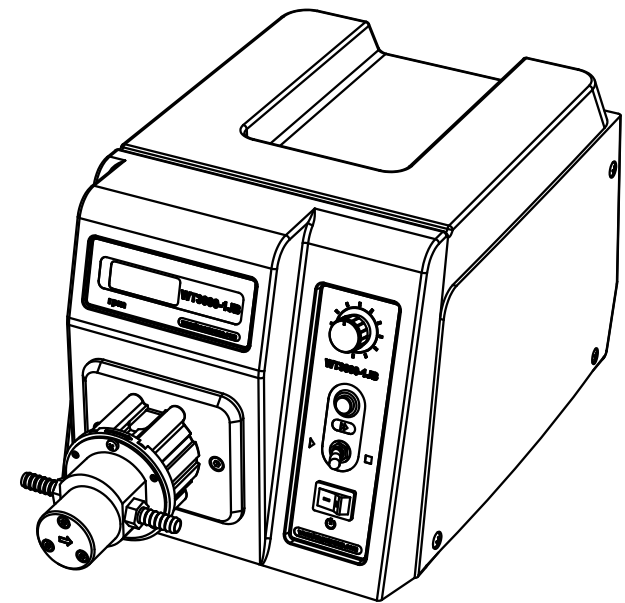


LONGER

WT3000-1FB Micro Gear Pump Drive Operating Manual



LONGER

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WT3000-1FB Gear Pump Drive

Baoding Longer Precision Pump Co.,Ltd.

A **Halma** company

Micro Gear Pump Drive Operating Manual

Important Information:

Please read operating manual carefully before operation.

Warning:

- To prevent damage to pump, do not run the pump dry.
- If the power line or the plug are worn or damaged please pull out the plug (Hold the plug not the power line when pulling out).
- Please shut down the power supply and pull out the plug when you think the pump needs to be maintained or repaired.
- Shut down the power supply of the pump when connecting to external control equipment.
- The International Protection rating of this pump is IP31. Do not let liquid enter this pump drive.

Warranty:

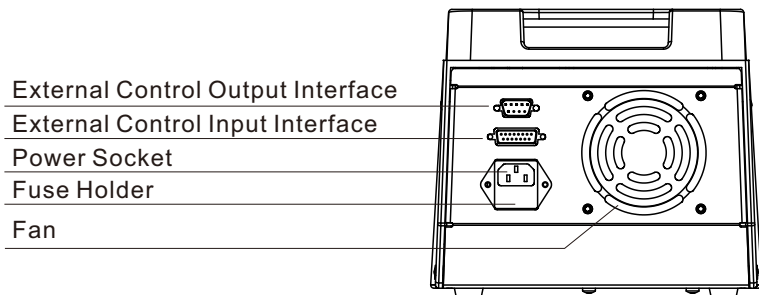
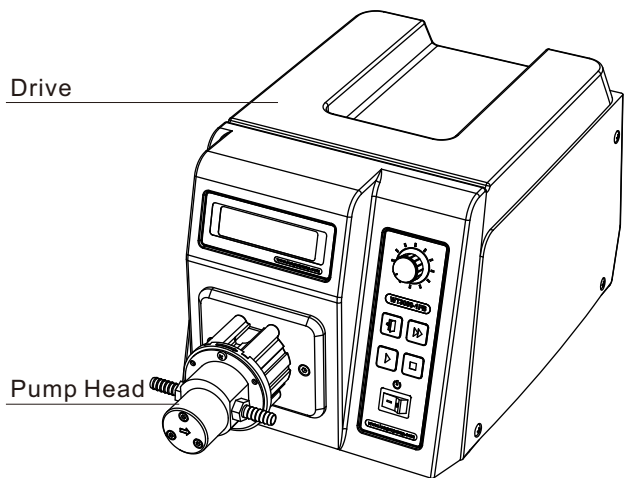
- The warranty period of this product is one year. If repair or adjustment is necessary within the warranty period, the problem will be corrected at no charge if it is not due to misuse or abuse on your part, as determined by the manufacturer. Repair costs outside the warranty period, or those resulting from product misuse or abuse, may be invoiced to you.
- Contact Longer Company or Longer's dealers before returning pump to repair.
- Adopt original carton or reliable package when returning pump to repair.
- Write a note on detailed description of failure phenomena and contact information and put this note along with pump before returning pump to repair.

