THE WATER & SOLAR COMPANY
WATER & ENERGY SYSTEMS

TGP HYBRID INVERTER

VEGA PUMPS

PRODUCT CATALOGUE

HYBRID DC/AC INVERTER TGP SOLAR INVERTER

The DC/AC Hybrid solar inverter is a type of off-grid solar inverter that accommodates both AC and DC inputs. It can be linked to the grid or a generator in cases where the power from the PV Panels is insufficient. This unit is engineered to function in either continuous or intermittent modes.
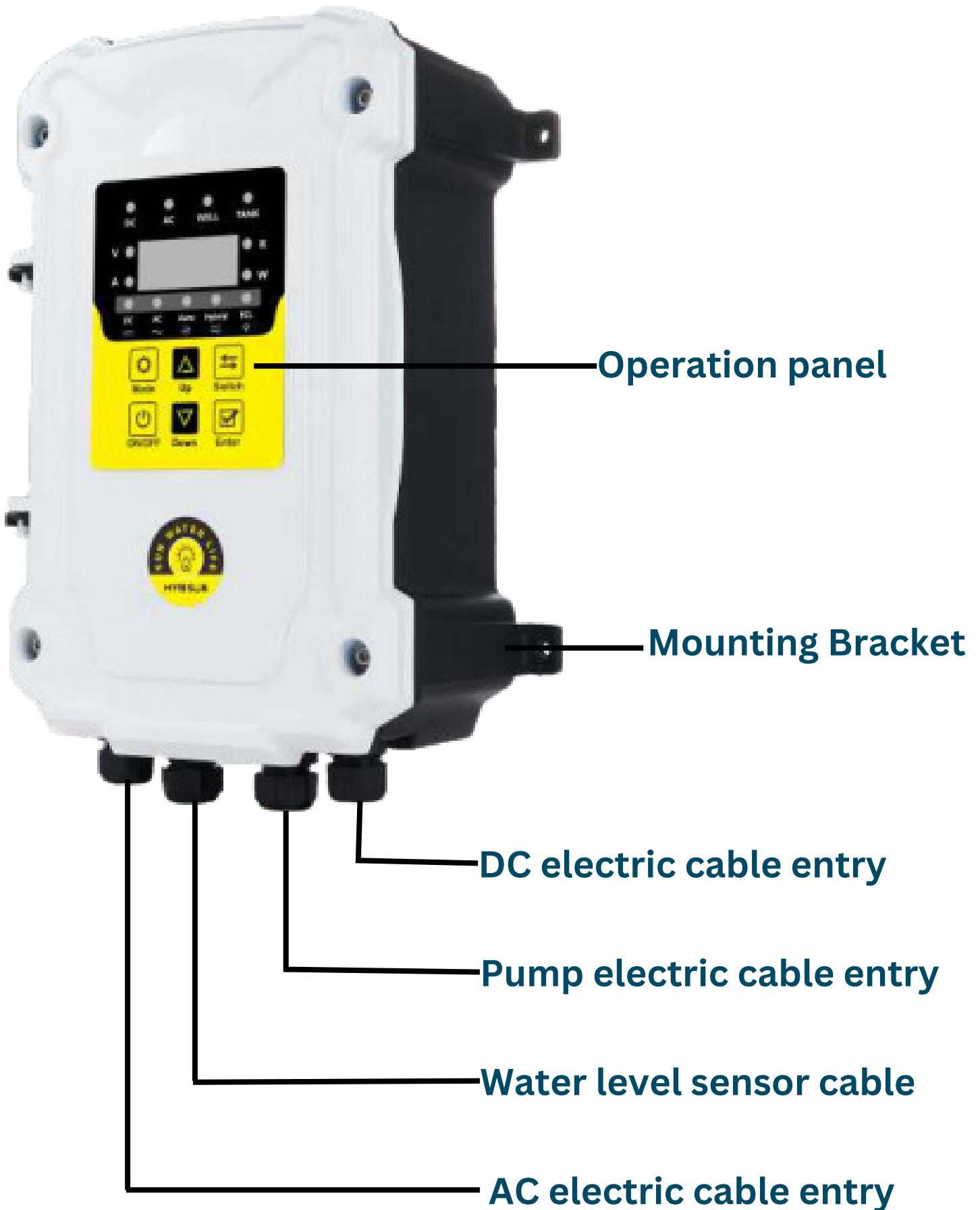
Product Feature:

- IP Rating: IP65
- High-efficiency MPPT software.
- Protection: Over/ under current, Over/ Under voltage, temperature, Locked rotor.
- Support AC & DC input together, AC bypass function.
- Support:220V, 3phase AC pump 220V, 1phase AC pump without capacitor 220V, 1phase AC pump with capacitor Brush-less DC Motors

Working Conditions:

Max control box ambient temperature: 50°C

CONTROLLER:

Operation panel

Mounting Bracket

DC electric cable entry

Pump electric cable entry

Water level sensor cable

AC electric cable entry

TECHNICAL DATA

Model	TGP-2-0.75	TGP-2-2.2
Input (DC)		
Max DC Voltage (VOC)	450	450
Min Working Voltage (V)	260	260
MPPT Working Voltage (V)	90 - 400	90 - 400
Max DC Current (A)	17	17
Input (AC)		
Input Voltage (VAC)	220/230/240V (1 Phase) -15% / +10%	
Input Frequency (Hz)	47 - 63	
Output (AC)		
Rated Power (Watt)	1100	2200
Rated Current	4	10
Output Frequency (Hz)	50	
Performance		
Control Mode	Motor control technology	
Type of motor	Asynchronous motor & Brush-less DC motor	
Efficiency	99%	
Enclosure class	IP65	
Installation	Wall mounting	
Other Parameters		
Dimensions (L X W X H)mm	420X310X210	420X310X210
Weight (kg)	6.5	6.5
Protection	IP65	IP65
Cooling	Natural (Require additional cooling if built into an enclosure)	
HMI	LCD Display	LCD Display
Certification		
Certification	CE:IEC61800-3 CS	
Operation Conditions		
Ambient temperature	-25°C ~ 50°C	
Max Working altitude	3000m	3000m
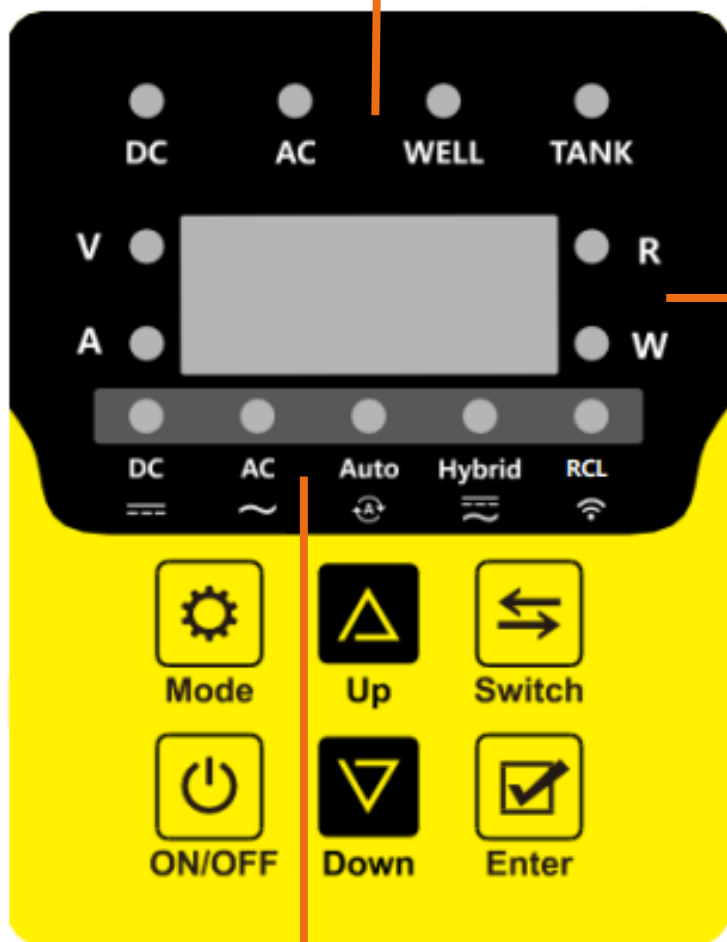
DC	DC power ON indicator Light
AC	AC power ON indicator Light
WELL	Supply level low
TANK	Tank level full

V	Voltage Input
A	Current Input
R	Motor Speed "RPM"
W	Watt

DC	DC Power Mode
AC	AC Power Mode
Auto	Auto switch DC/AC
Hybrid	DC&AC power
RCL	Not in use

MINIMUM VOLTAGE REQUIREMENT

HYBRID/AUTO Mode

Motor Type	Motor Input Voltage	Inverter kW:	Max DC VOC	Max DC Isc	Minimum DC VMPP	Minimum AMPP
1 Phase	220	0.75	430	17	340	6.2
1 Phase	220	1.1	430	17	340	8
1 Phase	220	1.5	430	17	340	11
3 Phase	220	0.75	430	17	340	4
3 Phase	220	1.1	430	17	340	5.9
3 Phase	220	1.5	430	17	340	7.8
3 Phase	220	2.2	430	17	340	11.6
DC Brush-less	110	0.75	430	17	340	10
DC Brush-less	150	1.1	430	17	340	10
DC Brush-less	200	1.5	430	17	340	10
DC Brush-less	300	2.2	430	17	340	10

DC only Mode

Motor Type		Motor Input Voltage	Inverter kW:	Max DC VOC	Max DC Isc	Minimum DC VMPP	Minimum AMPP
1 Phase		220	0.75	430	17	310	6.2
1 Phase		220	1.1	430	17	310	8
1 Phase		220	1.5	430	17	310	11
3 Phase		220	0.75	430	17	310	4
3 Phase		220	1.1	430	17	310	5.9
3 Phase		220	1.5	430	17	310	7.8
3 Phase		220	2.2	430	17	310	11.6
DC Brush-less		110	0.75	430	17	110	10
DC Brush-less		150	1.1	430	17	150	10
DC Brush-less		200	1.5	430	17	200	10
DC Brush-less		300	2.2	430	17	300	10

WIRING DIAGRAM

BLDC PUMP WIRING

AC IN			Float Switch				Pump				DC IN	
PE	L	N	TH	TH	TL	TL	U	V	W	PE	+	-
●	●	●	●	●	●	●	●	●	●	●	●	●

BLDC PUMP WIRING

AC
90V~300V

Ground

Solar pump

DC
90V~430V

Solar panels
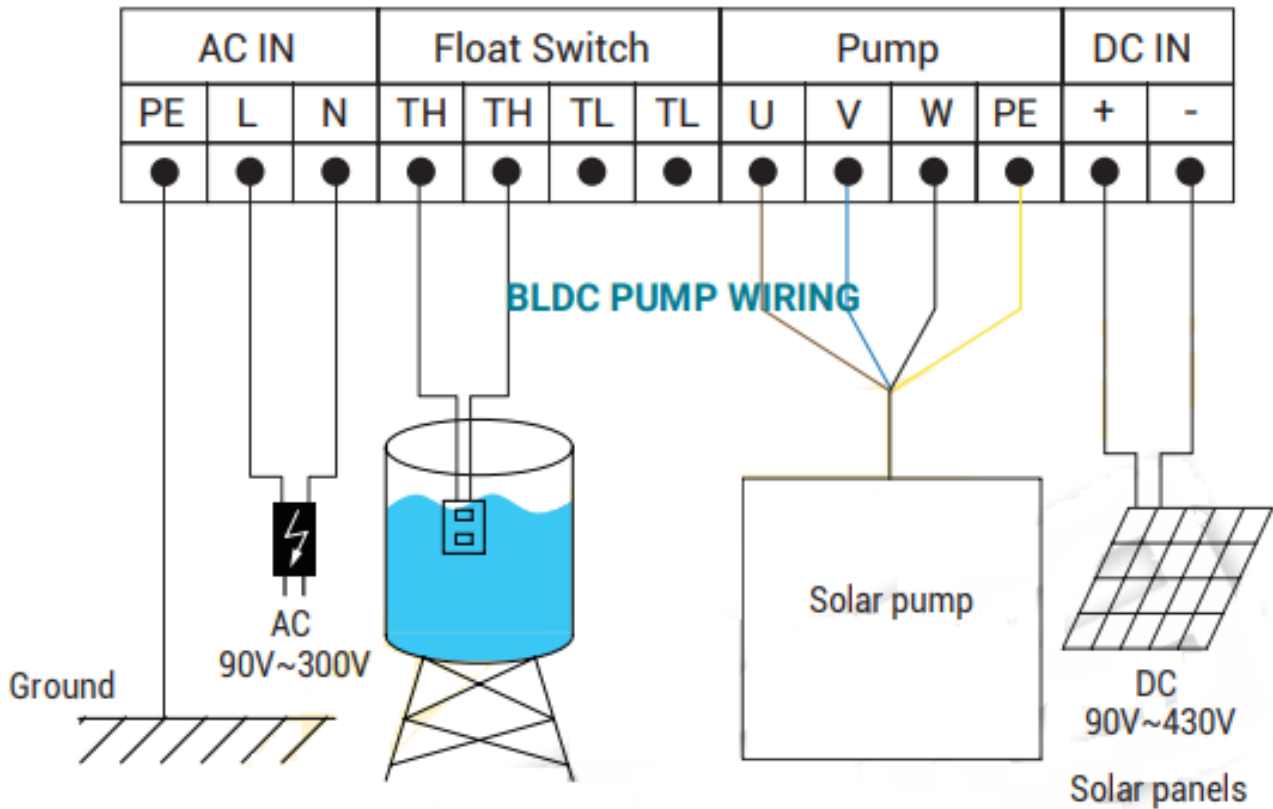
AC 110/220 SINGLE PHASE PUMP WITH CAPACITOR

