

Electrical industry
regulations and standards

New AS/NZS 3000:2018 wiring rules

Guide to
the changes

:hager

June 2018

AS/NZS 3000:2018 wiring rules published

AS/NZS 3000:2018 - Amendment 1, Published 2020

AS/NZS 3000:2018 - Amendment 2, Published 2021

Because of the development of new technologies, new products and an improvement in safety, the AS/NZS 3000:2018 Wiring Rules were published in June 2018 and enforced / mandatory as of 1 January 2019. Everyone in the industry is bound by them and every customer is the beneficiary.

An amendment to the Wiring Rules was made in 2020 to address consistency issues and provide additional clarifications.

An additional ammendment was published in 2021, bringing in new technical requirements with respect to switchboard compliance as well as more information on RCD selection and installation verification.

This document has been prepared to outline the changes to the regulations that relate to our products and offer recommendations for best application. Please be aware that this is only a guide to the changes in regulations and does not cover every individual situation. For specific circumstances, refer to the AS/NZS 3000:2018 Wiring Rules.

Every Hager product chosen is not only compliant to the new regulations, but they provide the safety, convenience and quality required for your future projects.

We at Hager are constantly evolving and improving: working on better products and innovative technologies and will support you with the very best products, solutions and services.



Who enforces the regulations in each state?

NSW	Office of Fair Trading
QLD	Electrical Safety Office
VIC	Energy Safe Victoria
SA	Office of the Technical Regulator
WA	Energy Safety
TAS	Electricity Standards and Safety
NT	NT Worksafe
ACT	Australian Greenhouse Office

The AS/NZS 3000:2018 Wiring Rules contain more than 200 changes. To simplify things, we have provided a selection of the major changes, including Amendment 2, that are relevant to your business.

2.6.3.2.2 Installation requirements - Australia only

RCDs shall be installed at the switchboard at which the final subcircuit originates.

2.6.3.2.2 Domestic & Residential installations - Australia only

30mA RCDs shall be provided for all final subcircuits.

2.6.3.2.5 Alterations, replacements and repairs - Australia only

RCD protection shall be provided as required by Clause 2.6.3.2.2, 2.6.3.2.3 and 2.6.3.2.4 where any alteration to an existing final subcircuit is undertaken or a switchboard replacement is completed.

2.6.3.2.6 Residential repairs - Australia only

When an existing fitting without RCD protection is replaced by a new fitting in the same location, no additional RCD protection is required.

2.3.4.5, 4.8.2.3 and 4.19 Isolation switches

Every water heater, air-conditioning and heat pump system shall be provided with an independent isolating switch (lockable) installed adjacent to but not on the unit.

4.18.1.1 Gas Appliances - Australia only

The means of isolation shall be a plug to an accessible switched socket-outlet.

2.6.3.2.3.3 Non Domestic & Non Residential installations - Australia only

30mA RCDs shall be provided for all socket outlet or lighting final subcircuits $\leq 32A$ and for fixed wired electrical equipment $\leq 32A$ that may represent a risk of electrical shock

2.6.3.2.4 Home care medical installations

Some installations require a 10mA Type I RCD.

New residential installations

The new wiring rules require ALL final sub-circuits to be 30mA RCD protected. This includes fixed electrical equipment like cooktops, hot water systems and air conditioning units.

- The requirements for a maximum of 3 circuits per RCCB, a minimum of 2 RCCBs and sharing of lighting circuits remain.
- It is recommended that each final sub-circuit is protected by a separate RCBO to avoid loss of supply to multiple circuits.

