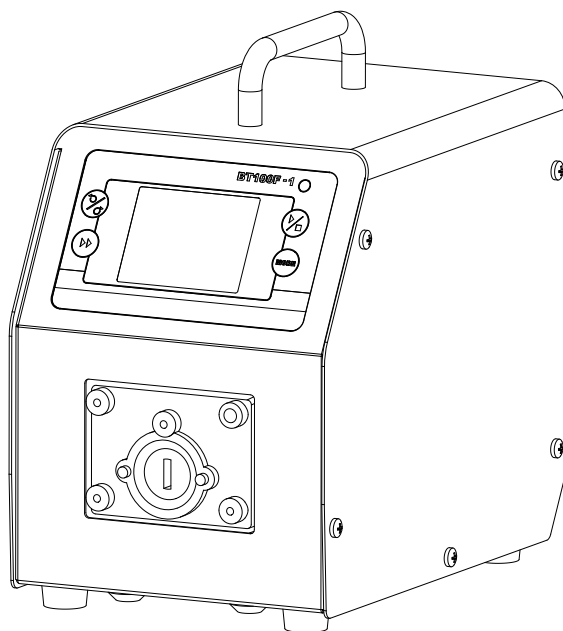




BT100F-1

Intelligent Dispensing Peristaltic Pump Operating Manual



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Safety Precautions



Danger

- Use the correct voltage indicated on the rating plate label of the pump to avoid any damage.
- Make no unauthorized dismantling, changes or modifications to the pump which could result in malfunctions or even potential accidents.
- Turn off the pump drive before installing or removing tubing, attempting any maintenance, cleaning or repair of the drive, connecting or disconnecting external control devices or a communication interface. Fingers or loose clothing could get caught in the drive mechanism.



Warning

- Ensure no chemical reactions occur between the handled fluid with the material of the pump head and tubing before use.
- Tubing should be checked regularly to avoid breakage. Tubing breakage may result in fluid being sprayed from the pump. Use appropriate measures to protect the operator and equipment. The operator is solely liable for damages resulting from tubing breakage, particularly the leakage of toxic or valuable liquids.
- The pump is provided with a grounded plug which must be well-grounded at all times.
- This device is not designed for nor intended for usage in patient-connected applications, including but not limited to medical and dental use.
- Observe all other applicable regulations concerning working safety, operational safety, environmental protection and relevant local regulations.

(DE) SICHERHEITSHINWEISE**Gefahr**

- Verwenden Sie die richtige Spannung, die auf dem Typenschild der Pumpe angegeben ist, um Schäden zu vermeiden.
- Nehmen Sie keine unbefugten Demontagen, Änderungen oder Modifikationen an der Pumpe vor, die zu Fehlfunktionen oder sogar zu Unfällen führen könnten.
- Schalten Sie den Pumpenantrieb aus, bevor Sie Schläuche ein- oder ausbauen, Wartungs-, Reinigungs- oder Reparaturarbeiten am Antrieb vornehmen oder externe Steuergeräte oder eine Kommunikationsschnittstelle anschließen oder trennen. Finger oder lose Kleidungsstücke können sich im Antriebsmechanismus verfangen.

**Warnung**

- Vergewissern Sie sich vor der Verwendung, dass keine chemischen Reaktionen zwischen dem Fördermedium und dem Material des Pumpenkopfs und der Schläuche auftreten können.
- Die Schläuche sollten regelmäßig überprüft werden, um Brüche zu vermeiden. Ein Schlauchbruch kann dazu führen, dass Flüssigkeit aus der Pumpe spritzt. Ergreifen Sie geeignete Maßnahmen zum Schutz des Bedieners und der Ausrüstung. Der Betreiber haftet allein für Schäden, die durch einen Schlauchbruch entstehen, insbesondere für das Austreten von giftigen oder wertvollen Flüssigkeiten.
- Die Pumpe ist mit einem geerdeten Stecker ausgestattet, der stets korrekt an eine abgesicherte Netzsteckdose angeschlossen sein muss. Dieses Gerät ist nicht für Anwendungen ausgelegt oder vorgesehen, die im Zusammenhang mit der Behandlung von Patienten stehen. Medizinische bzw. zahnmedizinische Anwendungen sind nicht bestimmungsgemäß.
- Beachten Sie alle anderen geltenden Vorschriften zur Arbeitssicherheit, zur Betriebssicherheit, zum Umweltschutz sowie die einschlägigen örtlichen Vorschriften.

(FR) CONSIGNES DE SÉCURITÉ**Danger**

- Utilisez la tension correcte indiquée sur la plaque signalétique de la pompe afin d'éviter tout dommage.
- Ne procédez pas à des démontages, changements ou modifications non autorisés de la pompe qui pourraient entraîner des dysfonctionnements, voire des accidents.
- Mettez l'entraînement de la pompe hors tension avant d'installer ou de retirer des tuyaux, d'effectuer des travaux d'entretien, de nettoyage ou de réparation sur l'entraînement ou de connecter ou déconnecter des dispositifs de commande externes ou une interface de communication. Des doigts ou des vêtements lâches pourraient se prendre dans le mécanisme d'entraînement.

**Avertissement**

- Avant toute utilisation, assurez-vous qu'il n'y a pas de réaction chimique entre le liquide pompé et le matériau de la tête de pompe et des tubes.
- Les tuyaux doivent être contrôlés régulièrement pour éviter les ruptures. Une rupture de tuyau peut entraîner des projections de liquide hors de la pompe. Prenez les mesures appropriées pour protéger l'opérateur et l'équipement. L'opérateur est seul responsable des dommages causés par une rupture de tuyau, notamment en cas de fuite de liquides toxiques ou précieux.
- La pompe est équipée d'une fiche de mise à la terre qui doit toujours être bien reliée à la terre.
- Cet appareil n'est pas conçu ni prévu pour être utilisé en présence de patients, y compris, mais sans s'y limiter, dans le cadre d'applications médicales et dentaires.
- Respectez toutes les autres réglementations applicables en matière de sécurité du travail, de sécurité d'exploitation, de protection de l'environnement.

(ES) INSTRUCCIONES DE SEGURIDAD**Peligro**

- Utilice la tensión correcta indicada en la placa de características de la bomba para evitar daños.
- No realice ningún desmontaje, cambio o modificación no autorizada en la bomba que pueda provocar un mal funcionamiento o incluso accidentes.
- Desconecte el accionamiento de la bomba antes de instalar o retirar las mangueras, realizar trabajos de mantenimiento, limpieza o reparación en el accionamiento o conectar o desconectar dispositivos de control externos o una interfaz de comunicación. Los dedos o la ropa suelta podrían quedar atrapados en el mecanismo de accionamiento.

**Advertencia**

- Antes de usarla, asegúrese de que no hay reacciones químicas entre el medio bombeado y el material de la cabeza de la bomba y las mangueras.
- Las mangueras deben ser revisadas regularmente para evitar roturas. La rotura de una manguera puede hacer que salga líquido de la bomba. Tome las medidas adecuadas para proteger al operador y al equipo. El operador es el único responsable de los daños causados por la rotura de una manguera, especialmente por la fuga de líquidos tóxicos o valiosos.
- La bomba está equipada con un enchufe con toma de tierra que debe estar siempre bien conectado a tierra.
- Este aparato no está diseñado ni pensado para su uso en relación con los pacientes, incluyendo pero sin limitarse a las aplicaciones médicas y dentales.
- Respetar todas las demás normas aplicables en materia de seguridad laboral, seguridad operativa y protección del medio ambiente.

