

This system is developed to use solar energy as an alternative energy. The system is capable to use as an HYBRID SYSTEM (solar + main utility) and as standalone solar system.

Why we call it Hybrid Solar system? Because it runs throughout the time when solar is enough power full to give power to the attached load . Solar system not only gives power to attached load it charge UPS batteries as well. Whenever system detects weak or absent Solar energy it automatically shifts it load to mains (Wapda), then it behaves like a normal UPS.

- Our system is equipped with modern technologies, capable to give power to almost all modern equipment from household to computing, communication system and networking systems.
- It reduces your electricity bills considerably by taking power from nature (Solar) .

System Architect:

This system has three main parts.

1. Solar charger.
2. Inverter
3. Battery charger.

Description:-

1. **Solar Charger:** Our charger is a MPPT (Maximum power point tracking) and a switch mode charger using an efficient buk regulator and it is unconventionally efficient, this circuit is placed between the solar panels, the battery and serve to regulate battery float voltage. Its control loop force the charger to operate at the point of maximum panel size and thus reduces the cost of overall solution. Our system improves solar energy extraction from a solar panel over a conventional diode-based reference circuit. It gives higher charge current and lower discharge current and reduce heating problems. The benefit of this circuit is particularly noticeable in the event of mismatch between the panel peak power voltage and the battery voltage.

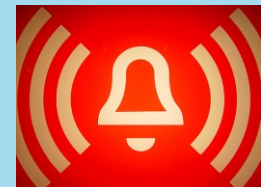


1. **Inverter:** Our inverter is isolated transformer based inverter controlled by micro controller and 32 bit (DSP) digital signal processor . It is a dual conversion H- bridge True sine wave inverter. Due to high performance SPWM it has very good output Stabilization on load and on battery conditions.
- i. **Filtering:** Our inverter has very high tech filters to snub any high frequency surge/Spike and EMI/RFI.
2. **Battery charger:** Our system has efficient charger design to charge batteries in a way that it enhance battery's life and charge batteries to give maximum level. It's a high frequency chopper based constant current charger capable of working on a wide range of input volts. The Battery Charger utilizes a five stage charger algorithm (Bulk, Absorb, Float, Equalize and Standby).



Some important features:

- a. Soft start for inductive load.
- b. Auto shut on over temperature.
- c. Overload protection.
- d. Low battery shutdown.
- e. Battery status bar.
- f. Audio and visual alarm for each performance.
- g. Auto detection on solar availability.
- h. User friendly Lcd display.

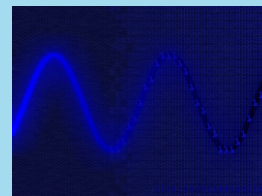


Some important applications/usage:

Almost all domestic, commercial and industrial usage includes Resistive, inductive, capacitive loads

Can be used with:

- 1) Domestic loads (Ac, fridge, fans ,lights and all hi fi equipments).
- 2) Commercial (Offices , Schools , Banks etc).
- 3) Industrial (Factories , Poultry control sheds , Embroidery machines, Petrol pumps , Tube wells , Fish farms etc).



Legate

HYBRID SOLAR⁺

INVERTER SPECIFICATIONS

Type	SPWM (sinusoidal pulse width modulator)
Controller Type	Microcontroller 8 bit nano watt technology/DSP 32 bit architecture and advanced control peripherals.
Conversion mode	Single Conversion H- Bridge low frequency Transformer based.

ELECTRICAL SPECIFICATIONS

Power Rating	1.5Kva	2.2Kva	3.5Kva	5Kva	10Kva
Output Supply	Single Phase				
Output Voltage	220 Vac(adjustable) On Batteries				
Output Frequency	50Hz or 60 Hz				
Output Waveform	Pure Sine Wave				
Output Stabilization	+/- 2 %				
DC Input	48VDC				
Surge Protection	By EMI/RFI Filters and MOV/ZNR				
Efficiency	90%				

OFF GRID SPECIFACTIONS

Pv Input Range	3.5Kva	5Kva	7Kva	10Kva	15Kva
System Stsrt @	52VDC				
System Stop @	40VDC				
Max input Current	80A DC.				
Output Voltage/Frequency	220VAC@50 Hz				

SOLAR CHARGER SPECIFICATIONS

Type	MPPT
Maximum Input Volts	80VDC
Charging Current	80 VDC Max
Boost/Bulk	Present
Over Temperature	Shut down @ 70 degree C

FAIL SAFE MODE/SAFETIES

DC Reverse Polarity	By DC Fuse
Low Battery	Auto Shut @ 40 Vdc, Auto Restart @50 VDC
Over Load	150 % for 1 second (Dual electronic protection sense from DC bus and AC output by CT)
Output Short Circuit	By AC Fuse /electronic shut down by over load circuit.
Over Temperature	Shut down @ 70 degree C

AUDIBLE/VISUAL INDICATORS

Audible Alarms	Inverter mode: Beep with intervals, Low battery :one minute pre shutdown with small intervals then long beep for 10 second @ shut down, Over load with long beep, Over temp with long beep.
LED INDICATORS	Continuous RED Led for Inverter mode & Flash with small interval for Faults.
LCD Display	Inverter On, Low battery, Over Load, Battery Voltmeter, Output AC Voltmeter.
LCD Display-2 (optional)	Temperature in degree C, Output Current in A/h, Output frequency.