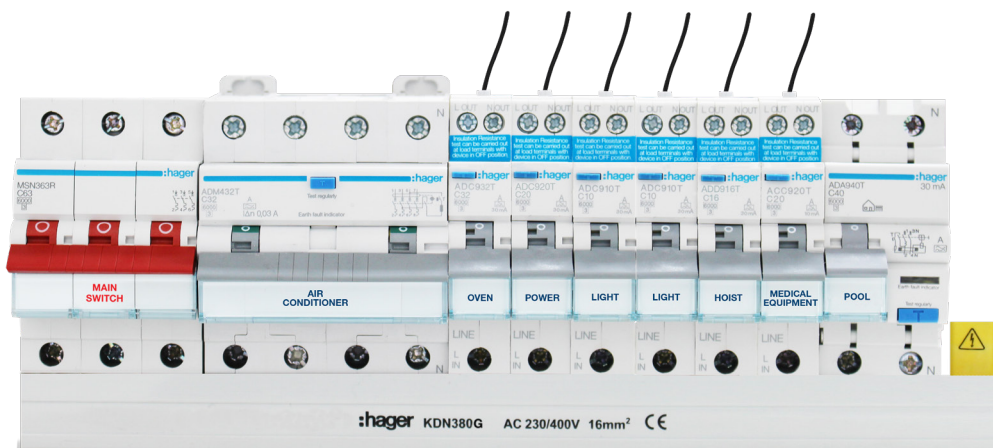
Unique Hager solutions



Single module RCBOs from 6A to 32A supplied with neutral fly lead and compatible with onekonekt busbar.



4P RCBOs to optimise space and avoid using a larger enclosure. Compatible with onekonekt busbar.



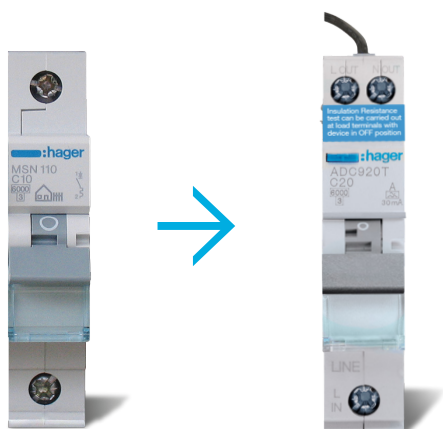
All our modular protection devices including main switches, RCBOs, RCDs and MCBs fit on our single or three phase busbars.

What changes do I need to make to comply?

Easy no think solution

- ✓ RCBOs used to protect stove, hot water and air conditioning instead of MCBs without RCD protection

Single phase



MCB without
RCD protection



1mod RCBO

Three phase



MCB without
RCD protection

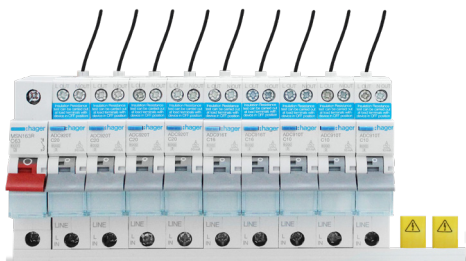


4P RCBO

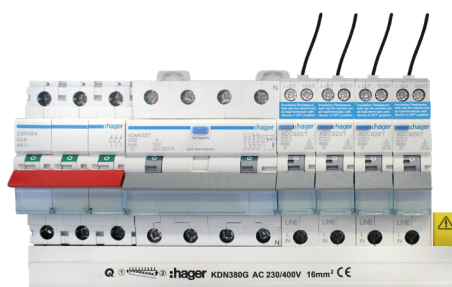
Best solution

- ✓ All sub-circuits protected by RCBOs
- ✓ Fast installation - all devices on one busbar
- ✓ Smallest footprint using single module RCBOs
- ✓ Individual sub-circuit protection - no risk of loss of supply to multiple sub-circuits.

Single phase



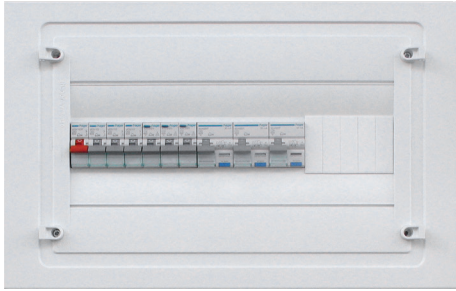
Three phase



Residential installations Alterations and repairs



Upgrade



Alterations

In accordance with Clause 2.6.3.2.5, where a switchboard replacement is carried out OR where any alteration to an existing final subcircuit is undertaken, additional RCD protection shall be installed.

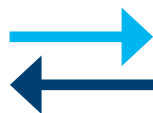


In accordance with Clause 2.6.3.2.3.2, where socket-outlets are added to an existing sub-circuit with compliant mechanical protection, RCD protection specifically intended for the protection of that socket-outlet can be installed at or adjacent to the socket-outlet.

Repairs

In accordance with Clause 2.6.3.2.6, no RCD protection is required where a socket-outlet, luminaire or single item of electrical equipment that is not RCD-protected is replaced with an equivalent in the same location.

Like for like replacement.