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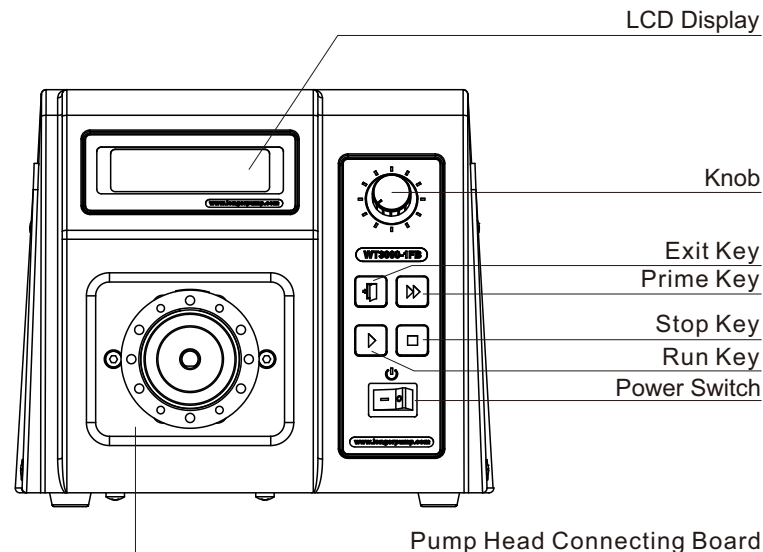
Instruction

Acceptable pump heads for WT3000-1FB are MG204, MG209 and MG213. The pump delivers flow rates from 83 to 2750 mL/min and dispensing volume is from 0.1 mL to 999 L. Combining 128×32 LCD display with membrane keypad and rotary coded switch makes the operation easy and prompt. The speed can be adjusted manually or automatically through external control interface.



 **Reference:**
Refer to page 10 to know the functions of External Control.

Basic Operation



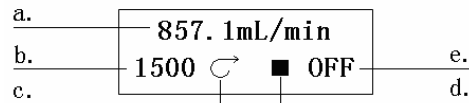
- **Run Key**
In stop state, press **Run Key**, the pump starts to run.
- **Stop Key**
In non-prime state, press **Stop Key**, the pump stops.
- **Prime Key**
When the pump is in flow rates mode state (the pump runs or stops) or in dispensing mode (the pump stops), press the **Prime Key** to enter prime state when the pump runs at full speed for emptying, filling and rinsing operation; Press the **Prime Key** again to return to common state. In prime state, other keys are invalid.
- **Exit Key**
Function 1: Cancel current operation and return to previous menu.
Function 2: In dispensing mode, press **Exit Key** to switch different dispensing parameters display.

- Knob
Function 1: Turn the **Knob** to adjust the flow rates in flow rates display state.
Function 2: Turn the **Knob** to select the menu and set the parameters, press **Knob** for confirmation in menu selection state.
- Power Switch
Turn on or off the pump.

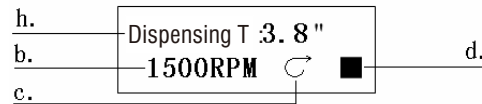
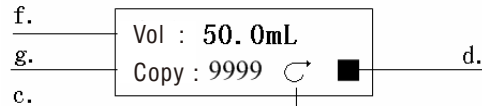
Running Interface

Turn on the pump, the pump is initialized first and select the language. Chinese and English are available. Turn the Knob to select the language. Then the pump displays the running interface.

