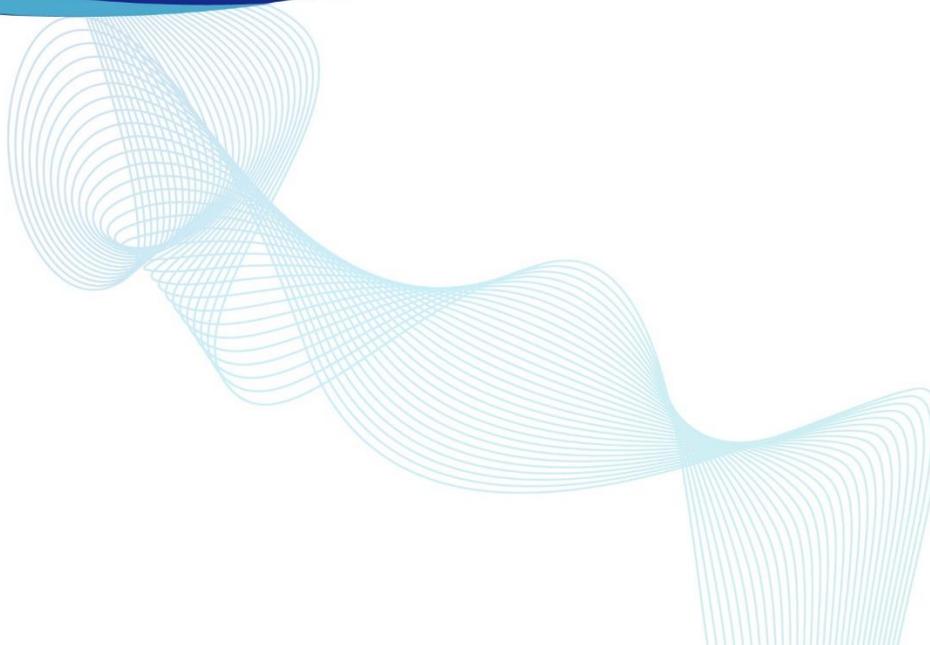




**BP601–TH35**  
**Peristaltic Pump**  
**User Manual**



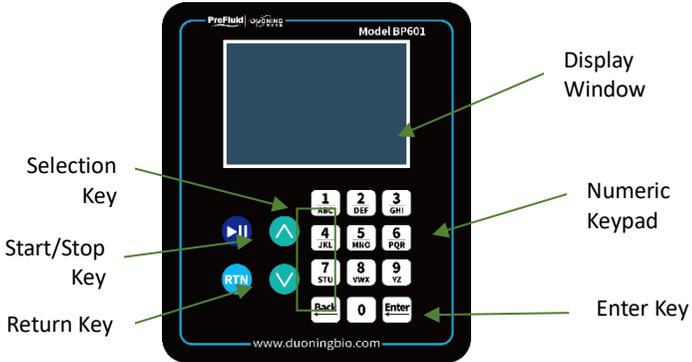


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## 1. Keyboard



- Pure digital input

Integer input: Press the number keys directly to input.

Decimal input: Input using fixed-point decimal method.

Example: To enter 1.23, press the buttons one by one , , , the input is completed.

Press  key to delete characters.

- Mixed input of numbers and letters

To enter a mixed string of numbers and letters, press the corresponding number key first, then press   to scroll through the selectable characters.

Press  key to delete characters.

Example: To enter the string "Ad8", use the following steps:

- ① Press  key, then press  key 4 times to select 'A';
- ② Press  key, then press  key once to select 'd';
- ③ Press  key, to complete string input

## 2. First Startup

- First time startup prompt

When you start the system for the first time (the first time you turn it on after leaving the factory or the first time you start it after restoring the factory settings), after the startup screen ends, a prompt will appear showing that you need to make necessary settings for the first time startup. Press  key to continue.



- Language selection

Press   keys to select the system language, press  key to confirm and go to the next step; the system language can also be changed in the system settings.



- Setting up pump manager

Enter the pump administrator's account, the default name is Admin. The pump administrator has the highest authority and can add users under user management.



Press  key to delete characters.

Press   keys to scroll through the selectable characters.

After entering, press  key to save and proceed to the password entry screen.

### Setting the Pump Administrator Password

Use the numeric keypad to enter a 4-digit password.



Press  key to delete characters.

