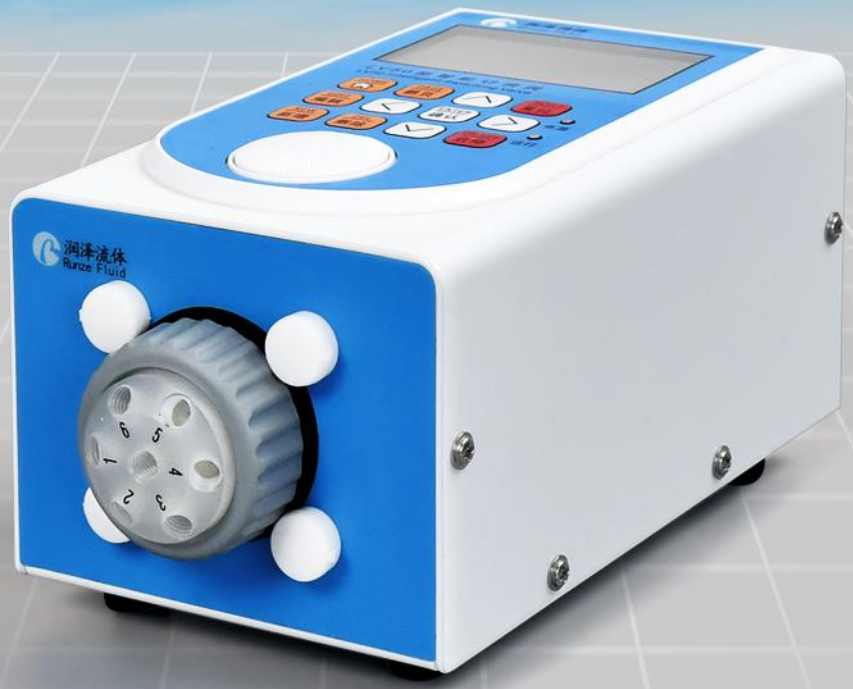
润泽流体 RUNZE FLUID

Key Components for Analytical Instrument
Ecological Closed-loop Supplier



V1.2

LV50 Series Intelligent Switching Valve Manual

南京润泽流体控制设备有限公司
NANJING RUNZE FLUID CONTROL EQUIPMENT CO.,LTD

Content

Chapter 1 Product Introduction

1.1 Company Overview

Nanjing Runze Fluid Control Equipment Co., Ltd., established in 2014, is a national high-tech enterprise focusing on R&D and production of fluid accessories for numerous analytical instruments. We engineer, manufacture and market differentiated standard products such as syringe pumps, multiport valves, peristaltic pumps, gastight syringes, plastic fittings, etc. We persevere in providing our customers with best quality and service in the fields of environmental monitoring, biopharmaceuticals, medical equipment, industrial automation and laboratory instruments, etc.

In past years, we have accumulated rich technical and practical experience that bring us honors of ISO9001, National High-tech Enterprise, Jiangsu Province Private Science and Technology Enterprise, 5A Bank Credit Assessment, 44 technical patents and software copyright including 2 invention patents, 27 utility model patents, 13 design patents, 2 software copyright.

RUNZE attracted experienced talents with strong capability on integrating software and hard-ware at electronic research, mechanical design, mold manufacturing. Continuous and substantial investment in research and development, which enabled the company to obtain a huge advantage in the manufacture and sales of analytical instrument accessories. RUNZE Technology Center has a reliable EMC laboratory and a series of advanced processing equipment and testing instruments, such as imported white light interferometer, Keens plane rapid detector, five-axis machining center, high-precision nano-grinding machine, etc., Continuous and substantial investment in research and development, which enabled the company to obtain a huge advantage in the manufacture and sales of analytical instrument accessories.

1.2 Brief Introduction

The LV50 series intelligent switching valve can achieve basic programming, which can realize the port switching in accordance with the predetermined logical sequence, and the CAN bus communication is adopted internally; The RS232/RS485 communication bus of the switching valve is bridged to the external DB15 terminal of the device for backup.

1.3 Notice

1. Regular maintenance of the valve core

When not in use for a long time, please empty the liquid in the valve core of the switching valve in time. Prevent the liquid from staying in the valve core for a long time and corrode the rotor plane.

2. Rotate the rotor regularly

When not in use for a long time, usually regularly (about 7 days), rotate the switching valve to prevent sticking due to residual liquid.

