

Micro-Embedded Generation Facility Protective Relay Settings

Inverter Based Generation

The following relay settings shall be used for inverters built to the CSA standard:

Source: CSA C22.2 No. 107.1-01 Table 16

| System Voltage Vn ' V nominal V (Volts) | Frequency F (Hertz) | Maximum Clearing Time (Seconds) | Maximum Clearing Time (Cycles) |
|---|------------------------|---------------------------------------|--------------------------------------|
| $V < 0.5 V_n$ | 60 | 0.1 | 6 |
| $0.5 V_n < V < 0.88 V_n$ | 60 | 2 | 120 |
| $1.10 V_n < V < 1.37 V_n$ | 60 | 2 | 120 |
| $V > 1.37 V_n$ | 60 | 0.033 | 2 |
| Vn | $F < 59.5^*$ | 0.1 | 6 |
| Vn | $F > 60.5$ | 0.1 | 6 |

*The UL1741 & IEEE P1547 Standards use $F < \text{rated} - 0.7$ i.e. 59.3 Hz. To update if CSA C22.2 No. 107.1-01 is changed.

Non - Inverter Generation

WNH's minimum requirements for other generation are as follows:

| System Voltage Vn ' V nominal V (Volts) | Frequency F (Hertz) | Maximum Clearing Time (Seconds) | Maximum Clearing Time (Cycles) |
|---|------------------------|---------------------------------------|-----------------------------------|
| $V < 0.5 V_n$ | 60 | 0.16 | 9.6 |
| $0.5 V_n < V < 0.88 V_n$ | 60 | 2 | 120 |
| $1.10 V_n < V < 1.20 V_n$ | 60 | 1 | 60 |
| $V > 1.20 V_n$ | 60 | 0.16 | 9.6 |
| Vn | $F < 59.3$ | 0.16 | 9.6 |
| Vn | $F > 60.5$ | 0.16 | 9.6 |

*Clearing time is the time between the start of the abnormal condition and the generation ceasing to energize WNH's distribution system.

If you are uncertain about your generation equipment's protective relay settings, please check with your generating equipment supplier.

Automatic reconnect setting time for your generator is after five (5) minutes of normal voltage and frequency on WNH's distribution system.

Please contact WNH's Engineering Department at 519-888-5552, or email generationbilling@wnhydro.com if you have any questions.

Net Metering Package

Net Metering Information

| | | | | | |
|--|---|--------------------------------|---------------------------------------|---------------------------------------|---|
| Renewable | <input type="checkbox"/> Solar Photovoltaic (rooftop) | <input type="checkbox"/> Wind | <input type="checkbox"/> Biomass | <input type="checkbox"/> Biogas | <input type="checkbox"/> Biogas On-Farm |
| Fuel Type: | <input type="checkbox"/> Solar Photovoltaic (non-rooftop) | <input type="checkbox"/> Water | <input type="checkbox"/> Landfill gas | <input type="checkbox"/> Other: _____ | |
| Connection Voltage: <input type="checkbox"/> 120/240V,1Ø <input type="checkbox"/> 120/208V,3Ø <input type="checkbox"/> 347/600V,3Ø | | | | | |
| **Inverter Capacity (kW): | | **Solar Panels Capacity (kW): | | Non-Solar Nameplate Capacity (kW): | |

Existing Customer Information

| | | |
|------------------------|---|---|
| Name: | | |
| Primary Phone: | | Fax/Email: |
| Service Address: | | City/Twp: PC: |
| Existing Service Amps: | Service Voltage: | <input type="checkbox"/> 120/240V, 1Ø <input type="checkbox"/> 120/208V, 3Ø <input type="checkbox"/> 347/600V, 3Ø |
| Existing Service Type: | <input type="checkbox"/> Overhead <input type="checkbox"/> Underground <input type="checkbox"/> Inside Meter <input type="checkbox"/> Outside Meter <input type="checkbox"/> Elec. Room | |

Electrical Contractor Information

| | |
|-----------------|-----------------|
| Company Name: | Contact Name: |
| Mailing Address | City/Town/Twp: |
| Fax/Email: | Business Phone: |

Consultant Information (if applicable)

| | |
|---------------------|----------------|
| Company Name: | Contact Name: |
| Billing Address | City/Town/Twp: |
| Business/Cell Phone | Fax/Email |

WNH Information (completed by WNH Engineering Department)

| | | |
|---|----------------|-----|
| | Date Received: | By: |
| Connection Agreement Received: <input type="checkbox"/> Yes <input type="checkbox"/> No | | |

In consideration of Waterloo North Hydro Inc. (the “**Distributor**”) agreeing to allow

(the “**Customer**”)

to connect a 10 kW name-plate rated capacity or smaller generation facility to the Distributor’s distribution system, the Customer hereby agree to the following terms and conditions:

1.0 ELIGIBILITY

- 1.1 The Customer agrees that its generation connection shall be subject to all applicable laws and regulations, including but not limited to the Distribution System Code and the Ontario Electrical Safety Code.
- 1.2 The connection is bound by the terms and conditions of the Distributor’s Conditions of Service as amended from time-to-time as well having been filed with the OEB, available upon request.

