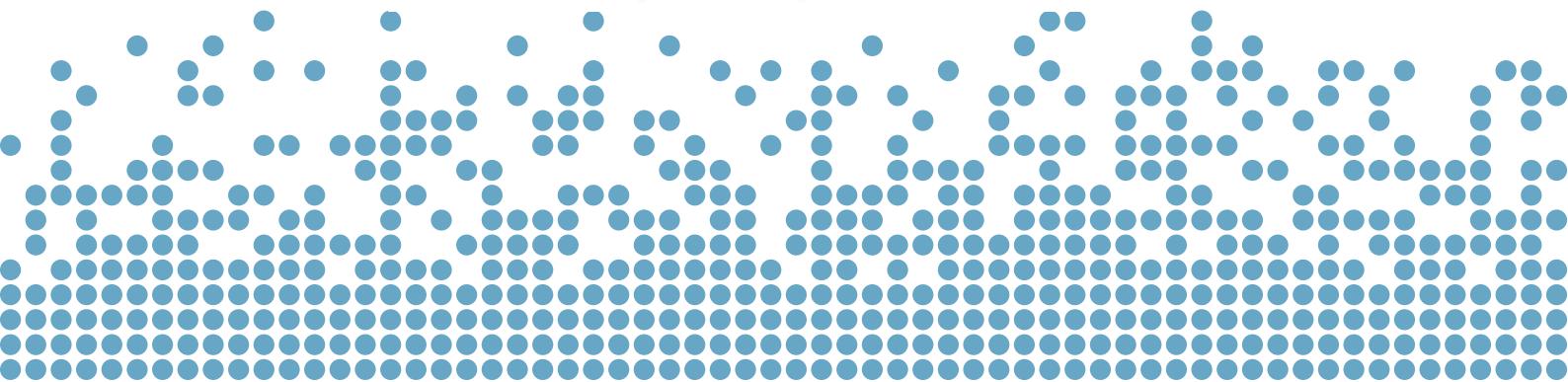


AQUA[®] FORTE

User Manual
Vario+ II
POND PUMP



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1. Introduction

Thank you for purchasing this frequency inverter.

This information belongs exclusively to, and is inextricably linked to the Vario+ II. Without written permission it is not permitted to make any change to the device or the accompanying documentation.

1.1. Purpose of this manual

The purpose of this manual is to help users understand the features and functions of the Vario_Plus_II, and to provide guidance on how to use it safely and effectively.

The manual includes all relevant information on:

- [Safety \(on page 5\)](#) provides important information on how to use the product safely, including warnings and precautions that users should be aware of.
- [Product specifications \(on page 5\)](#) describes the dimensions, features and other relevant information about the product.
- [Installation guidance \(on page 8\)](#) provides step-by-step instructions on how to install the product, including information on electrical connections, and positioning.
- [Operation \(on page 11\)](#) explains how to use the product, including how to set the temperature, how to turn it on and off, and how to adjust the settings.
- [Maintenance \(on page 14\)](#) provides guidance on how to keep the product in good working order, including information on cleaning and regular maintenance tasks.

Overall, the product manual is an essential resource for anyone who owns or operates a Vario+ II. By following the instructions and guidance provided in the manual, users can ensure that they can get the most out of their investment.

1.2. Target audience

This frequency inverter is a valuable investment for anyone wanting to transform their one-speed pump into a variable speed solution without replacing the entire pump, saving up to 80% in energy and reducing noise levels by up to 25%. This manual is intended for anyone using this product.

1.3. Intended and non-intended use

CAUTION



Safety Hazard

Make sure that the frequency inverter is installed according to the procedures described in this manual.

A frequency inverter is a device that turns a one-speed pool pump into a device with multiple speeds. However, it is important to understand both the intended and non-intended uses of a frequency inverter for this purpose. In all deviating situations, the manufacturer or an authorized dealer must be consulted in advance.