After entering, press  key to confirm, and you will be prompted to enter the administrator password again.



If requested, enter your PIN again.

Press  key to delete characters.

After entering, press  key to confirm.

If the two passwords you entered do not match, the following screen will be displayed.



Press  key to return to the first password entry screen

## Create your first recipe

When the system is turned on for the first time or restored to factory settings, there is no recipe in the storage, and you need to create the first recipe. If you need to add or modify recipes later, you can do so in recipe management.

The new recipe is created using a wizard-style operation. Users only need to enter or select the necessary information Press the prompts, and the system will automatically generate the recipe. Users only need to fine-tune individual parameters when using it.

- Enter the recipe name



Press  key to delete characters.

Press   keys to scroll through the selectable characters.

After entering, press  key to save and enter the work mode selection screen.

- Flow setting

Continuous delivery mode, set flow rate, unit: mL/min.



Use the numeric keypad to enter

Press  key to delete characters

Press  key to return to working mode selection

Press  key to enter tube selection interface

- Tube selection

Select the tube according to the actual tube number used.



Press   keys to select tube type.

Press  key to return to the loading volume setting or flow rate setting interface.

Press  key to complete the setting

At this point, the first recipe is created, and the system will automatically calculate the pump's operating speed, operating angle and other

parameters. Other parameters take the default values.

There are more recipe settings in recipe management, including creating new recipes, deleting recipes, editing recipes and other operations.

- Complete the setup

The first start-up settings are complete. Press  key to enter the working interface.



### 3. Login

If this is not the first time you start the pump, and the control mode is set to "Local", the peristaltic pump will display the initialization screen and the login screen in sequence.

- User login



Press   keys to select a username.

Press  to enter the password input interface.



Enter a 4-digit password using the numeric keypad.

Press  key to delete characters.

Press  to return to the username selection interface.

After entering, press  key to confirm.

If the password is correct, you will enter the work interface; if the password is incorrect, the following interface will be displayed

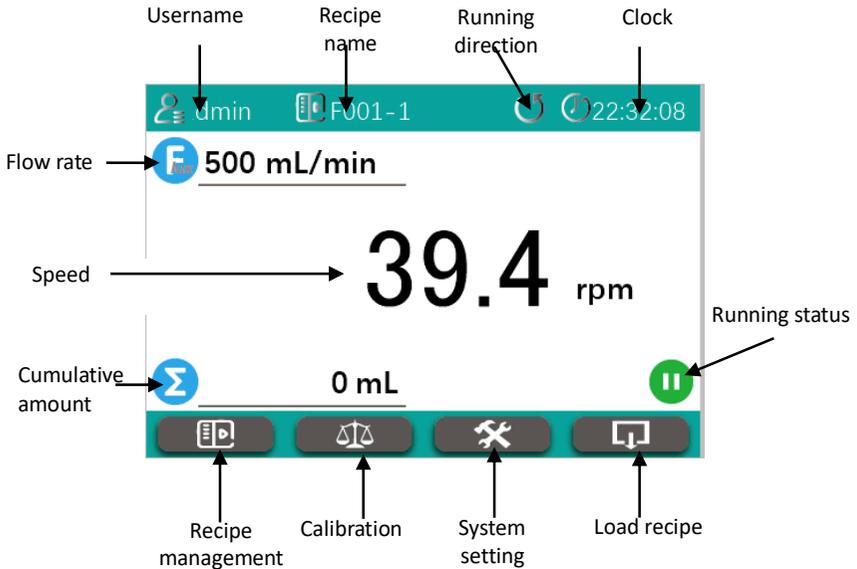


Press  key to return to the password input interface.

## 4. Working Interface

- Interface layout

“Continuous delivery” working interface:



- Icon Description



Currently logged in user name



The name of the recipe currently being called



Clock

 Rotation direction

 Target flow rate

 Cumulative amount

 Running status: fast loading

 Running status: running clock

 Running status: Pause (waiting to run)

 Function menu: Recipe management, after been selected:



 Function menu: Calibration, after been selected:



 Function menu: System settings, after been selected:



 Function menu: Log out, after been selected:



When the pump is paused, press   to select a menu item, press  key to enter corresponding function interface

In continuous delivery mode, press  once, the pump runs, press it again to stop the pump

When the pump stops, press and hold  key to empty

- Speed fine-tuning

In the "Continuous Delivery" working interface, when the pump is paused, press   keys, select the speed, as shown below, the speed is displayed in red



Press  key to enter the speed fine-tuning mode, and the speed value will flash.