AC IN			Float Switch				Pump				DC IN	
PE	L	N	TH	TH	TL	TL	U	V	W	PE	+	-
●	●	●	●	●	●	●	●	●	●	●	●	●

L   N

AC
90V~300V

Ground

Solar pump

Solar pump

DC
90V~430V

Solar panels
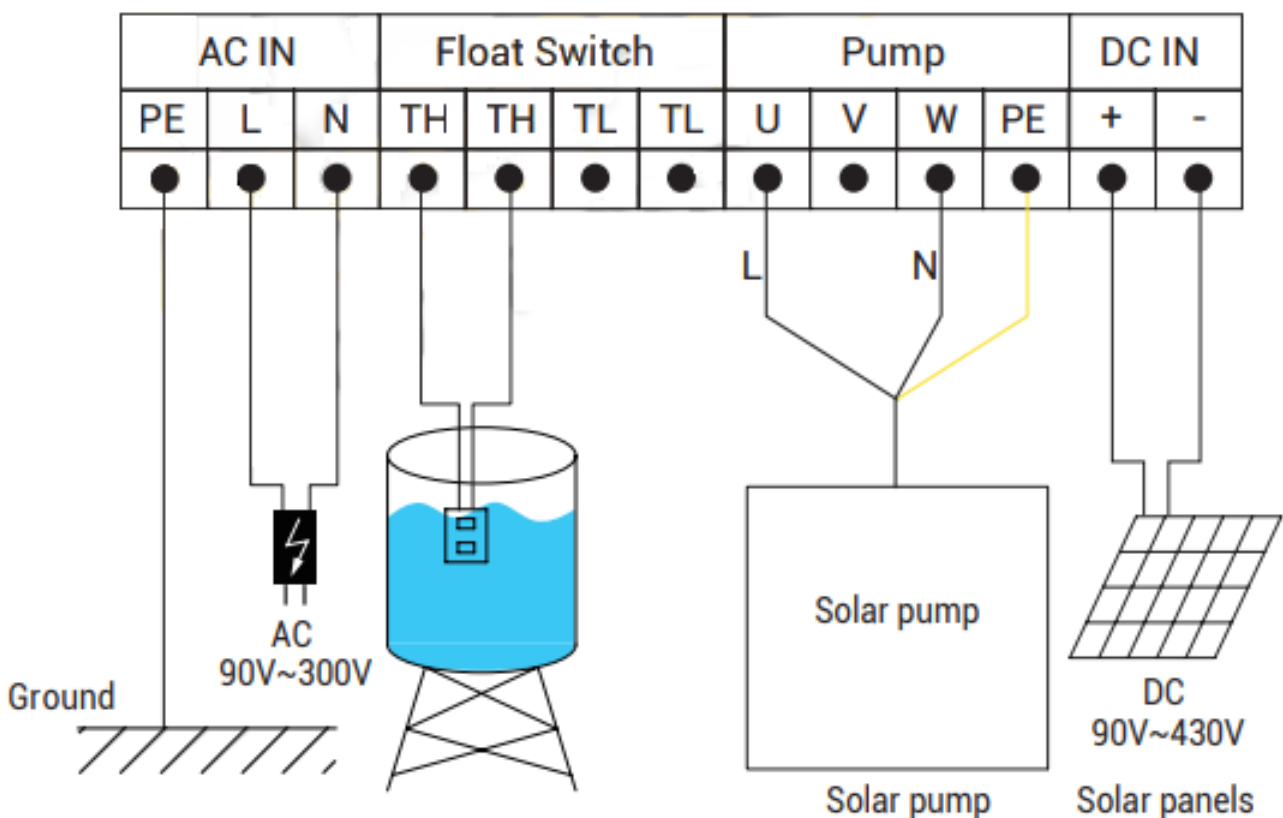
AC 110/220V THREE PHASE PUMP

AC IN			Float Switch				Pump				DC IN	
PE	L	N	TH	TH	TL	TL	U	V	W	PE	+	-
●	●	●	●	●	●	●	●	●	●	●	●	●

AC
90V~300V

Ground

Solar pump

DC
90V~430V

Solar panels

AC 110/220V SINGLE PHASE PUMP WITHOUT CAPACITOR

AC IN			Float Switch				Pump				DC IN	
PE	L	N	TH	TH	TL	TL	U	V	W	PE	+	-
●	●	●	●	●	●	●	●	●	●	●	●	●

