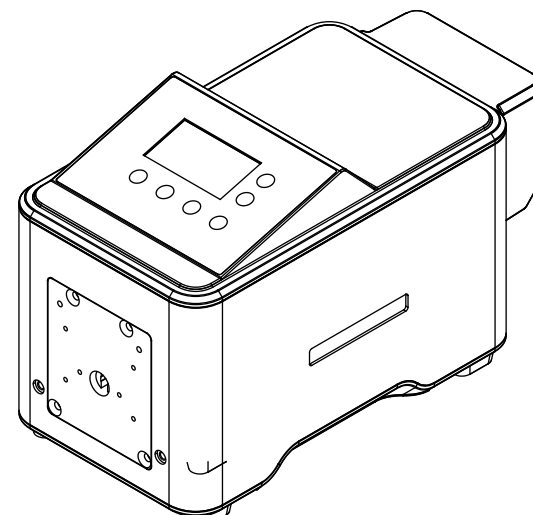


MS106

High Protection Peristaltic Pump Operation Manual



Safety Precautions



Important information:

Be sure to read the manual carefully before operation!

	This icon warns: Keep fingers away from moving parts.
	This icon warns: Be careful.
	This icon warns: Be careful, the surface is hot.
	This icon warns: Be careful, electric shock hazard.
	This icon warns: To recycle this product.
	This icon warns: Personal protective equipment (PPE) must be worn.

Danger:

	Please use the same power supply as that on the nameplate of the machine, otherwise the equipment will be damaged!
	Please do not disassemble the shell or modify the interior of the equipment by yourself, otherwise it may cause malfunctions or even electric shock accidents!
	When installing and disassembling the pump tube, please turn off the power first and do not approach the rotating roller to prevent fingers and clothing from getting entangled in the mechanical mechanism!
	When installing and disassembling external control devices, please turn off the power first to prevent electric shock accidents or damage to the equipment!



Please connect the protective area of the machine to the ground, otherwise there is a risk of electric shock, electromagnetic interference, or induced static electricity!



If it is used to transport dangerous liquids, special operating procedures must be developed for this liquid, and personnel must also be prevented from being injured during use.



This product is not suitable for explosion-proof environment, and it should not be used in explosive environment.

Warning:



Before using, please confirm that the transmitted liquid will not react chemically with the tube or pump head, otherwise it will damage the tube or pump head. If unsure, please consult our engineers.



The tube is a vulnerable part, please check it regularly. Our company is not responsible for the loss caused by tube damage, especially the leakage of toxic, harmful and valuable liquids!



Due to the fact that the actual working environment conditions (including temperature, humidity, power supply voltage, etc.) exceed our technical specifications and the machine is damaged, our company is responsible for the paid warranty, but we will not be responsible for any other damages caused by it!



The primary protection for the operator against injury from the moving parts of the pump is provided by the pump head safety device. Please note that safety devices vary from product to product, depending on the model of pump head. See pump head section in manual.



If the pump was running before the power failure, the pump will automatically start when the power is turned back on.

Contents

Peristaltic Pump Introduction	3
Description	3
Applications	3
Functions and Features	4
Components and Interfaces	5
Display Panel and Operating Keypad	6
Keypad	6
Icon Description	7
LCD Display	7
External Control Interface	9
Installation Instructions	10
Before Operation	10
Install Pump Head and Tube	11
Power Connection	11
Operation Instructions	12
First Run Wizard	12
Setting Menu	13
System Parameter Setting	14
User Permission Management	17
Mode Switch	18
Internal Control Mode	18
External Control Mode	19
Time Dispensing Mode	21
Level 1 Mode (Original Foot Switch Mode)	22
Level 2 Mode (Original Level Mode)	24
Communication Mode	25
Speed Setting	27
Malfunction and Maintenance	28

Daily Maintenance	28
Maintenance Worksheet	29
Malfunction Solutions	30
Dimensions	31
Ordering Information	31
Optional Accessories Table	31
Naming Rules	32
Technical Parameters	32
Flow Rate Chart of the Pump	33
Suitable Pump Heads for Peristaltic Pump Drives	34
External Control Input and Output Performance	35

Peristaltic Pump Introduction

Peristaltic pump is a safe and reliable fluid transmission equipment, the fluid only contacts with the inner wall of the tube line, through squeeze the tube to realize the fluid transmission. Its unique design, which integrates tube lines without valves or seals, ensures fluid cleanliness, reduces the risk of leakage, and provides a more reliable, safe, and clean method of transmission.

Working Principle

The tube fits between the roller and the pressure block, forming a seal at the point of contact when squeezed. As the roller rotates and advances along the tube, the sealing contact advances with it. As the rollers pass, the tube returns to its original shape, creating a vacuum that draws in liquid. Before the roller reaches the end of the pressure block, a second roller starts compressing the tube at the beginning of the pressure block, isolating the fluid between the two compression points. As the first roller clears the pressure block, the second roller continues to expel the liquid through the discharge port of the tube.

At the same time, a new partial vacuum is created behind the second roller, sucking in more liquid from the inlet. There is no back flow and siphoning, and the pump effectively seals the tube when not in use, so there is no need for a separate valve.

Description

The high protection peristaltic pump driver MS106 not only features basic functions such as start-stop, speed adjustment, full speed, and forward-reverse rotation, but also includes a large-sized LCD screen showing operational status with graphical representation, as well as functions for multi-stage timed dispensing and anti-drip. Addition of three-level permission management ensures operational security. The universal MODBUS protocol and RS485 communication enable seamless connection with other devices, allowing for remote control implementation. The whole machine has a high protection level, allowing it to operate stably in harsh environments such as humidity, weak acid and alkali, salt mist, and dust.

Applications

- Suitable for transporting corrosive liquids.
- Low shear force, can be used to transfer emulsions or liquids containing foam etc.

- Suitable for transporting liquids containing gases, magnetic beads, or suspensions containing small particles.
- It is suitable for accurate metering and quantitative feeding, and high filling accuracy can be obtained by selecting appropriate tube diameter and filling efficiency.
- Suitable for transporting viscous liquids.
- If use food and medical grade tube, this pump can be used for food and medical transmission and filling.
- Replacement tube of special material to transfer abrasive liquids.

Functions and Features

- The large LCD screen displays information in both Chinese and English, allowing for easy operation through keypad controls, making the operational status clear at a glance.
- With forward and reverse rotating, start and stop, speed regulation and full speed functions.
- It can be set for running time, interval time, and number of circles, enabling filling and dispensing.
- High-precision speed control.
- External analog signal adjusts speed, with options for 0-5V/0-10V/4-20mA, switchable via software settings without the need to modify external wiring.
- External control signal controls start and stop, forward and reverse rotating, external control signal 5-24V wide range input, photoelectric isolation.
- RS485 communication, supports MODBUS communication protocol, with multiple parameters that can be set, facilitating communication with master computer.
- The circuit board is sprayed with conformal coating to achieve the effect of dustproof and moistureproof.
- IP66/IP67 high protection level, suitable for harsh environments such as humidity, weak acid and alkali, salt spray, dust, etc.
- Super anti-interference characteristics, wide voltage design, suitable for complex power supply environment.
- Aluminum shell is easy to clean and effectively protects against the corrosion of various acids, alkali, salts and organic solvents.

