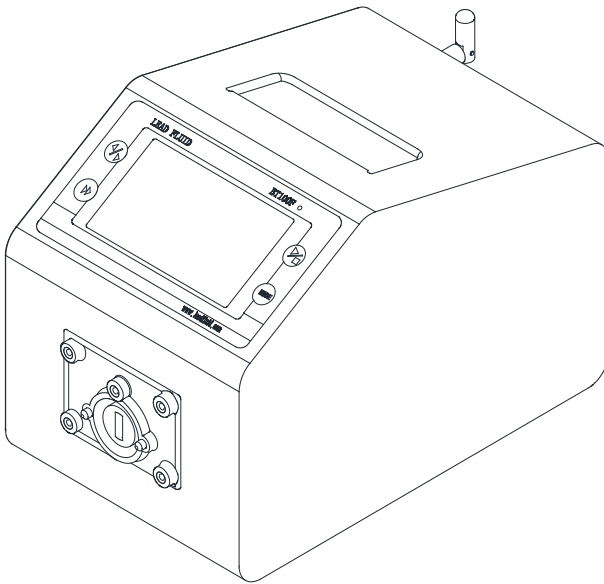




# GOLANDER PUMP

## BT/F Operation Manual

### For Intelligent Dispensing Peristaltic Pump



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<http://golanderpump.com>

1-678-587-8806

## Safety Cautions



**Danger:** Please use correct AC power voltage source shown on the sticker on the equipment to avoid any damage.

Please do not open the case. High voltages exist and are accessible. Use extreme caution when servicing internal components. For maintenance, please contact the manufacturer or distributor directly.

**Danger:** Turn drive off before removing or installing tubing. Fingers or loose clothing could get caught in drive mechanism.



**Warning:** Tubing breakage may result in fluid being sprayed from pump. Use appropriate measures to protect operator and equipment.

**Warning:** Remove power from pump before attempting any maintenance or any cleaning operation is started.

**Warning:** Remove power from pump before connecting or disconnecting the external control device or communication interface.

**Warning:** Pump is provided with a grounded plug, it must be well grounded at all times.

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# 1 Description

BT/F new type intelligent dispensing peristaltic pump suitable for Measured accurately and dosing certain volume liquid to realize high accuracy flow rate control. Compared with the previous version, it adopts larger color LCD touch screen, more convenient and show more information. Added recycle dispense mode can realize complex experimental process and different Lab requirements.RS485 communication adds more settings on the basis of MODBUS to meet different communication equipment requirements.

This pump series includes:

- BT100F, flow rate: 0.00011-720 mL/min, speed: 0.1-150 rpm
- BT300F, flow rate: 0.006-1600 mL/min, speed: 0.1-350 rpm
- BT600F, flow rate: 0.006-2900 mL/min, speed: 0.1-600 rpm

# 2 Application Area

- Can handle extremely viscous fluids
- No seals in contact with the medium pumped
- No valves to clog.
- The inner surfaces are smooth and easy to clean.
- Fluid contacts only the tubing.
- Suction lift and priming can be up to 8m water column at sea level.
- It can handle the most shear sensitive of fluids like latex or firefighting foam with low shearing. It is capable of running dry and pumping fluids with high quantities of air, such as black liquor soap.
- Suitable for accurate measurement and quantitative feeding, can achieve high precision.
- Tubing and tube materials are available for food and pharmaceutical use.

# 3 Functions and Features

- Color LCD display, touch screen and keypad for operating.

- Reversible direction, start/stop control and adjustable speed.
- 0.2% high precision rotating speed control with 0.1 rpm speed
- Flow display and calibrate.
- Three dispense mode available. Time Dispense Mode: Volume Dispense Mode: Cycle Dispense Mode.
- Store 5 groups of working parameters for flow mode and dispense mode.
- Store 30 groups of working parameters for cycle dispense mode.
- Intelligent temperature control.
- WIFI control function
- Alarm block function
- External logic level signal can control start/stop, direction and easy dispense functions; external analog signal can adjust the rotating speed. Signal is optically isolated.
- With RS485 MODBUS interface, easy to be controlled by external device.
- Internal double-deck isolation structure; circuit board with conformal coating makes it dust-proof and moisture proof.
- Anti-electromagnetic interference feature, wide input voltage range for complex power environment.
- Stainless steel enclosure, easy to clean, resistant to the corrosion of the acid, alkali, sodium and organic solvents.

## 4 Components and Connectors

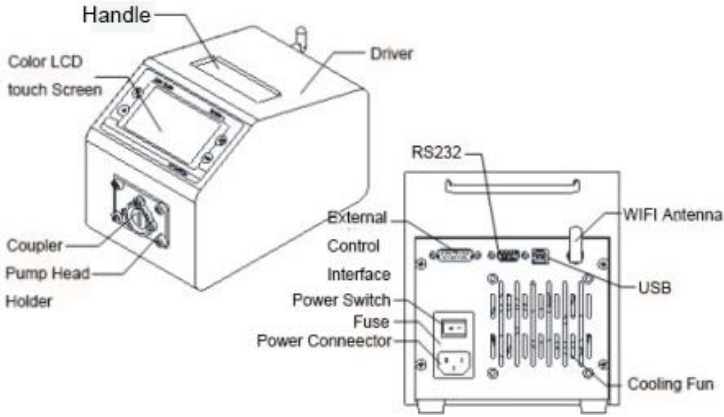


Figure 1. Components and connectors

## 5 Display Panel and Operating Keypads

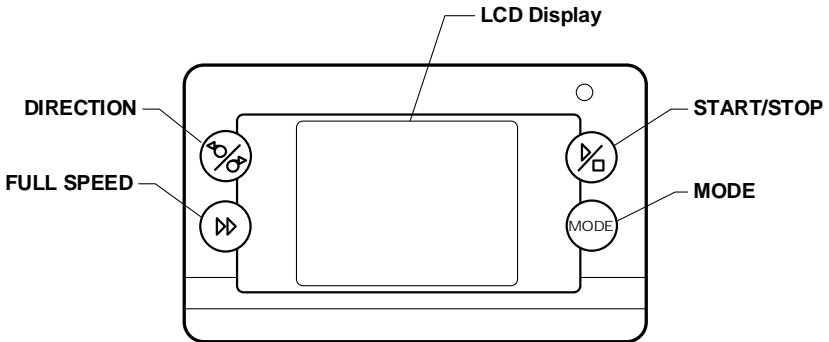


Figure 2. Display Panel

## 6 Keypad



START/STOP key. Press to start or stop pump.



DIRECTION Key. Press to change the drive rotating direction, clockwise or counterclockwise.



FULL SPEED key. Press the key to run pump at full speed. Press again to return to the previous state.



MODE key. When pump is not running, use the MODE key to change the working mode. When keypad is locked, use the MODE key to change the display content.

## 7 LCD Touch Screen Display



Figure 3. LCD display

## 8 Status bar

A. Tone Button status ,The icon show the key tone on/off.

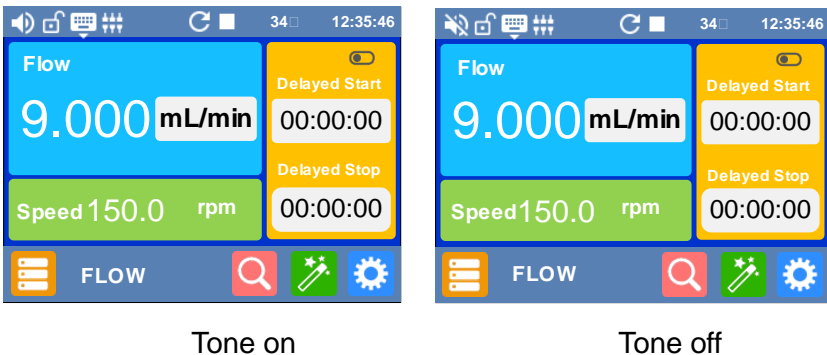
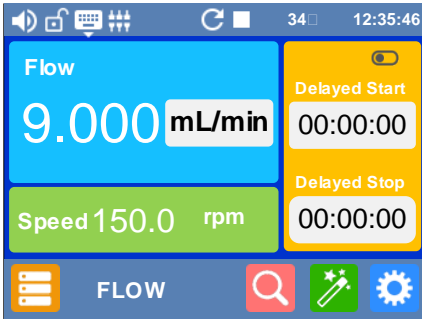


Figure 4. Key Tone

- B. Keypad Lock. Shows the state of the keypad lock. When the keypad is locked, the control mode and system parameter settings cannot be changed.



Keypad unlocked



Keypad locked

Figure 5. Keypad Lock

- C. Control Mode, display control way the details as below:  
Internal Control Mode: Pump is controlled by keypad and touch screen.