M   A   C

AC
90V~300V

Ground

Solar pump

DC
90V~430V

Solar panels
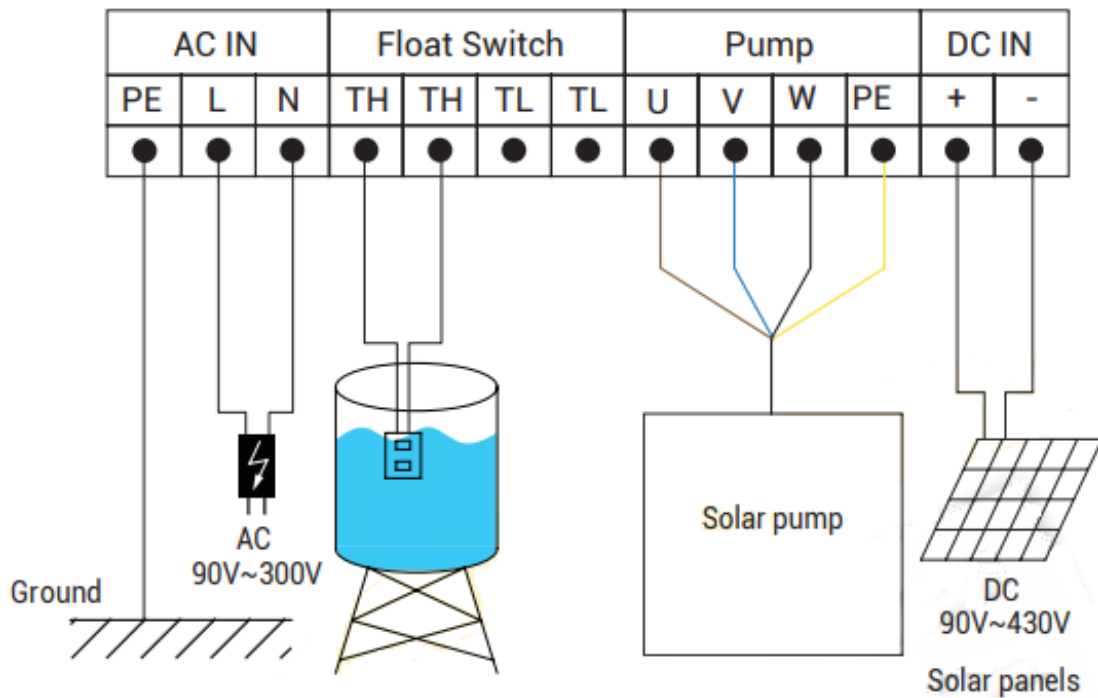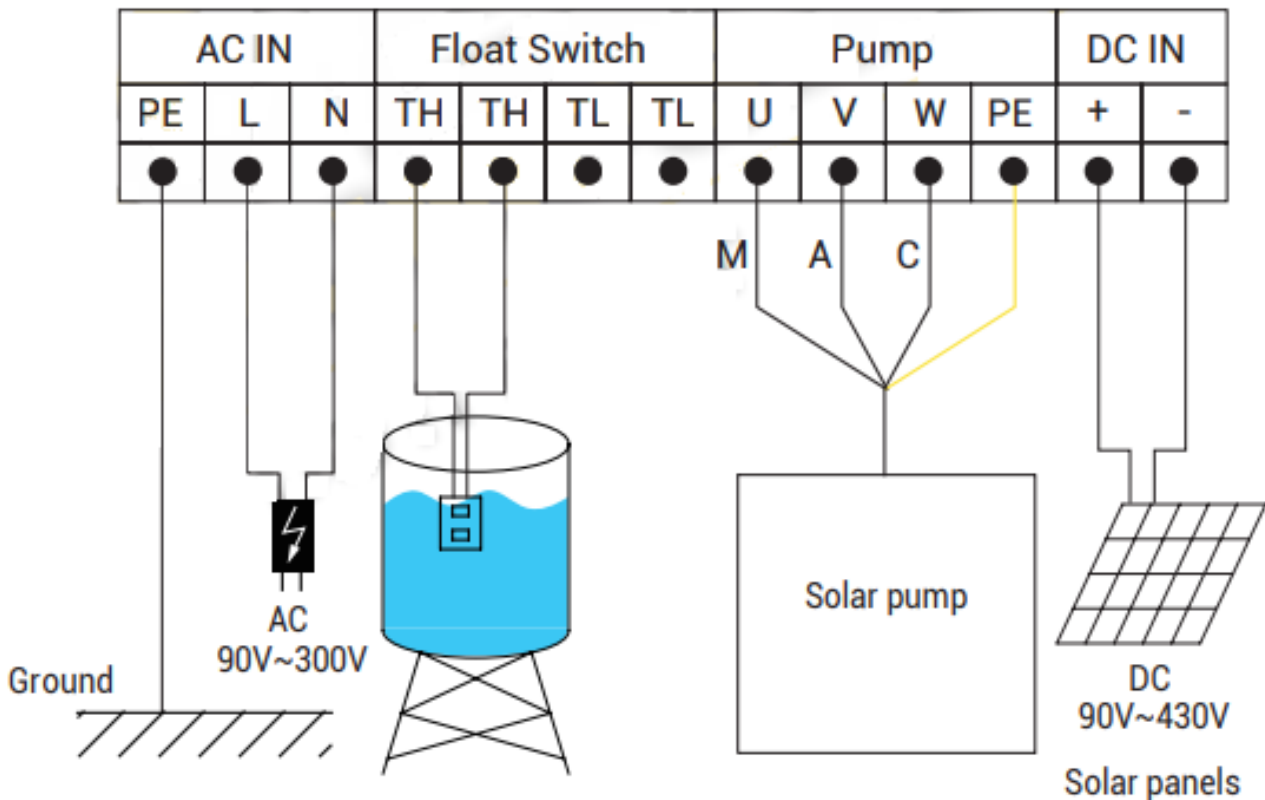
LONG DISTANCE AUTO STOP/START WIRELESS
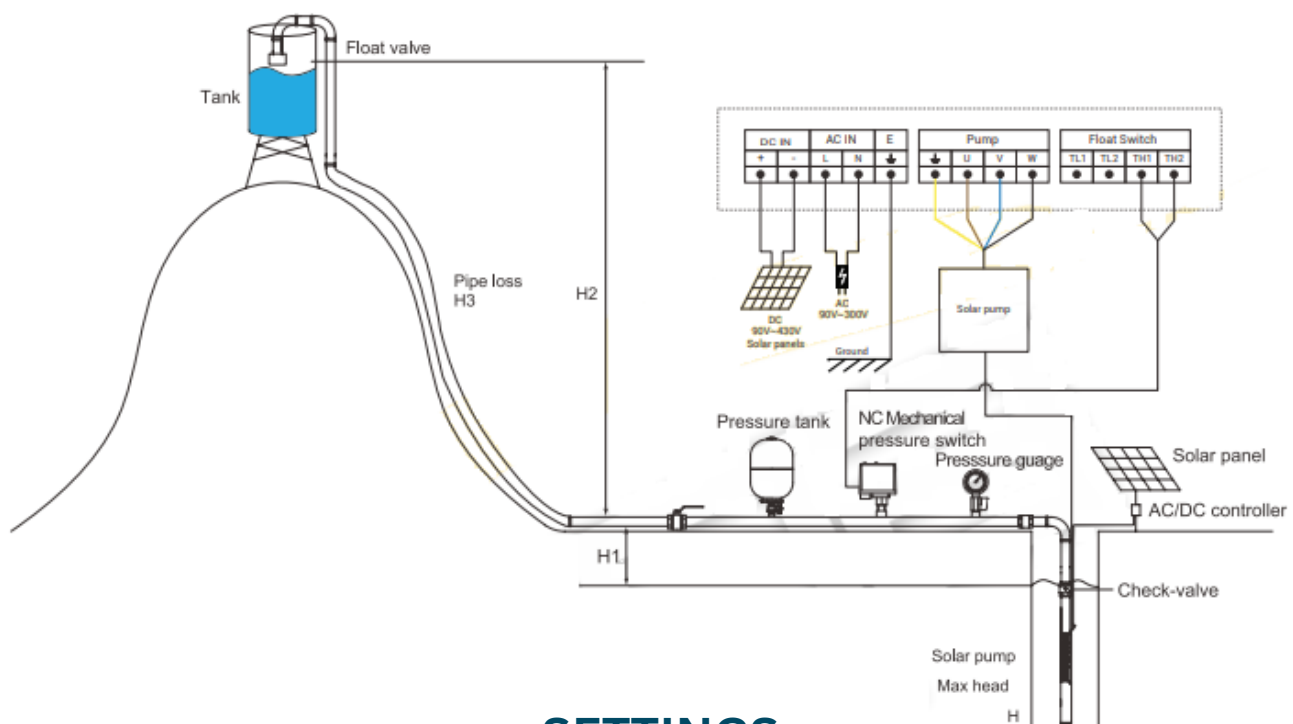
SETTINGS

