



# **National Metering Installation Requirements**

**Draft: November 2019**

## Foreword

On 1 December 2017, the coordination of the installation of metering equipment in the National Electricity Market (NEM) (excluding Victoria) became the responsibility of Electricity Retailers who nominate and contract the NEM roles of Metering Coordinators and Metering Providers to perform the metering works. Prior to this date, small customer metering was the responsibility of the local electricity distributor or their agent, with the requirements for *Metering Installations* included in jurisdictional or electricity distributor specific Service and Installation Rules.

To support the efficient operation of the market, the competitive metering industry is seeking to proactively align to develop the underlying standards and work practices required to deliver a safe and accurate *Metering Installation*.

These *Metering Installation* Requirements (Requirements) have been developed by the members of the Competitive Metering Industry Group (CMIG) MIR Working Group (MIR-WG) and supersedes the metering requirements previously included in Service and Installation Rules (excluding Victoria). This edition of these Requirements will commence operation in each Jurisdiction in accordance with Section 6 - Specific Jurisdictional Requirements and *Shall* apply to all *Metering Installations* in the NEM.

These Requirements form the major part of a Metering Providers' technical requirements as referred to in the National Electricity Rules (NER) and draw heavily on the requirements previously published by distribution businesses. These Requirements have been subject to industry consultation during their development and provide industry agreed specifications intended to assist manufacturers, distributors, retailers, customers and customers' agents to meet their regulatory and electricity supply obligations.

Whilst care has been taken in the preparation this MIR these Requirements may not cover all circumstances. This may include unusual connections, inadvertent omissions or changes to legislation and codes. The CMIG does not accept responsibility where this occurs. The relevant Metering Provider must be consulted in these circumstances.

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## Revision History

Version	Comment	Date
Draft 1	Initial release to MIR-WG based on content transferred to CMIG from Queensland QEMM.	03/04/2019
Draft 2	Further release to MIR-WG incorporated input from MIR-WG two full day face to face workshops in Sydney on April 30 <sup>th</sup> and May 1 <sup>st</sup> 2019 resulting in a major rewrite of several sections. Includes first attempt to include historical requirements from NSW, SA, Tas and Vic.	08/06/2019
Draft 3	Further release to MIR-WG incorporated further input from MIR-WG collected during full day face to face workshops in Brisbane on 04/07/2019 and Sydney on 24/07/2019 which resulted in a major rewrite of meter panel/enclosure, metering neutral and communications requirements. Includes first attempt at new panel layout drawings for MIR-WG comment.	25/09/2019
Draft 4	Further release to MIR-WG and Industry for comment which incorporates further input from MIR-WG collected during teleconference workshops on 17/10/2019 and 18/10/2019. Includes more refined version of panel layout drawings	31/10/2019

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# 1 Introduction

The purpose of these Requirements is to provide a consistent approach to ensure that a customers' electrical *Metering Installation*, as defined in the NER, is safe during and after the installation of an advanced meter.

During the process of developing these Requirements, attempts have been made to align them to historical practices wherever possible while ensuring provision is made for current metering and distributor equipment.

These Requirements also seek to promote a consistent, NEM approach to *Metering Installation* and maintenance thus ensuring customers receive the most effective services, allowing metering businesses operating across state boundaries to operate with consistency and efficiency.

As Victoria has opted out of the *Small Customer Metering Competition Reform*, as a jurisdiction they do not fall under these Requirements as metering is still provided by distribution businesses. *Large customer* metering is subject to metering competition and is subject to these Requirements.

## 1.1 Scope

These Requirements apply to all new and alterations or additions to existing energy Whole Current *Metering Installations* connected to the NEM and provides guidelines for metering arrangements of a customer's installation.

Requirements for High *Voltage*, Current Transformer and Mixer Current Transformer / Whole Current installations will be detailed in future versions of these Requirements.

Where departures or clarification from these Requirements may be necessary, prior consultation with the relevant Metering Provider is required. (see clause 1.5)

## 1.2 Failure to comply with these Requirements

These Requirements are additional to the Australian Wiring Rules and are not intended to over-ride AS/NZS 3000 Wiring Rules. Customers whose installations do not comply with these Requirements may have the installation of metering equipment delayed or withheld until the non-compliant circumstances have been rectified

## 1.3 Innovation

These Requirements do not preclude alternative methods, innovation, or technology that achieves the same outcomes as the specifications detailed in this document. However, any such proposal requires approval by the respective Metering Coordinator and/or Metering Provider (see clause 1.5).

## 1.4 Definitions

Any terms used within this document are consistent with the definitions in the NER and AS/NZS 3000 Wiring Rules.

### 1.4.1 Metering Installation Requirements

The general reference to these Metering Installation Requirements within this document is with the

<https://competitivemetering.com.au/>

capitalised word 'Requirements'.

## 1.5 Exceptional Circumstances

In exceptional circumstances, parts of these Requirements may be waived and/or modified by the submission of a written request to the relevant Metering Provider.

The request *shall* include the following:

- A. A detailed statement of the reasons why non-compliance with these Requirements is sought.
- B. Full details and diagrams, as necessary, showing the specific aspect of a requested variation.
- C. The installations National Metering Identifier (NMI) and location details.

No action or variation *shall* be undertaken until a written approval from the Metering Provider has been given.

## 1.6 Historic Buildings

Compliance with these Requirements is generally expected in all circumstances, however, historic buildings may require elements of these Requirements to be waived and/or modified. (e.g. meter positions and panel design and sizing etc). In these cases, an application *shall* be made in accordance with section 1.5 of these Requirements.

## 1.7 Responsibility for Equipment

Provision *shall* be made for Metering equipment deemed to be necessary by the Metering Provider to record electricity consumption.

Customer-supplied equipment may form part of the Metering Installation and the Metering Provider may require the customer to carry out certain activities on their equipment or facilities to ensure the Metering Installation remains compliant with the requirements in the NER.

Network Devices deemed to be necessary to control electricity consumption that are supplied by the distributor, *shall* be maintained and remain the property of the distributor and installed in accordance with the requirements of the Distributor.

For safety and security reasons, all whole-current meters and Network Device terminals *shall* be connected directly to isolating devices. These devices may be service/meter protection devices (*Fuses*), service/metering *Isolation* links (*Fuse* holders with a link).

Note: Metering *Active/Neutral* links are distinct and different to customer's *Active/Neutral* and/or NEM links)



## 1.8 Additions and Alterations

Where a customer directs a retailer to request metering or tariff changes, any alterations to the customer's metering panel or meter enclosure *shall* be the customer's responsibility.

Unless otherwise agreed with the Metering Provider, where the customer initiates alterations, additions or relocation of existing metering, facilities that are in accordance with these Requirements *shall* be provided.

Any asbestos material that may create an Occupational Health & Safety risk *shall* be removed from the *Metering Installation*.

For example, where an existing timber or asbestos meter board or panel exists, it *shall* be replaced with a hinged *insulated* panel with appropriate design, size and clearances in accordance with these Requirements.

Where the location of the metering equipment is to be changed, it shall comply with the location requirements of the jurisdictional service and installation rules and:

- Have sufficient space to adequately accommodate the intended equipment complying with clause 3.3;
- Have minimum wiring space complying with clause 3.4 at the rear of the board or panel, and,
- Ensure that equipment that has been previously mounted on Asbestos material is treated as asbestos contaminated and is not be reused on new metering panels.

## 1.9 Repairs

The Metering Coordinator is responsible to ensure the customers connection point is metered in a manner that complies with the NER. Should the metering equipment require repair or replacement, the Metering Coordinator will appoint a Metering Provider to carry out the repair or install a new meter.

Should new metering equipment need to be installed, the Metering Provider may require that the customer upgrade their facilities to be either fully or partially be in accordance with these Requirements.

In the case of natural disasters, these may be considered an exceptional circumstance as described in clause 1.5 of these Requirements and the Metering Provider may limit the upgrades required to the customers facilities in order to quickly reinstate the customers electricity supply after the natural disaster.

## 1.10 Metering Determination

Excluding *distributor* approved unmetered supply and AEMO registered Type 7 loads, all customer *Electrical Installations shall* be metered

- (a) in accordance with the NER,
- (b) In accordance with these Requirements,

- (c) to meet the Retail tariff requirements and
- (d) to meet the Network tariff requirements.

In the case of new connections, additions or alterations, the customer or their agent *shall* be responsible for determining the *Electrical Installation's* load requirements, and method of metering (i.e. whole current or current transformer metering or high voltage metering). Table 1 provides guidance on the typical load groups for low Voltage metering.

Maximum Demand of Connection point for Metering per phase	CT requirements	Metering Equipment
LV 0 - 100A	None	Whole Current meter single or three phase
LV Up to 400 A	Type S 200/5 Long range Current Transformer	CT Meter
LV between 400 - 1600 A	Type T 800/5 Long range Current Transformer	CT Meter
LV between 1500 – 3000 A	Type W 1500/5 Long range Current Transformer	CT Meter

*Table 1 - Typical Load Groups for Low Voltage Metering*

*Note: Whole Current metering equipment intended to be installed at the interface to the public electricity distribution network in Australia is designed to comply with AS62052.31. This standard requires that the metering equipment be protected by an 80amp HRC Type 11b Fuse manufactured in accordance with AS 60269.3.0 and AS 60269.3.1. Fuses manufactured to this standard will carry 100 Amps for an extended period of time meaning they are suitable for use on connections with a maximum demand of 100 amps.*

The customer *shall* notify their Retailer if the load of their installation is exceeding the limits for the metering equipment shown in Table 1. The customer shall take steps to either reduce their load such that it is within the limits of Table 1 or have the Metering Installation upgraded such that it is sufficient for the installations load requirements.

The customer or their agent should consult with the customer's Retailer at the earliest opportunity in order to determine their Retail Tariff / Network Tariff and Metering requirements.

## 2 Access and Security

### 2.1 Access to Metering Equipment

A customer shall provide the Metering Provider a safe and unhindered access to their Metering Installation for any purposes associated with the metering of electricity and testing of the customer's *Electrical Installation* including connection, interruption, disconnection or reconnection of supply.

Acceptable locations for the *Metering Installation* are detailed in Distributor Service and Installation Rules (SIR's).

Equipment *shall* be mounted at heights such that it *readily accessible* and allows safe access to read and maintain the equipment and *shall* be in accordance with AS/NZS 3000 Wiring Rules section on Location of Switchboards.

Examples of acceptable mounting heights for equipment from the floor or platform are:

- Revenue meters- Min 400mm and Max 2100mm to the bottom or top of the device respectively.
- De-loading devices & communications Equipment - Min 300mm and Max 2100mm to the operating mechanism. Antennae equipment see cl 3.9.1
- MIL/MPD & meter *Neutral* links - Min 400mm and Max 2000mm to the operating mechanism.
- Network control devices - Min 600mm and Max 1800mm or per the Distributors requirements (SIR's)

## 2.2 Locking Facilities

Where the Metering Provider's metering equipment is enclosed or within a low security area that the customer wishes to secure with a lock, access to the area or *enclosure* must be fitted with an approved lock which is compatible with the relevant distributors Master Key System.

## 2.3 Metering Providers Security Seal

The NER requires that *Metering Installations* have facilities to keep them secure from interference. Provision *shall* be made for the application of security seals to any un-metered portion of a *Metering Installation*.

Sufficient access *shall* be allowed for sealing each point and in any case not less than 25mm clearance around each sealing point. Escutcheon panels which provide access to un-metered sections or terminals of switchboards *shall* also be provided with sealing facilities. Sealing facilities *should* not rely on holes to be aligned through nuts and threaded studs.

Provision *shall* be made for the sealing of all Current Transformer metering panels, dedicated Current Transformer and Voltage Transformer chambers and High Voltage metering panels.

# 3 Whole Current Metering

## 3.1 General requirements

The customer *shall* provide and maintain facilities in accordance with AS/NZS 3000 Wiring Rules, the applicable Acts, Regulations and Codes and these Requirements to accommodate metering and network equipment.

In general, this requires the customer to provide facilities with sufficient space to mount all the required equipment such that each NMI is individually metered and does not require that the Metering Provider

interferes with the *Electrical Installations* facilities and wiring to install the metering, other than that required to connect, fix or *repair* the metering equipment.

Metering equipment may include load control services (e.g. switching on electric hot water during off-peak times). Where *Network Devices* are deemed necessary to control electricity consumption these *shall* be supplied, maintained and installed in accordance with the requirements of the distributor.

For *Whole-Current* directly connected *Metering Installations*, all meter and *Network Device active* terminals *shall* be connected directly to the Metering Protective Device / Metering Isolation Link or Service Active/Neutral Link.

