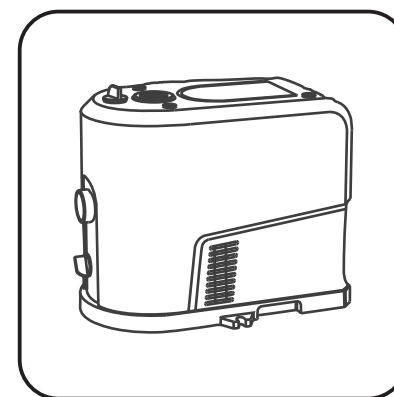




Permanent Magnet Intelligent Booster

Original Instruction Manual



MAC

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Fault	Possible causes	Solution
In constant pressure mode, the valve is closed and the pump cannot stop.	Pressure sensor failure.	Check if the pressure sensor wire is connected, replace the pressure sensor.
	Water outlet pipeline leakage.	Detect if there is a leak in the outlet pipeline.
The static water temperature is lower than 5°C, but the antifreeze protection fails to be activated.	Pressure sensor failure.	Check if the pressure sensor cable well connected or replace the pressure sensor.
The pump will not start if below the start-up pressure	Pressure sensor failure.	Check if the pressure sensor cable well connected or replace the pressure sensor.

Note:

1. The drawings in this manual are schematic diagrams. The electric pump and accessories you purchased may differ from the illustrations in this manual. Understanding is appreciated if any inconveniences occur.
2. The performance of this product is being constantly improved. All products (including appearance and color, etc.) are subject to the actual product and are subject to change without prior notice.

Fault	Possible causes	Solution
The motor can't start or power-on	Cables are of poor contact or broken.	Check the terminal block connector or replace with new cable.
	Controller is broken.	Replace the controller.
	Stator winding burnout.	Replace the winding coil(sent to the maintenance center).
	Circuit board burned down.	Replace the controller (sent to the maintenance center).
The motor can work but without discharging water	The pump is rotating in the wrong direction.	Check the rotation direction of motor.
	The pump is not filled with water.	Refill the pump.
	Impeller damage.	Replace the impeller (sent to the maintenance center).
	Suction pipe leaking.	Check the sealing of each joint of the inlet pipeline.
	Water level is too low.	Adjust the pump installation height.
	The pump check valve is stuck.	Check if the check valve is stuck.
	The whole pump is leaking.	Determine whether the product is leaking or which part is leaking by gas test or water test.
	Inlet pipe leaking.	Check if the pipeline is properly installed.
Vibration of the pump	bottom valve is not open or blocked.	Check if foot valve is free with obstructions.
	There are foreign objects in the pipeline or pump chamber.	Tighten the anchor bolt.
	Base is poorly stabilized.	Check, clean the pipes and pump runner system.
The motor pump continues to work or the stator winding burns out	Motor overrun for a long time.	Mounted on a stable base.
	Impeller stuck or overloaded for a long time.	Install valves at the water outlet to reduce water output.
	Grounding error or cable breakage, electric pump is struck by lightning.	Remove debris from the pump chamber and try to make the pump work at rated flow.
Water leakage	Debris wears mechanical seal out.	Investigate the reason, replace the winding coil.
	Pump damaged.	Clean or replace the mechanical seal.
	Bearing damaged.	Sent to the maintenance center.
	Impeller blocked.	Replace with the same type of bearing.

Always disconnect the appliance from the supply before assembling, disassembling or cleaning.

Appliances can be used by persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and if they understand the hazards involved.

Children shall not play with the appliance.

Pumps without indication that they are protected against the effect of freezing shall not be left outside during freezing weather conditions

This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved.Cleaning and user maintenance shall not be carried out by children unless they are aged from 8 years and above and supervised.

Attention!

If the appliance or the supply cord is damaged, it must be repaired by manufacturer, its service agent or qualified person.