2.0 TECHNICAL REQUIREMENTS

- 2.1 The Customer represents and warrants that they have installed, or will install prior to the connection of the generation facility, an isolation device satisfying Section 84 of the Ontario Electrical Safety Code and in a location satisfactory to the Distributor. The Customer shall allow the Distributor’s staff access to and operation of this as required for the maintenance and repair of the distribution system.
- 2.2 The Customer agrees to perform regular scheduled maintenance to the generation facility as outlined by the equipment manufacturer in order to assure that connection devices, protection systems, and control systems are maintained in good working order and in compliance with all applicable laws.
- 2.3 The Customer agrees that during a power outage on the Distributor system, the generation facility will shut down, unless special transfer and isolating capabilities are installed on the generation facility.
Further, the Customer agrees to the automatic disconnection of its generation facility from the Distributor’s distribution system, as per the generator protective relay settings provided in Table 1 and 2 of this Agreement, in the event of a power outage on the

Distributor's distribution system or any abnormal operation of the Distributor's distribution system.

- 2.4 The Customer covenants and agrees that the design, installation, maintenance, and operation of the generation facility are conducted in a manner that ensures the safety and security of both the generation facility and the Distributor's distribution system.
- 2.5 Due to the Distributor's obligation to maintain the safety and reliability of its distribution system, the Customer acknowledges and agrees that, in the event the Distributor determines that the generation facility (i) causes damage to; and/or (ii) is producing adverse effects affecting other distribution system customers or the Distributor's assets, the Customer will disconnect generation facility immediately from the distribution system upon direction from the Distributor and correct the problem at the Customer's own expense prior to reconnection.

3.0 LIABILITIES

- 3.1 The Customer and the Distributor will indemnify and save each other harmless for all damages and/or adverse effects resulting from either party's negligence or willful misconduct in the connection and operation of the generation facility or the Distributor's distribution system.
- 3.2 Both parties shall not be liable to each other under any circumstances whatsoever for any loss of profits or revenues, business interruptions losses, loss of contract or loss of goodwill, or for any indirect, consequential, incidental or special damages, including but not limited to punitive or exemplary damages, whether any of the said liability, loss or damages arise in contract, tort or otherwise.

4.0 COMPENSATION AND BILLING

- 4.1 If the Customer is not an embedded retail generator, they agree that, subject to any applicable law:
- a) the Distributor will not pay for any excess generation that results in a net delivery to the Distributor between meter reads; and
 - b) there will be no carryover of excess generation from one billing period to the next unless the Customer is, at the relevant time, a net metered generator (as defined in section 6.7.1 of the Distribution System Code).
- 4.2 If the Customer is an embedded retail generator selling output from the generation facility to the Ontario Power Authority under contract, the

Customer agrees that the Distributor will pay for generation in accordance with the Retail Settlement Code.

4.3 If the Customer is an embedded retail generator delivering and selling output to the Distributor, the Distributor will pay for generation in accordance with the Retail Settlement Code.

5.0 TERMINATION

5.1 The Customer has right to terminate this agreement at any time, and that by doing so the generation facility shall be disconnected with notification provided to the Distributor.

6.0 ASSIGNMENT

6.1 The Customer may assign their rights and obligations under this Agreement with the consent of the Distributor, which shall not withhold its consent unreasonably. The Distributor shall have the right to assign its rights and obligations under this Agreement without the consent of the Customer.

7.0 AGREEMENT:

I understand, accept and agree to comply with and be bound by the above terms and conditions governing the connection of my generation facility to the Distributor’s distribution system.

Customer’s Signature 1 Date

Customer’s Signature 2 (if applicable) Date

I confirm that the following information is true and accurate:

| | | | | | |
|--|---|--------------------------------|---------------------------------------|---------------------------------------|---|
| Renewable | <input type="checkbox"/> Solar Photovoltaic (rooftop) | <input type="checkbox"/> Wind | <input type="checkbox"/> Biomass | <input type="checkbox"/> Biogas | <input type="checkbox"/> Biogas On-Farm |
| Fuel Type: | <input type="checkbox"/> Solar Photovoltaic (non-rooftop) | <input type="checkbox"/> Water | <input type="checkbox"/> Landfill gas | <input type="checkbox"/> Other: _____ | |
| Connection Voltage: <input type="checkbox"/> 120/240V,1Ø <input type="checkbox"/> 120/208V,3Ø <input type="checkbox"/> 347/600V,3Ø | | | | | |
| **Inverter Capacity (kW): | | **Solar Panels Capacity (kW): | | Non-Solar Nameplate Capacity (kW): | |

** Neither the manufacturer’s total installed rated capacity of the solar panels nor the manufacturer’s specified maximum power output of the inverter(s) may be greater than 10kW.