



DC SOLAR WATER PUMPS

Instruction Book

530V AC/DC AUTO SOLAR CONTROLLER



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I. Solar Panel Selection (Solar Panel Connection Instructions and Recommendations)

A. Solar panel selection:

Recommended total solar panel power: (1.2-1.3) times the pump's rated power

Recommended optimum operating voltage for solar panels: (1.0-1.4) times the rated voltage of the water pump

B. For the AC/DC solar controller described in this product, when selecting and installing solar panels, priority should be given to the series connection method of solar panels, and the open circuit voltage (V_{oc}) of the solar panels after board connection is required to be less than the maximum limit of the controller's operating voltage.

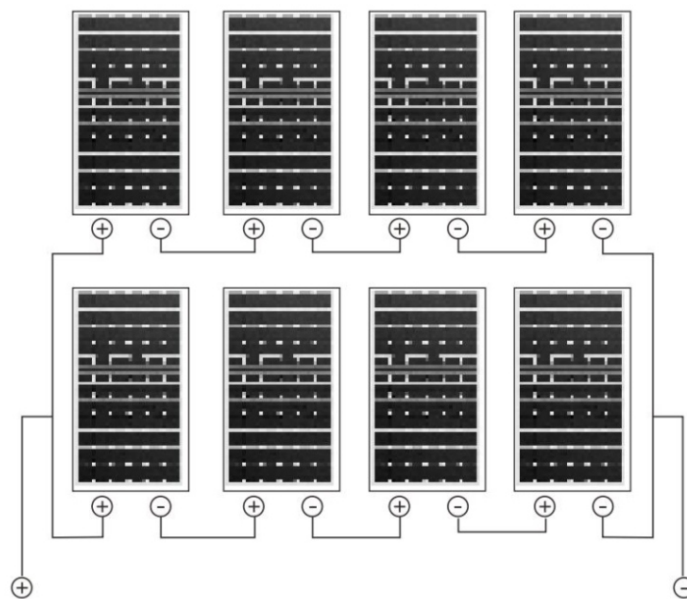
C. If the power required for the pump cannot be met under series connection conditions, series plus parallel collocation may be considered as a method that requires attention:

(1) The optimum operating voltage (V_{mp}) of the completed assembled solar panel needs to be higher or equal to the rated voltage of the pump.

