Section 6

Supply Characteristics and Supply Use

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6.1. Supply

6.1.1 Supply Systems

Electricity supplied throughout Victoria is in the form of alternating current of approximately sinusoidal waveform at a frequency of 50 Hz. Electricity Distributors' endeavour to maintain the voltage at the Point of Supply in accordance with the Electricity Distribution Code (Refer Table 1. and the Code) and may superimpose control signals on the normal supply voltage.

At the time of publication:

- Standard nominal voltages are 240 V, 415 V, 480 V, 6.6 kV, 11 kV, 22 kV and 66 kV; and
- Standard Low Voltage Systems are 3 phase 4 wire 415/240 V, and Single phase 240 V and 3 wire 480/240V Systems; and

It has been proposed that standard nominal low voltages be 3 phase 4 wire 400/230V, single phase 230V and 3 wire 460/230V. However, these systems and voltages have not been adopted at the time of publication.

Table 6.1 Standard Nominal Voltages and Voltage Variations

Voltage Level in kV	Voltage Range for Time Periods Voltage			Impulse Voltage
	Steady State	Less than 1 minute	Less than 10 seconds	
<1.0	± 6 %	± 10 %	Phase to Earth +50%-100% Phase to Phase +20%-100%	6 kV peak
1-6.6	± 6 % (± 10 % Rural Areas)	± 10%	Phase to Earth +80%-100%	60 kV peak
11			Phase to Phase +20%-100%	95 kV peak
22				150 kV peak
66	± 10%	± 15%	Phase to Earth +50%-100% Phase to Phase +20%-100%	325 kV peak

6.1.2 Prospective Short Circuit Current

The Wiring Rules require electrical installations to be designed with consideration to the prospective short-circuit current under short circuit conditions within the electrical installation.

For the purpose of this clause a bolted short circuit means a fault of negligible impedance at the point of short circuit.

Dependent upon the relative location of the electrical installation's connection to the electrical distribution system the prospective short-circuit current at the consumer terminals will vary. This variance is due to the electrical distribution system characteristics such as size and impedance of the transformer and impedance of cables supplying the consumer terminals.

For electrical installations connected to low voltage supply, except as provided for below, the prospective short-circuit current at the consumer terminals shall be deemed to be 6kA phase to earth, and 10kA between phases for 0.1 of a second, and 0.04 of a second immediately beyond the fuse where a service fuse cartridge is fitted.

Higher prospective short-circuit current values apply to consumer terminals close to transformers of a capacity of 500kVA and from transformers of greater capacity. In these cases, the relevant Distributor should be contacted to provide the actual prospective short-circuit current value and its duration at the particular location.

Lower prospective short-circuit current values than the 6kA and 10kA stated above may apply in some locations where the supply arrangements are not expected to change for the anticipated lifespan of the installation. In these cases, where the 6kA and 10kA values are not adopted, and also where the prospective short-circuit current value at a particular electrical installation's location is uncertain, the relevant Distributor should be contacted in accordance with the details in Section 3 to provide the prospective short-circuit current.

Details of prospective short-circuit currents and their duration relating to high voltage installations are provided in clause 9.10 (Short Time Withstand Current).

6.2. Point of Supplies

6.2.1 Property

For the purpose of these Rules "Property" means land on which the single electricity customer or controlling body or their representatives have the right to install their electrical installation.

A property may include:

(a) a single parcel of freehold, leasehold and/or public land, and/or land held under lease or licence on which the customer or controlling body has the right to install their electrical installation;

(b) any combination of contiguous land to which the customer or controlling body has the right to install their electrical installation; and

(c) contiguous land and/or individual titles to which a corporate body, customer and or controlling body has the right to install their electrical installation;.

An expressed easement through adjacent property to which the customer or controlling body does not have occupancy rights is not considered to form part of a property for the purpose of the establishment of a Point of Supply.

In the event that the boundary of the property to be supplied is not clearly defined, the prospective customer shall be responsible to physically and accurately define the boundary of the property to the satisfaction of the Responsible Officer.

6.2.2 Point of Supply

6.2.2.1 Definition

Point of Supply (POS) – the point at which the electricity Distributors service cable or supply main connects to the consumer terminals. (Refer Section 1 – Definitions)

6.2.2.2 Provision

The Distributor, following application in accordance with clause 5.4 (Application for Supply), and during negotiations for supply, will nominate the location and provide one point of supply for each property.

However, in certain situations the relevant Distributor may agree to a customer's written request for more than one point of supply. Examples of where more than one point of supply may be agreed are:

- Engineering considerations such as load and distance;
- Where subdivision may take place; and
- Existing titles comprising of one property where rights to individual titles and/or parcels of land may change.

