INVERTER POOL PUMP

RAPID X20 - iWP

INSTALLATION AND OPERATION MANUAL

CONTENTS

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.

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1. ⚠ IMPORTANT SAFETY INSTRUCTIONS

This guide provides installation and operation instructions for this pump. If you have any other questions about this equipment, please consult your supplier.

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

• RISK OF ELECTRICAL SHOCK. Connect only to a branch circuit protected by a ground-fault circuit interrupter (GFCI). Contact a professionally trained and qualified electrician if you cannot verify that the circuit is protected by a GFCI.

• TO PREVENT THE ELECTRICAL SHOCK RISK, please connect the ground wire on the motor (green/yellow) to the grounding system.

• 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.

- The pump is not submersible.
- Never open the inside of the drive motor enclosure.

All installations must be fitted with earth leakage or residual current protection devices, having a rated residual operating current not exceeding 30mA.

⚠ **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 number	Advised Pool Volume (m^3)	P1	Voltage (V/Hz)	Qmax (m^3/h)	Hmax (m)	Circulation (m^3/h)	
		KW				at 10m	at 8m
iWP15	30-50	0.8	220-240/ 50/60	25	19	14.5	19
iWP22	40-70	1.2		29	21	23	27
iWP28	50-80	1.5		35	22	30	33
iWP33	70-100	1.8		41	23	34	37

3. OVERALL DIMENSION (mm)

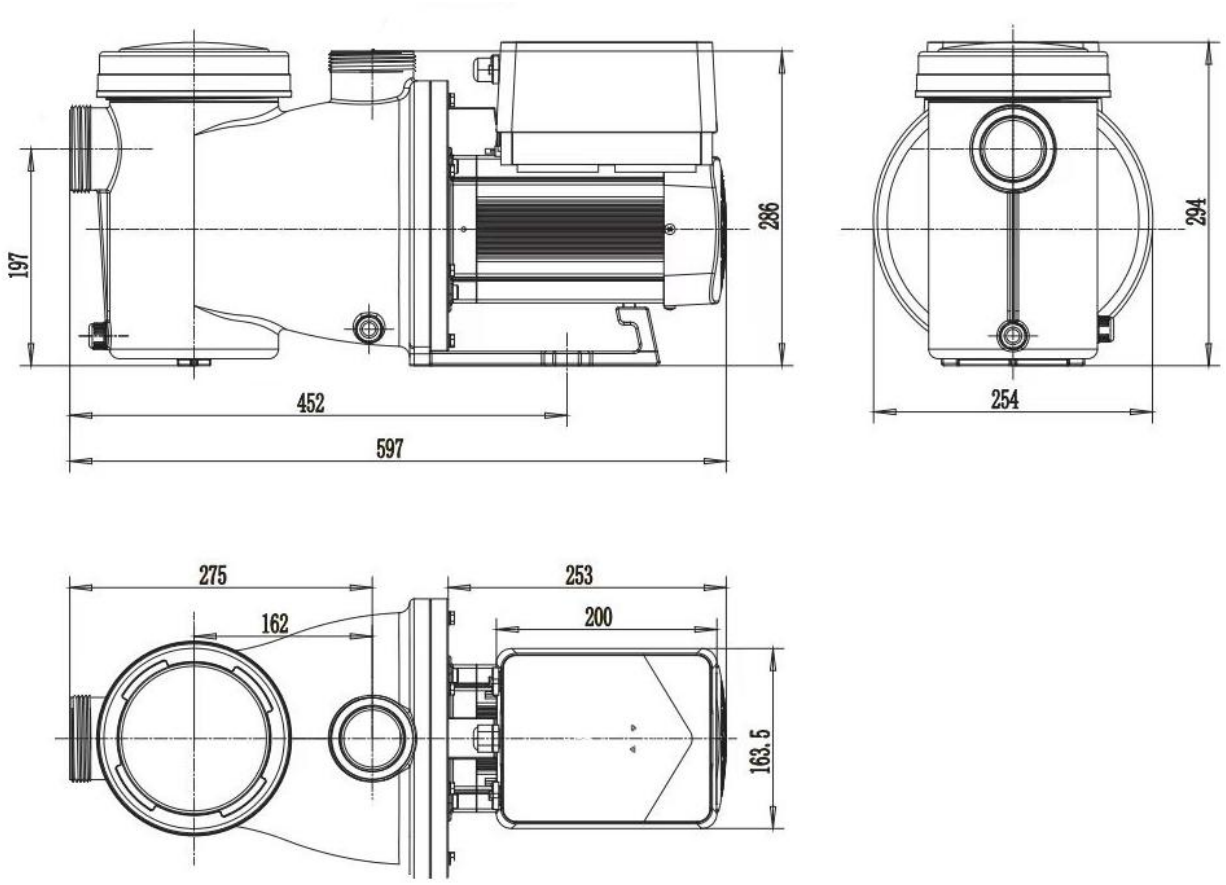


Figure 1 - Pump Dimensions

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 the pump and motor at least 150mm away from obstacles; pump motors require unrestricted airflow 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 48.3/50/60.3/63mm.
2) For optimization of the pool plumbing, a larger pipe size should be used. It is recommended to use a pipe with a size of 63mm.
3) When installing the inlet and outlet fittings (joints) with the plumbing, use the special sealant for PVC material.
4) The dimension of the suction line should be the same or larger than the inlet line diameter to avoid the 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 being impacted by 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.

2) Joints must be tight.

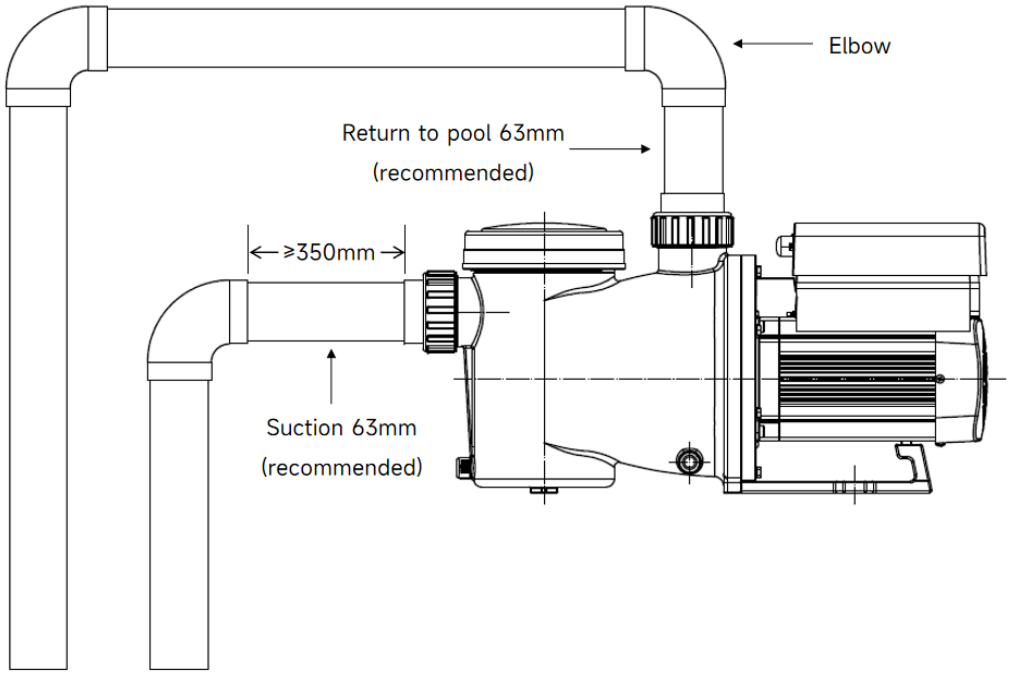


Figure 2 - Plumbing and Fittings installations

* The pump inlet/outlet union size: optional with 48.3/50/60.3/63mm

3) Use the UNION KIT supplied by the pump manufacturer (Refer to Figure 3). Do not use fittings other than those provided to connect the pump inlet/outlet, as incompatible fittings may damage the pump body.

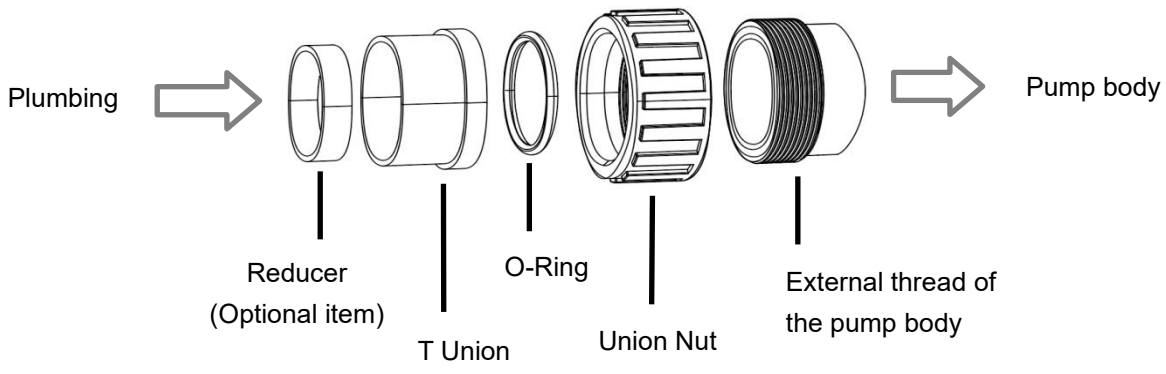


Figure 3 - Union Kit

4.4. Check before initial startup

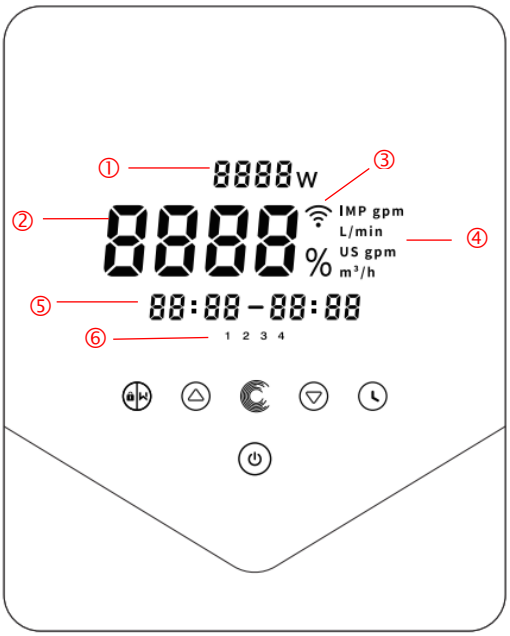
1) Check whether the pump shaft rotates freely.
2) Check whether the power supply voltage and frequency conform to the nameplate.
3) Facing the fan blade, the direction of motor rotation should be clockwise.
4) It is forbidden to run the pump without water.

