

From: S--G--/Products/Lahore [mailto:S--G--@wateen.com]

Sent: None

To: info@aurora.in

Subject: Solar Pump Inquiry

Dear Sir,

While searching for the irrigation solution from solar water pumps, I came across your organization name and was impressed with your expertise and experience. I am looking for one off grid and one on grid solution.

Currently we are using surface mounted centrifugal pumps installed at the depth of 50-55 feet (which I believe is the water table as well).At the suction side we bore to the depth of 150 feet. With this view we are looking at the total head of around 65 – 70 feet. I am interested to install a solar water pump (surface mount / or submersible). From your literature I came to know that you are using both submersible and surface mounted pumps. I am interested to know the quotes for various options both with submersible and surface mounted pumps.

Are you using self tracking solar arrays or is it fixed.

Looking forward for your reply

Regards,

S--G--

From: R [mailto:r@auroville.org.in]

Sent: Tuesday, January 05, 2010 9:12 AM

To: S--G--/Products/Lahore; info@aurora.in

Subject: RE: Solar Pump Inquiry

Dear S--,

The solar Submersible pumps have a maximum lift of 70 meters that's 215 feet. If the water table is less than 70 meters in the peak summer months of May and June then the solar pump will work. Below is the description of solar pump and the brochure is attached for you reference.

Solar water pumping is site specific it's customized for each and every site. We use solar submersible pump sets from a company called Grundfos which specializes in making solar pumps, these pumps are then powered by using solar panels.

The solar pump can work in the day time only using the solar power directly without the use of batteries or inverter. The same pump can also be operated on AC 220 volts single phase supply, Diesel Generator and wind turbine. So at time of monsoon you can use the grid to operate the pump, or on days when you need more water that can be met by solar pump you use the pump in the evening on grid power.

The pumps come with a range of 10 – 70 meters pumping head and can work from 240 watts of solar input to 1440 watts of solar input. It can handle DC power from 30 Volts – 300 Volts.

For example if the head is 70 meters then the pump will pump close to 16,000 Liters per day using 1440 watts of solar input, if the requirement of water is less then you can add less wattage to the solar pump.

Crucial part is to arrive at the technical design of the solar pump. Which capacity of pump to be used and how much power to use to lift desired quantity of water, for which site survey and assessment of the basic parameters of bore well is essential.

In order to provide you technical details and establish the cost i would need the following details from the site

1. Dynamic head including draw down from where water has to be pumped.
2. The volume of water to be pumped
3. Diameter of bore well.
4. Horizontal and vertical Distance from the bore well to the over head tank
5. Distance between the place where solar panels can be mounted and the bore well
6. Availability of grid supply at site
7. Site should get clear sun light from morning 7am – evening 4pm
8. Water Consumption pattern for agriculture or for drinking water application

For 35 meters of pumping head the maximum amount of water the pump can pump will be between 32,000 – 35,000 Liters per day, if more water is required we can operate the pump on Grid as it consumes just 2 Hp against your existing pump of bigger capacity.

To know the exact water consumption I advice a water meter to be installed and reading taken for a week's time to know average pumping per day. If the water meter is installed then please depute someone to note down the reading once a day.

Typically a pump with 1440 watts will be in the range of 3.5 – 4 Lakhs. There is no government subsidy for the solar water pumping systems.

The pump requires no maintenance and operational cost, apart from making sure that the solar panels are cleaned at regular intervals preferably once a week by the site maintenance staff.

Regards

R

From: S--G--/Products/Lahore [mailto:S--G--@wateen.com]

Sent: 05 January 2010 20:02

To: R-; info@aurora.in

Subject: RE: Solar Pump Inquiry

Dear R,

Thank you for your prompt mail.

I am looking for a solution for 25-30 m water head with maximum flow rate. Would you recommend the surface mount pump for this application, we can install the pump in the well to increase the delivery head. Are these pumps also from the Grundfos (I tried checking their Indian website but I could not find the solar pumps mentioned in your mail).

The technical data as required by you is as follows

- 1). Water table is at around 50-55 feet (16.7m). I plan to install surface mount pump in the well.