Chapter 2 Main Technology and Function

2.1 Features

LV50 can be regarded as a programmable control switching valve. The logical sequence, stay time (hour/minute/second), and cycle index can be preset through the keypad. You can perform operations such as adding and deleting items. The interface function is clear and intuitive.

Widely used in Instruments for environmental monitoring, experimental analysis, medical analysis, chromatographs, etc.

2.2 Product Technical Parameters

- Valve head: Compatible with universal switching valves figured with 6 or more ports in RUNZE protocol
- Cycle index: Support 1~9999 times loop, or 0000 means infinite loop
- Number of members: Support 1~999 members, at least 1 member
- Rotary encoder control interface: Has a nicer man-machine conversation interface
- Power supply: DC24V±10%
- Power: 20W
- Working environment: Temperature range: 0 ~ 40℃; Relative humidity <80%
- Dimension

Dimension	Length (mm)	Width (mm)	Height (mm)
LV50 6	197	100	93
LV50 8	197	100	93
LV50 10	197	100	93
LV50 12	202	100	93
LV50 16	207	100	93

- Weight: 1.58kg~1.68kg
- IP rate: IP31

2.3 Power-on Specific Function Switch

- **Query version function.**

Press and hold the "ENTER" key to turn on, you can check the software version and software release time.

- **Chinese /English interface switching.**

Press and hold the "HOME" key to turn on, switch between Chinese and English interface.

- **Store the latest factory settings.**

Press and hold the "NEW key" to turn on, the ferroelectric parameters will be transferred to FLASH. (Note: Similar to FC function, while parameter editing is completed, use once, avoid frequently use)

- **Restore the latest factory settings.**

Press and hold the "Delete" (DEL) key to turn on, and the FLASH parameters will be transferred to ferroelectric. (Note: similar to FF function, use it with caution)

- **Completely restore factory settings.**

Press and hold the "Edit" (EDIT) button to turn on, and use the CODE area parameters to completely restore the factory settings. CODE -> Ferroelectric -> FLASH (Note: similar to erase function, use it with caution)

Chapter 3 Hardware Settings

3.1 Overall Structure Diagram

Figure 3-1 *The structure diagram of the LV50 intelligent switching valve*

3.2 DB15 Interface Definition

No.	Item	Description
1	NC	null
2	RS232-TXD	Built-in switching valve RS232 data sending
3	S232-RXD	Built-in switching valve RS232 data receiving
6	OUT1	Status output 1 (default status is high 3.3V, the status is low when the cycle starts)
7	OUT2	State output 2 (default status is high 3.3V, the status is low when the valve moves)
8	D0	Signal input interface (spare, no such function temporarily)
9	GND	Grounding
10	EX_ST	External start-stop signal input interface (triggered when shorted to ground once)
13	SWD-DIO	SWD data
14	SWD-CLK	SWD clock
15	+5V	DC5V power supply (spare)

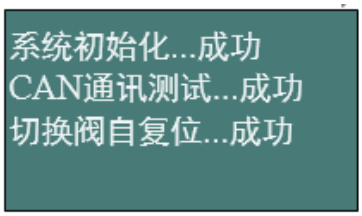
3.3 Memory Attributes

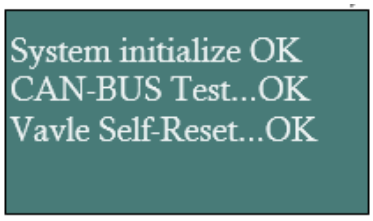
In order to facilitate the understanding of the memory media types involved in the subsequent descriptions, relevant explanations will be provided in advance.

Memory media	Volatility	Read-write	Read-write limit	Abbreviation
RAM memory block	Volatile	Radom	Almost unlimited times	RAM
CODE memory block	Non-Volatile	Read only	10000 times	CODE
FLASH memory block	Non-Volatile	Block erase/rewrite	10000 times	FLASH
Ferroelectric memory block	Non-Volatile	Read and write	1014 times	Ferroelectric

Chapter 4 Interface Introduction

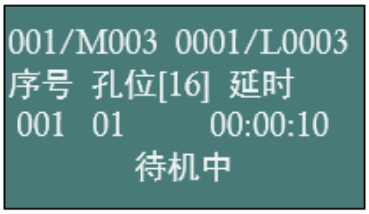
4.1 Power-on Self-test Interface

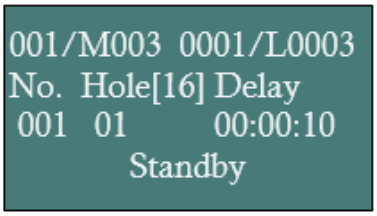




4.2 Home Screen

Note: three switchable holes by default in the main interface, you can either add or delete holes if required.