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 3.5 g/l
Humidity	≤90% RH, （20°C±2°C）
Installation	The pump can be installed max. 2m above water level
Protection	Class F, IP55

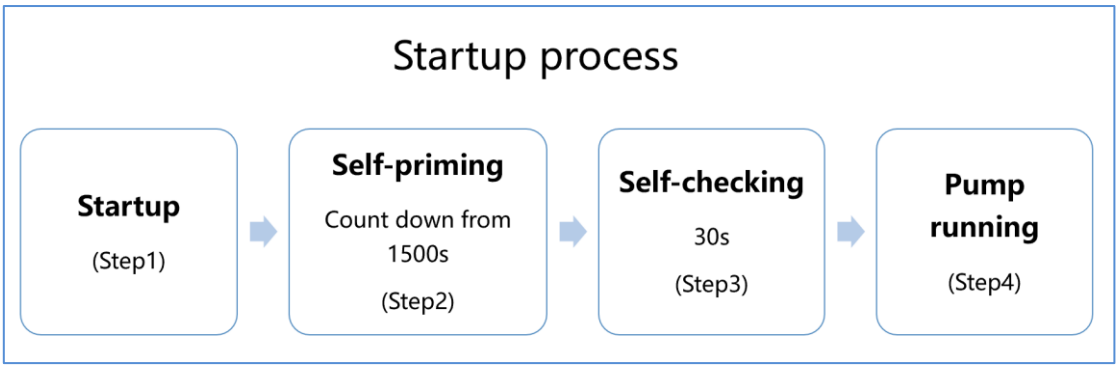
5. SETTING AND OPERATION

5.1. Display on control panel



① Power consumption
② Running capacity / Flow rate
③ WIFI indicator
④ Unit of flow
⑤ Timer period
⑥ Timer 1/2/3/4
Backwash/unlock
Up/down: to change the value of setting
Switch between Manual Inverter Mode and Auto Inverter Mode. **Manual Inverter Mode**: The running capacity will be set manually between 30%-120%. **Auto Inverter Mode**: The running capacity will be automatically adjusted between 30%-120% according to the preset flow rate. The default mode is **Manual Inverter** mode.
Timer setting
On/off

5.2. Startup process overview



① Step 1: Startup

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

② Step 2: Self-priming

- The pump will start counting down from 1500 s. 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 30 s 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 illuminate for 3 seconds, displaying the device code, and then it will enter its normal working state.

When the screen is locked, only the button  and  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 begin self-priming.

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

1) 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)

2) If the default self-priming function is disabled, and the pump has not been used for a long time, the water level in the strainer basket may drop. Users can manually activate the self-priming function by pressing both   for 3 seconds, the adjustable period is from 600s to 1500s (default value is 600s).

3) After the manual self-priming is completed, the pump will return to the previous state before activating the manual self-priming. If the pump has previously entered Auto Inverter mode, it will perform self-learning for 180 seconds to redefine the adjustable flow range after manual self-priming.

4) Users can press  for more than 3 seconds to cancel the manual self-priming, and the pump will run the same as the manual self-priming is completed.

5.5. Backwash

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

	Default	**Setting range**
Running Time	180s	Press  or  to adjust from 0 to 1500s with 30 seconds for each step
Running capacity	100%	80-100%, 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 the users set a speed limit, 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 1m³/h for each step.
3		The unit of flow rate could be changed to L/min, IMP gpm or US gpm, by pressing both  for 3 seconds.
4		Press  to switch to Manual Inverter mode.

Self-learning:

When switching to the Auto Inverter mode for the first time, the system performs the self-priming process (see 5.4) and then the self-learning process for 180 seconds, redefining the adjustable flow range of the pump by detecting the pipeline pressure.

eg: the default adjustable flow range of iWP22 is 5-25 m³/h, after self-learning, the range may be redefined to 7-22 m³/h according to the pipeline situation. If the set flow exceeds the current adjustable range, the actual achievable flow rate will be displayed once the motor speed has stabilized.

The default adjustable flow range for iWP is as below:

Model	Default adjustable flow rate range
iWP15	5-20 m³/h
iWP22	5-25 m³/h
iWP28	5-30 m³/h
iWP33	8-35 m³/h

Note:

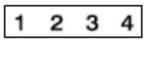
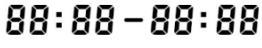
1) After the first self-priming, the pump will redefine the adjustable flow range. The system will record the pipeline pressure after the pump runs at the set flow/capacity for 5 minutes without other operations.
2) During the pump running, if it is detected that the pipeline pressure changes beyond a certain range, the icon of % or m³/h (or other flow units) symbol will flash for 5 minutes. If the change lasts for 5 minutes, the pump will perform a self-priming and self-learning process, and redefine the flow range accordingly.
3) After the redefinition of the flow range, the pump will automatically adjust the running capacity to reach the set flow.
4) Users can set the time interval to trigger the self-learning automatically in the parameter setting (see 5.11) to ensure the accuracy of the flow rate.

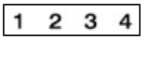
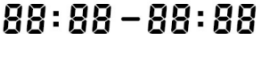
5.8. Timer mode

The pump's on/off and running capacity can be controlled by a timer, which can 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  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  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, preventing debris from accumulating and providing users with a cleaner pool.

1) Activate Skimmer Mode:

1	Unlock the screen, press both  for 3s to enter the preset interface of skimmer mode.
2	Press  or  to select the presetting (refer to Table 1 as below), the chosen presetting will be activated after 5s without operation.
3	When skimmer mode is activated, the controller exits the preset interface and displays the normal running state.

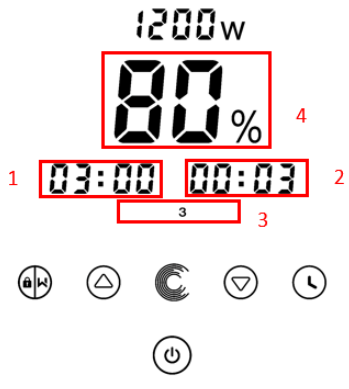
2) Cancel Skimmer Mode:

1	When skimmer mode is activated, press both buttons for 3 seconds to enter the preset interface of skimmer mode.
2	In the preset interface, press both  for 3s to cancel skimmer mode.
3	When skimmer mode is canceled, the controller will display the normal running state.

3) Details of the presetting:

Presetting	Skimmer cycle	Skimmer duration	Skimmer speed	Time period	Remark
1	1h	3 min	100%	7:00 – 21:00	Editable in parameter setting
2	1h	10 min	100%	7:00 – 21:00	Not editable
3	3h	3 min	80%	7:00 – 21:00	Not editable

Table 1 - Presetting of skimmer mode

	1. Skimmer cycle (hour) 2. Skimmer duration (minute) 3. Skimmer mode presetting number 4. Skimmer speed

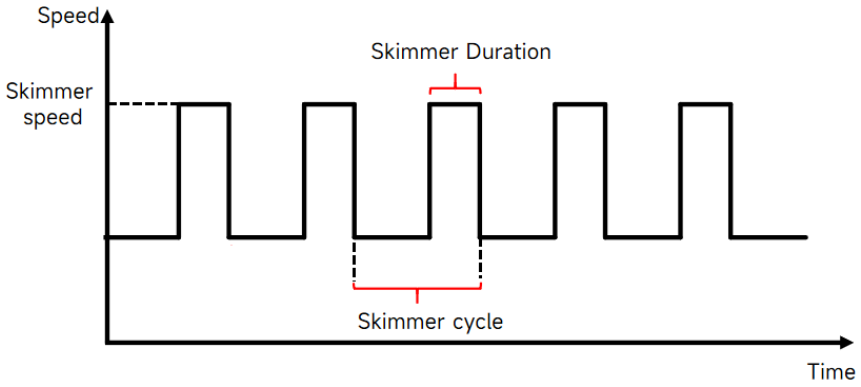


Figure 4 - Skimmer cycle

5.10. Speed Limit

Users can set the speed limit of the running capacity to meet the flow requirement of other equipment, such as sand filters.

The speed limit of the running capacity can be set from 60% to 100% in the parameter setting. (see 5.11) 100% means no speed limit, and the running capacity can be set from 30% to 120% under regular operation.

To ensure the performance, the following mode or process will not be limited by the speed limit:
1. Self-priming at each start
2. Manual self-priming
3. Self-learning
4. Auto Inverter mode
5. Flow rate setting in the timer mode

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; If current address does not need to be adjusted, press  to next address.