Replacement



Isolation switch requirements

01

A combined gas and electric cooker (4.7.1)

An Isolating switch (switching all Active & Neutral conductors) and located in a “readily accessible” position (within 2m of cooker and not where you have to move things out of the way to get to it).

02

A gas hob with electric ignition (4.18.1.2)

It is OK to put a GPO in the cupboard under the appliance and to plug into the GPO. Even if there are pots & pans in the way, this is OK because the GPO need only be ‘Accessible’ not ‘Readily Accessible’.

03

Built in electric oven or microwave

No isolation next to the built in unit is required.

04

Air conditioning and heat pump systems fixed wired (4.19)

Readily accessible, lockable isolation switch adjacent to each air conditioner (do not mount on the air conditioner). No need to switch the neutral, but it is recommended for a safer installation.



**Gas appliances
require switches
in an accessible
location.**



Hot water systems, air conditioning units and heat pumps require lockable isolators, not on the equipment, but adjacent to the unit (at arms length or 1.25 metres).

05

Air conditioner single unit plugged into a GPO (4.19)

As long as the GPO is 'Readily Accessible', this is enough – no other Isolation is required.

06

Motor or load with low power factor (4.13.1.2)

Use an isolation device with the utilisation category AC23 or a significant de-rating shall be applied.

07

Hot water system fixed wired, gas or electric (4.8.2.3)

Readily accessible, lockable isolation switch adjacent to the hot water system (do not mount on the hot water system). No need to switch the neutral, but it is recommended for a safer installation.

08

Hot water system heat pump or gas plugged into a GPO (4.18.1.2)

As long as the GPO is 'Readily Accessible', this is enough – no other Isolation is required.

Commercial installations



In commercial installations, the new AS/NZS 3000:2018 wiring rules require additional RCD protection.

2.6.3.2.3.3

- 30mA RCDs shall be installed on all final sub-circuits supplying lighting and socket outlets $\leq 32A$. (previously 20A)
- 30mA RCDs should be installed on all final sub-circuits supplying 32A fixed wired equipment.
- 30mA RCDs shall be installed on all final sub-circuits supplying 32A fixed wired equipment that may represent an increased risk of electric shock such as environmental conditions (e.g. wet areas) and the type of electrical installation and process being conducted.

Unique Hager solutions

In accordance with Clause 2.10.3.2, switchboards complying with the requirements of AS/NZS 61439 are deemed to comply with the requirements of the Wiring Rules.

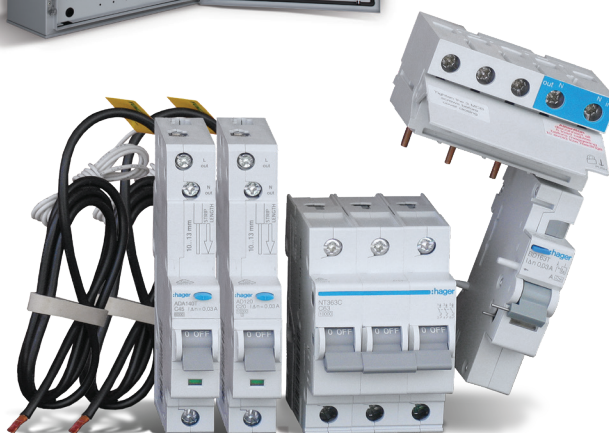
invicta 6kA panelboards



- 1mod 30mA RCBO
- MCB + RCD 30mA Add-On Block

✓ Smallest footprint on chassis

performa 6kA-10kA panelboards



- Longbody 30mA RCBOs
- MCB + RCD 30mA Add-On Block

✓ The RCD Add-On Block turns any breaker up to 63A into an RCBO.

RCDs for DIN rail enclosures



Single phase

Cat ref.	ACC9xxT	ADC9xxT	ADD9xxT	ADA9xxT	AEA9xxT
Earth fault wave form	Type A	Type A	Type A	Type A	Type A
Overcurrent trip characteristic	C curve	C curve	D curve	C curve	C curve
Breaking capacity	6kA	6kA	6kA	6kA	6kA
Current rating	6A to 32A	6A to 32A	6A to 25A	6A to 40A	6A to 40A
Residual current ($I_{\Delta n}$)	10mA	30mA	30mA	30mA	100mA
Poles	1P+N	1P+N	1P+N	1P+N	1P+N
I.R. test facility*	Yes	Yes	Yes	Yes	Yes
Fork busbar	1P/3P	1P/3P	1P/3P	1P/3P	1P/3P