A single tariff two or three phase supply *shall* be metered with a single polyphase meter.

All metering and control equipment *shall* be back wired and mounted on a hinged panel attached to a metering *enclosure*, surround or a *switchboard* frame in accordance with clause 3.4 (no fixed panels are allowed).

For multiple tenancy installations, access to sub boards within tenancies may be required for testing purposes and to verify installations are correctly metered.

Where metering or control equipment is no longer required, the Metering Provider *shall* be contacted to arrange for its removal.

Customer's ancillary equipment such as surge diverters, voltmeters, phase failure relays etc. *shall* be connected on the load side of the revenue metering equipment. Customer owned Current Transformers for energy management are permitted on the line side of revenue metering equipment at multiple tenancy installations.

## **3.2 Metering Equipment Protection and Isolation**

### **3.2.1 Protection of Whole Current Metering**

Whole Current metering equipment used in Australia is required to comply with AS62052.31 which requires that Whole Current metering equipment is protected by a Type 11b fault current limiting (HRC) fusible link manufactured in accordance with AS60269.3.0 and AS 60269.3.1 with maximum rated current of 80 amps.

A metering protective device (MPD) *shall* be installed where the upstream service protective device does not meet the protection requirements of AS62052.31 or the meter manufacturers installation requirements.

### 3.2.2 Discrimination / Selectivity with MPD

Discrimination/selectivity with the 80 amp meter protection device (MPD) is the customers responsibility. If selectivity is a requirement, a 63 amp or less, C curve *Circuit-breaker* or *Fuse* should be used.

Current Transformer metering may also be necessary where the Installation is 100 Amps or less and is supplying Safety Services to AS/NZS 3000 (Special Electrical Installations)

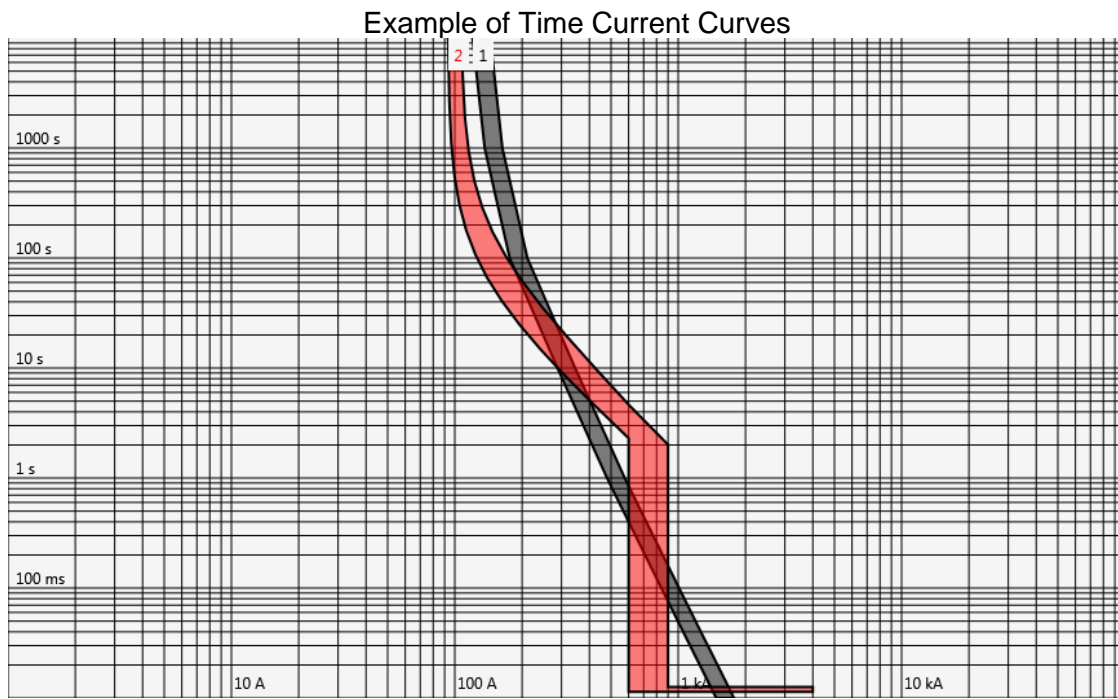


Figure 1 – Time Current Curves (1) MPD 80AGg Fuse (2) De-loading Device C-curve 100A Breaker

### 3.2.3 Isolation of Whole Current Metering

Whole Current metering equipment *shall* be installed with *accessible* before and after *isolation* such that metering equipment can be installed or replaced safely.

Whole Current metering equipment *shall* be installed on the line side of the individual installation's *main switches*. Each individually metered customer tariff must be able to be individually *isolated* without affecting any other customers supply.

The *isolation* point *shall* be next to (for examples see Appendix A – Typical Panel Layouts) the metering equipment and may also be the installations service/metering protective device or an *isolation* link. A switch or *Circuit-breaker* may also be used as an *isolation* point provided the metering equipment is appropriately protected by a HRC *Fuse* in accordance with clause 3.2.1.

All *Isolation* equipment must be able to be sealed in accordance with these Requirements.

### 3.2.4 De-loading of Whole Current Metering

Provision *shall* be made to remove an *Electrical Installations* load from the metering equipment such that the *isolation* fuses or links can be removed under no load. De-loading *shall* be achieved by operating a *Circuit-breaker* or switch on the load side of the metering equipment. The de-loading switch or *Circuit-breaker* may also be the installations *main switch* but must be within the same *switchboard* and *adjacent* to the metering equipment and clearly labelled.

### 3.3 Metering and Control Equipment – Spacing Requirements

#### 3.3.1 General

Meter panels *shall* be of a size to adequately accommodate the metering equipment to be installed upon it and be of an equal or greater size than the meter panels dimensions detailed in these Requirements.

Consideration *should* be given to a larger size meter panel to accommodate:

- extra metering equipment for possible future tariff changes;
- extra Distributor equipment such as service *fuses* and load control equipment;
- additional communication equipment as provided by approved Metering Provider;
- meter *Neutral* and/or *Active* links; and
- meter *Isolation/Protection* devices.

Each *Metering Installation* *shall* have an insulated hinged panel with an area for the exclusive mounting to metering and control equipment that meets the requirements of clause 3.4.

The minimum size panel permitted on a single *residential* dwelling *shall* be 480mm (H) x 460mm (W).

#### 3.3.2 Sizes of equipment to be accommodated

The minimum space requirements for mounting of individual meters and control equipment are shown in Table 2 below:

<b>Meter and <i>Network Device</i> Equipment types</b>	<b>Height (mm)</b>	<b>Width (mm)</b>	<b>Depth (mm)</b>
Single Phase Meter	255	150	135
Polyphase Meter	300	185	135
Metering Protection Device / <i>Isolation</i> Link	90	40	90
Distributor Control Equipment	175	110	70
Minimum clearance between equipment	10	10	--
Minimum distance from edge of panel	20	20	--

Table 2 – Space Requirements for Equipment

### 3.3.2.1 Equipment Examples

Equipment examples are developed from the dimensions of equipment commonly used in the NEM.

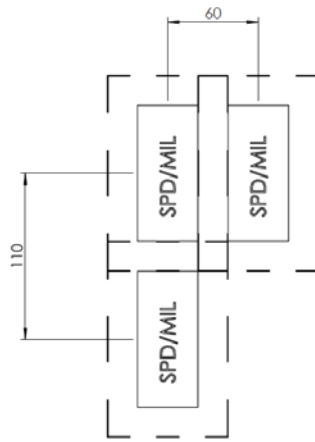
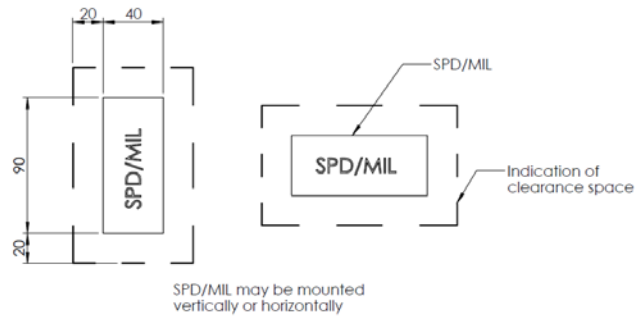


