Energiesparend

APOOLCO

SMART POOL TECHNOLOGIES

INVERTER POOL PUMP

INSTALLATION AND OPERATION MANUAL

Content

THANK YOU FOR PURCHASING OUR INVERTER POOL PUMP.

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

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

CE UKCA

Revision 1.1

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.

1.1 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 RISK OF ELECTRICAL SHOCK, please connect the ground wire of 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 of under 50°C. Due to the fixed installation method, this pump is not recommended for use with above-ground pools that can be readily disassembled for storage.
- The pump is not submersible.
- Never open the inside of the drive motor enclosure.

1.2 All installations must be fitted with earth leakage or residual current protection devices, with a rated residual operating current of under 30mA.

⚠ **WARNING:**

- Fill the pump with water before starting. Do not run the pump dry. In case of a dry run, the mechanical seal will be damaged, and the pump will start leaking.
- Before servicing the pump, switch OFF the energy supply 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 of foreign matter.

2 TECHNISCHE DATEN

Model	Advised pool volumen (m^3/h)	P1 (kW)	Voltzage (V/Hz)	Qmax (m^3/h)	Hmax (m)	Circulation (m^3/h)	
						at 8m	at 4m
ASPT-20	30-50	0.75	220-240/ 50/60	23.7	11.3	17.4	11.6
ASPT-24	40-70	1.05		26.3	13.9	23.1	19.5
ASPT-30	60-90	1.4		28.7	16.7	27.5	25.1

3 OVERALL DIMENSIONS

Overall product dimensions in mm.

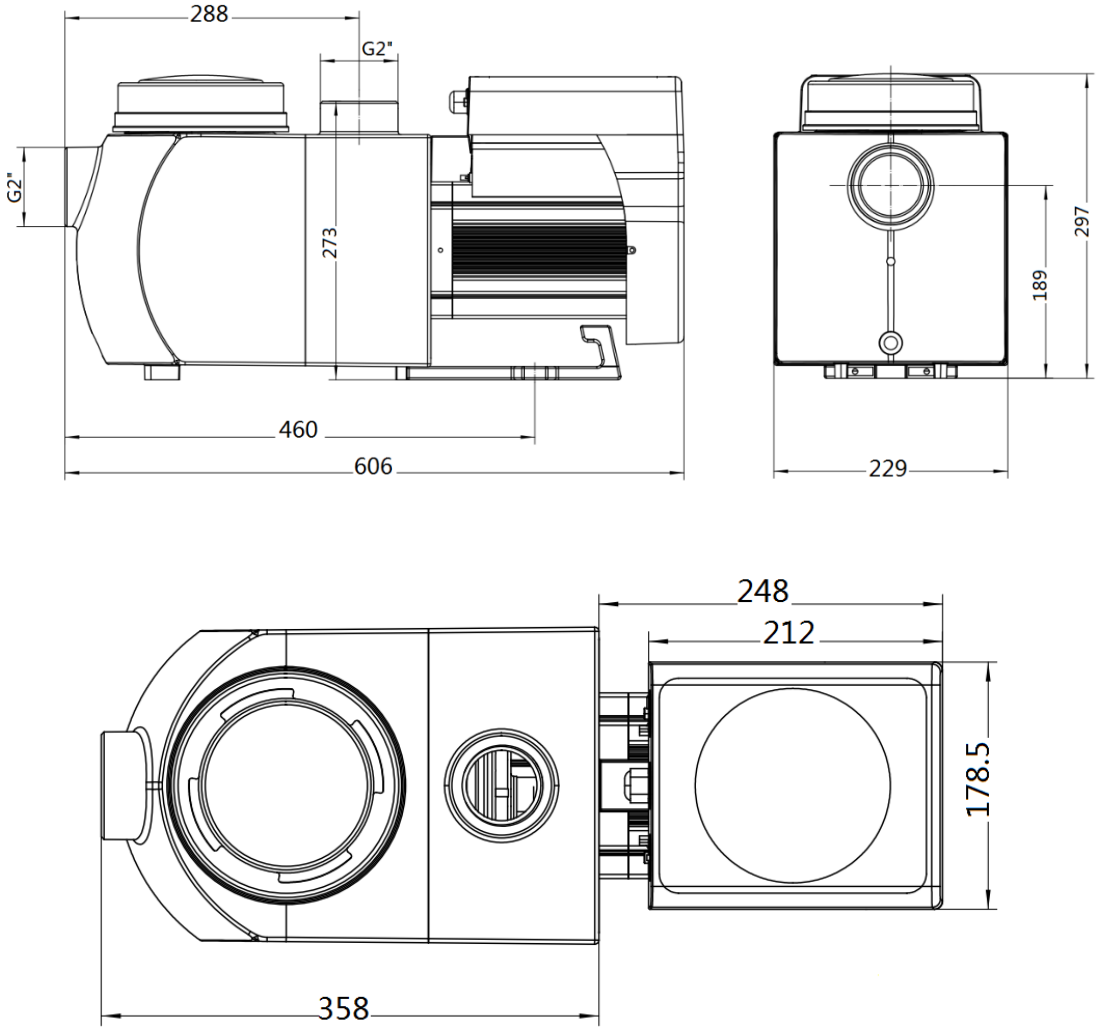


Figure 1: Overall product dimensions in mm

4 INSTALLATION

4.1 Pumpenstandort

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 15 cm away from obstacles, pump motors require free circulation of air for cooling.
4) The pump should be installed horizontally and fixed in the space on the support with screws to prevent unnecessary noise and vibration.

4.2 Piping

1) For optimization of the pool plumbing, it is recommended to use a pipe with size of 63mm. When installing the inlet and outlet fittings (joints), use the special sealant for PVC material.
2) The dimension of the suction line should be the same or larger than the inlet line diameter, to avoid the pump sucking air, which would affect the efficiency of the pump.
3) Plumbing on the suction side of the pump should be as short as possible.
4) For most installations we recommend installing a valve on both the pump suction and return lines, which is more convenient for routine maintenance. However, we also recommend that 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.
5) The pump outlet piping system should be equipped with a check valve to prevent the pump from the impact of medium recirculation and pump-stopping water hammer.

