CONNECTION AND SETUP GUIDE

# Kit ECGSOLAX HVM 1.2kW 12V + POWINVER mini 12.8V 100Ah

Inverter ECGSOLAX HVM 1.2kW 12V + battery POWINVER mini 12.8V 100Ah 1280Wh



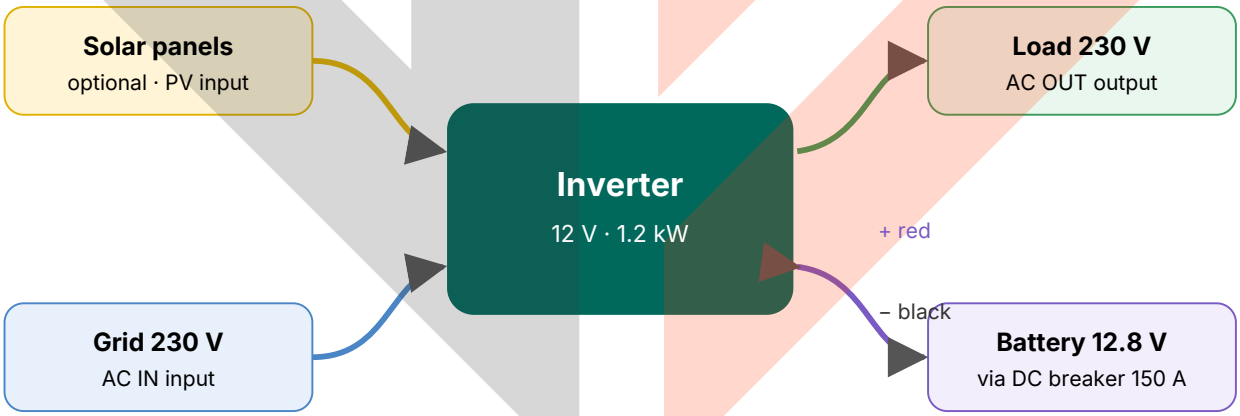

## Kit contents

- **Inverter ECGSOLAX HVM 1.2kW 12V**
- **Battery POWINVER mini 12.8V 100Ah 1280Wh**

## What else you will need

- Battery–inverter power cables 35 mm², M8 lugs
- DC breaker / fuse 150 A
- 16 A breaker, 3×1.5 mm² cable to the grid input
- Screwdriver, 13 mm wrench, multimeter

## Wiring diagram

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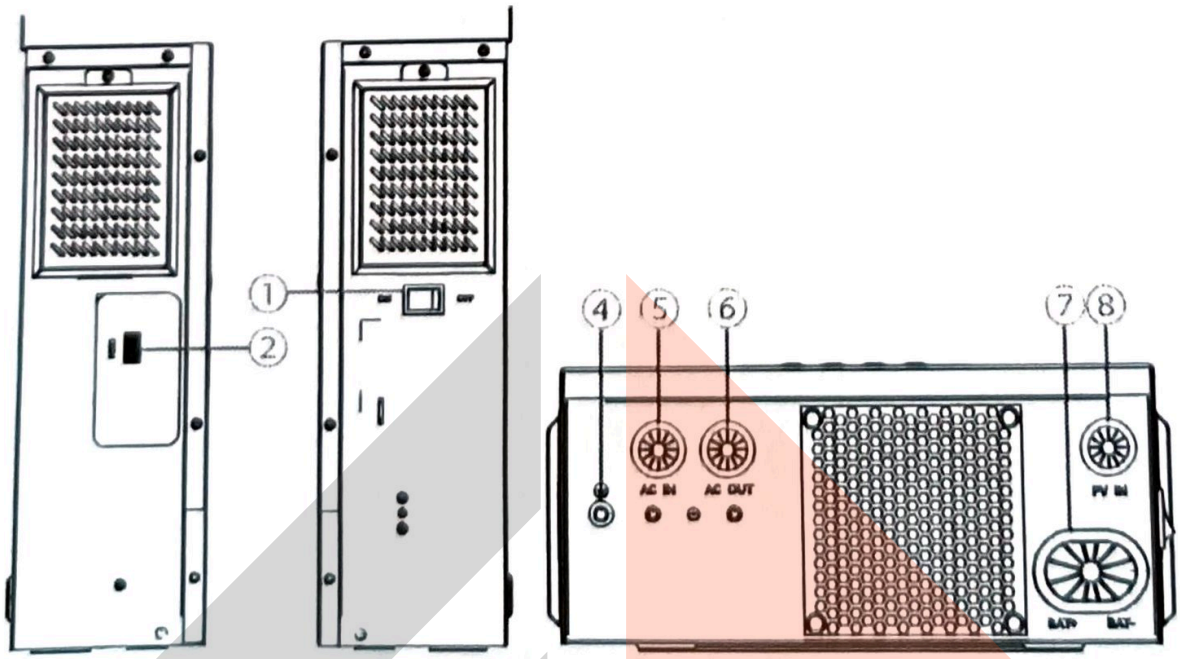
## Inverter connectors: side walls and bottom panel