Meaning of crossed –out wheeled dustbin:

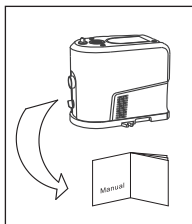
Do not dispose of electrical appliances as unsorted municipal waste, use separate collection facilities.

Contact you local government for information regarding the collection systems available.

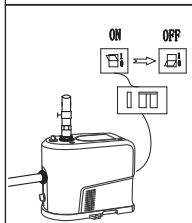


Please read this manual carefully before the installation.
The manufacturer does not bear any responsibility or compensation for any personal injury, pump damage and other property damage caused by any violation of the safety warnings.

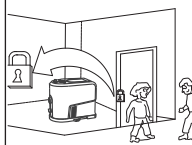
1. Safety Precautions



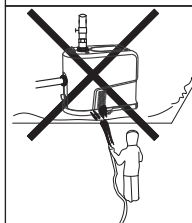
1). In order to ensure the normal and safe operation of the electric pump, please read the instruction carefully before use.



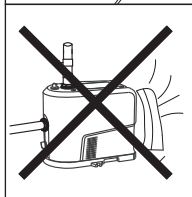
2). The electric pump should be grounded reliably to prevent leakage. For safety reasons, the leakage protection switch should be equipped. Be careful not to wet the plug. The socket connection should be in an area not affected by moisture. The pump is to be supplied through a residual current device (RCD) having a rated residual operating current not exceeding 30 mA.



3). When running, the electric pump is strictly prohibited from being touched. Do not wash, swim or put livestock in the vicinity of the working area to prevent accidents.



4). Avoid pressureful water splashing on the electric pump to prevent water from immersing in the electric pump.



5. Keep the pump ventilated.

11. Fault Code and Repair

Code	Fault	Display	Possible causes	Solution
E01	Communication Failure		1. Loose connection cable; 2. Connection line interface desoldering.	Go to the repair station for inspection and repair
E02	Stalled		1. The pump sucks the impurities and stuck the impeller; 2. Bearing damage, stuck shaft.	1. After 1 minute of power failure, disassemble the pump body part and clean up the stalled debris; 2. Send it to a professional repair station for repair;
E03	Overvoltage protection and undervoltage protection		Input supply voltage is too high or too low.	1. Check if the connection is wrong after 1 minute of power failure; 2. Contact the power sector; 3. Pump voltage selection is incorrect.
E04	Pressure sensor failure		1. Pressure sensor damage; 2. Communication cable or pressure sensor cable connection is loose; 3. Communication line or pressure sensor line connection line interface desoldering.	Go to the repair station to replace the pressure sensor
E05	Controller failure		1. Motor stall, out of step, overspeed, controller overcurrent, etc; 2. The motor cable is not connected well; 3. The internal combustion of the motor.	Go to the repair station to check and replace the controller
Null	Water shortage		1. The inlet pipe does not reach into the water; 2. The water level drops; 3. Inlet pipe leaking; 4. Check valve blocked; 5. No water supply.	1. Insert the inlet pipe into the water; 2. Lengthen the inlet pipe; 3. Check and improve the leaking part; 4. Clean up the check valve; 5. After the water is available, it can be started by itself or manually started;
Null	There is a leak in the pipe		1. The water pipe leaks; 2. The faucet is not closed.	1. Check and improve the leaking part; 2. Close the faucet.
Null	Constant pressure setting overrange		The setting value is too high or too low.	Re-adjust the settings or restore the default settings.

10.2) Maintenance

- 1). In summer or when the ambient temperature is high, please pay attention to ventilation to prevent dew on the electrical part and cause electrical failure.
- 2). If the temperature of the pump is found to be too high or abnormal, please cut off the power immediately and check the fault.
- 3). Place the pump in a safe position to prevent the pump from falling and being broken.
- 4). In the winter, if the pump is not used, the power must be disconnected, Release discharge bolt to discharge the retained water to prevent the water in the pump from freezing.

