USER MANUAL · ENGLISH

Inverter ECGSOLAX HVM 3.6kW 24V

Hybrid solar inverter 3.6 kW / 24 V, model **ECG-H** VM3.6K: description, installation, connection, operating modes, LiFePO4 setup, faults



This manual was prepared by the seller. Before installation check the label on the inverter case against this manual: values on the label and in the manufacturer's manual take priority. How to connect a specific battery: see "Connection: inverter + battery" on the product page.

1. What this device is

Hybrid (off-grid) inverter 3.6 kW for a 24 V system: pure sine wave inverter, MPPT solar charge controller and grid charger in one case. Works as a UPS for a house or cottage and as a solar station; can also run without a battery.

- Grid / generator input 230 V (AC IN)
- Solar panel input (PV IN), MPPT 40–450 V
- Battery 24 V: LiFePO4 25.6 V (8S), lithium NMC or lead-acid (AGM, flooded)
- 230 V output to loads (AC OUT)
- BMS port (RJ45, RS485 / CAN) and COM port for the comms module

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2. Technical specifications

Model	**ECG-HVM3.6K**
Rated power	**3.6 kW (3600 W)**
Battery voltage	**24 V DC** (LiFePO4 25.6 V 8S or 2×12 V lead-acid); recommended capacity from 200 Ah; operating range 20–30 V (per rating plate)
Output	230 V AC ±5 % (208 / 220 / 240 V possible), 50 Hz (or 60 Hz), pure sine; rated current 15.7 A
Grid / generator input	230 V AC; voltage limits (programs 22 / 23): APP and GEN low 90–154 V, high 264–280 V (factory 154 V / 264 V); UPS low 170–200 V (factory 185 V), high 264 V; max. bypass current (grid → load) 20 A
Solar panels (PV)	MPPT 40–450 V; start from 60 V; **Voc no more than 500 V;** max. PV power **5000 W,** max. PV current **18 A**
Charging current	solar + grid up to 100 A (program 07); from grid 2–100 A (program 06)
Running without battery	yes
Parallel operation	no
Operating temperature / protection	−10…+60 °C; IP21 (indoor only); protection class I: earthing mandatory
Battery comms	RS485 / CAN, RJ45 port “BMS”
Monitoring	COM port for the comms module (option); some versions have built-in Wi-Fi
DC breaker / battery cable	175 A / 35 mm², DT lugs
AC / PV breakers	25 A / 25 A DC rated above 500 V; AC and PV cables 2.5 mm²

PV power and current, battery voltage range, IP and bypass current are from the rating plate on the case. Peak power, efficiency, dimensions and weight are not given in the manufacturer’s manual.

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Inverter rating plate

Label on the case: model and main specifications.



3. Contents and location

In the box

- Inverter
- Manufacturer's manual
- OT lug with insulating sleeve for earthing

Prepare cables, breakers and M6 expansion screws separately. Check the contents against the box.

Where to install

- Vertically on a concrete or other non-combustible wall, in a dry room, at eye level
- At least 30 cm free on all four sides
- Ambient temperature −10...+60 °C, away from direct sun and moisture
- Two holes with a ϕ8 drill 160 mm apart, M6 expansion screws; hang the inverter by its top holes on the screws
- Close to the battery (short battery cables)

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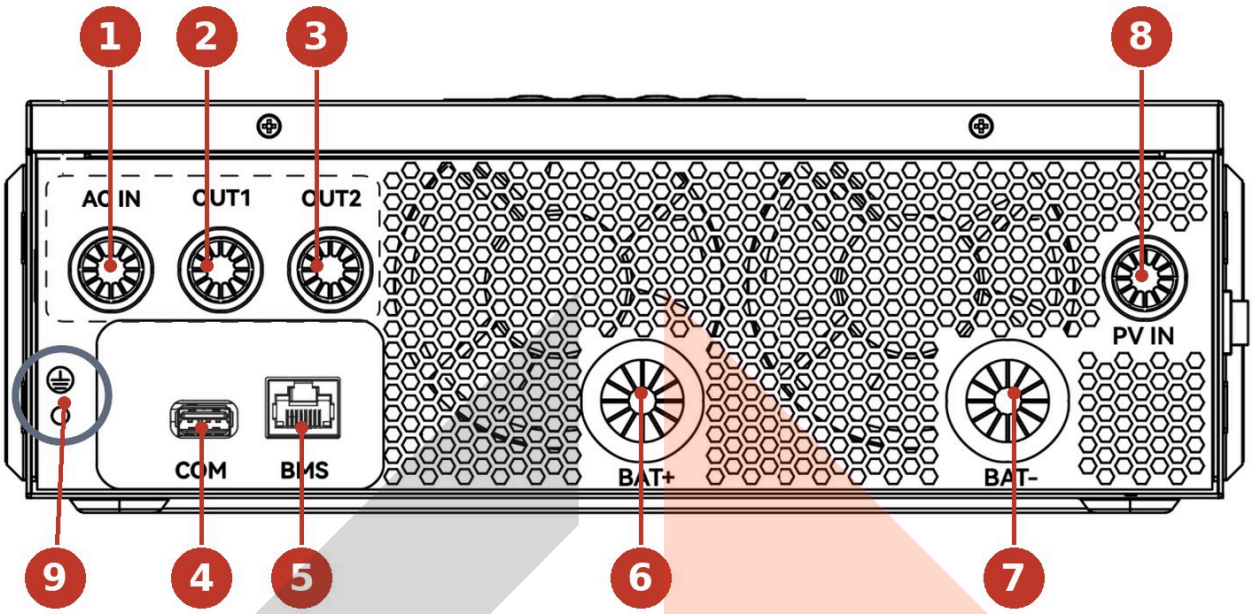
Inverter connectors: bottom panel