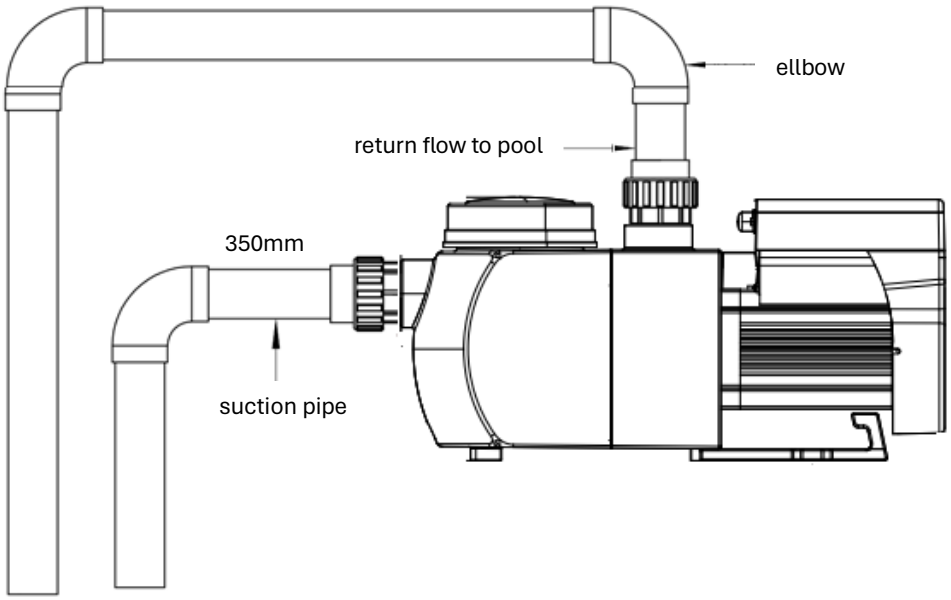


Figure 2: Piping

4.3 Valves and Fittings

1) Elbows should not be closer than 350mm to the inlet. Do not install 90° elbows directly onto the pump inlet/outlet. Joints must be tight.
2) Flooded suction systems should have gate valves installed on suction and return line for maintenance. The suction gate valve should be no closer than seven times the suction pipe diameter as described in this section.
3) Use a check valve in the return line where there is significant height difference between the return line and the pump outlet.
4) Be sure to install check valves when plumbing in parallel with other pumps. This helps prevent reverse rotation of the impeller and motor.

4.4 Check before initial startup

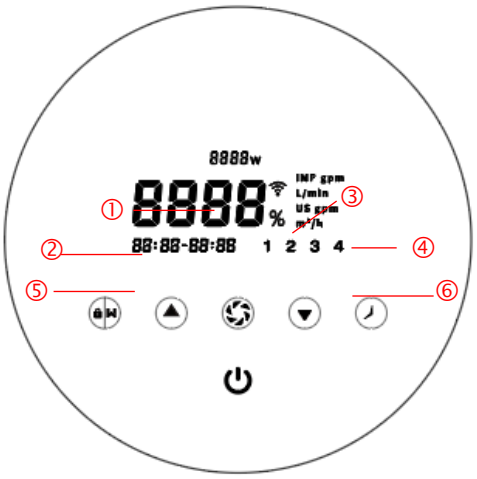
1) Check whether pump shaft rotates freely.
2) Check whether power supply voltage and frequency conform to the nameplate.
3) Facing the fan blade, the direction of motor rotation should be clockwise.
4) It is forbidden to operate the pump without water.

4.5 Application conditions

Ambient temperature	Indoor installation, temperature range: -10 - 42℃
Water temperature	5℃-50℃
Salt pools	Salt concentration up to 0.5%, i.e 5g/l
Humidity	≤90% RH, （20℃±2℃）
Altitude	Max. 1000m above sea level
Installation	The pump can be installed max. 2m above water level
Insulation	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 (capacity/flow/time)
Switch between Manual-Inverter Mode and Auto-Inverter Mode **Manual-Inverter Mode**: The running capacity will be set manually between 30-100% **Auto-Inverter Mode**: The running capacity will be automatically adjusted between 30-100% according to the preset flow rate. The default mode is **Manual-Inverter** mode.
Timer setting
On/off

5.2 Startup

When the power is switched on the screen will be bright for 3 seconds, the device code will be displayed, and then it will enter the normal operating state. The screen will automatically lock if there is no activity for more than 1 minute and the brightness of the screen will be reduced by 1/3. When the screen is locked, only the button will light up; short press to wake up the screen and observe the operating parameters. Press and hold for more than 3 seconds to access the display.

5.3 Self-priming

At the first start after installation the pump will start self-priming automatically, followed by a learning phase to optimize the operation.

Self-priming:

When the system performs self-priming, it will count down 25 minutes and stop automatically when the pump is filled. Then the system will check again for 30 seconds to make sure the self-priming is completed.

The user can exit the self-priming manually by pressing  for more than 3 seconds. The pump will then perform the learning phase for 3 minutes and afterwards enter the default Manual-Inverter mode. If the user exits the self-priming after the following start up, the pump will run in the mode and setting that was set before the last shut-down.

Self-learning:

After the first self-priming is completed, the system will perform the first learning phase for 3 minutes and define the adjustable flow range of the pump by detecting the pipeline pressure.

eg: the default adjustable flow range of Inverterpump ASPT-24 is 5-25 m^3 /h, after self-learning, the range may be redefined to 7-22 m^3 /h. User can still set 25 m^3 /h in this situation, the pump will adjust the running capacity automatically to reach the current reachable max. flow rate (22 m^3 /h), and the flow display on the controller will turn back to 22 m^3 /h after 3 seconds.

The default adjustable flow range is as below:

Model	Default adjustable flow rate range
ASPT-20	5-20 m^3/h
ASPT-24	5-25 m^3/h
ASPT-24	5-30 m^3/h

Remark:

The pump is delivered with self-priming enabled. Each time the pump restarts, it will perform self-priming automatically. The user can enter the parameter setting to disable the default self-priming function (see 5.8).

If the default self-priming function is disabled, and the pump has not been used for a long time, the water level in basket may drop. The user can manually activate the self-priming function by pressing  and  for 3 seconds, the adjustable period is 10-25 minutes (default mode is 10 minutes). After the manual self-priming is completed, the pump will perform the learning phase for 3 minutes to redefine the flow range of the system.

User can press  for more than 3 seconds to exit the manual self-priming, the pump will perform self-learning for 3 minutes after the next restart.

5.4 Backwash

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

	Default	Setting range
Time	3 minutes	Press  or  to adjust from 0 to 25 minutes with 30 seconds for each step
Running Capacity	100%	80-100%, enter the parameter setting (see 5.8)

If backwash is completed or disabled press and hold  for 3 seconds, the pump will return to the normal operating status.

5.5 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 after self-priming.
3		Press  or  to set the running capacity between 30% and 100%, each step by 5%.
4		Press  again to switch to Auto-Inverter mode.

5.6 Auto-Inverter Mode

In Auto-Inverter-Mode the pump will detect the system pressure automatically and adjust the motor speed 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  in 1m^3 /h steps.
3		The unit of flow rate can be changed to lpm, IMP gpm or US GPM by pressing both  and  for 3 seconds (default is m3/h).
4		Press  to switch to Manual-Inverter mode.

Note:

The pump will define the adjustable flow range after the first self-priming. The pipeline pressure will be recorded by the system after the pump was running at the set flow/capacity for 3 minutes without disruption.

