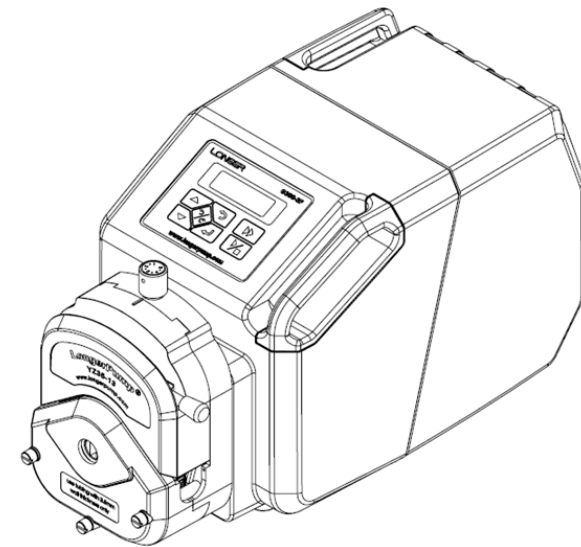


LONGER

**Industrial Peristaltic Pump
G300-3F
Operating Manual**



LONGER

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2019.8

G300-3F Peristaltic Pump

Baoding Longer Precision Pump Co.,Ltd.

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1. General Information

1.1 Precaution

The housing of the drive is provided with grounding terminal. In order to guarantee the operator's safety and improve the electromagnetic compatibility of the equipment, please ground the product reliably.

- The pump should be used properly within the scope specified in the product specifications. Otherwise, the pump may be damaged.
- This pump drive has high precision and high IP rating. Please do not disassemble, refit or maintain the product without permission, so as to avoid any damage or reduction to its performance.
- All ports at the end of the drive shall be protected against damp and water. Besides, the end caps or plugs shall be screwed up in time.
- If tubing leaks or bursts, fluid may spray from the tubing and pump head. Take reasonable practicable measures to ensure the operators' safety.
- Make sure fluid in the tubing has been drained out, no pressure in the pipeline and disconnect pump from mains power, while removing or replacing the tubing.
- Disconnect pump from the mains power before connecting the control signal wire.
- Do not touch the rotor while pump is running.
- Release the compression block when pump stop running for a long time to avoid tubing deformation caused by squeezing.
- Keep the rotor clean and dry to avoid tubing excessive wear and premature failure of pump head or drive.
- Please do not add the lubricating oil to the rotor by yourself, any improper operation could corrode the pump head housing or dislocate the tubing
- Please connect the power cord, control cable, communication cable in correct way, and do not damage the plug.
- If the pump head can't resist organic solvent and corrosive liquid, please clean the liquid left on the surface of the pump head in time.

1.2 Repair Notes

Please contact Longer or its distributor, and provide the product serial number before returning the product. Products which has been contaminated with, or exposed to, toxic chemicals or any other substance hazardous to health must be decontaminated before returning to Longer or its distributor. You must ship the product in its original packaging or better, to insure it against possible damage or loss during the transport.

1.3 Contacts Information

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2. Product Introduction

2.1 Main Features of G300-3F

G300-3F is industrial peristaltic pump drives especially designed for severe environment. Using aluminium alloy housing with anti-corrosion paint treatment, the pump has good corrosive resistance and longer life time in corrosive environment. With high IP rating, the pump could be used in wet and dusty environment. Using step motor, the pump speed could be precisely controlled with turndown ratio of 3000:1. The pump drive could be fixed with YZ35-13 and KZ35 pump head, and provide 1.0mL-5000mL/min flow rate.

2.2 Unpacking

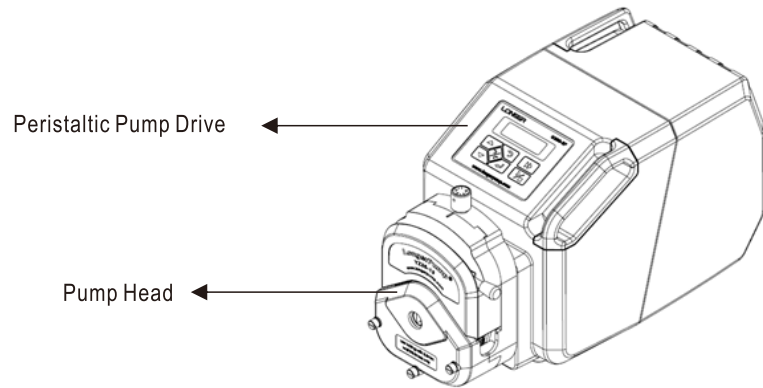
To unpack the pump, follow below steps:

- 1) Take out the pump and the accessories from the shipping carton;
- 2) In case of any question, please contact Longer or the local distributor.