The interface information is described as follows:

The 1st line indicates in turn: the current member is 001/total members is M003; the current cycle is 0001/total number of cycles is L0003.

The 2nd line means: "Serial No.--Port number [maximum effective port] --Delay" information prompt.

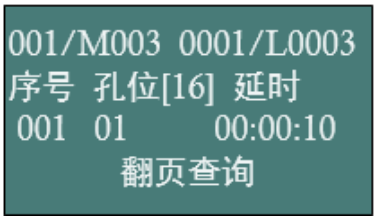
The 3rd line means: current serial No.-port number - holding time (hour: minute: second)

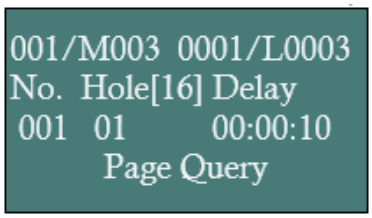
The 4th line is the information prompt area.

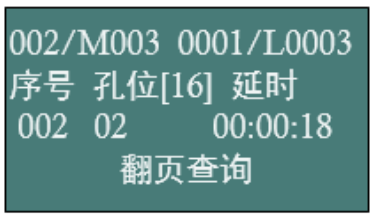
The same content in the follow-up will not be repeated here.

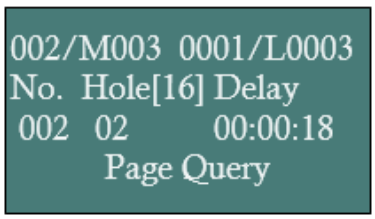
4.3 Query Operation

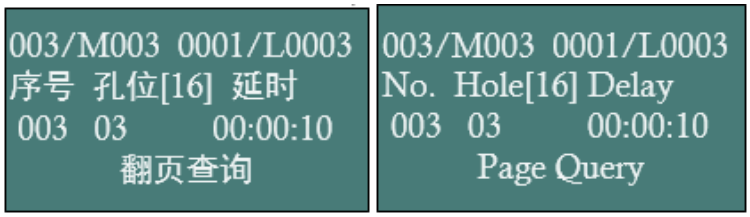
In the home screen, press the "PAGE/up/down key" to query the content of a member.











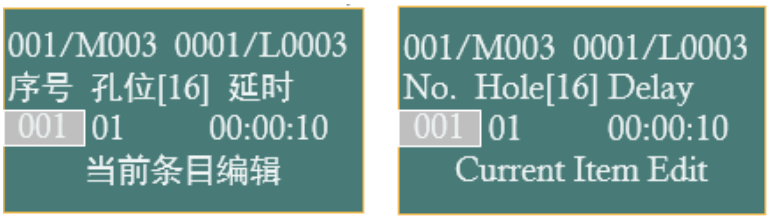
4.4 Edit Operation

4.4.1 Selection Interface of Item Edit

In the main interface or any query interface, press the "EDIT" key to enter the item edit selection interface. When you enter item editing for the first time, the content of the "Serial Number" position is in reverse display. At this time, you can press the "PAGE" key/up key/down key to change the member object to be edited currently.

Note: the number of total members smaller than or equals to 10, page jump is 1

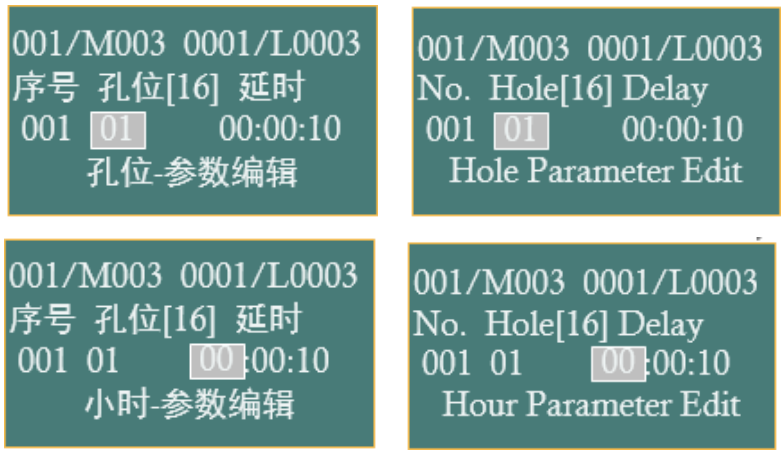
the number of total members bigger than 10, page jump is 10

