



Zaptec

EV Charging Systems

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1. Introduction

Zaptec EV charging systems: Technical requirements for tender processes

This document is intended for use in tender processes and project descriptions for both private and public procurements, general offers, and contracts. It outlines the technical specifications required to ensure compatibility and compliance with Zaptec's products and services. Zaptec accepts no responsibility for third-party use of this document or its contents.

Zaptec develops, and designs, its charging systems in Stavanger, Norway, while manufacturing takes place in both Stavanger and Germany, serving specific parts of the European market. All systems meet the highest safety and installation standards, providing efficient and scalable charging for housing cooperatives, car parks, and businesses, with an unwavering focus on quality, safety, and future-proof technology.



2. General requirements for EV charging systems

Electrical and mechanical characteristics

Specifications	Details
Charging mode	Mode 3 - standard for EV charging stations.
Socket type	Type 2 socket with shutters (T2S).
Power range	Power delivery from 1.2kW to 22kW.
Compatibility	Three-phase (3P+N / 400V) and single-phase (1P+N / 230V) connections.
Built-in protection	RDC-DD (6mA DC).
Current clamping	Adjustable current clamping in steps from 1A to 32A.
Protection rating	IP54 for ingress protection and IK10 for mechanical protection.
Temperature range	-30°C to 40°C, with automatic current reduction above 40°C to protect components.
Weight	The charger and its mounting system must not exceed 6 kg.
Power meter	MID class B certified. Displays total energy (kWh).

3. Compliance and standards

To ensure safety and quality, all chargers comply with the following standards:

- **Safety standards:** Compliant with the IEC 61851-1 series. This takes place at TÜV SÜD, Germany, which provides safety tests and approvals.
- **CE marking:** CE marking in accordance with Radio Equipment Directive 2014/53/EU and ROHS Directive 2011/65/EU.
- **ISO 15118 readiness:** Physically prepared for ISO 15118, Plug & Charge, and V2G, supporting future functionalities without the need for hardware updates. This means that Zaptec Pro is equipped to receive vehicle communication, such as charging status, departure time, and more.

These certifications ensure that the products are safe, environmentally friendly, and future-proof.

4. Installation requirements

Electrical connections and phase rotation

Requirements	Details
Electrical connections	No internal electrical connections. The connection system is separate from the charger for easy handling.
Phase rotation	Integrated dynamic phase rotation system for automatic power order alignment during charging.

Mounting options

The charging stations can be installed on walls or columns, depending on the project's needs. A backplate system, such as the Zaptec Pro Backplate, ensures a seamless setup and quick, secure installation.

5. Connectivity and communication

The charging stations offer robust connectivity options to ensure seamless integration into the infrastructure:

- **Independence:** Each charger operates independently, without relying on a master unit.
- **4G LTE-M:** Built-in e-Sim.
- **Wi-Fi 2.4GHz (Channel 1,6 or 11):** Standard integration.
- **Powerline communication (PLC):** Chargers can receive internet over the grid with a PLC module, which requires Ethernet to be connected to the module.

6. Metering and monitoring of consumption

Energy metering:

All charging stations have an integrated, MID-certified, and calibrated (EN 50470) electricity meter that measures power, voltage, and current from each charge point. A clear display shows the total kW delivered since the charger's first commissioning. Users can monitor real-time and historical power consumption, with detailed energy usage reports available via the connected cloud platform.

Remote monitoring:

Using a cloud-based portal, such as Zaptec Portal, it should be possible to remotely access consumption data, track usage, and generate detailed reports, ensuring complete control over the charging infrastructure.

Power guard:

By using additional power management devices, such as Zaptec Sense, the charging speed is dynamically adjusted based on real-time electricity usage data from the building.

7. Energy management of charging infrastructure

Energy management solution

A cloud-based energy management system enables charger control without the need for a physical installation of an additional device, such as a local energy management system.

Real-time power variation

Option to set and adjust maximum current limits for all chargers, accommodating fixed, scheduled, or variable conditions. It ensures flexibility for both individual sub-switchboards and the entire infrastructure.

Charger power adaptation

Charging power dynamically adjusts based on the connected vehicle's capacity and consumption. The system manages phase transitions and prioritises certain chargers, ensuring consistent performance across various electrical panel configurations.

- During three-phase charging, the system seamlessly switches between three-phase and single-phase modes depending on the electrical installation's constraints throughout the vehicle's charging cycle.
- For single-phase charging on a three-phase network, the charger automatically draws power from the least stressed phase, thanks to an integrated phase rotation system.
- Priority chargers can be designated to ensure a minimum charging intensity, allowing both priority and non-priority chargers to operate within the same installation.
- These rules apply whether chargers are connected to a single electrical panel or multiple panels.

8. Integration and accessibility

Third-party system integration

- **OCPP 1.6J protocol:** Standard protocol for communication between EV charging stations and third-party systems.
- **Webhooks:** Allows integration with third-party services for charge authorisation, payment processing, and other event-based notifications.
- **API:** Open API allows third-party integrations to request data and control charging stations and their installations.
- **Remote configuration:** Remote configuration through cloud systems, such as Zaptec Portal.

User identification and access

User access can be managed remotely through tools such as Zaptec Portal or a third-party supervision system. This configuration allows for defining user access for individual chargers, multiple chargers within a single installation, or chargers spread across different sites. It also enables session tracking and downloading detailed reports by users, stations, or installations.

Access can be managed via:

- RFID (MIFARE-classic) /NFC badge.
- Bluetooth connection (BLE 4.1).
- "Plug & Charge" (ISO 15118 ready).

9. Operation and maintenance

Remote management:

A cloud-based platform, such as Zaptec Portal, monitors, balances and optimizes the load between charging stations, while displaying real-time power usage. The platform makes it possible to access detailed charging reports, control user access, monitor charging status, receive maintenance alerts, and perform remote software updates.

Guarantee:

A 5-year guarantee should apply in the case of product defects or malfunctions. The guarantee period applies from the time the retailer's end customer purchases the product. The supplier should cover the cost of returns and repairs during the guarantee period.

Support:

Remote troubleshooting for chargers and local language support for installers and partners.