2.3 System Structure

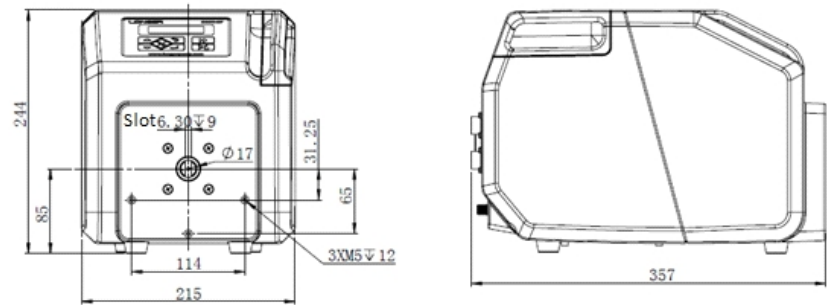
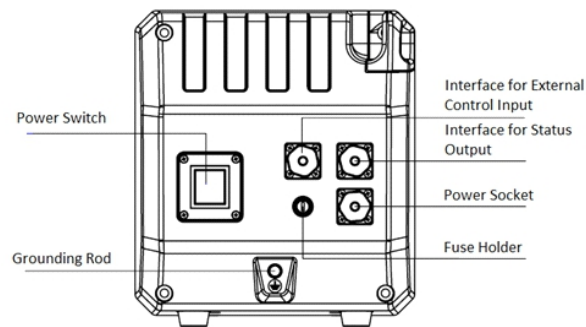
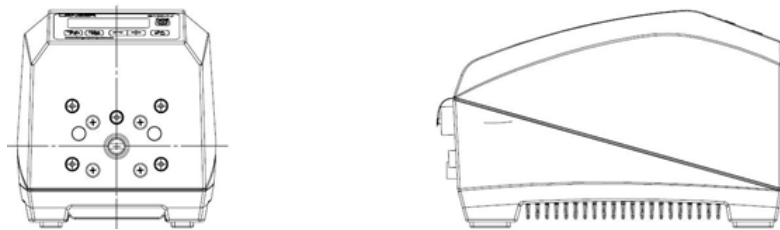
Peristaltic pump includes the following parts:

- ① Peristaltic pump drive G300-3F
- ② Pump head + tubing



2.3.1 Peristaltic Pump Drive and Outline Dimension

The pump drive is used to rotate the rotor assembly inside the pump head, to squeeze and release the tubing for fluid delivery.



2.3.2 Applicable Pump Head and Tubing, and Reference Flow Rate

The pump head and tubing are used to transfer the fluid. Please refer to below table for the applicable pump heads and tubings.

Table 1 Applicable Pump Head and Tubing, and Reference Flow Rate.

Pump Head	Applicable Silicone Tubing	Reference Flow Rate (mL/min)
YZ35 - 13	73#	1 - 3000
KZ35	82#	1.83 - 5500

Note: Only recommend silicone tubing. The flow rate in above table is only for the reference, which were tested at the indoor temperature with water. When select pump head and tubing, the decay of flow and the fluid viscosity need to be considered.

2.4 Function & Specification

2.4.1 Main Functions

- Applicable pump heads: YZ35, Kz35
- Control modes: keypad control mode, and external signal control mode (start and stop control, running direction control, and speed control)
- Running direction control: CW and CCW
- Work mode: flow rate mode and dispensing mode
- Flow rate mode: flow rate is displayed and the pump runs continuously at the set flow rate
- Flow rate calibration: improve the flow rate accuracy
- Dispensing mode: the pump dispenses continuously according to the parameters: dispensing volume, flow rate, cycles, interval, back suction.

