

Back Up Pak Installation Manual,



Make sure that all the breakers and battery switch on the Back up Pak are turned off.

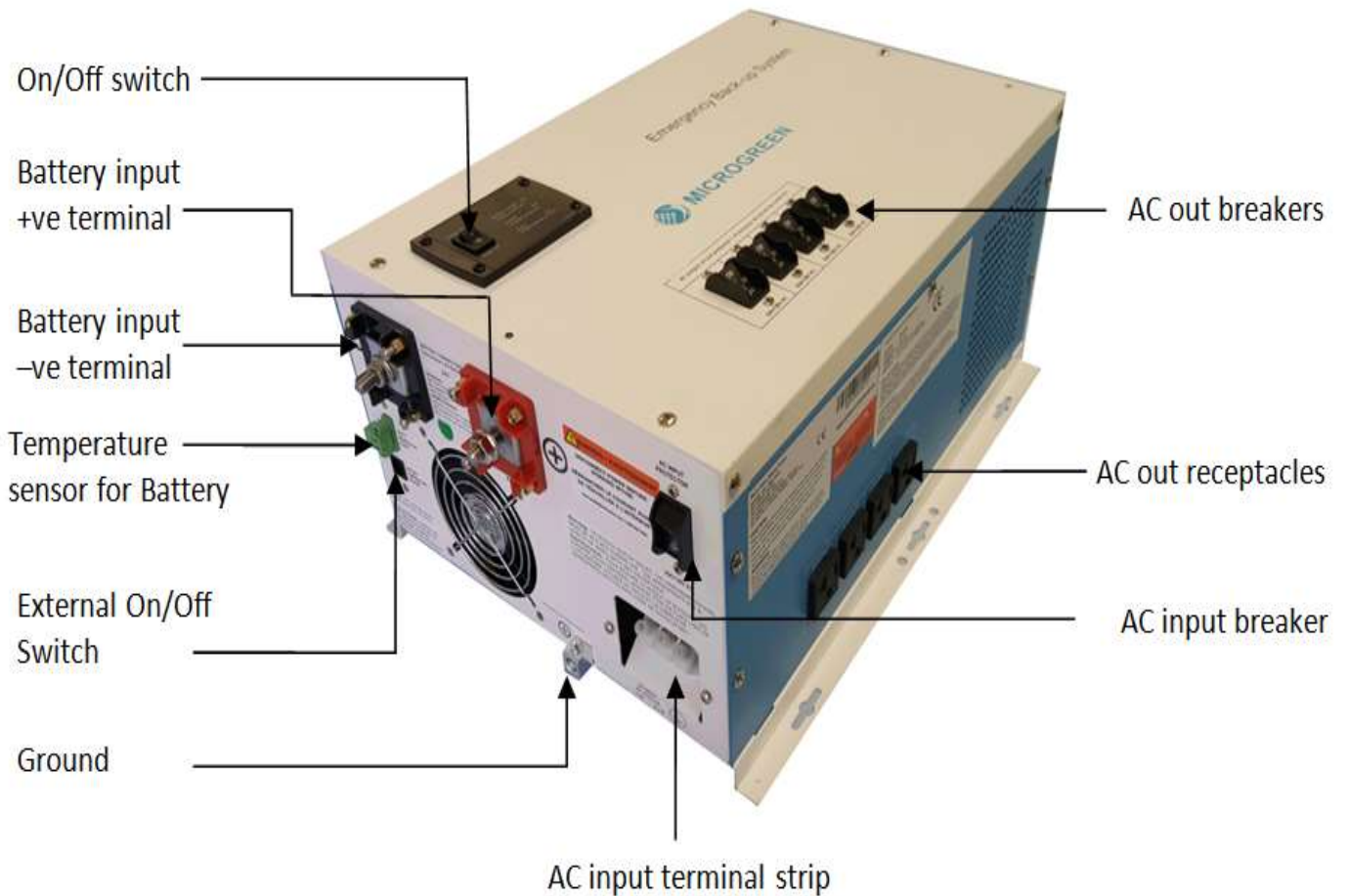


Figure 1

Read the entire installation manual before starting. It will give you a better perspective about the mechanics of the installation.

We also recommend you should have another person to help you during this installation.

