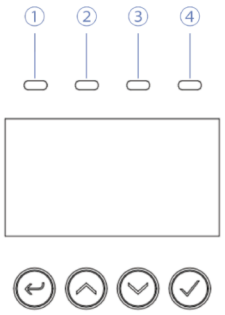
CONNECTION AND SETUP GUIDE

Hybrid inverter POWLAND SMS-6.5KP 6.5 kW 48 V

Connectors, cables, display menu (items 01–64), lithium battery setup, fault codes: based on the manufacturer's original manual



Control panel (figure from section 4.2 of the manufacturer's manual)

Control panel

Front panel: LCD display, four indicators (AC, INV, CHG, FAULT) and four buttons.

ESC	UP	DOWN	ENTER
exit the settings menu	previous item / value	next item / value	enter menu and confirm

How to change settings

1. Press and hold **ENTER** 2 seconds to open the settings menu.
2. Use **UP / DOWN** to choose the item number.
3. Press **ENTER** and choose the value with **UP / DOWN**.
4. Press **ENTER** to confirm or **ESC** to exit.

The inverter is switched on with the ON/**OFF** switch on the bottom panel, after everything is connected.



Most important: battery type is item 17.

For a lithium iron phosphate battery (LiFePO4) choose FEL, for ternary lithium LIt, for lead-acid AGM or FL d. BMS link: item 44. Item 05 is the charging source, not the battery type.

LEDs

Indicator	Steady	Flashing	Off
AC (green)	Grid normal, inverter runs from grid	Grid normal, but the inverter has not switched to it yet	Grid abnormal
INV (yellow)	Output fed from battery or solar in battery mode	—	Other states
CHG (yellow)	Battery in float stage	Battery charging at constant voltage (CV)	Other states
FAULT (red)	Inverter fault	Warning	Working normally

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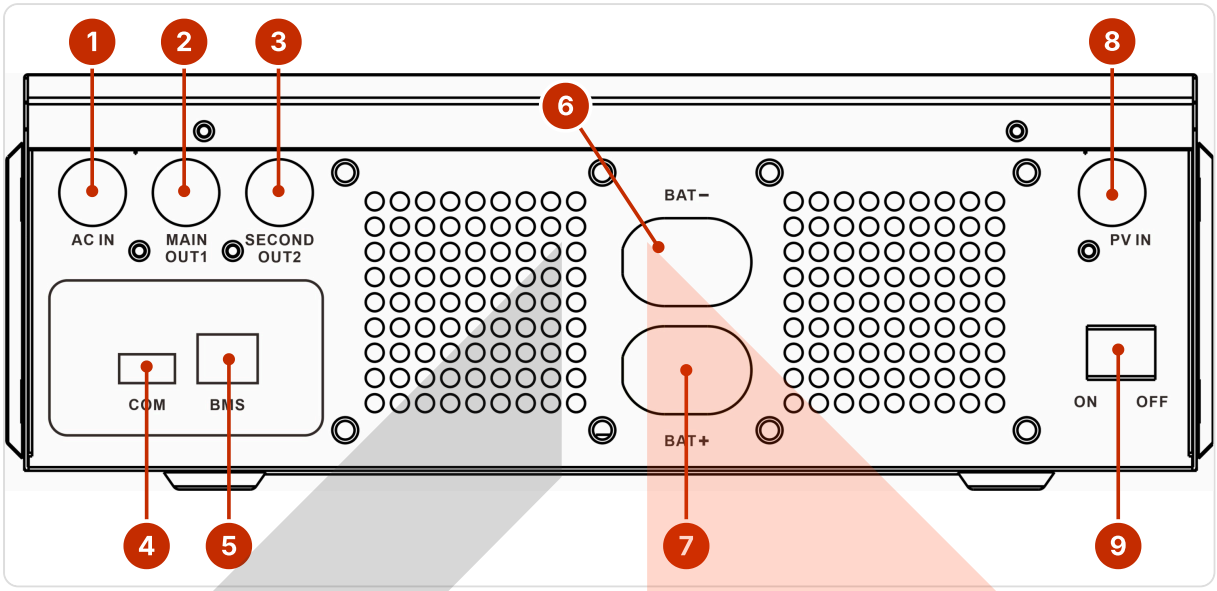
BOTTOM PANEL

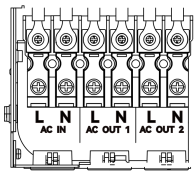
Inverter connectors: what goes where



Bottom panel figure from the manufacturer's original manual (section 3.5.2). Numbers in the figure match the table.

