



POWTRAN®

Special Solar inverter  
for Water Pump

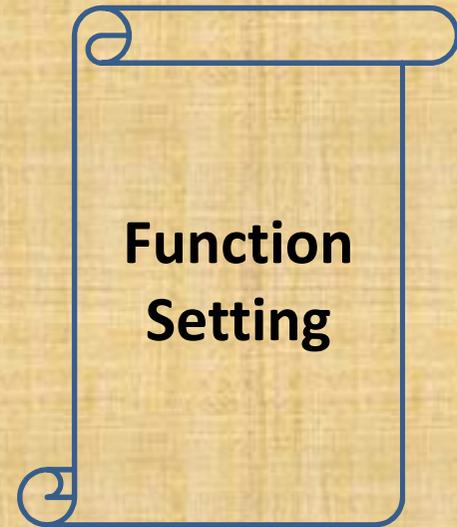
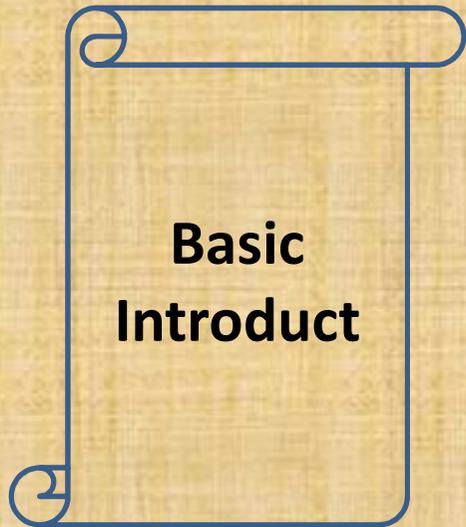


The leading & professional variable Speed AC drive  
& servo motor manufacturer in China

Powtran Solar Inverter Quick Guide  
**Dalian Powtran Technology Co.,Ltd**

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# Quick Guide Introduction



# Brief Introduction



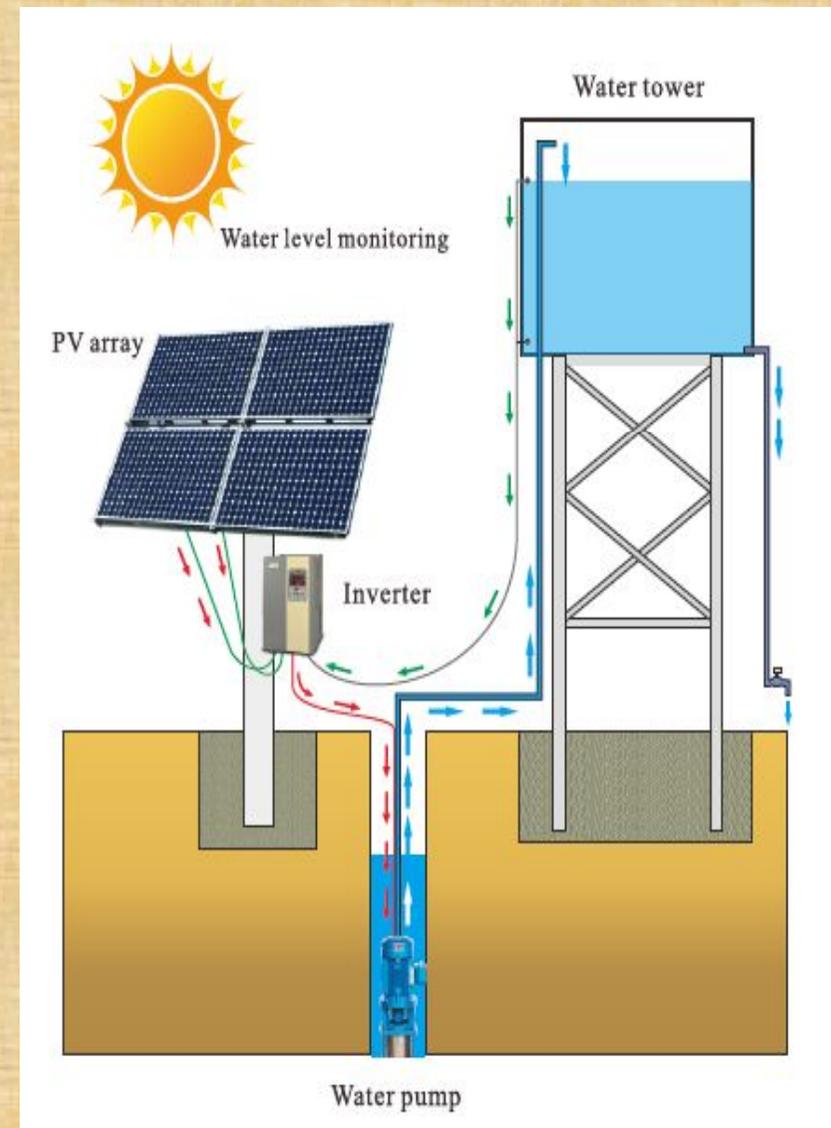
PI500-S series solar inverter special for PV water pumps, adopting high accuracy fast MPPT algorithms, tracking the PV array output by maximum power point, driving the pump motor as much as possible to meet various pumping applications.