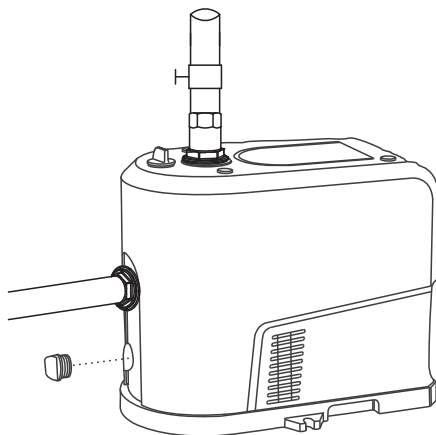


Figure 13 Water Discharge

5. After the pump starts, the pressure inside the tank should be checked regularly. The inspection method is as shown in Figure 16. If the pressure in the gas tank is lower than 1.2 Bar, the tank can be inflated by an inflator, as shown in Figure 17. The maximum pressure in the tank should not exceed 1.6 Bar, and the ideal pressure in the tank should be kept within the range of 1.4-1.6 Bar.

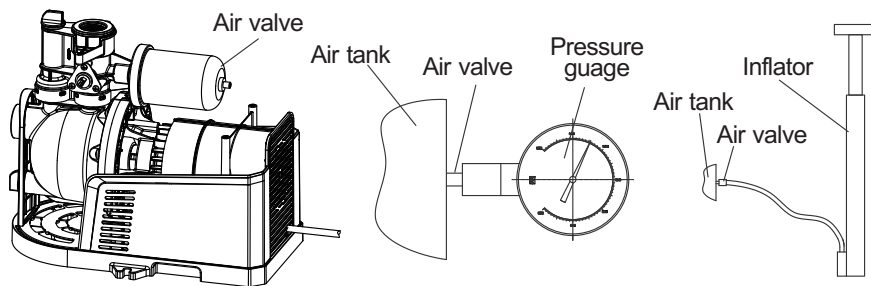
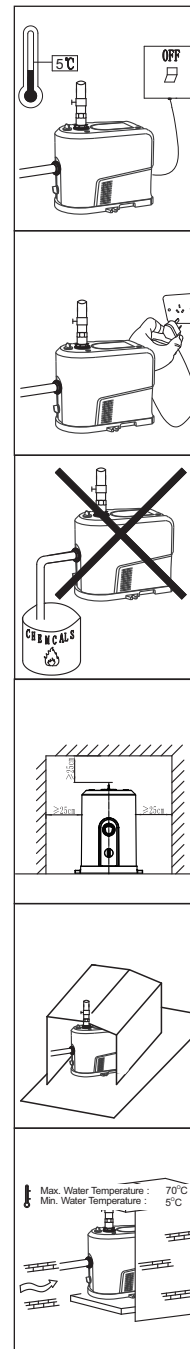


Figure 14 Schematic Diagram for Water Pump

Figure 15

Figure 16



6). When the ambient temperature is lower than 4°C and it is not used for a long time, in order to prevent the water in the pump chamber from freezing and causing damage to parts, it is better to drain the liquid in the pump chamber.

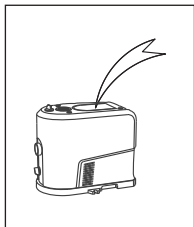
7). When installing and maintaining and ensure that the pump does not run automatically, please turn off the pump power supply before operating. A all-pole disconnection must be connected to the power supply terminal, and (the switch) the contact gap of each pole should equipped with all-pole disconnection under Class III conditions.

8). The pump shall not transfer any flammable, easily vaporized or explosive liquid beyond the specified limits.

9). The pump is installed in a place that is convenient for maintenance and inspection. Keep dry and ventilated. When installing the pump in a narrow place, install it as shown in the figure in order to facilitate heat dissipation.

