



# INVERTER POOL PUMP

INSTALLATION AND OPERATION MANUAL



Follow this QR code for installation and operation manual

## CONTENTS

1.  IMPORTANT SAFETY INSTRUCTIONS .....	1
2. TECHNICAL SPECIFICATIONS .....	3
3. OVERALL DIMENSION (mm) .....	3
4. INSTALLATION .....	4
5. SETTING AND OPERATION .....	6
6. WIFI OPERATION (OPTIONAL ITEM) .....	15
7. EXTERNAL CONTROL .....	23
8. PROTECTION AND FAILURE .....	25
9. MAINTENANCE .....	28
10. WARRANTY & EXCLUSIONS .....	28
11. DISPOSAL .....	28

THANK YOU FOR PURCHASING OUR INVERTER POOL PUMPS.

THIS MANUAL CONTAINS IMPORTANT INFORMATION THAT WILL HELP YOU IN OPERATING AND MAINTAINING THIS PRODUCT.

PLEASE READ THE MANUAL CAREFULLY BEFORE INSTALLATION & OPERATION AND RETAIN IT FOR FUTURE REFERENCE.

INSULATED WET END PUMP.

USE COPPER CONDUCTORS ONLY.

FOR USE WITH SWIMMING POOLS, HOT TUBS, AND SPAS.

CAUTION: CONNECT ONLY TO GROUNDING TYPE RECEPTACLE PROTECTED BY A CLASS A GROUND FAULT CIRCUIT INTERRUPTER.

CAUTION: TO ENSURE CONTINUED PROTECTION AGAINST SHOCK HAZARD, USE ONLY IDENTICAL REPLACEMENT PARTS WHEN SERVICING.

CAUTION: THIS PUMP IS FOR USE WITH PERMANENTLY-INSTALLED POOLS ONLY – DO NOT USE WITH STORABLE POOLS.

POMPE À EXTRÉMITÉ IMMERGÉE ISOLÉE.

UTILISEZ UNIQUEMENT DES CONDUCTEURS EN CUIVRE.

POUR UNE UTILISATION AVEC LES PISCINES, LES BAINS À REMOUS ET LES SPAS.

ATTENTION: BRANCHER SEULEMENT À UNE PRISE DE COURANT AVEC MISE À LA TERRE PROTÉGÉE PAR UN DISJONCTEUR DIFFÉRENTIEL DE CLASSE A.

ATTENTION: À FIN D'ASSURER UNE PROTECTION PERMANENTE CONTRE LE DANGER DE CHOC

ÉLECTRIQUE, LORS DE L'ENTRETIEN EMPLOYER SEULEMENT DES PIÈCES DE RECHANGE IDENTIQUES.

ATTENTION: CETTE POMPE EST DESTINÉE À ÊTRE UTILISÉE UNIQUEMENT AVEC DES PISCINES INSTALLÉES EN PERMANENCE – NE PAS UTILISER AVEC DES PISCINES STOCKABLES.

## 1. **IMPORTANT SAFETY INSTRUCTIONS**

When installing and using this electrical equipment, basic safety precautions should always be followed, including the following:

- 1) **READ AND FOLLOW ALL INSTRUCTIONS**
- 2) **WARNING** – To reduce the risk of injury, do not permit children to use this product unless they are closely supervised at all times.
- 3) **WARNING** – Risk of Electric Shock. Connect only to a branch circuit protected by a ground-fault circuit-interrupter (GFCI). Contact a qualified electrician if you cannot verify that the circuit is protected by a GFCI.
- 4) The unit must be connected only to a supply circuit that is protected by a ground-fault circuit interrupter (GFCI). Such a GFCI should be provided by the installer and should be tested on a routine basis. To test the GFCI, push the test button. The GFCI should interrupt power. Push the reset button. Power should be restored. If the GFCI fails to operate in this manner, the GFCI is defective. If the GFCI interrupts power to the pump without the test button being pushed, a ground current is flowing, indicating the possibility of an electric shock. Do not use this pump. Disconnect the pump and have the problem corrected by a qualified service representative before using it.
- 5) **WARNING** – To reduce the risk of electric shock, replace the damaged cord immediately.
- 6) **CAUTION** – This pump is for use with permanently-installed pools and may also be used with hot tubs and spas if so marked. Do not use it with storable pools. A permanently-installed pool is constructed in or on the ground or in a building such that it cannot be readily disassembled for storage. A storable pool is constructed so that it is capable of being readily disassembled for storage and reassembled to its original integrity.
- 7) Do not install within an outer enclosure or beneath the skirt of a hot tub or spa.
- 8) A solid copper bonding conductor not smaller than 8 AWG (8.4 mm<sup>2</sup>) shall be connected from the accessible wire connector on the motor to all metal parts of the swimming pool, spa, or hot tub structure and to all electrical equipment, metal conduit, and metal piping within 5 feet (1.5 m) of the inside walls of a swimming pool, spa, or hot tub, when the motor is installed within 5 feet of the inside walls of the swimming pool, spa, or hot tub.

- 9) For Use With Swimming Pools, Hot Tubs, and Spas.
- 10) CAUTION: This Pump is for Use with Permanently-Installed Pools Only – Do Not Use with Storable Pools.
- 11) CAUTION: To reduce the risk of electric shock, install at least 6 feet from the inside walls of a pool. Do not use an extension cord.
- 12) CAUTION: To ensure continued protection against shock hazard, use only identical replacement parts when servicing.
- 13) This pump is for use with permanently installed in-ground or above-ground swimming pools and may also be used with hot tubs and spas with a water temperature under 50°C. Due to the fixed installation method, this pump is not suggested to be used on above-ground pools that can be readily disassembled for storage.
- 14) The pump is not submersible.
- 15) Never open the inside of the drive motor enclosure.
- 16) SAVE THESE INSTRUCTIONS.



**WARNING:**

- Fill the pump with water before starting. Do not run the pump dry. In case of dry run, mechanical seal will be damaged and the pump will start leaking.
- Before servicing the pump, switch power OFF to the pump by disconnecting the main circuit to the pump and release all pressure from pump and piping system.
- Never tighten or loosen screws while the pump is operating.
- Ensure that the inlet and outlet of the pump are unblocked with foreign matter.

## 2. TECHNICAL SPECIFICATIONS

Model	Voltage (V)	Frequency (Hz)	THP	Qmax (US gpm)	Hmax (Ft)
DCP08DV	115V	50□60	0.85	106	62
	230V		0.85	106	
DCP12DV	115V	50□60	1.05	110	66
	230V		1.30	123	
DCP15DV	115V	50□60	1.25	119	69
	230V		1.65	132	

## 3. OVERALL DIMENSION (mm)

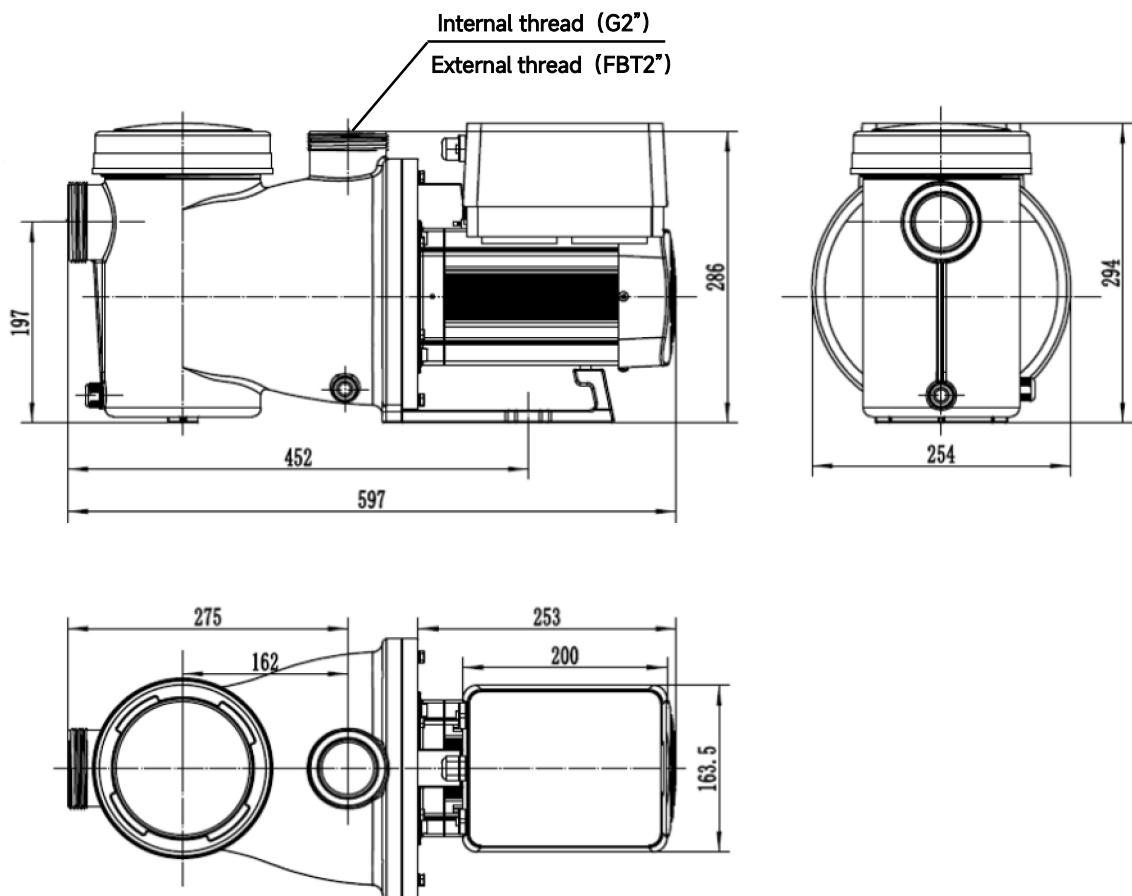


Figure 1 - Pump Dimensions

## 4. INSTALLATION

### 4.1. Pump Location

- 1) Install the pump as close to the pool as possible, to reduce friction loss and improve efficiency, use short, direct suction and return piping.
- 2) To avoid direct sunshine, heat or rain, it is recommended to place the pump indoors or in the shade.
- 3) DO NOT install the pump in a damp or non-ventilated location. Keep pump and motor at least 150mm away from obstacles, pump motors require free circulation of air for cooling.
- 4) The pump should be installed horizontally and fixed in the hole on the support with screws to prevent unnecessary noise and vibration.