Press   keys to adjust the speed

Press  key to exit speed fine-tuning mode

## 5. Recipe Management

- Enter the recipe management interface

In standby mode, press   keys, select the recipe management icon, as shown below



Press  key to enter the recipe management interface.



Press   keys to select operation, the selected item will be displayed with  icon in front, press  key to enter the corresponding operation interface.

- Deleting a recipe

In the recipe management interface, press   to select the "Delete

## Recipe" option



Press  key to enter the recipe list



Press   to select the recipe to be deleted.

Press  to delete the selected recipe.

- New Recipe

In the recipe management interface, press   to select the "New Recipe" option.



Press  to enter the New Recipe Wizard.



Enter the recipe name and press  key to save and enter working mode selection.



Press   keys to select working mode.

Press  key to enter the flowrate setting interface.

Working mode "Continuous delivery" mode, set flow rate, unit: mL/min.



Use the numeric keypad to enter.

Press  key to delete characters.

Press  key to return to working mode selection.

Press  key to enter tube selection interface.

Select the tube according to the actual tube number used.



Press   keys to select tube type.

Press  key to return to the loading volume setting or flow rate setting interface.

Press  key to complete the setting.

At this point, the new recipe is complete, and the system will automatically calculate the pump speed and other parameters. Other

parameters take the default values.

After the new recipe is created, the system will load the new recipe into the working recipe and enter the working interface.

- Edit current recipe

In the recipe management interface, press   to select the "Edit current recipe" option.



Press  key to cancel the selection and return to the working interface.

Press  key to enter the recipe editing interface.



Press   keys to select the edit item.

Press  key to return to the recipe management interface.

Press  key to pop up an input box or selection box

The complete editing items are shown in the following table:

Edit item	Description
Recipe name	Not editable
Working mode	Selected when creating a new recipe, cannot be edited
Tube size	Selected when creating a new recipe, cannot be edited
Flow rate	Unit: ml/min, volume of liquid pumped per minute, valid in "continuous delivery" mode
Speed	Pump speed during running
Acceleration curve	The speed of the motor when accelerating, can be set as 1-5
Deceleration curve	The speed of the motor when it decelerating, can be set as 1-5
Back-suction speed	Motor rotation speed during back-suction

## 6. Flow Rate Calibration

In the "Continuous Delivery" working interface, press   keys to select  icon.



Press  key to cancel the selection and return to the working interface.

Press  key to enter the flow calibration interface.



Use the numeric keypad to enter the calibration time. After entering, press  key to enter the next step.



Make sure the tube is full of liquid, press and hold  key to start loading, release it to stop.

Press  key to start the calibration run, the pump starts, and the countdown begins.

Wait for the countdown to end and enter the actual pumping volume input interface.



Enter the actual measured volume of liquid.

Press  key to complete the calibration, the system automatically calculates the actual running speed and saves it to the recipe.

## 7. System Settings

In standby mode, press   keys to select  icon.



Press  key to cancel the selection and return to the working interface.

Press  key to enter the system settings interface.





Press   keys to select a setting item.

Press  key to return to the working interface.

Press  key to pop up an input box or selection box

The complete editing items are shown in the following table:

Setting items	Description
Running direction	Set the direction of pump operation (CW, CCW)
External control start and stop mode	Pulse: The running state of the pump changes once at each falling edge of the external control start/stop signal. Level: The pump runs when the external control signal is at a low level, otherwise the pump stops
Analog quantity	Analog type: 4-20 mA, 0-5V, 0-10V If analog quantity is enabled, the communication function will be automatically disabled.
Analog minimum speed	The speed value corresponding to the minimum analog value input, unit: rpm
Analog maximum speed	The speed value corresponding to the maximum value of the input analog value, unit: rpm
Communication enable	Optional RS485, RS232 or communication function disabled If the communication function is enabled, the analog quantity will be automatically closed.
Baud rate	Select the baud rate used for communication: 9600, 19200, 38400

Setting items	Description
Local address	The slave address of this system during communication control 1-255
Buzzer	Buzzer switch
Language settings	Set the system language
Account management	Change password, create new account, delete account
Time and date settings	Time and date settings
Restore factory settings	Clear all data and restore all configurations to factory settings

## 8. Recipe Loading

In standby mode, press   keys to select  icon.



