

IDEV

Electric Vehicle Chargers



Information Document.

Read about our range of EV chargers.

Our EV Chargers.

Temporary Electric Vehicle Charging Solutions. Our range of EV chargers are suitable for charging at remote locations, construction sites and festivals to meet the needs of a growing fleet of electric and hybrid vehicles.

AC vs DC charging:

AC uses an onboard charger to convert to DC.

This determines the charging capability, depending on vehicle. For instance, a Tesla Model 3 can charge at 11kWh maximum, even on a 22kWh charge point. For fast charging a DC charger is needed, which bypasses the onboard charger, and can deliver 100kWh + if the vehicle is capable.

Fast DC chargers are usually found at motorway services and petrol stations. AC charging is generally for destination charging such as work place, home and car parks.

Charging rates:

Although engineers understand Kilo Watt Hours (kWh), and charge rates, for many people the simple "miles per hour" or how many miles of charge can be achieved per hour of charge is more easily understood e.g 17 miles per hour. This is dependent upon the charge point capability and how fast the on board car charger is, the vehicle software often works this out for you, and tells you the "miles per hour" charge rate being delivered.

Single vs 3 phase:

Not all vehicles can take advantage of 3 phase charging, and certainly most plug-in hybrids are single phase only. Both systems use the same cable, it's the charger that determines what's available.

The advantage of 3 phase is up to 22kWh charging, if the vehicle is capable, but most can benefit from 11kWh (say 25 miles of charge per hour).

In a temporary installation where a generator may be used, 3 phase charging, even if limited to 16A per phase (11kWh), helps to balance phase loads which is better for the generator.

IDE recommends 16A 3 phase, or 32A 3 phase if a fast charge requirement is needed (again bear in mind most vehicles cannot use the full 22kWh).

An example of charging throughout the day:



Kangoo can charge at 7.4kWh, so achieves 28 miles per hour.

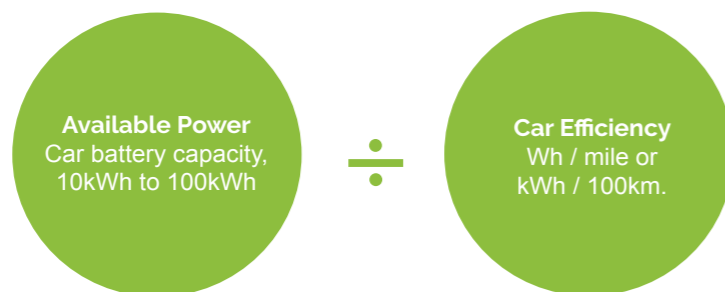


If the driver manages 10 minutes of charging 6 times a day, such as when loading/unloading, an extra 28 miles of charge can be gained.



A 30 minute lunch break gives 14 miles extra. Or 5 hours on site working means they could easily travel 90 miles to work, and 90 miles back, even with a battery capacity of 117 miles.

How far can I go?



To calculate distance, use the formula: 'battery size in kWh' / 'Wh per mile'.

E.g Renault Kangoo ZE, 31kWh battery, 265 Wh per mile, so 117 miles typical. Of course like a petrol or diesel car, range depends on how fast you drive, acceleration etc. Batteries are also affected by temperature, so on cold days range is less than warm days.

Charger functions:

When the vehicle is plugged in, the charger goes through handshaking with the car to determine:

- > Cable size
- > Charge point capability
- > Charging rate of the vehicle
- > Earth continuity

The charger then sets its maximum allowable charge rate, to ensure no overloading of the cable or power supply.

There are a few connector types available such as CHAdeMO & CCS. CCS is most commonly used in Europe, and is pretty much the standard now.

It supports both AC and DC fast charging in a single connector. Faster chargers (DC) tend to have tethered cables, whereas AC chargers tend to use the vehicle owners own cable.

For temporary applications IDE recommends a socketed charger and vehicle owners cable, which prevents cable damage causing chargers to go out of use, and is less prone to vandalism.

PEN and DC 6mA Protection Regulations:

EV Charger installations rely on a protected Earth and Neutral scheme (PEN). When the PEN conductor is broken the neutral voltage can rise with respect to true earth and the normal protective earth forms the return path for any current that could flow.

For an EV charger this means that the body of the car forms the return path, presenting a real risk that anyone touching the car will get an electric shock. This is why the 18th Edition of the wiring regulations (BS7671:2018) tightened up the rules under clause 722.411.4.1 on the installation of EV charge points for domestic installations.

All IDE chargers have a protection circuit that detects a PEN fault and disconnects the charger output, protecting the user and removing the need for Earth spikes at the temporary charge point.

The nature of battery charging using AC to charge DC batteries can create DC current feedback affecting standard RCD circuits. This may cause the RCD to lock up and not provide protection for earth leakage faults. The 18th Edition rules require an installation to monitor for DC currents above 6 mA, and if detected switch off the charge current.

All IDE chargers have a 6 mA DC detection circuit ensuring they comply with the standard when connected to a basic Type A RCD / RCBO.

IDEV Onsite EV Charger

IDEV Onsite is a robust and easily mountable temporary EV charging point for the challenging construction and industrial environment.

