SL360

Peristaltic Pump

User Manual

Safety Information

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

1) Please turn off the drive power before install or disassemble the pump head and tubing, otherwise fingers or coat corner may get caught into the drive;

2) Turn off the power before connecting to external control equipment, otherwise the pump may get damaged;

3) Site the pump on a flat, horizontal, rigid surface, free from excessive vibration;

4) Site the pump in a protected place to avoid being stepped over, which may lead to personal injuries;

5) Pull out the power plug before cleaning the pump;

6) You are forbidden to break down, alternate or repair this product. If needed, please contact us.

Attention

1) Before using peristaltic pump, please carefully go through this manual

and make sure you fully understand this manual;

2) Before using peristaltic pump, please carefully go through and follow the safety guidance in this manual;

3) Pump tubing is consumable product, long time using may lead to split because of fatigues, please inspect and change tubing frequently so as to avoid unnecessary leaking accidents;

4) Take care of this manual.

Warning! 

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

Contents

Chapter 1: General

SL360 Peristaltic Pump is a large volume and large torque pump. Large LED screen enables clear and intuitive display of all specifications and English-Chinese menu. The control panel and buttons on it are programmed to adjust all data. There are four work mode available: Speed, Flow Rate, Volume & Speed, and Volume & Time.

The pump house is made of SS metal with linear design, IP56.

The pump is equipped with AC Servo System of large torque. Maintenance free, stable operation. Fits for the application of large volume transfer and dispense.

The pump with XC 45 pump head as below:

The product consists of two main parts:

a) Pumphead Please refer to *Pumphead Instruction* for more information

b) Drive Main part of the pump (power source)

Chapter 2: Product Introduction

2-1 Function

- LED display of specifications, clear and intuitive.
- User-friendly operation menu, easy to operate.
- Flexible operation mode, fits for different applications.
- Button beep can be enabled and disabled.
- Start/Stop control by external electricity level and pulse signals enabled.

➢ Speed (or flow rate) control by external 4-20mA current (or 0-5V voltage) signal enabled.

➢ Start/Stop, Speed control by communication protocol (RS485) enables.

➢ AC Servo System, large torque and maintenance free.

➢ Auto memory service. The pump will automatically resume the operation from the last power off setup.

➢ Capable of data storage for reference to improve the work efficiency.

2-2 Specification

SL360 Peristaltic pump specification as below:

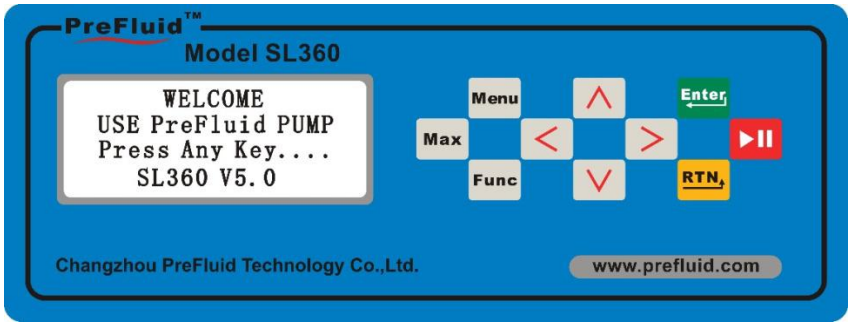
Model	**SL360**
Pumphead	XC45
Motoe	Large Torque. Quiet Operation. Maintenance Free.
Display	Large LED screen enables clear display of all specifications and English-Chinese menu.
Control	Membrane Control Panel controls Speed or Volume. Designed with Volume Calculation or Time Mode. Capable of running at Fixed Volume & Fixed Speed and Fixed Volume & Fixed Time.

Optional Appendix	Foot Switch etc.
Speed Range	0.1～360.0rpm
Step	0.1rpm
Adjust Control	Membrane Control Panel with button beep
External Control	RS485 Communication, Level(or pulse), 4-20mA (or 0-5V), control of Start/Stop, Speed (or Volume)
Voltage	AC110±10％ 50/60HZ
Working Environment	Temperature 0-50℃， Humidity<80%
Dimension	460×290×320
Weight	21Kg
IP	IP56

Chapter 3: Control Panel and Back Panel

3-1 Control Panel

The control panel consists of a LED screen and 10 membrane button, as below:



➢ **LED Screen：** Displays pump parameters and work mode.

➢ **Buttons：**

 —— Start/Stop

 —— Enter Setup Specifications and Data

 —— Return Return to the last menu or to exit

 —— Down Turn down the parameter

 —— Up Turn up the parameter

 —— Right Adjust data

 —— Left Adjust data

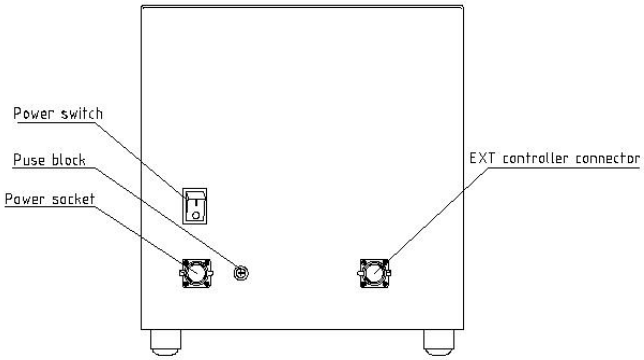
Max —— Prime After setting up of prime direction, press this to quickly prime or empty the tubing by running at MAX speed.

Menu —— Menu Switch between Work Mode and Setup menu

Func —— Function Use with other buttons: 1. with Enter to enter data adjust menu; 2. with Menu to enter calibration menu; 3. with < or > to switch running direction; 4. with ∧ or ∨ to switch between speed and volume in certain work mode; 5. with Max to reset(return all data to zero) in certain work mode.

3-2 Back Panel

The back panel consists external connector, power socket, fuse block and power switch, as below:



- **Power Switch：** “I”as ON，“O”as OFF.
- **Power Socket：** 110V AC input plug-in
- **External Connector：** Signal input for external control of Start/Stop and Speed.
- **Note：** Please refer to details for external control in the later chapters.

Chapter 4: Operation Instruction

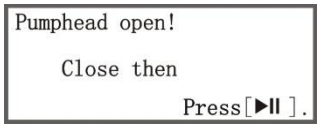
4-1 Pumphead and Tubing Installation

Please follow the *Pumphead Instruction*, and install the pumphead and tubing first.

4-2 Power on

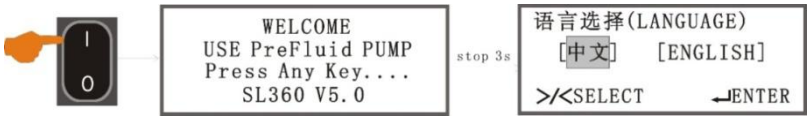
➢**Warning： Please confirm that you have the right power voltage.**

➢**Warning： Please confirm the pump head is rightly closed. Otherwise there will be a warning as below:**



➢ Power Switch: “I” as on, “0” as off.

➢ For first time turn on (for new machine) or if you have resume the default setup, you will need to set up the language. There are two options: Chinese and English. First the display will be a welcome page. Press any button, or you can wait for three seconds, the program will get to language setup. Choose English. Press Enter to confirm and get into WORKMODE menu.

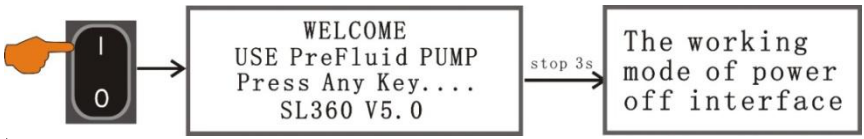


There are four work mode available:

- Speed: Setup the speed and running direction, and starts the operation.
- Flow rate: Setup the flow rate (speed) and running direction, and starts the operation.
- Volume & Speed: Setup and store and resume fixed volume and fixed speed data, and starts the operation.
- Volume & Time: Setup and store and resume fixed volume and fixed time data, and starts the operation. Timed dispense enabled.

➢ To enter into WORKMODE menu:

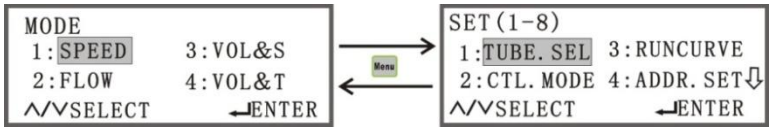
- Press RTN or Menu or RTN + Menu in other menu interface, all enables WORKMODE interface immediately.