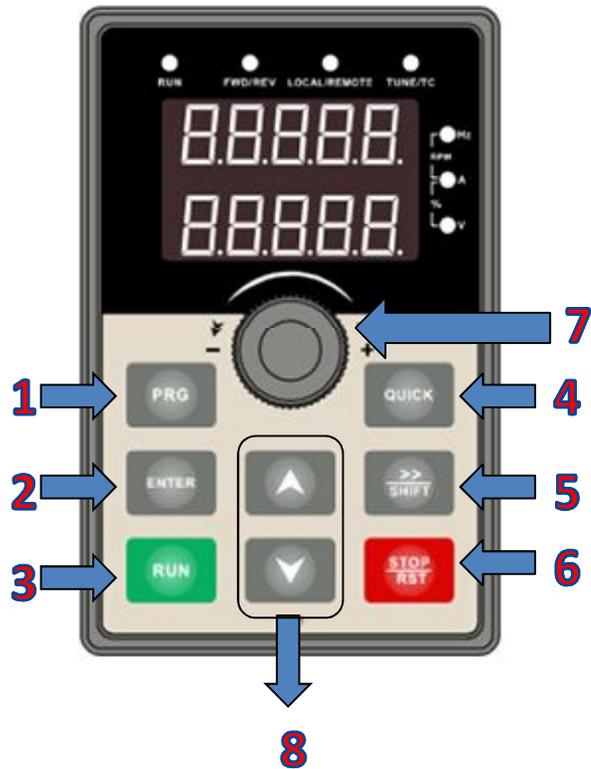
## Basic Introduction

1. Solar inverter special for PV water pump with built-in high precision MPPT algorithms
2. The inverter can accept dual input: AC input or DC input to supply to the motor for meeting various emergency needs.
3. PI500-S series solar inverter special for PV water pump provides full potentiation,maximizing the life of motor and pump

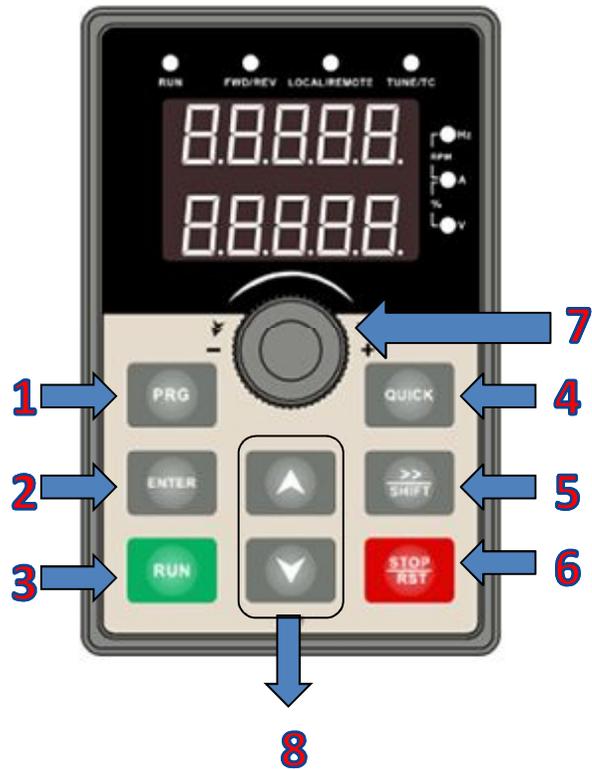
# Technique Features

1. ※ Built-in high precision PV array maximum power point tracking
2. ※ LED displays the real time situation and the parameter of system
3. ※ Built in RS485 for real time remote control system
4. ※ Fast installation design, no need extra maintenance
5. ※ Built-in full protection and diagnostic mechanism.
6. ※ MPPT algorithms
7. ※ Dry running mode monitoring, treatment
8. ※ Tank water level control
9. ※ Accept DC/AC input