(IT) ISTRUZIONI DI SICUREZZA**Pericolo**

- Usare la tensione corretta indicata sull'etichetta della targhetta della pompa per evitare qualsiasi danno.
- Non eseguire smontaggi, cambiamenti o modifiche non autorizzati alla pompa che potrebbero causare malfunzionamenti o addirittura potenziali incidenti.
- Spegnerne l'azionamento della pompa prima d'installare o rimuovere tubi, tentare qualsiasi manutenzione, pulizia o riparazione dell'azionamento, collegare o scollegare dispositivi di controllo esterni o un'interfaccia di comunicazione. Dita o indumenti larghi potrebbero rimanere impigliati nel meccanismo di azionamento.

**Attenzione**

- Assicurarsi che non si verifichino reazioni chimiche tra il fluido trattato e il materiale della testa della pompa e dei tubi prima dell'uso.
- I tubi devono essere controllati regolarmente per evitare rotture. La rottura del tubo può provocare spruzzi di fluido dalla pompa. Utilizzare misure appropriate per proteggere l'operatore e l'attrezzatura. L'operatore è l'unico responsabile dei danni derivanti dalla rottura dei tubi, in particolare della fuoriuscita di liquidi tossici o preziosi.
- La pompa è dotata di una spina con messa a terra che deve essere sempre ben collegata a terra.
- Questo dispositivo non è progettato né destinato all'uso in applicazioni collegate al paziente, incluso ma non limitato all'uso medico e dentistico.
- Osservare tutte le altre norme applicabili riguardanti la sicurezza sul lavoro, la sicurezza operativa, la protezione dell'ambiente e le norme locali pertinenti.

1 Description

The BT100F-1 intelligent dispensing peristaltic pump provides a flow rate from 0.0001 to 1700 mL/min with compatibility for various pump heads and tubing. It is easy to operate, featuring an intuitive and clear color LCD touch screen. Four operation modes are available: Volume Dispense Mode, Time Dispense Mode, Copy Dispense Mode and Flow Mode. The intelligent cooling fan control ensures quiet pump operation. With the RS485 MODBUS interface, the pump communicates easily with external devices, such as a PC, HMI or PLC.

2 Functions and Features

Peristaltic pumps can handle fluids that are abrasive, corrosive, or viscous. With no seals in contact with the pumped medium and no valves to clog, these pumps offer reliable performance. Only the tubing or tube material comes into contact with the fluid. The pumps can achieve a suction lift and priming of up to 8 meters of water column at sea level. They are suitable for shear-sensitive fluids like latex or firefighting foam, offering low shear. Additionally, peristaltic pumps can run dry and handle fluids with high levels 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 also available for food and pharmaceutical use.

- Color LCD display with touch screen and keypad for operation.
- Reversible direction, start/stop control and adjustable speed.
- Precise motor control technology improves dispense accuracy
- Anti-drip function ensures dispensing accuracy.
- Three dispense modes:
 - o Time Dispense Mode: automatically dispense by setting the duration for each dose, lag time between doses and number of cycles.

- o Volume Dispense Mode: automatically dispense by setting the volume for each dose, lag time between doses and number of cycles.
- o Copy Dispense Mode: automatically dispense by setting the total volume need to dispense, lag time between doses and number of cycles.
- Store five groups of working parameters for each dispense mode (power-off memory).
- Flow rate display and control; cumulative dispense volume display.
- Flow rate calibration.
- 0.2% high precision rotating speed control with 0.1 rpm speed resolution.
- Professional operating system with a setup wizard for configuration.
- Intelligent temperature control to minimize working noise.
- External logic level signal can control start/stop, direction and easy dispense functions; external analog signal can adjust the rotating speed. Signals are optically isolated.
- RS485 MODBUS interface.
- Internal double-layer isolation structure and conformal coated circuit board protect the pump from dust and moisture.
- Anti-electromagnetic interference feature
- Wide input voltage range for complex power environments.
- Stainless steel enclosure, easy to clean, resistant to corrosion from acid, alkali, sodium and organic solvents.
- Drive multi-channel and variable pump heads.
- Optional footswitch and remote infrared control.

3 Components and Connectors

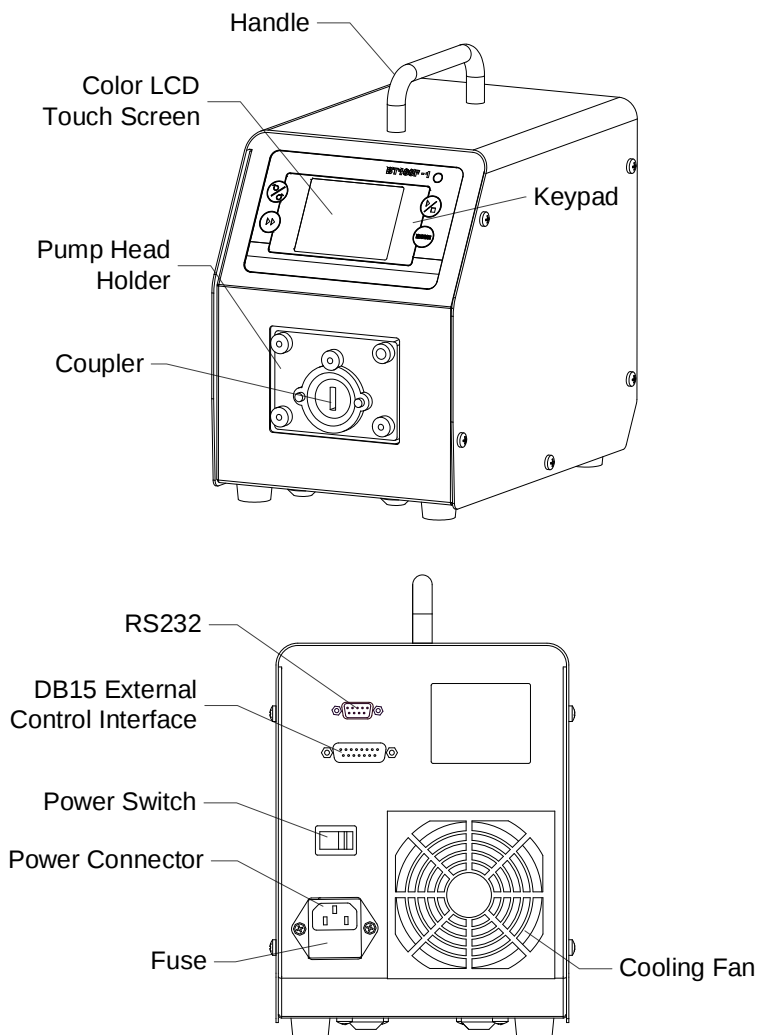


Figure 1. Components and Connectors

4 Display Panel and Operating Keypads

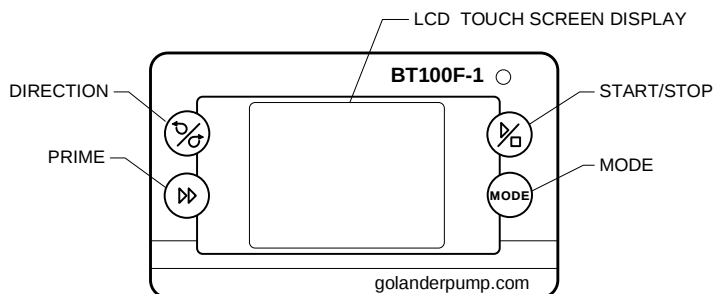


Figure 2. Display Panel

4.1 Keypad



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



DIRECTION Key. Press to change the rotating direction, clockwise or counterclockwise.



