MICROLIT


## Microlit India

629 Pakramau, Kursi Road, Lucknow 226026, India
Phone: +91 9918625629, Email: info@microlit.com
**www.microlit.com**

## Microlit USA

33 Wood Avenue South, Suite 600, Iselin, NJ 08830, USA
Phone: +1 732 321 0852, Email: info-usa@microlit.com
**www.microlit.us**

## Microlit LATAM

Business Place Ibirapuera, Alameda dos Jurupis,1005,
Indianópolis, São Paulo, Brasil
Phone: +55 11 93269-5932,


ISO 14001 CE GERMAN CERT ISO 9001 ASCB(E) UK ISO 13485 ISO 17025

MICROLIT PERISTALTIC PUMP

# Speed Variable Peristaltic Pump

(MP100B, MP300B, MP600B)
(MP110B, MP310B, MP610B)

CII INDUSTRIAL INNOVATION AWARDS 2022 | 9TH DESIGN EXCELLENCE AWARDS 2019 | GOOD DESIGN AWARD 2019 | INDIA DESIGN MARK

OPERATION MANUAL

EXPERIENCE PRECISION

# TABLE OF CONTENTS

## 1. Symbols Description

| | |
|---|---|
|  | Danger |
|  | Caution / Warning |
|  | Wi-Fi |
|  | Voltage/ ElectricalWarning |
|  | Keep finger away from moving parts |
|  | Personal protective equipment (PPE) must be worn |
|  | Warranty Policy |
|  | Disposal |



## 2. Important information

Be sure to read the instructions carefully before operation.

### Danger 

- Please use the power supply consistent with that on the nameplate of the machine, otherwise the equipment will be damaged.
- Do not disassemble the casing and modify the interior of the equipment by yourself, otherwise it will cause faults and even electric shock accidents.
- When installing and removing the pump tube, please turn off the power first and do not get close to the rotating roller to prevent fingers and clothes from being drawn into the mechanical mechanism.
- When installing and removing the external control device, please turn off the power first to prevent electric shock accident or damage to the equipment.
- Please connect the protective ground of the machine to the earth, otherwise there will be the risk of electric shock, electromagnetic interference or Induced static electricity.

### Warning 

- Before using, please make sure that the transmitted liquid will not react with the tube and pump head, otherwise the tube or pump head will be damaged. If you are not sure, please consult our engineer.
- Tubes are vulnerable parts. Please check them regularly. Our company is not responsible for the losses caused by tube damage, especially the leakage of toxic, harmful and precious liquids.
- If the actual working environment conditions (including temperature, humidity, power supply voltage, etc.) exceed our technical indicators and cause machine damage, our company is responsible for paid warranty, but we are not responsible for any other damage caused thereby.

## 3. Introduction

The speed variable peristaltic pump not only has the basic functions of start & stop, speed regulation, full speed, direction, etc., but also is upgraded to LCD display, adding the functions of multi segment dispensing operation and anti drip function. In addition, it can be easily connected and controlled with other equipment through RS485 communication of MODBUS protocol. This series of basic speed variable peristaltic pumps include:

MP100B/MP110B flow range 0.00011-720 ml/min, working speed 0.1-150 RPM
MP300B/MP310B flow range 0.006-1600 ml/min, working speed 0.1-350 RPM
MP600B/MP610B flow range 0.006-2900 ml/min, working speed 0.1-600 RPM

## 4. Applications

- Suitable for abrasive liquids
- The pump body never comes in contact with liquid
- No valve blockage
- The inner surface is smooth and easy to clean
- The liquid comes in contact only with the tube
- The maximum suction lift can reach 8m water column
- Low shear force, can be used to transport emulsion or liquid containing foam
- Suitable for transporting liquids containing a large amount of gas
- Suitable for precise transmission and quantitative feeding, and can achieve certain accuracy
- Can be used to transport viscous liquids
- By changing the tube and material, it can be used for various applications, including food and medical treatment

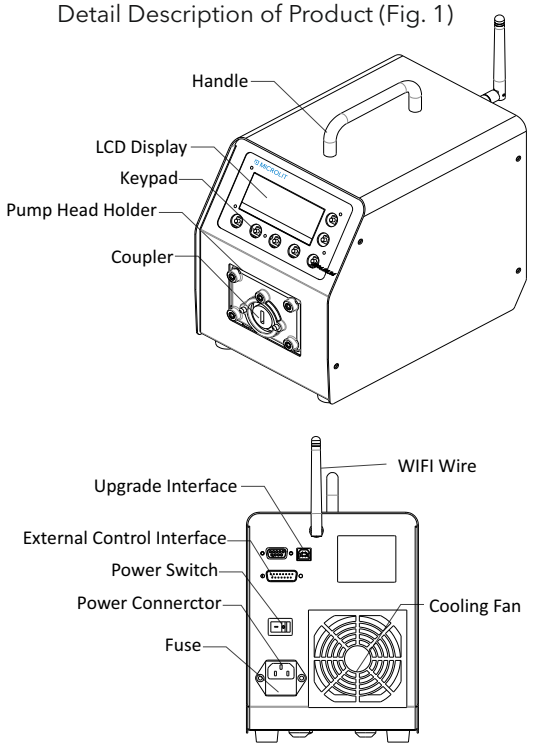
## 5. Functions and Features

- LCD display speed and working mode
- Mask key operation enables ease of usage
- The run time, pause time and cycles can be set
- High precision speed control limit
- External analog variable speed regulation, high and low level control start and stop, positive and negative, signal physical isolation
- RS485 communication, support MODBUS communication protocol, and facilitate connection with various control devices
- WIFI is selected to realize wireless communication and remote control
- The circuit board is sprayed with three proofing paints to achieve the effect of dust and moisture prevention
- Strong anti-interference characteristics, wide voltage design, suitable for complex power supply environment
- ABS engineering plastic housing with streamline and attractive appearance



