CONNECTION AND SETUP GUIDE

Kit ECGSOLAX 1kW 12V + POWINVER mini 12.8V 100Ah

Inverter ECGSOLAX 1kW 12V + battery POWINVER mini 12.8V 100Ah 1280Wh



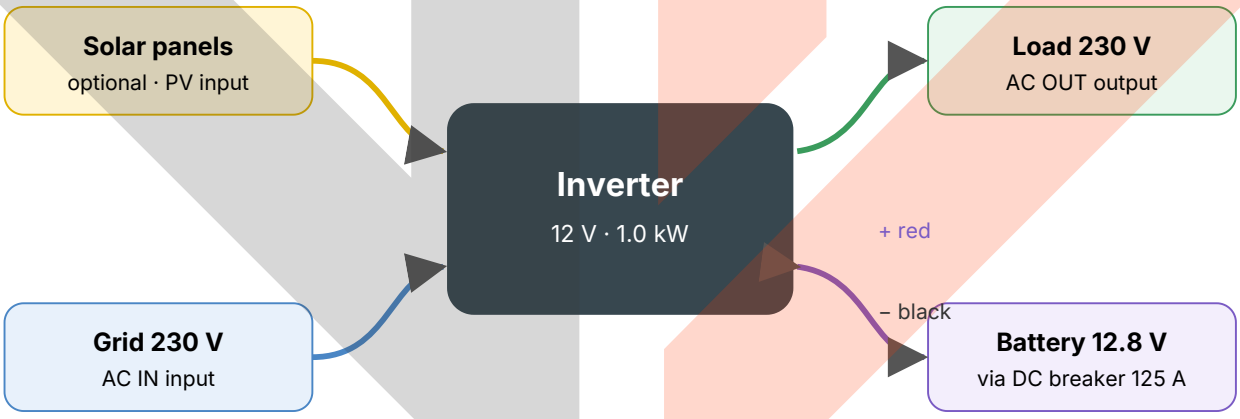
Kit contents

- **Inverter ECGSOLAX 1kW 12V**
- **Battery POWINVER mini 12.8V 100Ah 1280Wh**

What else you will need

- Battery–inverter power cables 25 mm², M8 lugs
- DC breaker / fuse 125 A
- 20 A breaker on the grid input
- Screwdriver, 13 mm wrench, multimeter

Wiring diagram



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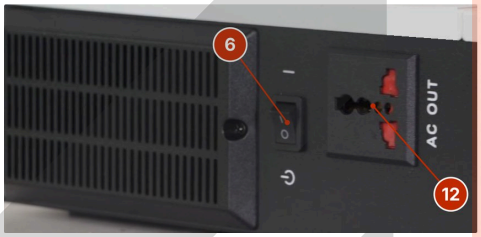
Inverter connectors: bottom and side panels





Бокова панель

№	Connector	What it is	What connects where
6	**Switch**	Switches the inverter on and off (on the side panel, ⏻ symbol).	—
7	**AC IN**	L · N terminals of the grid or generator input.	cable from the grid via a separate 20 A breaker
8	**AC OUT**	L · N terminals of the output to the loads. Do not confuse with AC IN.	cable to the load panel
9	**PV IN**	+ · − terminals of the solar panels.	cables from the panels via a separate DC breaker
10	**BATTERY**	Entry for the 12 V battery cables (+ · −).	battery cables via DC protection / isolator
11	**Breaker (INPUT BREAKER)**	Input breaker. If the inverter “does not see” the grid, check that it has not tripped.	—
12	**AC OUT socket**	Output socket on the side panel (the same inverter output).	appliance plug

Numbers 6–12 follow the parts list in the manufacturer’s manual (1–5 are the display, indicators and buttons on the front panel); the earth symbol next to the input breaker is the case earthing point.

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Key values for this kit

14.2 V charge voltage (26)	**13.6 V** float voltage (27)	**12.0 V** cut-off (29)
USE battery type (05)	**50 A** max. total charge current (02)	**20–40 A** grid charging (11)

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 **125 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 **25 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 20 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 1.0 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.

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Inverter settings

Entering the menu: hold the **ENTER** (or **SET**) button for 3 seconds. Use ▲/▼ to select the program number, press ENTER, change the value, press ENTER to save. Exit: **ESC**.

№	Parameter	Value	Why
01	Output source priority	**USb (**no panels) or **SBU (** with panels)	USb: grid first, the battery is kept full for power cuts; solar and battery supply power when there is no grid. SBU: solar first, then the battery, then the grid.
02	Maximum charging current (total)	**50 A**	Total charging from solar and grid together: 50 A. Charging from the grid alone is limited by program 11.
03	AC input voltage range	**UPS** (from the grid) / **APL** (from a generator)	UPS: fast switchover, computers do not restart. APL: if you run on a generator.
05	Battery type	**USE** (user-defined)	The battery has no communication with the inverter: the charge and cut-off voltages are set manually below. Do not select AGM/FLD: those are for lead-acid batteries.
06	Auto restart after overload	**LTE** (enabled)	The inverter resumes operation by itself.
07	Auto restart after overheating	**TTE** (enabled)	The inverter resumes operation by itself.
09	Output frequency	**50 Hz**	Standard for Ukraine and Europe.
11	Maximum grid charging current	**20–40 A**	Moderate grid charging so as not to overload the wiring and the battery.
12	Back-to-grid voltage (SBU mode)	**12.5 V**	When the battery discharges to this voltage, the load switches to the grid (if available).
13	Back-to-battery voltage (SBU mode)	**13.4 V**	After recharging to this voltage, the inverter runs from the battery again.
16	Charging source priority	**SNU** (solar + grid)	The battery charges from both solar and grid. Without panels, it charges from the grid.
26	Charge voltage (Bulk / CV)	**14.2 V**	Standard for LiFePO4 4S (12.8 V).
27	Float voltage	**13.6 V**	The battery is not overcharged when it stays on the grid for a long time.
29	Cut-off voltage (Low DC cut-off)	**12.0 V**	The inverter switches off its output so as not to drain the battery to zero and trip the BMS.

Program numbers follow this inverter manufacturer's manual. After entering the settings, switch the inverter off and on again.

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Compact 1 kW inverters may lack some menu items. Set the ones that are there; the main ones are battery type, charge and cut-off voltages, and charge current.

Which mode to choose

- **Backup during power cuts only (no panels):** 01 = USb, 16 = SNU. 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:** 01 = SBU, 16 = SNU (or CSO). Solar power by day, battery at night, the grid only when the battery has dropped to 12.5 V.
- **Running on a generator:** 03 = APL, 11 = 20–40 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.

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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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