Robust design with easy on site mounting with clamp plate. With charging rates up to 32A, single or three phase (7.4kWh or 22kWh), vehicles can be conveniently and quickly charged whilst onsite, whether it's a quick top-up for visiting personnel or full vehicle charge.

Compatible with all European vehicles, the Type 2 connection is the most popular, covering BMW, Tesla, VW, Renault, Mercedes, Porsche, Hyundai and many others.



| Specification | Details |
|---------------|---|
| Input | 32A 400V 5 or 3 Pin IP67 Inlet or Hardwire with adaptable mounting plate. No protection – requires connecting to a 32A RCBO outlet. |
| Output | Type 2 Charging socket, 3 phase capable, locking pin for cable security, PEN and DC 6mA protection. |
| ON/OFF | Key switch to enable charging, three settings 'OFF', 16A or 32A |
| Mounting | 4 M5 studs and clamp plate. Clamp plate used for mounting to IDE SD range and on-site fencing /boarding etc. |
| Adapters | 32A 1 phase socket, 32A 3 phase socket, blanking plate for rear cable entry, gland plate for bottom entry hard wire |
| Dimensions | H160 x L245 x D165 (mm) |

IDEV Onsite + EV Charger

The IDEV Onsite + AC charging unit has been designed to charge electric vehicles from a temporary power source. Housed in a steel enclosure suitable for outdoors, this EV charger has 2 x type 2 charge sockets, for a selection of models to suit all input requirements. Portable charging unit for ease of use.

Up to 3 charge units, 6 charging points can be connected in line and powered from a single 63A 3 phase supply, or 6 modules with 12 charging points in "low power" mode.



| Specification | Details |
|----------------|---|
| Input | Optional configurations for 32A 3 Phase, 63A Single Phase, 63A 3 Phase and feedthrough 63A 3 Phase. |
| Output | 2 x Type 2 Charging socket, 3 phase capable, locking pin for cable security, PEN and DC 6mA protection. |
| ON/OFF | Lockable 4pole isolator, and charge current selector (16A or 32A) |
| Phase Selector | Phase selector switch to balance phases during set up. Three phase only. |
| Dimensions | H600 x W350 x D180 (mm) |

Choosing the right EV Charger:

*This is a fixed configuration to avoid potential overload

| Input Rating | Charge Rating (Amps) | Phase | kWh rating per socket | OnSite EV Charger (Single) | OnSite EV+ Charger (Dual) | Event EV Charger (Dual) |
|------------------|----------------------|--------|-----------------------|-------------------------------|---------------------------|-------------------------|
| 16A Single phase | 16A | Single | 3.7kWh | Yes | No | No |
| 16A Three phase | 16A | Single | 3.7kWh | Yes | *Factory set only x 2 | |
| | 16A | Three | 11.0kWh | Yes | No | |
| 32A Single phase | 16A | Single | 3.7kWh | Yes - switchable to lower amp | *Factory set only x 2 | |
| | 32A | Single | 7.4kWh | Yes | No | |
| 32A Three phase | 16A | Single | 3.7kWh | Yes - switchable to lower amp | Yes - switchable x 2 | |
| | 16A | Three | 11.0kWh | Yes - switchable to lower amp | *Factory set only x 2 | |
| | 32A | Single | 7.4kWh | Yes | Yes 2 x Sockets | |
| | 32A | Three | 22.1kWh | Yes | No | |
| 63A Single phase | 16A | Single | 3.7kWh | No | Yes - switchable x 2 | |
| | 32A | Single | 7.4kWh | No | Yes 2 x Sockets | |
| 63A Three phase | 16A | Single | 3.7kWh | No | Yes - switchable x 2 | |
| | 16A | Three | 11.0kWh | No | Yes - switchable x 2 | |
| | 32A | Single | 7.4kWh | No | Yes 2 x Sockets | |
| | 32A | Three | 22.1kWh | No | Yes 2 x Sockets | |

EV Versions - available:

| EV Version | Description | Notes |
|-------------|--|-------------------------|
| Onsite EV-1 | Single 7.4 kW - Type 2 EV Charger, 32A 1 phase, inlet supply, 16A charge limit selector | |
| Onsite EV-2 | Single 22 kW - Type 2 EV Charger, 32A 3 phase, inlet supply, 16A charge limit selector | |
| Onsite EV-3 | Single 7.4 kW - Type 2 EV Charger, 32A 1 phase hardwired supply, 16A charge limit selector | |
| Onsite EV-4 | Single 22 kW - Type 2 EV Charger, 32A 3 phase hardwired supply, 16A charge limit selector | |
| Onsite+EV-1 | Dual Port, 7.4 kW, 63/1 Incomer, 16A charge limit selector | |
| Onsite+EV-2 | 63/3in dual 22kW outputs, no feedthrough, 16A charge limit selector | |
| Onsite+EV-3 | Dual Port, 7.4 kW, 63/3 Incomer, Feedthrough, Phase Selector, 16A charge limit selector | |
| Onsite+EV-4 | 32/3in dual 7.4kW outputs, no feedthrough, 16A charge limit selector | L1+L2 or L2+L3 or L3+L1 |
| Onsite+EV-5 | 32/3in dual 11kW outputs, no feedthrough | |

Our EV Chargers are available to purchase or to rent.



For more information:

T: 01543 574 111

E: enquiries@idesystems.co.uk

www.idesystems.co.uk/idev