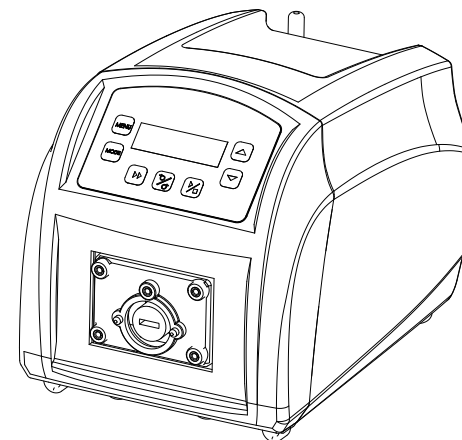


BT/ 01S

**Basic Speed Variable
Peristaltic Pump Operation Manual**



Safety Precautions



Important information:

Be sure to read the manual carefully before operation!

	This icon warns: Keep fingers away from moving parts.
	This icon warns: Be careful.
	This icon warns: Be careful, the surface is hot.
	This icon warns: Be careful, electric shock hazard.
	This icon warns: To recycle this product.
	This icon warns: Personal protective equipment (PPE) must be worn.

Danger:

	Please use the same power supply as that on the nameplate of the machine, otherwise the equipment will be damaged!
	Please do not disassemble the shell or modify the interior of the equipment by yourself, otherwise it may cause malfunctions or even electric shock accidents!
	When installing and disassembling the pump tube, please turn off the power first and do not approach the rotating roller to prevent fingers and clothing from getting entangled in the mechanical mechanism!
	When installing and disassembling external control devices, please turn off the power first to prevent electric shock accidents or damage to the equipment!



Please connect the protective area of the machine to the ground, otherwise there is a risk of electric shock, electromagnetic interference, or induced static electricity!



If it is used to transport dangerous liquids, special operating procedures must be developed for this liquid, and personnel must also be prevented from being injured during use.



This product is not suitable for explosion-proof environment, and it should not be used in explosive environment.

Warning:



Before using, please confirm that the transmitted liquid will not react chemically with the tube or pump head, otherwise it will damage the tube or pump head. If unsure, please consult our engineers.



The tube is a vulnerable part, please check it regularly. Our company is not responsible for the loss caused by tube damage, especially the leakage of toxic, harmful and valuable liquids!



Due to the fact that the actual working environment conditions (including temperature, humidity, power supply voltage, etc.) exceed our technical specifications and the machine is damaged, our company is responsible for the paid warranty, but we will not be responsible for any other damages caused by it!



The primary protection for the operator against injury from the moving parts of the pump is provided by the pump head safety device. Please note that safety devices vary from product to product, depending on the model of pump head. See pump head section in manual.



If the pump was running before the power failure, the pump will automatically start when the power is turned back on.

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Peristaltic Pump Introduction

Peristaltic pump is a safe and reliable fluid transmission equipment, the fluid only contacts with the inner wall of the tube line, through squeeze the tube to realize the fluid transmission. Its unique no-valve, no-seal, tube line integrated transmission design, Ensure the cleanliness of the fluid, reduce the risk of leakage, and make the fluid more reliable, safe and clean way of transmission.

Working Principle

The tube fits between the roller and the pressure block, forming a seal at the point of contact when squeezed. As the roller rotates and advances along the tube, the sealing contact advances with it. As the rollers pass, the tube returns to its original shape, creating a vacuum that draws in liquid. Before the roller reaches the end of the pressure block, a second roller starts compressing the tube at the beginning of the pressure block, isolating the fluid between the two compression points. As the first roller clears the pressure block, the second roller continues to expel the liquid through the discharge port of the tube.

At the same time, a new partial vacuum is created behind the second roller, sucking in more liquid from the inlet. There is no back flow and siphoning, and the pump effectively seals the tube when not in use, so there is no need for a separate valve.

Description

BT101S/BT301S/BT601S speed variable peristaltic pump not only has the basic functions of start-stop, speed control, full speed and forward and reverse rotating, but also the addition of the LCD display and multi-segment dispensing operation and anti-drop function, but also through the MODBUS protocol of the RS485 communication can be easily connected to other equipment control.

This series of speed variable peristaltic pumps include:

BT101S flow range: 0.00011-750mL/min, speed rang: 0.1-150 rpm

BT301S flow range: 0.005-1750mL/min, speed rang: 0.1-350 rpm

BT601S flow range: 0.005-3000mL/min, speed range 0.1-600rpm.

Applications

- The pump body does not touch the liquid.

- No valve blockage.
- The inner surface is smooth and easy to clean.
- The suction lift can reach up to 8 meters of water column.
- Low shear force, can be used to transfer emulsions or liquids containing foam, cells, etc.
- Suitable for transporting liquids containing gases, magnetic beads, or suspensions containing small particles.
- It is suitable for accurate metering and quantitative feeding, and high filling accuracy can be obtained by selecting appropriate tube diameter and filling efficiency.
- Suitable for transporting viscous liquids.
- The liquid only comes into contact with the tube
- If use food and medical grade tube, this pump can be used for food and medical transmission and filling.
- Replacement tube of special material to transfer abrasive liquids.

Functions and Features

- Chinese and English LCD screen display, key operation.
- With forward and reverse rotating, start and stop, speed regulation and full speed functions.
- Run time, interval time, cycle time can be set.
- High-precision speed control.
- External analog quantity to adjust the speed, analog quantity 0-5V/0-10V /4-20mA.
- External control signal controls start and stop, forward and reverse rotating, external control signal 5-24V wide range input, photoelectric isolation.
- RS485 communication, support MODBUS communication protocol, a variety of communication parameters can be set.
- The circuit board is sprayed with conformal coating to achieve the effect of dustproof and moistureproof.
- Super anti-interference characteristics, wide voltage design, suitable for complex power supply environment.
- ABS plastic shell, beautiful and generous.