Press  key to cancel the selection and return to the working interface.

Press  key to open the recipe list.



Press   to select recipe.

Press  to return to the working interface.

Press  to confirm and open the selected recipe.

## 9. Pump Cover Inspection

When you start the pump with the pump cover open or open the pump cover while the pump is running, the following interface will appear and the pump will stop running immediately. Press  key to continue.



## 10. Analog Speed Regulation

Analog speed regulation is only applicable to "continuous delivery" mode.

- Analog related settings

In standby mode, press   keys to select  icon.

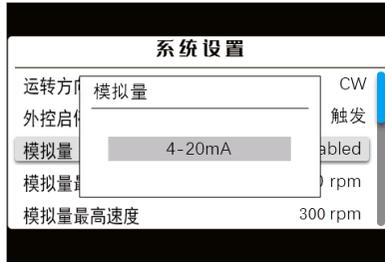


Press  key to enter the system settings interface.

Press   keys to select the "Analog" setting item.



Press  key to pop-up selection box



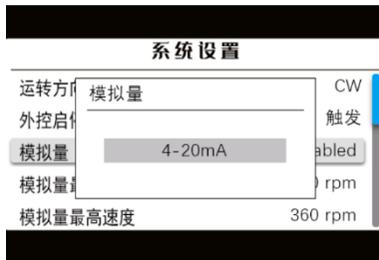
Press   keys to select analog quantity type.

Press  key to save and return to the system settings interface.

Press   keys to select "Analog minimum speed".



Press  key to pop up input box.



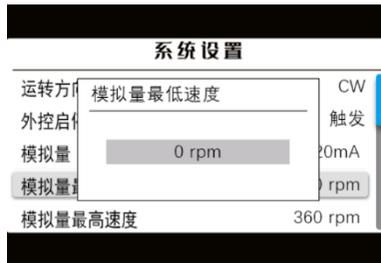
Use the numeric keyboard to input the speed corresponding to the minimum analog value. Press  key to delete characters.

Press **Enter** key to save and return to the system settings interface.

Press **▲** **▼** keys to select "Analog minimum speed".



Press **Enter** key to pop up input box.

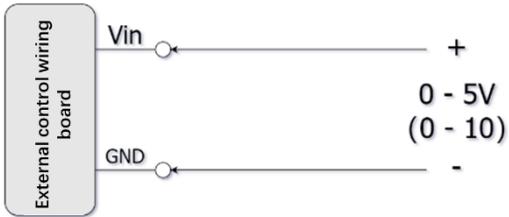
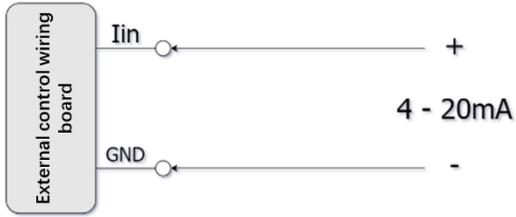


Use the numeric keyboard to input the speed corresponding to the maximum analog value. Press **Back** key to delete characters.

Press **Enter** key to save and return to the system settings interface.

- Wiring instructions

Press the selected analog type, refer to the figure below to select the appropriate wiring method.



## 11. RS485 Communication Control

RS485 communication using MODBUS RTU Protocol. Data format: 8, N, 1; Baud rate: 9600, 19200, 38400. To use RS485 communication control, first enable the communication function in the system settings, and set the baud rate and local address.

- Enable RS485 communication control

The RS485 communication control is disabled by default when the system leaves the factory. This function can be enabled by the following operation. After the communication function is enabled, the system will directly enter the remote-control mode each time it is turned on, without logging in. The operating parameters and operating status of the pump are completely determined by communication control.

In standby mode, press   keys to select  icon.

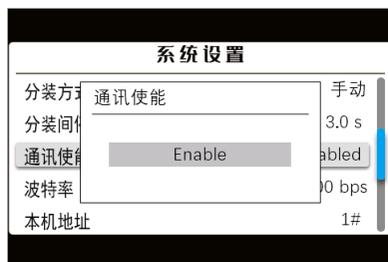


Press  key to enter the system settings interface.

Press   to select the "Communication Enable" setting item.



Press  key to pop-up selection box.



Press   to select "Enable", press  key to save and return to the system settings interface.

