

BT Series

**Peristaltic Pump
Basic pump – Variable Speed**

User manual

Safety Information

Before using this product, please follow the notes below in order to avoid fire, lightning strokes and personal injuries.

- 1) Please turn off the drive power before install or disassemble the pump head and tubing, otherwise fingers or coat corner may get caught into the drive;
- 2) Turn off the power before connecting to external control equipment, otherwise the pump may get damaged;
- 3) Site the pump on a flat, horizontal, rigid surface, free from excessive vibration;
- 4) Site the pump in a protected place to avoid being stepped over, which may lead to personal injuries;
- 5) Pull out the power plug before cleaning the pump;
- 6) You are forbidden to break down, alternate or repair this product. If needed, please contact us.

Attention

- 1) Before using peristaltic pump, please carefully go through this manual and make sure you fully understand this manual;
- 2) Before using peristaltic pump, please carefully go through and follow the safety guidance in this manual;
- 3) Pump tubing is consumable product, long time using may lead to split because of fatigues, please inspect and change tubing frequently so as to avoid unnecessary leaking accidents;
- 4) Take care of this manual.

Warning!

- 1) In certain kinds of special industrial environment or nearby the wireless firing device, pump may have error because of electromagnetic field interference;
- 2) Please don't make unwarranted repair or alternation to the pump, otherwise we reserve the right to hold back our after-sale service.

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1 General

BT series peristaltic pump is an economy pump with variable speed application. There are two kinds of pump house, one is made of carbon steel with special coating, and the other one is made of stainless steel. The pump is equipped with stepping motor, which is stable, quiet and accurate. It is widely used in applications of beverage production, pharmaceutical industry, lab application and printing industry.

➤ BT600L:



➤ The pump has two major parts:

Pump head: Please refer to *Pump head Instruction*.

Drive: Pump power supply.

➤ Main Power cable:

The Pump is suitable for 120V or 240v supplies and earthed effectively. The power cord plug with grounding conductor is requested here. Do ensure using the same type plug as shown.



If there are any questions about the correct connection to an earthed, consult professional. Do not alter the provided plug arbitrarily. If the socket is inapplicable, it is suggested to be changed by trained electricians.



Caution: Risk of electrical shock will be caused by the incorrect assembling of power cord protective grounding conductor. When replacing power cord or plug, do not connect the GND (green wire) to the flat terminal

➤Fuse

Two type 1A standard fuses are contained in the power socket. Replace the fuse using screwdriver to open the fuse drawer with the spare one.

Fuse type: 1.0AH 250V 5*20mm time-delayed



WARNING - Unplug the appliance before replacing the fuse.



2 Product Introduction

2-1 Features

- Three digit numerical speed display. Rotary encoded switch.
- Control switch panel with functions of direction control, start/stop control.
- Featured with prime function; capable of running at max speed to quickly prime or fill up the tubing.
- Remote control of speed, direction, start/stop.
- Communication protocol of Modbus or RS485 for remote control.
- Automatic data memory. In case of sudden power off, the pump will be able to save the present operation set up and return to the same set up when power gets back on.

2-2 Specifications

Model	BT600
Drive	64 steps Stepping Motor Drive
Speed	0~600rpm
Step	1rpm
Speed Control	Encoding knob
Display	Three digit numerical speed display.
External Control	Start/stop, direction, speed (4-20mA); RS485 communication protocol for start/stop, direction and speed.
Power Supply	120V/240V ($\pm 10\%$), 50Hz/60Hz
Power Consumption	$\leq 70W$
Working Environment	Temperature: 0 ~ 50°C, humidity: $\leq 80\%$, Indoor Use, Altitude < 2000M, Pollution degree 2
Pump Head	YZ15/KZ15、DG series、BZ25
Ingress Rate	IP31
Flow rate	0.06-2280ml/min

House	Upper: ABS; Base: Carbon steel with corrosion resistant coating
Drive Dimension	200×175×280 (mm)

