Permanent Magnet Synchronous Variable Speed Swimming Pool Pump

Operation Manual

E 211201

Content

1.0 Function Introduction

Permanent magnet synchronous variable speed water pump has the characteristics of high efficiency, high power density, adjustable speed and high degree of intelligence. It can run in manual mode and automatically run as planned. At the same time, it is equipped with a smart mode of WIFI/Bluetooth+App which can realize functions such as remote monitoring and mobile phone configuration parameters. This instruction is based on safety considerations and detailed operating procedures which must be strictly followed. Before starting operation, please read the operating instructions carefully.

1.1 Schedule Function

The Schedule function is an automatic operation function. Users can preset the running time and speed of the pump according to their requirements. When the water pump is energized, it will run automatically according to the internal clock and operation plan.

Note: Only Speed1, Speed2 and Speed3 can be selected for the running speed in the Schedule State and the values of the three speeds can be changed in the manual setting.

Note: The Schedule Function currently supports up to 3 operating periods in a day. When setting through the touch screen panel, the operation schedule is the same every day. Through the APP, you can set up a different daily operation plan from Monday to Sunday.

The parameters that can be modified and set in Schedule Mode include:

- Set1 (plan 1) speed with start and end time
- Set2 (plan 2) speed with start and end time
- Set3 (plan 3) speed with start and end time

1.2 Manual Function

The Manual function is a manual operation function.The user can manually start or shut down the pump at any time as required. Manual mode also integrates with a countdown function. When the running time is 0, it means that the pump will continue to run until it is manually shut down. When the running time is not 0, it means countdown running. If the set time is 30, it means it will automatically shut down after 30 minutes.

Note： The running speeds Speed1, Speed2 and Speed3 in manual state can be changed ⊕/⊖ key to adjust the size while the adjusted speed will be automatically saved as the default speed

Three different speeds and running times can be set in Manual mode which including:

- Set1 (plan 1) speed with start and end time
- Set2 (plan 2) speed with start and end time
- Set3 (plan 3) speed with start and end time

1.3 Primming Function

Priming function is the function of starting the pump (self-priming and exhausting). When the water pump is powered on for the first time after a power failure.It will perform self-priming operation according to the preset starting speed and time. After the self-priming is completed, the Manual/Schedule function can be executed normally. The Priming function can be set in PRE with parameters including:

- Self-priming and exhaust running time in seconds.For example： "30" means running for 30s
- Auto start speed setting at boot

Note ： When the self-priming and exhausting time is 0, it means that the self-priming and exhausting function is not activated.

1.4 Auto Start Function

The automatic start function includes the following two situations：

◆ When the pump has a voltage or temperature failure, the pump will automatically stop and display a failure icon. When the voltage or temperature returns to normal, the pump will automatically resume operation.

◆ When the pump encounters a power outage or a circuit interruption during the normal operation.The pump will automatically return to the state before the power failure after the power supply is restored.

Note：The automatic start-up function is turned on by default.

1.5 Time Setting

Relevant time settings can be set under Time Setting including:

- Year setting
- Date setting
- Time setting

Note：When the water pump is connected through the mobile phone APP, the program will automatically synchronize the mobile phone time to the internal clock of the water pump.

2.0 Control Panel

2.1 Panel Display

①. Schedule mode operation/setting instructions

②. Pump operation instruction

③. Pump stop indication

④. Manual mode operation/setting instructions

⑤. Prompt that the device is in the setting state

⑥. Decrease the speed (the speed is reduced by 50 RPM every time you press it)

Time reduction (Each time the Schedule Setting is pressed, the clock is reduced by 1H and the minute is reduced by 15min; Each time the Manual Setting is pressed, the time is reduced by 30min; Each time the Time Setting of year/month/day/hour/minuteis is pressed and 1 year/month/day/hour/minute is reduced; Each time you press the PRE Setting, the time is reduced by 30 seconds)

⑦. Long press for 2 seconds to enter the setting state when stopping.

Press this key when running to view the pump parameters

⑧. Setting mode auxiliary button, see the setting process for details

⑨. Mode auxiliary button, see the setting process for details

⑩. Power Button

Increase Speed (50RMP increase every time when you press it)

Time reduction (Each time the Schedule Setting is pressed, the clock is reduced by 1H and the minute is reduced by 15min; Each time the Manual Setting is pressed, the time is reduced by 30min; Each time the Time Setting of year/month/day/hour/minuteis is pressed and 1 year/month/day/hour/minute is reduced; Each time you press the PRE Setting, the time is reduced by 30 seconds)

Display of different operating speeds

LED numerical display

Time setting prompt

Operating speed setting prompt

⑯ Wireless connection: Bluetooth and WIFI connection is currently supported

⑰ Wired connection

⑱ Fault reminder: water shortage/overcurrent/overvoltage/undervoltage

2.2 Panel Boot Display

Display 1: Manual operating state (after power-on, the last unfinished operating parameters are executed and the pump enters the operating state as shown in Figure 1).

Figure 1

Display 2: Manual stop state (after power-on, the parameters set last time have been executed and the controller enters the stop state as shown in figure 2)

Figure 2

2.3 Function Settings

2.3.1 How to enter the setting interface?

The pump is running after the start-up. If you need to modify the parameters，press button to enter Manual stop state.Then long press the specific operation as follows：

Long press Menu button and wait for 2 seconds to enter the setting interface, at this time "setting" keeps flashing; if the boot is in the manual stop state, directly press Menu and hold the key and wait 2 seconds to enter the setting interface, at this time "setting" and "schedule" keep flashing.

