

Comprehensive Step-by-Step Checklist for Home EV Charger Installation

Step 1: Assess Electrical Capacity

- ☐ **Check main fuse rating**
 - Identify if your home is **single-phase (1x25A/35A)** or **three-phase (3x25A/35A)**.
 - Confirm that the fuse rating can support both **existing household loads and the EV charger**.
 - ☐ **Calculate total household load**
 - List high-consumption appliances: oven, heat pump, dryer, induction cooktop, etc.
 - Sum their maximum simultaneous load to determine **available capacity** for the EV charger.
 - ☐ **Decide if upgrades are necessary**
 - If total load + charger exceeds main fuse rating:
 - Upgrade main fuse
 - Add sub-panel or secondary distribution board
 - Consider three-phase supply for faster charging
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Step 2: Select Charger Type

- ☐ **Determine desired charging power**
 - 3.7–7.4 kW (single-phase) for overnight charging
 - 11–22 kW (three-phase) for faster charging
 - ☐ **Select charger features**
 - Standard vs smart (app integration, scheduling, dynamic load management)
 - Compatibility with **future EV models**
 - ☐ **Verify certification and compliance**
 - CE-marked
 - Compliant with **NEN 1010, IEC 60364, NEN-EN 61851, NEN-EN 62196**
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Step 3: Inspect Fuse Box & Dedicated Circuit

- ☐ **Check for available breaker slots**
 - Ensure space for a **dedicated breaker** for the EV charger

- ☐ **Select correct breaker type and rating**
 - Breaker must match **charger current and phase type**
 - ☐ **Ensure dedicated circuit**
 - The EV charger should **not share a circuit with other appliances**
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Step 4: Plan Wiring & Cabling

- ☐ **Measure distance from fuse box to charger**
 - Longer distance may require **larger cable cross-section**
 - ☐ **Select cable type**
 - Appropriate copper/aluminium conductor size for **amperage and voltage drop**
 - Consider **armoured or weather-resistant cables** for outdoor or buried routing
 - ☐ **Plan conduit and cable protection**
 - Protect cables from mechanical damage, UV, water, and sharp bends
 - ☐ **Ensure proper earthing conductor**
 - Correct size and connection to main earth
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Step 5: Install RCD / Earth Leakage Protection

- ☐ **Select RCD type**
 - Type A + 6 mA DC detector (common for residential EVs)
 - Type B for industrial/high DC leakage
 - ☐ **Check for built-in DC protection** in the charger
 - If present, Type A may be sufficient
 - ☐ **Determine RCD placement**
 - Main distribution board vs integrated in the charger
 - ☐ **Schedule RCD testing**
 - Test every 3–6 months for proper function
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Step 6: Load Management

- ☐ **Choose dynamic or static load balancing**
 - Dynamic: adjusts charging current in real-time based on household consumption

- Static: sets a fixed maximum current for the charger
 - **Install CT clamps for dynamic balancing**
 - Attach around main phase wires in the fuse box
 - Monitor **total household load** and communicate with charger
 - **Verify smart charger compatibility**
 - Ensure charger can **interpret CT data** and reduce current automatically
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Step 7: Earthing & Grounding

- **Measure earth resistance**
 - Target <30 Ω for residential installations
 - **Bond charger metal parts to earth**
 - Prevents shock in case of insulation fault
 - **Install additional grounding rods if required**
 - Especially in areas with **poor soil conductivity**
 - **Confirm compliance** with NEN 1010 / IEC 60364
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Step 8: Choose Charger Location & Practical Setup

- **Proximity to parking spot**
 - Charger should reach the EV without excessive cable tension
- **Distance to fuse box**
 - Minimize cable length to reduce voltage drop and installation cost
- **Mounting type**
 - Wall-mounted: secure, space-saving
 - Freestanding: requires a stable base
- **Height & accessibility**
 - Typically 1.2–1.5 m from ground
 - Clear access for plugging/unplugging and maintenance
- **Weather protection**
 - IP54 minimum for outdoor, IP65 recommended for exposed locations
 - Consider a canopy or shelter for additional protection
- **Cable management**

- Hooks, reels, or conduits to prevent tripping hazards
 - ☐ **Future-proofing**
 - Leave space for additional EVs, higher power chargers, or energy storage
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Step 9: Permits & Compliance

- ☐ **Check with grid operator**
 - Confirm supply capacity and approvals for high-power chargers
 - ☐ **Municipal building permit**
 - Required for external mounting on protected buildings or public areas
 - ☐ **HOA/landlord approval** if in shared properties
 - ☐ **Equipment compliance**
 - CE marking, NEN/IEC standards
 - ☐ **Inspection & certificate of compliance**
 - Required for insurance and verification
 - ☐ **Notify insurance provider**
 - Ensure coverage in case of electrical fault
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Step 10: Budget & Cost Planning

- ☐ **Hardware costs**
 - Charger, smart features, load management, CT clamps
 - ☐ **Electrical upgrade costs**
 - Wiring, breakers, RCD, main fuse, sub-panel
 - ☐ **Labor costs**
 - Certified electrician, installation time
 - ☐ **Permits & compliance fees**
 - Grid operator, inspection, building permit
 - ☐ **Future-proofing costs**
 - Extra conduit, longer cables, higher-rated supply
 - ☐ **Ongoing costs**
 - Electricity, maintenance
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Step 11: Pre-Installation Review

- ☐ **Verify all components and upgrades** are ready
 - ☐ **Re-check cable routes, clearances, and mounting**
 - ☐ **Confirm permits and approvals** are in place
 - ☐ **Schedule installation with certified electrician**
 - ☐ **Review safety checklist** before first use
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Key Takeaways

- Following this checklist **step by step ensures safe, compliant, and future-proof EV charging.**
- Proper planning reduces the risk of **electrical hazards, RCD trips, or costly retrofits.**
- Integrating **load management, earthing, and smart features** ensures optimal charging efficiency.