If it is detected that the pipeline pressure changes beyond a certain range during operation, the icon of % or m^3/h (or other flow unit) symbol will flash for 5 minutes. If the change lasts for 5 minutes, the pump will perform a self-priming and learning phase (see 5.3) and redefine the flow range accordingly. After the redefinition of flow range the pump will automatically adjust the running capacity to reach the set flow.

5.7 Timer mode

The pumps on/off and running capacity can be commanded by timer and can be programmed daily as needed.

1	Enter timer settings 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 the user can set the flow rate by pressing).
5	Repeat above steps to set up to 3 timers.
6	Hold 3 seconds to save the settings.
7	Press or to check the 4 timers to make sure all settings are valid.

Note:

If the set time period contains the current time, the pump will start running according to the set running capacity or flow rate. If the set time period does not contain the current time, the timer number 1 2 3 4 (or 1 or 2 or 3 or 4) that is about to start running will flash and show up on the display. The symbols 88:88–88:88 will display the corresponding time period, indicating a successful timer setting.

All 4 time periods should be set in chronological order. Overlapping time settings will be considered as invalid, the pump will only run based on the previous valid setting. If all 4 time periods set by the timer are invalid, --:---:-- and 1 2 3 4 will flash to remind the user. You can press to reset the time period again to make sure they are valid.

During timer setting, if you want to return to the previous setting, hold both for 3 seconds. If you do not want to set all 4 timers you can hold for 3 seconds, the system will automatically save the set value and activate the timer mode.

5.8 Parameter Setting

Restore factory setting	In off mode: hold both  and  for 3 seconds.
Check the software version	In off mode: hold both  and  for 3 seconds.
Manual priming	In on mode: hold both  and  for 3 seconds.
Enter parameter setting as below	In off mode: hold both  and  for 3 seconds; If current parameter does no need to be adjusted, press  and  .

Parameter Number	Description	Default Setting	Setting Range
1	PIN3	100%	30-100%, in steps of 5%
2	PIN2	80%	30-100%, in steps of 5%
3	PIN1	40%	30-100%, in steps of 5%
4	Backwash capacity	100%	80-100%, in steps of 5%
5	Control mode of Analog Input	0	0: current control 1: Voltage control
6	Enable or disable the priming at each start	25	25: enables 0: disables

6 WIFI-OPERATION

6.1 InverFlow Download

InverFlow App

Android

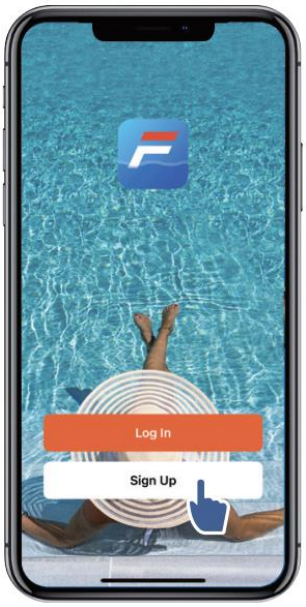
ANDROID APP ON Google play

iOS

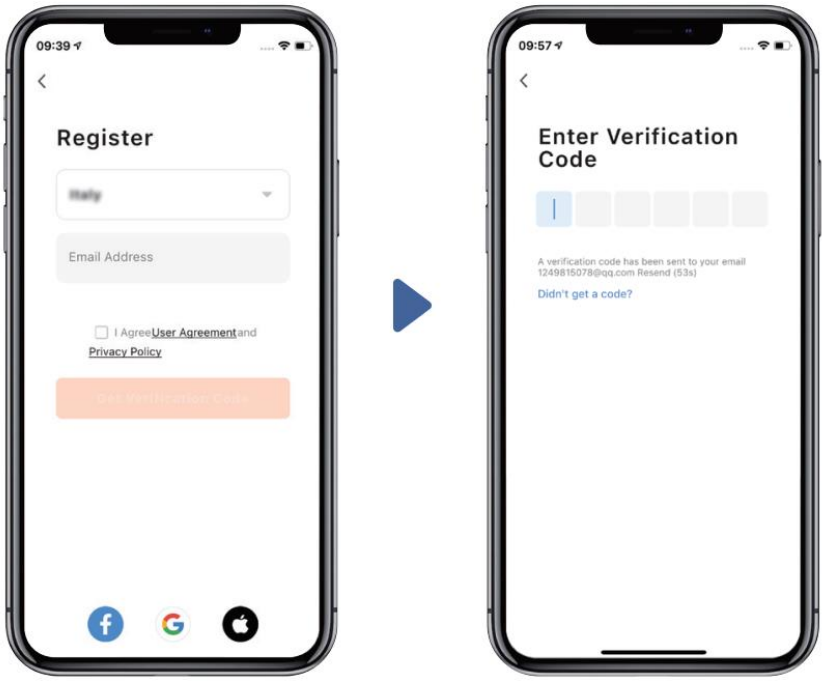
Available on the App Store

6.2 Account registration

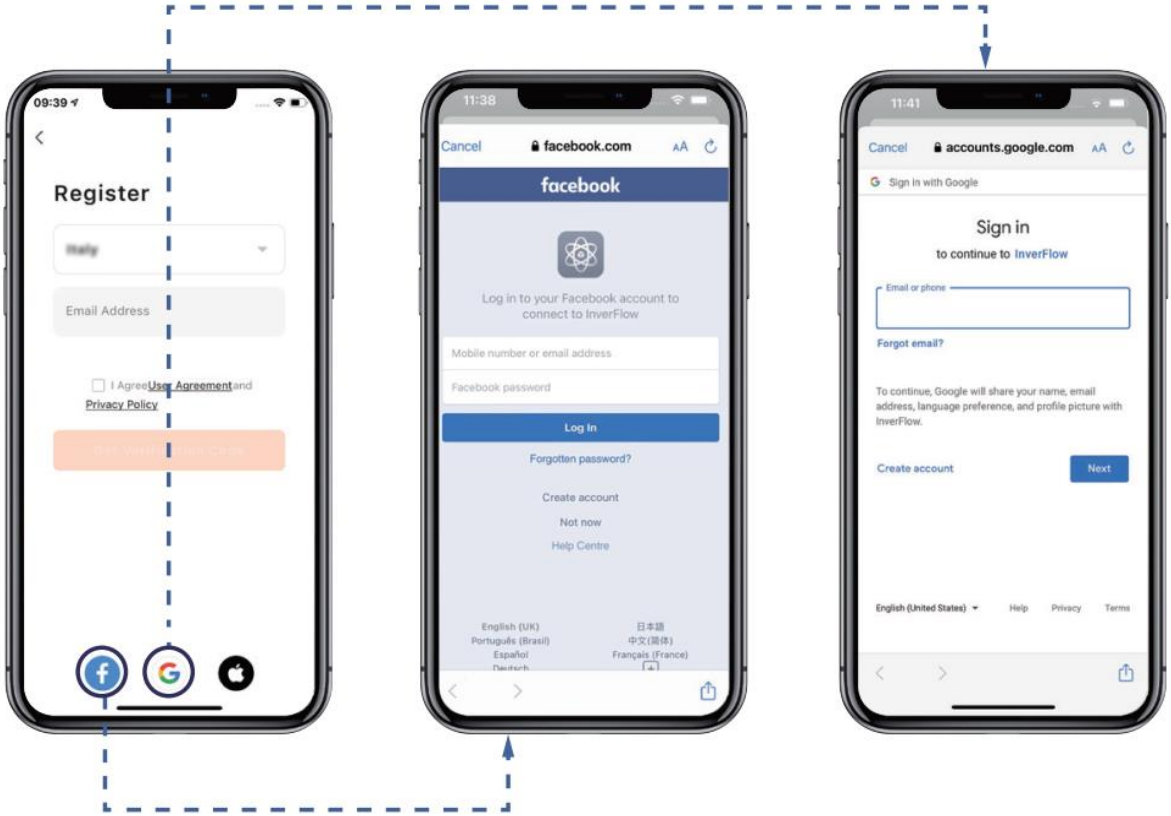
Register by e-mail (a)
or third-party application (b)



