Pump & Filter Manual

MASTER EDITION 2025

Residential Models 16 ft | 20 ft | 24 ft Drop-Stitch Inflatable Pool System

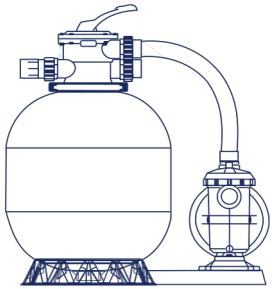
44729 Morley Drive | Clinton Township, MI 48038 | (800) 941-3340 | info@theperfectpoolco.com |

www.theperfectpoolco.com

Rev 1.2 Effective January 1 2025

PLASTIC COTTON BALL FILTERS SYSTEM
OWNER'S MANUAL

Model: TPPC21F



1 HOW IT WORKS

The filter uses special filter cotton ball to remove dirt particles from pool water. The filter cotton ball is loaded into the filter tank and functions as the permanent dirt removing media. The pool water, which contains suspended dirt particles, is pumped through your piping system and is automatically directed by the patented filter control valve to the top of the filter tank. As the pool water is pumped through the filter cotton ball, dirt particles are trapped by the cotton ball bed, and filtered out. The cleaned pool water is returned from the bottom of the filter tank, through the control valve and back to the pool through the piping This entire sequence is continuous and automatic and provides for total recirculating of pool water through your filter and piping system.

After a period of time, the accumulated dirt in the filter causes a resistance to flow, and the flow diminishes and the reading of pressure gauge rises. This means it is time to clean (backwash) your filter. With the control valve in the backwash position, the water flow is automatically reversed through the filter so that is directed to the bottom of the tank, up through the cotton ball, flushing the previously trapped dirt and debris out the waste line. Once the filter is backwashed (cleaned) of dirt,the control valve is manually positioned to Rinse, and then positioned to Filter to resume normal operation.

2 INSTALLATION

Only simple tools (screwdriver and wrenches), plus pipe sealant for plastic adapters, are required to install and/or service filter.

1. The filter system must be placed on level, very firm, ground. Position the filter so that the piping connections, control valve and winter drain are convenient and accessible for operation, service and winterizing.
2. Assemble the Pump to the platform base. The adapters must now be installed to connect the pump/filter system.

a. Apply Teflon pipe sealant tape or Permatex No. 2 sealant to straight adapter. Screw adapter into pump discharge port. (Do not over tighten.)

b. Apply Teflon pipe sealant tape or Permatex No. 2 sealant to elbow adapter. Screw adapter securely into opening in control valve marked PUMP. (Do not over tighten.)

3. Loading cotton ball media. Filter cotton ball media is loaded through the top opening of the filter.

a. Loosen flange clamp and remove Filter Control Valve (if previously installed).

b. Cap internal pipe with cotton ball shield to prevent cotton ball from entering it. Be sure pipe is securely in place in bottom under drain hub.

c. We recommend filling tank approximately 1/2 way with water to provide a cushioning effect when the filter cotton ball is poured in. This helps protect the under drain laterals from excessive shock. (Be sure the winter drain cap is securely in place on drain pipe.)

NOTE

Check to confirm all laterals are in the down position before loading with cotton ball. (See Figure in Page 2.)

d. Carefully pour in correct amount and grade of filter cotton ball, as specified. (Be sure center pipe remains centered in opening.) Cotton ball surface should be leveled and should come to about the middle of the filter tank. Remove cotton ball shield from internal pipe.

4. Assemble Filter Control Valve to filter tank.

a. Place valve flange clamp around neck of tank. Do not tighten. Wipe filter flange clean.

b. Insert Filter Control Valve (with valve/flange O-ring in place) into the tank neck, taking care that the center pipe slips into the hole in the bottom of the valve. Place clamp around valve flange and tank flange just enough so that the valve may be rotated on tank for final positioning.

c. Carefully screw pressure gauge, with pipe tape, into 1/4 tapped hole in valve body. Do not over tighten.

d. Place hose clamps on clear hose and fit hose over straight and elbow adapters and secure with clamps. If it is difficult to fit hose over adapters, place hose in hot water for several minutes. Connect pump to control valve opening marked PUMP according to instructions. After connections are made,tighten valve flange clamp with screwdriver, tapping around clamp with screwdriver handle to help seat valve flange clamp.