1.3.1. Intended Use

This frequency inverter serves the following purpose:

- controlling the speed of a single-phase pool pump with permanent split capacitor motor.

This pump is for use with permanently installed in-ground or above-ground swimming pools and may also be used with hot tubs and spas with a water temperature under 50 °C.

1.3.2. Non-Intended Use

While a frequency inverter can be a great way to make a pool pump more adaptable and efficient, there are also some non-intended uses that should be avoided. For example, this frequency inverter should not be used with any devices other than pool pumps.

Additionally, the device is NOT compatible with:

- Single-phase motor with centrifugal switch
- Pool pump motors with start relays or switches
- Series or DC motors
- Pool pump motors with faults in their rotors or capacitors
- Shaded-pole asynchronous motors

By understanding both the intended and non-intended uses of this frequency inverter, you can ensure that you are using the device in the most efficient and cost-effective way possible.



If you are not sure of the compatibility of your pool pump with this device, please contact your supplier or manufacturer before proceeding with installation.

1.4. Reading guide

This manual contains important warnings and notes that highlight information relevant to the user:

WARNING



This section warns that there is a safety hazard.

Indicates a hazardous situation that could result in serious injury or death and/or serious damage to the product or environment if the safety instructions are not followed.

CAUTION



This section warns of a possibly hazardous situation.

Indicates a hazardous situation that could result in minor or moderate injury and/or damage to the product or environment if the safety instructions are not followed.



Information that is considered important but is not injury-related (e.g., information related to property damage).



Information that's useful for future use.



Information that is relevant to the context or understanding of the user.



Tips and tricks to make usage easier or more convenient.

1.5. Warranty

This product comes with a general product warranty starting at the date of purchase.

The warranty covers any defects in materials or workmanship under normal use and maintenance. If a defect arises during the warranty period, you should contact your dealer immediately.

To make a warranty claim, you must provide proof of purchase, the defective product and a description of the problem. The warranty does not cover damage caused by improper installation, unintended use, abuse, or neglect. It also does not cover normal wear and tear, or any damage caused by acts of nature such as lightning.

This warranty is the sole and exclusive warranty for this device. We make no other warranties, express or implied, including any warranty of merchantability or fitness for a particular purpose. In no event shall we be liable for any incidental, consequential, or special damages arising out of or in connection with the use or inability to use this product, even if we have been advised of the possibility of such damages.

2. Safety

 This manual does not include site and/or country specific regulations, the installer of the drum filter is responsible for following the local rules and regulations.

We have provided important safety messages in this manual and on your device. Read all safety information and instructions. Failure to observe the safety information and instructions may result in electric shock, fire and serious injury. Keep all safety information and instructions for future reference.

2.1. Warning

DANGER

Electrical hazard



- BEFORE cleaning the product, shut off the power!
- Normal users MUST NEVER attempt to service or open the product cover!
- Before any type of service or maintenance of the device, wait at least 3 minutes after the device has been unplugged, as the device contains high voltage conversion components.
- If the device is malfunctioning, contact your nearest dealer or service center.
- All installations must be fitted with an earth leakage protection or a residual current protection device with a rated residual operating current not exceeding 30 mA.

CAUTION



- Do not touch the heat sink while the device is in operation or until at least 30 mins after it has been switched off.
- Packing parts (e.g. plastic bags) may be dangerous. Therefore, store away from children, domestic animals and anyone incapable of understanding the dangers. This device is not a toy.



Service and/or disposal MUST be carried out by people with proven expertise.

2.2. Safety information

- Repairs may only be carried out by a trained service technician. If repairs are required, please contact the nearest after-sales service centre. Any repairs should be performed in strict accordance with this manual.
- In case of storm/lightning, disconnect the main power supply to prevent any damage caused by lightning.
- Switch off the product during installation of and/or repairs to the product.

3. Product specifications



This device is able to perform normally within an air temperature range of -10°C~40°C, but the device performance depends on the operating conditions.