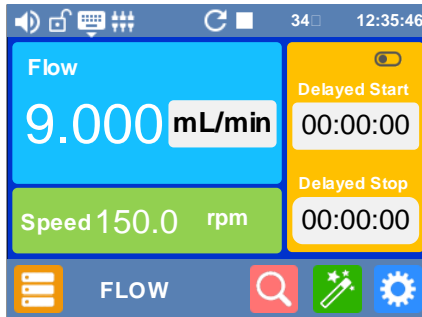
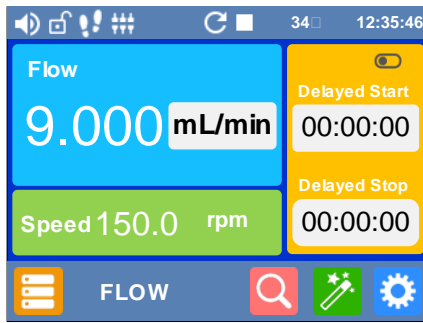


Figure 1 Internal Control Mode

Footswitch Control Mode. Footswitch controls start/up, the other parameters controlled by keypad and touch screen.





*Figure 7 Footswitch Control Mode*

Current Control Mode.: External 4-20mA analog current signal controls flow rate, external logic level signal controls start/stop. Keypad is disabled.



*Figure 8 Current Control Mode*

Voltage Control Mode 0-5V: External 0-5V analog voltage signal controls flow rate. External logic level signal controls start/stop and direction. Keypad is disabled.



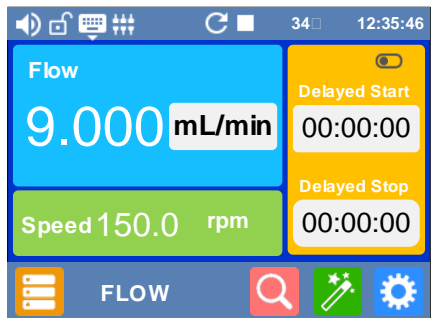
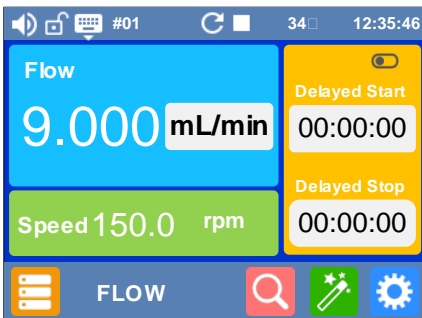
Figure 9 Voltage Control Mode

Voltage Control Mode 0-10V: External 0-10V analog voltage signal controls flow rate. External logic level signal controls start/stop and direction. Keypad is disabled.



Figure 9 Voltage Control Mode

D. Communication State, It shows current communication on/off.

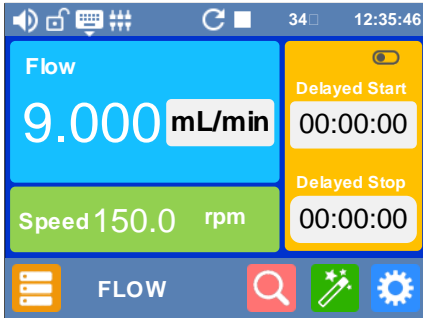


Communication connected

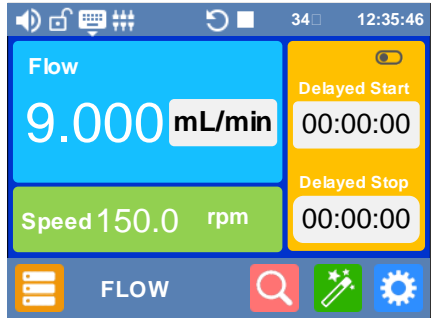
communication disconnected

Figure 10 Communication State

- E. Rotation Direction. It shows current rotation direction. When pump is not running, it will show one of the following icon.



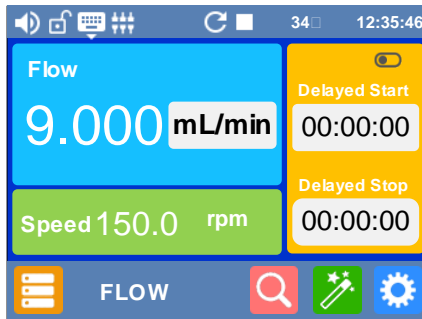
Clockwise



Counterclockwise

Figure 2. Direction State

- F. When the pump is running, it will change to a carton icon as shown below.



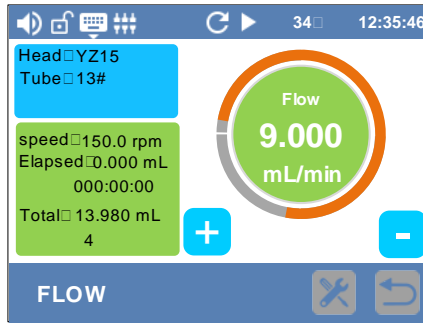


Figure 3. Running Animation

- G. Temperature display: display current degree of driver, such: 34°C
- H. Time display: display current time, such: 12:35:46

## 9 Operation zone

- A. Parameters settings: When the pump is not running, press it to input desired value in the pop-up window. Please pay attention to the range of the value and flow rate unit.

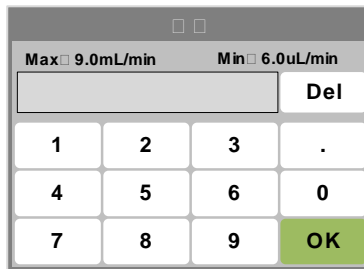


Figure 13. Flow Rate Setting

- B. The Unit Settings. When the pump is not running, press it to change the unit. The allowed units are  $\mu\text{L}/\text{min}$ ,  $\text{mL}/\text{min}$ ,  $\text{L}/\text{min}$ . flow rate unit setting as below:
  - A.

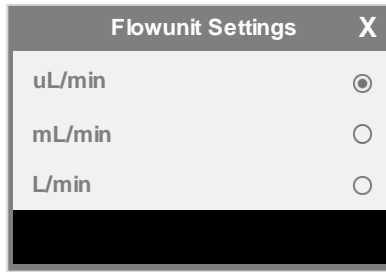
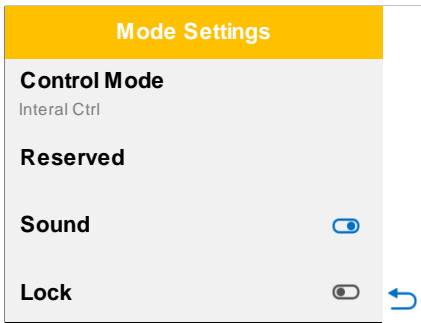


Figure 14 Choose Flow Rate Unit

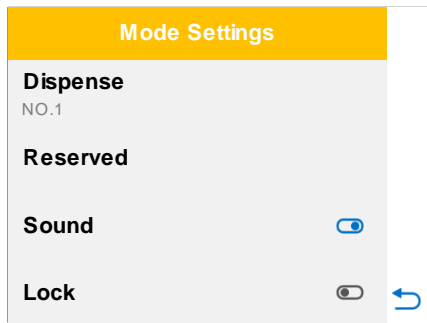
## 10 Navigation button



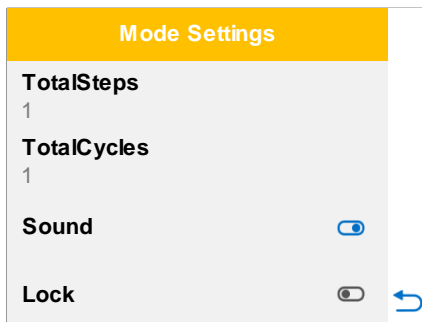
Mode setting: Set the specific control mode in different working modes, the prompt tone is on/off, and the lock is on/off.



Flow mode



Volume dispense mode and  
Time dispense mode



Cycle dispense mode

Figure 15 Mode setting interface



Preview mode: view running status, parameter changes.

Among them, the current running parameter appears on the left side of the interface, and the running status is displayed on the right side, as shown below.

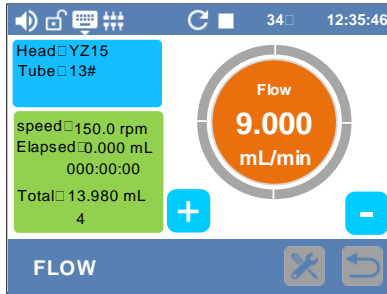


Figure 16 Preview interface

In flow mode, orange indicates the stop state, green indicates the running state, the current flow is displayed in the middle.