№	Connector	What it is	What connects where
1	**AC IN**	Grid / generator cable entry to the AC IN terminals (L, N, PE)	2.5 mm² cable via a separate 25 A breaker; PE first. Do not confuse with the output, do not connect the input and output N together
2	**OUT1**	Entry for the main 230 V output cable (terminals L1, N1)	2.5 mm² cable via a 25 A breaker to the load panel
3	**OUT2**	Entry for the second output cable (terminals L2, N2), not on all versions	2.5 mm² cable via a 25 A breaker
4	**COM**	Communication module port (USB connector) for monitoring	The communication module (optional) plugs directly into the port
5	**BMS**	RJ45 port for communication with the lithium battery BMS (RS485 or CAN)	Battery communication cable; pinout: 1 — RS485B, 2 — RS485A, 4 — CANH, 5 — CANL; program 17 = FEL, program 38 = battery protocol
6	**BAT+**	Entry for the battery positive cable 24 V	Red 35 mm² cable with a DT lug via a 175 A DC breaker
7	**BAT−**	Entry for the battery negative cable	Black 35 mm² cable with a DT lug
8	**PV IN**	Solar panel cable entry to the PV+ / PV− terminals	2.5 mm² cable via a separate 25 A DC breaker rated above 500 V DC; Voc up to 500 V, MPPT 40–450 V, start from 60 V
9	**PE**	Case grounding point	Yellow-green cable with an OT lug for an M4 screw; the PE core of the AC IN cable can be used

Some versions have only one output (OUT1); the ON/OFF switch is on the side wall.

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4. Wiring sequence

1. All breakers off, inverter switch (on the side wall) OFF. Remove the bottom cover (4 screws). Do not switch on any breaker until all connections are complete.
2. **Earth:** yellow-green cable with OT lug under an M4 screw at the earth point (the PE core of the AC IN cable can be used).
3. **Battery.** 35 mm² cables with DT lugs, via a 175 A DC breaker: red "+" to BAT+, black "−" to BAT−. Reversed polarity damages the inverter. Put nothing between terminal and lug.
4. **BMS comms cable** (if any): into the BMS port (RJ45). Inverter pinout: 1 RS485B, 2 RS485A, 4 CANH, 5 CANL; the cable must match the battery pinout. In the menu program 17 = FEL and program 38 = battery protocol (section 6).
5. **Loads:** to AC OUT terminals (L1, N1; on the dual-output version also L2, N2) via a 25 A breaker, cable 2.5 mm².
6. **Grid:** to AC IN terminals (L, N, PE) via a separate 25 A breaker, cable 2.5 mm². PE first. Do not mix up AC IN and AC OUT and do not join the input N and output N.
7. Solar panels: to PV+ / PV− via a separate 25 A DC breaker rated above 500 V DC, cable 2.5 mm². Check polarity with a multimeter; do not earth PV+ and PV−. String open-circuit voltage (Voc) allowing for frost below 500 V, operating within MPPT 40–450 V, start from 60 V.
8. Refit the bottom cover. Switch on the battery DC breaker, then the inverter ON switch, set up the menu (section 6), then grid, PV and loads.

Safety. Make connections with battery, grid and PV off; in daytime cover the panels with opaque material. Battery short-circuit current is very high. Installation is best left to an electrician. Air conditioners and fridges need a restart delay of 2–3 minutes: without it the inverter may switch the output off for overload.

5. Output priority and charge priority

Codes and program numbers as on the ECG-HVM3.6K screen per the manufacturer's manual.

Program 03 "OPP"	How it works	When to choose
Grd	Grid first: loads run from the grid, solar charges the battery; solar and battery feed the loads when there is no grid. Factory value.	Grid stable, backup matters most
PU	Solar first: if solar is not enough, the grid adds; battery when there is no grid and not enough solar.	Savings with panels, battery kept full
PbG	Solar → battery → grid. Switches to grid at low voltage or battery SOC (programs 15 and 41), back to battery when charged (programs 16 and 40).	Maximum own energy

Program 05 "CHP"	How it charges the battery	Code	How it charges the battery
PNG	Solar and grid together. Factory value.	**Grd**	Grid first.
OPu	Solar only (OPV in the manual), the grid does not charge the battery.	**Pu**	Solar first.