Table 1. Specifications

Model	Vario+ II
Input power	1 phase AC
Input voltage/frequency	220~240V 50Hz

Table 1. Specifications (continued)

Model	Vario+ II
Output power	Max. 1.1kW
Output voltage	1ph, 0~240V
Pump type	Single phase
Max. current	6A
Speed range	1200~2900RPM
Cooling	Ventilation
Net dimensions (L*W*H)	222*117*166mm

3.1. Overall dimensions (mm)

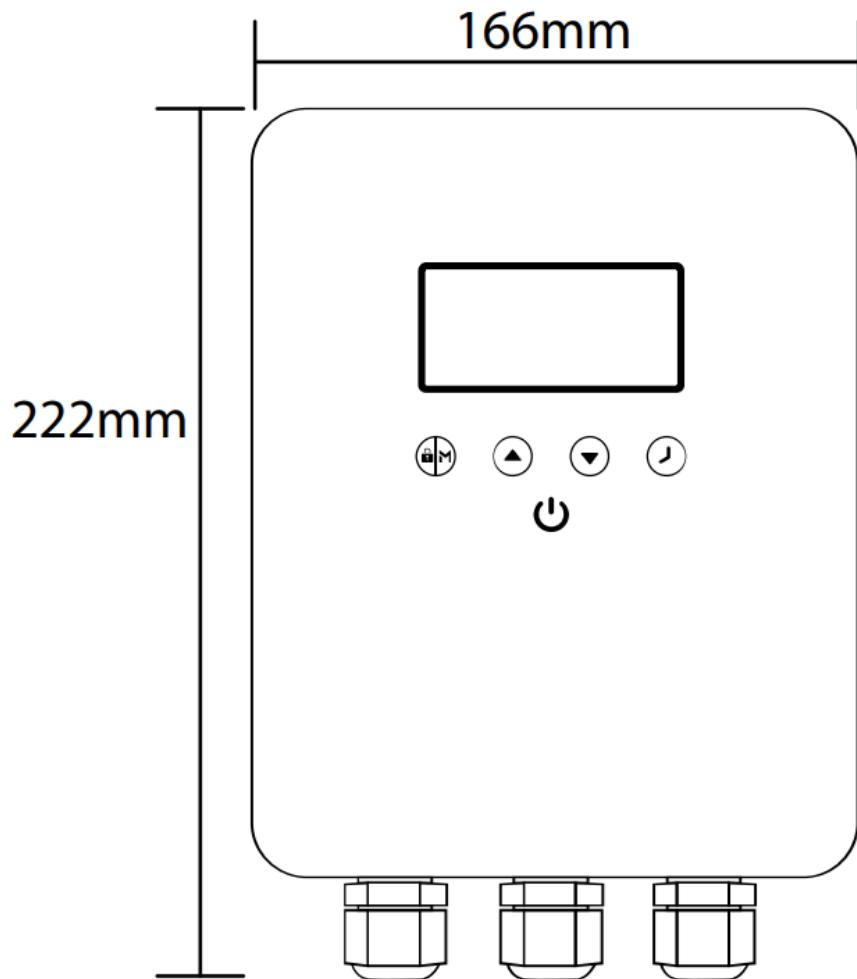


Figure 1. Front view