Back up Pak installation

The Back up Pak unit should be installed near your electrical panel. Mount the Back up Pak at least 4 to 5 feet off the floor, allowing room to access to the lower AC in and AC out terminal connections. Make room on the floor to house the batteries.

The Back up Pak has two flat rails that it rests upon and are to be used when mounting it on the wall. **See above Figure 1**

Each rail has 3 elongated holes, along with 6 round holes giving you multiple spots to screw into the wall.

Due to the weight of the Back up Pak, we recommended the Back up Pak be mounted on at least one stud.

Mount a piece of plywood on the wall for the Back up Pak to be installed upon.

At least two of the holes on the rails, are at the distance of two studs. Mounting the Back up Pak across 2 studs is preferred.

Using a #12 pan head wood screw at 2 " long, add a ¼ washer under the head of the screw. Proceed to drill the screw into the top centre hole while holding the unit in place.

If you do not have a helper to hold the unit, mount a 2 X 2 or 2 X 4 with screws, on the wall. Level this wooden brace, it will make it easier to install the Back up Pak.

Rest the Back up Pak on this wooden support and install it. (if you level the wooden support first, then you can mount all 3 screws into the top rail) finish by mounting the bottom three screws. Otherwise mount one screw on top rail and move the unit until it is level and mount a second screw.

Batteries:

The battery switch located on the side of the Back up Pak must be in the off position. This protects the inverter from any sparks that may cause a voltage jump, when connecting the battery leads to the inverter. There is a potential voltage difference between the batteries and the inverter. The capacitors inside the inverter need to be brought up to the same potential as the batteries. This will occur when you turn the battery switch on later.

When installing the batteries, they should be located below the Back up Pak. If they are being placed on concrete floor, place a 2 " piece of Styrofoam under the batteries. The Batteries should not be made cold by the concrete floor.

A concrete floor will make the Batteries cold, which will affect their operation. If the Batteries are as cold as 0 degrees Celsius, the Battery may appear to be full, but can only deliver 50 % of it's Back up.

DO NOT let the black and red cable ends touch each other, they will produce a large spark, which could damage the new batteries

Connect a minimum of, 2 – 12-volt batteries or 4 – 6-volt batteries together to energize the Back up Pak. . **See below Figure 2-3**

The Back up Pak operates from a 24 Volt DC supply. You can connect more 24-volt battery groups together. Each pair of batteries is considered a group. There is a limit of up to 5 groups of batteries can be connected to this unit. When installing two groups together, connect across the neg to neg and then across the pos to pos. Place the inverter cables across the two groups in order to get an equal charge in all cells. **See below Figure 2**

If you install 3 to 5 groups of batteries, you should use two bus bars, one for positive and one for negative. **See Figure 3**

This method of mounting interconnect cables will insure each battery receives the same amount of charge.

You will need to buy a proper bus bar or use a piece of copper bar, ¼” thick 1.5 “ wide and 6 inches long.

Then drill the bus bar with 6 holes of 3/8” diameter each and spaced evenly across the bus bar.

Drill some smaller holes (1/8 inch dia) in the 4 corners for mounting the bus bar on the back wall.

You will need longer interconnect cables for this bus bar installation.

Take a cable from each negative pole of each battery and connect it to the negative bus bar.

Repeat for the positive side. **The battery leads to the Back up Pak should not be any longer than 10 feet or 3 metres**

Microgreen can supply premanufactured bus bars and longer interconnect cables as required. See fig 3

Once all the interconnect cables (cables used to group the batteries together) are connected, verify with a meter that your system voltage is 24 volts DC. Measure across the Positive and Negative poles of the battery group.,

