KIT CONNECTION GUIDE · IN ENGLISH

# 3-phase kit 19.5 kW + battery 18.4 kWh

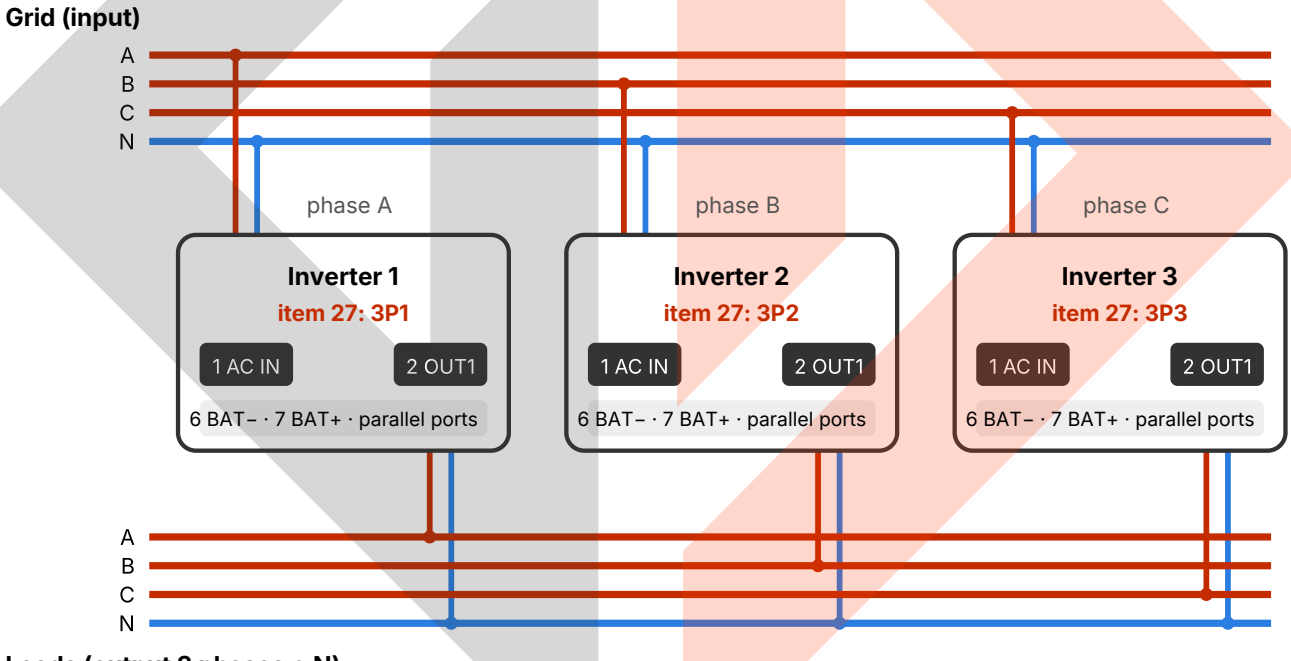
3 × EASUN SMS-6.5KP and 51.2 V 360 Ah battery: how to connect, configure and start up; * = calculation or recommendation

## Kit contents

| | What is in the kit |
|---|---|
| Inverters | 3 × EASUN SMS-6.5KP — hybrid inverters 6.5 kW, 48 V, parallel version (KP), Wi-Fi |
| Power | **19.5 kW** (3 × 6.5 kW), one inverter per phase |
| Battery | 51.2V 360Ah 18.4kWh LiFePO4 battery — one, shared by all three inverters; no BMS cable (p. 4) |
| Solar panels | each inverter has its own PV input (per the datasheet up to 27 A / 9000 W); one panel string must not be connected to several inverters |
| Parallel cables | communication cables for the parallel connection (in the manual: “standard cables in the accessories”) |

**What the manual says about three phases.** Up to 9 inverters in parallel; for three phases each phase must have at least **one working inverter** (here, one each). If the system has batteries, all inverters are connected to **the same** batteries; the manufacturer recommends a common copper busbar. A parallel system can also work without batteries and grid, but the output power is then reduced.

