

Interested in national requirements and state-based Service and Installation Regulations (SIRs) governing domestic EV charging installations? Here's what you need to know.



Disclaimer:

The Electric Vehicle Council (EVC) is not your local electrical regulator. Therefore, this guidance should be considered in combination with input from your relevant electrical regulator or licensed electrical inspector. It is not to be interpreted as legal guidance. If in doubt, please contact the relevant electrical regulator in your region for clarification.

What are the national requirements?

In Australia, we have a document known as “the wiring rules”, [AS/NZS 3000:2018](#). This document serves as the bible for electricians, as it defines all manner of things relating to electrical installations. The wiring rules are a standard maintained by Standards Australia, and can be purchased from here: https://infostore.saiglobal.com/en-au/Standards/AS-NZS-3000-2018-98926_SAIG_AS_AS_208028/

The 2018 version of the standard has a few new provisions that relate to EV charging installations. Appendix P, in particular, is an informative piece relating to electric vehicle charging in Australia. The appendix is informative, rather than normative, and this was the first time that the wiring rules contemplated EV charging. The guidance provided in the appendix is a good start and in particular it provides good explanation on the selection of **RCDs** (Residual Current Devices).

Appendix P provides guidance on which type of RCD is appropriate upstream of EV charger installations. For instance, according to the appendix, type B RCDs are indicated if the charging station does not have the capability to detect DC fault currents. In the case where charging station has the ability to detect DC fault current and shut down, RCD type A is sufficient, and is lower cost.

Manufacturers of EV charging stations are generally converging towards putting DC fault current detection in the charging station, in response to the regulatory requirements in international jurisdictions.

Do we need an isolator?

AS3000:2018 is not 100% clear on the topic of whether an isolator is needed at an EV charging station. Most charging manufacturers and installers believe it's a good idea, for the same reason that an isolator is required next to an air-conditioning unit – if maintenance is required, the person doing the maintenance wants to be certain that the unit stays switched off while his or her hands are inside it. This aspect is likely to get cleared up in the next revision of the standard.

What are the requirements of cable sizing?

Cable sizing from the upstream supply to the EV charger is done in accordance with a different standard, AS/NZS 3008.1.1:2017. This is the same standard that electricians use to size any cable. Among other things, it takes into account the current that the cable needs to support, the distance the cable needs to run, and the nature of the surrounds of the installation. These things are important, because if the cable is undersized for the job, it'll get hot. A typical 32 A single phase AC charger, installed in a domestic home, will usually need cable with a cross sectional area of 6 mm². However, particularly long distances will take the sparky to using a larger gauge cable (such as 10 mm²), and particularly easy installations may be achievable with lighter gauge cable (such as 4 mm²).

In addition to the notes above, installers are required to follow the manufacturers' installation instructions. So, if the manufacturer specifies cable with 10 mm² cross sectional area, for example, that's what needs to be used.

What do Service and Installation Rules (SIRs) tell us about domestic EV charging?

In addition to the national rules, there are state based requirements known as Service and Installation Rules (SIRs). These documents are free to download and add additional requirements in the various state and territories applicable to EV charging. In particular, the SIRs address the maximum size of switched load that may be installed, which typically includes single phase EV chargers. For example, some of the states allow 32 A charger that could be installed whilst others cap the rating to 20 A.

Victoria

The [Victorian SIRs](#) do not have any specific section or discussion on EV charging. Section 6.5.3 deals with the phase imbalance and suggests that in most areas (which are served by three phase supply) connecting a single-phase load above 25 A between active and neutral conductors should not be done. This said, the clause is framed as advice rather than a mandated requirement, so at the discretion of the installing electrician, a 32 A EV charger can still be installed.

New South Wales (NSW)

Similar to the Victorian SIRs, the [NSW SIRs](#) do not have any specific section on EVs. Like the Victorian rules, section 1.17.2.3 of NSW SIRs provides guidance in the direction of limiting single phase equipment to 25 A. As was the case with Victorian SIRs, it is a guide, rather than a mandate. Therefore, there is still room for 32 A single phase EV chargers to be installed.

Tasmania

[Tasmanian SIRs](#) do not mention EVs and do not have sections limiting the size of switched loads or have a discussion on phase balancing. There is nothing stipulated in the Tasmanian SIRs stopping from the installation of 32 A EV chargers.

Australian Capital Territory (ACT)

[ACT SIRs](#) consider EVs in the context of grid exporting assets. The ACT SIRs lump them in with other forms of generation in cases where they are intended to export to the grid, but do not specifically reference them otherwise.

Section 6.1.3 and table 8 specify that single phase equipment being switched on/off not more frequently than four times per hour (which would typically define an EV charging equipment) is acceptable at 25 A. This could be read to imply that a 32 A EV charger is not acceptable, but it is not very clear.

Northern Territory

Under the section 4.2.2.1 of [Northern Territory's SIRs](#), similar to ACT's SIRs, the single phase equipment cannot switch on and off more than four times per hour. And clearly stipulates that the rule limits single phase current to 25 A. This would be applicable in case of EV charging equipment as well.

Queensland

In section 4.2 of [Queensland's SIRs](#), maximum size of single phase equipment connected to the supply is addressed. For single phase equipment, the limit is 20 A on an uncontrolled circuit (i.e., general supply will be available whenever it is desired). However, it is increased to 35 A on a controlled circuit (i.e., where network will have the ability to turn it on or off at different times of the day). And it is made clear that this also applies to the EV charging equipment.

South Australia - changes

In the section 6.2.7 of [South Australian SIRs](#), 20 A is specified as the maximum single phase switched load that can be installed. It is explicitly mentioned and stated that an exemption for EV chargers may apply if approval is sought through SA Power Networks [SmartApply](#) application process.

Western Australia

Section 10.11.6 of [Western Australian SIRs](#) specifically covers EVs. The subsection 10.11.6.1 makes it clear that the single-phase chargers with residential settings shall be limited to 20 A only.

Next steps

If you'd like to discuss these matters further with the EVC, or enquire about becoming a member, please reach out to us at office@evc.org.au.