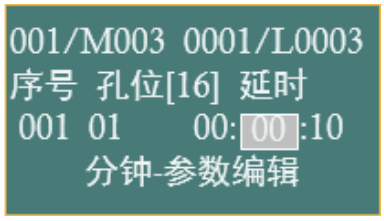


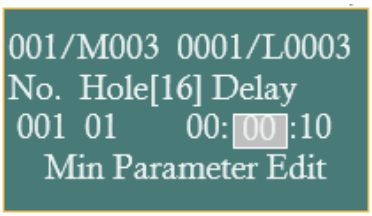
4.4.2 Editing Interface of Basic Parameters

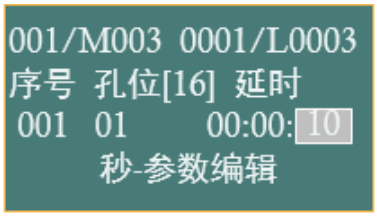
The basic parameters include "port No./hour/minute/second"

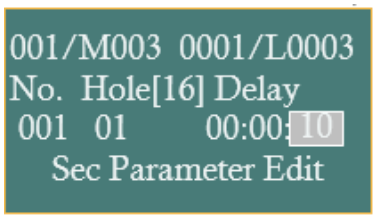
In the 4.4.1 interface, press the left/right key to switch to the basic parameter editing state of the current item. After entering this state, you can use the up key/down key/rotary encoder to modify the corresponding parameters.











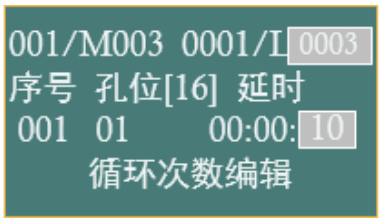
After editing the parameter "port No. /hour/minute/second", press the "ENTER" key to return to the item editing interface. At this time, the changed information of the item is temporarily stored in the RAM memory area. Meanwhile, you can continue to edit other items through "Page key /Up key/Down key/Rotary encoder".

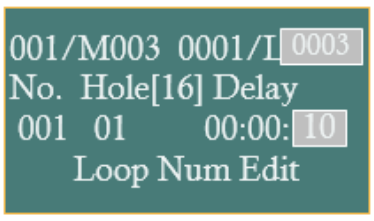
When all the items are edited and then press the "ENTER" key in the item editing interface to return to the main interface, the editing parameters of all items are saved in the ferroelectric memory.

Note: If you press the "HOME" key to return to the main interface after editing all items, the editing parameters of all items are only saved in the RAM memory area, not in the ferroelectric or FLASH memory. Under the condition of uninterrupted power restart, it can run according to the latest edited parameters. After power off then restart, it will run according to the last parameters saved in the ferroelectric memory.

4.4.3 Editing Interface of the Total Cycle Index

In the editing interface of 4.4.1 / 4.4.2, if you press the "EDIT" key again, you will enter the editing interface of the total number of cycles.

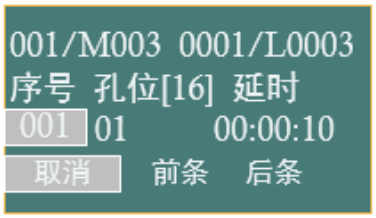


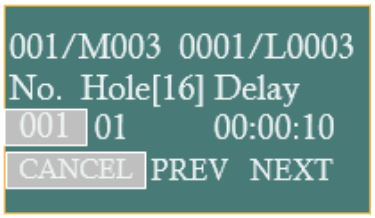


After entering this state, you can use the up key/down key/rotary encoder to modify the corresponding parameters. Long press and hold the up/down key to quickly change the total number of cycles. After editing, press the "ENTER" key to return to the item editing interface. At this time, the changed information of the total number of cycles has been saved in the ferroelectric memory.

4.4.4 Operation of Adding Items

In the 4.4.1 editing interface, press the "NEW" key to enter the operation of adding items.





At this time, the left/right keys can be used to select "Cancel"/"Previous"/"Next".

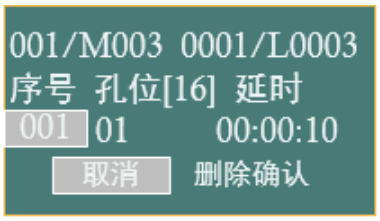
Select "CANCEL" (CANCEL) and press the "ENTER" key to exit the operation of adding items.

