

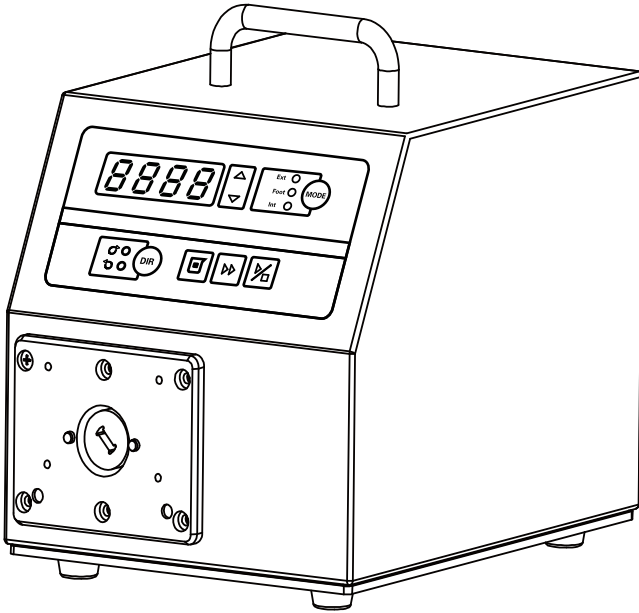


# GOLANDER PUMP

## Operation Manual

For Basic Variable-Speed Peristaltic Pump

WT300S, WT600S



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## Safety Cautions



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

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

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



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

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

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

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

**Warning:** This product is not designed for, nor intended for use in patient connected applications; including, but not limited to, medical and dental use.

## 1 Description

WT-S basic variable-speed peristaltic pump provides not only the basic functions such as reversible direction, start/stop and adjustable speed, but also Time Dispense feature. Brushless drive with large torque can work with multiple pump heads. With MODBUS RS485 interface, pump is easy to communicate with external device, such as PC, HMI or PLC. This pump series includes:

- WT300S, flow rate range: 3-3500 mL/min, speed: 30-350 rpm
- WT600S, flow rate range: 3-6000 mL/min, speed: 30-600 rpm

## 2 Functions and Features

Advantage of peristaltic pump: Peristaltic pump can handle extremely viscous fluids, abrasive slurries and corrosive fluids. There is no seals in contact with the medium pumped and no valves to clog. The inner surfaces are smooth and easy to clean; fluid contacts only the tubing or tube material. Suction lift and priming can be up to 8m water column at sea level. It can handle the most shear sensitive of fluids like latex or firefighting foam with low shearing. It is capable of running dry and pumping fluids with high quantities of entrained air, such as black liquor soap. The high volumetric efficiency allows operation in metering or dosing applications where high accuracy is required. Tubing and tube materials are available for food and pharmaceutical use.

- Four-digit LED displays speed and working mode.
- LED indicator shows working state.
- Membrane keypad.
- Reversible direction, start/stop control and adjustable speed.
- Time Dispense Mode: Set the duration time for each dose. Pump will dispense once by pressing DISPENSE key.
- Brushless drive with large torque to work with multiple pump heads. The drive is no maintenance required.
- 3% precision rotating speed control with 1 rpm speed resolution.
- External logic level signal can control start/stop, direction and dispense function; external analog signal can adjust the rotating speed. Signal is optically isolated.
- With RS485 MODBUS interface, easy to communicate with external device.
- Internal double-deck isolation structure; circuit board with conformal coating makes it dust-proof and moisture-proof.
- Anti-electromagnetic interference feature, wide input voltage range for complex power environment.
- Stainless steel enclosure, easy to clean, resistance to the corrosion of the acid, alkali, sodium and organic solvents.