Figure 2 - Meter Protection / Isolation Devices

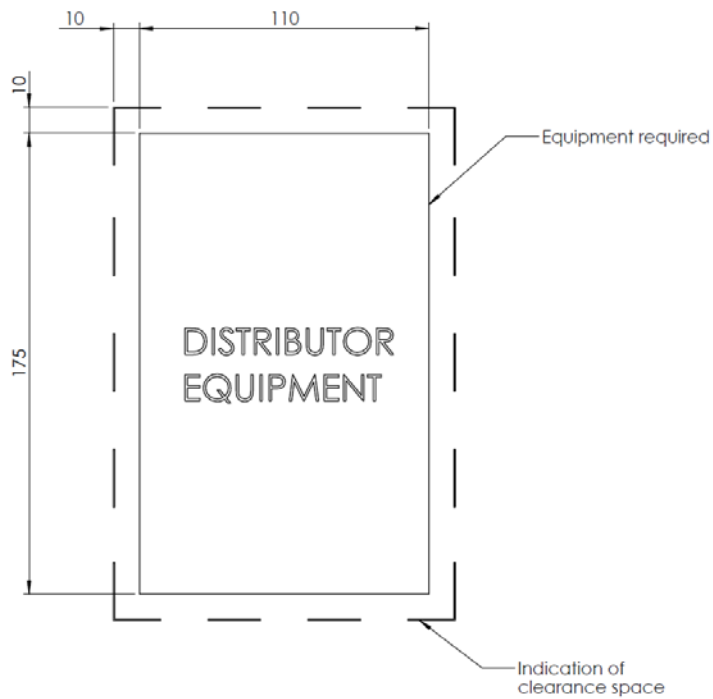


Figure 3 - Distributor/Network Equipment

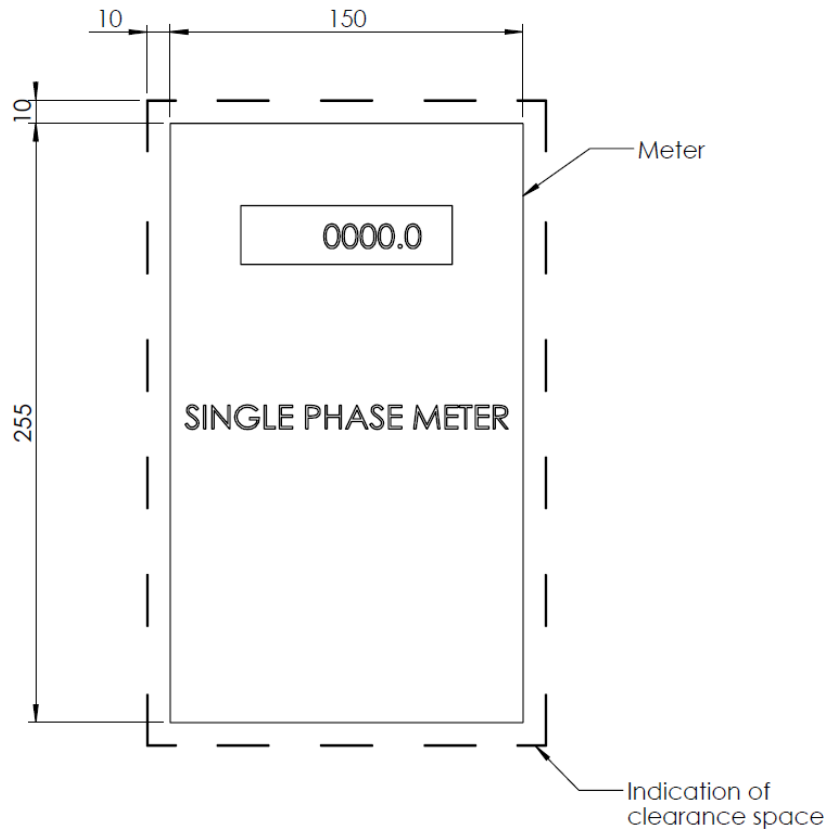


Figure 4 - Single Phase Meter

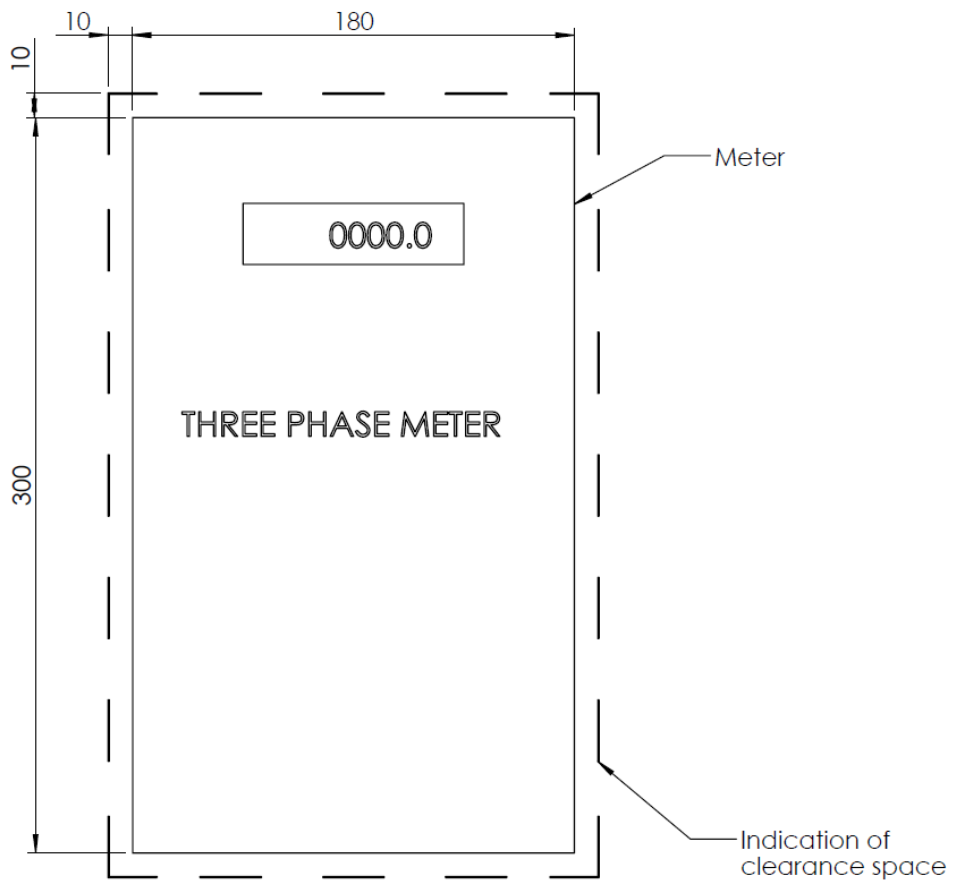


Figure 5 - Three Phase Meter



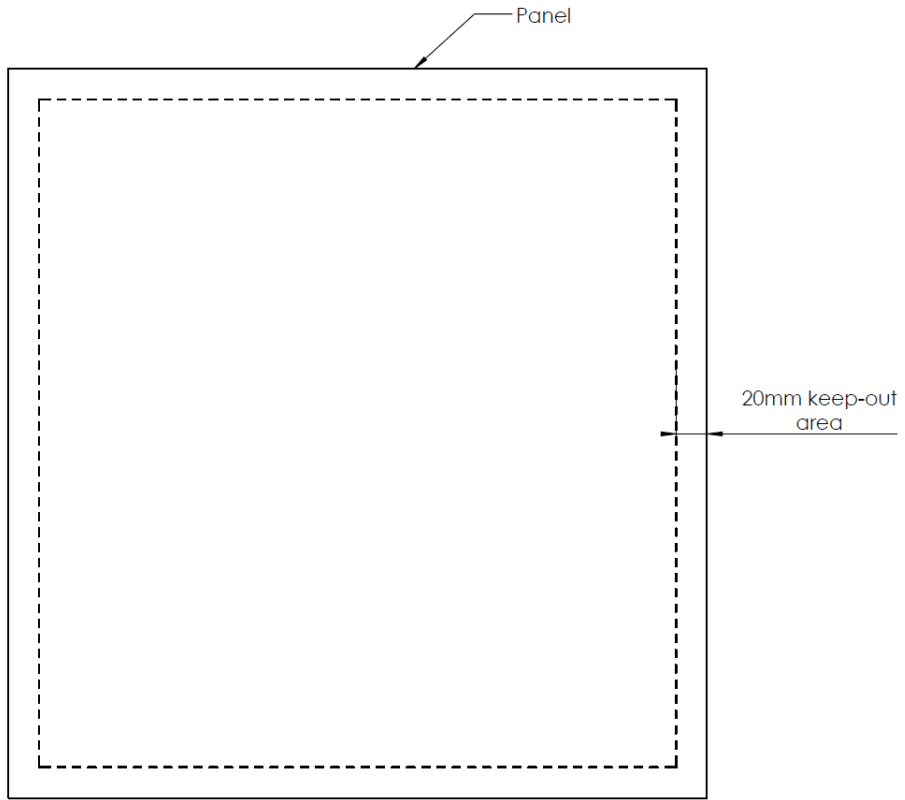


Figure 6 - Minimum Distance from edge of Panel

### 3.3.2.2 Equipment Building Block examples

Equipment building block examples are provided to help *switchboard* manufacturers design boards that can efficiently accommodate the required equipment.

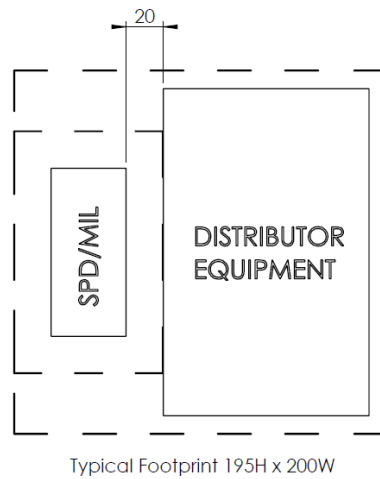
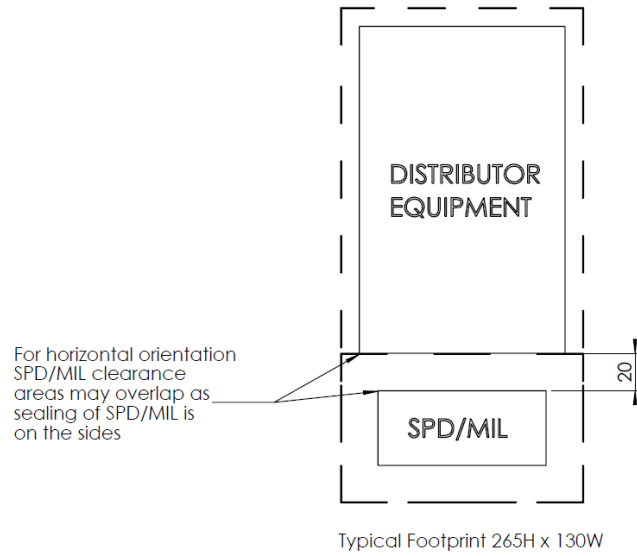
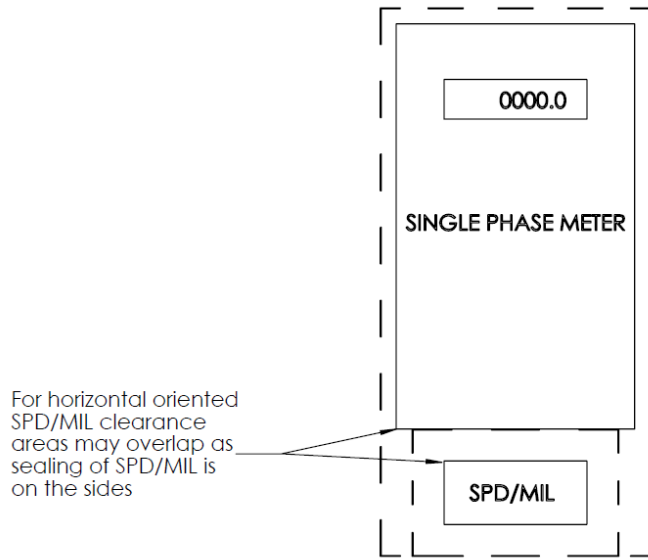
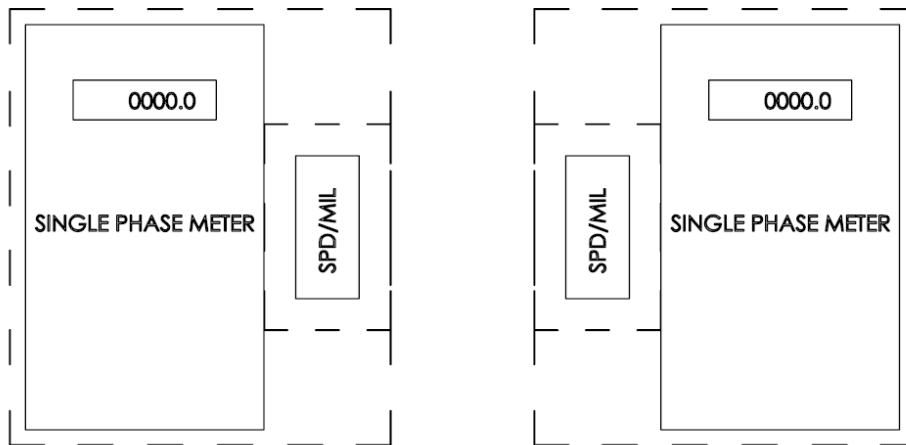


Figure 7 - Distributor Equipment with Isolation link

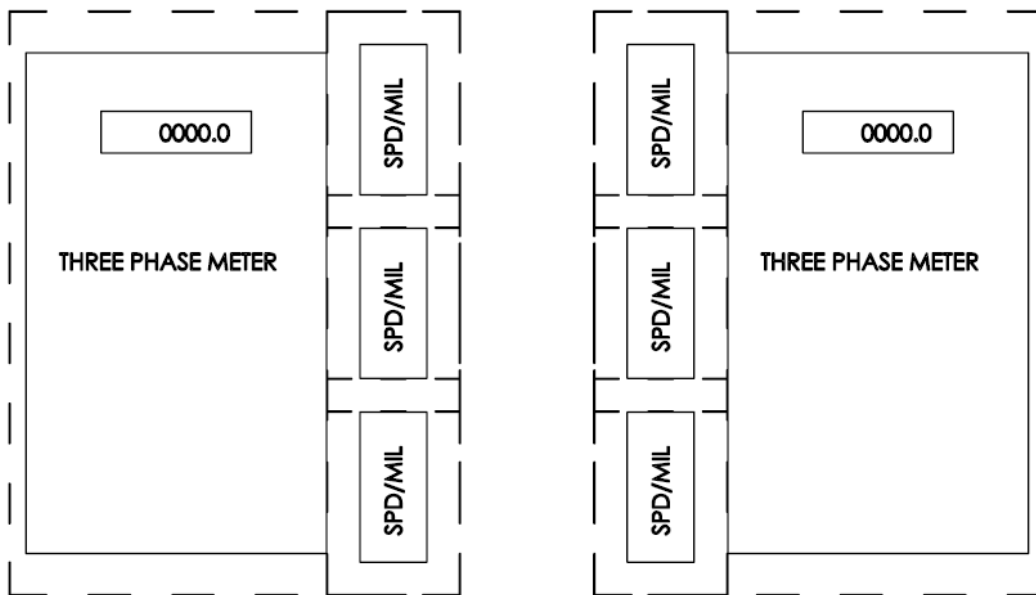
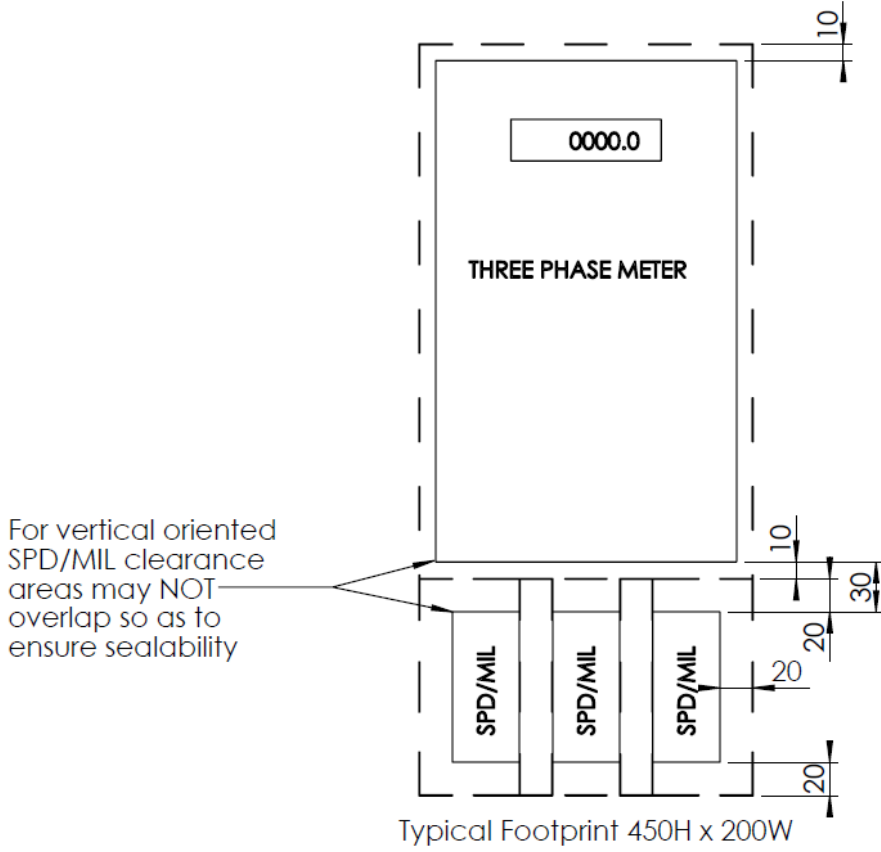


Typical Footprint 345H x 170W



Typical Footprint 275H x 240W

Figure 8 - Single Phase meter with Isolation Link



Typical Footprint 350H x 270W

Figure 9 - Three Phase meters with Isolation links

### 3.3.3 Minimum Metering Equipment Combinations

Each *Metering Installation* shall make provision for the following minimum equipment combinations.

