

## Power Quality Response Mode Settings

Australia's electricity network is rapidly changing and everyone has a part to play in helping to ensure that electricity supply continues to be safe and reliable for all.

Energy Networks Australia and our members are pleased to provide the following information for installers to ensure that customers who have invested in solar panels or forms of Distributed Energy Resources (DER) like residential batteries get the best outcomes and help keep the grid stable.

This information is updated on a quarterly basis and should be your "one stop" for inverter settings when connecting to the grid.

For more information or to find out who your local electricity distributor is please go to <https://www.aer.gov.au/consumers/who-is-my-distributor>.

**Table 1 – Progress with DNSP grid connection rules re Volt-Watt and Volt-var capability**

State	DNSP	Grid connection rules with respect to Volt-Watt and Volt-var	Comments
Victoria	Ausnet Services	V-W and V-var capability are mandatory for grid connection in Victoria	Refer to tables 2a, 2b and 2c for details of the required settings
	Jemena		
	Citipower		
	Powercor		
	United Energy		
Queensland	Energex	V-W and V-var capability are mandatory for grid connection in Queensland	Refer to tables 3a, 3b and 3c for details of the required settings
	Ergon Energy		
South Australia	SA Power Networks	V-W and V-var capability are mandatory for grid connection in SA	Refer to tables 4a, 4b and 4c for details of the required settings
New South Wales	Ausgrid	V-W and V-var capability are mandatory for grid connection on the Ausgrid, Endeavour Energy and Essential Energy networks	Refer to tables 5a, 5b and 5c for details of the required settings
	Endeavour Energy		Refer to tables 6a, 6b and 6c for details of the required settings
	Essential Energy		Refer to tables 3a, 3b and 3c for details of the required settings
Western Australia	Horizon Power	V-W and V-var capability are mandatory for grid connection in Western Australia	Refer to tables 7a, 7b and 7c for details of the required settings

	Western Power		Refer to tables 8a, 8b and 8c for details of the required settings
Australian Capital Territory	Evoenergy	V-W and V-var capability are mandatory for grid connection in the ACT.	Refer to tables 9a, 9b and 9c for details of the required settings Final draft of guidelines is being reviewed by local regulatory bodies.
Northern Territory	NT Power and Water	V-W and V-var capability are not required.	Confirmed 8 Nov 2019 that they plan to review grid connection rules in the near future.
Tasmania	TasNetworks	V-W and V-var capability are not required. Plans to update grid connection rules in mid-2020.	Awaiting update on plans and timeline for review of connection rules.

**Tables 2a to 2c – Mandatory settings for Victorian DNSPs**

**Table 2a: Mandatory volt-var response mode settings**

Reference	Voltage (V)	Var (% rated VA)
V1	208	44% leading (exporting vars)
V2	220 (default)	0%
V3	241	0%
V4	253	44% lagging (sinking vars)

**Table 2b: Mandatory volt-watt response mode settings**

Reference	Voltage (V)	Power (% rated Power)
V1	207 (default)	100% (default)
V2	220 (default)	100% (default)
V3	253	100% (default)
V4	259	20% (default)

**Table 2c: Sustained operation for voltage variation**

Reference	Voltage (V)
V nom-max	258

**Tables 3a to 3c – Mandatory settings for Queensland DNSPs and Essential Energy (NSW)**

**Table 3a: Mandatory volt-var response mode settings**

Reference	Voltage (V)	Var % rated VA	Power factor
V1	207	44%	0.9 leading
V2	220	0%	1
V3	240	0%	1
V4	258	60%	0.8 lagging

**Table 3b: Mandatory volt-watt response mode settings**

Reference	Voltage (V)	Max value (P/P <sub>rated</sub> ), %
V1	207	100%
V2	220	100%
V3	253	100%
V4	260	20%

**Table 3c: Sustained operation for voltage variation**

Reference	Voltage (V)
V nom-max	258

**Tables 4a to 4c – Mandatory settings for SA Power Networks**

**Table 4a: Mandatory volt-var response mode settings**

Reference	Voltage (V)	Var % rated VA
V1	207 (default)	31% leading (sourcing vars, 2.4% per Volt)
V2	220 (default)	0%
V3	248	0%
V4	253	44% lagging (sinking vars, 8.8% per volt)