Where it is proposed to cross a major asset of another Authority within the customer's property, the customer shall consult with that Authority and the relevant Distributor regarding the requirements of the other Authority or an alternative means of providing supply to the property.

6.2.2.3 Location

In all cases, the Distributor reserves the right to determine the location of the point of supply and method of supply.

The following are points of supply and consumer terminals location relative to the type of supply.

Refer to Clauses 7.2.1 (Underground Supplies-Consumer Terminals) and 7.3.3 (Overhead Supplies-Consumer Terminals) and Section 9 High Voltage Electrical Installations for specific details of POS and consumer terminal arrangements for low and high voltage supplies.

Table 6.2 Point of Supply/Customer Terminals Location

SUPPLY TYPE	POINT OF SUPPLY/CUSTOMER TERMINALS LOCATION
AERIAL SERVICE CABLE	Within 500mm of the first point of the service cable attachment within the property or on the premise.
UNDERGROUND	
Supply pit	In the pit adjacent the property
Supply cable	Within a supply connection facility at, or with the Distributor's agreement, a short distance from the property boundary.
Ground, Kiosk & Indoor Type Substation on property	As nominated by the Distributor – normally at or as close as practicable to the substation terminals.
Pole & Pole Type Substation	As nominated by the Distributor – normally 4m from ground level.
High Voltage	The point agreed between the relevant Distributor and Customer

6.3. Consumer Terminals

The Distributor reserves the right to determine the location of the Consumer's Terminals including the method of supply, and may require the customer to arrange facilities for the installation of the service cable and conduits at the customer's expense.

6.3.1 Definition

Consumer Terminals - means the junction at which the consumer mains connect to the Distributor's service cable or supply mains conductors. (Refer Section 1 – Definitions)

6.3.2 Number of Consumer Terminals per Point of Supply

No more than one set of consumer terminals shall be connected to a point of supply.

The relevant Distributor may agree to a customer's request for the connection of more than one set of consumer terminals to a point of supply dependant upon the circumstance.

6.3.3 Identification of Consumer Terminals

Consumer terminals shall be labelled adjacent to the terminals in accordance with Clause 4.5 (Labelling) to identify the electrical installation they supply in the following circumstances:

- Where more than one set of consumer terminals are supplied from a common point of supply; and
- Where the consumer terminals are located within a supply pit.

6.4 Supply Arrangement Diagrams

In addition to the requirements of the Electricity Safety Act and Electricity Safety (Installations) Regulations the following Rules apply where, in accordance with the provisions of Clause 6.2.2 (Point of Supply):

- more than one point of supply is provided to a property and/or more than one set of consumer terminals are connected to a point of supply; and
- there is a risk of incorrect identification of:
  - the property's supply arrangements; and
  - segregation between the electrical installations and occupancies un-metered wiring, switchboards and metering.

The supply arrangement diagrams shall be permanent, indelible, legible and dimensioned with a margin of error not exceeding 500mm. The diagrams must show the location of the point of supply for each electrical installation, the un-metered wiring, the metering points and each switchboard location shall be installed within the main metering location and/or main un-metered switchboard – whichever applies.

Where multiple meter locations are connected to an electrical installation the diagram installed at that location shall identify the supply point and wiring supplying the meter position, and the location of the occupancy switchboards supplied from that meter position.

The customer is responsible for the provision and maintenance of the diagrams and to ensure they are permanent, legible and up to date at all times.

6.5. Supply Loading

6.5.1 Obligations

At the time of publication Clause 3.2 of Electricity Distribution Code included obligations for customers to use best endeavours to ensure:

(a) protection equipment in the customer's electrical installation is at all times effectively coordinated with the electrical characteristics of the distribution system; and

(b) ensure that the distribution system and the reliability and quality of supply to other customers are not adversely affected by the customer's actions or equipment.

Additional requirements of the Code are duplicated in these Rules for convenience of reference.

However the current Code should be referenced for specific details. This clause also contains some specifications that are not included in the Code.

6.5.2 Non Compliance

If, in the opinion of the Electricity Distributor, a person should use or deal with electricity supplied in such a manner as to cause undue interference with the supply to other customers or to any third party, the Distributor may direct the customer to take corrective action and, in the event of failure to comply with such directions, the Distributor may discontinue the supply of electricity to the electrical installation or occupancy.

The fact that the Distributor may have permitted connection of the apparatus or equipment causing the interference shall not exempt the customer from the application of this Clause.

6.5.3 Power Factor

At the time of publication Clause 4.3 of the Electricity Distribution Code stated:

A ***customer*** must ensure that the ***customer's demand*** for ***reactive power*** does not exceed the maximum level allowed by applying the ***power factor*** limits specified in Table 2 to the

customer's maximum ***demand*** for ***apparent power*** (measured in kVA) or ***active power*** (measured in kW).