Three phase






Cat ref.	ADA5xxT	ADM4xxT	AEM4xxT	ADX4xxT	AEX4xxT
Earth fault wave form	Type A	Type A	Type A	Type A	Type A
Overcurrent trip characteristic	C curve	C curve	C curve	C curve	C curve
Breaking capacity	10kA	6kA	6kA	10kA	10kA
Current rating	6A to 32A	6A to 40A	6A to 40A	6A to 40A	6A to 40A
Residual current ($I_{\Delta n}$)	30mA	30mA	100mA	30mA	100mA
Poles	1P+N	4P	4P	4P	4P
I.R. test facility*	Yes	Yes	Yes	Yes	Yes
Fork busbar	2P	3P	3P	3P	3P

*Insulation Resistance test can be carried out without disconnecting outgoing conductors.

Single phase

Cat ref.	 CDA2xxT	 CDA5xxT	 CEA5xxT	 CDF5xxT	 CDB5xxT
Earth fault wave form	Type A	Type A	Type A	Type F	Type B
Current rating	25A to 63A	80A to 100A	25A to 100A	40A to 63A	25A to 63A
Residual current ($I_{\Delta n}$)	30mA	30mA	100mA	30mA	30mA
Short circuit withstand (Inc)	6kA	10kA	10kA	10kA	10kA
Poles	2P	2P	2P	2P	2P
I.R. test facility*	Yes	Yes	Yes	Yes	No
Fork busbar	1P	1P	1P	1P	No

Three phase

Cat ref.	 CDA4xxT	 CDA6xxT	 CEA6xxT	 CDF6xxT	 CDB6xxT
Earth fault wave form	Type A	Type A	Type A	Type F	Type B
Current rating	25A to 63A	80A to 100A	25A to 100A	40A to 63A	25A to 63A
Residual current ($I_{\Delta n}$)	30mA	30mA	100mA	30mA	30mA
Short circuit withstand (Inc)	6kA	10kA	10kA	10kA	10kA
Poles	4P	4P	4P	4P	4P
I.R. test facility*	Yes	Yes	Yes	Yes	No
Fork busbar	3P	3P	3P	3P	No

The use of RCCBs is not recognised as a safe means of protection and must always be used in conjunction with an overcurrent protection device such as a circuit breaker.

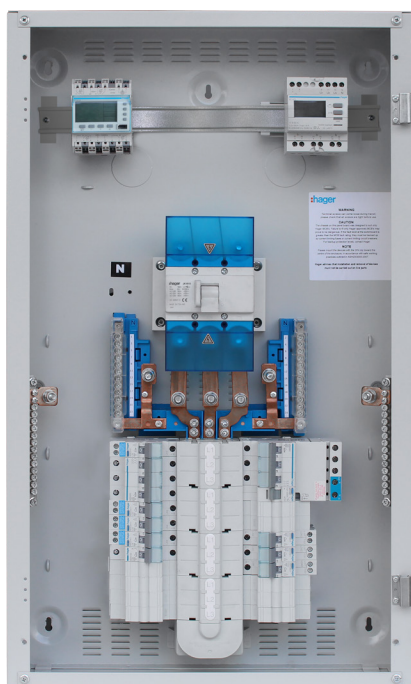
*Insulation Resistance test can be carried out without disconnecting outgoing conductors.

RCBOs for Invicta panelboards



Single phase

Cat ref.	ACC9xxT	ADC9xxT	ADD9xxT
Earth fault wave form	Type A	Type A	Type A
Overcurrent trip characteristic	C curve	C curve	D curve
Breaking capacity	6kA	6kA	6kA
Current rating	6A to 32A	6A to 32A	6A to 25A
Residual current (I Δ n)	10mA	30mA	30mA
Poles	1P+N	1P+N	1P+N
I.R. test facility*	Yes	Yes	Yes
Features	- invicta panelboards - reduced height		



Invicta Panelboard







Performa Panelboard




*Insulation Resistance test can be carried out without disconnecting outgoing conductors.