| № | Connector | What it is | What connects where |
|---|---|---|---|
| 1 | **ON / OFF** | Inverter power switch (on the side panel) | Switch on after connecting the battery and its fuse |
| 2 | **COM** | Wi-Fi communication module port (optional) | The Wi-Fi module plugs directly into the port |
| 4 | **PE** | Case grounding point | Yellow-green wire with an OT lug for an M4 screw |
| 5 | **AC IN** | Entry for the grid / generator cable to the IN terminals (L, N) | 1.5 mm² cable via a separate 16 A breaker; do not confuse with the output |
| 6 | **AC OUT** | Entry for the 230 V output cable to the OUT terminals (L, N) | 1.5 mm² cable to the loads; do not connect the input and output N together |
| 7 | **BAT+ / BAT−** | Entry for the 12 V battery power cables | 35 mm² cable with tubular lugs; DC fuse or 150 A DC breaker in the “+” near the battery |
| 8 | **PV IN** | Solar panel cable entry to the PV+ / PV− terminals | 2.5 mm² cable via a separate 16 A DC breaker rated above 115 V DC; Voc up to 115 V, MPPT 17–115 V, up to 800 W |

There is no number ③ in the manufacturer’s figure. On some versions there is a BMS port next to the COM port (RJ45, RS485 or CAN): 1 — RS485B, 2 — RS485A, 4 — CANH, 5 — CANL.

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## Key values for this kit

| | | |
|---|---|---|
| **14.2 V**<br>charge voltage (20) | **13.6 V**<br>float voltage (21) | **12.0 V**<br>cut-off (19) |
| **CUS**<br>battery type (17) | **50 A**<br>max. total charge current (07) | **20–50 A**<br>grid charging (06) |

## Connection procedure

1. Mount the inverter vertically on a non-combustible wall in a dry place. Leave at least 20 cm of free space above and below for cooling.
2. Make sure everything is switched off: inverter button OFF, battery switch/button OFF, DC breaker off, 230 V grid not connected.
3. Install a **150 A** DC breaker or fuse between the battery and the inverter in the positive (red) wire.
4. Connect the power cables (cross-section at least **35 mm²**, M8 lugs): **red** from the battery "+" to the inverter "+ BAT", **black** from the battery "−" to "− BAT". Check the polarity twice: swapping "+" and "−" is guaranteed to damage the inverter.
5. Tighten the terminal bolts firmly (without stripping the thread) and fit the protective caps. A loose contact heats up and melts the terminals.
6. Switch on the battery (button or switch on the case, if any), then the DC breaker.
7. Switch on the inverter with the ON button. The battery voltage should appear on the display. Enter the settings from the table below.
8. Switch off the inverter and connect the 230 V grid to the **AC IN** terminals (L, N, PE) through a separate 16 A breaker.
9. Connect the load (your socket/distribution board) to the **AC OUT** terminals (L, N, PE). Never mix up AC IN and AC OUT: feeding grid power into the output damages the inverter.
10. If you have solar panels, connect them to the **PV** input last, observing polarity. The open-circuit voltage of the panels (Voc) rises in frosty weather: do not exceed the PV maximum on the inverter label.
11. Switch on the inverter and check: 230 V at the output, the battery charges from the grid (charging icon on the display), the lights stay on when the grid is off.

**Important: power from the battery.** The battery BMS is usually rated for 100 A continuous current (the exact value is on the battery label). That is ≈ **1.2 kW** of continuous load from the battery. The inverter delivers its full 1.2 kW when grid or solar power is available. If the battery "trips" during a power cut, reduce the number of powerful appliances switched on at the same time.