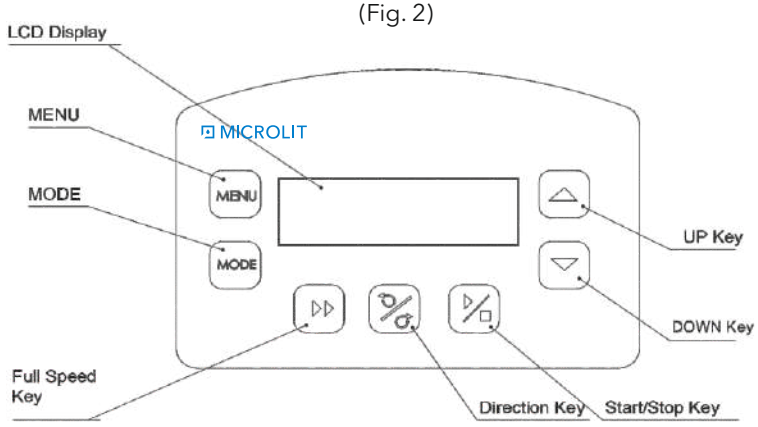
## 6. Components and Interface

Detail Description of Product (Fig. 1)




## 7. Display Panel and Operating Keypads

(Fig. 2)



## 8.1 Keypads

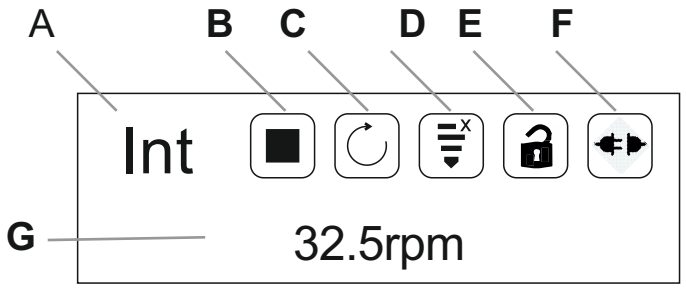
| KEY | FUNCTION |
|---|---|
| ▲ | UP Key. When press it shortly, the last digit of the value will increase by 1. Hold the key to increase the value quickly. |
| ▼ | DOWN Key. When press it shortly, the last digit of the value will decrease by 1. Hold the key to decrease the value quickly. |
| MENU | MENU Key. When on main screen, press the MENU key to enter the setting menu. When on the setting menu, press it to return to main screen. When the drive is running, this key is disabled. |
| MODE | MODE key. When the drive is not running, use the MODE key to change the working mode: Internal Control mode, External Control mode, Time Dispense mode, Logic Level 1 control mode or Logic Level 2 Control mode. Invalid when the motor is running. |
| ▶▶ | PRIME key. Press the key to run pump at maximum allowed speed in the direction shown on the display. Press again to return to the previous state. |
| ⇄ | DIRECTION Key. Press to key to change the drive rotating direction, clockwise or counterclockwise. |
| ▶/■ | START/STOP key. Press to start or stop the drive, press this key to enter the submenu in menu mode. |

## 8.2 Digital Display

| Icon | Function | Icon | Function |
|---|---|---|---|
| ▶ | Start | ■ | Stop |
| ⏸ | Pause | >>>>>> | Full Speed |
| ↻ | Clockwise rotation | ↺ | Counter Clockwise rotation |
| 🔊 | Tone on | 🔈 | Tone off |
| 🔒 | Locked | 🔓 | Unlocked |
| #1 | Show pump number in communication | ⇹ | Communication is disconnected |



## 8.3 LCD Display




(Fig. 3)

A.Control mode: Display the current control mode, press to switch, including internal control, external control, timing dispensing, level 1 and level 2.

- Internal control mode: It is controlled by keys on the panel, and the start and stop are controlled by external pulse signal.
- External control mode: The speed, external level, signal direction and start stop are controlled by external analog quantity.
- Timing dispensing mode: Set the run time, pause time and cycle times to realize the timing transmission of liquid.
- Level 1 (Original Foot Switch) mode: The start and stop are controlled by external level signal, and the direction and speed adjustment are operated by the panel.
- Level 2 (Original Level) mode: The external level signal controls the start, stop and direction, and the speed is adjusted by the panel

B. Running status:
Displays the current running status

Stopped status Running status Paused status

C. Rotation direction:
Displays the current rotation direction

Clockwise Counterclockwise

D.WIFI signal strength: Displays the signal strength of the current WIFI

Good signal intensity

Medium signal intensity

Bad Signal intensity

WIFI connection unsuccessful

E. Lock status: Displays whether the current is locked. In the locked state, only the start stop on the panel works, and other keys are invalid. In the main interface, long press the direction key to enter the locking state. Long press the start / stop key to unlock.

Keypad unlocked Keypad locked

F. A.Communication status:
Displays whether current communication is in progress.

Communication disconnected

**#1** Connected, pump number is set to 1

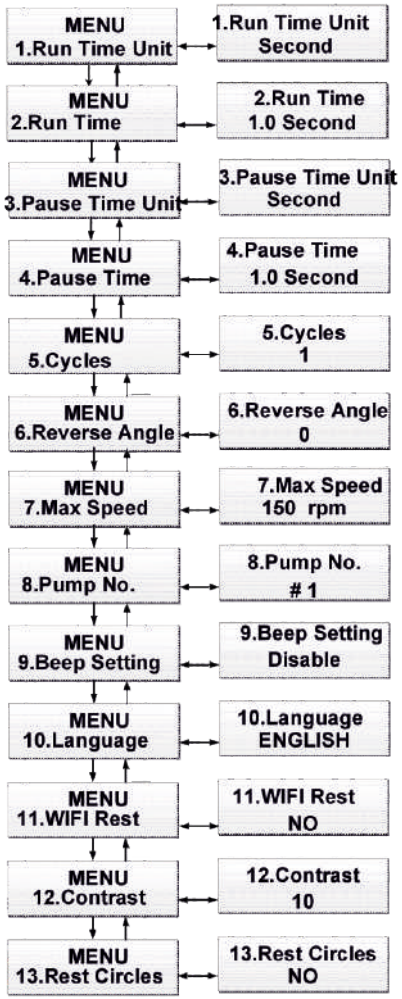
G. Speed display: Displays the current speed in rpm. When > > > > > > > > > is displayed, it is in full speed status.