Components and Interfaces

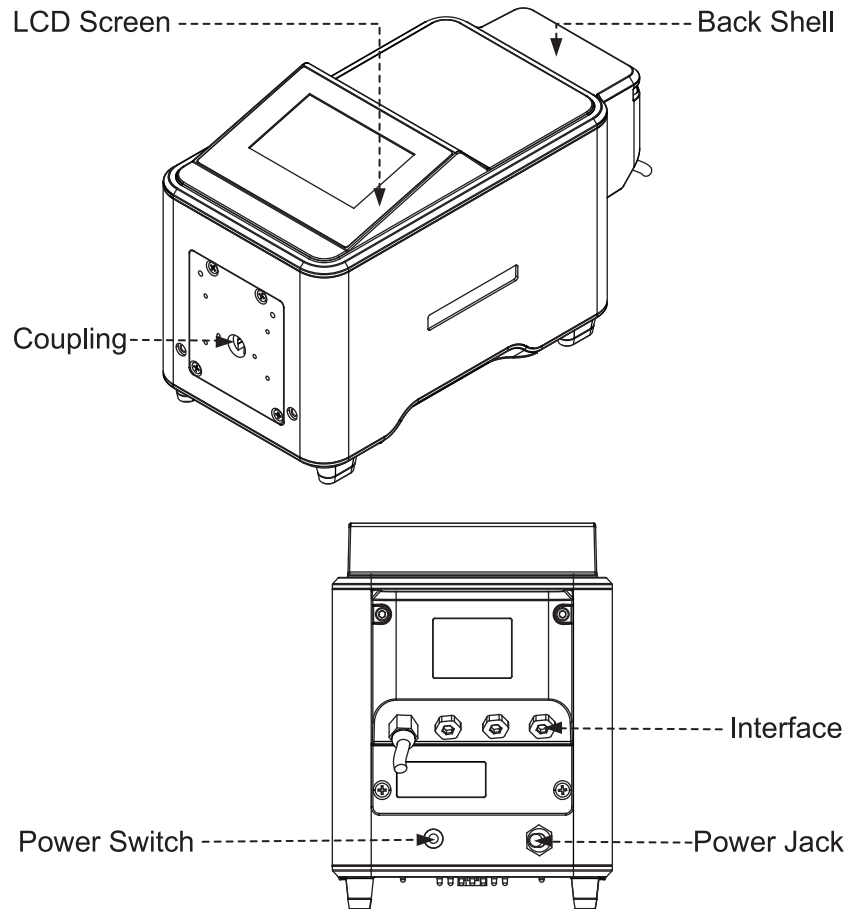


Figure 1 Components and Interfaces

Display Panel and Operating Keypad

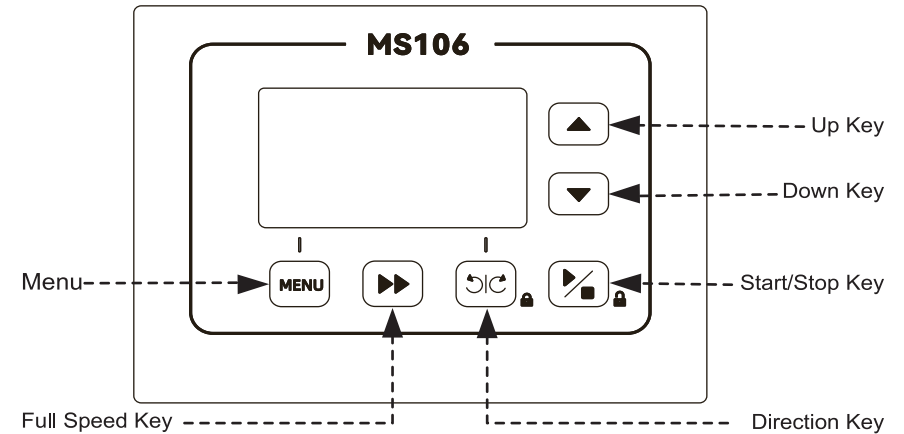


Figure 2 Display Panel and Operation Keys

◆ Keypad

- ▲ : **[Up Key]**: Value increase key. Press the key once, the lowest digit of the value will increase by 1, long press the key, the value will increase rapidly.
- ▼ : **[Down Key]**: Value decrease key. Press the key once, the lowest digit of the value will be reduced by 1, long press this key, the value will decrease rapidly.
- MENU : **[Menu Key]**: Press this key to enter the menu interface when on the main interface, long press this key when not on the main interface. Return to main interface. when not on the main interface, this button functions as a function key, assigning specific functions according to the button prompt information; invalid during motor running.
- ▶▶ : **[Full Speed Key]**: Press this key to switch between the highest speed and the original state.
- ↻ : **[Direction Key]**: On the main interface, changes the direction of motor movement, toggling between clockwise and counterclockwise states; when not on the main interface, this button functions as a function key, assigning specific functions according to the button prompt information; on the main interface, long press this key to lock the screen.

: **[Start/Stop Key]**: On the main interface, controls the motor's start and stop functions. On the main interface, long press this key to unlock the screen.

◆ **Icon Description**

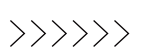
Icon	Functions	Icon	Functions
	Start		Stop
	Pause		Full speed
	Clockwise rotation		Counterclockwise rotation
	the key prompt sound is turned on		the key prompt sound is turned off
	Locked		Unlocked
#1	show pump number in communication		Communication disconnected

Table 1 Description of Display Icons

◆ **LCD Display**

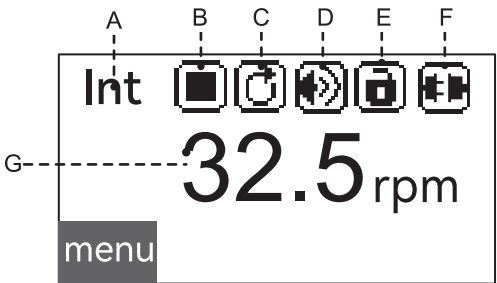


Figure 3 LCD Display

- A. Control Status: Displays the current working mode, which can be switched in the mode settings. The modes include Internal Control, External Control, Timed, Level 1, and Level 2.
- Internal control: Through the key control on the panel, and the external pulse signal controls the start and stop.
 - External control: The speed is controlled by an external analog quantity, and the start and stop are controlled by an external level signal.
 - Dispensing: Set the running time, interval time, and cycle times to realize the regular transmission of liquid.
 - Level 1 (original foot switch mode): The start and stop are controlled by an external level signal, and the speed adjustment is operated by the panel.
 - Level 2 (original level mode): The start and stop are controlled by an external level signal, and the speed adjustment is operated by the panel.
- B. Running State: Display the current running state.
-  Stopped state  Running state  Paused state
- C. Rotation Direction: Displays the current rotation direction.
-  Forward clockwise  Reverse counterclockwise
- D. Tone: The state of the key prompt tone is displayed
-  Tone on  Tone off.
- E. Lock State: Display whether the current state is In the locked state, only the start and stop keys on the panel work, and other keys are invalid. In the main interface, press and hold the direction key to enter the locked state, long press the start and stop key to unlock.
-  Unlocked State  Locked State
- F. Communication State: Displays whether the communication is currently in progress.
-  Communication is disconnected
pump number displayed in communication #1
- G. Speed Display: Display the current rotational speed, the unit is When >>>>>> is displayed, it is at full speed.