Note: The factory default is the Schedule Setting interface as shown in Figure 3 below：

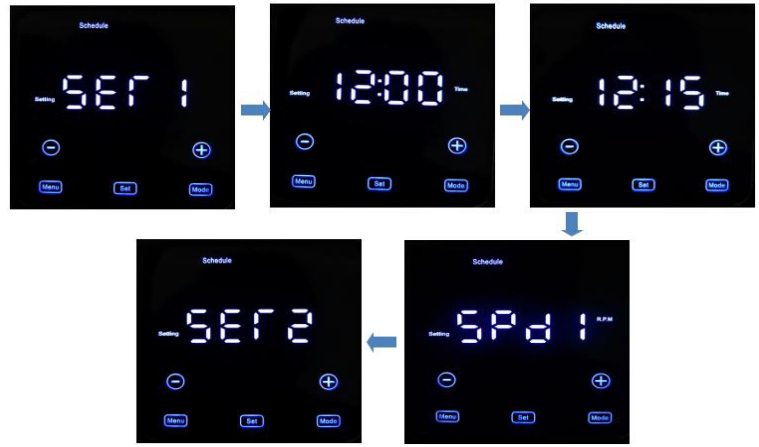
Figure 3

2.3.2 Four Settings of Panel

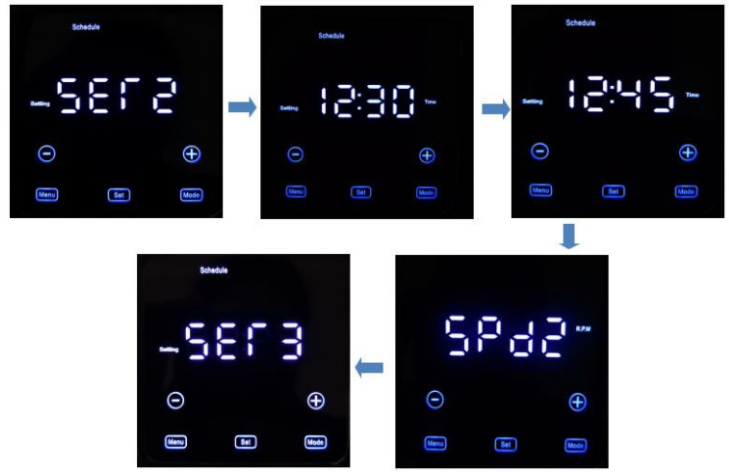
Schedule Mode

The specific operations are as follows:

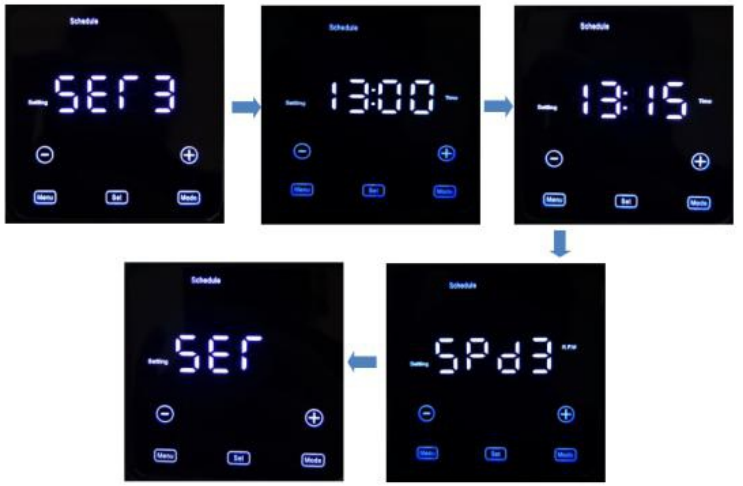
1) Enter the setting interface (as shown in Figure 3 above) and press Mode key to set the start and end time of Set1 operation. The key can add and subtract the time, and the key Set can switch the clock and minutes. Press Mode key to confirm each time the setting is completed. Then press key to switch Speed1/Speed2/Speed3, continue to press Mode key to enter the setting of Set2;



2)Press key to add or subtract time, Set key to switch between clock and minute and press Mode key to confirm each time the setting is completed. Then press key to switch Speed1/Speed2/Speed3, continue to press Mode key to enter the setting of Set3;



3)Press ⊕⊖key to add or subtract time.Press Set key to switch between clock and minute, and press Mode to confirm each time the setting is completed. Then press ⊕⊖ key to switch Speed1/Speed2/Speed3, continue to press Mode key to return to the Schedule setting interface;



Manual Mode

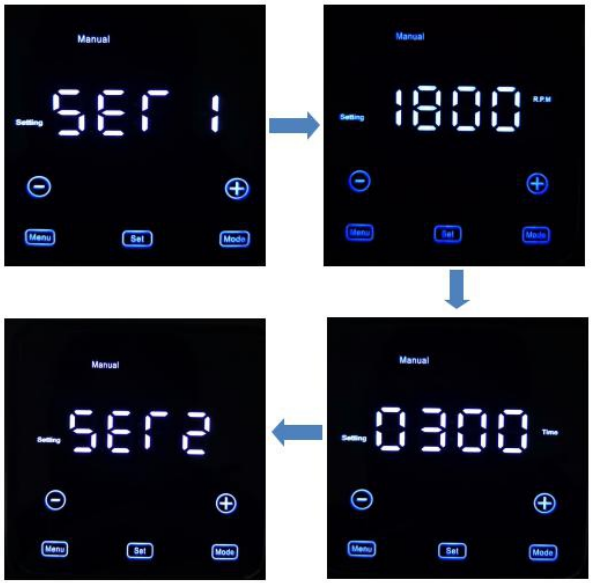
The specific operations are as follows:

1) Power on to enter the setting interface，or press Menu key to return to the upper setting interface (refer to Figure 3);