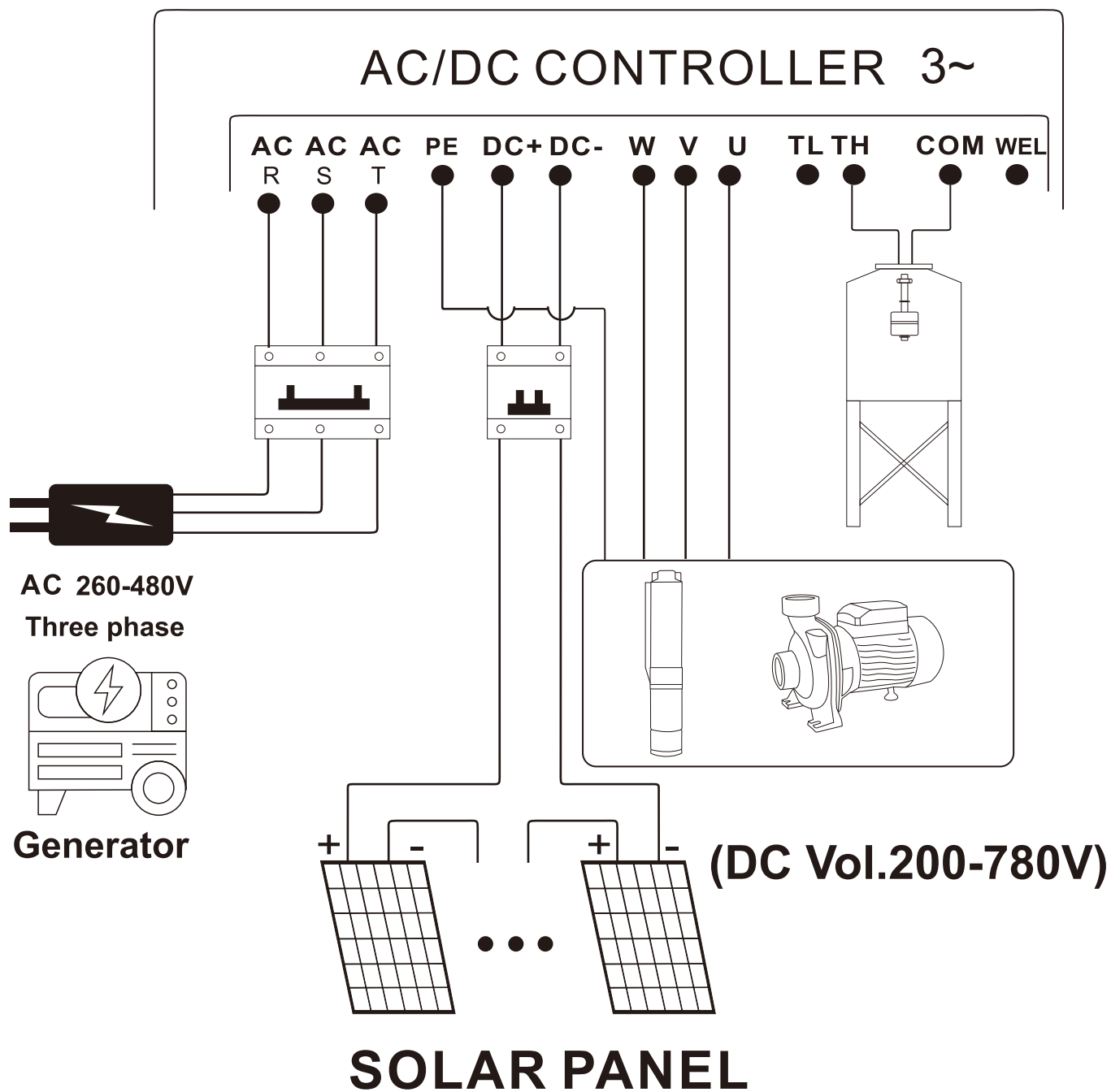
(2) The number of solar panels on the parallel branch circuit needs to be equal to the number of solar panels on the main circuit.

D. When solar panels are connected in parallel, increase the current and power of the solar panels. Solar panels connected in series increase the voltage and power of the solar panel.

Schematic diagram of series-parallel connection:



II. Wiring Diagram



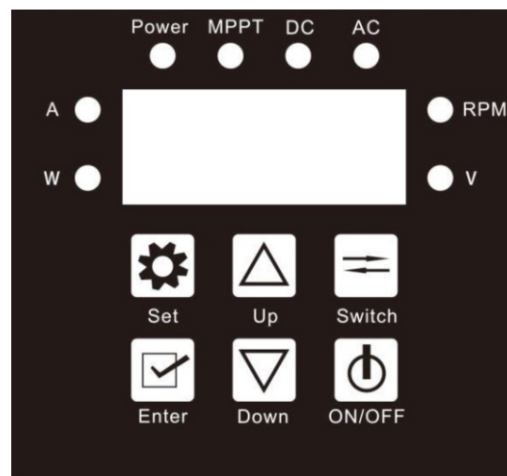
III. Working Environment and Electrical

Electrical specifications of the electric control and specifications of the suitable water pump							
Electric control model	Pump specifications	Rated Input Power (KW)	Maximum input current (A)	Maximum Input Voltage (V)	Minimum Input Voltage (V)	Optimum MPPT voltage (V)	Working environment (°C)
HD530-3000W	Rated 530V-3000 water pumps	3000	15	780	80	480-650	-15-60
HD530-4000W	Rated 530V-4000 water pumps	4000	15	780	80	480-650	-15-60
HD530-5500W	Rated 530V-5500 water pumps	5500	15	780	80	480-650	-15-60

Caution.