➢ After the initial start-up, the power on procedure will be as below:

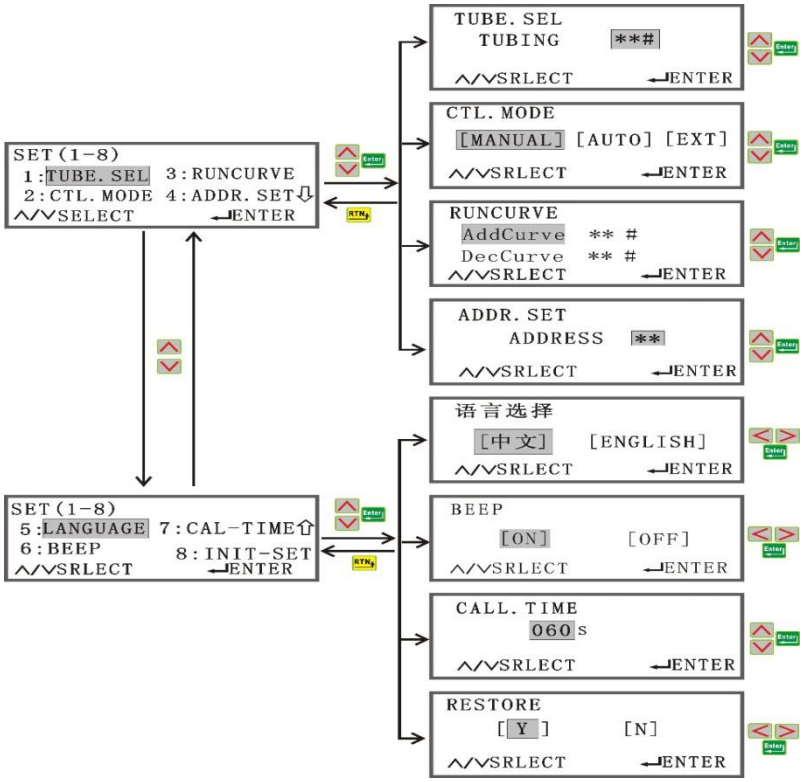
4-3 System Setup

Press Menu to get into the Setup Menu.



Note: Press Menu to shift between the two menus:

Setup Menu instructions:



Tubing Selection: Choose the right tubing according to the pumphead and your application.

➢ **Control Mode:** Choose the control mode of the pump. There are

Manual control, Auto control and external control modes. The selected work mode will be displayed on the screen.

Note: In Auto Mode, the setup options of INTERNAL will be enabled.

➢ **Run Curve:** Set up the time duration of start (from 0rpm to current speed) and stop (from current speed to 0rpm). There are 10 curves available, you can choose the right curve for your application according to the fluid viscosity.

Curve	1#	2#	3#	4#	5#	6#	7#	8#	9#	10#
Time(s)	0.02	0.2	0.5	1	2	3	4	5	7.5	10

For example:

Add Curve 1# represents that when starting up, it takes 20ms to reach 360rpm from 0 rpm.

Decrease Curve10#, represents that when stopping, it takes 10s to reach 0rpm from 360rpm.

➢ **Address Setup:** When there are multiple pumps in the same system, you need to setup the pump address (1-16). The default address is 01#.

➢ **Language:** Options of different languages available.

➢ **Beep:** Choose to enable or disable the button beep.

➢**Calibration Time:** The time for each calibration attempt. Range: 5-500s.

Note: Only available in Volume Calculation Mode and Fixed Volume & Fixed Speed Mode. When calibrating, just input your actual volume after the test run, no matter what your calibration time is.

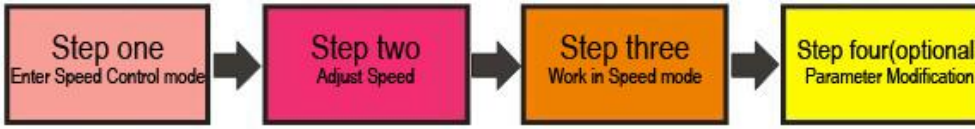
➢ **Restore Default Setting:** When the setups are messed up, use the default setting to reset.

Note: Once you've restored the default setting, all stored data and setups will be wiped out, and the menu will return to the "First time on" display. Please take precaution consideration before using.

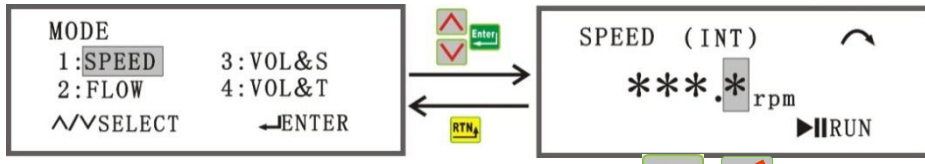
4-4 Speed Control Mode

4-4-1 Internal Control Mode Operation:

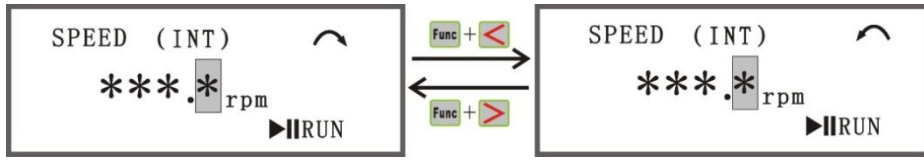
Note: Must choose *Auto Mode* or *Manual Mode* in *System Setup*.



Step one: Enter Speed Control Mode



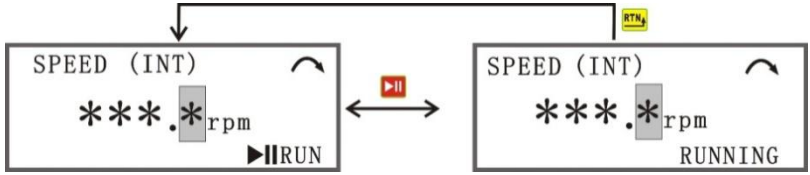
➢ : CW Rotation; : CCW Rotation。Use Func + or Func + , you can change the rotation direction, as below:



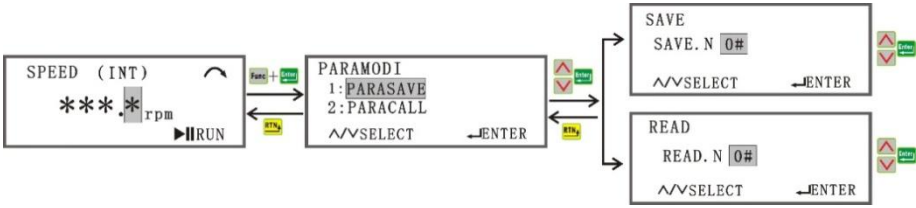
Step two: Adjust Speed

Press Enter or < or > to choose the digits adjusted. Press ∧ once, the digit increases 1. Keep pressing the button, the number will keep on increasing. The longer you hold, the quicker it increases. Press ∨, it works the same way down. When the number exceeds the speed limitation, it will stop changing. Press Enter to confirm the speed.

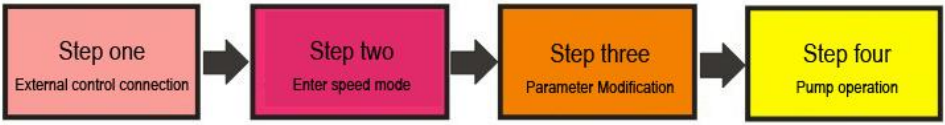
Step three: Work in Speed Mode



Step four (optional): Parameter Modification (Press Func + Enter)



4-4-2 External Control Mode Operation:

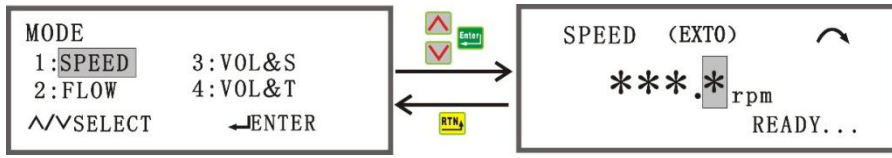


Step one: External control connection (Please refer to Chapter Five: External Connection Instruction)

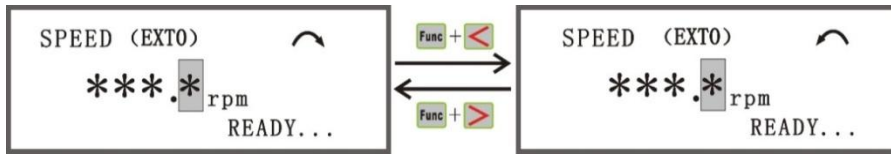
There are five connection method available. Please refer to the following instructions to choose the right method.