Parameter Address	Description	Default Setting	Setting Range
1	Di2 (Digital input 2)	100%	30-120%, by 5% increments
2	Di3 (Digital input 3)	80%	30-120%, by 5% increments

3	Di4 (Digital input 4)	40%	30-120%, by 5% increments
4	Backwash capacity	100%	80-100%, by 5% increments
5	Pump control	0	0: Only the panel takes effect, and other external controls are invalid 1: Panel + analog current input takes effect 2: Panel + analog voltage input takes effect 3: Panel + digital input takes effect 4: Panel +RS485 input takes effect
6	Enable or disable the self-priming at each start	0	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
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	100%	60%-100%, by 5% increments 100% means no speed limit
12	RS485 address	170(0xAA)	160-190 (0xA0-0xBF), each step by 1.
13	Time intervals to trigger the self-learning automatically	0	0, 1, 3, 5, 7, 14, 21, 28 (day) "0" means will not trigger the self-learning automatically

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

① Download iGarden APP

iGarden

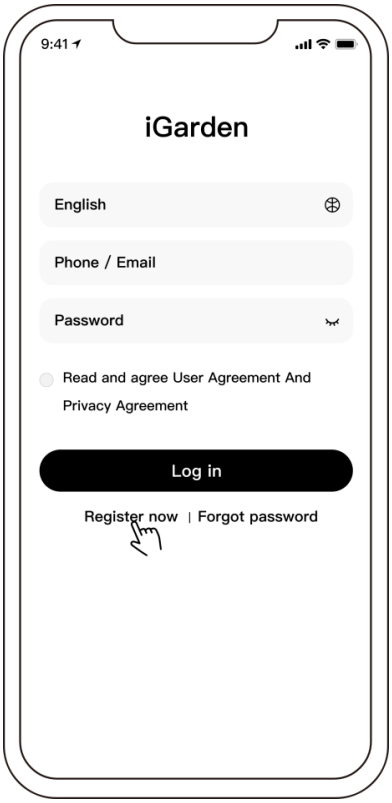
Android

ANDROID APP ON Google play

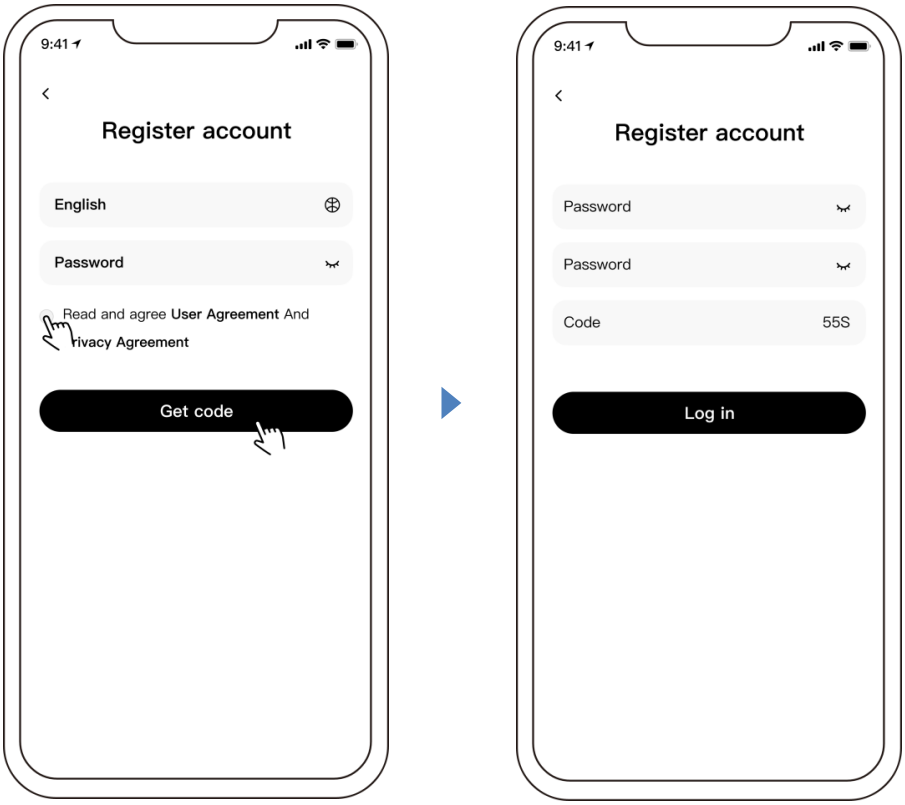
iOS

Available on the App Store

② Account Registration



Phone / Email Registration



3 App Pairing

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

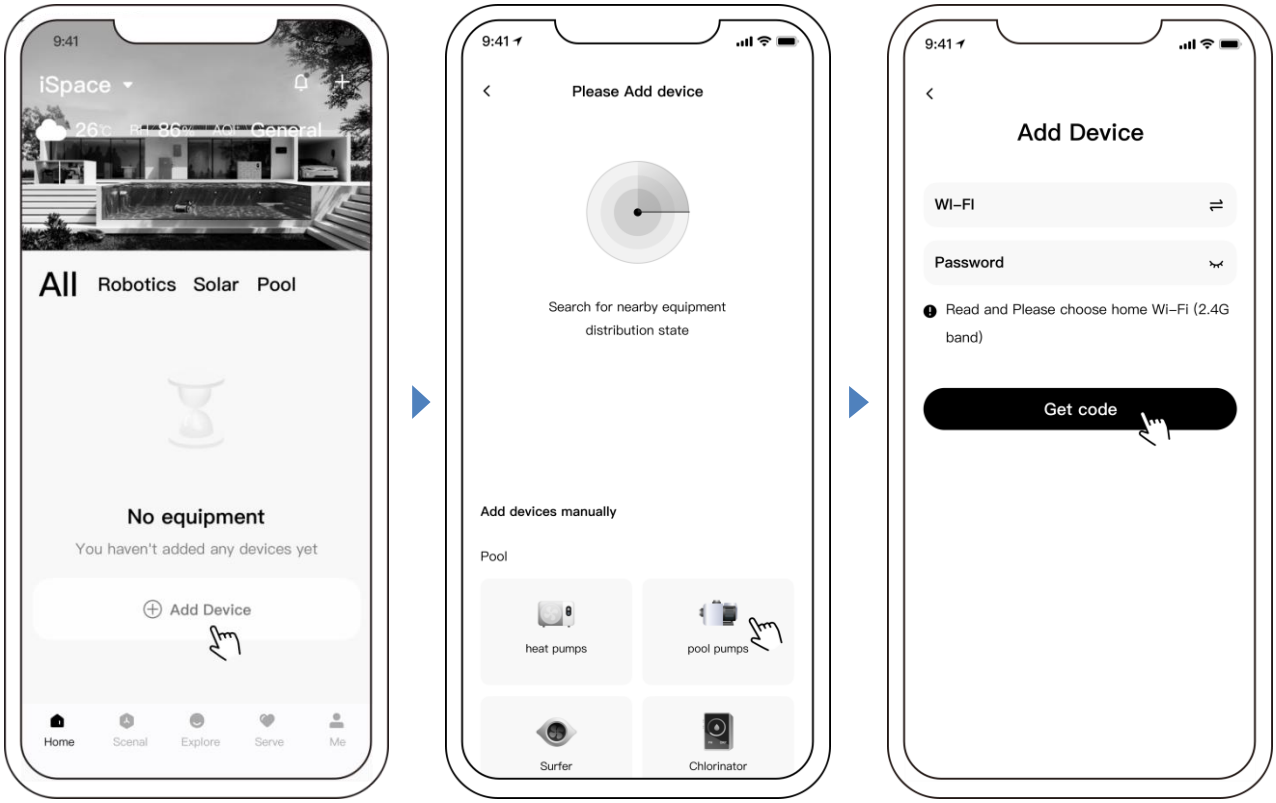
Option 1 (Recommended): With Wifi and Bluetooth

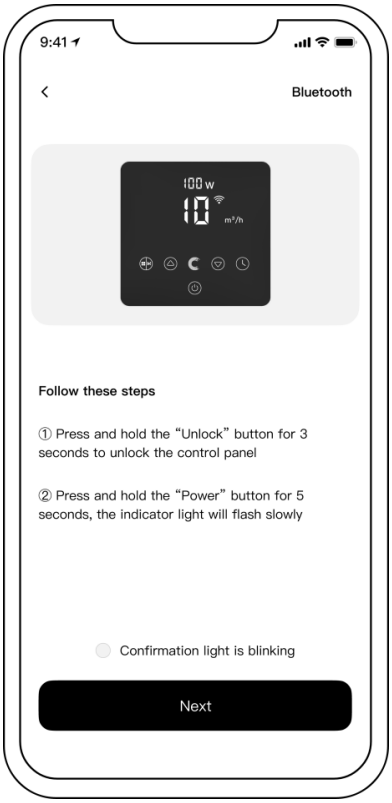
(Network requirement: 2.4GHz; 2.4Ghz and 5GHz into one SSID; but no separate 5GHz network)

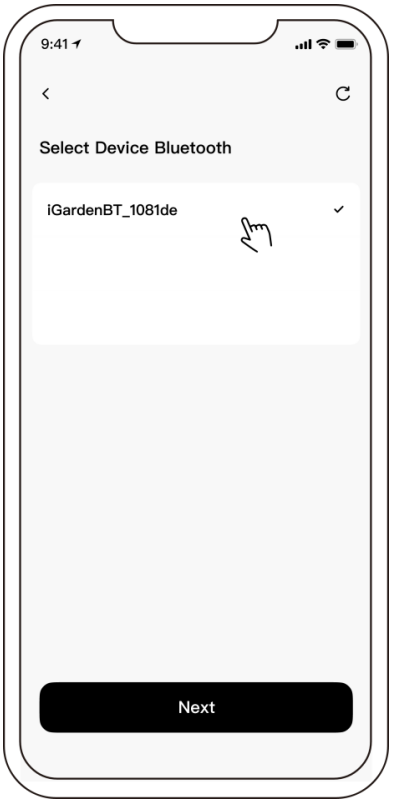
1) Please confirm that your phone is connected to Wifi and your Bluetooth is on.

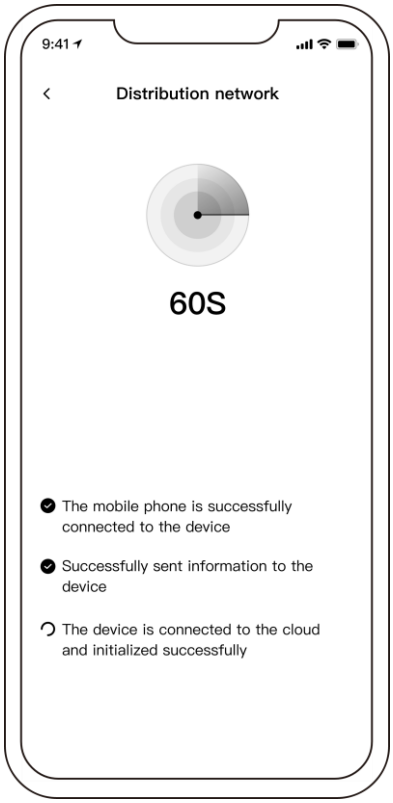
2) Press  for 3 seconds to unlock the screen. After switching on the pump, press  for 5 seconds until hearing "Beep" and then release.  will flash.