№	Label	What it is	What connects where
1	**AC IN**	Entry for the grid or generator cable	to terminals **AC IN L, N** under the cover; PE (yellow-green) to the earth screw on the side of the case
2	**MAIN OUT1**	Entry for the main output cable	to terminals **AC OUT1 L, N** → main loads panel
3	**SECOND OUT2**	Entry for the second output cable	to terminals **AC OUT2 L, N** → secondary loads; output switches off by voltage, time or battery SOC (items 38–40). Only on the dual-output model
4	**COM**	Communication port	the Wi-Fi module goes here if the model has external Wi-Fi (manual section 3.7)
5	**BMS**	RJ45 port for BMS communication	cable from the lithium battery comms port (RS485 or CAN); protocol: item 44
6	**BAT−**	Entry for the battery "minus" cable	to terminal **BAT−**, cable **35 mm² with DT lug**
7	**BAT+**	Entry for the battery "plus" cable	to terminal **BAT+**, via fuse / breaker 150 A
8	**PV IN**	Entry for the solar panel cables	to terminals **PV+** (red) and **PV−** (black), via a separate DC breaker
9	**ON / OFF**	Power switch	switches the inverter on and off

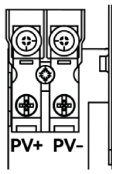
Terminals under the bottom cover



AC terminal block (left): AC IN, AC OUT1, AC OUT2



Battery terminals (middle): BAT+, BAT−



Panel terminals (right): PV+, PV−

Terminal figures from the manufacturer's manual; the cover is removed by unscrewing 4 screws. AC OUT2 on the dual-output model (single-output model has only AC IN and AC OUT1).

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Before connecting

Cables and protection (manufacturer's recommendations)

Section	Cable	Protection (manufacturer's recommendation)
AC input (grid / generator)	**6 mm²**	separate AC breaker **40 A** between inverter and source
Outputs AC OUT1 / OUT2	**4 mm²**	—
Solar panels (PV)	**6 mm²**	separate DC breaker between inverter and panels
Battery	**35 mm², DT lugs for 35** mm²	separate DC overcurrent protection / disconnector **150 A**

In a parallel system the manufacturer advises an input AC breaker with 300 mA leakage current.

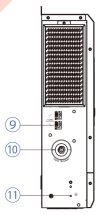
Key safety rules

- Decide in advance which system you have, **lithium or lead-acid battery:** with the wrong choice the system will not work properly.
- Connection is done by a qualified electrician; follow local rules. The inverter must be reliably **earthed.**
- Charge only deep-cycle lead-acid and lithium batteries. Never charge a frozen battery.
- In daytime cover the panels with opaque material during installation: their terminals carry high voltage. Do not earth PV+ and PV−.
- Do not switch on DC switches and breakers until all connections are complete. Before servicing disconnect all cables; start work at least 5 min after power-off.
- Do not short the AC output and DC input. Do not disassemble the inverter. Take care with metal tools near the battery: a spark or short can cause an explosion.
- **Do not join the input and output neutrals (N)** together: this can damage the inverter. Do not mix up input and output terminals.
- Air conditioners need 2–3 min to restart; without a start delay in the unit itself, a brief power loss can damage it.

Technical data

From the manufacturer's manual	
Nominal battery voltage	**48 V** (lead-acid or lithium)
Output voltage / frequency	**208 / 220 / 230 / 240 V, 50 / 60 Hz** (items 01, 02)
Grid voltage limits (items 22, 23)	APP / GEN: low **90–154 V,** high **264–280 V;** UPS: low 170–200 V, high 264 V
Grid / total charge current	up to **120 A** (items 06, 07)
Max. panel open-circuit voltage	**500 V**
PV charge start voltage	**80 V**
MPPT range	**60–450 V**
Grid feed-in	up to **6.5 kW** (item 37)
Battery discharge current	limit 10–140 A (item 61)
Operating temperature	**−10...+60 °C**

From the model specifications (not in the manual: check against the label)	
Rated / peak power	6.5 kW / 12 kVA
Max. panel current / power	27 A / 9000 W
Max. efficiency (battery)	94 %
Enclosure rating	IP21
Parallel operation	up to 9 inverters



Parallel (up to 9 inverters, items 27, 28, 30). Side wall per the KP datasheet: **9:** parallel ports, **10:** AC input breaker, **11:** PE. They are not in the manual's bottom panel figure: check your inverter.

