

## VICTORIAN SERVICE & INSTALLATION RULES

### Supply Protection & Supply Capacity Limitation - Guidelines

## 1.1 Supply Capacity (Maximum Demand by Limitation)

### 1.1.1 Application

Unless otherwise required by the relevant Distributor, maximum demand to electrical installations specified in this clause shall be controlled in accordance with SIR clause 6.7.2 and the Electricity Safety (Installations) Regulations 2009, and in particular regulation 232 in relation to Safety Services.

### 1.1.2 Electrical Installations subject to a demand agreement/contract

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

### 1.1.3 Capacity Control and types of Electrical Installations subject to a specific electricity distribution connection agreement or contract, or a deemed electricity distribution contract

Electrical installations shall be arranged in accordance with the Wiring Rules so as not to exceed 130% of the Distributors nominated supply capacity for more than 2 hours by one of the following means:

- Moulded case circuit breakers with a fixed thermal trip unit setting of 130% of the rated current of the circuit breaker
- Miniature circuit breakers with a fixed thermal trip unit setting of 145% of the rated current of the circuit breaker. These circuit breakers must be de-rated to achieve 130% of the nominated supply capacity.

Adjustable circuit breakers are acceptable provided the thermal trip unit is set to a level equal to the nominated supply capacity and the overload duration is set as agreed with the distributor.

#### 1.1.3.1 New Electrical Installations, where:

- i) The Distributor has specified 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, maximum demand by limitation 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.

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#### 1.1.3.2 Existing Electrical Installations, where:

- i) The Distributor has specified 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, maximum demand by limitation would reduce or eliminate the interference; or
- iii) Alterations or additions to the existing installation where;
  - a) The electrical installations calculated maximum demand as determined under the Wiring Rules exceeding 100 Amps per phase; or
  - b) The electricity supply is not metered.

#### 1.1.4 Maximum Demand by Limitation

##### 1.1.4.1 General

A device or devices other than fuse cartridges shall control the supply capacity to electrical installations specified in SIR clause 6.7.1 (Application) and the Electricity Safety Act, Regulations and the Wiring Rules.

##### 1.1.4.2 Maximum Demand Limitation Device/s

Circuit breakers utilised to limit the maximum demand shall:

- be installed on the main switchboard in accordance with the Electricity Safety Act and Regulations, the Wiring Rules, and these Rules;
- be arranged to ensure the aggregate rating of the devices does not exceed the supply capacity where multiple devices are used; and
- provide a sealing facility to secure the adjustable settings by the use of distributor seals or equivalent means.

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## 1.2 Installation & Supply Protection

### 1.2.1 Additional Installation Protection

Customers are advised to install supplementary protective equipment to limit possible damage to their electrical installation in the event of voltage variation, transients, and loss of one or more phases of supply or due to leakage current, eg, switchboard internal arcing fault. Customers should also ensure discrimination between the Distributors and the customer's protective equipment in the event of an over-current fault on the customer's installation.

Note; Refer to SIR Clause 6.5 (Supply Loading) and the Electricity Distribution Code.

#### 1.2.1.1 Supply Protection

The Electricity Safety Act requires service lines to be protected by protective equipment that can isolate each of the active conductors of an electrical installation and prescribes their location.

The customer shall install and maintain an assembly to accommodate "supply protection device/s" (SPD) in accordance with the Electricity

Safety (Installations) Regulations, these Rules and the obligations of the Distributor to connect and disconnect electrical installations.

In the case of electricity supplies provided directly from a substation, the Distributors will provide the supply protection equipment within the substation. Note; *Exception. Pole type substations located on customer's property.*

The installed SPD shall:

- (a) minimise any adverse conditions which may affect other customer's electrical installations and the distribution system. The SPD must ensure adequate protection is provided up to the electrical protective equipment of the electrical installations they supply.

Note: In some cases Distributors may utilise their HV protection equipment for supply protection. It will be necessary to confirm the supply protection arrangement with the relevant distributor at the design stage of the electrical installation.