- Flow rates display



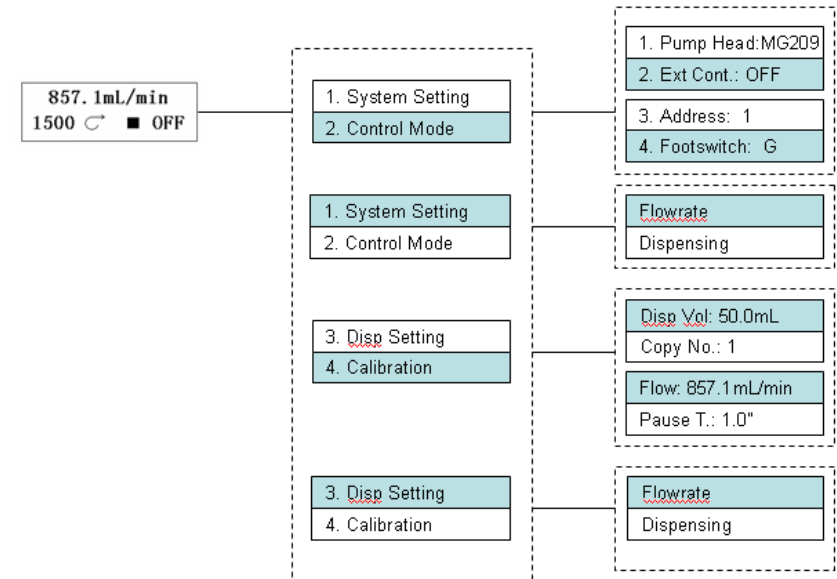
- Dispensing display: Dispensing parameters are displayed in two interfaces, Press Exit Key to switch these two interfaces.



- a. Current flow rates: Display current flow rates. Turn the Knob to increase or decrease the flow rates.
- b. Current speed: Display current speed. The speed will change when adjusting the flow rates.
- c. Running direction: Indicate the direction of the pump. The running direction of the pump can't be changed.

- d. Running status: [▶] means the pump runs; [■] means the pump stops; [▶▶] means the pump is in prime state.
- e. Control mode: INT means the pump is controlled internally; V means the pump is controlled by external analog voltage signal; mA means the pump is controlled by external analog current signal; Hz means the pump is controlled by external 0 10 kHz pulse signal. Off means shutting off the external control function by setting menu;
- f. Dispensing volume: Display dispensing volume in dispensing mode.
- g. Copy number: Display copy number under dispensing mode.
- h. Dispensing time: Display the dispensing time. When the dispensing procedure starts, the dispensing time will be counted down. Adjust the flow rates or dispensing volume to change the dispensing time in dispensing parameters setting interface.

Menu Navigation Diagram



Pump Head Operation

❖ Pump Head Installation:

The pump head is mounted on drive before the pump leaves the factory. Follow below procedure for changing another pump head.

1. Loose the three M3 screws which connect the pump head and the pump head bracket. Dismantle the pump head slightly.
2. Put the new pump head in the old pump head location. Pay attention to the inlet and outlet locations of the pump head. Use three M3 screws to connect the pump head and the pump head bracket.

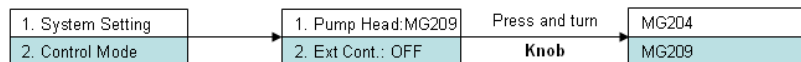
💡 Turn off the power supply before changing the pump head.

❖ Pump Heads and Flow rates

Acceptable Pump Heads	Part Number	Flow Rates(mL/min) 300~3000(rpm)
	MS(Strong Magnet)	
MS204	05015010011	85.7~857.1
MS209	05015010012	171.4~1714.3
Ms213	05015010013	257.1~2571.4

❖ Pump Head Setting

Press the **Knob** to highlight Pump Head line, press **Knob** again to enter pump head selection interface, turn **Knob** to select the pump head, press the **Knob** for confirmation and return to previous menu, or press **Exit Key** not to store the selection and return to previous menu.