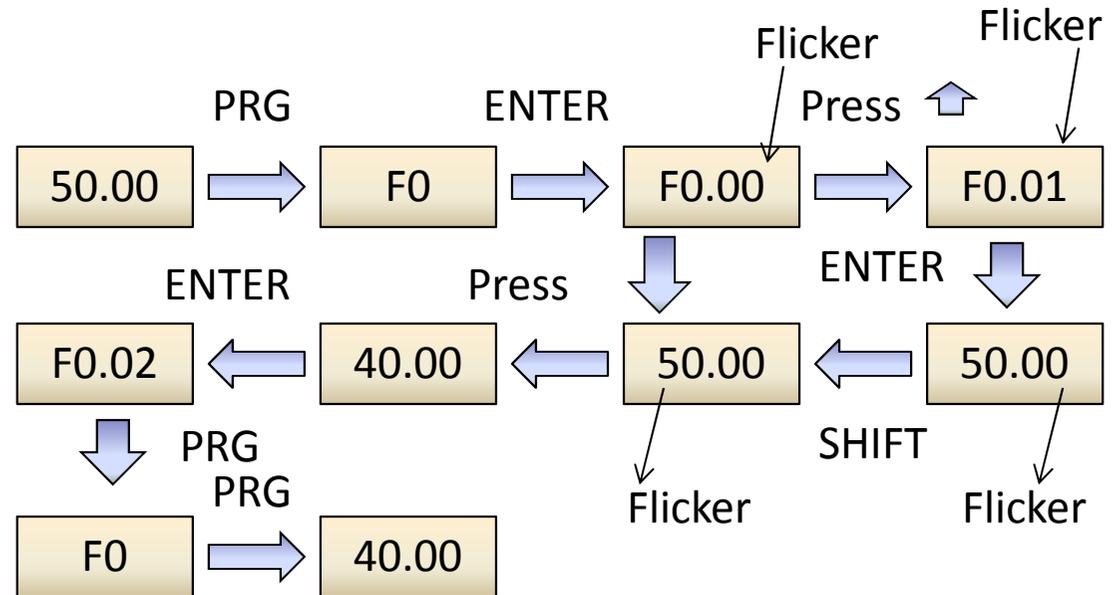


	<p>Parameter Setting / Esc Key</p>	<ul style="list-style-type: none"> <li>* Enter into the modified status of main menu</li> <li>* Esc from functional parameter modification</li> <li>* Esc submenu or functional menu to status menu</li> </ul>
	<p>Enter key</p>	<p>Enter into levels of menu screen confirm setting</p>
	<p>Running key</p>	<p>For starting running in the mode of keyboard control status</p>
	<p>Quick multifunction key</p>	<p>This key function is determined by the function code F6.21.</p>



	<p>Shift Key</p>	<p>*Choose displayed parameter circularly under running or stop interface; choose parameter's modified position when modify parameter</p>
	<p>Stop/Reset Key</p>	<p>*For stopping running in the running status; for resetting the operation in fault alarm status. The function of the key is subject to F6.00</p>
	<p>Keyboard encoder</p>	<p>* In query status, function parameter increasing or decreasing                  * In modified status, the function parameter or modified position increasing or decreasing.                  * In monitoring status, frequency setting increasing or decreasing</p>
	<p>Increasing/Decreasing Key</p>	<p>Parameter or function number increasing, set by parameter F6.18/F6.19</p>

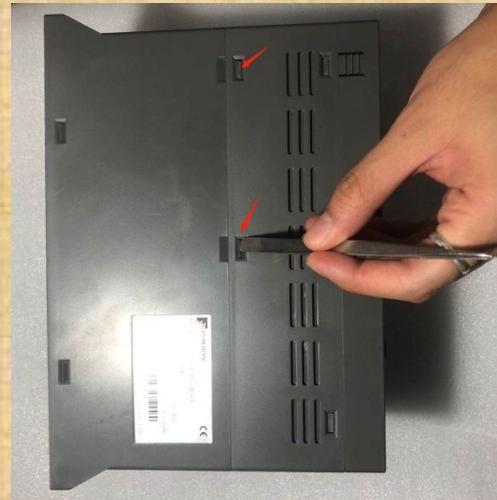
## How to change the parameters on the inverter?