### 4.2. Plumbing and Valves

- 1) The pump inlet/outlet union size: optional with metric (48.3 or 60.3mm) or imperial (1.5" or 2").
- 2) For optimization of the pool plumbing, a larger pipe size should be used. It is recommended to use a pipe with size of 2".
- 3) When installing the inlet and outlet fittings (joints) with the plumbing, use the special sealant for PVC material.
- 4) The dimension of suction line should be the same or larger than the inlet line diameter, to avoid pump sucking air, which will affect the pump's efficiency.
- 5) To reduce friction loss and improve efficiency, plumbing on the suction and return side should be short and direct.
- 6) Flooded suction systems should have valves installed in both the pump suction and return line, which is convenient for routine maintenance. A valve, elbow, or tee installed on the suction line should be no closer to the front of the pump than seven times the suction line diameter.
- 7) Use a check valve in the return line where there is a significant height between the return line and the outlet of the pump, to prevent the pump from the impact of medium recirculation and pump-stopping water hammer.

### 4.3. Fittings

- 1) Elbows should be no closer than 350mm to the inlet. Do not install 90° elbows directly into the pump inlet/outlet. Joints must be tight.
- 2) Joints must be tight.

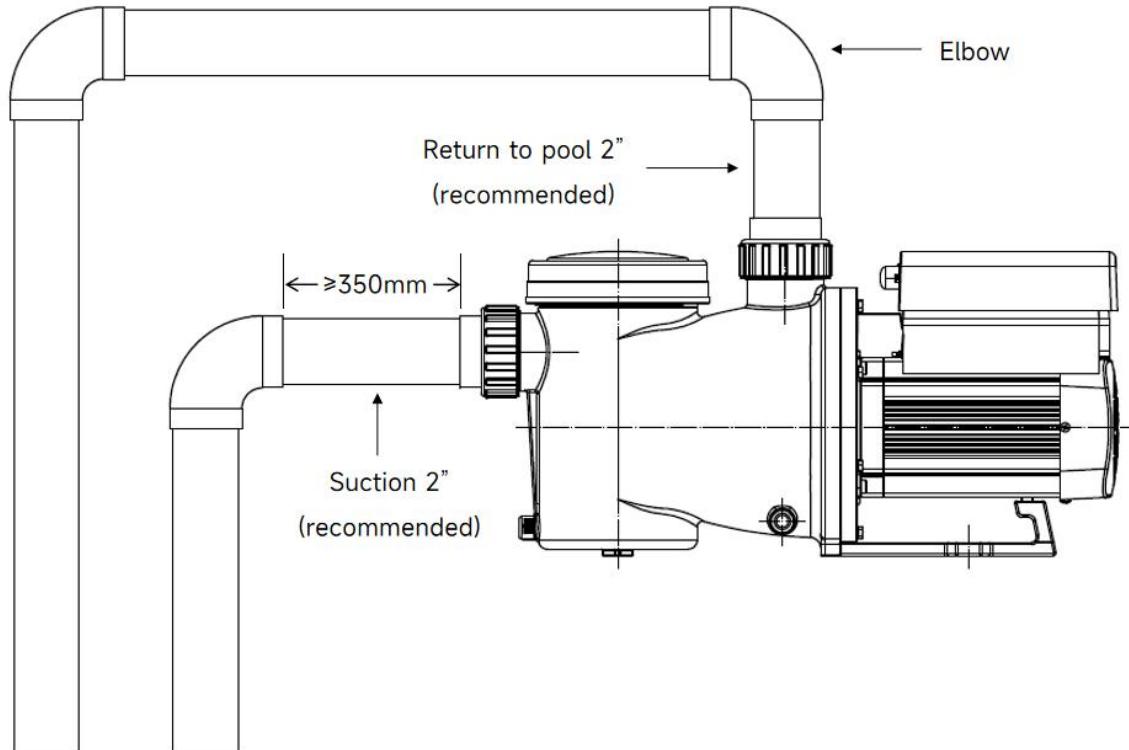


Figure 2 - Plumbing and Fittings installations

\* The pump inlet/outlet union size: optional with metric (48.3 or 60.3mm) or imperial (1.5" or 2")

- 3) Use the UNION KIT supplied by the pump manufacturer (Refer to Figure 3). Do not use other fittings to connect the pump inlet/outlet, in case the fittings are not match and damage the pump body.

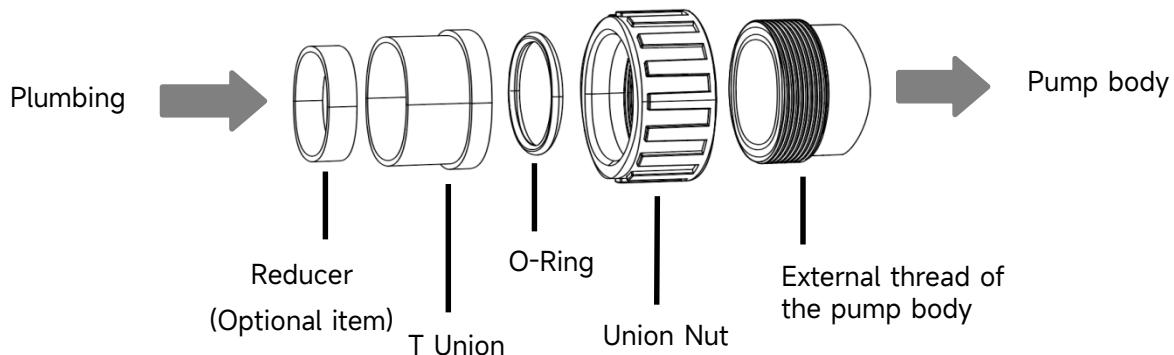


Figure 3 - Union Kit

#### 4.4. Check before initial startup

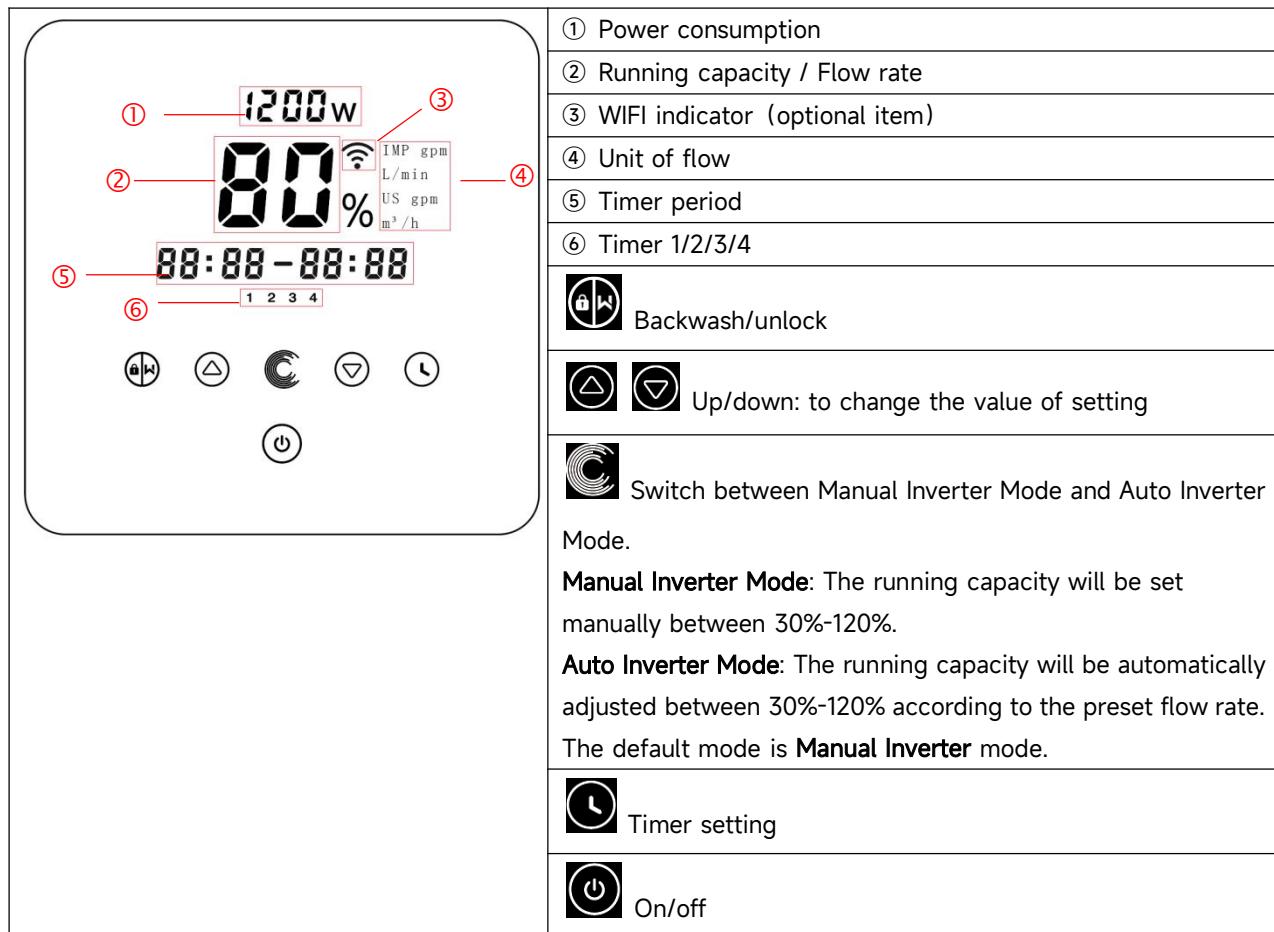
- 1) Check whether pump shaft rotates freely;
- 2) Check whether power supply voltage and frequency conform to the nameplate;
- 3) Facing the fan blade, the direction of motor rotation should be clockwise;
- 4) It is forbidden to run the pump without water.