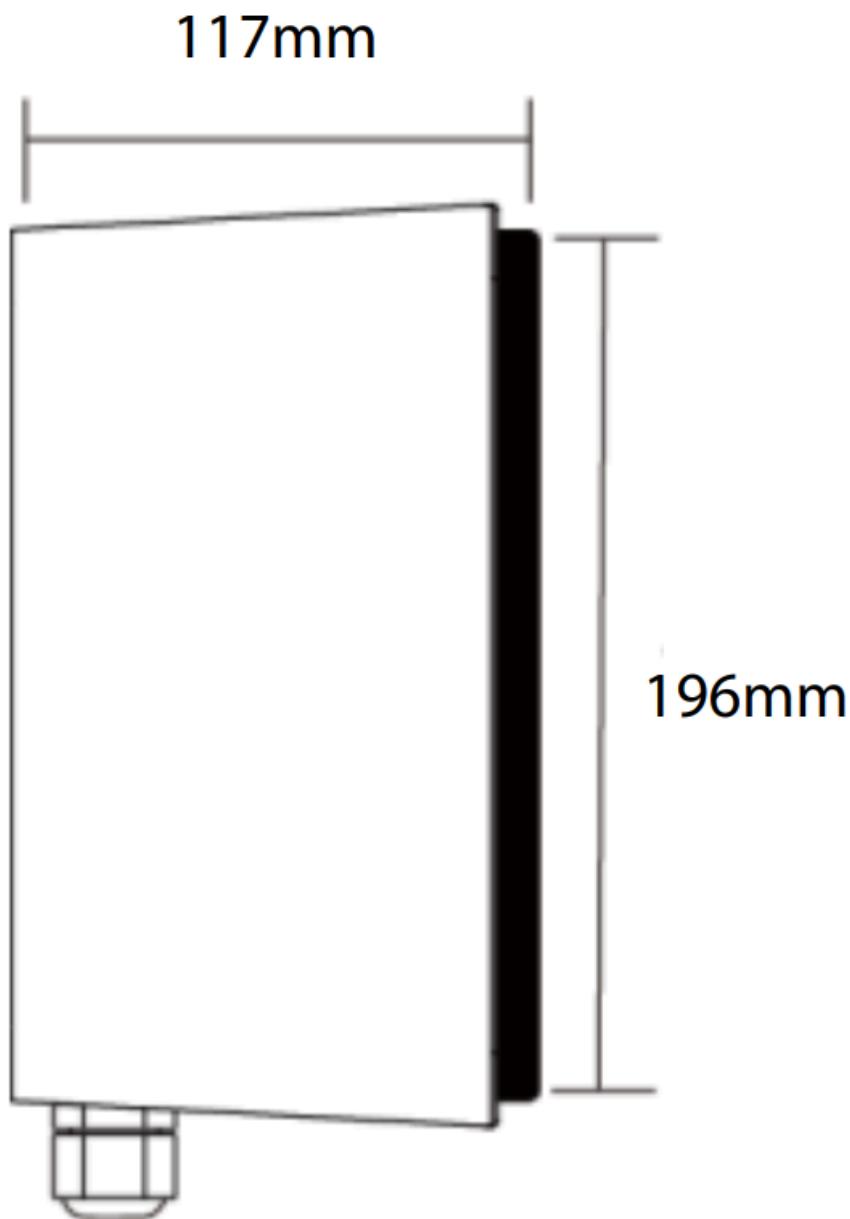


Figure 2. Side view



Related parameters are subject to adjustment periodically for technical improvement without further notice. For more details please refer to the nameplate of the product.

3.2. Compatibility

This device can ONLY be used with pool pumps with permanent split capacitor motor. The image shows a typical single speed swimming pool pump motor:

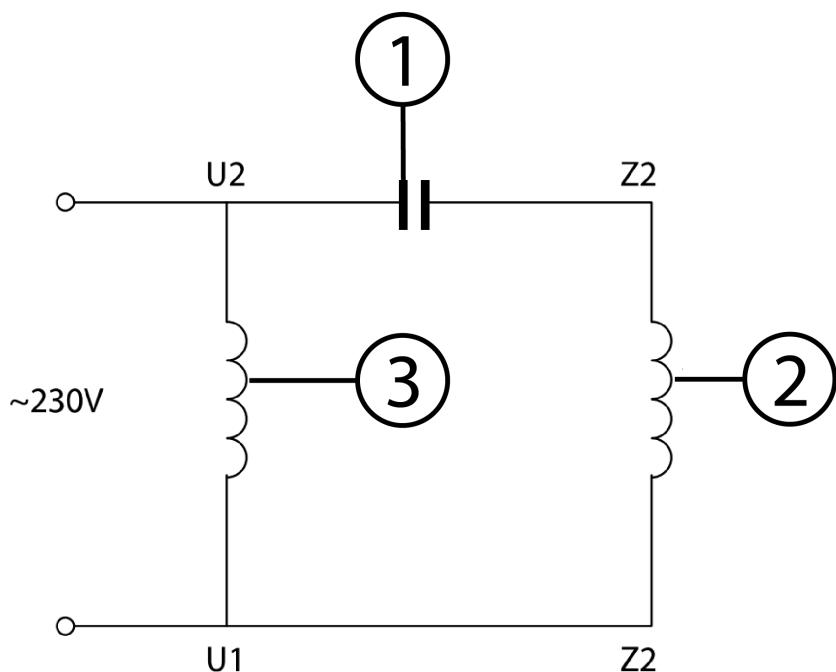


Figure 3. Pump motor schematic

1. Running capacitor
2. Auxiliary winding
3. Main winding

4. Installation guidance

⚠ WARNING



Safety hazard

- Do not proceed with the installation if the device is damaged in any way.
- Do not use extension leads with the device. This can lead to danger, especially in the vicinity of a swimming pool.

⚠ CAUTION



- Do not block the ventilation of the device and do not install the device in an enclosed space with limited airflow. A lack of ventilation may cause overheating or potential failure of the device.
- Only connect 1 pool pump to the inverter.
- Do not connect any devices other than pool pumps to the inverter.

4.1. Installation location

The installation location must meet the following conditions:

- Ambient temperature of -10 ~ 40°C
- 45-90% relative humidity, non-condensing
- Below 1000m above sea level
- No direct sunlight
- Good ventilation
- Sufficient clearance around the device ([Figure 4: Minimum clearance \(on page 9\)](#))