10). The pump cannot in water. When the pump is installed outdoors, it is necessary to have suitable coverings to prevent sun and rain.

11). Avoid using the pump at too high or too low a water temperature.



12). Power supply according to the voltage marked on the nameplate; when not in use for a long time, it should be stored in a dry, ventilated and cool place.

2. Product Introduction

The MAC series product is a permanent magnet constant pressure pump. The pump equips automatic function, memory function, stall protection function, over-voltage protection function, temperature abnormal reminder, waterless protection and other functions, high efficiency and energy saving, variable frequency speed regulation, providing users with a stable, safe and comfortable water-consuming environment.

3. Application Environment

It can be used for living water supply, equipment matching, pipe pressurizing, high buildings, central air-conditioning and concentrated heating circulatory systems etc.

It can only be used for transferring clean water and other low-viscosity and erosion-free liquids. It cannot be used to transfer liquids that are inflammable, explosive, easy for evaporation and the liquid should not contain any solid particles or fibers. The supply medium shall have a PH value of 6.5-8.5.

Ambient temperature 5~40°C°C;

Medium temperature 5~70°C;

The volume ratio of solid impurities in the medium should not exceed 0.1%, and the particle size should not be larger than 0.2mm.

4. Performance Parameters

Model	MAC350	MAC450
Input voltage	220~240V(50/60Hz)	220~240V(50/60Hz)
Power	350W	450W
Maximum speed	5200rpm	6000rpm
Maximum rated current	3A	4A
Maximum flow	4m³/h	4.5m³/h
Maximum head	30m	40m
Maximum self-priming height	6m	6m
Constant pressure adjustment range	15-40m	15-50m
Maximum noise	58dB	58dB

9. Electrical Connection



Do not wire the controller unless the power is off.
The electric pump should be grounded reliably to prevent leakage and should be equipped with a leakage protection switch.

Electrical connections and protection shall be in accordance with local regulations. The nameplate is marked with the working voltage specification. Please ensure that the motor matches the power supply.

If the working area of the electric pump is far away from the power supply, the power supply line should be properly thickened, otherwise the normal operation of the electric pump will be affected due to the voltage drop.

If the electric pump is used outdoors, the extension line should be rubber cable that is exclusively for outdoor use.

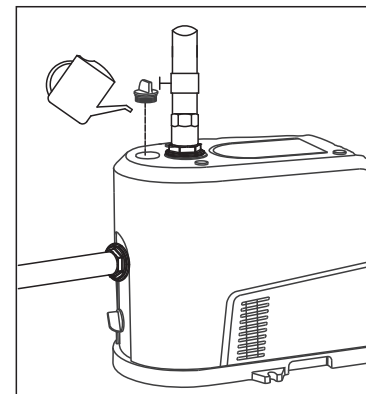
If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.