If, for the purposes of clause 4.3.1, the ***customer's*** maximum ***demand*** for ***apparent power*** *(Rmax*) is used, then the ***customer's*** allowable ***demand*** for ***reactive power*** *(Qmax*) is calculated using the formula $Qmax = Rmax*(1-pfmin^2)^{1/2}$, where *pfmin* is the minimum power factor specified in Table 2.

If, for the purposes of clause 4.3.1, the ***customer's*** maximum ***demand*** for ***active power*** (Pmax) is used, then the ***customer's*** allowable ***demand*** for ***reactive power*** (Qmax) is calculated using the formula $Qmax = (Pmax/pfmin)*(1-pfmin^2)^{1/2}$, where pfmin is the minimum power factor specified in Table 2.

If the ***customer's*** network tariff includes a charge for the maximum ***demand*** for ***apparent*** or ***active power***, then, for the purposes of this clause 4.3, the ***customer's*** maximum ***demand*** for ***apparent*** or ***active power*** is to be taken to be the maximum ***demand*** for which it was most recently billed.

Despite clause 4.3.1, a ***customer*** must use best endeavours to keep the ***power factor*** of its ***electrical installation*** within the relevant range set out in Table 2 when the ***customer's demand*** for ***active*** or ***apparent power*** is at or more than 50% of the ***customer's*** maximum ***demand***.

Table 6.3 Table 2 of the Electricity Distribution Code

POWER FACTOR LIMITS						
Supply Voltage in kV	**Power Factor Range for Customer Maximum Demand and Voltage**					
	Up to 100 kVA		**Between 100 kVA - 2 MVA**		**Over 2 MVA**	
	Minimum Lagging	**Minimum Leading**	**Minimum Lagging**	**Minimum Leading**	**Minimum Lagging**	**Minimum Leading**
< 6.6	0.75	0.8	0.8	0.8	0.85	0.85
6.6 11 22	0.8	0.8	0.85	0.85	0.9	0.9
66	0.85	0.85	0.9	0.9	0.95	0.98

6.5.4 Harmonics

At the time of publication Clause 4.4 of the Electricity Distribution Code stated in part:

A ***customer*** must keep harmonic currents below the limits specified in Table 4 and otherwise comply at its nearest ***point of common coupling*** with the ***IEEE*** Standard 519-1992 *'Recommended Practices and Requirements for Harmonic Control in Electrical Power Systems'*.

Table 6.4 Table 4 of the Electricity Distribution Code

CURRENT HARMONIC DISTORTION LIMITS						
	Maximum Harmonic Current Distortion in Percent of IL					
	Individual Harmonic Order "h" (Odd Harmonics)					Total Harmonic Distortion
ISC/IL	<11	11≤ h <17	17≤ h < 23	23≤ h < 35	35 ≤ h	
<20*	4.0%	2.0%	1.5%	0.6%	0.3%	5.0%
20<50	7.0%	3.5%	2.5%	1.0%	0.5%	8.0%
50<100	10.0%	4.5%	4.0%	1.5%	0.7%	12.0%
100<1000	12.0%	5.5%	5.0%	2.0%	1.0%	15.0%
>1000	15.0%	7.0%	6.0%	2.5%	1.4%	20.0%

Notes:

1. Even harmonics are limited to 25% of the odd harmonics listed above.
2. Current distortions that result in a DC offset, e.g. half-wave converters, are not allowed.
3. *All power generation equipment is limited to these values of current distortion, regardless of actual I_{SC}/I_L.
4. I_{sc} = maximum short-circuit current at ***point of common coupling***.
5. I_L = maximum ***demand*** load current (fundamental frequency component) at ***point of common*** coupling.

The Wiring Rules also has a requirement for electrical equipment not to cause adverse effects and interference (such as harmonics) to other equipment.

6.5.5 Load balance

At the time of publication Clause 4.7 of the Electricity Distribution Code stated:

A ***customer*** must ensure that the current in each phase of a three phase ***electrical installation*** does not deviate from the average of the three phase currents:

(a) by more than 5% for a standard nominal ***voltage*** up to 1 kV; and

(b) by more than 2% for a standard nominal ***voltage*** above 1 kV.

Despite clause 4.7.1, deviations are permissible for periods of less than 2 minutes:

(a) up to10% for a standard nominal ***voltage*** up to 1 kV; and

(b) up to 4% for a standard nominal ***voltage*** above 1 kV.

6.5.6 Disturbing Loads

At the time of publication Clause 4.8 of the Electricity Distribution Code stated in part:

Subject to clause 4.8.3, a ***customer*** must ensure that the ***customer's*** equipment does not cause ***voltage*** fluctuations at the ***point of common coupling*** greater than the levels specified in ***AS/NZ*** 61000.3.5:1998 and ***AS/NZ*** 61000.3.7:2001 as appropriate.