Installation Type	Minimum Equipment Types to be accommodated	Typical Minimum Panel Size
<i>Residential House</i>	1 x Polyphase Meter 1 x Single Phase Meter 1 x Distributor Control Equipment 3 x Metering Protection Device / <i>Isolation Link</i>	480mm (H) x 460mm (W)
<i>Residential Duplex</i>	2 x Polyphase Meter 2 x Single Phase Meter 2 x Distributor Control Equipment 7 x Metering Protection Device / <i>Isolation Link</i>	480mm (H) x 550mm (W)
<i>Residential apartment buildings</i>	1 x Polyphase Meter per apartment 3 x MPD / MIL (1 in every 10 meter positions is left blank for the installation of distributor/network equipment unless load control is required, then 1 in every 4 meter positions is left for the installation of distributor load control equipment)	Select panel size using building blocks
<i>Commercial buildings</i>	1 x Polyphase Meter 1 x Single Phase Meter 1 x Distributor Control Equipment 4 x Metering Protection Device / <i>Isolation Link</i> (1 in every 10 meter positions is left blank for the installation of distributor/network equipment)	Select panel size using building blocks

Table 3 – Metering Equipment to be Accommodated

Smaller panels maybe permitted by the Metering Provider in accordance with Clause 1.5 if the customer can demonstrate that the installation is unlikely to be upgraded in the future.

See Appendix A – Typical Panel Layouts for examples of how panels can be laid out to accommodate equipment.

### 3.3.4 Provision for Distributor Equipment

Each single *residential* dwelling or commercial installation *shall* make space for the installation of one piece of Distributor/Network Equipment.

Where load control is required, multiple *residential* dwellings or commercial installations *shall* leave one

in every three meter positions available for the installation of distributor/network equipment. (typically, each distributor's load control device can control 3 loads, i.e. one piece of distributor equipment for 3 customers).

Where load control is not required, multiple *residential* dwellings or commercial installations *shall* leave one in every ten meter positions available for the installation of distributor/network equipment.

When distributor equipment is installed in multiple occupancies, it *shall* have a dedicated MPD/MIL such that the distributor equipment can be maintained without interrupting supply to customers.

### 3.4 Metering Panels, Surrounds and Enclosures

#### 3.4.1 General

Switchboards and surrounds *shall* be suitable to withstand the mechanical, electrical and thermal stresses that are likely to occur in service and the environments in which it is to be installed. All metering panels, *enclosures*, surrounds and supplementary equipment *shall* comply with AS/NZS 3000 Wiring Rules. Switchboards complying with the relevant requirements of AS/NZS 61439 series are considered to meet the requirements of these rules.

Meter mounting facilities *shall* be provided that are of a type and in a location, *accessible* and prepared for the meter's installation:

- in a metering *enclosure* within the customer's *Switchboard* equipment; or
- in a meter only *enclosure*; or on a surround; or
- within or on facilities that are acceptable to the Metering Provider. (Refer to clause 1.5 for exemptions)

#### 3.4.2 Meter Panels

Meter panels *shall* be constructed of insulating material:

- to an equal or better standard than that required by the AS/NZS 3000 Wiring Rules for switchboards;
- suitable for its intended use and environment, including exposure to ultraviolet where exposed to daylight.
- All meter panel materials must comply with the glow-wire test to 960°C according to AS/NZS 61439.

##### 3.4.2.1 Fixing Arrangements

The meter panel *shall* be:

- hinged mounted on one vertical edge of the panel and secured to the metering *enclosure* or surround;
- capable of being opened to an angle of not less than 80 degrees from the closed position with all metering equipment installed;
- equipped with hinges:
  - constructed of a suitable non-corroding material that will maintain a structural and dimensional fit after metering equipment has been installed;

- of a removable type with double off-set for meter panels installed within *enclosures*;
- of a removable type for meter panels on surrounds;
- secured in the closed position by a fastener/s which requires the use of a tool to release; and
- be able to be easily fitted with a seal to seal the panel in the closed and fastened position. A 1.6mm – 2mm diameter hole is to be provided for the attachment of a seal.

#### 3.4.2.2 Labelling

Where the metering installations for multiple occupancies occur at the same street addresses, each of the occupancies metering *shall* be labelled or identified in a manner acceptable to the Metering Provider. Labels *shall* be displayed on the metering panel to indicate the relationship of meters, *fuses* and other equipment.

Every label required by these Requirements *shall* be permanent, indelible, legible and suitable for the purpose for which it is intended. For example, labels *should* be of laminate and manufactured with letters and numbers of not less than 6mm in height.

#### 3.4.2.3 Wiring

Meter panels *shall* be wired in accordance with these Requirements or the Metering Provider specifications and the AS/NZS 3000 Wiring Rules. Unused meter wiring must be terminated in accordance with AS/NZS 3000 Wiring Rules. Acceptable methods to comply with these Requirements include the fitting of all intended metering equipment to the panel at the same time, or to ensure unused wiring is appropriately *insulated* and terminated at the rear of the panel or within a junction box.

All *Conductors* connected to metering equipment on the metering panel *shall* be;

- provided with sufficient free length to allow the panel to be moved into a position to enable work to be carried out;
- suitably fixed or otherwise retained in position to avoid undue movement or stress at terminals of metering/electrical equipment when the panel is moved or is fixed in position; and
- arranged to prevent undue pressure on *electrical equipment* mounted behind the panel.

#### 3.4.2.4 Wiring Holes

Metering Providers may install a variety of metering equipment that may require wiring holes in different locations. There is no requirement to pre-drill holes in the meter panel.

Holes for ELV and communications cabling *shall* be separate from LV *Cable* holes. See AS/NZS 3000 Wiring Rules section on “Prevention of mutual detrimental effects between services for requirements for communication cabling”.

#### 3.4.2.5 Mounting of Equipment

The meter panel is dedicated for revenue metering equipment and *Network Devices*. Customer owned equipment (including GPOs, Contactors etc) *shall* not be installed on the meter panel; this excludes metering *isolation* links or *Circuit-breakers* used as a *main switch*. . Customer owned metering *neutral* and *active* links *should* also be mounted on the rear of the meter panel or meter *enclosure* and *shall* not

be mounted on the front of the meter panel.

Bolts/screws used to mount and fix equipment on *insulated* meter panels *shall* be fit for purpose. Fixing screws and fasteners *shall* not protrude through the rear of the panel in a manner that could damage *conductors* or create un-earthed exposed metal. Where conductive mounting bolts/screws do protrude through the meter panel and can be contacted from the front of the panel (i.e. not IP2X) and can come into contact with wiring at the rear of the panel then a non-conducting bolt/screw (e.g. nylon or plastic) *shall* be used.

*Note: Metal screws with needle points and self-drilling tips are not permitted. The practice of insulating of metal screws using silicone or other material is not permitted.*

### 3.4.3 Metering Surrounds and Enclosures

#### 3.4.3.1 General

Meter Surrounds and *Enclosures shall* be constructed:

- to accommodate a meter panel in accordance with these Requirements;
- to prevent the spread of fire in accordance with the requirements of AS/NZS 3000 Wiring Rules in relation to the construction of *Switchboard* cases and surrounds;
- to prevent *direct contact* by persons with wiring at the rear of the meter panel when the meter panel is in the closed position;
- to provide a minimum clearance at the back of the meter panel not less than 75mm;
- provided a clearance between the front of the meter panel and the inside of the *enclosure* door of not be less than 175mm;
- to be provided with suitable fixing devices to allow the meter panel to be fixed and sealed in position in accordance with clause 3.4.2.1 when closed;
- to ensure movement of the meter panel is not obstructed and the device used to retain the hinged meter panel in the closed position is in correct alignment when all necessary equipment is mounted on the meter panel; and
- with an IP rating suitable for the installed environment, and a minimum degree of protection of IP23 for *Enclosures* and IP2X for surrounds, in accordance with AS/NZS 3000 Wiring Rules.

#### 3.4.3.2 Temperature Rise Considerations

Metering Facilities and *Enclosures shall* be designed to ensure the meter is not at any time subjected to temperatures in excess of its specified operating range conditions as defined by Table 5, of AS 62052.11.

Appropriate air circulation, ventilation, shading or siting of the metering equipment *should* be considered in meeting those operating temperature limits. Where metering is enclosed within the customer's *Switchboard*, a temperature rise limit (above ambient) of 10 Kelvin is to be used for LV CT and HV connected meters, and 25 Kelvin for whole current meters. Temperature rise limits may be determined using actual type testing procedures in accordance with AS/NZS 61439 or assessment by under AS60890-2009.

## 3.5 Whole Current Meter Wiring

*Conductors* for Whole Current metering *shall* not be less than 4mm<sup>2</sup> and *shall* not exceed 25mm<sup>2</sup> with

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the insulation of *Conductors* coloured in accordance with AS/NZS 3000 Wiring Rules to facilitate identification of *Neutral* and *Active Conductors*.

In all circumstances, the bared *Conductor* for insertion into the meter terminals *shall* be of sufficient length to be clamped under all terminal screws.

Not more than one 16mm<sup>2</sup> or 25mm<sup>2</sup> *Active Conductor* may be connected to any single terminal of a Whole Current meter.

Compressed (compacted) or hard drawn *conductors shall* not be used as meter wiring due to the flexibility required for the hinged panel and bend radii required connecting to the metering terminals.

Aluminium *cables shall* not be connected directly into meter terminals.

Insulated *Flexible Cables* may be used provided that un-insulated bootlace pins (end sleeves) are securely crimped around the *conductors* using an appropriate tool. A bootlace pin length of at least 25mm is required to ensure clamping under all meter terminal screws.

### 3.6 Metering Active and Neutral Requirements

#### 3.6.1 Connection of Metering Neutral Conductors to Main Neutral

Integrity of the *Neutral* of the *Electrical Installation* shall always be maintained..

The Metering *Neutral* Link (which may be combined with the Service *Neutral* Link dependant on local service rules requirements) *shall* be constructed such that:

- 1) it is connected to the main *Neutral* of the *Electrical Installation* in such a manner that it cannot be disconnected or removed without breaking seals or disturbing the *Neutral* integrity of the *Electrical Installation*; and
- 2) metering equipment *Neutrals* can be disconnected and reconnected without disturbing the integrity of the *Neutral* of the *Electrical Installation*.

Examples of appropriate connection methods include:

- Soldered or crimped to the main *Neutral*; or
- Use of an un-slotted flag lug under the main *Neutral* connection; or
- A sealable terminal or bolt on the *Neutral* link/bar where:
  - the consumer's mains are a busway or busbar arrangement;
  - the installation *main Switchboard* is supplied by more than one connection point and a bus-tie arrangement is in place (the consumer's mains *neutrals shall* be connected to a common *Neutral* link/bar); or
- Where the main *Neutral Conductor* is 25 mm<sup>2</sup> or larger a terminal may be used; or
- Under a stud fitted with a suitable nut that is drilled and tapped into the consumer's mains *Neutral* lug, provided the arrangement can be sealed.

