Investment Projects

NuPower Solar

NuPower Solar

Renewable energy solutions that work

This brochure describes the model, features and configuration options in Solar available to the national market. There may be deviations from the features and configuration options described in this brochure, in terms of the standard and optional equipment for the model specified to the South African market.

For more specific information go to **www.nupower.co.za**

Contents


Don’t let energy supply
affect your future


NuPower
Solar
Renewable energy
solutions that work

About Us

NuPower Solar was established in 2008 by a group of businessmen in the Western Cape. The current owner, Sampie Pienaar, invested in the company soon after it was formed. At the time he was involved in the electronic bank transaction environment in a joint venture with Absa Bank. The investment in a company in the renewable energy space was consistent with the pioneering spirit which was the hallmark of the IT environment which he was coming from.

The initial focus was on the soon to be implemented SA National Standard that stipulated that 50% of a new building's water heating had to come from an alternative source, other than electricity.

NuPower Solar quickly established itself as a leader in the high pressure solar water heating (SWH) industry and as part of the Eskom DSM rebate programme.

NuPower Solar developed a range of products suitable for the South African market and all products carry the SABS mark of approval. We are currently a major supplier to new affordable and mid-income housing projects.

NuPower Solar's unique selling point has always been based on our service levels and the fact that we have a 24/7 helpline available for clients.

Early in 2017, NuPower Solar made the strategic decision to expand with a photo voltaic (PV) energy division. The first objective was to leverage over 12000 existing clients that NuPower Solar had on the SHW side to take the next step in their renewable journey and install PV. We gained a fast understating in the Hybrid PV system market.

The next step was to target a specific commercial/industrial sector who could benefit from NuPower Solar's vast experience, customer service and technical know-how, to help educate them about the financial benefit possible with grid-tie PV system. With the knowledge gained from working with hybrid systems on larger applications, we are confidently able to deliver a customer-based solution at a market-related price, ensuring the best return on investment for our clients.

We currently have one of the largest in-house installation capacities in South Africa.

Innovation and Technology

The sun's energy is fed to connected loads where the user wants a guaranteed supply, and the excess is used to charge the battery. Once the battery has been fully charged, the system starts behaving like a grid-tied system, and any excess energy is fed to the energy intensive appliances as well, the air conditioners and pool pumps etc. This ensures that as much as possible of the available solar energy is used and the user gets the full return on investment for the PV panels.

To further extend the use of solar energy when the sun does not shine, the battery drain can be programmed, for instance set at 50%. So, when the sun goes down, the battery energy is used to supply BOTH the critical loads and the rest of the house. When the battery reaches 50% state of charge, the loads will be fed from Eskom. In the event of a power failure, the batteries will be allowed to drain completely, supplying only the critical loads.

The beauty of these systems is that they can be installed at a much lower cost compared to a traditional "off-grid" system, and they are fully modular, so the user can keep adding panels and batteries over time to become fully independent of Eskom.

victron energy
BLUE POWER

1,6kVA

3kVA

5kVA

Industry leading energy products

Easy Solar Units

All-in-one solar power solution
The EasySolar combines a MPPT solar charge controller, an inverter/charger and AC distribution in one enclosure.
The product is easy to install, with minimal wiring.

The solar charge controller: Blue Solar MPPT 100/50
Up to three strings of PV panels can be connected to three sets of MC4 (PV-ST01) PV connectors.

The inverter/charger: MultiPlus Compact 12/1600/70 or 24/1600/40
The MPPT charge controller and the MultiPlus Compact inverter/charger share the DC battery cables (included). The batteries can be charged with solar power (BlueSolar MPPT) and/or with AC power (inverter/charger) from the utility grid or a genset.

AC distribution
The AC distribution consists of a RCD (30 mA/16 A) and four AC outputs protected by two 10A and two 16A circuit breakers.
One 16A output is controlled by the AC input: it will switch on only when AC is available.

PowerAssist
Unique PowerAssist technology protects the utility or generator supply from being overloaded by adding extra inverter power when needed.

MultiPlus

Multifunctional, with intelligent power management

The MultiPlus is a powerful true sine wave inverter, a sophisticated battery charger that features adaptive charge technology, and a high-speed AC transfer switch in a single compact enclosure. Next to these primary functions, the MultiPlus has several advanced features, as outlined below.

Two AC Outputs

The main output has no-break functionality. The MultiPlus takes over the supply to the connected loads in the event of a grid failure or when shore-/generator power is disconnected. This happens so fast (less than 20 milliseconds) that computers and other electronic equipment will continue to operate without disruption.
The second output is live only when AC is available on the input of the MultiPlus. Loads that should not discharge the battery, like a water heater for example, can be connected to this output (second output available on models rated at 3kVA and more).