Step two: Enter speed mode

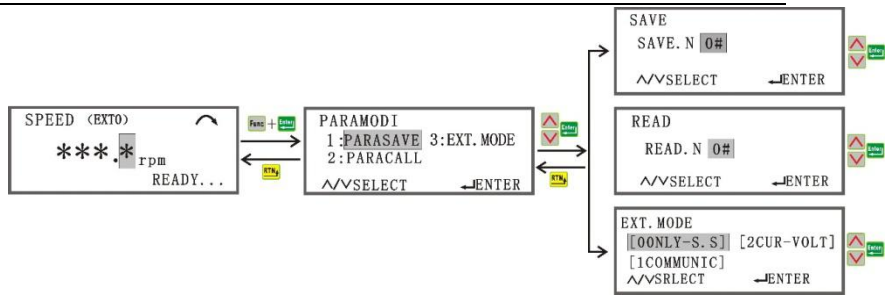
Note: Must choose “External Control” in “System Setup” first.



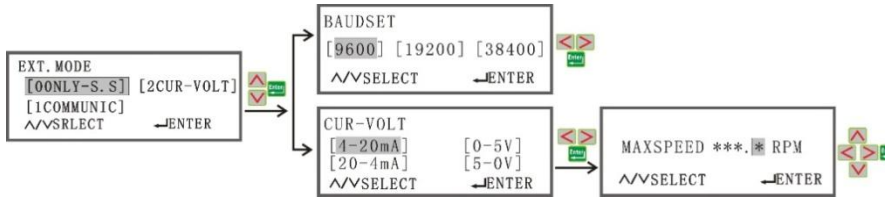
➢ ：CW Rotation；：CCW Rotation。Use Func + or Func + , you can change the rotation direction, as below:



Step three: Parameter Modification (Press Func + Enter)



To modify the parameter:



➢ **Parameter Save:** There are up to 10 storage units available.

➢ **Parameter Read:** To read the stored parameter.

➢ **0 Only Start-Stop:** EXT0. Speed and running direction is still controlled by the panel, and Start-Stop is controlled by external control devices (level or pulse).

➢ **1 Communication:** EXT1. Speed, running direction, start-stop are all controlled via RS485 by external devices. There are three Baud Rate.

The communication protocol is MODBUS. You can ask for it or download it from website.

- **2 Current-Voltage:** EXT2. Current controls the speed; level controls running direction. Start-stop control method is the same as EXT0.
- **Current-Voltage:** Current controls the speed; level controls running direction. Start-stop control method is the same as EXT0.
- **Max Speed:** Setup the max speed for current-voltage control. For example: Set the max speed as 360rpm, and choose 4-20mA control, then the speed range will be 0.1-360rpm accordingly. Set the max speed as 360rpm, and choose20-4mA control, then the speed range will be 0.1-360rpm accordingly.

Step four: Pump operation

1. Choose **0ONLY-S.S** in the system, the speed and running direction will be controlled by the panel, and start-stop will be controlled by the external control device.

   Choose **Connection One**: Level control. Connect pin 2 and pin 8 to other control device. When pin 2 and pin 8 are connected, the pump starts; when they are disconnected, the pump stops.

   Choose **Connect Two**: Pulse control. Connect pin 2 and pin 9 to

other control device. When pin 2 and pin 9 are connected, the pump starts; when they are disconnected, the pump stops.

2. Choose **1COMMUNIC** in the system, and speed, running direction, start-stop are all controlled via RS485 by external devices. There are three Baud Rate. The communication protocol is MODBUS. You can ask for it or download it from website.
3. Choose **2CUR-VOLT** in the system, and speed, running direction, start-stop are all controlled by external devices.

   Choose **Connection Three or Four.** Pin 2 is GND. Inputting current or voltage signal through Pin 5 (voltage is zero between Pin5 and Pin2) will create control of speed. Pin 2 and pin 3 controls running direction. In connection, CW; disconnected, CCW. The start-stop control is the same as 0ONLY-S.S.

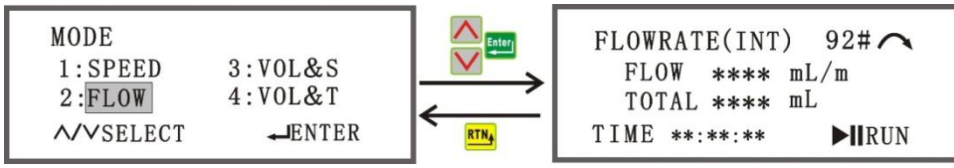
Note: If you are using an external device (such as PLC) to control the pump, you can use power switch (such as a relay) to control, or you can use a level control through pin 2. Connected means closed switch, or a low level TTL through pin 2 (no more than 0.5V). Disconnected means opened switch, or a high level

TTL through pin 2 (no less than +3.0V, max +24V).

4-5 Flow Rate Mode

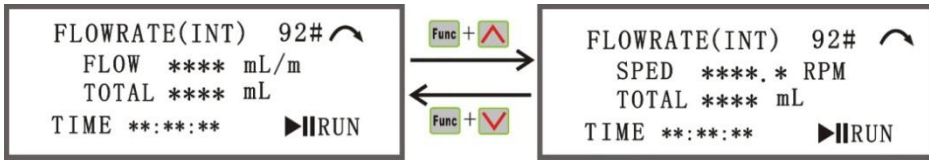
4-5-1 Internal Control Mode Operation

Step One: Enter into flow rate mode



Note: You must use “Tubing Selection” in the system Setup and choose the control method of Auto or Manual first.

You can make switch between flow rate and speed, as below:

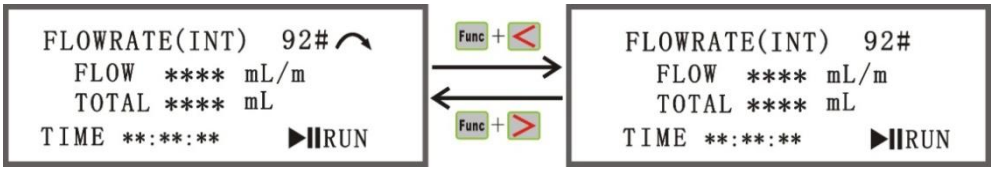


➢ Flow rate: The fluid the pump handles every minute. The speed is calculated according to the flow rate and tubing size. Before calibration, the pump will use the default data. After calibration, the new data will be generated. You can switch between speed and flow rate.

➢Total: Total amount of fluid accumulated.

➢Time: The accumulated time of running.

➢**92#:** The tubing in example is 92#. You can change it in System Setup.



➢ ： CW Rotation； ： CCW Rotation。Use Func + < or Func + >, you can change the rotation direction, as below:

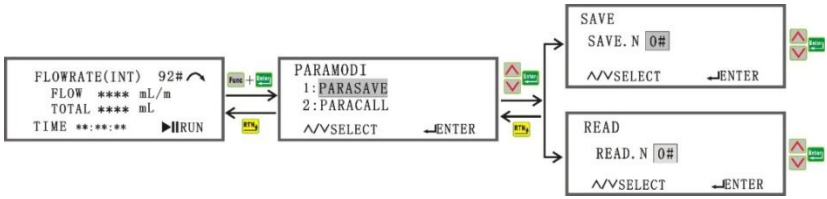
Step Two: Adjust flow rate

Press Enter or < or > to choose the digit. Press ∧ once, the number increases by 1.

Press ∨ once, the digit decreases by 1. Press Enter to confirm. The measure of mL/m and L/m will switch automatically.

Note: Since there is speed limit to the pump, there is flow rate limit as well. When the number exceeds the limitation, it will stop

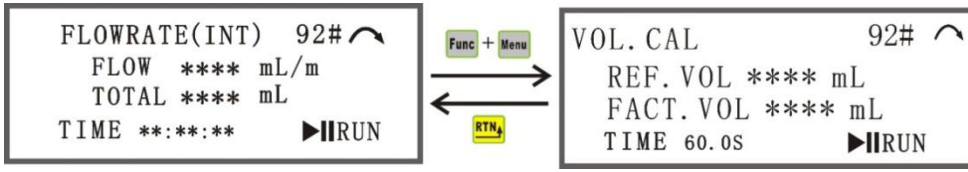
changing.