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



MODE key. When the drive is not running, use the key to change the working mode. When the keypad is locked, use this key to change the display content.

4.2 LCD Touch Screen Display

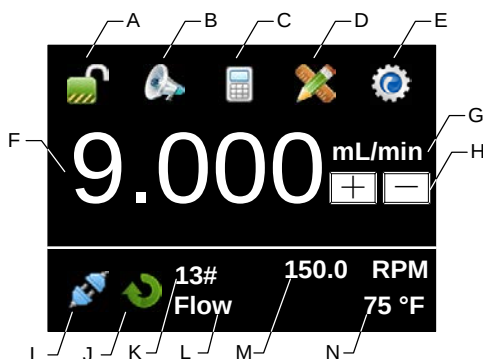


Figure 3. Main screen



A - Keypad Lock

Press the icon to lock/unlock the keypad. When the keypad is locked, the control mode and system parameter settings cannot be changed. Use the **MODE** key to change the display content. A Password can be set to unlock the keypad, preventing accidental changes to system parameters.



Keypad
unlocked



Keypad
locked



B - Tone Button

Press this icon to turn on/off the key tone.



Tone on

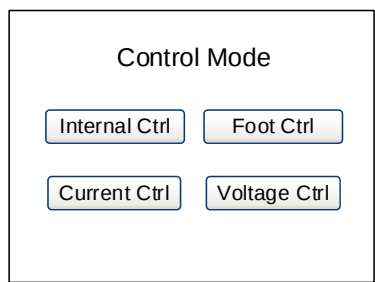


Tone off



C - Control Mode

Press this icon to enter the Control Mode interface. Four control modes are available.



- **Internal Ctrl (Internal Control Mode):** Operate the pump using the keypad and touch screen.

- **Foot Ctrl (Footswitch Control Mode):** Use a footswitch to control start/stop, and use the keypad and touch screen for the other operations.
- **Current Ctrl (Current Control Mode):** An external 4-20mA analog current signal controls rotating speed, and a logic level signal controls start/stop. The keypad is disabled.
- **Voltage Ctrl (Voltage Control Mode):** An external 0-5V or 0-10V analog voltage signal controls rotating speed, and an external logic level signal controls start/stop and direction. The keypad is disabled.

The screen will display the corresponding icon for the control mode selected.



Internal Control
Mode



Footswitch
Control Mode



Current Control
Mode



Voltage Control
Mode



D - Quick Settings

Press the icon to access the Quick Settings interface to set the pause time unit to: seconds, minutes, and hours, and clear the cumulative liquid volume and cumulative count. In volume dispense, time dispense and copy dispense modes, five groups of preset data are available. Use the “Prev” or “Next” key to select a desired preset group. The settings displayed on the main screen will adjust accordingly.

Quick Settings

Pause Time Unit

Flow Mode

Quick Settings

Pause Time Unit

No.1: 5.000 mL 001.0s
6.000 mL/min 1 T

Other Modes



E - System Settings

Press this icon to enter the System Settings menu where you can change the parameters shown on the screen.

F - Flow Rate Setting

This shows the current flow rate setting. When the drive is not running, press it to input the desired value in the pop-up window. Please pay attention to the range of the value and the flow rate unit.

Max:9.0ml/min Min:0.6ul/min

1	2	3	.
4	5	6	0
7	8	9	OK

G - Flow Rate Unit

It shows the current flow rate unit. When the drive is not running, press it to change the unit. The allowed units are μ L/min, mL/min and L/min.

H - Fine Adjustment

When the drive is running, press the fine adjustment button to adjust the flow rate in real time. Press or shortly to increase or decrease

the flow rate. Press and hold the buttons to change the value quickly.

I - Communication State

It shows the current RS485 communication state.



Communication
connected



Communication
disconnected

J - Rotation Direction

It shows the current rotation direction. When the drive is not running, it shows one of the following icons.



Clockwise



Counterclockwise

When the drive is running, it changes to an animated icon as shown below.



K - Tubing or Pump Head

It shows the current configured tubing size or pump head model.

- 17# means the tubing size is 17#.
- ID0.13 means the internal diameter of the tubing is 0.13mm.
- YZ15 means the pump head is YZ15.

L - Working Mode

It shows the current working mode, such as Flow Mode, Volume Dispense Mode, Time Dispense Mode or Copy Dispense Mode.

M - Speed or Cumulative Cycles

It shows the current speed or cumulative dispense cycles, switched by pressing the MODE key. If the speed exceeds the maximum allowed speed, it will show **U_Overflow**; if the speed is lower than the minimum allowed speed, it will show **D_Overflow**. The cumulative cycles can be

reset from the Quick Settings menu.

N - Internal Temperature or Cumulative Volume

It shows the temperature inside the drive or cumulative volume that the pump has delivered. The cumulative volume can be reset on the Quick Settings menu.

The temperature display can be set to either Fahrenheit or Celsius. To switch between them, open the System Information window (see Figure 13), and tap the temperature area (e.g., “75 °F” or “24 °C”).

4.3 System Settings

When the drive is not running, press the icon  to enter the System Settings menu.



Figure 4. System Settings

4.3.1 Wizard

The Wizard helps a user set up parameters. The system will select the appropriate tubing and pump head.

4.3.2 Calibrate

The pump will accurately show the current flow rate/volume after Flow Rate Calibration.

Note: Calibration is necessary to ensure precise flow rate display.

4.3.3 Setup

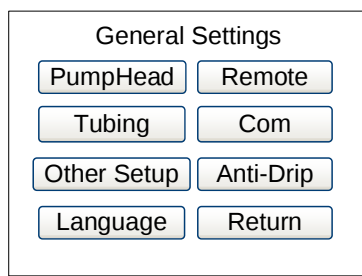


Figure 5. General Settings

- **Pump Head** - Choose the model of the installed pump head.

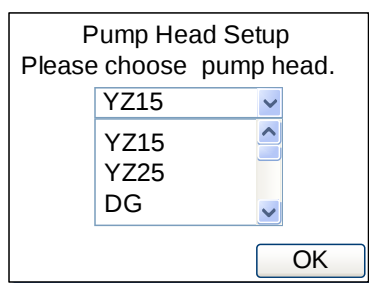


Figure 6. Pump Head Select

- **Tubing** - Choose the appropriate tubing size for the selected pump head.

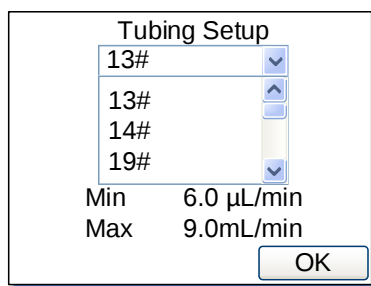


Figure 7. Tubing Select

- **Other Setup** - Turn on/off the infrared control or the power fail restart functions.

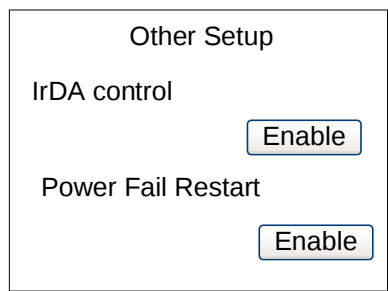


Figure 8. Other Setup

- **Language** - Choose the display language, Chinese or English.
- **Remote** - It is the setting for external control mode: Logic Level control mode or Pulse control mode. When it is set to Logic Level, the pump state will change when the external switch is closed or opened. It is designed for a maintained switch. When it is set to Pulse, the pump state will change when the switch is closed and then open again. It is designed for a normally open momentary switch.

