



UNWIND THE TREASURE OF POWER

# **ITS POWER AND INFRASTRUCTURE PVT. LTD.**

❖ **OFF-GRID Hybrid (BI-DIRECTIONAL) SOLAR INVERTER**

❖ **SOLAR INVERTER**

❖ **SOLAR UPS**



**ITS Power & Infrastructure Pvt. Ltd.** is a leading designs, manufacturer & supplier of power product. ITS Power Company is in Bavdhan, Pune.

**ITS** is a manufacturer of power product likely Online UPS, Inverter, Industrial Power Supply, Battery Charger, Servo Stabilizer, Solar Inverter.

We have very good technical team having experience more than 20 years in power field. **ITS** has done so many customized power product installation successfully from last 5 years.

Now a days, Solar Inverter is most demanding power product in India, because India is going in Green Power and **ITS** power is introducing **Solar Inverter** with Good Quality, Technology as per Indian power condition & most importantly our product is Economical.

**ITS** brands solar inverter design specially made for Indian condition. It can be used with grid or without grid for all applications like domestic purpose, office purpose, industrial purpose etc. along with different configuration.

**ITS** Power is manufacturer of Solar off Grid Inverter. The configuration of this is done as per application & availability of Grid supply.

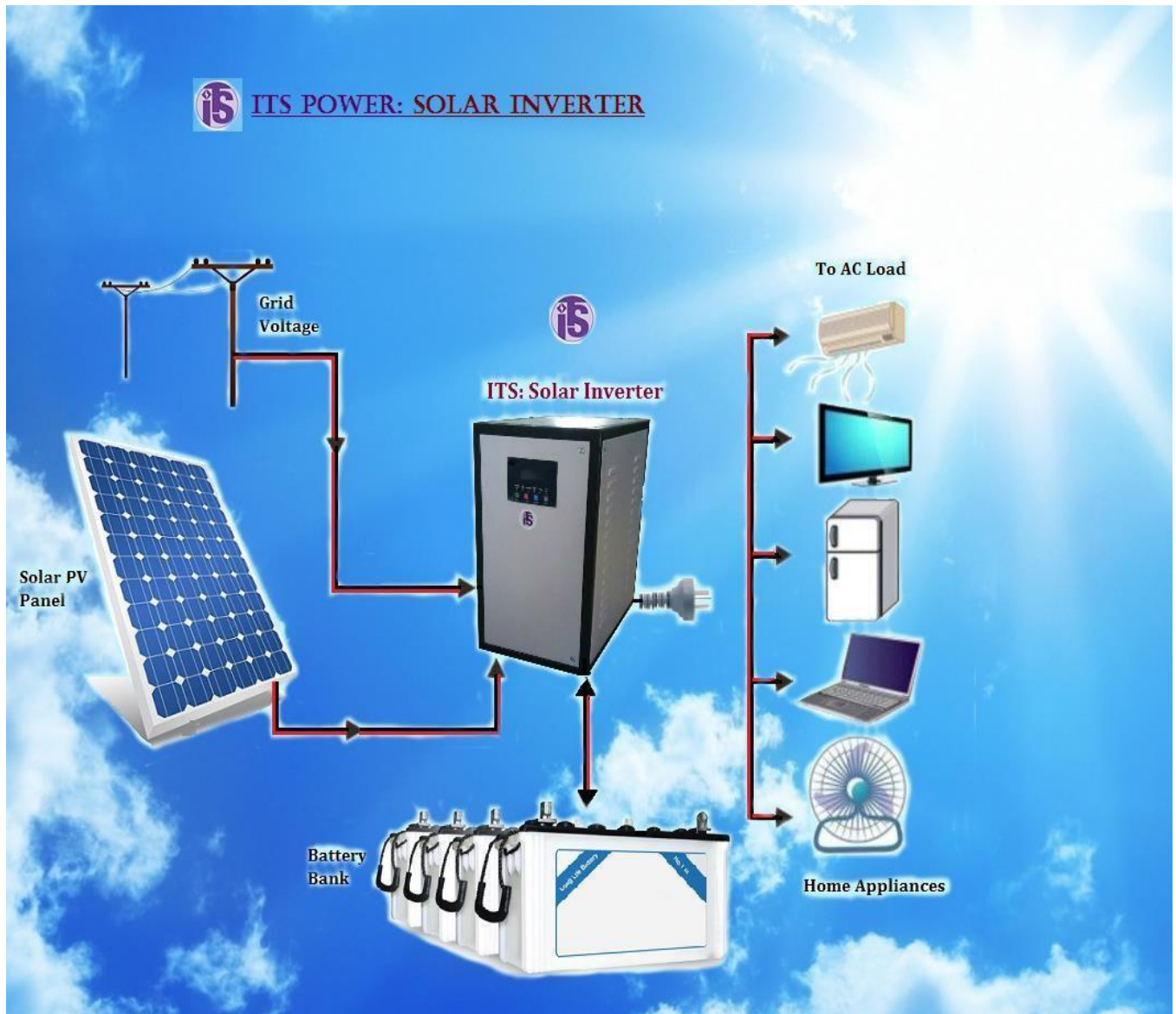
Mainly there are three type of solar product:

