DIPump550

intelligent peristaltic pump

User Manual

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Kamoer Fluid Tech (Shanghai) Co., Ltd.

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Main features

Speed range	0.1- 400RPM
Speed resolution	0.1RPM
Flow range	⩽450ml/min
Direction control	Support clockwise and counterclockwise operation
Display mode	LED 4-digit digital tube
Control mode	Encoder, toggle switch, external analog signal control, RS485 communication control, foot switch control
External analog signal control	4-20mA, 0-5V
Power failure parameter memory	support
Working mode	Speed mode, Flow mode
Way of working	Fully automatic circulation, semi-automatic circulation, manual
Support function	Start and stop, forward and reverse, speed adjustment, etc.
Power supply mode	External power adapter
Power	＜50W

Working conditions

- **Ambient temperature:** -20°C～60°C
- **Rated voltage:** DC24V
- **Maximum current:** 2A

Appearance description

- **Digital display**

Used to display information such as speed, flow and time;

When all are numbers: the current speed/currently set speed;

When all are numbers and all numbers are beating: The number indicates the currently set operating flow

When the first digit is displayed  and is beating: the last three digits indicate the currently set working time

When the first digit shows  no beating: the last three digits indicate the current remaining working time

When the first digit is displayed  and is beating: the last three digits indicate the currently set stop duration

When the first digit is displayed  without bounce: the last three digits indicate the current remaining stop duration

When the first digit is displayed  without bounce: the last digit indicates the selection of setting function

- **Rotary encoder**

Used to adjust the speed and time; increase clockwise and decrease counterclockwise. The faster the rotation speed, the larger the increment of adjustment; The speed can be adjusted during the operation of the peristaltic pump.

- **Direction control switch**

Used to control the direction of rotation of the peristaltic pump, when dialed to the left, the pump rotates counterclockwise; when it is dialed to the right, the pump rotates clockwise. The switch is ineffective during the operation of the peristaltic pump, and will only switch to the post-switching state when the peristaltic pump stops running and runs again.

- **Power socket**

External DC power, 24VDC 2A.

- **Combination control port**

1. 485 communication (pin 2, 3)
2. External start and stop control (pin 4, 5)
3. Analog signal control 0 ～ 5V (pin 6, 7)
4. Analog signal control 4 ～ 20mA (pin 8, 9)

Working mode setting—Speed Mode

- **Fully automatic cycle mode setting**

1. Press and hold the encoder in the speed setting state, the digital tube switches to the time setting mode, the first upper port jumps  (red in the figure), at this time is set the running time of the pump;
2. The rotary encoder can set the time, and the settable time range is 0 to 999 seconds.
3. Press the encoder (not long press) to switch to the pump stop time setting, and the first position of the digital tube will jump  (red in the picture);
4. The rotary encoder can set the time, and the settable time range is 0 to 999s;
5. Press and hold the encoder to return to the speed display interface. The running time and stop time will be saved automatically.
6. Press the encoder (not long press), the pump will run according to the set running time and stop time;

   Note: When the pump starts to cycle, the digital tube displays the time countdown, and follows 1.3. The upper and lower ports are displayed;
7. Press the encoder (not long press) and the pump stops cycling. The digital tube switches to the display speed interface.

- **Semi-automatic cycle mode setting**

Simply set the time to 0 in step 4 of the fully automatic cycle mode setting mode;
At this time, after the pump stops running according to the set working time, it will not start automatically; if it starts again, the user needs to press the encoder or step on the foot switch.

- **Manual mode setting**

1. Set the time to 0 in step 2 of the automatic cycle mode setting;
2. Set the time to 0 in step 4 of the automatic cycle mode setting;

At this point, the start and stop of the pump is controlled by encoder or foot switch.

Working mode setting—Flow Mode

- **Fully automatic cycle mode setting**

1. In the flow mode, long press the encoder to switch to the operating flow setting. The nixie tube displays all numbers and flickers. At this time, it is to set the operating flow of the pump;
2. The rotary encoder can set the Operating flow, and the setting range is 0 ~ 9999 ml.
3. Press the encoder (not long press) to switch to the pump stop time setting, and the first position of the digital tube will jump  (red in the picture);
4. The rotary encoder can set the time, and the settable time range is 0 to 999 seconds;
5. Press and hold the encoder to return to the flow rate display interface, and the running flow and stop time will be saved automatically;
6. Press the encoder (not long press), the pump will run according to the set Operating flow and stop time;
7. Press the encoder (not long press) and the pump stops cycling. The digital tube switches to the display flow rate interface.

