AC007 7kW AC EV Charger - Tier-1 LFP Hardware Deep-Dive and Performance Ledger

PRODUCT OVERVIEW AND TECHNICAL DATASHEET: AC007 7KW AC EV CHARGER

INDUSTRY POSITIONING AND CORE VALUE PROPOSITION

The AC007 7kW AC EV Charger represents a precision-engineered, grid-interactive charging solution designed for the modern commercial and residential ecosystem. Built upon a foundation of Tier-1 grade components and rigorous safety architecture, this unit delivers dependable, efficient, and smart charging for electric vehicles across workplace, hospitality, multi-dwelling, and private home environments. As a key element in a holistic energy management strategy, the AC007 integrates seamlessly with PV, storage, and building management systems to optimize self-consumption and reduce operational carbon intensity.

HARDWARE DEEP-DIVE AND SYSTEM ARCHITECTURE

The AC007 leverages a robust, IK10-rated polycarbonate and die-cast aluminum enclosure, ensuring longevity in both indoor and outdoor deployments. The internal architecture prioritizes thermal efficiency and electrical safety, featuring a dedicated residual current monitoring unit (RCMU) with 6mA DC leakage detection, eliminating the need for external Type-B RCDs and reducing installation complexity and cost.

KEY FEATURES

- Dynamic Load Balancing (DLB): Integrated CT clamp interface enables real-time adjustment of charging current based on site-wide electrical load, preventing main fuse trips and optimizing available grid capacity without costly upgrades.

- OCPP 1.6J & 2.0.1 Compliance: Full interoperability with all leading Charge Point Management Systems (CPMS) for remote monitoring, user authentication, billing integration, and smart scheduling.

- Integrated MID-Certified Energy Meter: Class B accuracy (± 1%) internal revenue-grade meter for precise energy billing, eliminating the need for an external meter and reducing hardware BOM.

- Smart Scheduling & Solar Matching: Built-in scheduler enables time-of-use (TOU) charging, and via external CT or inverter communication, allows dynamic diversion of solar PV surplus directly to the EV.

- RFID & App Authentication: ISO 14443 A/B compliant RFID reader for user access control, combined with Bluetooth and Wi-Fi connectivity for local commissioning and OTA firmware updates.

- Emergency Stop & Safety Lock: Front-accessible emergency stop button (red, 30mm) and a charging cable locking mechanism (electronically controlled) to prevent unauthorized disconnection.

SAFETY AND COMPLIANCE ARCHITECTURE

The AC007 incorporates multiple independent protection layers: over-voltage, under-voltage, over-current, short-circuit, residual current (Type A + 6mA DC), surge protection (Mode 2, Type 3 SPD integrated), and thermal monitoring on the relay contacts. The unit achieves a dual-rated ingress protection of IP65

(enclosure) and IK10 (impact resistance), guaranteeing operation from -30°C to +50°C with full derating above +40°C.

TECHNICAL SPECIFICATIONS

Parameter	**Specification**
Rated Power	7 kW (230V / 32A, single-phase)
Connector Type	Type 2 socket (IEC 62196-2) with electronic cable lock
User Authentication	RFID (ISO 14443 A/B), App, OCPP remote start
Communication Protocols	OCPP 1.6J / 2.0.1, Modbus TCP, MQTT, REST API
Integrated Metering	MID-certified Class B (± 1%) internal energy meter
Safety Protection	RCMU (6mA DC detection), Type A + 6mA DC, Over/Under Voltage, Surge (SPD Type 3)
Enclosure Rating	IP65 / IK10
Operating Temperature	-30°C to +50°C (derated >40°C)
Load Balancing	Integrated dynamic load balancing via external CT clamp

Certifications	CE, UKCA, IEC 61851-1, MID, ETSI EN 303 645

ELECTRICAL PARAMETERS

- Rated Power: 7 kW (single-phase)

- Rated Current: 32 A (adjustable 6A – 32A via DIP switch or app)

- Nominal Voltage Range: 230 V AC ± 10% (50/60 Hz)

- Output Voltage Range: 230 V AC (per phase)

- Power Supply: 1P + N + PE (L-N-PE)

- Standby Consumption: < 2 W (< 0.5W in deep sleep Eco-mode)

CONNECTOR AND CABLE

- Connector Type: Type 2 socket (IEC 62196-2) with shutter mechanism

- Cable Management: Optional 5m or 7.5m Type 2 tethered cable, or socket-only variant

- Cable Lock: Electronically controlled pin lock, unlock via RFID/App/CPO command

USER INTERFACE & COMMUNICATIONS

- Display: 2.0" monochrome LED status ring + 4.3" optional color touchscreen (SKU dependent)

- Connectivity: 4G (Cat 4, optional), Ethernet (RJ45), Wi-Fi 2.4 GHz (802.11 b/g/n), Bluetooth 5.0 (commissioning)

- Protocols: OCPP 1.6J (JSON), OCPP 2.0.1, Modbus TCP (local BMS integration), MQTT

- API: RESTful API for local integration via Home Assistant, Node-RED, etc.