RCBOs, Add-on Block for Invicta and Performa panelboards

Single phase

Cat ref.	 ADA1xxT	 AD1xxB	 ACA1xxT	 AC1xxB
Earth fault wave form	Type A	Type A	Type A	Type A
Overcurrent trip characteristic	C curve	C curve	C curve	C curve
Breaking capacity	6kA	10kA	6kA	10kA
Current rating	6A to 45A	6A to 32A	6A to 32A	6A to 32A
Residual current ($I_{\Delta n}$)	30mA	30mA	10mA General Purpose	10mA General Purpose
Poles	1P	1P	1P	1P
I.R. test facility*	No	No	No	No
Features	<ul style="list-style-type: none"> - performa panelboards - unswitched neutral and earth lead 			

Three phase

Cat ref.	 BD163T	 BE163T	 BF163T
Earth fault wave form	Type A	Type A	Type A
Current rating	63A	63A	63A
Residual current ($I_{\Delta n}$)	30mA	100mA	300mA
Short circuit withstand (Inc)	6kA	6kA	6kA
Poles	3P	3P	3P
I.R. test facility*	No	No	No
Features	<ul style="list-style-type: none"> - invicta panelboards - performa panelboards - unswitched neutral 		

*Insulation Resistance test can be carried out without disconnecting outgoing conductors.

Isolators for Hot water, HVAC and gas

Isolators for hot water systems, air conditioners and motors



JG2xxIN



JG3xxIN



JG4xxIN

Cat ref.	JG2xxIN	JG3xxIN	JG4xxIN
Poles	2	3	4
Current rating	20A to 63A	6A to 32A	6A to 40A
Utilisation category	AC23	AC23	AC23
IP rating	IP66	IP66	IP66
Rated operational voltage	250V	250V	250V
Rated insulation voltage	440V	440V	440V

Utilisation category AC23 is suitable to isolate motors without derating.

40A Double pole 'cooker' switches for gas appliances



WBSCKSV1



WBSCKSV1-MB



WBVCKSV1



WBVCKSV1-BK

Style	silhouette	silhouette	visage	visage
Colour	White	Matt Black	White	Black

Premire double pole sockets for gas appliances



WBP1DS



WBP1DS-TG



WBP115DS



WBP2DS



WBP2DS-TG

Colour	White	Titanium Grey	White	White	Titanium Grey
Socket type	Single socket	Single socket	Single socket	Double socket	Double socket
Current rating	10A	10A	15A	10A	10A

The switches and sockets indicated above are a small selection of the full range of products available including specialist mechanisms and colour variations. Contact your local Hager rep for a full list of products or for more information.

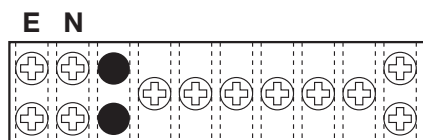
Important notes when selecting enclosures

Tunnel terminals in neutral bars

Clause 2.10.4

All sorts of tunnel terminal types may be used. The standards (AS 5112 & AS/NZS 3000) provide directives for tunnel-type terminals which have screws that are in direct contact with conductors, as pertaining to

Illustration A



02 2 screws

Two screws are required for connection of the following conductors:

- the main incoming neutral
- the main earthing conductor
- the MEN connection
- the PEN (protective earth neutral)

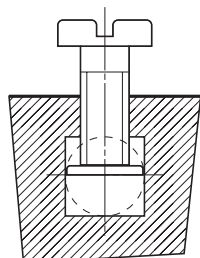



Illustration B
Tunnel terminals with a plate or ferrule giving indirect pressure



Illustration C
Hager terminal

04 Exception

Those rules don't apply when the conductor is clamped by another means, like **Illustration B** or Hager  terminals as in **Illustration C**.

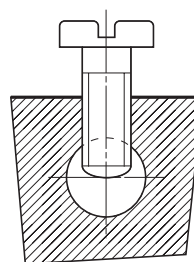
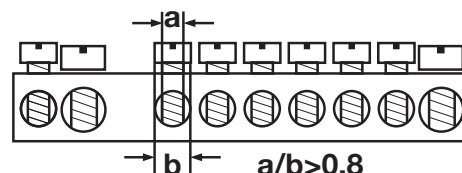


Illustration A
Tunnel terminals with screws in direct contact with the conductor

01 Screw shape

All screws shall be shaped not to cut the conductor (no sharp edge at the end of screws)



03 Or 80% diameter

Alternatively, the terminal shall be of a type having one screw with an outside diameter not less than 80% of the tunnel diameter.

05 All of our DIN rail enclosures and panelboards comply to these rules.

General installation tips

Compliance with manufacturer's instructions (2.1.2)

All installations shall be installed in accordance with the Wiring Rules as well as any additional requirements as specified in the manufacturer's instructions.