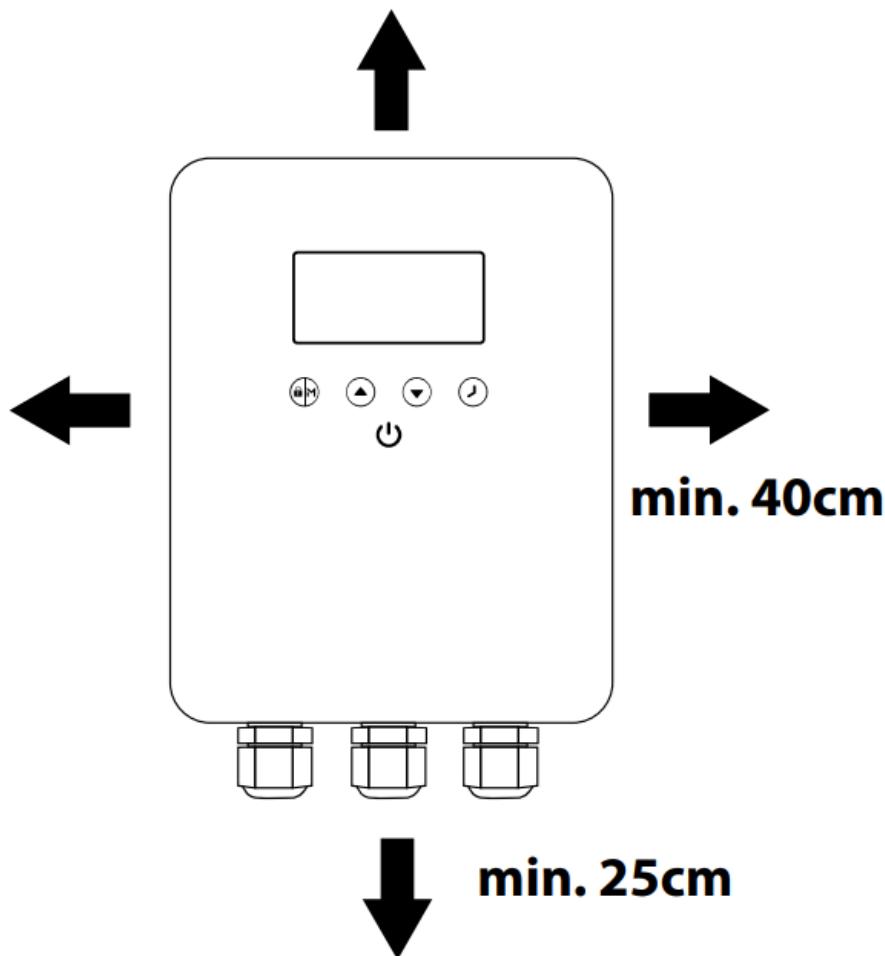


Figure 4. Minimum clearance

4.2. Wall mounting

1. Mark the 2 hole locations on the wall.
2. Drill the holes.
3. Install the provided expansion plugs.
4. Place the screw into the holes.
5. Hang the device on the screws.

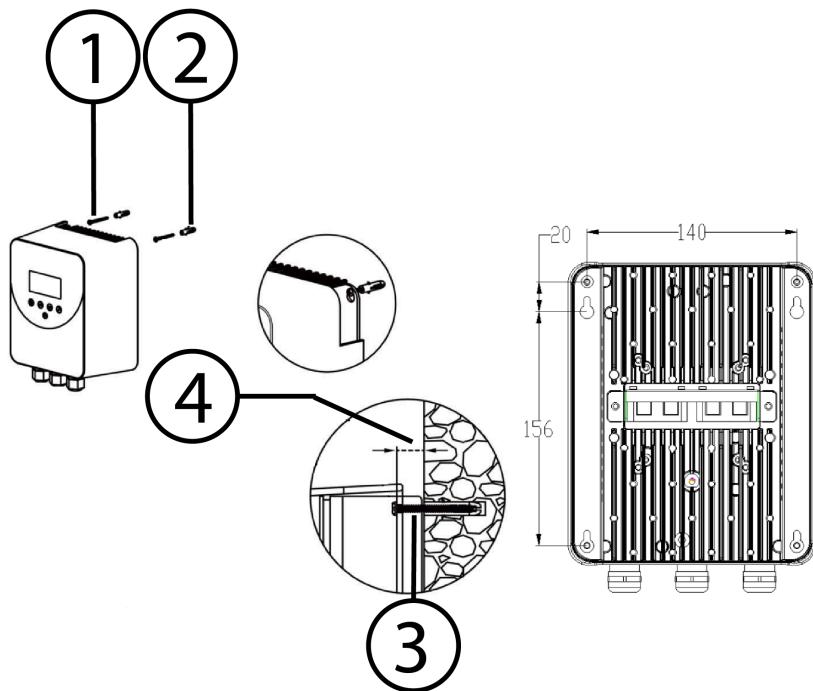


Figure 5. Wall mounting

4.3. Connecting to a pool pump

! The total length of the output cable of the device and the power cable of the pool pump should not be more than 2m.

1. Turn off the electrical supply to the pump.
2. Unplug the pump from the main switch or the chlorinator that provides electrical power to the pump.
3. Plug the pool pump into the power outlet of the device.
 - The power outlet of the device is marked PUMP CONNECTION ONLY.
4. Plug the device back into the original power connection (main switch/chlorinator/timer connection).
5. Connect the ground wire on the device to the ground terminal of the pool pump motor to reduce electromagnetic interference.
6. Switch all power back on.
7. Ensure that the chlorinator or timer is active.

The device is ready to be used.