1. Before powering up, be sure to test the open circuit voltage of the solar panel with an instrument or calculate it using the knowledge of series and parallel connection. The open-circuit voltage of the solar panel must not exceed the maximum input voltage of the controller, otherwise it will cause irreversible damage.

IV. Operation Panel



1. LED Indicator Light

- Voltage display indicator (V): Always on in voltage display mode, otherwise off.
- Speed display indicator (RPM): Always on in speed display mode, otherwise off.
- Current display indicator (A): Always on in current display mode, otherwise off.
- Power Display Indicator (W): Always on in power display mode, otherwise off.
- DC power supply mode indicator (DC): Lights up when DC power supply mode is selected, otherwise it goes out.
- AC Power Mode Indicator (AC): Lights up when AC power is selected as the power supply mode, otherwise it is off.
- Solar mode running lamp (MPPT): This indicator is always on when running on solar power, otherwise it is off.

- Power and Run Indicator (Power): This indicator is always on when the

Buton Type	Function
 Set Buton	● Press the Setup button and the Confirm button to enter the user advanced menu settings. ● Short press the Setup button to exit the menu settings.
 Enter buton	● Short press the button in the advanced menu setting to enter the menu screen and set parameters step by step to enter.
 Up	● Press the button briefly to increment the data or parameter
 Down	● Pressing the button briefly decreases the data or parameter.
 Switch	● In the operation status, switch the display mode. Display mode in voltage (V) -> Cyclic switching between current (A) -> speed (RPM) -> power (W). ● Press and hold for three seconds to change direction
 On/Off	● In the running state, you can turn it off. . ● In the shutdown state, you can turn it on.

controller is powered up.

2. Buton operation

V. Pre-use Inspection

1. Before use, you need to check whether the pump is intact, whether the cable is broken as well as scratches, and use a multimeter ohm stop to measure the insulation impedance between the pump cable and the shell, the insulation impedance should be greater than 2M in the cold state.
2. When the water pump and the controller are connected to the extension cable situation, the access to the extension cable wire diameter must be larger than the original motor cable wire diameter.
3. Before the official use of the water pump needs to be connected to the power supply to check whether the startup and operation is normal, and whether the pump rotation direction is correct. Check in the absence of water, running time can not be too long, after checking the need to stop the pump as soon as possible. If the pump is running in the wrong direction, you need to change the motor cable in any two of the three-phase line to change the direction.
4. When installing the pump, it is strictly prohibited to pull the cable line, need to increase the rope fixed in other parts of the pump. Water pump and the bottom of the well water height needs to be controller in more than 1 metre, to prevent sediment inhalation, damage to mechanical sealing components and impeller and other components.

VI. Pump Operation Mode

1. Water pump start-up

1) power-on startup

The pump starts automatically by default after each power supply input if the float signal is not triggered.

2) Push-button power-on startup

A short press on the on/off button switches the pump to start and stop, and a short press on the on/off button resets the pump to stop when the controller fails.

3) Restore boot after WELL troubleshooting

When the controller status is in the WELL protection situation, if the water shortage signal is eliminated, the pump will start automatically after a 5-minute delay, so that if the controller receives the TL port signal at this time, the pump will start immediately.

4) TH fault eliminated and start-up resumed

When the controller status is in TH guard situation, if the tank full water signal is eliminated, the pump will be delayed for 1 minute and then start automatically, if the controller receives the TL port signal at this time, the pump will start immediately.

2. Pump shutdown

1) Float signal stop

When the pump is in operation, the pump stops immediately when the tank full signal is triggered (TH).

When the pump is in operation, the pump stops immediately when the water shortage signal is triggered (WELL).

2) outage

If the water pump is in normal operation and the load power is consistently less

than the set value, the controller will stop immediately and display the P50 fault code.