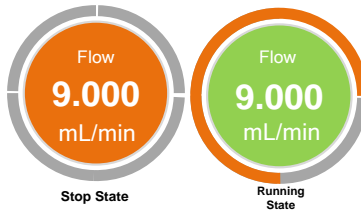


Figure 17 Running status display

The direction in which the ring rotates indicates the direction in which the pump operates

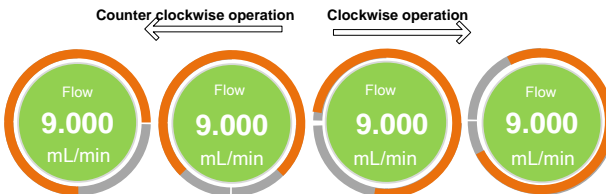


Figure 18 Direction indication

In dispense mode, orange is the stop state, green is the running state, and yellow is the pause

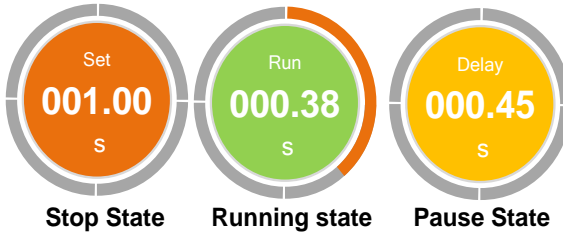


Figure 19 Dispense status indication



Quick setting: zero clearing accumulative fluid and accumulative times, prompt tone open / close, lock open / close.

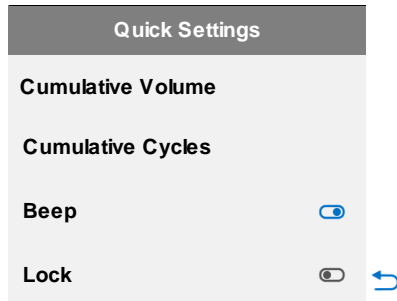


Figure20 Quick settings interface

H: Fine Adjustment Button .When the pump is running/stop, press the fine adjustment button to adjust the flow rate in real time. Press the **+** button or **-** button shortly to increase or decrease the flow rate. Press and hold the buttons to change the value quickly.



Figure 21 Fine Adjustment Button



**Calibrate:** Pump will accurately show current flow rate/volume by measuring the weight or volume of the transferred fluid through balance or cylinder.

**Note:** The calibration is necessary to display flow rate precisely.



**System Settings:** When the pump is not running, press the icon



to enter System Settings menu.

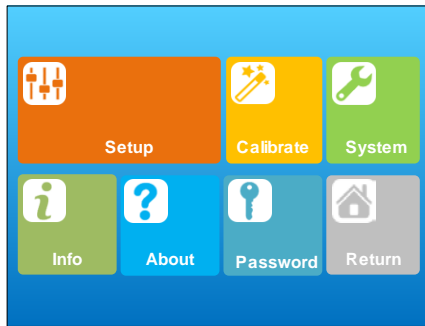



Figure 22. System Settings

**Setup:** To setup the general settings, use  view the menu, details as figure 23.



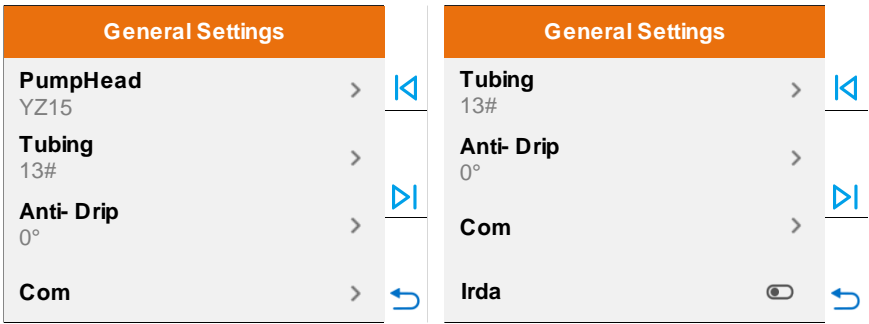




Figure 23 General Settings interface

- **Pump Head** - Choose the model of the installed pump head, use   view the menu, details as figure 24

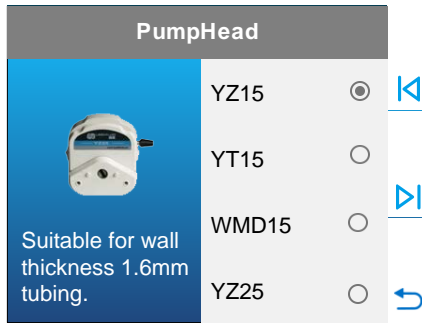




Figure 24. Pump Head Select

- **Tubing** - Choose the appropriate tubing size for selected pump head. use   view the menu ,details as figure25

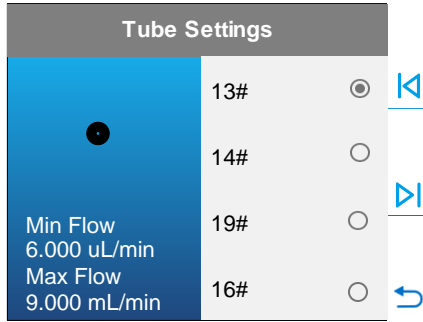


Figure 25. Tubing Select

- **Backflow**

Motor will rotate the set angle reversely to prevent fluid dropping from the tubing outlet when pump stops. Set the backflow angle/rotating speed in the pop-up window. When the angle is set to 0, this function is disabled.

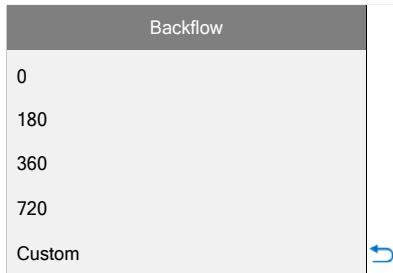
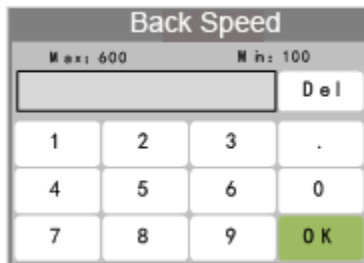


Figure 26. Backflow Setting

- **Back speed:** According to the actual situation, set the back speed of pump



- **Communication settings:** sets some parameters of RS485 communication, as shown in the following figure:

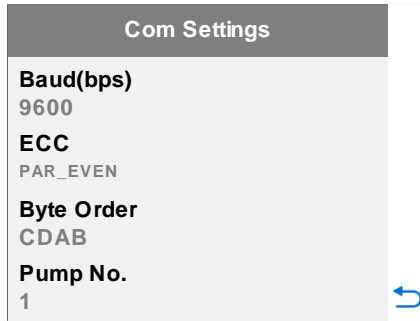




Figure 27. Communication Settings

When the password is empty, you can see more parameter settings in general settings, and use   to view the menu.

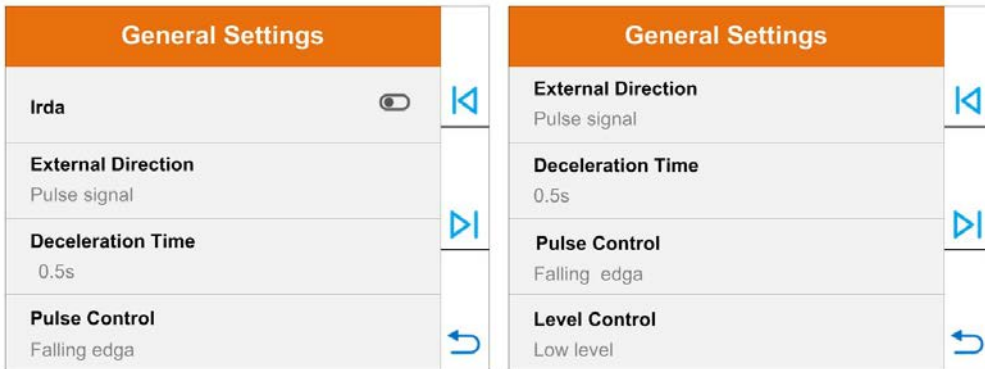
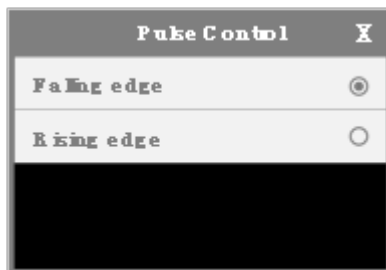


Figure 29 general settings(high level)select

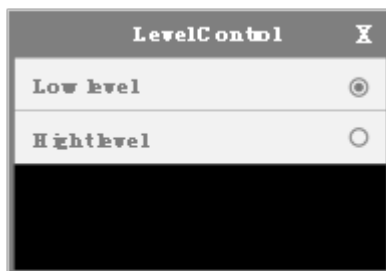
- **External control direction:** select the direction of external control signal is level mode or pulse mode. Level mode refers to the switching state of an external control signal, such as a switch. By keeping it closed or open, while the pulse mode refers to the switching state of an external control signal, such as an unlocked button, by instantaneous closing.