External Control Interface

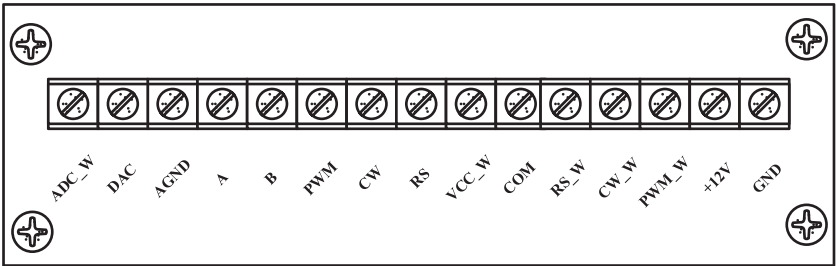


Figure 4 External Interface

External Control Pins	English Notes	Description
1	ADC_W	The positive input of the external analog signal
2	DAC	Analog quantity output
3	AGND	Negative input of external analog signal
4	A	Communication interface, A pole of RS485
5	B	Communication interface, B pole of RS485
6	PWM	Pulse signal output
7	CW	Internal output to control direction ;
8	RS	Internal start/stop signal output.
9	VCC_W	External DC power input
10	COM	External commons
11	RS_W	External input to control start/stop
12	CW_W	External input signal to control direction
13	PWM_W	External pulse signal input
14	+12V	Positive of internal +12V power source
15	GND	Ground of Internal power source

Table 2 Definition of External Control Pins

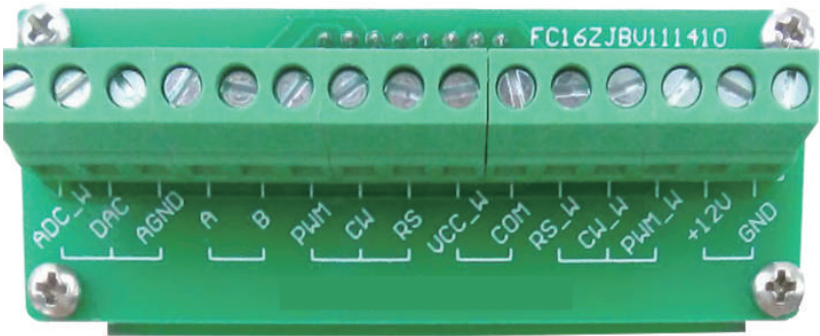


Figure 5 External Control Interface Board



Note: Follow the legend pins to provide the correct signal. Do not exceed the specified range of the signal value. Please pay attention to the specified voltage range when connecting to an external power supply, otherwise it may cause permanent damage and will not be covered by the warranty.



Note: Low voltage signals must be isolated from mains power. Use a separate shielded ground input wire.



Note: Use a qualified protective wire sleeve at the end of the multi-strand cable, otherwise there will be a risk of damage to the equipment.

Installation Instruction

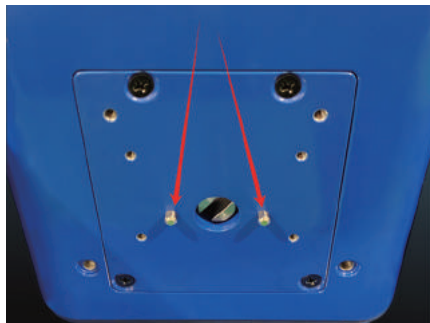
◆Before Operation

- Please compare the packing list to check whether all accessories are wrong or damaged when you open the outer package of the pump. Please contact us in time, if you find any problems.
- Read the operation manual carefully, and keep it at hand, or keep it in a fixed place for reference at any time.
- Place the pump on a level table with the rear at least 20 cm away from obstacles.

◆ Install Pump Head and Tube

For detailed installation steps, please refer to the operation manual of the corresponding pump head!

- The equipment is suitable for YZ15, YZ25, KZ25, DMD25, YZ35 pump head.
- Align the flat shaft of the pump head with the groove of the driver coupling and push it in, rotate the pump head to align the locating hole at the rear of the pump head with the locating pin of the driver pump head bracket, fit the pump head with the pump head bracket, and tighten the two fixing screws through the fixing hole of the pump head.
- Pull the pump head lever to open the pump head, put the tube into the pump head smoothly and straighten it, pull the lever in the opposite direction to the horizontal position, and the tube is installed.
- Note: When installing the YZ35 pump head, it is necessary to remove the positioning pin on the pump head bracket, as the figure below.



◆ Power Connection

- The power supply should match the power supply used as indicated by the nameplate on the rear of the case.
- Plug the supplied power cord into the power socket on the rear of the drive.

	Note: Make sure all power supply wires are rated for equipment wattage.
	Note: The pump must be located so that it can be easily disconnected from the power source when the equipment is in use.
	Note: Please use the same power supply as that on the nameplate of the machine, otherwise the equipment will be damaged!

Operation Instructions

◆ First Run Wizard

The pump has preset default operating parameters, as shown in the table below:

Parameter	Default Setting
Working Mode	Internal control
Run Time Unit	Second
Run Time	1.0S
Pause Time Unit	Second
Interval Time	1.0 seconds
Cycles	1
Reverse Angle	0°
Max Speed	350rpm
Pump number setting	#1
Power Fail Restart	No
Beep Setting	Turn on
Language	
Contrast Setting	10
Baud Rate	9600
Stop Bit	1
Parity Check Mode	Even parity
Pulse Trigger	Falling Edge
Level Trigger	High Level
External Control Mode	Voltage 0-5V
ADD Time	0.6S
Deceleration time	0.6S
Three-level Permission Switch	Closed
Administrators password	0000
Technician password	0000
Operator password	0000

Table 3 Device Default Parameter List

◆ Setting Menu

In the main interface, press the  to enter the menu settings interface. In the settings interface, press the   to select parameters, press the 'Select' key to enter the submenu, adjust parameters by pressing the   in the submenu. To return to the main interface, long press the  or follow the prompt to press the 'Confirm' key to return to the previous menu level, then press the 'Return' key to go back to the main interface. Refer to Figure 6 for specific operations:

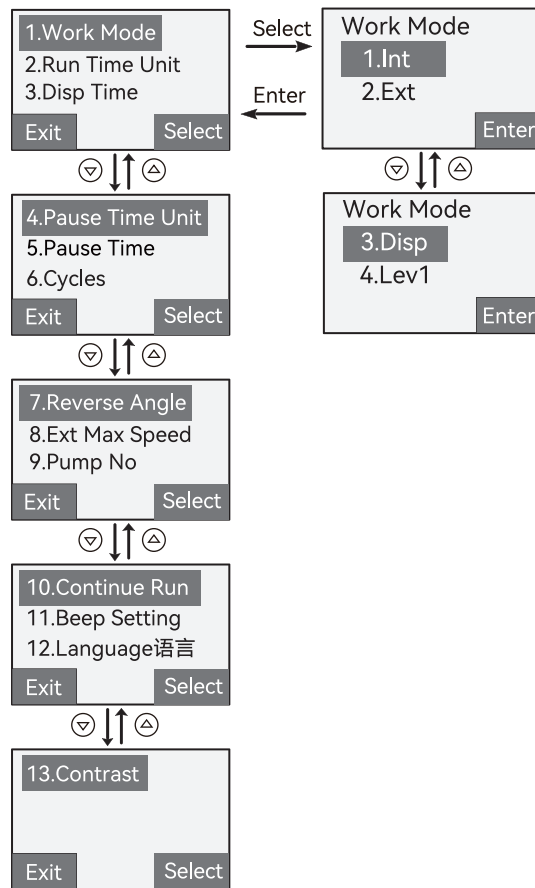


Figure 6 Menu Setting Flow Chart

- Working Modes:** There are five modes: internal control, external control, time dispensing, level 1 and level 2.
- Run Time Unit:** In the dispensing mode, set the running time unit can be set in days, hours, minutes, and seconds.
- Run Time:** In time dispensing mode, set the duration of operation within the range of 0.1 – 999.9 seconds/minutes/hours/days.
- Interval Time Unit:** In time dispensing mode, set the interval time unit, which can be set as days, hours, minutes, or seconds.
- Interval Time:** In the time dispensing mode, when the number of cycles is not 1, set the interval time between each operation, the setting range is 0.1– 999.9 seconds\minutes\hours\days.
- Cycles:** In the dispensing mode, set the number of repeated operations, and the setting range is 0-999 times. Setting range 0 - 50000 times. When the setting value is 0, the cycle will be infinite until press to  stop. When the setting value is other, the cycle will be stopped automatically after completing the set number of cycles.
- Reverse Angle:** When the peristaltic pump stops, in order to prevent the liquid in the tube line from dripping, the motor of the peristaltic pump rotates in the opposite direction for an angle to suck back the liquid in the tube. The anti-drip angle can be adjusted from 0 to 720 degrees. When the angle is set to 0, this function is off.
- Max Speed:** In the external control mode, set the upper limit of the analog controllable speed.
- Pump Number Setting:** In the communication mode, set the communication address of the pump.



Note: Restart the drive to apply the settings.

- Power Failure Recovery:** Can be set to resume operation according to the state before power failure after power restoration.
- Tone Setting:** Set whether to turn on or off the key prompt sound.
- Language Setting:** Switch the system language to Chinese or English.
- Backlight Setting:** Adjust the LCD contrast.

◆ System Parameter Setting

In the main interface, press  +  key to enter the parameter setting interface of the system. In this interface, press   key to select

MS106 Peristaltic Pump Operation Manual

advanced parameters, press to enter the submenu, and press   key to adjust the parameters in the submenu. If you want to return to the previous menu, press the 'Confirm' key. If you want to return to the main interface, you can long press the  key or follow the prompt of the function key, press the 'Confirm' key to return to the previous menu, then press the 'Return' key to return to the main interface. Refer to Figure 7 for specific operations:

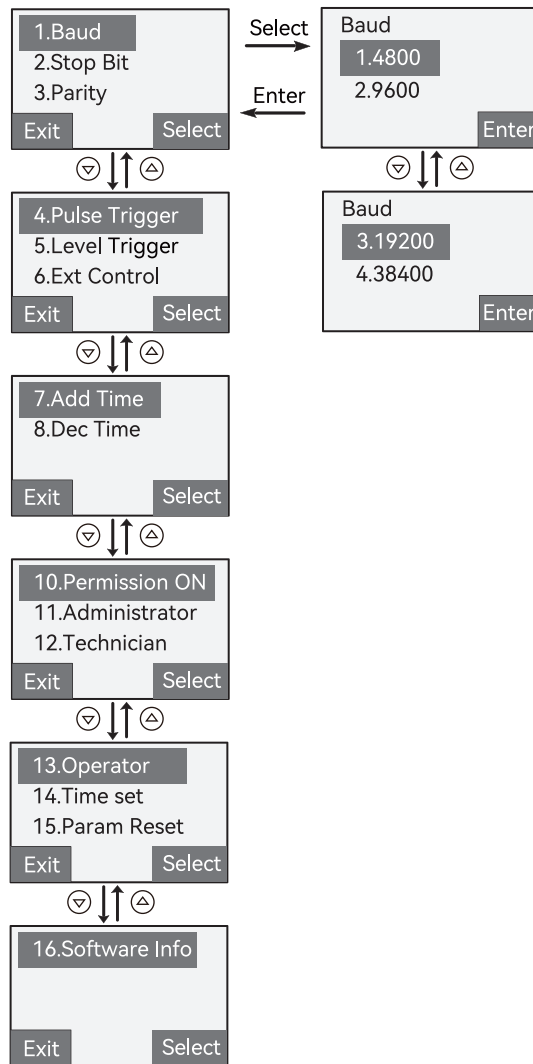


Figure 7 Flow Chart of System Parameter Setting

1. Baud Rate: In the communication mode, set the size of rate, which can be set to 4800, 9600, 19200 and 38400 (the default is 9600).
2. Stop Bit: In the communication mode, set the size of the stop bit, Which can be set to 1 or the default is 1).

3. Parity Check Mode: In the communication mode, set the type of parity check mode, which can be set to odd parity, even parity and no parity (the default is even parity).
4. Pulse Trigger: In internal control or dispensing mode, set the trigger type in which the driver is controlled by an external pulse signal to start and stop. It can be set to rising edge trigger or falling edge trigger (the default is falling edge trigger).
5. Level Trigger: In the external control or level mode, set the level trigger type when the drive is controlled externally, which can be set as high level trigger or low level trigger (the default is high level trigger).
6. Ext Control: In the external control mode, set the parameter type of the drive speed controlled by the analog quantity, which can be set to voltage mode 0-5V, voltage mode 0-10V, current mode 4mA-20mA (with the change of the external control analog quantity, the drive speed will change linearly).
7. Acceleration Time: Set the acceleration time when the driver starts running, the unit is second (the default value is 0.6 seconds).
8. Deceleration Time: Set the deceleration time when the driver stops running, the unit is second (the default value is 0.6 seconds).
10. Three-level Permission Switch: Enable or disable three-level permission management (default: disabled).
11. Administrator Password: Used for three-level permission management. Set the administrator password within the range of 0-9999.
12. Technician Password: Used for three-level permission management. Set the technician password within the range of 0-9999.
13. Operator Password: Used for three-level permission management. Set the operator password within the range of 0-9999.
14. Time Set: Customers can customize the date and time when using the time.
15. Param Reset: Restore all parameters to default value, after pressing to switch to "Yes", press to return to the main interface, the parameters will be restored to default.
16. Software: Check the current version.

◆User Permission Management

The drive has four levels of user permissions to ensure the reliability of parameter setting and working process. Avoid economic and property losses caused by misoperation of the drive during using. The permissions from high to low are administrator permissions, technician permissions, operator permissions. You can enter the password to obtain the corresponding permissions and then perform the relevant operations.

User permission management can be enabled or disabled. When this feature is enabled, the driver defaults to operator authority upon startup. To unlock the screen after it has been locked, a password is required. Through this process, user authority can be switched. Corresponding permissions are also required when accessing parameter settings or system settings.

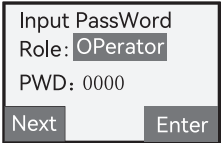
Operator: Buttons on the main interface control start/stop, direction, and full speed. Up and down buttons adjust speed.