Components and Interfaces

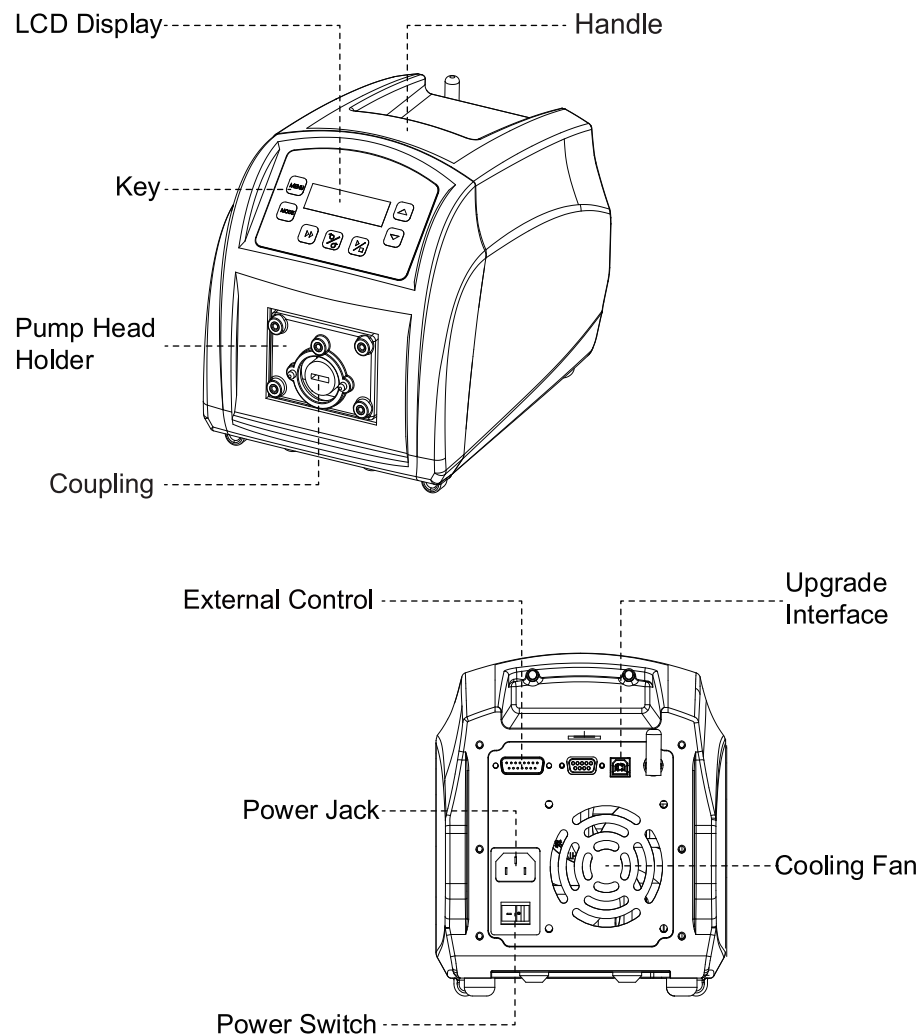


Figure 1 Components and Interfaces

Display Panel and Operating Keypad

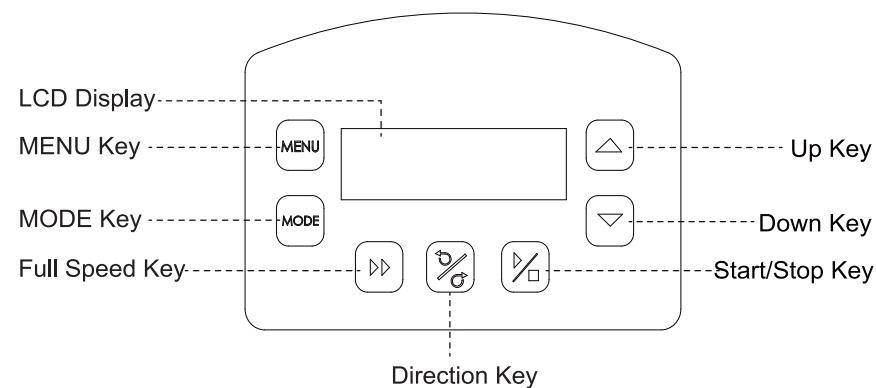


Figure 2 Display Panel and Operation Keypad

◆ Keypad

-  : **Up Key:** Value increase key. Press the key once, the lowest digit of the value will increase by 1, long press the key, the value will increase rapidly.
-  : **Down Key:** Value decrease key. Press the key once, the lowest digit of the value will be reduced by 1, long press this key, the value will decrease rapidly.
-  : **MENU Key:** In the main interface, press this key to enter the menu interface. In the menu interface, press this key to return to the main interface, it is invalid during operation.
-  : **MODE Key:** In the main interface, short press this key to switch the control mode between internal control, external control, dispensing, level 1, and level 2.
-  : **Full Speed Key:** Press this key to switch between the highest speed and the original state.
-  : **Direction Key:** Control the direction of pump operation, switch between forward (clockwise) and reverse (counterclockwise).
-  : **Start /Stop Key:** Control the start and stop of the pump, press this key in the menu mode to enter the submenu.

◆Show Icon Description

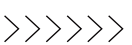
Icon	Function	Icon	Function
	Start		Stop
	Pause		Full speed
	Clockwise rotation		Counterclockwise rotation
	Tone on		Tone off
	Locked		Unlocked
	Show pump number in communication		Communication is disconnected

Table 1 Description of Display Icons

◆LCD Display

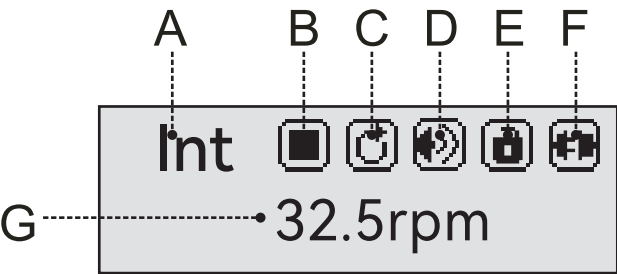


Figure 3 LCD Display

A. **Control State:** Display the current control mode, press  to switch, which are internal control, external control, dispensing, level 1, and level 2 in turn.

- Internal control: Through the key control on the panel, and the external pulse signal controls the start and stop.
- External control: The speed is controlled by an external analog quantity, and the start/stop and rotating direction are controlled by an external level signal.
- Dispensing: Set the running time, interval time, and cycle times to realize the regular transmission of liquid.
- Level 1 (original foot switch mode): The start and stop are controlled by an external level signal, and the speed and rotating direction are controlled by the panel.
- Level 2 (original level mode): The start/stop and rotating direction are controlled by an external level signal, and the speed adjustment is controlled by the panel.

B. **Running State:** Display the current running state.

 Stopped state  Running state  Paused state

C. **Direction of Rotation:** Shows the direction in which the pump rotates.

 Clockwise  Counterclockwise.

D. **Tone:** The state of the key prompt tone is displayed here.

 Tone on  Tone off

E. **Lock State:** Display whether the current state is locked. In the locked state, only the start and stop keys on the panel work, and other keys are invalid. In the main interface, press and hold the direction key to enter the locked state, long press the start and stop key to unlock.

 Unlocked state  Locked state

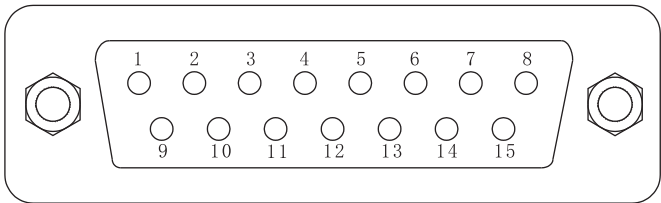
F. **Communication State:** Displays whether the communication is currently in progress.

 Communication is disconnected

 #1 pump number displayed in communication #1

G. **Speed Display:** Display the current rotational speed, the unit is RPM. When >>>>>> is displayed, it is at full speed.