- **Select single float switch mode: P500 = 1**
- **Select single float switch detection time: P504 = 600 (Unit: seconds, The default time: 600sec)**
- **Opposite polarity for switch: P604 = 1**

H: Solar pump max head
H1: Height from water level to NC Mechanical Pressure Switch
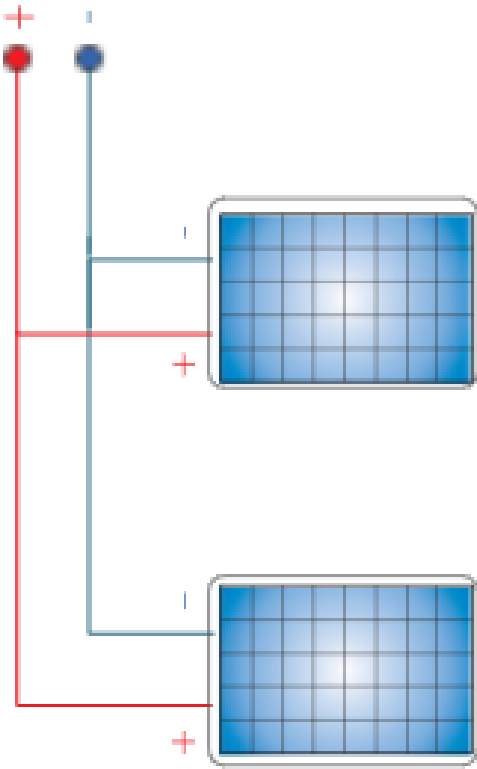H2: Height From NC Pressure Switch to tank
H3: Pipe friction loss
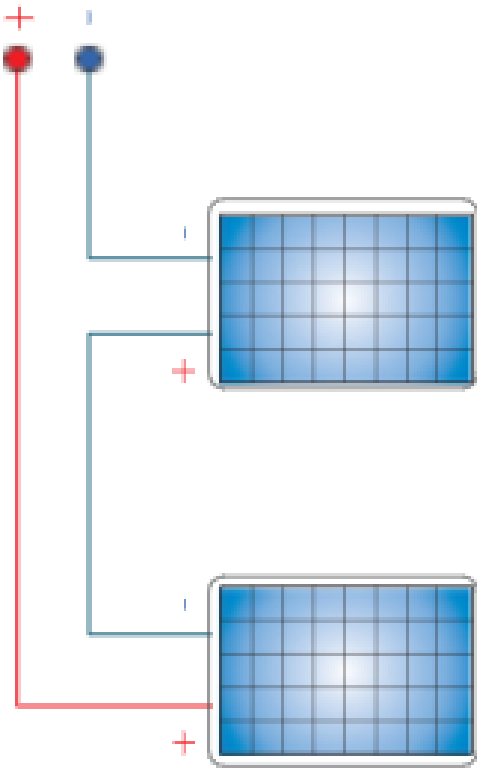
LIMITS

H2<P1: NC Mechanical pressure switch min pressure bar (Start Value)
H-H1-H3<P2: NC Mechanical pressure switch max pressure bar (Stop Value)