Press   to select the "Baud Rate" setting item.



Press  key to pop-up selection box.

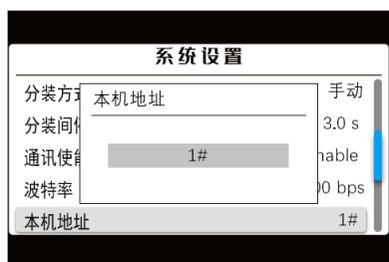


Press **▲** **▼** to select the baud rate, press **Enter** key to save and return to the system settings interface.

Press **▲** **▼** to select the "Local Address" setting item.



Press **Enter** key to pop up input box.



Use the numeric keypad to enter the local address (1-255), press **Back** key to delete characters.

Press **Enter** key to save and return to the system settings interface.

At this point, the communication settings are complete, turn off the power and restart. After restarting, enter the working interface directly and you can use RS485 communications to control the peristaltic pump.

- Close RS485 communication control

To exit RS485 communication control, follow the steps below:

Press   keys to select  icon.



Press  key to enter the system settings interface.

Press   to select the "Communication Enable" setting item.



Press  key to pop-up selection box.

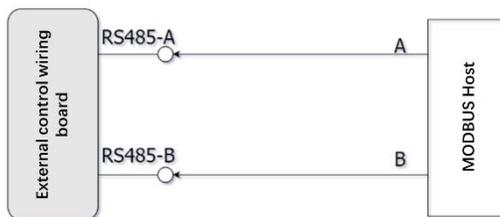


Press to select “Disabled” and press key to save.

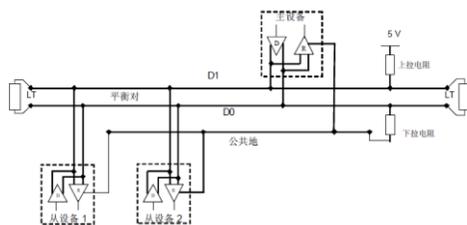
Turn off the power and restart it. The RS485 communication control is switched off.

- Wiring instructions

Set the RS485 interface as shown below:



This system supports centralized control of multiple slaves. When there are multiple slaves, it is recommended to connect them according to the following topology to avoid star wiring.

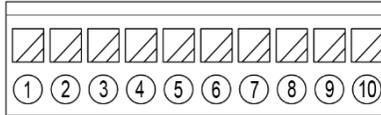


- Address Table

Address (PLC address)	Name	Description
40001	Working Mode	0: Continuous delivery 1: *
40002	Start up	0: Stop 1: Run
40003	Direction	0: CW 1: CCW
40004	Tube size	*
40005	Flow rate L	Unit: ml/min
40006	Flow rate	
40007	Loading volume L	*
40008	Loading volume	
40009	Running speed	Unit: 0.1rpm Value range 10 - 3000
40010	Running angle	*
40011	Back-suction speed	Unit: 0.1rpm Value range 10 - 3000
40012	Back-suction Angle	
40013	Acceleration curve	Value range1 - 5
40014	Deceleration curve	Value range1 - 5
40015	Fault code 1	
40016	Fault code 2	

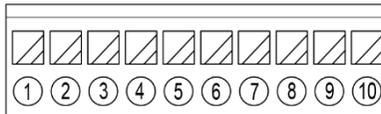
## 12. External Control Interface Definition

JP1: Digital input and output and analog interface



Item	Definition	Description
1	Vin	Voltage input (0-5V or 0-10V)
2	Iin	Current input (4-20ma)
3	GND	Analog common negative pole
4	COM	Digital output common terminal
5	DO2	Digital output 2, optocoupler PNP output, output low level when fault occurs
6	DO1	Digital output 1, optocoupler PNP output, output low level when running
7	GND	Digital common negative pole
8	DI2	Digital input 2, undefined
9	DI1	Digital input 1, start/stop signal
10	GND	Digital common negative pole

JP2: Communication interface



Item	Definition	Description
1	+5V	+5V power output
2	GND	Negative pole of power supply
3	B/TXD	When RS485 communication is selected, RS485-B

Item	Definition	Description
		When RS232 communication mode is selected, RS232-TXD
4	A/RXD	When RS485 communication mode is selected, RS485-A When RS232 communication mode is selected, RS232-RXD
5	GND	Negative pole of power supply
6		
7		
8		
9		
10		



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