If two or more ***customers' electrical installations*** are ***connected*** at the same ***point of common coupling*** , the maximum permissible contribution to ***voltage*** fluctuations allowable from each ***customer*** is to be determined in proportion to their respective maximum ***demand***, unless otherwise agreed.

6.5.7 Switched Loads

To meet the specifications regarding load balance and disturbing loads with supply the following advice may assist:

In many electrical installations individually switched loads rated in excess of the value specified below should not be connected between an active and the neutral conductor.

- Single Phase 480/240 Volt areas of supply – 20 Amperes
- Three Phase 415/240 Volt areas of supply – 25 Amperes

6.5.8 Voltage Drop

The Wiring Rules specify the allowable voltage drop within an electrical installation.

6.5.9 Equipment Requiring Special Consideration

The relevant Distributor may refuse to permit or apply conditions and/or tests for the connection of equipment in the following categories if it considers that by such connection, the supply to other customers would be adversely affected –

(a) Equipment which could cause excessive fluctuation of voltage on the Distributor's system as a result of its large or fluctuating demand, e.g. Non linear load control such as variable speed motors, gas discharge lighting, arc furnaces, welding machines, X–ray units, frequently–started large motors, etc.

(b) Equipment which could cause excessive distortion of the wave shape of the Distributor's system voltage, e.g. rectifiers, frequency converters, load control devices using thyristors or saturable reactors, etc.

No expense should be incurred by any customer or prospective customer until an application has been made to the relevant Distributor and advice has been received that the supply will be given and upon what terms and conditions it will be given.

6.5.10 Starting Current of Motors

6.5.10.1 General

The current taken by a motor of a type mentioned in this Clause under the conditions of starting shall not exceed the values in Table 6.3 and Table 6.4 when measured by the methods outlined in Clause 6.5.11 (Test Method of Measurement of Motor Starting Current).

6.5.10.2 Three Phase Motors 415 Volt

The kW output of motors installed refers to the motors connected to the particular electrical installation from which the proposed motor is to be supplied and includes the proposed motor, provided that no limitation need be placed on the starting current of any three phase motor which is not frequently started and the rating of which does not exceed 10 per cent of the total motor load installed.

In electrical installations which are supplied directly from a substation or where special supply conditions exist, starting currents in excess of those set out in Table 6.3 sections (b) and (c) may be permitted if permission has been obtained from the Responsible Officer.

Table 6.5 Three Phase Motors 415 Volts

MOTOR SIZE	ALLOWABLE CURRENT – I
not exceeding 1.5 kW	**I = 26 Amperes**
exceeding 1.5 kW, but not exceeding 3.75 kW	**I = (kW x 17.5) Amperes**
Exceeding 3.75 kW	**(a) I = (kW x 3.5) + 53 Amperes, or**
	(b) I = total kW of motor installed x 1.1 Amperes, or
	I = the starting current of the largest of the other motors installed calculated in accordance with sub-clause (a), whichever is the greatest.

6.5.10.3 Single Phase Motors

Table 6.6 Single Phase Motors

MOTOR VOLTAGE	MOTOR SIZE	ALLOWABLE CURRENT – I
240 Volts	All sizes	I = 45 Amperes
480 Volts	Not exceeding 1.5 kW	I = 45 Amperes
	Exceeding 1.5 kW, But not exceeding 3.75 kW	I = (kW x 9.5) + 26 Amperes
	Exceeding 3.75 kW, But not exceeding 30 kW	I = (kW x 6.5) + 35 Amperes
	Exceeding 30 kW	I = (kW x 7.4) + 15 Amperes

6.5.11 Test Method for Measurement of Motor Starting Current

The starting currents of alternating current motors shall be determined by either of the following methods –

6.5.11.1 Fall in Voltage Method

The starting current shall not cause a fall in voltage of more than 5 per cent for more than 0.02 seconds when connected to a typical 415/240 volt, three phase, 50 Hz supply having a supply system impedance of –

- 0.2 + j 0.2 ohms (phase–neutral)
- + j 0.1 ohms (line impedance per phase)

The fall in voltage shall be determined by the oscillographic method or any other method considered appropriate by the Distributor.

6.5.11.2 Current Measurement Method

The starting current may be determined by the locked rotor method with low voltage, 50 Hz, as appropriate, applied to the terminals of the motor. In the case of motors having rotors which cannot readily be locked, the current may be measured with a back–stopped ammeter or by other methods approved by the Distributor.

6.5.12 Back Feed

Except as permitted by clause 6.8 (Alternative Supplies), where a potential exists within an electrical installation to cause current flow or earth potential rise by back-feeding through the electrical installations equipment into the electricity supply system all necessary steps must be taken to prevent any back feed into the supply system.