Virtually unlimited power thanks to parallel operation

Up to six Multis can operate in parallel to achieve higher power output. Six 24/3000/70 units, for example, provide 15kW / 18kVA output power with 420 Amps of charging capacity.

Three phase capability

In addition to parallel connection, three units can be configured for three-phase output. But that's not all: with three strings of six parallel units a 45 kW / 54 kVA three phase inverter and 1260 A charger can be built.

Quattro

Two AC inputs with integrated transfer switch

The Quattro can be connected to two independent AC sources, for example the public grid and a generator, or two generators. The Quattro will automatically connect to the active source.

Two AC Outputs

The main output has no-break functionality. The Quattro takes over the supply to the connected loads in the event of a grid failure or when shore/generator power is disconnected. This happens so fast (less than 20 milliseconds) that computers and other electronic equipment will continue to operate without disruption.
The second output is live only when AC is available on one of the inputs of the Quattro. Loads that should not discharge the battery, like a water heater for example, can be connected to this output.

Virtually unlimited power thanks to parallel operation

Up to 6 Quattro units can operate in parallel. Six units 48/10000/140, for example, will provide 48kW / 60kVA output power and 840 Amps charging capacity.

Three phase capability

Three units can be configured for three phase output. But that's not all: up to 6 sets of three units can be parallel connected to provide 144kW / 180kVA inverter power and more than 2500A charging capacity.

VRM (Victron Remote Monitoring)

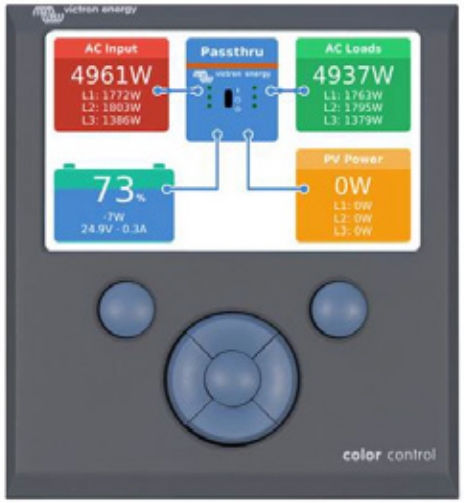
Online monitoring and maintenance

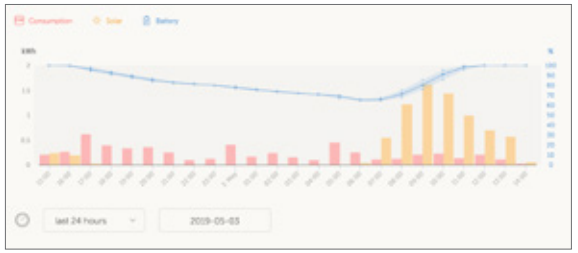
VRM Online Portal: Remotely monitor Victron equipment

Victron Remote Management (VRM) is provided by Victron Energy to remotely monitor electrical equipment all over the world.

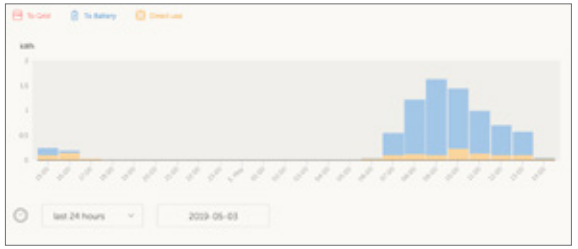
Once you have a VRM account, you will be able to view live feeds from your installation, such as generate solar energy, state of charge of your batteries and the consumptions.

To get an impression of the VRM Online Portal, please visit:
www.vrm.victronenergy.com and use the 'Take a look inside' button. The portal is free of charge.




Overview


Consumption


Solar


Advanced


victron energy
Login
ESS 3/3 TR
Solar Yield usage
System overview

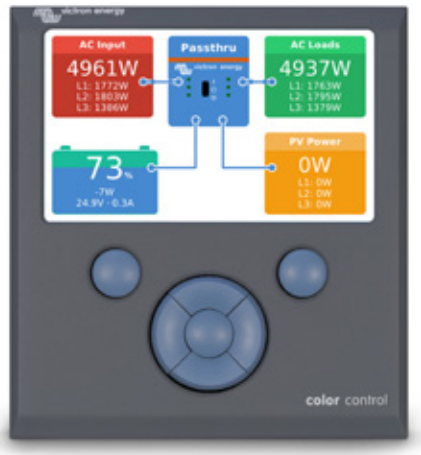

Increase the value of your
home and business


BLUE NOVA
energy

System Controller

GX products are Victron's state-of-the-art monitoring solution. The family consists of the different Venus-device models, and their accessories.