#### 3.6.2 Metering Active and Neutral Links

Metering *Active* and *Neutral* links *shall* –

- (a) incorporate a separate connecting device for the incoming and each outgoing *Circuit*, and
- (b) consist of tunnel terminals using either of methods (i); (ii) or (iii) for termination of the *Conductors*.
- i. Two screws *shall* be provided for each terminal; or
  - ii. One screw, the outside diameter of which is not less than 80% of the tunnel diameter; or
  - iii. One screw, which is arranged so that the *Conductor* is clamped by suitable ferrules or plates in *direct contact* with the *Conductor*.

Where metering *Active* or *Neutral* links are used, they must be sealable or, where this facility does not exist (for larger sized consumer's mains), the links must be installed within a suitable dedicated *enclosure* fitted with a sealable cover.

All *metering* and *Network Device Neutral* terminals *shall* be connected to a dedicated terminal of the metering *Neutral* link via a separate *Neutral Conductor*. Soldered meter and *Network Device Neutral* connections are not permitted.

### 3.6.3 Metering Active and Neutral Link Mounting

Where metering *Active* and *Neutral* links are mounted on the rear of the meter panel, they *shall* be mounted in such a way that they do not interfere with the mounting of the metering equipment.

Where metering *Active* and *Neutral* links are mounted on the rear of the meter *enclosure* and the material on which they are mounted is conductive, they *shall* be mounted on insulating material with low water absorption properties that will extend past the *live parts* of the link by a minimum of 25mm in all directions. This mounting arrangement is not required where the link has been specifically designed for installation onto metal surfaces.

Access to metering links must not be obstructed by any structure or wiring within the *Switchboard*.

### 3.6.4 Metering Active and Neutral Link Labelling

Metering *Active* and *Neutral* links *shall* be identified as such.

## 3.7 Metering requirements for a Builder's Temporary Service (BTS)

Builder's Temporary Services are required to comply with these Requirements.

These requirements include but are not limited to:

- All metering and control equipment *shall* be back-wired and mounted on a hinged panel attached to a metering *enclosure*.
- A metering *Isolation* link per phase *shall* be connected to the line side of the metering.

Builder's Temporary Services meter panels do not need to be dedicated to revenue metering equipment unless they are intended to be installed in the permanent position.

Attention is drawn to the requirement to also comply with AS/NZS3012 *Electrical Installations* - Construction and demolition sites

### 3.8 Plug-in Metering

Plug-in kilowatt hour meters are only available on existing installations where the plug-in type bases are already installed. Plug in metering may not be supported at all by some Metering Providers which may require the replacement of the plug-in base and/or the metering panel such that bottom connect metering equipment can be installed on a panel that complies with these Requirements.

### 3.9 Metering Communications

#### 3.9.1 General

All metering equipment installed in the NEM is required to have communications fitted for remote access and reading. Generally, communications for metering is provided via mobile telephone infrastructure.

When metering *enclosures* are being positioned within or on a building, consideration *shall* be given to ensuring mobile phone signal is available at the metering equipment. Where equipment is installed in a secure location indoors, the use of metering surrounds is encouraged such that mobile phone signal is not impeded by metal *enclosures* and doors.

When metering equipment is enclosed in metal *enclosures*, provision *shall* be made for the installation of an external antenna. Where equipment is installed in switch rooms, this may include provision of conduits to allow for antenna's to be run outside the room to obtain signal.

#### 3.9.2 Segregation of wiring

Antenna or communications cabling associated with metering equipment is generally considered to be operating at extra-low *Voltage*. AS/NZS 3000 Wiring Rules requires that *cables* of low *voltage circuits* and *cables* of extra-low *voltage circuits shall* only be enclosed in the same wiring system where one of the following arrangements is employed:

- (a) The low *voltage cables* are of a type providing the equivalent of double insulation.
- (b) All *cables* or each *conductor* of a multi-core *cable* are *insulated* for the highest *voltage* present.
- (c) The low *voltage cables* are installed in a separate compartment of a common *cable trunking* system having fixed and continuous barriers between compartments.

Antenna or Communications cabling *shall* be installed and fixed, loomed and or cable tied in a manner that it will not obstruct any other *electrical equipment* (*Switchboard* escutcheons and meter panels) and their operational requirements and run in a manner to maximise separation with low *voltage circuits*.

#### 3.9.3 Location of Equipment

With the exception of antennae, metering communications equipment *shall* be located on the meter panel of the associated meter, such that it will not obstruct any other *electrical equipment*, including the meter, MIL / SPD, *Neutral* link and *shall* allow unhindered opening of the meter panel, and or *enclosure* door, removal of door where applicable, and removal of the meter panel.

#### 3.9.4 Customer and third party provided Communication Equipment

Customer and third-party provided communication equipment *shall* not be installed on the meter panel or obstruct access to the meter panel. The installed equipment *shall* not obstruct or cause interference

to other equipment, including the meter, MIL / SPD, *Neutral* link and metering communications equipment.

Where mobile reception at the metering equipment is improved using a mobile repeater, this equipment *shall* be installed such that they comply with clause 3.9.3.

## 4 Low Voltage Current Transformer Metering

Detail to be added in next version of draft – focus on WC metering for first release

### 4.1 Isolation of Current Transformer Metering

Each individual Current Transformer *Metering Installation shall* be capable of being *isolated* separately by a suitable isolator or *main switch*. All *Isolation* equipment *shall* be clearly identified and readily *Accessible* and *Shall* be installed and maintained by the customer and be capable of being sealed and operated by the Metering Provider.

## 5 High Voltage Metering

Detail to be added in future versions

## 6 Specific Jurisdictional Requirements and Transitional Arrangements

### 6.1 Queensland

#### 6.1.1 Card Operated Metering

In Ergon Energy's Far North Queensland region, card operated meters (COMs) will be supplied for designated remote communities and most *isolated* generation sites in the Torres Strait Islands.

Commercial installations requiring special tariffs or current transformer metering will not use card operated meters.

Temporary Builder's Supplies in card operated meter areas *shall* have card operated meters installed with commercial tariffs to apply.

Requests for exemptions can be lodged for critical loads (e.g. sewerage pumps, unmanned communications sites etc) so that card operated meters are not used.

A metering *Isolation* link is required to be installed on the line side of all card operated meters.

In general Ergon Energy will provide one service to a community title scheme or cluster development installation with card operated meters.

Where a cluster or community title scheme development with card operated meters consists of a number of tenanted buildings a meter position located on common ground for each building may be permitted.

The following meter positions will also be acceptable:

- i. The *main Switchboard* located on common ground and all metering equipment installed at this position.

- ii. The *main Switchboard* and the first metering point located on common ground and subsequent metering points located either on each building or as otherwise approved by Ergon Energy.

*Note: - A single community meter position is preferred, however approval may be granted for an additional community meter where a single position is not practical. Each community meter will be treated as a separate account for billing purposes.*

To clarify the required metering type in the remote communities and *isolated* generation sites in Far North Queensland contact Ergon Energy Customer Service.

## **6.2 New South Wales**

## **6.3 South Australia**

## **6.4 Tasmania**

## **6.5 Australian Capital Territory**

## **6.6 Victoria**

# Appendix A – Typical Panel Layouts

## Single Occupancies

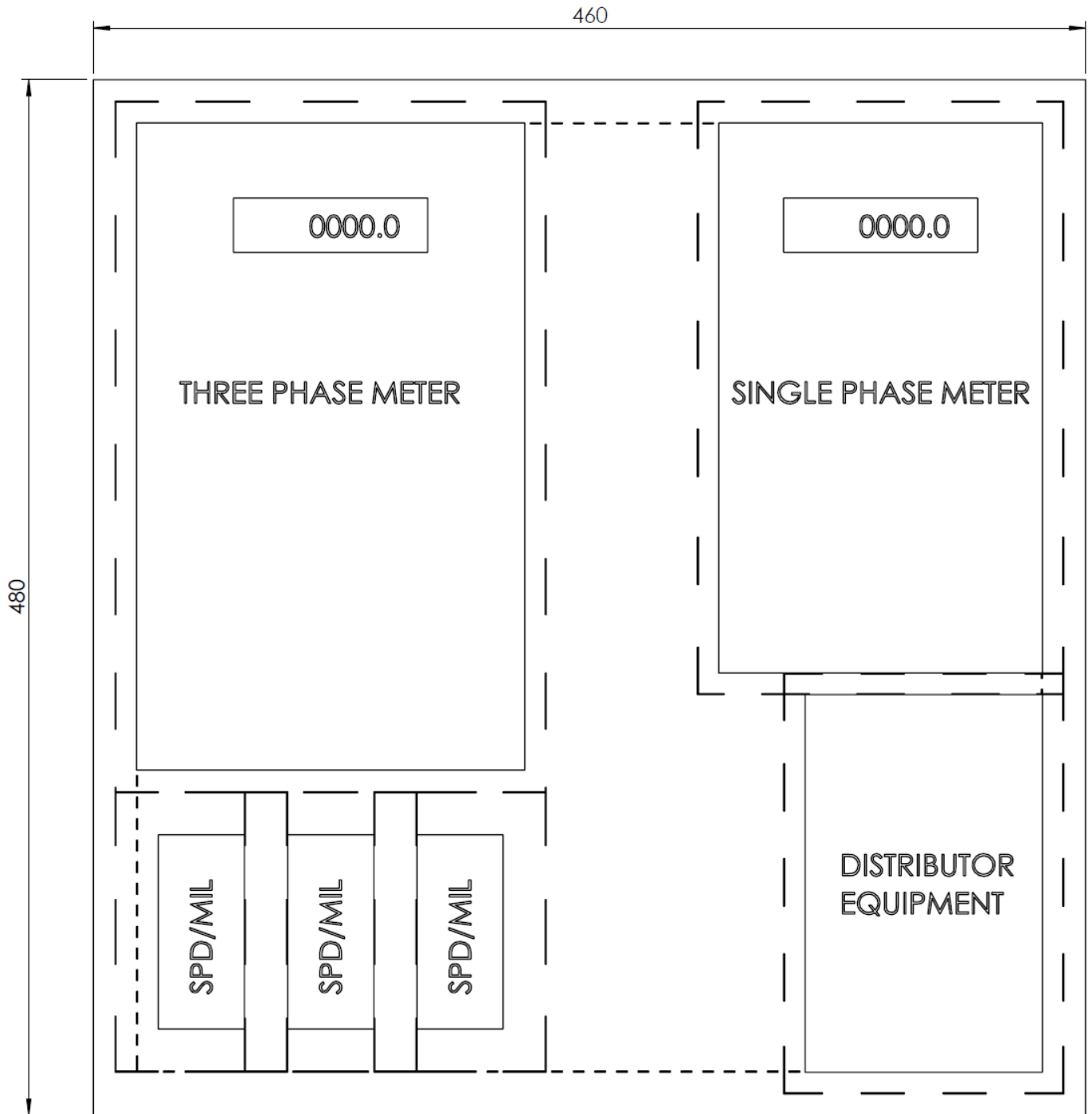


Figure 10 - Typical Panel Layout for Residential House with Multi-phase, single phase meters and load control