## 9. Setup Menu

In the main interface, press MENU key to enter the menu setting interface. In the setting interface, press ▲ ▼ key to select parameters, press ▶/■ key to enter the sub menu, and press ▲ ▼ key in the sub menu to adjust parameters. If you want to return to the main interface, long press MENU key to return or long press MENU return the main interface.

(Fig. 4)



1. Run time unit: In the timing dispensing mode, set the run time unit, and you can set days, hours, minutes and seconds.

2. Run time: In the timing mode, set the run time, with the setting range of 0.1-999 seconds\minutes\hours\days.

3. Pause time unit: In the timing dispensing mode, set the pause time unit, which can set days, hours, minutes and seconds.

4. Pause time: In the timing dispensing mode, when the set number of cycles is not 1, the pause time between two adjacent operations, with the set range of 0.1-999 seconds\minutes\hours\days.

5. Cycles: In the timing dispensing mode, set the number of times to repeat the timing operation. Set the range 0-999 times. When the setting value is 0, the cycle is infinite until you press stop. When it is set to other values, it will stop automatically after completing the set cycle times.

6. Reverse angle: When the pump is stopping, prevent the liquid from dripping and rotate in the opposite direction. The setting range is 0-720 degrees. There is no suction back at 0 degrees.

7. Maximum speed: In the external control mode, set the upper limit of analog control speed.

8. Pump No.: In the communication mode, set the communication address of the pump.

Note: You need to restart the driver to take effect.

9. Beep setting: Set whether to turn on or off the key prompt tone.

10. Language setting: Choose between Various Languages & select 'English'.

11. WIFI reset: After resetting WIFI, the mobile app can be rebinding.

12. Contrast setting: Set the contrast of LCD.

13. Reset circles: After replacing a new tube, reset the tube life and recalculate the tube life.



## 10. System Advanced Parameter Settings

In the main interface, press MENU + △ key to enter the system parameter setting interface. In this interface, press △ ▽ key for advanced parameter selection, press ▷/□ key to enter the submenu, press △ ▽ key to adjust parameters. To return to the previous menu, press ▷/□. To return to the main interface, press MENU key

Figure 5 for details

(Fig. 5)

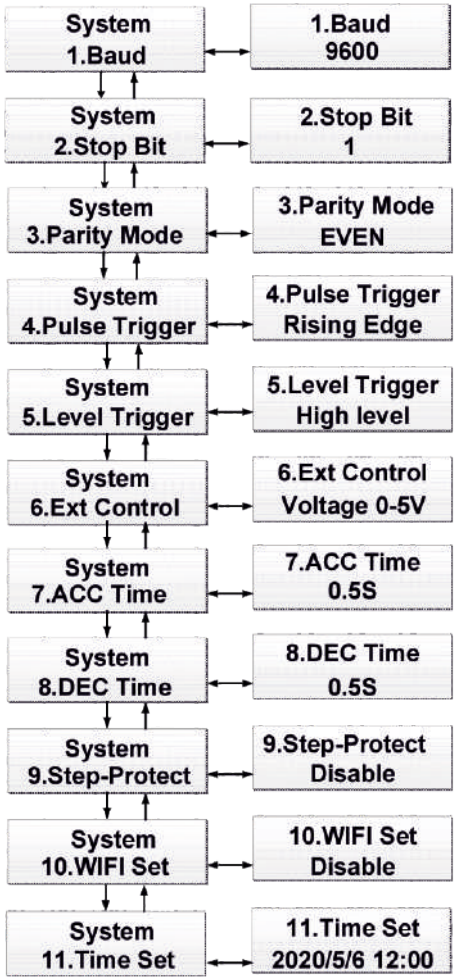



Figure 5 System advanced parameter setting flow chart

1. Baud: In the communication mode, set the baud to 4800, 9600, 19200, 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 and 2 (the default is 1).

3. Parity Mode: In the communication mode, set the parity type, which can be set as odd parity, even parity and none parity (the default is even parity).

4. Pulse Trigger: In internal control or timing mode, set the pulse trigger type of external control start / stop signal of the driver, which can be set as rising edge trigger and falling edge trigger (the default is rising edge trigger).

5. Level trigger mode: in external control or level mode, set the level trigger type when the driver is controlled externally, which can be set as high-level trigger and low-level trigger (the default is high-level trigger).

6. External control mode: In the external control mode, set the parameter type of analog quantity to control the driver speed, which can be set as voltage mode 0 - 5V, voltage mode 0 - 10V, and current mode 4mA - 20mA (the driver speed will change linearly with the change of external control analog quantity).

7. Acceleration time: Set the acceleration time when the drive is started and running. The unit is seconds (the default value is 0.5 seconds).

8. Deceleration time: Set the deceleration time when the drive stops running. The unit is seconds (the default value is 0.5 seconds).

9. Step-Protect: The switch setting of the driver out of step protection is off by default (WIFI version has this function).

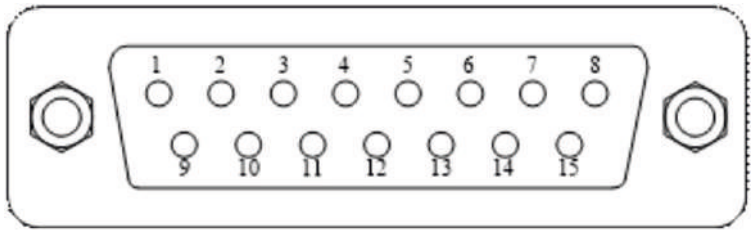
10. WIFI setting: The WIFI switch of the driver is off by default (WIFI version has this function).