If this potential exists, the customer must provide in the application for supply, details regarding how it proposes to prevent the occurrence of back-feeding.

6.6. Type of Supply and Load

The applicable supply contract or agreement referred to in Clause 5.1 (Conditions of Supply) specifies:

- the conditions for connection of the electrical installation to the electricity network;
- the type of supply including the voltage and number of phases; and
- the allocated supply capacity where this is applicable.

Except for electrical installations subject to a deemed electricity distribution contract, the conditions for connection, the type of voltage and number of phases and supply capacity, that

is, the allocated maximum demand or the allocated supply capacity can be determined from the customer's copy of the contract or agreement applicable to the electrical installation.

The relevant Distributor should be contacted as detailed in Section 3 (Areas of Supply) of this document to determine the supply arrangements where a customer does not have a specific electricity distribution connection agreement or contract or demand tariff agreement available and where a deemed electricity distribution contract applies.

The electrical installation loading shall be in accordance with the contract applicable to the electrical installation and arranged to comply with these Rules.

6.7. Supply Capacity

6.7.1 Application

Unless otherwise required by the relevant Distributor, supply capacity to electrical installations specified in this clause shall be controlled in accordance with clause 6.7.2 (Supply Capacity Control).

6.7.1.1 Electrical Installation subject to a demand tariff agreement or contract

All new electrical installations and existing electrical installations where the Distributor has specified in writing that the supply capacity be controlled, that are subject to a demand tariff agreement or contract that contains an allocated maximum demand shall be controlled so as not to exceed that supply capacity, ie, the allocated maximum demand.

6.7.1.2 Electrical Installations subject to a specific electricity distribution connection agreement or contract, or a deemed electricity distribution contract

The following electrical installations shall be controlled so as not to exceed a load equal to approximately 130% of their supply capacity for more than 2 hours:

(a) New Electrical Installations, where:

i) The Distributor has specified in writing that the supply capacity be controlled; or

ii) The nature of electricity use by the electrical installation may interfere with the reliability or quality of supply to other customers, and in the opinion of the Distributor, supply capacity control would reduce or eliminate the interference; or

iii) The maximum demand as determined under the Wiring Rules exceeds 100Amps per phase; or

iv) The electricity supply is not metered.

(b) Existing Electrical Installations, where:

i) The Distributor has specified in writing that the supply capacity be controlled; or

ii) The nature of electricity use by the electrical installation may interfere with the reliability or quality of supply to other customers, and in the opinion of the Distributor, supply capacity control would reduce or eliminate the interference; or

iii) Any portion of the consumer mains is replaced and either:

a) The electrical installations maximum demand as determined under the Wiring Rules exceeds 100 Amps per phase; or

b) The electricity supply is not metered.

6.7.2 Supply Capacity Control

6.7.2.1 General

A device or devices other than a fuse cartridge shall control the supply capacity to electrical installations specified in clause 6.7.1 (Application).

Acceptable methods to control supply capacity include the use of Circuit Breakers and/or Load Management Systems that are acceptable to the relevant Distributor. Any other method that is proposed to control supply capacity shall be subject to the acceptance of the relevant Distributor.

Consideration should be taken to ensure supply capacity control equipment for electrical installations containing essential building services and general electrical installation non-essential supplies is co-ordinated to minimise any effect of the control equipment on the essential services.

In these cases, the essential building services equipment need not be subject to the electrical installations supply capacity control, provided the allocated supply capacity less the essential services equipment maximum demand is controlled in accordance with this clause.

6.7.2.2 Supply Capacity Control Device/s

(a) Circuit Breakers

- May be installed at any point between the point of supply and main switchboard in accordance with the Electricity Safety Act and Regulations, the Wiring Rules, and these Rules;
- Will normally be located and serve the purpose of:
  - the Service Protection Device/s provided they meet the requirements for those devices and this clause; or
  - the electrical installations main switch/s provided they meet the requirements of this clause and the Wiring Rules;
- Must be arranged to ensure the aggregate rating of the devices does not exceed the supply capacity where multiple devices are used; and
- Shall have access and means to seal any adjustable settings by the use of distributor seals or equivalent means.

Table 6.7 Circuit Breakers to Satisfy Clauses 6.7.1.1 and 6.7.1.2

Nominated Supply Capacity	CB manufactured to AS/NZS 3947.2:2002 Satisfy Sub-clause 6.7.1.1. and 6.7.1.2	CB manufactured to AS/NZS 4898:1997 De-rating required to Satisfy Sub-clause 6.7.1.2	CB manufactured to AS 3111 Satisfy Sub-clause 6.7.1.2
20A	–	16A	20A
25A	–	20A	25A
32A	–	25A	32A
40A	–	32A	40A
50A	–	40A	50A
63A	–	50A	63A
80A	–	63A	80A
100A	–	80A	100A
125A	125A	100A	125A
160A	160A	125A	–
200A	200A	–	–
250A	250A	–	–
315A	315A	–	–
400A	400A	–	–
500A	500A	–	–
630A	630A	–	–
800A	800A	–	–

(b) Load Management System/s

To prevent loss of supply, situations where the installation of a load management system should be considered include:

- where the electrical installation incorporates essential building services such as fire and smoke control equipment, evacuation equipment and/or lifts;
- priority loads where the demand may approach the maximum supply capacity; and
- where loss of supply may have adverse customer effects, eg, loss of production.