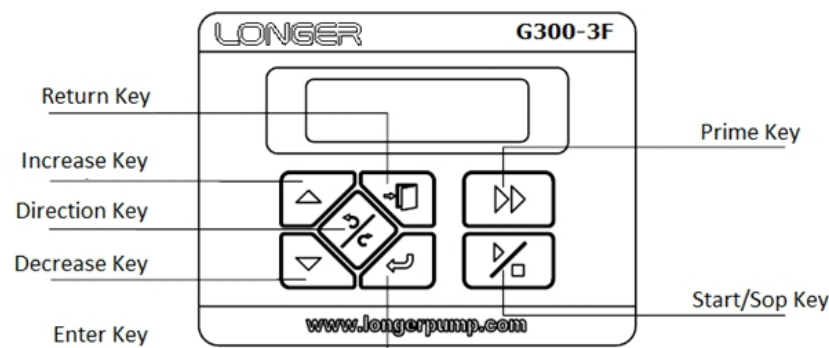
- Dispensing calibration: improve the dispensing volume accuracy.
- Prime function: fast filling or emptying at full speed.
- Back Suction: prevent the liquid dripping after dispense by setting the degrees of reverse rotation.
- Display function: LCD
- External control function: control the pump flow rate, start/stop and running direction by input external signal.
- Footswitch function: control the pump start/stop by footswitch.
- Pump status output: output the pump status of run/stop, direction and speed.
- Memory function: The status and parameters will be saved automatically, and could be used directly when power on.

2.4.2 Specifications

- Flow rate: 1.0-5500mL/min
- Speed: 0-300(rpm)
- Dispensing volume: 0.1mL-9999L
- Dispensing cycle: 0-9999, "0" means unlimited cycles
- Interval time: 1sec-99.9min
- Back suction angle: 0°-180°, resolution is 36°
- Flow rate calibration time: 30-1800 sec
- External signal control: signals for start/ stop control and running direction control are logic voltage between 5V and 12V. Signal for pump speed control is 0-5V analogue signal.
- Pump status output: run/stop, running direction and speed outputs are open-collectors. The 0-4000Hz frequency output is directly proportional to pump speed.
- Power supply: AC220V±10%, 50/60Hz
- Power consumption: <200W
- Operating environment: Ambient temperature: 0-40°C; Relative humidity: <100%
- Outline dimensions (L*W*H): 360mm×215mm×243mm
- Weight: 14kg
- IP Rating: IP65

3 System Operating

3.1 Keypad



3.2 Basic Operating (Introduction about the keypads' functions)

Start/Stop Key:

In the keypad control mode, tap the Start/Stop Key to start or stop the pump.

Direction Key:

In the keypad control mode, tap the Direction Key to change the fluid transfer direction as CW or CCW.

Prime Key:

In flow rate mode, tap the Prime Key to run the pump at full speed for the fast filling or empty operation. Then tap the Prime Key again to return to previous status.

In dispensing mode, when the pump stops, tap the Prime Key to run the pump at full speed for the fast filling or empty operation. Then tap the Prime Key again to return to the stop status.

When the pump is running at prime state (full speed by Prime Key), all parameters can be checked by Enter Key, but other keys are disabled.

Return Key:

Function 1: On the parameter setting screen, tap Return Key to cancel the parameter setting operation and return to the previous screen.

Function 2: On the running screen of dispensing mode, tap Return Key to check current speed and the dispensing time.

Increase Key/ Decrease Key:

Function 1: In non-prime state, tap the Increase Key or Decrease Key to increase or decrease the flow rate.

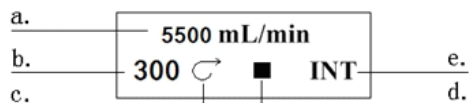
Function 2: On parameter setting screen, tap Increase Key or Decrease Key to select options, set functions or parameters.

Enter Key

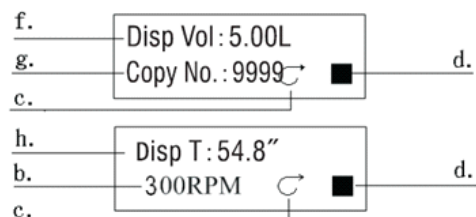
Tap the Enter Key to enter the parameter setting menu, and confirm the options, functions or parameters setting.