## AC diagram



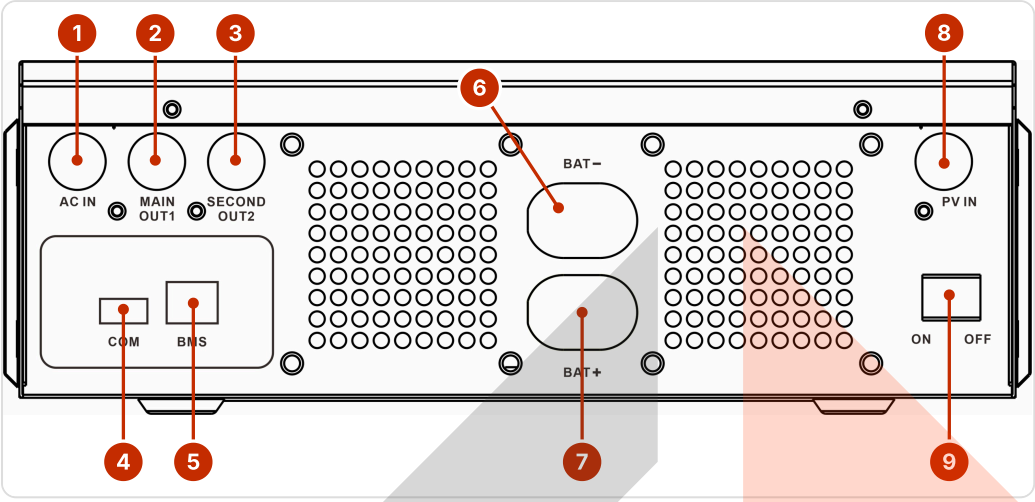

According to the figure in section 5.2 of the manual: grid phase A → AC IN of inverter 1 (3P1), B → inverter 2 (3P2), C → inverter 3 (3P3); the neutrals (N) of all inverters are connected together. The OUT1 outputs supply load phases A, B, C. The grid cables of each phase are identical in material, cross-section and length; the same applies to the output cables. If you use OUT2, they are connected separately from OUT1 in the same way. Numbers 1, 2, 6, 7 are the connectors on the bottom panel (photo on the next page).

## Protection

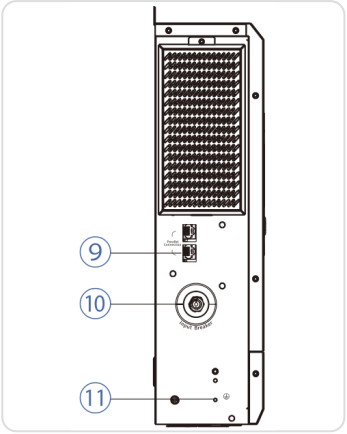
- The AC input breaker in a parallel system must have a **300 mA** residual current rating.
- For each inverter: AC breaker **40 A /** cable 6 mm² at the input; battery: cable 25 mm², protection 150 A (recommendations for one inverter; the manual advises sizing breakers with the number of inverters in mind).
- The cables from the batteries to the inverters are identical in material, cross-section and length.

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# Parallel connectors and cables




**Bottom panel** (figure from the manual, section 3.5.2): 1 AC IN, 2 MAIN OUT1, 3 SECOND OUT2, 4 COM (Wi-Fi), 5 BMS, 6 BAT−, 7 BAT+, 8 PV IN, 9 ON/OFF.