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6. Settings for LiFePO4 25.6 V with BMS

Hold **ENTER** 2 seconds to enter the menu; **UP / DOWN:** select, **ENTER:** confirm, **ESC:** exit. Set the battery type (17) first: voltages 15–21 are set for the chosen type.

№	Program (code)	What to set
01 / 02	Output (OPU / OPF)	230 V, 50 Hz
03	Output priority (OPP)	PbG: maximum solar and battery; Grd: if backup matters most
04	Input mode (nOd)	APP household appliances; UPS computers (transfer 10 ms); GEN generator on the grid input
05	Charge priority (CHP)	PNG (solar + grid) or OPu (solar only)
06	Grid charge current (ACC)	20–40 A (factory 40 A, range 2–100 A), no more than the battery allows
07	Max. charge current, solar + grid (nCC)	per battery data sheet (factory 60 A; 2/10/20...100 A)
17	Battery type (bAt)	**FEL:** LiFePO4 (factory AGn = AGM)
38	BMS link (bnS)	battery protocol: **PYL:** Pylontech (RS485 or CAN); GRO, VOL, IRO: RS485. Set the same protocol with the DIP switch on the battery. Without BMS cable: OFF
20	Charge voltage (bCV)	**28.4 V** (FEL factory 27.6 V, range 25–29 V)
21	Float voltage (bFL)	**27.2 V** (factory 27.6 V, range 24–28 V); must be below item 20
18	Low voltage warning (bAL)	**24.5 V** (factory 24 V, range 20.6–25 V): slightly above cut-off voltage
19	Low voltage shutdown (bAU)	**24.0 V** (factory 23.2 V, range 20–24 V)
15	Switch to grid (btG)	**25.0 V** (factory 24.8 V, range 20–25 V)
16	Back to battery (btb)	**27.0 V** (factory 26.6 V, range 23–29 V); FUL possible: only after full charge
39–41	By SOC, BMS link only (bSU / Stb / StG)	shutdown at 20 %, back to battery at 95 %, to grid at 50 % (factory); StG must be below Stb
29 / 34	Equalising charge (EQn)	OFF: not used for LiFePO4

With a BMS link, pages 12–17 appear on the screen: BMS voltage and current, temperature, SOC, capacity, CV point from BMS, BMS alarms. If the link is lost ERR flashes and warning 56 appears.

7. Maintenance

- Check terminal tightness every 3 months.
- Keep the ventilation openings and dust filter clean.
- Do not disassemble the inverter: dangerous voltage inside even after switching off. Servicing no sooner than 5 minutes after disconnecting all sources.

8. If something is wrong

Check the error code on the screen against the table in the manufacturer's manual (main codes in the table below). If the fault cannot be cleared, contact the seller.

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Codes on the ECG-HVM3.6K screen

Red indicator lit: fault (code with ERROR icon); flashing: warning “ALA nn”. After 6 failed auto restarts the inverter stays in fault: switch it off completely (until the screen goes dark) or wait 30 minutes.

Code	Meaning	What to do
02	Bus high voltage	PV string voltage (Voc) above 500 V: use fewer panels per string
03, 08	Low bus voltage / bus short circuit	Switch off the loads and restart; if that helps, too many high-inrush appliances
05	Overheating	Check the fan, clean the filter, 30 cm free space, no direct sun (ambient up to 45 °C)
06	High battery voltage	Check battery type (17) and charge voltages (20, 21)
12, 14, 29	Short circuit / overload / output overcurrent	Reduce the load (to 3600 W), check output wiring
26	BMS fault	See the error in the battery’s own app
ALA 50	Battery not connected	Check the DC breaker and battery terminals
ALA 51, 52	Low battery voltage	Charge the battery from grid or solar; check programs 18 and 19
ALA 55	Battery overcharge	Check battery type (17) and charge voltages (20, 21)
ALA 56	No BMS link	Cable in the correct battery port, battery DIP switch = protocol in program 38, pinout 1 RS485B, 2 RS485A, 4 CANH, 5 CANL
ALA 57, 58	Overheating / fan fault	Clear space around, check the fans; if it recurs, contact the seller
ALA 60	Overload above 102 %	Switch some loads off
ALA 61	Abnormal generator waveform	Program 04 = GEN; check the generator
ALA 68, 69	Low battery SOC (program 39)	Charge the battery; clears when SOC is 5–10 % above the threshold

Full code table: see the “Original manufacturer’s manual” on the product page.

9. Troubleshooting

What you see	Cause	What to do
Will not turn on	No battery voltage, DC breaker off, BMS in protection	Check the breaker and polarity, switch the battery on
Overload	Load power above 3600 W or high inrush current	Switch some loads off
Low battery voltage	Battery discharged, thin or long cables	Charge the battery, check the 35 mm² cables and terminal tightness
No solar charging	PV voltage outside the MPPT range, PV breaker off, program 05	Check string voltage (40–450 V), PV polarity and charge priority
No BMS link	Wrong battery type / protocol, different cable	Program 17 = FEL, program 38 = battery protocol, check the cable pinout
Does not switch to grid	Grid voltage or frequency out of range, generator	For a generator choose GEN in program 04; check limits in programs 22 and 23

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