- (b) enable the Distributor to connect, disconnect and isolate each active conductor supplying the electrical installation for commercial and/or safety reasons; and
- (c) not exceed one device per phase

Refer to Supply Protection tables 2.1.1- 2.1.4

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#### 1.2.1.2 **Assemblies to accommodate LV Supply Protection Devices (SPD)**

##### 1.2.1.3 **General**

The customer is responsible for the provision of an assembly to accommodate supply protective device/s (SPD) provided by the Distributor. This equipment must be of an acceptable type as required by these Rules and shall be located and installed in accordance with the relevant requirements of the current Electricity Safety Act and Regulations.

##### 1.2.1.4 **Access**

The assembly for the purpose of accommodating the SPD shall be installed in a position where convenient and unhindered access is readily available for the Distributor to safely operate and work on the device/s at all hours, unless otherwise agreed by the Distributor.

Access to SPD/s and their assemblies fitted at the termination of overhead service lines, shall be arranged to permit safe and ready operation by means of a low voltage operating stick from ground level in accordance with SIR Clause 7.3.4.2 (POA Access) and SIR Clause 7.3.4.3 (POA Location).

Should access to SPD/s and the assembly be impeded, arrangements shall be made for the restoration of unobstructed access at the customer's expense.

Delays may be experienced with connection or restoration of supply where access to the SPD and assembly is not readily available.

##### 1.2.1.5 **SPD and Assembly Selection**

Where a multiphase supply is provided, the SPD and assembly may be of a type which opens all phases simultaneously or opens each phase individually.

##### 1.2.1.6 **Common Enclosures**

The electrical wiring and SPD/s and the assemblies installed in a common enclosure with other electrical installation wiring and equipment shall be segregated by barriers from other equipment.

Provision shall be made to work on other electrical installation equipment without the need to disturb the SPD/s and the assembly connections in any way.

Measures provided for locking the SPD assembly shall be arranged to permit such locking without the need to disturb other electrical installation equipment.

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## 1.3 Security of SPD and Assembly

### 1.3.1 General

SPDs and the assemblies shall be located and arranged to limit the ability of non Distributor personnel to interfere with and/or operate the assemblies and the associated devices.

An acceptable method to restrict unauthorised interference is to locate the SPDs and assemblies within an enclosure fitted with facilities to accommodate a Distributor's lock or seal. This requirement need not apply to SPDs and the assemblies associated with an overhead service cable or supplies originating from a distributors substation.

### 1.3.2 Identification, Sealing & Locking Facilities

Where a service protection assembly is located within a switchboard, any door/cover must be arranged to provide unhindered access and shall be prominently and permanently marked to indicate the SPD is contained within.

SPDs and the assemblies required to be locked or sealed shall be capable of being secured by the Distributor.

Where the SPDs and the assemblies are to be secured by means of a lock, the locking facility shall be capable of accepting a Distributor's padlock having a minimum 5.5mm shackle - 6mm hole.

SPDs, other than those incorporated in an overhead line connector box, shall be provided with facilities to enable a Distributor's seal to seal the assembly at all times.

### 1.3.3 Construction Sites

Supply conditions specified by ESV for electrical installations at construction sites require, that fuse assemblies mounted on meter panels, must be fitted with a lockable device acceptable to ESV to prevent electrical hazards due to unauthorised interference. This lock shall be a VPI lock in accordance with SIR Clause 4.7 or a CL001 lock.

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**1.3.4 Operation**

**1.3.4.1 General**

SPD's shall be supplied and installed by the relevant Distributor unless otherwise specified in these Rules or agreed with the Responsible Officer.

SPD/s and the assemblies shall only be operated by:

- (a) Persons authorised by the relevant distributor; or
- (b) Authorised emergency services personnel whilst carrying out their duties.

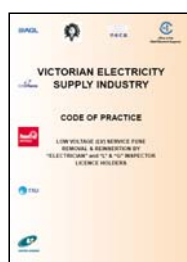
**1.3.4.2 Emergency Services Personnel**

Emergency services personnel should only operate SPD/s and the assemblies if they are so authorised by their organisation.

Where the SPD and the assembly are operated by emergency service personnel, it should only be operated to de-energise the electrical installation and shall not be operated to energise or re-energise the electrical installation.

Where emergency services personnel de-energise an electrical installation by operation of a SPD and the assembly, the customer (occupant) and relevant Distributor must be advised at the earliest opportunity.