The Venus-device lies at the heart of the system, providing monitoring and operating as the communication centre of your installation. All the other system components - such as inverter/chargers, solar chargers and batteries - are connected to it. The Venus device ensures that they all work in harmony. Monitoring can be carried out locally or remotely via our free-to-use Victron Remote Management portal (VRM). The Venus device also provides Remote firmware updates and even allows the settings to be changed remotely.



Client Testimonials

I installed an entry-level 5 KVA system to ensure power reliability in an event of continuous power outages. This not only enabled me to run my household in a normal way even when Eskom was off for 3 day in a row, but the Hybrid ESS system also reduced my Electricity bill by R600 which was a complete bonus. I intend to upgrade my system to reduce my grid dependence even further.

Kyle Engelsman

NuPower Solar provided me with the necessary information during the sales process to make an informed decision on the system I was going to purchase, the costs involved and the benefits I will get.

Darryl Fourie

The Victron products and Smartphone application is the best way to ensue my system is performing at its optimal level. It is also great to monitor grid dependence and also when I purchased my upgrades I could see the exact benefits. It is exciting to see my grid dependence drop to reach my eventual goal of complete grid independence.

Leon De Klerk

Energy Storage System (ESS)

What is ESS?
ESS is an abbreviation for the term Energy Storage System, however that's a short description for a very clever renewable energy management system. Generally a PV solution would be either off-grid, or grid tied.

An off-grid system has PV panels that supplies power to the load when the sun shines, and any excess power is stored into a battery. Once the connected load has been supplied and the batteries are fully charged the power taken from the PV panels will be cut back, and a lot of potential PV energy is lost. The system only "borrows" energy from the grid or a back-up generator when its own storage (batteries) was depleted, or when the connected load exceeds a certain setpoint. Because of the high associated battery cost most of these systems only connect to essential loads like lights, security and a few other things that the user wants the security of guaranteed power for. Energy intensive appliances like air conditioners or pool pumps are left to run on the Eskom feed, and do not receive any benefit from the sun.

A grid-tied solution is less complicated, it has no batteries and the PV power is fed into the load to supplement the Eskom feed. Any additional power is lost as in South Africa we cannot (without great difficulty) feed excess power into the grid, with the exception of some areas where it is allowed. Therefore systems are sized to only match the load during daytime, which means we only get the benefit of free sun energy for 6-8 hours a day, about one third. One drawback of these systems is that they switch off during a power failure because they cannot operate without a live Eskom feed.

This is where an ESS system comes in. It's a combination of both systems.

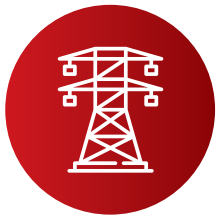
The sun's energy is fed to connected loads where the user wants a guaranteed supply, and the excess is used to charge the battery. Once the battery has been fully charged, the system starts behaving like a grid tied system, and any excess energy is fed to the energy intensive appliances as well, the air conditioners, geysers and pool pumps etc. This ensures that as much as possible of the available solar energy is used, and the user gets the full return on investment for the PV panels.

To further extend the use of solar energy when the sun does not shine, the battery drain can be programmed, for instance set at 50%. So when the sun goes down, the battery energy is used to supply BOTH the critical loads, and the rest of the house. When the battery reaches 50% state of charge the loads will be fed from Eskom. In the event of a power failure, the batteries will be allowed to drain completely, supplying only the critical loads.

The beauty of these systems is that they can be installed at a much lower cost compared to a traditional "off-grid" system, and they are fully modular so the user can keep adding panels and batteries over time to become fully independent of Eskom.

Reduce grid dependence at minimum cost

Explanation of Hybrid System

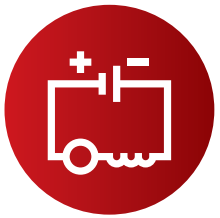


GRID

The grid tab displays how much power is being taken from the grid at that moment

AC LOADS

This tab displays how much power is being used by all the non-essential loads (these are the loads that will go off when the grid fails)



BATTERY

This tab displays the battery state of charge, battery voltage and how much power is being sent to or taken from the battery

CRITICAL LOADS

These are the loads that are connected to the battery bank, and are powered from the battery bank in an off-grid state when the grid fails

PV

This tab displays how much power is being generated by the solar panels

System Design

DISCUSS

MEASURE

DESIGN AND CONSULT

IMPLEMENT

Single Phase

80% of solutions will be single phase applications due to the fact that, in general, all critical loads are single phase loads. And generally single phase power is enough for your standard South African household.

Three Phase

In certain system designs three phase power is required or where existing houses have been designed with this electrical layout. In these cases a MultiPlus inverter wil be connected to each of the three phases.

With three phase systems PHASE COMPENSATION can be activated. When enabled (default), ESS balances the total power (L1 + L2 + L3) to zero Watt.

For single phase systems, this setting has no effect.