### 3 Components and Connectors

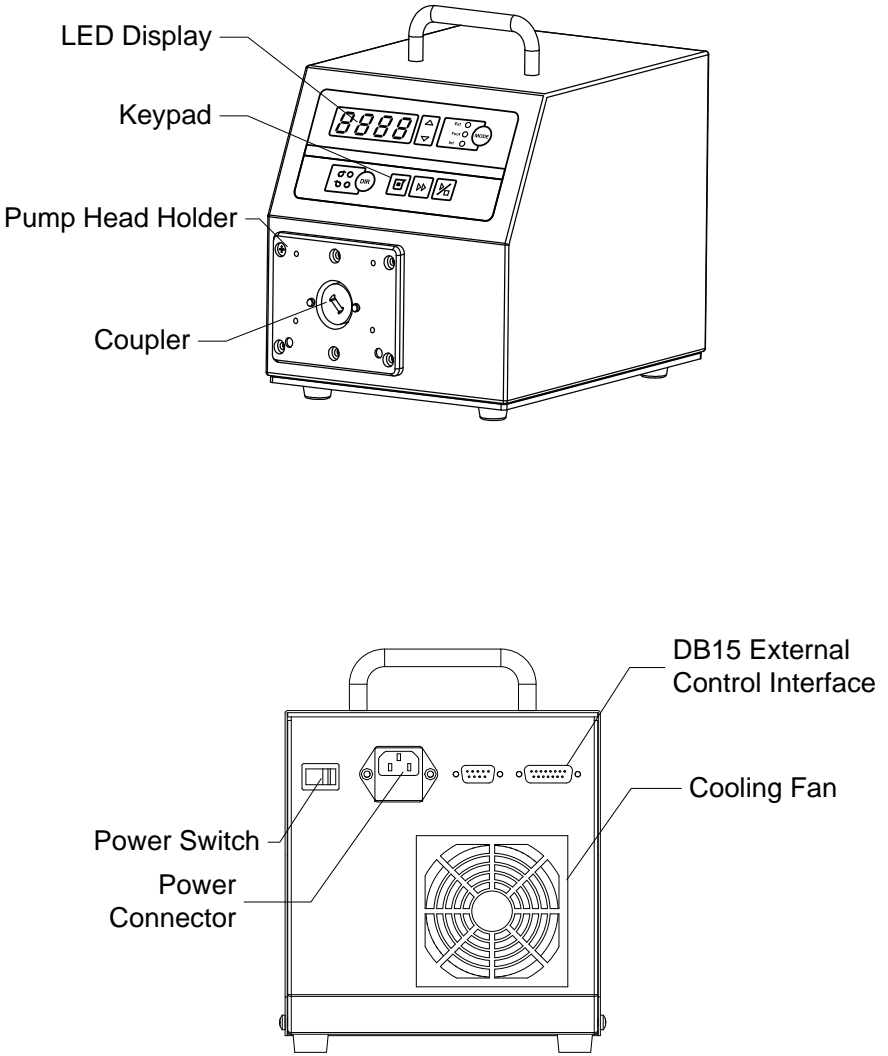


Figure 1. Components and Connectors

## 4 Display Panel and Operating Keypads

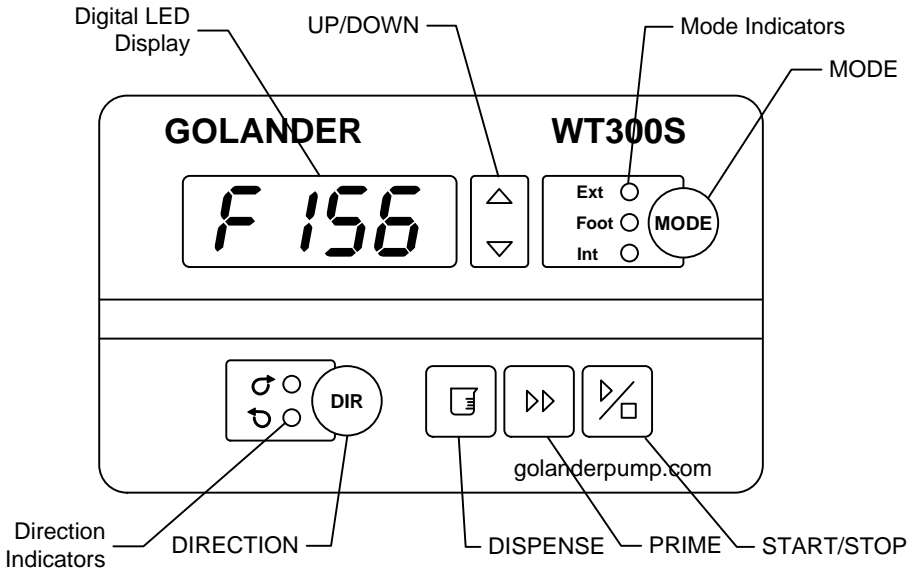
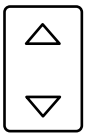


Figure 2. Display panel

### 4.1 Keypad



**UP Key.** When press UP key shortly, the last digit of speed will increase 1. Hold the key to increase speed quickly.

**DOWN Key.** When press DOWN key shortly, the last digit of speed will decrease 1. Hold the key to decrease speed quickly.



Mode.