2).The delivery side distance will be (16.7 m) + 3-5 meter of delivery pipe protruding out of well + friction loss of 1 or two bends. I assume that it will be not more than 25 m

3).For volume of water required, I require at least 100,000 liters per day. Average volume of water for 1 acre is 100,000 liters fro 1 acre empty plot with 1 inch water column height. Now if you have some crop sown you would safely require 50,000 liters per acre per irrigation. The pump would at least irrigate 2 acres per day. This is at least 100 cubic meters per day.

4). I am open to any size of bore diameter as I already have the well.

5). Site is totally off grid

What is the operating voltage of the pump system , as you mentioned your pumps have variable input with 1440 watts what is the operating voltage (12 , 24) i.e. I want to estimate operating current (120 amps, 60 amps).

What is the after sales support and warranty available with the system.

What are payment terms and installation time line?

Well these are just the requirement I just mentioned. What is the maximum flow rate available with your system at 20-25 m head?

Regards,

S--G--

R_r@auroville.org.in 8:06 PM (18 hours ago)

info@aurore.in Wed, Jan 6, 2010 at 8:06 PM

To: S--G--/Products/Lahore <S--G--@wateen.com>,

RE: Solar Pump Inquiry

Dear S--,

You can opt for a solar submersible pump set with a maximum head of 30 meters. The surface pump is not a good solution for the reasons mentioned below.

1. First the dynamic head of the surface pump is 14 meters only.
2. The pump even if it's mounted 50 feet below the ground to lower the suction may or may not work, the output will be in the range of 50,000 Lpd a day if it works.
3. The pump installed in this manner does not have a good life as often the well breaks down and the water and mud enter the pump
4. Maximum life of a DC solar surface pump is not more than 5 years
5. The maintenance and repair of this pump is not only costly but also difficult to access trained manpower to repair this pump
6. The motor has carbon brushes which need regular maintenance and need to be changed from time to time.
7. The 2 HP pump works on 1800 watts of solar power compared to 1400 watts for the SQ flex submersible pump set; hence the cost of the pump is lower
8. The DC pump is made of Cast iron compared to Stainless steel from Grundfos
9. The DC pump works purely on solar while the SQ flex works on normal 220 Volts grid as well as the diesel genset

I do not have the exact figure of the volume of water that can be pumped from 30 meters (as i am travelling will be able to send you on Monday) but i assume it to be in the range of 40,000 Lpd using 1440 watts of solar at 30 meters.

The pump can be wired to any DC voltage from 30 Volts DC to 300 Volts DC; we will operate it at 108 Volts DC by wiring 2 sets of 9 solar panels in series each of 75 watts 12 Volt and then making them in parallel.

The output will be of 1 ¼” HDPE pipe. The bore diameter required is minimum 4”.

The pump requires hardly any maintenance all you need to do is to clean the solar panels regularly. The pump comes with 1 year warranty, solar panels 10 years and on the complete installation 1 year. The solar panels are mounted on tracking system which is manually operated to enhance the volume of water to be pumped.

I can send you more details on the flow rate and exact volume of water on my return to office and the total cost.

Please mention the installation area.

Regards

R

[S--G--/Products/Lahore](#) S--G--@wateen.com

R--<r--@auroville.org.in>, "info@aurore.in" info@aurore.in

Fri, Jan 8, 2010 at 10:10 AM

RE: [SPAM] Solar Pump Inquiry

Dear R--

Thank you for a detailed response. Looking forward for your detailed reply on cost and flow. As you mentioned that submersible pump would be better option, I might be inclined to using the surface pump due to cost issues. I need to do the cost benefit analysis in term of cost as well. From the data that you have mentioned, I gather that

Surface pump have a maximum head of 14 m (46 feet) can be used in areas with lower head. Since I have a proper brick well made I might use it n the well. At one of my farms the water table is high around 25 feet. I might be able to save on the cost of pump however on the other hand the cost of the solar array might go up. I will need to use 400 Wp of extra wattage for surface pump.

For submersible pump I may not need the well at all just have a bore of 4 inches and suspend the pump inside. Here I save on the panel cost (using 400 Wp less), but then cost of pump goes up.

I would appreciate if you could send me the detailed costing for comparison. My goal is to maximize flow rate at given cost. Looking forward for your reply ...

Safe traveling...

Regards,

S--G--