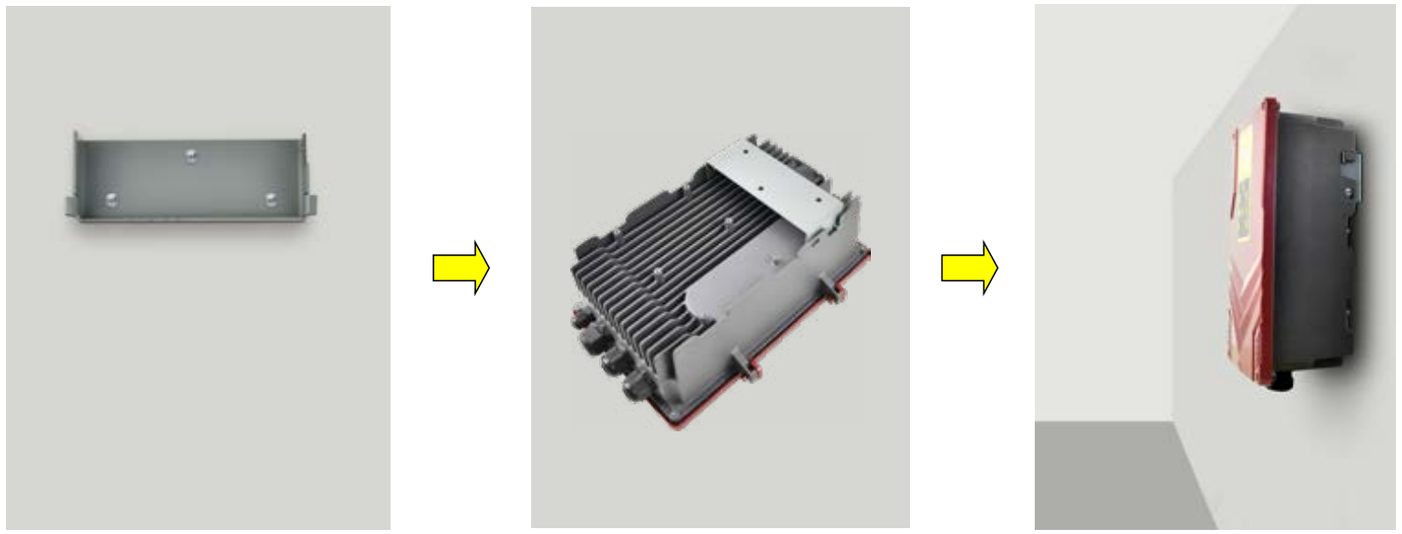
INGE MPPT AC Solar Pump Inverter Setup Guide

Product List

Controller Bracket 1 Bracket 2

Bracket 1 Installation



Bracket 2 Installation

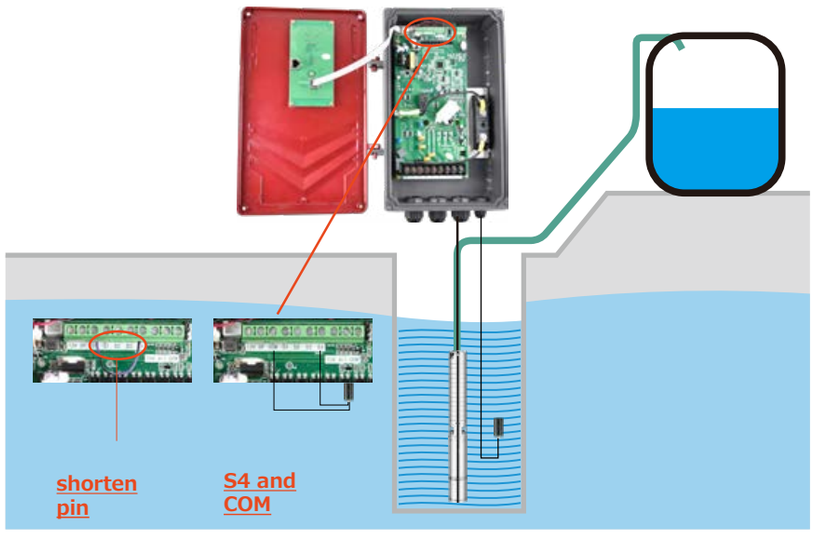
Notes

1.DC input: positive (+) and negative (-) connect to controller P+ and P- respectively
AC input: single-phase to controller R and S terminals, three-phase to R, S, T terminals, all ground to PE
2.The controller input must not be connected to the leakage protection
3.The output of the controller is better not to connect the switch, if the switch is connected, the switch shall not be used directly to start and stop the pump
4.The controller shall not be installed in a closed container
5.Prohibit the pump to run without the controller
6.The cable must be fastened when it is connected to the terminal and must not be loosened