External Control Interface Description



DB15 Number	English Notes	Description
1	ADC_W	The positive input of external analog signal
2	B	Communication interface, B pole of RS485
3	A	Communication interface, A pole of RS485
4	+12V_W	External DC power input
5	-	-
6	CW_W	External input signal to control direction
7	PWM	Pulse signal output
8	COM	external commons.
9	AGND	Negative input of external analog signal
10	+12V	Internal +12V power supply output
11	GND	Internal power ground
12	CW	Internal direction signal output
13	RS_W	External input signal to control start/stop
14	-	-
15	-	-

Table 2 Definition of External Control Pins

Note: Follow the legend pins to provide the correct signal. Do not exceed the specified range of the signal value. Please pay attention to the specified voltage range when connecting to an external power supply, otherwise it may cause permanent damage and will not be covered by the warranty.

Note: Low voltage signals must be isolated from mains power. Use a separate shielded ground input wire.

Note: Use a qualified protective wire sleeve at the end of the multi-strand cable, otherwise there will be a risk of damage to the equipment.

Installation Instruction

◆Before Operation

- Please compare the packing list to check whether all accessories are wrong or damaged when you open the outer package of the pump. Please contact Enterprise or agent in time, if you find any problems.
- Read the operation manual carefully, and keep it at hand, or keep it in a fixed place for reference at any time.
- Place the pump on a level table with the rear at least 20 cm away from obstacles.

◆Install Pump Head and Tube

Install YZ15, YZ25 pump head

- Align the flat shaft of the pump head with the groove of the driver coupling and push in. Then turn the pump head so that the screw holes of the pump head are aligned with the screw holes of the pump head bracket of the driver and push in. After fitting the pump head and its bracket, put two fixing screws into the fixing holes of the pump head and tighten them.
- Pull the pump head lever to open the pump head, put the tube into the pump head smoothly and straighten it, pull the lever in the opposite direction to the horizontal position, and the tube is installed.

Install DG multichannel pump head

- Align the flat shaft of the pump head with the groove of the driver coupling and push it in, turn the pump head so that the positioning hole at the rear of the pump head is aligned with the positioning pin of the pump head bracket of the driver and push in, fit the pump head to the pump head bracket, and then insert the two hexagon socket screws into the fixing holes on the inside of the pump head and tighten them.
- Put the tube into the card smoothly and straighten it, push the tube clamps at both ends of the tube into the fixing groove, firstly clamp the left end of the card into the cylindrical guide rail of the pump head, and then clamp the other end of the card into the square guide rail.

◆Power Connection

Plug the supplied power cord into the power socket on the rear of the drive.



Note: Make sure all power supply wires are rated for equipment wattage.



Note: The pump must be located so that it can be easily disconnected from the power source when the equipment is in use.



Note: Please use the same power supply as that on the nameplate of the machine, otherwise the equipment will be damaged!

Operation Instructions**◆First Run Wizard**

The pump has preset default operating parameters, as shown in the table below:

Parameter	Default Setting
Run Time Unit	Second
Disp Time	1.0 seconds
Interval Time Unit	Second
Interval Time	1.0 seconds
Cycles	1
Reverse Angle	0°
Max Speed	150/ 350/ 600rpm
Pump No.	#1
Beep Setting:	Enable
Language	Chinese
Contrast	8
Hose Warn	Disable
Baud Rate	9600
Stop Bit	1
Parity Check Method	Even Parity
Pulse Trigger	Falling Edge
Level Trigger	High Level
Ext Control	Voltage 0-5V
ADD Time	0.6S
DEC Time	0.6S
Step Protection	Disable

Table 3 Device Default Parameter List

◆Setting Menu

In the main interface, press  the key to enter the menu setting interface.

In the setting interface, press the key

  to select parameters, press the key  to enter the submenu,

and press the key   to adjust

the parameters in the submenu. If you

want to return to the main interface,

you can press and hold  to return

or press  continuously until you

return to the main interface.

Refer to figure 4 for specific operations:

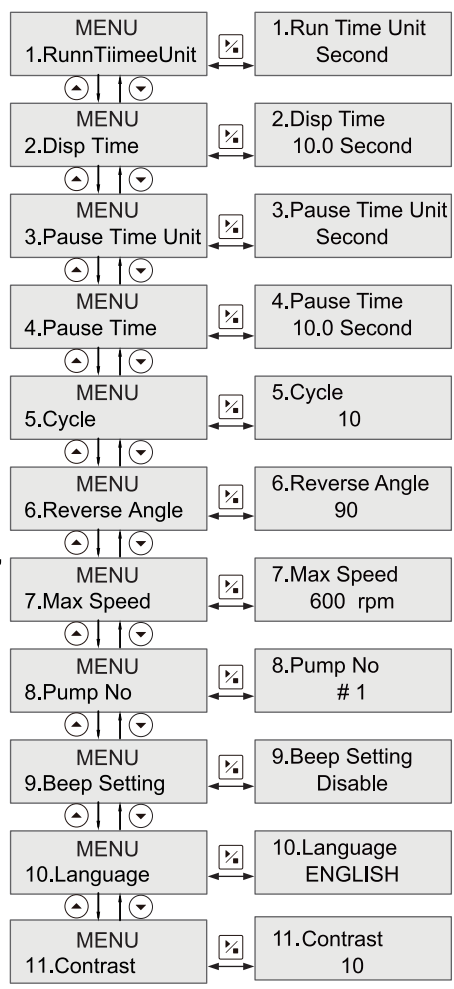


Figure 4 Menu Setting Flow Chart

1. Run Time Unit: In the dispensing mode, set the running time unit, which can be set in days, hours, minutes, and seconds.
2. Disp Time: In dispensing mode, set the running time, the setting range is 0.1-999 seconds\minutes\hours\days.
3. Interval Time Unit: In the dispensing mode, set the interval time unit, which can be set in days, hours, minutes, and seconds.
4. Interval Time: In the dispensing mode, when the number of cycles is not 1, set the pause time between each operation, the setting range is 0.1-999 seconds\minutes\hours\days.
5. Cycles: In the dispensing mode, set the number of repeated operations, and the setting range is 0-999 times. Setting range 0 - 999 times. When the setting value is 0, the cycle will be infinite until press  to stop. When the setting value is other, the cycle will be stopped automatically after completing the set number of cycles.
6. Reverse Angle: When the peristaltic pump stops, in order to prevent the liquid in the tube line from dripping, the motor of the peristaltic pump rotates in the opposite direction for an angle to suck back the liquid in the tube line. range 0-750 degree, adjust the anti-drip angle. When the angle is set to 0, this function is off.
7. Max Speed: In the external control mode, set the upper limit of the analog controllable speed.
8. Pump No.: In the communication mode, set the communication address of the pump.



Note: The drive needs to be restarted to take effect.

- 9. Beep Setting: Set whether to turn on or off the key prompt sound.
- 10. Language: switch the system language to Chinese or English.
- 11. Contrast: Set the contrast of the LCD screen.

