

VFA-18M Series

Single-Phase Water Pump Inverter



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PERMANENT MAGNET
FREQUENCY CONVERSION



ENERGY SAVING AND
ENVIRONMENTAL
PROTECTION



INTELLIGENT OPERATION



LOW NOISE



MULTIPLE PROTECTION

This VFA-18M constant pressure water supply system adopts the industry leading technique SPWM (Sinusoidal Pulse Width Modulation) and high-performance space vector, performs V/F VVVF (Variable Velocity Variable Frequency) Control.

Together with the advanced pressure sensing technique, it collects real-time pressure change of the pipeline and adjusts the revolving speed of the pump.

It makes the outlet pressure constant and thus saving water and electricity.

Applications

It can be used to increase water pressure in various occasions, such as tap water booster, household and residential, swimming pool, commercial, factory dormitory, Industrial water circulation, cooling water, cold water circulation.



Product Advantages

- 01.** This inverter is used especially for water pump, it adopts the industry leading technique SPWM and pressure transmission technique, detects actual pipeline pressure change and controls the rotation speed of the pump.
- 02.** The operation of this device is very easy, all functions can be finished by parameters setting, no need any professional staffs to debug.
- 03.** This inverter is high-efficient, it can save water and electricity up to 20%~60% compared to traditional water supply system.
- 04.** Soft starting and stopping, constant water pressure prolong the service life of the pipe network and make the water usage comfortable and enjoyable.
- 05.** The voltage application range is wide and it can work stably even in areas with large voltage fluctuations.
- 06.** The installation is very easy with direct screw thread, it can be used different kinds of water pumps and thus reduce extra costs.
- 07.** LED display makes it convenient and fast to check and set actual pressure values.

Instructions for Maintenance

- 01.** Professionals needed to do the maintenance.
- 02.** During the operation, structures and specified performances of this appliance can't be altered. Otherwise, the company will not be responsible for any consequences.
- 03.** In summer, good ventilation is needed. At the same time, goods should avoid direct sunshine and rain. In winter, keep it warm and away from combustibles.
- 04.** Cut power when it's off work for long time.



Storage & Safekeeping

If need short/long time storage, follow these instructions:

- 01.** Keep it in dry, dust-free, good ventilation places and at required temperature.
- 02.** If it's kept in storage for more than a year, charging test should be made to wake up the capacitor.
- 03.** Any puncture tests are not allowed, they will shorten the service life of the inverter.



01
PRODUCT
DESCRIPTION

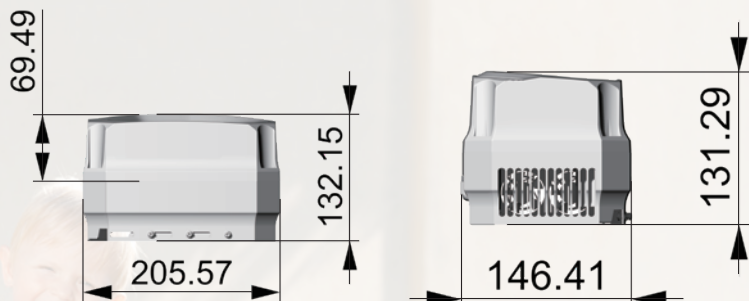
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Product Size