**MODE key.** When the drive is not running, use the MODE key to change the working mode: Internal Control mode, External Control mode, Time Dispense Mode and Logic Level Control



**DIRECTION Key.** Change the drive rotating direction, clockwise or counterclockwise.



DISPENSE key. When the drive is not running, use the DISPENSE key to start dispensing. Press and hold the key to enter Time Dispense Setup Mode.



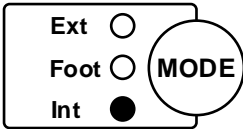
PRIME key. Press the key to run pump at maximum allowed speed in the direction shown on the display. Press again to return to the previous state.



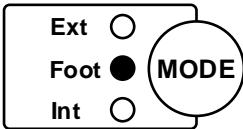
START/STOP key. Press the key to start or stop pump.

## 4.2 Digital LED and Indicators

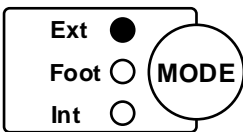
### 4.2.1 Indicators



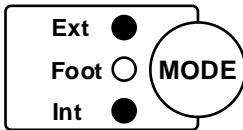
Int: Internal Control Mode. Use the keypad to operate the pump. Footswitch can be used to control start /stop.



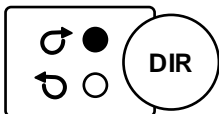
Foot: Time Dispense Mode. Use footswitch or DISPENSE key to start or stop dispensing. Use the keypad for other operations.



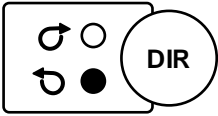
Ext: External Control Mode. Use external analog signal to control rotating speed. Use logic level signal to control direction, start and stop. The keypad is disabled.



Int+Ext: Logic Level Control Mode. Use logic level signal to control start and stop. Use the keypad to control direction and speed.



Clockwise Direction: The motor runs in clockwise direction.



Counterclockwise Direction: The motor runs in counter-clockwise direction.

### 4.2.2 Digital LED Display

The digital LED displays the rotating speed and working mode.



Figure 3. Internal Control Mode, 215 rpm



Figure 4. External Control Mode, 355 rpm

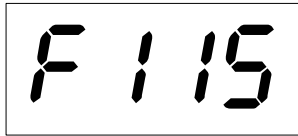


Figure 5. Time Dispense Mode, 115 rpm



Figure 6. When flashing, pump is on Time Dispense Setup Mode

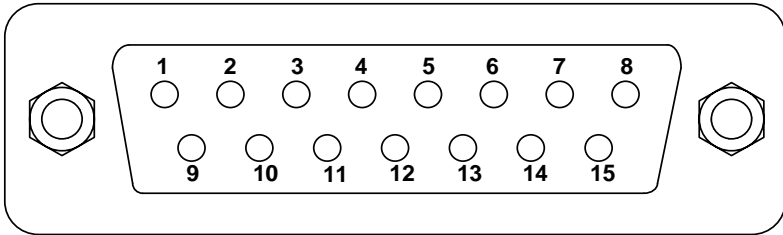
Dispense Duration 8.5 seconds





Figure 7. Drive running at full speed

## 5 External Control Interface



DB15	Mark	Note
1	ADC_W	Positive of external analog input
2	B	Communication interface, B pole of RS485
3	A	Communication interface, A pole of RS485
4	VCC_W	External DC power input
5		
6	CW_W	External input signal to control direction
7		
8	COM	Ground of external power
9	AGND	Negative of analog signal input
10	+12V	Positive of internal +12V power source
11	GND	Ground of Internal power source
12		
13	RS_W	External start/stop signal input terminal
14		
15		

## 6 Operation Instructions

### 6.1 Before Operation

- 1) Please check the packing slip to make sure nothing is wrong or damaged in the package. If there is problem, please contact the manufacturer or distributor.
- 2) Read through the instruction.
- 3) There should be more than 200 mm space for the rear of the pump when it is running.

### 6.2 Power Connection

The voltage of the power supply should be marked on the sticker of the pump. Please make sure to use the right power source for the pump. Please plug the power cord into the IEC Power Connector on the rear of the pump and plug the opposite end of the power cord into an electrical outlet. Flip the power switch located on the rear of the pump.

### 6.3 Mode Change

To change the working mode, turn on the power switch. The display will be on. Press MODE key to change the working mode.