6.8. Sources of Alternative Supply

6.8.1 General

Where a Grid interactive energy supply is proposed, the proposal shall be submitted to the relevant Distributor for approval at the earliest opportunity. Where applicable, the customer should also advise their Retailer of the proposal. The proposal shall include a schematic diagram of the electrical installation supply arrangements.

6.8.2 Connection of Break before Make Alternative Supply Sources

Where the Distributor agrees to connection arrangements that enable an electrical installation to be disconnected from the Distributor's supply system and connected to a private alternative source, the arrangements shall be such that the Distributor's system, service and metering equipment cannot be energised from such alternative source. This can be arranged either directly (electronically) or by suitable interlocking devices to prevent the simultaneous connection of the alternative supply to the Distributor's system. An example of an acceptable interlock arrangement is shown in Figure 6.1.

The opening or closing of any associated switchgear door or cover shall not affect the interlocking system. A prominent label shall be fixed on the main switchboard to show that such facilities exist, and the sections of the electrical installation they supply including their point of control.

If the alternative supply automatically comes into operation on the loss of mains supply, a means of isolating the alternative supply from the Distributor equipment shall be provided on the electrical installation main switchboard or Distribution Switchboard to which the alternative supply is connected.

Where a generator is directly connected under emergency conditions, the interlocking arrangement may be achieved by creating a physical break, eg, disconnection of cables, which requires other than normal operational means to restore.

The neutral shall not be switched or broken on the distribution supply (upstream) side of the M.E.N. connection.

Refer also to the Wiring Rules and AS 3010.1 "Electrical Installations – Supply by Generating Set".

6.8.3 Grid Connected Alternative Supplies

Specific requirements apply in respect of any proposal to incorporate parallel generation facilities within an electrical installation. These requirements are specified in the National Electricity Code, the Distribution Code, the Electricity Safety Act and Regulations and Australian Standards. It is therefore essential that the Distributor be formally consulted before any commitment to proceed is made.

6.8.4 Grid Connection of Energy Systems via Inverters

These Rules specify the electrical installation requirements for inverter energy systems with ratings up to 10 kVA for single-phase units, or up to 30 kVA for three-phase units.

6.8.4.1 Inverter Requirements

Only approved models that satisfy AS 4777 Part 2 “Grid Connection of Energy Systems via Inverters, Inverter Requirements and Part 3, Grid Protection Requirements” may be connected to the grid.

Type Test certification of compliance with this standard must be provided to the Distributor prior to the grid connection of the inverter.

6.8.4.2 Installation and Connection to Grid

The installation of the inverter shall be in accordance with the requirements of AS 4777.1 and AS 4777.3. and these Rules:

- The customer’s inverter must be connected to a dedicated circuit on the customer’s main switchboard or distribution switchboard closest to the inverter via a lockable isolating switch;
- The switchboard must be clearly and permanently labelled as having an inverter energy system connected to it. The circuit breaker, fuse or switch must also be clearly labelled;
- The installation of an Inverter Controlled Energy System is “prescribed work” and a copy of the Certificate of Electrical Safety and Electrical Work Request shall be provided to the Distributor;
- A test shall be carried out by the relevant Distributor’s representative at the time the system is commissioned to ensure that “islanding” does not occur; and
- A label indicating that an alternative power supply system is connected to the electrical installation shall be fitted at the FOLCB for an overhead electricity supply or at the consumer terminals and service fuse for underground supply.

6.8.4.3 Metering

The meter shall be an electronic meter with import and export registers to accept periods of reverse power flow when power is flowing into the grid from the customer’s premises. Refer to relevant Distributor for details.