#### 4.5. Application conditions

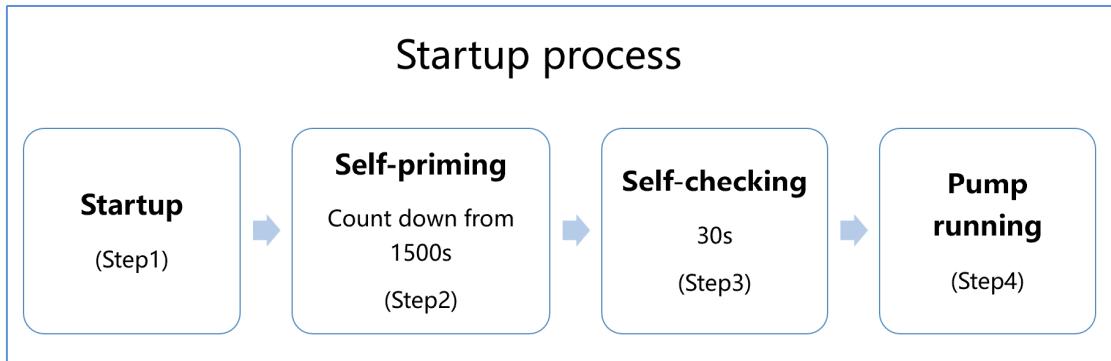
Ambient temperature	Indoor installation, temperature range: -10-42°C
Maximum water temperature	50°C
Salt water available	Salt concentration up to 3.5%, i.e 35g/l
Humidity	≤90% RH, (20°C±2°C)
Installation	The pump can be installed max. 2m above water level
Protection	Class F, IP55

### 5. SETTING AND OPERATION

#### 5.1. Display on control panel



## 5.2. Startup process overview



### ① Step 1: Startup

- Press and hold  for more than 3 seconds to unlock the screen.
- Press  to startup the pump.

### ② Step 2: Self-priming

- The pump will start counting down from 1500s; When the system detects the pump is full of water, it will stop counting down and exit priming automatically.
- Users can enter the parameter setting to disable the default self-priming function (see 5.11).

### ③ Step 3: Self-checking

- The pump will recheck for 30s again to make sure the self-priming (Step2) is completed.

### ④ Step 4: Pump running

- The pump will run at 80% of the running capacity at the initial startup after the self-priming.

### 5.3. Startup

When the power is switched on, the screen will fully light up for 3 seconds, the device code will be displayed,

and then it will enter the normal working state. When the screen is locked, only the button  will light up;

Press and hold  for more than 3 seconds to unlock the screen. The screen will automatically lock up when there is no operation for more than 1 minute and the brightness of the screen will be reduced to 1/3 of the normal display. Short press  to wake up the screen and observe the relevant operating parameters.

### 5.4. Self-priming

Each time the pump is started, it will start self-priming.

When the pump performs self-priming, it will count down start from 1500s and stop count down automatically when the system detects the pump is full of water, then the system will recheck for 30s again to make sure the self-priming is completed.

Users can cancel self-priming manually by pressing  for more than 3 seconds. The pump will enter the default Manual Inverter mode at the initial startup.

#### Remark:

The pump is delivered with self-priming enabled. Each time the pump restarts, it will perform self-priming automatically. Users can enter the parameter setting to disable the default self-priming function (see 5.11)

### 5.5. Backwash

Users can start the backwash or fast re-circulation in any running state by pressing .

	Default	Setting range
Time	180s	Press  or  to adjust from 0 to 1500s with 30 seconds for each step
Running capacity	100%	60-100%, enter the parameter setting (see 5.11)

#### Exit backwash:

When backwash mode is on, users can hold  for 3 seconds to cancel it, the pump will return to the previous state before backwash. If a speed limit is set by the users, the running capacity of the backwash will not exceed the set speed limit. (see 5.10)

## 5.6. Manual Inverter Mode

1		Hold  for more than 3 seconds to unlock the screen.
2		Press  to start. The pump will run at 80% of the running capacity at the initial startup after the self-priming.
3	 	Press  or  to set the running capacity between 30%-120%, each step by 5%.
4		Press  again to switch to Auto Inverter mode.

**Note:**

- 1) When the pipeline pressure is high, to maintain an adequate flow rate, users can set the running capacity to 105%-120%. The pump will run at a higher speed to against the high pipeline pressure.
- 2) At the range of 105%-120% running capacity, the pump will automatically adjust the speed when it reaches the maximum power.

For example, when the users adjust the speed to 110%, if the pump power has reached to the maximum value at this speed, at this time, even if the users continue to increase the pump speed to 120%, the pump will maintain the speed at the maximum power, i.e. 110%. And the display speed will drop from 120% to 110%.

## 5.7. Auto Inverter Mode

Under Auto Inverter Mode, the pump can automatically detect the system pressure and adjust the speed of motor to reach the set flow.

1		Unlock the screen, press  to switch from the Manual Inverter mode to Auto Inverter mode.
2	 	The flow rate could be adjusted, by pressing  or  with 5 US gpm for each step.
3	 	The unit of flow rate could be changed to L/min, IMP gpm or m <sup>3</sup> /h, by pressing both   for 3 seconds.
4		Press  to switch to Manual Inverter mode.

The default adjustable flow range for InverCaptain is as below:

Model	Adjustable flow rate range*
DCP08DV	35-90 US GPM
DCP12DV	35-110 US GPM
DCP15DV	35-130 US GPM

**\*Note:**

In Auto Inverter Mode, the maximum adjustable flow rate is based on around 8m head.

If users set the flow at maximum adjustable flow rate and the pipeline pressure is higher than 8m, in this situation the pump will automatically increase the running speed and input power to against with the high pressure and maintain the maximum flow rate which the users set.

When the motor speed and input power increase to the maximum level but it's not enough to against with the huge pipeline pressure, the display flow on the pump controller will drop from the set flow to the actual achievable flow.

### 5.8. Timer mode

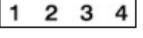
The pump's on/off and running capacity could be commanded by a timer, which could be programmed daily as needed.

1	Enter timer setting by pressing 
2	Press  or  to set the local time
3	Press  to confirm and move to time-1 setting
4	Press  or  to choose the desired running periods, running capacity or flow rate (when % icon is flashing, users can change to set the flow rate by pressing  )
5	 Repeat above steps to set the other 3 timers
6	 Hold 3 seconds to save setting and activate timer mode
7	 or  Check 4 timers to make sure there is no invalid setting

**Note:**

1) If the set time period contains the current time, the pump will start running according to the set running capacity or flow rate, the current timer indicator  (1 or 2 or 3 or 4) will light up, and the area

**88:88 - 88:88** will display the corresponding time period.

2) If the set time period does not contain the current time, the timer number  (1 or 2 or 3 or 4)

that is about to start running will be displayed and flash, and the area **88:88 - 88:88** will display the corresponding time period.

3) During timer setting, if you want to return to the previous setting, hold both   for 3 seconds. If

you don't need to set all 4 timers, you can hold  for 3 seconds, the system will automatically save the current set value and activate the timer mode.

4) The timer settings of the pump have been limited, users will not set the overlapping timers.

5) After the timer is set and then users turn off the pump, when users turn on the pump again, it will continue to return to the timer mode.

6) Users can cancel the timer mode by pressing .

## 5.9. Skimmer Mode

The skimmer mode enables the pump to skim the water surface, prevents the debris from accumulating, and provides users with a cleaner pool.

Hold  and  to enter the preset interface of the skimmer mode. When first switching to this mode, preset 1 will be activated.

Users can press  or  to view the 4 presets, the details of each preset are as below, the selected preset will be activated after 5s without operation.

Preset	Skimmer cycle	Skimmer duration	Skimmer speed	Time period	Remark
1	1h	3 mins	100%	7:00 – 21:00	Editable in parameter setting
2	1h	10 mins	100%	7:00 – 21:00	Not editable
3	3h	3 mins	80%	7:00 – 21:00	Not editable
4	Turn off the skimmer mode				Not editable

Table 1 - Presets of skimmer mode



At the skimmer duration, the controller will display the parameter of the preset, users can hold for 3 seconds to cancel the skimmer duration each time. When the skimmer duration ends, the pump will return to the normal state for the users to operate.

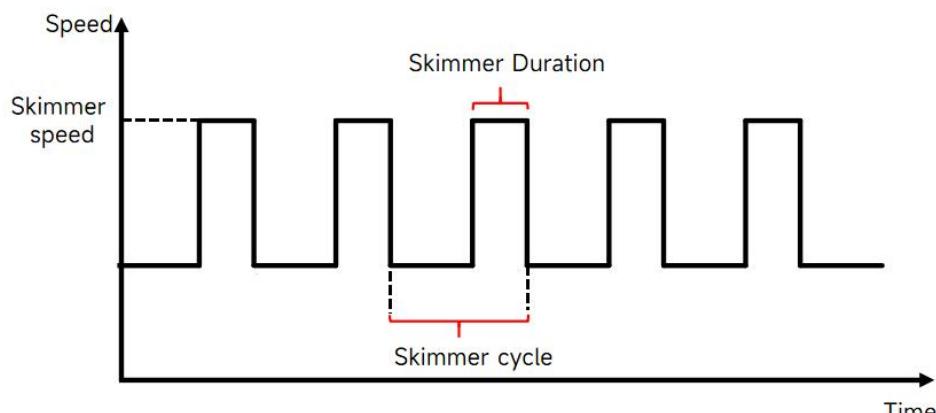
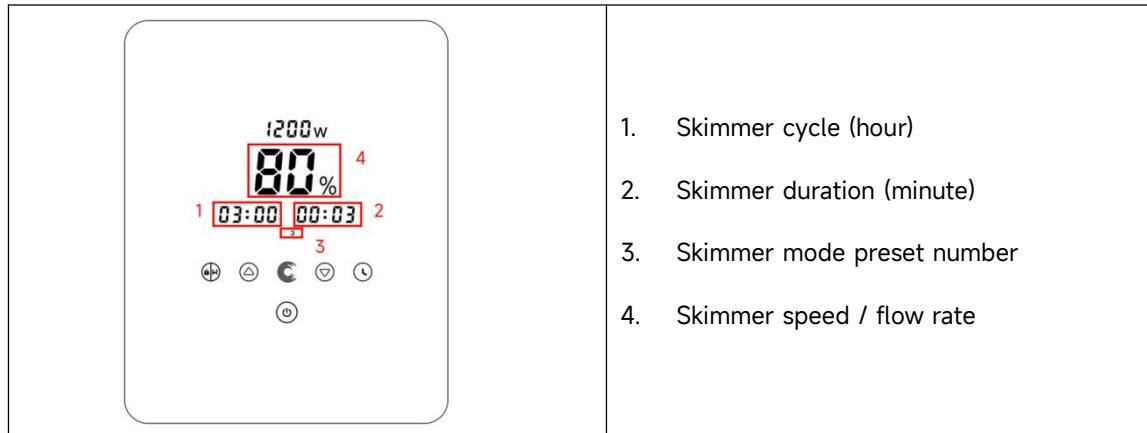


Figure 4 - Skimmer cycle

## 5.10. Speed / Flow Limit

Users can set the speed/flow limit of the pump to meet the flow requirement of other equipment such as sand filters.