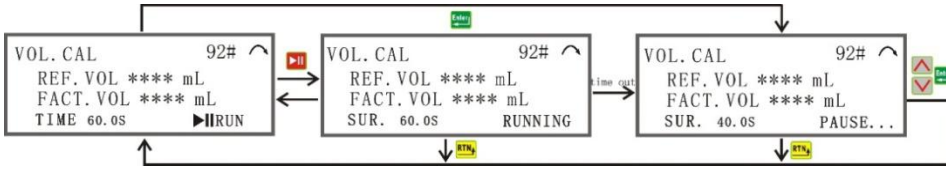


Step Three: Parameter Modification (Press Func + Enter)

Step Four: Flow rate calibration

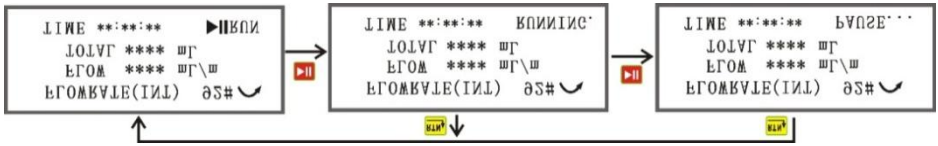
In order to match the displayed flow rate to the actual flow rate, calibration is needed. Press Func + Menu to get calibration menu, as below:





The calibration works as below:

Note: The default Calibration running time is 1 minute. You can change it in System Setup. The time will count down in calibration. Enter the actual flow rate and confirm to finish calibration. This process can be repeated to achieve higher accuracy.



Step Five: Flow rate work mode

Note: Press RTN, to get back to main menu. Press Func + Max then, the accumulated total flow rate and time will be reset to 0.

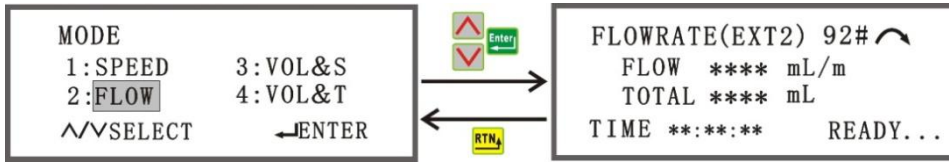
4-5-2 External Control Mode Operation

Step One: External Connector Connection (Please refer to Chapter Five: External Connection Instruction)

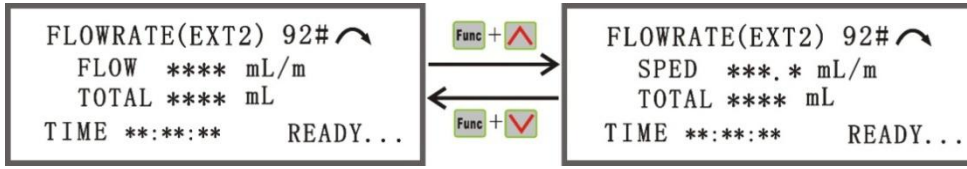
There are five connection method available. Please refer to the following instructions to choose the right method.

Step Two: Enter Flow Rate Work Mode

Note: You must use "Tubing Selection" in the system Setup and choose the control method of **External** first.



You can make switch between flow rate and speed, as below:



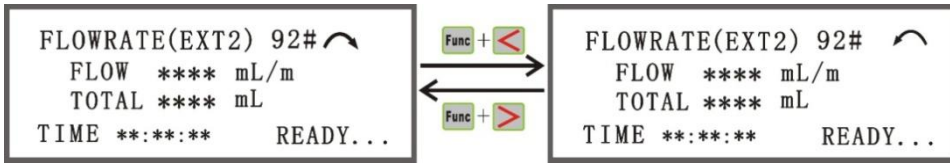
➢ **Flow rate:** The fluid the pump handles every minute. The speed is calculated according to the flow rate and tubing size. Before calibration, the pump will use the default data. After calibration, the new data will be generated. You can switch between speed and flow rate.

➢**Total:** Total amount of fluid accumulated.

➢**Time:** The accumulated time of running.

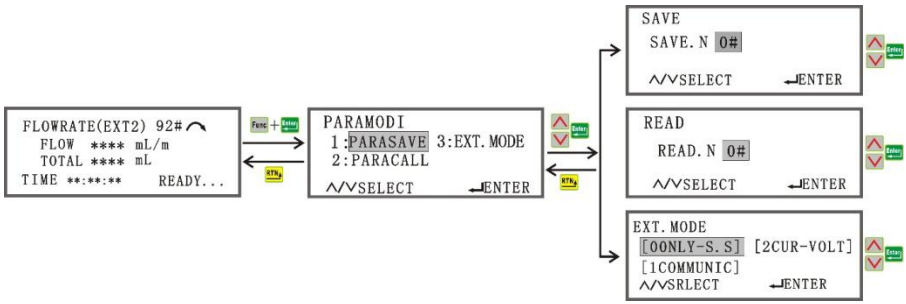
➢**92#:** The tubing in example is 92#. You can change it in System Setup.

➢ ↷ : CW Rotation ; ↶ : CCW Rotation 。 Use Func + < or Func + >, you can change the rotation direction, as below:



Step Three: Parameter Modification

Press Func + ∧ or Func + ∨ to get into the menu, as below:



➢ **Parameter Save:** There are up to 10 storage units available.

➢ **Parameter Read:** To read the stored parameter.

➢ **0 Only Start-Stop:** EXT0. Speed and running direction is still

controlled by the panel, and Start-Stop is controlled by external control devices (level or pulse).

➢ **1 Communication:** EXT1. Speed, running direction, start-stop are all controlled via RS485 by external devices. There are three Baud Rate. The communication protocol is MODBUS. You can ask for it or download it from website.

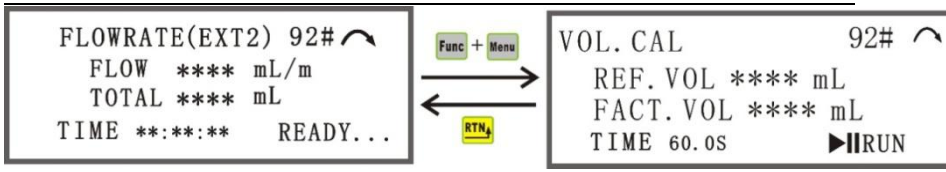
➢ **2 Current-Voltage:** EXT2. Current controls the speed; level controls running direction. Start-stop control method is the same as EXT0.

➢ **Current-Voltage:** Current controls the speed; level controls running direction. Start-stop control method is the same as EXT0.

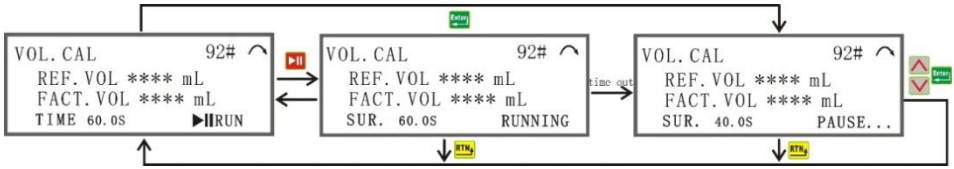
➢ **Max Speed:** Setup the max speed for current-voltage control. For example: Set the max speed as 360rpm, and choose 4-20mA control, then the speed range will be 0.1-360rpm. Set the max speed as 360rpm, and choose20-4mA control, then the speed range will be 360-0.1rpm.

Step Four: Flow Rate Calibration

In order to match the displayed flow rate to the actual flow rate, calibration is needed. Press Func + Menu to get calibration menu, as below:



The calibration works as below:



Note: The default Calibration running time is 1 minute. You can change it in System Setup. The time will count down in calibration. Enter the actual flow rate and confirm to finish calibration. This process can be repeated to achieve higher accuracy.

Step Five: Pump operation

1. Choose **0ONLY-S.S** in the system, the speed and running direction will be controlled by the panel, and start-stop will be controlled by the external control device.

   Choose **Connection One**: Level control. Connect pin 2 and pin 8

to other control device. When pin 2 and pin 8 are connected, the pump starts; when they are disconnected, the pump stops.

Choose **Connect Two**: Pulse control. Connect pin 2 and pin 9 to other control device. When pin 2 and pin 9 are connected, the pump starts; when they are disconnected, the pump stops.

2. Choose **1COMMUNIC** in the system, and speed, running direction, start-stop are all controlled via RS485 by external devices. There are three Baud Rate. The communication protocol is MODBUS. You can ask for it or download it from website.
3. Choose **2CUR-VOLT** in the system, and speed, running direction, start-stop are all controlled by external devices.

   Choose **Connection Three or Four.** Pin 2 is GND. Inputting current or voltage signal through Pin 5 (voltage is zero between Pin5 and Pin2) will create control of speed. Pin 2 and pin 3 controls running direction. In connection, CW; disconnected, CCW. The start-stop control is the same as 0ONLY-S.S.