1. Solar Inverter
2. Solar UPS
3. Solar Inverter(without Battery)-Export of solar power



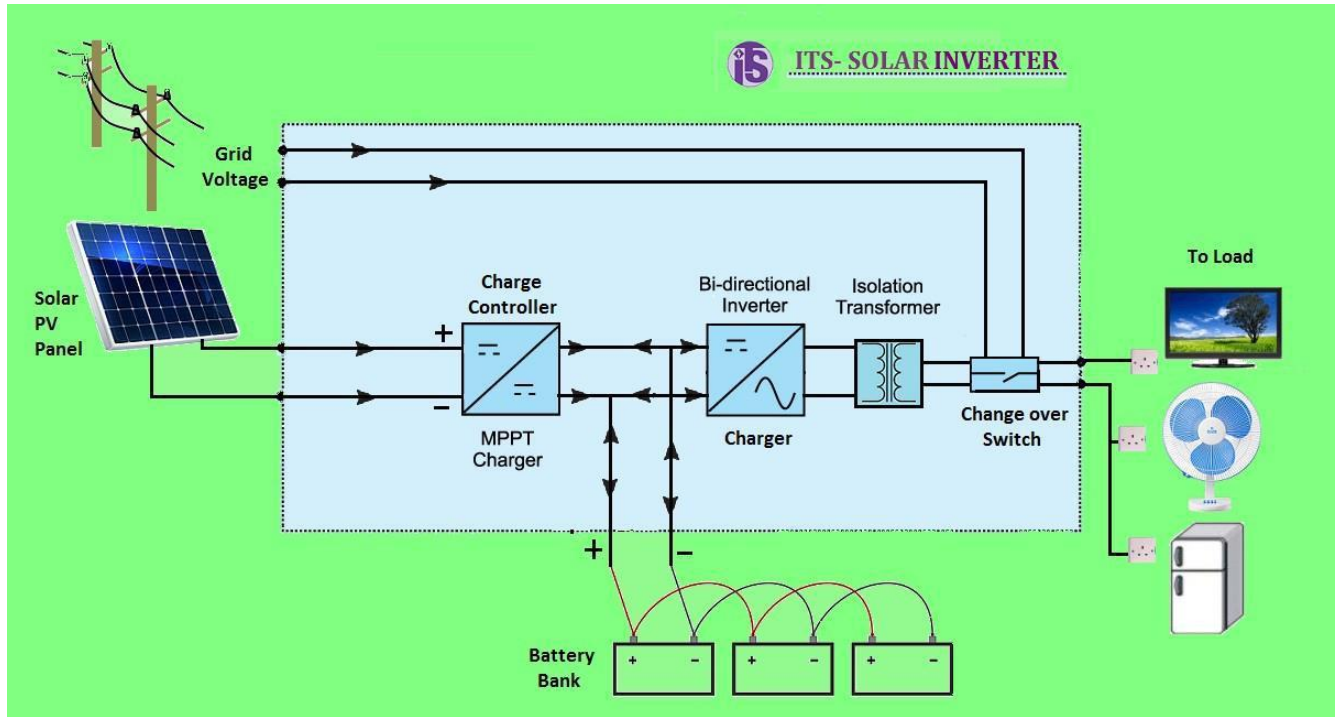
**Solar Off-Grid Inverter**

# ITS Power : Solar Inverter

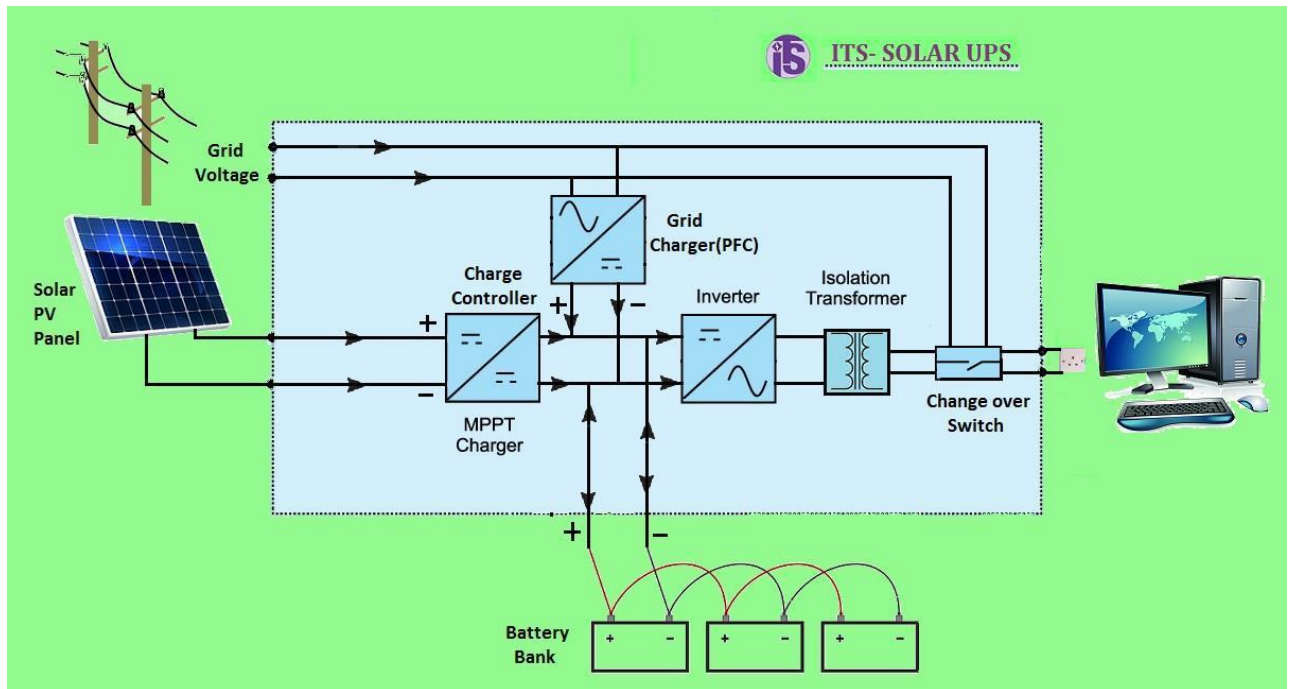


# Schematic Block Diagram:-

## 1. Solar Inverter:



## 2. Solar UPS:



## Special Features:-

- 1) Its design is totally based on highly efficient DSP based microcontroller.
- 2) It has high efficiency charge controller.
- 3) Solar charge controller is MPPT.
- 4) Easy for maintenance and understanding.
- 5) All parameter display on LCD based display card.
- 6) Easy to operate.
- 7) System is in sync with grid so changeover time is very less
- 8) Adjustment in charger current without any changing spares of the system.
- 9) Inverter is DSP based with power IGBT device. It can operate in bi-directional mode.
- 10) System is totally design with highly efficient isolation transformer.
- 11) Inverter operated in bi-direction. It is working as a inverter in one direction that is from DC to AC and working as a charger in reverse direction for grid voltage to DC voltage.
- 12) Available in different configuration
  - A) Solar, Solar Battery, Battery, Grid
  - B) Solar,Solar Battery,Battery,Grid(With Grid Charger)
  - C) Solar, Solar Grid, Grid, Battery (Online Solar UPS)
  - D) Solar only (Solar Power Export to Grid)
- 13) We can change the configuration by adjusting parameter with the help of front display.
- 14) It can be used without battery that means generated power from solar is going to connected load. If extra power is present then it is export to grid. And if suppose grid is fail then solar power going to grid will stop only solar supply power to connected load.