MECHANICAL & ENVIRONMENTAL

- Dimensions (H x W x D): 380 mm x 260 mm x 145 mm

- Weight: 4.5 kg (socket version) / 5.2 kg (tethered, 5m cable)

- Enclosure Rating: IP65 (whole unit), IK10 (front panel)

- Operating Temperature: -30°C to +50°C (derating >40°C: linear to 16A @50°C)

- Storage Temperature: -40°C to +85°C

- Altitude: ≤ 2000 m (derating above 1000m, contact engineering)

- Relative Humidity: 5% – 95% (non-condensing)

- Overvoltage Category: CAT III

CERTIFICATIONS & COMPLIANCE

- EU: CE (LVD 2014/35/EU, EMC 2014/30/EU, RED 2014/53/EU), RoHS

- UK: UKCA

- International: IEC 61851-1 (2017), IEC 61851-21-2 (EMC), IEC 61000-6-1/3, IEC 62955 (RCMU)

- Meter: MID Directive 2014/32/EU (Class B, EN 50470-3), OIML R46

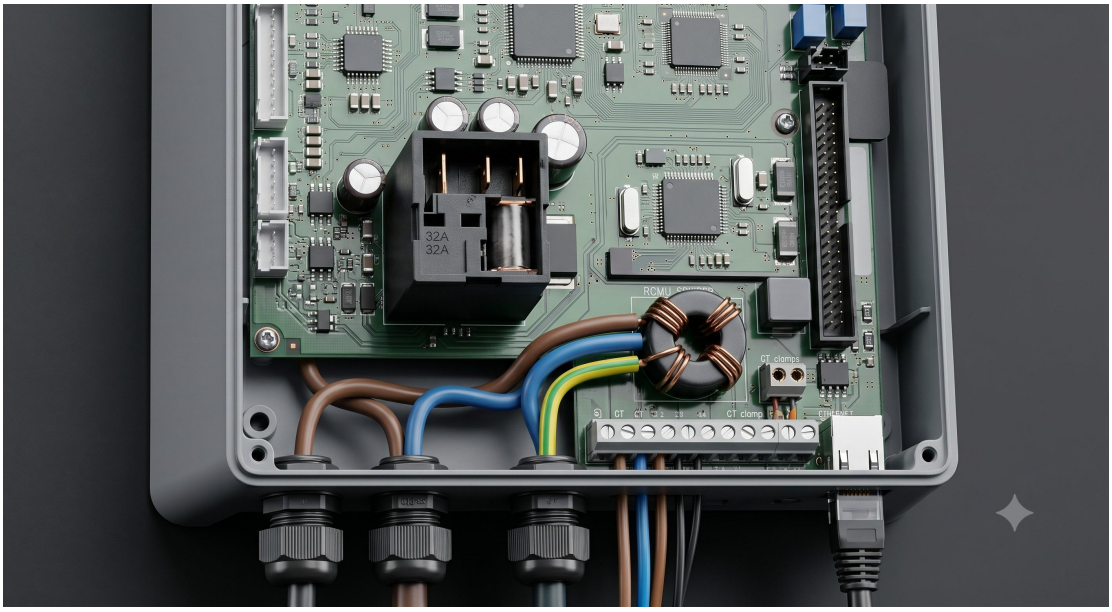
- Cybersecurity: ETSI EN 303 645 (IoT baseline compliance), OCPP security profile

INSTALLATION STANDARDS

- Mounting: Wall-mounted or pedestal/pole-mount (optional stand)

- Wiring: Rear or bottom cable entry (PG21 / M25 glands)

- Grid Connection: Dedicated 40A MCB/RCBO (Type A, 30mA) required upstream



DEPLOYMENT AND OPERATIONAL LOGIC

For optimal performance, the AC007 should be commissioned using the installer mobile application (Bluetooth). Post-commissioning, the device

operates in standard OCPP mode connecting to a central CPMS. In solar-matching mode, the unit's Modbus TCP interface polls a PV inverter's export power sensor every 200ms, adjusting the EV's charging current from 6A up to 32A to match available solar surplus, achieving up to 98% renewable self-consumption efficiency during daylight hours.

WARRANTY AND SUPPORT

Standard Limited Warranty: 3 years (extendable to 5 years upon online registration within 30 days of installation). Warranty covers manufacturing defects, including the RCMU, relay, and communication boards. Tethered cable wear and tear is excluded after 12 months. Global technical support via email, portal, and regional service centers (response within 4 business hours for critical issues).