Note: If you are using an external device (such as PLC) to control the pump, you can use power switch (such as a relay) to control, or you can use a

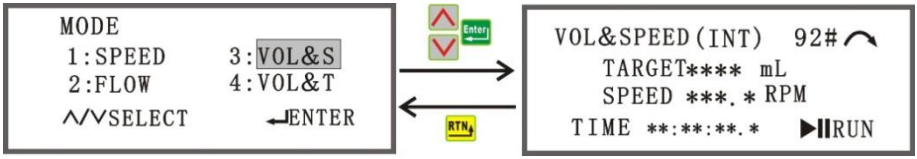
level control through pin 2. Connected means closed switch, or a low level TTL through pin 2 (no more than 0.5V). Disconnected means opened switch, or a high level TTL through pin 2 (no less than +3.0V, max +24V).

4-6 Volume & Speed Mode

4-6-1 Internal Control Mode Operation

Step One: Enter Vol&S Mode

Note: You must make Tubing Selection in System Setup and choose **Internal Control** first.



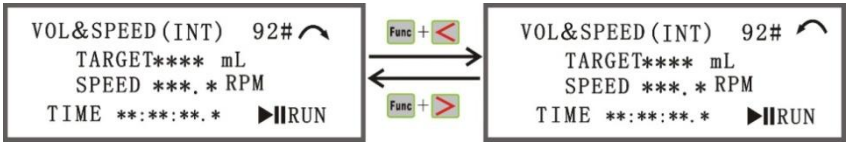
➢ **Target:** Input your target volume, the pump will stop when it hits the target.

➢**Speed (Flow Rate):** The speed (or flow rate) of the pump. You can press Func + ∧ or Func + ∨ to switch between speed and flow rate.

➢**Time:** Calculation of time based on target volume and flow rate.

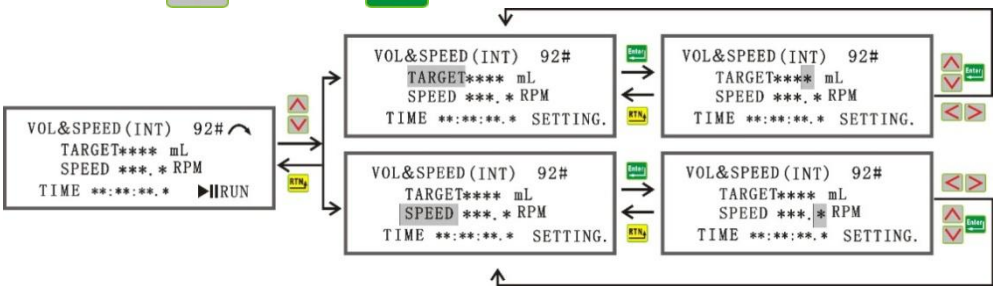
➢**92#:** The tubing is 92#. You can change it in System Setup.

➢ ↷**: CW motor running direction;** ↶**: CCW motor running direction.** **Press** Func + < or Func + > to change the running direction, as below:



Step Two: Input Target Volume and Speed (Flow Rate)

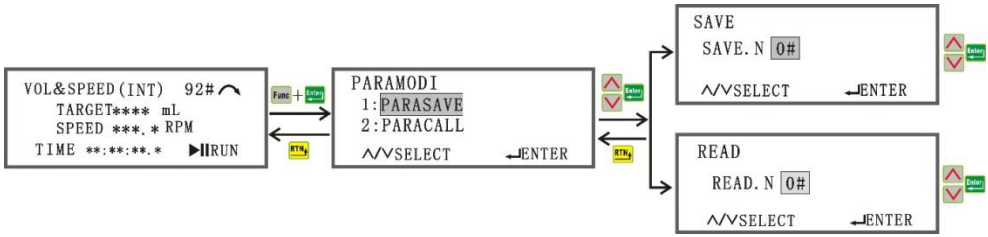
Press ∨ and then Enter to choose Target. The last digit of



Target Number will be highlighted. Press < or > to choose the digit you want to change, and press ∧ once to increase the digit by 1; press ∨ to decrease the digit by 1. Keep pushing until you get the number you want. Press Enter to confirm. You can set up the speed (flow rate) in the say way. When you are ready, press RTN to return to Vol&S work mode interface.

Note: In this setup process, the program will automatically calculate the time needed and the max is 100hrs. The pump has its limitation in speed and time, as a result, when the number hits the limitation, the number will remain unchanged.

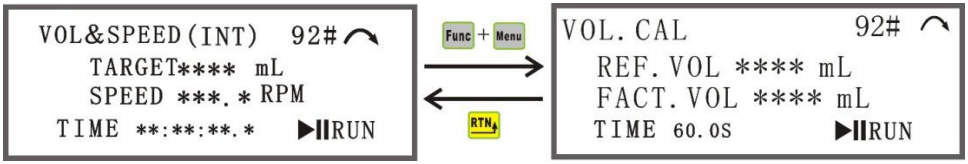
Step Three: Parameter Modification. Press Func + Enter:



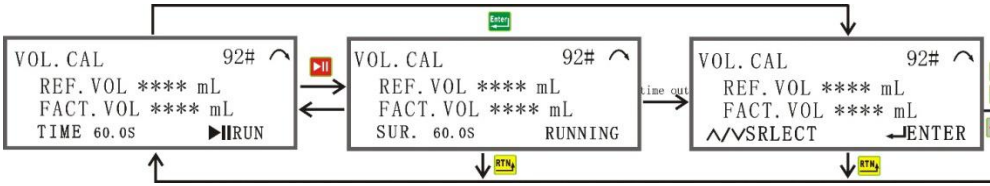
Step Four: Flow Rate Calibration

In order to match the displayed flow rate to the actual flow rate,

calibration is needed. Press Func + Menu to get calibration menu, as below:

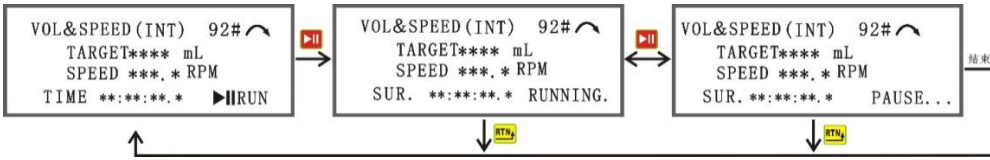


The calibration works as below:

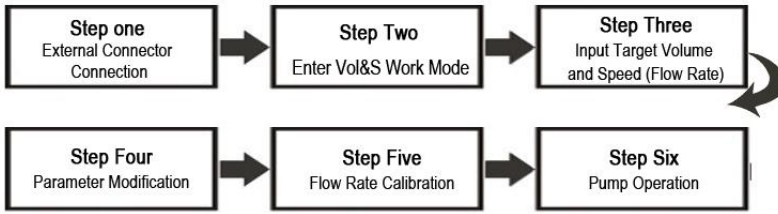


Note: The default Calibration running time is 1 minute. You can change it in System Setup. The time will count down in calibration. Enter the actual flow rate and confirm to finish calibration. This process can be repeated to achieve higher accuracy.

Step Five: Vol&S Work Mode



4-6-2 External Control Mode Operation



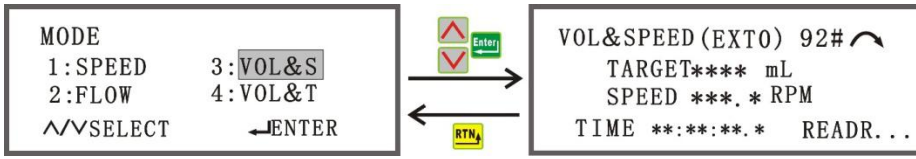
Step One: External Connector Connection

Please refer to *Chapter Five: External Control Instruction.*

Only Connection 2 and Connection 5 is available for this mode.

Step Two: Enter Vol&S Work Mode

Note: You must use "Tubing Selection" in the system Setup and choose the control method of **External** first.



➢ **Target:** Input your target volume, the pump will stop when it hits the target.

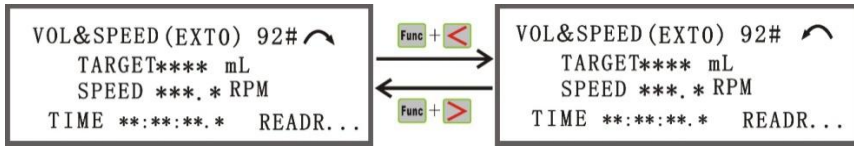
➢**Speed (Flow Rate):** The speed (or flow rate) of the pump. You can press Func + ∧ or Func + ∨ to switch between speed and

flow rate.