1. Water Level Sensor Installation

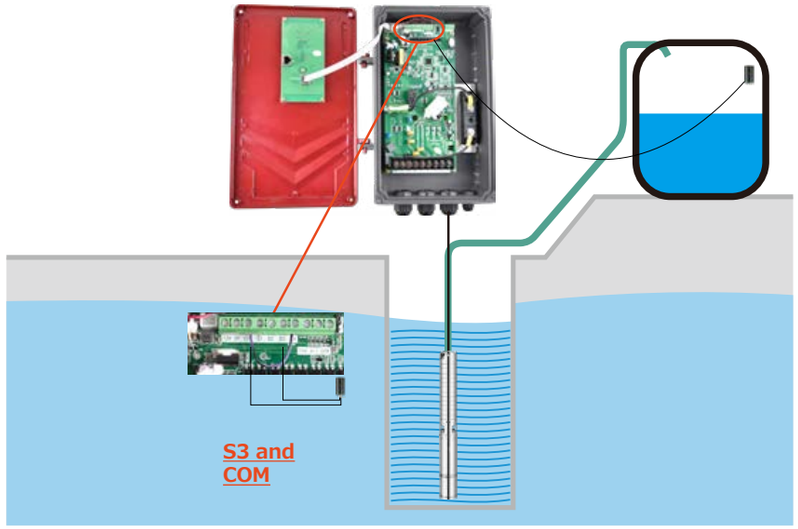
A. Low Water Level Sensor Installation

If you want to use water level sensor to control the high water level and low water level. It can be done. When your tank is full or your well has no water, the system can stop and work again automatically. In the controller, **S4 and COM** is used to control low water level, if your well has no water, it can stop automatically and protect the pump. you can installed sensor, if the water level is lower than sensor, then the pump will stop automatically. When you connect the low water level sensor, you should take away the **shorten pin** between S4 and COM, then connect the water level sensor two feet to S4 and COM. If you no need the low water level sensor, should put shorten pin between S4 and COM again, otherwise, the pump will not work. When the water level go up again, then pump will start working again after 5 minutes.

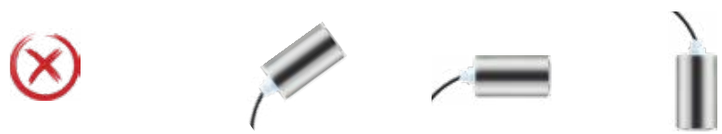


B. High Water Level Sensor Installation

In the controller, **S3 and COM** is used to control high water level. If your tank is full, the pump will stop working automatically. you just connect the water level sensor two feet to S3 and COM. Then install the water level sensor to the location which you think is highest in the tank. If you no need the high water level sensor, you just take away the sensor two feet from S3 and COM. When the water level go down again, then the pump will start working again after 5 minutes.



C. Water Level Sensor Installation Position Drawing



Note : two water level sensors are the same,can be used to anyone.

2. Connection of Controller U, V, W and Pump Cable

1. **Three-phase motor connection**

Connect the three wires of the motor to the U,V,W of the controller, then run the motor to confirm whether the steering is correct. If the motor rotates in forward direction, it is correct, otherwise it is wrong. If it is wrong, swap the connection of any other two wires. If the pump was installed in the well, then check the water flow, the bigger flow is the correct connection.