Upgrade from single phase to three phase systems

With the Victron Energy inverters, a single phase system can be upgraded to a three phase system by adding two additional inverters on the other two phases.
A lot of clients start off with a single phase solution and later upgrade to a full three phase solution.

Off Grid

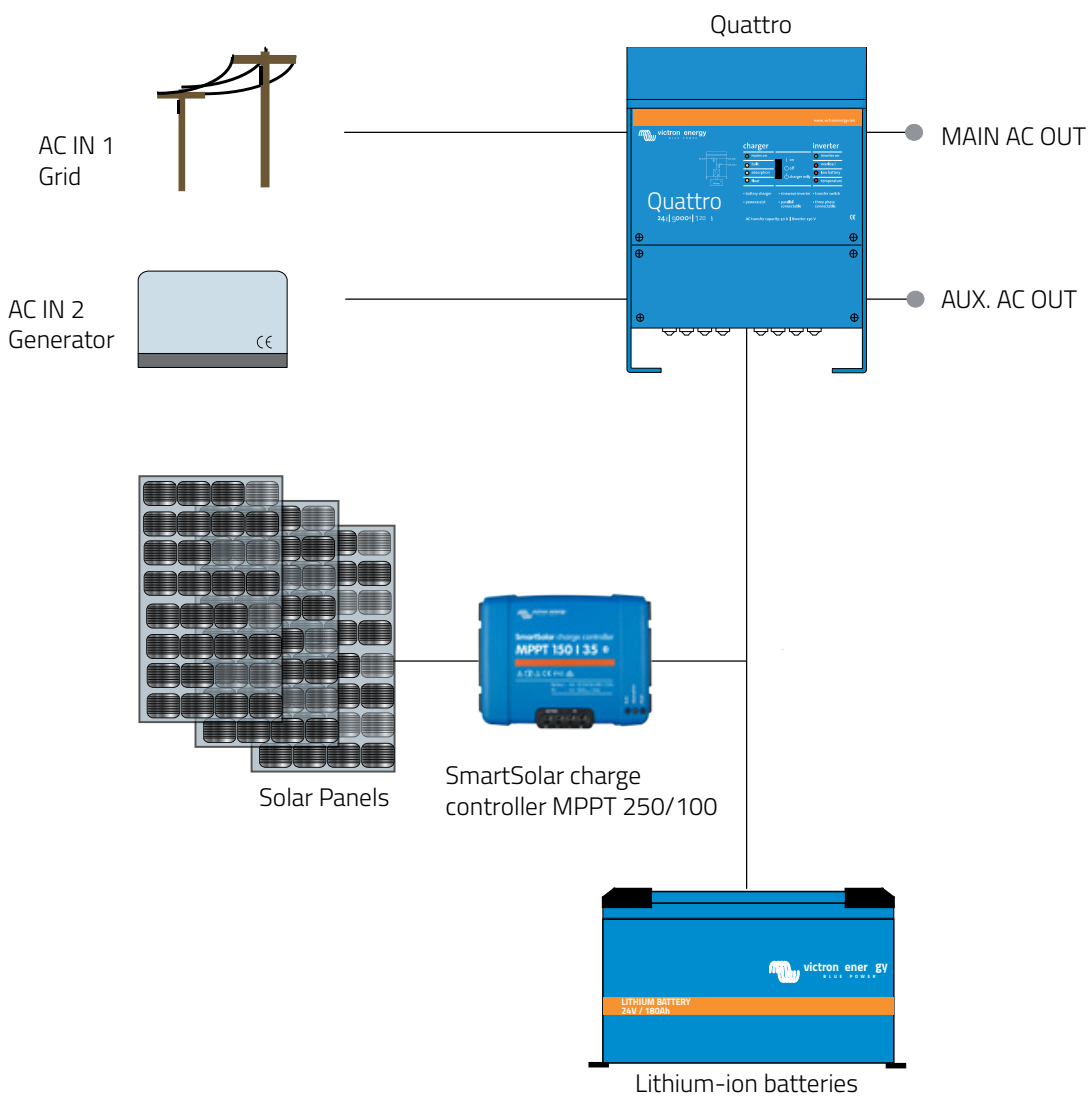
The presence of a functional electricity grid is not always as obvious as it would seem to be. An insufficient infrastructure is often the cause for an unreliable grid. Things become even more difficult when there is no grid at all. And yet you are in need of a reliable electricity supply.