NOTE

To prevent breakage and damage to pump and control valve, use only pipe sealants specifically formulated for plastics. Do not over tighten fittings or adapters.

5. Connect pool return line to control valve opening marked RETURN. Complete suction line and waste plumbing connections.

6. Refer to Pump Owners Guide for electrical connections.

7. Check all connections including winter drain cap for leaks.

3 INITIAL START-UP OF FILTER

1. Be sure correct amount of filter cotton ball media is in tank and that all connections have been made and are secured.

2. Depress control valve handle and rotate to BACKWASH position. (To prevent damage to control valve seal, always depress handle before turning.)

3. Prime and start pump according to pump instructions (be sure all suction and return lines are open), allowing the filter tank to fill with water.

NOTE

All suction and discharge valves must be open before operating the filter system. Failure to do so could cause severe personal injury and/or property damage. Once water flow is steady out the waste line, run the pump for at least 2 minutes. An initial backwashing of the filter is recommended to remove any impurities or fine cotton ball particles in the cotton ball media.

4. Turn pump off and set valve to RINSE position. Start pump and operate until water in sight glass is clear-about to 1 minute. Turn pump off, set valve to FILTER position and restart pump.Your filter is now operating in the normal filter mode, filtering particles from the pool water.

5. Adjust pool suction and return valves to achieve desired flow. Check system and filter for water leaks and tighten connections, bolts, nuts, as required.

6. Note the initial pressure gauge reading when the filter is clean. (It will vary from pool to pool depending upon the pump and general piping system.) As the filter removes dirt and impurities from the pool water, the accumulation in the filter will cause the pressure to rise and flow to diminish. When the pressure gauge reading is 8-10 PSI (0.55-0.69 BAR) higher than the initial "clean" pressure you noted, it is time to backwash (clean) the filter (see BACKWASH under Filter Control Valve Functions).

NOTE

During initial clean-up of the pool water, it may be necessary to backwash frequently due to the unusually heavy initial dirt load in the water.

NOTE

To prevent unnecessary strain on piping system and valves, always shut off pump before switching Filter Control Valve positions.

To prevent damage to the pump and filter and for proper operation of the system, clean pump strainer and skimmer baskets regularly.

4 BACKWASHING

The function of backwashing is to separate the deposited particles from filter media grains and flush them from the filter bed.
Backwashing is achieved by reversing the flow of water through the filter bed at a fairly high flow rate. This high flow rate expands the filter bed and the water collects the debris taking it to waste.

1.CONDITIONS FOR BACKWASHING:-

Time for backwashing is determined by the following conditions:

1. The flow rate through the filter bed decreases until it is insufficient to meet the demand.
2. The removal efficiency of the filter bed decreases to the point where the effluent quality deteriorates and is no longer acceptable.
3. When the pressure gauge reading is 50 kPa (7.2 psi) higher than the start up pressure.
4. If the filter is connected to mains water, pressure rise is not an accurate indicator as mains pressure tends to fluctuate. It is best to rely on the actual flow rate.

NOTE

Recommends that you backwash a swimming pool cotton ball filter in a residential installation at least once a month.

2. IMPORTANCE OF BACKWASHING

The importance of backwashing cannot be overstated. Dense filter media can become "packed" without proper and frequent enough backwashing. Debris will remain trapped and create channeling within the filter bed.

This will result in the filter bed exhausting early. Moreover, if debris is not flushed from the media grains,the filter bed will become dirtier and dirtier as time goes on until the filter operation fails.

3. BACKWASHING INSTRUCTIONS:

3.1 Switch off the Pump / Close the Inlet Valve.

NOTE

If a pump is installed, switch the pump on and off, instead of closing and opening the Inlet Valve.

3.2 Release the filter's pressure by loosening Pressure Release Valve until the Pressure Gauge needle drops to zero <0>.

3.3 Retighten Pressure Release Valve.

3.4 Depress and turn Handle 180°C to the BACKWASH position.
In the BACKWASH position,the water flow is automatically reversed through the filter so that it is directed to the bottom of the filter vessel,up through the cotton ball,flushing the previously trapped dirt and debris out the waste line.

3.5 Switch on the Pump / Open the Inlet Valve. Backwash water will flow out through drain pipe.

3.6 When the backwash water in the sight glass appears clear, Switch off the Pump / Close the Inlet Valve.

3.7 Depress and turn the handle to the RINSE position.
In the RINSE water flow is directed through the filter bed and out of the filter through the backwash outlet.
This process settles the filter media bed into place and ensures any dirt or debris is rinsed out of the filter,preventing possible return to the pool.