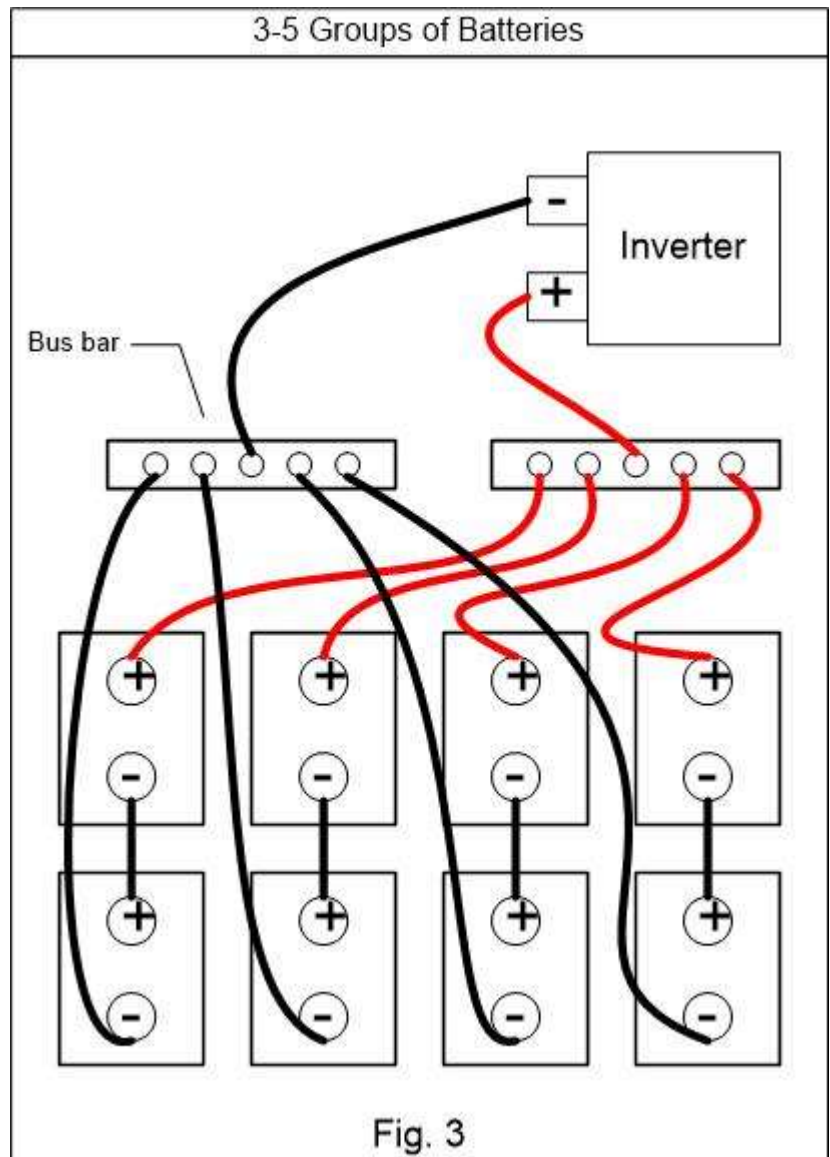
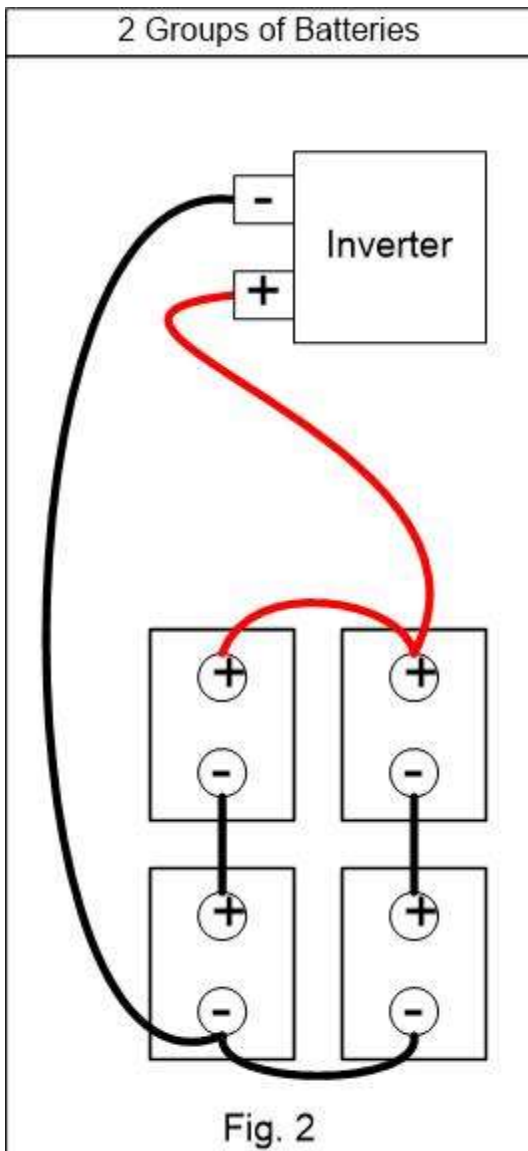
Measure across the batteries where the battery cable from the inverter will connect. Once the battery voltage is verified, connect the black (negative) cable from the bus bar to the inverter.