- 15) It can be designed as per customer priorities.
- 16) We design solar product (1Ø-1Ø) for different DC voltage, different configuration ranging from 1KW to 15KW.
- 17) Solar Charger capacity is 200%.

## ITS Solar Off-Grid Inverter Configuration:-

Solar configuration means mode of operation is depend on customer requirement as per his requirement.

- **Configuration- 1**

**Solar** → **Solar Batteries** → **Battery** → **Grid**

In this configuration, first of all system will take power from solar, if solar is less than connected load will take power from battery and it is operating upto battery setting value (30% buffer battery supply.)

Once battery reaches buffer point then load is shifted to grid and batteries are charging through solar. Once battery are fully charge through solar then again load is shifted to solar.

Buffer capacity of battery is kept for emergency backup if solar is not present and grid is also not present. In this situation, system will get 30% backup to the load.

- **Configuration- 2**

**Solar** → **Solar Battery** → **Battery** → **Grid (With Grid charger)**

In this configuration, whole thing is same as that of configuration- 1, only difference is that it has grid charger which charge the battery up to 80% and connected load will take power from grid.

- **Configuration- 3**

**Grid** → **Solar Batteries** → **Batteries**

It is same as domestical Inverter. In this system batteries are charging through solar only and inverter will give power to load when only grid fails.