## Inverter settings

Menu access: hold the **ENTER** button for 2 seconds. Use ▲/▼ to select the program number, ENTER, change the value, ENTER to save. Exit: **ESC.**

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| № | Parameter | Value | Why |
|---|---|---|---|
| 01 | Output voltage | **230V** | Standard for Ukraine and Europe. |
| 02 | Output frequency | **50Hz** | Standard for Ukraine and Europe. |
| 03 | Output source priority | **GPb** (no panels) or **PbG** (with panels) | GPb: from the grid, battery kept full in case of a power cut. PbG: solar and battery first, the grid when they are not enough. |
| 04 | Input mode | **UPS** (grid) / **GEN** (generator) | UPS: fast switching for computers. GEN: power from a generator. |
| 05 | Charging source priority | **PNG** (solar + grid) | Charging from both solar and grid. |
| 06 | Grid charging current | **20–50 A** | Moderate grid charging, without overloading the wiring or the battery. |
| 07 | Maximum charging current (total) | **50 A** | Total solar + grid charging, safe for LiFePO4 100Ah. Do not set higher. |
| 09 | Auto restart after overload | **ON** | The inverter resumes operation by itself. |
| 10 | Auto restart after overheating | **ON** | The inverter resumes operation by itself. |
| 17 | Battery type | **CUS (**user-defined) | The voltages are set manually below. AGM / FLD are for lead-acid batteries only. |
| 20 | Charge voltage (CV) | **14.2 V** | Standard for LiFePO4 4S (12.8 V). |
| 21 | Float voltage | **13.6 V** | The battery is not overcharged when it stays on the grid for a long time. |
| 19 | Cut-off voltage | **12.0 V** | The inverter cuts the output before the battery reaches BMS protection. |
| 15 | Switch to grid | **12.5 V** | When discharged to this voltage, the load switches to the grid. |
| 16 | Return to battery | **13.4 V** | After recharging to this voltage, the inverter runs from the battery again. |
| 32 | Equalization charge | **OFF** | Not used for LiFePO4. |

Program numbers as in the ECGSOLAX HVM menu according to the manufacturer's manual. After entering the settings, switch the inverter off and on again.

## Which mode to choose

- **Backup during power cuts only (no panels):** 03 = GPb, 05 = PNG. The inverter runs from the grid and the battery is always full; when the power goes out it switches to the battery automatically.
- **You have solar panels and want to save:** 03 = PbG, 05 = PNG (or OPV — solar only). Solar power by day, battery at night, the grid only when the battery has dropped to 12.5 V.

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- **Running from a generator:** 04 = GEN, 06 = 20–50 A or less, so as not to overload the generator.

## How long it runs on battery

| Load | Example | Runtime |
|---|---|---|
| 100 W | router, lights, chargers | **≈ 10.4 h** |
| 200 W | fridge + lights | **≈ 5.2 h** |
| 300 W | fridge + lights + TV | **≈ 3.5 h** |
| 500 W | fridge, laptop, pump | **≈ 2.1 h** |
| 1000 W | boiler, kettle briefly, several appliances | **≈ 1.0 h** |

Approximate: 90% of battery capacity and inverter efficiency ≈90%. A fridge runs in cycles, so the real runtime is longer.

## Check after start-up

- Battery voltage on the display: ≈ 13.6–14.2 V when full, ≈ 12.5 V when discharged.
- Switch off the grid breaker: the load must keep running without interruption.
- After 10–15 min of operation, touch the terminals and cables: they must not be hot. If they heat up, a connection is loose or the cable is too thin.
- A battery below 11.5 V may have gone into BMS protection: charge it from the grid through the inverter.

**Safety.** Make all connections only with the battery, inverter and grid switched off. Do not short-circuit the battery terminals: the short-circuit current of LiFePO4 is very high. Do not install the inverter in a bathroom, outdoors in the rain or near flammable materials. If in doubt, contact an electrician.

## Shutdown and maintenance

- Switch off in reverse order: load → grid → panels → inverter → DC breaker → battery.
- Every 3 months, check that the terminals are tight and the ventilation openings are clean.
- If you do not use the kit for a long time, charge the battery to 50–70% and switch it off.

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