10. Startup and Maintenance



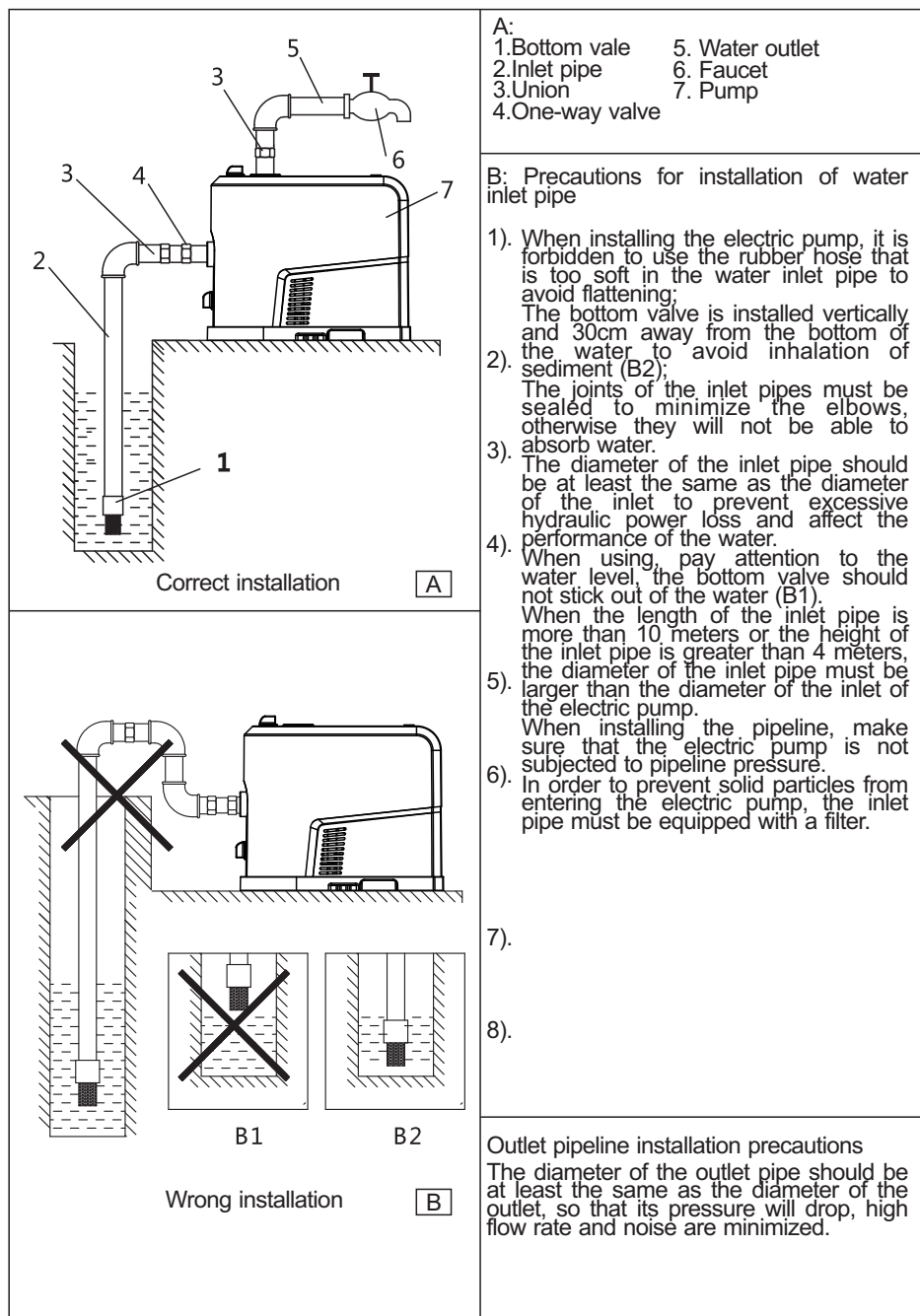
Do not start the pump until the pump chamber is filled with water
Do not remove the pump unless the water in the pump chamber is drained.

10.1) Startup



1. Do not start the pump until the pump is filled with water.
2. Unscrew the injection screw plug, fill the pump chamber with clean water. then tighten the water injection screw plug after the air is exhausted.
3. Power on according to the nameplate voltage.
4. After the pump starts, press the "+" and "-" buttons to adjust the pressure value.
5. If the suction depth of the pump exceeds 6 meters, water should be added more than once.