- **Configuration- 4(solar power export to grid)**

**Solar** → **Grid**

Generally it is called solar export to grid and it can be used for office load that is light, fan and computer and extra power is export into grid.

### **Application:-**

- School
- College
- Defence
- Hospital
- Restaurant
- Offices
- Factory
- IT Companies

## **Working of Solar Inverter:-**

Solar Inverter has three sections:-

- 1 MPPT / Charge Controller Section
- 2 Inverter / Bi-directional Section
- 3 Changeover Section

### **1) MPPT / Charge Controller Section :-**

MPPT (Maximum Peak Power Transfer) or Charge controller is used for charging the battery from solar panel.

The function of this charger is convert higher variable DC voltage (which is generated from solar panel) to fix DC voltage for inverter DC bus and battery charging purpose.

Topology is buck converter with IGBT Controlled technology and efficiency is more than 90%

- ### **2) Inverter / Bi-directional Section:-**
- In this section we are converting DC voltage either from charger controller or batteries into pure sine wave with Isolation Transformer at output side.

It can be also used as grid charger in reverse direction.

### **3) Changeover Section:-**

In this section there is contactor changeover, it is operating as per direction given by control section.

This direction is totally depend on mode of directions

## Technical Specification for Solar Inverter [Model Suryabaan] Of ITS Brand

Sr. No.	Parameter	Specification		
1	<b>Rating</b>	2 KVA to 4 KVA	5 KVA to 9 KVA	10 KVA to 15 KVA
2	<b>DC Voltage</b>	48 V	96 V - 120 V	180 V
3	<b>Grid Voltage</b>	170 V to 270 V	170 V to 270 V	170 V to 270 V
4	<b>Grid Frequency</b>		47 - 53 Hz	
5	<b>Synchronize</b>	Grid Voltage & Inverter Voltage are in sync		
6	<b>Grid Charger</b>	Bi - Direction as Inverter in Reverse Direction		
7	<b>Solar Charger</b>	Charge Controller OR MPPT (Depends on nature of load)		
8	<b>Topology</b>	buck converter by using IGBT as a controlled Switching Device		
9	<b>Capacity Of Solar Charger controller</b>	2 times of Rate for Inverter		
10	<b>Max open Circuit PV Voltage VOC</b>	150V	250V	300V
11	<b>MPPT Voltage Rating</b>	60 - 120V	130 V - 200V, 160 V - 250 V	240 V - 320 V
12	<b>Peak Charging efficiency</b>	90 to 95%		
13	<b>Out Put Inverter Voltage</b>		230 V AC $\pm$ 2 %	
14	<b>Out Put Inverter Frequency</b>		50 Hz $\pm$ 0.5%	
15	<b>Continuous Power</b>	Rating $\times$ 0.8 ( P.F )		
16	<b>THD</b>		THD less than 4%	
17	<b>Selected Configuration</b>	1)Solar, Solar Battery, Battery & Grid - (With 30% buffer capacity of battery it can be adjustable as per customer requirement ) Without Grid Charger.  2.Solar,Solar Battery, Battery& Grid ( With Grid charger 100% use of solar Battery Buffer Capacity can		



		<p>be adjustment as Customer Requirement )</p> <p>3&gt;Grid Battery - (Simple like domestic inverter with solar panel is only charging the battery.)</p> <p>4&gt;Solar, Solar-Grid (Without Battery with solar power can be export to Grid &amp; it can also use when Grid supply fail )</p> <p>5&gt;Solar On line UPS Solar, Solar - Grid, Grid, Battery.</p>		
<b>18</b>	<b>Change Over Time</b>	<15 ms both Inverter & grid are in sync		
<b>A</b>	<b>Waveform</b>	Pure sine wave		
<b>B</b>	<b>O/P P.F.</b>	0.8 Lagging		
<b>C</b>	<b>Efficiency of Invertor</b>	> 85%		
<b>D</b>	<b>Over Load Capacity</b>	125% for 60 sec. , 150%for 5 sec. ( can be adjustable as per nature of load )		
<b>19</b>	<b>Manual By Pass</b>	Available		
<b>20</b>	<b>Protection</b>	AC over, AC under, Over Load, DC under, Short circuit, DC over.		
<b>21</b>	<b>Display Parameter On Front Display</b>	System Mode	Grid Voltage	Output Voltage
		Current Status	Grid Current ( Optional ) Frequency.	Load in Amp. (Load in %)
		Battery Voltage		Panel Voltage
		Battery Status in %		Panel Current
		Charging Current		
		Discharging Current		KW, KWH
<b>22</b>	<b>Faulty Condition On Display</b>	All Faulty Conditions Of Protection		
<b>23</b>	<b>LED Indication</b>	Mains On, Load On Inverter, Load On Bypass, PV On Fault.		