Speed/flow limit of the pump can be set in the parameter setting. (see 5.11)

100% means no speed limit and the running capacity can be set from 30% - 120% under normal operation.

Model	Speed / Flow limit	
	Maximum Running Speed	Maximum Flow Rate
DCP08DV	60%~100%	55~90 US GPM
DCP12DV	60%~100%	65~110 US GPM
DCP15DV	60%~100%	80~130 US GPM

To ensure the performance, the self-priming process at each start will not be limited by the speed/flow limit function.

## 5.11. Parameter Setting

Restore factory setting	Switch off the pump, then hold both   for 3 seconds
Check the software version	Switch off the pump, then hold both   for 3 seconds
Enter parameter setting as below	Switch off the pump, then hold both   for 3 seconds; Press  to select the parameter address and press  or  to adjust the parameter setting.

Parameter Address	Description	Default Setting	Setting Range
1	Di2 (Digital input 2)	Speed: 100%	Speed: 30-120%, by 5% increments;  Flow: by 5 US gpm increments; DCP08DV: 35~90 US gpm DCP12DV: 35~110 US gpm DCP15DV: 35~130 US gpm
2	Di3 (Digital input 3)	Speed: 80%	
3	Di4 (Digital input 4)	Speed: 40%	Note: Press  to switch to flow rate setting.
4	Backwash	Speed: 100%	Speed: 60-100%, by 5% increments;  Flow: by 5 US gpm increments; DCP08DV: 35~90 US gpm DCP12DV: 35~110 US gpm DCP15DV: 35~130 US gpm  Note: Press  to switch to flow rate setting.
5	Control mode of Analog Input	0	0: Current control 1: Voltage control
6	Enable or disable the self-priming at each start	25	25: enables 0: disables
7	Reserved	0	Not editable

8	System time	00:00	00:00 - 23:59
9	Preset 1 of the skimmer mode	Skimmer cycle : 01:00 Skimmer duration : 00:03 Skimmer speed : 100%	*Skimmer cycle: 1-24h, 1h for each step; *Skimmer duration: 1-30min, 1min for each step; *Skimmer speed: 30%-100%, by 5% increments; *Skimmer flow: by 5 US gpm increments; DCP08DV: 35~90 US gpm DCP12DV: 35~110 US gpm DCP15DV: 35~130 US gpm  Note: Press  to switch to flow rate setting.
10	Time period of the preset 1 of the skimmer mode	7:00-21:00	Start time: 00:00-24:00 End time: 00:00-24:00
11	Speed limit	Speed: 100%	Speed: 60%-100%, by 5% increments; (100% means no speed limit)  Flow: by 5 US gpm increments; DCP08DV: 55~90 US gpm DCP12DV: 65~110 US gpm DCP15DV: 80~130 US gpm  Note: Press  to switch to flow rate setting.
12	RS485 address	170(0xAA)	160-190 (0xA0-0xBF), each step by 1.
13	Reserved	0	Not editable

For example: How to Enable / Disable Self-Priming Function?

- 1) **Enter parameter setting:** Switch off the pump, then hold both   for 3 seconds;
- 2) **Select parameter address:** Press  to select address 6;
- 3) **Enable or disable the self-priming function:** Adjust by pressing  or , 25= Enables, 0=Disables.

## 6. WIFI OPERATION (OPTIONAL ITEM)

### 1 Download InverFlow APP



Android



iOS

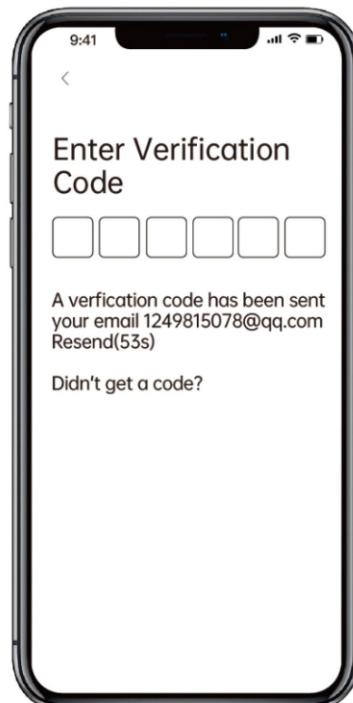
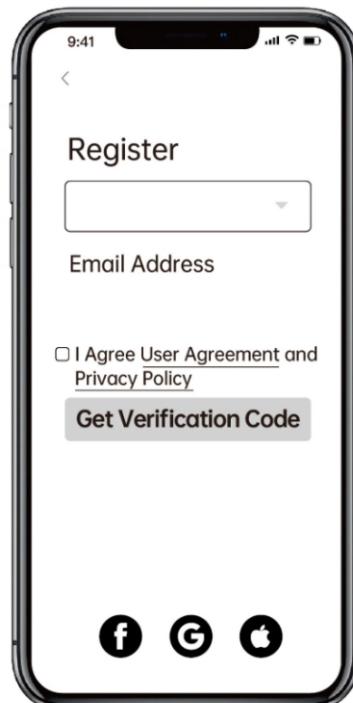


### 2 Account Registration

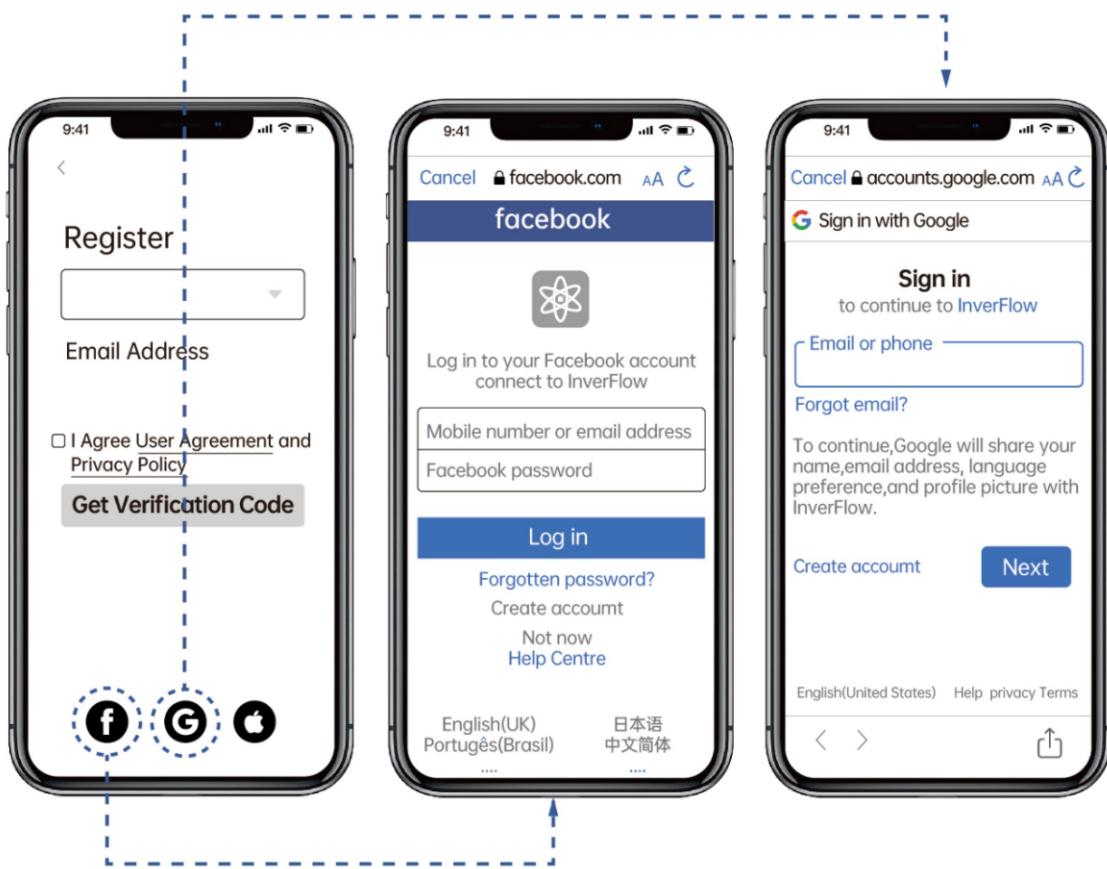
Register by e-mail or third-party application.



#### a. Email Registration

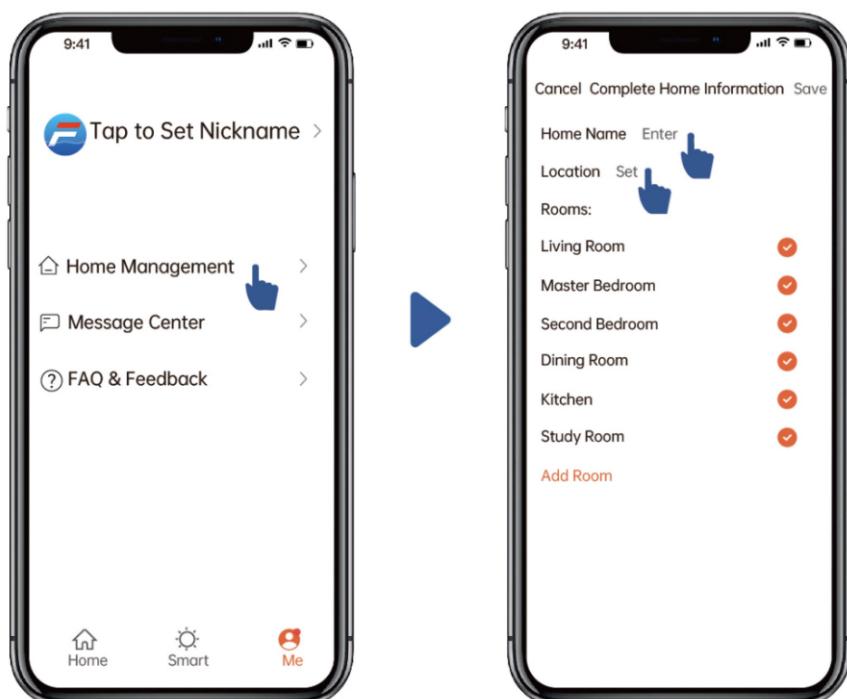


b. Third-party application registration



### ③ Create Home

Please set home name and choose the location of the device. (It is recommended to set the location so the weather can be shown in the App for your convenience)



## 4 App pairing

Please make sure your pump is turned on before you start.