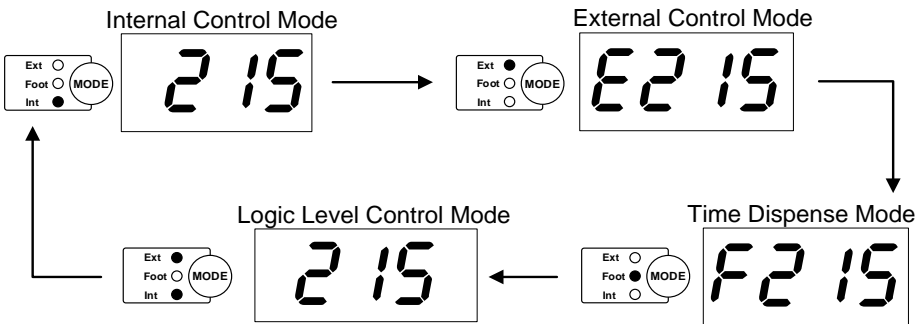
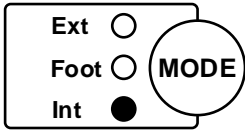


Figure 8. Change Working Mode

## 6.4 Internal Control Mode

On this mode, use the keypad to operate the pump.

- 1) Turn on the power switch. The display will be on.



- 2) Press MODE key to change the mode to Internal Control Mode (Int indicator is on).
- 3) Press UP or DOWN key to set the speed.
- 4) Press DIRECTION key to change the rotating direction.

- 5) Press START/STOP key to start or stop the drive.
- 6) Press PRIME key, the drive will run at full speed.

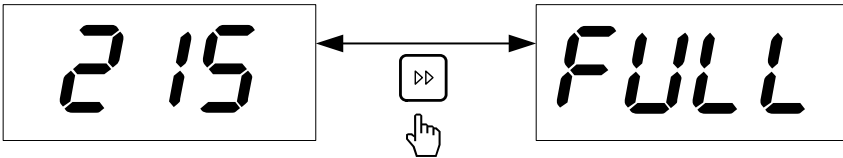


Figure 9. Full Speed

## 6.5 External Control Mode

On this mode, use logic level signal to control direction, start and stop, and use external analog signal to control rotation speed. The keypad is disabled. The analog signal could be 0-5V, 0-10V or 4-20mA. By default, the signal is 0-5V. For 0-10V or 4-20mA, the jump setting on the analog signal control board has to be changed.



0-5V (default)

0-10V

4-20mA

Figure 10. Analog Signal Control Board Setting

To control pump by external signal

- 1) Switch the power off. Wire the DB15 connector as shown on *Figure 11* or *Figure 12*, and connect it to the DB15 port on the rear of the pump.

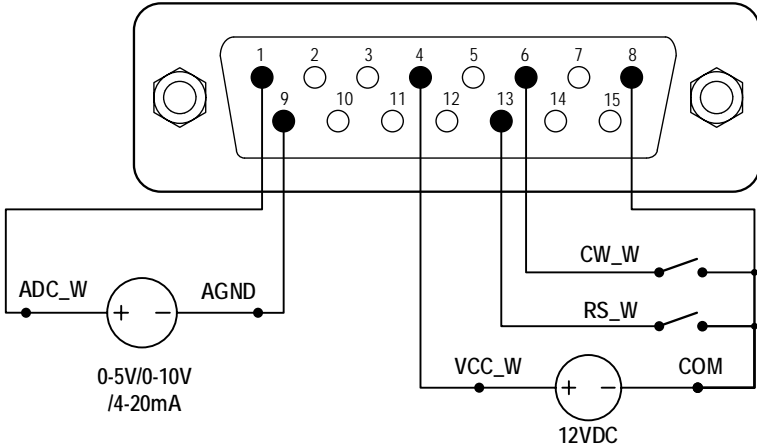


Figure 11. DB15 Wiring with External 12VDC Power Source

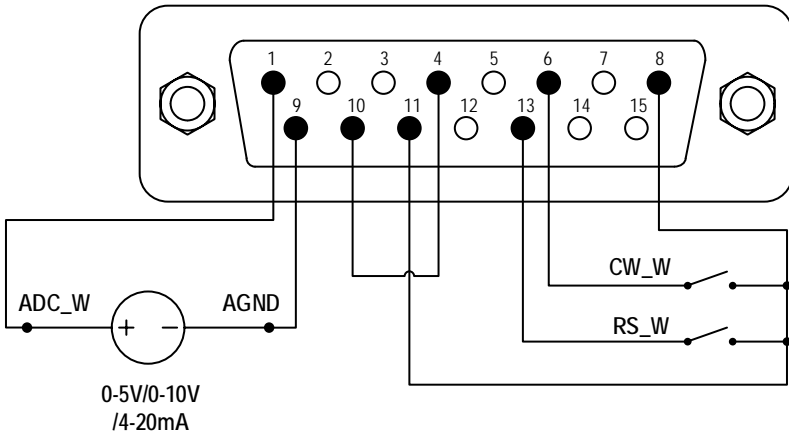
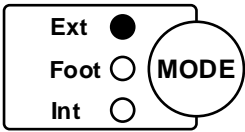


Figure 12. DB15 Wiring with Internal 12VDC Power Source

- 2) Turn on the power switch. The LED display will be on.