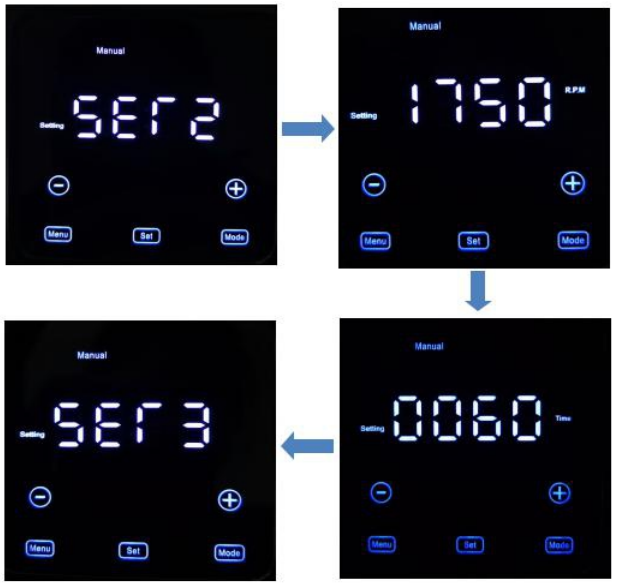
2) Press ⊕⊖key to select and enter the Manual Setting interface. At this time, the "Setting" and "Manual" lights keep flashing, as shown in Figure 4;

Figure 4

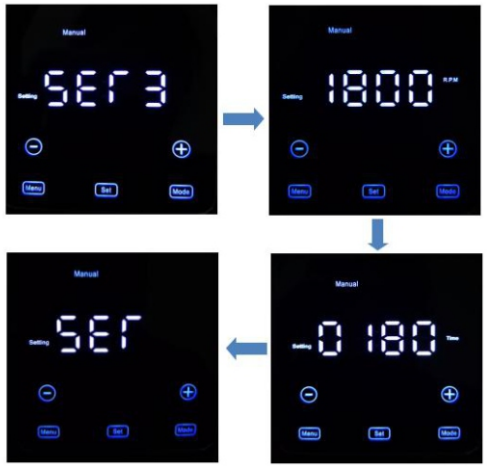
3) Press Mode key to enter the Set1 setting, then press Mode key to set the running speed, ⊕⊖key to increase or decrease the speed, and press Mode key to confirm; continue to press ⊕⊖ key to set the running time, and press Mode key to enter the Set2 setting;



4) Press Mode key again to set the running speed, press ⊕⊖ key to increase or decrease the speed, and press Mode key to confirm; continue to press ⊕⊖ key to set the running time, and press Mode key to enter the Set3 setting;



5)Press Mode key again to set the running speed, and press ⊕ ⊖ key to increase or decrease the speed, and press Mode key to confirm; continue to press ⊕⊖ key to set the running time, and press Mode key to return to the Manual setting interface.



Time Setting

The specific operation is as follows：

Power on to enter the setting interface, or press Menu to return to the previous setting interface (refer to Figure 3)

Press ⊕⊖ key to select and enter the Time Setting interface. At this time, the "Setting" and "Time" lights keep flashing, as shown in Figure 5;

Figure 5

1) Press Mode key to set the year

2)Press Mode key to set the date, ⊕⊖key to add or subtract time, Set key to switch between month and date;

3) Press Mode key to set the time. ⊕⊖key can add or subtract the time, and Set key can switch between clock and minute; press Mode key again to return to the Time setting interface.

PRE Setting

The specific operation is as follows

1） Power on to enter the setting interface, or press Menu to return to the previous setting interface (refer to Figure 3)

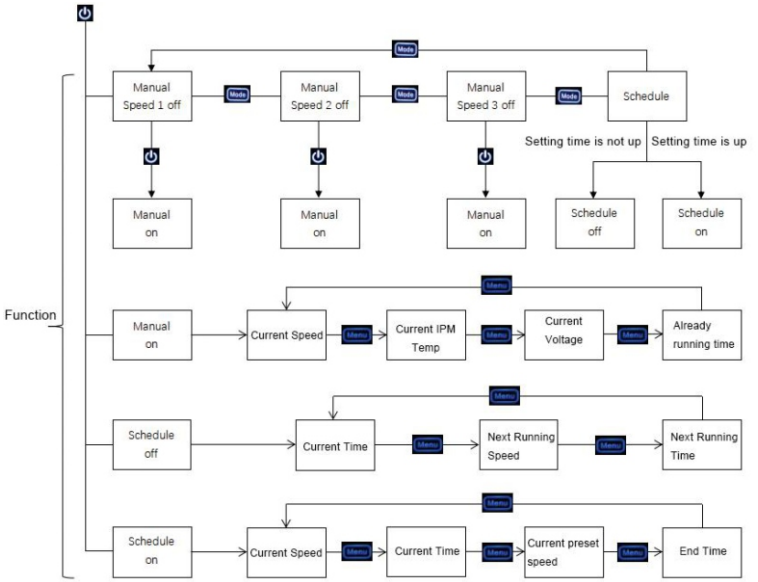
2）Press ⊕⊖ key to select and enter the PRE setting interface, at this time the "setting" light keeps flashing, as shown in Figure 6;

Figure 6

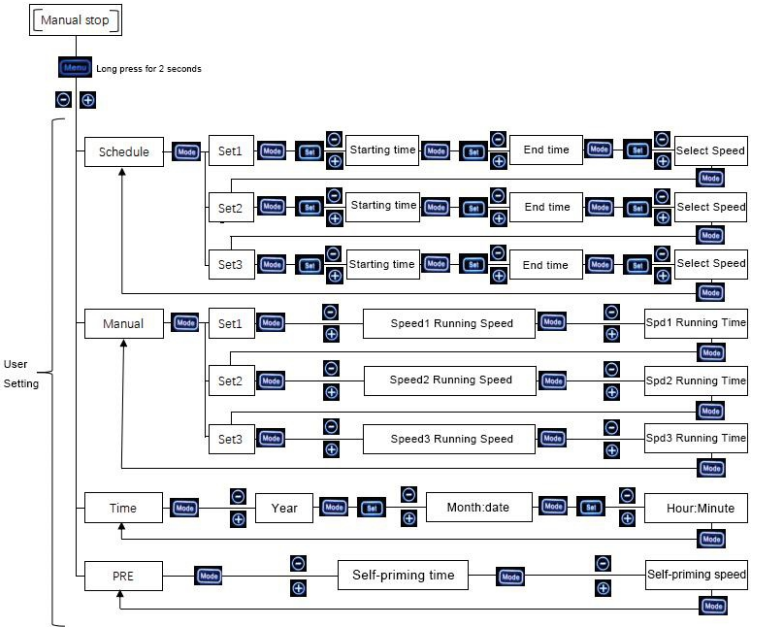
3） self-priming time, and ⊕⊖key to add or subtract time;

4） Press Mode key to enter the self-priming speed setting, and press ⊕⊖ key to increase or decrease the speed. Press Mode again to return to the PRE setting interface.