◆System Parameter Setting

In the main interface, press  +  to enter the parameter setting interface of the system.

In this interface, press  +  to select advanced parameters, press  to enter the submenu, and press   to adjust the parameters in the submenu. If you want to return to the previous menu, press  . If you want to return to the main interface, press  . Refer to Figure 5 for specific operations:

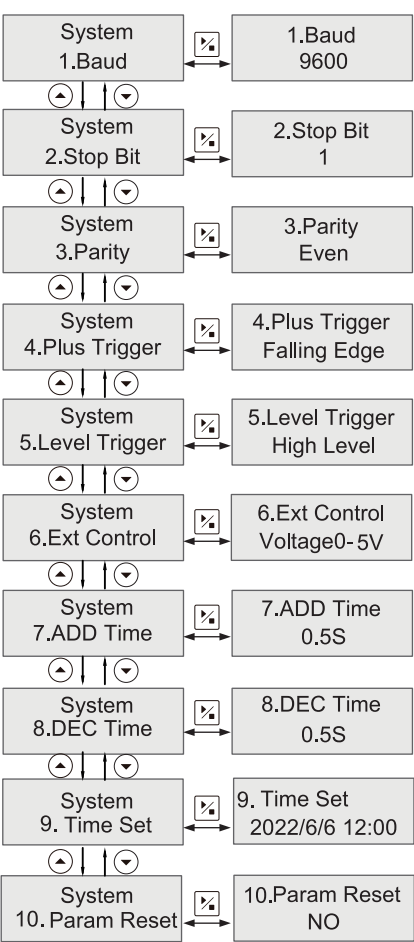


Figure 5 Flow Chart of System Parameter Setting

1. Baud Rate: In the communication mode, set the size of the baud rate, which can be set to 4800, 9600, 19200 and 38400 (the default is 9600).
2. Stop Bit: In the communication mode, set the size of the stop bit, Which can be set to 1 or 2 (the default is 1).
3. Parity: In the communication mode, set the type of parity check method, which can be set to odd parity, even parity and no parity (the default is even parity).
4. Pulse Trigger Mode: In internal control or dispensing mode, set the trigger type in which the driver is controlled by an external pulse signal to start and stop. It can be set to rising edge trigger or falling edge trigger (the default is falling edge trigger).
5. Level Trigger Mode: In the external control or level mode, set the level trigger type when the drive is controlled externally, which can be set as high level trigger or low level trigger (the default is high level trigger).
6. Ext Control Mode: In the external control mode, set the parameter type of the drive speed controlled by the analog quantity, which can be set to voltage mode 0-5V, voltage mode 0-10V, current mode 4mA-20mA (with the change of the external control analog quantity, the drive speed will change linearly).
7. ADD Time: Set the acceleration time when the driver starts running, the unit is second (the default value is 0.6 seconds).
8. DEC Time: Set the deceleration time when the driver stops running, the unit is second (the default value is 0.6 seconds).
9. Time Set: Customers can customize the date and time when using, press  to change the set parameters, press   to adjust the time, press  to save and exit.
10. Param Reset: Restore all parameters to default value, after pressing  to switch to "Yes", press  to return to the main interface, the parameters will be restored to default value.

◆ Mode Switch

- Turn on the power switch, the LCD screen will display a welcome message and enter the main interface.
- Press  once to switch the mode once. For specific information display logic, refer to Figure 6:

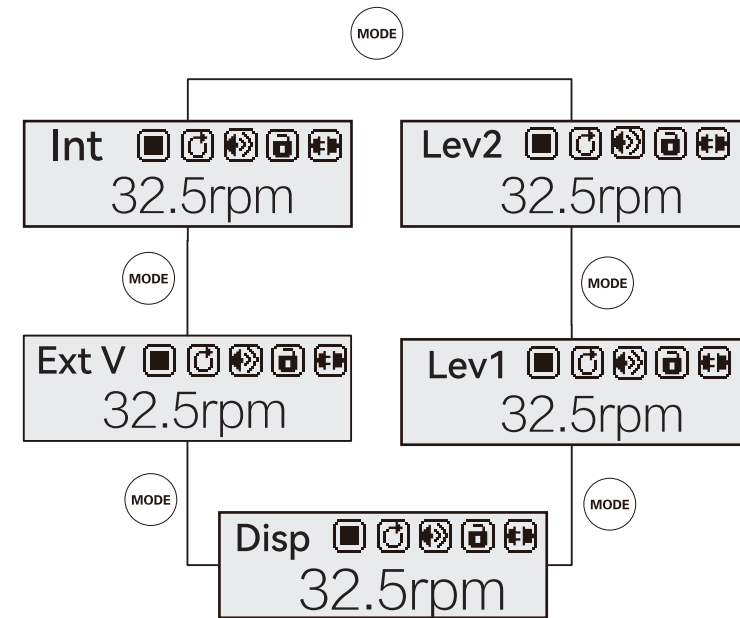


Figure 6 Mode Switching

◆Internal Control Mode

The operation of the pump is controlled by the keys on the front panel of the pump.

- Turn on the power switch, the LCD screen will display a welcome message and enter the main interface.
- Press  to switch the mode to internal control mode.
- Press   to adjust to the speed to be set.
- Press  to adjust the direction of rotation.
- Press  to start or stop the pump.
- Press  and the pump will run at maximum speed.

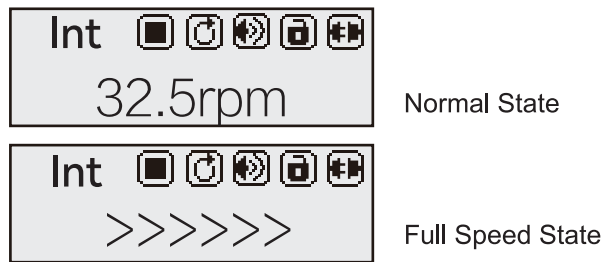


Figure 7 Internal Control Mode

◆External Control Mode

The speed is controlled by the external input analog quantity, and the start/stop and rotating direction are controlled by the external level.

The keys on the control panel do not work.

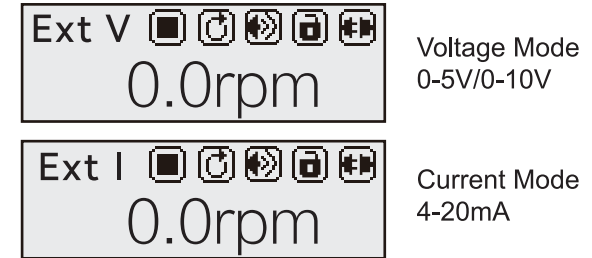


Figure 8 External Control Mode

- When the power is cut off, connect the circuit according to the wiring diagram below, and connect the DB15 interface to the back interface of the pump.