11. Time setting: The customer can customize the date and time of use.

Press ⏩ to change the set parameters, press ⏫ ⏬ to adjust the time, and press ↗ to save and exit



## 11. External Control Interface




(Fig. 6)

| DB15 | Mark | Note |
|---|---|---|
| 1 | ADC_W | Positive end of external analog signal input |
| 2 | B | Communication interface, B pole of RS485 |
| 3 | A | Communication interface, A pole of RS485 |
| 4 | +12V_W | External voltage input terminal |
| 5 | CW_W | External direction signal input terminal |
| 6 | PWM | Pulse output |
| 7 | COM | External public land |
| 8 | AGND | Negative end of external analog signal input |
| 9 | +12V | Internal + 12V power output terminal |
| 10 | GND | Internal power ground |
| 11 | CW | Internal direction signal output |
| 12 | RS_W | External start/stop signal input terminal |

12.1

# Operation Instructions

## Preparation Work

- Please check whether all accessories are wrong or damaged according to the packing list. If any problem is found, please contact the manufacturer or distributor in time.
- Carefully read the instruction manual and keep it at hand or in a fixed place for easy reference at any time.
- Install the pump into the embedded square hole or place it on a horizontal table, paste rubber pads at the four corners of the bottom, and keep the rear more than 200mm away from the obstacle.

12.2

## Install Pump Head and Tubing

Install PH15T Pump Head

Align the flat shaft of the pump head with the groove of the driver coupling, push it in, rotate the pump head to align the screw hole of the pump head with the screw hole of the driver pump head support, fit the pump head with the pump head support, insert two fixing screws into the fixing hole of the pump head and tighten it.

## Install the tubing

Pull the pull rod of the pump head, open the pump head, put the tube smoothly into the pump head and straighten it, pull the pull rod in the opposite direction to the horizontal position, and the tube installation is completed.

## Install multichannel pump head

Align the flat shaft of the pump head with the groove of the driver coupling, push it in, rotate the pump head to align the screw hole of the pump head with the screw hole of the driver pump head support, and fit the pump head with the pump head support. Thread two hexagon socket set screws into the fixing hole of the pump head and tighten them. Put the tube smoothly into the card and straighten it, fix both ends of the hose, install one end of the card in the pump head guide rail, and press the other end into the card, and the tube installation is completed.

12.3

## Power Connection

The power supply shall be consistent with the power supply indicated on the

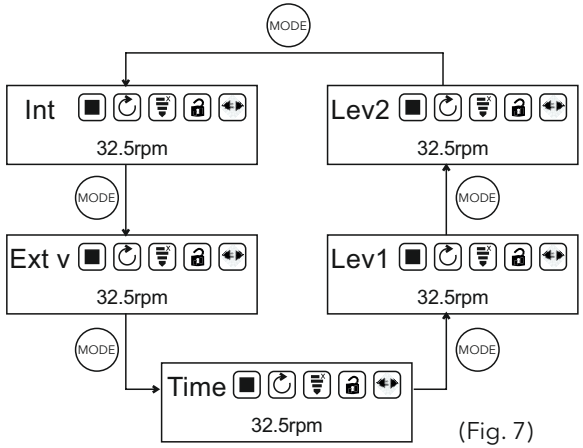


nameplate at the rear of the chassis. Plug the included switching power supply into the power socket on the back of the drive.

12.4

## Mode Change

- Turn on the power switch, the LCD displays welcome information and enters the main interface
- Press (MODE) key, the mode is switched once, as shown in Figure 7 below:



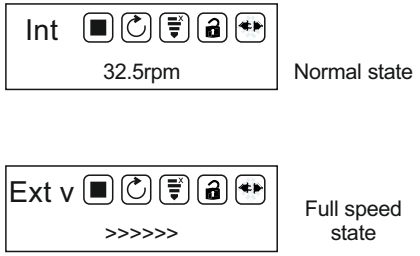

(Fig. 7)

12.5

## 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, LCD display and enter the main interface
- Press (MODE) key to switch the mode to the internal control mode, as shown in the following figure 8



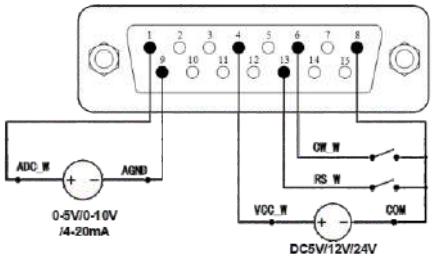

(Fig. 8)

- Press △ ▽ key to adjust the speed to be set
- Press key to adjust the direction of rotation
- Press key to start or stop the pump
- Press ▷▷ key, the pump runs at the highest speed

## 12.6 External Control Mode

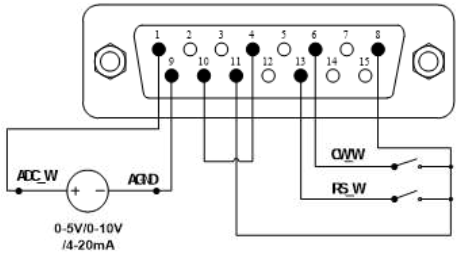
The speed is controlled by the external input mode analog quantity, and the start/ stop and direction are controlled by the external level. Control panel keys do not work.

- When the power is cut off, connect the circuit according to the following wiring Figure 9 and 10 and connect the DB15 interface to the back interface of the pump.




(Fig. 9)

Figure 9 Wiring diagram for connecting external power supply under external control mode.



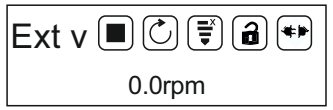

(Fig. 10)

Figure 10 Wiring diagram for connecting internal DC12V power supply under external control mode.

- Turn on the power switch, LCD display and enter the main interface
  Press MODE key to switch the mode to external control mode, as shown in the following figure.