3.0 Operation Flow Chart

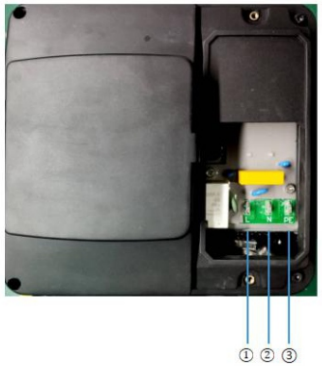


Note: Press Menu key to return to the upper level operation



4.0 Wire Connection Introduction

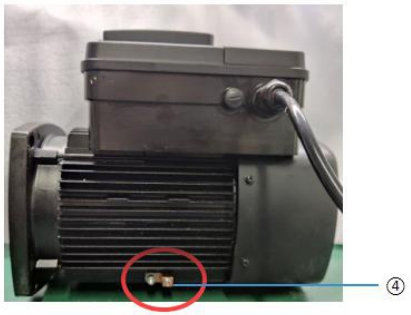
Note: Please follow the instructions for correct operation!



①. Black Wire：L

②. White Wire：N

③. Green Wire：PE



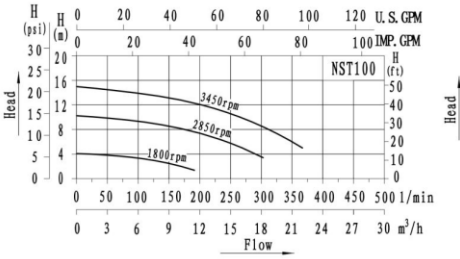
④. ground terminal

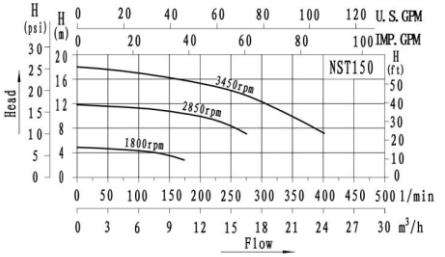
5.0 Pump Important Documents

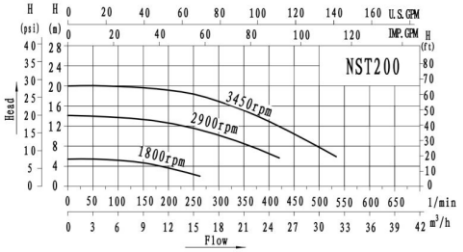
5.1Pump Model and Parameter

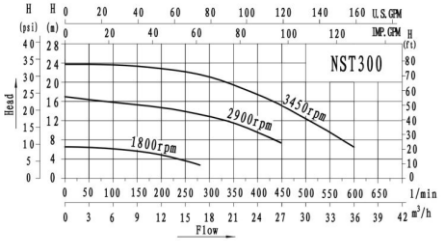
- NST100: 1HP，0.75kW；208-240V；50/60Hz；600-3450rpm
- NST150: 1.5HP，1.1kW；208-240V；50/60Hz；600-3450rpm
- NST200: 2HP，1.5kW；208-240V；50/60Hz；600-3450rpm
- NST300: 3HP，2.2kW；208-240V；50/60Hz；600-3450rpm

5.2 Performance Curve









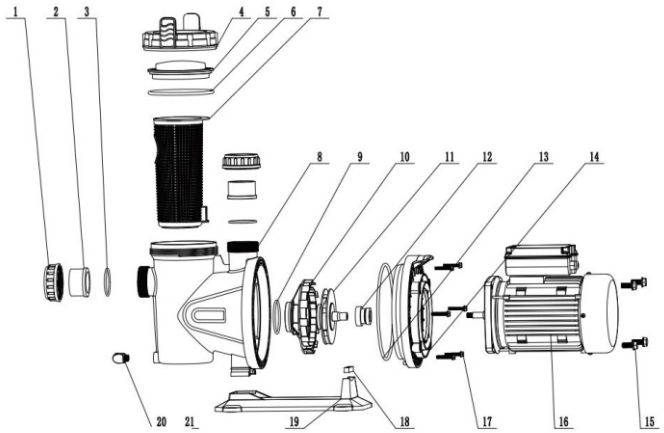
5.3 Structure Introduction

- The pump is mainly composed of a motor,pump cover,an impeller,pump body and a mechanical seal which as shown in the figure below.

- The key impeller, pump body and pump cover of the pump are all made of engineering plastics.

