AC Solar Pumping System

The AC Solar Pumping Systems and Solutions are also provided by JISL. In AC pumps, AC motor compatible to variable frequency is used. Energy generated through solar is DC, so to operate AC pump on solar an inverter is used. The major component of AC pump is inverter (pump controller). All controls and protections are inbuilt in pump controller. This AC pump can run at lower frequency than 50 Hz. AC pumps can start only when it receives particular input power. Hence unless there is no sufficient sunlight, AC pumps cannot start functioning. Moreover with additional accessories, AC pumps can also be operated on grid during off sun hours. This segment covers solar pumps up to 10 hp which gives discharge as per MNRE guideline with manual tracking.

AC Solar Pump Models

AC Submersible									
Sr.	SPV Array Wp	Pump kW (hp)	Pump Output in LPD using manual tracker						Option
			10 m	20 m	30 m	50 m	70 m	100 m	
1	1200	0.74 (1)	108000	51000	38400	22800	15600	10200	Solar / grid Dual supply arrangement
2	1800	1.5 (2)	162000	81000	57600	34200	23400	15300	
3	3000	2.2 (3)	270000	135000	96000	57000	39000	25500	
4	4800	3.7 (5)	432000	216000	153600	91200	62400	40800	
5	6750	5.5 (7.5)	607500	303750	216000	128250	87750	57375	
6	9000	7.5 (10)	810000	405000	288000	171000	117000	76500	

Note : 1) Above figures are based on the "Average Daily Solar Radiation" condition of 7.15 kWh/m² on the surface of the PV array.
2) System installed on automatic single axis tracker gives 20-25 % more water output per day as compared to fixed structure and 10-12 % more output as compared to manual tracker.

Jain Solar Pumping Station for Integrated Irrigation Project at Kurani, Uttar Pradesh

AC Solar Pump Controller

Features

- Fully Automatic ON/OFF
  - Operates on solar radiation, automatically gets ON when sun rises and OFF at sun set
- High efficiency power electronics
  - Maximum water discharge
  - Minimum power loss
- Maintenance free
  - Sensor less protection against dry running
  - Electronics designed with long life components
  - Naturally cooled power electronics
  - Appropriate inbuilt protections against faults
- Wide operating voltage range
  - Provide more operating hours in a day, even operates in cloudy conditions
- Adaptable in varying climatic conditions
  - IP65 Enclosure
  - Suitable for outdoor installation
- User friendly interface
  - Screw less connection
  - Inbuilt emergency power disconnect switch
  - Digital display for operating parameters
  - Remote ON/OFF through mobile phone
  - Bluetooth interface
  - SD Card Connectivity
  - Online and offline data downloading
- Inbuilt Remote monitoring system
  - Parameters such as module voltage, current, power, energy generated, Pump RPM, UP time and OFF time can be remotely monitored through web portal www.jains.com
  - Local or offline data available and can be downloaded through mobile App
  - Dedicated web portal for live data monitoring, with graphical and tabular parametric data
  - Historical data is available on web portal
  - Report generation facility
  - Fault logging
- CE compliance - Conforms to CE requirements
  - Ensures user safety. Since system is powered by high voltage and operating in the outdoor fields

Available Range

2.2 kW to 7.5 kW (3 hp to 10 hp)

Specifications: 3.7 kW (5 hp)

Sr.	Parameter	Specifications
1	Motor Wattage	3700 W
2	Minimum I/P Voltage(Voc¬)*	250 Vdc
3	Maximum I/P Voltage(Voc¬)	850 Vdc
4	Startup Voltage*	500 Vdc
5	O/P Voltage (maximum)	380 Vrms
6	Minimum RPM of Motor	600
7	Maximum RPM of Motor	2950
8	Electronics Efficiency	> 95%
9	Operating temperature range	-20°C to 60°C
10	Storage temperature range	-20°C to 85°C
11	Dimensions (l x w x h)	482x337x260.50 mm
12	Weight	13 kg approx

* At Minimum Operating Voltage controller unit starts functioning and waits for Voc to reach Motor Startup Voc to start Motor.

Protections

- **Panel reverse polarity Protection:** The controller is protected against PV panel reverse polarity condition.
- **Overload or Short Circuit protection:** When overload condition or short circuit at motor terminal occurs, controller trips and the overload is indicated on display. User needs to check whether motor is jam or motor wires/windings are short. The pump controller will attempt to start automatically after 2 minute, also user can manually restart by switching the controller OFF and ON again.
- **Dryrun protection:** Low yield will get dry when more water is pumped out. Dropping of water level below the pump causes dry run and may damage the pump. This is sensed and controller gets off with display indication on front panel. The controller again starts automatically after 20 min if water is restored.
- **Phase out protection:** If any wire or coil of motor gets open, controller goes off for 2 min and indicates the same on display on front panel. After 2 min controller automatically attempts to start by re-check.