80kW-400kW All-in-one DC Charging Station - Official Technical Overview & Datasheet

EXECUTIVE SUMMARY

The next-generation 80kW-400kW All-in-one DC Charging Station represents a paradigm shift in distributed energy asset integration. Purpose-built for commercial & industrial (C&I) facilities, electric vehicle supercharging hubs, and micro-grid deployments, this unified solution merges high-power DC charging with embedded energy storage and intelligent power electronics. By enabling zero-carbon operations, on-site renewable self-consumption, and dynamic peak shaving, the system directly addresses the escalating grid capacity constraints and demand charge challenges faced by fleet operators and site owners.

Leveraging a modular, liquid-cooled architecture and Tier-1 LFP battery cells, the unit delivers up to 400kW of ultra-fast charging output while simultaneously performing grid support functions. The integrated Energy Management System (EMS) orchestrates seamless transitions between grid-tied and islanded modes, making it an ideal backbone for solar-storage-charging (PV-Storage-Charging) hubs. For utilities and site developers, this platform reduces transformer upgrade costs by 40% and enables participation in demand response programs, accelerating ROI through

both energy arbitrage and EV service revenue.

SYSTEM ARCHITECTURE & SAFETY

The system combines a high-voltage battery bank (Tier-1 Grade A LFP cells, UL 1973 certified), a bi-directional 1500V DC converter, and multiple 80kW-400kW DC charging dispensers in a single outdoor-rated enclosure. All power modules, battery packs, and control boards are housed within a NEMA 3R / IP55 chassis with independent liquid cooling loops. The LFP chemistry ensures zero thermal runaway propagation under normal use, supported by a three-layer fire suppression system: (1) cell-level pressure relief vents and ceramic separators, (2) module-level aerosol-based fire suppression, and (3) zone-level FM-200 release triggered by multi-point gas and temperature sensors. The thermal management system maintains cell delta-T below 5 °C across all operating

conditions, extending cycle life beyond 8,000 cycles at 80% depth of discharge.

KEY FEATURES

- Seamless grid transition (<20ms): The system incorporates a grid-forming inverter that enables uninterrupted power supply (UPS) functionality for critical EV loads during blackouts, with automatic resynchronization upon grid return.

- EMS smart dispatch with AI learning: The built-in Energy Management System predicts usage patterns based on historical charging data, weather forecasts, and time-of-use tariffs, optimizing charge/discharge schedules to minimize operational costs by up to 35%.

- Modular power expansion: The 80kW base module can be paralleled up to 400kW in the same enclosure (5 modules), allowing pay-as-you-grow capacity upgrades. Additional battery cabinets can be added externally without redesigning the charging core.

- Full PV-Storage-Charging integration: Native support for 1500Vdc PV input (up to 200kW) via MPPT channels, enabling direct DC coupling with solar arrays. Excess solar energy is stored or used for EV charging with a single DC/AC conversion step, raising round-trip efficiency to 94.5%.

- Vehicle-to-Grid (V2G) ready: With bi-directional charging capability, the unit can discharge energy from compatible EVs back into the site load or grid during peak tariff periods, creating an aggregated virtual power plant (VPP) asset.

COMPLIANCE & STANDARDS

The 80kW-400kW All-in-one DC Charging Station is fully certified for global deployment. Key certifications include UL 1973 (battery), UL 9540 (energy storage system), UL 9540A (thermal runaway propagation test), IEC 62619 (industrial battery safety), CE (EMC and LVD directives), UN38.3 (transportation), IEC 61851-23 (DC charging safety), and CHAdeMO 3.0 / CCS Combo 2 interface compatibility. The system also meets FCC Part 15 and IEEE 1547 grid interconnection requirements.

TECHNICAL SPECIFICATIONS

The following table summarizes the core electrical, mechanical, and environmental parameters for the 80kW to 400kW product family. All values refer to standard test conditions (25°C ambient, 100% SOC).

Parameter	**Specification**
DC Output Power Range	80 kW / 160 kW / 240 kW / 320 kW / 400 kW (field selectable)
Max Output Current	666 A (per 400kW unit, 1000Vdc / 1500Vdc platform)
Voltage Range (battery side)	600 V – 1500 Vdc (LFP battery pack)

Usable Energy Capacity	215 kWh (base) / 430 kWh (extended) / 645 kWh (max)
Battery Chemistry	Tier-1 LFP (Lithium Iron Phosphate), 8,000 cycles @ 80% DoD, 25°C
Cooling Method	Integrated liquid cooling (battery + power modules), -30 ° C to +50 ° C ambient
Round-trip Efficiency (DC-DC)	94.5% at rated power (excluding auxiliary loads)
Grid Connection	3-phase, 480V / 400V / 380V, 50/60 Hz, 0.99 PF adjustable
PV Input (optional)	2 x MPPT, 1500Vdc, 200kW max total, IP66 combiner box
Fire Suppression	Aerosol (module level) + FM-200 (zone level), dual gas/pressure sensors
Enclosure Rating	NEMA 3R / IP55 (indoor/outdoor), IK10 impact resistance
Communication	Ethernet, 4G/5G, Modbus TCP, OCPP 1.6/2.0.1, IEC 61850
Certifications	UL 1973, UL 9540, UL 9540A, IEC 62619, CE, UN38.3, IEC 61851-23
Dimensions (W x D x H)	1800 x 1100 x 2200 mm (80-240kW) /

	2400 x 1300 x 2400 mm (400kW)
Weight	2,800 kg – 5,500 kg depending on capacity