2. **Single-phase motor connection**

First, remove the capacitor, there are three ways to confirm whether the correct connection, as follows:

2.1 if the wires' color are brown, blue and black, please connect as below:

U connect brown

V connects blue

W connects to black

Then use a multimeter to measure the resistance to see if it is correct, as follows:

Brown line and blue line resistance is bigger than the brown line and black line resistance

brown line and the black line resistance is bigger than the blue line and the black line resistance

If the result is different, please follow 2.3

2.2 If the wires are marked with A, M, C, then please connect as follow:

U connects to A

V connects to M

W connects to C

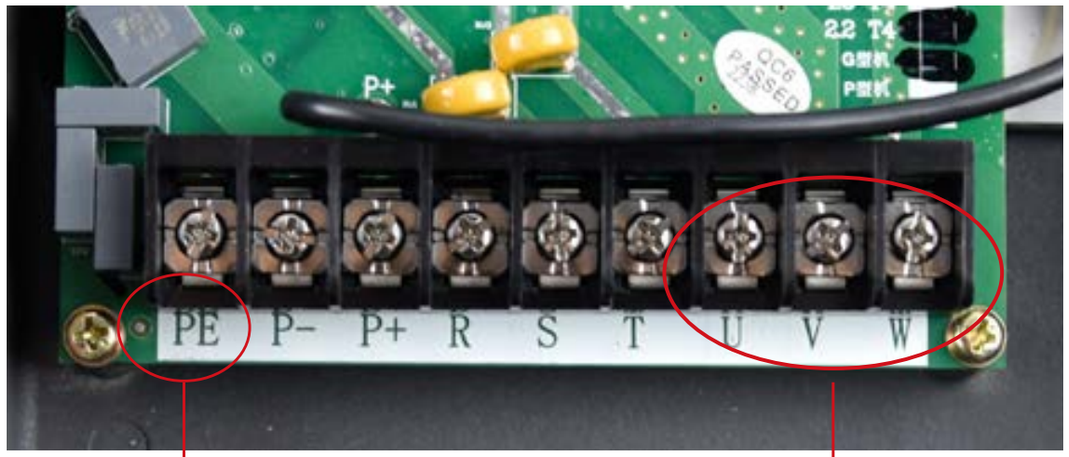
Then use a multimeter to measure the resistance to see if it is correct, as follows:

A and M resistance is bigger than the A and C resistance

A and C resistance is bigger than the M and C resistance

If the result is different, then follow 2.3 way to confirm

2.3 If the color is wrong, the letters are wrongly marked or there is no any marking, then check resistance to confirm. First, each wire is marked A, B, C, and then measure the resistance of A and B, A and C, B and C. Then choose the maximum resistance group. For example, B and C resistance is the biggest, then A connects to W, assuming that A and C resistance is the smallest, then C connects to V, B connects to U.



Grounding Wire Connection

Connection point with pump cable

3. How to set the Common Software Parameters

1. Step to adjust the maximum frequency
2. Step to adjust the frequency (adjust pump capacity)
3. Step to adjust the frequency and current of water shortage protection
4. Step to adjust frequency reduction current
5. Resume factory setting
6. Step to adjust acceleration time
7. H1 How to reduce the carrier frequency and reduce leakage
8. How to use pressure switch
9. Remote pressure gauge parameters and wiring instructions
10. Sensor parameters and wiring instructions
11. Step for output cable lengthening adjustment

1.Step to adjust the maximum frequency

Step	Button	Parameter	Remark
1	Press STOP after power on		Autorun after power on,need stop to operate
2	Press PRG	Display P02.00	
3	Press ▲ to	P02.18	Press ◀ to change the display position
4	Press ENTER	Display 50.00	Factory default maximum frequency
5	Press UP and DOWN to adjust	To adjust maximum frequency	Press ◀ to change the display position
6	Press ENTER ater modification	Display P02.19	
7	Press ▲ to	P05.08	Press ◀ to change the display position
8	Press ENTER	Display 50.00	Factory default motor upper limit frequency
9	Press UP and DOWN to adjust	To adjust upper limit frequency	Press ◀ to change the display position
10	Press ENTER ater modification	Display P05.09	
11	Press PRG	Exit to the Main screen	

2.Step to adjust the frequency (adjust pump capacity)