**Side wall** (KP datasheet, its own numbering): 9 — parallel ports, 10 — AC input breaker, 11 — PE.

## Parallel communication cables in a ring

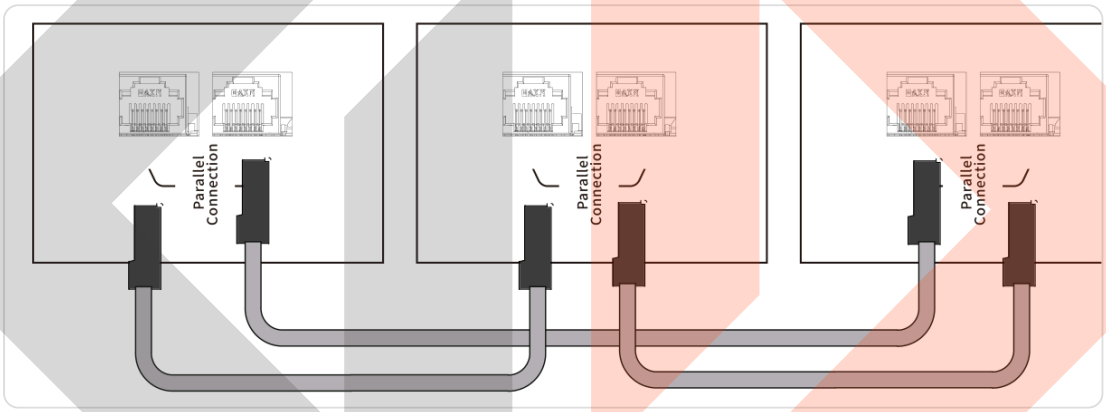



Figure from the manual (section 5.3): 3 inverters. The cable plugs into any parallel port; phase and order do not matter, but the connection must form a **ring** (1→2→3→1). Route the communication cables separately from the power cables, at least 5 cm apart. Battery BMS: all three inverters work with the battery without a BMS cable; its protocol is unknown, so on voltage only (item 44 = OFF, p. 4). Wi-Fi: a module on any one inverter transmits the data of the whole system.

## Setup order (section 5.5)

1. Check the wiring. All breakers (PV, AC input, AC output, battery) are open; the neutrals of all inverters are connected together.
2. The **ON/OFF** switches (9) of all inverters are OFF. Switch on the battery breaker so that the inverters receive power.
3. If there is no grid: switch the inverter ON/OFF to ON, wait for the display and set it to OFF; the display stays lit for a while. If there is grid, go straight to step 4.
4. While ON/OFF is in the OFF position, set item **27:** 3P1 / 3P2 / 3P3 (otherwise the setting cannot be saved).
5. Repeat steps 3–4 on each inverter.
6. Switch ON/OFF on the inverters to ON, then all breakers.
7. Check the phase sequence: item 04 = **UPS.** If the display shows that the grid does not connect, change the phase order at the system input; then set APP or UPS.

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# Three-phase settings

## Menu items for three phases

| Item | On the display | What to choose |
|---|---|---|
| **27** | PAn | Phase A inverter: **3P1,** phase B: **3P2,** phase C: **3P3.** If even one is set to SIG or one of the modes is missing, fault **24** appears on all of them. |
| **28** | PId | **AtO** (auto, default) or numbers 1–9; the same number on two inverters is not allowed (fault 19). |
| **30** | POP | **OFF** (default) when there is a battery. ON: parallel with solar only, without a battery. |
| **04** | nOd | To check the phase sequence, **UPS;** after the grid connects normally, APP or UPS as needed. |
| **12 / 25** | PuS / StE | Power saving and soft start do not work in parallel: **OFF.** |

How to enter the menu: hold ENTER for 2 s, UP / DOWN for the item, ENTER to change, ENTER to save, ESC to exit. The system determines the master and slave inverters itself; after the parallel setup, a change of other parameters on one inverter is picked up by the others automatically.