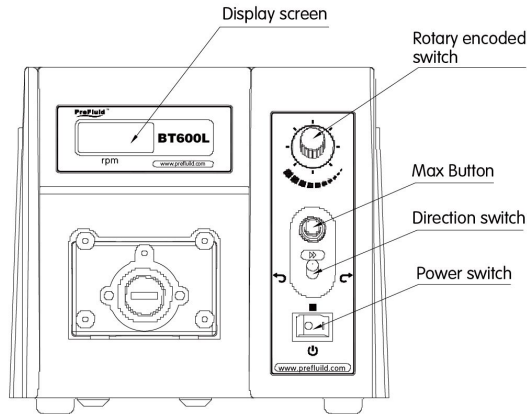
Note 1: The pump head in the chart above can be used alternatively on the same drive to apply to different requirements of channel, flow rate and pressure.

Note 2: Please refer to *Pump head Instruction* for flow rate specifications.

3 Control Panel and Back Panel

3-1 Control Panel

The control panel consists of one 3-digit numerical speed display screen, one direction control switch, one prime button and one speed control knob, and power switch as showed below. (BT300 and BT600 are the same)

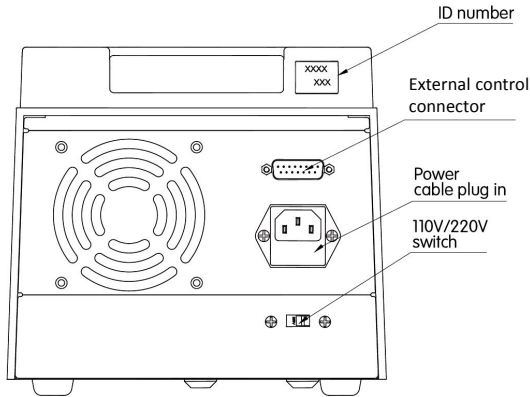


Panel Parts Instruction:

- **Display Screen:** Three digit LED display, shows current speed.
- **Direction switch:** Control the rotation direction of the pump. When the switch is in the middle, the pump is stopped.
- **Prime button:** Keep pressing the button for max speed. Release the button to return to operation speed.
- **Speed control knob:** CW for speed up, CCW for speed down.
- **Power Switch:** “I” as on, “O” as off.

3-2 Back Panel

The back panel consists of one external control connector, one voltage selector switch and one power cord plug-in.



- External control connector: For external or communication signal of start/stop, speed and direction inputs.
- Power cord plug-in: 120V/240V AC voltage inlet.
- Voltage selector switch: 120V/240V switch

Ensure switch is correctly set for supply voltage before connecting mains



4 Operation Instruction

4-1 Pump head and tubing installation

Please install the pump head and tubing before the following procedures.
For specific installation instruction, please refer to *Pump Head Instruction*.

4-2 Power on and off

Plug in the power cable connector. The power supply for this pump is 120V/240V AC power.

Please turn on the power switch on the back panel. The numerical display window will display the current speed. As you turn the speed control knob, the speed will change.

Note: Please be sure to use the advised power supply.

Power On/Off Switch: “I” for on, “O” for off.

4-3 Operation

Turn the rotary switch until the speed gets to your desired number, then adjust the direction according to your application. The pump will be running in the direction at the speed.

If you want to stop the pump, push the switch to the middle position.

If you wish to operate the pump at full speed, push the prime button. The LED screen will display “FULL” and the pump will operate at full speed. This feature is for quick prime or quick fill of the fluid in the tubing.

Note 1: Speed refers to rpm, revolutions per minute. The speed is adjustable when the drive is stopped or running.

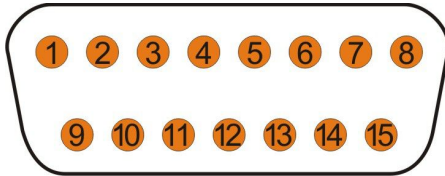
Note 2: In order to prime or fill in the tubing quickly, you need to use prime button and direction switch together to achieve the desired function.

5 External Control Instruction

The pump can be adjusted through panel control, or by remote signals and communication protocol.

5-1 External Control Connector

External control connector at the back panel is DB-15 connector. The connection instructions are as below:



Pin 1 —+5V, for external control device. Current<100mA.

Pin 2 —GND, public earth wire.