- Deceleration time: refers to the time from setting speed to stopping in fluid dispensing mode and copy dispensing mode. By modifying this parameter, the problem of spatter during liquid filling can be reduced.
- Pulse signal: when the external control signal is a pulse signal, choose the descending edge or the rising edge by the option. The descent edge is a jump from high to low level, and the rising edge is a jump from low level to high level.



*Figure 30 Pulse signal select*

- Level signal: when the external control signal is a level signal, the selection of low level or high level is effective.




*Figure 31 Level signal select*

**Calibrate guide:** in order to improve the flow accuracy of liquid delivery, the flow rate needs to be corrected. According to the guide, the weighing of the transmissible liquid through the balance or the measuring cylinder makes the display value correspond to the actual flow accurately.

Note: if you need to accurately display the flow, you must carry out flow

correction.

**System setting:** set the system parameters of the peristaltic pump, use

 to view the menu, as follows:

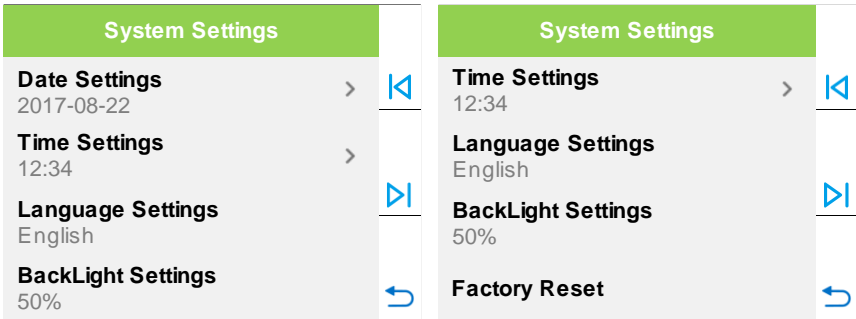


Figure 32 system setting select

- Date setting: set the current year, date and month, and then select the current date.

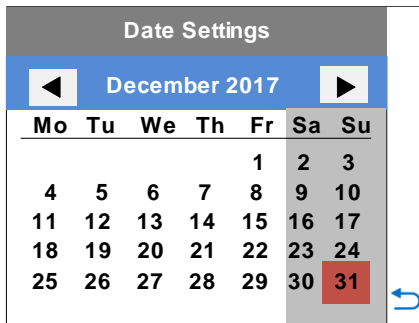


Figure 33 Date setting select

- Time setting: set the current time Hour, Minute and Seconds, by setting up and down keys.

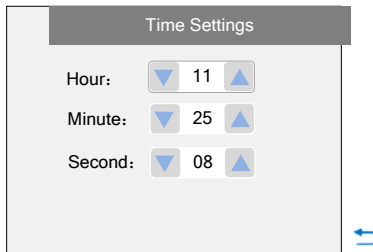


Figure 34 Time setting

- **Language** - Choose display language, Chinese or English



Figure 35 Language select



- **Factory reset:** It is to reset the pump to factory settings. Restart pump to apply the settings. Users can also press and hold the  direction key and mode key  to default, when hearing a click to release the button to restore the factory value.



Figure 36 Factory Reset

- **Reset WIFI:** Clear WiFi binding information, and rebind after reset.



Figure 37 Reset WIFI

- Transfer mode : select liquid quantity transmission mode, liquid quantity and flow mode or liquid quantity and time mode.

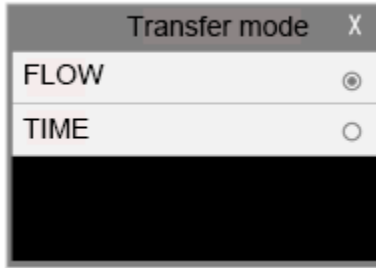


Figure 38 Transmission mode selection

Information query: for information about the using of peristaltic pump, use the page to view the peristaltic pump

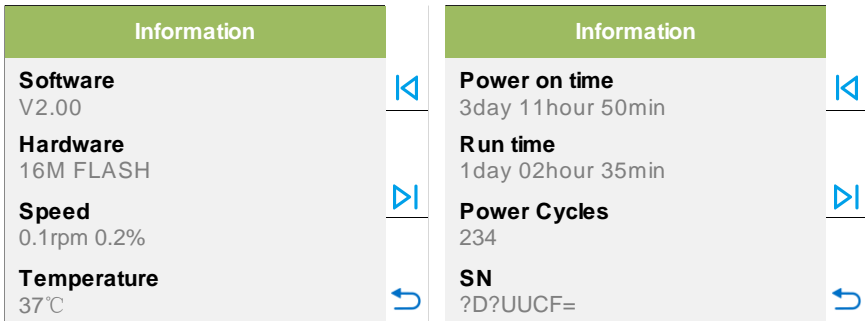


Figure 39 Information

**Operation description:** contact information and brief introduction.

**Password setting:** set password, unlock, and prevent others from modifying parameters. Default password is empty.

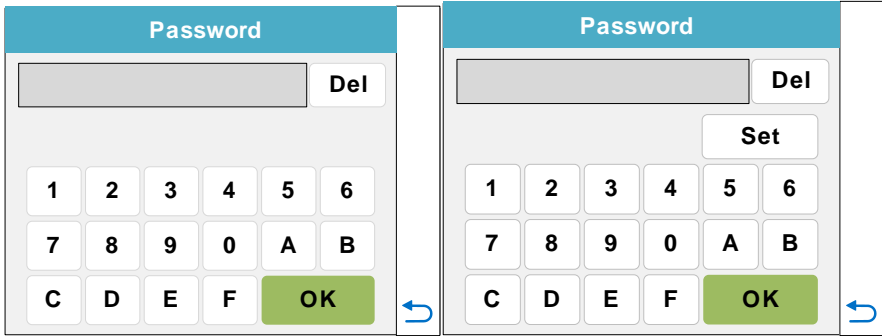
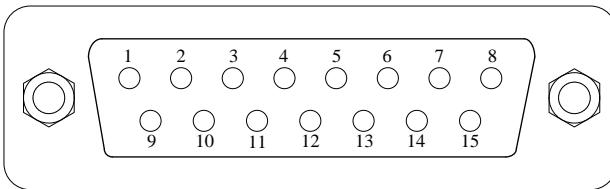


Figure 40 Password setting select

Return master: return to master interface

## 11 External Control Interface



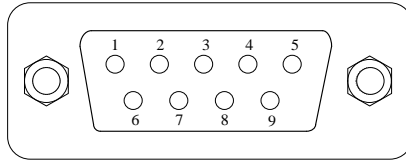
DB15	Mark	Note
1	ADC_W	Positive of external analog input
2	B	Communication interface, B pole of RS485
3	A	Communication interface, A pole of RS485
4	VCC_W	External DC power input
5	DAC	Analog voltage signal output
6	CW_W	External input signal to control direction
7	PWM	Pulse signal output
8	COM	Ground of external power
9	AGND	Negative of analog signal input
10	+12V	Positive of internal +12V power source
11	GND	Ground of Internal power source
12	CW	Direction signal output



## Golander BT-F Dispensing Pump

13	RS_W	External start/stop signal input
14	PWM_W	External Pulse signal input
15	RS	Internal Start/stop signal output

Table 1 External definition



No.DB9	Mark	Note
1		
2	RXD	Receiving data
3	TXD	Send data
4		
5	GND	Signal ground line
6		
7		
8		
9		

Table 2 RS232 definition

## 12 Operation Instructions

### 12.1 Before Operation

- 1) Please check the packing slip to make sure nothing is wrong or damaged in the package. If there is problem, please contact the manufacturer or distributor.

- 2) Read through the instruction.
- 3) There should be more than 200 mm space for the back of the pump when it is running.

## 12.2 Installation of pump heads and tube

Installation of pump heads

### YZ15, YZ25 pump head

Put one side of the pump head flat shaft towards to drive, push on the groove of coupling in front of drive. Make the pump head in suitable position through the two position column of pump head support, put the pump head cling to the drive. Insert the 2 pieces of pump head nails to mounting holes, tighten pump head nails.

Pull the lever of the pump head, open the pump head, put the hose smoothly into the pump head and straighten out, pull the lever to the horizontal position in the opposite direction, and install the hose immediately.

### DG Pump Head

- 1) Remove the cartridge from pump head by pressing down the trigger (for DG with 1-3 channels) or pressing the provided small tool in the arrow direction on the cartridge (for DG with  $\geq 4$  channels).
- 2) Insert the tang of the pump head shaft into the slot in the shaft on the drive. Then align the pump onto the reference bolts on the drive.
- 3) Press the pump head against the drive. Insert the provided two Allen screws (M4x12) into the mounting holes from **the back wallboard of the pump head**.