## Install picture showing



## Install picture showing



When you need to check or repair the Inverter, you can use a tweezers, take it apart.



Then you need a screwdriver,  
remove all the screws.

You can replace power board  
and the IGBT

## Configuration of solar panels 1

 <b>SUNTECH</b>	
Model Number STP310-24/Vem (GradeB)	
Rated Maximum Power	( $P_{max}$ ) 310W
Output Tolerance	0/+5%
Current at Pmax	( $I_{mp}$ ) 8.50A
Voltage at Pmax	( $V_{mp}$ ) 36.5V
Short-Circuit Current	( $I_{sc}$ ) 8.96A
Open-Circuit Voltage	( $V_{oc}$ ) 44.9V
Nominal Operating Cell Temp.	( $T_{NOCT}$ ) $45^{\circ}\text{C} \pm 2^{\circ}\text{C}$
Weight	25.8kg
Dimension	1956mmx992mmx40mm
Maximum System Voltage	1000V
Maximum Series Fuse Rating	20A
Cell Technology	multi-Si
Application Class	A
All technical data at standard test condition: AM=1.5 E=1000W/m <sup>2</sup> T <sub>c</sub> =25°C	

**The input DC volt from PV should meet 1.4 times of the AC volt:**

AC220V inverter:  $V_{mp} > \text{DC}310\text{V}$ ,  $V_{oc} < \text{DC}450\text{V}$

AC380V inverter:  $V_{mp} > \text{DC}540\text{V}$ ,  $V_{oc} < \text{DC}800\text{V}$

AC480V inverter:  $V_{mp} > \text{DC}680\text{V}$ ,  $V_{oc} < \text{DC}900\text{V}$

The total power of the solar panels are required to be higher than 1.3 times of the water pump at least.

## Configuration of solar panels 2

For example:

The specification of solar panel:

$P_m$ : 310W,  $V_{mp}$ : 36.5V,  $V_{oc}$ : 44.9V

The specification of the pump:

Type of the pump: submersible pump

3-phase AC220V 4kW 19A

Recommended inverter model for the pump:

PI500A-S 5R5G2, 5.5kW AC220V 25A

The mini PV for 1 string:  $310/36.5=8.49$ , about 9 panels

Required mini power for the pump:  $P_s > 4kW * 1.3 = 5.2kW$

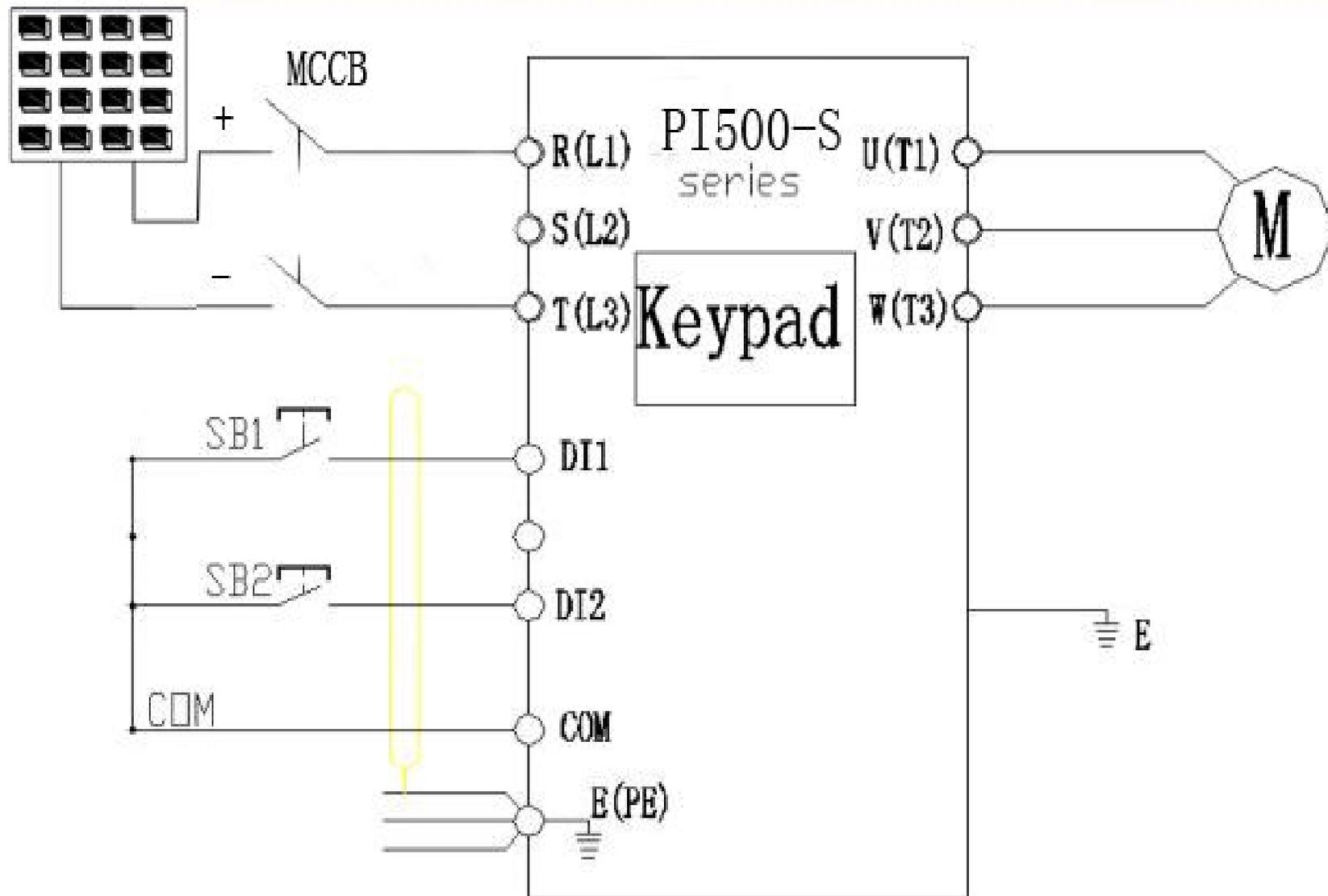
The mini PV for the pump:  $5.2/0.31kW=16.7$  about 17 panels