3.8 Switch on the Pump / Open the Inlet Valve. Rinse water will flow out through the drain pipe.

3.9 When the rinse water in the sight glass appears clear. Switch off the Pump / Close the Inlet Valve.

3.10 Depress and turn the handle to the Filter position and Switch on the Pump / Open the Inlet Valve for normal operation.

5 MAINTENANCE

The filter media will only require replacement once it has reached the limits of its designated life.Refer to the product information of the particular filter media used.

To ensure the maximum life of the selected filter media, please follow the procedures below:

1. Backwash the filter regularly according to the instructions set under "Backwashing".
2. Refer to the specifications of the filter media used and implement regeneration procedures accordingly.
3. Maintain a correct chemical balance your pool / spa water. The chemical balance of water is a relationship between its Ph, total alkalinity, calcium hardness and water temperature. The water must be maintained at all times to the following:

PH LEVEL: BETWEEN 7.2 & 7.8.

TOTAL ALKALINITY: BETWEEN 80 & 150ppm.

CALCIUM HARDNESS: BETWEEN 150 & 300ppm.

And within these tolerances be balanced to the Langelier Saturation Index within a range of -0.2 to +0.2.

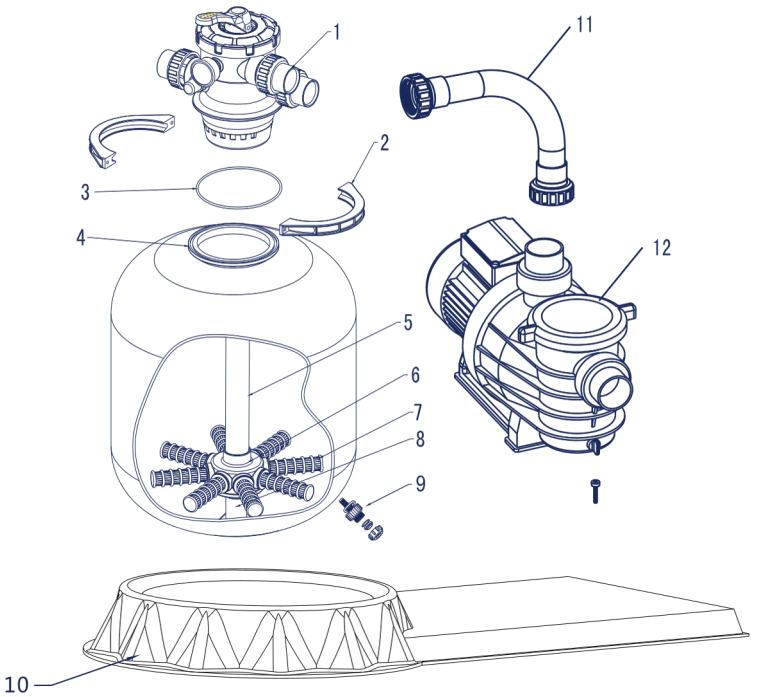
NOTE

Testing kits are available to test the water yourself or alternately bring a sample of the water to a professional pool and spa shop.

4. Mains water and rural water supplies need to be monitored. Saturation (life) in mains water or bore (rural) will vary depending on water quality.
5. To prevent damage to the pump and filter and for proper operation of the system, clean pump strainer and skimmer baskets regularly.
6. Replace the pressure gauge if faulty readings are observed.

6 REPLACEMENT PARTS

ID	CODE	DESCRIPTION	QTY	ID	CODE	DESCRIPTION	QTY
1	01-05	Multiport Valve 1.5"	1	5	02-09036	PVC pipe	1
2	01-0505	Valve Clip-L	1	6	02-0107	Lateral Assembly	1
	01-0506	Valve Clip-R	1	7	02-0108	Lateral	8
	01-0507	Screw	2	8	02-0112	Support pipe	1
	01-0112	Nut	2	9	02-0111	Drain	1
3	02-0901	O-ring	1	10	02-0110	Filter Support Stand 350~550	1
4	02-09031	14" Tank	1	11	04-0103	Hose	1
	02-09032	16" Tank	1	12	04-08	Pump	1
	02-09033	18" Tank	1				
	02-09034	21" Tank	1				
	02-09035	25" Tank	1				



7 TECHNICAL APPENDIX

1. INSTALLATION INSTRUCTIONS

The installation of the valve is carried out by screwingor sliping in, of the available connections according to the installation scheme.