Voltage Mode
0-5V/0-10V




Current mode
4-20mA

(Fig. 11)

Figure 8 External control mode.

- Close external RS_ W switch, turn on the analog power supply, and the pump speed changes with the change of analog. Disconnect the external RS_ W switch, the pump stops running.

- Disconnect CW_ W switch, the pump operates clockwise. Close CW_ W switch, the pump operates counterclockwise.

## 12.7 Time Dispensing Mode

The liquid volume is dispensed by regular operation.

Parameters setting

- Turn on the power switch and the LCD will display
  Press MODE key to switch the mode to the timing mode, as shown in the following figure.


Stop State


Running State

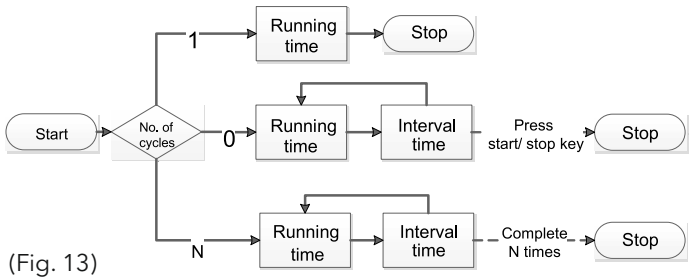
(Fig. 12)

Current run /
Interval time

Current
Completion times

Figure 12 Timing dispensing mode

- Press (MENU) key to enter the parameter setting interface.
- Set the timing unit, run time, pause time and cycle times respectively.
- Return to the main interface.

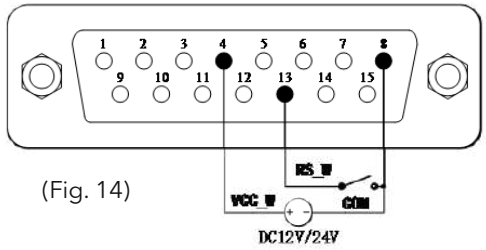



(Fig. 13)

- Press [⇅] key to adjust the rotation direction.
- Press [▷] key to run the setting process.
- During operation, press the start / stop key to stop the process.
- In the time dispensing mode, the start can also be started with the foot switch.
- During operation, the run time or pause time and the number of runs are displayed.

## 12.8 Level 1 (Original Foot Switch) Mode

The start and stop of the pump is controlled by external high and low levels. When the power is cut off, connect the circuit with reference to Figure 15 or Figure 14, and connect the DB15 interface to the back interface of the pump.




(Fig. 14)

Figure 15 Wiring diagram of external power supply under level 1 mode.



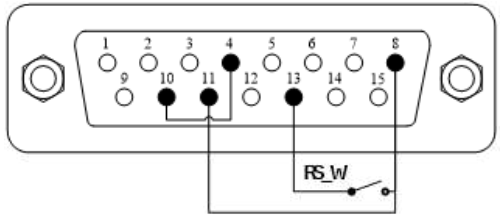



Figure 16 Wiring diagram of internal 12V power supply under level 1 mode.

(Fig. 15)

- Turn on the power switch and the LCD will display.
- Press (MODE) key to switch to foot switch mode, as the following figure.

(Fig. 16)


Figure 16 Level 1 mode.

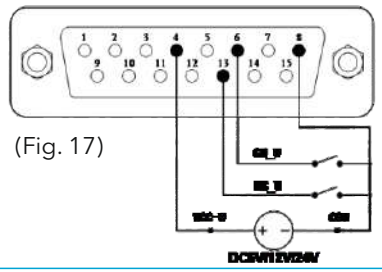
- Press [⇅] key to adjust the rotation direction.
- Press (△)(▽) key to adjust the speed to be set.
- The foot switch is closed and the pump runs. The foot switch is disconnected and the pump stops.

Note: This mode is used when controlled by the time dispensing!

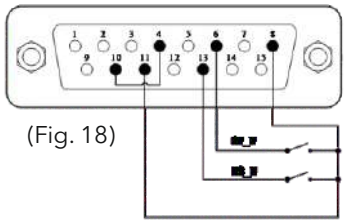
## 12.9 Level 2 Mode

The start/stop and direction of the pump are controlled by external high and low levels.

- When the power is cut off, connect the circuit and connect the DB15 interface to the back interface of the pump with reference to Figure 17 or Figure 18



(Fig. 17)



(Fig. 18)

Figure 19 Wiring diagram of internal 12V power supply under level 2 mode.

- Turn on the power switch and the LCD will display.

Press (MODE) key to switch the mode to level mode. (Fig. 19)

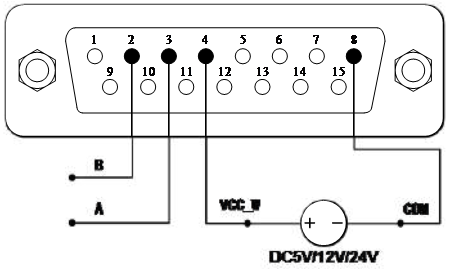

- Press (△)(▽) key to adjust the speed to be set.
- Close external RS_ W switch, the pump operates according to the set speed. Disconnect the external RS_ W switch, the pump stops running.
- Disconnect CW_ W switch, the pump runs clockwise. Close CW_ W switch, the pump runs counterclockwise.

12.10

## Communication Mode

RS485 communication supports Modbus protocol and can control various functions of the pump. For specific parameter addresses and supporting instructions, refer to our communication technology standards.

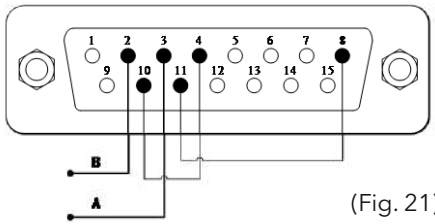
- When the power supply is cut off, conduct wiring with reference to Figure 20 or Figure 22. Then connect the DB15 interface to the back interface of the pump.




