



**Bati Energy,
Your solar farmers,**

Wednesday, 06 May 2015

We bring you, high quality and highly reliable Solar Water Pumping Systems. The Best thing Ever happened to Agriculture. Solar water pumps helping irrigation in desert land.



Solar Water Pumps Operating on AC power.

Solar Pump Controller: A unique Solution for existing AC Pumping Systems

Rising draught situations and inaccessibility to power have been one of the predominant challenges for rural economic progress. Addressing this scenario, the nation has also acted upon concrete developmental plans of promoting off-grid solar systems for the betterment of life.

Solar pumps are poised to play a tremendous role in rural electrification especially in the areas suffering from accessibility of energy.

As against all the efforts our system has been specifically designed and tried on fields for any type/make of AC pumps and have proven in the field as:

- 1. Direct interface with PV Array**
- 2. Unmatched pump output/delivery**
- 3. Unique Smart logic to calculate maximum power every 1 millisecond.***
- 4. Fully programmable system.**
- 5. Compliance to regulatory standards.**
- 6. Remote monitoring feature (optional)**



Salient features / Technical details

- **Field Oriented Vector control Inverter with “Built in” ‘Smart Logic’ to control the motor to be operated from Solar Panels, together with Auto Start, Auto Restart, Dry Run Protection and Restart, On-Off Programmable timer function - as a single composite unit.**
- **“Built in” EMC Filter and Toroidal DC Choke**
- **DC Voltage range : 580 - 630 VDC**
- **This solution will work only with conventional modules**
- **Suitable for any AC Motor pump of 400 VAC, 3 Phase, 50Hz +/-2 Hz**
- **Models available up to 18.5KW (Higher Power solutions are available up to 1MW)**
- **Suitable for 45 Deg C Ambient**
- **110% overload for 60 sec**
- **Speed regulation of 1:100**
- **Suitable for output cable lengths up to 100 meters.**
- **Protected against short circuit of Phase to Phase, Phase to ground/earth**
- **GSM Connectivity for remote monitoring (optional)**
- **3 Years Warranty**
- **CE, UL approved**
- **Galvanized Sheet Metal Body**
- **Water level control On/Off feature**

We offer our standard systems ranging from 0.55 KW to 18 KW and can extend up to any higher size as tailor made solutions.

As a unique working model; our controller can give you numerous advantages. This is a direct solution that we offer for a conventional 3 phase AC motor pump which has many advantages over the existing DC Solar Pump solutions:

At Bati Energy, we also recognise the importance of high efficiency, stand Alone DC Solutions, and hence we also provide up to 5KW range Stand Alone DC Solar Water Pumping systems, where Grid Interaction is not required.

Solar Panels:

Solar panels have to be of compatible electrical parameters, to work better with a controller, cum Inverter; hence we provide them combined with the Controller, to give 3phase, AC power output. Solar panels that we offer with the systems are made in Indian Solar Panel Manufacturing units, with European Engineering standards. These panels provide reliable performance. They carry quality standards as per IEC, CE, and ISO.

The major benefit, apart from quality and reliability of a proven technology, is lesser losses at Increasing Temperatures compared to other players. We choose the best for you.

Line Diagram:

