



**RITUDHAN**  
SOLAR POWER

## Product Profile

**RITUDHAN SOLAR POWER 9879111390** is the great visionary of **Mr. Dhanesh B Patel** (Huge experience of 19 years in solar field) established in the year of 2011-12. It was started with goal to enhance the idea of renewable energy in Gujarat state and India. After independence it was realized that the country was facing severe power shortage. This organization was established with an aim to overcome this shortage by rendering services and marketing the availability of Renewable Energy Sources (Solar Power) in most rural parts of the state. The organizations is aiming at enlightening each and every house in remote villages, facing power problems, with the eternal source of energy "The SUN" through availability in all and provide sophisticated services with generation of employment.

After 68 years of independence also there are so many hamlets in our country are still remain un-electrified. And the people residing there cannot afford electricity bill and line connection charges. The problem can be solved using solar products.

Now a day's ecological imbalance is posing a big challenge forth us. To overcome this calamity and challenge to our existence we should switch over from conventional energy sources to non-conventional energy sources such as solar products.

To the best of our knowledge solar energy, the most easily and abundantly available energy, is the best permanent solution to this grave problem.

**Solar Water Heater | Street Light | Power Plant | Glass Tube System & All type of Solar Products**

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## PRODUCTS PROFILE



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### Solar Water Heating System (FPC)

Solar Water Heater is a device, which heat the water by solar radiation, consist of a Flat Plate Collector & insulated Storage Tank. In Flat Plate Collector Solar radiation is passed through cover plate (Toughened glass), which is absorbed by the Copper Absorber and converted in to heat and it pass to the water inside the absorber tube. Thus water gets heated by solar radiation. Hot water is stored in insulated Hot Water Storage Tank from which we can utilized hot water as and when we require. Mostly the water heating system is working on greenhouse effect and thermosyphone principle

### APPLICATIONS:

Hot water from Solar Hot Water System can be utilized for Bathing Cooking, Washing etc in domestic Sector, and for Preheating of Boiler feed water up to 80°C., Washing & Cleaning of vessels, Sterilizing Process, Pasteurization Process in dairy industries. Same can also utilized in other industries like Textiles, Edible oil and refining, Breweries, Pharmaceuticals - drug manufacturing Units, Electroplating / Galvanizing Unit, Paint Shops, Pulp and Paper Industries, Soft drink bottling plant and also Hot water at 60-80 degree for hostels, Hospitals, restaurants, dairies, homes, industries etc.

### Payback Period

Solar water heaters are cost comparative in many applications, when you calculate account for the total energy cost over the life of the system. Approximate life of the solar water heating system is 15-20 year. Although the initial cost of the solar water heaters is higher than conventional water heaters, but the fuel (solar radiation) is free. A 100 liters per day capacity SWHS can replace an electric geyser for residential use and saves 1,435 units of electricity annually. The return on investment has become increasingly attractive with the increase in prices of conventional energy. The payback period will be around:

- 1.5-2.5 years when electricity is replaced
- 3-4 years when furnace oil is replaced
- 3-4 year when coal replaced.

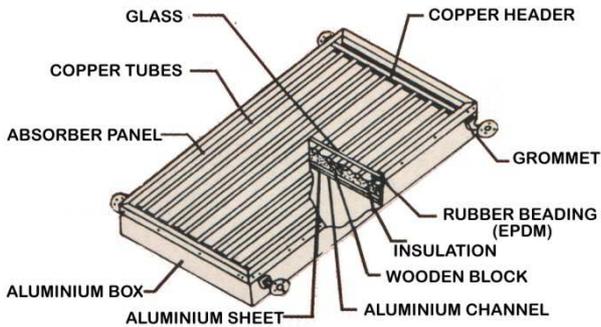
Plus, they are environmentally friendly. A SWHS of 100 Liters capacity can prevents emission of 1.5 tones carbon dioxide per year.

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### PARTS OF SOLAR FLAT PLATE COLLECTOR



### Evacuated Solar Water Heater (ETC)



### Solar Water Heating System (ETC)

Solar Water Heater is a device, which heat the water by solar radiation, consist of a Evacuate Glass Tube & high quality PUF insulated GI/SS Storage Tank. In Evacuated tube collector, Solar radiation is passed through cover plate, which is absorbed directly to the water inside the selective coated absorber tube. Thus water gets heated by solar radiation directly. Hot water is stored in to high quality PUF insulated Hot Water Storage Tank from which we can utilized hot water as and when we require. Mostly the water heating system is working on and thermosyphone principle.