a) E-Mail registration

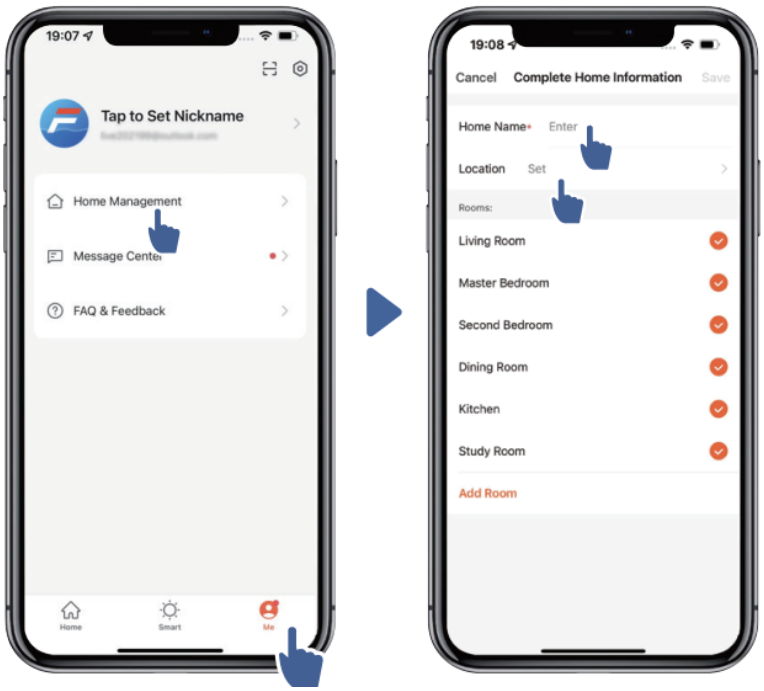


b) Third-party application registration



6.3 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).