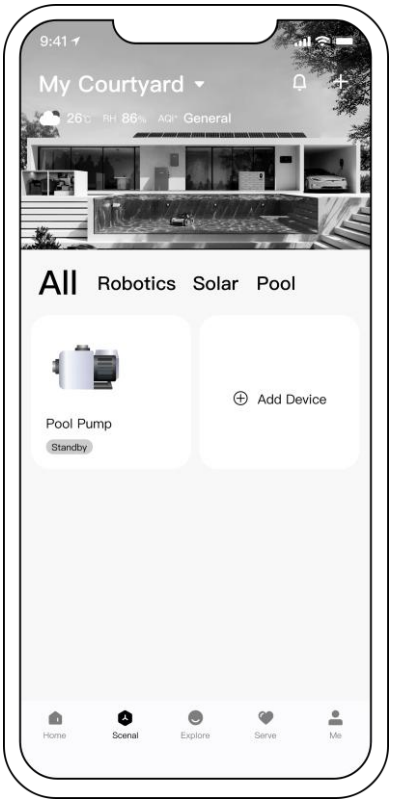
3) Click "Add Device", and then follow the instructions to pair device.




9:41
Bluetooth
100 W
10
m³/h
Follow these steps
① Press and hold the “Unlock” button for 3 seconds to unlock the control panel
② Press and hold the “Power” button for 5 seconds, the indicator light will flash slowly
Confirmation light is blinking
Next


9:41
Select Device Bluetooth
iGardenBT_1081de
Next


9:41
Distribution network
60S
The mobile phone is successfully connected to the device
Successfully sent information to the device
The device is connected to the cloud and initialized successfully

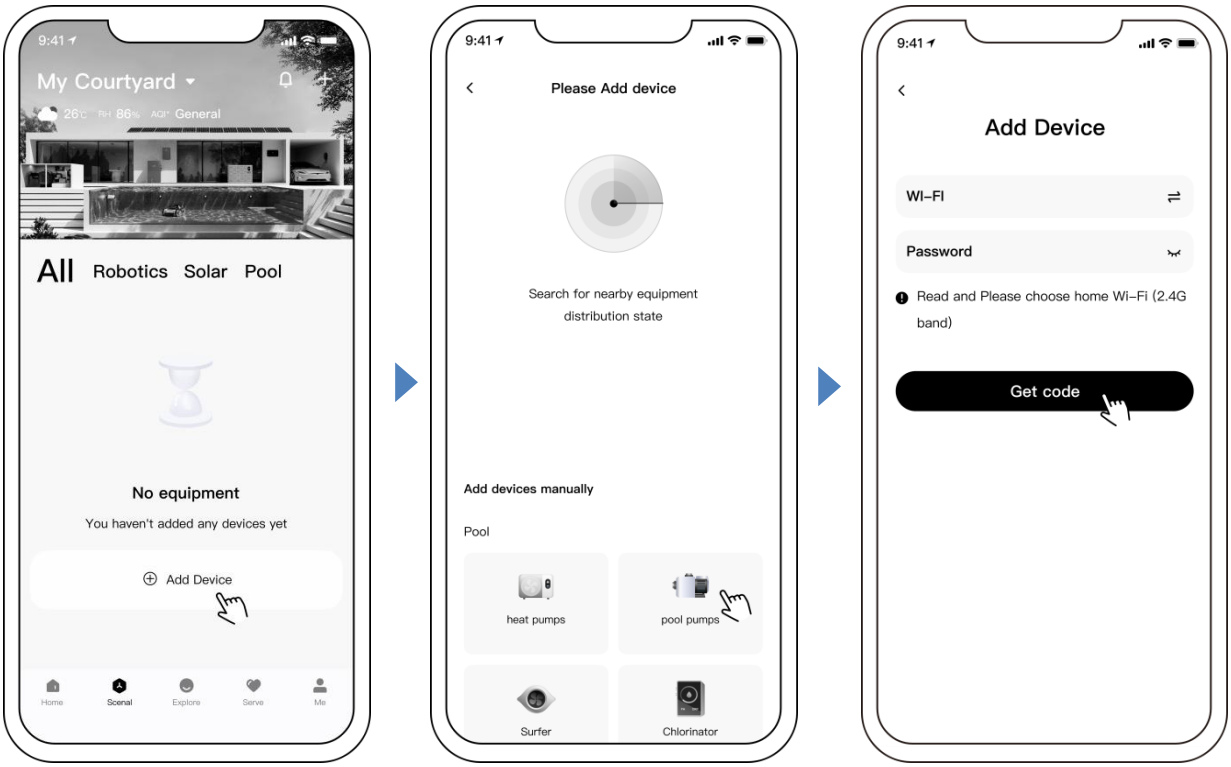

9:41
My Courtyard
General
All
Robotics
Solar
Pool
Pool Pump
Standby
Add Device
Home
Scenal
Explore
Serve
Me

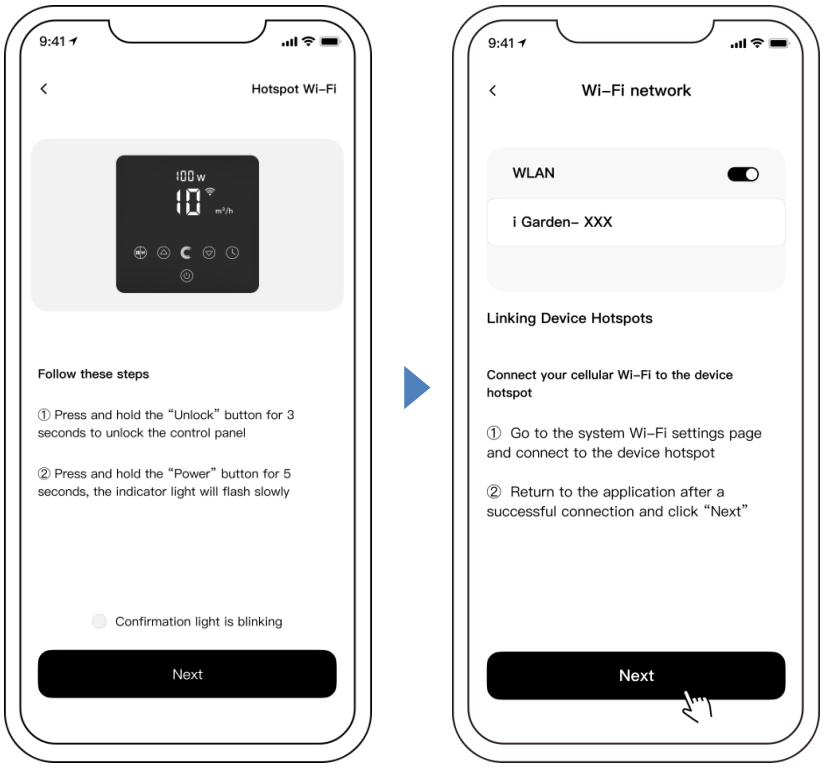
Option 2: With Wifi (Network requirement: 2.4GHz only)

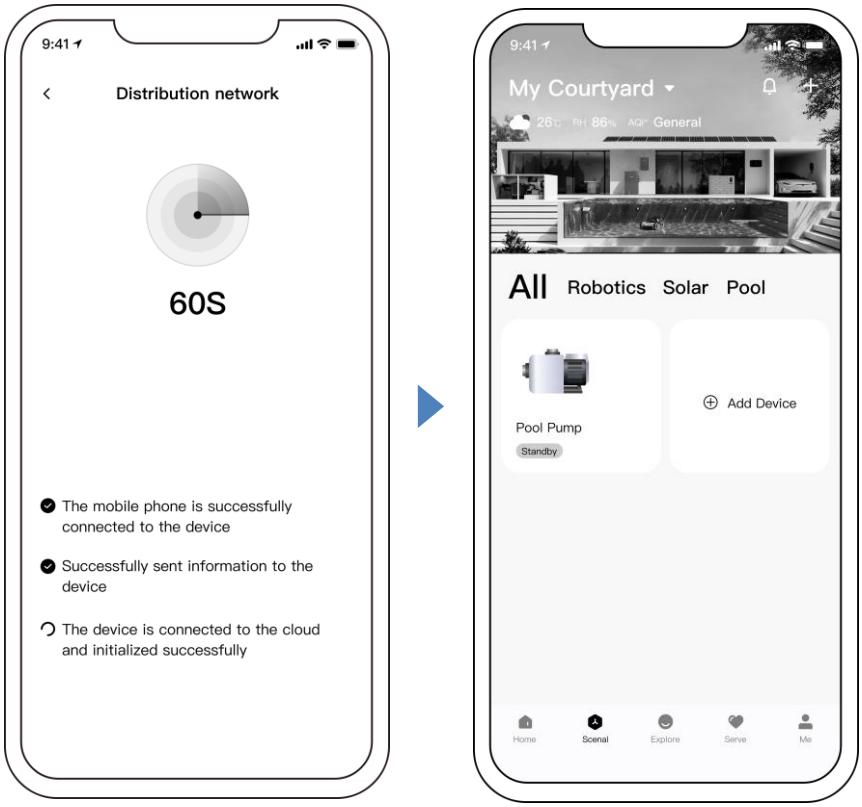
1) Please confirm that your phone is connected to Wifi.

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 Device", and then follow the instructions to pair device.