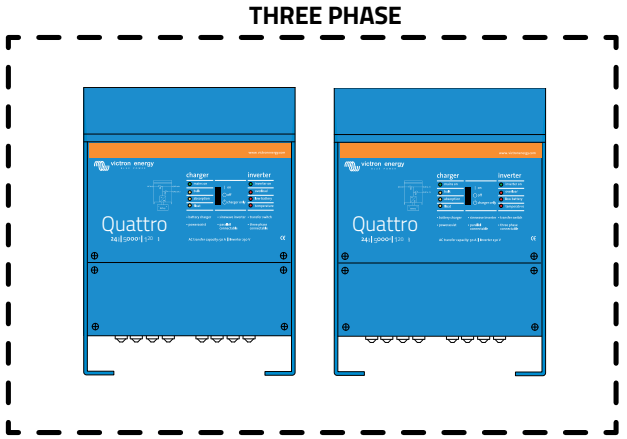
A local and properly functioning system is the only answer at this point. Victron Energy offers you such an answer. We are proud to offer you our modern translation for freedom and independence.

Energy, Anytime, Anywhere.

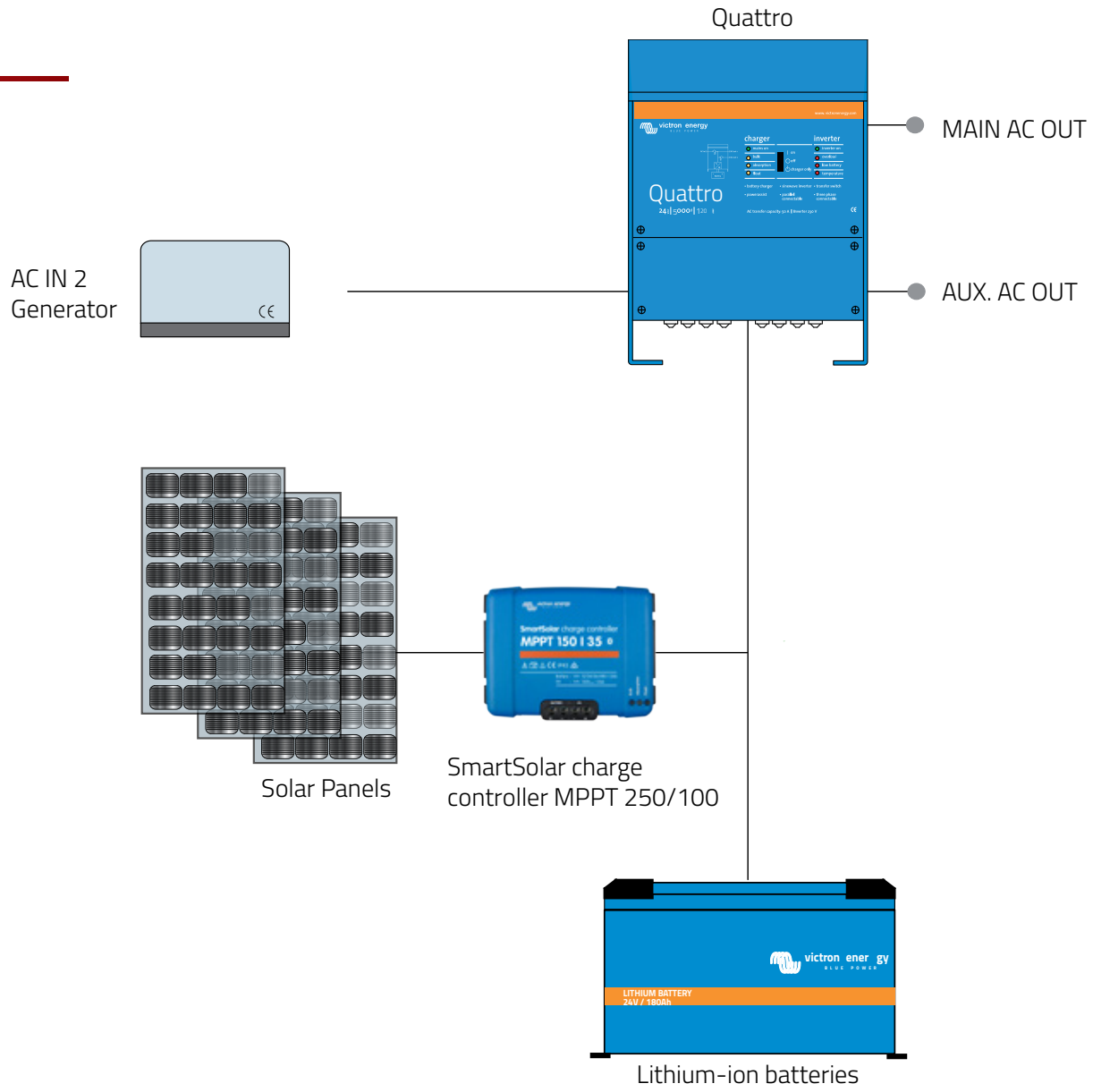

Start your off-grid
journey today

Single / Three Phase





Off Grid


Quattro
MAIN AC OUT
AUX. AC OUT
AC IN 2
Generator
Solar Panels
SmartSolar charge
controller MPPT 250/100
Lithium-ion batteries

Applications

Residential

Installations

Increase business continuity and
maximise profitability

NuDebt Case Study

NuDebt is a debt recovery services & payment solutions company with call centre manned by 400 agents.