Tighten the screws using the Allen wrench.

## 12.3 Power Connection

The voltage of the power supply should be marked on the sticker of the pump. Please make sure to use the right power source for the pump.

## 12.4 First Run Wizard



Flow Rate Calibration

Calibrate the flow rate of the actuators by weighing the actual transmissible liquid through the balance or cylinder. The following must

be corrected

- First time to use the pump
- Pump head is changed
- Tubing is replaced
- Transfer fluid in one channel with dual pump heads
- Tubing is restalled
- After continuous work for a long time

The details as follows:

- 1) Install pump head and tubing.
- 2) In the General Settings window, set the model number of the installed pump head and tubing.( refer specifically to figures 24 and 25 in the description of commonly used parameters)
- 3) In the Flow Mode window, press FULL SPEED  key to fill tubing with liquid.
- 4)When pump is not running, press  enter into system settings choose calibration wizard icon.
- 5)In calibration wizard window, system shows the calibration of current selected tubing, flow rate and fluid volume.

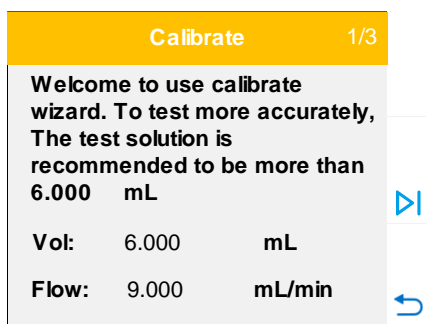



Figure 41 Flow Rate Calibration

The flow rate 9.000 mL/min is the desired flow rate and 6.000 mL is the fluid volume need to test. The values or the units can change directly

when press the button. Press  button to enter the calibration

window, or press  button to exit the wizard to the System Settings window.

**Note:** The fluid volume should not be less than the suggested value.

1) Test window shown as below

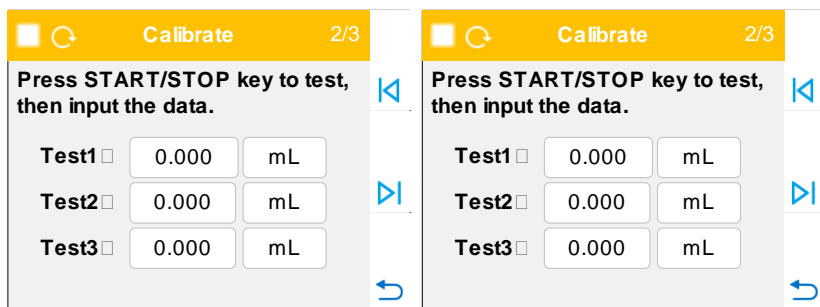






Figure42 Calibration actual interface

Prepare the cylinder or beaker, make the tubing filled with fluid. Press START/STOP  key, the pump will start to transfer fluid. Wait for the pump to stop testing, and then measure the volume of the transferred fluid. Repeat the above steps couple more times, and enter the results of the Test1, Test 2 and test 3 in the calibration window. Please pay attention to the unit to make sure it is correct. Press  to enter Analyse and Calculate window.

If you want to modify the test flow rate and liquid volume, press  button to re-enter the values, press  button to exit the calibrate to the System Settings window.

**Note:** If there is an accident during the process of the test, please press START/STOP key to stop the test.

Input one set or multiple sets of testing data to the pump, the system will calculate the average value automatically.

- 7) The correction testing result will be calculated and the old value is also displayed on the screen for reference only. The new value and old value would be different. However, if the ratio of new to old value is less than 0.5 or higher than 2, please check the following.

Volume measurement



The volume unit setting

The pump head & tubing size setting

The liquid viscosity is too high

If dual pump heads are used for one channel

If no problem found, press  button to save the new value.

Otherwise, press  to test again. Or, press  to exit without saving the new value and return to the System settings window.

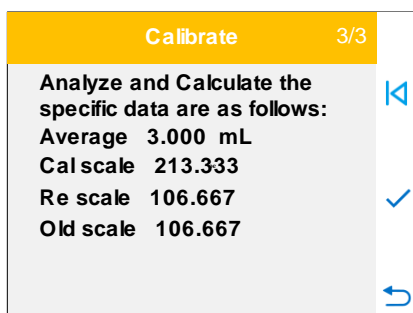



Figure 43 Calibrate result interface

If there is no data input to the system, it will show the window as below. Please press  to test again or just press Return.

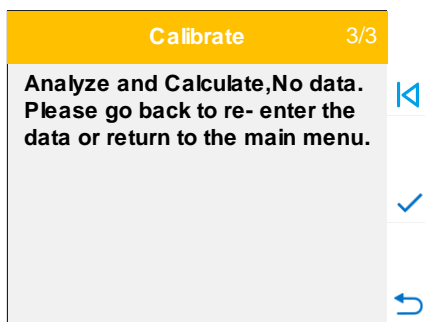


Figure 44 No input data interface

## 12.5 Working Mode

When pump is not running, press MODE key to enter Working Mode window as shown below.

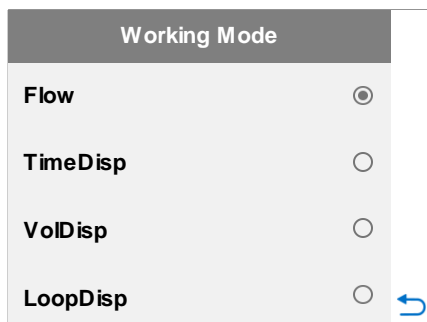


Figure 45 Working Mode

- **Flow Mode**

Pump will be running according to the set flow rate, and record the cumulative fluid volume

In the main interface, the flow and flow unit can be set, or set the speed the flow can be changed. In the preview interface, display the model of the current pump head tube size, the current operating time and liquid volume, and fine adjust the flow rate by adding and subtracting keys

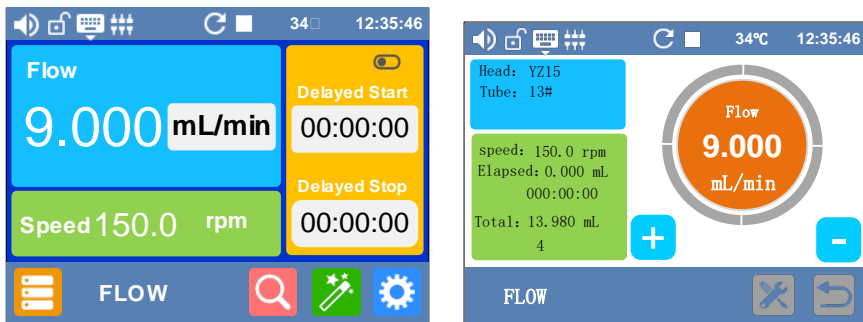


Figure 46 Flow interface

In the flow mode, the functions of delay start and delay stop can be realized, such as automatic start after 30 minutes delay and automatic stop after 1 hour and 30 minutes operation. Click the time below to set the delay start time and delay stop time in the pop-up dialog box.

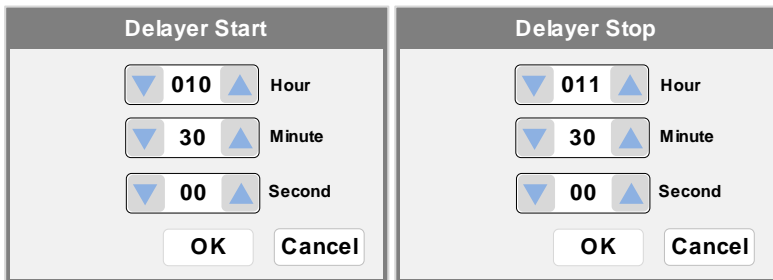



Figure 47 setting certain time interface

Then click the start stop button , to start the delay process, there is an alarm sign in the status bar, as shown in the figure below.

**Note:** If the delay stop time is set to 0, the delay process cannot be started.

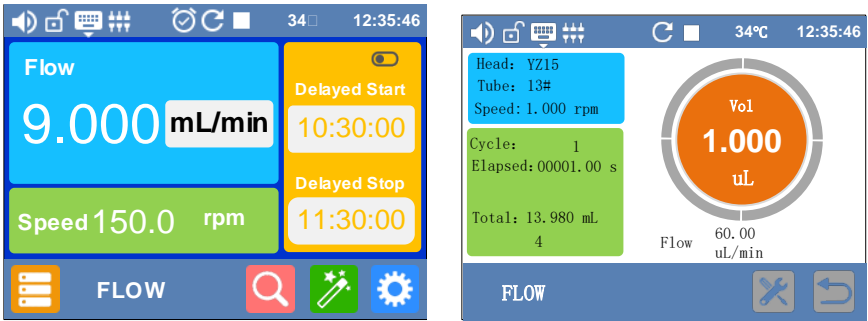


Figure 48 Timing on status icon

- **Volume Dispense Mode**

Pump will dispense by setting dispense volume for each dose, lag time between doses and number of cycles. System will calculate duration time for each dose automatically.