$17 \text{ panels} / 9 \text{ panels} = 1.88$  about 2 strings

$DC 44.9V * 9 = 404V < 450V$ , test OK

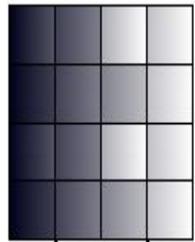
We suggest that you should total 18 panels for 4kW 220V solar pumping system, 2 strings, 9 panels for each string.

# Water control with water tank and well

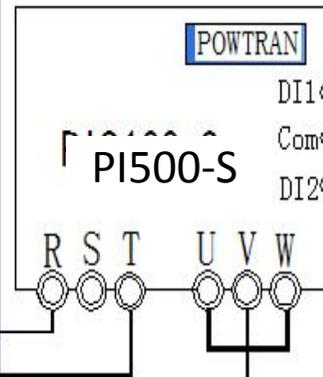


# Simulated diagram

Solar Panel



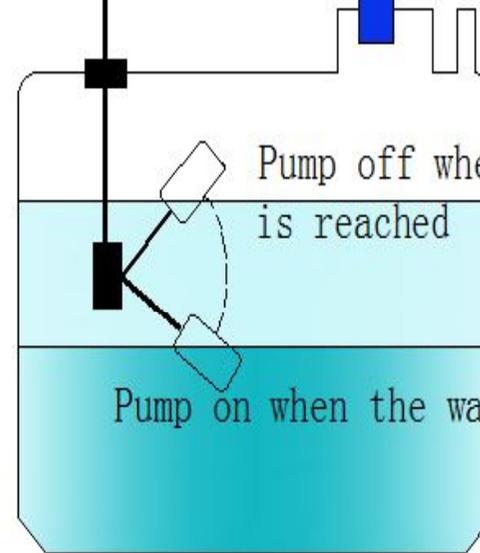
- +



submersible  
watertight  
cable

Pump on when the water  
level is reached

Pump off when the waterlevel  
is reached



Pump off when the water level  
is reached

Pump on when the water level is reached

## Parameter setting as follow

F0.03	Frequency source master setting	8:PV setting	8
E0.00	Solar operation mode selection	2:MPPT mode	2
F0.11	Command source selection	4: Terminal +Communication +keypad control	4
F1.00	DI1 terminal function selection	1:Forward run	1
F1.01	DI2 terminal function selection	10:Run pausing	10

- ◆ The inverter will run after water level switch short DI1 with COM.
- ◆ It will stop after DI1 and COM is open.
  
- ◆ The inverter also be controlled by DI2 terminal.
- ◆ When DI2 short with COM, the inverter will stop.

# Thank You !

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