- **Semi-automatic cycle mode setting**

Simply set the time to 0 in step 4 of the fully automatic cycle mode setting mode. At this time, after the pump stops running according to the set Operating flow, it will not start automatically; if it starts again, the user needs to press the encoder or step on foot switch.

- **Manual mode setting**

1. Set the Operating flow to 0 in step 2 of the automatic cycle mode setting;
2. Set the time to 0 in step 4 of the automatic cycle mode setting;

At this point, the start and stop of the pump is controlled by the encoder or the foot switch.

Enter menu settings page

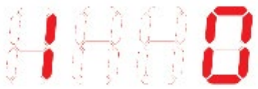
1. On the operation preparation page, long press the rotary encoder to switch to the working mode setting interface (If the operation mode is speed mode , The first digit of the nixie tube jumps  (Red in the picture); If the operation mode is flow mode, the digital display on the nixie tube is all digital, and it jumps and flashes).
2. In the working mode setting interface, long press the rotary encoder again to switch to the menu setting interface (the first digit of the nixie tube jumps  , the middle two digits are 0, and the last digit is the corresponding function selection).
3. In the menu setting interface, the rotary encoder can select the functions to be set. The last 8 digits of "1-8" correspond to 8 different functions. Select the function to be set and press the rotary encoder to enter the detailed setting interface of the function.

Specific function settings

Note: In the setting interface, only long press the rotary encoder to save the settings and make the settings take effect. Short pressing the rotary encoder will not save the settings.

- **"C001" Mode switching**

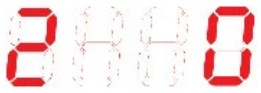
In the function selection interface, the rotary encoder, when it displays "C001", the corresponding function is "mode switching", short press the rotary encoder to enter the setting interface, you can switch between "speed mode" and "flow mode", the last digit represents Mode, select the rotary encoder, short press the rotary encoder to return to the function selection interface; long press the rotary encoder (the setting takes effect) and return to the home page.

Interface	Setting	Introduce
		Speed mode
		Flow mode

- **“C002” Direction adjustment**

In the function selection interface, the rotary encoder, when it displays "C002", the corresponding function is "direction level mode setting", short press the rotary encoder to enter the setting interface, and you can set the direction level mode. The last digit represents the direction level, which can be used to match the direction of the direction button and the label on the surface.

Tip: If the running direction is the same as the direction of the label on the surface, there is no need to set this item.

Interface	Setting	Introduce
		Low level mode (When the direction button is turned counterclockwise but the pump actually rotates clockwise, select 0 to adjust the pump to counterclockwise)
		High level mode (When the direction button is turned counterclockwise rotation and the pump actually rotates counterclockwise, select 1 to adjust the pump to clockwise)

- **“C003” Foot switch setting**

In the function selection interface, the rotary encoder, when it displays "C003", the corresponding function is "Foot Switch Setting", short press the rotary encoder to enter the setting interface, and you can set the foot switch usage mode. The last digit represents how the foot switch is used.

Interface	Setting	Introduce
C003	3H H0	Edge trigger (press the foot switch once, the pump starts to work, press again, the pump stops)
	3H H1	Low level trigger (long press the foot switch, pump work, release the foot switch, pump stop)
	3H H2	High level trigger (releasing the foot switch, the pump works, long press the foot switch, the pump stops working)

- **“C004” Calibration**

In the function selection interface, rotary encoder, when it displays "C004", the corresponding function is "flow calibration", short press the rotary encoder to enter the setting interface, and you can perform pump head flow calibration.

After entering the setting interface, the calibration speed and calibration time will switch back and forth every 2 seconds; the first digit shows 4, the middle one space, and the last two digits represent the calibration time; the rotary encoder sets the calibration speed and calibration time, after completing the setting Short press the rotary encoder to start flow calibration.

The flow calibration is accompanied by a countdown. After the countdown is over, the volume input interface is displayed, enter the actual volume, press and hold the rotary encoder (the setting takes effect) and return to the home page.

Interface	Setting	Introduce
C004	H100.0	Set the calibration speed
	4 60	Set calibration time
	063.5	Enter actual volume

- **“C005” Running status setting**

In the function selection interface, for the rotary encoder, when the corresponding function of "C005" is displayed as "saving in running state", short press the rotary encoder to enter the setting interface, and you can set whether to save the current running state. The last digit represents whether to save.

Interface	Setting	Introduce
		Not save the running state
		save the running state

- **“C006” Analog quantity selection**

In the function selection interface, rotary encoder, when the corresponding function of "C006" is displayed as "analog selection", short press the rotary encoder to enter the setting interface, and you can set the analog selection. The last digit represents the analog option.