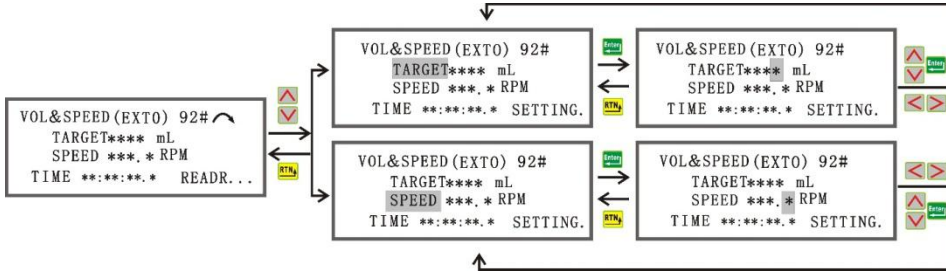
➢**Time:** Calculation of time based on target volume and flow rate.

➢**92#:** The tubing is 92#. You can change it in System Setup.

➢ : **CW motor running direction;** : **CCW motor running direction.** **Press** Func + < or Func + > to change the running direction, as below:

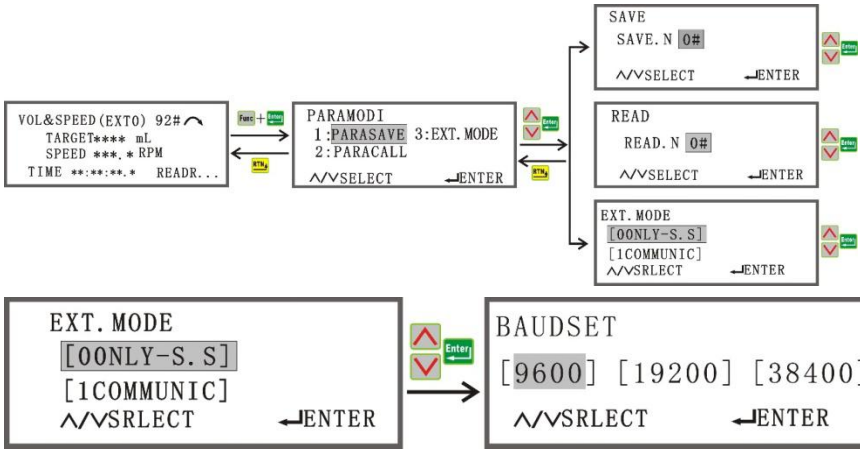


Step Three: Input Target Volume and Speed (Flow Rate)



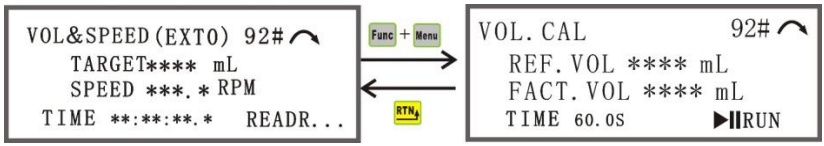
Follow the same operation method of internal control.

Step Four: Parameter Modification

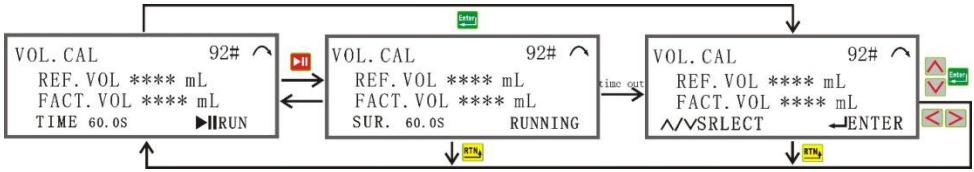


Step Five: Flow Rate Calibration

In order to match the displayed flow rate to the actual flow rate, calibration is needed. Press **Func** + **Menu** to get calibration menu, as below:



The calibration works as below:



Note: The default Calibration running time is 1 minute. You can change it

in System Setup. The time will count down in calibration. Enter the actual flow rate and confirm to finish calibration. This process can be repeated to achieve higher accuracy.

Step Six: Pump Operation

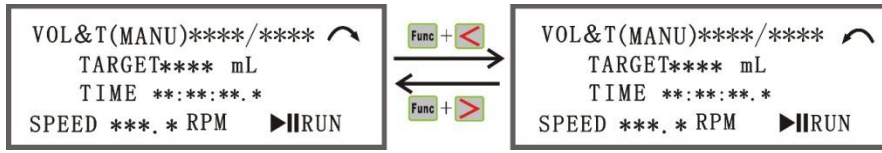
1. Choose **0ONLY-S.S** in the system, and connect a power switch or a foot switch to the wire. Connect Pin2 and Pin9 once, the pump will run according to the programmed target volume and stop when it reach the volume; connect Pin2 and Pin 9 again, the pump will operate the same way again. In running, connect Pin2 and Pin9 once, the pump will stop and return to the original work mode interface.
2. Choose **1COMMUNIC** in the system, and speed, running direction, start-stop are all controlled by external devices. You can only choose Connection 5. The communication protocol is MODBUS. You can ask for it or download it from website.

4-7 Volume & Time Mode

4-7-1 Auto & Manual Control Mode Operation

Step One: Enter Vol&T Mode

Note: You must make Tubing Selection in System Setup and choose **Auto or Manual Control** first.



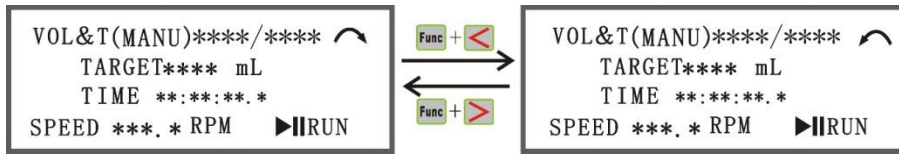
➢ **Target:** Input your target volume, the pump will stop when it hits the target.

➢ **Time:** Input the time as you wish to achieve and the pump will automatically calculate the speed (flow rate) needed. The result will be displayed at the left down corner of the screen. Press Func + ∧ or Func + ∨ to switch between flow rate and speed.

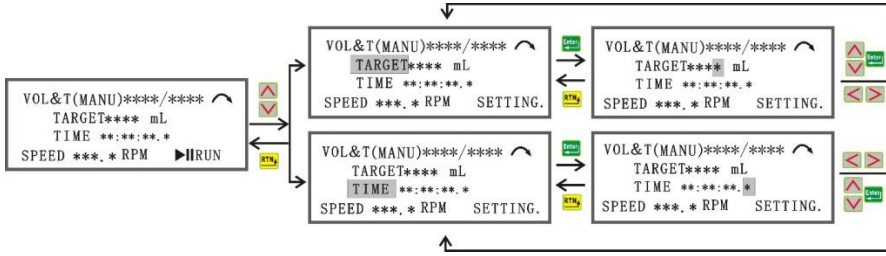
➢ ******/****:** Dispense Function. The first **** is the batch of dispense done so far. The number will increase by one after each complete operation, until it reach the max number. Press Func + Max to reset it to 0. The second **** is the batch number you set up as target. The

operation will stop when it reach the target number.

➢ : **CW motor running direction;** : **CCW motor running direction. Press** Func + < or Func + > to change the running direction, as below:



Step Two: Input Target Volume and Time

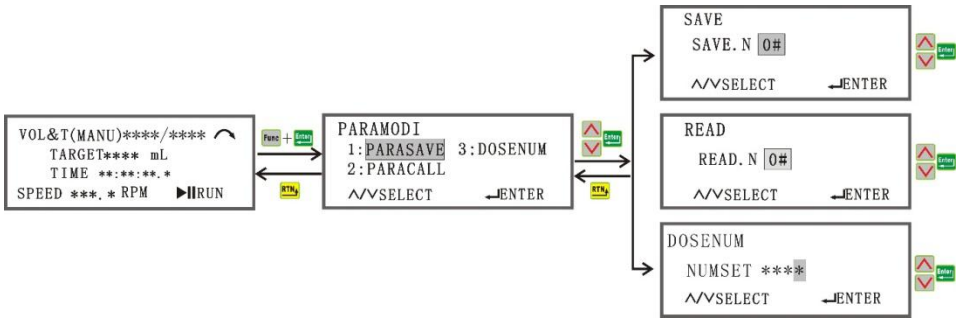


Press V and then Enter to choose Target. The last digit of Target Number will be highlighted. Press < or > to choose the digit you want to change, and press ∧ once to increase the digit by 1; press V to decrease the digit by 1. Keep pushing until you get

the number you want. Press Enter to confirm. You can set up the speed (flow rate) in the say way. When you are ready, press RTN to return to Vol&S work mode interface.

