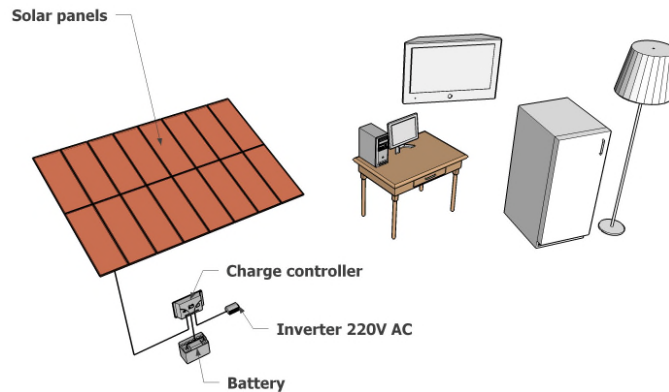


Datasheet • Solar Autonomous Energy Kits for 220V AC electrical devices



Autonomous power supply

Free Energy is specialised in solar autonomous power supply design and delivery. You need professional quality systems to power your AC loads in remote areas. You will find your solution in this leaflet.

No more grid cuts

Connected to the grid, you are frequently facing electricity cuts that disturb your activities. The Free Energy Solar Autonomous Kits bring you the solution you were waiting for.

Service continuity

Thanks to solar photovoltaic panels' energy production stored in a battery, you will continue to power your electrical devices (computers, lights, radio ...) in case of electrical grid breakdowns, even at night.

Sure, cheap and eco-friendly

Contrary to fuel generators, solar autonomous backup kits are neither noisy nor pollutant and do not require any fuel. They appear to be an eco-friendly and economical solution for electricity production in case of electrical grid power cut. In addition, **Free Energy provides a 10 years guarantee on panels included in these kits. Their expected lifetime exceeds 20 years.**

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Operating principle

At daytime, solar panels convert light into electricity stored in a battery. On normal operation or during an electrical grid cut, this energy powers your electrical devices.

When electricity shortage occurs, you just need to move your device plug from your house or office grid socket to output socket of your solar autonomous system¹⁾. You can now use your devices and wait for electricity grid recovery. When it will start again, you will move your devices back to it.

After recovery, solar panels included in your system will continue generating electricity to be stored again in your battery. You will soon be ready to face a new grid breakdown. After some time, energy will be available to power again your devices during the next electricity shortage.

Content

The solar autonomous system is made of a couple of photovoltaic solar panels connected to a battery bank through a charge controller.

Stored energy is transferred through the charge controller to an inverter. This device converts the DC current of the solar system into 220V AC power suitable for current electrical appliances (following table on next page shows the configuration for up to 300W as an example).

The system is delivered as a kit to be mounted by a local installer.

¹⁾ Free Energy can supply manual or automatic supply change-over switch on demand.

How to select a solar autonomous kit

Selecting a solar autonomous system requires following parameters:

- **Installation location:** irradiation differs within continents, countries and regions. Available light energy being unequal on earth; solar autonomous system should be selected taking minimum irradiation level of installation location into consideration.
- **Energy to be delivered** during one day operation or the power shortage (expressed in watt hours): to define this energy, two following elements should be collected:
 - **Appliances power:** energy required to run a light is generally much less than the one needed to power a TV set or a computer. If several appliances are concerned, solar autonomous kit should provide energy to the defined set of apparatus.
 - **Time of use or grid cut duration:** the more time you will run a device, or the energy shortage will last, the more the required energy will increase.

Multiplying appliance power value (W) by usage or shortage duration (h) provides required energy (Wh). If the installation includes several appliances, their individual energy consumptions should be summed up.

- **Inverter power:** inverter power should in principle be defined with just a higher value than the total power of the whole set of devices to be simultaneously powered. Nevertheless, some appliances like fans or electrical water pumps generate a high current peak when starting then requiring a higher power inverter like the 300W version. In case of still higher peak current, ask us for appropriate device.



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Example 1: one device

A user wants to power his **100W** power computer for **4 hours** per day. Required energy is then 4h x 100W = 400Wh/day.

He lives in a **5,5kWh/m²/day** minimum irradiation area. He must choose the solar autonomous kit delivering 640Wh/day energy in the selection table below.

Two options are available depending upon inverter choice. If the computer does not generate any huge current peaks when starting, an autonomous kit with **150W** inverter is appropriate. Its reference is « **NR-BU-168/180/1** ».

Example 2: several appliances

The same user *additionally* wants to run five 11W lights during 5 hours. Required operating energy will be 4h x 100W + 5 x 5h x 11W = 675Wh/day.

Total power becomes 100W + 5 x 11W = 155W.

In the **5,5kWh/m²/day** minimum irradiation area, he must select the autonomous kit generating 960Wh/day with a 300W inverter.

The suitable solar autonomous kit will then be reference « **NR-BU-336/360/2** ».

Selection table

Minimum irradiation ¹⁾ (kWh/m ² /day)	Required energy (Wh/day)	Inverter power ²⁾ (W)	Recommended autonomous system	Number of FEE-14-12 panels	Battery capacity (Ah 12V)
5.5	80	150	NR-BU-028/026/1	2	26
		300	NR-BU-028/044/2		44
	160	150	NR-BU-056/044/1	4	44
		300	NR-BU-056/055/2		55
	240	150	NR-BU-084/070/1	6	70
		300	NR-BU-084/090/2		90
	320	150	NR-BU-112/090/1	8	90
		300	NR-BU-112/110/2		110
	640	150	NR-BU-168/180/1	12	180
		300	NR-BU-168/210/2		210
	960	150	NR-BU-336/280/1	24	280
		300	NR-BU-336/360/2		360
	1920	150	NR-BU-560/540/1	40	540
		300	NR-BU-560/720/2		720
3.5	80	150	NR-BU-042/026/1	3	26
		300	NR-BU-042/044/2		44
	160	150	NR-BU-084/044/1	6	44
		300	NR-BU-084/070/2		70
	240	150	NR-BU-112/070/1	8	70
		300	NR-BU-112/090/2		90
	320	150	NR-BU-168/090/1	12	90
		300	NR-BU-168/110/2		110
	640	150	NR-BU-280/180/1	20	180
		300	NR-BU-280/210/2		210
	960	150	NR-BU-448/280/1	32	280
		300	NR-BU-448/360/2		360
	1920	150	NR-BU-896/540/1	64	540
		300	NR-BU-896/720/2		720

¹⁾ Average monthly irradiation reference (5.5 kWh/m²/day = typical value for Africa; 3.5 kWh/m²/day = typical value for Europe).

²⁾ 50Hz inverter included; 60Hz on demand

Should your need be different, ask for a customised configuration.

Non contractual photos and sketches