Interface	Setting	Introduce
		0-5V
		4-20mA
		485 mode

- **“C007” Suction back function**

In the function selection interface, the rotary encoder, when "C007" is displayed, the corresponding function is "Suction Setting", short press the rotary encoder to enter the setting interface, the settings of "Suction Time" and "Suction Speed" in the interface are set every time Circulating scrolling every 2 seconds, the pump head can be set to suck back after running. "Suction time" setting, the first digit of the interface digital tube is "7", the second space, and the last two digits represent the suction time. At this time, turn the encoder to adjust the suction time (0-99 seconds) ; "Suction speed" setting, there is a decimal point display between the third and

fourth digits of the interface. At this time, turn the encoder to adjust the speed of suction (0.1-999.9ml/min).

Interface	Setting	Introduce
C00A	A 05	Suck back time
	100.0	Suction speed

- **“C008” Drive enable**

In the function selection interface, for the rotary encoder, when the corresponding function of "C008" is displayed as "drive enable setting", short press the rotary encoder to enter the setting interface, and the drive enable setting can be performed. The last digit represents the enable option.

Interface	Setting	Introduce
C008	8 H 0	Low level enable
	8 H H	High level enable

- **“C009” Maximum speed setting**

This function is used by the manufacturer to debug the equipment. The internal display is the equipment speed. The minimum speed is 150 rpm and the maximum speed is 1500 rpm. Please do not change the option, otherwise it will easily lead to abnormal phenomena such as pump head jamming.

Interface	Setting	Introduce
C009	400.0	The default speed is 400 rpm, and the rotary encoder adjusts the speed.

External control

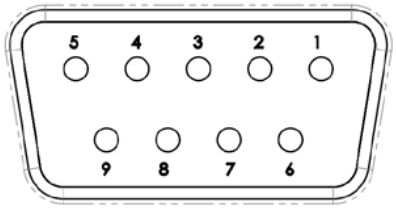
- **485 mode**

  The board is controlled by 485 communication mode; please connect to the 485-communication wire.

- **Analog signal control mode**

  Control the board by analog signal mode (0～5V, 4～20mA);

  Please connect the signal line according to the actual control mode.



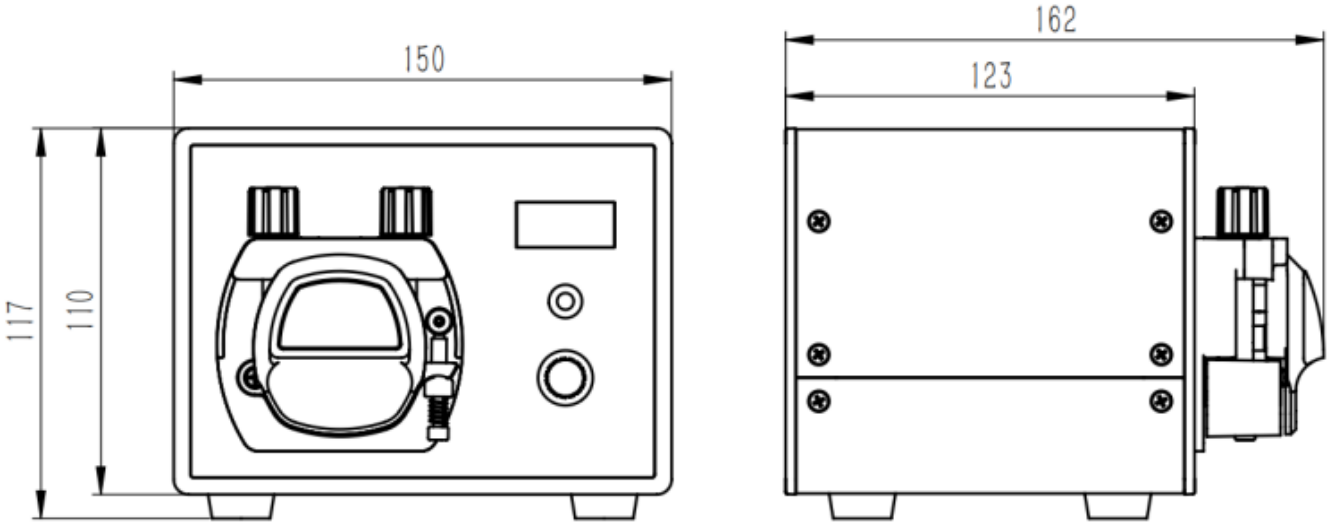
Pin 1: reserved Pin 2: 485 B Pin 3: 485 A