Step	Button	Parameter	Remark
1	Press STOP after power on		Autorun after power on,need stop to operate
2	Press PRG	Dispaly P02.00	
3	Press ▲ to	P02.18	Press ◀ to change the display position
4	Press ENTER	Dispaly 50.00	Factory default maximum frequency
5	Press UP and DOWN to adjust	To adjust maximum frequency	Press ◀ to change the display position
6	Press ENTER ater modification	Dispaly P02.19	
7	Press ▲ to	P05.08	Press ◀ to change the display position
8	Press ENTER	Dispaly 50.00	Factory default motor upper limit frequency
9	Press UP and DOWN to adjust	To adjust upper limit frequency	Press ◀ to change the display position
10	Press ENTER ater modification	Dispaly P05.09	
11	Press PRG	Exit to the Main screen	

3.Step to adjust the frequency and current of water shortage protection

Step	Button	Parameter	Remark
1	Press STOP after power on		Autorun after power on,need stop to operate
2	Press PRG	Display P02.00	
3	Press ▲ to	P02.60	Press ◀ to change the display position
4	Press ENTER	Display 45.00	"This data is the frequency, the action of detecting the water shortage protection , When the running frequency is higher than this data and the current is lower than the data set by P02.61, the water shortage protection will be triggered"
5	Press UP and DOWN to adjust	To adjust frequency detection data	Press ◀ to change the display position
6	Press ENTER ater modification	Display P02.61	
7	Press ENTER	Display 3.00	"This data is current, the action of detecting the water shortage protection, When the running frequency is higher than the data set by P02.60 and the current is lower than this data , the water shortage protection will be triggered"
8	Press UP and DOWN to adjust	To adjust minimum current	Press ◀ to change the display position
9	Press ENTER ater modification	Display P02.62	
10	Press ▲ to	P05.51	Press ◀ to change the display position
11	Press ENTER	Display 600.00	This data is the water shortage protection recovery time (seconds)
12	Press UP and DOWN to adjust	To adjust water shortage protection recovery time	Press ◀ to change the display position
13	Press ENTER ater modification	Display P05.52	
14	Press ▲ to	P16.11	Press ◀ to change the display position
15	Press ENTER	Display 20.00	This data is the trigger water shortage protection time (seconds)
16	Press UP and DOWN to adjust	To adjust water shortage protection time	Press ◀ to change the display position
17	Press ENTER ater modification	Display P16.12	
18	Press PRG	Exit to the Main screen	

4.Step to adjust frequency reduction current

Step	Button	Parameter	Remark
1	Press STOP after power on		Autorun after power on,need stop to operate
2	Press PRG	P02.00	
3	Press ▲ to	P05.71	Press ◀ to change the display position
4	Press ENTER	Display 150	"This data is frequency reduction protection current，set by the percentage of motor rated current。 E.g. the rated current of the motor is 10A，if the data is 150, then the frequency reduction protection current is 15A。"
5	Press UP and DOWN to adjust	To adjust frequency reduction current	Press ◀ to change the display position
6	Press ENTER ater modification	Display P05.72	
7	Press PRG	Exit to the Main screen	

5.Resume factory setting

Step	Button	Parameter	Remark
1	Press STOP after power on		Autorun after power on,need stop to operate
2	Press PRG	Display P02.00	
3	Press ▲ to	P01.11	Press ◀ to change the display position
4	Press ENTER	Display 0	Factory setting
5	Press UP and DOWN to adjust	2	2:Resume inverter factory setting
6	Press ENTER ater modification	P01.12	
7	Press ▲ to	P01.20	Press ◀ to change the display position
8	Press ENTER	Display 00000	
9	Press UP and DOWN to adjust		"AC pump set：1185 DC pump set：1085"
10	Press PRG	Exit to the Main screen	

6.Step to adjust acceleration time

Step	Button	Parameter	Remark
1	Press STOP after power on		Autorun after power on,need stop to operate
2	Press STOP after power on	P02.00	
3	Press ▲ to	P02.50	
4	Press ENTER	Display 30.00	Acceleration time
5	Press ▲ to	40.OO	Press ◀ to change the display position
6	Press ENTER	Display P02.51	
7	Press ▲ to	P02.70	
8	Press ENTER	Display 20.00	Deceleration time
9	Press ▲ to	40.OO	Press ◀ to change the display position
10	Press ENTER	Display P02.71	
11	Press PRG	Exit to the Main screen	