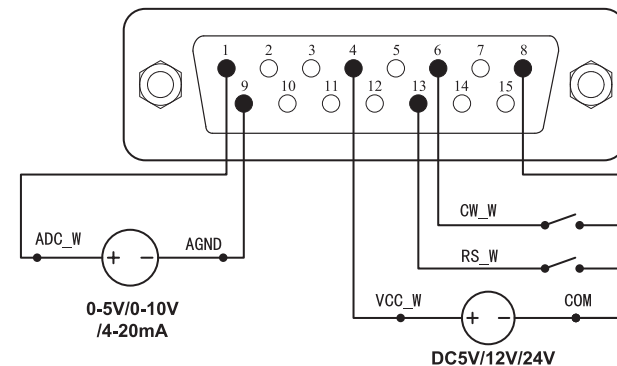


Figure 9 Wiring Diagram for Connecting External Power Supply in External Control Mode

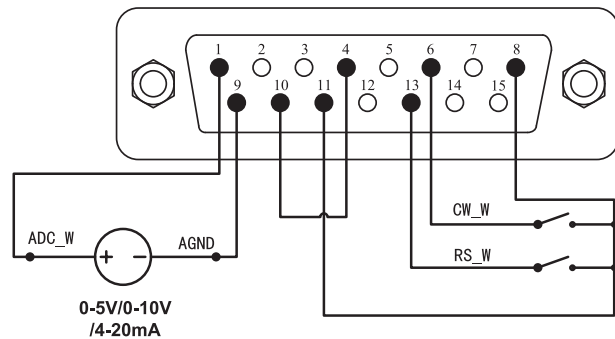


Figure 10 Wiring Diagram for Connecting Internal Power Supply in External Control Mode



Note: Follow the legend pins to provide the correct signal. Do not exceed the specified range of the signal value. Please pay attention to the specified voltage range when connecting to an external power supply, otherwise it may cause permanent damage and will not be covered by the warranty.



Note: Low voltage signals must be isolated from mains power. Use a separate shielded ground input wire.



Note: Use a qualified protective wire sleeve at the end of the multi-strand cable, otherwise there will be a risk of damage to the equipment.

- Turn on the power switch, the LCD screen will display a welcome message and enter the main interface.
- Press **MODE** to switch the mode to external control mode.
- Connecting the switch of the external RS_W, turn on the analog power supply, the pump will change the speed with the change of the analog value, disconnect the switch of the external RS_W, the pump will stop running.
- Disconnecting the switch for external CW_W turns the pump in clockwise direction. Closing the switch for external CW_W turns the pump counterclockwise.

◆Dispensing Mode

Liquid volume dispensing is performed by dispensing operation.

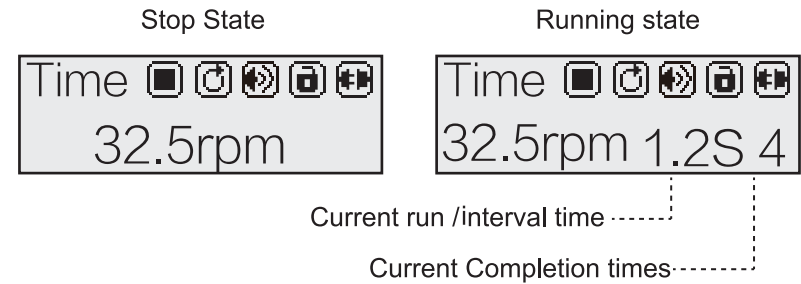


Figure 11 Dispensing Mode

Setting Parameters

- Turn on the power switch, the LCD screen will display a welcome message and enter the main interface.
- Press **MODE** to switch the mode to dispensing mode, as shown in the figure below.
- Press **MENU** to enter the parameter setting interface.
- Set the dispensing unit, running time, interval time and cycle times respectively.
- Back to Home page.

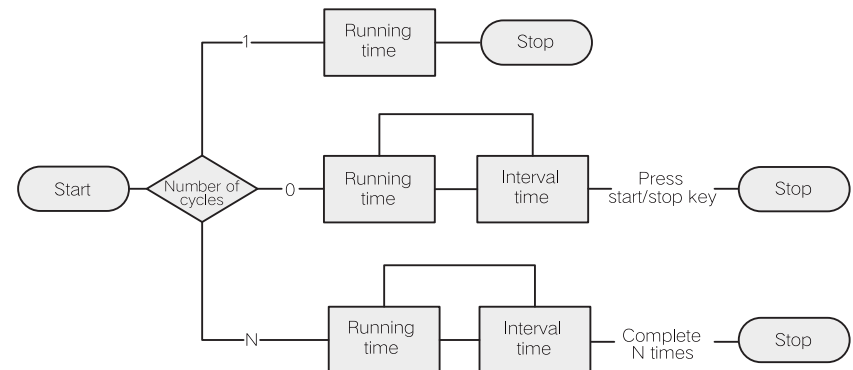


Figure 12 Timing operation flow chart

Dispensing Operation

- Press  to adjust the direction of rotation.
- Press  to run the setting process.
- During the operation, press  to stop the operation.
- In dispensing mode, a foot switch can also be used to start a run.
- During the running, the run time, interval time and number of runs are displayed.

◆Level 1 Mode (Original Foot Switch Mode)

The start and stop of the pump is controlled by the external high and low levels.

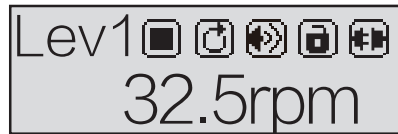


Figure 13 Level 1 Mode

When the power is cut off, connect the circuit according to figure 14 or figure 15, and connect the DB15 interface to the back interface of the pump.

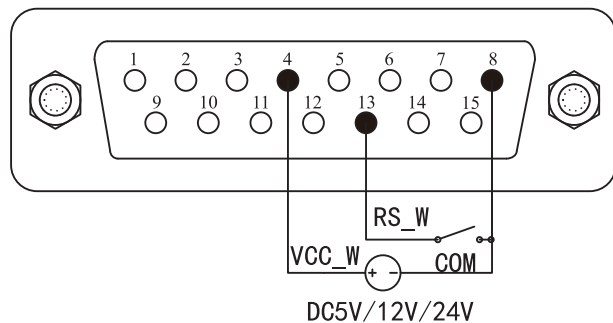


Figure 14 Wiring Diagram of External Power Supply of Level 1

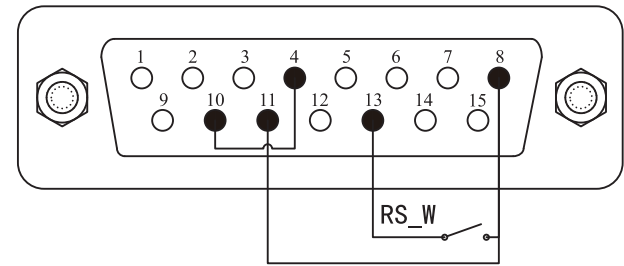


Figure 15 Wiring Diagram of Internal Power Supply of Level 1



Note: Follow the legend pins to provide the correct signal. Do not exceed the specified range of the signal value. Please pay attention to the specified voltage range when connecting to an external power supply, otherwise it may cause permanent damage and will not be covered by the warranty.