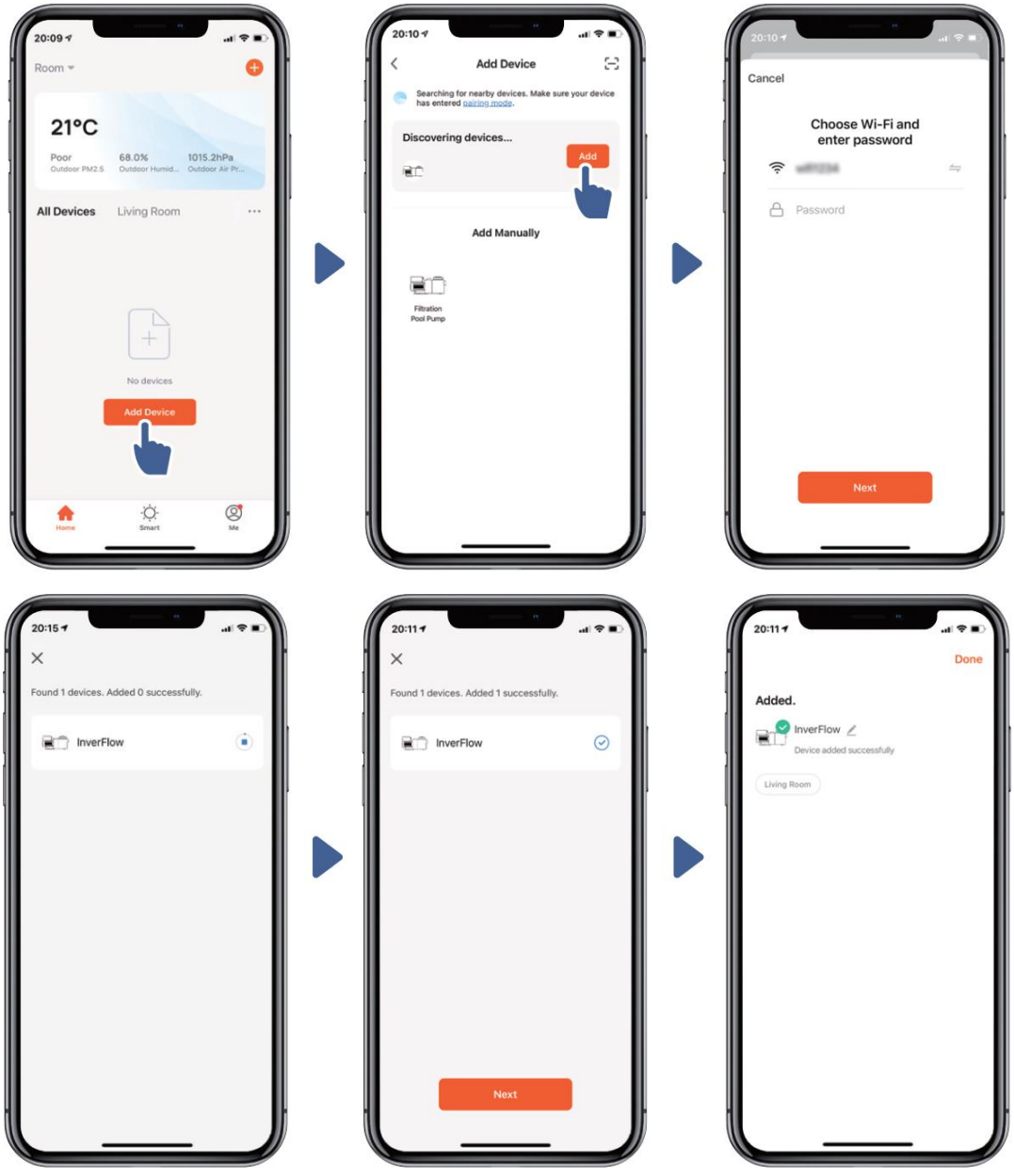
6.4 App Pairing

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

Option 1 (recomended): Wifi and Bluetooth

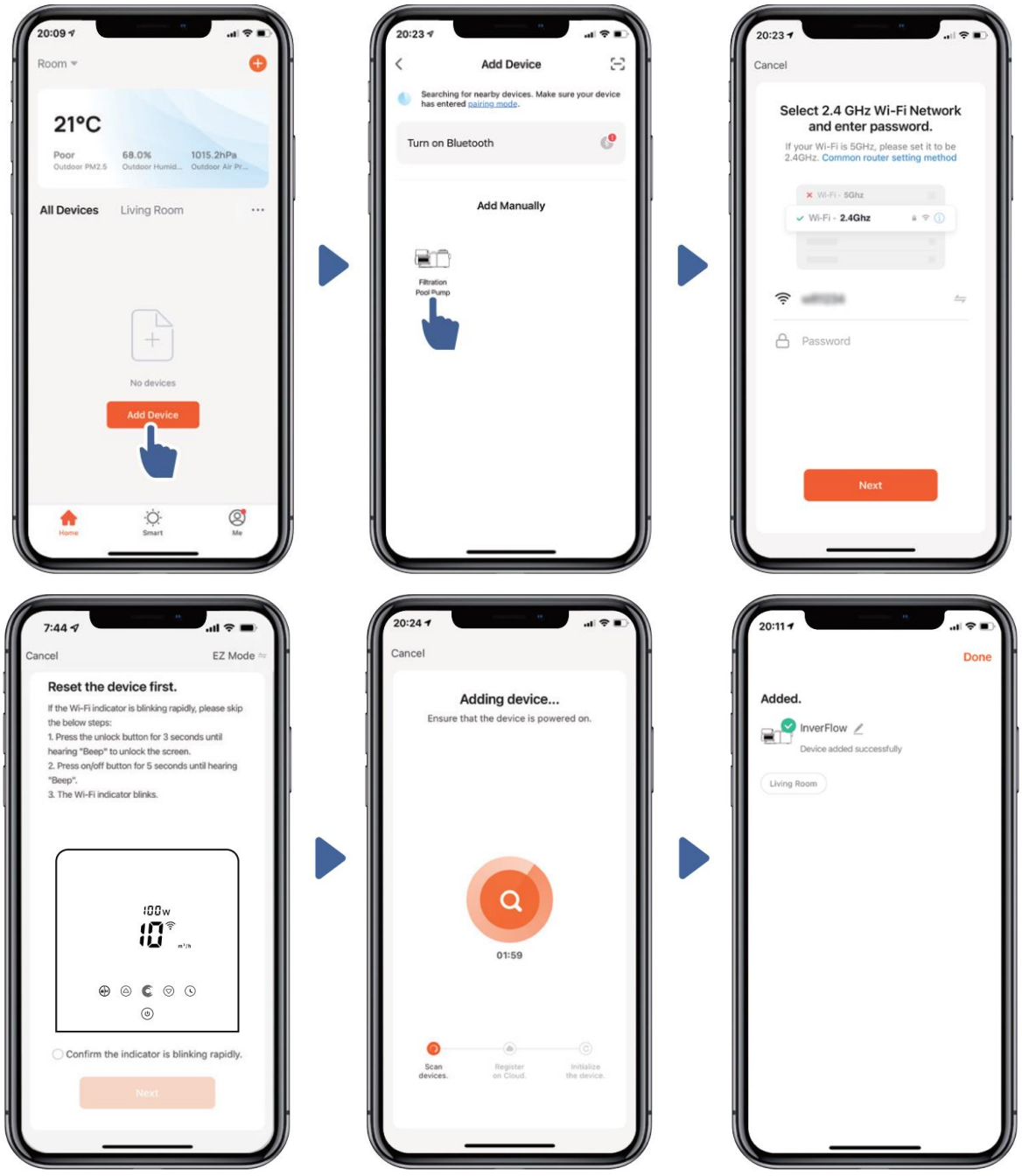
(Network requirement: 2.4GHz; 2.4Ghz and 5GHz in one SSID; no separate 5GHz network)

1) Please confirm that your phone is connected to Wifi and your Bluetooth is activated.
2) Press  for 3 seconds until you hear “Beep” to unlock the screen. Press  for 5 seconds until you hear “Beep”, then release the button. The symbol  will flash.
3) Click “Add Device” and follow the instructions to pair the device.



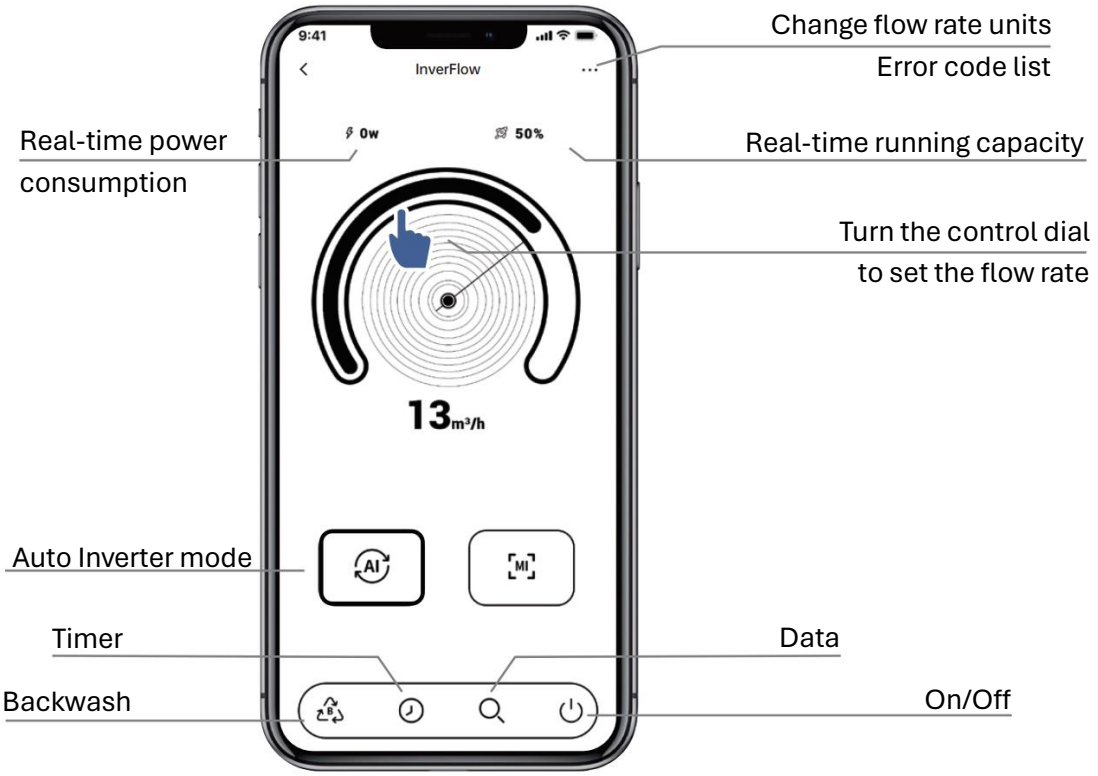
Option 2: Wifi (Network requirement: 2.4GHz only)

1) Please confirm that your phone is connected to the Wifi.
2) Press for 3 seconds until you hear “Beep” to unlock the screen. Press for 5 seconds until you hear “Beep”, then release the button. The symbol will flash.
3) Click “Add Device” and follow the instructions to pair the device.

