




AM-STD-0007 – Setting for Distributed Generation Inverter Standard

Asset Management – Network Assets

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Approvals

CREATED BY:	Matthew Ting Graduate Electrical Engineer	14 Aug 2020	 SIGNATURE
APPROVED BY:	Anton Booyzen GM Asset Management	17 Aug 2020	 SIGNATURE

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Version Change Table

VERSION	PAGE	PARAGRAPH	DESCRIPTION OF CHANGE

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1. Inverter Protection Setting

Inverters that are allowed to be used to connect generation systems to PowerNet’s Network must:

- Comply with all standards included on our website¹, and
- Include a grid protection or anti islanding device which must prevent power being fed into the network during a power outage or shutdown. The generation system may run, if capable, the associated installation while islanded or disconnected from the network, and
- Be set to the specific New Zealand voltage settings detailed in AS/NZS 4777.2² and summarised below in Table 1.

Table 1: AS/NZS4777 NZ Settings for Inverter Voltage and Frequency Limits (Passive Anti-Islanding Set-Point Values)

Parameter	Limit	Min Trip Delay Time (s)	Max Disconnection (trip) Time (s)
V_{nom-max} (10minute average)	248 V		
Overvoltage 1	260 V	1.0	2.0
Overvoltage 2	265 V	-	0.2
Under voltage	180 V	1.0	2.0
Under-frequency	45 Hz	1.0	2.0
Over-frequency	52 Hz	-	0.2
Minimum reconnection time	60 s		

2. Voltage Response Capability

PowerNet requires that, (if available) the Inverters voltage response is enabled to avoid any adverse effect on voltage at the point of supply. Our voltage response requirements are outlined below in Table 2:

Table 2: Voltage Response Mode

Available	Enable
Both Volt-VAR and Volt-Watt	Both Volt-VAR and Volt-Watt
Either Volt-VAR or Volt-Watt	Volt-VAR
Only Volt-Watt	Volt-Watt

If PowerNet does not require the voltage response to be enabled, this will be advised by PowerNet as part of the generation connection approval process.

The required volt responses are specified in Table 3 below – these are the recommended preferences of the *Green Grid Network Analysis Group (NAG) and the EEA Guide for the connection of small scale inverter based distribution generation.*³

¹ <https://powernet.co.nz/your-power-supply/distributed-generation/>

² <https://shop.standards.govt.nz/catalog/4777.2%3A2015%28AS%7CNZS%29/view>

³ <https://www.eea.co.nz/tools/products/details.aspx?SECT=publications&ITEM=2917>

Table 3: Volt Response Capability

Reference	Volt-VAr Response (V)	Volt-Watt Response (V)
V ₁	207	207
V ₂	220	220
V ₃	235	244
V ₄	244	246

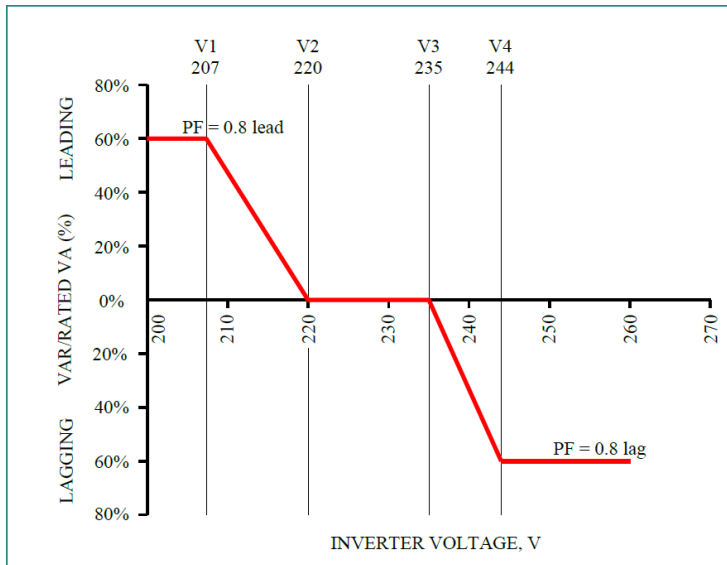


Figure 1: Inverter Volt-VAr characteristic

The installer should programme the inverter such that the Volt-VAr characteristic follows the red line displayed in Figure 1, in which at V₄ = 244 Volts the inverter produces lagging reactive power corresponding to 60% of the inverter’s Volt-Ampere rating.

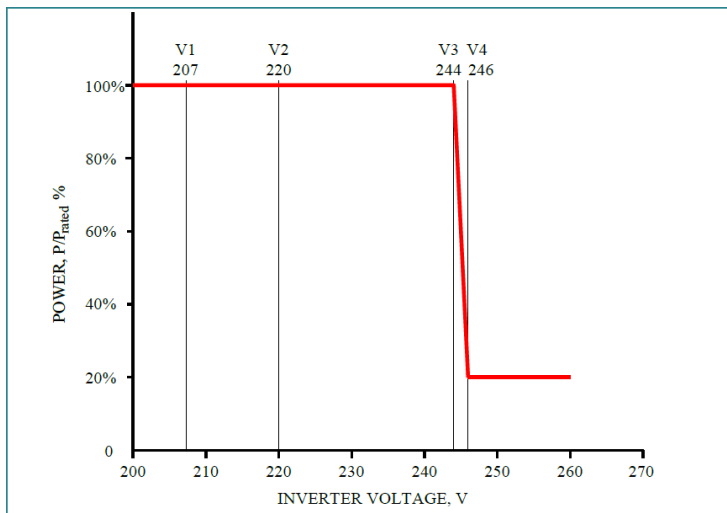


Figure 2: Inverter Volt-Watt characteristic

The installer should programme the inverter such that the Volt-Watt characteristic follows the red line displayed in Figure 2, in which at between V₃ = 244 Volts and V₄ = 246 Volts the inverter power output reduces from 100% to 20% of the inverter’s power rating.

3. Witness and Commissioning Test

PowerNet Limited may wish to inspect the completed installation and witness any commissioning test. A fee will be chargeable for this; we will advise you when we approve the connection if we will require an inspection or witness of tests. For more details see our website⁴

Any questions/comments please email enquires@powernet.co.nz

⁴ <https://powernet.co.nz/your-power-supply/distributed-generation/>