### Option 1 (Recommended): With Wifi and Bluetooth

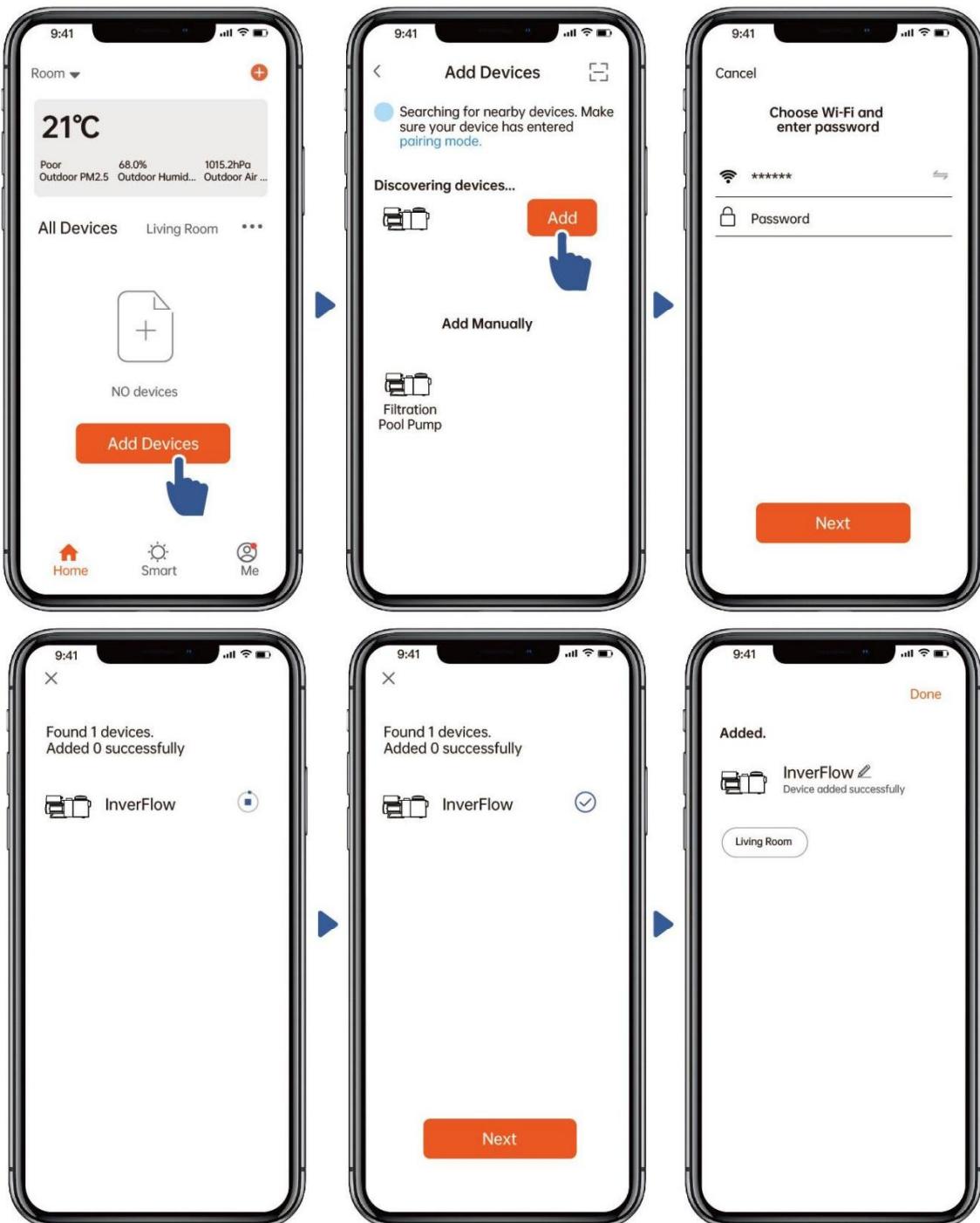
(Network requirement: 2.4GHz; 2.4Ghz and 5GHz into one SSID; but no separate 5GHz network)

- 1) Please confirm that your phone is connected to Wifi and your Bluetooth is on.

- 2) Press  for 3 seconds to unlock the screen. After switching on the pump, press  for 5 seconds

until hearing “Beep” and then release.  will flash.

- 3) Click “Add Devices”, and then follow the instructions to pair device.



## Option 2: With Wifi (Network requirement: 2.4GHz only)

- 1) Please confirm that your phone is connected to Wifi.

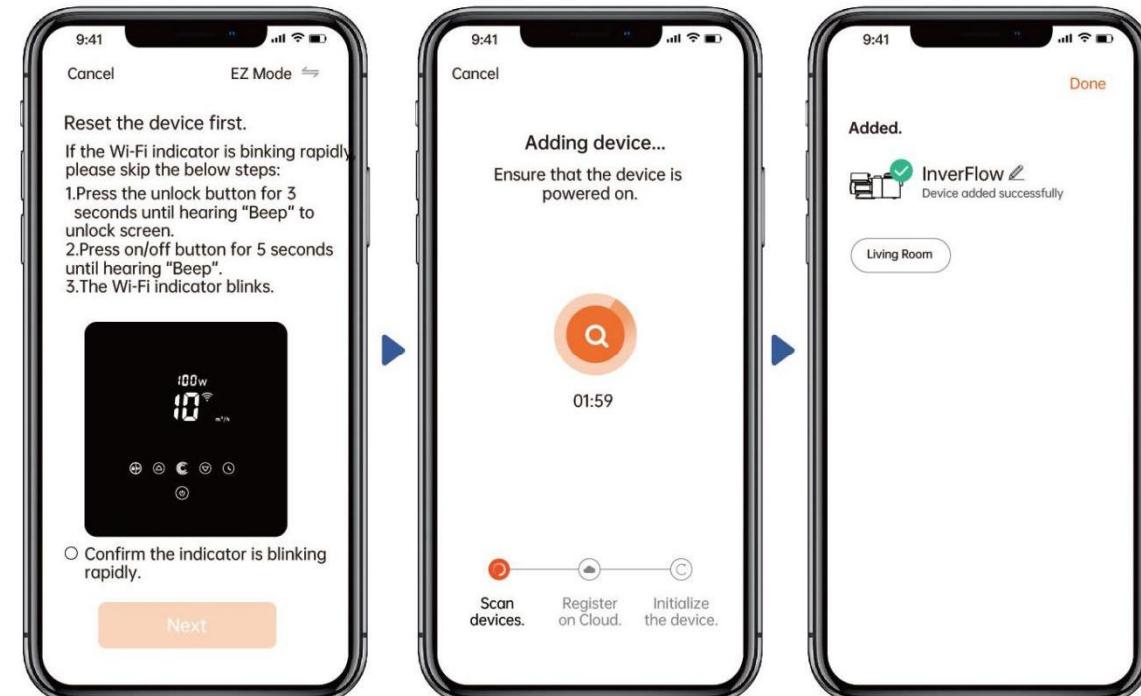
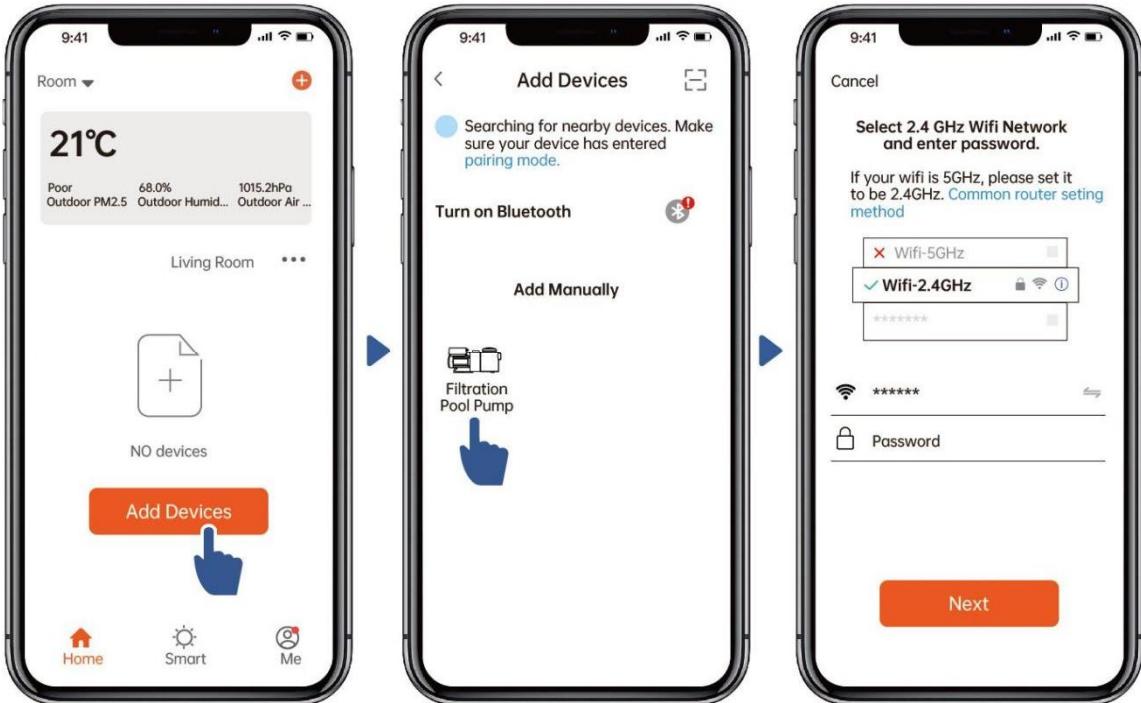


