

**Attachment 4: Further important information which should be noted and acted upon by the Installer and Customer**

**4.1 Customer/Contractor and Installer** should ensure that they familiarize themselves with the Australian/New Zealand Standard: AS/NZS 4777.1:2016, (Part 1 Installation Requirements), and AS/NZS 4777.2:2020, (Part 2 Inverter Requirements), so as to ensure that the proposed PVI system is compliant with these standards. No exceptions will be permitted. Proposed compliant inverters should also be accurately described on the current Clean Energy Council list of approved inverters.

**4.2 Demand Response Mode**

Australian/New Zealand Standard AS4777.2:2020 specifies that inverters installed shall have Demand Response Modes, (DRM), available and connected to a Demand Response Enabling Device, (DRED), Section 3, (generally), and Section 3.2.2, (specifically). Customers/consultants should familiarize themselves with the standard, and, with respect to voltage rise control, the following section:

**4.3 Volt Response Modes**

Customer should consider the relay and inverter settings as per Attachment 2 enclosed here and confirm the proposed settings for this PVI system, and you and your electrical contractor/PVI/ESI installer shall ensure the following power quality response modes have been set in the inverter/s, (as per AS4777.2:2020 Section 3.3) and may not be changed without written approval from SA Power Networks. These settings should be confirmed at commissioning irrespective of the make and model of inverter installed.

Both power quality response mode settings must be enabled for inverters if a fixed power factor is not specified in Attachment 2. If a fixed power factor is specified in Attachment 2, only Volt-Watt is required to be enabled.

Sustained operation for Voltage variations (Clause 4.5.2 of AS 4777.2: 2020)

Reference	Voltage in Volts
V <sub>nom-max</sub>	258

Volt-VAr response mode (Table 3.7 of AS 4777.2: 2020)

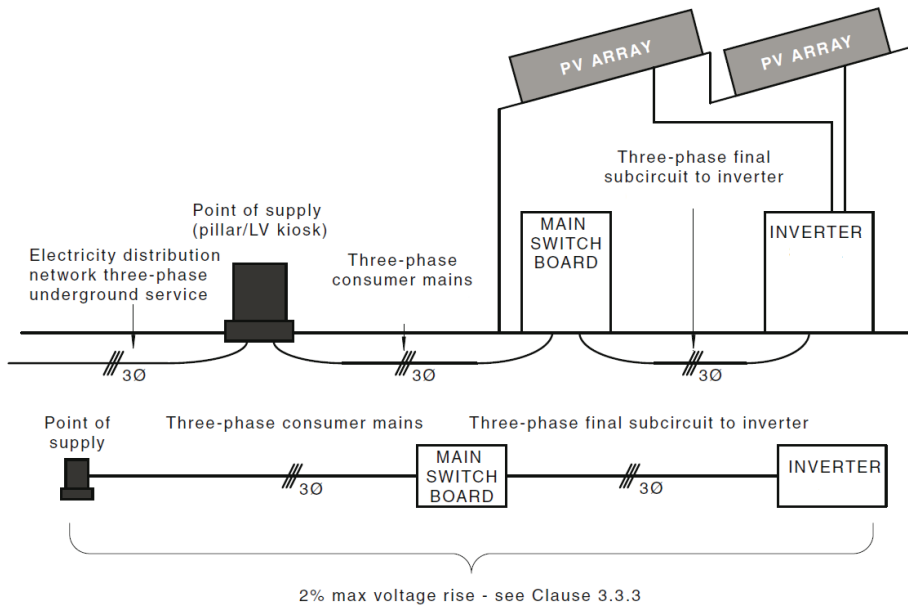
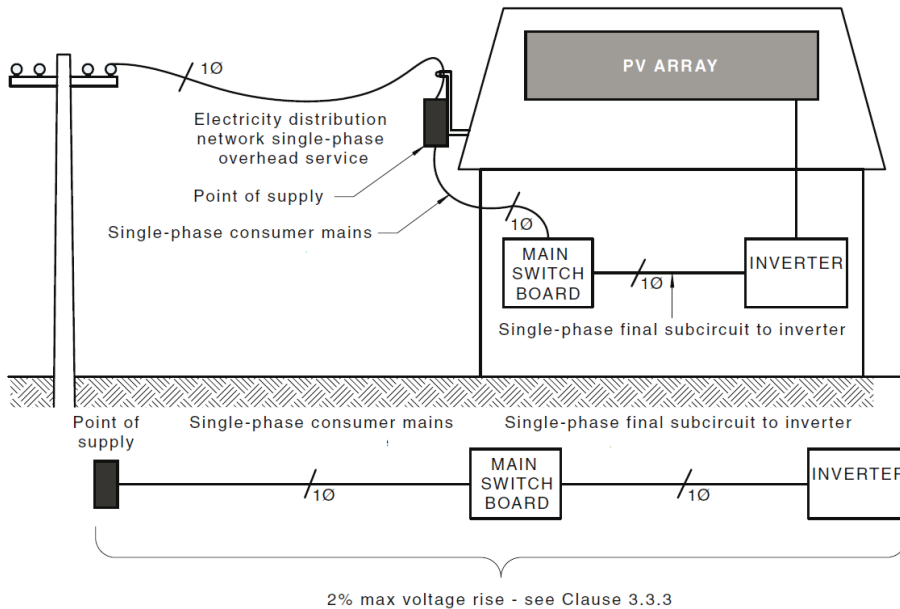
REFERENCE	VOLTAGE (e.g. 230/400V)	VAr % RATED VA
V <sub>V1</sub>	90% Nominal Voltage (207V)	44% leading (sourcing VArS, 3.4%/V)
V <sub>V2</sub>	96% Nominal Voltage (220V)	0
V <sub>V3</sub>	104% Nominal Voltage (240V)	0
V <sub>V4</sub>	112% Nominal Voltage (258V)	60% lagging (sinking VArS, 3.3%/V)