NOTE

It is recommended to use adapter unions. Maintenance works and replacement are also easier by using adapter unions.

2. FUNCTION AND INSTALLATION SCHEME

I. Filtration of medium (i.e. water)

Pool → pump → valve (to filter) → filter → valve (from filter) → pool

II. Drainage of pool wtih pump

Pool → pump → valve → canal

III. No circulation

Do not operate pump.
Pool → pump → valve

IV. Cleaning of filter medium (i.e.cotton ball) in upstream (reserved flow in filter)

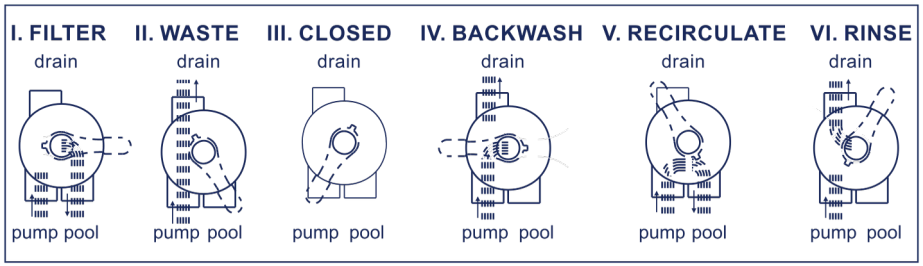
Pool → pump → valve (from filter) → filter → valve (to filter) → waste

V. Recirculation of fluid without filter (by pass filter)

Pool → pump → valve → pool

VI. Cleaning of filter medium (i.e.cotton ball) after backwash

Pool → pump → valve (to filter) → filter → valve (from filter) → waste



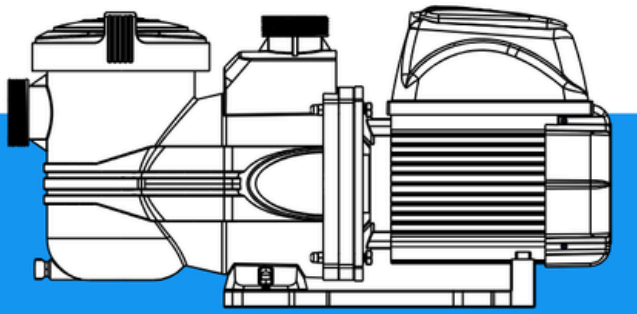
8 WARNING

NOTE

1. This filter operates under high pressure. When any part of the circulating system (e.g., clamp, pump, filter, valves, etc.) is serviced, air can enter the system and become pressurized . Pressurized air can cause the lid or valve to be blown off which can result in severe injury, death, or property damage. Do not unscrew screws of flange clamp while filter operating.
2. Turn pump off before changing valve position.
3. To prevent damage to the pump and for proper operation of the system, Clean pump strainer and skimmer baskets regularly.

HLVSP SERIES

VARIABLE SPEED PUMP MANUAL



HLVSP100QW

HLVSP150QW

HLVSP200QW

HLVSP100QWU

HLVSP150QWU

The information in this paper instruction manual may not show the latest status of the product. In order to obtain the most accurate and latest product information, please contact our after-sales service department to obtain the electronic version of the manual. Thank you for your understanding and support.

1 PRODUCT INTRODUCTION

HLVSP series pump is designed for the filtration of small and medium swimming pool, fountain, spa, aquaculture and water park.

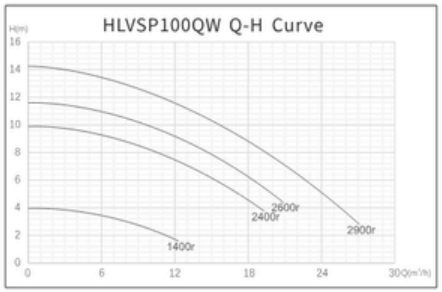
2 PRODUCT BASIC PARAMETERS

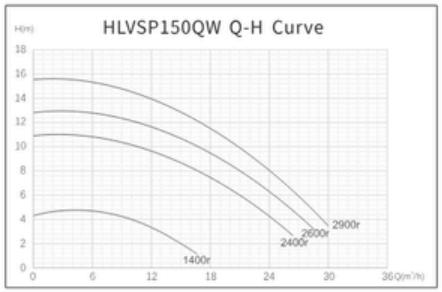
Self-priming height: 2.5m;
Ambient temperature: 5-45°C;
Liquid temperature:5-50°C.