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STEP-BY-STEP CONNECTION

Installation and connection

Step 1 Location and mounting

- Only vertically on a concrete or other non-combustible solid wall, at eye level (so the display is visible). Air temperature −10…+60 °C.
- Leave **30 cm** free above, below, left and right for cooling and cable routing.
- Drill Φ8 mm, two holes **160 mm** apart, plugs for M6 screws. Hang the inverter by its holes on the screws and fix it.

- Remove the bottom cover by unscrewing **4 screws.**

Step 2 Grid and AC outputs

1. Fit a separate AC breaker **40 A** between inverter and grid and switch it off.
2. Strip 12 mm of insulation, trim the conductor to 10 mm, crimp ferrules.
3. First connect **PE** (yellow-green) to the earth screw on the side of the inverter, then **L** (brown or black) and **N** (blue) to the **AC IN** terminals. Cable 6 mm².
4. Connect outputs **AC OUT1** (and **AC OUT2** if present) the same way with 4 mm² cable, observing L and N.
5. Check that all cables are tightened securely.

Step 3 Solar panels

1. Fit a separate DC breaker between inverter and panels and switch it off.
2. String open-circuit voltage must not exceed **500 V** and must be above the start voltage **80 V;** MPPT operating range 60–450 V.
3. Strip 12 mm of insulation, trim the conductor to 10 mm, crimp lugs. Cable 6 mm².
4. Check polarity with a tester and connect: + → **PV+** (red), − → **PV−** (black). Reverse polarity can damage the inverter (fault 18).

Step 4 Battery 48 V

1. Between battery and inverter fit separate DC overcurrent protection / disconnector **150 A.**
2. Cable 35 mm², two DT lugs for 35 mm²: strip 12 mm of insulation, trim the conductor to 10 mm, crimp.

3. Pass the cables through the BAT+ and BAT− holes in the bottom panel and tighten on the terminals. Put nothing between the flat part of the terminal and the lug (or it will overheat); apply anti-oxidant only after tightening.
4. Before the last DC connection check: **plus to plus, minus to minus.** The manufacturer advises battery capacity of at least 200 Ah; for lead-acid, charge current 0.3C.
5. Lithium battery: also an RJ45 comms cable into the **BMS** port, see the “Lithium battery setup” page.

Step 5 Finishing and switching on

Refit the bottom cover with 4 screws. Switch on the breakers and the **ON/OFF** switch on the bottom panel. Set item 17 (battery type), and for a lithium battery item 44 (BMS protocol).

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LITHIUM BATTERY SETUP

Lithium battery: type, BMS port, protocols

Only what is in the manufacturer's manual (sections 3.5.2, 4.2.2, 9)

1 BMS comms cable

A lithium battery has two connections: the power cable and the BMS comms port (RJ45). Power cable as in step 4. Plug the comms cable at one end into the inverter's **BMS** port (No. 5 on the bottom panel), at the other into the battery's comms port. Link: **RS485 or CAN;** the cable must be wired pin to pin to this inverter port pinout:

RJ45 pin	1	2	3	4	5	6	7	8
Inverter BMS port	**RS485B**	**RS485A**	—	**CANH**	**CANL**	—	—	—

2 Menu settings

1. Item **17:** battery type **FEL** (LiFePO4) or **LIt** (ternary). For the BMS link the manufacturer requires LIT or FEL.
2. Item **44:** the protocol your battery's BMS supports: **PYL** (PYLON, 485 and CAN), **GRO** (GROWATT, 485 and CAN), **CVT** (CVTE, 485), **VOL** (VOLTRONIC, 485), **IRF** (China Tower, 485), **PAC** (PACE RTU, 485).
3. Item **45:** BMS address: leave **AtO** (auto) or set your battery's address.
4. Once the BMS is connected, the inverter takes charge voltages (items 20, 21) from BMS data.
5. Control by state of charge (SOC): items **46** (shutdown at low SOC), **47 / 48** (grid ↔ battery switching in PBG mode), **40** (second output shutdown).
6. Items **63 / 64:** detecting a disconnected battery and lithium battery activation.
7. **Do not enable** equalising charge (items 31–35) for lithium batteries.

3 Check

Use UP / DOWN to view pages **P3–P8:** battery voltage, current, temperature, SOC, capacity. If they show **ERR** or the display shows **ALA 56:** there is no BMS link: check the battery port, the protocol DIP switches on the battery, the cable pinout and the selected protocol.