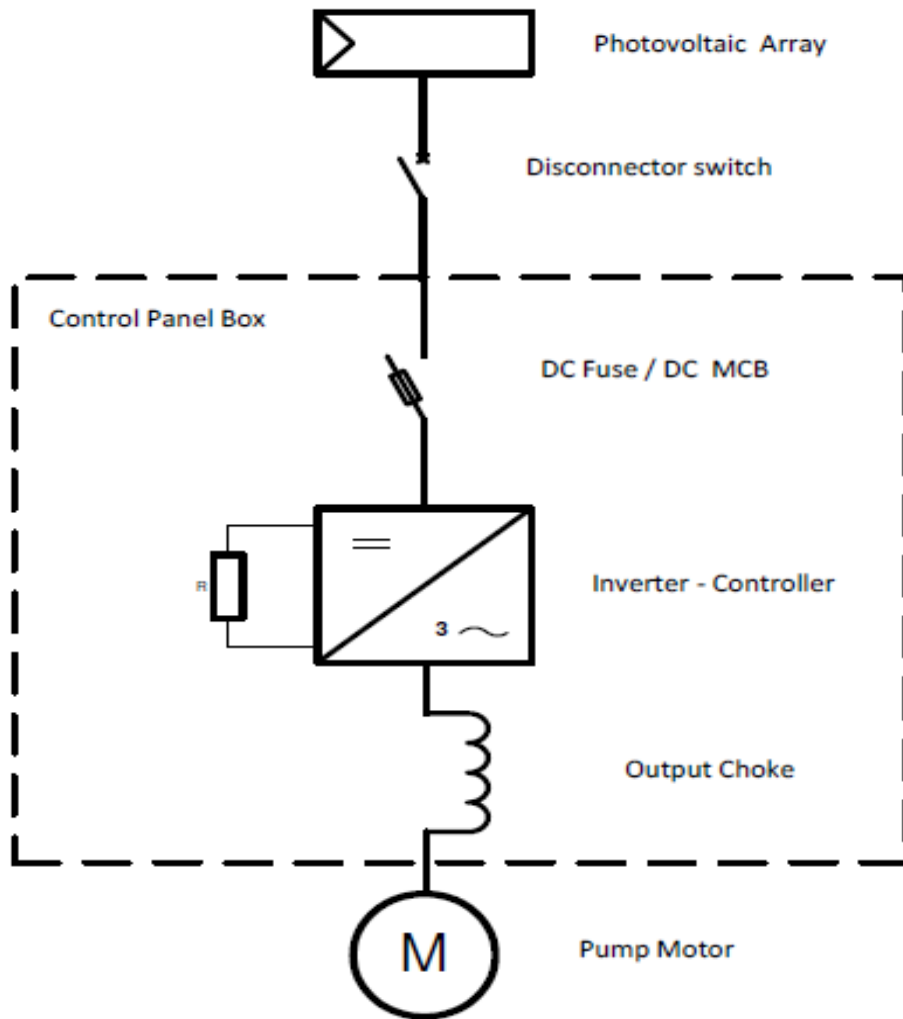


Figure No.1. Solar Pump Controller Line Diagram

System Configuration:

At the heart of the system lies smart controller which necessitates an operating DC Link voltage in the range of 580 - 630 VDC. Hence proper selection of PV modules with correct maximum DC (Vmax) voltage and peak wattage (Wp) along with optimal system design is essential to make effective use of solar irradiation for the choice of controller and pump.

Change over Scheme: There is also a provision of switching the pump from solar power to grid power at night or when required. This can be simply followed up by use of a change over switch as depicted in Fig. No.2.

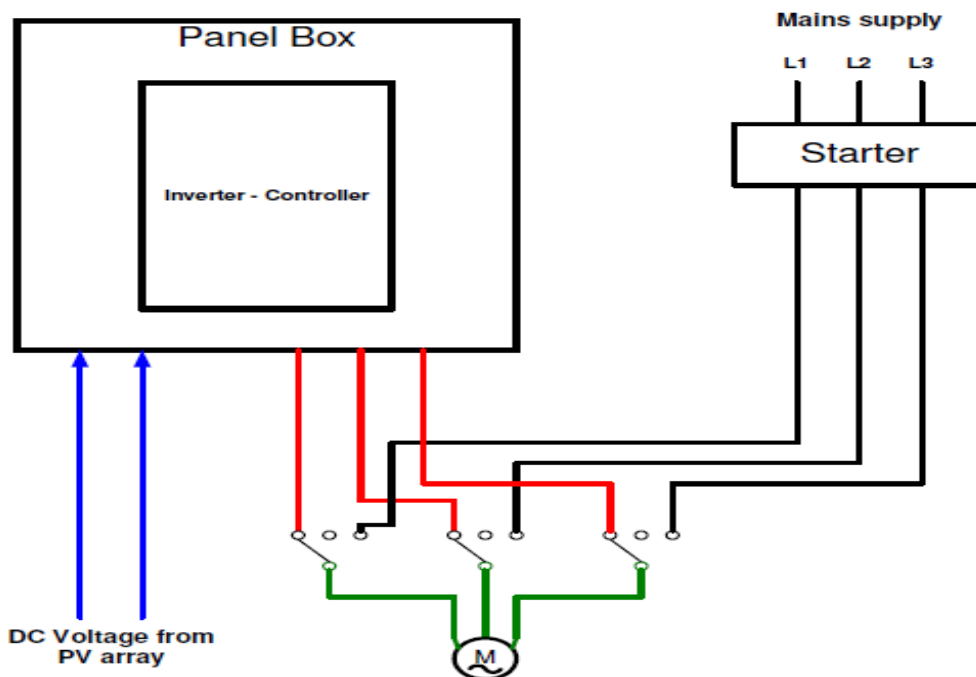


Figure No.3. Change over switch Scheme



Recommended Protections:

Brake Resistor , Output Choke

DC Systems	AC Systems
Dc Pumps and control systems are good where grid interaction is not required. I.e. Where pump is a standalone solution and doesn't need to operate on night time	Ac Pumps and control systems are good where grid interaction is required. I.e. Where pump is not a standalone solution and does need to operate on night time, on available grid power.
Dc Pumps and control systems are good only up to 5KW, with respect to the cost of DC Submersible pumps and only when a standalone system is needed.	AC Pumps and control systems are good only up to 5KW, with respect to the cost of DC Submersible pumps and only when a standalone system is needed.
Dc pumps have slight higher working efficiencies and hence slightly higher, up to 5-10% more performance/ water output compared to AC, depending on Lifts/head levels	AC Pumps have slightly lower efficiencies and hence slightly depending on head / lift levels compared to DC pumps
Dc Pumps are between 5 to 10 times more costly than AC Pumps and difficult for repairs. In case of any issues, the only remedy is replacement.	AC induction motors based Pumps are a lot cheaper compared DC pumps and easier for repairs.
DC Pumps, up to 5KW can work on at optimum performance curve, at up to 100meter Total Dynamic Head/ up to 90meters of vertical Lift	AC Pumps with solar systems can be offered up to any customized range, up to a 1000 Horse Power, and can operate in very deep wells, with heads up to 700 meters.
DC Pumps have no interaction or role play with Government grids	AC solar water pumps can be standalone fully or can be made to operate on grid power for night time operations when needed.

Thank you and Kind Regards

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