- 3) Press MODE key to change the mode to External Control Mode.
- 4) Close the external RS\_W switch, and turn on the external analog signal power source. The speed will change according to the intensity of the input signal. Open the RS\_W to stop the drive.
- 5) Open the CW\_W switch, then the drive will run in clockwise direction; close the CW\_W switch, then the drive will run in counterclockwise direction.

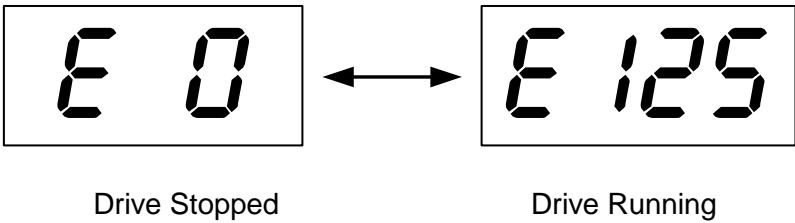


Figure 13. External Control Mode

**Note:** The external DC power source can be 5V, 12V. If it is 24V, 1.5K resistor is needed to protect internal circuit.

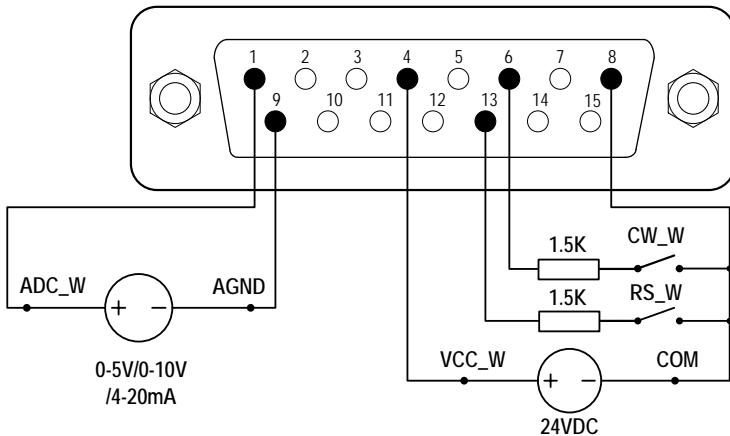


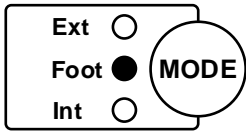
Figure 14. DB15 Wiring with External 24VDC Power Source

## 6.6 Time Dispense Mode

Pump will dispense fluid by setting the duration time for each dose. The drive will stop automatically when finished dispensing.

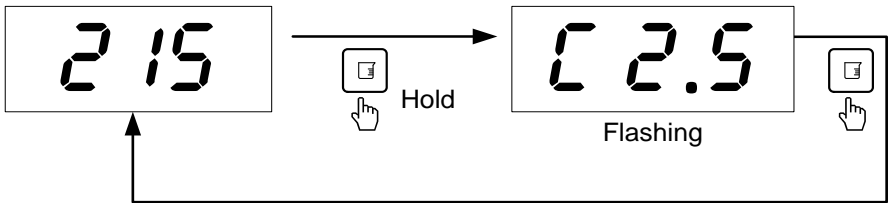
To set the duration time for each dose

- 1) Turn on the power switch. The display will be on.



- 2) Press MODE key to change the mode to Internal Control Mode or Time Dispense Mode.

- 3) Press and hold DISPENSE key for 3 seconds, the four-digit LED display will be flashing. Pump is on Time Dispense Setup Mode.



*Figure 15. Time Dispense Setup Mode*

- 4) When on Time Dispense Setup Mode, press UP or DOWN key to set the duration time, the time range is 0.1-999 seconds.
- 5) Press the DISPENSE key again to exit the Time Dispense Setup Mode.

To Dispense Fluid

- 1) Press DIRECTION key to adjust the running direction, clockwise or counterclockwise.
- 2) When on Internal Control Mode or Time Dispense Mode, press DISPENSE key to dispense one dose. Press DISPENSE key again to repeat dispensing.
- 3) When on Time Dispense mode, an optional footswitch can be used to start dispensing. Close then open the footswitch to dispense one dose. Close then open the footswitch again to

repeat dispensing (see section [6.9](#)).