Technician: Buttons on the main interface control start/stop, direction, and full speed. Up and down buttons adjust speed. Access to parameter settings interface.

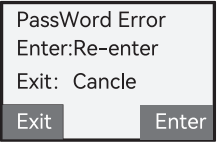
Administrator: Buttons on the main interface control start/stop, direction, and full speed. Up and down buttons adjust speed. Access to parameter settings interface and system settings interface. Administrators have the authority to enable/disable this feature and modify user passwords.

Follow the steps below to enable this feature and set various permission passwords:

- Turn on the power switch, the LCD screen will display a welcome message and enter the main interface.
- Access the system parameter settings and set the three-level permission switch to 'enabled', while also setting the administrator password, technician password, and operator password.
- When permissions are insufficient, the pump will enter the permission modification interface, as shown in the figure below. Press the shift function key to toggle between operator and password, use the up and down keys to modify permissions and change passwords (range 0000-9999), and then press the confirm function key to confirm.

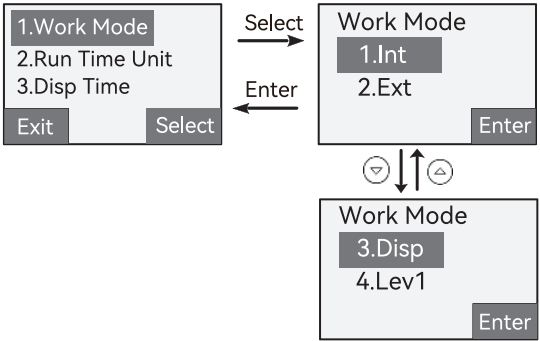


- If the password is correct, proceed to the subsequent interface. If the password is incorrect, a password error interface will appear, allowing you to choose to re-enter the password or exit.
- When three-level permissions are enabled, entering the permission password is required to unlock. This operation can be performed when switching permission levels is necessary.



◆Mode Switch

- Turn on the power switch, the LCD screen will display a welcome message and enter the main interface.
- In the menu settings, select the desired operating mode.



◆Internal Control Mode

The operation of the pump is controlled by the keys on the front panel of the pump.

- Turn on the power switch, the LCD screen will display a welcome message and enter the main interface.
- In the menu settings, switch the mode to internal control mode.
- Press   to adjust to the speed to be set.
- Press  to adjust the direction of rotation.
- Press  to start or stop the pump.
- Press , and the pump will run at maximum speed.

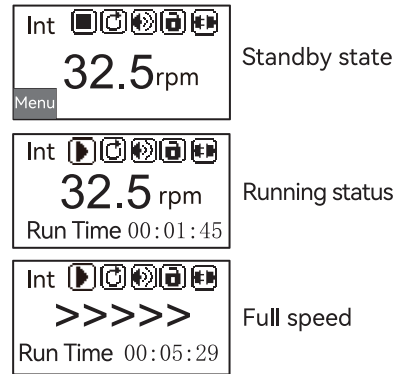


Figure 8 Internal Control Mode

◆ External Control Mode

The speed is controlled by the external input analog quantity, and the start and stop are controlled by the external level. The keys on the control panel do not work.

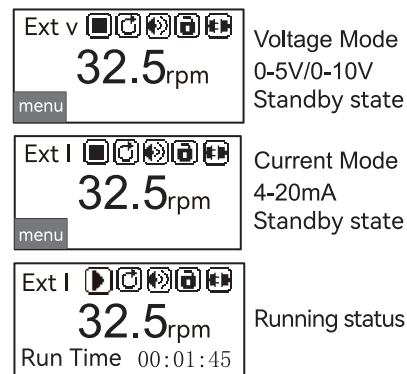


Figure 9 External Control Mode

- Turn the power off, connect the circuit according to the wiring diagram 10 or 11 below, and connect the DB15 interface to the back interface of the pump.

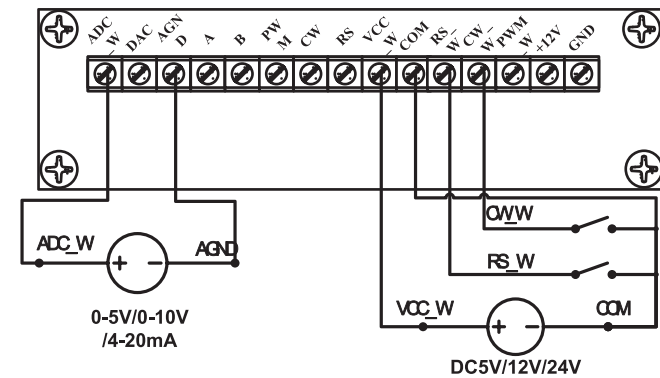


Figure 10 Wiring Diagram for Connecting External Power Supply in External Control Mode

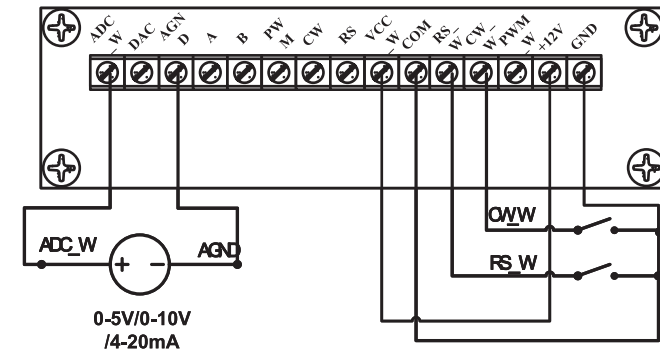


Figure 11 Wiring Diagram for Connecting Internal Power Supply in External Control Mode



Note: Follow the legend pins to provide the correct signal. Do not exceed the specified range of the signal value. Please pay attention to the specified voltage range when connecting to an external power supply, otherwise it may cause permanent damage and will not be covered by the warranty.



Note: Low voltage signals must be isolated from mains power. Use a separate shielded ground input wire.

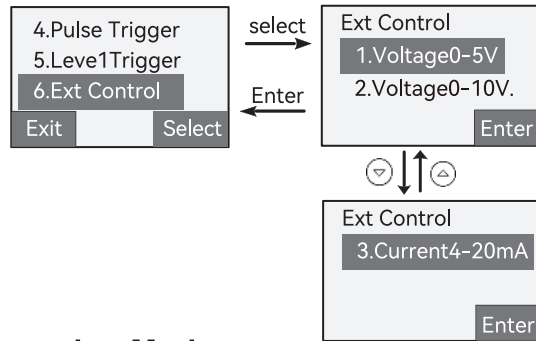


Note: Use a qualified protective wire sleeve at the end of the multi-strand cable, otherwise there will be a risk of damage to the equipment.

MS106 Peristaltic Pump Operation Manual

- Turn on the power switch, the LCD screen will display a welcome message and enter the main interface.
- In the menu settings, switch the mode to external control mode.
- Connecting the switch of the external RS_W, turn on the analog power supply, the pump will change the speed with the change of the analog value, disconnect the switch of the external RS_W, the pump will stop running.
- Disconnecting the switch for external CW_W turns the pump in clockwise direction. Connecting the switch for external CW_W turns the pump counterclockwise.

