CONNECTION AND SETUP GUIDE

Kit POWGROW SMS-5kW + DATOU BOSS 8kWh

Inverter POWGROW SMS-5kW 24V + battery DATOU BOSS 25.6V 314Ah 8.03kWh (RS485, Pylontech)



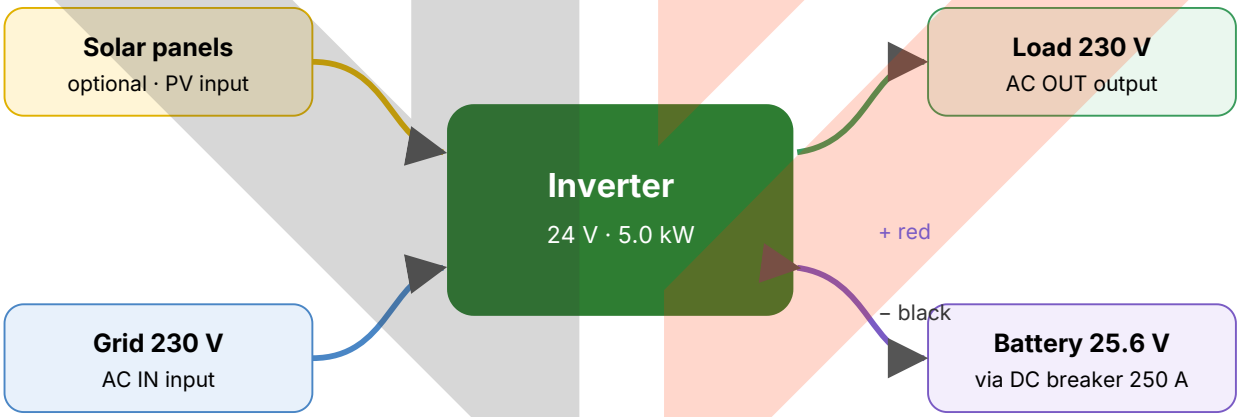
Kit contents

- **Inverter POWGROW SMS-5kW 24V**
- **Battery DATOU BOSS 25.6V 314Ah 8.03kWh**

What else you will need

- Battery–inverter power cables 50 mm², M8 lugs
- RS485 communication cable (RJ45), e.g. “Communication cable 1.3 m”
- DC breaker / fuse 250 A
- 32 A breaker on the grid input, cable 3×4 mm²
- Screwdriver, 13 mm wrench, multimeter

Wiring diagram



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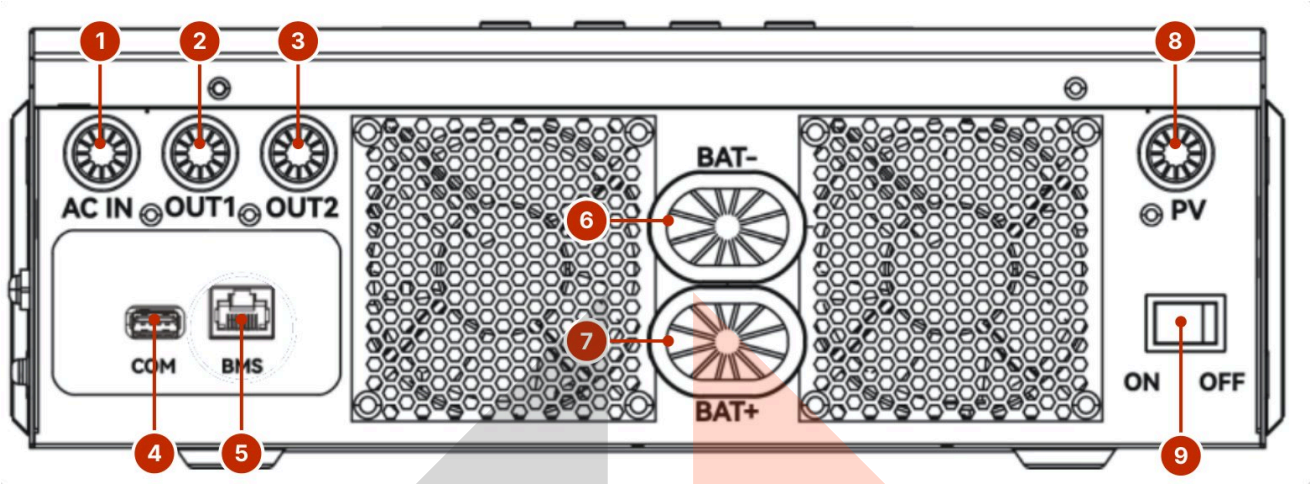
Inverter connectors: bottom panel



