

Solar Energy Center
Ministry of New and Renewable Energy

PV WATER PUMPING SYSTEM
M/s Shakti Pumps (India) Ltd.
Plot No. 401-402-413, Sector-3,
Pithampur, Dhar-454775,
Madhya Pradesh

S.N.	Test Description	Requirements as per JNNSM, MNRE Specifications 2012-13.	Observations	Remarks
1.	<p><u>PV Module/ Array</u></p> <p>i. Array Capacity at STC</p> <p>ii. Fabrication of PV Modules</p> <p>iii. Type of modules</p> <p>iv. RFID Tag (Inside PV Module Laminate)</p> <p>v. Peak power output of SPV module under STC.</p> <p>v. Efficiency</p> <p>vi. Fill Factor</p>	<p>Should be between 200 Wp and 5000 Wp under STC.</p> <p>Modules should be IEC 61215 & IEC 61730 Part I & Part-II, qualified, properly laminated and hermetically sealed.</p> <p>Crystalline Silicon solar cell module.</p> <p>RFID tag is mandatory from 1st April 2013</p> <p>Peak wattage of each Module should be more than 74 Wp</p> <p>Should be more than 13%</p> <p>Should be more than 70 %</p>	<p>4914 Wp</p> <p>Yes, properly laminated. IEC 61215& IEC 61730 qualified</p> <p>Multi Crystalline Silicon modules. Manufactured by M/s PV Power Technologies Pvt. Ltd. Provided</p> <p>Nominal module wattage 230 Wp</p> <p>Module Efficiency :14.4 %</p> <p>Fill Factor :72.6 %</p>	<p>Module Mismatch = 2.1 %</p>
2.	<p><u>Motor and Pump Details:</u></p> <p>i. Make, model & Serial No.</p> <p>ii. Type of pump</p> <p>iii. Operation</p> <p>iv. MODEL specifications</p>	<p>Shallow well or Deep well pump</p> <p>DC/AC</p> <p>Shallow Well Pumping System: MODEL-I, MODEL -II or MODEL-III Deep Well Pumping System: MODEL-I, MODEL -II , MODEL-III or MODEL -IV</p>	<p>M/s Shakti Pumps(I) Ltd., Model: QF10-10ST SOLAR, Sr. No. 2034484801 , 5 HP</p> <p>Centrifugal Submersible Deep well mono-block pump</p> <p>AC</p> <p>Deep Well Pumping System: Model-IV</p>	

Tested & Prepared by:

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Approved by:

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Issued by:

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File No. ~~244~~ 2012/CSC/SEC 1293
Government of India
Ministry of New & Renewable Energy
Solar Energy Centre

By Speed Post

19th Milestone, Gurgaon-Faridabad Road
P.O. Gwal Pahari, Distt. Gurgaon, Haryana.
Telefax No. 0124-2579 207

Dated: 9-11-2012

To,

M/s. SHAKTI PUMPS (INDIA) LTD
Plot No 401, SECTOR 3
Pitampur, Distt DHAR
(M.P)

Sub: Forwarding of Test Report-reg.

Ref: Your Letter dated 03-10-2012 submitting PV WP testing for at SEC.

Dear Sir,

Please refer to your letter cited under reference on the above subject. In this connection I am directed to enclose herewith the Test Report No. 15/2012/WP/SEC in respect of your submitted samples in original, for ready reference and record.

- Discrepancies, if any observed, in respect of any of the entries contained in the above report should be brought to the notice of this office **within 30 days** from the date of issue of this letter, failing which it will be presumed that the entries therein are in order and no further correspondence will be entertained thereafter on this particular report.
- Further you are also requested to collect your Samples at your cost within 30 days, **positively**, from the date of issue of this letter failing which SEC will not be responsible for the loss/damage for your sample.
- I am enclosing a Feed Back Form. I request you to fill up this form and send us the same as soon as possible. Your suggestions are very valuable for us to make our further planning / corrective action / improving the quality of service

Kindly acknowledge the receipt.