Default voltages for each battery type

When you choose the type in item 17, the inverter fills in these values. For LIT, FEL and CUS they can be changed (ranges in the item descriptions).

Item	AGM	FLD	LIT	FEL (LiFePO4)	CUS
15 switch to grid	46	46	47.6	49.6	47.6
16 return to battery	52	52	54.4	53.2	54.4
18 "low" warning	44*	44*	47.6	48	47.6
19 shutdown	42*	42*	46	42	46
20 CV charge	56.4*	58*	56.4	55.2	56.4
21 float	54*	54*	55.2	54.4	55.2

Default values in volts. *: not adjustable for AGM and FLD. Equalising (item 31): 58.4 V, lead-acid batteries only.

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DISPLAY

What the display shows

Display zones

Display zone	Shows
① **Battery**	Battery type (AGM / FLD / USER / Li-ion), charge stage (CC constant current, CV constant voltage, FLOAT), charge / discharge voltage and current; alongside: CV, FLOAT or end-of-discharge voltage (END)
② **AC input**	Grid icon, input mode UPS or APP (in GEN mode APP is shown), grid voltage and frequency
③ **PV input**	Sun icon, panel power, voltage and current
④ **AC OUTPUT**	Output voltage, apparent (VA / kVA) and active (W / kW) power alternating every 5 s, frequency
⑤ ⑥ **BATT / LOAD**	Battery charge and load bars (25–100 %); overload icon
⑦ **AC OUTPUT2**	Second output voltage
⑧ **Bottom line**	Information, menu item number and value, fault and warning codes
Other	Mute (crossed-out speaker); **Wi-Fi connected;** “grid + solar”: both icons lit; “solar first”: sun and grid icons with an arrow

Information pages (UP / DOWN buttons)

Page	Shows
P1	Solar yield for the day, kWh
P2	Total solar yield, kWh
P3	Lithium battery voltage and current
P4	Lithium battery temperature and SOC
P5	Rated and remaining lithium battery capacity
P6	Maximum charge voltage and minimum discharge voltage of the lithium battery
P7	Maximum charge and discharge current of the lithium battery
P8	Lithium battery warnings and faults
P9	Inverter firmware version

P3–P8 show ERR if the BMS link is broken, and are not shown if the BMS link is off (item 44 = OFF). If nothing is pressed for a long time, the bottom of the display shows the day’s solar yield.

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SETTINGS MENU · MANUAL SECTION 4.2.2

All display menu items

The display image shows values as in the example in the manufacturer's manual. Items 41–43, 49–60 and 62 are not in the menu; 27, 28, 30 only on the parallel model.

Output and operating modes



01 Output voltage

230 V by default. Options: 208, 220, 230, 240 V.



02 Output frequency

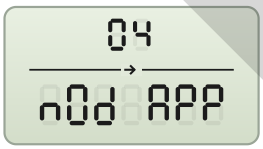
50 Hz by default. Options: 50 or 60 Hz.



03 Load supply source priority

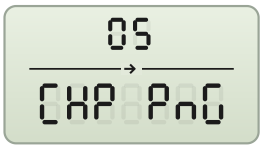
- **GPB: grid first** (default). The grid feeds the loads, solar charges the battery; if solar is too weak to charge, the grid charges the battery too. Without grid, solar feeds the loads, and if it is weak, solar and battery.
- **PGB: solar first.** Solar feeds the loads; surplus charges the battery. If solar is not enough, the grid is added. Without grid, solar and battery feed the loads.
- **PBG: solar, then battery, then grid.** If solar is low, the battery adds energy; if both are not enough, the grid feeds the loads and solar charges the battery. When the battery is charged enough, solar and battery feed the loads again.
- **MKS: generator first.** Generator + solar + battery: works like PBG. Generator with solar only or battery only: works like GPB.

In all modes: if there is no grid and solar plus battery are not enough, the inverter goes to standby and charges the battery.



04 AC input mode

- **APP:** household appliances (default), transfer typically 10 ms.
- **UPS:** computers and similar equipment, transfer typically 10 ms.
- **GEN:** generator on AC IN, transfer typically 20 ms. In GEN mode the display shows APP.



05 Battery charging source priority

- **PNG:** solar and grid charge together (default).
- **OPV:** solar charging only.
- **PVF:** solar first: with both solar and grid, solar charges; with grid only, the grid charges.