- 2) Press  for 3 seconds to unlock the screen. After switching on the pump, press  for 5



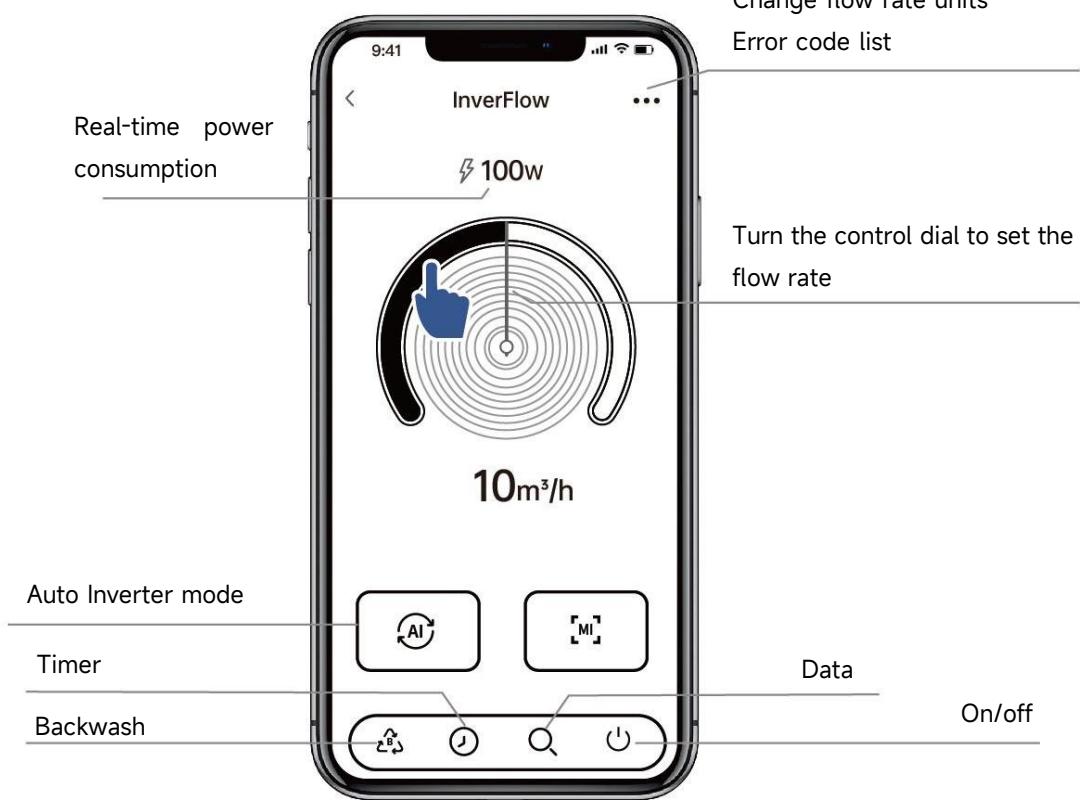
seconds until hearing “Beep” and then release.  will flash.

- 3) Click “Add Devices”, and then follow the instructions to pair device.