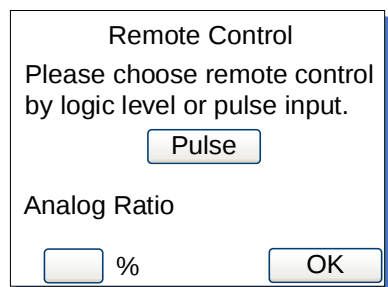
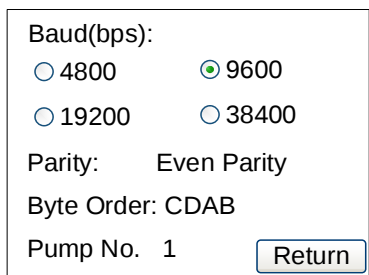


Figure 9. Remote Control Mode

- **Com (communication)-** It is the setting for RS485 MODBUS communication including parameters such as baud rate, transmission mode and pump address. To change the address, click on the address number displayed on the screen, then input the value in the pop-up window. Restart the pump to apply the new settings.

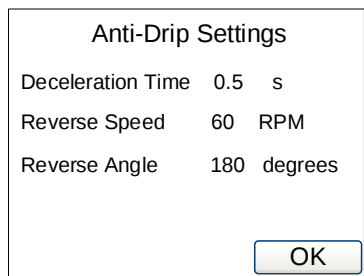


A dialog box titled "Communication Settings" with a blue border. It contains the following text and controls:

- Baud(bps):
 - ☐ 4800
 - ☒ 9600
 - ☐ 19200
 - ☐ 38400
- Parity: Even Parity
- Byte Order: CDAB
- Pump No. 1
-

Figure 10. Communication Settings

- **Anti-Drip** - The pump provides a deceleration time setting to reduce fluid splash at the end of a dispense. It is the time for the drive to stop from the running speed to 0. In addition, the drive can reverse direction to draw the fluid back at the end of the tubing to minimize the drip after a dispense. To access this feature, set the reverse angle/rotating speed in the pop-up window. When the angle is set to 0, this feature is disabled.

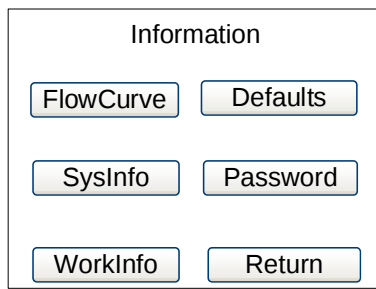


A dialog box titled "Anti-Drip Settings" with a blue border. It contains the following text and controls:

- Deceleration Time 0.5 s
- Reverse Speed 60 RPM
- Reverse Angle 180 degrees
-

Figure 11. Anti-Drip Settings

4.3.4 Info



A dialog box titled "Information" with a blue border. It contains six buttons arranged in three rows and two columns:

- FlowCurve
- Defaults
- SysInfo
- Password
- WorkInfo
- Return

Figure 12. Information

- **Flow Curve-** It shows the flow curve of the pump head.
- **Sysinfo-** It shows the software version, memory size, internal temperature, etc.

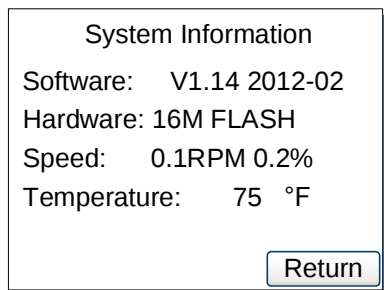


Figure 13. System Information

- **Workinfo-** It shows total power on time, running time and power cycles.

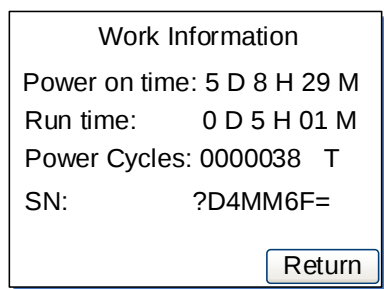


Figure 14. Work Information

- **Defaults-** It resets the pump to its factory settings. Restart the pump to apply the changes. The system can also be restore to factory settings by simutanously holding the DIRECTION and MODE keys when powering on the pump. Release the keys after a beep.

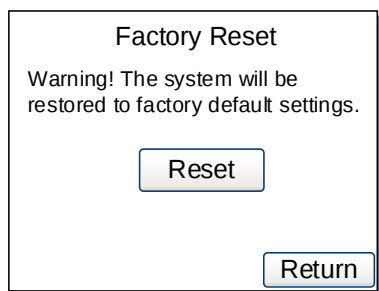


Figure 15. Factory Reset

- **Password-** It is to set a password to unlock the keypad. It will prevent accidental parameter changes. The default password is blank.

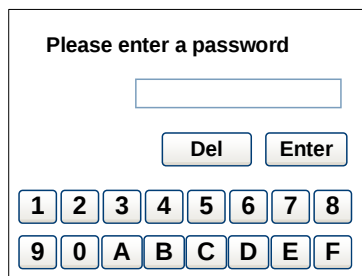


Figure 16. Password

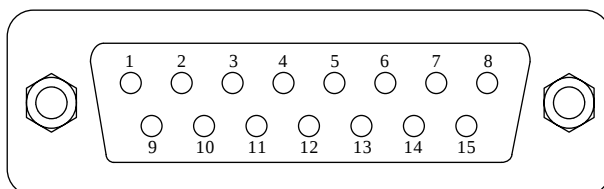
4.3.5 About

It shows the functions and features of the pump.

4.3.6 Return

Press to return to the main display screen.

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	DAC	Analog voltage signal output
6	CW_W	External input signal to control the
7	PWM	Pulse signal output
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	CW	Direction signal output
13	RS_W	External start/stop signal input
14	PWM_W	Pulse signal input
15	RS	Start/stop signal output



Warning

- Ensure the correct signal is provided by following the legend pins. Do not exceed the specified signal value range. Pay attention to the specified voltage range when connecting to an external power supply; failure to do so may result in permanent damage, which will not be covered by the warranty.
- Low-voltage signals must be isolated from mains power. Use a separate, shielded ground input wire.
- Always use a qualified protective wire sleeve at the end of the multi-strand cable to prevent potential equipment damage.

6 Operation Instructions

6.1 Before Operation

- 1) Verify that the packing slip matches the contents and that all items are intact and undamaged. If there are any issues, contact the

manufacturer or distributor.

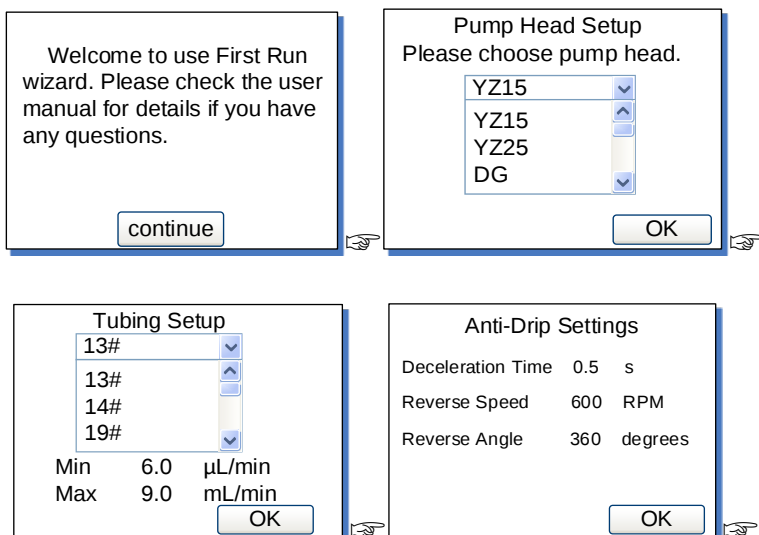
- 2) Carefully read the instructions to understand the setup and operation process.
- 3) Ensure at least 200 mm of space behind the pump during operation for proper ventilation.