**1.3.4.3 Licensed Electrical Workers**



Persons eligible to operate SPD and the assembly under the VESI Code of Practice for Low Voltage Service Fuse Removal and Reinsertion by “Electrician” and “L” and “G” Class Inspector Licence Holders, must adhere to the conditions of that code to be authorised under clause 1.3.4.1.

The Code may be downloaded from Distributors, ESV and Victorian SIR web sites.

**1.3.5 Specifications**

**1.3.5.1 SPD's and Assemblies – General Requirements**

SPD/s and the assemblies shall:-

- (a) be of a type acceptable to the Service and Installation Rules Management Committee or the relevant Distributor;
- (b) conform to the requirements of the appropriate Australian or International Standard for the type of device employed;

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- (c) be installed in accordance with the requirements of the Electricity Safety Act, Regulations and these Guidelines;
- (d) be installed so as to comply with the minimum height requirement of consumer's terminals connected to the distributor's service cables, refer to Table 7.3 and Figure 7.1
- (e) be selected with regard to the following conditions, taking account of the nature of the supply (i.e. overhead, underground):
  - i) operating environment;
  - ii) enclosure of live parts;
  - iii) short-circuit interrupting capacity;
  - iv) ability to be manually operated, either directly by hand or by means of a standard low voltage operating stick from ground level;
  - v) facilities for sealing or locking by the Distributor as required by these Rules;
  - vi) termination compatibility with service conductors; and
  - vii) provision of separate terminals for connection of service neutral conductor and the consumers neutral conductor in an approved manner.
- (f) have a rated short circuit current capacity equal to or greater than the prospective short circuit current at the point it is installed;
- (g) have, or be installed with, facilities for sealing un-metered connections to prevent unauthorised access;
- (h) be maintained by the customer in accordance with the manufacturers specifications.

#### 1.3.5.2 Fuses

##### 1.3.5.2.1 Cartridges

All fuse cartridges shall be supplied by the Distributor.

Subject to approval by the relevant distributor, Miniature Combined Fuse Switches may be used and are required to be provided by the customer and shall be supplied to AS/NZS 60269.3.1.

Fuse carrier assemblies rated at up to 100A shall be capable of accepting 22mm barrel fuse cartridges of Type 2a, to AS/NZS 60269.2.1, or a recognised equivalent Standard.

Fuse carrier assemblies rated in excess of 100A shall be suitable for use with Din type NH blade fuse cartridges to AS/NZS 60269.2.1, or a recognised equivalent.



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#### 1.3.5.2.2 Assembly Types

##### 1.3.5.2.2 (a) Fused Overhead Line Connector Boxes

Fused overhead line connector boxes shall comply with AS/NZS 3124.

Fused overhead line connector boxes shall provide for manual operation by means of a low voltage operating stick from ground level and the cover shall be provided with sealing facilities.

##### 1.3.5.2.2 (b) Panel Mounted Fuses

Panel mounted fuse base and carrier's shall be of a minimum continuous rating of 100 Amp, 500 Volt rating with a hand operated fuse carrier; and

- comply to AS/NZS 60269.2.1;
- have all live parts shrouded;
- be capable of being sealed using facilities cast into the base and carrier when the fuse carrier is inserted; and
- be back connected - Studs or front wired types are not acceptable.

Spacing, ventilation and de-rating of panel mounted fuses should be considered where subject to continuous loads exceeding 50 Amperes for periods greater than 2 hours.

##### 1.3.5.2.2 (c) Fused Switch Disconnecter (FSD)

Fused Switch Disconnectors shall comply with AS 3947.3 and may be single or multiphase devices which accept DIN type HRC NH fuse cartridges.

Stick operated FSDs shall be suitable for mounting on either a pole or building facade and be capable of unhindered manual operation by means of a low voltage operating stick from ground level.

Hand operated FSDs shall be suitable for mounting within the standard service connection facility and arranged in accordance with SIR Table 7.3 and Fig 7.1.

Where mounted on a customer's structure FSD's must be so arranged that access to active parts (removal of cover) can only be gained with the use of a tool.

