KIT CONNECTION GUIDE · IN ENGLISH

3-phase kit 19.5 kW: 3 × POWLAND SMS-6.5KP 48 V

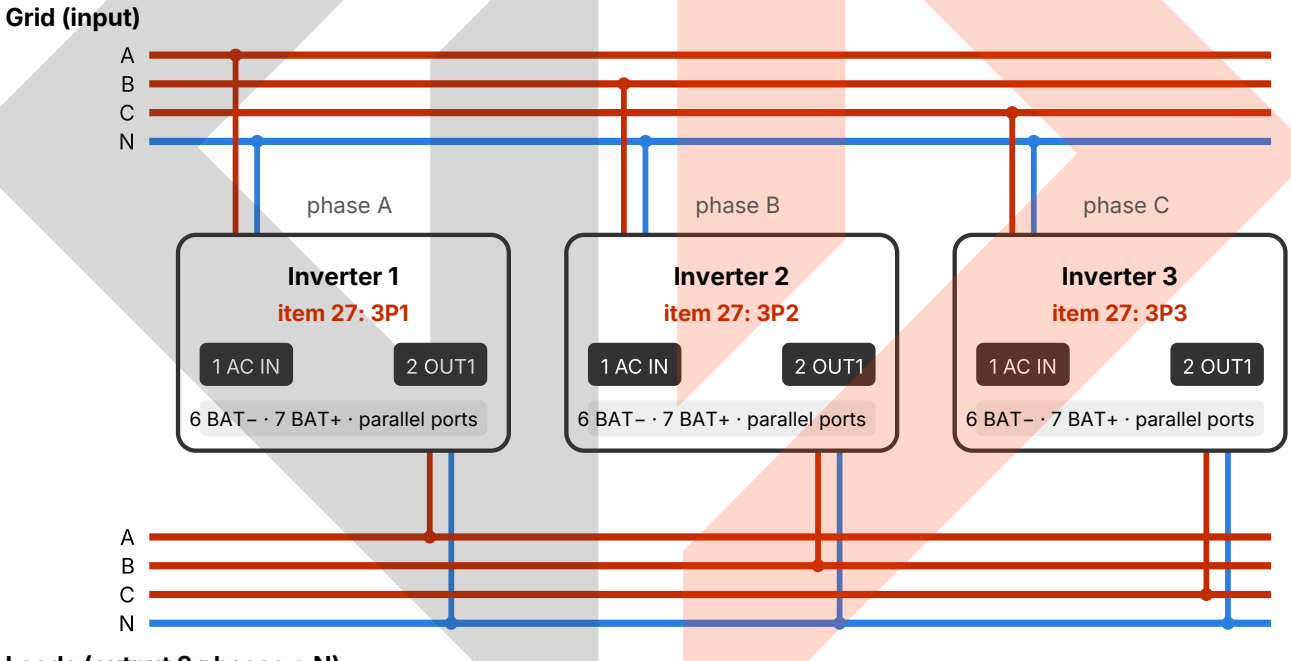
Three-phase parallel: how to connect three inverters and what to set, strictly according to the manufacturer's manual

Kit contents

	What is in the kit
Inverters	**3 × POWLAND 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	**not included** in the kit; 48 V, shared by all three inverters
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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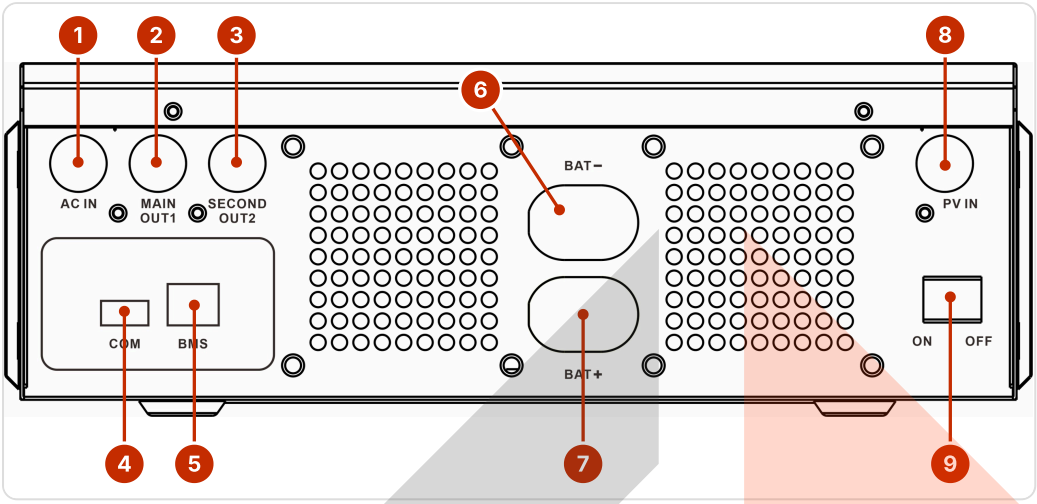
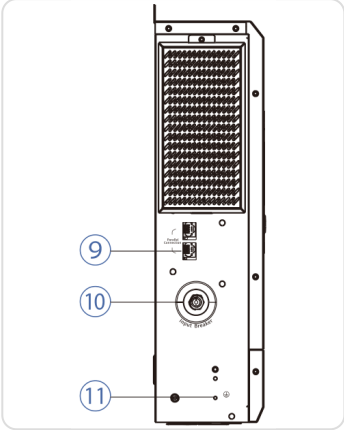
Parallel connectors and cables



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

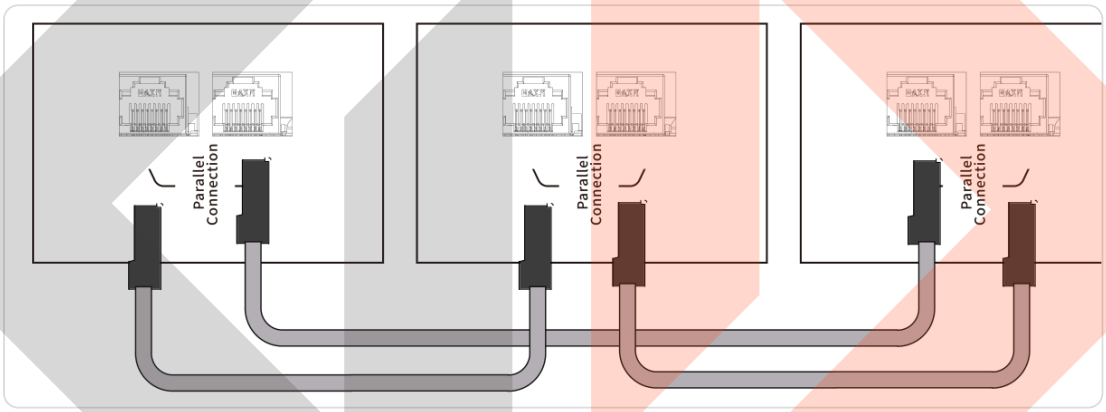


Figure from the manual (section 5.3): 3 inverters. The cable plugs into any parallel port; phase and order do not matter, but the connection must form a **ring** (1→2→3→1). Route the communication cables separately from the power cables, at least 5 cm apart. Battery BMS: all BMSs are linked together and connected to **one** inverter (or each BMS to its own inverter if there are as many batteries as inverters). 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 (type in item 17, protocol in 44) according to the inverter and battery manuals.

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