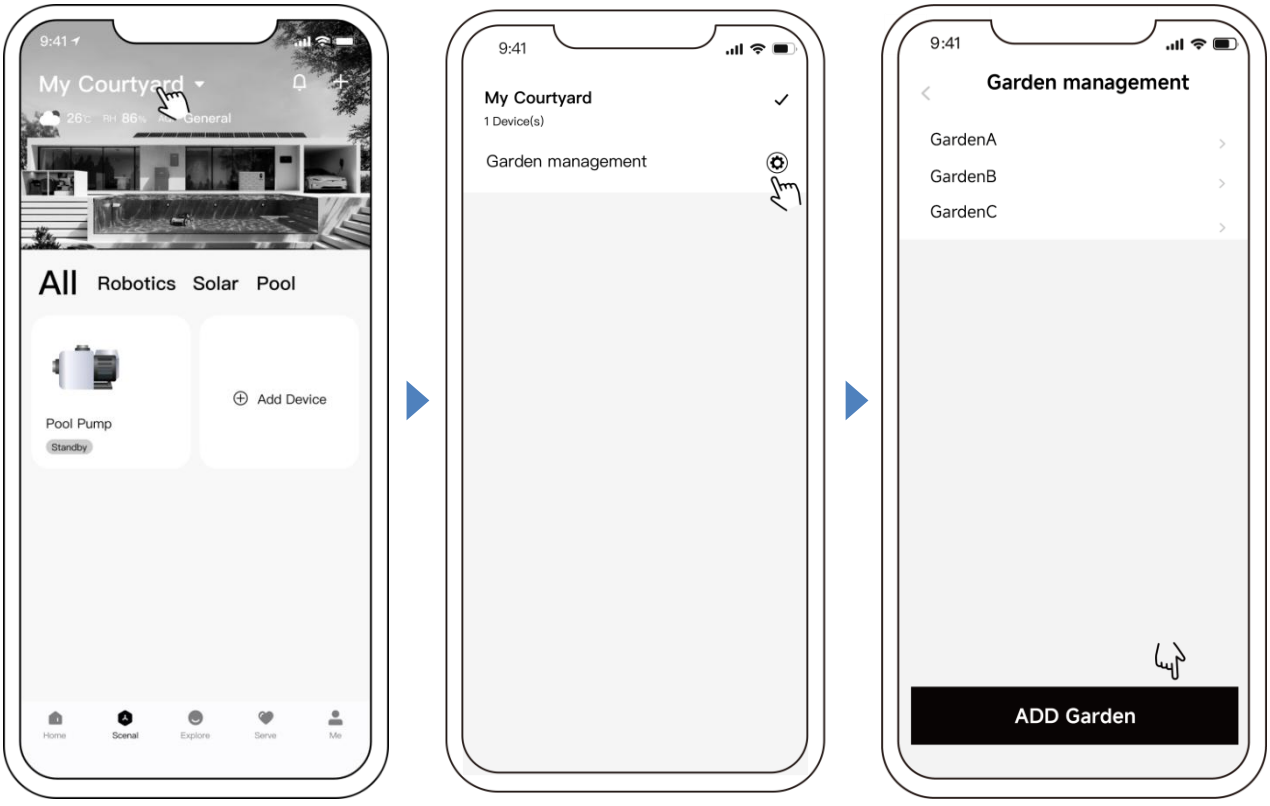






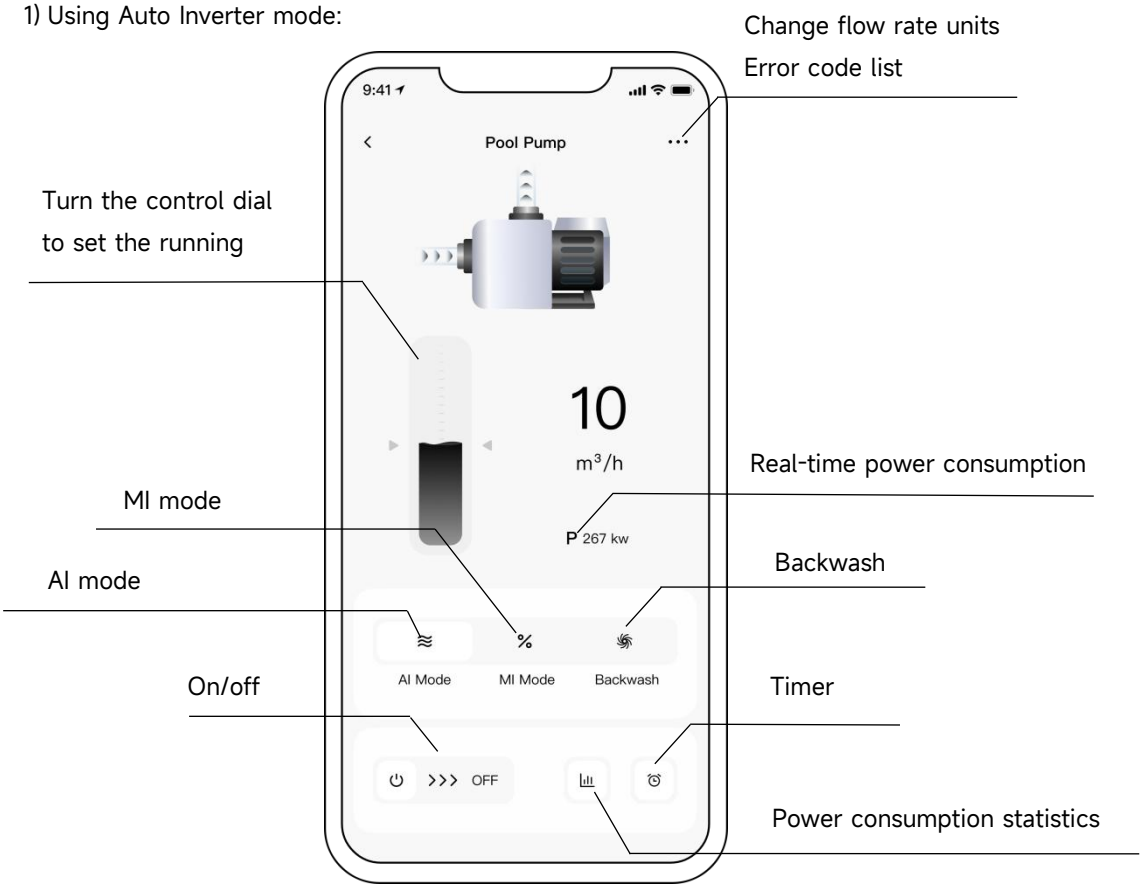
4 Garden Management

In the device list, the current courtyard is displayed. After clicking, you can view/switch to all the current courtyards, click Garden Management, and you can also enter the courtyard list page. As shown below:

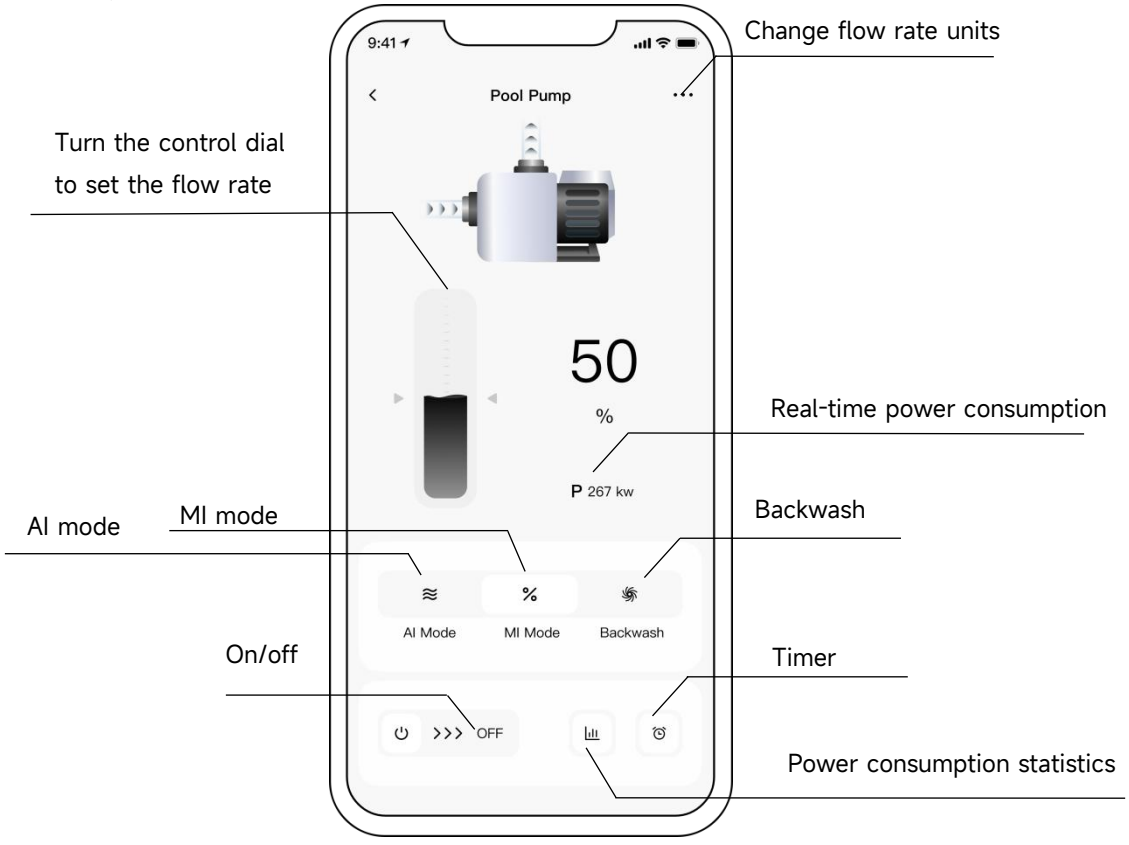


5 Operation

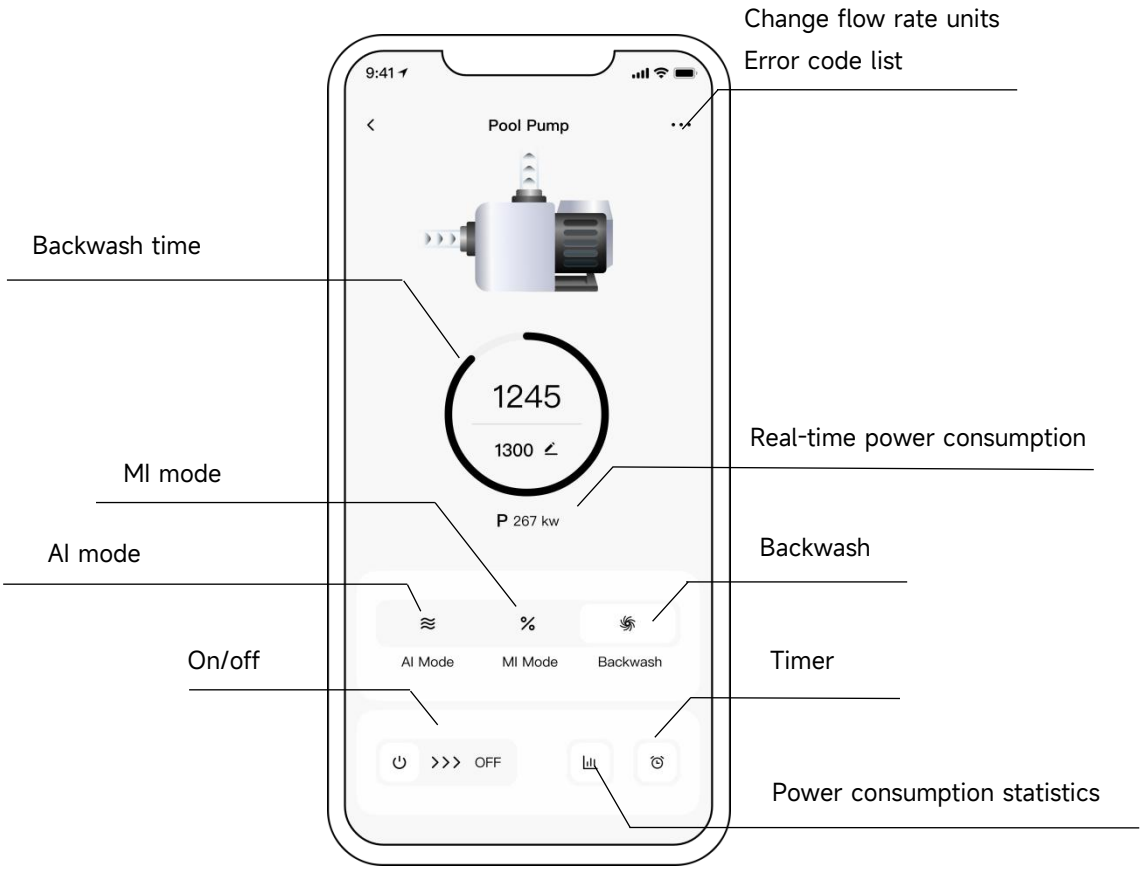
1) Using Auto Inverter mode:



2) Using Manual Inverter mode:

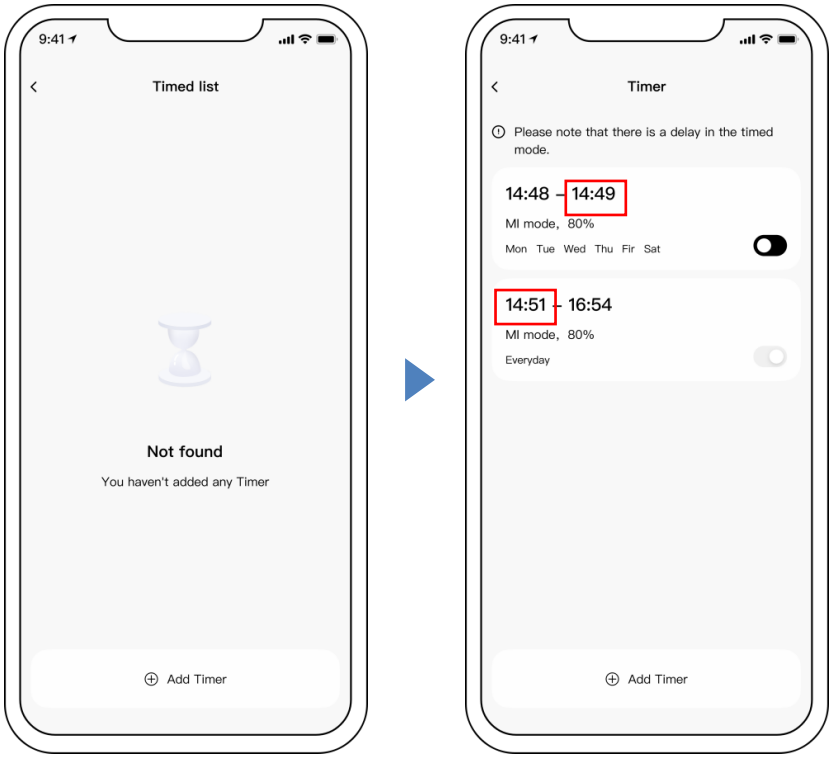


3) Backwash mode:



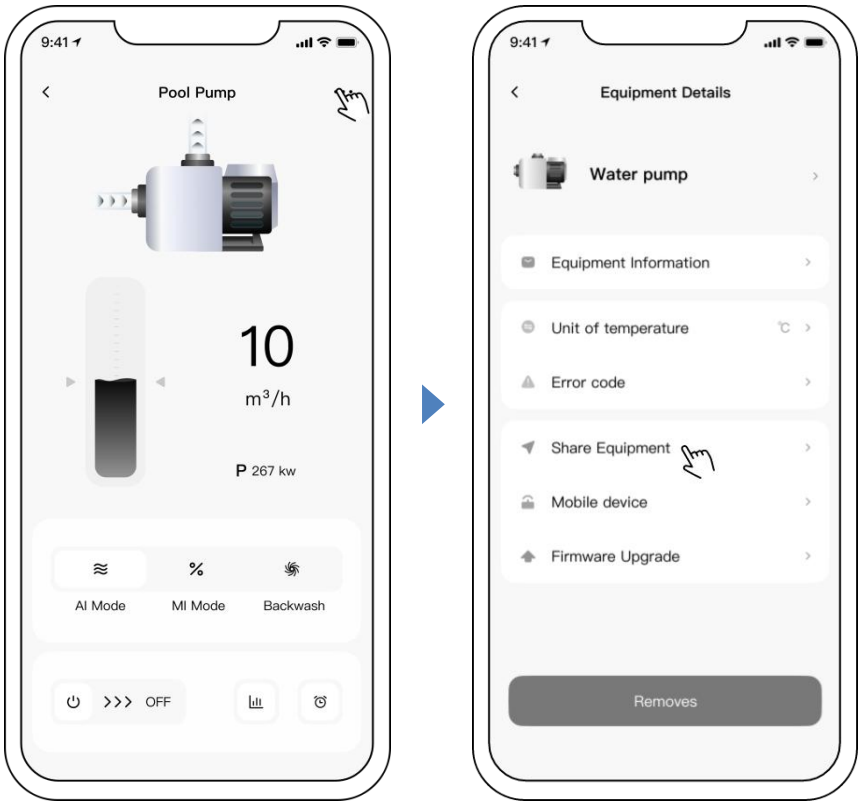
Notice for the timer setting via the APP:

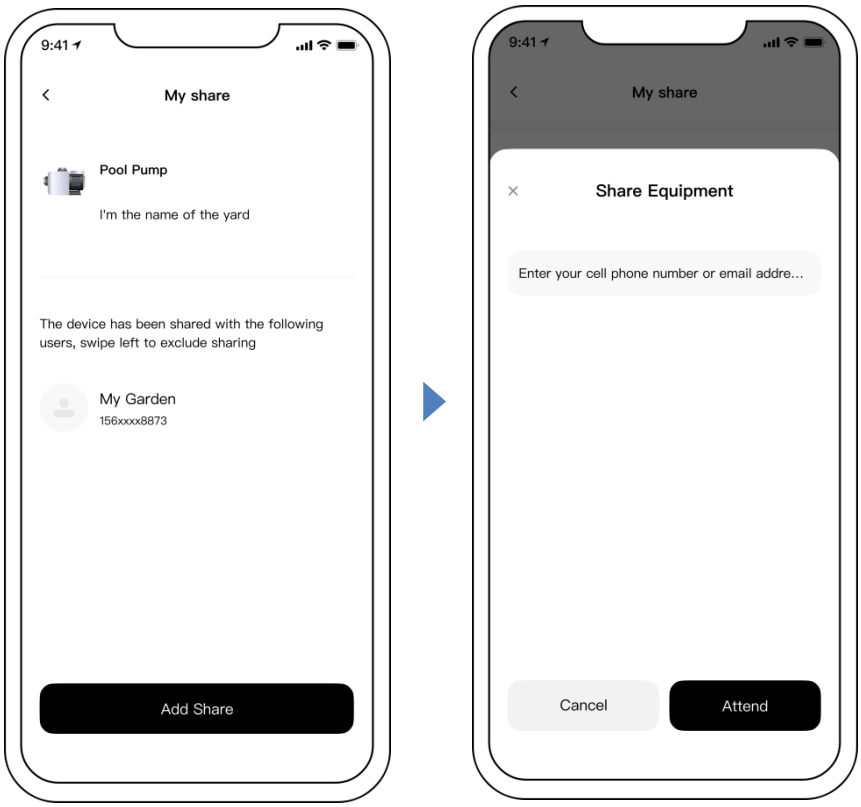
1) Time variance is ±30s;
2) In order to avoid overlapping timing points conflicting and invalidating due to network delay, it is recommended that the end time and the start time of the next timing period cannot overlap, and a sufficient time interval should be reserved, for example, at least 2 minutes;