Figure 12 Water Injection



5. Operating Instructions

5.1. Interface Introduction

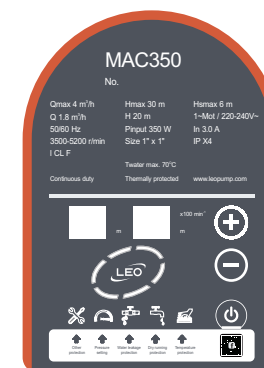


Figure 1 The Interface

The first two digits	88 m	Current pressure value; unit "m"
The last digits	88 m	Constant pressure mode
	88 x100 min ⁻¹	Manual speed control mode
Error icon		Fault, pressure setting, leakage, waterless, temperature
Power button		Running or standby
		Long press to switch between constant voltage mode and manual speed control mode.
Adjustment buttons		Switch between constant pressure mode and manual mode
Factory Defaults		Press the LEO switch button and the power switch at the same time to restore the default settings

5.2 Interface Operating instructions

a. Power On

Power on after water filled, start after 3 seconds delay, as shown in Figure 2:

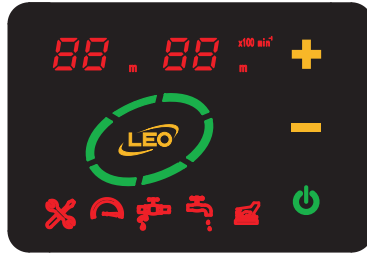


Figure 2 Startup Picture

b. Pump Operation

Around the LOGO, the green lights will be illuminated in a counterclockwise direction symmetrically, light "LEO", the yellow LOGO indicator and "+", "-" button light, the first digitals show the current pressure, the last digitals show the set pressure value (default value: 20m), the power button lights up in green, as shown in Figure 3:



Figure 3 Pump Operation

c. Set Pressure Adjustment

By tapping "+" or "-", directly adjust the constant pressure value (default value 20m), the adjustment range is: MAC350(15-40m), MAC450(15-50m), increment is 5m; Users can adjust the pressure value as necessary to meet the actual demand (the value is 30 as shown in Fig. 4). please note that the pressure value should not be too high.