3.3 Running Screen

The running screen in flow rate work mode:



The running screen in dispensing work mode:

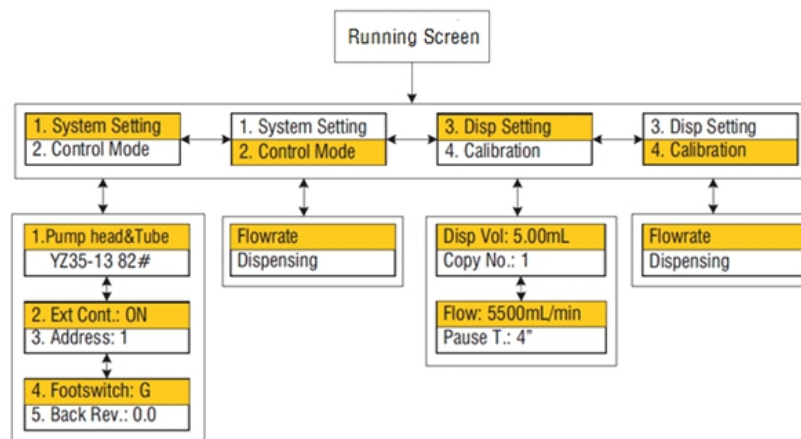


There are two screens for the dispensing mode. One screen displays the dispensing volume and cycles (Copy No.), one screen displays current pump speed and dispensing time. Tap Return Key to switch between the two screens.

Run Screen Introduction:

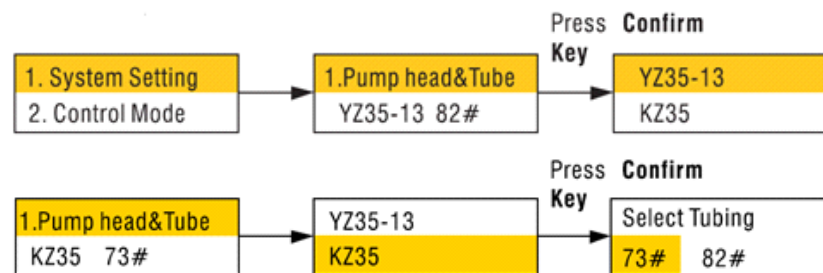
- a. Flow Rate: current flow rate, could be changed by tap Increase Key or Decrease Key.
- b. Pump Speed: current pump speed, will be changed when flow rate changes.
- c. Running Direction: pump running direction as CW or CCW.
- d. Running Status: ► means the pump is running, ■ means the pump stops. ■■ means the pump pauses. Tap Start/Stop Key to start or stop the pump and related symbol will be displayed. When pump is running in dispensing mode, the pause symbol will be displayed during the interval between each dispense.
- e. Control Mode: **INT** means keypad control mode, and external control function is enabled. **OFF** means keypad control mode and the external control function is disabled. **V** means input the external control signal and the pump is working in the external control mode.
- f. Dispensing Volume: the dispensing volume in one cycle.
- g. Copy No.: the dispensing cycles
- h. Dispensing Time: the dispensing time in one cycle. The display counts down as the dispensing proceeds. When change the dispensing volume and/or flow rate from the dispensing setting menu, the dispensing time will be changed automatically.

3.4 Setting Menu Diagram



3.5 Pump Head and Tubing Selection

Select the pump head following below procedure.



- From the running screen, tap Enter Key to enter the parameter setting menu.
- Tap Increase Key or Decrease Key to select "System Setting", and tap Enter Key to enter the system parameter setting menu.
- Tap Increase Key or Decrease Key to select "Pump head & Tube", and tap Enter Key to enter the pump head selection screen.
- Tap Increase Key or Decrease Key to select the pump head, then tap Enter Key to confirm the pump head selection and enter the tubing selection screen.
- Tap Increase Key or Decrease Key to select the tubing, then tap Enter Key to confirm the tubing selection and return to previous screen.
- During the setting procedure, tap Return Key any time to cancel current setting and return to previous screen.

3.6 Flow Rate Mode Operation

3.6.1 Set the Work Mode as Flow Rate Mode

Follow below procedure.



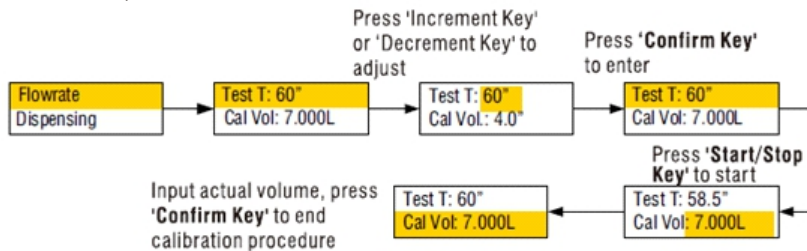
- From the running screen, tap Enter Key to enter the parameter setting menu.
- Tap Increase Key or Decrease Key to select “Control Mode”, then tap Enter Key to enter the work mode setting screen.
- Tap Increase Key or Decrease Key to select “Flowrate”, then tap Enter Key to confirm the setting and return to previous screen.
- During the setting procedure, tap Return Key any time to cancel current setting and return to previous screen.