(Fig. 20)

Figure 21 Wiring diagram of external 12V power supply for communication.





(Fig. 21)

Figure 21 Wiring diagram of internal 12V power supply for communication.

- Turn on the power switch and the LCD will display.
- Press (MODE) to switch the mode to internal control mode or timing mode.

Figure 20 Communication mode.

- Control various functions of the pump through communication.
- Press (▷/□) key to stop the pump.

12.11

## Speed Setting

In the main interface, the resolution of the speed is 0.1 in the range of 0.1-100 and 1 in the range of 100-600. It can be set by pressing the (△)(▽) key. Each time you press the key, the lowest bit of the speed increases or decreases by one and the long press (△)(▽) key can increase or decrease continuously and quickly. Press (▷▷) key for a long time, and then press (△) key can be directly set to the maximum speed.

Press (▷▷) key for a long time, and then press (▽) key can be directly set to the minimum speed.

12.12

## WI-FI Distribution Network Equipment

- When the device is powered on, the WI-FI icon shows that the connection is not successful.


(Fig. 22)

- Connect your mobile phone to WI-FI for distribution network and log in to your cloud control app account.

- Click the "+" button of the motor in the upper right corner of the home page of cloud control, select the WI-FI distribution network to add a device, the app will automatically read the current WI-FI, manually enter the Wi-Fi password, click the "link" button, and wait for 20 seconds to see the added device (Figure 23.)


(Fig. 23)

13.

## Malfunction and Maintenance

Repair and After-sales

- This product is guaranteed free of charge for one year (If it is damaged due to improper operation of the user, the company is responsible for the warranty, but the maintenance fee shall be charged)

- If maintenance is carried out beyond the free warranty period, only material and labor costs and maintenance fees shall be charged.

Routine Maintenance

- Regularly check the tube for damage or loss of elasticity

- There is a cooling fan behind the peristaltic pump. Please do not cover it to avoid affecting the cooling
- The peristaltic pump cannot be washed with water. If the pump tube breaks during operation, the liquid in the pump head shall be wiped dry or dried in time
- Do not use chemical solvents to clean the peristaltic pump and pump head



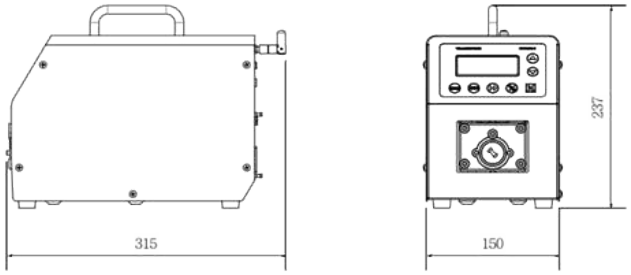
| NO | Malfunction | Description | Solution |
|---|---|---|---|
| 1 | Hardware | No display | Check the power cord<br>Check the fuse is. If it was blown, replace it with a 0.5A slow–blow fuse<br>Check the internal power cord connection inside the pump. |
| | Hardware | Motor does not rotate | Check whether the indicator light of the drive board is on<br>Check whether the connecting wire between the motor and the drive board is in good condition<br>Check whether the connecting line between the drive board and the main control board is in good condition |
| 3 | Hardware | The motor rotates in only one direction | 1. Check whether the connecting line between the drive board and the main control board is in good condition |
| 4 | Hardware | Button does not work | 1.Check whether the connecting line between the button and the main control board is loose<br>2.Check the button for damage |
| 5 | Hardware | External control does not work | Check that the connection is correct<br>Check whether the external control power supply is powered<br>Check whether the external control panel is fixed firmly |
| 6 | Hardware | Communication does not work | 1. Check that the connection is correct<br>2. Check whether the external control power supply is powered<br>3. Check whether the communication board is fixed firmly |
| 7 | Hardware | Loud sound during operation | 1. Check whether the pump head screw and plate rod are tightened |
| 8 | Software | External control does not work | 1. Whether the mode is external control mode |
| 9 | Software | Communication does not work | Whether the mode is communication mode<br>Reset the machine address with the software provided by the company<br>Check if there are two machines on the bus with the same address |

If the problem can't be solved, please contact the manufacturer or distributor.

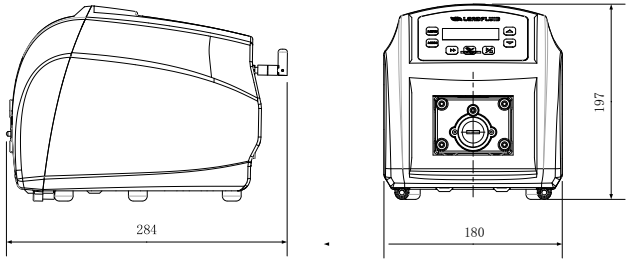
Note: This product is not medically certified. When it is used as a component in a medical device, the medical device itself must have medical certification.

## 14. Dimensions of MP100B & MP110B

Unit: mm




MP100B (Fig. 24)




MP110B (Fig. 25)



## 15. Technical Parameter

### Main Function of MP100B

| | |
|---|---|
| Key functions | Control the speed, direction, start and stop, full speed, working mode and other parameters. |
| External control function | The external control signal controls the start, stop and direction, and the analog quantity regulates the speed |
| Communication function | RS485 communication, support Modbus Protocol.<br>WIFI optional |
| Display function | Display the current running speed, running direction, working mode and parameter setting information. |
| Power down memory | The operatin g parameters before power failure can be memorized. |
| Direction control | Free adjustment of forward and reverse rotation direction |