- 4) When the drive is running, press START/STOP key to stop the process anytime when an accident occurs.

## 6.7 Logic Level Control Mode

On this mode, use logic level signal to control start and stop. The keys on the front panel can control direction and speed.

- 1) Switch the power off. Wire the DB15 connector as shown on [Figure 16](#) or [Figure 17](#), and connect it to the DB15 port on the rear of the pump.

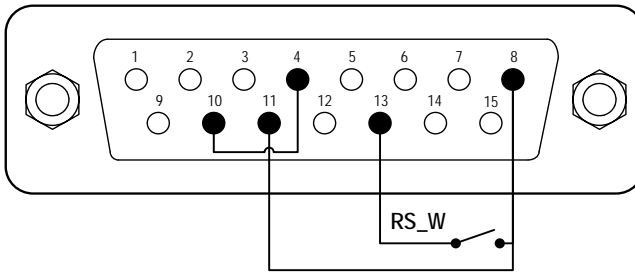


Figure 16. Logic Level Control with Internal 12V Power Source

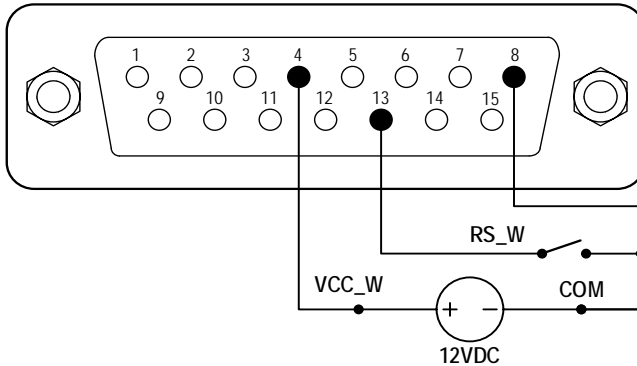
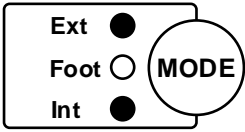


Figure 17. Logic Level Control with External 12V Power Source

- 2) Turn on the power switch. The display will be on.



- 3) Press MODE key to change the mode to Logic Level Control Mode.
- 4) Press UP or DOWN key to set the speed.
- 5) Press DIRECTION key to change the rotating direction.

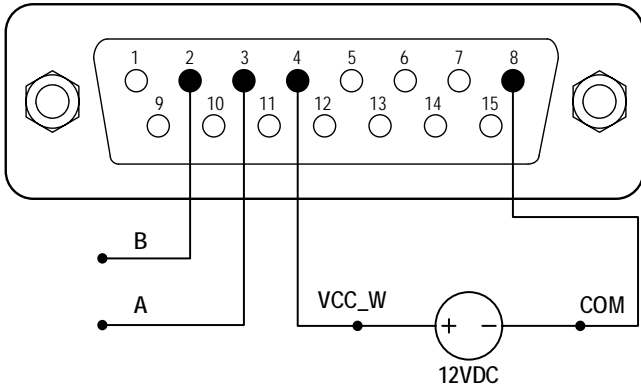
6) When RS\_W switch is closed, the drive will be running; when RS\_W switch is open, the drive will stop.

Note: Use this mode to work with a TIME DISPENSE CONTROLLER.

## 6.8 Communication Mode

The RS485 interface supports standard MODBUS protocol. Pump can communicate with external device via the communication port. Please refer to the [Communication Instruction Manual](#) for the parameters and supported commands.

- 1) When the power is off, wire the DB15 connector as shown on *Figure 18*, and connect it to the DB15 port on the rear of the pump. External DC power source is recommended to avoid electrical interference.



*Figure 18. RS485 MODBUS Wiring*

- 2) Turn on the power switch. The LED display will be on.
- 3) Press MODE key to change the mode to Internal Control Mode or Time Dispense Mode.
- 4) Control pump with communication interface.
- 5) Press the START/STOP key to stop the drive anytime.



## 6.9 Footswitch Control

- 1) Switch the power off. Wire the DB15 connector as shown on [Figure 19](#) or [Figure 20](#), and connect it to the DB15 port on the rear of the pump.