Encl:

- Total Page:---

Copy forwarded for information to:

- 1 Advisor & Head SEC
- 2 Guard File
- 3 Office- Copy

Yours faithfully,

(Dr. O.S. Shastry)
Scientist-F (SEC)





Govt. of India
Ministry of New & Renewable Energy
Solar Energy Centre
Village & P.O. Gwalpahari, Distt. Gurgaon
Haryana, India
2012-2013

**TEST REPORT
ON
PV WATER PUMPING SYSTEM**

Sample Number: 15/2012/WP
Manufactured by:
Pump System: M/s Shakti Pumps (India) Ltd.
PV Array : M/s PV Power Technologies Pvt Ltd.
Submitted by: M/s Shakti Pumps (India) Ltd.
Plot No. 401-402-413, Sector-3,
Pithampur, Dhar-454775,
Madhya Pradesh

NOTE

This is a report on measurements carried out on PV WATER PUMPING SYSTEM (sample number 15/2012/WP) submitted at Solar Energy Centre as per specifications stipulated by the JNNSM, MNRE 2012-13. The data reported in this TEST REPORT are valid at the time of and under the stipulated conditions of measurement and the test results are applicable to those items of product which have been tested and do not apply to other products even though declared to be identical. The data contents in this report do not constitute a qualification certificate under any set of specifications. SEC does not accept any liability for any consequences including commercial or otherwise arising out of the utilization of the information contained in this report.

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PV WATER PUMPING SYSTEM
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Plot No. 401-402-413, Sector-3,
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Madhya Pradesh

S.N	Test Description	Requirements as per JNNSM, MNRE Specs. 2012-13	Observations	Remarks
3.	<u>Testing of complete SPV pump</u>			
	i. Output of water per day/per watt at Irradiation of 5.5 kWh/sq.m. at a total head of 50.0 meters.	Not less than 17 liters	23 ±1 liters	
	ii. Average Output of water per day at Irradiation of 5.5 kWh/sq.m. at a total head of 50.0 meters.	Not less than 82,000 liters	1,17,000 Litres	
	iii. Max. total dynamic head	160 meters	100 meters	
4.	<u>Tracking system:</u>	Continuous, Manual, Passive or Electronic tracking are permitted.	Manual	
5.	<u>Protections</u>			
	a. Against dry running	Required	Provided	
	b. Against wind speed	Should withstand speeds up to 150 Kms/hr.	Not tested	
	c. Against lightening, hail and storm.	Required	Not tested	
	d. Against open circuit short-circuit and reverse polarity.	Required	Provided.	
6.	<u>Others</u>			
	a. Design of PV array	Should be modular for easy replacement.	Modular	
	b. DC/AC switch	Required	Provided	
	c. Connection cable	Required	Provided	

Comments: The Water pumping System sample was tested at SEC with total head of 50 meters and the radiation data was measured on the horizontal surface from dawn to dusk, and then was extrapolated for 5.5 KWh/sq.m., from the actual measured radiation. Water pumping system sample meets the requirements of JNNSM, MNRE specifications for 2012-13. The average wire to water performance of the pump over the day at 50 meter head is 49%

Tested & Prepared by:

Renu

Approved by:

Anu

Issued by:

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Tested & Prepared by:

Renu Singh

Approved by:

Anu Lal

Issued by:

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Madhya Pradesh

Peak Wattages of Individual PV Modules tested at SEC

S.NO.	Voc(V)	Isc(A)	V _{max} (V)	I _{max} (A)	P _{max} (W)
ECO 02123971	37.20	8.70	29.17	8.13	237
ECO 02123990	37.18	8.76	29.07	8.14	237
ECO 02123991	37.22	8.67	29.19	8.10	237
ECO 06110158	36.80	8.68	28.73	8.02	230
ECO 06110231	36.88	8.66	28.80	8.00	230
ECO 06110332	36.89	8.63	28.78	7.98	230
ECO 06110340	36.88	8.62	28.76	7.95	229
ECO 08120257	36.94	8.69	29.05	8.11	235
ECO 08120258	36.83	8.67	28.87	8.09	234
ECO 08120259	36.84	8.70	28.93	8.09	234
ECO 09120185	36.71	8.71	28.80	8.13	234
ECO 09120186	36.71	8.70	28.78	8.08	233
ECO 09120187	36.53	8.63	28.61	8.03	230
ECO 09120261	37.06	8.67	29.10	8.03	234
ECO 09120262	37.36	8.59	29.41	7.99	235
ECO 09120263	37.20	8.69	29.22	8.07	236
ECO 09120264	37.20	8.66	29.49	8.11	239
ECO 09120265	37.21	8.74	29.31	8.14	239
ECO 09120266	37.22	8.80	29.25	8.17	239
ECO 09120267	36.86	8.50	29.02	7.94	230
ECO 11110366	36.93	8.50	29.14	7.97	232

Total P_{max} = 4914 Wp

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