### Main Performance of MP100B

| | |
|---|---|
| Flow rate range | 0.00011 -750 mL/min |
| Speed range | 0.1-150 RPM |
| Dispens ing range | 0.1-999 seconds /min utes/hours/day |
| Speed resolution | 0.1 RPM, accuracy ≤ ± 0.5% |
| External control signal | The speed is controlled by external analog quantity.<br>0~5V/0 -10V/4~20mA can be switched by software setting.<br>External control input start / stop direction signal is compatible with DC 5V/1 2V/24V |
| Communication settings | Communication rate: 4800/9600/19200/38400 can be set. Verification method: odd verification / even verification / no verification can be set. |
| Display | 132*32 LCD display |
| Power supply | AC 100 -240V, 50-60Hz |
| Power consumptio n | <40W |
| Working environment | Working temperature: 0~40 °C<br>Relative humidity <80% |
| Dimension | 315×150×237 mm |
| Driver weight | 4.9kg |
| IP grade | IP31, IP66 |

## Main Function of MP300B

| | |
|---|---|
| Key functions | Control the speed, direction, start and stop, full speed, working mode and other parameters. |
| External control function | The external control signal controls the start, stop and direction, and the analog quantity regulates the speed |
| Communication function | RS485 communication, support Modbus Protocol.<br>WIFI optional |
| Display function | Display the current running speed, running direction, working mode and parameter setting information. |
| Power down memory | The operatin g parameters before power failure can be memorized. |
| Direction control | Free adjustment of forward and reverse rotation direction |

## Main Performance of MP300B

| | |
|---|---|
| Flow rate range | 0.005-1750 ml/min |
| Speed range | 0.1-350 RPM |
| Dispens ing range | 0.1-999 seconds /min utes/hours/day |
| Speed resolution | 0.1 RPM, accuracy ≤ ± 0.2% |
| External control signal | The speed is controlled by external analog quantity.<br>0~5V/0 -10V/4~20mA can be switched by software setting.<br>External control input start / stop direction signal is compatible with DC 5V/1 2V/24V |
| Communication settings | Communication rate: 4800/9600/19200/38400 can be set. Verification method: odd verification / even verification / no verification can be set. |
| Display | 132*32 LCD display |
| Power supply | AC 100 -240V, 50-60Hz |
| Power consumptio n | <50W |
| Working environment | Working temperature: 0~40 °C<br>Relative humidity <80% |
| Dimension | 264×157×237 mm |
| Driver weight | 4.9kg |
| IP grade | IP31, IP66 |



## Main Function of MP600B

| | |
|---|---|
| Key functions | Control the speed, direction, start and stop, full speed, working mode and other parameters. |
| External control function | The external control signal controls the start, stop and direction, and the analog quantity regulates the speed |
| Communication function | RS485 communication, support Modbus Protocol.<br>WIFI optional |
| Display function | Display the current running speed, running direction, working mode and parameter setting information. |
| Power down memory | The operatin g parameters before power failure can be memorized. |
| Direction control | Free adjustment of forward and reverse rotation direction |

## Main Performance of MP600B

| | |
|---|---|
| Flow rate range | 0.005-3000 ml/min |
| Speed range | 0.1-600 RPM |
| Dispens ing range | 0.1-999 seconds /min utes/hours/day |
| Speed resolution | 0.1 RPM, accuracy ≤ ± 0.2% |
| External control signal | The speed is controlled by external analog quantity.<br>0~5V/0 -10V/4~20mA can be switched by software setting.<br>External control input start / stop direction signal is compatible with DC 5V/1 2V/24V |
| Communication settings | Communication rate: 4800/9600/19200/38400 can be set. Verification method: odd verification / even verification / no verification can be set. |
| Display | 132*32 LCD display |
| Power supply | AC 100 -240V, 50-60Hz |
| Power consumptio n | <60W |
| Working environment | Working temperature: 0~40 °C<br>Relative humidity <80% |
| Dimension | 264×157×237 mm |
| Driver weight | 5.2kg |
| IP grade | IP31, IP66 |

## Main Function of MP110B

| | |
|---|---|
| Key functions | Control the speed, direction, start and stop, full speed, working mode and other parameters. |
| External control function | The external control signal controls the start, stop and direction, and the analog quantity regulates the speed |
| Communication function | RS485 communication, support Modbus Protocol.<br>WIFI optional |
| Display function | Display the current running speed, running direction, working mode and parameter setting information. |
| Power down memory | The operatin g parameters before power failure can be memorized. |
| Direction control | Free adjustment of forward and reverse rotation direction |

## Main Performance of MP110B

| | |
|---|---|
| Flow rate range | 0.00011 -750 mL/min |
| Speed range | 0.1-150 RPM |
| Dispens ing range | 0.1-999 seconds /min utes/h ours/day |
| Speed resolution | 0.1 RPM, accuracy ≤ ± 0.2% |
| External control signal | The speed is controlled by external analog quantity.<br>0~5V/0 -10V/4~20mA can be switched by software setting.<br>External control input start / stop direction signal is compatible with DC 5V/1 2V/24V |
| Communication settings | Communication rate: 4800/9600/19200/38400 can be set. Verification method: odd verification / even verification / no verification can be set. |
| Display | 132*32 LCD display |
| Power supply | AC 100 -240V, 50-60Hz |
| Power consumptio n | <30W |
| Working environment | Working temperature: 0~40 °C<br>Relative humidity <80% |
| Dimension | 284×180×197 mm |
| Driver weight | 4.5kg |
| IP grade | IP31, IP66 |



## Main Function of MP310B

| | |
|---|---|
| Key functions | Control the speed, direction, start and stop, full speed, working mode and other parameters. |
| External control function | The external control signal controls the start, stop and direction, and the analog quantity regulates the speed |
| Communication function | RS485 communication, support Modbus Protocol.<br>WIFI optional |
| Display function | Display the current running speed, running direction, working mode and parameter setting information. |
| Power down memory | The operatin g parameters before power failure can be memorized. |
| Direction control | Free adjustment of forward and reverse rotation direction |