3.6.2 Set the Flow Rate

When the pump is set as flow rate work mode, the flow rate can be set from the running screen. Tap Increase Key or Decrease Key to change the flow rate.

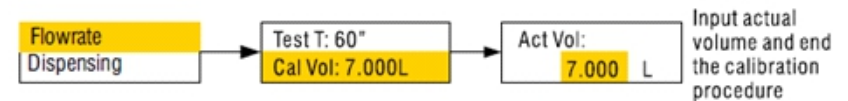
3.6.3 Flow Rate Calibration

Follow below procedure.

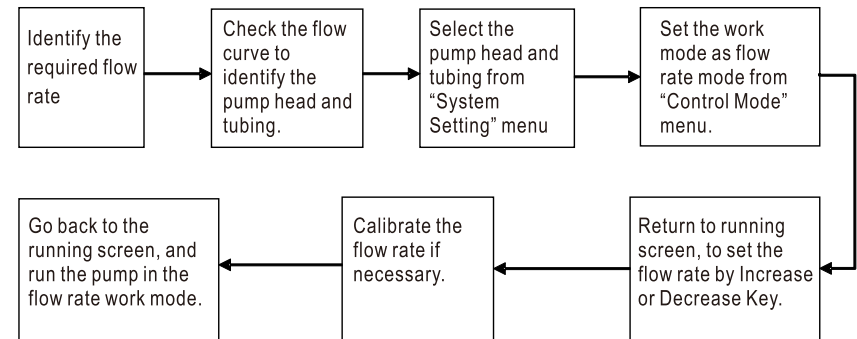


- From the running screen, tap Enter Key to enter the parameter setting menu.
- Tap Increase Key or Decrease Key to select “Calibration”, then tap Enter Key to enter the calibration menu.
- Tap Increase Key or Decrease Key to select “Flowrate”, and tap Enter Key to enter the flow rate calibration screen.
- Tap Increase Key or Decrease Key to select “Test T.”, then tap Enter Key to select the calibration time area.
- Tap Increase Key or Decrease Key to set the calibration time, then tap Enter Key to confirm the time setting.

- Tap Start/Stop Key to begin pumping a volume of fluid for calibration, and the screen will display “Run Time” counting down and “Act Vol”.
- The pump will stop when the calibration time is completed. Then tap Increase Key or Decrease Key to input the actual volume. Then tap Enter Key to confirm the actual volume, calibrate the pump and return to previous screen. This procedure can be repeated to get more accurate flow rate.
- If the actual volume for the calibration time is known in advance, the one trial pumping is not needed. After setting the calibration time, tap Increase Key or Decrease Key to select the “Cal Vol”, then tap Enter Key to enter the actual volume setting screen. Tap Increase Key or Decrease Key to set the actual volume. Then tap Enter Key to confirm the setting, calibrate the pump and return to previous screen.



3.6.4 The Procedure of Flow Rate Mode Operation



3.7 Dispensing Mode Operation

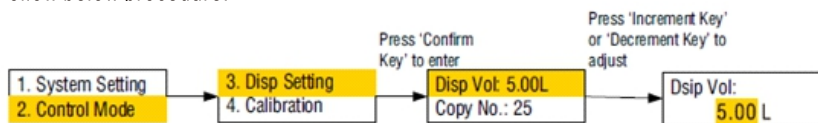
3.7.1 Set the Work Mode as Dispensing Mode

Follow below procedure.



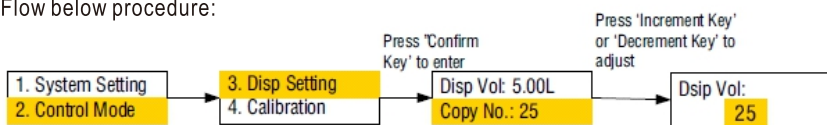
- From the running screen, tap Enter Key to enter the parameter setting menu.
- Tap Increase Key or Decrease Key to select “Control Mode”, then tap Enter Key to enter the work mode setting screen.
- Tap Increase Key or Decrease Key to select “Dispensing”, then tap Enter Key to confirm the setting and return to previous screen.
- During the setting procedure, tap Return Key any time to cancel current setting and return to previous screen.