7.H1 How to reduce the carrier frequency and reduce leakage

Step	Button	Parameter	Remark
1	Press STOP after power on		Autorun after power on,need stop to operate
2	Press PRG	Display P02.00	
3	Press ▲ to	P06.05	
4	Press ENTER	Display 2	
5	Press UP and DOWN to adjust		Adjust according to actual usage
6	Press ENTER	Display P06.06	
7	Press PRG	Exit to the Main screen	

8.How to use pressure switch

Step	Button	Parameter	Remark
1	Press STOP after power on		Autorun after power on,need stop to operate
2	Press M to switch mode		Switch to photovoltaic + float mode (The first and second lights under the display light together)

Wiring: Remove the shorting piece of COM and S1, and connect to the pressure switch wire(need to connect to the normally closed end of the pressure switch).

9.Remote pressure gauge parameters and wiring instructions

Step	Button	Parameter	Remark
1	Press STOP after power on		Autorun after power on,need stop to operate
2	Press M to switch mode		Switch remote pressure gauge + float mode (The second and third lights under the display light together)
3	Press PRG	P02.00	
4	Press ▲ to	P04.09	Press ◀ to change the display position
5	Press ENTER	Display 016.00	This data is pressure gauge highest range 016.00 equals 1.6Mpa。
6	Press UP and DOWN to adjust	Actual pressure gauge maximum head	
7	Press ENTER ater modification	Display P04.10	
8	Press ▲ to	P04.11	Sleep frequency
9	Press ENTER	Display 85	"This data is a percentage of the maximum frequency. E.g. Maximum frequency is 100Hz, and the frequency of the pump reduce to 80Hz after all valves close. If the pump needs to be stopped at this time, the sleep frequency must be set to 85Hz (5Hz higher than the frequency after the valve close). This data=85/100*100=85"
10	Press UP and DOWN to adjust	To adjust sleep frequency	Press ◀ to change the display position
11	Press ENTER ater modification	P04.12	Sleep time
12	Press ENTER	Display 10	The unit of this data is seconds.Enter sleep mode after set time when reaching the sleep frequence .
13	Press UP and DOWN to adjust	To adjust sleep time	Press ◀ to change the display position
14	Press ENTER ater modification	P04.13	Wake-up deviation
15	Press ENTER	Display20	This data is the percentage of the set pressure (when the set pressure is 10 and the wake-up deviation is set to 20, the pump will wake up to runwhen the feedback pressure drops to 8)
16	Press UP and DOWN to adjust	To adjust wake-up deviation	Press ◀ to change the display position
17	Press ENTER ater modification	P04.14	Wake-up time
18	Press ENTER	2	The unit of this data is seconds.The pump restarts after the set time when reaching the wake-up deviation.
19	Press UP and DOWN to adjust	To adjust wake-up time	Press ◀ to change the display position
20	Press ENTER ater modification	P04.15	
21	Press PRG	Exit to the Main screen	

Wiring ：1. The red wire of the pressure gauge connects to the inverter COM, the green power wire connects to the inverter 10V, and the yellow output wire connects to the inverter AI1;