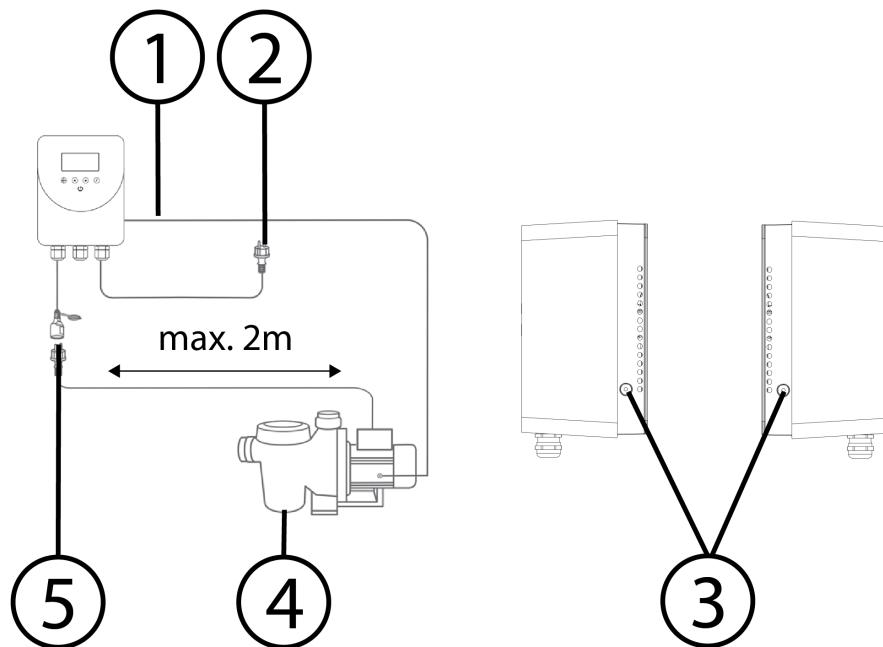


Figure 6. Device connections

1. Additional ground wire (connecting the heat sink to the motor ground terminal)
2. Power plug
3. Heat sink ground terminal
4. Pool pump
5. Pump socket

5. Operation

⚠ WARNING



Safety hazard

Do not touch the heat sink while the device is in operation or until at least 30 mins after it has been switched off.



The device has no external control options.

5.1. Control panel

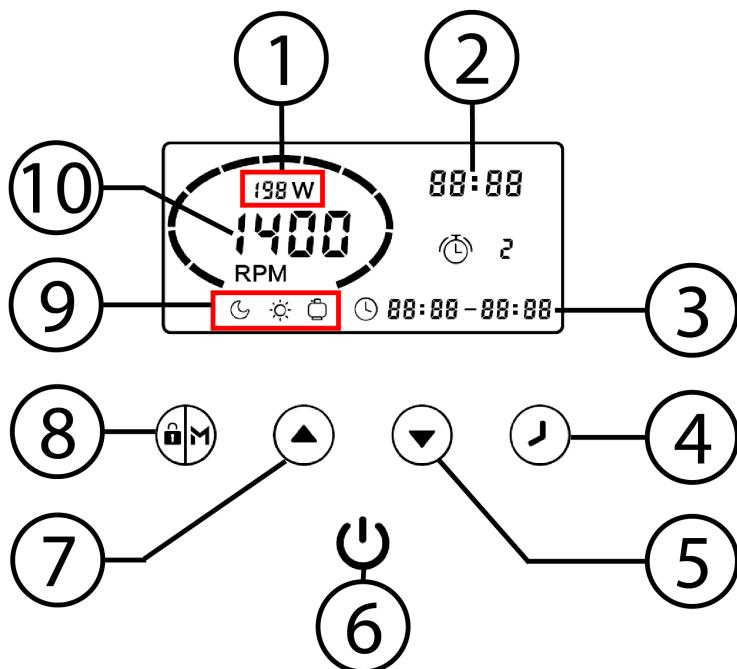


Figure 7. Control panel

1. Power consumption
2. Current time
3. Timer on/off
4. Timer button
5. Decrease button
6. On/off button
7. Increase button
8. Lock/Mode button
9. Day/Night/Backwash indicator (Low/medium/high speed)
10. Speed in RPM

5.2. Mode selection

The frequency inverter has 3 modes (speed ranges). You can run the pump in two ways:

- Use the Mode button to choose a constant speed.
- Set up to 4 timers daily, each with an individual speed (see [Timer setting \(on page 13\)](#)).