### APPLICATIONS:

Hot water from Solar Hot Water System can be utilized for Bathing Cooking, Washing etc in domestic Sector, and for Preheating of Boiler feed water up to 80 °, Washing & Cleaning of vessels, Sterilizing Process, Pasteurization Process in dairy industries. Same can also utilized in other industries like Textiles, Edible oil and refining, Breweries, Pharmaceuticals - drug manufacturing Units, Electroplating / Galvanizing Unit, Paint Shops, Pulp and Paper Industries, Soft drink bottling plant and also Hot water at 60-80 degree for hostels, Hospitals, restaurants, dairies, homes, industries etc.

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### Payback Period

Solar water heaters are cost comparative in many applications, when you calculate account for the total energy cost over the life of the system. Approximate life of the solar water heating system is 10-12 year. Although the initial cost of the solar water heaters is higher than conventional water heaters, but the fuel (solar radiation) is free, A 100 liters per day capacity SWHS can replace an electric geyser for residential use and saves 1,435 units of electricity annually. The return on investment has become increasingly attractive with the increase in prices of conventional energy. The payback period will be around:

- 1-2 years when electricity is replaced
- 2-3 years when furnace oil is replaced
- 2.5-3 year when coal replaced.

Plus, they are environmentally friendly. A SWHS of 100 Liters capacity can prevents emission of 1.5 tones carbon dioxide per year.

### PARTS OF SOLAR FLAT PLATE COLLECTOR



### Highlights of Solar Water Heating System

- Latest Technology – Best in Quality
- High Efficiency
- Simple, Safe and very low maintenance
- High-Tech Evacuate Glass Tube Absorber also available
- Pollution Free
- Hot Water available without Electricity or other Fuels



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## Solar Water Heater Projects:



### System Photo of 20,000 LPD at 80<sup>o</sup>C

Capacity of Systems	:	20,000 & 10,000 Liters per day
Outlet temperature	:	80 <sup>o</sup> C
System Type	:	Forced Flow
Annual Energy Saving	:	33,00,00,000 Kcal- 68,750 Kg of Furnace Oil
Purpose	:	Preheating of Boiler Feed Water



Capacity of Systems	:	5,000 Liters per day
Outlet temperature	:	60 <sup>o</sup> C
System Type	:	Forced Flow
Purpose	:	Milk cans washings.

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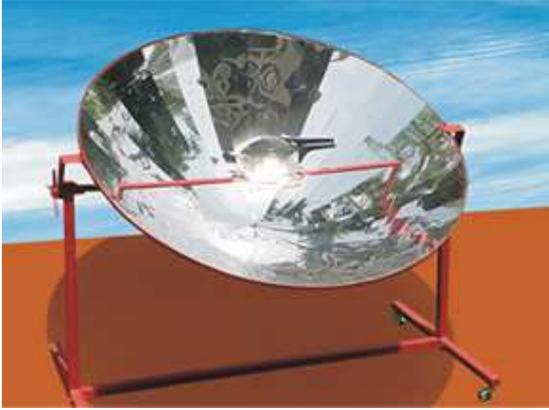
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## Solar Parabolic Cooker



Dish solar cooker is used for faster outdoor cooking for about 10-15 persons with solar energy. A dish cooker (SK -14 type Solar cooker) with a dish diameter of 1.4 meter is made of single reflector or by joining smaller pieces of reflector, fixed to a rigid frame, when exposed to Sun in the normal direction; a point focus would be formed for cooking food. It consists of bright anodized aluminum sheets of 0.4 mm thick or 3 mm thick glass mirrors, bowl supporting frame, bowl stand, and manual tracking mechanism. Accessories like cap, hand gloves, goggles, manual and 5 ltr capacity ISI marked pressure cooker are also supplied with dish cooker. This cooker may be used for cooking food without any conventional fuel for large families or institutions where food is cooked for 10-15 persons every day.

## Box type solar Cooker



A solar cooker can cook food without any cooking gas or kerosene, electricity, coal or wood. This cooker works with the solar energy, which is available free. A solar cooker can cook two meals per day for four to five persons. Solar Cooker suits very well for the food habits and meal timings of rural households. Solar Cooker can be used for cooking several items like pulses, rice, kheer, khichri, vegetables, cereals, etc. Some special dishes like Muthia, Handva, Patra, Idli, Dhokia, Lapsi, Dudhpak, Pulao and soups can also be cooked. To add to the list, we can bake bread, biscuits, cake and nankhatai, etc. The non-vegetarian items like fish, chicken, meat curry, shahi kababs, etc., which are boiled or roasted can also be prepared in a solar cooker. Solar Cooker cannot be used for making rotis, chapatis, rotla etc. as well as for frying. It can't cook food for more than 4-5 persons at a time. It is not useful during non-sunny days.