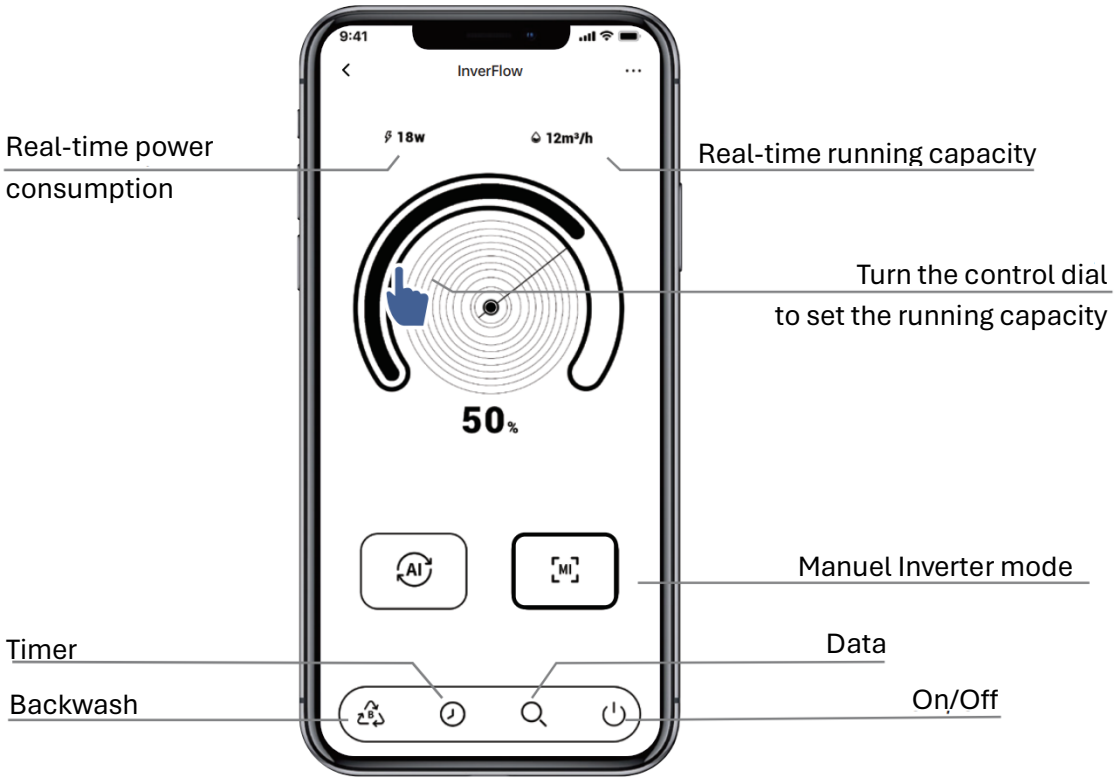


6.5 Operation

1) Using Auto Inverter mode:

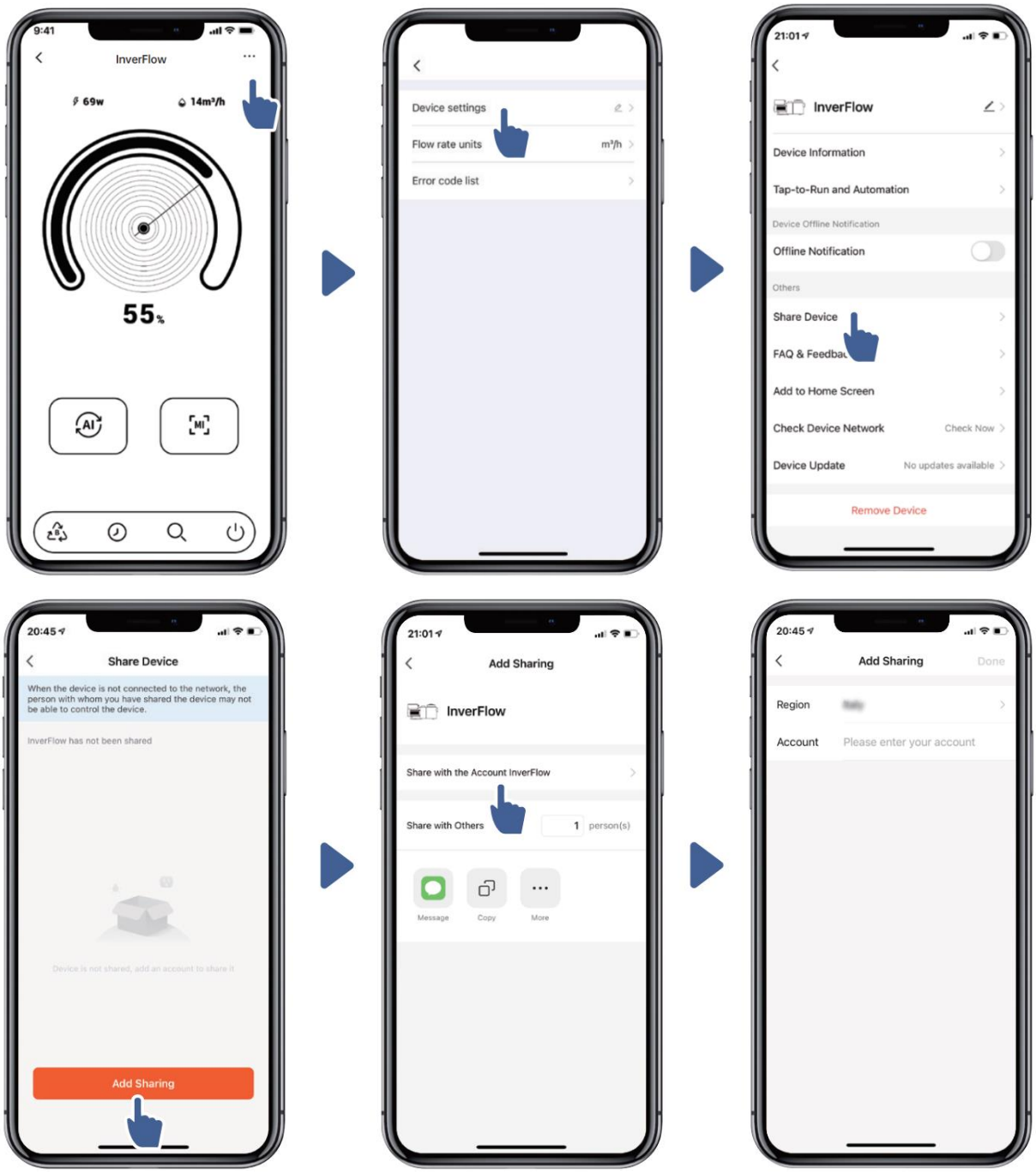


2) Using Manual Inverter mode:



