High Capacity Solar Pumping Solutions

Jain Irrigation Systems Ltd., being an irrigation & solar expert, provides tailor made solutions for higher capacities more than 37 kW (50 hp) single unit solar pumping stations used in agricultural and water supply sectors. JISL provides the solution as per the requirement and site conditions without constraint of duty points i.e. head and discharge. To achieve the desired pumping capacity, several pumps are connected in parallel and its operation is controlled by PLC. JISL has in house capacity to design & develop the electrical and control panels required for high capacity pumping.

The high capacity solar pumping station contains various sub systems like solar power generation system, power conversion system, power controlling system, hydraulic controlling system, filtration system, electrical & hydraulic safety and protection system and SCADA system. There are various options as per customer requirement are available for high capacity pumping stations like stand alone solar pumping, solar and grid dual supply mode, grid sharing mode and grid feed mode. These options are configured to achieve long term sustainable project viability. The Solar AC Pump Set & Pump Controllers > 7.5 kW (10 hp) are sourced from outside.

Sr.	Sub-system	Major Components
1	Solar power generation system	PV Modules, Module mounting structure and accessories
2	Power conversion system	Pump controller / Inverter
3	Power / Hydraulic Controlling System	PLC, Pressure release valves, Pressure transducers
4	Filtration system	Filtration plant as per requirement
5	Electrical & hydraulic safety and protection system	As per requirement
6	SCADA system	As per requirement

Jain Solar Pumping Station for Integrated Micro Irrigation Project, Talwara, Punjab

AC Solar Pump Configurations

Stand Alone Solar AC Pump

A. Features

- Independent of grid
- Power distribution infrastructure not required
- Capacity from 0.75 kW (1 hp) to 75 kW (100 hp)
- High capacity can be achieved by paralleling of pump hydraulically and synchronizing pump controller

B. Limitation

- Pump can be operated during Sun hours only
- Discharge varies with time of day and insolation
- Entire set up remains idle when not in use

DC/AC Dual supply Solar AC Pump

A. Features

- Independent of grid in solar mode
- Pump can be operated on grid during non Sun hours
- Capacity from 0.75 kW (1 hp) to 75 kW (100 hp)
- High capacity can be achieved by paralleling of pump hydraulically and synchronizing pump controller

B. Limitation

- Grid feed not possible though power distribution infrastructure is available (set up remains idle when pump is not in use)
- Discharge varies with time of day

AC Pump with Solar Grid Connected Plant

A. Features

- AC solar pump can be operated on solar as well as grid
- Pump can be operated during non Sun hours
- No limitation of pump capacity
- When pump is not operated, power generated from solar can be fed to grid

B. Limitation

- Reliable power distribution infrastructure is required
- Grid availability is must. In absence of grid it will not work on solar also
- Bi-directional meter is required and associated regulations are applicable

Solar AC Pump with Battery backup

A. Features

- Any type of pump can be operated on off grid solar power plant independent of live grid
- Pump can be operated during non Sun hours on grid and or partially on battery
- When pump is not operated power generated from solar can be fed to grid if battery bank is fully charged

B. Limitation

- Additional components like change over, VFD inverter synchronization etc are additionally required
- System is more complicated
- Battery bank has techno-commercial limitations
- Higher maintenance
- Efficiency of system is reduced