

# SOLAR PUMP CONTROLLER



**12**

Months Warranty

**MNRE Approved**

ETIPL's (Elcomponics Technologies india Pvt. Ltd.)  
 DSP based 3-Phase Pure Sine Wave Solar Pump  
 Controller With Inbuilt MPPT, MPET\* and VFD  
 Suitable for Pumps upto 5 HP.

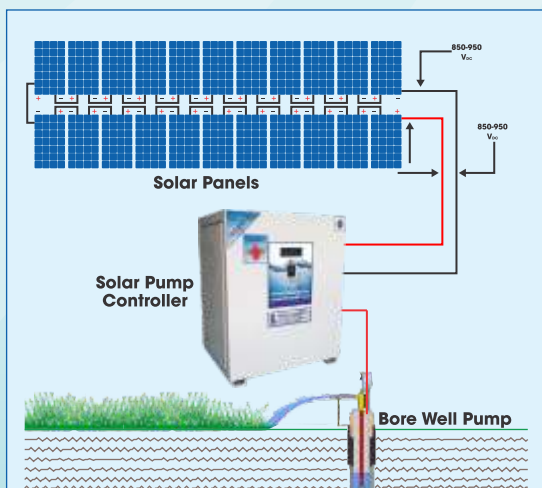
## Key Features

- Air cooled (forced convection with fan)
- Product Dimension - 52x42x36 (cm)
- MC4 connector at DC input
- Operating temperature - 0° to 55°C
- Pump control units efficiency is up to 93.25%
- Suitable for any type of 3 - Ph AC pumps/motors
- Optional manual change over to switch between Solar & Grid input
- 5-9 hours continuous working as per sun light availability
- No batteries needed

Model	Neer X <sub>5</sub>	Neer X <sub>3</sub>	Neer X <sub>2</sub>	Neer X <sub>1</sub>
Power Rating	5 hp	3 hp	2 hp	up to 1.5 hp
Input Voltage Voc	70-160 VDC	70-160 VDC	70-160 VDC	70-160 VDC
Input Voltage Vmp	60-130 VDC	60-130 VDC	60-130 VDC	60-130 VDC
Output Voltage	200-440 VAC* (3-phase)	200-440 VAC* (3-phase)	200-440 VAC* (3-phase)	200-440 VAC* (3-phase)
Frequency	20-60HZ	20-60HZ	20-60HZ	20-60HZ

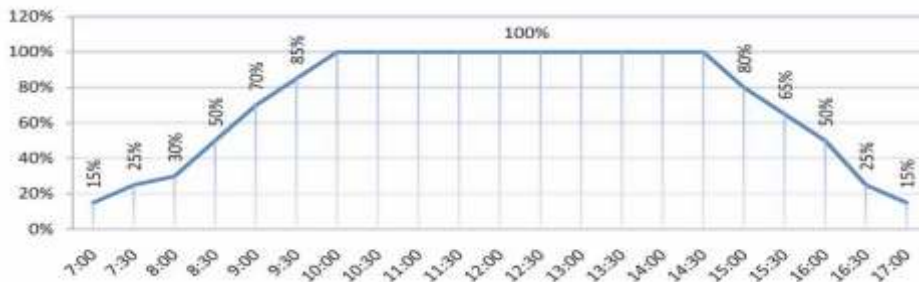
\* Factory settable for pumps with different output voltages(i.e. 110/230/380)

## Suggested Solar Input



Motor Power	Solar Panel (in Wp)			
	Depth Upto 100 ft	Depth Upto 250 ft	Depth Upto 400 ft	Depth Upto 500 ft
1 hp	800 W	1000 W	1100 W	1200 W
2 hp	1600 W	2000 W	2200 W	2400 W
3 hp	2400 W	3000 W	3300 W	3600 W
5 hp	4000 W	5000 W	5500 W	6000 W

## Water discharge (%) v/s Time



\* Based on average data captured from Open-well /Submersible Installation.

## Ours Main Advantages

### Inbuilt MPPT, MPET\* & VFD controlled by DSP :

In our solar pump controller, Digital Signal Processor (DSP) continuously multiply panel current with panel voltage and vary the PWM duty cycle as well as modulation frequency to obtain the maximum power (voltage x current) from the panel throughout the variation in the intensity of the sunlight. So from the panel we will always get the maximum energy. This is called Maximum Power Point Tracking (MPPT) function available in our controller.

At a particular slip the motor will run at its maximum efficiency which will vary depending on lot of factors. So the DSP will sense the maximum efficiency at a particular slip and will control the voltage & frequency to ensure that the motor always runs at maximum efficiency. This is Maximum Power Efficiency Tracking (MPET)\* function and because of this our controller gives about 30% more water output than any other pump controllers under the same sunlight intensity using same panel and same motor. Only putting MPPT and VFD together cannot achieve this. Also it can lift water up to 1000 ft of vertical head and ensure to run motor even in cloudy weather.

### Pure Sine Wave 3-Ph Output:

There is no limitation in the length of AC cable between controller to the motor because we are generating pure sine wave output in our system. We can draw cable even for few kilometers. Other brands have AC cable length limitation to only few meters because they generate high frequency PWM pulses.

### No spikes in output:

Other make of controllers generates high frequency PWM output in AC side & have high voltage spikes in it. These spikes damage the insulation of the motor winding and it forces customer to change their motor in shorter span which means lot of expenditure to do so in near future. We have safe pure sine wave clean output – means no such problem & smooth operation in years on years.

### Low Voltage Operation – Safety For All:

Other makes of controllers require around 300V dc as minimum panel voltage because they use conventional VF drive method. Our controller operates from 65V dc onwards. In lower HP pumps, this is a big advantage - for example, in a 1HP unit using 300V panel would mean a lot of panels in series. In our design we can use only 2 panels or 4 panels for 1HP. Also safety is a major factor to consider because high voltage is fatal.

### Isolation in DC and AC:

In our controller, the three phase output 415V is isolated from the dc side (from panel) using transformer so there is no chance of 415V to return to the panel giving more safety but other systems the 415V is connected to the panel because they are using conventional VF drive method. This 415V AC is in contact with the panel and this is more hazardous.

### Using MOSFETs:

In our method we are using MOSFETs and conventional VFD use IGBTs. MOSFETs have very low voltage drop compared to IGBTs so the efficiency when operating in low voltages will be much high.

### Pump Protections:

Frequency of the motor will vary for available current from the panel. So constant torque will be maintained even at lower RPM and no Eddy current will be produced hence no heating of coil in the motor.

\* MPET is optional function, available at extra cost on demand

**Disclaimer :** Due to constant quality improvement at our R&D center, specifications/models may change without prior notice.

To know more, visit our ELWORLD showroom at B-25, Lajpat Nagar-II, Delhi  
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