



SP PRO Grid Fail - Generator Backup Kit Installation Note

Introduction

This installation note details the addition of the Grid fail-Generator backup kit to the SP PRO inverter. The kit is only suitable for the small range (SPMC) of SP PRO AU or GO series (Series II) in a single phase or a three phase Advanced Multiphase Solar Hybrid installation.

NOTE: *Three kits are required for a three phase Advanced Multiphase Solar Hybrid installation.*

The Grid fail - Generator Backup ONLY operates with Auto Start generators and CANNOT BE USED with manual start generators. A three phase generator must be used in a three phase installation.

When the Grid fail-Generator backup kit is installed into the SP PRO, the system allows for the connection of an auto start backup generator that is automatically started and stopped by the SP PRO as required during a grid outage.

SP PRO Models	Grid fail – Generator backup kit, single phase.	Grid fail – Generator backup kits, three phase.
SPMC 240-AU, 004723	1 off SPMCA-GFGB-2448, 005268	3 off SPMCA-GFGB-2448, 005268
SPMC 241-AU, 004724		
SPMC 481-AU, 004725		
SPMC 482-AU, 004726		
SPMC 1201-AU, 004722	No Kit Available	No Kit Available

Preparation

- When installing a single phase system, make sure one Grid Fail Generator Backup kit (005268) is on site.
- When installing a three phase Advanced Multiphase system, make sure three Grid Fail Generator Backup kits (3 x 005268) are on site.
 - If installing a three phase system, make sure the AMP Three Phase kit is on site (Order code 005304)
- This document needs to be read in conjunction with the SP PRO Instruction Manual and SP LINK instruction manual (both found in SP LINK Help menu)

Additional information

Selectronic web site – <http://www.selectronic.com.au> or contact the Selectronic Sales Team

This document applies for SP PRO Series II Rev 21 and above



Operation

The Grid Fail - Generator Backup (GFGB) functions as follows:

1. When the grid is available and in tolerance the grid is connected via the GFGB contactor to the SP PRO and the SP PRO synchronises to the grid as per normal Solar Hybrid Operation.
2. When the grid fails, or is out of voltage or frequency tolerance (as per the settings in the SP PRO), the SP PRO will disconnect from the grid via the SP PRO AC source contactor. At this stage, the GFGB contactor is keeping the SP PRO attached to the grid supply, and if the grid is restored then the SP PRO will again synchronise to the grid.
3. The SP PRO will continue to power the loads from the battery bank and any connected renewable energy until the grid is restored.
4. If the grid is not restored before a "Generator start" condition, the SP PRO will automatically start the generator and switch over the GFGB contactor to connect the SP PRO AC source input to the generator supply. The SP PRO will then synchronise to the generator to charge the batteries and power the loads.
5. When the "Generator Stop" condition is satisfied, the SP PRO stops the generator and continues to run from the battery and any connected renewable energy. This cycle will continue until the grid is restored.
6. When the grid is restored and stable for 60 seconds, the SP PRO will stop the generator (if it is running and has been running longer than the "Minimum Runtime" in Configuration Settings>AC Source>Generator Controller Settings), disconnect its AC source contactor then switch over the GFGB contactor to return the SP PRO to the grid. The SP PRO will then synchronise to the grid.

