products listed below are eligible to bear the CSA Mark shown with adjacent indicators 'C' and 'US' for Canada and US or with adjacent indicator 'US' for US only or without either indicator for Canada only.*



**Issued by:** Chih Wu, Eng'g Technologist

**Authorized by:** Lindsay Clark, Product Group Manager

## **PRODUCTS**

- CLASS 5311 09** - POWER SUPPLIES - Distributed Generation Power Systems Equipment
- CLASS 5311 89** - POWER SUPPLIES - Distributed Generation - Power Systems Equipment
  - Certified to U.S. Standards

Utility Interactive Inverter, Model EW3.5 - 3Phase, 60Hz, permanently connected, system ratings as follows:

### INPUT RATINGS:

Maximum input voltage: 215Vac (3 phases)

Range of input operating voltage: 100Vac to 215Vac

Maximum input current (ac): 11A



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Maximum input short circuit current: 95A

Maximum input source backfeed current to input source: 15A

**OUTPUT RATINGS:**

Output power factor rating: 0.99

Operating voltage range (ac) (L-L)<sup>1</sup>: 183-228.8 V ac

Operating frequency range or single frequency<sup>1</sup>: 59.3-60.5 Hz

Number of phases: 3

Nominal output voltage (ac): 208V ac

Normal output frequency: 60Hz

Maximum continuous output current (ac): 8.3A

Maximum continuous output power (ac): 3000 W

Maximum output fault current (ac) and duration: 28Arms/ 75ms

Maximum output overcurrent protection: 15A

Utility interconnection voltage and frequency trip limits and trip times: See Note 1 below

Trip limit and trip time accuracy:

Voltage: 88% to 120%, +/- 2.5% of Nominal

50%, +/- 5.0% of Nominal

Frequency: +/- 0.2 Hz

Time: +/- 5%

Normal operation temperature range: 0°C - 35°C

Maximum operating ambient: 35°C

Enclosure Rating Type: Type 1

**Notes:**

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



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Voltage and frequency limits for utility Interaction

**Condition A**

Simulated utility source: Voltage (V):  $< 0.50 V_{norb}$ , Frequency (Hz): Rated

Maximum time (sec) (cycles) at 60 Hz<sup>a</sup> before cessation of current to the simulated utility: 0.16

**Condition B**

Simulated utility source: Voltage (V):  $0.50 V_{norb} \# V < 0.88 V_{nor}$ , Frequency (Hz): Rated

Maximum time (sec) (cycles) at 60 Hz<sup>a</sup> before cessation of current to the simulated utility: 2

**Condition C**

Simulated utility source: Voltage (V):  $1.10 V_{norb} < V < 1.20 V_{nor}$ , Frequency (Hz): Rated

Maximum time (sec) (cycles) at 60 Hz<sup>a</sup> before cessation of current to the simulated utility: 1

**Condition D**

Simulated utility source: Voltage (V):  $1.20 V_{nor} \# V$ , Frequency (Hz): Rated

Maximum time (sec) (cycles) at 60 Hz<sup>a</sup> before cessation of current to the simulated utility: 0.16

**Condition E**

Simulated utility source: Voltage (V): Rated, Frequency (Hz):  $f > 60.5$

Maximum time (sec) (cycles) at 60 Hz<sup>a</sup> before cessation of current to the simulated utility: 0.16

**Condition F**

Simulated utility source: Voltage (V): Rated, Frequency (Hz):  $f < (59.8 - 57.0)$  (Adjustable Set Point)

Maximum time (sec) (cycles) at 60 Hz<sup>a</sup> before cessation of current to the simulated utility: 0.16 – 300 (Adjustable)

**Condition G**

Simulated utility source: Voltage (V): Rated, Frequency (Hz):  $f < 57.0$

Maximum time (sec) (cycles) at 60 Hz<sup>a</sup> before cessation of current to the simulated utility: 0.16

2. Utility interactive evaluations were conducted with firmware versions:

Software: PWC2-FLASH-PL1-020010011-2009-04-24.



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3. Surge Testing for Combination Wave (1.2/50us) was done at 6 kV/3 kA, 2 ohms effective impedance, and Ringwave (0.5us-100kHz) was done at 6 kV/0.5 kA, 12 ohms effective impedance. Tests were performed using both polarities, for common mode and differential mode coupling, 20 pulses each test. After surge testing the unit was operational with control functionally verified by frequency and voltage disconnect tests.

4. Utility Interactive Inverter, Model EW3.5 is evaluated for indoor use only. Maximum operating ambient temperature is 35 deg C.

5. Utility Interactive Inverter, Model EW3.5 is evaluated with certified external transformer rated 6KVA, 3 phases, 0.95 minimum power factor and 208V/208V connected in Delta/Y configuration.

#### **APPLICABLE REQUIREMENTS**

CAN/CSA-C22.2 No. 0-M91 - General Requirements - Canadian Electrical Code - Part II

CAN/CSA-C22.2 No. 0.4-04 - Bonding of Electrical Equipment

CAN/CSA-C22.2 No. 107.1-01 - General Use Power Supplies

UL Std No. 1741-First Edition - Inverter, Converter, Controller and Interconnection System Equipment for Use With Distributed Resources (Including Revisions through and including November 7, 2005)

CAN/CSA-C22.2 No. 14-04 - Industrial Control Equipment (used as guide)

UL Std No. 508-Seventeenth Edition - Industrial Control Equipment (used as guide)