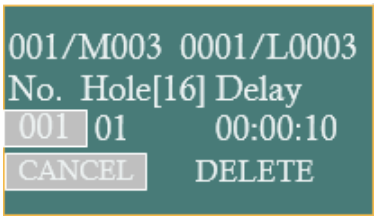
Select " PREV " (PREV) and press the "ENTER" key to add an item in the previous position of the current item. The original current item and all subsequent items are moved back by one item.

Select "NEXT" and press the "ENTER" key to add an item to the next position of the current item. All items after the original current item are moved back by one item position.

4.4.5 Operation of Deleting Items

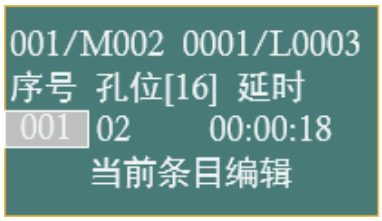
In the 4.4.1 editing interface, press the "DEL" key to enter the operation of deleting items.

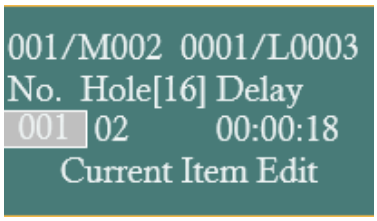




At this time, the left/right keys can be used to select "Cancel"/" Delete".

Select "CANCEL" (CANCEL) and press the "ENTER" key to exit the operation of deleting items.



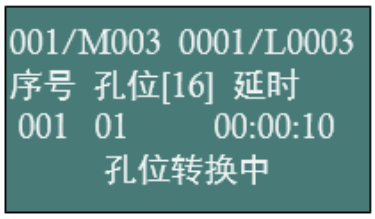


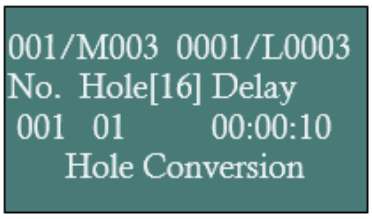
Select "DELETE" and press "ENTER" to delete the current item, and all items after the original current item are moved forward by one item. The total number of members is reduced by 1. When the current total number of members is 1, that is, when M001 is displayed, the deletion cannot be continued.

4.5 Running Operation

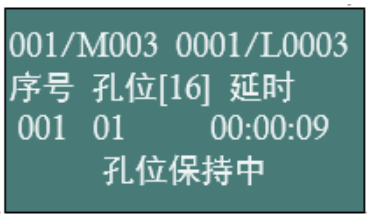
4.5.1 Start the Control Flow

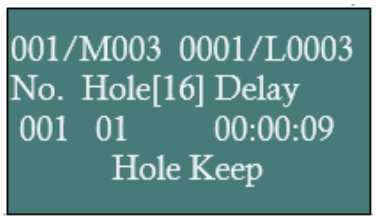
In the 3.2 main interface, press the "ON/OFF" key to start the switching valve control flow.



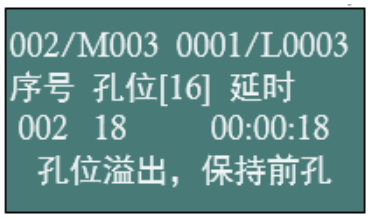


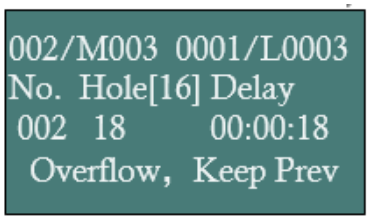
After the port switching is over, "Hole position is being held" is displayed.





Countdown starts from the pre-set holding time, once the countdown reaches 0, it will automatically switch to the port of the next item. If the preset port No. exceeds the maximum port No., an error will be reported and the countdown will be valid.

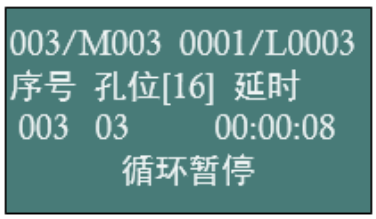


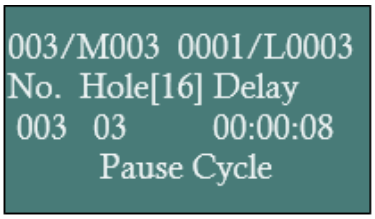


When the current cycle is over, it will automatically switch to the next cycle. When all cycles are over, the control flow ends.