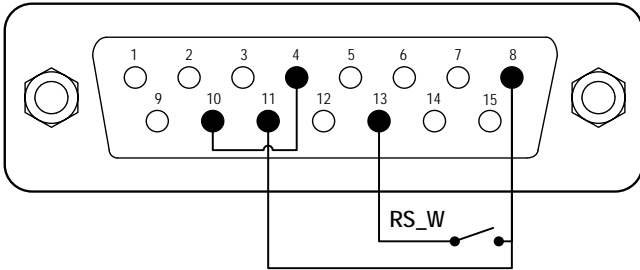


Figure 19. Footswitch with internal 12V Power Source

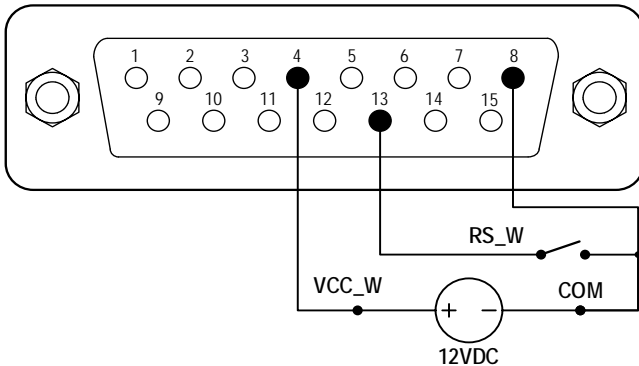


Figure 20. Footswitch with External 12V Power Source

- 2) Turn on the power switch. The LED display will be on.
  - 3) Press MODE key to change the working mode.
- On Internal Control Mode, when the switch RS\_W is closed then open, the drive will start; when the switch RS\_W is closed then open again, the drive will stop.
  - On Time Dispense Mode, when the switch RS\_W is closed then open, pump will dispense one dose then stop.

- On Logic Level Control Mode, close the switch RS\_W to start the drive; open the switch to stop the drive.

## 7 Maintenance

### 7.1 Warranty

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

### 7.2 Regular Maintenance

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

### 7.3 Malfunction Solutions

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

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3	Hardware	Motor is trembling	<ol style="list-style-type: none"> <li>1. Check the wire connection between the motor and the driver board.</li> <li>2. The motor is overloaded. Check the mechanical connection.</li> </ol>
4	Hardware	Motor only runs in one direction	Check the connection between the drive board and the main control board.
5	Hardware	Keypad does not work	<ol style="list-style-type: none"> <li>1. Check the wire connection between keypad and the main board.</li> <li>2. Check if the key is broken.</li> </ol>
6	Hardware	External control does not work	<ol style="list-style-type: none"> <li>1. Check the wiring of the connector.</li> <li>2. Check if the external control power voltage is provided.</li> <li>3. Check the connections of the external control board.</li> </ol>
7	Hardware	RS485 com does not work	<ol style="list-style-type: none"> <li>1. Check the wiring of the connector.</li> <li>2. Check if the external control power voltage is provided.</li> <li>3. Check the connections of the communication board.</li> </ol>
8	Hardware	Noisy when running	Check the screws and level on pump head to make sure they are secure.
9	Software	External control does not work	Check if pump is on External Control Mode.
10	Software	RS485 does not work right	<ol style="list-style-type: none"> <li>1. Check if the display shows the communication is ready.</li> <li>2. Reset the address of pump.</li> <li>3. Check whether on the bus there are two pumps using the same address</li> </ol>



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

## 8 Dimensions

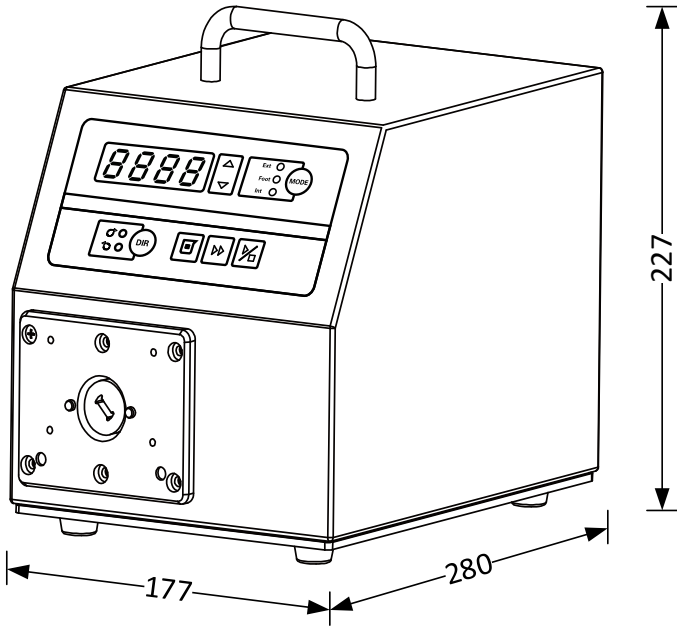
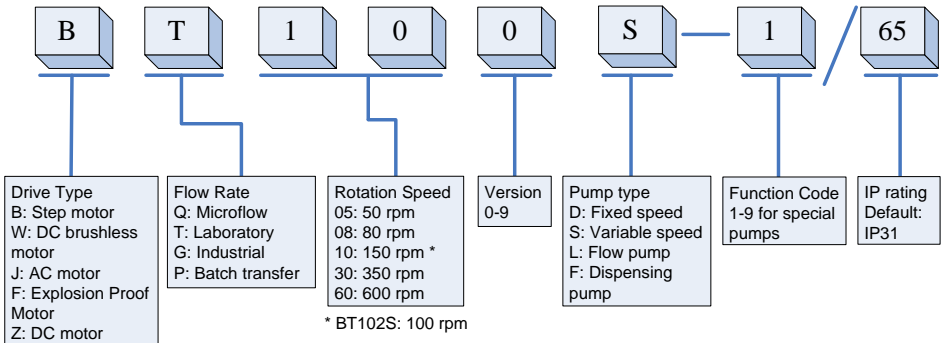