Table 2. Speed modes

Mode	Speed range	Default speed
Night (Low)	1200~1650RPM	1400RPM
Day (Medium)	1700~2400RPM	2000RPM
Backwash (High)	2450~2900RPM	2900RPM

To set a constant speed, do the following:

1. Plug in the device. The Lock/Mode button lights up.
2. Press and hold the Lock/Mode button for 3 seconds to unlock the screen.
3. Press the On/off button to start the device.
 - The pump will run at a maximum speed of 2900RPM for 1 minute to self-prime. The self-priming can be increased to 10 minutes (see [Parameter setting \(on page 13\)](#)).
4. Press the Lock/Mode button to change the running speed.
5. Press the Decrease or Increase button to adjust the running speed in steps of 50RPM.

After self-priming, the pump will automatically switch to the preset speed. The control panel shows the current RPM and power consumption.

5.3. Timer setting

You can set up to 4 timers to run the pump at different times and speeds to take advantage of electricity tariffs at different times of day. The device remembers stored timer settings and will resume them after being turned off.

1. Press the Timer button to enter the timer setting.
2. Use the Increase and Decrease buttons to set the first timer. Press the Timer button to move to the next setting.
3. Press the Lock/Mode button to choose a speed range for the timer.
4. Use the Increase or Decrease button to set the speed.
5. Repeat the above steps to set the other 3 timers.
6. Hold the Timer button for 3 seconds to save the settings or wait 10 seconds for the device to save the settings automatically.
 - A flashing Timer on/off indicator on the control panel indicates that the device is waiting for the next timer to start.
7. Use the Increase and Decrease buttons to check all 4 timers.
 - Any overlap between the periods will be considered invalid and the pump will only run based on the previous valid setting.
8. To abandon the timer setting at any point, press and hold the Lock/Mode button for 3 seconds.

If the device is inactive for 1 minute, the screen will lock automatically. Press and hold the Lock/Mode button for 3 seconds to unlock the device.

5.3.1. Restore factory setting

1. While the device is OFF, press and hold the Increase button and Timer button simultaneously for 3 seconds to retrieve the factory setting.

5.4. Parameter setting



Parameter 3, 4 and 5 are not active for this model.

1. While the device is OFF, press and hold the Increase and Decrease buttons simultaneously for 3 seconds to enter the parameter setting.
2. Set the parameters according to the table below.

Table 3. Parameter settings

Parameter	Description	Default setting	Setting range
1	Priming time	1 minute	0~10mins, by 1-minute increments
2	Minimum RPM	1200RPM	1200~2000RPM, by 100RPM increments
6	Self-priming speed	2900RPM	1200~2900RPM, by 100RPM increments

6. Maintenance



Service MUST be carried out by people with proven expertise.

7. Troubleshooting

Table 4. Error codes

Item	Code	Description	Analysis
1	E001	Abnormal input voltage	Not faulty
2	E002	Output overcurrent	Not faulty
3	E101	Heatsink overheat	Contact your supplier
4	E102	Heatsink sensor error	Contact your supplier
5	E103	Master driver board error	Contact your supplier
6	E201	Circuitboard error	Contact your supplier
7	E202	Master board EEPROM reading failure	Contact your supplier
8	E203	RTC time reading error	Contact your supplier
9	E204	Keyboard EEPROM reading failure	Contact your supplier
10	E205	Communication error	Contact your supplier
11	AL01	Auto speed reduction against high temperature	Contact your supplier

- AL01 is not an error indication. When it appears the inverter will automatically switch to a lower speed to self-protect against high internal temperature. When the temperature drops back to 68°C, the inverter resumes at the preset speed.
- When the cause for E002/E101/E103 lifts, the device will resume working automatically. However, when it appears a fourth time, the device will stop working. To resume operation, unplug the device, plug it back in and restart it.

8. Disposal

When disposing of your old device, please do so safely and properly to protect the environment and comply with local regulations.

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