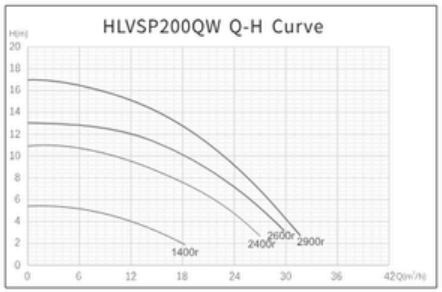
2.1 TECHNICAL PARAMETERS TABLE

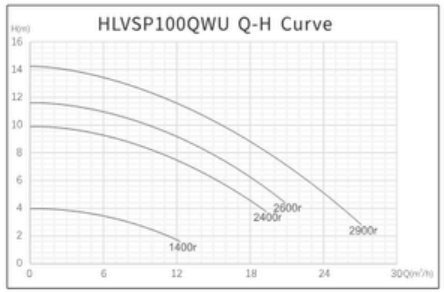
Model	Voltage (V)	RPM (r/min)	Horse power (HP)	Connection size	Advised pool volume (m^3)
HLVSP100QW	220-240V 50/60Hz	1000-2900	1	2"/63mm	60-90
HLVSP150QW	220-240V 50/60Hz	1000-2900	1.5	2"/63mm	80-120
HLVSP200QW	220-240V 50/60Hz	1000-2900	2	2"/63mm	100-150
HLVSP100QWU	110-120V 50/60Hz	1000-2900	1	2"/63mm	60-90
HLVSP150QWU	110-120V 50/60Hz	1000-2900	1.5	2"/63mm	80-120

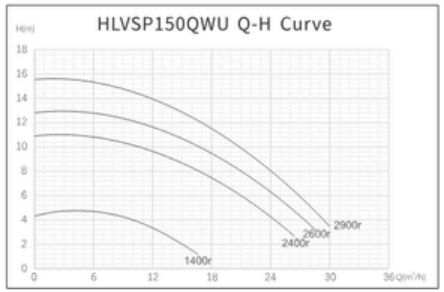
2.2 Q-H CURVE







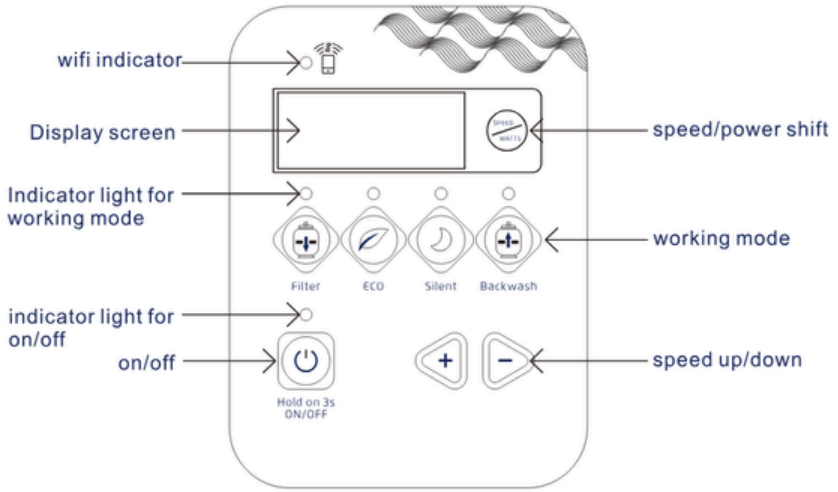




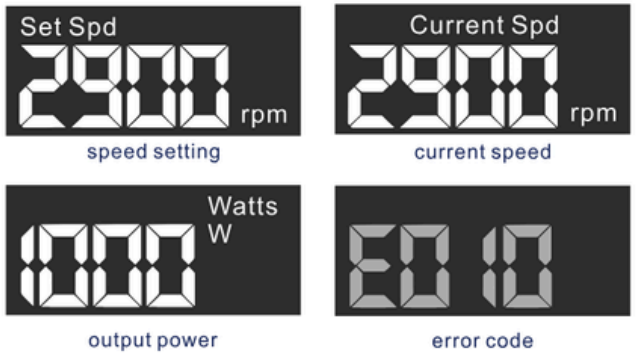
Model	Max. Flow (m^3/h)	Max. Head (m)	Head		
			8m	10m	12m
			Flow Rate (m^3/h)		
HLVSP100QW	27	14.5	20	16	11
HLVSP150QW	30	16	24	21	17
HLVSP200QW	33	17	26	23	20
HLVSP100QWU	27	14.5	20	16	11
HLVSP150QWU	30	16	24	21	17

3 PRODUCT OPERATION INSTRUCTION

Control panel.