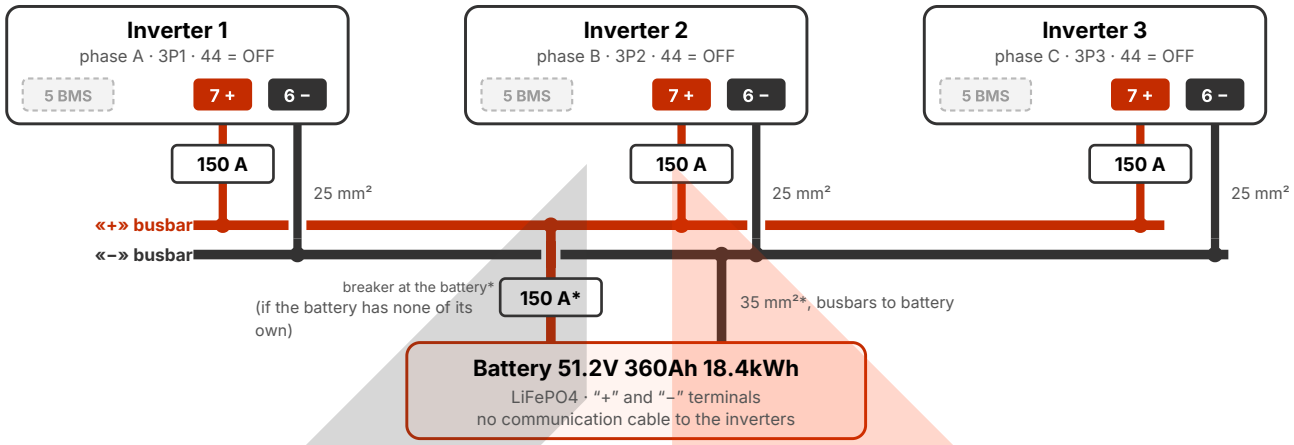
**Parallel codes:** 19 — duplicate number (ID); 20 — communication failure; 21 / 22 / 23 — different battery voltage / grid voltage / frequency between inverters; 24 — different parallel modes, phase loss or an inverter in SIG mode; 25 — loss of output synchronisation. Set up the battery (items 17, 19–21, 44, 03, 07 / 06) the same on all three, p. 4.

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# 51.2V 360Ah 18.4kWh battery: cables, settings and start-up

## DC diagram




Each inverter connects with 25 mm² cables through its own 150 A DC breaker to common copper busbars; the cables of all three are identical in material, cross-section and length. From the busbars to the battery: 35 mm²* and a 150 A* breaker at the battery if it has none of its own. The BMS cable is not connected: there is no manufacturer's manual for this battery and its BMS protocol is unknown, so port 5 (BMS) stays free and the inverters work with the battery on voltage.

## Battery settings — on all three inverters

| Item | Value | Why |
|---|---|---|
| **17** bAt | **FEL** | LiFePO4 16S (51.2 V). |
| **20** | **56.8 V*** | Charge voltage (CV). |
| **21** | **54.4 V*** | Float voltage: no overcharging when the battery stays on the grid for a long time. |
| **19** bAU | **48.0 V*** | Output shutdown on discharge, before the BMS protection trips. |
| **44** bnS | **OFF** | No BMS communication (protocol unknown); otherwise warning ALA 56. |
| **03** OPP | **GPB or PGB** | Do not choose PBG or MKS*: in these the battery supplies the load even when the grid is present. |
| **07** nCC | **30 A* on each** | Max. charge in total 90 A* (≈ 0.25 C); also limits solar charging: ≈ 4.6 kW*. |
| **06** tCC | **10 A* on each** | Grid charging in total 30 A* (≈ 1.5 kW*). |

Set while ON/OFF is OFF (p. 2, step 4); in parallel the other inverters pick up the change (manual, 5.5.1, note 3), so check each one. There is no battery manufacturer's manual: the voltages are typical for LiFePO4 16S*; if the battery label gives others, use those.

**Important about power.** The BMS discharge current of this battery is unknown; count on ≈ 150 A*, which gives no more than ≈ **7 kW*** continuously from the battery for all three phases together (150 A × 48–51.2 V × efficiency ≈ 94 %). The full 19.5 kW only while the grid or solar covers the load (hence 03 = GPB or PGB). If the battery label gives a discharge current, the limit is ≈ that current × 48 V*. More only with a second identical battery in parallel on the same busbars* (charge both to the same voltage before connecting*).

## Start-up procedure

1. Everything off: ON/OFF of all three OFF, the 150 A breakers and the breaker at the battery OFF, battery off, grid disconnected.
2. Cables per the diagram; check the polarity on the busbars with a multimeter (swapped "+" and "–" damage the inverters).
3. Switch on the battery, the breaker at it and the three 150 A breakers: all three displays show the same battery voltage.
4. On each, while ON/OFF is OFF: item 27 (p. 2, steps 3–5), items 28 and 30 (p. 3) and the table above.
5. ON/OFF of all three to ON, then the grid and load breakers; phase order: p. 2, step 7.
6. Check: FEL and 44 = OFF on all three, no codes 21 or ALA 56; after 10–15 min under load the cables are not hot.

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