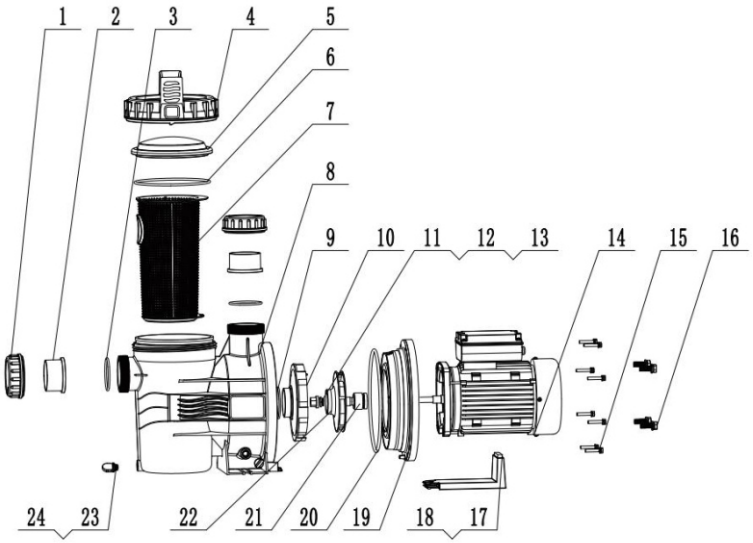
- The pump adopts a single-end internal-mounted mechanical seal which the grinding block is ceramic/graphite.

- The connection between the pump and the pipeline is pipe thread which is in accordance with《GB/T7307 55° Non-sealed Pipe Thread》



1.Joint nut 2.Connector 3.O-ring 4.Perspective cover gland 5.Transparent cover 6.O-ring 7.Filter basket 8.Pump body 9.O-ring 10.Guide vane 11.Impeller 12.Mechanical seal 13.O-ring 14.Pump cover 15.Hexagon bolts 16.Motor 17.Hexagon bolts 18.Rubber spacer 19.Base 20.O-ring 21.Drain water screw plug

Figure 1：NST100/NST150



1.Joint nut 2.Connector 3.O-ring 4.Perspective cover gland 5.Transparent cover 6.O-ring 7.Filter basket 8.Pump body 9.O-ring 10.Diffusser 11.Impeller nut 12.Spring washer 13.O-ring 14.Motor 15.Hexagon bolts 16.Hexagon bolts 17.Rubber spacer 18.Base 19.Pump cover 20.O-ring 21.Mechanical seal 22.Impeller 23.O-ring 24.Drain screw plug

Figure 2：NST200/NST300

5.4 Installation And Connection

1、Pump installation

- It must be installed on a hard and flat surface which using a short and direct pipeline system (to reduce the loss of water flow). The pump installation position should not be 3 meters above the water surface. Install a valve at the water inlet and outlet to drain the machine room. The system is good to prevent the machine room from being too humid.In order to facilitate the inspection and repair of the water pump and pipes,the machine room must reserve enough space.
- The warning signs on the top of the motor must be read after installation.In addition to providing safe ultra-low voltage <12V components, live parts must be inaccessible to people in the swimming pool.
- For Class I devices without plugs, they must be permanently connected to a fixed line. Electrical components other than remote control equipment must be located or fixed.

2、Piping device

- The water inlet and outlet pipes should not be supported by the pump body. The diameter of the water inlet pipe must be greater than or equal to the water inlet of the pump. The water inlet pipe should be slightly inclined to avoid air being left in the pipe.
- Avoid dripping water on the motor, otherwise it will cause damage to the motor.

3、Electrical connection ⚠

- The electrical installation should have a multiple isolation system with a contact opening of at least 3mm.The electrical installation must refer to the national wiring rules.In order to continuously prevent possible electric shock,the device should be installed on the base according to the installation instructions.
- The power cord of the water pump should be connected through a circuit with a residual current circuit breaker (RCD),the specified operating value should not exceed 30mA.The power supply cable should comply with EMC standards (2).Single-phase motors have built-in thermal protection function.The electrical connection must be carried out by qualified personnel in strict accordance with the "EN60335-2-41" standard.Make sure that the ground wire is connected correctly.
- Ensure that the equipotential connection between the swimming pool and the water pump is correct.The cross-section of the equipotential bonding wire should be between 2.5 ~ 6m ㎡ with suitable terminals should be equipped.

4、The outline and installation dimensions of the pump

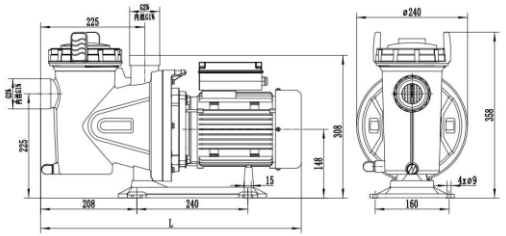


Figure 3：NST100/NST150

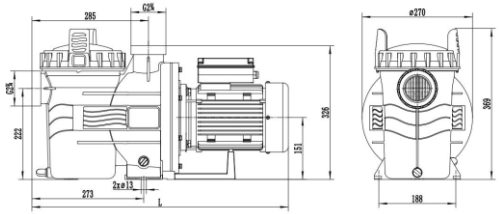


Figure 4：NST200/NST300

Model	L（mm）	Connector Size	Packing Size L*W*H(cm)	Weight(Kg)
NST100	510	48.5/50	58*26*39	11
NST150	530	48.5/50	58*26*39	12
NST200	610	60.3/63	76*35*44	16
NST300	627	60.3/63	76*35*44	17