The existing power back up system comprised of only a large generator. Every time a power failure was experienced the call centre agents experienced a 10-minute downtime as the complete call centre lost power and had to restart operation once the generator started feeding power. A separate call UPS for each call station would have been costly and also these smaller UPS devices have a relatively short life expectancy. A more permanent solution was required.

Every time a power failure occured, a loss of revenue of around R10,000 was experienced.

Taking this into consideration, NuPower Solar designed a system that created a UPS solution for their entire operation: 3 X15 KVA quattro units were installed and integrated into their existing generator setup.

A 40Kw PV panel array was also installed to reduce their electricity bill on a daily basis, and in an event of power failure to reduce their load on an already strained generator.

The solution payback will be less than three years, taken on an average of one power outage per month. In the first three months of installation they already experienced 12 outages.

With Victron's products and hybrid solutions, systems can be designed that will have a better return on investment than any grid-tied solution.


victron energy
AGM
12-230
• Constant voltage charge
• Caution:
Sealed Lead Battery
Must be recycled
or disposed of properly
www.victronenergy.com

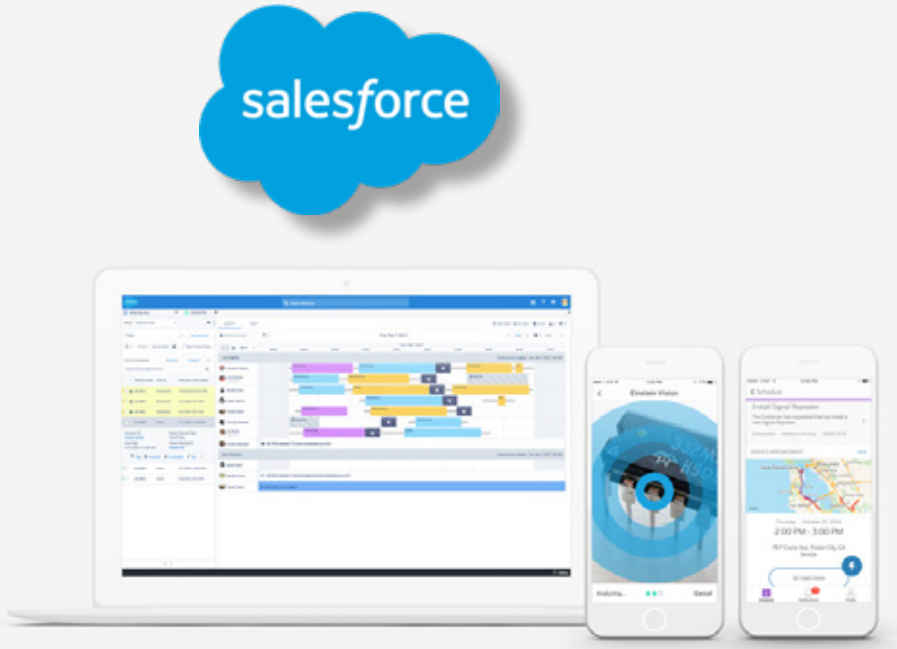
Customer Service
salesforce.com

We revolutionised the Customer Relationship Management (CRM) software industry in 1999 with our cloud-based CRM solution now known as Sales Cloud. Since then, we've evolved into one of the world's most innovative companies, engineering cloud computing solutions for companies worldwide to connect with their customers and grow their businesses.

Innovative solutions like Service Cloud and Marketing Cloud work seamlessly with Sales Cloud to give you a 360-degree view of your customers; improving customer service, generating more leads, and increasing sales. Salesforce Platform helps you create apps at the speed of Lightning, while solutions like IoT Cloud and Wave Analytics allow you to harness the power of your data.

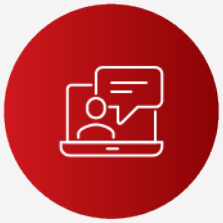
Our cloud-based CRM software is fast, secure and doesn't require hardware or software maintenance. With Salesforce, every team has access to the most up-to-date and reliable data, anywhere, any time, from any device. That's what makes Salesforce applications the ideal solution for small businesses and large enterprises alike.

Built in the cloud with our customers at the heart of everything we do, it's easy to see why Salesforce is the world's #1 CRM software. Discover the power of Salesforce today.



EFFICIENT INSTALLATIONS

NuPower Solar has in-house installation teams to ensure the quality and efficiency of our product solutions offered to customers. We also do installations on behalf of our dealer network in areas, where possible.