> Item 05 is the **charging source**, not the battery type. Battery type is item 17.

Charging current



06 Grid charging current

60 A by default. Options: 2, 10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120 A. 2 A only on the non-parallel model.

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07 Maximum charge current (solar + grid)

100 A by default. Options: 2, 10, 20 … 120 A in 10 A steps. 2 A only on the non-parallel model.

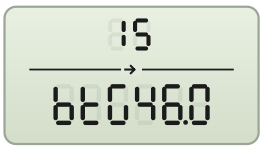
Battery



17 Battery type

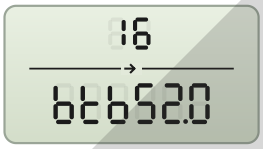
- **AGM:** lead-acid AGM (default).
- **FLd:** flooded lead-acid.
- **Lit:** ternary lithium.
- **FEL:** lithium iron phosphate (LiFePO4).
- **CUS:** user settings.

The type sets the values of items 15, 16, 18–21 (table on the “Battery setup” page). For AGM and FLD some voltages cannot be changed.



15 Battery voltage to switch to grid

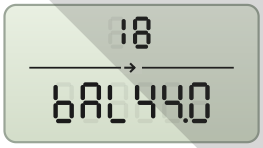
AGM / FLD	LIT	FEL (LiFePO4)	CUS
46 V 44–52 V	47.6 V 40–50 V	49.6 V 40–50 V	47.6 V 40–50 V



16 Battery voltage to return to battery mode

FUL: return to battery only after full charge.

AGM / FLD	LIT	FEL (LiFePO4)	CUS
52 V 48–58 V	54.4 V 46–58 V	53.2 V 46–58 V	54.4 V 46–58 V



18 Warning: low battery voltage

AGM / FLD	LIT	FEL (LiFePO4)	CUS
44 V fixed	47.6 V 41.2–50 V	48 V 41.2–50 V	47.6 V 42–54 V



19 Battery discharge cut-off

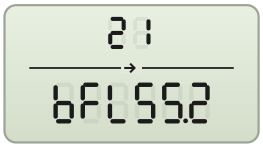
AGM / FLD	LIT	FEL (LiFePO4)	CUS
42 V fixed	46 V 40–48 V	42 V 40–48 V	46 V 40–48 V



20 Constant voltage (CV) charge voltage

AGM / FLD	LIT	FEL (LiFePO4)	CUS
AGM 56.4 V FLD 58 V fixed	56.4 V 48–60 V	55.2 V 48–60 V	56.4 V 48–60 V

CV voltage must be above float voltage (item 21). Without a BMS the inverter uses the set voltages; with a BMS connected, these values follow the data sent by the BMS.



21 Float voltage

AGM / FLD	LIT	FEL (LiFePO4)	CUS
54 V fixed	55.2 V 50–58 V	54.4 V 50–58 V	55.2 V 48–60 V

With a BMS connected, values follow BMS data.

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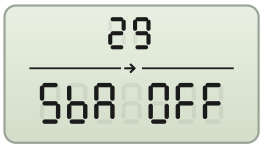


29 **Battery disconnect signal**

OFF by default: no alarm when the battery is disconnected. ON: the alarm is enabled.



61 **Maximum battery discharge current**

OFF by default: no limit. A value of 10–140 A (step 5 A) limits discharge current: exceeding it gives warning 60, and if it lasts 5 s, fault 14 (the inverter enters fault mode).



63 **Auto-detect disconnected battery / lithium battery activation**

ON by default: the inverter detects battery disconnection and activates a lithium battery itself. OFF: the inverter keeps the “battery disconnected” state and does not detect / activate.



64 **Immediate battery detection / lithium battery activation**

OFF by default. ON: the inverter detects / activates as soon as conditions are met, then the item returns to OFF by itself.

Grid and grid feed-in



22 **Grid voltage lower limit**

APP and GEN input modes: 90–154 V, default **154 V.** UPS mode: 170–200 V, default **185 V.**



23 **Grid voltage upper limit**

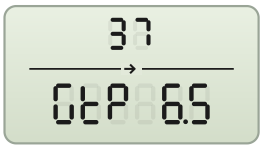
APP and GEN: 264–280 V, default **264 V.** UPS: always 264 V, fixed.