Home care and patient areas (2.6.3.2.4)

In a room where medical electrical equipment of Class I is installed for either home care or in patient areas, the socket outlets for the equipment shall be protected by a Type I RCD 10mA. This RCD shall interrupt all live conductors.

Note

There are many differing factors that contribute to whether a Type I 10mA RCD needs to be installed.

Please ensure you check the AS/NZS 3000:2018 wiring rules section 2.6 or AS/NZS 3003 section 5.2, 1.4.17, 2.1, 2.2, and 2.8 for each individual scenario.

Minimum IP ratings for wall mounting under eaves (4.1.3)

Electrical accessories without a specific IP rating are protected when installed within the space contained by the edge of the eave, verandah or overhang and a plane from the outer edge of 30° continuing to the exterior wall. Anything out side this area shall have a minimum protection degree of IP33.

Exception

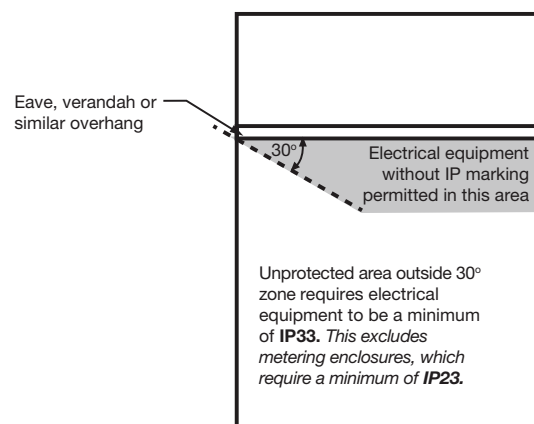
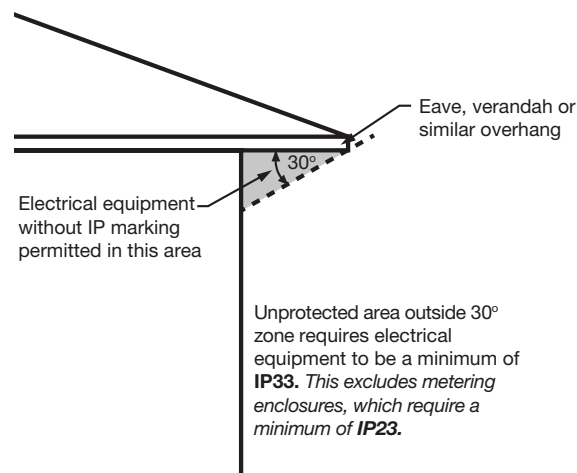
Meterboxes outside the area shall have a minimum protection degree of IP23.

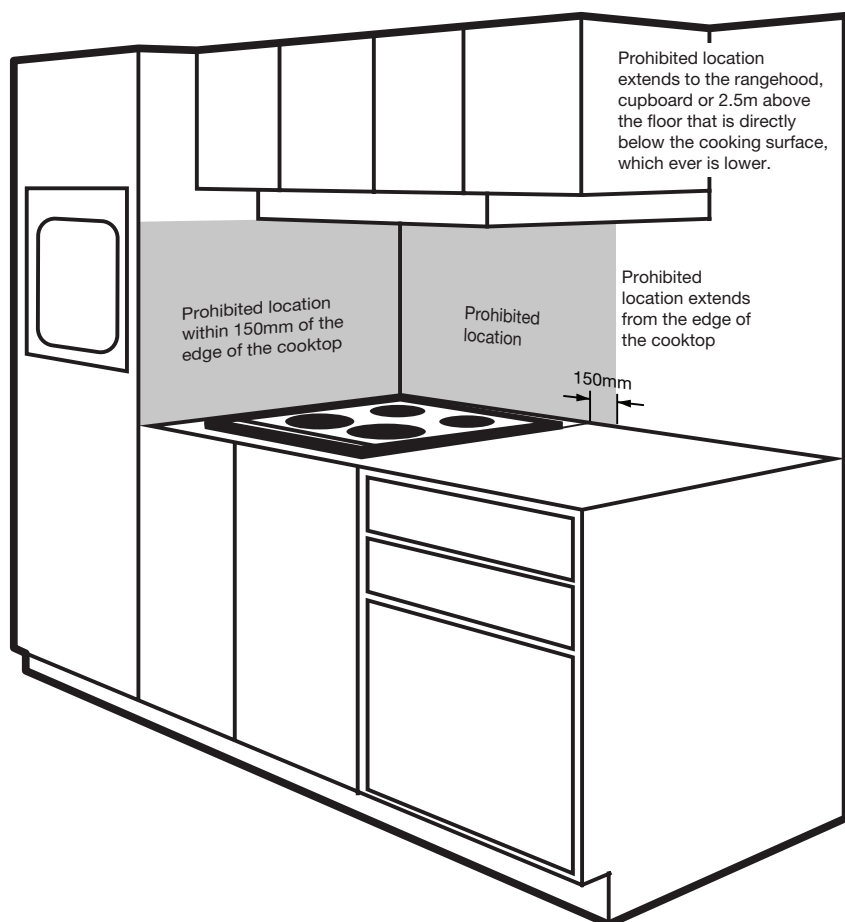
Condensation issues (4.1.3)

