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Rochester Gas and Electric Corporation  
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## GENERAL INFORMATION

### 14. DISTRIBUTED GENERATION INTERCONNECTION REQUIREMENTS (Cont'd)

#### a. Single-Phase Inverters and Relay Packages

All single-phase inverters shall be non-islanding inverters as defined by IEEE 929. Inverters 10 kW and below shall at the time of production meet or exceed the requirements of the most current versions of IEEE 929 and UL 1741. Specifically, the inverter shall automatically disconnect for an islanding condition with load quality factor of 2.5 within two (2) seconds. In addition, all single-phase inverters and single-phase voltage and frequency relay packages shall initiate a trip from a waveform generator for the waveforms listed below to verify they meet the requirements set forth in Section II.A.1, Design Requirements – Common.

**Non-Volatile Memory Test:** Prior to waveform testing, all batteries shall be disconnected or removed for a minimum of ten (10) minutes. If the system requires no battery, then the device shall be disconnected from its source of power for a minimum of ten (10) minutes. This test is to verify the system has a non-volatile memory and that the protection settings are not lost. A test shall also be performed to determine that failure of any battery used in the power conversion and control process and not used to supply trip power will result in an automatic shutdown.

**Waveform Testing:** Each waveform test described below shall be repeated ten (10) times. Unless otherwise noted, the device should cease exporting power to the utility within the relevant time limits specified in Section A.1.

**Reset Timer:** These tests shall also verify the inverter or power-producing facility shall not automatically reconnect to the waveform generator until after five (5) minutes of continuous normal voltage and frequency. The manufacturer may supply a special production sample with the reset timer disabled or otherwise temporarily reduce or eliminate the delay in software to minimize the waiting time during type testing. At least three of the 60 total tests (6 waveforms, 10 times each) must be performed on a sample with the reset timer set to the required delay time to verify the function and accuracy of the timer. The test will be considered a failure if, in any one of the tests, the inverter automatically reconnects to the utility system prior to the required time interval. Once the delay timer has been tested three times, the phrase "...and resumes to XX for five minutes..." at the end of the test procedures may be ignored.

The voltage magnitudes listed below are given in percent of rms voltage rating of the inverter, followed in parentheses by the rms voltage magnitude on a 120 V basis:

**Waveform 1:** A 100% of rated voltage (120 V rms) 60 Hz sinusoidal that drops in voltage to 49% of rated (59 V rms) for six (6) cycles beginning and ending at a zero crossing and resuming to 100% of rated voltage (120 V rms) for five minutes.

**Waveform 2:** A 100% of rated voltage (120 V rms) 60 Hz sinusoidal that drops in voltage to 88 % of rated (105 V rms) for 120 cycles beginning and ending at a zero crossing and resuming to 100% of rated voltage (120 V rms) for five minutes.

**Waveform 3:** A 100% of rated voltage (120 V rms) 60 Hz sinusoidal that rises in voltage to 111% of rated (133 V rms) for 120 cycles beginning and ending at a zero crossing and resuming to 100% of rated voltage (120 V rms) for five minutes.

**Waveform 4:** A 100% of rated voltage (120 V rms) 60 Hz sinusoidal that rises in voltage to 138 % of rated (166 volts) for two (2) cycles beginning and ending at a zero crossing and resuming to 100% of rated voltage

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