Note: Low voltage signals must be isolated from mains power. Use a separate shielded ground input wire.



Note: Use a qualified protective wire sleeve at the end of the multi-strand cable, otherwise there will be a risk of damage to the equipment.

- Turn on the power switch, the LCD screen will display a welcome message and enter the main interface.
- Press  to switch to level 1 mode
- Press  to adjust the direction of rotation.
- Press   to adjust to the speed to be set.
- Connect the switch of the foot switch, the pump will run. Disconnect it, the pump will stop.



Note: Use this mode when the dispensing is controlled by an accessory called dispensing controller.

◆Level 2 Mode (Original Level Mode)

The external high and low levels control the start/stop and rotating direction of the pump.



Figure 16 Level 2 Mode

- When the power is cut off, connect the circuit according to figure 17 or figure 18, and connect the DB15 interface to the back interface of the pump.

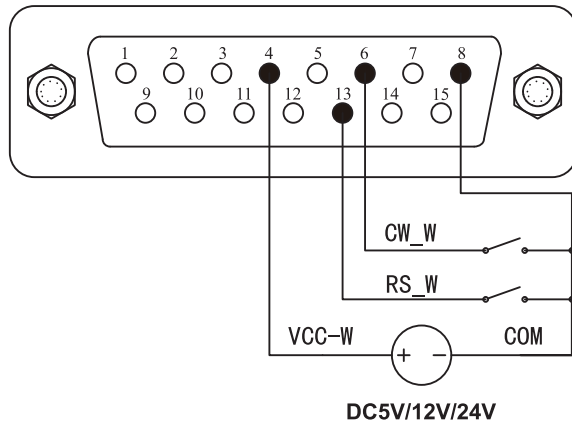


Figure 17 Wiring diagram of external power supply of level 2

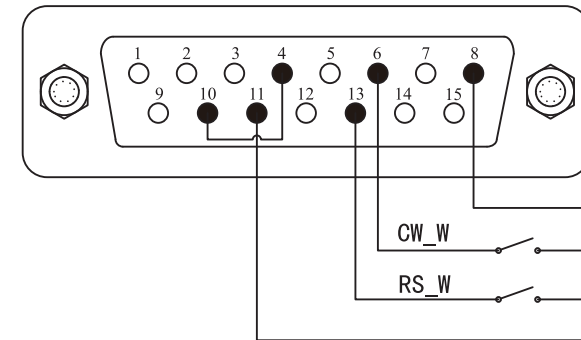


Figure 18 Wiring diagram of internal power supply of level 2



Note: Follow the legend pins to provide the correct signal. Do not exceed the specified range of the signal value. Please pay attention to the specified voltage range when connecting to an external power supply, otherwise it may cause permanent damage and will not be covered by the warranty.



Note: Low voltage signals must be isolated from mains power. Use a separate shielded ground input wire.

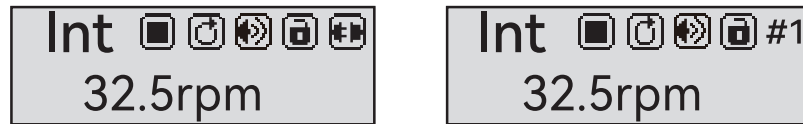


Note: Use a qualified protective wire sleeve at the end of the multi-strand cable, otherwise there will be a risk of damage to the equipment.

- Turn on the power switch, the LCD screen will display a welcome message and enter the main interface.
- Press **MODE** to switch to level 2 mode.
- Press **▲** **▼** to adjust to the speed to be set.
- Connect the switch of external RS_W, the pump will run according to the set speed. Disconnect the switch of external RS_W, the pump will stop running.
- Disconnect the CW_W switch and the pump runs in clockwise direction. Connect the CW_W switch and the pump runs in counterclockwise direction.

◆ Communication Mode

RS485 communication supports MODBUS protocol, which can control various functions of the pump. For specific parameter addresses and support instructions, refer to the communication technical standard of Enterprise.



Communication not connected

Communication is normal

Figure 19 Communication mode

- With the power supply disconnected, refer to Figure 20 or Figure 21 for wiring. Then connect the DB15 interface to the back interface of the pump.

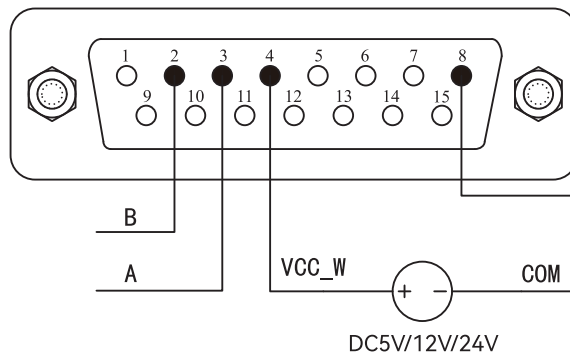


Figure 20 Communication External Power Supply Wiring Diagram

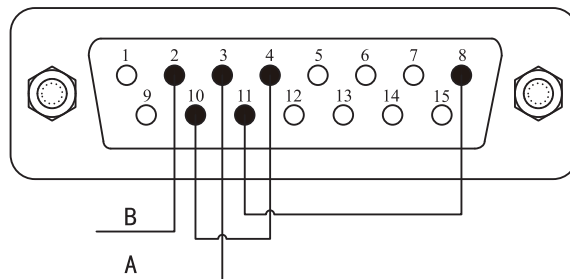


Figure 21 Communication Internal Power Supply Wiring Diagram

	Note: Follow the legend pins to provide the correct signal. Do not exceed the specified range of the signal value. Please pay attention to the specified voltage range when connecting to an external power supply, otherwise it may cause permanent damage and will not be covered by the warranty.
	Note: Low voltage signals must be isolated from mains power. Use a separate shielded ground input wire.
	Note: Use a qualified protective wire sleeve at the end of the multi-strand cable, otherwise there will be a risk of damage to the equipment.

- Turn on the power switch, the LCD screen will display welcome information and display the main interface.
- Press to switch the mode to internal control mode or dispensing mode.
- Control the functions of the pump through communication.
- Press to stop the pump.

◆ Speed Setting

In the main interface, the resolution of the speed is 0.1 in the range of 0.1-100, and the resolution is 1 in the range of 100-600, which can be set by pressing . Press and hold can increase or decrease continuously and rapidly. Press and hold , and then press to directly set the speed to the highest. Press and hold and then press to directly set the speed to the lowest.

Malfunction and Maintenance

◆ Drive Spare Parts

Spare Parts	Model	Spare Part Number
Blown fuses	1A	3020200100004
Power cable	250V 10A	3022300200016

Table 4 Drive Spare Parts

◆ Daily Maintenance

- Regularly check the tube for breakage or loss of elasticity.
- There is a cooling fan behind the peristaltic pump, please do not cover it to avoid affecting heat dissipation.
- Peristaltic pumps can not be flushed with water, if the pump tube rupture during operation, the liquid in the pump head should be dried or dried in time.
- Do not use chemical solvents to clean the peristaltic pump and pump head surface.