In installations where condensation may be an issue, purpose made anti-condensation and waterdrains that maintain the IP rating of the enclosure may be used. This shall be installed according to manufacturers instructions to ensure the IP rating is maintained.

Note

Drilling a drain hole in the bottom of the enclosure alone destroys the IP rating of the enclosure.





Switches for cooking appliances (4.7.3)

A circuit for a fixed or stationary cooking appliance having an open cooking surface incorporating electric heating, shall be provided with a switch operating all active conductors, mounted near the appliance in a visible and readily accessible position.

Note

The switch shall not be mounted on the cooking appliance.

Prohibited zones in wet areas

In baths, showers and other fixed water containers there are 4 zones each covering different electrical devices and many individual specific scenarios.

Please ensure you check the AS/NZS 3000:2018 wiring rules section 6.2 for each individual scenario.

Examples of fixed water container scenarios are given at right.

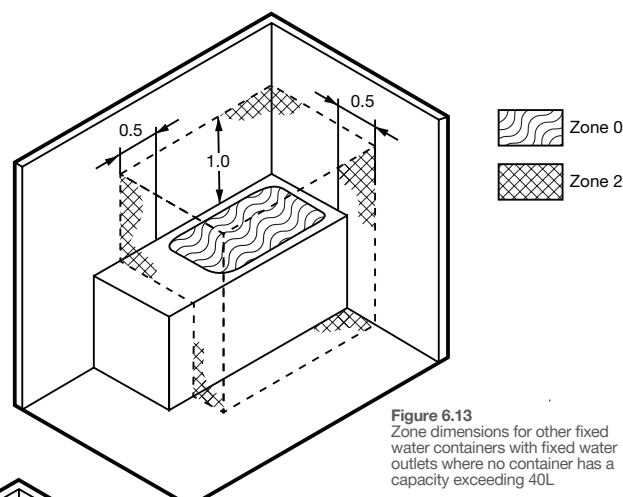


Figure 6.13
Zone dimensions for other fixed water containers where no container has a capacity exceeding 40L.

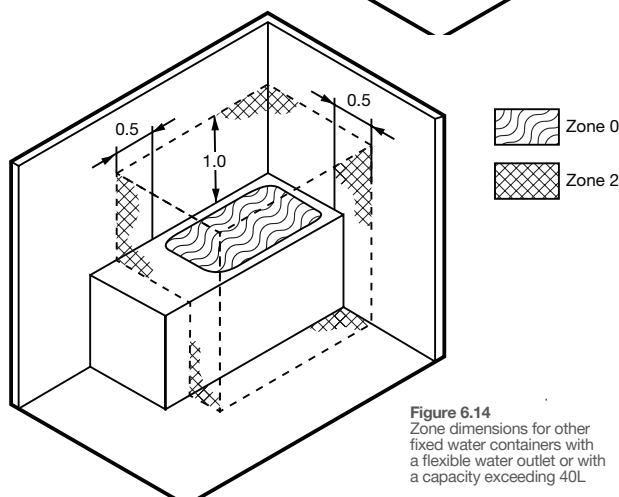


Figure 6.14
Zone dimensions for other fixed water containers with a flexible water outlet or with a capacity exceeding 40L.

Changes to definitions

1.4.2 - Accessible

Capable of being reached for inspection, maintenance and repairs but does not include the destructive dismantling of structural components.