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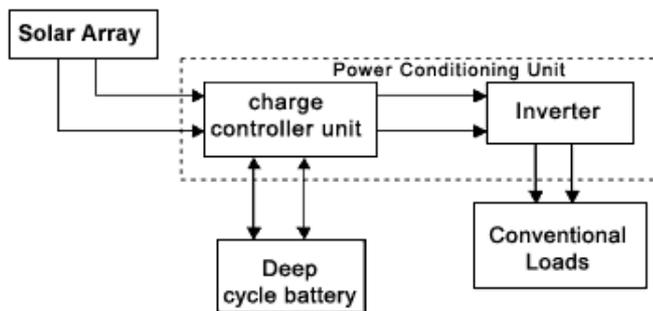
## SOLAR POWER PACK

Solar Power pack is systems used to generate electricity that make use of benign solar power. These systems are ideal for locations where grid is inaccessible or the access is prohibitively expensive. The Solar power pack can also be used in conjunction with existing grid to enhance the energy delivered at that particular location.

The electricity generated by the solar array is stored in the Battery through Charge Controller. The loads are activated when required and is powered by the Battery through an Inverter. A change over switch is provided to transfer the load from Solar to grid and vice versa. In general, the backup period for the full load is 4 -5 hours per day.

### Description:

The block diagram of the system is explained below:



### Solar Array:

The Solar array consists of a set of solar modules connected in a predetermined fashion to get the desired voltage and current. These modules are mounted on a solar module mounting structure and installed at an equal to latitude of the site and tilted towards the true South. The array is installed at a shadow free area and near to the battery to avoid cable losses.

The range of solar array is from 1Wp to 5 KWp and can support load from 0.8W to 4kW for a maximum backup of 4-5 hours per day.



### Power Conditioning Unit (PCU):

PCU consists of a Charge Controller Unit (CCU) and an Inverter. CCU will control the charging, discharging of the battery, Load connection and disconnection and Panel connection and disconnection. In other words the PCU is the heart of the system and ensures the life of the battery and optimum usage of the system.



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*Inverter will convert the DC energy into alternating energy to meet the conventional load demand for the predetermined period. It will also take care of the initial surge current required for inductive loads. The capacity of the Inverter will always be double the size of the load demand.*

*Indicators are available on the PCU for obtaining the system status at any given point of time.*

- *Green light indicates real charging of the battery from solar array.*
- *Red light indicates that the battery is discharged and requires charging. Please note that the load is not active during the battery low condition.*
- *Yellow light indicates that the Inverter is ON and the output loads are active.*
- *Neon light indicates that the output is overloaded and disconnects the loads from Inverter. For restoration of the supply to loads reset button has to be pressed.*
- *Other indications like Input ON, Output ON etc. can be added and are optional.*

### Battery:

*Batteries used in the Power pack are Low Maintenance lead acid batteries for longer life and un-interrupted operation of the system. The batteries will take in the energy from solar array and release the energy to loads when desired through PCU. The battery will have autonomy of 1 day i.e. the loads can be operated for one day even though the solar energy is not available. The autonomy can be increased based on the Customer requirement.*

### Conventional loads:

*The loads like Fluorescent lamps, Incandescent lamps. Ceiling fans, Television set, Music system etc. can be connected to the Power pack and can be used for the predetermined period without any interruption. The duration of the usage can be increased proportionately if the load management principle is implemented.*

*In case of system failure the loads can be activated with the help of conventional energy by using a change over switch.*

*\* Design and technical specifications are subject to change without notice.*



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## Solar Pumping System



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### System Layout

The solar pump system consists of solar panels on a mounting structure, a pump controller, an electric pump and a storage tank for water. The big advantage of the solar pump is that there is no battery necessary to back-up the solar power. The pump is connected to solar panels, so water is pumped from low to high level in case the sun shines. The water is buffered in the tank that is mounted at a higher level than the taps. In this way there is pressure on the taps and there is water available if the sun is not shining. The function of the water tank is comparable to the function of the battery.

To obtain a good match between solar panels and the pump, the pump controller is connected in between. This controller makes the solar pump a unique product. Not any other pump can be used, on the contrary! The controller converts the direct current from the solar panels into alternating current with a frequency that depends to the irradiation. At the low irradiation, for example in the morning at sunrise, the pump will be driven by a slowly rotating engine. The speed of rotation will increase when the sun rises in the course of the day.

As per your requirement for solar pumping solution, we are pleased to submit the following proposal. The solutions will be use good quality solar panels. For the pumping system, we propose to use the Lorentz or submersible/surface pumps. The pump is accompanied with a solar drive, which will convert the DC solar power to AC and operate the pump.