This fault will automatically clear and start the pump after a 5 minute delay.

3) power down by pressing a button

When the pump is running, a short press on the on/off button  stops the pump.

3. Pump operation mode

VII. AC/DC switching strategy (the power supply input needs to be connected to both solar and AC two-phase power supply at the same time)

1. Solar power independent power supply

When solar light is strong, switch to solar power independent power supply (DC independent power supply).

2. AC and DC power supply at the same time

When the solar light is weak, switch to AC/DC simultaneous power supply (DC+AC simultaneous power supply).

3. Solar DC power supply switching to AC/DC simultaneous power supply conditions

When solar DC power supply, if the detected working power is less than the judgement value (judgement anti-shaking time 60S), switch to AC and DC power supply at the same time.

4. AC/DC simultaneous power supply switching to solar DC power supply conditions

(1) AC and DC power supply at the same time, if the solar power supply voltage is detected to be higher than the set voltage, switch to solar DC power supply.

(2) AC and DC power supply at the same time, such as AC power failure occurs, switch to solar DC power supply.

model number	Switching Voltage
HD530- 3000W	300V
HD530- 4000W	350V
HD530- 5500W	350V

VIII. User Advanced Menu Settings

1. Press  Setting button and  Enter button at the same time to enter the user advanced menu, after finishing the modification, press  Setting button briefly to exit.
2. After entering the menu, the interface will display the menu number, for example, P0.1.
Short press the up  down  button to set the menu number. Short press  Enter button, the interface will jump to the parameter setting of the menu number, please refer to the table below for the meaning of the parameter corresponding to the specific number. After modifying the parameter, press  Enter button briefly to return to the menu number

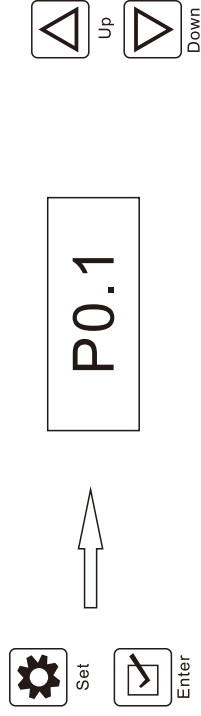
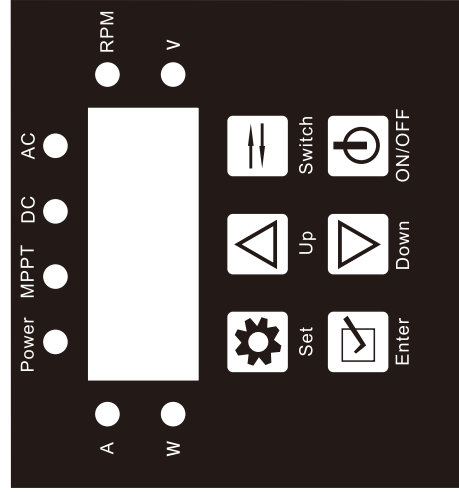
interface.

Menu number	menu parameter	starting value	note
P0.1	Setting the operating speed Adjustable range 1000 - 5000 Rpm	4000Rpm	Step length 100Rpm
P0.2	Setting the motor output current limit Adjustable range 5.0 - 15.0 A	3.0 = 9.0A 4.0 = 11.0A 5.5 = 14.0A	pacemaker r 1.0 A
P0.3	Setting DC switching AC power value Adjustable range 50 - 1000 W	3.0 = 600W 4.0=800W 5.5=800W	pacemaker r 50W
P0.4	Setting the time between switching from DC mode to AC mode Adjustable range 1 - 60 minutes	10 minutes.	pacemaker r 1 minute.
P0.5	Setting the time between switching from AC to DC mode Adjustable range 1 - 60 minutes	10 minutes.	pacemaker r 1 minute.