Pin 4: Foot switch + Pin 5: Foot switch -

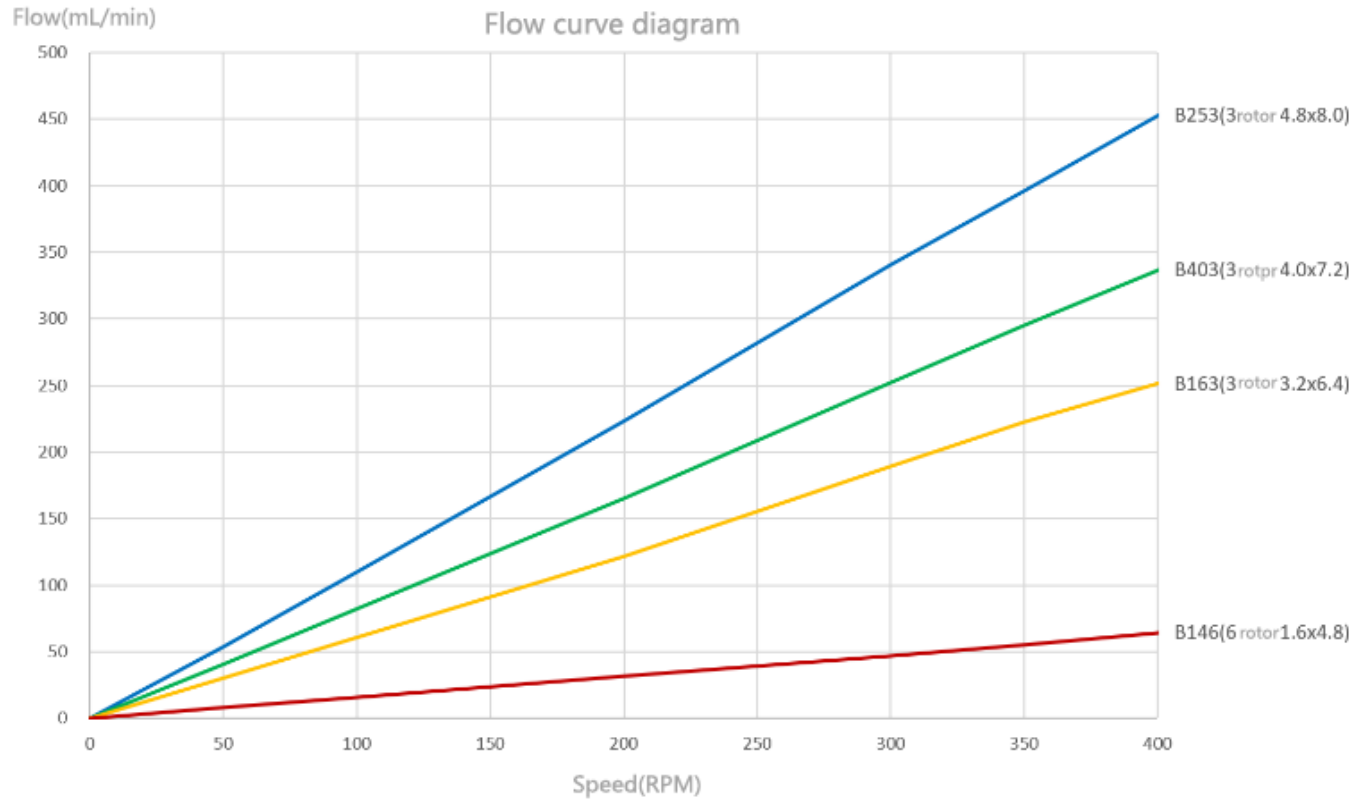
Pin 6: Analog signal 5V- Pin 7: Analog signal 5V+

Pin 8: Analog signal mA- Pin 9: Analog signal mA+

Appearance dimension drawing



Pump tube flow reference



Code	Pump pipe material	ID x OD mm	Number of rotors	Maximum flow ml/min
B146	BPT	1.6×4.8	6	64
B163	BPT	3.2×6.4	3	252
B403	BPT	4.0×7.2	3	336
B253	BPT	4.8×8.0	3	452

Note: the maximum flow in the above chart is obtained by testing water at 400 rpm with a new pump pipe aged for 30 minutes at room temperature (about 25 °C) for reference only. Ambient temperature, material and elasticity of pump pipe, viscosity of test liquid and other factors will affect the actual flow. The thickness of pump pipe will affect the maximum speed of actual stable operation.

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