MIDDY'S
TechEnergy

EV Charging FAQs

Electric vehicles are a growth industry throughout the world and how they are charged is increasingly a topic of interest. When vehicles are parked for longer periods of time, such as overnight, they can be charged with AC, or in a short amount of time they can be quickly charged with DC. Middy's offers a complete range of electric vehicle chargers to suit every need, from low-cost home solutions to large DC Quick Charging. We also make installation easy by offering everything you will need upstream, enabling quick and simple implementation of the chargers.

AC Mini Plus

What upstream protections are required for the AC Mini Plus?
Since the AC charger can detect 6mA DC, the recommended upstream RCD is a 30mA Type A. There is currently no standard for the requirement of Type B RCD for RCD protection, unless you are in NZ, in which case you must follow the building code. In the absence of this, it falls to the manufacturer's recommendations and NHP recommends Type A.

Product	RCBO	MCB	RCCB
AC Mini Plus	DSRCB4030A	DTCB6140C	DSRCD24030A

As a safe installation practice and to support safe maintenance practice, NHP recommends an isolator is installed upstream of the AC Mini Plus.

Product	AC Mini Plus
AC Mini Plus	NL140L

Which EV charger is the most suitable for a home installation?
The AC Mini Plus is the best option for home use. It is a 230V 32A Single Phase AC charger that does not require the house to have three-phase power. It has internal dipswitches that allow the charger to limit how much current it requires so it can match how much the site can supply.

If you want to charge faster but your car cannot use three-phase AC, NHP recommends the DC Wallbox. This product has a significantly higher upfront cost but you will be able to charge at 25kW DC.

I need to charge my vehicle at work. Which EV charger would you recommend?
For AC charging, NHP recommends the AC Mini Plus (230V 32A Single Phase) with communications enabled. The communications portion is crucial for the installation of multiple AC Mini Plus units and for future proofing. With communications enabled, a load management system can balance the power required with how much power a site can provide.

Can I mechanically set the charger to have a lower output?
The AC Mini Plus has internal dipswitches, allowing you to set the current rating to match what the building can supply. The installation manual includes a guide on the dipswitch settings and the currents they can be set to: 6Amp, 8Amp, 10Amp, 13Amp, 16Amp, 20Amp, 25Amp and 32Amp.

Configuration	Max. Current Ratings	Configuration	Max. Current Ratings
000 	6A (Default)	100 	16A
001 	8A	101 	20A
010 	10A	110 	25A
011 	13A	111 	32A

What are the upstream protections required for the DC Wallbox?
For DC Wallbox upstream protection, NHP recommends the installation of a 3 pole 63A MCB and a 30mA Type A RCD.

	MCB	RCCB
DC Wallbox	DTCB6363C	DSRCD46330A

As a safe installation practice and to support safe maintenance practice, NHP recommends an isolator be installed upstream of the DC Wallbox.

Product	Isolator
DC Wallbox	ISO473MG

Can I configure the DC Wallbox to have a lower output?
The DC Wallbox can be configured to have a lower output using an online configuration tool to set the output of the unit to meet your requirements. The online tool also allows for integration with OCPP and the ability to set the maximum amount of power users can charge from the unit. To gain access to the tool, please contact your local Middy's representative.

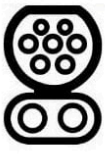
What is the difference between 22kW AC three-phase and 25kW DC
AC charging is limited by how much power an electric car can internally rectify. Most electric vehicles currently sold do not charge AC above single-phase charging at 32A. The current models that charge with 3-phase are: BMW i3 (up to 11kW), Renault Zoe and Tesla Model X and S. When a single-phase car is charged on 3-phase, there is no added benefit to the charging time as the vehicle can only convert up to 32A, 230V single-phase at a time, which is the maximum the car can handle

When charging with DC you do not need to worry about how much power the electric car can convert. DC charging bypasses the internal rectifiers of the car and puts power directly into the battery. This allows much higher amounts of electricity to be put into the vehicle. For example, a Delta DC Wallbox charges at 25kW for all fully electric vehicles on the market, compared to only the Renault Zoe and Tesla Model S and X, that can charge at 22kW three-phase.

Compatibility

What types of plugs are there?
For AC charging there are two plug types: Type 1 (J1772) and Type 2 (Mennekes). Type 1 is an American standard, while Type 2 is a European standard. For DC charging there are three plug types: CCS1, CCS2 and CHAdeMO. CCS1 is a combination of Type 1 (J1772) and Type 2 DC pins. CCS2 or Combo 2 is a Type 2 (Mennekes) plug combined with 2 DC charging pins. CHAdeMO is the Japanese DC charging standard.

In Australia, Tesla uses a proprietary modified Type 2 plug for both AC and DC charging. NHP AC chargers can be used seamlessly to charge a Tesla but NHP DC chargers (and any other non-Tesla brand) require a Tesla adapter to charge off CHAdeMO.