10.Sensor parameters and wiring instructions

Step	Button	Parameter	Remark
1	Press STOP after power on		Autorun after power on,need stop to operate
2	Press M to switch mode		Switch sensor + float mode (The second and forth lights under the display light together)
3	Press PRG	P02.00	
4	Press ▲ to	P04.09	Press ◀ to change the display position
5	Press ENTER	Display 016.00	This data is pressure gauge highest range 016.00 equals 1.6Mpa。
6	Press UP and DOWN to adjust	Actual pressure gauge maximum head	
7	Press ENTER ater modification	Display P04.10	
8	Press ▲ to	P04.11	Sleep frequency
9	Press ENTER	85	"This data is a percentage of the maximum frequency. E.g. Maximum frequency is 100Hz, and the frequency of the pump reduce to 80Hz after all valves close. If the pump needs to be stopped at this time, the sleep frequency must be set to 85Hz (5Hz higher than the frequency after the valve close). This data=85/100*100=85"
10	Press UP and DOWN to adjust	To adjust sleep frequency	Press ◀ to change the display position
11	Press ENTER ater modification	P04.12	Sleep time
12	Press ENTER	Display 10	The unit of this data is seconds.Enter sleep mode after set time when reaching the sleep frequence .
13	Press UP and DOWN to adjust	To adjust sleep time	Press ◀ to change the display position
14	Press ENTER ater modification	P04.13	Wake-up deviation
15	Press ENTER	Display 20	This data is the percentage of the set pressure (when the set pressure is 10 and the wake-up deviation is set to 20, the pump will wake up to run when the feedback pressure drops to 8)
16	Press UP and DOWN to adjust	To adjust wake-up deviation	Press ◀ to change the display position
17	Press ENTER ater modification	P04.14	Wake-up time
18	Press ENTER	Display 2	The unit of this data is seconds.The pump restarts after the set time when reaching the wake-up deviation.
19	Press UP and DOWN to adjust	To adjust wake-up time	Press ◀ to change the display position
20	Press ENTER ater modification	P04.15	
21	Press PRG	Exit to the Main screen	

Wiring: The red wire of the voltage sensor connects to the inverter 10V, and the black wire connects to the inverter COM. The factory is a voltage type sensor.
If the current sensor is used, the jumper should be switched to the I position, the red wire of the current sensor connects

11.Step for output cable lengthening adjustment

Step	Button	Parameter	Remark
1	Press STOP after power on		Autorun after power on,need stop to operate
2	Press PRG	Display P02.00	
3	Press ▲ to	P06.40	Press ◀ to change the display position
4	Press ENTER	Display data	Display different resistance according to different models of water pump
5	Press UP and Down to adjust	To adjust resistance	Press ◀ to change the display position,the longer the wire, the larger the resistance needs to be changed,addition and subtraction range (0.1-0.2) each time
6	Press ENTER ater modification	Display P06.41	
7	Press PRG	Exit to the Main screen	

Due to the lengthening of the output cable (the diameter of the cable is too small/too long), the water pump cannot work normally, and the phenomenon is that no water is produced.It can be switched by looking at the display, F (output frequency) and C (output current) by pressing the ◀ If the output frequency is too high and the output current is too low, then it is necessary to change P06.40 (stator resistance)

4. Fault Code Table

Fault code	Protection function	Explanation
E0001	System abnormality	Inverter hardware failure or software failure
E0004	Ground fault	The resistance value to ground is abnormal and leakage occurs
E0005	Short circuit to ground	Short circuit to ground
E0006	Output short circuit	When the output current of the inverter is greater than 250% of the rated current of the inverter, the inverter turns off the output
E0007	Output overcurrent	When the output current of the inverter is greater than 200% of the rated current of the inverter, the inverter turns off the output
E0008	DC bus overvoltage	If the DC voltage of the main circuit is higher than 400V (220V model) or 800V (380V model) when the motor decelerates, the inverter shuts off the output
E0009	DC bus undervoltage	When the input voltage decreases, if the DC voltage of the main circuit is too low, the inverter shuts off the output
E0010	Inverter overheating	When the temperature of the heat sink is detected to be overheated, the inverter turns off the output.
E0011	Self-learning failure	The self-learning parameters are incorrect or the motor is abnormal
E0013	Rectifier bridge overheating	The rectifier module is overheated
E0014	U phase missing phase	U phase missing phase
E0015	V phase missing phase	V phase missing phase
E0016	W phase missing phase	W phase missing phase
E0019	No motor connection	The motor is disconnected during operation
E0020	Input phase loss	Input phase loss
E0021	Inverter overload	When the output current of the inverter exceeds the rated rating of the inverter (150% for 1 minute), the inverter turns off the output
E0022	Overtorque	Motor over torque
E0024	Motor overheating	The motor temperature is too high
E0025	Motor overload	When the output current of the inverter exceeds the rated rating of the motor (150% for 1 minute), the inverter truns off the output
E0026	Current limit	The output current exceeds the set limit threshold
E0027	Input power-down	The input voltage is lower than the power-down level (P05.86)
E0063	User failure	User-defined fault (see parameter P03.08)
E0063	well is empty	well light flash
E0063	tank is full	tank light flash