**Table 4b: Mandatory volt-watt response mode settings**

Reference	Voltage (V)	Var % rated VA
V1	207 (default)	100% (default)
V2	220 (default)	100% (default)
V3	250 (default)	100% (default)
V4	265 (default)	20% (default, 5.3% per volt)

**Table 4c: Sustained operation for voltage variation**

Reference	Voltage (V)
V nom-max	258

**Tables 5a to 5c – Mandatory settings for the Ausgrid network**

**Table 5a: Mandatory volt-var response mode settings**

Reference	Voltage (V)	Var % rated VA	Power factor
V1	207	60% leading	0.8 leading
V2	220	0%	1
V3	248	0%	1
V4	258	60% lagging	0.8 lagging

**Table 5b: Mandatory volt-watt response mode settings**

Reference	Voltage (V)	Max value (P/P <sub>rated</sub> ), %
V1	207	100%
V2	220	100%
V3	248	100%
V4	258	20%

**Table 5c: Sustained operation for voltage variation**

Reference	Voltage (V)
V nom-max	258

**Tables 6a to 6c – Mandatory settings for the Endeavour Energy network**

**Table 6a: Mandatory volt-var response mode settings**

Reference	Voltage (V)	Var % rated VA
V1	207	60% export <sup>1</sup>
V2	220	0%
V3	248	0%
V4	260	60% import <sup>1</sup>

**Table 6b: Mandatory volt-watt response mode settings**

Reference	Voltage (V)	Var % rated VA
V1	207	100%
V2	220	100%
V3	255	100%
V4	265	20%

**Table 6c: Sustained operation for voltage variation**

Reference	Voltage (V)
V nom-max	258

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<sup>1</sup> If the inverter is not capable of 60% reactive power (0.8 power factor) adjustment then it shall be set to the limit of the inverter capability which shall be at least 30% or greater

**Tables 7a to 7c – Mandatory settings for the Horizon Power network**

**Table 6a: Mandatory volt-var response mode settings**

Reference	Voltage (V)	Var % rated VA
V1	207	60% leading
V2	230	0%
V3	240	0%
V4	265	60% lagging

**Table 6b: Mandatory volt-watt response mode settings**

Reference	Voltage (V)	Var % rated VA
V1	207	100%
V2	220	100%
V3	254	100%
V4	265	20%

**Table 6c: Sustained operation for voltage variation**

Reference	Voltage (V)
V nom-max	258



**Tables 8a to 8c – Mandatory settings for the Western Power network**

**Table 8a: Mandatory volt-var response mode settings**

Reference	Voltage (V)	Var % rated VA
V1	205	30% (vars source)
V2	220	0%
V3	235	0%
V4	250	30% (vars sink)

**Table 8b: Mandatory volt-watt response mode settings**

Reference	Voltage (V)	Var % rated VA
V1	207	100%
V2	220	100%
V3	250	100%
V4	265	20%

**Table 8c: Sustained operation for voltage variation**

Reference	Voltage (V)
V nom-max	258

**Tables 9a to 9c – Mandatory settings for the Evoenergy network**

**Table 9a: Mandatory volt-var response mode settings**

Reference	Voltage (V)	Var % rated VA
V1	207	30% leading
V2	220	0%
V3	250	0%
V4	258	30% lagging

**Table 9b: Mandatory volt-watt response mode settings**

Reference	Voltage (V)	Var % rated VA
V1	207	100%
V2	220	100%
V3	250	100%
V4	258	20%

**Table 9c: Sustained operation for voltage variation**

Reference	Voltage (V)
V nom-max	258

**Tables 10a and 10b – Mandatory NEM-wide settings proposed by AEMO for AS 4777.2**

**Table 10a: AEMO proposal for mandatory NEM-wide volt-var response mode settings**

<b>Reference</b>	<b>Voltage (V)</b>	<b>Var % rated VA</b>
V1	208	44% (leading)
V2	220	0%
V3	241	0%
V4	253	44% (lagging)

**Table 10b: AEMO proposal for mandatory NEM-wide volt-watt response mode settings**

<b>Reference</b>	<b>Voltage (V)</b>	<b>Var % rated VA</b>
V <sub>w1</sub>	253	100%
V <sub>w2</sub>	260	20%