Pin 3 —F/R, control rotation direction.

Pin 4 —+12V, for external control device. Current<100mA.

Pin 5 —lin, current (4-20mA) speed control input (in inverse proportion).

Pin 6 —GND

Pin 7 —Vin, voltage (0-5mA) speed control input.

Pin 8 —REMV, current/voltage speed control switch.

Pin 9 —A, port A of Rs485 communication.

Pin 10 —B, port B of RS485 communication.

Pin 11—REM, grounded for entering external control mode.

Pin 12—S/S, Start/stop signal input.

Pin 13—OUT-, Status output optocoupler negative terminal.

Pin 14—OUT+, Status output optocoupler positive terminal.

Pin 15—READY, Start/stop only.

5-2 External Control Connection Instruction

5-2-1 General External Control Connection

Pin 2 is GND, while applying a low level (TTL) in Pin 11 referenced to pin 2 (or connecting pins 2 and 11), the pump will be external controlled. The speed will be controlled by current signal (4~20mA) input through pin 5 or voltage (0~5V) input through pin 7.

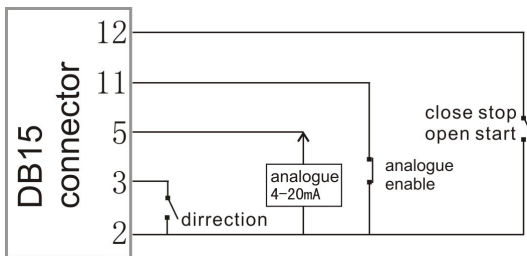
Note 1: "In inverse proportion" means the bigger the electricity current is, the slower the speed is and the lower the flow rate is. "In proportion of positive" means the bigger the electricity current is, the quicker the speed is and the higher the flow rate is.

Rotation Direction can be controlled by a TTL level input in Pin3 (Opened or closed between Pin3 and Pin2), when the level in Pin3 is high (opened), the direction is CCW, and when the level in Pin3 is low (closed), the direction is CW.

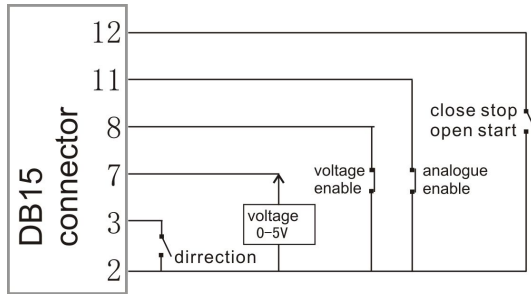
Start /Stop can be controlled by a TTL level input in Pin9 (Opened or closed between Pin9 and Pin2), when the level in Pin 9 is high (opened), the pump will start, and when the level in Pin 9 is low (closed), the pump will stop.

Voltage/Current speed control switch When applying a high level input to pin 8 referenced to pin 2 (equivalent to disconnecting pin 8 and 2), the pump is in current speed control in inverse proportion; when applying a lower level input to pin 8 referenced to pin 2 (equivalent to connecting pin 8 and 2), the pump is in voltage speed control in directly proportion.

Typical connection instruction:



Current speed control in inverse proportion

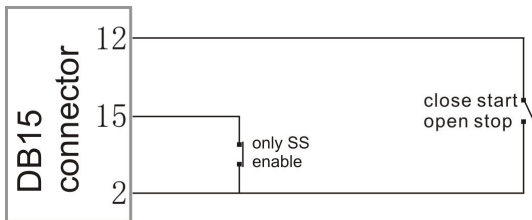


Voltage speed control in directly proportion

Note: The switch is closed as a low level (TTL), and the switch is open as a high level (TTL). When using a level control, voltage is zero between the low level and Pin2, and +5V~+24V between the high level and Pin 2.