3.7.2 Set the Dispensing Volume
Follow below procedure.



- From the running screen, tap Enter Key to enter the parameter setting menu.
- Tap Increase Key or Decrease Key to select “Disp Setting”, then tap Enter Key to enter the dispensing parameter setting menu.
- Tap Increase Key or Decrease Key to select “Disp Vol”, and tap Enter Key to enter the dispensing volume setting screen.
- Tap Increase Key or Decrease Key to set the dispensing volume, then tap Enter Key to confirm the setting and return to previous screen.
- During the setting procedure, tap Return Key any time to cancel current setting and return to previous screen.

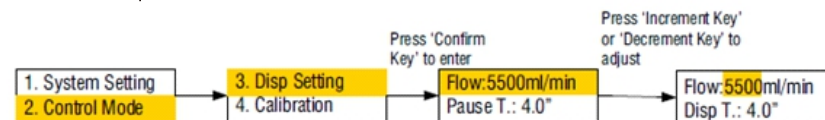
3.7.3 Set the Dispensing Cycle Number
Flow below procedure:



- From the running screen, tap Enter Key to enter the parameter setting menu.
- Tap Increase Key or Decrease Key to select “Disp Setting”, then tap Enter Key to enter the dispensing parameter setting menu.
- Tap Increase Key or Decrease Key to select “Copy No.”, and tap Enter Key to enter the dispensing cycle number setting screen.
- Tap Increase Key or Decrease Key to set the cycle number, then tap Enter Key to confirm the setting and return to previous screen.
- During the setting procedure, tap Return Key any time to cancel current setting and return to previous screen.

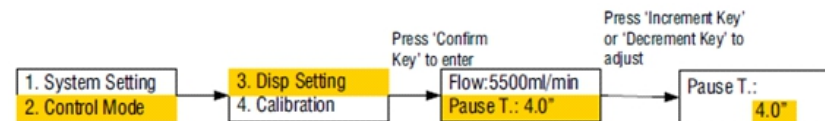
Note: The range of dispensing cycle number is 0-9999. “0” means unlimited cycles, then dispensing process only can be stopped by tapping Start/Stop Key.

3.7.4 Set the Flow Rate for Dispensing Process
Follow below procedure.



- From the running screen, tap Enter Key to enter the parameter setting menu.
- Tap Increase Key or Decrease Key to select “Disp Setting”, then tap Enter Key to enter the dispensing parameter setting menu.
- Tap Increase Key or Decrease Key to select “Flow”, and tap Enter Key to select the flow rate setting area.
- Tap Increase Key or Decrease Key to set the flow rate, then tap Enter Key to confirm the setting and return to previous screen.
- During the setting procedure, tap Return Key any time to cancel current setting and return to previous screen.

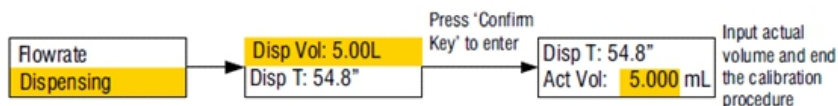
3.7.5 Set the Interval Time
Follow below procedure.



- From the running screen, tap Enter Key to enter the parameter setting menu.
- Tap Increase Key or Decrease Key to select “Disp Setting”, then tap Enter Key to enter the dispensing parameter setting menu.
- Tap Increase Key or Decrease Key to select “Pause T.”, and tap Enter Key to enter the interval time setting screen.
- Tap Increase Key or Decrease Key to set the interval time, then tap Enter Key to confirm the setting and return to previous screen.
- During the setting procedure, tap Return Key any time to cancel current setting and return to previous screen.