P0.6	Setting the power sensitivity level for the dry-run protection function Adjustable range 1 - 4 steps	3rd gear	pacemaker 1st gear
P0.7	Setting dry run protection enable 0: Incapacitation 1: Enabling	1	
P0.8	Setting power supply mode selection 0: Pure DC power supply 1: AC/DC automatic switching	1	
P0.9	Setting the motor output current limit (fine adjustment) range value 5-15A	3.0 = 9.0A 4.0 = 11.0A 5.5 = 14.0A	pacemaker 0.1 A
P1.0	Setting the DC switching voltage threshold (used for AC/DC switching judgement, AC/DC switching will be triggered when the input voltage on the DC side is greater than the set value) Adjustable range 200 - 500 V	3.0 = 300 4.0=350 5.5=350	pacemaker 5 V
P1.1	The software version number is		

	displayed and cannot be modified																
P1.2	Setting the motor model Adjustable range 3000W - 5500W corresponds to the following table <table><tr><td>Controller Specifications</td><td>demonstrate</td></tr><tr><td>4LHD530 - 3000</td><td>4L3.0</td></tr><tr><td>4LHD530 - 4000</td><td>4L4.0</td></tr><tr><td>4LHD530 - 5500</td><td>4L5.5</td></tr><tr><td>6LHD530 - 3000</td><td>6L3.0</td></tr><tr><td>6LHD530 - 4000</td><td>6L4.0</td></tr><tr><td>6LHD530 - 5500</td><td>6L5.5</td></tr></table>	Controller Specifications	demonstrate	4LHD530 - 3000	4L3.0	4LHD530 - 4000	4L4.0	4LHD530 - 5500	4L5.5	6LHD530 - 3000	6L3.0	6LHD530 - 4000	6L4.0	6LHD530 - 5500	6L5.5	Determined by controller model	
Controller Specifications	demonstrate																
4LHD530 - 3000	4L3.0																
4LHD530 - 4000	4L4.0																
4LHD530 - 5500	4L5.5																
6LHD530 - 3000	6L3.0																
6LHD530 - 4000	6L4.0																
6LHD530 - 5500	6L5.5																
P1.3	Motor head selection Factory settings only																
P1.4	AC Input Power Limit Adjustable range 200W - 5500W If the maximum input power of the controller is exceeded, it will not take effect. (For example, if a controller with a maximum input power of 4KW is set to 5.5KW, the effective value will still be 1.5KW.)	3.0 = 3500 4.0=4500 5.5=5500															
P1.5	Power-on default operation command values and mode settings 0: Automatic mode, pump shutdown																

AC/DC(530V)controller system setting



Press "Set" and "Enter"
at the same time

Switch between “up” or “down”



must press ENTER to maintain after setting

 Set

Press the SET to exit to save

	INITIAL VALUE	RANGE VALUE
P0.1:Speed setting	4000	1000-5000
P0.2:Power grade setting		3000=9.0 4000=11.0 5500=14.0
P0.3:Power shift setting		3000=600 4000=800 5500=800
P0.4:DC running time setting	10	60
P0.5:AC running time setting	10	60
P0.6:Dry-running protection grade setting	3	1-4
P0.7:Dry-running protection turn ON/OFF	1	0-1
P0.8:Shut OFF AC power running	1	0-1
P0.9:Power grade difference		3000=9.0 4000=11.0 5500=14.0
P1.0:Voltage value of DC switch		3000=300 4000=350 5500=350
P1.2:Motor model setting	decided by the controller model	4"Submersible pump: 3000W=4L3.0;4000W=4L4.0 5500W=4L5.5
		6"Submersible pump: 3000W=6L3.0;4000W=6L4.0 5500W=6L5.5
P1.3:Pump head		Only APP type
P1.4:AC Power limit		3000W=3500;4000W=45000; 5500W=5500
P1.5:Again Power on the memory switch status	1	0: Default off 1:Start by default 2:Use the last command

	state after power on. 1: Automatic mode, power on for the pump running state. 2: Manual mode, the value of the run command after power up will be equal to the command of the last user operation. (If the last user operation was to start the pump, the command for the next power up after power off will be equal to run, if the last operation was to shut down the equipment, the command for the next power up after power off will be equal to shut down).		
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IX. Servicing and Maintenance

1. After working 3000 hours, the easily damaged parts should be replaced (such as bearing, sealing ring, mechanical seal), or it may cause much more serious damage..
2. If the pump didn't use for long time, please scrub it, place at dry and ventilated place and keeping properly.