Note: In the system parameter settings, the external control mode can be modified: 0-5V, 0-10V, 4-20mA. The interface for modifying the external control mode is shown in the figure below.



◆ Time Dispensing Mode

Liquid volume dispensing is achieved by setting the pump's working time.



Figure 12 Time Dispensing Mode

Setting parameters

- Turn on the power switch, the LCD screen will display a welcome message and enter the main interface.
- In the menu settings, switch the mode to time dispensing mode.

- Press key to enter the parameter setting interface.
- Set the time unit, running time, interval time unit, interval time and cycle times respectively.
- Back to home page.

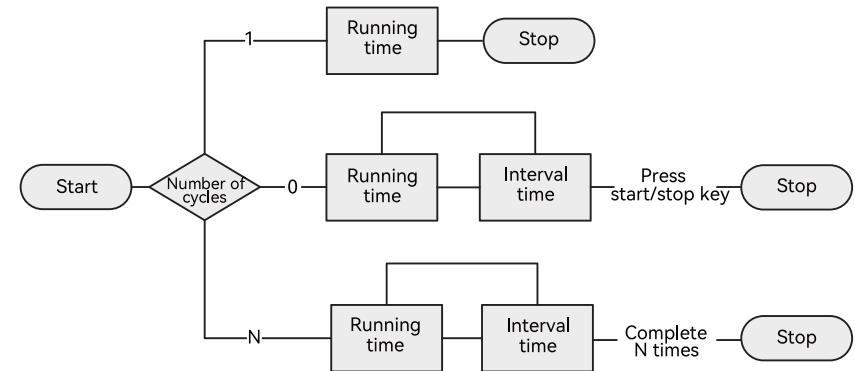


Figure 13 Timing operation flow chart

- Press to adjust the direction of rotation.
- Press to run the setting process.
- During the operation, press to stop the operation.
- In dispensing mode, a foot switch can also be used to start a run.
- During the running, the run time, interval time and number of runs are displayed.

◆ Level 1 Mode (Original Foot Switch Mode)

The start and stop of the pump is controlled by the external high and low levels.



Figure 14 Level 1 Mode

When the power is cut off, connect the circuit according to figure 15 or figure 16, and connect the DB15 interface to the back interface of the pump.

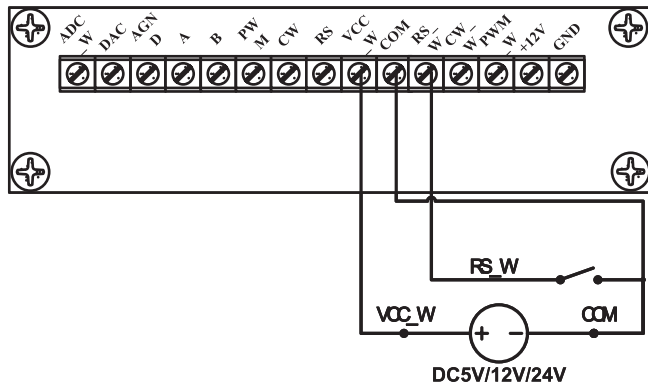


Figure 15 Wiring Diagram of External Power Supply of Level 1

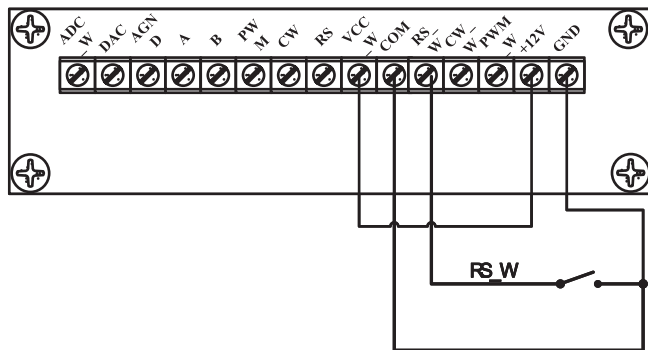


Figure 16 Wiring Diagram of Internal Power Supply of Level 1



Note: Follow the legend pins to provide the correct signal. Do not exceed the specified range of the signal value. Please pay attention to the specified voltage range when connecting to an external power supply, otherwise it may cause permanent damage and will not be covered by the warranty.



Note: Low voltage signals must be isolated from mains power. Use a separate shielded ground input wire.



Note: Use a qualified protective wire sleeve at the end of the multi-strand cable, otherwise there will be a risk of damage to the equipment.

- Turn on the power switch, the LCD screen will display a welcome message and enter the main interface.
- In the menu settings, switch the mode to Level 1 mode.
- Press  to adjust the direction of rotation.
- Press   to adjust to the speed to be set.
- When switch of the foot switch is connected, the pump runs. When the switch is disconnected, the pump stops.



Note: Use this mode when the dispensing is controlled by an accessory called dispensing controller.

◆Level 2 Mode (Original Level Mode)

The start and stop of the pump is controlled by the external high and low levels.



Standby state



Running status

Figure 17 Level Mode

- When the power is cut off, connect the circuit according to figure 18 or figure 19, and connect the DB15 interface to the back interface of the pump.

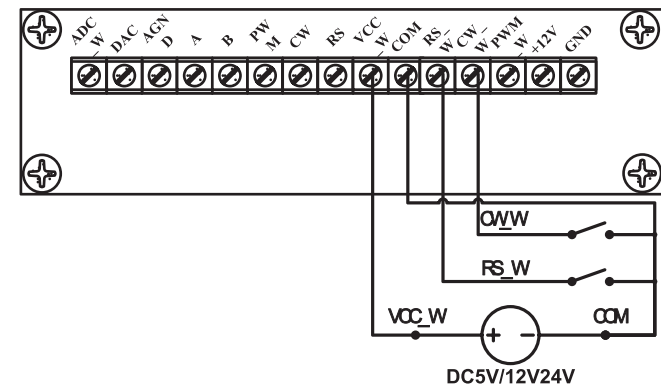


Figure 18 Wiring Diagram of External Power Supply of Level 2

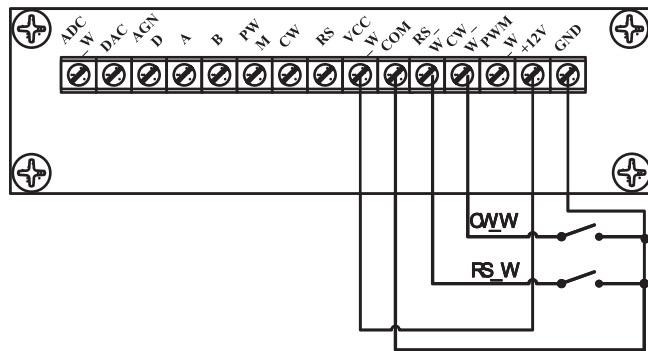


Figure 19 Wiring Diagram of Internal Power Supply of Level 2



Note: Follow the legend pins to provide the correct signal. Do not exceed the specified range of the signal value. Please pay attention to the specified voltage range when connecting to an external power supply, otherwise it may cause permanent damage and will not be covered by the warranty.



Note: Low voltage signals must be isolated from mains power. Use a separate shielded ground input wire.



Note: Use a qualified protective wire sleeve at the end of the multi-strand cable, otherwise there will be a risk of damage to the equipment.