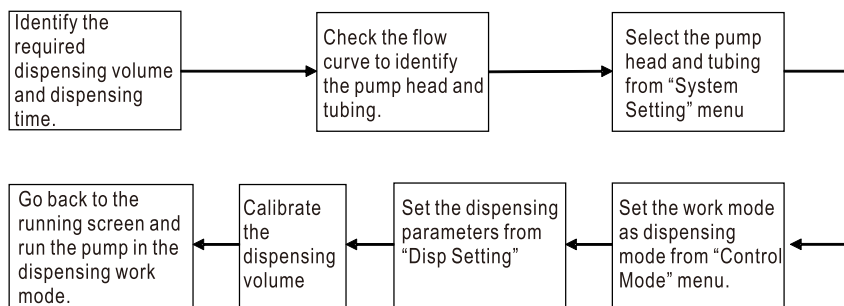
3.7.6 Dispensing Calibration

Follow below procedure.



- From the running screen, tap Enter Key to enter the parameter setting menu.
- Tap Increase Key or Decrease Key to select "Calibration", then tap Enter Key to enter the calibration menu.
- Tap Increase Key or Decrease Key to select "Dispensing", and tap Enter Key to enter the dispensing calibration screen. The "Disp Vol" and "Disp T" are dispensing volume and dispensing time set through "Dispensing Setting" screen, and can not be modified here.
- Tap Start/Stop Key to begin one trial dispensing for calibration, and the screen will display dispensing time counting down.
- The pump will stop when the dispensing time is completed. Then tap Increase Key or Decrease Key to input the actual volume. Then tap the Enter Key to confirm the actual volume, calibrate the pump and return to previous screen.
- This procedure can be repeated to get more accurate flow rate.
- If the actual volume for the dispensing time is known in advance, the one trial dispensing is not needed. After "running screen"->"Calibration"->"Dispensing", tap Enter Key to enter the actual volume setting screen. Tap Increase Key or Decrease Key to set the actual volume, then tap Enter Key to confirm the setting, calibrate the pump and return to previous screen.

3.7.7 The Procedure of Dispensing Mode Operation

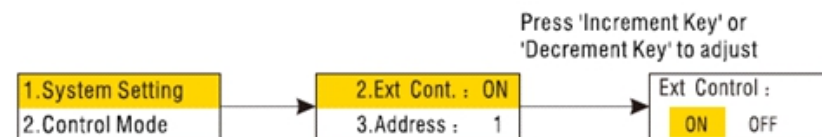


3.8 External Signal Control

Control the pump flow rate, start/stop and running direction by input external signal.

3.8.1 External Control Function Enable/Disable

Follow below procedure:

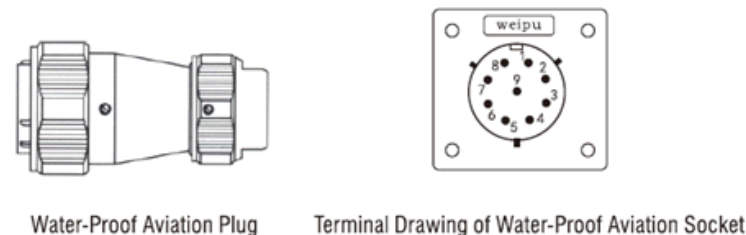


- From the running screen, tap Enter Key to enter the parameter setting menu.
- Tap Increase Key or Decrease Key to select "System Setting", then tap Enter Key to enter the system parameter setting menu.
- Tap Increase Key or Decrease Key to select "Ext Cont.", then tap Enter Key to enter the external control function enable screen.
- Tap Increase Key or Decrease Key to select "No" for enable or "OFF" for disable, then tap Enter Key to confirm the setting and return to previous screen.
- During the setting procedure, tap Return Key any time to cancel current setting and return to previous screen.

Note:

When the external control function is enabled, the pump will operate accordingly when input the external control signal.
When the external control function is disabled, the pump will not operate when input the external control signal.

3.8.2 Definition of External Control Port



Pin 1: External flow rate control signal input. Connected to 0-5V signal+. The flow rate is directly proportional to the signal.

Pin 2: External start/stop control input. Low input or no connection for pump running. High input (logic voltage between 5V and 12V) for pump stop.

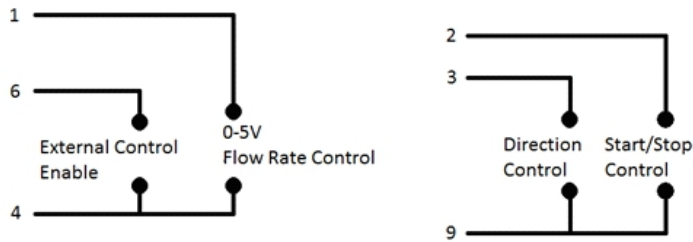
Pin 3: External direction control input. Low input or no connection for clockwise rotation. High input (logic voltage between 5V and 12V) for counter-clockwise rotation.