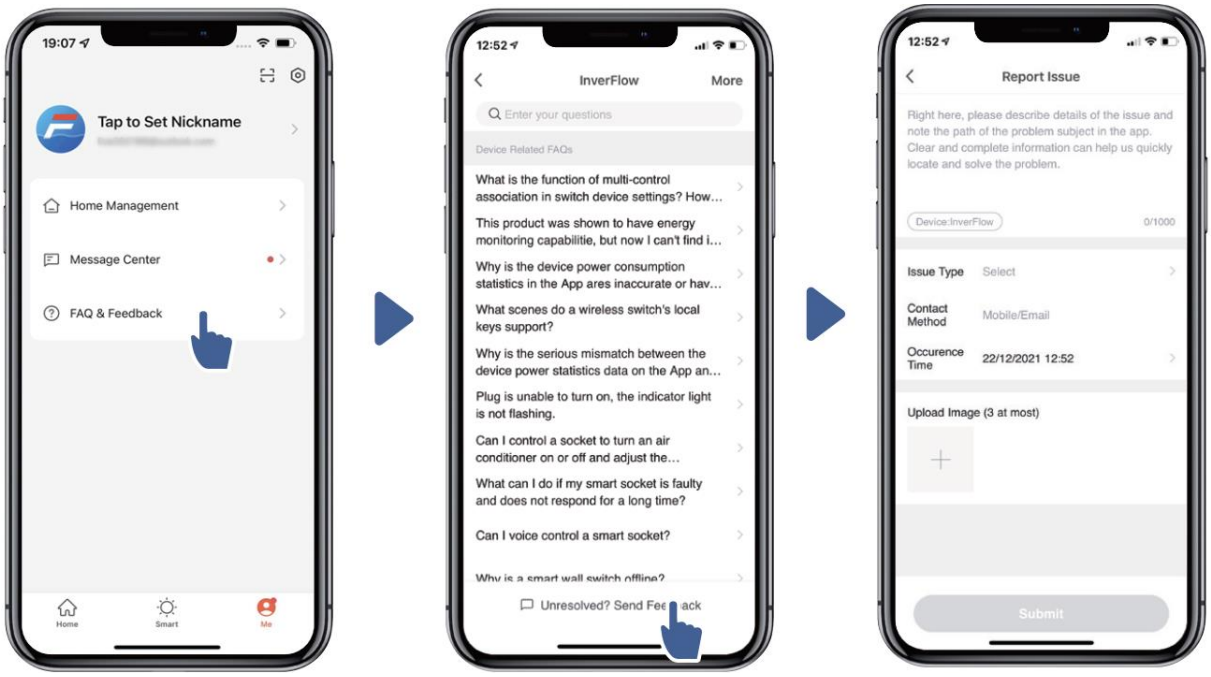
6.6 Sharing devices with your family members

If your family members also want to control the device after pairing, please let them register in the app“InverFlow”first, then the administrator can operate as below:



6.7 Feedback

If any problems should occur during operation, you are very welcome to send your 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 further notice.

7 EXTERNAL CONTROL

An 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

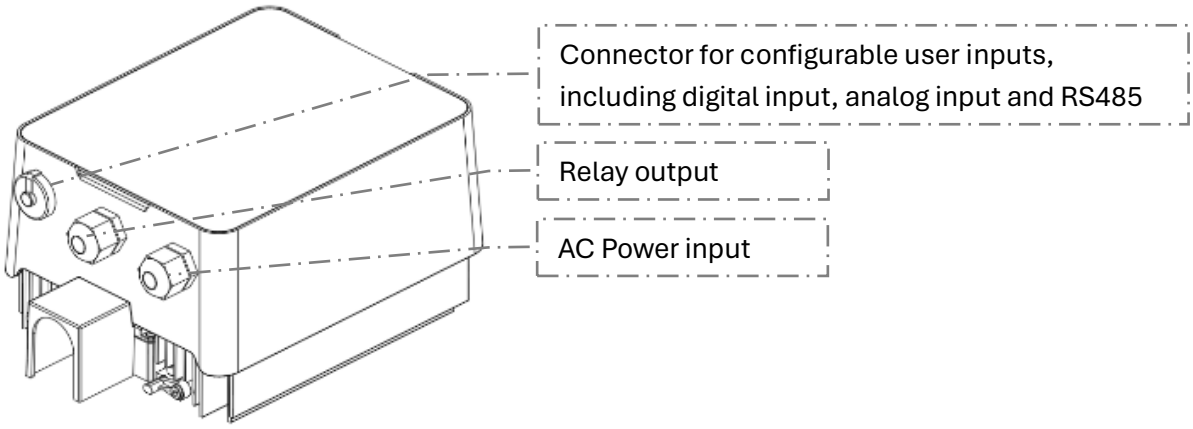


Figure 3: External control (1)