6.2 Power Connection

The voltage of the power supply is indicated on the pump's sticker. Ensure that you use the correct power source. Plug the power cord into the power connector on the rear of the pump, then connect the other end to an electrical outlet. Flip the power switch on the rear of the pump to turn it on.

6.3 First Run Wizard

When using the pump for the first time or after a factory reset, the system will display a welcome screen. It will then guide you through the setup process in the following sequence: Pump Head Setup → Tubing Setup → Anti-Drip Setup → Working Mode Setup → Calibration. Users can configure the parameters and operation mode as needed. The pump will save these settings, and the setup wizard only needs to be completed once.



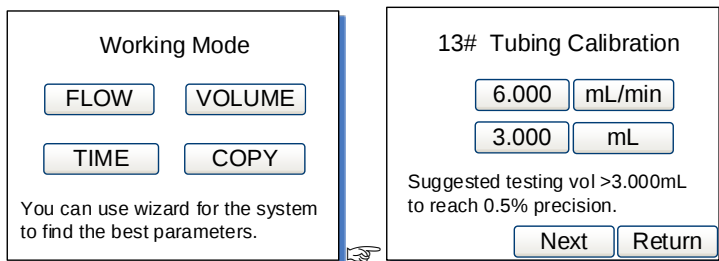


Figure 17. First Run Wizard

6.4 Flow Rate Calibration

Calibration is necessary under the following circumstances:

- First-time pump usage
- Pump head replacement
- Fluid transfer in a single channel with dual pump heads
- Reinstallation of tubing
- Prolonged continuous operation

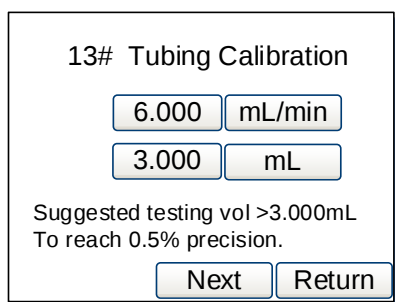
Calibration Steps

- 1) Install a pump head and tubing.
- 2) In the General Settings window, set the model number of the installed pump head.
- 3) When the pump shows the Main screen, press PRIME  to initiate the pump priming and fill the tubing with fluid.
- 4) When the drive is not running, press the System Settings icon  then select "Calibrate".



Figure 18. System Settings

- 5) The calibration wizard window shows the currently selected tubing, the desired flow rate and the suggested testing volume.



13# Tubing Calibration

6.000 mL/min

3.000 mL

Suggested testing vol >3.000mL
To reach 0.5% precision.

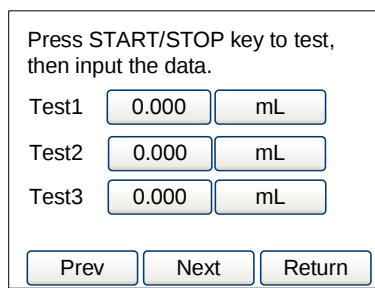
Next Return

Figure 19. Flow Rate Calibration

The 6.000 mL/min is the desired flow rate and 3.000 mL is the suggested volume for testing. The values or the units can be changed directly by pressing the area. Press “Next” to enter the calibration window, or press “Return” to exit the wizard to the System Settings window.

Note: Ensure that the liquid volume is not less than the suggested value.

- 6) The test window is shown below.



Press START/STOP key to test,
then input the data.

Test1 0.000 mL

Test2 0.000 mL

Test3 0.000 mL

Prev Next Return

Figure 20. Calibration

Ensure that the tubing is filled with liquid, then press the START/STOP key to initiate fluid transfer. Allow the pump to complete testing, and measure the delivered volume accurately. Repeat the steps a few more times and input the results of Test1, Test2, and Test3 into the calibration window, ensuring the correct units are used. Press Next to proceed to the “Analyze and

Calculate" window.

If adjustments are required for the desired flow rate and volume to test, press "Prev" to re-enter the values. Input the test results into the system. The system will disregard any results of 0 and solely utilize the results entered to calculate the appropriate speed for the desired flow rate.

Note: Use the "START/STOP" key to immediately stop the test in case of an unexpected or undesired situation.

- 7) The corrected testing scale will be calculated, while the old scale is displayed on the screen for reference.

Analyze and Calculate		
Average Vol	3.068	mL
Cal scale	208.6957	
Re scale	213.3330	
Old scale	213.3330	

Prev
Return
OK

Figure 21. Analyze and Calculate

The scale is a coefficient for the tubing. The calculated scale should be close to the reference scale (the "Re scale" shown in *Figure 21*). Otherwise, please check the following and press Prev to test again.

- The accuracy of the volume measurement
- The volume unit setting
- The model of the pump head setting
- The tubing size setting
- The liquid viscosity. When it is too high, the flow rate may not be linear to the speed.
- If dual pump heads are used for one channel

If no issues are identified, press "OK" to save the new value. The pump will automatically adjust the speed based on the calculated scale. Alternatively, press "Return" to exit without saving the new

value and return to the System Settings window. If no data has been input into the system, the window will display as shown below. Press “Prev” to redo the test, or simply press “Return” to go back to the System Setting.

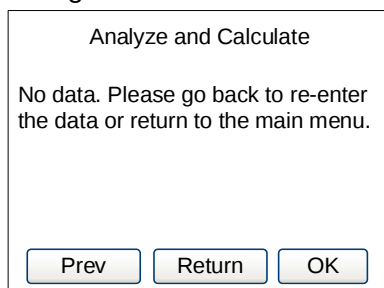


Figure 22. No Input Data

6.5 Working Mode

When the drive is not running, press the MODE key to enter the Working Mode window as shown below.

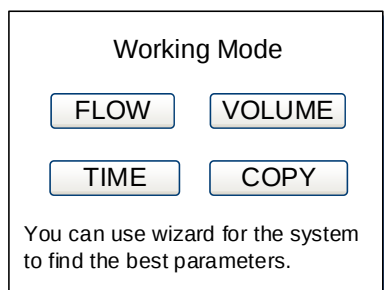


Figure 23. Working Mode

- **FLOW - Flow Mode**

In this mode, the pump runs according to the set flow rate and records the cumulative fluid volume.

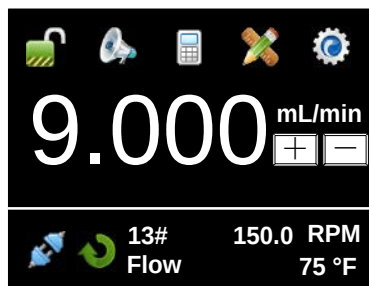


Figure 24. Flow Mode

• VOL - Volume Dispense Mode

In this mode, the pump will dispense by setting the dispense volume for each dose, the lag time between doses and the number of cycles. The system automatically calculates the duration time for each dose.