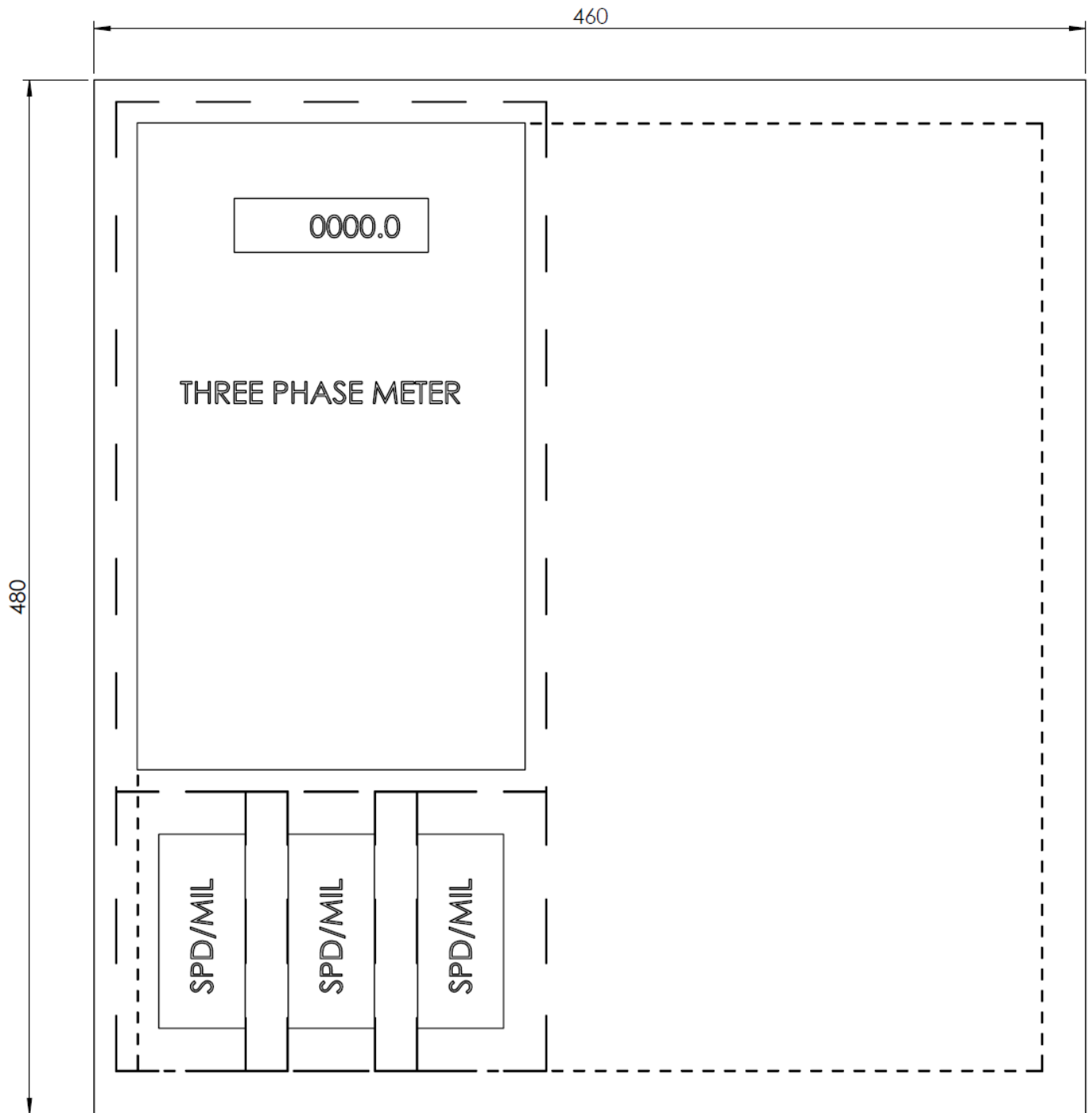


Figure 11 - Typical Panel Layout for Residential House with Multi-phase meter

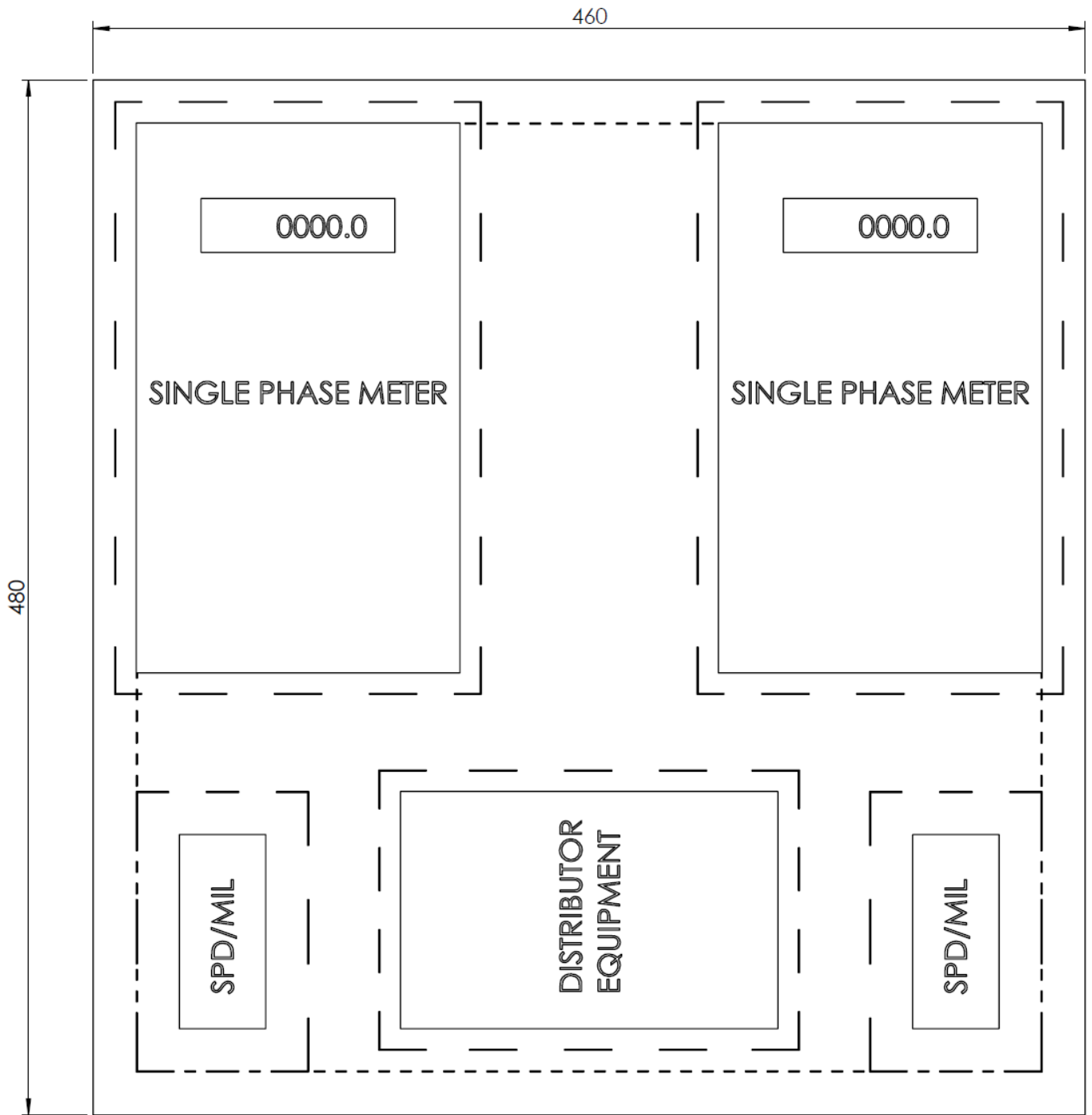


Figure 12 - Typical Panel Layout for Residential House with two single phase meters and load control



# Multiple Occupancies

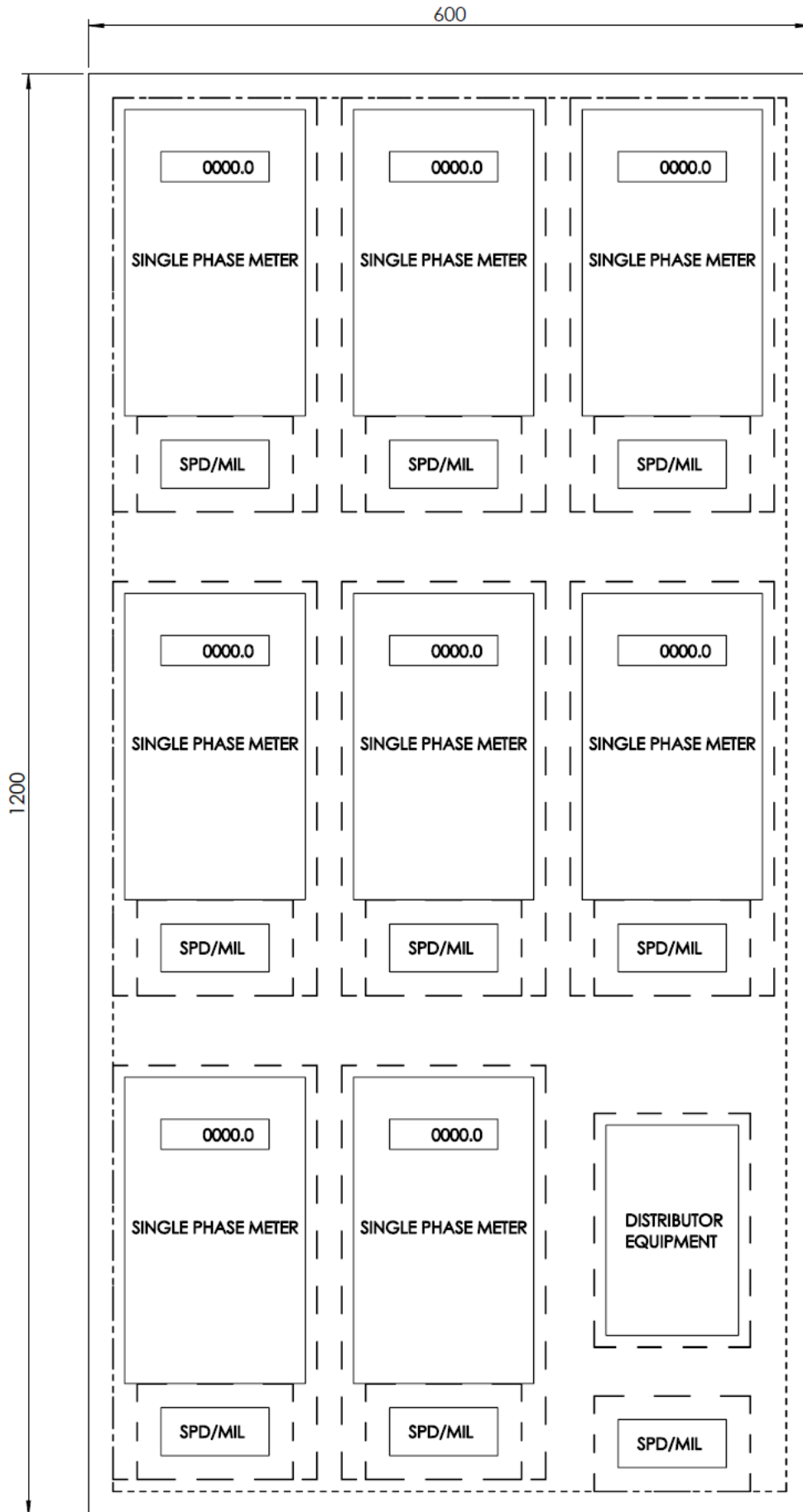


Figure 13 - Typical Panel Layout for Multi Occupancy, Single phase, 1200 x 600 panel



Figure 14 - Typical Panel Layout for Multi Occupancy, multiphase, 1200 x 600 panel

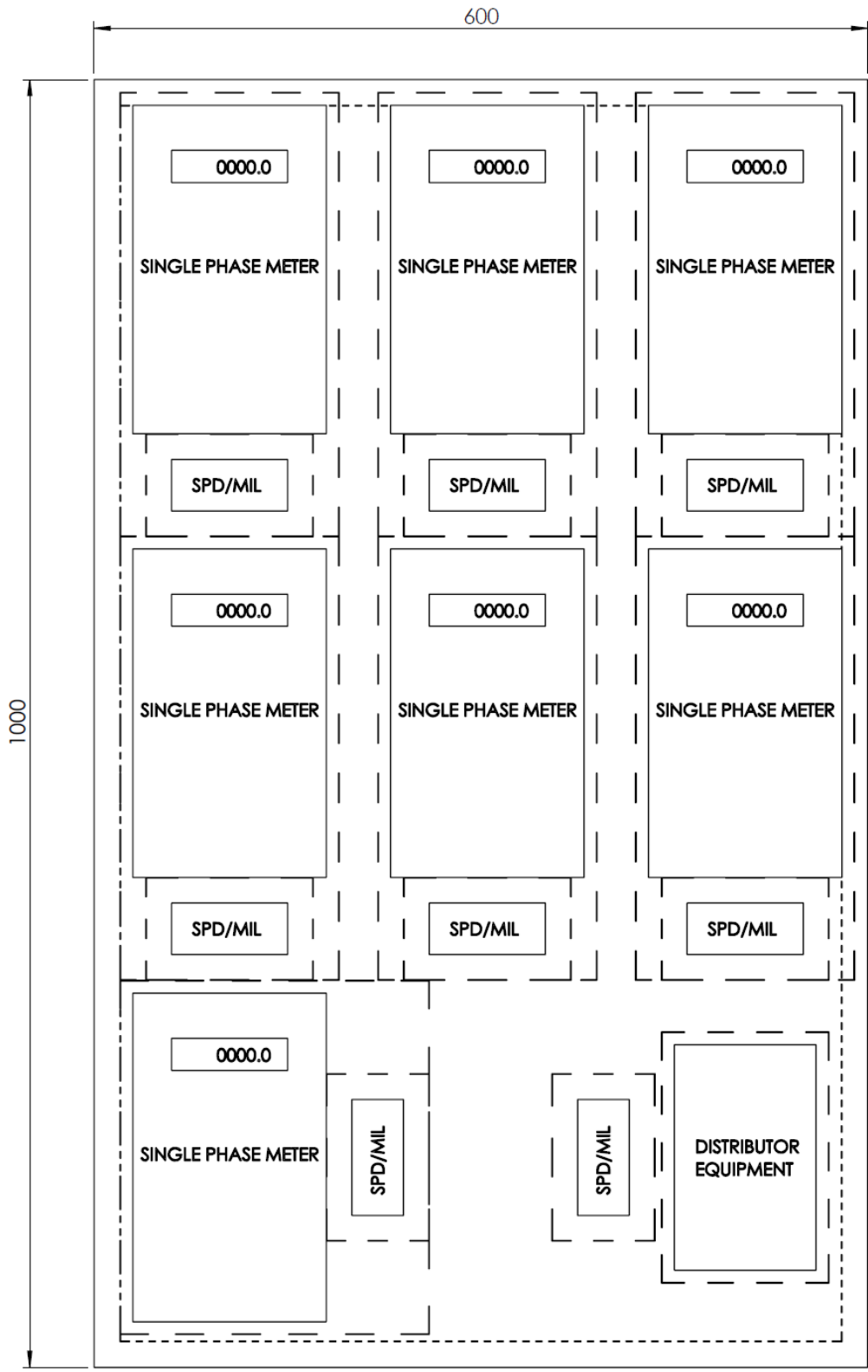


Figure 15 - Typical Panel Layout for Multi Occupancy, Single phase, 1000 x 600 panel