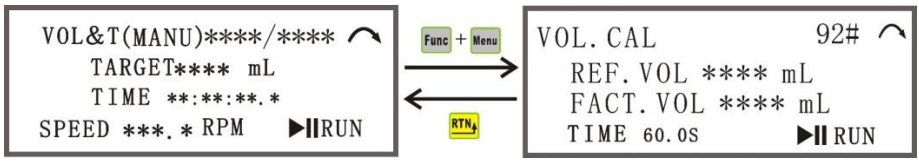
Note: In this setup process, the program will automatically calculate the time needed and the max is 100hrs. The pump has its limitation in speed and time, as a result, when the number hits the limitation, the number will remain unchanged.

Step Three: Parameter Modification. Press Func + Enter:

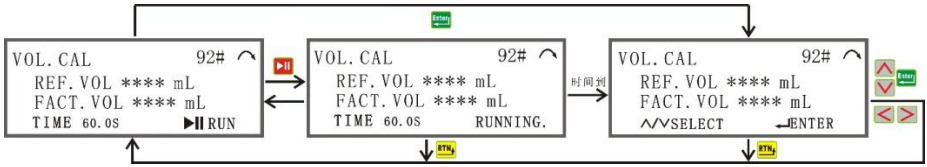


Step Four: Target Calibration

In order to match the displayed flow rate to the actual flow rate, calibration is needed. Press Func + Menu to get calibration menu, as below:



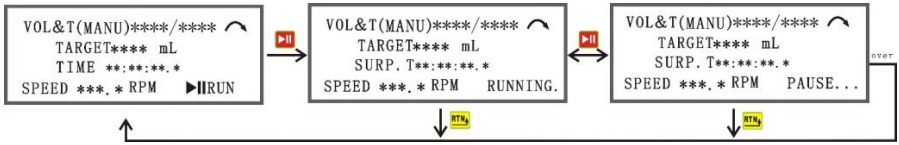
The calibration works as below:



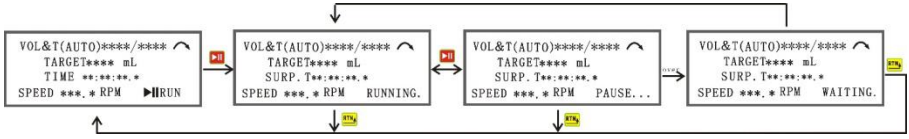
Note: The default Calibration running time is 1 minute. You can change it in System Setup. The time will count down in calibration. Enter the actual flow rate and confirm to finish calibration. This process can be repeated to achieve higher accuracy.

Step Five: Vol&T Work Mod

Manual

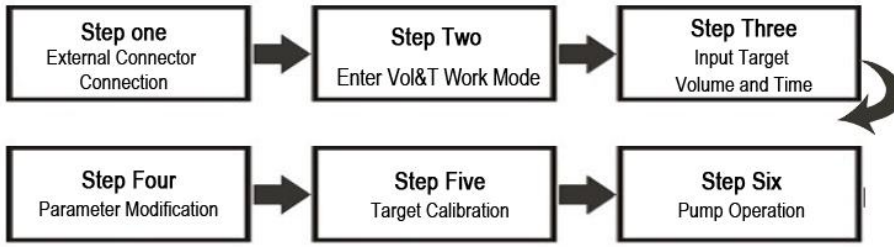


Auto



Note: When the Surp. Time gets to 0, or when you press RTN to return to the main menu interface, the Surp. Time will return to Time.

4-7-2 External Control Mode Operation



Step One: External Connector Connection

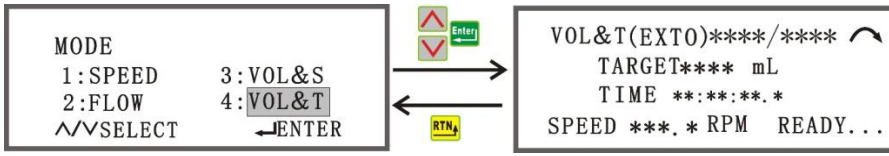
Please refer to *Chapter 5: External Control Instruction.*

First Option: *Connection 1* bottle signal input + *Connection 2* dispense start signal input.

Second Option: *Connection 5* Communication Connector Signal Input.

Step Two: Enter Vol&T Work Mode

Note: You must make Tubing Selection in System Setup and choose **External Control** first.

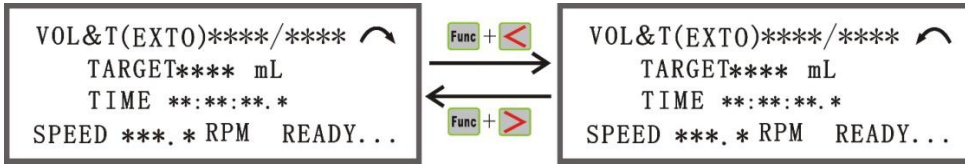


➢ **Target:** Input your target volume, the pump will stop when it hits the target.

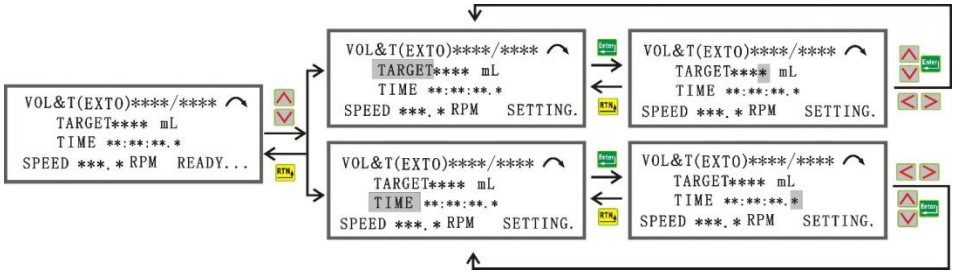
➢ **Time:** Input the time as you wish to achieve and the pump will automatically calculate the speed (flow rate) needed. The result will be displayed at the left down corner of the screen. Press Func + ∧ or Func + ∨ to switch between flow rate and speed.

➢ ******/****:** Dispense Function. The first **** is the batch of dispense done so far. The number will increase by one after each complete operation, until it reach the max number. Press Func + Max to reset it to 0. The second **** is the batch number you set up as target. The operation will stop when it reach the target number.

➢ ↷ **: CW motor running direction;** ↶ **: CCW motor running direction. Press** Func + < or Func + > to change the running direction, as below:

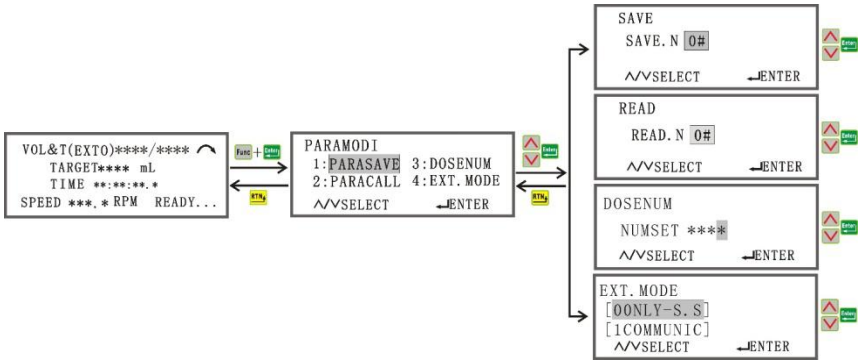


Step Three: Input Target Volume and Time



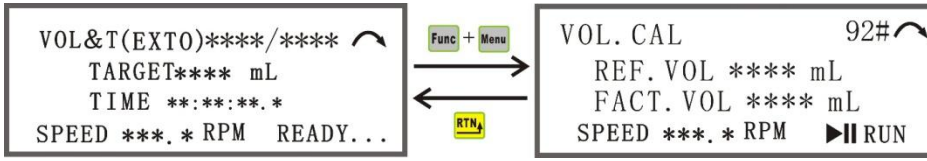
Follow the same operation method of internal control.

Step Four: Parameter Modification. Press Func + Enter :

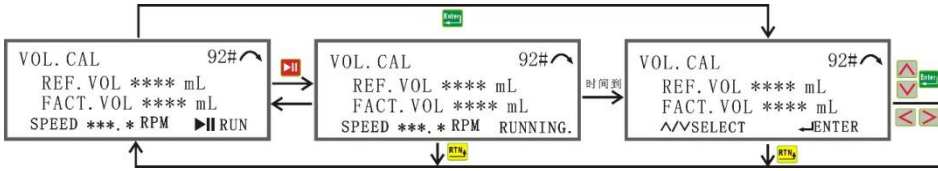


Step Five: Target Calibration

In order to match the displayed flow rate to the actual flow rate, calibration is needed. Press Func + Menu to get calibration menu, as below:



The calibration works as below:



Note: The default Calibration running time is 1 minute. You can change it in System Setup. The time will count down in calibration. Enter the actual flow rate and confirm to finish calibration. This process can be repeated to achieve higher accuracy.