INCREASED CUSTOMER COMMUNICATION

NuPower Solar has a dedicated 24-hour contact number for emergencies. Only a few other solar companies within the industry offer this advantage.

24-Hour Emergency Number:
082 328 8330

ADVANCED AFTER SALES SERVICE

NuPower Solar consultants work closely with the company's technical staff to provide valuable input for refinement of each customer's individual needs.

CONTINUOUS SERVICE DEVELOPMENTS

At NuPower Solar, we continually strive to offer products and services that are relevant and in-keeping with trends in solar solutions offered worldwide.


Renewable Energy Solutions
That Work

Technical Specs

EasySolar	EasySolar 24/3000/70-50 MPPT150/70	EasySolar 48/3000/35-50 MPPT150/70	EasySolar 48/5000/70-100 MPPT150/100
INVERTER/CHARGER			
Transfer switch	50A	50A	100A
INVERTER			
Input voltage range	19 – 33V	38 – 66V	38 – 66V
'Heavy duty' output AC 2	16 A		
Output AC 1a, 1b, 1c, 1d	Output voltage: 230VAC ± 2% Frequency: 50 Hz ± 0,1% (1)		
Cont. output power at 25°C (3)	3000VA / 2400W	3000VA / 2400W	5000VA / 4000W
Cont. output power at 40°C	2200W	2200W	3700W
Cont. output power at 65°C	1700W	1700W	3000W
Peak power	6000W	6000W	10000W
Maximum efficiency	94%	95%	95%
Zero load power	20W	25W	35W
Zero load power in search mode	10W	12W	15W
CHARGER			
AC Input	Input voltage range: 187-265 VAC Input frequency: 45 – 65 Hz Power factor: 1		
Charge voltage 'absorption'	28,8V	57,6V	57,6V
Charge voltage 'float'	27,6V	55,2V	55,2V
Storage mode	26,4V	52,8V	52,8V
Charge current	70A	35A	70A
Battery temperature sensor	yes		
Programmable relay (5)	yes		
Protection (2)	a - g		
SOLAR CHARGE CONTROLLER			
Model	MPPT 150/70-MC4	MPPT 150/70-MC4	MPPT 150/100-MC4
Maximum output current (4)	70A	70A	100A
Maximum PV power	2000W	4000W	5800W
Maximum PV open circuit voltage	150V		
Maximum efficiency	98%		
Self-consumption	10mA		
Charge voltage 'absorption', default setting	28,8V	57,6V	57,6V
Charge voltage 'float', default setting	27,6V	55,2V	55,2V
Charge algorithm	multi-stage adaptive		
Temperature compensation	-16 mV / °C	-32 mV / °C	-64 mV / °C
Protection	a – g		

EasySolar	EasySolar 24/3000/70-50 MPPT150/70	EasySolar 48/3000/35-50 MPPT150/70	EasySolar 48/5000/70-100 MPPT150/100
COMMON CHARACTERISTICS			
Operating temp. range	-40 to +65°C (fan assisted cooling)		
Humidity (non-condensing):	max 95%		
ENCLOSURE			
Material & Colour	aluminium (blue RAL 5012)		
Protection category	IP 21		
Battery-connection	Four M8 bolts (2 plus and 2 minus connections)		
PV connection	Two sets of MC4 PV connectors.		Three sets of MC4 PV connectors
230 V AC-connection	Screw terminals 13 mm² (6 AWG)		
Weight	28kg	28kg	48kg
Dimensions (hxwxd)	810 x 258 x 218	810 x 258 x 218	877 x 328 x 241
STANDARDS			
Safety	EN 60335-1, EN 60335-2-29, EN 62109-1		
Emission / Immunity	EN 55014-1, EN 55014-2, EN 61000-3-3, EN 61000-6-3, EN 61000-6-2, EN 61000-6-1		
Anti-islanding	See our website		

1) Can be adjusted to 60Hz and to 240V
2) Protection:
a. Output short circuit
b. Overload
c. Battery voltage too high
d. Battery voltage too low
e. Temperature too high
f. 230 VAC on inverter output
g. Input voltage ripple too high

3) Non-linear load, crest factor 3:1
4) At 25°C ambient
5) Programmable relay which can be set for general alarm, DC under voltage or genset start signal function

PV Panels

NuPower Solar uses only A-grade, tier-one solar panels. These come with a 25-year, 80% performance warranty – that means in 25 years the panels should still deliver a minimum of 80% of their original capacity. Tier-one manufacturers are panel manufacturers that have been manufacturing for at least 5 years, are publicly listed or have a strong balance sheet and have a fully automated production line with a high degree of vertical integration. Some of the manufacturers we source from include Canadian Solar, JA Solar, Jinko and CNBM.