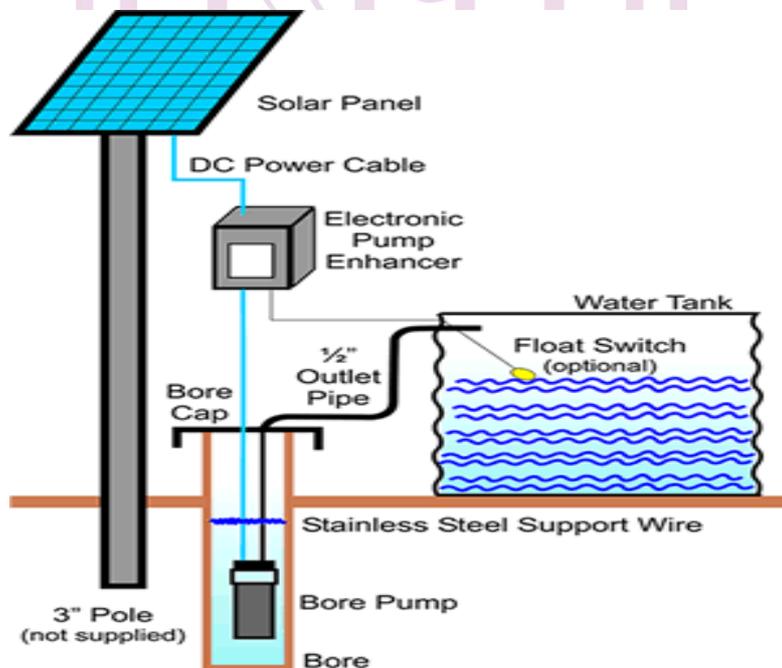


FIGURE 1 SCHEMATIC OF A TYPICAL SOLAR PUMPING SYSTEM

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**Solar Street Light (CFL)** Solar radiation are fall on Photovoltaic Cell, convert sunlight directly in to electricity. A solar PV cell consists of semi conducting material that absorbs the sunlight. The solar energy knocks electrons looser from them atoms, allowing them to flow through the material to produce electricity. PV cell are typically combined into modules. These modules are mounted in PV arrays. PV arrays can be used to generate electricity.

A power plant can also use a concentrating solar power system, which uses the solar radiation to generate electricity. The sunlight is collected and focused by mirrors to create a high-intensity heat source. This heat source produces steam or mechanical power to run a generator which produce electricity.

Lamp	:	CFL 11 Watt
Battery	:	12 V - 75 Ah. Tubular / SMF
Module	:	12V / 74 Wp
Pole	:	MS 5 meter
ON/OFF`	:	Dusk to dawn
Body	:	Metallic Coated
Efficiency	:	More than 80 %

**Solar Street Light (LED)** Solar radiation are fall on Photovoltaic Cell, convert sunlight directly in to electricity. A solar PV cell consists of semi conducting material that absorbs the sunlight. The solar energy knocks electrons looser from them atoms, allowing them to flow through the material to produce electricity. PV cell are typically combined into modules. These modules are mounted in PV arrays. PV arrays can be used to generate electricity.

A power plant can also use a concentrating solar power system, which uses the solar radiation to generate electricity. The sunlight is collected and focused by mirrors to create a high-intensity heat source. This heat source produces steam or mechanical power to run a generator which produce electricity.

Lamp	:	11 Watt (LED)
Battery	:	12 V / 40 Ah. Tubular / SMF
Module	:	12V / 40 Wp
Pole	:	MS 5 meter
ON/OFF`	:	Dusk to dawn
Body	:	Metallic Coated
Efficiency	:	More than 85 %

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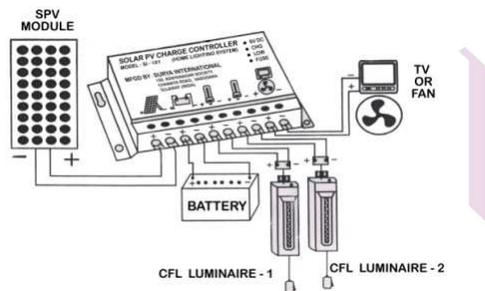
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## Solar Lantern



Body	:	UV stabilized Plastic
Lamp	:	CFL 7 watt
Battery	:	12 V / 7Ah.
Module	:	5/10/12 watts
Efficiency	:	More than 80 %

## Solar Small Home Light



Lamp	:	3 / 6 watt/ LED fixture
Battery	:	12 V, 40 /50 / 75 Ah
Module	:	10/20/37/74 watt
Efficiency	:	More than 80 %

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