Flow Mode Operation

❖ Enter Flow Mode

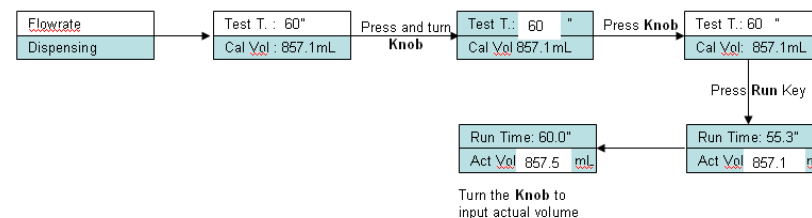
Press and turn the **Knob** to highlight control mode line. Press **Knob** to enter next interface, turn **Knob** to select control mode, press **Knob** for confirmation. Press **Exit Key** not to store the selection and return to previous menu.



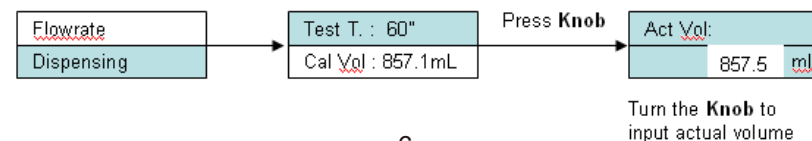
❖ Flow Control: Turn the Knob to adjust the flow rates.

❖ Flow Calibration

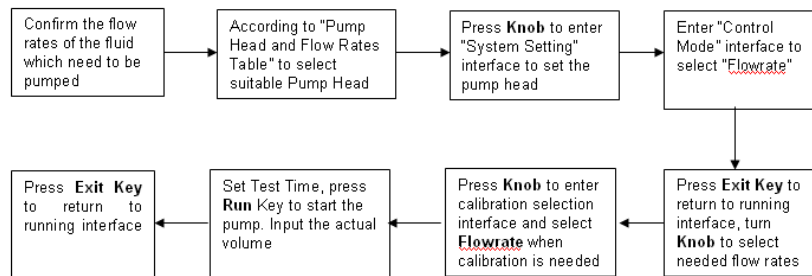
- Press and turn **Knob** to highlight calibration line. Press **Knob** to enter next interface. Turn **Knob** to select **Flowrate**. Press **Knob** to highlight test time line. Press **Knob** again to highlight the value of time. Turn **Knob** to select test time (its range is from 30 to 1800 seconds), press **Knob** for confirmation. Press **Exit Key** not to store the selection and return to previous menu.
- Press **Run Key**, the LCD displays running time and actual volume. Running time counts down. Turn **Knob** to input actual test volume. Press **Knob** for confirmation. The calibration operation can be repeated.



If the actual volume is known in advance, enter the calibration interface and input the actual volume directly.



❖ Flow Mode Operation Procedure



Dispensing Mode Operation

❖ Enter Dispensing Mode

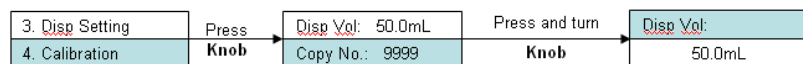
Press and turn the **Knob** to highlight Control Mode line. Press **Knob** to enter next interface, turn **Knob** to select **Dispensing**, press **Knob** for confirmation. Press **Exit Key** not to store the selection and return to previous menu.



❖ Dispensing Volume

The volume to be dispensed between two time intervals.

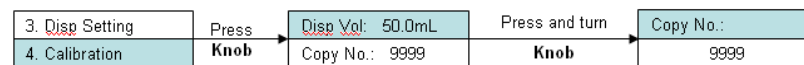
- Press and turn **Knob** to highlight dispensing setting line. Press **Knob** to highlight dispensing volume line. Press **Knob** again to highlight the value of the volume. Turn **Knob** to select dispensing volume, press **Knob** for confirmation. Press **Exit Key** not to store the selection and return to previous menu.
- Change the dispensing volume, the dispensing time will change accordingly.