1.4.3 - Accessible, readily

Capable of being reached quickly and without climbing over or removing obstructions, or using a movable ladder, and in any case not more than 2.0m above the ground, floor or platform.

1.4.6 - Adjacent

Next to or adjoining without obstruction and within arm's reach.

1.4.16 - Arms reach

A zone extending from any point on a surface where persons usually stand or move about, to the limits that a person can reach with the hand in any direction without assistance. (e.g tools or ladder) (see Figure 1.1)

1.4.8 - Alteration

A modification to part(s) of an electrical installation (which affects the electrical characteristics of the original installation).

1.4.101 - Repair

The work to restore the electrical installation to safe and sound working condition after deterioration or damage which has occurred.

1.4.55 - Electrical installation Residential

An electrical installation or that portion of an electrical installation associated with a living unit or units. e.g. residential institutions, hotels, boarding houses, hospitals, accommodation houses or motels.

1.4.88 - Outbuilding - Individual

A structure containing a switchboard, that is separated by an area of land from the structure containing the switchboard that supplies it.

1.4.89 - Outbuilding - Combined

Any number of structures installed or built on the same foundation, or sharing conductive metal roofing or conductive metal frames, with more than one electrical supply, and separated by an area of land from another structure that contains the switchboard from which those electrical supplies are obtained.

1.4.107 - Shall

Indicates a statement is mandatory.

1.4.108 - Should

Indicates a recommendation.

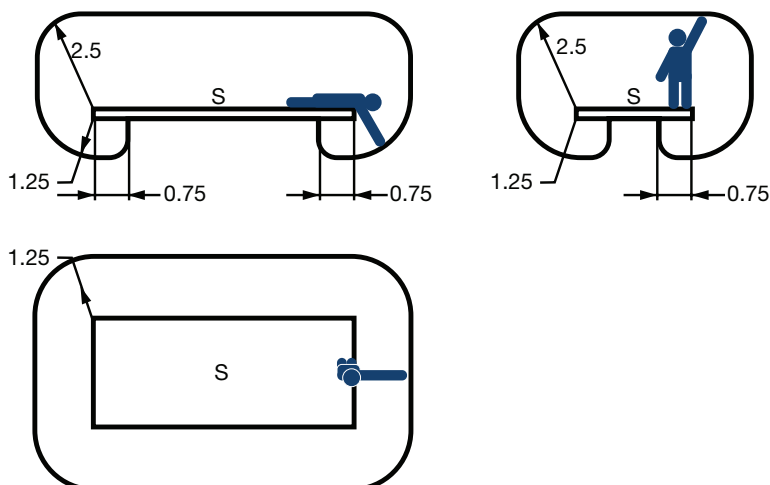


Figure 1.1 - Zone of Arm's reach

Frequently asked questions

What requirements apply when a new circuit is installed?

All the requirements of AS/NZS 3000:2018 apply including safety switches protection.

Does the addition of a socket-outlet require safety switch protection?

Yes - 30mA RCD protection shall be provided where any alteration to an existing final sub-circuit is undertaken.

Does the addition of a device to an existing lighting circuit without RCD protection need to be protected by an RCD?

Yes, this is an alteration to the original circuit. Addition of devices such as combination fan, light and heater unit or an exhaust ceiling fan or a smoke detector or a ceiling sweep fan (with an unswitched socket outlet) must be protected by an RCD.

Is the replacement of an item of electrical equipment considered a repair?

Yes. Provided it does not alter the characteristics of the circuit.

Does the replacement of an exhaust fan require safety switch protection?

30mA RCD's need not be installed where a single item of electrical equipment, that is not RCD protected, is replaced with an equivalent item in the same location. If the equipment is protected by fuse or MCB they can remain. Although it is recommended for safety to make sure all circuits are RCD protected.

Can I replace like for like a switchboard?

No. Where ALL of the circuit protection on a switchboard is replaced, additional protection by RCDs shall be provided for the final sub-circuits supplied from that switchboard. It is most likely that the switchboard to be replaced will have at best only the light and power-outlet circuits protected.

Can a socket-outlet added to an existing circuit be protected by an RCD incorporated into the socket-outlet?

Yes, although it is preferable to locate the RCD in the switchboard to protect the complete circuit rather than installing an RCD that protects only the individual socket-outlet.

Can I install a IP23 meterbox outside?

Yes in areas under eaves, veranda or similar overhang require electrical equipment to be IP33. This excludes meter boxes that only require IP23.



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