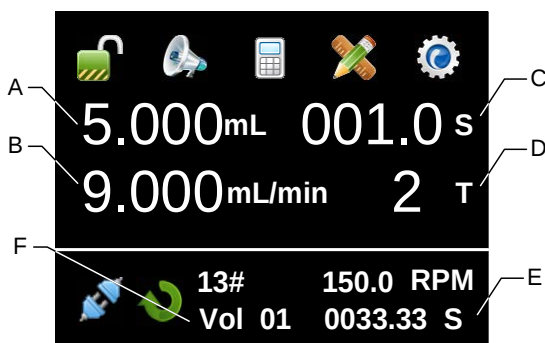


Figure 25. Volume Dispense Mode

A - Dispense volume for each dose, μ l, mL or L.

B - Dispense flow rate, μ l/min or mL/min.

C - Lag time. The time between consecutive doses.

D - Dispense cycles.

- Setting dispense cycles to 0 enables the drive to continue running until the START/STOP key is pressed.
- Setting dispense cycles to 1 allows the drive to operate a single time, rendering the pause time setting invalid.
- Setting dispense cycles to a value greater than 1 prompts the drive to operate for the specified number of cycles before stopping.

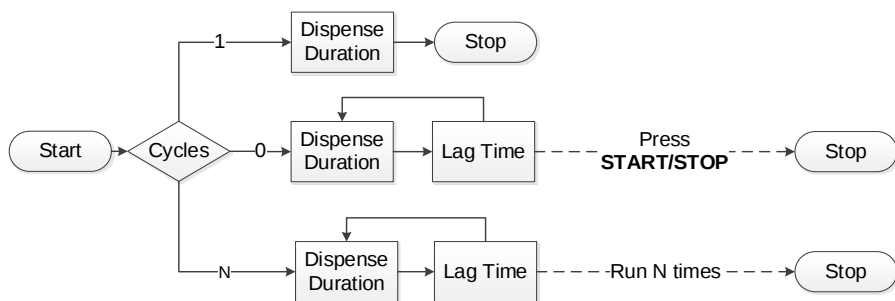


Figure 26. Dispense Cycles

E - Dispense duration for each dose. According to the dispense volume and time, the system will calculate the dispense duration automatically.

F - Volume Dispense Mode, with group 1 data. The data group can be selected from the Quick Settings menu.

• TIME - Time Dispense Mode

In this mode, the pump dispenses by setting the dispense duration for each dose, the lag time between doses and the number of cycles. The system automatically calculates the dispense volume for each dose.

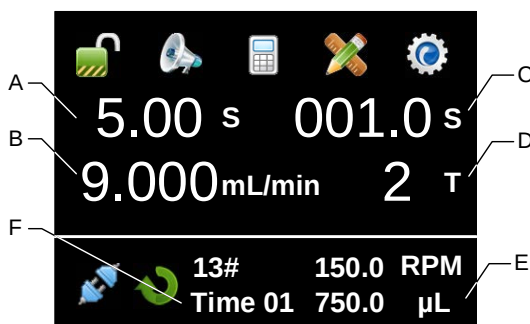


Figure 27. Time Dispense Mode

A - Dispense duration for each dose

B - Dispense flow rate, mL/min or L/min.

C - Lag time. The time between consecutive doses.

D - Dispense cycles.

- Setting dispense cycles to 0 enables the drive to continue running until the START/STOP key is pressed.
- Setting dispense cycles to 1 allows the drive to operate a single time, rendering the pause time setting invalid.
- Setting dispense cycles to a value greater than 1 prompts the drive to operate for the specified number of cycles before stopping.

E - Dispense volume for each dose. According to the dispense duration and flow rate, the system will calculate the dispense volume for each dose automatically.

F - Time Dispense Mode, with group 1 data. The data group can be selected from the Quick Setting menu.

• COPY - Copy Dispense Mode

The pump will dispense by setting the total volume to be dispensed, lag time between doses and number of dispense cycles. The system will calculate the dispense volume for each dose automatically.

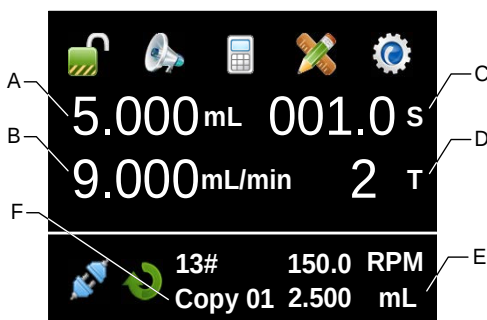


Figure 28. Copy Dispense Mode

A - Total dispense volume, μL , mL or L

B - Dispensing flow rate, $\mu\text{L}/\text{min}$, mL/min

C - Lag time. The time between consecutive doses.

D - Dispense cycles.

- Setting dispense cycles to 0 enables the drive to continue running until the START/STOP key is pressed.
- Setting dispense cycles to 1 allows the drive to operate a

single time, rendering the pause time setting invalid.

- Setting dispense cycles to a value greater than 1 prompts the drive to operate for the specified number of cycles before stopping.

E - Dispense volume for each dose. According to the total dispense volume and number of cycles, the system will calculate the dispense volume for each dose automatically.

F - Copy Dispense Mode, with group 1 data. The data group can be selected from the Quick Setting menu.

6.6 Wizard

By running this wizard, the system will automatically help you select the appropriate pump head and tubing size.

- 1) When the drive is not running, press the icon , then select Wizard. The pump will display a Welcome screen. Press "Next" to enter the parameter setup interface.

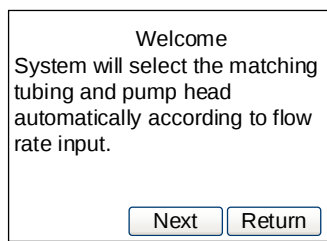


Figure 29. Welcome Screen

- 2) Input the required values as shown below.

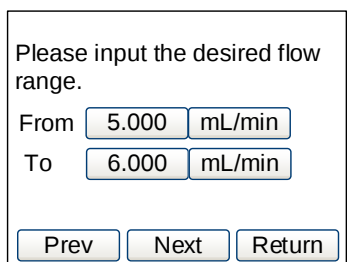


Figure 30. Flow Mode

Please input volume, duration for each dose.

Volume

Duration

Figure 31. Volume/Time Dispense Mode

Please input total volume, cycles and duration for each dose.

TotalVol

Cycles

Duration

Figure 32. Copy Dispense Mode

- 3) Press “Next”, the system will automatically list matching pump heads. Select the desired pump head and tubing, and press Next to set up lag time and cycles. If no pump head is listed, go back to re-enter the data.

Please select one set of the matching pump head and tubing.

YZ15	13#	v
YZ15	13#	v
YZ15	14#	v
YZ15	19#	v

Figure 33. Matching Pump Heads List

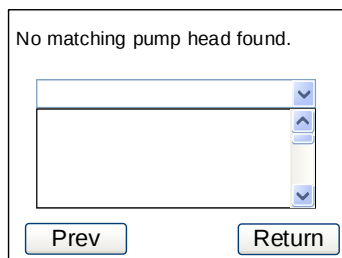


Figure 34. No Matching Pump Head

- 4) In the "Other Parameter Settings" page, the lag time between doses and the number of cycles can be set.

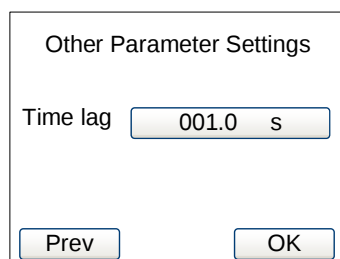


Figure 35. Volume/Time Dispense Mode

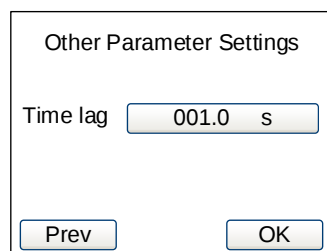


Figure 36. Copy Dispense Mode

6.7 External Control Mode

In this mode, the external logic level signal controls the direction and start/stop. External analog signal controls rotating speed. The keypad is disabled. The analog signal could be 0-5V (default), 0-10V or 4-20mA. For 0-10V or 4-20mA, the jumper setting on the analog signal control board has to be changed.