Figure 21. Dimensions (mm)

## 9 Naming Rule



## 10 Specifications

Speed resolution	1 rpm
Speed accuracy	3%
Power supply	AC180-264V 50Hz/60Hz (standard) AC90-132V 50Hz/60Hz (optional)
Power consumption	< 200W
External logic level control signal	5V, 12V (standard), 24V (optional)
External analog control signal	0-5V (standard); 0-10V, 4-20mA (optional)
Communication interface	RS485 MODBUS
Operating condition	Temperature 0~40°C, Relative humidity <80%
IP grade	IP31
Display	Four-digit LED
Dimensions (LxWxH)	280x177x227 mm (11.02x6.97x 8.94 inch)
Weight	6.2 kg (13.7 lbs)

### WT300S Suitable Pump Heads and Tubings, Flow Parameters

Drive type	Pump Head	Ch	Tubing size	Flow rate per channel (mL/min)
WT300S	YZ15	1	13# 14# 16# 19# 25# 17#	3~990
	YZ25	1	15# 24#	50~990
	2 x YZ15	2	13# 14# 16# 19# 25# 17#	3~990
	2 x YZ25	2	15# 24#	50~990
	4 x YZ15	4	13# 14# 16# 19# 25# 17#	3~990
	4 x YZ25	4	15# 24#	50~990
	YT15	1	13# 14# 16# 19# 25# 17# 18#	3~1300
	YT25	1	15# 24# 35# 36#	50~1600
	2 x YT15	2	13# 14# 16# 19# 25# 17# 18#	3~1300
	2 x YT25	2	15# 24# 35# 36#	50~1600

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	4 x YT15	4	13# 14# 16# 19# 25# 17# 18#	3~1300
	4 x YT25	4	15# 24# 35# 36#	50~1600
	DT15-24	2	16# 19# 25# 17#	14~930
	DT15-44	4	16# 19# 25# 17#	14~610
	KZ25	1	15# 24# 35# 36#	80~3500
	2 x KZ25	2	15# 24# 35# 36#	80~3500

WT600S Applicable Pump Heads and Tubings, Flow Parameters

Drive type	Pump Head	Ch	Tubing size	Flow rate per channel (mL/min)
WT600S	YZ15	1	13# 14# 16# 19# 25# 17#	3~1700
	YZ25	1	15# 24#	50~1700
	2 x YZ15	2	13# 14# 16# 19# 25# 17#	3~1700
	2 x YZ25	2	15# 24#	50~1700
	4 x YZ15	4	13# 14# 16# 19# 25# 17#	3~1700
	4 x YZ25	4	15# 24#	50~1700
	KZ25	1	15# 24# 35# 36#	80~6000
	2 x KZ25	2	15# 24# 35# 36#	80~6000
	DT15-24	2	16# 19# 25# 17#	14~1600
	DT15-44	4	16# 19# 25# 17#	14~1600
	YT15	1	13# 14# 16# 19# 25# 17# 18#	3~2300
	YT25	1	15# 24# 35# 36#	50~2900
	2 x YT15	2	13# 14# 16# 19# 25# 17# 18#	3~2300
	2 x YT25	2	15# 24# 35# 36#	50~2900
	4 x YT15	4	13# 14# 16# 19# 25# 17# 18#	3~2300
4 x YT25	4	15# 24# 35# 36#	50~2900	