3.1 DISPLAY SCREEN



3.2 INDICATOR LIGHT

Indicator light	Description
Wi-Fi indicator flashing green	The device enters the pending network mode and can be configured through the APP.
WiFi indicator is always green	The device is networked.
Wi-Fi indicator is always red	The device network is abnormal/the device is offline.
On/off indicator light is always red	The device is powered on and enters standby mode.
On/off indicator light is off	The device is powered off.
On/off indicator light is always white	The device is powered on and enters working state.
The mode indicator is always white	If the mode indicator is always on, it means the device has entered this working mode.

3.3 PUMP FUNCTION

Working Mode:
There are 4 pre-set working modes, they are Filter, ECO, Silent and Backwash.

Working Mode	Description
Filter	The pump's speed will be converted to 2900r/min within 40 seconds.
ECO	The pump's speed will be converted to 2600r/min within 40 seconds.
Silent	The pump's speed will be converted to 2400r/min within 40 seconds.
Backwash	The pump first runs at 2900r/min for 15s and then falls back to 2400r/min.

Speed adjustment function:
Short press "◀▶" ,the speed will be increased or decreased by 50r/min; Long press "◀▶", the speed will be increased or decreased by 100r/min.

Speed/Power shift:
Press " ", the screen will show the current speed or output power.

On/Off:
Long press " " for 3s, the pump will be on or off.

Self-priming:
After the pump starting, it will self-prime 2 minutes at a speed of 2900 rpm, and then enters to preset mode or custom speed.

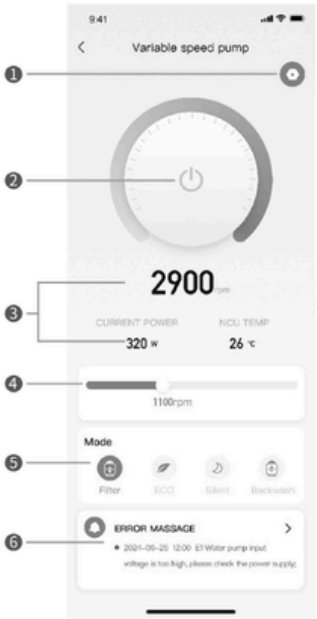
WIFI network configuration/Cancel WIFI network configuration:
Long press and hold button "◀▶" for 3s, after the device buzzer beeps twice, it enters the pending network configuration mode, and then complete network configuration settings from the app.

3.4 APP DOWNLOAD

Search "tuya" on Google Play or App Store to download it.

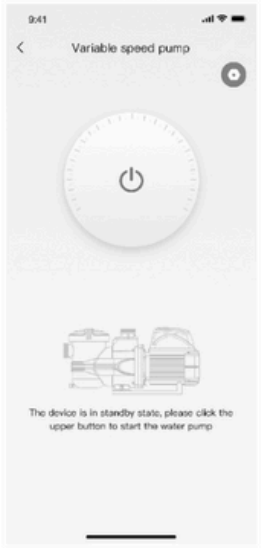
3.5 APP FUNCTION

Home Dashboard



1. Click the menu button to enter the secondary page（pump information , time setting.）
2. Click to turn the pump on/off.
3. View real-time data on current speed, power, and water temperature.
4. Press and slide the slider left and right to control the speed(RPM).
5. 1. Click the Filter mode, the pump will be converted to 2900r/min within 40 seconds.
   2. Click the ECO mode, the pump will be converted to 2600r/min within 40 seconds.
   3.Click the Silent mode, the pump will be converted to 2400r/min within 40 seconds.
   4. Click the Backwash mode, the pump will first run at 2900r/min for 15 seconds, and then fall back to 2400r/min.
6. Click the "ERROR MESSAGE" to check the details.