№	Connector	What it is	What connects where
1	**AC IN**	Grid or generator input (L, N, PE).	Cable from the grid through a separate 40 A breaker. A generator also connects here, item 04 = GEN.
2	**OUT1**	Main AC output 230 V.	Cable to the load panel (L, N).
3	**OUT2**	Second AC output. It can be switched off automatically by battery voltage, discharge time or SOC (items 38– 40).	Cable to less important loads (L, N).
4	**COM**	Communication port (USB connector).	The Wi-Fi module (dongle) plugs in here directly.
5	**BMS**	RJ45 port for communication with the lithium battery BMS, RS485 or CAN.	Communication cable from the battery BMS. Protocol: item 44. Inverter port pinout: 1 = RS485B, 2 = RS485A, 4 = CANH, 5 = CANL; straight-through cable.
6	**BAT–**	Battery “minus” cable entry.	Battery negative, 50 mm² cable.
7	**BAT+**	Battery “plus” cable entry.	Battery plus via a 250 A fuse / isolator.
8	**PV**	Solar panel cable entry to the PV+ and PV– terminals.	Panels via a separate DC breaker.
9	**ON / OFF**	Inverter power switch.	Switch on after all connections are complete.

The grid PE protective wire is connected first, on the inverter side (side wall figure in section 3.3 of the manufacturer’s manual).

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Key values for this kit

28.4 V charge voltage (20)	**27.2 V** float voltage (21)	**24.0 V** cut-off (19)
PYL BMS protocol (44)	**100 A** max. charge current (07)	**40–100 A** 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 **250 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 **50 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. Connect the battery and the inverter with the **communication cable** (RJ45): **RS485** port on the battery → **BMS / RS485** port on the inverter. Do not plug the cable into the CAN or WiFi port. For protocol settings, see "Battery communication".
7. Switch on the battery (button or switch on the case, if any), then the DC breaker.
8. Switch on the inverter with the ON button. The battery voltage should appear on the display. Enter the settings from the table below.
9. Switch off the inverter and connect the 230 V grid to the **AC IN** terminals (L, N, PE) through a separate 32 A breaker.
10. 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.
11. 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.
12. 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.

Battery communication: Pylontech protocol (RS485)

This battery has an RS485 port and "talks" to the inverter: the inverter sees the state of charge in percent (SOC) and takes the correct charge voltages and currents from the BMS by itself.

On the battery:

1. The Pylontech protocol is already set on the battery at the factory; nothing needs to be changed on the battery.
2. Battery address (ADD DIP switches, if present) for a single battery: all set to OFF (address 0/1 according to the battery manual).

On the inverter:

1. Program **17** (battery type) = **FEL,** program **44 (**BMS communication) = **PYL.**
2. Cable from the inverter **BMS / RS485** port to the battery **RS485** port.
3. Switch the inverter off and on. After 10–30 seconds the battery charge should appear on the display in **%.** If only the voltage or a communication error (alarm 56) appears instead of percent, check the cable, port and protocol.
4. Once communication is established, the inverter takes the charge (20, 21) and cut-off (19) voltages from the battery. The values in the table below are a fallback if communication is lost.
5. SOC thresholds with BMS communication (PBG mode): program **48 —** switch to grid, **47 —** return to battery, **46 —** shutdown at low SOC; recommended: **20%** switch to grid, **80%** return to battery.

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.**

№	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	**“Grid first”** (no panels) or **PBG** (with panels)	“Grid first”: from the grid, battery kept full for power cuts. 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	**40–100 A**	Moderate grid charging, without overloading the wiring or the battery.
07	Maximum charging current (total)	**100 A**	Total solar + grid charging, safe for LiFePO4 314Ah. Do not set higher.
17	Battery type	**FEL** (LiFePO4)	Lithium iron phosphate. AGM / FLD are for lead-acid only.
44	BMS communication (protocol)	**PYL**	Battery protocol; see “Battery communication”.
20	Charge voltage (CV)	**28.4 V**	Standard for LiFePO4 8S (25.6 V).

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21	Float voltage	**27.2 V**	The battery is not overcharged when it stays on the grid for a long time.
19	Cut-off voltage	**24.0 V**	The inverter cuts the output before the battery reaches BMS protection.
15	Switch to grid	**25.0 V**	When discharged to this voltage, the load switches to the grid.
16	Return to battery	**27.0 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 POWGROW SMS-5kW 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 = "Grid first", 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 for solar only). Solar by day, battery at night, grid only when the battery has dropped to 25.0 V.
- **Running from a generator:** 04 = GEN, 06 = 40–100 A or less, so as not to overload the generator.

How long it runs on battery

Load	Example	Runtime
100 W	router, lights, chargers	**≈ 65.1 h**
200 W	fridge + lights	**≈ 32.6 h**
300 W	fridge + lights + TV	**≈ 21.7 h**
500 W	fridge, laptop, pump	**≈ 13.0 h**
1000 W	boiler, kettle briefly, several appliances	**≈ 6.5 h**
2000 W	air conditioner, water heater, electric stove	**≈ 3.3 h**
4000 W	whole house, pump, power tools	**≈ 1.6 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: ≈ 27.2–28.4 V when full, ≈ 25.0 V when discharged.
- Switch off the grid breaker: the load must keep running without interruption.

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- 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 23.2 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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