#### 1.3.5.3 Prohibited Fuses

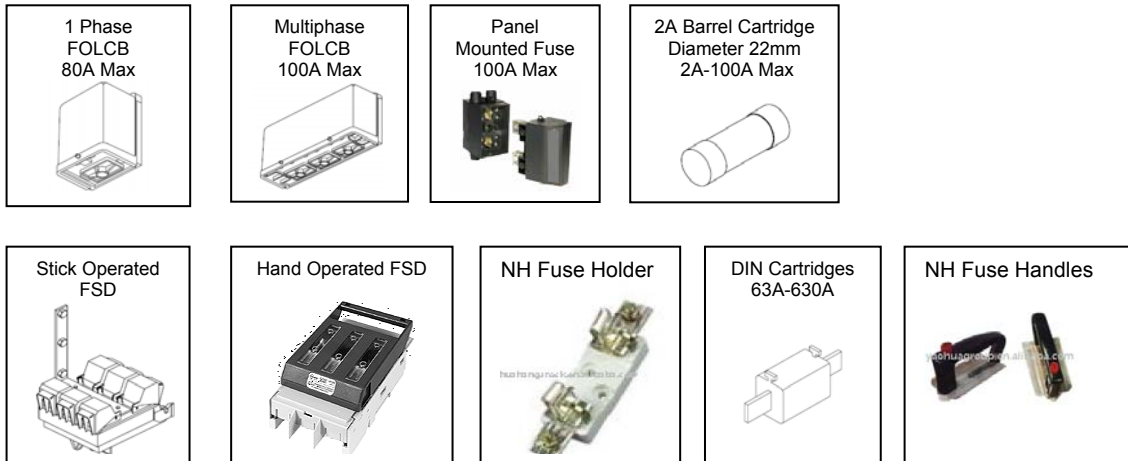
Stick Operated, Panel Mounted Fuses are a specific form of panel mounted fuse originally designed for mounting on a connection box mounted on the underside of a shop veranda.

These fuses are no longer acceptable for use as an SPD or occupancy disconnection device for new connections, alterations or additions to existing electrical installations.



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**1.5.5.3.1 Acceptable Fuse Assemblies and Fuse Cartridges**



**1.6 SPD – Specific Type & Use**

The type of Supply Protection Devices and their use in any particular situation is dependent upon the type and supply arrangement to an electrical installation.

Specific types of Supply Protection Devices and their use are detailed in the following tables.



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## 2.1 Supply Protection

### List of Tables

**Table 2.1.1 SPD – Supply from a Service Pit Connected to Underground or Overhead Distribution**

**Table 2.1.2 SPD – Supply from an Underground Service Cable Connected to Underground or Overhead Distribution**

**Table 2.1.3 SPD – Supply from an Overhead Aerial Service Cable**

**Table 2.1.4 SPD – Supply from an Indoor, Kiosk and Ground Type Substation located within the property it supplies**

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**2.1.1** Unless otherwise agreed with or required by the relevant Distributor, where supply is provided from a Service Pit the SPD shall be of a type and located in accordance with Table 2.1.1.

**Table 2.1.1 SPD – Supply from a Service Pit Connected to Underground or Overhead Distribution**

Supply Current Rating Per Phase	Distribution Reticulation	Supply Protection Assemblies	Responsibility for the provision of Supply Protection Assembly	Supply Protection Device Types Provided by the Distributor	SPD Location
≤ 100A	URD Area or U/G from O/H	Panel Mounted Fuse/s	Customer	Type 2a Number of devices must not exceed one device per phase	Meter Panel
	O/H Reticulation conversion to Underground Reticulation or U/G from O/H	FOLCB	Customer	Type 2a	A point where an overhead line was previously connected
> 100A ≤ 170A Special Circumstances & By Agreement Only	URD Areas only	FSD	Customer	Sizes 00, 2 and 3 Din type NH fuses	1. As close as practicable to the applicable property boundary; or, 2. at or within 3m of the consumer's terminals; or, 3. in a position at or next to the distributors metering equipment.
	O/H areas only	FSD	Distributor Note: (Dedicated service only)	Sizes 00, 2 and 3 Din type NH fuses	Distributors pole
	O/H Reticulation conversion to Underground Reticulation or U/G from O/H	FSD	Customer	Sizes 00, 2 and 3 Din type NH fuses	A point where an overhead line was previously connected

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**2.1.2** Unless otherwise agreed with or required by the relevant Distributor, where supply is provided from an Underground Service Cable the SPD shall be of a type and located in accordance with Table 2.1.2.

