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HIGH PERFORMANCE

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Power Control & Management

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POWERCOM AGROSOL BLDC SOLAR PUMP

In many developing countries of Asia and Africa, agriculture accounts for up to 30 % of the GDP and almost employs 70% of the rural population. Majority of small and marginal farmers do not have access of electricity for irrigation of their lands which make them dependant on excessive fossil fuel or leaves them to the mercy of erratic rainfall which leads to crops failure and severe economic losses. POWERCOM AGRO-SOL has developed a wide range of surface and submersible pumps which are suitable for various application like drip, sprinkler, flood irrigation, drinking water for remote area, livestock watering, green houses, aqua culture , hydroponics, aeration of freshening and urban water supply.

PRODUCTS DESCRIPTION

POWERCOM Agrosol positive-displacement diaphragm submersible DC solar pump is very convenient and efficient for agriculture and drinking water application according to hydrological condition of Bangladesh. People can easily select the size of pump according to their daily water requirement. It is absolutely brushless-zero brush synchronous DC pump which more efficient than AC solar pump. It lasts long more than 7500 hours due to BLDC and synchronous topology to prevent erosion and corrosion during operation.

Notice that User can also run pump by using batteries during night time and also against adverse weather in emergency cases. User must choose MPPT solar charger separately to get better safety and performance once it will be run by batteries.

SALIENT FEATURES OF AGROSOL DC SUBMERSIBLE PUMPS

1. Permanent magnet DC brushless synchronous motor. The Efficiency is improved 15%-20%; Save energy and reduce the consumption of solar panels.
2. Thermally protected encapsulated winding.
3. S/S impeller for long lasting.
4. 304 Stainless Steel parts to protect corrosion and erosion to increase life span.
5. Uniform LASER welded impeller to discharge maximum amount of water.
6. Japanese NSK bearing, the working life will be 3 to 5 times prolonged.
7. Double bearing motor base can work under more axial pressure.
8. Alloy mechanical seal: Longer Working life and high reliability.
9. Motor Coil is made by automatic winding machine with centralized winding technology, motor efficiency is much improved.
10. Intelligent water shortage protection: The pumps stops working automatically when there is no water in the well, and automatically start working 30 minutes later.

SALIENT FEATURES OF AGROSOL MPPT PUMP CONTROLLER

1. Waterproof protection grade IP65.
2. Ambient Temperature from -15° to 60°.
3. Automatic charging function.
4. LED segment displays the power, voltage, current, speed etc working condition.
5. It can automatically run with frequency conversion according to the solar power, and user also can change the speed of pump manually.
6. A automatically start and stop working.
7. Water proof and leak-proof: Double seal effect.
8. Soft start: No impulse current, protect the pump motor.
9. High voltage /Low voltage /Over – Current/ High temperature protection.
10. Harnessing max. input current through MPPT
11. MPPT Function, the solar power utilization rate is higher.
    Tacking stay near to fill factor of SPV

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APPLICATION

The system is designed for off-grid households as a near zero recurring cost replacement for any fuel. The maximum flow rate of the pump can be 4000 LPH and the maximum head can be 180M. People can use for seasonal crops, domestic uses, drinking water for refugees camp, hospital, livestock watering etc. H, the Max head can be 180M. People can use for seasonal crops, domestic uses, drinking water for refugees camp, hospital, livestock watering etc.

PUMP SELECTION CHART AND SPECIFICATIONS

SL	BLDC Pump Model Identification XY>PC>Blade Materials :Poly Carbon XY>SS>Blade Materials :Stainless Steel	Electrical Specifications of Pump				Mechanical Specifications of Pump			
		Pump Power (Wdc)	Pump Voltage (Vdc)	Minimum Solar PV Panel (Wp)	Maximum Solar PV Voltage (V)	Pump Outer Dia (INCH)	Maximum flow (LPH)	Maximum Head (M)	Pump Outlet (INCH)
01	MPPT-3DXY1.2-77-36-250	250	36	400	55	3	1200	77	1
02	MPPT-3DXY1.7-109-48-500	500	48	800	75	3	1700	109	1
03	MPPT-3DXY3.5-95-72-750	750	72	1200	110	3	3500	95	1.25
04	MPPT-3DXY3.8-123-110-1000	1000	110	1600	170	3	3800	123	1.25
05	MPPT-3DXY3.8-180-110-1500	1500	110	2400	170	3	3800	180	1.25

Important Math: 1M3 /H=1000 L/H, 1M=3.28 F

Important Note: Bore Hole Dia 25%>Pump Outer Dia, 30M Max Dynamic Head (M) in Bangladesh.

Model Nomenclature of MPPT-3DSS1.7-109-48-500; MPPT>Maximum Power Point Tracking controller topology, 3D> 3 Inch body diameter of pump, PC>Poly Carbon molded case impellers, SS>Stainless Steel impellers, 1.7>1.7 M3/H water flow rate, 109>109 Meter dynamic head of pump, 48>48Vdc pump operating voltage, 500>500W pump capacity.

PROJECT SELECTION CHART

Sl	Manipulation Parameters	Need to Know	Measurement
01	Objective of lifting-water	Drinking	☐Seasonal ☐Constantly
		Cultivation	☐Paddy ☐Seasonal Crops
02	Installation site:	Country	☐
		City	☐
		PS	☐
		Village	☐
03	Water source	S	☐Lake ☐river ☐reservoir ☐dam
04	Average daily water demand	Q	☐m3 ☐Litre
05	Borehole (Diameter)	D	☐mm ☐Inch
06	H1 (lift from lowest water level to ground)	H1	☐m ☐Feet
07	H2 (tank height and extra lift if any)	H2	☐m ☐Feet
09	L (Horizontal distance for water transport)	L	☐m ☐Feet

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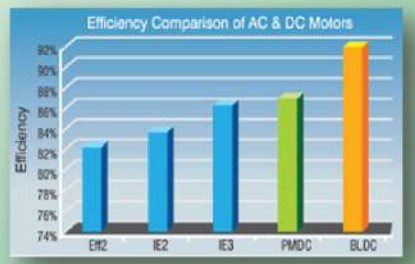
HIGH VALUE PROTECTION

Service marine cable DC leakage protection.
Over Temperature inside coil chamber.
Free Wheeling Diode to release stored energy, E=〖1/2 i〗^2 L or protect counter EMF.
Protect high rupturing current once Rotor blocking.
Run dry without damaging but should avoid it .
Never reach Curie Temperature to damage permanent magnetism.
Water shielding jacket embalmed surrounding the coil, no water leakage inside coil.
Over current protection, short circuit current protection, wrong connection protection available in circuitry.

CONCLUSION

Now-a-days solar power is still costly. Still 50% panel cost 40% pump cost and rest 10% accessories and bore hole cost is being incurred for solar pumping system. It is recommended for the investor to use high performance BLDC solar pump rather than AC pump to reach net positive value (NPV) within shortage possible time for achieving higher IRR. Investor must focus on OPEX to keep as minimum as possible since CAPEX is still very high for solar pumping. If OPEX is high for low quality dc pump, project will go into insignificant.



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