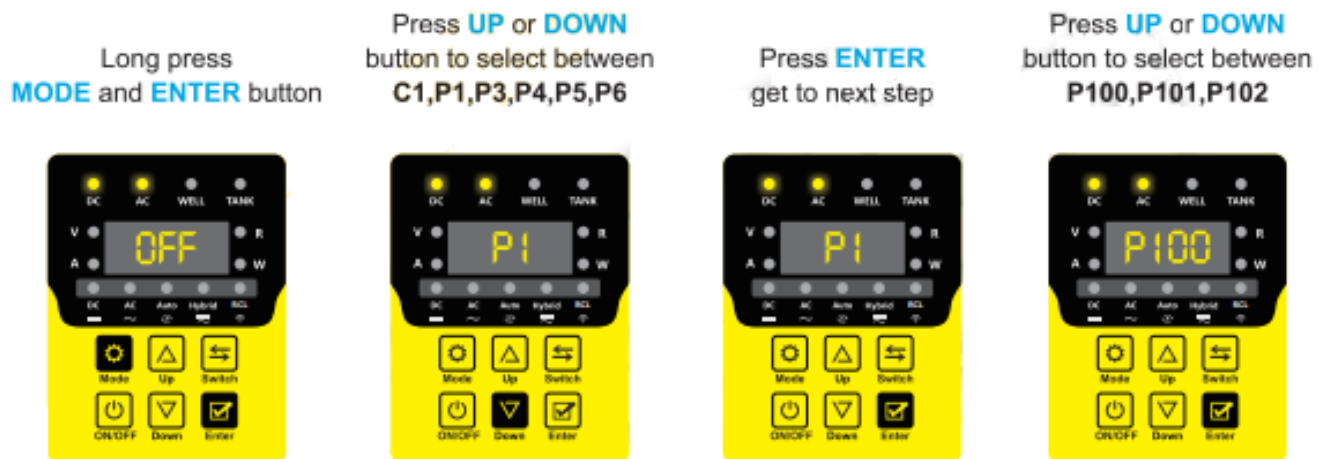# PV PANEL WIRING
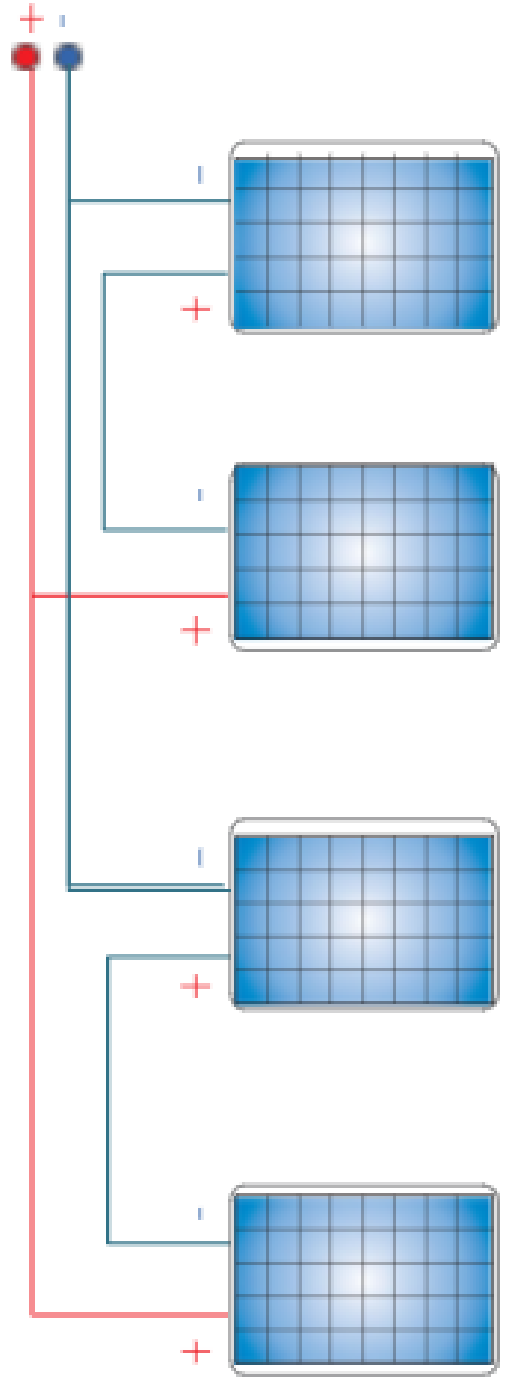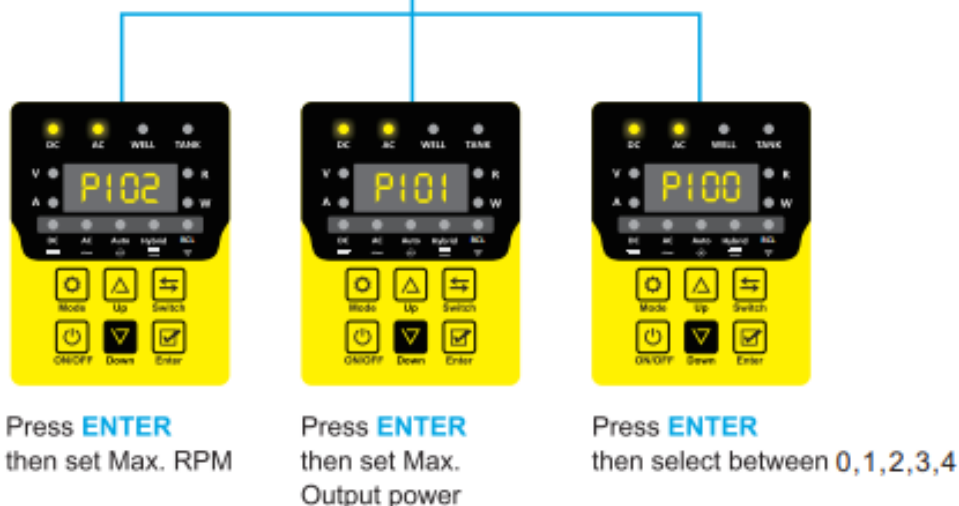
HYBRID DC/AC INVERTER SETTINGS

- P1 -	Motor Type/Power/Speed setting
P100	0 : AC 110V/220V single phase pump - without capacitor 1 : AC 110V/220V three phase pump 2 : Special BLDC water-filled pump 3 : Special BLDC oil-filled pump 4 : AC 110V/220 single phase pump - with capacitor
P101	Maximum power limit: Maximum output power
P102	Maximum speed limit: Limit the maximum target speed of the pump
P103	Minimum input power limit: set to 0.2kW when DC input power is less than 0.2kW.
P104	Set a time to re-detect DC power supply

Long press
MODE and **ENTER** button

Press **UP** or **DOWN**
button to select between
C1,P1,P3,P4,P5,P6

Press **ENTER**
get to next step

Press **UP** or **DOWN**
button to select between
P100,P101,P102

Remarks

After the setting, press **ENTER** button to save the parameters.
Long press **MODE** & **ENTER** button to exit parameter setting mode.