## Main Performance of MP310B

| | |
|---|---|
| Flow rate range | 0.005-1750 ml/min |
| Speed range | 0.1-300 RPM |
| Dispens ing range | 0.1-999 seconds /min utes/h ours/day |
| Speed resolution | 0.1 RPM, accuracy ≤ ± 0.2% |
| External control signal | The speed is controlled by external analog quantity.<br>0~5V/0 -10V/4~20mA can be switched by software setting.<br>External control input start / stop direction signal is compatible with DC 5V/1 2V/24V |
| Communication settings | Communication rate: 4800/9600/19200/38400 can be set. Verification method: odd verification / even verification / no verification can be set. |
| Display | 132*32 LCD display |
| Power supply | AC 100 -240V, 50-60Hz |
| Power consumptio n | <40W |
| Working environment | Working temperature: 0~40 °C<br>Relative humidity <80% |
| Dimension | 284×180×197 mm |
| Driver weight | 4.7kg |
| IP grade | IP31, IP66 |

## Main Function of MP610B

| | |
|---|---|
| Key functions | Control the speed, direction, start and stop, full speed, working mode and other parameters. |
| External control function | The external control signal controls the start, stop and direction, and the analog quantity regulates the speed |
| Communication function | RS485 communication, support Modbus Protocol. WIFI optional |
| Display function | Display the current running speed, running direction, working mode and parameter setting information. |
| Power down memory | The operatin g parameters before power failure can be memorized. |
| Direction control | Free adjustment of forward and reverse rotation direction |

## Main Performance of MP610B

| | |
|---|---|
| Flow rate range | 0.005-3000 ml/min |
| Speed range | 0.1-600 RPM |
| Dispens ing range | 0.1-999 seconds /min utes/hours/day |
| Speed resolution | 0.1 RPM, accuracy ≤ ± 0.5% |
| External control signal | The speed is controlled by external analog quantity. 0~5V/0 -10V/4~20mA can be switched by software setting. External control input start / stop direction signal is compatible with DC 5V/1 2V/24V |
| Communication settings | Communication rate: 4800/9600/19200/38400 can be set. Verification method: odd verification / even verification / no verification can be set. |
| Display | 132*32 LCD display |
| Power supply | AC 100 -240V, 50-60Hz |
| Power consumptio n | <50W |
| Working environment | Working temperature: 0~40 ℃ Relative humidity <80% |
| Dimension | 284×180×197 mm |
| Driver weight | 4.9kg |
| IP grade | IP31, IP66 |



# 16. Flow Rate Chart of Pump Head

| Model No. | Pump Head | Channel | Tubing Size | Flow rate per channel |
|---|---|---|---|---|
| **MP110B** | PH10-28 (8 Rollers) | 1,2 | 13#14#, Wall 0.8~1mm ID≤3.17mm | 0.00023~64 |
| | PH15T | 1,2 | 13# 14# 19# 16# 25# 17# 18# | 0.005~641 |
| | PH25 | 1 | 114# 116# 15# 24# 35# 36# | 0.024~750 |
| **MP310B** | PH15T | 1,2 | 13# 14# 19# 16# 25# 17# 18# | 0.005~1495 |
| | PH25 | 1 | 114# 116# 15# 24# 35# 36# | 0.024~1750 |
| **MP610B** | PH15T | 1,2 | 13# 14# 19# 16# 25# 17# 18# | 0.005~2562 |
| | PH25 | 1 | 114# 116# 15# 24# 35# 36# | 0.024~3000 |
| **MP100B** | PH6-4 | 4 | Wall 0.8 ~ 1 mm, ID ≤ 3.17 mm | 0.00016 ~ 49 |
| | PH15T | 1,2 | 13# 14# 19# 16# 25# 17# 18# | 0.005~641 |
| | PH25 | 1,2 | 114# 116# 15# 24# 35# 36# | 0.024~750 |
| **MP300B** | PH15T | 1,2 | 13# 14# 19# 16# 25# 17# 18# | 0.005~1495 |
| | PH15-24 (4 Rollers) | 2 | 19# 16# 25# 17# | 0.67~1307 |
| | PH15-44 (4 Rollers) | 4 | 19# 16# 25# | 0.67~770 |
| | PH25 | 1,2 | 114# 116# 15# 24# 35# 36# | 0.024~1750 |
| **MP600B** | PH15T | 1,2 | 13# 14# 19# 16# 25# 17# 18# | 0.005~2562 |
| | PH15-24 (4 Rollers) | 2 | 19# 16# 25# 17# | 0.0067~2240 |
| | PH25 | 1,2 | 114# 116# 15# 24# 35# 36# | 0.024~3000 |

## 17. Warranty Policy

Microlit warrants that this product will be free from defects in material and workmanship for a period of two (2) years from the date of delivery. If a defect is present, Microlit will, at its option and cost, repair, replace, or refund the purchase price of this product to the customer, provided it is returned during the warranty period.

(Fig. 26)

We are not liable for damage resulting from any actions not described in the operating manual or non-original spare parts or components being used.

This warranty does not apply if the product has been damaged by accident, abuse, misuse, or misapplication, or from ordinary wear and tear. If the required maintenance and inspection services are not performed according to the manuals and any local regulations, such warranty turns invalid, except to the extent, that the defect of the product is not due to such non-performance.

Items being returned must be insured by the customer against possible damage or loss. This warranty shall be limited to the aforementioned remedies.

## 18. Disposal

The adjoining symbol means that storage batteries and electronic devices must be disposed of separately from household trash (mixed municipal waste) at the end of their service life. According to the Directive 2002/96/EC of the European Parliament and of the Council on Waste Electrical and Electronic Equipment (WEEE) published on 27 January 2003, electronic equipment requires disposal according to the relevant national disposal regulations.Batteries contain substances that can have harmful effects on the environment and human health. Therefore, according to the Directive 2006/66/EC of the European Parliament and the Council on Waste Batteries of 6 September, 2006, batteries require disposal according to the relevant national disposal regulations. Dispose the batteries only when they are completely discharged. (Fig. 25)


(Fig. 27)