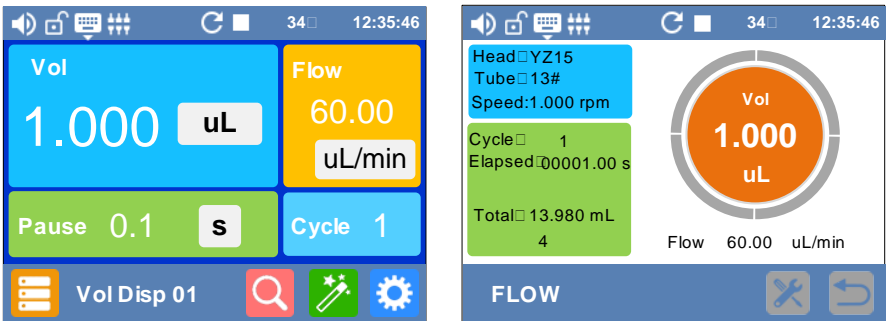


Figure 49 Volume Dispense Mode



The main interface parameters can be set as follows:  
 A - Dispense volume for each dose,  $\mu$ L, mL or L.




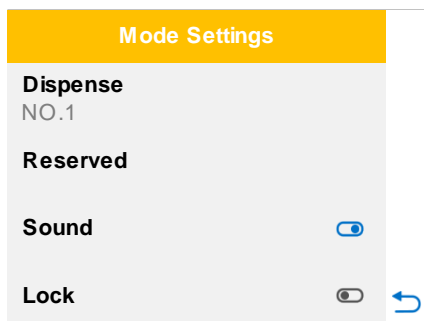
B - Dispense flow rate,  $\mu\text{L}/\text{min}$  or  $\text{mL}/\text{min}$ .

C - Lag time. The time between doses.

D - Dispense cycles. When set dispense cycles to zero, pump will keep running until START/STOP key is pressed. When set dispense cycles to 1, pump will run only once, and the lag time setting is invalid. When set dispense cycles to more than 1, the pump will run the set number of cycles then stop.

Preview interface shows the current pump head size, number of times and time it has been run.

Click  Mode setting icon, select different group numbers in the interface, can be stored in five groups



● **Time Dispense Mode**

Pump will dispense by setting the dispense duration for each dose, lag time between doses and number of cycles. System will calculate dispense volume for each dose automatically.

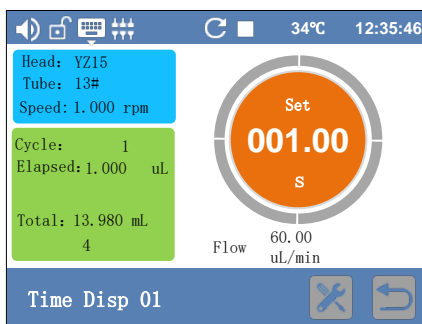


Figure 50 Time Dispense Mode

A - Dispense duration for each dose

B - Dispense flow rate, mL/min or L/min.

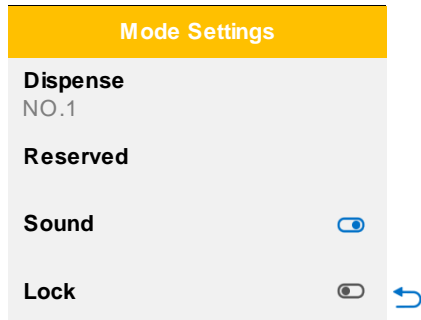
C - Lag time. The time between doses.

D - Dispense cycles. When set dispense cycles to zero, pump will keep running until START/STOP key is pressed. When set dispense cycles to 1, pump will run only once. The lag time setting is invalid. When set dispense cycles to more than 1, the pump will run the set number of cycles then stop.

The preview interface shows the current type of pump hose, the number of times it has been run and the amount of fluid used.



Mode setting icon, select different group numbers in the interface, can be stored in five groups



● **Cycle Dispense Mode**

By setting the steps to run and the number of cycles, the pump automatically completes each step by following the steps.



Figure 51 Cyclic Dispense Mode

A - Total dispense volume,  $\mu\text{L}$ , mL or L

B - Dispensing flow rate,  $\mu\text{L}/\text{min}$ , mL/min


C - The time between the dispensing.

D - Pause time. The time between dose. When dispense many times, it is intermediate stop time. Optional unit (time, minutes, seconds)

E - Cycle. Dispensing times ,When the dispensing time is 1,the pump only working once . when dispensing times more than 1, pump running to set the number of times, automatically to the next step.

F:Direction: the direction in which the pump is distributed. Clockwise and counterclockwise optional.

The preview interface shows the current pump head tube size, the amount of fluid that has been run, the volume, time and the number of times it has been run

Click  Mode setting icon, the total steps and the total number of cycles can be set in the interface

## 12.6 External Control Mode

The external input mode analog control the speed, the external signal controls the start/stop and the direction. The front panel button doesn't work.

- 1) Switch the power off. Wire the DB15 connector as shown on 50 , and connect it to the DB15 port on the rear of the pump.

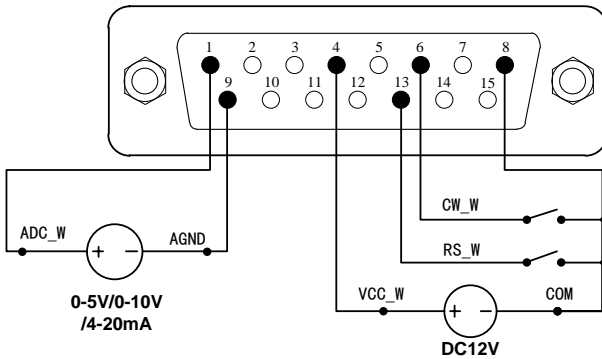
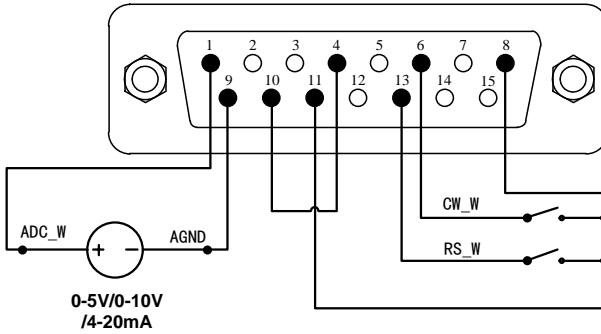


Figure 52 DB15 Wiring with External 12V DC Power Source



FF

Figure 53 DB15 Wiring with Internal 12V DC Power Source

- Turn on the power switch. Pump will display the main screen.
- Press the MODE key to select the flow mode
- Select voltage mode or current mode by control mode



Current Control Mode



Voltage Control Mode

Figure 54 Analog control interface

- 2) When set the External Control Mode to Logic Level, close the external RS\_W switch, the pump will run and the speed will change according to the analog input signal. Open RS\_W switch to stop pump. When CW\_W switch is open, pump will run in clockwise direction; when CW\_W switch is closed, pump will run in counterclockwise direction.
- 3) When set the External Control Mode to Pulse, close then open the external RS\_W switch, the pump will run and the speed will change according to the analog input signal. Close and open RS\_W switch again to stop pump.

When close then open the external CW\_W switch, pump will run in clockwise direction; when close then open CW\_W switch again, pump will run in counterclockwise direction.

**Note:** If external DC power source is 24V to control pump start/stop and direction, a 1.5K resistor is needed between pin 13 and RS\_W, another 1.5K resistor is needed between pin 6 and CW\_W. Otherwise it may damage the internal circuit.

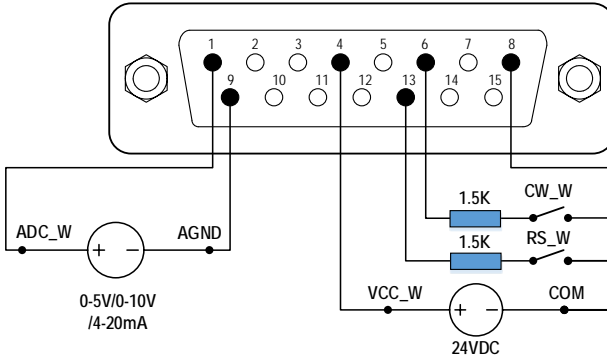


Figure 55 Wiring Diagram of external Control Mode connecting external DC24V Power supply

## 12.7 Communication mode

### 12.8

The RS485 interface supports standard MODBUS protocol. Pump can be controlled by external device via the communication port. Please refer to the Communication Instruction manual for the parameters and supported commands.