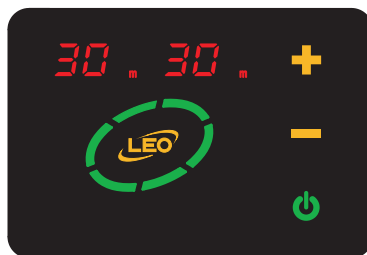


Figure 4 Set Pressure adjustment

8.2) Pipe Installation

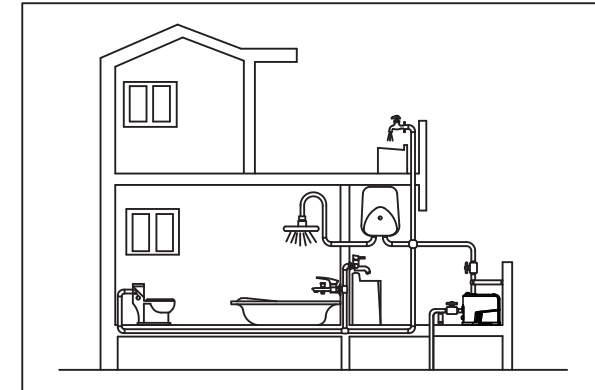


Figure 8 Direct pressure of tap water

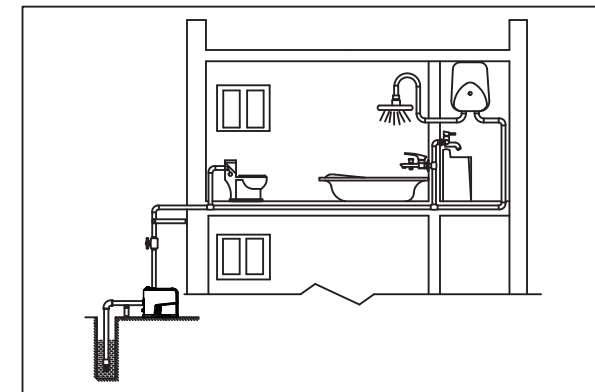


Figure 9 pumping well water to pressurize

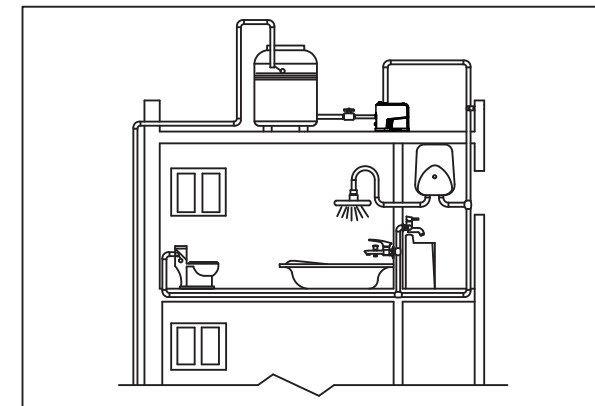



Figure 10 Indirect pressure from the roof water tower

8. Product Installation



Install and maintain this product by a person who is proficient in this manual and has a professional qualification certificate.

Installation and operation must comply with local regulations and recognized operating guidelines.

Install the pipeline properly according to the instructions, and at the same time adopt the antifreeze measures for the pipeline.

8.1) Product Size

The pump must be mounted horizontally on the floor and bolted to the solid horizontal base through the holes in the bottom plate. The dimensions are shown below.

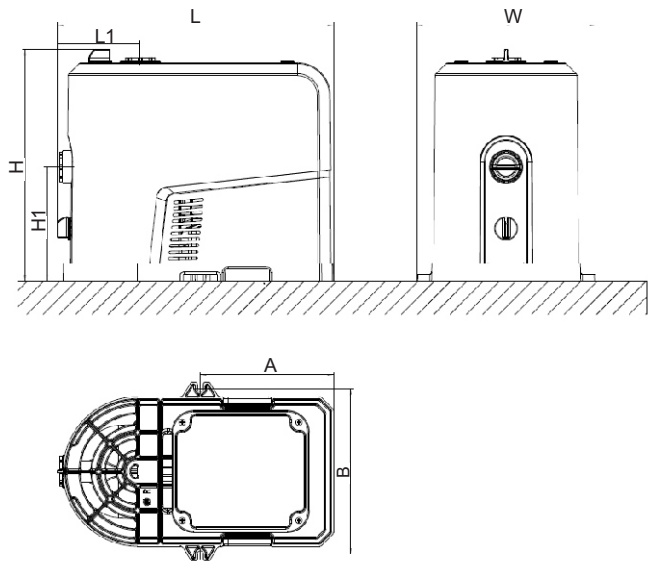


Figure 7 Dimension

Code	Dimension	Code	Dimension
L(mm)	381	H(mm)	320
L1(mm)	114	H1(mm)	158
A(mm)	183.5	W(mm)	246
B(mm)	228	Inlet/Outlet	G1

d. Do Not Use Manual Mode (Recommended)

In the case of a failure of the constant voltage mode, the manual mode can be used for the moment.

In manual mode, the pump does not stop (regardless of whether the valve is closed), intervention is required, the improper operation will accelerate the damage of pump.

e.Difference Between Manual Mode and Constant Pressure Mode

When the pump is running, tap “LEO” and the pump will switch between constant pressure and manual control mode. The main difference is the unit displayed. The display “m” is constant pressure mode, and “X100min-1” is manual control mode. As shown in the figure: the current mode is manual control, the current pump outlet pressure is 30 m, the speed is 4500 r/min;