Shutdown page



Menu secondary page

1. Click the Back icon to return to the previous page.

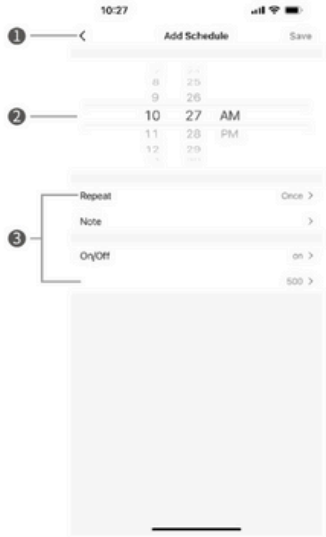
2. 1.Click the **Timer Setting** to enter the page and set the working time for the pump.
   2.Click the **Energy Consumption Curve**, and a pop-up window will appear at the bottom to view the daily and monthly 0-24h energy consumption.
   3. Click on the **Power-on Working Mode**, and a pop-up window will appear at the bottom to set the power-on working mode to "power-on start" or "power-on standby".

Timer Setting Page

1. Click the Back button to return to the previous page.

2. Click the **Add** button to add a timing schedule.

Timer Setting Page

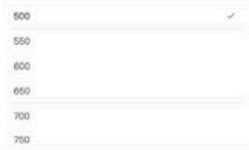


1. Click the Back button to return to the previous page Click **Save** to save the timing.

2. Scroll up and down to select specific times.

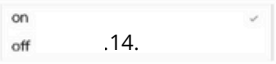
3. Click Repeat or the arrow to enter the third-level page, set the execution rules for the timer, and check or uncheck.

Click the Note or arrow to enter the third-level page, make notes for the timer, click **Save** to generate the notes immediately, and click **Cancel** to return to the previous page.



Click the current speed or arrow t to enter the third-level page and adjust the speed of the timer.

Click the ON/OFF or the arrow to enter the third-level page to turn the pump on and off.



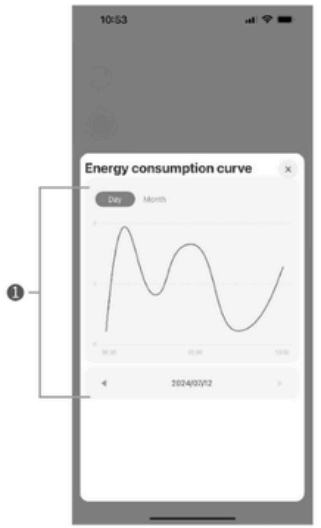
Timing page added

1. Click the Back button to return to the previous page

2. View the content of the timer settings.
   Use sliding to turn on and off the timer.
   Slide left to delete the unnecessary time plans.

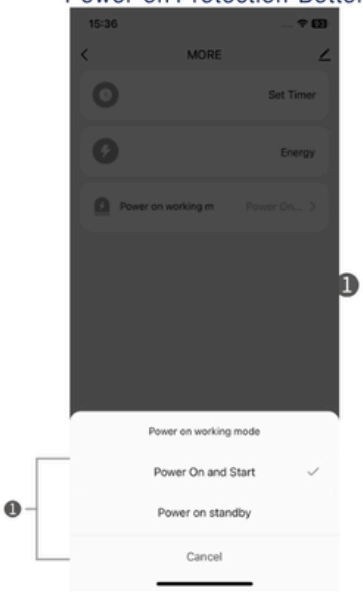
3. Click the "Add Schedule" button at the bottom of the screen to add a new timer schedule.

Energy Consumption Curve Page



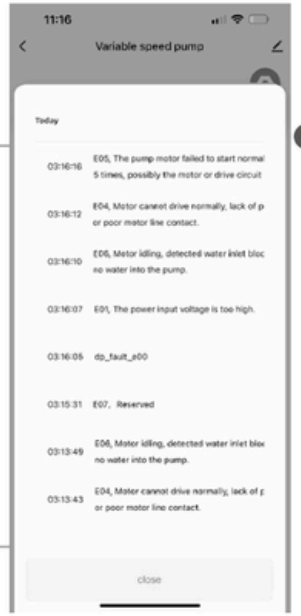
1. 1. Click the top right button in the pop-up window to exit the energy consumption curve data page.
   2. You can click on "day" or "month" on the curve chart to switch time, and click on the curve in the table to display specific energy consumption data.