5.5 Common faults and solutions

Fault	原因分析	排除方法
When the starter is closed, the motor cannot start.	a) Power supply failure b) The fuse is blown c) Motor overload d) Starter failure e) Control loop failure f) Motor failure	a) Check the power supply b) Replace the fuse c) Check the system d) Replace the starter e) Replace the control circuit f) Repair the motor
The starter overload device trips (when the power is turned on, it trips immediately)	a) The fuse is blown b) There is a problem with the contact of the overload device c) The cable connection is loose or the power supply fails d) There is a problem with the motor coil e) The pump is blocked or rubbed firmly f) The overload current setting is too low	a) Replace the fuse b) Check or replace the starter c) Check the cable connection or power supply d) Replace the motor e) Clear the blockage in the pump f) Reset
Overload device accidentally trips	a) The overload current setting is too low b) Periodic power failure c) The voltage is too low during peak electricity consumption	a) Reset b) Overhaul the power supply c) Add voltage stabilizing device
The overload device does not trip, but the pump does not work	a) Poor contact of the starter or problem with the coil b) There is a problem with the control circuit	a) Replace the starter b) Check the control circuit
Unstable pump performance	a) The inlet pressure of the pump is too low b) The pipeline/pump is blocked by debris c) The pump sucks in air d) The direction of rotation of the pump is wrong	a) Check the water absorption conditions b) Clean the pipeline/water pump c) Check the condition of the suction pipeline d) Adjust the rotation of the motor
The pump runs but no water comes out	a) The pipeline/pump is blocked by debris b) The bottom valve or check valve is stuck in the closed position c) Leakage of water inlet pipe d) There is air in the inlet pipe or pump	a) Clean the pipeline/pump b) Overhaul the bottom valve or check valve c) Overhaul the water inlet pipe d) Refill liquid to remove air
The pump has abnormal vibration and noise	a) Leakage of water inlet pipe b) The inlet pipe is too small or blocked by debris c) There is air in the inlet pipe or pump d) The pump has mechanical friction e) Motor bearing failure	a) Overhaul the water inlet pipe b) Enlarge or clean the water inlet pipe c) Refill liquid to remove air d) Overhaul the pump e) Replace the bearing
Mechanical seal leakage	a) Mechanical seal failure	a) Replace the mechanical seal

6.0 Important Matters

1.The contents of this manual are subject to change without notice.

2.Under the condition of proper selection and correct use, the user can get three guarantees for one year for the pump.

3.During the warranty period, the user will disassemble the quality problem by himself, and all consequences shall be borne by the user.

7.0 Packing List

1.One pump

2.One copy of the instruction manual

3.One copy of the certificate

Attachment: App User Manual

“Alpump”APP User Manual

1.0 Introduction

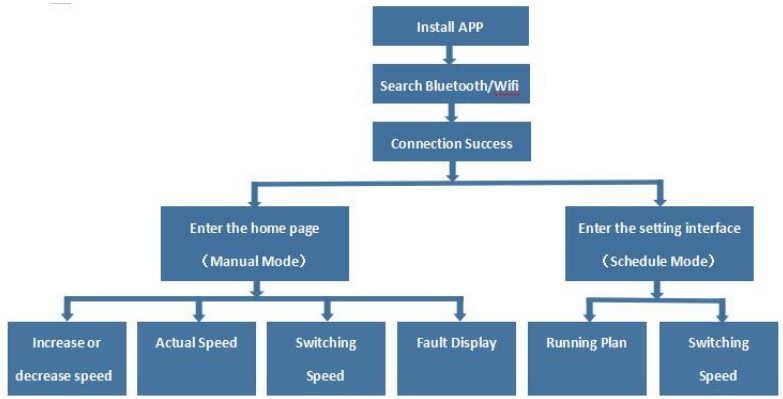
The "Alpump" APP mainly connects the mobile phone and the water pump via Bluetooth or Wiifi, so as to achieve the purpose of remote control. On this APP, you can view the operating parameters of the pump in manual and automatic modes, such as expected speed, real-time speed, and faults.

2.0 Operating environment

This APP can be used in both ios system and android system.

So far, the wifi method is only a test version.

3.0 APP APP use frame diagram

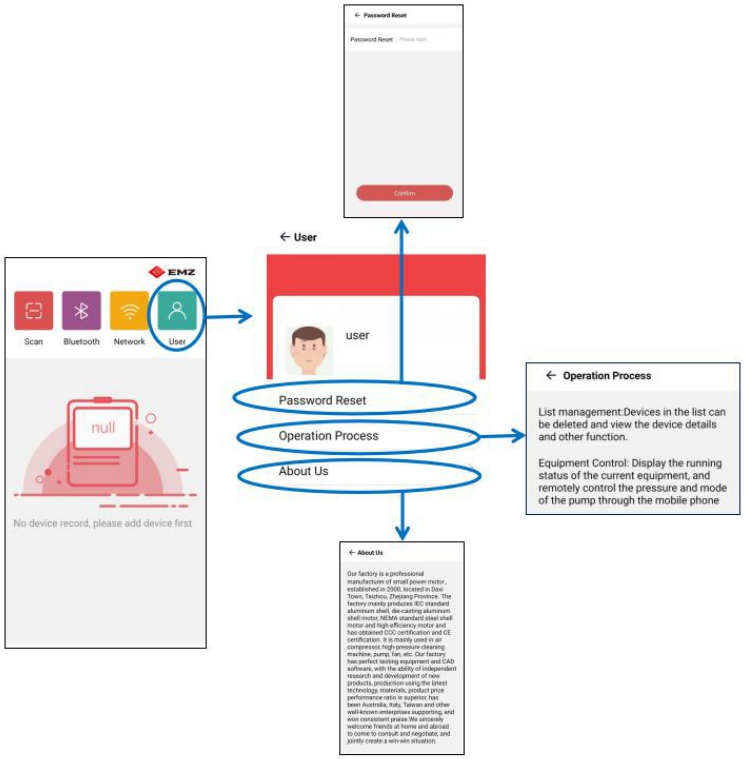


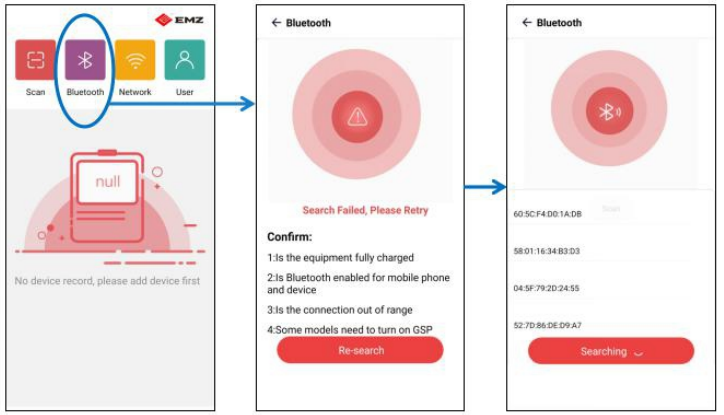
4.0 App (Bluetooth version) operating instructions