36 **Grid feed-in**

OFF: no export to the grid. **INT:** exports according to the priority in item 03:

- PGB, battery charged enough: while the grid is present, solar exports the maximum, surplus charges the battery.
- PGB, battery not charged enough: solar charges the battery first, surplus goes to the grid.
- GPB and PBG: while the grid is present, solar charges the battery at maximum, surplus goes to the grid.
- MKS: no export to the grid.



37 **Maximum grid export power**

6.5 kW by default, range 0–6.5 kW, step 0.5 kW.

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Lithium battery: BMS link and state of charge (SOC)



44 BMS communication

OFF by default. Choose the protocol your battery's BMS supports, and the inverter will receive battery data from the BMS:

CVT CVTE (485)	**PYL** PYLON (485 and CAN)	**GRO** GROWATT (485 and CAN)
VOL VOLTRONIC (485)	**IRF** China Tower (485)	**PAC** PACE RTU (485)

If the link fails after switching on, warning 56 appears and the inverter stops following BMS data.



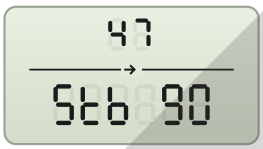
45 BMS address (BMS ID)

AtO (auto) by default: the inverter polls addresses from low to high and locks the first that answers correctly. **OVE:** the inverter polls all addresses and merges BMS data. Can be set manually 0–15 (on the display A–F = 10–15).



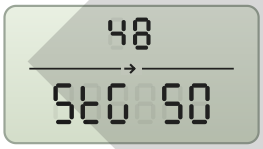
46 Low-SOC cut-off

Default **20 %,** range 5–50 % or OFF. When SOC in battery mode drops below the setting, the inverter shuts down with warning 68. Warning 69: when SOC is below the setting + 5 %. If the BMS link fails, the inverter ignores SOC and clears these warnings.



47 Grid to battery transfer at high SOC

Default **90 %,** range 10–100 % or OFF. In PBG mode the inverter switches from grid to battery only when SOC is above the setting **and** battery voltage is above item 16. OFF: no SOC-based transfer.



48 Battery to grid transfer at low SOC

Default **50 %,** range 10–90 % or OFF. In PBG mode the inverter switches to grid when SOC is below the setting **or** battery voltage is below item 15. If the value is above item 47, items 47 and 48 stop working.

Second output (AC OUT2)



38 Second output shutdown by battery voltage

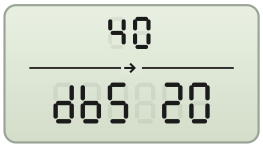
In battery mode the second output switches off when battery voltage drops below the setting and back on when it rises above the setting + 1 V per additional cell. Default **48 V,** range 44–60 V. If the setting is above CV voltage minus 1 V per cell, the reconnect voltage becomes the CV voltage.



39 Second output run time on battery

In battery mode the second output switches off when discharge time reaches the setting: 5–900 min. **FUL:** no time limit.

> The manual is inconsistent: the display image shows FUL, the text says "default OFF". Check on your inverter.



40 Second output shutdown by SOC

In battery mode the second output switches off when SOC is below the setting and back on when it is 5 % above it. Default **20 %,** range 5–90 % or OFF.

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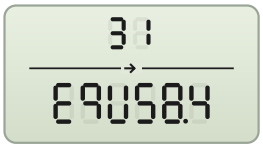
Equalising charge (lead-acid batteries only)



31 Equalization charge voltage

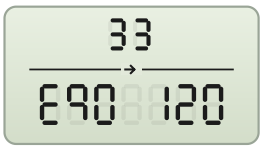
> Do not enable equalising charge for lithium batteries (manual section 8).

Default **58.4 V,** range 48–60 V.



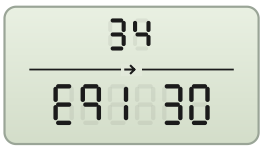
32 Equalization charge time

OFF by default: no equalising. Value 5–900 min, step 5 min: the inverter charges the battery to the voltage in item 31 and holds it to the end of the set time.



33 Equalising charge extension

If the time is up and the voltage in item 31 is not reached, charging is extended by this time; if still not reached, it returns to float. Default **120 min,** OFF or 5–900 min, step 5 min.



34 Equalization charge interval

How often to run equalising (in float stage): default **30 days,** 1–90 days.



35 Start equalising now

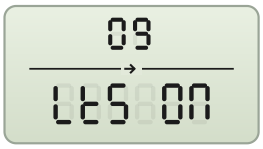
OFF by default. ON: in float stage (with equalising enabled and battery detected) equalising starts at once.