- Turn on the power switch, the LCD screen will display a welcome message and enter the main interface.
- In the menu settings, switch the mode to Level 2 mode.
- Press   to adjust to the speed to be set.
- Connect the switch of external RS_W, the pump will run according to the set speed. Disconnect the switch of external RS_W, the pump will stop run.
- Disconnect the CW_W switch and the pump runs in clockwise direction.
- Connect the CW_W switch and the pump runs in counterclockwise direction.

◆ Communication Mode

RS485 communication supports MODBUS protocol, which can control various functions of the pump. For specific parameter addresses and

support instructions, refer to the communication technical standard of Lead Fluid.



Figure 20 Communication Mode

- With the power supply disconnected, refer to Figure 21 or Figure 22 for wiring. Then connect the DB15 interface to the back interface of the pump.

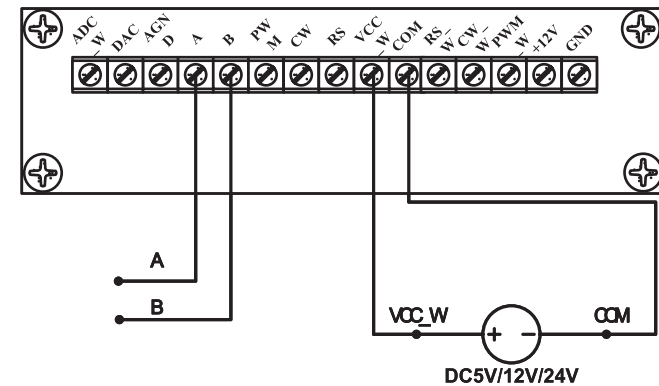


Figure 21 Communication External Power Supply Wiring Diagram

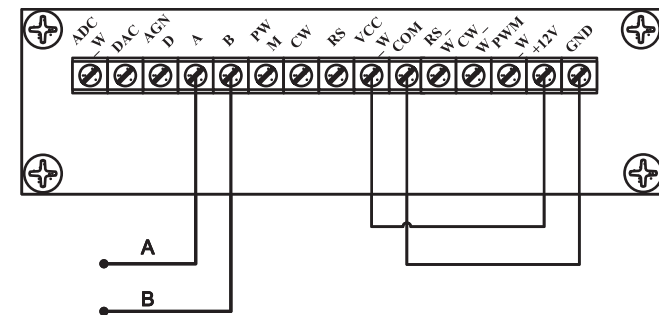


Figure 22 Communication Internal Power Supply Wiring Diagram



Note: Follow the legend pins to provide the correct signal. Do not exceed the specified range of the signal value. Please pay attention to the specified voltage range when connecting to an external power supply, otherwise it may cause permanent damage and will not be covered by the warranty.



Note: Low voltage signals must be isolated from mains power. Use a separate shielded ground input wire.



Note: Use a qualified protective wire sleeve at the end of the multi-strand cable, otherwise there will be a risk of damage to the equipment.

- Turn on the power switch, the LCD screen will display welcome information and display the main interface.
- Menu Setting, mode to internal control mode or time dispensing mode.
- Control the functions of the pump through communication.
- Press  to stop the pump.

◆Speed Setting

In the main interface, the speed can be set within the range of 0.1-350 with a resolution of 0.1. Adjustment can be made using  . Each press of the key increments or decrements the lowest digit of the speed by one, while long pressing   enables continuous rapid increase or decrease. Press and hold , and then press  to directly set the speed to the highest. Press and hold , and then press  to directly set the speed to the lowest.

Malfunction and Maintenance

◆Daily Maintenance

- Regularly check the tube for breakage or loss of elasticity.
- There is a cooling fan behind the peristaltic pump, please do not cover it to avoid affecting heat dissipation.
- Peristaltic pumps can not be flushed with water, if the pump tube rupture during operation, the liquid in the pump head should be dried or dried in time.
- Do not use chemical solvents to clean the peristaltic pump and pump head surface.



Note: Always disconnect the pump from the mains power before opening the pump head cover to change tubes, or performing any assembly, disassembly or maintenance activities.

◆ Maintenance Worksheet

Regular maintenance of the pump according to the maintenance schedule will help reduce damage to pump components and ensure personal and property safety.

Maintenance Tasks	Frequency	Actions After Exception
Check if the pump leaks and damage.	1. Check before starting each time. 2. Daily visual inspection. 3. Periodic inspection during pump operation.	1. Before operating the pump, repair leaks and damage. 2. Replace parts when necessary. 3. Clean up all spilled liquid.
Check for abnormal temperature or noise during pump operation.	1. Daily visual inspection. 2. Periodic inspection during pump operation.	1. Check and replace worn parts.
Is tube replacement needed	1. Check the condition of tube at most every three days	Please replace the tube in the following situations: 1. When the flow rate is lower than 75% of the original value. 2. When the tube has burst and is badly worn. 3. When the user-defined replacement cycle is reached.
Check pump head and rotor assembly.	1. Regularly check the wheel flexibility every week. 2. Check when replacing tube. 3. Once a year complete inspection for wear and tear, check bearing clearance and function.	1. Worn and damaged surfaces can lead to premature tube failure, replace worn parts in a timely manner.

Table 4 Maintenance Work List

◆ Malfunction Solutions

NO.	Malfunction Type	Malfunction Description	Solutions
1	Hardware	No display	1. Check whether the power cord is connected properly. 2. Check whether the fuse is blown. If it is blown, please contact the manufacturer for replacement.
2	Hardware	Motor does not rotate	1. Check whether the flow or speed is set too small, such as 0.1rpm.
3	Hardware	Motor is trembling	1. Check that the pump head screws and plate rod are tightened.
4	Hardware	The motor rotates in only one direction	1. Check that the direction keys are working properly. 2. Check whether the external control direction signal is normal.
5	Hardware	Key does not work	1. Whether it is locked.
6	Hardware	Noisy when the pump is running	1. Around 70 rpm and 120 rpm, it belongs to the resonance frequency of the motor, and it is normal for the sound to be loud. 2. Check that the pump head screws and plate rod are tightened.
7	Hardware/ Software	Communication does not work	First check the software: 1. Whether the mode is communication mode. 2. Reset the machine address. 3. Check if there are two machines on the bus using the same address. If the problem is not resolved, continue to check the hardware: 4. Check if the connection is correct 5. Check whether the external control power supply supplies power.
8	Hardware/ Software	External control does not work	First check the software: 1. Whether the mode is external control mode. If the problem is not resolved, continue to check the hardware: 2. Check if the connection is correct. 3. Check whether the external control power supply supplies power.

Table 5 Malfunction Solutions Reference Table



Note: This product is not medically certified. When used as a component in a medical device, the medical device itself must have medical certification.