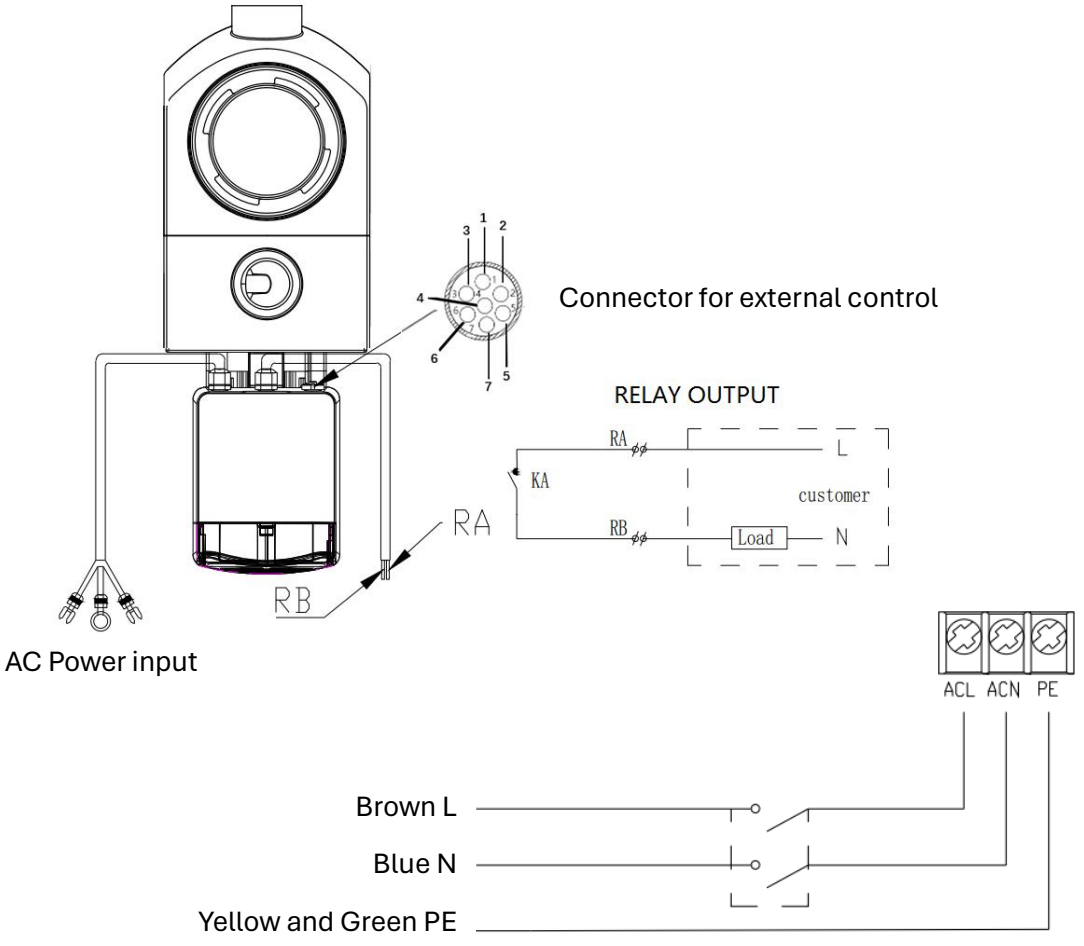


Figure 4: External control (2)

Pin-Configuration

Name	Color	Description
PIN 1	Red	Digital Input 4
PIN 2	Black	Digital Input 3
PIN 3	White	Digital Input 2
PIN 4	Grey	Digital Input 1
PIN 5	Yellow	Digital Ground
PIN 6	Green	RS485 A
PIN 7	Brown	RS485 B
PIN 8	Blue	Analog Input 0 (0-10V or 0-20 mA)
PIN 9	Orange	Analog Input

a) Digital Input:

The running performance is determined by the state of digital input.

When PIN 4 connect with PIN 5, the pump will be mandatory to stop; if disconnected, the digital controller will be invalid.

When PIN 3 connect with PIN 5, the pump will be mandatory to run at 100%; if disconnected, the control priority will be back on panel control.

When PIN 2 connect with PIN 5, the pump will be mandatory to run at 80%; if disconnected, the control priority will be back on panel control.

When PIN 1 connect with PIN 5, the pump will be mandatory to run at 40%; if disconnected, the control priority will be back on panel control.

The capacity of inputs (PIN 1/PIN 2/PIN 3) could be modified according to the parameter setting.

a) Analog Input (optional):

When connected to PIN 8 and PIN 9, the operating capacity can be determined by an analog voltage signal of 0 to 10 V or an analog current signal of 0 to 20 mA.

The following table shows the relationship between the analog signal at the input and the parameter to be activated:

Analog Control	Motor stopps	Motor runs
Current (mA)	2.6-5.8 mA	5.8-20 mA
Voltage (V)	1.3-2.9 V	2.9-10 V

The default control mode is by current signal, if you want to switch to voltage signal, please enter the parameter setting. (see 5.8)

b) RS485:

To connect with PIN6 and PIN7, the pump could be controlled via Modbus 485 communication protocol.

c) Relay output (optional):

Connect terminal L & N to enable external control. An additional on-off Relay is necessary while bearing power is greater than 500W (2.5A).

8 PROTECTION AND FAILURE

8.1 High Temperature Warning and Speed Reduction

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℃), it enters the high temperature warning state; when the temperature drops to the high temperature warning release threshold (78℃), the high temperature warning state is ended. The display area alternately displays AL01 and running speed or flow.

1) If AL01 displayed for the first time, the running capacity will be automatically reduced as below:
   a) If current operating capacity is higher than 85%, the running capacity will be automatically reduced by 15%.
   b) If current operating capacity is higher than 70%, the running capacity will be automatically reduced by 10%.
   c) If current operating capacity is lower than 70%, the running capacity will be automatically reduced by 5%.
2) Suggestion for non-first display of AL01: check the module temperature every 2 minutes. Compared with the temperature in the previous period, for every 1-degree Celsius increase, the speed will decrease by 5%.

8.2 Undervoltage protection

If the device detects that the input voltage is less than 197V, the device will limit the current running speed:

If input voltage is less than or equal to 180V, the running capacity will be limited to 70%.

If the input voltage range is 180-190V, the running capacity will be limited to 75%.

If the input voltage range is 190-197V, the running capacity will be limited to 85%.

8.3 Trouble shootiung

Problem	causes and solution
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 obstacles and mobility.
	Caused by long immobility. Unplug the power supply and manually rotate motor rear shaft a few times with a screwdriver.
Pump does not prime	Loose connections on the suction side.
	Strainer basket or skimmer basket filled with debris.
	Suction side clogged.
	Empty pump/strainer housing. Make sure the pump/strainer casing is filled with water and the O-ring of the cover is clean.
	If the distance between the pump inlet and the water level is more than 2m, the pump should be installed lower.
Low Water Flow	The pump does not prime.
	Air is entering the suction piping.
	Basket is filled with debris.
	Low 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.
	Damaged motor bearing or impeller (contact the supplier for repair).

8.4 Error code

When the device detects an error (except for the running capacity reduction strategy and 485 communication failure), it will power off automatically and display the failure code. After the power is off for 15 seconds check if the failure is cleared. If it is cleared, it will resume to start.

Item	Error Code	Description
1	**E001**	Abnormal input voltage
2	**E002**	Output overcurrent
3	**E101**	Heat sink over heat limit
4	**E102**	Heat sink sensor error
5	**E103**	Master driver board error
6	**E104**	Phase-deficient protection
7	**E105**	AC current sampling circuit failure
8	**E106**	DC abnormal voltage
9	**E107**	PFC protection
10	**E108**	Motor power overload
11	**E201**	Circuit board error
12	**E203**	RTC time reading error
13	**E204**	Display Board EEPROM reading failure
14	**E205**	Communication Error
15	**E207**	No water Protection
16	**E208**	Pressure sensor failure
17	**E209**	Loss of prime

Note:

When causes for E002/E101/E103 are displayed, the device will resume working automatically, however when it appears a fourth time, the device will stop working. To resume operation, unplug the device and plug in & restart again.

9 MAINTENANCE

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

1) Disconnect 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, 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 in case of damage replace it.
6) 6). Check the O-ring of the lid for stretching, tears, cracks or any other damage.
7) 7). Replace the lid, hand tightening is sufficient.

Note: Periodically inspect and clean the strainer basket will help prolong its life.

10 WARRANTY & EXCLUSIONS

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

The guarantee will be void in case 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.