❖ Copy No.

the total filling number in dispensing mode. Its range is from 0 to 9999.

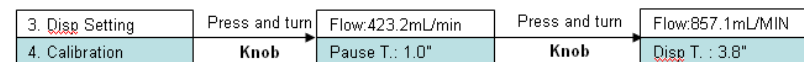
- Press and turn **Knob** to highlight copy number line. Press **Knob** to enter next interface. Turn **Knob** to select copy number, press **Knob** for confirmation. Press **Exit Key** not to store the selection and return to previous menu.
- If the copy no. is "0", the dispensing process of the pump will continue until press **Stop key** or shut off the pump to stop dispensing.



❖ Flow Rate Setting

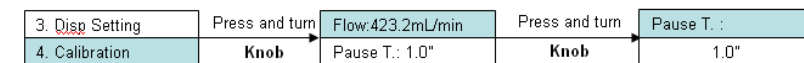
the pump's flow rates in dispensing mode. Adjusting the dispensing flow rates can change the dispensing time.

- Press and turn **Knob** to highlight dispensing flow rates line. Press **Knob** To enter next interface, turn **Knob** to select suitable flow rates, press **Knob** for confirmation. Press **Exit Key** not to store the selection and return to previous menu.



❖ Pause Time: Time Interval between every dispensing operation.

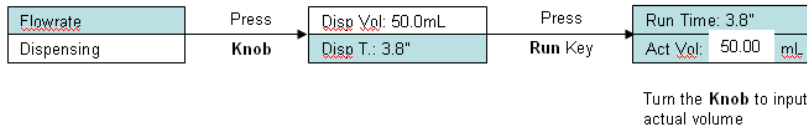
- Press and turn **Knob** to highlight pause time line. Press **Knob** to enter next interface. Turn **Knob** to select pause time, press **Knob** for confirmation. Press **Exit Key** not to store the selection and return to previous menu.



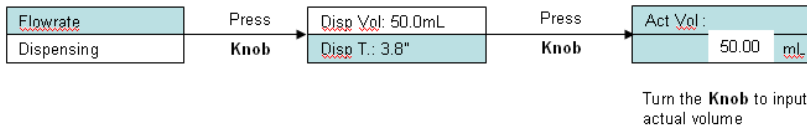
❖ Dispensing Calibration

The parameters can not be changed under dispensing volume calibration operation. The defaulted parameters are the parameters set under Dispensing Setting.

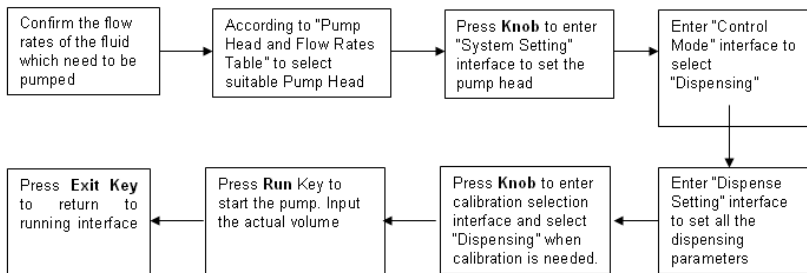
- Pump stops under dispense mode, press and turn **Knob** to highlight calibration line. Press **Knob** to enter next interface. Turn **Knob** to select Dispensing. Press **Knob** to enter next interface.
- Press **Run Key**, the LCD displays running time and actual volume. Running time counts down.
- Turn **Knob** to input actual volume. Press **Knob** for confirmation.