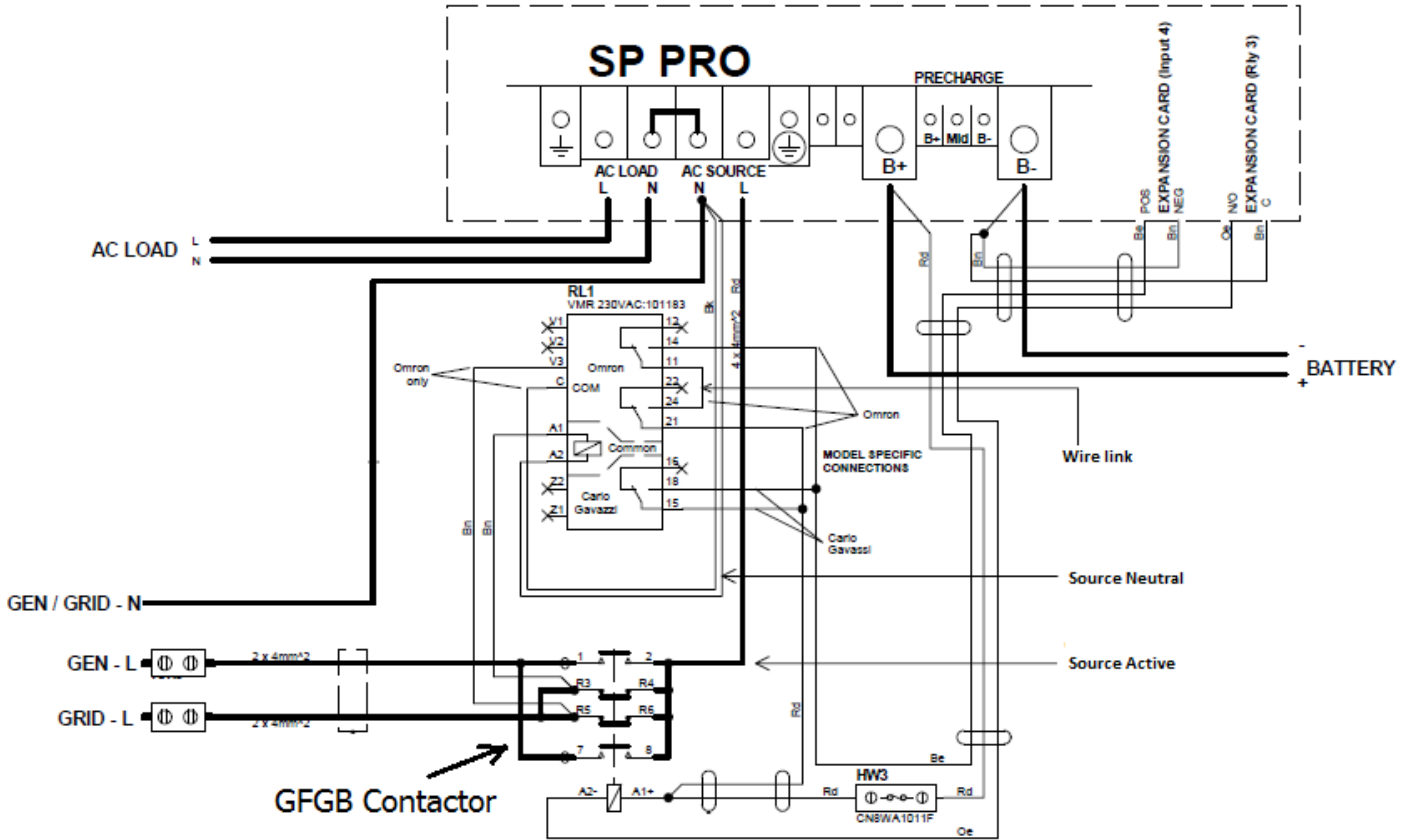
Note: The GFGB contactor is a break before make changeover contactor. This ensures that the generator supply and grid supply cannot be cross connected.

Installation Notes



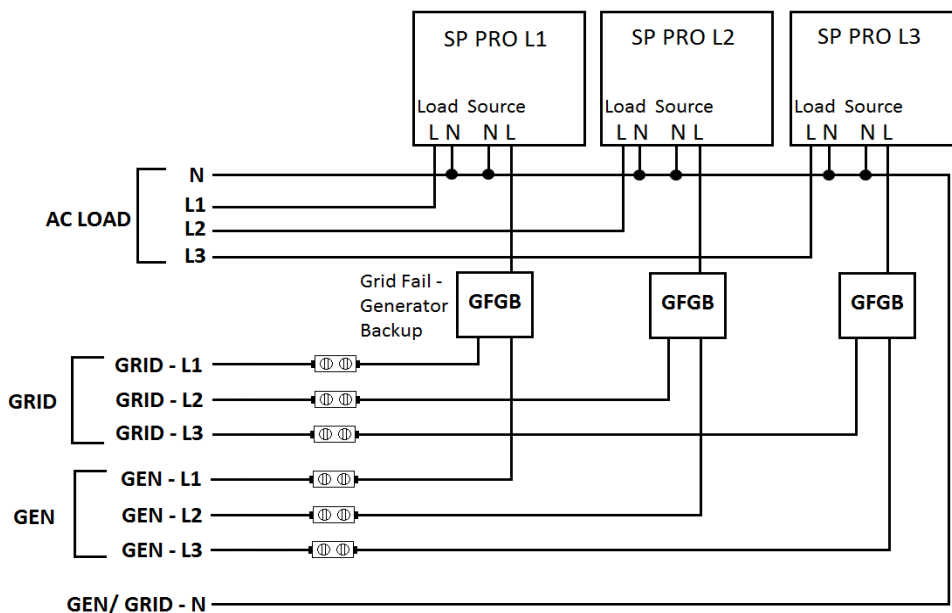
Wiring Overview

The following is an overview of the internal and external connections which form part of the Grid Fail – Generator Backup Expansion housing.



Grid Fail – Generator Backup in a Single phase system

Note: Diagram is applicable for 24V and 48V SP PRO.



Grid Fail – Generator Backup in an Advanced Multiphase system

SP PRO Installation

The SP PRO must be installed as per the installation instructions in the user manual. All wiring is carried out in the SP PRO with the exception of the grid L input and the generator L input wiring. These are wired to the Grid fail-Generator backup kit once it is installed.