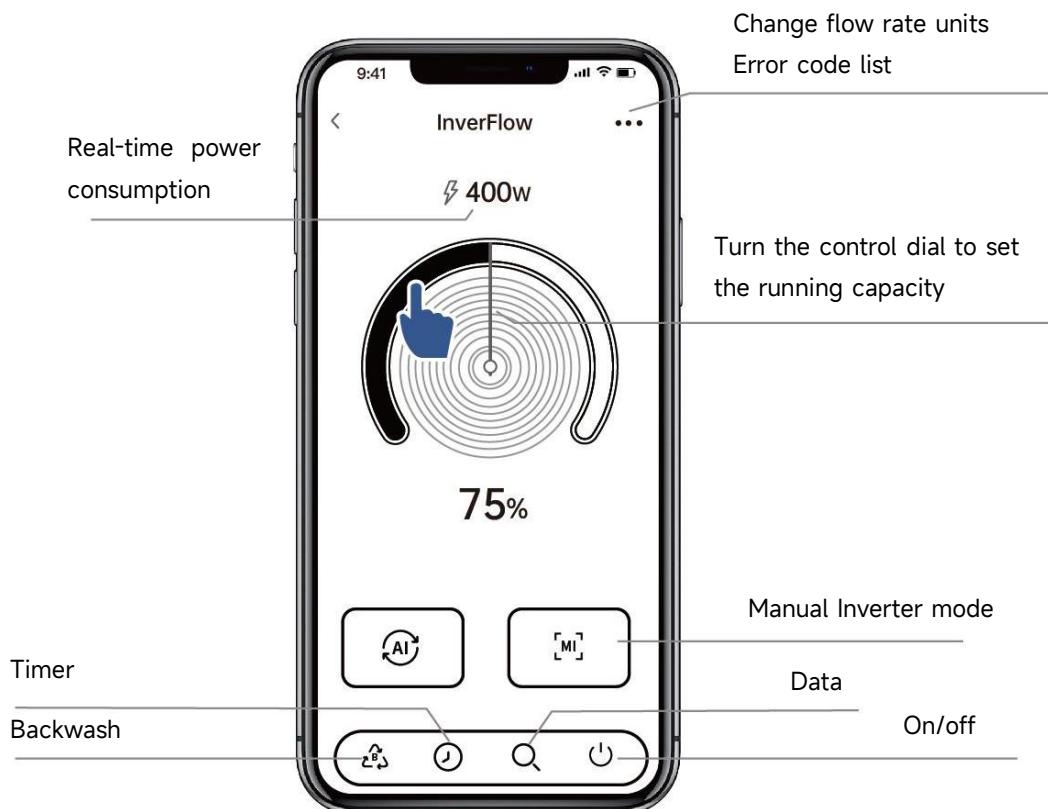


## 5 Operation

### 1) Using Auto Inverter mode:

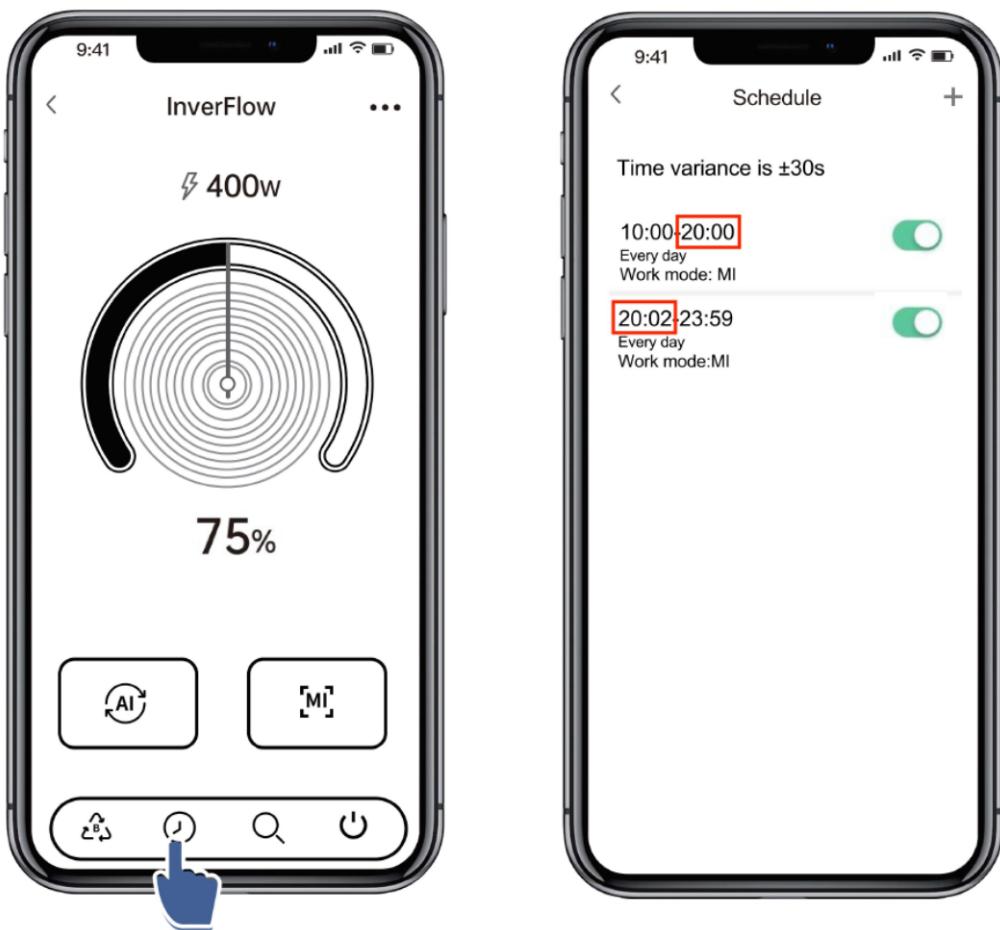


### 2) Using Manual Inverter mode:



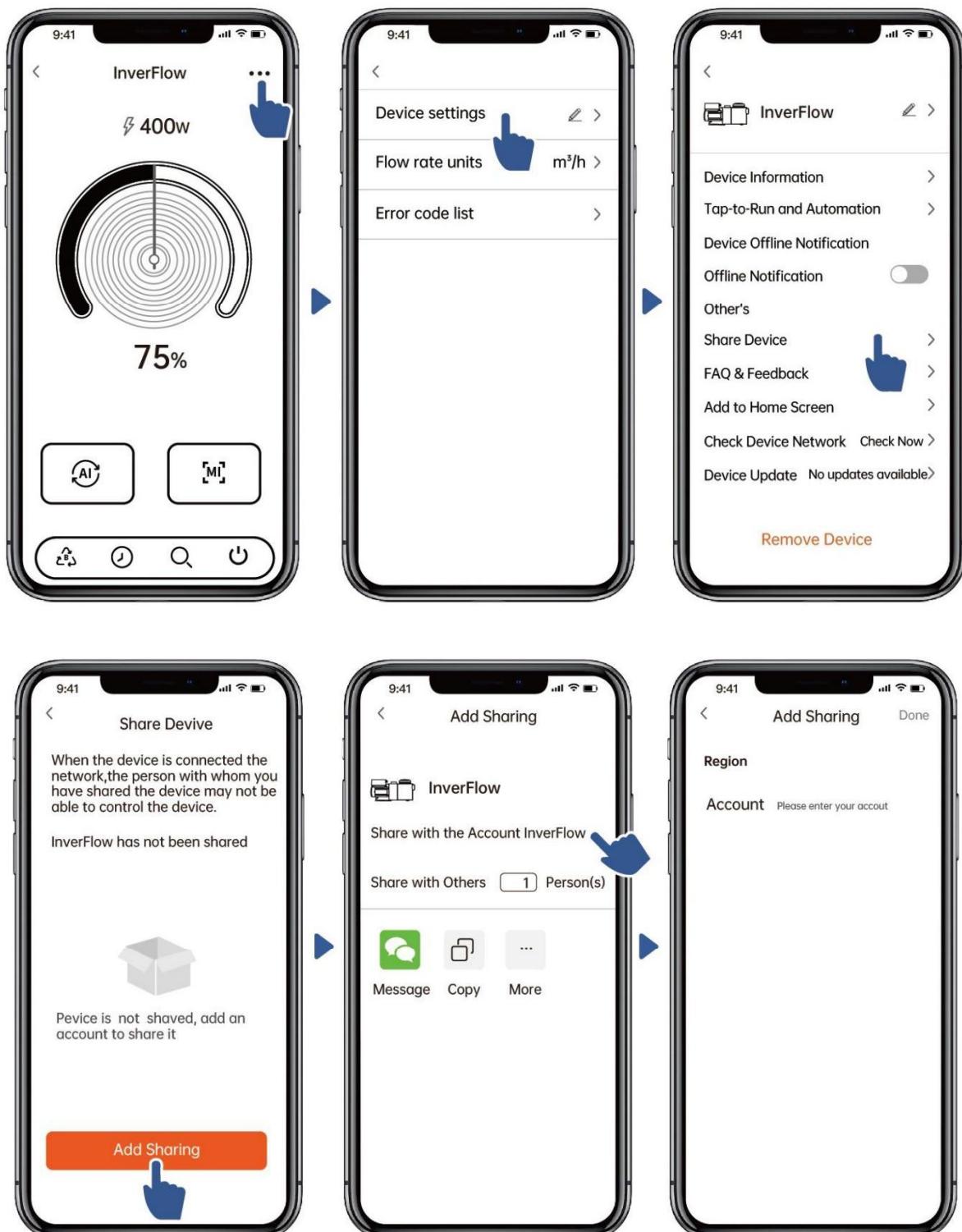
**Notice for the timer setting via the APP:**

- 1) Time variance is  $\pm 30s$ ;
- 2) In order to avoid overlapping timing points conflicting and invalidating due to network delay, it is recommended that the end time and the start time of the next timing period cannot overlap, and a sufficient time interval should be reserved, for example, at least 2 minutes;



## 6 Sharing Devices with your family members

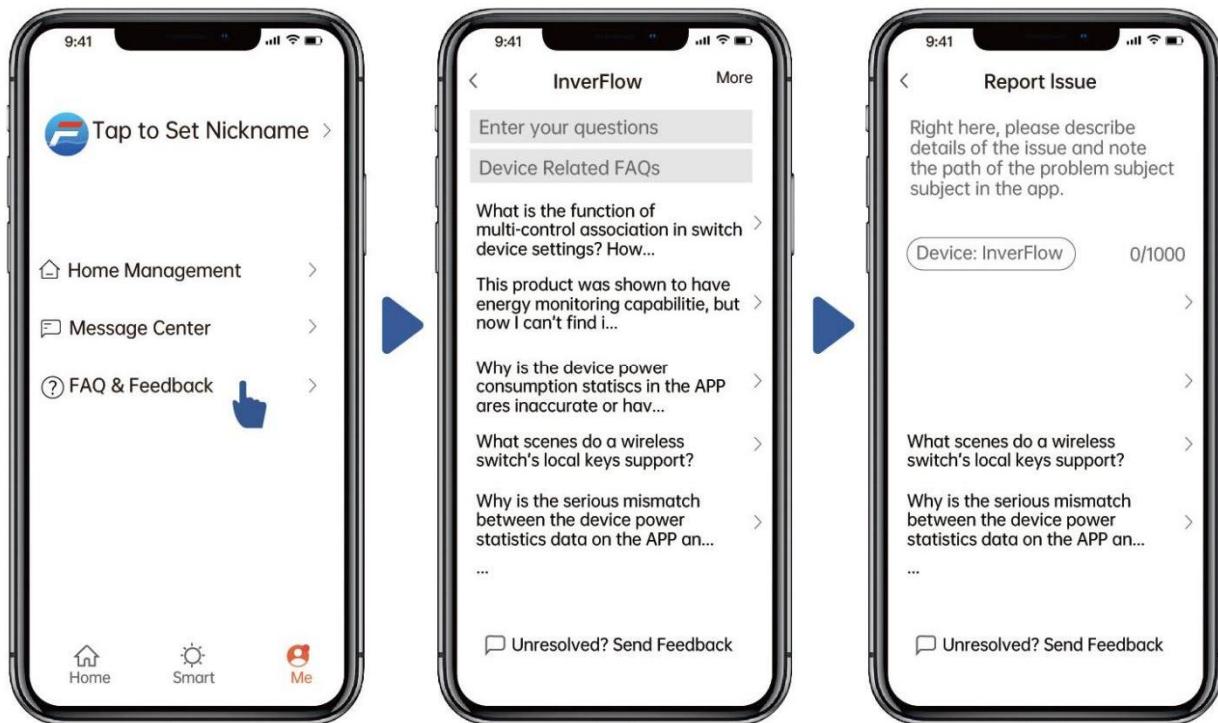
After pairing, if your family members also want to control the device, please let your family members register "InverFlow" first, and then the administrator can operate as below:



## 7

## Feedback

If you have any problem while using, welcome to send feedback.



### Notice:

- 1) The weather forecast is just for reference;
- 2) The power consumption data is for reference only, as it may be affected by network problems and imprecision of the calculation.
- 3) The App is subject to updates without notice.

## 7. EXTERNAL CONTROL

External control can be enabled via following contacts. If more than one external control is enabled, the priority is as below: Digital Input > RS485 > Panel control