Display, buzzer and protections



08 Return to main screen

ON: if nothing is pressed for 1 min, the display returns to the first page. **OFF:** stays on the current one.



09 Auto restart after overload

ON by default.



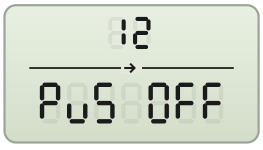
10 Auto restart after overheating

ON by default.



11 Grid loss alarm

ON by default: when the grid fails, the buzzer sounds for 5 s. OFF: silent.



12 Power saving mode

OFF by default; not available in parallel. ON: in battery mode with a load below 25 W the output periodically switches off and on; above 35 W it runs continuously.

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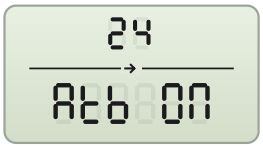
13 Switch to bypass on overload

OFF by default. ON: in PBG and MKS modes on overload the inverter immediately switches the loads to grid (bypass).



14 Silent mode

OFF by default. ON: the buzzer stays silent on any warnings and faults. Button sounds remain.



24 Backlight auto-off

ON by default: the backlight goes off after 1 min without presses.



25 Soft start

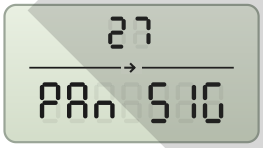
OFF by default. ON: output voltage ramps up smoothly from 0. Not available in parallel.



26 Reset to factory settings

Set ON: all settings return to factory defaults, then the item shows OFF again. Only possible with the ON/OFF switch on.

Parallel operation (parallel model only)



27 Parallel operation mode

SIG: single inverter (default). PAR: parallel on one phase; 3P1, 3P2, 3P3: phases R, S, T of a three-phase system. Set in grid mode or standby, not in battery mode. Factory reset does not change it. **The single version of the inverter has no such page.**



28 Parallel number (ID)

AtO (auto) by default or 1–9; two inverters cannot have the same number. Factory reset does not change it. The single version has no such page.



30 Parallel without battery

OFF by default: without battery, on solar only, inverters do not run in parallel (with grid they do). ON: parallel operation on solar only without battery.

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Faults and warnings

Faults (Err): the red FAULT indicator is lit

The inverter enters fault mode, the display shows a code, e.g. **Err 18,** the buzzer sounds for 10 s. The inverter tries to restart by itself; if it does not work after six attempts, switch it off completely (until the display goes dark) or wait 30 minutes. Codes 19–25 apply only to a parallel system.

Code	Meaning	When it occurs	When it clears
1	**Grid soft-start error**	During grid soft start the bus voltage does not reach the set value	15 s after the voltage is reached
2	**Bus overvoltage**	Bus voltage above the set value	15 s after the voltage is reached
3	**Bus low voltage**	Bus voltage below the set value	does not recover
4	**Battery overcurrent**	Battery current above the set value	does not recover
5	**System overheating**	Temperature above the set value or fan not connected	15 min after cooling and connecting the fan
6	**Battery overvoltage**	Battery voltage above the set value	15 s after voltage is back to normal
7	**Bus soft-start error from battery**	During start from battery the bus voltage did not reach the set value	15 s after the voltage is reached
8	**Bus short circuit**	Bus voltage below the set value	does not recover
9	**Inverter soft-start error**	During start the output voltage did not reach the set value	15 s after the voltage is reached
11	**Low output voltage**	In battery mode the output voltage is below the set value	15 s after the voltage is reached
12	**Output short circuit**	Output voltage below and current above the set values	15 s after back to normal
14	**Overload**	Load current above the set value (see also item 61)	15 s after back to normal
17	**Firmware update**	The inverter firmware is updating (including OTA)	after the update
18	**PV polarity reversed**	Solar panels connected with reversed polarity	15 s after correct connection
19	**Parallel: same ID**	Two identical parallel numbers in the system	when there are no duplicate numbers
20	**Parallel: link failure**	Link failure, the number of inverters in parallel dropped to 1	after parallel is restored or switch to single mode
21	**Parallel: different battery voltage**	Battery voltage difference between inverters too large	when battery voltage is equal on all inverters
22	**Parallel: different grid voltage**	Input voltage difference between inverters too large	when grid voltage is equal on all inverters
23	**Parallel: different grid frequency**	Input frequency difference between inverters too large	when frequency is equal on all inverters
24	**Parallel: different settings**	Different parallel modes on inverters, phase loss or an inverter in single mode	after setting modes or switch to single mode
25	**Parallel: sync lost**	Output voltage synchronisation lost	does not recover in parallel; after switching to single mode
26	**BMS fault**	The BMS message contains an error code	after the BMS fault is cleared

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Warnings (ALA): the red FAULT indicator flashes

The inverter keeps working, the display shows a code, e.g. **ALA 52.** The buzzer sounds every second for 1 minute.