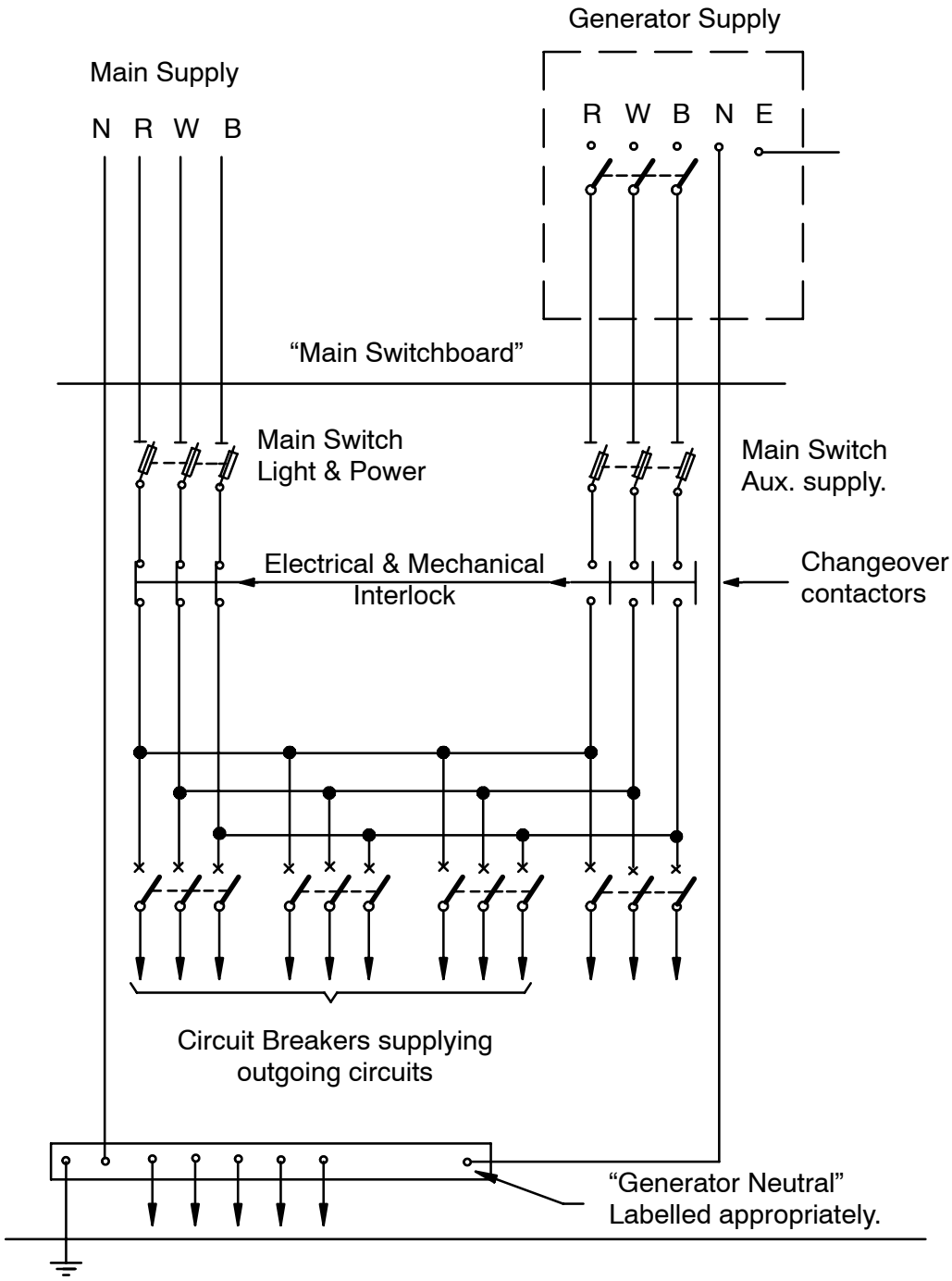


Figure 6.1 Typical Alternative Supply Arrangements

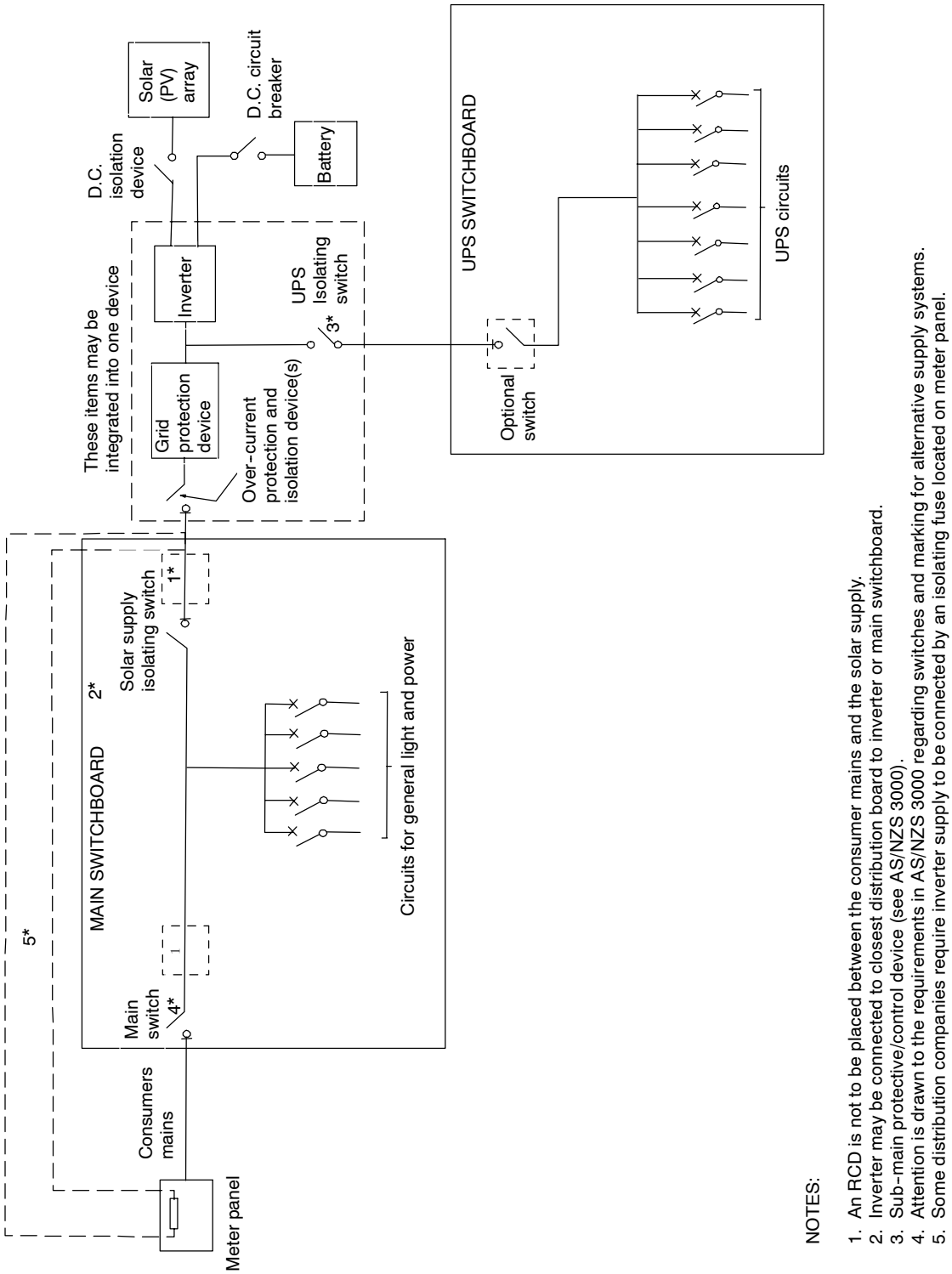
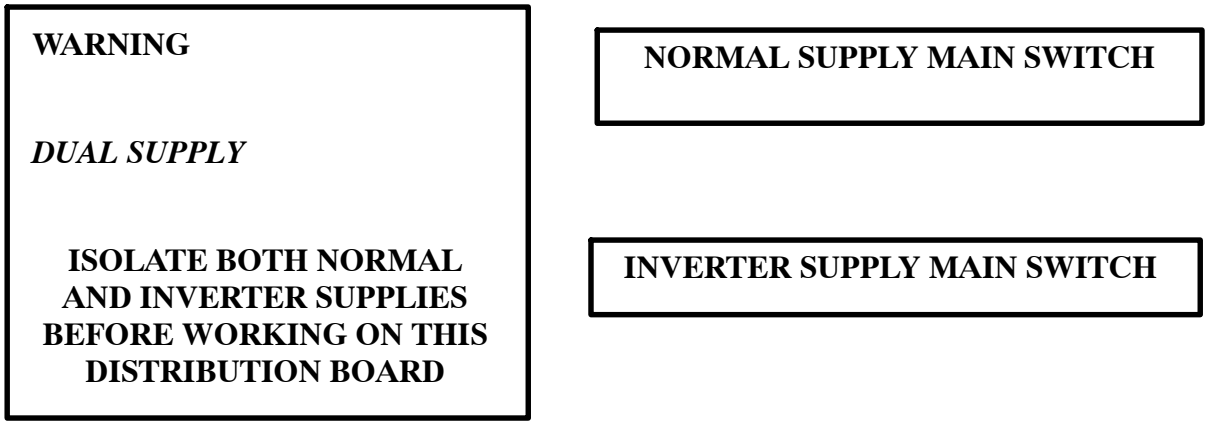


Figure 6.2 Typical Installation of an Invertor Energy System Incorporating an Uninterruptible Power Supply



Typical label to be installed at Main Switchboard or Distribution Board where the inverter energy system is connected.

Typical labels to be installed adjacent to isolating switches at Main Switchboard or Distribution Board where the inverter energy system is connected

Figure 6.3 Typical Labelling Requirements