X. Fault Information and Troubleshooting Method

Fault type			
Fault Code	Fault Description	Reasons and Solutions	Recovery Process
P30	Module Overcurrent protection	● Motor model is mismatched. ● UVW three-phase open circuit please rewire UVW and ensure its correct connection	Clear faults and reset reboot 30S after a fault occurs
P34	Output Out-of-Phase	● Disconnection exists in the UVW 3-phase, rewire to ensure reliable contact between the UVW and the controller.	Clear faults and reset reboot 30S after a fault occurs
P14	Blocking Protection	● Water pump bearings seized, clean water pump bearings. ● Motor model mismatch, select a matching pump.	Clear faults and reset reboot 30S after a fault occurs
P16	Out-of-step Protection	● Motor model mismatch, select a matching pump. ● Water pump extension cord is too long, reduce the extension cord. ● The power supply is too low, increase the power supply. ● Water pump bearings seized, clean water pump bearings.	Clear faults and reset reboot 30S after a fault occurs
P40	Power Shortage	● Motor model mismatch, select a matching pump. ● Water pump extension cord is too long, reduce the extension cord. ● The power supply is too low, increase the power supply. ● Water pump bearings seized, clean water pump bearings.	Clear fault and reset reboot 60S after fault occurs
P12	Low Voltage	● Voltage input is too low, refer to the	Delay 30S after

	Protection	electrical characteristics of the corresponding model for normal power distribution.	voltage returns to normal, clear fault and reset to restart
P10	High Voltage Protection	●Voltage input is too high, refer to the electrical characteristics of the corresponding model for normal power distribution.	Delay 30S after voltage returns to normal, clear fault and reset to restart
P20	High Temperature Protection	●Controller power module temperature exceeds 85°C	Automatically clears when temperature is normal
P50	Dry-run Protection	●Pump air is not drained empty, cut off power, wait 30 seconds to reapply power and start the pump. ●No water in pool, wait for water source, restart.	60S after the 1st fault, clear the fault and reset and restart. After 5 minutes of subsequent faults, clear the fault and reset and restart.
P51	Water tower full (TH)	●Water tower level float signal triggered, waiting for water tower level to drop	After 1 minute after the TH signal is removed, clear the fault and reset and restart.
P50	Lack of water in wells (WELL)	●Well level float signal triggered, waiting for well water supply	After 5 minutes after the WELL signal is removed, clear the fault and reset and reboot.
P70	DC power supply failure	●The power supply mode set by controller P0.8 cannot detect the corresponding power input or the input voltage is too low. Please check whether the power supply mode selection matches the controller wiring.	Automatically cleared after fault recovery

P72	AC Power Failure	●The power supply mode set by controller P0.8 cannot detect the corresponding power input or the input voltage is too low. Please check whether the power supply mode selection matches the controller wiring.	Automatically cleared after fault recovery
E17	Display panel communication failure	●The communication wire between the main board and the display board is damaged or has poor contact, please disconnect the power and re-insert the wire harness to ensure a reliable connection.	The communication connection is automatically cleared when it is established, if it is not automatically restored, the harness needs to be replaced.
P42	Input out of phase	● Abnormal connection between controller and power cord	Check the power cord and controller connection terminals
P1	Backwater fault	The bus voltage is abnormal	1. Pump is returning water, please wait 10 minutes to restart 2. Motor wire to ground short circuit, please check the motor wire