4.1 Install the application

4.2 Search Bluetooth

(1) Open the app and enter the connection interface

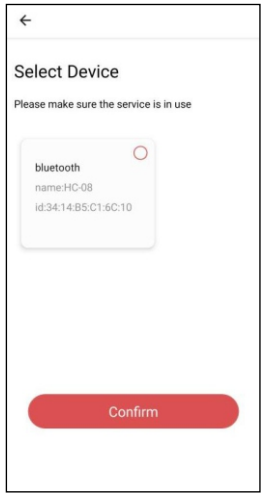




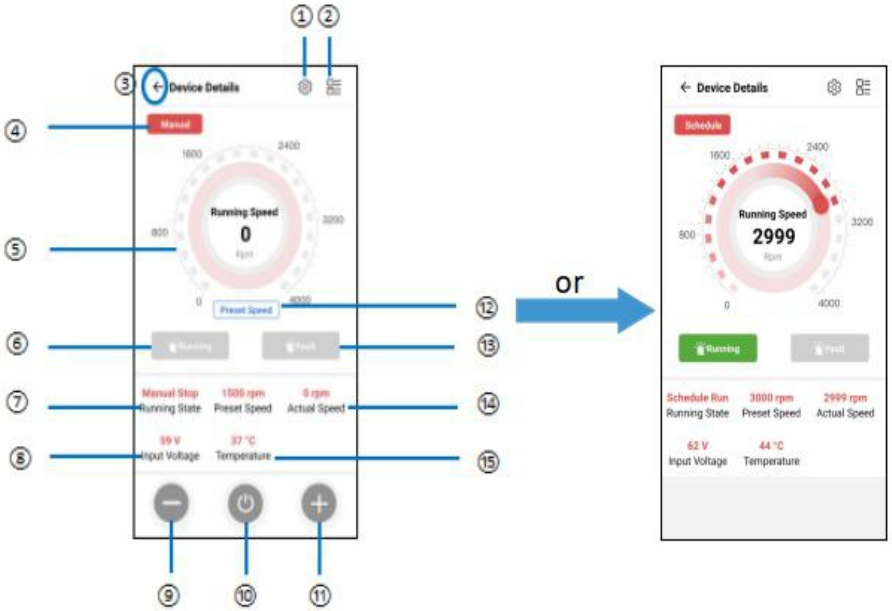
(2) Select "Bluetooth", click Re-search---Searching

4.3 Successful connection

Select the Bluetooth (Name:HC-08) that needs to be connected and click to confirm



4.4Enter the homepage (Manual or schedule interface)

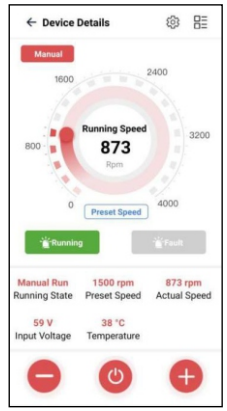


①. Here to enter the setting interface
②. View fault type
③. Return to the connection interface
④. Manual or Schedule mode
⑤. Speed display panel: can display the current running speed
⑥. The Running light turns green, indicating that it is running
⑦ . Operation status display (manual stop/manual operation/automatic stop/automatic operation)
⑧. Input voltage
⑨. Decrease speed (the speed is reduced by 50 rpm every time you press it)
⑩. Power button: turn on or turn off the power
⑪. Increasing speed: (every press the speed increases by 50rpm)
⑫. Click and set the current desired speed
⑬. Fault display, this light turns red