Note: Always disconnect the pump from the mains power before opening the pump head cover to change tubes, or performing any assembly, disassembly or maintenance activities.

◆ Maintenance Worksheet

Regular maintenance of the pump according to the maintenance schedule will help reduce damage to pump components and ensure personal and property safety.

Maintenance Tasks	Frequency	Actions After Exception
Check if the pump leaks and damage.	1. Check before starting each time. 2. Daily visual inspection. 3. Periodic inspection during pump operation.	1. Before operating the pump, repair leaks and damage. 2. Replace parts when necessary. 3. Clean up all spilled liquid.
Check for abnormal temperature or noise during pump operation.	1. Daily visual inspection. 2. Periodic inspection during pump operation.	1. Check and replace worn parts.
Do you need to replace the tube	1. Check the condition of tube at most every three days	Please replace the tube in the following situations: 1. When the flow rate is lower than 75% of the original value. 2. When the tube has burst and is badly worn. 3. When the user-defined replacement cycle is reached.
Check pump head and rotor assembly.	1. Regularly check the wheel flexibility every week. 2. Check when replacing tube. 3. Once a year complete inspection for wear and tear, check bearing clearance and function.	1. Worn and damaged surfaces can lead to premature tube failure, replace worn parts promptly

Table 5 Maintenance Work List

◆ Malfunction Solutions

NO.	Malfunction Type	Malfunction Description	Solutions
1	Hardware	No display	1. Check whether the power cord is connected properly. 2. Check whether the fuse is blown. If it is blown, please contact the manufacturer for replacement.
2	Hardware	The motor does not rotate	1. Check whether the flow or speed is set too small, such as 0.1rpm.
3	Hardware	Drive is trembling	1. Check that the pump head screws and plate rod are tightened.
4	Hardware	The motor rotates in only one direction	1. Check that the direction keys are working properly. 2. Check whether the external control direction signal is normal.
5	Hardware	Key does not work	1. Whether it is locked.
6	Hardware	Noisy when the pump is running	1. Around 70 rpm and 120 rpm, it belongs to the resonance frequency of the motor, and it is normal for the sound to be loud. 2. Check that the pump head screws and plate rod are tightened.
7	Hardware/ Software	Communication does not work	First check the software: 1. Whether the mode is communication mode. 2. Reset the machine address. 3. Check if there are two machines on the bus using the same address. If the problem is not resolved, continue to check the hardware: 4. Check if the connection is correct 5. Check whether the external control power supply supplies power.
8	Hardware/ Software	External control does not work	First check the software: 1. Whether the mode is external control mode. If the problem is not resolved, continue to check the hardware: 2. Check if the connection is correct. 3. Check whether the external control power supply supplies power.

Table 6 Malfunction Solutions Reference Table



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



Note: There are no parts in the pump that can be repaired by the user. If the user repairs by himself, the warranty of the pump will be invalid. If there is a fault that cannot be solved after checking the software and connecting the external hardware, please contact the Enterprise, and do not repair by yourself.

Dimensions

Unit: mm

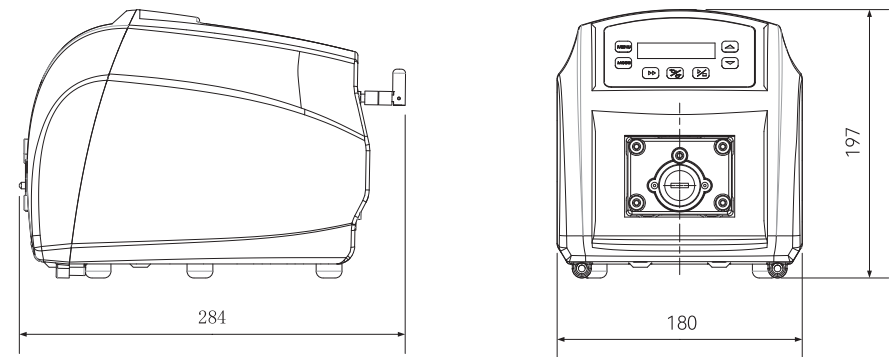


Figure 25 Dimensions

Ordering Information

Product Model	Description	Order Number
BT101S		
BT301S		
BT601S		

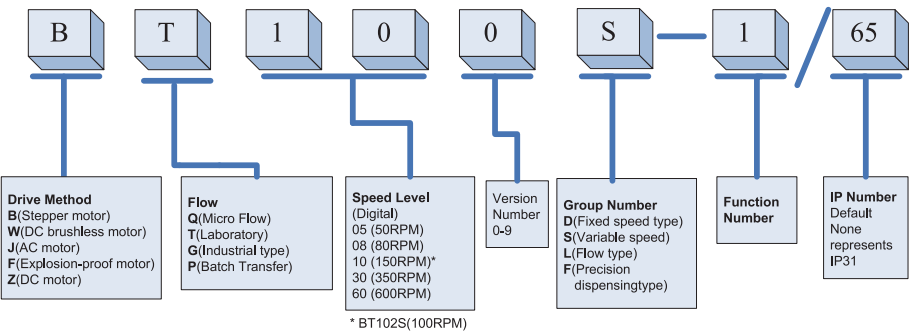
Table 7 Ordering Information

Optional Accessories Table

Accessories list	Description	Order Number
Foot switch		1060200100017

Table 8 Table of Optional Accessories

Naming Rules



Technical Parameters

BT101S Technical Parameters

Functions

Suitable Pump Heads	YZ15, YZ25, DG6, DG10, DT10, YT15, YT25
Key Functions	Control speed, rotation direction, start and stop, full speed, working mode, state memory (power-off memory), dispensing operation and other parameters.
External Control Functions	Foot switch control, external control start/stop, external control forward and reverse rotating, 5-24V wide range input, photoelectric isolation, analog 0~5V/0~10V/4~20mA software setting switching.
Communication Functions	RS485, support Modbus communication protocol
Display Functions	Displays the current running speed, running direction, working mode and each parameter setting information.
Direction Control	Free adjustment of forward and reverse rotation direction.

Performance

Flow Range	0.00011-750mL/min
Speed Range	0.1-150 rpm
Speed Resolution	0.1 rpm, accuracy error less than ±0.2%
Dispensing Range	0.1 ~ 999 seconds/minutes/hours/day
Adjustment Method	Mask key operation
Display Method	132*32 LCD
Applicable Power Supply	AC 100-240V 50Hz/ 60Hz
Wattage	<30W
Working Environment	Temperature 0- 40°C, Relative humidity<80%
Dimensions	284×180×197 mm
Driver Weight	4.5kg
Degree of Protection	IP31
Degree of Pollution	2

BT301S Technical Parameters

Functions

Suitable Pump Heads	YZ15, YZ25, YT15, YT25
Key Functions	Control speed, rotation direction, start and stop, full speed, working mode, state memory (power-off memory), dispensing operation and other parameters.
External Control Functions	Foot switch control, external control start/stop, external control forward and reverse rotating, 5-24V wide range input, photoelectric isolation, analog 0~5V/0~10V/4~20mA software setting switching.
Communication Functions	RS485, support Modbus communication protocol
Display Functions	Displays the current running speed, running direction, working mode and each parameter setting information.
Direction Control	Free adjustment of forward and reverse rotation direction.