- 1) Power pump off. Wire the DB15 connector as shown on Figure 54, and connect it to the DB15 port on the rear of the pump.

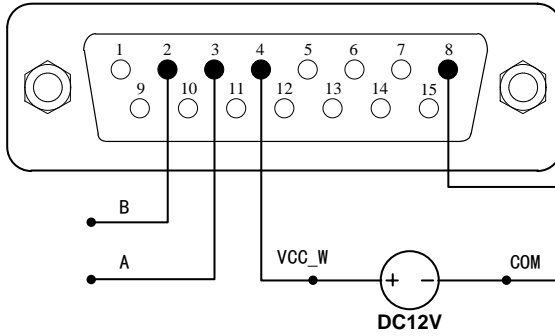


Figure 56 Control Start/Stop with external 12V Power Source

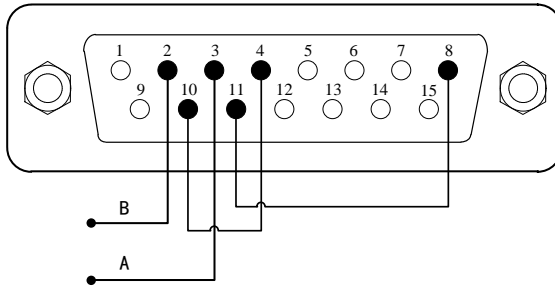


Figure 57 Control Start/Stop with internal 12V Power Source

- 1) Turn the power on. Pump will display the main screen.



Figure 58 Communication Connected

- 2) On Internal Control Mode, when the main screen shows Pump number (such as #01), the communication is connected.

Otherwise, the communication is disconnected.

Peristaltic pump through RS485 communication, the default set for communication rate 9600, and data bit 8 bits, check bit pairs check, stop 1 bit. Communication parameters can be modified in the communication settings of commonly used parameters, such as the following figure.

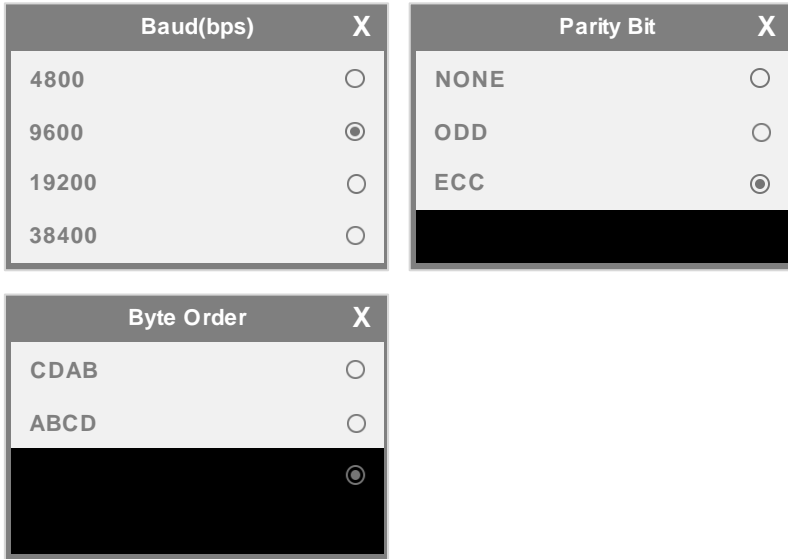


Figure 59 communication interface

After the connection is successful, the functions of the pump are controlled by the communication instruction

## 12.9 Footswitch

Power pump off. Wire the DB15 connector, and connect it to the DB15 port on the rear of the pump.

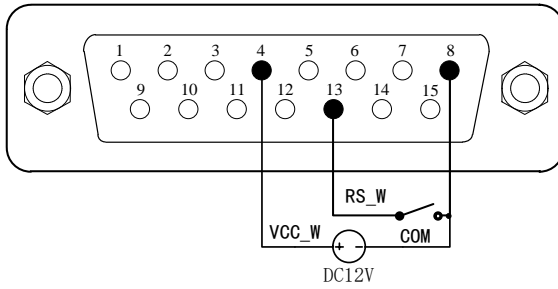


Figure 60 Footswitch Control Start/Stop with external 12V Power Source

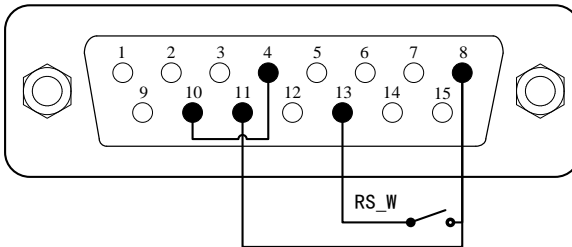


Figure 61 Footswitch Control Start/Stop with internal 12V Power Source

Turn the power on. Pump will display the main screen.

On Internal Control Mode, if pump is set to Volume, Time or Cycle Dispense Mode, when the switch RS\_W is closed then open, pump will start to dispense.

On Footswitch Control Mode, if External Control is set to Logic Level, when the switch RS\_W is closed, pump will start; when the switch is open, pump will stop.

On Footswitch Control Mode, if External Control is set to Pulse, when the switch RS\_W is closed then open, pump will start; when the switch is closed then open again, pump will stop.



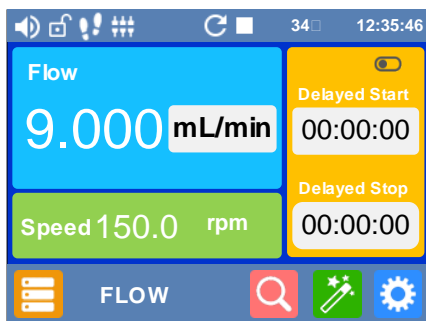


Figure 62 Footswitch Control

## 13 Maintenance

### 13.1 Warranty

#### 13.2

The product comes with one-year labor and parts warranty. The limited warranty does not cover any damage that is caused by improper usage and handling.

### 13.3 Regular Maintenance

- 1) Always check the tubing and connections to make sure there is no leakage.
- 2) Do not cover the fan on the rear of the pump.
- 3) Do not use water to wash the pump. Keep pump head dry.
- 4) Do not use chemical solvents to clean pump and pump head

### 13.4 Malfunction Solutions

#### 13.4.1

NO.	Malfunction	Description	Solution
1	Hardware	No display	<ol style="list-style-type: none"> <li>1. Check the power cord</li> <li>2. Check the fuse. If it was blown, replace it with a 1A slow-blow fuse</li> <li>3. Check the internal power cord connection inside the pump.</li> <li>4. Check the wire connection between LCD and main control board.</li> </ol>
2	Hardware	Motor does not work	<ol style="list-style-type: none"> <li>1. Check the indicator of the driver board.</li> <li>2. Check the wire connection between motor</li> </ol>

## Golander BT-F Dispensing Pump

			and driver board. 3. Check the wire connection between the driver and the main board. 4. Check the power voltage for the pump.
3	Hardware	Motor is trembling	1. Check the wire connection between the motor and the driver board. 2. The motor is overloaded. Check the mechanical connection.
4	Hardware	Motor only runs in one direction	Check the connection between the drive board and the main control board.
5	Hardware	Keypad does not work	1. Check the wire connection between keypad and the main board. 2. Check if the key is broken.
6	Hardware	External control does not work	1. Check the wiring of the connector. 2. Check if the external control power voltage is provided. 3. Check the connections of the external control board.
7	Hardware	RS485 com does not work	1. Check the wiring of the connector. 2. Check if the external control power voltage is provided. 3. Check the connections of the communication board.
8	Hardware	Noisy when running	Check the screws and level on pump head to make sure they are secure.
9	Software	External control does not work	Check if pump is on External Control Mode.
10	Software	Flow not precision	1. To make calibration again.
11	Software	RS485 does not work right	1. Check if the display shows the communication is ready. 2. Reset the address of the pump. 3. Check whether on the bus there are two pumps using the same address



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



This product is not designed for, nor intended for use in patient connected applications; If use as the accessories, the medical or dental equipment need to make certification.