Code	Meaning	When it occurs	When it clears
50	**Battery disconnected**	Battery disconnected (up to 10 min)	after battery connection and 2 min of charging
51	**Battery discharged to shutdown**	Battery voltage below item 19 (bAU): shutdown or cannot switch on	when voltage is above item 19 by 2 V
52	**Low battery voltage**	Battery voltage below item 18 (bAL)	when voltage is above item 18 by 2 V
53	**Short circuit while charging**	Battery voltage below 20 V with charge current above 4 A; not charging	does not recover
56	**No BMS link**	Link failure after enabling item 44	after the link is restored or the function is off
58	**Fan**	No fan speed signal; fan runs at full speed	when the signal returns
59	**EEPROM error**	Memory read or write error	does not recover
60	**Overload**	Output current above 40 A (or discharge current above the item 61 limit)	when output current is below 38 A
62	**Weak solar**	Solar only: PV power is below the load. Solar output to the load switches off, solar battery charging continues	after 10 min
64	**Parallel: different settings**	In standby: incompatible parallel mode; the inverter goes to standby	after correct parallel setup
68	**Low-SOC cut-off**	BMS reports SOC below item 46; the inverter goes to standby	item 46 or 44 is off, or SOC is 5 % above the setting
69	**Low SOC**	SOC below the setting + 5 % (grid or battery) or + 10 % (standby); the inverter stays in standby	item 46 or 44 is off, or SOC is 10 % above the setting
72	**Battery cannot start the inverter**	In standby the battery voltage is below the start threshold	when voltage is above the threshold
77	**Unstable grid**	Grid lost 3 times in 5 minutes	after 5 min

Troubleshooting (section 9)

Code	Event	What to check and do
Err 2	**Bus overvoltage**	Check whether the panel string open-circuit voltage exceeds the inverter maximum (500 V): if so, use fewer panels. In parallel: whether output voltage settings are the same on all inverters: if not, correct them.
Err 3	**Bus low voltage**	Disconnect the loads and restart. If it recovers, there are too many loads with inrush currents; remove some.
Err 5	**Overheating**	After cooling switch the output on and check the fan turns (if not, faulty fan or wiring). Clean the dust filter. Check free space over 30 cm around and air temperature (above 45 °C avoid direct sun). If the air guide plate has come loose, fix it with the manufacturer's plastic clips.
Err 26	**BMS fault**	Check the fault information in the battery management tools and fix the battery problem.
ALA 56	**No BMS link**	1) Cable in the correct battery port (there may be several). 2) DIP switches on the battery set for the protocol chosen in item 44. 3) Cable pinout matches the inverter BMS port: otherwise replace the cable. 4) The battery protocol is supported by the inverter: otherwise change the protocol. 5) To test, swap the battery or inverter: if it works, the comms hardware is faulty.
ALA 58	**Fan**	Remove foreign objects blocking rotation; check the fan connection; replace if damaged.
ALA 62	**Weak solar**	Check that panel power is normal; if it is less than the load, reduce the load.

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Monitoring via Wi-Fi

Wi-Fi What the manufacturer’s manual says

- The Wi-Fi module is either built in or connected as a separate plug-and-play device. With it the system status is visible from a phone or website anytime, anywhere (section 2).
- Model with **external Wi-Fi:** plug the Wi-Fi module (stick) straight into the **COM port (No.** 4 on the bottom panel): it connects to the cloud platform (section 3.7).
- Model with **built-in Wi-Fi:** see the short app guide (quick configuration guide) supplied with the inverter.

- When connected, the **Wi-Fi** icon is lit on the display.
- In a parallel system the Wi-Fi module can go on any one inverter, and data for the whole system goes through it; or on each inverter. If modules are on several inverters, those without a module do not send data (section 5.6).

The original manual gives no app name, QR code or step-by-step Wi-Fi setup. Use the app named on the leaflet or box of the Wi-Fi module supplied.

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