Performance

Flow Range	0.005-1750 mL/min
Speed Range	0.1-350 rpm
Speed Resolution	0.1 rpm, accuracy error less than $\pm 0.2\%$
Dispensing Range	0.1 ~ 999 seconds/minutes/hours/day
Adjustment Method	Mask key operation
Display Method	132*32 LCD
Applicable Power Supply	AC 100-240V 50Hz/ 60Hz
Wattage	<40W
Working Environment	Temperature 0~ 40°C, Relative humidity<80%
Dimensions	284×180×197 mm
Driver Weight	4.7kg
Degree of Protection	IP31
Degree of Pollution	2

BT601S Technical Parameters

Functions

Suitable Pump Heads	YZ15, YZ25, YT15, YT25
Key Functions	Control speed, rotation direction, start and stop, full speed, working mode, state memory (power-off memory), dispensing operation and other parameters.
External Control Functions	Foot switch control, external control start/stop, external control forward and reverse rotating, 5-24V wide range input, photoelectric isolation, analog 0~5V/0~10V/4~20mA software setting switching.
Communication Functions	RS485, support Modbus communication protocol
Display Functions	Displays the current running speed, running direction, working mode and each parameter setting information.
Direction Control	Free adjustment of forward and reverse rotation direction.

Performance

Flow Range	0.005-3000mL/min
Speed Range	0.1-600 rpm
Speed Resolution	0.1 rpm, accuracy error less 0.5%
Dispensing Range	0.1 ~ 999 seconds/minutes/hours/day
Adjustment Method	Mask key operation
Display Method	132*32 LCD
Applicable Power Supply	AC 100-240V 50Hz/ 60Hz
Wattage	<50W
Working Environment	Temperature 0~ 40°C, Relative humidity<80%
Dimensions	284×180×197 mm
Driver Weight	4.9kg
Degree of Protection	IP31
Degree of Pollution	2

◆Flow Rate Chart of the Pump

Driver Model	Suitable Pump Head	Channel Number	Suitable Tube (mm)	Single-Channel Flow Rate(mL/min)
BT101S	DG6-1(6 rollers)	1	Wall thickness 0.8 ~ 1, inner diameter ≤2.79	0.00016 ~ 49
	DG10-1(10rollers)	1		0.00011 ~ 32
	DG6-2(6 rollers)	2		0.00016 ~ 49
	DG10-2(10rollers)	2		0.00011 ~ 32
	DG6-4(6 rollers)	4		0.00016 ~ 49
	DG10-4(10rollers)	4		0.00011 ~ 32
	DT10-18	1	13#14#, Wall thickness 0.8 ~ 1, inner diameter ≤3.17	0.00023 ~ 64
	DT10-28	2		0.00023 ~ 64
	YZ15	1	13#14#16#19#25#17#	0.005 ~ 450
	YZ25	1	15#24#	0.17 ~ 450
BT301S	YT15	1	13#14#16#19#25#17#18#	0.006 ~ 675
	YT25	1	15#24#35#36#	0.18 ~ 750
	YZ15	1	13#14#16#19#25#17#	0.005 ~ 1050
	YZ25	1	15#24#	0.17 ~ 1050
BT601S	YT15	1	13#14#16#19#25#17#18#	0.006 ~ 1575
	YT25	1	15#24#35#36#	0.18 ~ 1750
	YZ15	1	13#14#16#19#25#17#	0.005 ~ 1800
	YZ25	1	15#24#	0.17 ~ 1800
	YT15	1	13#14#16#19#25#17#18#	0.006 ~ 2700
	YT25	1	15#24#35#36#	0.18 ~ 3000



Note: The above applicable pump head, the number of suitable channels and the flow rate of a single channel are all obtained from the test of purified water with a Enterprise tube under normal temperature and pressure conditions in the laboratory. This data is for reference only, due to pressure in actual use, temperature, medium characteristics, tube material and other specific factors, the specific situation needs to consult our engineers.

◆Suitable Pump Heads for Peristaltic Pump Drives



YZ15/YZ25



YT15/YT25

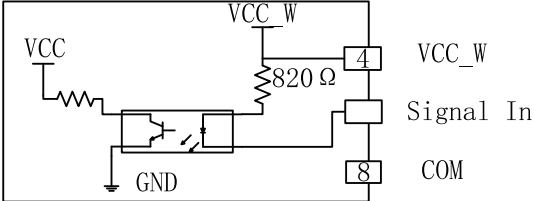
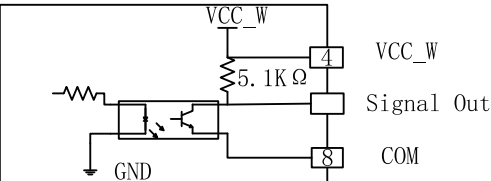


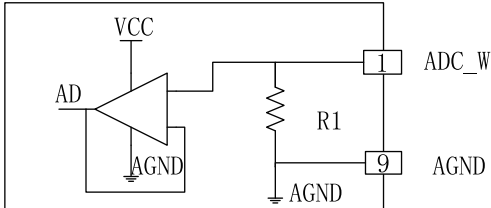
DG6/DG10



DT10

External Control Input and Output Performance

Input Switch Value or OC Gate Specification		
Project	Parameter	
Input Interface Principle		
Single Signal Input ON Current	$5.5\text{mA} < I_{on} < 15\text{mA}$	
Single Signal Input OFF current	$I_{off} < 1.5\text{mA}$	
Signal Input Method	switch (closed, open) or NPN transistor OC gate	
External Control Input Voltage	5V	Input loop requires no series resistors
	12V	
	24V	
Isolation Method	Optoelectronic isolation	
IOutput Specification		
Project	Parameter	
Principle of Output Interface		
Output Method	NPN transistor OC gate with internal pull-up	
Isolation Method	Optoelectronic isolation	

Input Analog Specifications		
Project	Parameter	
Interface Principle		
Input Impedance (<100HZ)	0-5V	R1=4KΩ
	0 -10V	R1=4KΩ
	4-20mA	R1=248Ω
Allowable Error	0-5V、0-10V、 4-20mA	±1%
Resolution	0-5V	5mV
	0-10V	10mV
	4-20mA	16uA
Internal Output Power Specifications		
Project	Parameter	
The Output Voltage	DC12V ± 1V	
Allowable Output Current	< 130mA	
External input Power Specification		
Project	Parameter	
Allowable Input Voltage	DC5-25V	
Allowable Input Current	> 350mA	