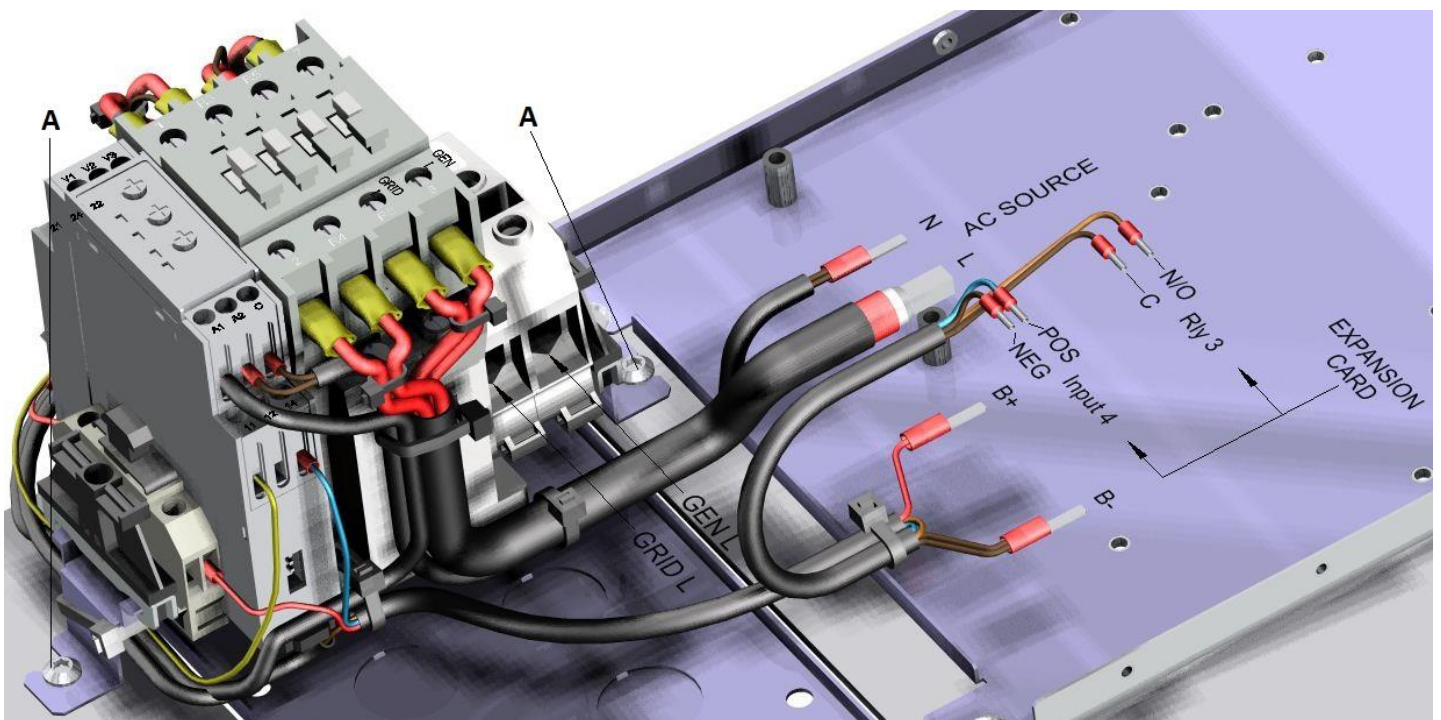
Note: For Advanced Multiphase systems, one Grid fail-Generator backup module is installed in each SP PRO.

When connecting the AC wiring to the SP PRO, please leave enough space for the Grid fail-Generator backup kit to be installed in the wiring cavity of the SP PRO.

Please note the following:

1. Backup loads connect into the AC Load L and N terminals in the SP PRO.
2. Only the L wire from the Grid fail-Generator backup connects into the AC Source L terminal within the SP PRO.
3. The Grid L connects to the GRID L terminal on the Grid fail-Generator backup kit. The Grid N connects to the AC source N on the SP PRO.
4. The Generator L connects to the GEN L terminal on the Grid fail-Generator backup kit. The Generator N connects to the AC source N on the SP PRO.

Once the SP PRO has been installed and wired, follow the steps below to install the Grid fail – Generator backup kit.





Installing the Grid fail-Generator backup kit into the SP PRO

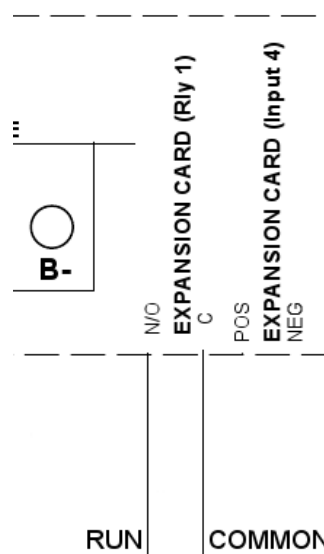
Referring to the diagram above (page 4), follow the steps below to install the kit.