Pin 4: Analog ground AGND for 0-5V flow rate signal,

Pin 4/Pin 6: External control enable signal. Connect a remote switch between pin 4 and pin 6. Switch open, the external control function is disabled. Switch close, the external control function is enabled.

Note: In order to control the pump remotely, the external control function needs to be enabled both through the software and the switch signal. Refer to 3.8.1 for the software enable.

Pin 9: COM for the start/stop signal and direction signal.



Wiring Diagram of External Control Port

Note:

In order to maintain the IP65 rating, the water-proof aviation socket is used for this pump. Please tighten the gap of aviation socket to protect the pump from water or moisture.

3.9 Footswitch Control

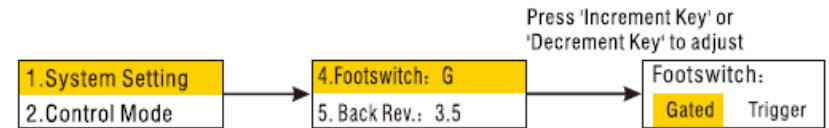
Connect the footswitch to the external control port, the start/stop of the pump can be controlled by footswitch. At this time the flow rate and direction are still controlled by keypad.

There are two work modes with the footswitch:

1. Trigger: The pump status of run/stop will be changed when footswitch is pressed once. The status will be maintained when the footswitch is released.

2. Gated: The pump will be one status when footswitch is pressed, and will be another status when footswitch is released. The status depends on the control logic of the footswitch. When the switch inside the footswitch is open, the pump runs. When the switch inside the footswitch is closed, the pump stops.

Follow below procedure to set the footswitch work mode:



- From the running screen, tap Enter Key to enter the parameter setting menu.
- Tap Increase Key or Decrease Key to select “System Setting”, then tap Enter Key to enter the system parameter setting menu.
- Tap Increase Key or Decrease Key to select “Footswitch”, then tap Enter Key to enter the footswitch work mode setting screen.
- Tap Increase Key or Decrease Key to select “Gated” or “Trigger”, then tap Enter Key to confirm the setting and return to previous screen.
- During the setting procedure, tap Return Key any time to cancel current setting and return to previous screen.

Note:

1. To use footswitch control the pump, don't need to set the external control enable through software. This pump will recognize the footswitch automatically. When the footswitch is connected to the external control port, the Start/Stop Key on the keypad will be disabled. Then to start or stop the pump through the footswitch.
2. Footswitch is an optional accessory. Customer needs to order it except the pump.
3. The footswitch should be pulled out from the external control port to recover the function of Start/Stop Key, if the footswitch control is not necessary. And the gap of aviation socket should be tightened to protect the pump from water or moisture.

3.10 Back Suction Setting

Follow below procedure to set the back suction angle:



From the running screen, tap Enter Key to enter the parameter setting menu.

Tap Increase Key or Decrease Key to select “System Setting”, then tap Enter Key to enter the system parameter setting menu.

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Tap Increase Key or Decrease Key to select “Back Rev.”, then tap Enter Key to enter the back suction setting screen.

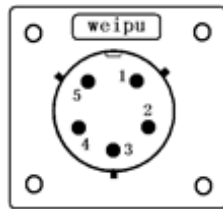
Tap Increase Key or Decrease Key to set the back suction angle, then tap Enter Key to confirm the setting and return to previous screen.

During the setting procedure, tap Return Key any time to cancel current setting and return to previous screen.

The setting range of back suction angle is 0°-1800°, and adjust resolution is 36°.

3.11 Pump Status Output

The pump status outputs of run/stop, running direction and speed are open-collectors. The pull-up resistor and power supply are needed when use these outputs. The required driven current is 5-10mA.



The interface for output is water-proof aviation socket. The pins definition are:

Pin 1: Run/stop status output. Low level signal for running, and high level signal for stop.

Pin 2: Direction status output. Low level signal for clockwise rotation, and high level signal for counter-clockwise rotation.

Pin 3: Pump speed output. The 0-4000Hz frequency output is directly proportional to pump speed.

Pin 4: COM for all outputs.