⑥ Sharing Devices with your family members

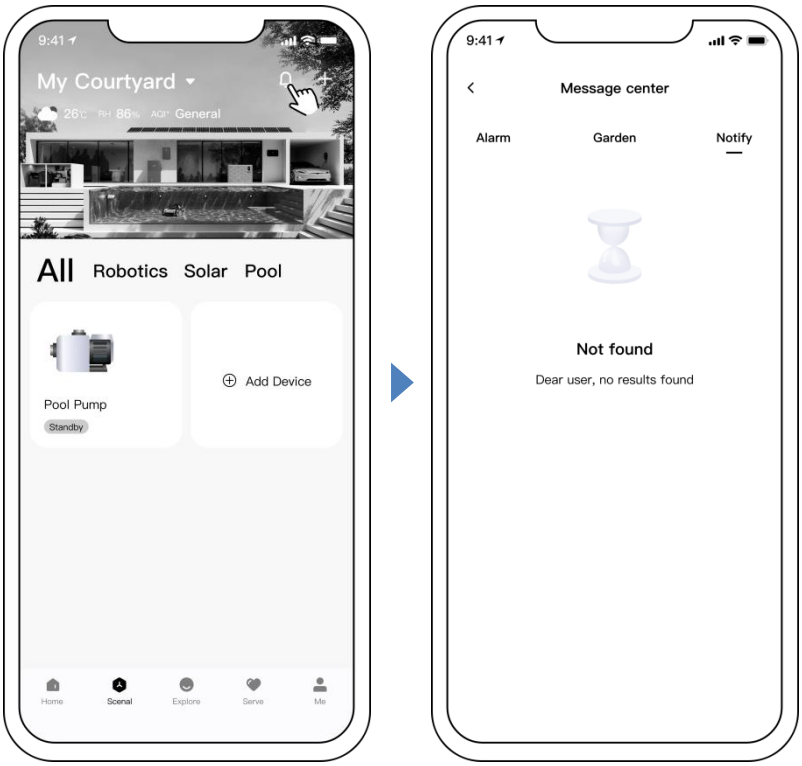
Users can share their devices to be controlled by their family members. Please let your family members register "iGarden" first, and then the administrator can operate as follows:



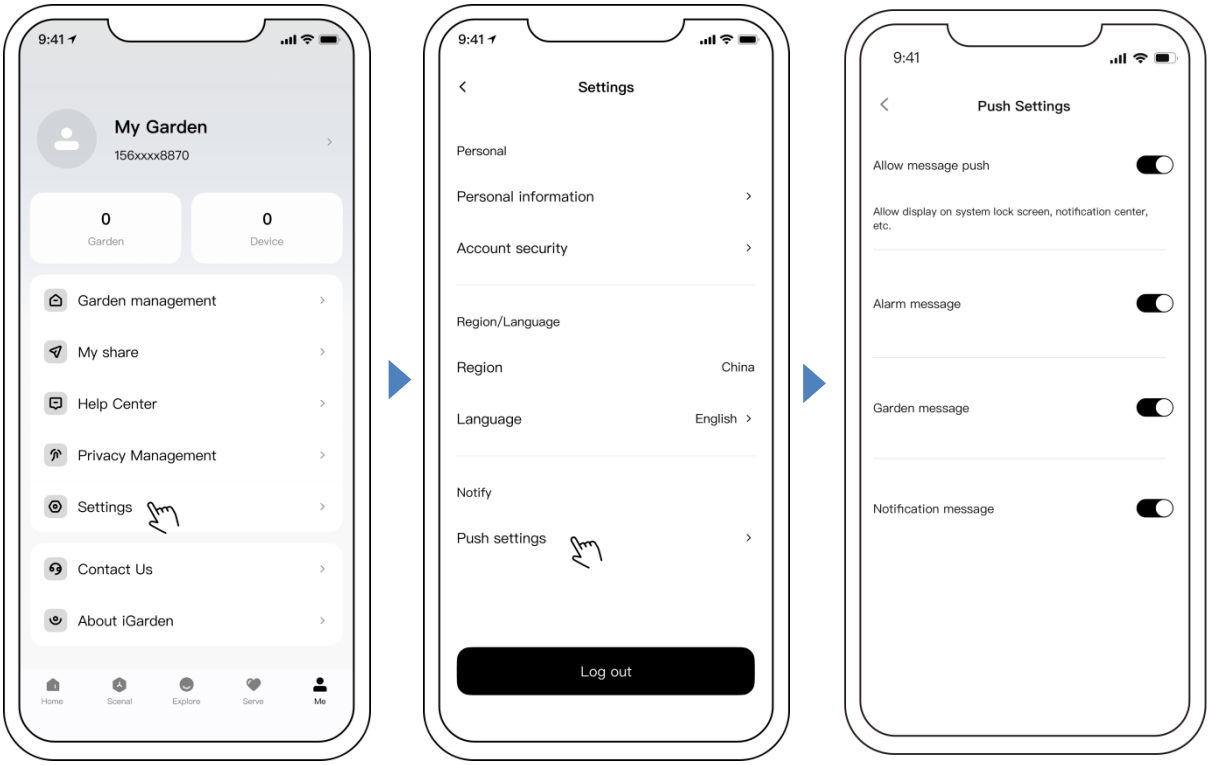


7 Message Center

A: View Message: On the device list page, click the message icon to enter the message center and view the corresponding message, as shown below: (Including: Alarm, Garden, Notify)

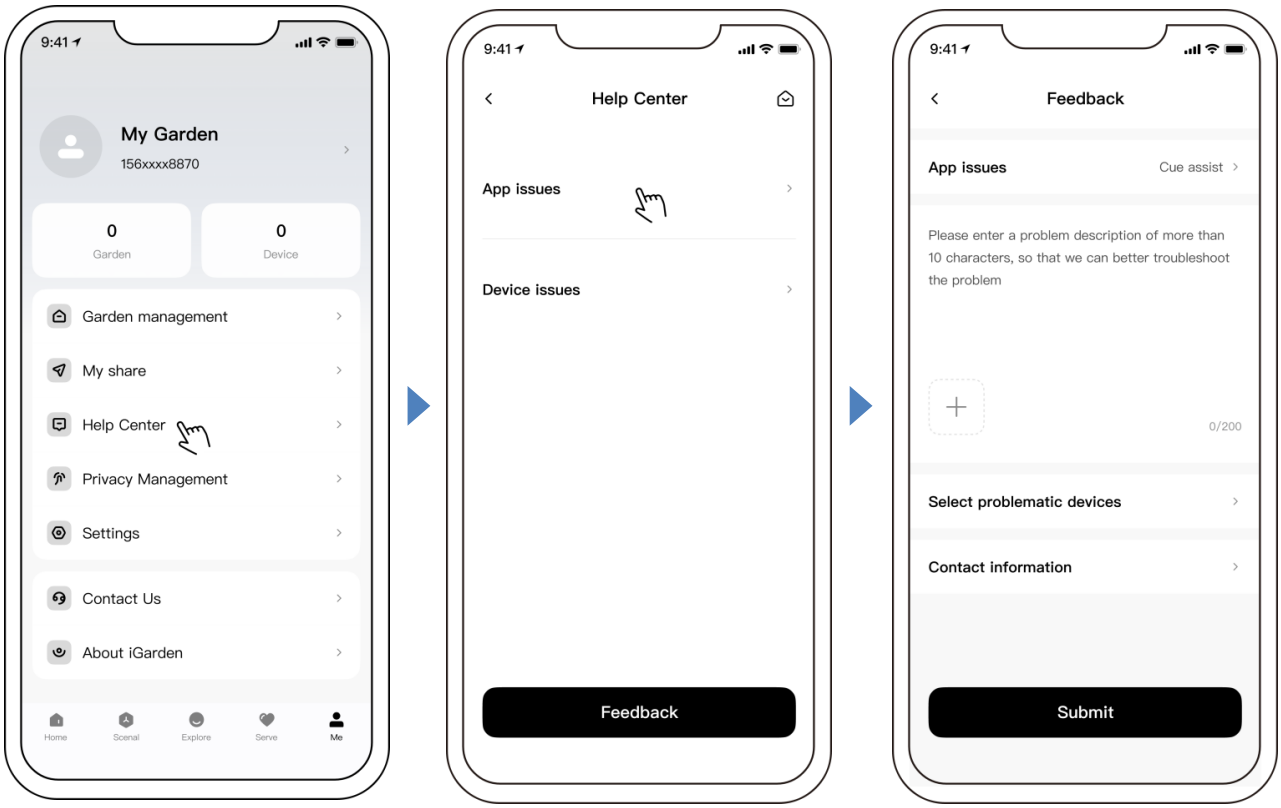


B: Push Settings: On the Settings page, click [Push Settings] to enter the Push Settings page. You can set the push settings according to the message classification, as shown below:



8 Feedback

If you have any problems while using, feel free to send feedback to us. The process is as follows:



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 the following contacts. If more than one external control is enabled, the priority is as follows: Digital Input >Analog Input >RS485 > Panel control.