Then connect the red, Positive cable to the inverter from the other bus bar. Check that all connections are tight.

Make sure polarity is kept right for each step of the installation.

Once all the batteries are installed, supported and connected, **turn the battery cable switch to ON.**

Once the battery cables are all installed, you must build a protective cover over the two bus bars, IE plywood door. You **Do Not want any metal object fall across these bus bars.**



Selecting Battery type

There is a selector switch beside the On/Off switch. Choose 1 for Gel, 2 for AGM and 4 for flooded.

In section 2.5.2 of the manual has a full explanation of your choices.

Main System

Operational Section

Push the Back up Pak switch “ ON” (push it down) to activate the unit. **See fig 1**

Once the unit has gone through its initial start-up routine ,a green LED will turn on to show the unit is ready and operating (LED is on the front panel beside the Back up ON switch (**see Figure 1**)

This Back up Pak has a 120 volt AC output. This means there is a L1 and neutral.

To understand how much Back up is available to use, check the following information., In a 24-volt system, using 4- 12 volt Batteries, two in series and 4 in parallel @ 105 amp/hr, means 2 batteries groups will be (105 times 2 times 24 V, equals about 5000 watts) You would have about 2500 watts of usable Back up (50% of the batteries total). IF you have 4 – 6 volt @ 400 amp/hr batteries, the Back up available is as follows. 400 times 24 volts equals 9600 watts, (50% of this will be 4800 watts of usable Back up)

Therefore, based on how many watts you may consume during a power outage, check, if the battery bank is enough.

When considering on whether to use 12 volt or 6 volt batteries, keep in mind to amount of Back up you may eventually need. If you choose 12 volt batteries, the maximum amount of Back up you can connect is 5 groups of 100 amp/hr or 24 times 500 equals 12,000 watts of Back up of which 50% is usable.

If you choose 6 volt, you can have 5 groups of 4-6 volt batteries or 50,000 watts available with 50% usable.

You can not mix 12 volt and 6 volt batteries.

AC wiring, switch off the Back up Pak for this section

Please refer to your local rules or guidelines for what is allowed or not, when connecting to the electrical panel.

Wiring the AC input and AC output from the Back up Pak is done through the white AC terminal strip located on the lower left side of the unit. All the AC Back up goes through this terminal strip. AC output should be connected to your electrical loads

The AC input should come from your electrical panel.

There are four AC receptacles on the bottom side of the Back up Pak. When the Back up Pak is operating, there is up to 20 amps of AC Back up @, 120 Volts are available in each receptacle.

When connecting to the AC terminal strip on the side of the unit, only undo the front screw.

The inner screw holds the inside wire from the Inverter to the terminal strip.

Charging the Batteries

The AC input is for your power to operate the devices connected to the backup pak. This needs to be connected to the electrical panel.

The batteries are always being charged while the power is on. When the grid goes down, the backup pak pulls power from the batteries to keep the items operating.

When the grid is restored, the Back up pak will switch to grid power for the connected items and start charging the batteries again.

Ground wire

The system comes with bare Ground wire if required. If you have an existing ground for your existing electrical panel, **do not install a second ground**. ESA does not allow two ground plates unless one is under another building at least 100 feet away. This could create a ground loop.

If there is an existing ground system in the building, you will need to take the ground wire connected to the Back up Pak and bond (crimp) it to the existing ground wire near the existing electrical panel.

If there is no existing ground for the building, install the ground plate outside in the ground below the Back up Pak. The ground wire is only 20 feet long.

Dig a hole 1.5 feet deep. Place the ground plate horizontally in the hole.

Attach the bare ground wire to the ground plate with the brass lug at one end of the ground plate. Fill in and tamper the dirt over the ground plate. Run the ground wire up to the Back up Pak and connect it to the grounding terminal on the base of the Back up Pak on the bottom left corner.