Press **ENTER**
then set Max. RPM

Press **ENTER**
then set Max.
Output power

Press **ENTER**
then select between 0,1,2,3,4

- P2 -	Frequency/Voltage setting
P200	4-0.8 - 4" 110V 0.75kW BLDC Motor
	4-1.1 - 4" 150V 1.1kW BLDC Motor
	4-1.5 - 4" 200V 1.5kW BLDC Motor
	4-2.2 - 4" 300V 2.2kW BLDC Motor
	3-0.8 - 3" 110V 0.75kW BLDC Motor
	3-1.1 - 3" 150V 1.1kW BLDC Motor
	3-1.5 - 3" 200V 1.5kW BLDC Motor

Long press
MODE and **ENTER** button

Press **UP** or **DOWN**
button to select between
C1,P1,P2,P3,P4,P5,P6

Press **ENTER**
get to next step

Press **UP** or **DOWN**
button to select

Remarks

After the setting, press **ENTER** button to
save the parameters.
Long press **MODE** & **ENTER** button to
exit parameter setting mode.

Press **ENTER**
and select the correct
motor according to size

- P3 -	Frequency/Voltage setting
P300	Frequency setting - Set to motor frequency
P301	Voltage setting - Set to input motor voltage

Long press
MODE and **ENTER** button

Press **UP** or **DOWN**
button to select between
C1,P1,P3,P4,P5,P6

Press **ENTER**
get to next step

Press **UP** or **DOWN**
button to select between
P300,P301,P302

Remarks

After the setting, press **ENTER** button to
save the parameters.
Long press **MODE** & **ENTER** button to
exit parameter setting mode.

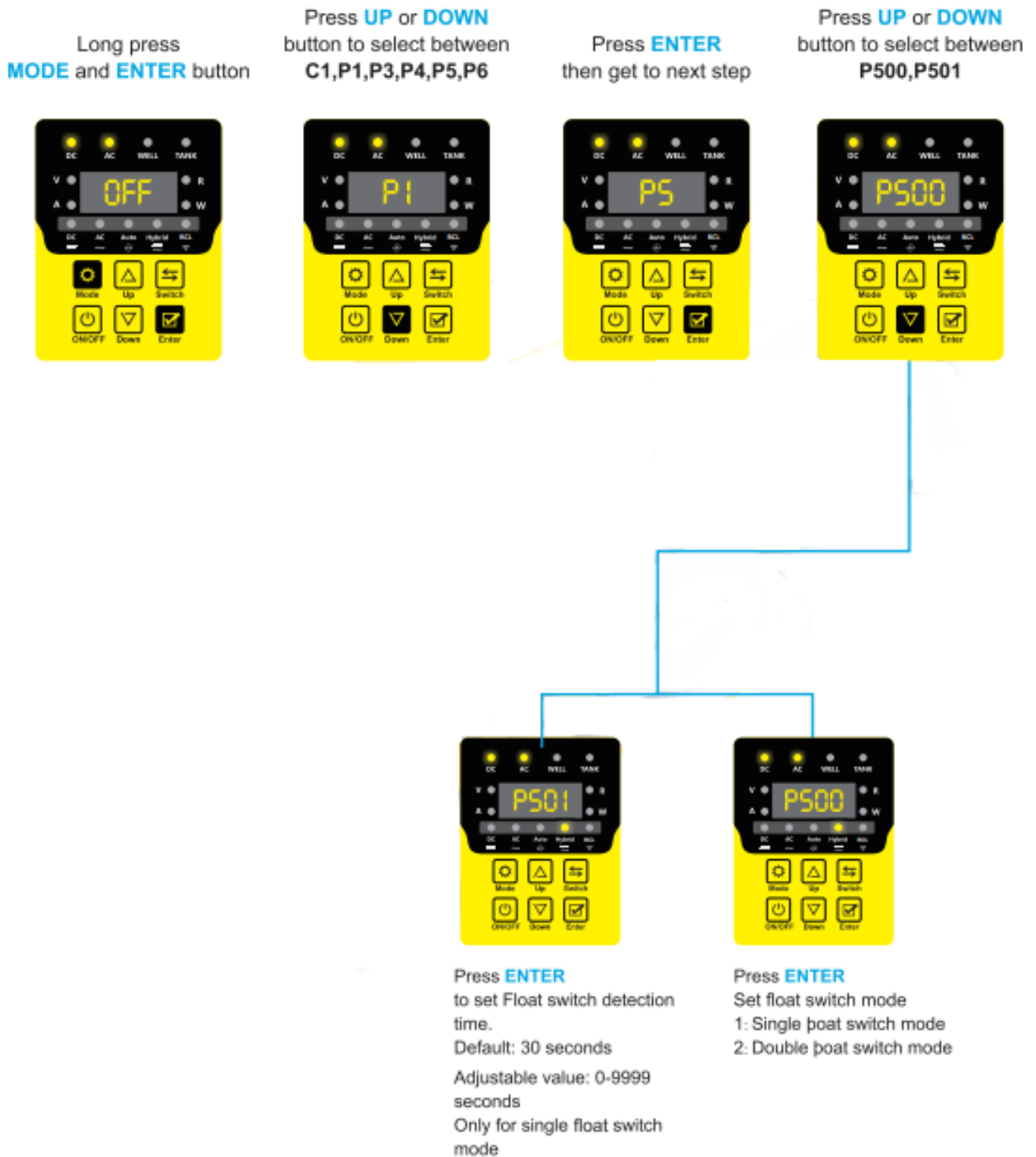Press **ENTER**
Set Frequency

Press **ENTER**
Set Voltage

- P5 -	Frequency/Voltage setting
P500	1: Single float switch mode (TH,TH)
	2: Double float switch mode (TH,TH,TL,TL)
P501	Pump restart working delay time (0000 - 9999) when the tank is no longer full.

Long press
MODE and **ENTER** button

Press **UP** or **DOWN**
button to select between
C1,P1,P3,P4,P5,P6

Press **ENTER**
then get to next step

Press **UP** or **DOWN**
button to select between
P500,P501

Press **ENTER**
to set Float switch detection time.
Default: 30 seconds
Adjustable value: 0-9999 seconds
Only for single float switch mode

Press **ENTER**
Set float switch mode
1: Single boat switch mode
2: Double boat switch mode

Float Switch State Checking

Press the MODE button on the operation interface to select the Operation Mode, the operation mode indicator will switch cyclically.

Long press **SWITCH** button to check

Press any button to exist

Tank high float switch status

0: Not Connected - Pump is off
- Pump is running but the water level is below switch
1: Connected, the pump will start automatically.

Tank low float switch status

0: Not Connected. The pump will run automatically.
1: Connected, water level is higher than the tank low float switch.