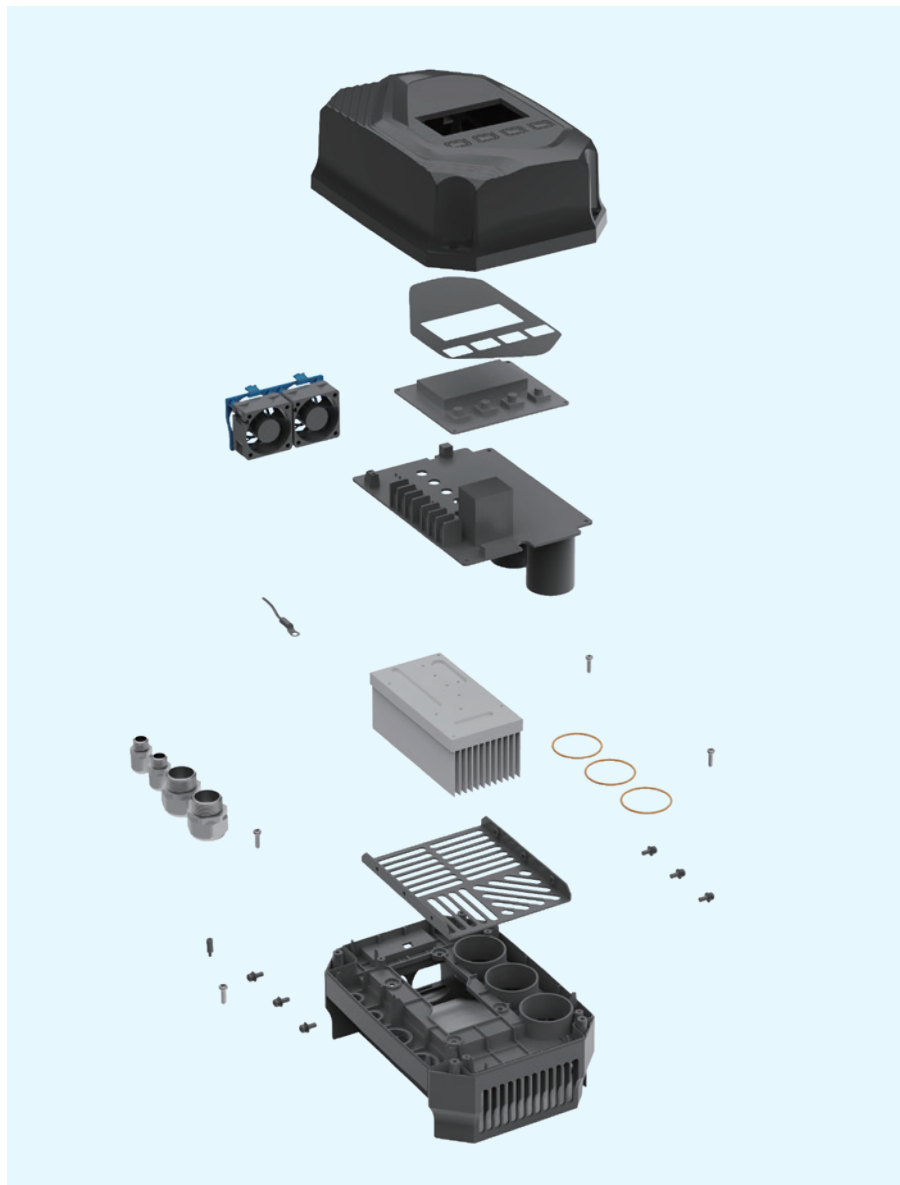
Technical Specifications

Model	Power	Size	Rated Current	Input Voltage	Output Voltage	Category	Input Frequency	Output Frequency	Pressure Sensor
VFA-18M	0.75KW	205.6*146.4*132.2mm	4.8A	1×220V	1×220V	Single-phase in and single-phase out	50/60Hz	20-50/60Hz	4-20mA +24V 10bar
	1.1KW	205.6*146.4*132.2mm	7A						
	1.5KW	205.6*146.4*132.2mm	9.6A						
	2.2KW	205.6*146.4*132.2mm	11.5A						