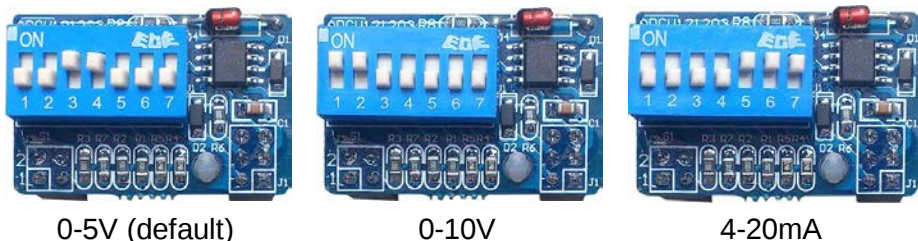


Figure 37. Analog Signal Control Board Setting

To control the pump with an external signal

- 1) Power off the pump. Wire the DB15 connector as shown in [Figure 38](#) or [Figure 39](#), and connect it to the DB15 port on the rear of the pump.

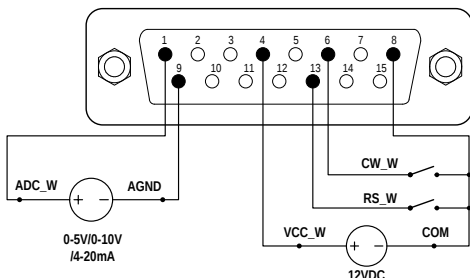


Figure 38. DB15 Wiring with External 12VDC Power Source

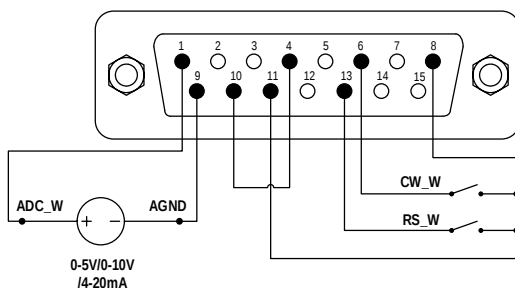


Figure 39. DB15 Wiring with Internal 12VDC Power Source

- 2) Power on the power switch. The pump will display the main screen.
- 3) Press  to set control mode to voltage , or current .
- 4) Turn on the external analog signal power source.

- 5) When setting the Remote Control Mode to Logic Level, close the external RS_W switch to start the pump. The speed will change based on the intensity of the analog input signal. Open the RS_W switch to stop the drive.

When the CW_W switch is opened, the drive will run clockwise; when the CW_W switch is closed, the drive will run counterclockwise.

- 6) When setting the Remote Control Mode to Pulse, close then open the external RS_W switch, the drive will run and the speed will change according to the intensity of the analog input signal. Close and open the RS_W switch again to stop the drive.

When close and then open the external CW_W switch, the drive will run clockwise. When close then open the CW_W switch again, the drive will run counterclockwise.

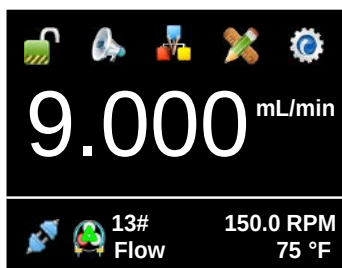


Figure 40. Voltage Control Mode

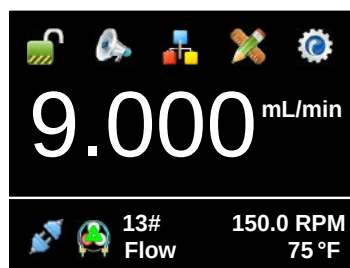


Figure 41. Current Control Mode

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

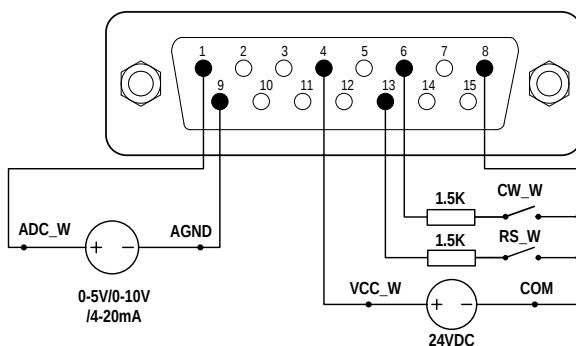


Figure 42. DB15 Wiring with External 24VDC Power Source

6.8 Communication Mode

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

Steps to Use Communication Mode

- 1) Power off the device. Wire the DB15 connector as shown in [Figure 43](#), and connect it to the DB15 port on the rear of the pump. An external DC power source is recommended to avoid electrical interference.

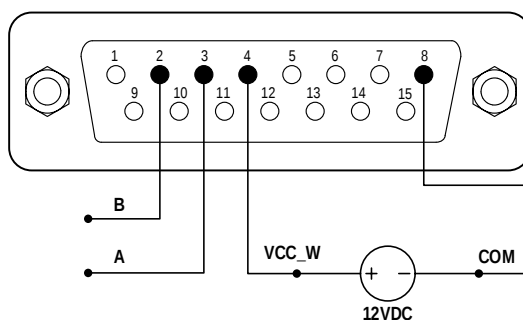


Figure 43. RS485 MODBUS Wiring

- 2) Power on the device. The pump will display the main screen.
- 3) In Internal control mode, the communication is connected when

the main screen shows , while the disconnected status is indicated by .

- 4) Control the pump with the communication interface.

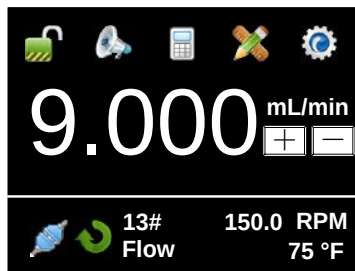


Figure 44. Communication Connected

6.9 Footswitch

To use a footswitch for controlling the start and stop functions:

- 1) Turn the power off. Wire the DB15 connector as shown in [Figure 45](#) or [Figure 46](#), and connect it to the DB15 port on the rear of the pump.

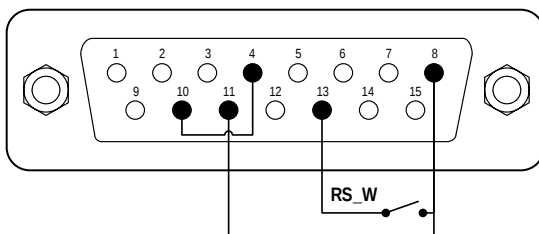


Figure 45. Control Start/Stop with Internal 12V Power Source

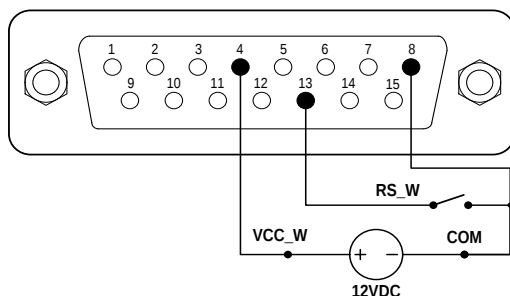


Figure 46. Control Start/Stop with External 12V Power Source

- 2) Turn the power on. The pump will display the main screen.
- 3) In the Internal Control Mode, if the pump is set to one of the dispense modes, the pump will start to dispense when the switch RS_W is closed and then opened.
- 4) In the Footswitch Control Mode: if the Remote Control Mode is set to Logic Level, the drive will start when the switch RS_W is closed; the drive will stop when the switch is opened.
- 5) In the Footswitch Control Mode: if the Remote Control Mode is set to Pulse, the drive will start when the switch RS_W is closed and then opened; the drive will stop when the switch is closed and then opened again.