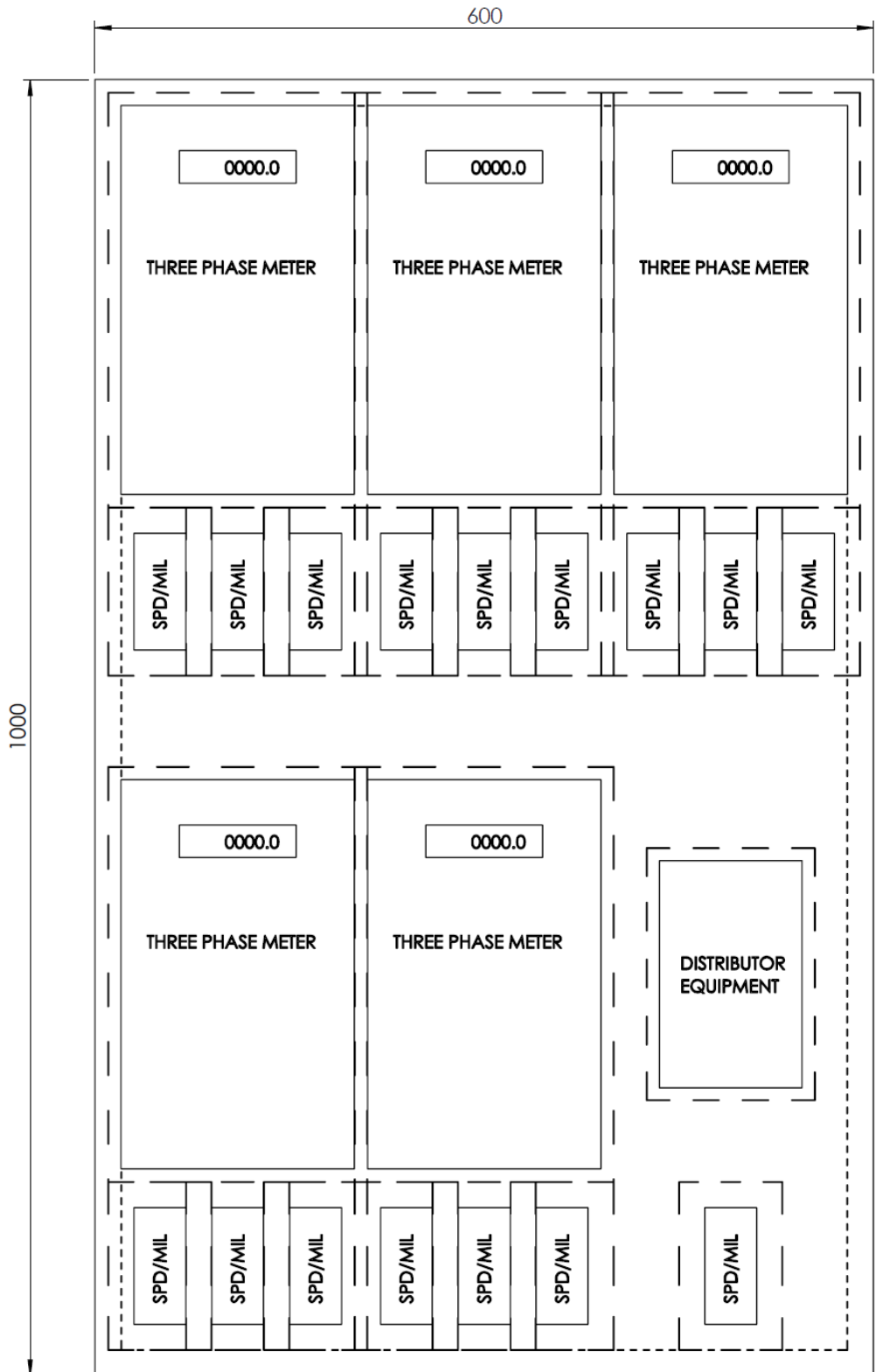


Figure 16 - Typical Panel Layout for Multi Occupancy, multiphase, 1000 x 600 panel

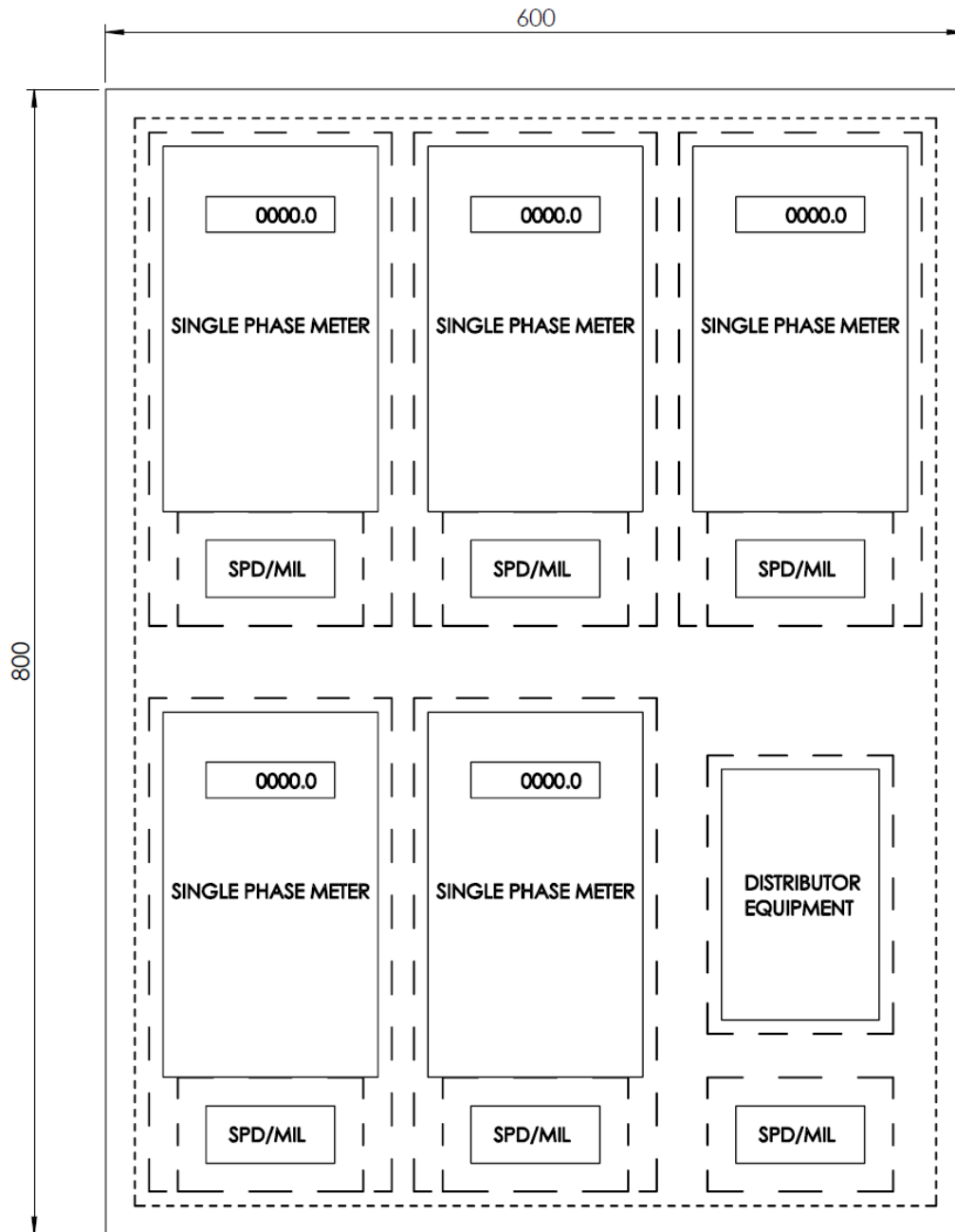


Figure 17 - Typical Panel Layout for Multi Occupancy, Single phase, 800 x 600 panel

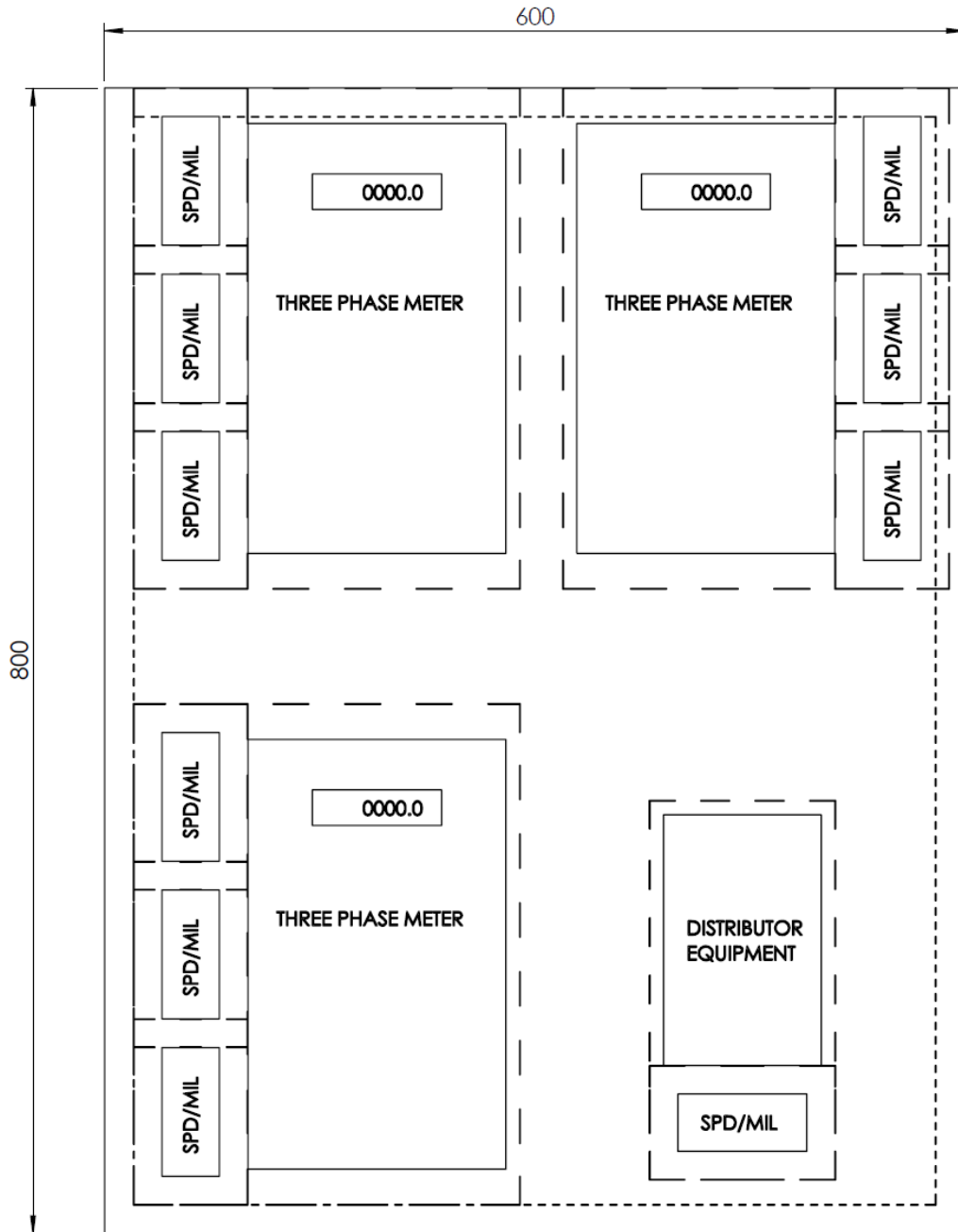


Figure 18 - Typical Panel Layout for Multi Occupancy, multiphase, 800 x 600 panel