**Table 2.1.2 SPD – Supply From an Underground Service Cable Connected to an Underground or Overhead Distribution (No Pit)**

Supply Current Rating Per Phase	Distributor Reticulation	Supply Protection Assemblies	Responsibility for the provision of Supply Protection Assembly	Supply Protection Device Types Provided by the Distributor	SPD location as Determined by the Distributor
>100A	Overhead Reticulated Area Note: (Dedicated service line)	FSD	Distributor	Sizes 00, 2 and 3 Din type NH fuses	On Distribution Company Pole
	Underground Reticulated Area		Customer		1. As close as practicable to the applicable property boundary: or, 2. at or within 3m of the consumer's terminals supplying UG consumer's mains terminated in a customer provided Supply Connection Facility: or, 3. in a position at or next to the distributors metering equipment.
	UG Service supplied directly from a Substation Note: (Dedicated service line)	FSD or Circuit Breaker	Distributor	Sizes 00, 2 and 3 Din type NH fuses or CB	At the Substation

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**2.1.3** Unless otherwise agreed with or required by the relevant Distributor, where supply is provided from a Overhead Aerial Service Cable the SPD shall be of a type and located in accordance with Table 2.1.3.

**Table 2.1.3 SPD – Supply From an Aerial Service Cable**

Supply Current Rating Per Phase	Supply To	Supply Protection Assemblies	Responsibility for the provision of Supply Protection Assembly	Supply Protection Device Types Provided by the Distributor	SPD Location
1 Ph <80A	Building or Structure	FOLCB	Customer	Type 2a Fuse	In accordance with SIR Table 7.4 See Note <sup>1</sup>
≤100A		FSD	Customer	Sizes 00, 2 and 3 Din type NH fuses	
>100A ≤170A					
≤100A	Private Pole (On Private Property in Low Bushfire Risk Areas)	Pole CB to POEL FOLCB to underground consumer mains	Customer	Type 2a Fuse if a FOLCB is applicable	
>100A ≤170A		Pole CB to POEL Pole FSD to underground consumer mains	Customer	Sizes 00, 2 and 3 Din type NH fuses if a FSD is applicable	

**Note<sup>1</sup>** Where agreed and installed above commercial premise veranda in accordance with the current rules (POA on Buildings) additional requirements are that fuses can be operated with a 600mm vertical standard fuse stick, sealing facilities are provided to restrict access to unmetered terminals, and supply disconnection devices are provided in accordance with the VSIR Section 8.

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### 2.1.4 Indoor, Kiosk, Pole and Ground Type Substations

Unless otherwise agreed with or required by the relevant Distributor, in cases where the electricity supply is provided directly from a substation located within the property it supplies, the Service Protection Assembly Devices shall be selected and located in accordance with Table 2.1.4.

**Table 2.1.4 SPD – Supply from an Indoor, Kiosk, Ground and Pole Type Substation located within the property it supplies**

Supply Current rating Per Phase	Substation Type	Supply Protection Assemblies	Responsibility for the provision of Supply Protection Assembly	Supply Protection Device Types Provided by the Distributor	SPD Location
>100A	Kiosk, Indoor, Ground Type	FSD MCCB ACB HV Protection	Distributor	Sizes 00, 2 and 3 Din type NH fuses	Installed within the Substation See Note <sup>1</sup>
				MCCB	
				ACB	
				HV Protection	
≤ 100A	Pole Type <sup>2</sup>	FOLCB	Customer	Type 2a Fuses	On Distribution Company Pole
> 100A		FSD		Sizes 00, 2 and 3 Din type NH fuses	
<p>In some cases Distributors may utilise their HV protection equipment for service protection. It will be necessary to confirm the service protection arrangement with the relevant distributor at the design stage of the electrical installation.</p> <p><b>Note</b><sup>1</sup> Electricity Safety (Installations) Regulations, <i>Regulation 235 Installation of protective equipment</i> (3) <i>In the case of electricity supplies provided directly from a substation, protective equipment must be installed within the substation.</i></p> <p><b>Note</b><sup>2</sup> <i>The use of a pole mounted circuit breaker is not permitted to be used as a supply protection device for underground lines forming consumer's mains</i></p>					