Volt-Watt response mode (Table 3.6 of AS 4777.2-2020)

REFERENCE	VOLTAGE (e.g. 230/400V)	W % RATED VA
V <sub>W1</sub>	110% Nominal Voltage (253V)	100%
V <sub>W2</sub>	113% Nominal Voltage (260V)	20% (11.4%/V)

**4.4 Voltage Rise: Voltage Rise provisions: single and three phase systems**

The voltage rise between the inverter and the distributor point of supply is to be less than 2%.



The allowable voltage drop as per AS/NZS 3000:2018, between the last general power outlet and the customer point of supply is currently 5%. However, for conditions of energy export, inverter outage caused by excessive voltage RISE may occur for some installations. Within the 5% window, the voltage at the inverter can move outside the AS4777.2:2020 voltage set points, while the voltage at the point of supply remains within distributor's regulatory limits. This discrepancy has resulted in two allowable voltage variations across Customer's wiring: that for volt drop, (5%), and the other for volt rise, (2%).

## Attachment 5: Commissioning Program Requirements

**The commissioning and correct operation of the Generating System is the customer's responsibility.** The components described in this document are to be used as a guide in order to satisfy SA Power Networks compliance requirements. The customer should communicate with the relevant Network Project Officer, (NPO), in order to determine a proposed commissioning witnessing date.

### 5.1 Commissioning Checklist:

As part of witnessing the compliance tests, the Customer must utilise the commissioning checklist template that outlines the testing that will be done on any of the equipment that may affect the security of the electricity Network and to allow SA Power Networks to understand what is proposed to be tested and the pass/fail criteria for each test. The commissioning checklist is available on line at: <https://www.sapowernetworks.com.au/public/download.jsp?id=310392> or if the customer cannot access this, the Network Project Officer will forward a copy of the SAPN Commissioning Witnessing Checklist to the customer for use during site commissioning.

### 5.2 Other Documents

SA Power Networks will not attend site and witness the compliance tests until the Customer has submitted the following:

- Documents showing compliance with all relevant Standards, including:
- A copy of the Electrical Certificate of Compliance;
- Single-Line Diagram (As Built)

The Customer must submit these documents to SA Power Networks **at least 5 business days prior** to the date the Customer wants SA Power Networks to attend site.

SAPN commissioning Officer will contact the customer a minimum of 2 business days before the target commissioning date to confirm the readiness of their system. Please note that if a rescheduled date is required by the customer, an extra fee may apply.

### 5.3 Commissioning Report:

The Customer must submit to SA Power Networks a copy of the commissioning test results within **20 business days** of undertaking the tests.

The test results should include:

- Completed and signed commissioning program.
- Measurement data, in a format suitable from a power quality logging device. If logging is required as specified in the Customer Offer, and the customer requests SAPN install the device, then the Network Project Officer will issue a sales order to the customer in order to recover the cost, and ensure payment has been received before proceeding further.

The commissioning report shall include a sign off sheet for the Customer, the Consultant or Installer and SA Power Networks.

## PART 4 – QUALITY OF SUPPLY AND POWER FACTOR

### QUALITY OF SUPPLY

Changes of voltage (e.g. resulting from starting motors) and harmonic distortion levels must comply with the National Electricity Rules and the Electricity Distribution Code.

Maximum limits are as detailed in the following table.

Generating System Capacity to be installed (Export)	To Be Decided
Proposed SA Power Networks Transformer / Service Size	59kVA
Maximum Design Fault Level at Service Point	35.1kA
Maximum allowable harmonic distortion at the point of common coupling (PCC):	1.67%
• total	1.33%
• any individual odd harmonic	0.67%
• any individual even harmonic	

**NOTE: If complaints of interference arise from the operation of your equipment, SA Power Networks will require that you take remedial action to our satisfaction.**

### POWER FACTOR

Unless we otherwise agree, you must, at times of your monthly maximum demand, keep the power factor of your electrical installation within the relevant range set out in the table below and take all reasonable steps to maintain its power factor within the specified range at all other times.

Supply Voltage in kV	Power Factor Range for Customer Maximum Demand and Voltage					
	Up to 100 kVA		Over 100 kVA - 2 MVA		Over 2 MVA	
	Minimum Lagging	Minimum Leading	Minimum Lagging	Minimum Leading	Minimum Lagging	Minimum Leading
< 6.6	0.80	0.80	0.85	0.80	0.90	0.85
6.6 - < 66	0.80	0.80	0.85	0.85	0.90	0.90
66 and above	As specified under Section S5.3.5 of the National Electricity Rules					

In order to comply with Power Factor requirements, it may be necessary to fit Volts Amps Reactive (VAR) support equipment.

## PART 5 - TARIFF SUMMARY SHEET

1. The Authorised Service Capacity for this Connection is: 59kW
2. The applicable Network Tariff for this Connection is:  
**SBTOU – Small Business Time of Use**  
**X Gen – Zero Rate – Solar Co Gen**

The meaning of the above terms is explained in clause 35 of the Construction Terms booklet.