Portable Mode 2 EV Charger — 16 A, Type 2

SORIVO Product Series: **IC-CPD** | Mode 2 · 16 A · 3.5 kW | Type 2 (IEC 62196-2) | CEE 7/7 mains plug | IEC 62752:2024



- Mains plug, CEE 7/7 — 16 A / 250 V
- Control box, PC + ABS, UL94 V-0, IP65
- Vehicle connector, Type 2 per IEC 62196-2, IP54
- Cable, TPU jacket, 3 × 2.5 + 2 × 0.5 mm²
- Status indication — power, charging, fault

APPLICATION

Mode 2 charging from an ordinary domestic socket: the control box sits in the cable and carries the protection that the socket behind it does not have. That is the whole point of the product — a household circuit was never designed for an eight-hour 16 A load, and the box is what makes the connection safe rather than merely possible.
Adjustable 6 / 8 / 10 / 13 / 16 A, Type 2 vehicle connector, single-phase.

CONSTRUCTION

Control box
PC + ABS, UL94 V-0, IP65

Mains plug
CEE 7/7 — fits CEE 7/3 (Schuko) and CEE 7/5 (French)

Cable
3 × 2.5 mm² power + 2 × 0.5 mm² signal, TPU

Vehicle connector
Type 2, L1 + N + PE plus CP and PP

Protection
Residual current, over-current, plug temperature, earth / PEN fault

WHY THE BOX IS IN THE CABLE

Under IEC 61851-1 a Mode 2 charge takes power from a **standard socket-outlet**, so everything an EV needs — residual current protection, over-current protection and the control pilot that tells the car how much current it may draw — has to travel in the cable. That is what IEC 62752 calls an IC-CPD, and it is why this is a protective device and not an extension lead.

STANDARDS

- **IEC 62752:2024** — in-cable control and protection device (IC-CPD) for mode 2 charging; the product standard
- **IEC 61851-1** — Mode 2 definition and the control pilot
- **IEC 62196-2:2022** — the Type 2 connector
- **IEC 62893** — the charging cable itself
- **CE marking** — an EU declaration of conformity (LVD, EMC, RoHS), not a third-party certificate

TECHNICAL PARAMETERS

Charging Mode
Mode 2 per IEC 61851-1

Input
220–240 V AC, 50/60 Hz, single-phase

Current
16 A maximum; adjustable 6 / 8 / 10 / 13 / 16 A

Output Power
3.5 kW at 16 A / 220 V; 3.7 kW at 230 V

Control Pilot
1 kHz ±12 V PWM; duty cycle announces the current

Residual Current
30 mA AC (Type A) + 6 mA DC detection

Enclosure
Control box IP65; vehicle connector IP54

Temperature
-30 °C to +50 °C operating

16 A	26.7 %	IP65
6–16 A adjustable	duty at 16 A	control box

THE PILOT WIRE IS THE PRODUCT

Table 1 — IEC 61851-1 announces current by duty cycle

CURRENT SETTING	PILOT DUTY CYCLE	POWER AT 220 V
6 A	10.0 %	1.3 kW
8 A	13.3 %	1.8 kW
10 A	16.7 %	2.2 kW
13 A	21.7 %	2.9 kW
16 A	26.7 %	3.5 kW

The car does not decide the current; the cable tells it. In the 10–85 % band **I = duty × 0.6 A**, so 16 A is 26.7 %. A charger that cannot state its duty cycle cannot prove what it offers.

SIX STATES ON ONE WIRE

Table 2 — the CP voltage tells both ends what the other is doing

CP VOLTAGE	STATE	MEANING
+12 V	A	No vehicle connected
+9 V	B	Vehicle connected, not ready
+6 V	C	Ready to charge, no ventilation needed
+3 V	D	Ready to charge, ventilation required
0 V	E	Short circuit or fault — no supply
-12 V	F	Charger not available

WHAT THE BOX WATCHES

Table 3 — five functions, one enclosure

FUNCTION	SETTING	WHAT IT PROTECTS
Residual current, AC	30 mA, Type A	Personnel — AC and pulsating DC
Residual current, smooth DC	6 mA detection	Type A core saturating on DC from the vehicle
Over-current	Above the selected setting	Cable and connector
Plug temperature	Cut-off ≈ 75 °C, resume ≈ 65 °C	A socket that is loose, tarnished or overloaded
Earth / PEN fault	Supply-side fault	A live chassis on a TN-C-S supply

Type A plus 6 mA DC is not the same claim as Type B. Type A is blind to smooth DC, which is what a vehicle's rectifier can produce; the 6 mA detector covers that gap. Together they behave like a Type B device, and some makers say so — the accurate description is the one in the table.

3.5 KW IS A CONDITIONAL NUMBER

Table 4 — the plug decides what the box is allowed to deliver

MARKET	PLUG	RATING	NOTE
Most of Europe	CEE 7/7	16 A / 250 V	Fits both CEE 7/3 (Schuko) and CEE 7/5 (French) sockets
Germany, Austria	CEE 7/4 into CEE 7/3	16 A / 250 V	The plug the 7/7 replaces — one market only
United Kingdom	BS 1363	13 A	Fused plug, 3.0 kW ceiling
China	GB 1002	10 A or 16 A, 250 V	Not compatible with CEE 7; needs its own version and GB/T 41589

16 A × 220 V is 3.5 kW on paper, and the plug is rated 16 A. Neither statement survives contact with a domestic installation unchanged: a 16 A circuit shared with a kitchen, a 1.5 mm² spur, or a socket that has been in the wall for thirty years will not carry it for a working day. The 10 A setting exists for exactly those sockets.

INSTALLATION NOTE

Read this before the first charge

- **16 A needs a dedicated circuit.** A circuit rated 16 A, in good condition, with nothing else drawing from it. Where that is not the case, select 10 A and accept 2.2 kW.
- **Never through an extension lead or a multi-way adaptor.** The adaptor is rated for a kettle, not for a continuous load, and it is the first thing to overheat.
- **Uncoil the cable.** A coiled cable under load is a heating element; the jacket is rated for the ambient, not for its own heat.
- **The earth has to be real.** The PEN-fault function protects a person touching the car, but it cannot supply an earth that the installation never had — a two-wire socket is not a charging point.

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