5-2-2 Connection of Start/Stop only

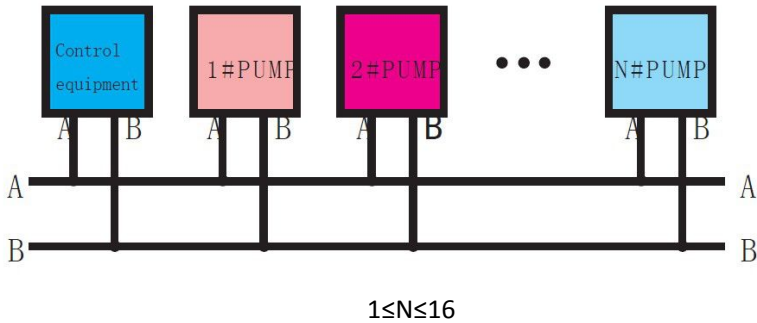
Pump will be required remote start/stop control when the direction and the speed have been set via control panel in some applications. Connect the pins according to diagram as shown below.



Connect pins 2 and 12 to a normal switch or footswitch (remote connecting allowable) after connecting pin 2 and 15. Then the pump start or stop will be controlled by switch operation. Close for pump running and open for stop.

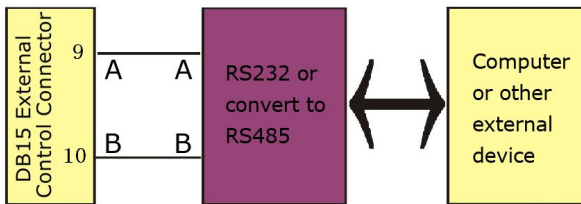
5-2-3 Communication Connection

In some cases, a network control is needed. You can connect Pin9 (A) and Pin10(B). The control system is showed as below:



Note 1: When connecting multiple pumps, the control system needs to make setup to the pump address. You can set up the address through communication protocol. Please refer to *Communication Connector Instruction* for more information.

Typical connection instruction:



Note 1: In communication control, the connection of pumps is simple. Just connect A and B according to the figure above.

Note 2: The present communication baud rate is 9600bps. You can also set up your own baud rate using computer.

Note 3: You can ask for the communication protocol of standard Modbus from our company.

Note 4: Pc control UI or any other UI can be programmed if needed.

6 Repair and Maintenance

6-1 Repair

- Please remove the tubing if the pump is going to be kept unused for a long time.
- Please keep the pump clean on the outside. You can clean the pump with soft cloth and clean water.

6-2 Maintenance

Get familiar with the correct operation, external control and other working requirement so as to make trouble shooting.

Troubling shooting chart:

Problem	Check	Trouble Shooting	Note
Pump start, but the fan , the numerical display and direction light doesn't work.	Check if the power supply is on; if the fuse is loose or broken.	Plug in the power supply cable, make sure it's intact; use a new fuse; make sure the fuse is the required model.	Make sure you find out what caused the fuse to burn out.
Pump start, the fan and light works normally, but the pump head doesn't work.	Check if the pump head is pressed too tight; if the motor is correctly connected.	Adjust the pump head; re connect the motor.	Otherwise the problem lies on the circuit board. Please contact the supplier or our company for resolution.
The pump is running, but the fluid (or air) doesn't transfer accordingly.	Check if the tubing is pressed too hard; if the tubing is leaking.	Adjust tubing clipper on both sides of the pump head; use new tubing.	
The speed display doesn't change as the rotary switch turns, and the power on switch doesn't work	Check if the internal/external switch is on the right position; if the power switch is working properly.	Put the switch on the right position; replace the switch.	
The tubing moves along with the roller in operation.	Check if the clipper is in the right place.	Adjust the clipper.	

7 Warranty

1. From the day of purchase, within three months, we will provide product exchange in case of product quality problem.
2. From the day of purchase, we will provide free maintenance and repair.
3. After this period, if there are problems that the clients can't resolve by themselves, please contact the supplier or us. We will provide maintenance and repair at a reasonable rate.
4. The following problems are not covered by our warranty:

Make unwarranted alternation; overload work; lack of proper maintenance; work in unsuitable environment; work in voltage other than required and make faulty connections.

Changzhou PreFluid Technology

Tele: 400-111-0186

Fax: +86-519-85133860

http:// www.prefluid.net

E-mail: pump@prefluid.com

Address: 21-1, Hengshan Rd., New North District, Changzhou, Jiangsu, Chian.

Post code: 213022