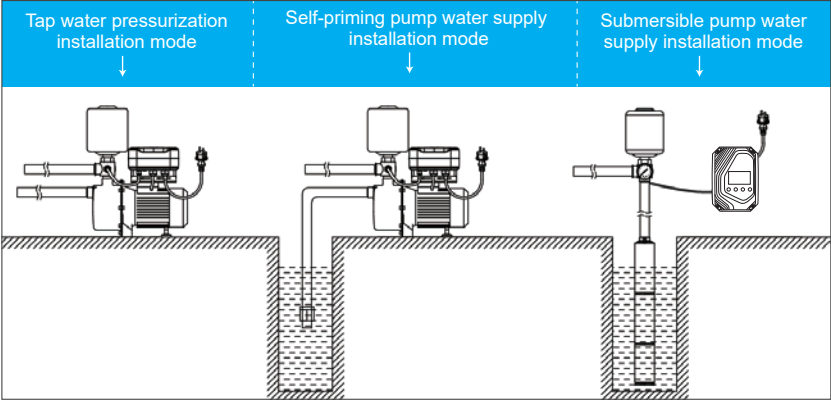
Parameters

No.	Product Specification	0.75kw	1.1kw	1.5kw	2.2kw
1	Input Power	Single-phase input, single-phase output			
2	Input Voltage	110VAC or 220VAC			
3	Allowed Voltage Fluctuation	80V~140V(110V) or 160V~260V(220V)			
4	Input Frequency	50/60Hz			
5	Output Voltage	110VAC or 220VAC			
6	Load Type	Pump			
7	Output Frequency Range	20-50/60Hz			
8	Pressure Sensor	24V, 4-20mA(10bar)			
9	Pressure Setting Range	0.5~9.0bar			
10	Pressure Tank Setting Requirements	Required not less than 2 liters inflatable pressure water tank (Preset pressure=60% of the setting pressure)			
11	Temperature Range	0~+40 ℃			
12	Medium	Clean water within the temperature range of 0~+100 ℃			
13	Required Pressure When Self-starting	When the factory setting pressure is less than 0.3 bar			
14	Installation	Make sure the grounding is appropriate and reliable before using			

EXPLOSION CHART



Inverter Installation Diagram



Wiring Diagram and Instructions

Single-phase in and single-phase out	Notes and Instructions
Wiring diagram To sensor ⊕ ⊖ Psi +24V 24V 4~20mA To pump ⊕ ⊕ ⊕ U V ⊕ 1~220V AC 50/60Hz M To power ⊕ ⊕ ⊕ ⊕ N L1 1~220V AC 50/60Hz	(1) The wiring job must be done by professionals. (2) Wiring operation must be performed when power is off. (3) Make sure the wiring is appropriate and confirm the voltage before power is on. (4) Puncture tests are not allowed. (5) Make sure the ground terminal is connected. (6) Panel must be installed before power is on.

Instructions for Use:

- Please confirm carefully while opening the boxes: the device has no broken parts and the nameplate is the one you ordered.
- Please read this manual carefully before installation and use.
- Please check whether the goods are damaged due to careless transportation or not, don't access to power supply if they're damaged.
- Before using, check the ground wire carefully. Make sure the grounding is appropriate and reliable.
- Any failure to follow safety warnings can result in damages of goods, personnel injuries and other property loss, the factory won't be responsible or bear joint liability or pay any compensation for your negligence.

● Definition of Safety

 Case of failure to follow this instruction can result in death or severe injuries.

 Case of failure to follow this instruction can result in minor injuries or property loss.

● Safety Warning marks:

 DANGER	1.Please install to metal and other non-combustibles, otherwise it might start a fire.
	2.Keep away from combustibles, otherwise it might start a fire.
	3.Keep away from explosive gases, otherwise it might explode.
	4.Make sure the grounding is appropriate and reliable, otherwise it might pose a risk of electric shock.
	5.Wiring operations should be done by professionals, otherwise it might pose a risk of electric shock.
	6.Choose and use the right power supply according to the instructions, otherwise it might pose a risk of electric shock and it might explode.
	7.Cut power before installation and maintenance, otherwise it might pose a risk of electric shock.
	8.Do not use wet hands to operate inverter, otherwise it might pose a risk of electric shock.
	9.If the product is stored for more than 2 years, the voltage regulator should be used to boost gradually, otherwise it might pose a risk of electric shock and it might explode.
	10.Maintenance should start 5 minutes after cutting power when all the indicator lights are off, otherwise it might pose a risk of electric shock.
	11.Do not touch any components and parts on circuit board with bare hands when power is on, otherwise it might pose a risk of electric shock.
	12.Professionals are needed for replacing components, no metal objects are allowed to be left in the device, otherwise it might start a fire.
	13.The exposed parts of circuit should be wrapped up with insulation tape, otherwise it might pose a risk of electric shock.