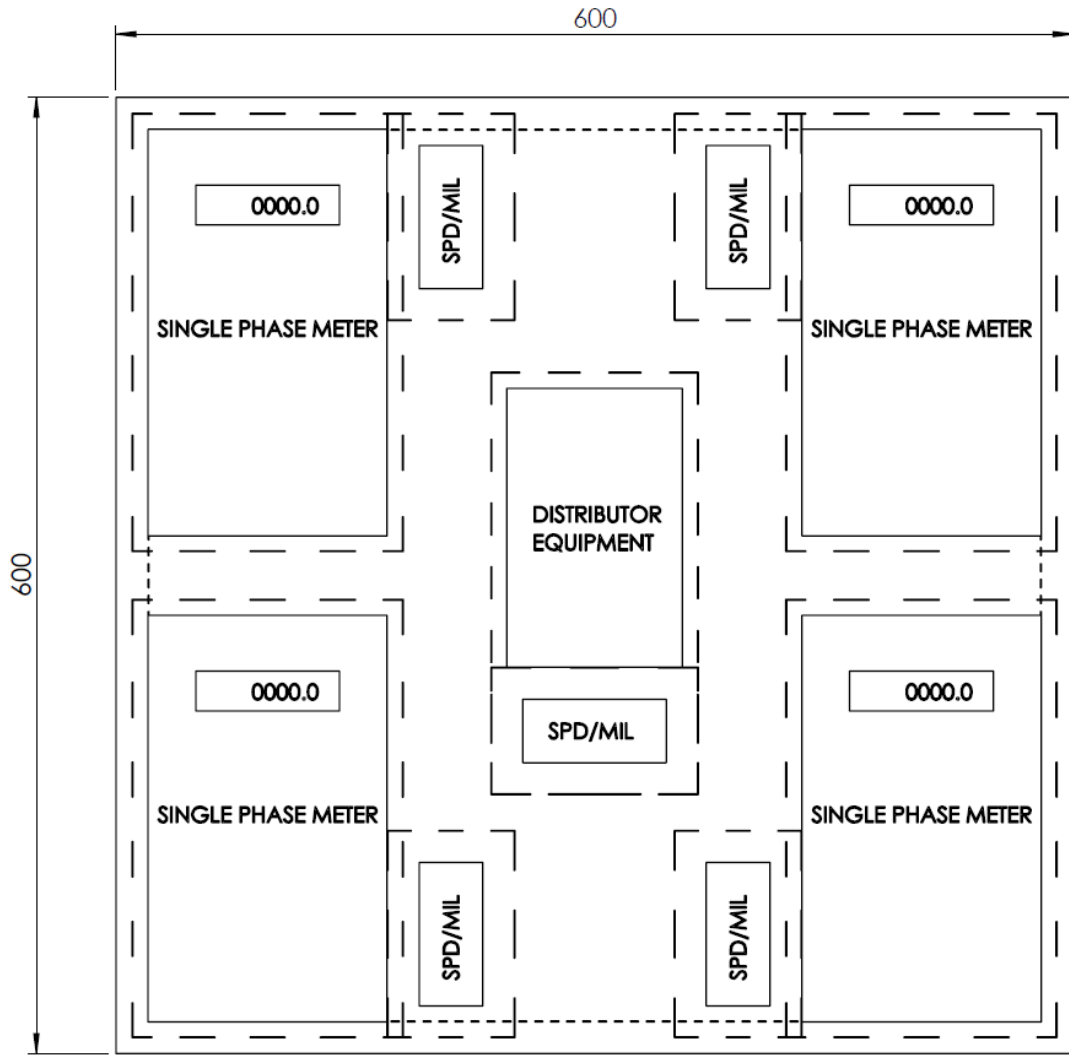


Figure 19 - Typical Panel Layout for Multi Occupancy, Single phase, 600 x 600 panel

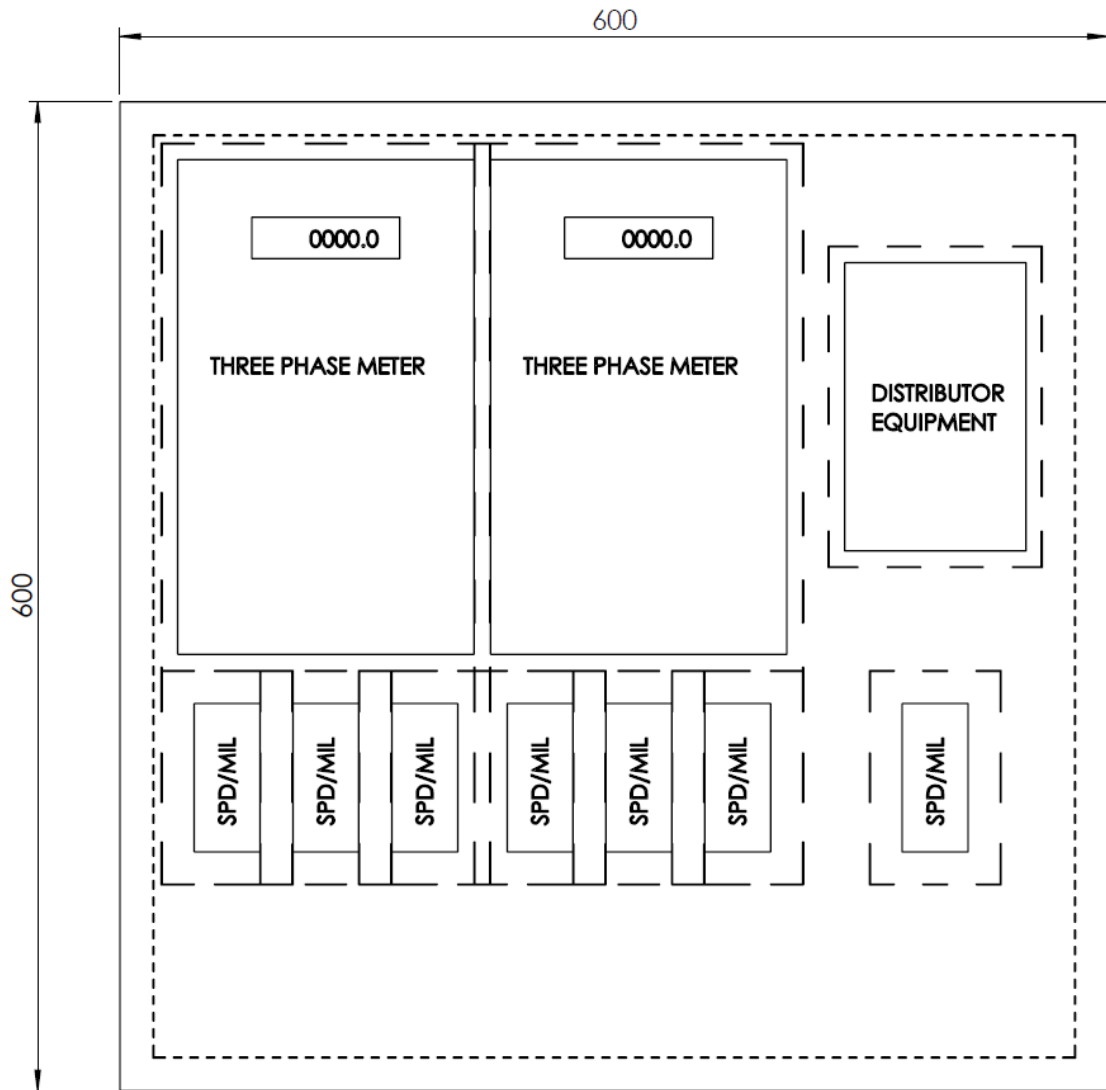


Figure 20 - Typical Panel Layout for Multi Occupancy, multiphase, 600 x 600 panel



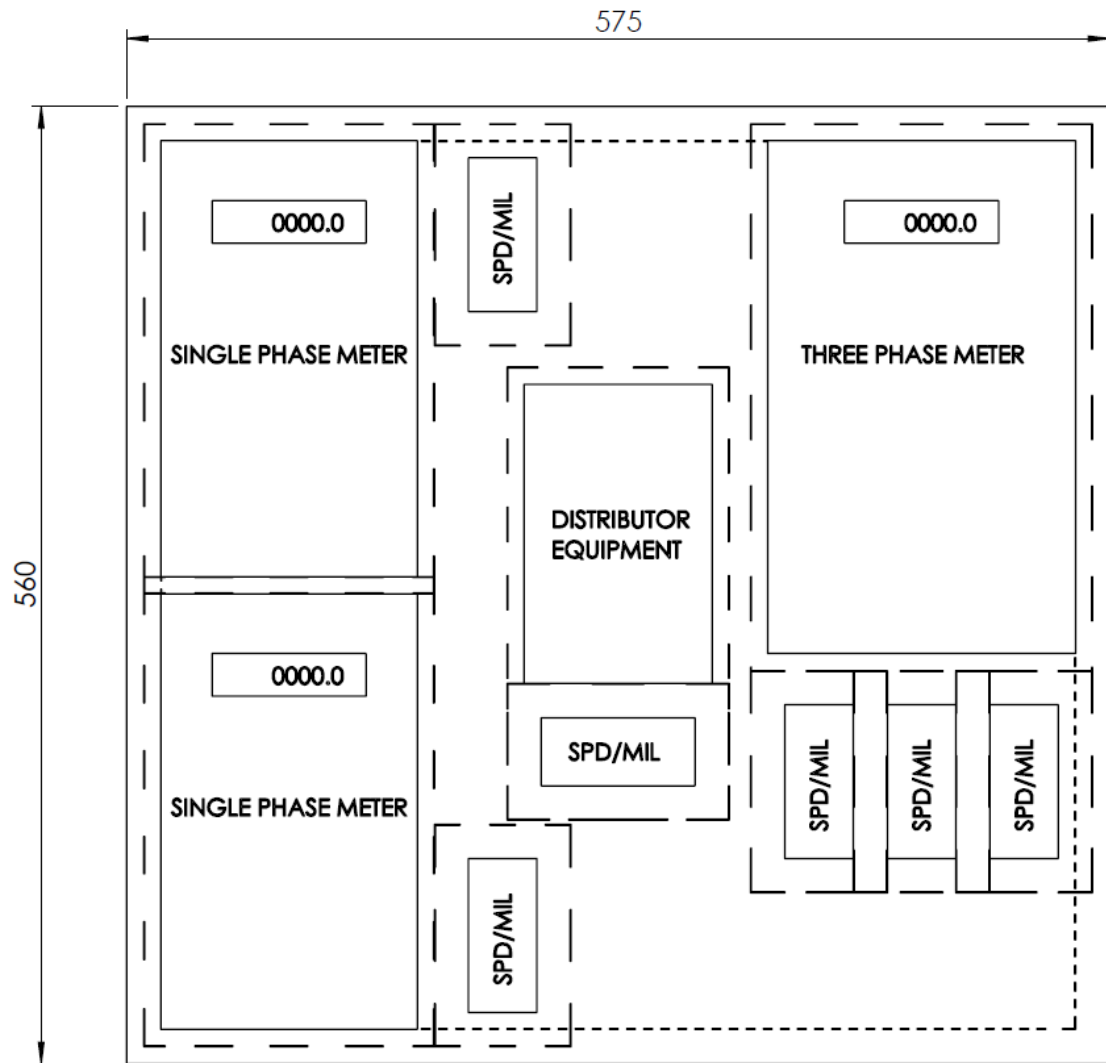


Figure 21 - Typical Panel Layout for Multi Occupancy, multiphase and single phase, 560 x 575 panel