Slow (AC)	Fast (DC)	Combo
Type 1 ("J1772") (Japan/US) 	CHAdeMO (Japan/US) 	Type 1 CCS (Japan/US) 
Type 2 ("Mennekes") (Europe) 		Type 2 CCS (Europe) 

Will the Delta charging range work with my vehicle?
If the charger has either Type 1, Type 2, CCS1, CCS2 or CHAdeMO and the vehicle has the correct corresponding port, then it will work with every vehicle. This is distinct from Tesla superchargers, which only work on Tesla vehicles.

Load Management

Why would I need a load management system?

When you are installing one or two EV chargers, it is not a significant load on the building system at 7.36 kW or 32A at 230V. If you are installing a large number, for example 25, into an existing building and calculate based of the current AS/NZ3000 draft for maximum demand, you would need 800A of room on the switchboard. NHP views this as unnecessary as that switchboard would only be utilised for a small portion of the day. Instead NHP recommends using smart load management. The load management system factors in human behaviour, like everyone plugging in their vehicle when they get home. This creates a peak of demand for the EV charging, whereas later at night there is very little demand. A load management system allows the chargers to lower their output during peak demand.

Installation

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What are the standards that should be considered when installing an EV charger?

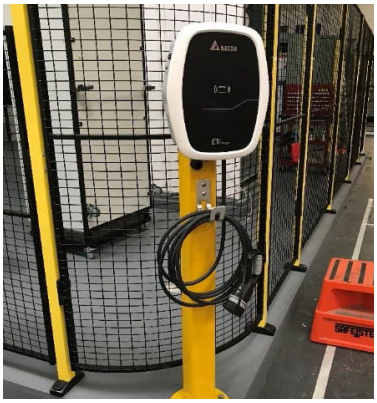
Beyond the requirements of AS/NZ3000, NHP's understanding is that this is not yet well defined within the industry. AS/NZ3000 June draft has content on EV chargers in segment P, but it is only informative.

NHP suggests consideration be given first to safety, by protecting to a degree against accidental destruction of the electrical asset by vehicles, and then to ergonomics/accessibility. Wall or post-mounted chargers should be mounted 1000-1200mm from the ground so they are unlikely to be driven into, while the plugs can still be easily reached from a wheelchair.

For floor mounted DC chargers, NHP recommends the installation of bollards to protect against accidental vehicle impacts. NHP recommends you follow "Building Code of Victoria Service & Installation Rules 2014" guidelines or follow your local regulations if this is not applicable.

Is there an alternative way to mount the AC Mini Plus and the DC Wallbox if there is not a wall available?

If there is not a wall available, you can mount the AC Mini Plus on a bollard. There is no defined standard for installation requirements but it will be like a traditional parking bollard, as seen below.



A freestanding post is available for the DC Wallbox (part number EVPEBKT02)

How are vehicles that use the charging stations billed for the electricity?

The monetisation of the provision of electricity is a topic with many answers and it is evolving all the time. That said, AC and DC are likely to be treated differently. The cost of the charging equipment and the value of the energy are much lower for AC and the equipment typically does not come with built-in credit card readers/NFC chips. Monetisation includes:

Indirect cost recovery: for example shopping centres and destination attractions often provide electricity to EV owners at no cost, offsetting it against increased spend in their facility.

As an added benefit of paid parking: if the parking space is already monetised, we expect the cost of the electricity to be structured into the cost of parking. The user will not want two separate transactions for parking and power and the operator will not see the value in the overheads associated with separate systems when it is comparatively easy to raise the existing price by 50 cents to one dollar per hour.

Time-of-use tariffs: when the charging equipment is in a private home the equipment runs through the existing energy meter and we expect time-of-use tariffs to be commonplace for EV owners.

Cloud-based billing for charging: if the parking is not monetised, and the owner of the charging equipment wants to monetise the provision of electricity, suitable solutions can be engineered. These include giving your money to an attendant who will activate the charger with a key or swipe card and app-based systems holding user credit card information that activate the charger directly over a cellular network. The monetisation of DC chargers is more common because the asset value and the value of the electricity provided in a single transaction are much higher.

In these cases, an app-based system is typically used, allowing users to authenticate themselves to the charger, with billing then applied to their credit card. In some cases, the charging equipment will have a credit card reader built-in. In Europe, networks of DC chargers are commonly operated by energy retailers.

By contrast, in the initial Australian experience, DC charging is being offered on the new Queensland Electric Super Highway free of charge to encourage uptake. The actual cost of the electricity expected to be provided over the first couple of years is likely to be a couple of orders of magnitude lower than the value of project execution. As far as NHP understands, the cost is effectively being absorbed as a project expense.

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