Dimensions

Unit: mm

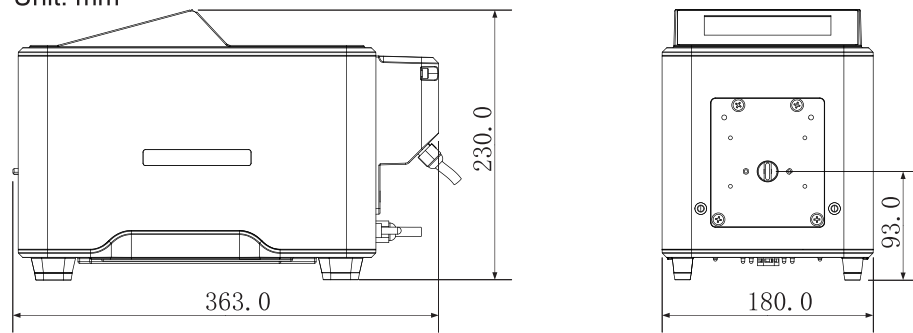


Figure 23 Dimensions of MS106

Ordering Information

Product Model	Description	Order Number
MS106		1100500101024

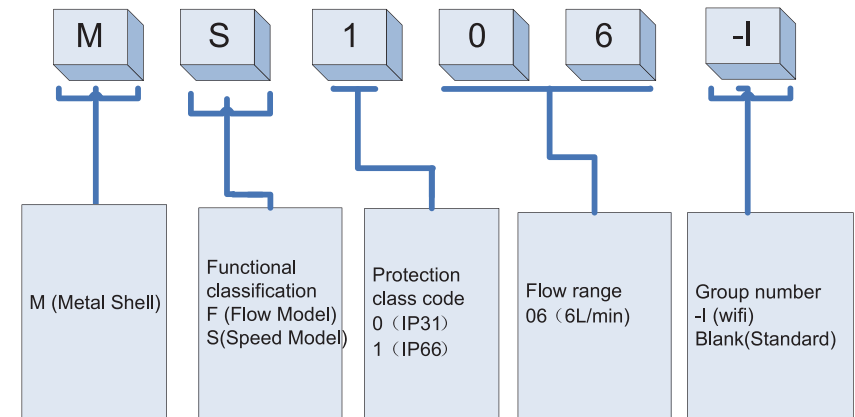
Table 6 Ordering Information

Optional Accessories Table

Accessories list	Description	Order Number
Foot switch		1060200100017

Table 7 Table of Optional Accessories

Naming Rules



Technical Parameters

MS106 Technical Parameters

Functions

Suitable Pump Heads	YZ15, YZ15, KZ25, DMD25, YZ35
Key Functions	Control speed, rotation direction, start and stop, full speed, working mode, power-off memory, time dispensing and other parameters.
External Control Functions	Foot switch control, external control start/stop, external control forward/reverse rotating, 5-24V wide range input, optoelectronic isolation, analog 0~5V/0~10V/4~20mA software setting switch.
Communication Functions	RS485, MODBUS.
Display Functions	Displays the current running speed, running direction, working mode and each parameter setting information.
Direction Control	Free adjustment of forward and reverse rotation direction.

Table 8 Main Functions

Performance

Flow Range	6-7700 mL/min
Speed Range	0.1-350 rpm
Speed Resolution	0.1 rpm, accuracy error less than $\pm 0.2\%$
Dispensing Range	0.1 ~ 999.9 seconds/minutes/hours/day
Adjustment Method	Mask key operation
Display Method	128*64 LCD
Applicable Power Supply	AC 100-240V 50Hz/ 60Hz
Wattage	<180W
Working environment	Temperature 0- 40°C Relative humidity<80%
Dimensions	363×180×230 mm
Drive Weight	10.5kg
Degree of Protection	IP66/IP67

Table 9 Main Performance

◆Suitable Pump Heads for Peristaltic Pump Drives



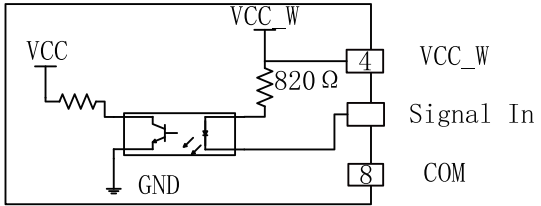
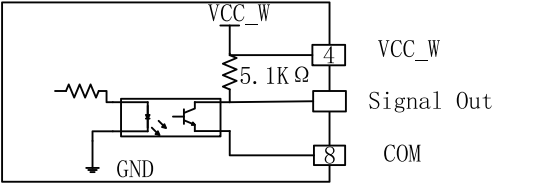
◆Flow Rate Chart of the Pump

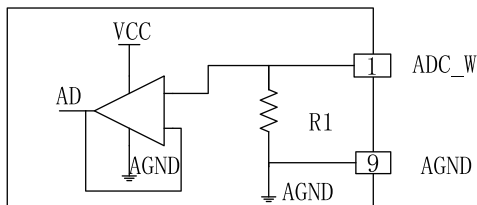
Driver Model	Suitable Pump Head	Channel Number	Suitable Tube (mm)	Single-Channel Flow Rate(mL/min)
MS106	YZ15	1	13#14#19#16#25#17#	0.005 ~ 1050
	2×YZ15	2	13#14#19#16#25#17#	0.005 ~ 1050
	4×YZ15	4	13#14#19#16#25#17#	0.005 ~ 1050
	YZ25	1	15#24#	51 ~ 1800
	2×YZ25	2	15#24#	0.17 ~ 1050
	YT15	1	13#14#19#16#25#17#18#	0.006 ~ 1575
	2×YT15	2	13#14#19#16#25#17#18#	0.006 ~ 1575
	4×YT15	4	13#14#19#16#25#17#18#	0.006 ~ 1575
	YT25	1	15#24#35#36#	0.18 ~ 1750
	2×YT25	2	15#24#35#36#	0.18 ~ 1750
	KZ25	1	15#24#35#36#	0.31 ~ 3850
	DMD25	1	15#24#35#36#	0.4 ~ 4200
	YZ35	1	73#82#	1.33 ~ 7700



Note: The above applicable pump head, the number of suitable channels and the flow rate of a single channel are all obtained from the test of purified water with a common tube under normal temperature and pressure conditions in the laboratory. This data is for reference only, due to pressure in actual use, temperature, medium characteristics, tube material and other specific factors, the specific situation needs to consult our engineers.

◆External Control Input and Output Performance

Input switch value or OC gate specification		
Project	Parameter	
Input interface principle		
Single signal input ON current	$5.5\text{mA} < I_{on} < 15\text{mA}$	
Single signal input OFF Current	$I_{off} < 1.5\text{mA}$	
Signal input method	switch (closed, open) or NPN transistor OC gate	
External control input voltage	5V 12V 24V	Input loop requires no series resistors
Isolation method	Optoelectronic isolation	
Output specification		
Project	Parameter	
Principle of output interface		
Output method	NPN transistor OC gate with internal pull-up	
Isolation method	Optoelectronic isolation	

Input Analog Specifications		
Project	Parameter	
Interface principle		
Input impedance ($<100\text{Hz}$)	0-5V	$R1=4\text{K}\Omega$
	0 -10V	$R1=4\text{K}\Omega$
	4-20mA	$R1=248\Omega$
Allowable error	0-5V、0-10V、 4-20mA	$\pm 1\%$
resolution	0-5V	5mV
	0-10V	10mV
	4-20mA	16uA
Internal Output Power Specifications		
Project	Parameter	
The output voltage	DC12V $\pm$ 1V	
Allowable output current	$< 130\text{mA}$	
External input power specification		
Project	Parameter	
Allowable input voltage	DC5-25V	
Allowable Input Current	$> 350\text{mA}$	