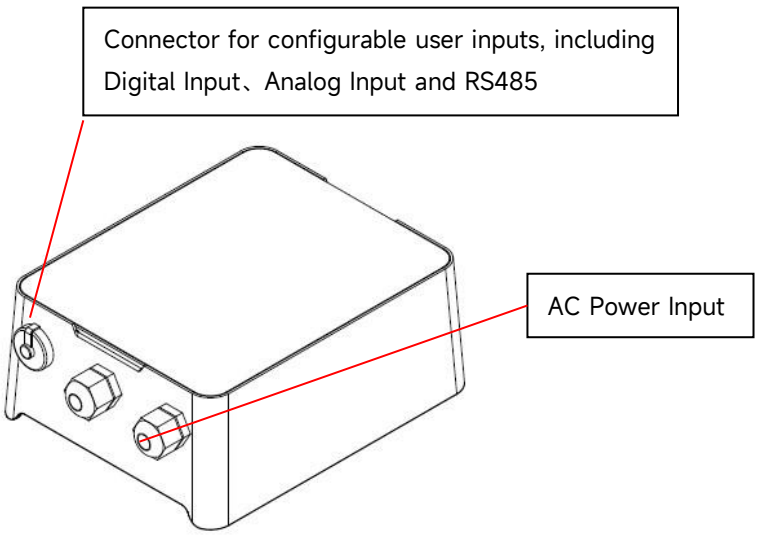


Figure 5 - Connector port location

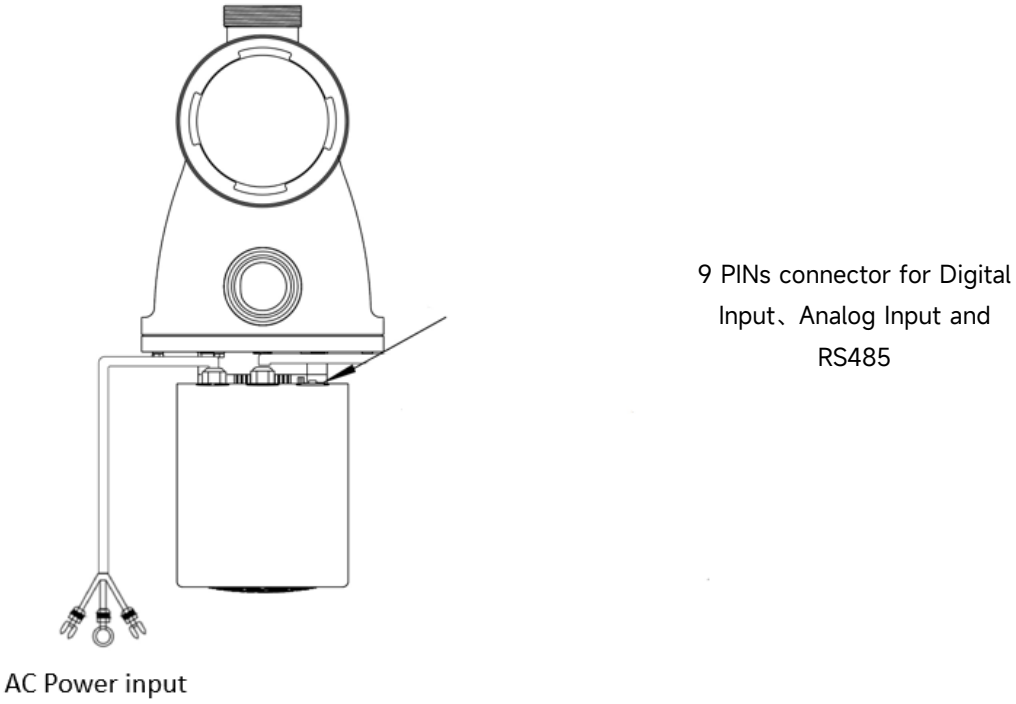


Figure 6 - Digital Input、Analog Input and RS485 connector

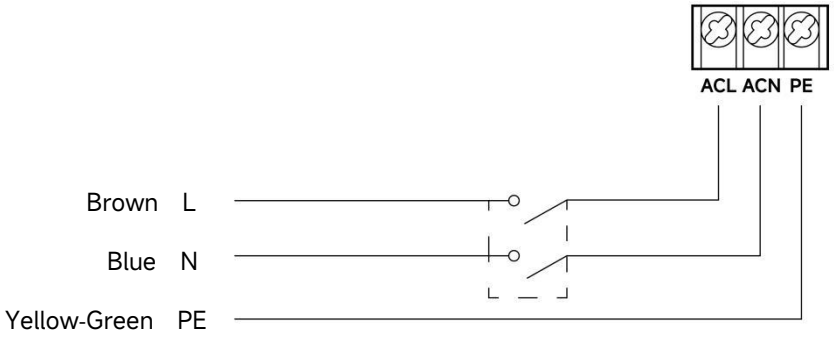


Figure 7 - Power cord connection

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
RS485	Green	RS485-A	/
	Brown	RS485-B	/
Analog Input	Blue	Analog Input (0~10V or 0~20mA)	/
	Orange	Analog Ground	COM

a. Digital Input

When the parameter setting（address No.5） is set to "3", the digital input function is enabled. (see 5.11) The running speed 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 both Di1（Grey）and Di2（White）connect with COM（Yellow）, the pump will be mandatory to run at 100%.

2.1) If both Di1（Grey）and Di2（White）disconnect with COM（Yellow）at the same time， the control priority will back to the panel control;

2.2) If Only Di2（White）disconnects with COM（Yellow）, the pump will be mandatory to stop;

3) When both Di1（Grey）and Di3（Black）connect with COM（Yellow）, the pump will be mandatory to run at 80%.

3.1) If both Di1（Grey）and Di3（Black）disconnect with COM（Yellow） at the same time，the control priority will back to the panel control;

3.2) If Only Di3（Black）disconnects with COM（Yellow）, the pump will be mandatory to stop;

4) When both Di1（Grey）and Di4（Red）connect with COM(Yellow), the pump will be mandatory to run at 40%.

4.1) If both Di1（Grey）and Di4（Red）disconnect with COM（Yellow）at the same time，the control priority will back to the panel control;

4.2) If Only Di4（Red）disconnects with COM（Yellow），the pump will be mandatory to stop;

5) If there are a few Di（Grey）connect with COM（Yellow）at the same time, the control priority is Di2 > Di3 > Di4.

b. Analog Input

When the parameter setting（address No.5） is set to “1” or “2”, the analog input function is enabled. (see 5.11)

Set to “1” means analog current control , set to “2” means analog voltage control.

To connect Di1（Grey）and Analog Input（Blue）with COM（Orange）, the running speed could be determined by 0~10V analog voltage signal or 0~20mA analog current signal.

State	Current control (mA)	Voltage control (V)
Invalid	0 — 2.6	0 — 1.3
Power off	2.6 — 5.8	1.3 — 2.9
30%	5.8 — 6.8	2.9 — 3.4
35%	6.8 — 7.8	3.4 — 3.9
40%	7.8 — 8.7	3.9 — 4.4
45%	8.7 — 9.7	4.4 — 4.9
50%	9.7 — 10.7	4.9 — 5.4
55%	10.7 — 11.7	5.4 — 5.9
60%	11.7 — 12.6	5.9 — 6.4
65%	12.6 — 13.6	6.4 — 6.9
70%	13.6 — 14.6	6.9 — 7.4
75%	14.6 — 15.6	7.4 — 7.9
80%	15.6 — 16.5	7.9 — 8.4
85%	16.5 — 17.5	8.4 — 8.9
90%	17.5 — 18.5	8.9 — 9.4
95%	18.5 — 19.5	9.4 — 9.8
100%	19.5 — 20.0	9.8 — 10.0

c. RS485

When the parameter setting（address No.5）is set to “4”, the RS485 function is enabled. (see 5.11)

To connect with RS485-A (Green) and RS485-B (Brown), the pump can be controlled via the 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 the running speed or flow.

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

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

8.2. Under-voltage protection - AL02

When the device detects that the input voltage is less than 197V, the device will limit the current running speed. The display area alternately displays AL02 and the 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 - 197V, the running capacity will be limited to 85%.

8.3. Troubleshooting

Problem	Possible causes and solutions
Pump does not start	• Power Supply fault, disconnected or defective wiring. • Fuses blown or thermal overload open. • Check the rotation of the motor shaft for free movement and lack of obstruction. • Because of a long time lying idle. Unplug the power supply and manually rotate the motor's rear shaft a few times with a screwdriver.
Pump does not prime	• Empty pump/strainer housing. Ensure the pump/strainer housing is filled with water and that the O-ring on the cover is clean. • Loose connections on the suction side. • Strainer basket or skimmer basket loaded with debris. • Suction side clogged. • If the distance between the pump inlet and the liquid level is higher than 2m, the installation height of the pump should be lowered.

Low Water Flow	• Pump does not prime. • Air entering suction piping. • Basket full of debris. • Inadequate water level in pool.
Pump being noisy	• 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. • Vibration caused by improper installation, etc. • Damaged motor bearing or impeller (need to contact the supplier for repair).

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	**Abnormal input voltage:** 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	**Output over current:** The peak current of the pump is higher than the protection current.
		Process	The pump will stop automatically for 15 seconds and then resume working. If this occurs three times continuously, the pump will shut down and need to be checked and restarted manually.
3	**E101**	Description	**Heat sink overheat:** The heat sink temperature reaches 91°C for 10sec.
		Process	The pump will stop automatically for 30 sec and resume working if it detects the heat sink temperature is less than 81°C.
4	**E102**	Description	**Heat sink sensor error:** The heat sink sensor detects an open or short circuit.
		Process	The pump will stop automatically for 15 seconds and resume operation if it detects that the heat sink sensor is not open or a short circuit has occurred.
5	**E103**	Description	**Master driver board error:** 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.
6	**E104**	Description	**Phase-deficient protection:** 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.
7	**E105**	Description	**AC current sampling circuit failure:** When the pump is powered off，the bias voltage of the sampling circuit is out of the range of 2.4V~2.6V.
		Process	The pump needs to be powered off and restarted manually.
8	**E106**	Description	**DC abnormal voltage:** The DC voltage is out of the range of 210V to 420V.
		Process	The pump will stop automatically for 15 seconds and then resume working. If this occurs three times continuously, the pump will shut down and need to be checked and restarted manually.
9	**E107**	Description	**PFC protection:** PFC protection occurs on the Master driver board.
		Process	The pump will stop automatically for 15 seconds and then resume working. If this occurs three times continuously, the pump will shut down and need to be checked and restarted manually.
10	**E108**	Description	**Motor power overload:** Motor power exceeds the rated power by 1.2 times
		Process	The pump will stop automatically for 15 seconds and then resume working. If this occurs three times continuously, the pump will shut down and need to be checked and restarted manually.
11	**E201**	Description	**Circuit board error:** When the pump is powered off，the bias voltage of the sampling circuit is out of the range of 2.4V~2.6V.
		Process	The pump needs to be powered off and restarted manually.
12	**E203**	Description	**RTC time reading error:** Reading and writing the information of timer clock is incorrect.
		Process	The pump needs to be powered off and restarted manually.
13	**E204**	Description	**Display Board EEPROM reading failure:** Reading and writing the information of display board EEPROM is incorrect.
		Process	The pump needs to be powered off and restarted manually.
14	**E205**	Description	**Communication Error:** 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.

15	**E207**	Description	**No water protection:** The pump is lack of water.
		Process	Stop the pump manually, fill up the pump with water, and restart it. If this occurs twice continuously, the pump will shut down and need to be checked manually.
16	**E208**	Description	**Pressure sensor failure:** The pressure sensor is open or short circuit.
		Process	The pump must be powered off and then restarted manually.
17	**E209**	Description	**Loss of prime:** The pump cannot self-priming due to reasons such as exceeding the suction range or the pipeline being too complicated.
		Process	Check the pump or pipeline for any 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 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: Periodic inspection and cleaning of the strainer basket will help prolong its life.

10. WARRANTY & EXCLUSIONS

Should a defect become evident during the warranty term, at its option, the manufacturer will repair or replace the item or part at its own cost and expense. Customers must follow the warranty claim procedure to receive the benefits of this warranty.

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

11. DISPOSAL

When disposing of the product, please sort the waste as electrical or electronic product waste and hand it over to your 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.

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