Power-on Protection-Bottom Pop-up



1. Click “Power-on Start” or “Power-on Standby” to set the function of power-on working mode.
   Click Cancel or the black area to return to the previous level.

Error message

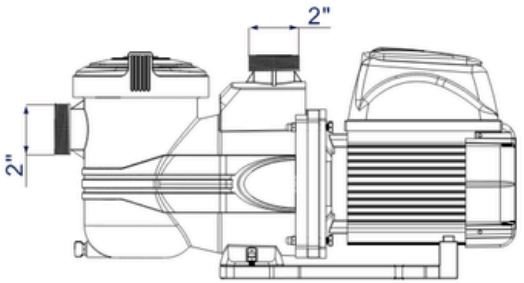


1 Click "Error message" on the first-level page to enter the pop-up window at the bottom to view detailed error .
Click the close button or the black area to return to the previous page;

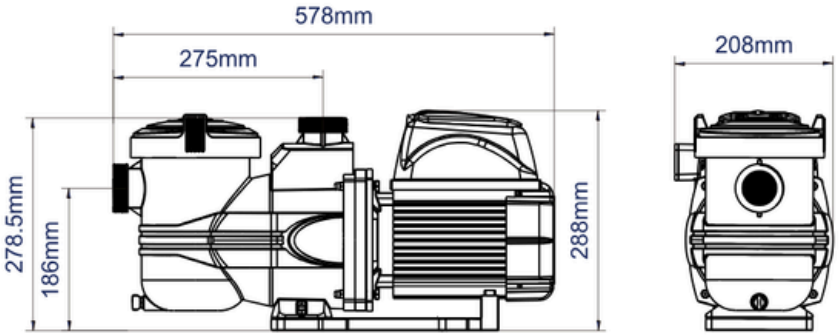
4 PRODUCT STRUCTURE AND DIMENSIONS

4.1 CONNECTION SIZE (INLET/OUTLET)

The pump comes with 2" connection.The user can use water pipe adapters to match different sizes of pipes.



4.2 PRODUCT DIMENSION



5 INSTALLATION

1. The pump needs to be installed on a flat and solid surface and fixed with hex bolts.
2. The pump inlet and outlet must be aligned with pipes, and there should be no misconnection.
3. The pump outlet pipe needs to install check valve.
4. The pump inlet and outlet pipes should be fixed to avoid damage to the pump caused by the vibration of the pump.
5. The pump cannot be installed above the water surface 2M.
6. Sufficient space should be reserved around the water pump for water discharge.

6 TROUBLE SHOOTING

Error code	Reason of Error	Remark & Solution
E001	overvoltage protection	Pump input voltage too high, check the power supply
E002	Low voltage protection	Pump input voltage too low, check the power supply
E003	over temperature protection	The IPM module temperature exceeds the protection threshold and causes shutdown.
E004	Phase failure	Motor not start, check motor internal wiring if wrong connection or loosen
E005	Start up failure	Motor failed to start, check circuit if normal. The pump motor failed to start normally after repeating 5 times, maybe the morot or the driving circuit is abnormal. (Instantaneous current overcurrent, IPM Fo, excessive field-weakening input, current sampling circuit failure.)
E006	Water shortage protection	The water pump is idling. Check whether water intake is blocked or the water inlet valve is not open.
E007	Placeholder	–
E008	Overload protection	The water pump runs abnormally and the overload protection starts,the driving current exceeds the protection threshold.
E009	OTA upgrade failure	OTA upgrade failed. Restore the previous version.
E010	Placeholder	–
E011	Keypad failure	The pump key panel is malfunctioning, check whether the pump internal wiring is loose
E012	PFC protection	An unexpected loss of input power has been detected.

7 PRECAUTIONS

1. The wiring must be correctly configured according to the wiring diagram indicated in the specification, and wrong wiring may lead to safety accidents.
2. Please avoid using under the following environmental conditions:

(1) Environment with severe vibration.

(2) Near flammable objects.

(3) In an environment prone to condensation, in an environment with a relative humidity of 90% or more.

(4) Please do not store the product with external force or heavy load, and do not place heavy objects on the product, otherwise it may cause damage to the appearance of the product or damage to the device .

3. Please avoid storing in high temperature and humid places. It's recommended to store the product with a humidity of 40-60%RH and a temperature of 20-30°C for a long-term storage.
4. In case of an error, please refer to the error code prompt for troubleshooting. If you still cannot solve it, please contact the salesman.