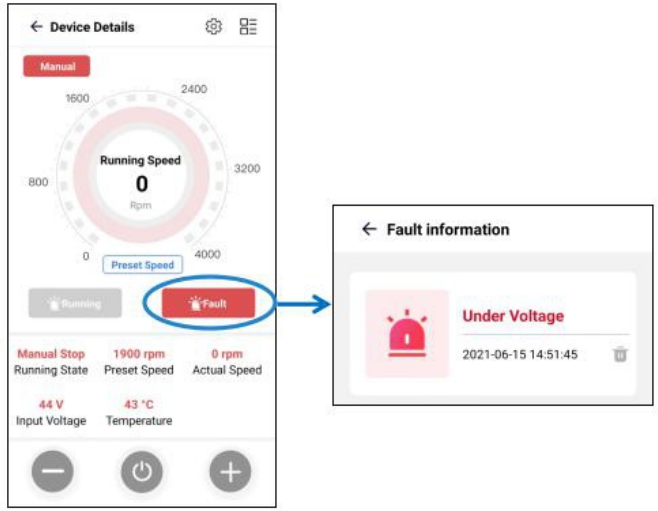
⑭. Real-time speed
⑮. IPM temperature

4.5 Manual Mode

4.5.1Normal operating interface

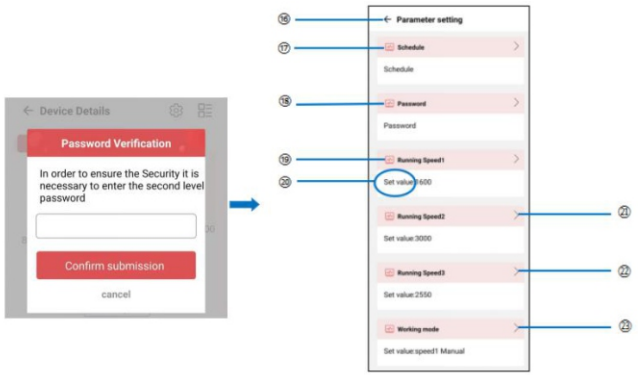


4.5.2 If a fault occurs, the fault light will turn red and the fault type can be viewed in ② (for example: undervoltage)



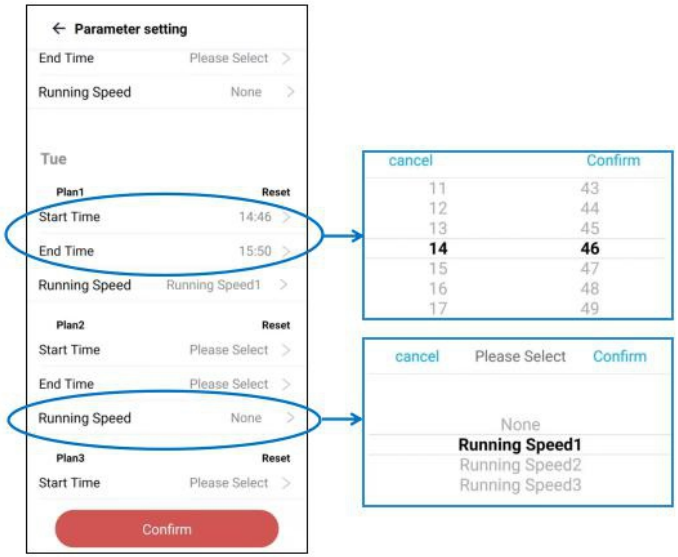
4.5.3 Runing Over

4.6 Enter the setting interface from ① to enter the password (initial password 000000), click to confirm

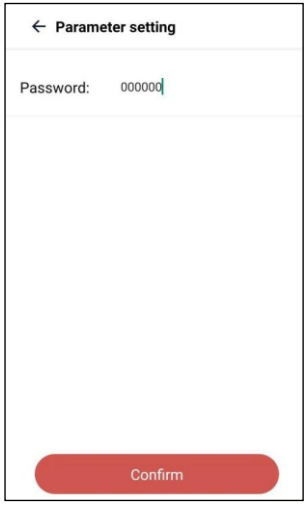


⑯. Return to Manual interface or Schedule interface

⑰. Click to enter the Schedule setting interface, three running schedules can be set every day



⑱. Password modification interface, finally click "confirm"



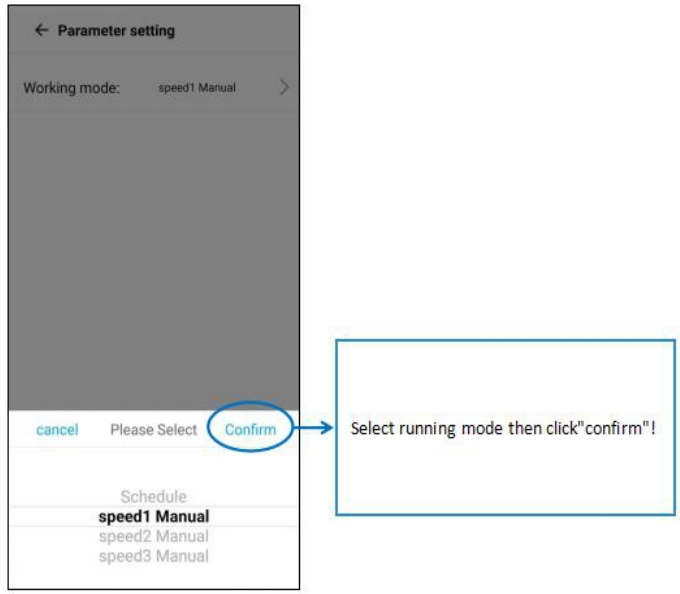
⑲.Running speed 1: You can set the value corresponding to running speed 1 in Speed1 Manual or Schedule mode

⑳. Set specific speed running value

㉑. Running speed 2: You can set the value corresponding to running speed2 in Speed2 Manual or Schedule mode

㉒. Running speed 3: You can set the value corresponding to running speed3 in Speed3 Manual or Schedule mode

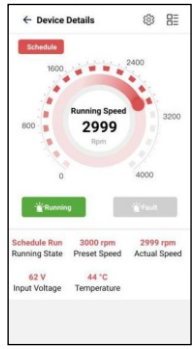
㉓ .Working mode: Here you can switch the operating mode to Speed1/2/3 Manual or Schedule,



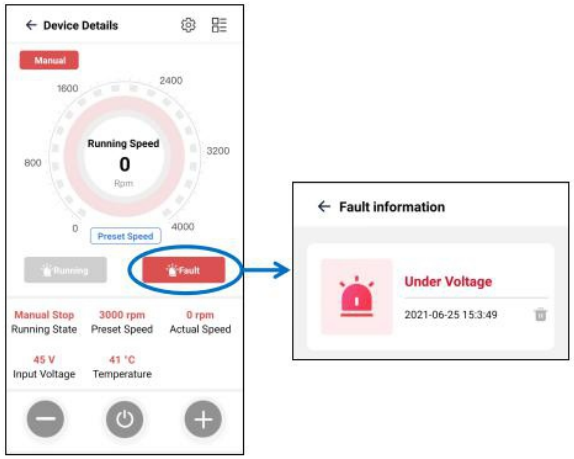
At last press"confirm"

4.7 Schedule Mode

4.7.1Normal Running Interface



4.7.2 If a fault occurs, the fault light turns red, the Schedule mode is switched to Manual mode, and the fault type can be viewed in ② (same as Manual mode)



4.7.3 After running, switch to Manual mode

Tips::

1) Enter the setting interface in Manual mode, the pump stops, and returns to the home page to continue running; if the setting parameters are returned to the home page, the pump stops and needs to be restarted;

2) In Schedule mode, enter the setting interface, the pump stops and switch to Manual mode, return to the home page, the pump continues to run and automatically switches to Schedule;

3) If you need to stop the machine in Schedule mode, you can switch to Speed1/2/3 Manual mode in the APP setting interface;

4) The effective range of Bluetooth must be within 10 meters of the pump.