Step Six: Pump Operation

1. EXT0: Dispense Function.

   Pin2 is GND (could be teat as common ground with other external control devices). Pin8 is the bottle signal input port (only low level TTL), Pin9 is the dispense start signal input port (only low level TTL).

   When Pin 2 and Pin 8 is closed (it means there is a container ready), connect Pin 2 and Pin 9 once, the pump will run as programmed, and

stop when it hits the target volume. If Pin 2 and Pin 8 is opened (it means there is no container), the pump will not run and the screen will display No-Container Alarms.

2. EXT1: Communication Control. Use Communication to control the target dispense volume, dispense time and start-stop. The communication protocol is MODBUS. You can ask for it or download it from website.

4-8 Prime the Pump

Before you start to use the pump, you need to fill the tubing with the fluid. You can press Max at any time to prime the tubing.

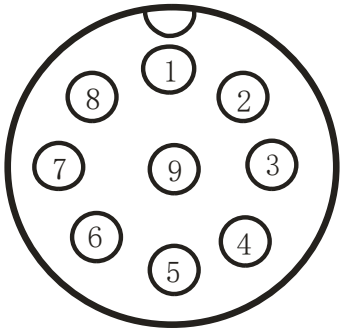
After each usage, you should empty the tubing before you shut down the machine. Reverse the running direction and press Max again to empty the tubing.

Chapter 5: External Control Instruction

This series of pump uses control panel and buttons, or through analogue interface control of electricity voltage and current in different level, or through communication protocol of RS485.

5-1 External Control Port Instruct

We use a 9 pin plug-in for external connector. Please refer to the picture below:



Aviation plug socke

Definition of each pin:

External Connector		
PIN	**Color**	**Function**
1	Brown	+5V, for external control device. Current < 100mA.
2	Red	GND, earth wire.
3	Orange	F/R, rotation direction control.
4	Yellow	+12V, for external control device. Current <

		100mA.
5	Green	Iin, current (4-20mA) or voltage(0-5V)
6	Blue	A, RS485 port A
7	Purple	B, RS485 port B
8	Grey	Electricity level control signal input
9	White	Pulse control signal input

5-2 Connection Instruction

There are 5 methods of connection for this series of pump in external analogue control and communication control. The electricity current and voltage level control instructions were provided already

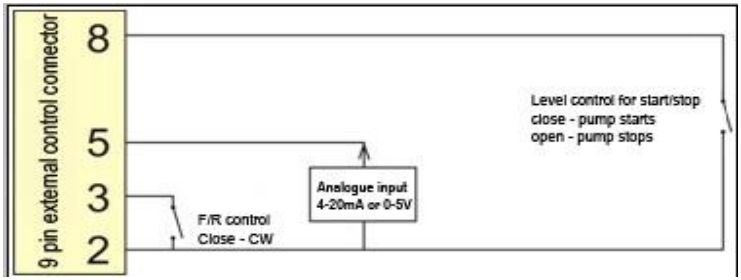
The 5 methods of connection:

1: Use pin 2, 8 in the external connector to connect to the external control device.

2: Use pin 2, 9 in the external connector to connect to the external control device.

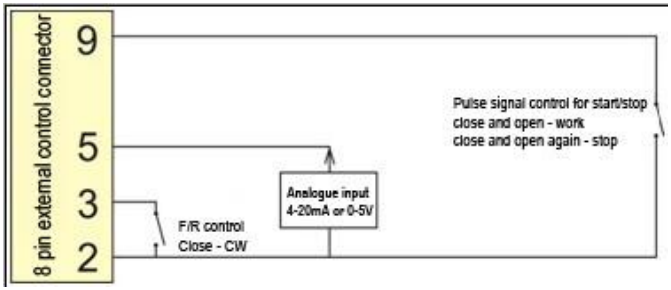
3: Use pin 2, 3, 5, 8 in the external connector to connect to the external control device.

Typical application instruction:



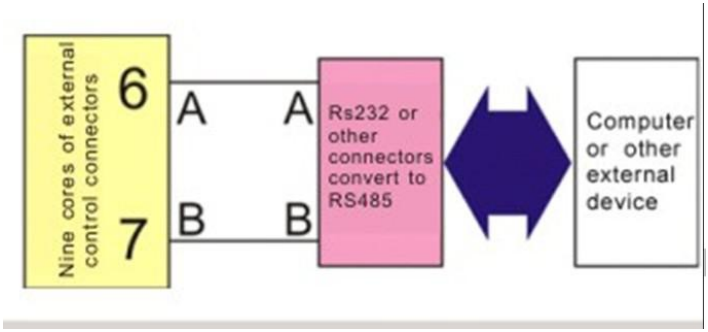
4: Use pin 2, 3, 5, 9 in the external connector to connect to the external control device.

Typical application instruction:



5: Use pin 6, 7 in the external connector to connect to the external control device. Used mainly for communication control interface.

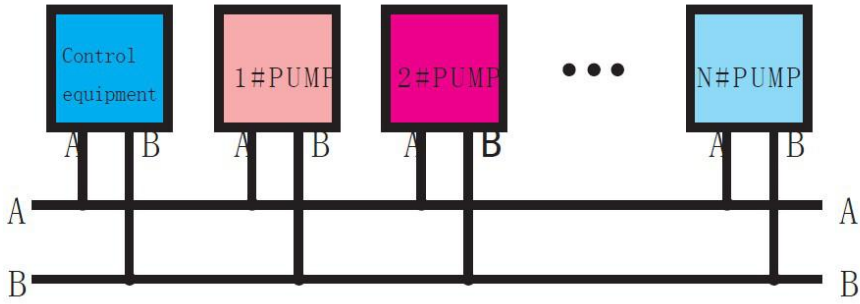
Typical application instruction:



Note： When you use method 3 and 4 with voltage level control, please note that between Pin 5 and ground, there is an electricity resistor of 250Ω, which will reduce the voltage. You'll need to have a more powerful power supply, otherwise the resistor will largely reduce the power and influence the performance.

5-3 Communication Connection between Multiple Pumps

It may happen that certain application requires multiple pumps to be connected together with external control. You can use method 5 noted above, with pin 6 (port A) and pin 7 (port B). The control system is showed as below:



1≤N≤16

Note : When connecting multiple pumps, the control system needs to make setup to the pump address

Chapter 6: Communication Protocol

We use MODBUS communication protocol. Please ask for it from our company.

Chapter 7: Repair and Maintenance

7-1 Maintenance

➢ Please remove the tubing if the pump is going to be kept unused for a long time.

➢ Please keep the pump clean on the outside. You can clean the pump with soft cloth and clean water.

Note: Please don't use ethyl alcohol to clean the membrane panel.

7-2 Repair

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

Troubling shooting chart:

Problem	Check	Trouble Shooting	Note

Pump start, but the LED screen doesn't work.	Check if the power supply is on; if the power socket is well connected; if the fuse is loose or broken.	Plug in the power supply cable, make sure it's intact; use a new fuse; make sure the fuse is the required model.	Make sure you find out what caused the fuse to burn out.
Pump start, the LED screen works fine, but the pump head doesn't work.	Check if the pump head is pressed too tight; if the motor is correctly connected; if the external connection is correctly connected	Adjust the pump head; reconnect the motor; reconnect the external control connector and check the signal input.	Otherwise the problem lies inside the pump. Please contact the supplier or our company for resolution.

	and if the signal is sending in.		
The pump is running, but the fluid (or air) doesn't transfer accordingly.	Check if the tubing is pressed too hard; if the tubing is leaking.	Adjust tubing clipper on both sides of the pump head; use new tubing.	
The tubing moves along with the roller in operation.	Check if the clipper is in the right place.	Adjust the clipper.	

Chapter 8: After-sale Service

1. From the day of purchase, within three months, we will provide product exchange in case of product quality problem.
2. From the day of purchase, we will provide free maintenance and repair for a year.
3. After this period, if there are problems that the clients can't resolve by themselves, please contact the supplier or us. We will provide maintenance and repair at a reasonable rate.
4. The following problems are not covered by our warranty: Make unwarranted alternation; overload work; lack of proper maintenance; work in unsuitable environment; work in voltage other than required and make faulty connections.