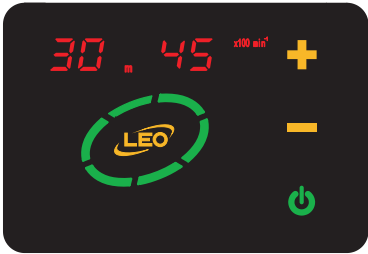


Figure 5 Manual Mode

6. Structure Introduction

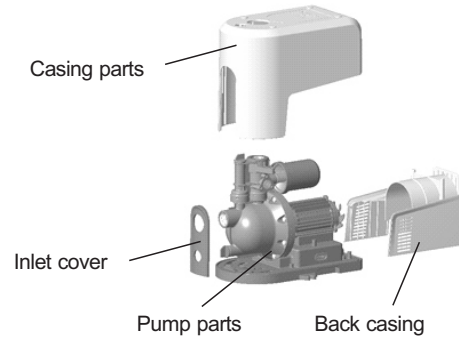


Figure 6 Structure

7. Function Description

1). Automatic function

When the user closes the valve, stops the water and the pump stops automatically;
Turn on the faucet to reach the starting pressure and the pump will run automatically.

2). Memory function

After the user sets the value, the system automatically writes it to the hardware storage.
After power off, the user's settings are not affected. The automatic save includes switch state, set value, working mode.

3). Restore default settings

Press the LEO switch button and the power switch key at the same time to restore the default settings the version number will be displayed.

4). Dry run protection and anti-cycling

4.1). Anti-cycling when water shortage

There is water in the pump chamber, no water in inlet. When the inlet lacks water, the pump will run for 6 minutes to judge whether it is waterless, if so it will stop the pump, the waterless indicator lights; the waterless indicator lights; the pump will start 2 times at 30-minute intervals, each time runs for 1 minutes; then will run into 2h-interval cycles, 1 minutes each time. If the water discharged normally, the water-free indicator light goes out and the pump runs normally. If the user needs water, manual intervention is needed, press the power button (turn green); if the user does not use water, press the power button (turn red) to prevent the pump from starting.

4.2). Dry run protection

No water in the pump chamber. When the pump runs for 7s, it detects no water, the pump stops, and the red waterless indicator flashes.

5). Leakage protection

When the user's pipeline leaks, the pump frequently pops 5 times and the leak indicator lights up, which will not affect the normal use of the pump.

6). Pressure setting protection function

When the constant pressure value is set, close the outlet valve. When the actual pressure still cannot reach the set pressure value, the water pressure indicator will light up, the set pressure of the water pump is automatically adjusted to 5 meters below the current pressure. Every 12 hours, the pump tries to automatically return to the original set value (press the adjustment button during this period cannot restore the pump to the original setting).

7). Temperature abnormal temperature protection

7.1). High temperature protection

When the controller temperature exceeds the programmed protection temperature, the temperature indicator lights up to alert the user. After the temperature is restored, it will start automatically and the indicator will go out.

7.2). Low temperature protection

When the detected temperature is lower than 5°C, the pump runs automatically and the temperature indicator lights up to remind the user that the current temperature is low.

(i) When the water temperature reaches 10°C and above, the water pump stops running, the temperature indicator is off, and the original mode is automatically restored;

(ii) When the water temperature is lower than 10 °C, the pump keeps running and the temperature indicator lights up.

8.) Communication failure

When a communication failure occurs between the display and the main control board, the fault indicator lights up, the error code E01 is displayed, and the pump stops.

9). Blocking protection function

When the pump stalls, the pump stops running, the fault indicator lights up, and the screen displays fault code E02. The pump will restart 5 times at 30 second intervals. If it is not successful, the pump stops.

10). Overvoltage and undervoltage protection functions

When the input voltage is higher than: 270V or lower than 140V, the fault indicator lights up, the error code E03 is displayed, the pump stops; After the voltage returns to the range of 180V-260V, the pump automatically returns to normal operation, the voltage indicator is off, and the error code clears.

11). Pressure sensor failure

When a failure of the pressure sensor is detected, the fault indicator lights up, error code E04 is displayed, and the pump stops.

12). Controller failure

12.1 When the controller has a fault such as stall or overcurrent, the fault indicator lights up, the error code E05 is displayed, and the pump stops.

12.2 When the motor has a phase loss problem (the motor cable is not connected well, the motor is burnt inside, etc.), the fault indicator lights up, the fault code E05 is displayed, and the pump stops.