## 14 Dimensions

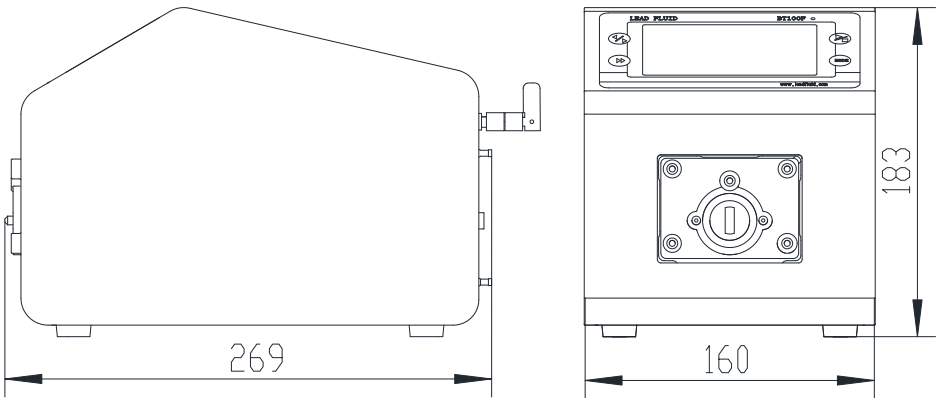
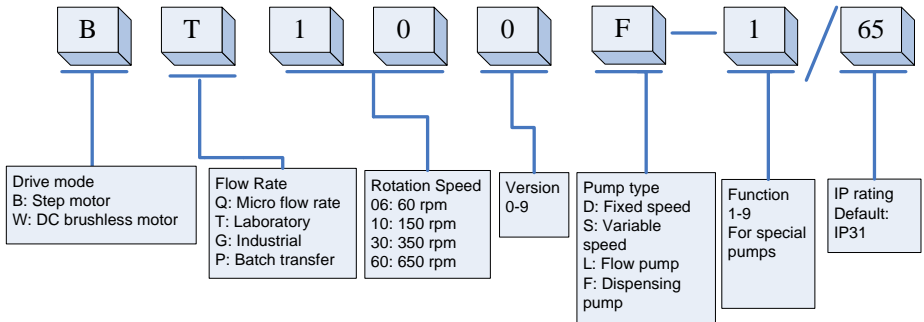


Figure 63 Dimensions (mm)

## 15 Naming Rule



## 16 Specifications

BT100F technical parameter

Main Function

Suitable head YZ15, YZ15X2, YZ25, YZ25X2, DG1, DG2, DG4,

## Golander BT-F Dispensing Pump

	DG8, DT10, DT15, YT15, YT25
Functions	Key control start stop, direction, full speed, state memory (power off memory) Foot switch control, external control start and stop, external control direction, with physical isolation , 5V/12V/24V level input optional; 0-5V/0-10V/4-20mA Speed regulation optional; Flow mode, Volume dispense, time dispense, recycle dispense.
Communication function	RS485 MODBUS
Display function	TFT Touch Screen LCD
Direction control	Positive and negative reversibility

### Main performance

Flow range	0.00016-720 ml/min
Speed range	0.1-150 rpm/min
Speed resolution	0.1 rpm/min, Speed accuracy 0.2%
Adjust mode	Mask button+Touch Screen
Display	LCD, 65536 Colors
Power supply	AC 100-240V 50Hz/60Hz
Power consumption	<40W
Working environment	Temperature 0~40°C, Relative humidity <80%
Dimensions	257X163X190mm
Weight	4.8kg
IP grade	IP31

### BT300F technical parameter

#### Main Function

Suitable head	YZ15, YZ15X2, YZ25, YZ25X2, DT15, YT15, YT25
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## Golander BT-F Dispensing Pump

Functions	Key control start stop, direction, full speed, state memory (power off memory) Foot switch control, external control start and stop, external control direction, with physical isolation , 5V/12V/24V level input optional; 0-5V/0-10V/4-20mA Speed regulation optional; Flow mode, Volume dispense, time dispense, recycle dispense.
Communication function	RS485 MODBUS
Display function	TFT Touch Screen LCD
Direction control	Positive and negative reversibility

### Main performance

Flow range	0.00016-1600 ml/min
Speed range	0.1-350 rpm/min
Speed resolution	0.1 rpm/min, speed accuracy 0.2%
Adjust mode	Mask button+Touch Screen
Display	LCD, 65536 Colors
Power supply	AC 100-240V 50Hz/60Hz
Power consumption	<50W
Working environment	Temperature 0~40°C, Relative humidity <80%
Dimensions	257X163X190mm
Weight	5.3kg
IP grade	IP31

### BT600F technical parameter

#### Main Function

Suitable head	YZ15, YZ15X2, YZ25, YZ25X2, DT15, YT15, YT25
Functions	Key control start stop, direction, full speed, state

## Golander BT-F Dispensing Pump

	memory (power off memory) Foot switch control, external control start and stop, external control direction, with physical isolation , 5V/12V/24V level input optional; 0-5V/0-10V/4-20mA Speed regulation optional; Flow mode, Volume dispense, time dispense, recycle dispense.
Communication function	RS485 MODBUS
Display function	TFT Touch Screen LCD
Direction control	Positive and negative reversibility

### Main performance

Flow range	0.006-2900 ml/min
Speed range	0.1-600 rpm/min
Speed resolution	0.1rpm/min, speed accuracy 0.2%
Adjust mode	Mask button+Touch Screen
Display	LCD, 65536 Colors
Power supply	AC 100-240V 50Hz/60Hz
Power consumption	<60W
Working environment	Temperature 0~40°C, Relative humidity <80%
Dimensions	257X163X190mm
Weight	5.5kg
IP grade	IP31

### Applicable Pump Head and Tubing, Flow Parameter

Drive type	Suitable pump heads	CH	Tubing size (mm)	Flow rate (mL/min) per channel
BT100F	DG6-1(6roller)	1	Wall0.8~1, ID≤3.17	0.00016~49
	DG10-1(10roller)	1	Wall0.8~1, ID≤3.17	0.00011~41
	DG6-2(6roller)	2	Wall0.8~1, ID≤3.17	0.00016~49

## Golander BT-F Dispensing Pump

	DG10-2(10roller)	2	Wall0.8~1, ID≤3.17	0.00011~41
	DG6-4(6roller)	4	Wall0.8~1, ID≤3.17	0.00016~49
	DG10-4(10roller)	4	Wall0.8~1, ID≤3.17	0.00011~41
	DT10-18	1	13#14#, Wall0.8~1, ID≤3.17	0.0002~82
	DT10-28	2	13#14#, Wall0.8~1, ID≤3.17	0.0002~82
	DT10-48	4	13#14#, Wall0.8~1, ID≤3.17	0.0002~82
	YZ15	1	13#14#16#19#25#17#	0.0006~420
	YZ25	1	15#24#	0.16~420
	2xYZ15	2	13#14#16#19#25#17#	0.0006~420
	2xYZ25	2	15#24#	0.16~420
	YT15	1	13#14#16#19#25#17#18#	0.006~570
	YT25	1	15#24#35#36#	0.17~720
	2xYT15	2	13#14#16#19#25#17#18#	0.006~570
	2xYT25	2	15#24#35#36#	0.17~720
	DT15-14	1	16#19#25#17#	0.05~400
	DT15-24	2	16#19#25#17#	0.05~400
	DT15-44	4	16#19#25#	0.05~260
BT300F	YZ15	1	13#14#16#19#25#17#	0.006~990
	YZ25	1	15#24#	0.16~990
	2xYZ15	2	13#14#16#19#25#17#	0.006~990
	2xYZ25	2	15#24#	0.16~990
	YT15	1	13#14#16#19#25#17#18#	0.006~1300
	YT25	1	15#24#35#36#	0.16~1600
	2 x YT15	2	13#14#16#19#25#17#18#	0.006~1300
	DT15-14	1	16#19#25#17#	0.05~930
	DT15-24	2	16#19#25#17#	0.05~930

## 17 External input power supply specification

Input switch quantity or OC specification	
Item	Parameters
Input interface principle	<p style="text-align: right;">+5V_W Signal In COM</p>
Single signal	$5.5\text{mA} < I_{on} < 15\text{mA}$

## Golander BT-F Dispensing Pump

input ON current		
Single signal input OFF current	$I_{off} < 1.5mA$	
Signal input	Switch quantity (closed, broken) or NPN transistor OC	
External control input voltage	5V	Input loop without series resistance
	12V	Input loop without series resistance
	24V	Input loop series 1.5K $\Omega$ resistance
isolation method	Photoelectric isolation	
<b>Output specification</b>		
Item	Parameters	
Input interface principle		
output way	NPN OC, with pulled up internally	
isolation way	Photoelectric isolation	
<b>Input analog specification</b>		
Item	Parameters	
Interface principle		
Input impedance (<100HZ)	0-5V	R1=4K $\Omega$
	0-10V	R1=4K $\Omega$
	4-20mA	R1=248 $\Omega$
tolerance	0-5V、0-10V、4-20mA	$\pm 1\%$
resolution	0-5V	5mV



Golander BT-F Dispensing Pump

	0-10V	10mV
	4-20mA	16uA
<b>Internal output power supply specification</b>		
Item	Parameters	
output voltage	DC12V $\pm$ 1V	
Allowable output current	<130mA	
<b>External input power supply specification</b>		
Item	Parameters	
Allowable input voltage	DC5-25V	
Allowable input current	>350mA	