1. Fit 2 x 5mm mounting screws to the base of the SP PRO inverter at position **A**. Leave screws loose.
2. Fit Grid fail-Generator backup kit to screws as shown. Tighten screws.
3. Wire the connections from the Grid fail-Generator backup kit to the SP PRO as shown. NOTE the polarity of the B+ and B- connections
4. Wire the Generator L and Grid L to the GEN L and GRID L terminals respectively on the Grid fail-Generator backup kit.
5. Double check all terminals are tight and clamping the wire only and not the insulation.

Generator Control Wiring

The Generator Run control wiring is wired into the expansion card as shown. This configuration is for a controller that require two wires to be closed to start and run and then opened to stop the generator.

In a three phase Advanced Multiphase system the Generator Control Wiring is ONLY connected to the SP PRO on the L1 phase.



Note: Refer to Tech Note TN0025 for other control options.

SP PRO Configuration – Additional Configuration Settings

The Site Configuration Wizard is used to configuration the SP PRO with the Grid Fail – Generator Backup. Step though the wizard to setup the system to suite the appropriate application.

Note: For more information when stuck through the “Site Configuration Wizard”, right click on the page and a help guide will appear to help setup the system.

The settings detailed in Appendix I (pages 7 to 8) will be set when the Site Configuration Wizard is used to configure the SP PRO. Only the settings required to enable Grid Fail – Generator Backup are shown. The remainder of systems settings will be set by the Site Configuration Wizard.



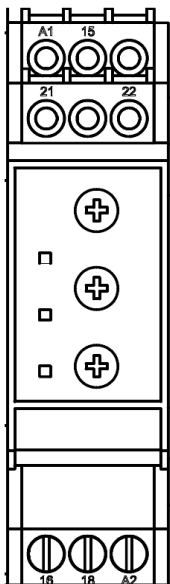
SP PRO CONFIGURATION – AUTOMATIC GENERATOR CONTROL

The generator will run upon loss of grid supply on the default settings based on low battery voltage or SoC if enabled. If you wish to enhance this operation, consult SP PRO User manual – Generator Automatic Start for full details.

Reference Information

RL1 - VOLTAGE MONITOR

The internal voltage monitor (RL1) is factory set and should not be adjusted. The factory setting is detailed below:



: + 15 %

: - 8 %

: 3 s

: DIP-switches – under cover –

1 – ON (DEL-REC)

2 – OFF (N.E.)

3 – ON (6 s)

4 – OFF (INHIBIT)

5 – ON (230 VAC)

6 – OFF (230 VAC)

WARNING: Do not open the DIP-switches cover if the Power Supply is ON.



Appendix I: SP LINK Configuration Check

AC SOURCE – AC INPUT

Check the Alternative Source is set to accommodate the different power limit and voltage/frequency range that the SP PRO will accept when the backup generator is running. The Primary Source settings are shown by way of comparison between grid and backup generator.

- Alternate AC Source Power – maximum power SP PRO will draw from backup generator
- Min, Max AC Voltage – allowable voltage range from generator
- Min, Max AC Frequency – allowable frequency range from generator

*Note: Default Values shown - Adjust values to suit the backup generator. **External CT** and **Extern. Contactor/CT** settings are not used in this configuration.*

AC SOURCE – GENERATOR CONTROLLER SETTINGS

Generator Controller: Enabled

Note: Remaining settings can be adjusted based on specific backup generator requirements. See SP PRO User Manual – Generator Controller Settings for further details.



INPUTS / OUTPUTS

Make sure the SP PRO is configured to control the correct inputs and outputs to monitor and switch between the grid and backup generator.

Digital Inputs –

Normal/Alternate AC Input Power Selector: Follow Backup Select
Inhibit Export Input: Follow Backup Select

Note: Low Batt Shut Down Override Input setting is not used in this configuration.

Digital Inputs

Low Batt Shut Down Override Input
None

Normal/Alternate AC Input Power Selector
Follow Backup Select

Inhibit Export Input
Follow Backup Select

Grid Fail Generator Backup –

Grid Fail Backup: Enabled
Grid Available Input: Digital Control Input 4
Backup Select Output: Relay Output 3

Grid Fail Generator Backup

Grid Fail Backup*
Enabled

Grid Available Input*
Digital Control Input 4

Backup Select Output*
Relay Output 3

Generator Outputs –

Generator Run Output – Relay Output 1

The actual generator output type used will depend on what signal is required by the backup generator to start and stop. Refer to generator documentation for details.

Note: Default settings shown. Start Output is not used in this configuration.

Generator Outputs

Generator Run Output
Relay Output 1

Generator Start Output
None