CanadianSolar

CNBM

CINCO

JA SOLAR

Batteries

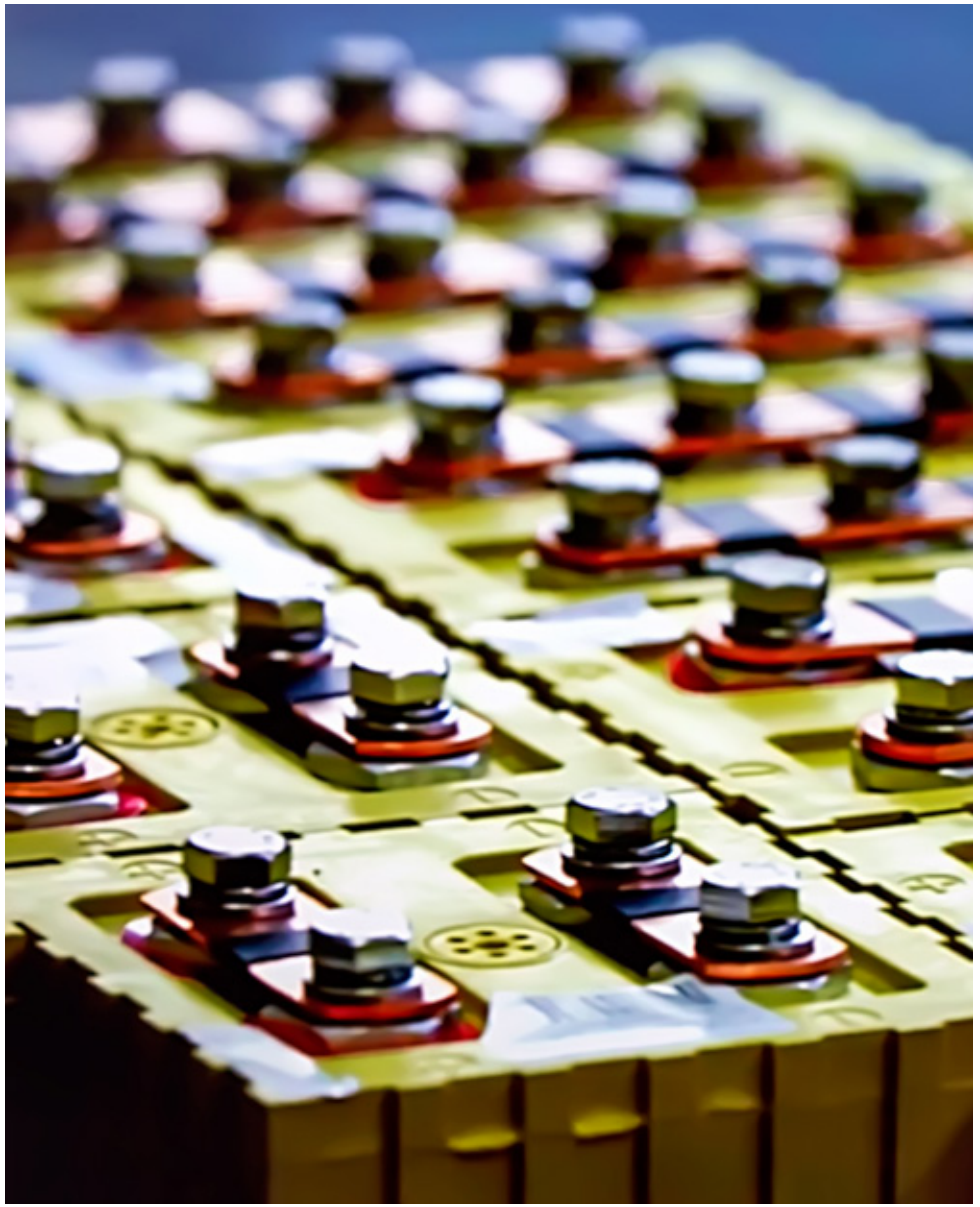
NuPower Solar supplies Lithium Iron Phosphate (LifePo4) batteries. This specific chemistry is chosen for its exceptional cycle life performance and excellent safety. The typical cycle life on these batteries are 5000-6000 cycles at a 80% depth of discharge. This means that 80% of the battery can be used 5000 to 6000 times, after which it has lost between 20% and 40% of its original capacity. NuPower Solar has chosen industry-leading manufacturers that have proven track records, support structures and product warranties. Some of these are BlueNova, BYD, Pylontech and Freedomwon.

BYD

BLUE NOVA energy

PYLONTECH

Plug into *The Current Future*
freedom WON



Investment Projects

Colourfast Trading Pty Ltd

NuPower Solar

Duncan Krause
0824420363
boss@duncankrause.co.za

Independant Sales Agent of NuPower