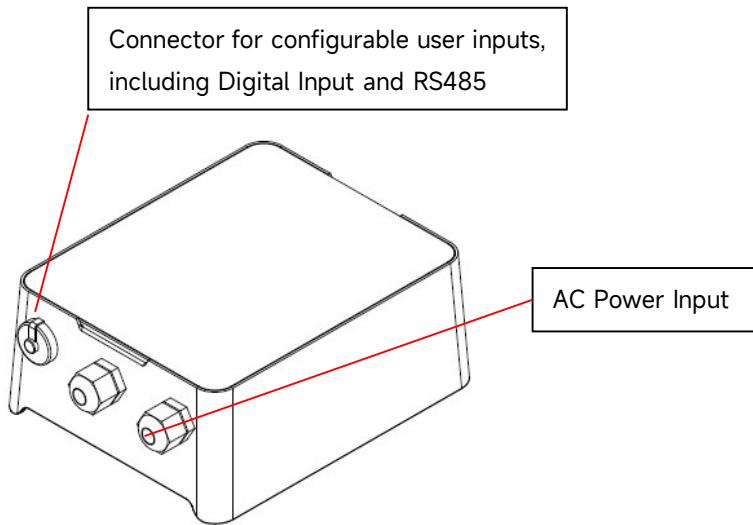


Figure 5 - Connector port location

### AC Power Input (Suitable for 115V and 230V)

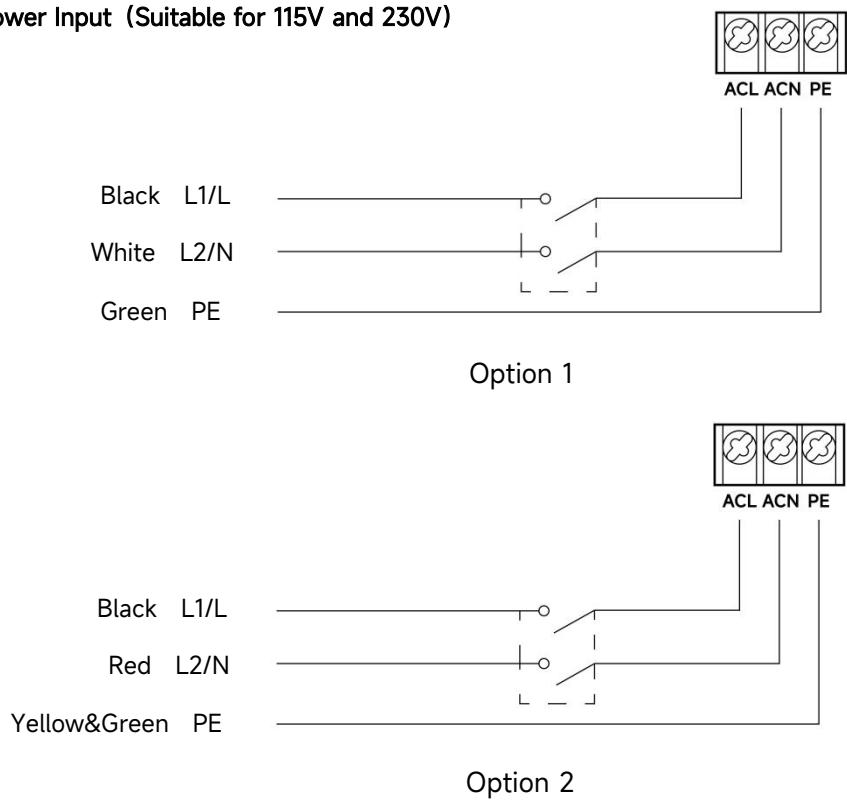


Figure 6 - Power cord connection

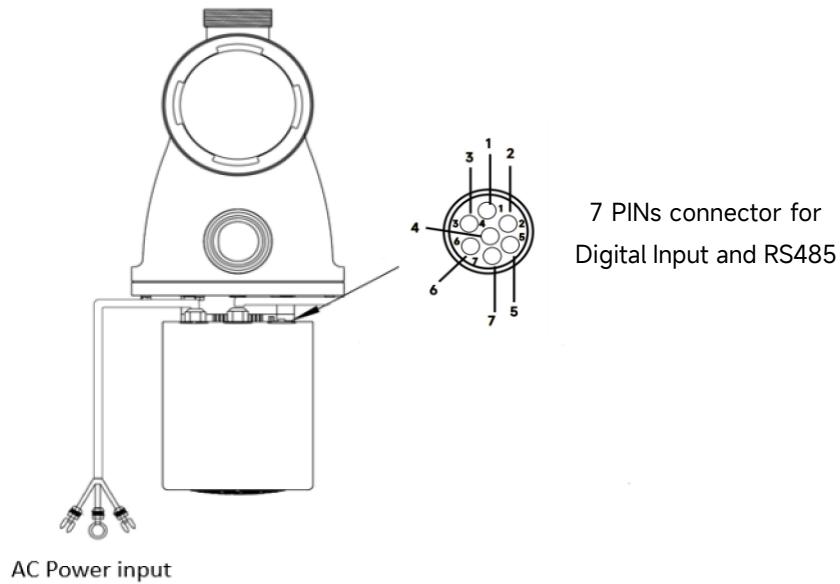


Figure 7 - Digital Input and RS485 connector

External Control	Color	Description	Note
Digital Input	Red	Di4 (Digital Input 4)	Default speed=40%
	Black	Di3 (Digital Input 3)	Default speed=80%
	White	Di2 (Digital Input 2)	Default speed=100%
	Grey	Di1 (Digital Input 1)	Stop
	Yellow	Digital Ground (COM)	COM
RS485	Green	RS485-A	/
	Brown	RS485-B	/

#### a. Digital Input

Running capacity is determined by the state of digital input,

- 1) When Di1(Grey) connects with COM(Yellow), the pump will be mandatory to stop; if disconnected, the digital control will be invalid;
- 2) When Di2(White) connects with COM(Yellow), the pump will be mandatory to run at 100%; if disconnected, the control priority will be back on panel control;
- 3) When Di3(Black) connects with COM(Yellow), the pump will be mandatory to run at 80%; if disconnected, the control priority will be back on panel control;
- 4) When Di4(Red) connects with COM(Yellow), the pump will be mandatory to run at 40%; if disconnected, the control priority will be back on panel control;
- 5) The capacity of inputs (Di2/Di3/Di4) could be modified according to the parameter setting.

#### b. RS485

To connect with RS485-A(Green) and RS485-B(Brown), the pump could be controlled via Modbus 485 communication protocol.

## 8. PROTECTION AND FAILURE

### 8.1. High-Temperature Warning and Speed Reduction - AL01

In "Auto Inverter/Manual Inverter Mode" and "Timer mode" (except backwash/self-priming), when the module temperature reaches the high-temperature warning trigger threshold (81°C), it enters the high-temperature warning state; when the temperature drops to the high-temperature warning release threshold (78°C), the high-temperature warning state is released. The display area alternately displays AL01 and running speed or flow.

If AL01 is displayed, the running capacity will be automatically reduced as below:

- 1) If current operating capacity is higher than 100%, the running capacity will be automatically reduced to 85%;
- 2) If current operating capacity is between 85% and 100%, the running capacity will be automatically reduced by 15%;
- 3) If current operating capacity is between 70% and 85%, the running capacity will be automatically reduced by 10%;
- 4) If current operating capacity is lower than 70%, the running capacity will be automatically reduced by 5%.

### 8.2. Undervoltage protection - AL02

The device is compatible with both 230V and 115V AC power input.

#### ① AC Power Input: 230V

When the device detects that the input voltage is less than 198V, the device will limit the current running speed. The display area alternately displays AL02 and running speed or flow.

- 1) When the input voltage is less than or equal to 180V, the running capacity will be limited to 70%;
- 2) When the input voltage range is within 180V - 190V, the running capacity will be limited to 75%;
- 3) When the input voltage range is within 190V - 198V, the running capacity will be limited to 85%.

#### ② AC Power Input: 115V

When the device detects that the input voltage is less than 98V, the device will limit the current running speed. The display area alternately displays AL02 and running speed or flow.

- 1) When the input voltage range is within 85V - 90V, the running capacity will be limited to 75%;
- 2) When the input voltage range is within 90V - 98V, the running capacity will be limited to 85%.

**Note: If the input voltage is less than 85V, error code E001 (Abnormal Input Voltage, see 8.4) will be displayed.**

### 8.3. Troubleshooting

Problem	Possible causes and solution
Pump does not start	<ul style="list-style-type: none"> <li>Power Supply fault, disconnected or defective wiring.</li> <li>Fuses blown or thermal overload open.</li> <li>Check the rotation of the motor shaft for free movement and lack of obstruction.</li> <li>Because of a long time lying idle. Unplug the power supply and manually rotate motor's rear shaft a few times with a screwdriver.</li> </ul>
Pump does not prime	<ul style="list-style-type: none"> <li>Empty pump/strainer housing. Make sure the pump/strainer housing is filled with water and the O ring of cover is clean.</li> <li>Loose connections on the suction side.</li> <li>Strainer basket or skimmer basket loaded with debris.</li> <li>Suction side clogged.</li> <li>Distance between pump inlet and liquid level is higher than 2m, the installation height of pump should be lowered.</li> </ul>
Low Water Flow	<ul style="list-style-type: none"> <li>Pump does not prime.</li> <li>Air entering suction piping.</li> <li>Basket full of debris.</li> <li>Inadequate water level in pool.</li> </ul>
Pump being noisy	<ul style="list-style-type: none"> <li>Air leak in suction piping, cavitation caused by restricted or undersized suction line or leak at any joint, low water level in pool, and unrestricted discharge return lines.</li> <li>Vibration caused by improper installation, etc.</li> <li>Damaged motor bearing or impeller (need to contact the supplier for repair).</li> </ul>

### 8.4. Error code

When the device detects a failure, it will stop automatically and display the error code. After stopping for 15 seconds, check if the failure is cleared. If cleared, the pump will resume working.

Item	Error Code	Details	
1	E001	Description	<b>Abnormal input voltage:</b> the power supply voltage is out of the range of 165V to 275V.
		Process	The pump will stop automatically for 15 sec and resume working if it detects the power supply voltage is within the range.
2	E002	Description	<b>Output over current:</b> The peak current of the pump is higher than the protection current.
		Process	The pump will stop automatically for 15 sec and then resume working, if this occurs for three times continuously, the pump will shut down and need to be checked and restarted manually.
3	E102	Description	<b>Heat sink error:</b> The heat sink temperature reaches 91°C for 10sec. Or the heat sink sensor detects an open or short circuit.

		Process	1. The pump will stop automatically for 30 sec and resume working if it detects the heat sink temperature is less than 81°C. 2. The pump will stop automatically for 15 sec and resume working if it detects the heat sink sensor is not open or short circuit.
4	E103	Description	<b>Master driver board error:</b> The Master driver board is faulty.
		Process	The pump will stop automatically for 15 sec and then resume working, if this occurs for three times continuously, the pump will shut down and need to be checked and restarted manually.
5	E104	Description	<b>Phase-deficient protection:</b> Motor cables are not plugged into the master drive board.
		Process	The pump will stop automatically for 15 sec and then resume working, if this occurs for three times continuously, the pump will shut down and need to be checked and restarted manually.
6	E203	Description	<b>RTC time reading error:</b> Reading and writing the information of timer clock is incorrect.
		Process	The pump needs to be powered off and restarted manually.
7	E204	Description	<b>Display Board EEPROM reading failure:</b> Reading and writing the information of display board EEPROM is incorrect.
		Process	The pump needs to be powered off and restarted manually.
8	E205	Description	<b>Communication Error:</b> The communication between display board and master driver board is failure lasts 15 sec.
		Process	The pump will stop automatically for 15 sec and resume working if it detects the communication between display board and master driver board lasts 1 sec.
9	E207	Description	<b>No water protection:</b> The pump is lack of water.
		Process	Stop the pump manually, fill up the pump with water and restart it. If this occurs for twice continuously, the pump will shut down and need to be checked manually.
10	E209	Description	<b>Loss of prime:</b> The pump cannot self-priming due to the reasons such as exceeding the suction range or the pipeline is too complicated.
		Process	Check the pump or pipeline that there is no leakage, and then fill up the pump with water and restart it.

## 9. MAINTENANCE

Empty the strainer basket frequently. The basket should be inspected through the transparent lid and emptied when there is an evident stack of rubbish inside. The following instructions should be followed:

- 1). Disconnected the power supply.
- 2). Unscrew the strainer basket lid anti-clockwise and remove.
- 3). Lift up the strainer basket.
- 4). Empty the trapped refuse from the basket and rinse out the debris if necessary.

**Note: Do not knock the plastic basket on a hard surface as it will cause damage**

- 5). Inspect the basket for signs of damage, and replace it.
- 6). Check the lid O-ring for stretching, tears, cracks or any other damage
- 7). Replace the lid, hand tightening is sufficient.

**Note: Periodically inspecting and cleaning the strainer basket will help prolong its life.**

## 10. WARRANTY & EXCLUSIONS

Should a defect become evident during the term of warranty, at its option, the manufacturer will repair or replace such item or part at its own cost and expense. Customers need to follow the warranty claim procedure in order to obtain the benefit of this warranty.

The guarantee will be void in cases of improper installation, improper operation, inappropriate use, tampering or using of non-original spare parts.

## 11. DISPOSAL



When disposing of the product, please sort the waste products as electrical or electronic product waste or hand it over to the local waste collection system.

The separate collection and recycling of waste equipment at the time of disposal will help ensure that it is recycled in a manner that protects human health and the environment.

Contact your local authority for information on where you can drop off your water pump for recycling.

## 12. Warning Statement

Warning: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

To maintain compliance with FCC's RF exposure guidelines, the distance must be at least 20cm between the radiator and your body, and fully supported by the operating and installation configurations of the transmitter and its antenna(s).