CAUTION	1.Must be installed in the place that can support the weight of this inverter, otherwise it might fall and cause injuries and property loss.
	2.Keep away from pipelines and places that can be splashed by water, otherwise it might cause property damages.
	3.Keep away from direct sunshine, otherwise it might cause property damages.
	4.Keep away from rain, otherwise it might cause property damages.
	5.Should be stored at room temperature, in place which is dry, cool and has good ventilation.
	6.In summer or at high temperature, good ventilation is needed to avoid condensate water or dew, otherwise it might cause property damages.
	7.Professionals are needed to install and maintain this inverter.
	8.Do not install or operate when the inverter is damaged or has missing components. Otherwise, it might start a fire and personnel might get hurt.
	9.Keep away from children. Put protection over inverter after installation and keep it out of the reach of children.

Required Environmental Conditions

The working environment of inverter has a direct impact on its functions and service life.

Therefore, the working environment must meet the following requirements:

- ◆ Required temperature range : $-10^{\circ}\text{C} \sim +40^{\circ}\text{C}$
- ◆ Keep away from corrosive and explosive gas.
- ◆ Must be installed in places which are dry and have good ventilation.
- ◆ Avoid dusts, cotton fibers and metal chippings getting into inverter.
- ◆ Indoor use only.
- ◆ Keep away from radioactive materials and combustibles.
- ◆ Avoid electromagnetic interference.

Parameter setting and function description

Basic Functions

CONTROL PANEL



5.1 Key Functions



● **RUN:** Start the pump manually, press this button to exit water shortage status.



● **STOP:** Stop the pump manually, press this button to exit water shortage status.



● **Add:** Each press add 0.1bar, long-press increase rapidly.



● **Deduct button:** Each press deduct 0.1bar, long-press decrease rapidly.

5.2 The meaning of the indicator light

● **POWER:** Power indicator, the light will always be on if the power is on.

● **PUMP:** Water pump running status indicator, when the pump is running, the light flashes(0.8S flashes one cycle); when the pump stops normally, the light is on; Press the "  " button, the pump stops and the indicator light is off.

● **GROUP:** Multiple Pump connection indicator, when the multiple pump connection is normal, the indicator light is on.

● **ERROR:** Water shortage indicator, when there is water shortage, the water shortage light flashes.

● **SET:** Setting indicator light, press the "Up" or "Down" button, or press the "Up" and "Down" buttons at the same time, the light will flash. If the button is not pressed within 8 seconds, the indicator light will automatically go out.

5.3 Parameters setting for inverter



Parameter setting function:

Press the ▲ and ▼ buttons simultaneously for 3 seconds to enter the parameter settings mode.

Press the RUN button to confirm, save and change parameters:

- ◆ P001: check the current output frequency value.
- ◆ P002: check the current output current value.
- ◆ P003: check the current input voltage value.
- ◆ P004: check the current temperature.
- ◆ P010: Restore factory settings. Press the ▲ and ▼ buttons to switch between “0” and “1”. The factory default value is displayed as “1”, and it will be automatically changed to 0 once any parameter is changed. When the value is “1” and press the RUN button, it will be restored to factory default setting.
- ◆ P011: Starting pressure parameter setting. Adjustment range: 0.1-2 bar, the factory default is 0.3bar. You can set the automatic starting pressure value when the inverter is automatically turned off.
- ◆ P012: Pressure parameter setting for water shortage. The default setting is 0.1 bar, the water shortage function is disabled and there is no water shortage protection when it's set to 0 bar.
- ◆ P013: Water shortage time parameter setting. Adjustment range: 0~60S, the default is 30S, It will automatically restart the pump for a specified time after water shortage protection: 10 seconds, 1 minute, 5 minutes, 15 minutes, 30 minutes, 1 hour, 2 hours, 4 hours, and cycle of 4 hours until the pressure returns to normal.