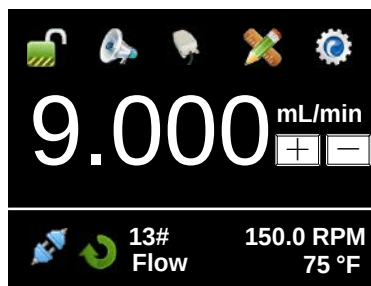


Figure 47. Footswitch Control

7 Maintenance

7.1 Warranty

The pump drive comes with a three-year and the pump head with a 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) Regularly inspect the tubing and connections to prevent leaks.
- 2) Avoid obstructing the fan located at the rear of the pump.
- 3) Keep the pump head dry.
- 4) If a filter is used, check and replace it at regular intervals.

Refrain from using chemical solvents to clean the pump or pump head.

7.3 Malfunction Solutions

No.	Malfunction	Description	Solution
1	Hardware	No display	1. Check the power cord 2. Check the fuse. If it was blown, replace it with a 1A slow-blow fuse 3. Check the internal power cord connection inside the pump. 4. Check the wire connection between the LCD and the main control board.
2	Hardware	Motor does not work	1. Check the indicator of the driver board. 2. Check the wire connection between the motor and the driver board. 3. Check the wire connection between the driver and the main board. 4. Check the power voltage for the pump.
3	Hardware	Motor is trembling	1. Check the wire connection between the motor and the driver board. 2. The motor is overloaded. Check the mechanical connection.
4	Hardware	Motor only runs in one direction	Check the connection between the drive board and the main control board.
5	Hardware	Keypad does	1. Check the wire connection between

BT100F-1 Intelligent Dispensing Peristaltic Pump

		not work	the keypad and the main board. 2. Check if the key is broken.
6	Hardware	External control does not work	1. Check the wiring of the connector. 2. Check if the external control power voltage is provided. 3. Check the connections of the external control board.
7	Hardware	RS485 com does not work	1. Check the wiring of the connector. 2. Check if the external control power voltage is provided. 3. Check the connections of the communication board.
8	Hardware	Noisy when running	Check the screws and level on the pump head to make sure they are secure.
9	Software	External control does not work	Check if the pump is in External Control Mode.
10	Software	RS485 does not work right	1. Check if the display shows the communication is ready. 2. Reset the address of the pump. 3. Check whether on the bus there are two pumps using the same address



If a problem persists, please contact the manufacturer or distributor.

8 Dimensions

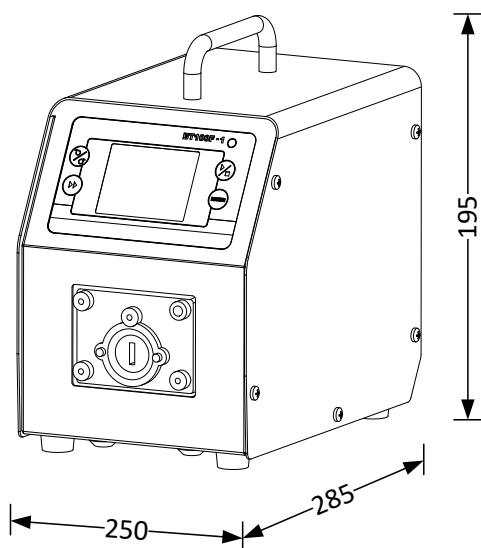
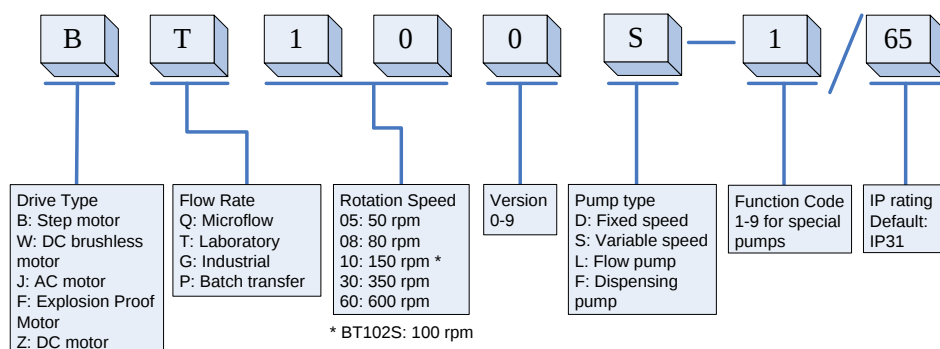


Figure 48. Dimensions (mm)

9 Naming Rule



10 Specifications

Speed resolution	0.1 rpm
Speed accuracy	0.2%
Power supply	AC 100-240V, 50Hz/60Hz
Power consumption	< 60W
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	TFT Touch Screen LCD, 65536 Colors
Dimensions (LxWxH)	285mm x 250mm x 195mm (11.2 inch x 9.8 inch x 7.7 inch)
Weight	6.5kg (14.3 lbs)

BT100F-1 Suitable Pump Heads and Tubings, Flow Parameters

Drive type	Pump heads	Ch	Tubing size (mm)	Flow rate per channel (mL/min)
BT100F-1	DG6-8 (6rollers)	8	Wall:0.8~1, ID:≤2.4	0.00016~26
	DG10-8 (10rollers)	8	Wall:0.8~1, ID:≤2.4	0.00011~20
	DG6-12 (6rollers)	12	Wall:0.8~1, ID:≤2.4	0.00016~26
	DG10-12 (10rollers)	12	Wall:0.8~1, ID:≤2.4	0.00011~20
	DG6-16 (6rollers)	16	Wall:0.8~1, ID:≤2.4	0.00016~26
	DG10-16 (10rollers)	16	Wall:0.8~1, ID:≤2.4	0.00011~20
	DG6-24 (6rollers)	24	Wall:0.8~1, ID:≤2.4	0.00016~26
	DG10-24 (10rollers)	24	Wall:0.8~1, ID:≤2.4	0.00011~20
	DT10-88	8	13# 14#, Wall:0.8~1, ID:≤3.17	0.0002~82
	YZ15	1	13# 14# 16# 19# 25# 17#	0.006~420
	YZ25	1	15# 24#	0.16~420
	2 x YZ15	2	13# 14# 16# 19# 25# 17#	0.006~420
	2 x YZ25	2	15# 24#	0.16~420
	YT15	1	13# 14# 16# 19# 25# 17# 18#	0.006~570
	YT25	1	15# 24# 35# 36#	0.017~720
	2 x YT15	2	13# 14# 16# 19# 25# 17# 18#	0.006~570
	2 x YT25	2	15# 24# 35# 36#	0.017~720
	DT15-14	1	16# 19# 25# 17#	0.05~400
	DT15-24	2	16# 19# 25# 17#	0.05~400
	DT15-44	4	16# 19# 25#	0.05~260
	KZ25	1	15# 24# 35# 36#	0.25~1200
	DMD25	1	15# 24# 35# 36#	0.3~1700

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