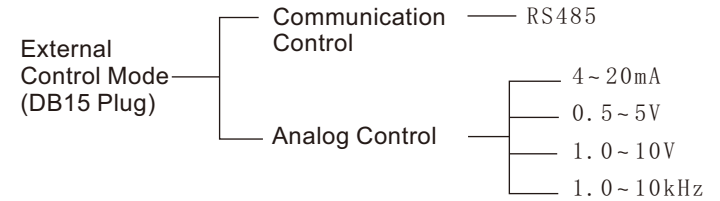
- If the actual volume is known in advance, enter the calibration interface and input the actual volume directly.



❖ Dispensing mode operation procedure



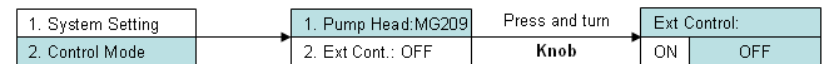
External Control



- 1.Enable the external control function.
- 2.These five Standard Analog Control Module need to be order separately.

❖ External control setting

- Set the pump to enable the external control or not.
On: Enable external control
Off: Disable external control
- Set the external control
Press and turn **Knob** to highlight the external control line. Press **Knob** to enter next interface, turn **Knob** to select On or Off, press **Knob** for confirmation. Press **Exit Key** not to store the selection and return to previous menu.



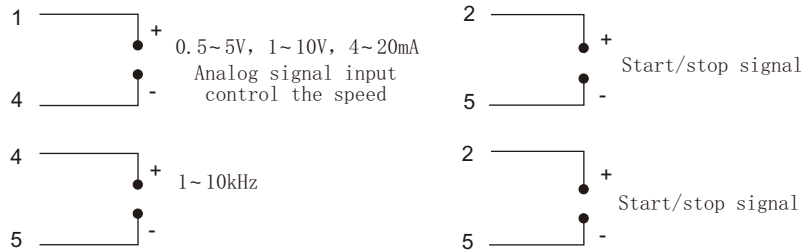
❖ Analog Signal Control

Set "External Control" in "on" state. External control module is shown as above.

- 💡 Five kinds of standard external control module need to be ordered separately according to special requirements.

Terminal Definition of Standard External Control Module

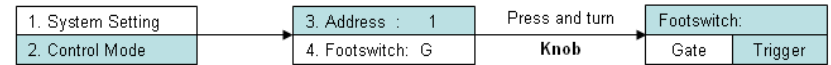
- 1# Analog input in 4 20 mA, 0.5 5 V, 1.0 10 V external control modules. Control the speed of the pump. It is open in 1-10kHz. External control module.
- 2# External control start/stop input. Open or connected to low level, the pump runs; connected to high level, the pump stops.
- 3# Open
- 4# Analog ground (AGND) in 4 20 mA, 0.5 5 V, 1.0 10 V external control modules; Pulse input in pulse input external control module, Control the speed of the pump. 10 kHz is corresponding to the max. speed.
- 5# is the COM of external control start/stop signal input.



❖ Footswitch Control

- Footswitch has two kinds of working modes:
Trigger: Press footswitch, the pump starts running; Press footswitch again, the pump stops.
Gated: The pump runs as long as the footswitch is pressed.
- Set footswitch
 Press and turn **Knob** to highlight the footswitch line. Press **Knob** to enter next interface, turn **Knob** to select Trigger or Gated, press **Knob** for confirmation. Press **Exit Key** not to store the selection and return to previous menu.

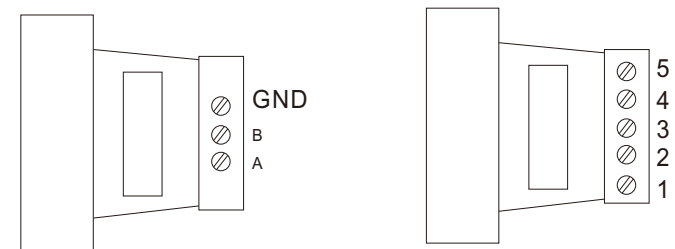
💡 The pump identifies the Longer Footswitch automatically. When the pump connects the footswitch, the **Start/Stop Key** on operating panel is invalid no matter the external control setting is on or off.