◆ P014: Carrier frequency parameter setting. Optional: “L” and “H” .

“L” is 6K for 2.2KW and 8K when it's less than 2.2KW;

“H” is 8K for 2.2KW and 16K when it's less than 2.2KW.

◆ P015: Acceleration and deceleration time setting range: 20 to 50 hundred milliseconds (2 to 5 seconds), the default is 2 seconds. Adjusting this parameter can improve the problem of pressure rise too fast or too slow.

◆ P016: Permissible pressure error fluctuation value. Setting range: 0 to 1 bar, the default is 0.1 bar. Adjusting this parameter can effectively improve the pressure fluctuation during constant pressure operation. Increase or decrease 0.05 bar every button.

For problem of failing to be turned off because of wide range and pipe network dripping. This parameter setting can be used in conjunction with P011 to ensure there is no pressure fluctuation while working, and turn off the system effectively when it's under non-use conditions.

◆ P017: minimum frequency of shutdown, minimum 20HZ, maximum 40HZ, (default: 24HZ).

◆ P018: No shutdown is allowed, “1” is not shutdown, “0” is shutdown, and the default is “0” .

◆ P019: Range selection (1.0--1.6--2.5Mbar) settings, the default is 1.0. If the setting pressure is 1.0Mbar, the pressure range is 0.5----9bar; if it's 1.6Mbar, the pressure range is 0.5----15bar; if it's 2.5Mbar , the pressure range is 0.5---- 24bar ;).

◆ P020: over-temperature setting (60--90---H), the default is 85 degrees

◆ P021: setting direction, 0 is forward rotation, 1 is reverse rotation, the default is 0.

◆ P022: local address (online), minimum 1, maximum 6, the default is 1. (1 Host, and 5 slave machines maximum).

◆ P023: Round-robin time (online), minimum 0 (it's better the value of P023 is bigger than 0), maximum 72 hours, the default is 48 hours. (rotational working time, for example 48 hours after the host worked, it will then go to another slave machine that works for 48 hours, then goes to other slaves for 48 hours and working in a loop.)

◆ P024: The maximum number of devices that can run at the same time (online) minimum 1, maximum 6, the default 6. (Number of machines that are allowed to work at the same time while online. For example, when the setting is 1, only 1 host is working; if the setting is 2, when the pressure does not reach the setting pressure, 2 sets can work at the same time, and so on.)

5.4 Display Code for different protection mode

Fault Code	Fault Explanation	Troubleshooting
OH	Over-temperature protection	Displayed when radiator temperature reaches 80°C. Wait for the drive temperature to drop, then it resumes automatically. Or move the pump to a cool, ventilated area.
OD	Overload protection	Check if power cord connections are loose, or if the pump impeller is stuck.
OC	Over-current protection	Disconnect power in time, do not repeatedly power on. First, check if water has entered the inverter. If no water-induced short circuits are found, suspect inverter circuit board fault.
uLU	Under-voltage protection	Displayed when voltage is below 160V. Check input voltage.
uLU	Over-voltage protection	Displayed when voltage is above 270V. Check input voltage.
OTP	Over-pressure protection	Displayed when pipe network pressure exceeds the sensor's maximum range. Check sensor wiring or replace the pressure sensor.
LTP	Low-pressure protection	Displayed when pipe network pressure is abnormal or no pressure sensor is detected. Replace the pressure sensor with a new one.
EL	Communication fault	Check if the connection cable between the display board and drive board is securely plugged in. Try unplugging and replugging.