Double float switch mode

	TH	TL	COMMAND	STATUS DISPLAY
Single float switch mode P500 = 1	Close	/	Stop the pump	1 - 1
	Open	/	Start the pump	1 - 0
Double float switch mode P500 = 2	Open	Open	Start the pump	2 - 0
	Close	Open	Fault Alarm	E - F1
	Open	Close	Keep state	2 - 01
	Close	Close	Stop the pump	2 - 11

Note: The float switch in this example refers to the upper conduction float switch with the following closed and open states.

Closed   Disconnected

- C1 -	Electric Parameter Checking	UNIT
C100	Display motor speed	rpm
C101	Display output current	A
C102	Display input AC voltage	V
C103	Display input DC voltage	V
C104	Display busbar voltage	Watt
C106	Display output voltage (motor line voltage RMS)	V
C107	Displays the last fault code that occurred NIL for no fault. Low voltage is not recorded within the fault. Press SWITCH on this screen to clear the fault record.	/

Long press
MODE and **ENTER** button

Press **UP** or **DOWN**
button to select between
C1,P1,P3,P4,P5,P6

After select to C1
Press **ENTER**
then get to next step

Press **UP** or **DOWN**
button to select between
**C100,C101,C102,C103,
C104,C106,C107**

Press **ENTER**
to show
motor speed

Press **ENTER**
to show motor
input current

Press **ENTER**
to show AC input
voltage

Press **ENTER**
to show DC input
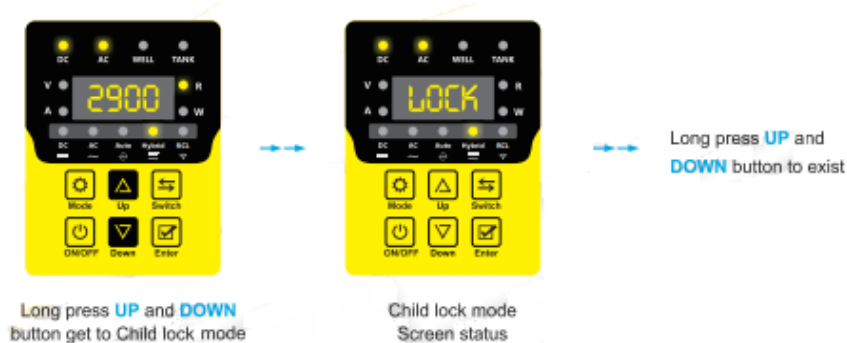voltage

Press **ENTER**
to show
output voltage

Press **ENTER**
to show Last fault
code

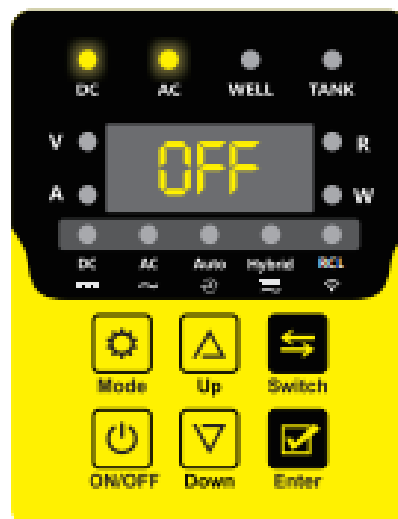| - P6 -	Other setting parameters	
P600	Direction of rotation setting (1 or 0) Set to 0	
P601	Dry running detecting co-efficient setting (5 is default value, Setting range: 0 - 15)	
P602	Child lock password setting, Setting range: 0000 - 9999	
P603	System recovery	Enter: 369
P604	Opposite polarity for float switch	0: NO switch (Closed is valid) 1: NC switch (Open is valid) 0: Default setting

Child Lock Mode

All buttons are locked under this mode.

Long press UP and DOWN button to exist

Long press UP and DOWN button get to Child lock mode

Child lock mode Screen status

Impeller Cleaning Instructions:

- **To clean, press and hold the SWITCH key and ENTER key at the same time.**
- **The motor will operate back and forth for 100 seconds, showing CLEN on the digital display.**
- **Once the cleaning process finishes, press the ON/OFF button to end it.**

ERROR CODES AND SOLUTIONS

CODE	DIAGNOSTIC	DESCRIPTION	SOLUTIONS	RECOVERY
E - A1	IPM Protection	Output phase-to-phase short circuit. Power IGPT damage	1. Ensure output terminals are secure. 2. Check motor 3. If error does not clear return unit to supplier	30 Seconds
E - A2	Over Current	Excessive input or output current	1. Check input power 2. Ensure control and motor power match. 3. Extend acceleration time in parameter settings. 4. If error does not clear return unit to supplier	30 Seconds
E - D1	Drive Failure	Drive hardware failure	Return unit to supplier	
E - N2	Dry Run	No water in supply or below inlet of unit	1. Check water supply and refill. 2. Check for obstructions or blockages in supply pipe line	Automatically after: 30 Seconds 30 Minutes after 3 attempts
E - F1	Float Switch	Incorrectly installed or Float switch faulty	1. Ensure float switch is installed correctly according to diagram. 2. Replace float level switch 3. If error does not clear return unit to supplier	30 Seconds
E - E2	Storage Failure	EPROM memory full	Return unit to supplier	
E - U1	Low Voltage	Supply voltage below 50V	1. Check input power 2. If error does not clear return unit to supplier	30 Seconds
E - U2	Over Voltage	Supply voltage is above 460V	1. Check input power 2. If error does not clear return unit to supplier	30 Seconds
E - CH	Over Temperature	The temperature inside the control box exceeds the set protection temperature.	1. Check installation environment and ensure unit is well ventilated. 2. Install cooling fan 3. If error does not clear return unit to supplier	30 Seconds
E - L1	Unit Stall	Motor parameters on controller are not correct	1. Ensure parameter settings on P1 & P2 are set correctly. 2. If error does not clear return unit to supplier	30 Seconds
E - L2	Voltage protection	Insufficient starting voltage. High fluctuation in AC power supply	1. Check input voltage supply. 2. If error does not clear return unit to supplier.	30 Seconds
E - 01	Current offset	Hardware Failure	Return unit to supplier	30 Seconds
E - N1	Out-of-phase	Incorrect wiring Phase failure Motor temperature to high	1. Check input power 2. Ensure wiring is according to diagram 3. Check motor 4. If error does not clear return unit to supplier	3 Minutes

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