- 💡 1.Enable the external control function.
 2.These five Standard Analog Control Module need to be order separately.

❖ Communication Control Mode

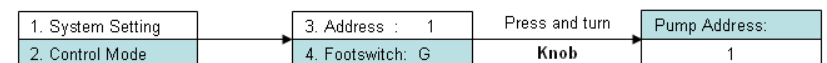
- The pump can connect to control computer (computer, PLC, SCM) through RS485 serial communication module (shown as below). Please contact Longer Company for communication protocol.



RS485 Communication Module

Analog Signal Module

- Address setting
 When control computer controls many pumps through RS485 interface, it must identify each pump's I.D. This pump I.D. should be unique. It's the identification of this pump. Maximum 30 pieces WT3000-1FB can be controlled through RS485 at the same time.
- Set the address
 Press and turn **Knob** to highlight the address line. Press **Knob** again to enter next interface, turn **Knob** to select Pump I.D. number, press **Knob** for confirmation. Press **Exit Key** not to store the selection and return to previous menu.



❖ External Control Output

Pump is equipped with output port in order to monitor the status of pump. Please see below “External Control Output Port pins Diagram: DB9”. Output signal adopts optoelectronic isolation circuit. A pull-up resistor and power supply are needed when using.

Terminals Definition :

1# Start/Stop output. Pump outputs low level when it runs; pump output high level when it stops.

8# Pulse output, 300 3000 rpm corresponding to 1.25~12.5 kHz.

4#, 6#, 7# COM

Maintenance

Drive surface and pump head should be kept clean and dry because it don't have chemical resistance to organic solvents and strong corrosive liquids, otherwise it will shorten the life of the machine.

Technical Specifications

❖ **Functions**

Acceptable Pump Head	MG204, MG209, MG213
Operation Mode	Membrane keypad and Knob
Prime	Full speed for fast filling and emptying
Display	128×32 graphic LCD displays all the information
External Control Input	Control Start/Stop and flow rates under flow rates mode
Footswitch	Control Start/Stop of the pump
External Control Output	Output the signals of Start/Stop and speed
Communication	Communicate with control computer
Flow rates Function	Deliver fluid at set flow rates
Dispensing Function	Set dispensing volume, copy number and pause time, etc
Memory Function	Store all the running information automatically
Calibration	Acquire higher accuracy
Cooling Mode	Heat-emitting fan
Direction	Clockwise only

❖ **Specifications**

Flow Rate	85.7~2571.4 (ml/min)	
Dispensing Volume	0.1mL~999L	
Copy No.	0~9999, '0' mean infinite cycle.	
Pause Time	1 second~999 hours, resolution is 0.1second.	
Flow Rate Calibration	30 second~30 minutes, resolution is 1 second.	
External Control	Input Function	4~20 mA, 0.5~5 V, 1.0~10 V modules control flow rates. TTL control the Start/Stop.
	Output Function	Output the status of Start/Stop and 1.25~12.5kHz corresponding to 300~3000 rpm under the mode of optical isolation.
	Communication	RS485
Liquid to be pumped	The diameter of particle in liquid is smaller than 10µm	
Acceptable Liquid Temperature	PTFE: -45~50°C, PEEK -45~120°C	
Maximum outlet pressure (Testing medium: water)	MG204: 1.4MPa	
	MG209: 0.9MPa	
	MG213: 0.8MPa	
Acceptable Liquid Viscosity	≤200cst	
Power Supply	AC176~264V/90~130V, 50Hz/60Hz	
Power Consumption	≤150W	
Operation Conditions	Temperature 0 to 40°C	
	Relative Humidity <90% (No dew)	
Drive Dimensions	292×185×180 (mm)(L×W×H)	
IP Rating	IP31	
Drive Weight	5.1kg	