4.5.2 Pause the Control Flow

During the start of the control flow, when the port position is hold (Hole Keep), if the "ON/OFF" key is pressed, the control flow is suspended. During the switching of port Hole Conversion), the pause operation is invalid.

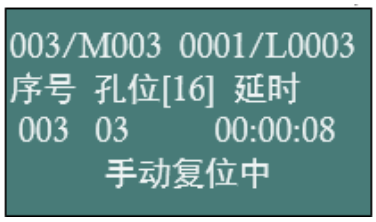


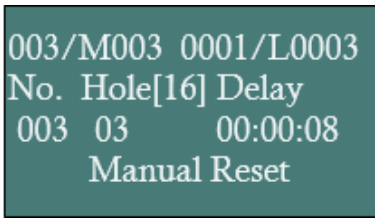


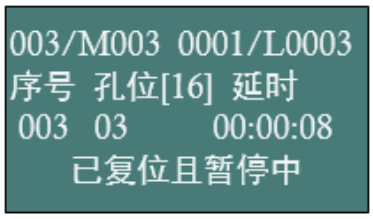
After the control flow is suspended, it will only be restarted after manual intervention.

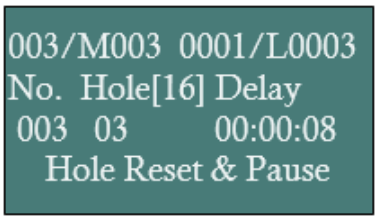
4.5.3 Manual Reset Operation

In the pause state, you can press the "Reset" (RESET) button to perform manual reset operations.







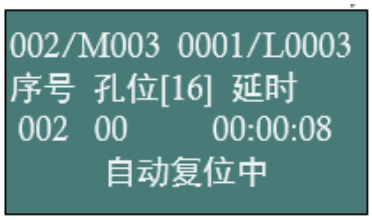


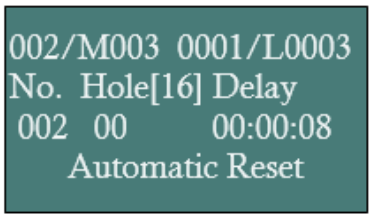
Note: Prompt "Manual Reset", the reset operation is in processing; Prompt "Hole Reset & Pause", the reset operation has been completed at this time; it is not the port position indicated by the current item.

Press （ON/OFF）again can automatically switch to the hole position of current item

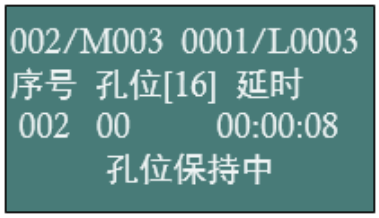
4.5.4 Automatic Reset Operation

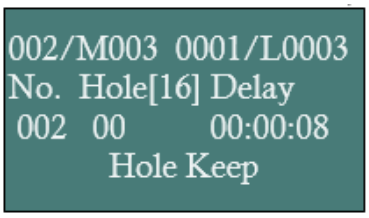
During the process, if the programmed port position is set to 0, when the item is executed, the "automatic reset" operation will be executed.





When the automatic reset operation is completed, the port/hole position is maintained according to the setting time.

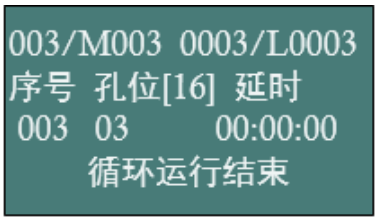


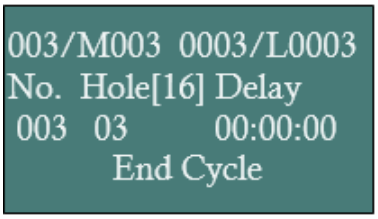


When the countdown set according to the control flow finished, proceed to the next item.

4.5.5 End of Cycle

When the total number of cycles is executed, the cycle operation ends automatically.





If the total number of cycles is 0000, it is regarded as an infinite cycle.

Chapter 5 Common Problems and Solutions

Trouble	Trouble Description	Troubleshooting
Backlight not working	The value of "Backlight time" in the "Settings" menu is set to 0	In the "Settings" menu, choose the "Backlight time" setting, change the value to a larger value.
	Backlight hardware or backlight power control partial failure	Backlighting does not affect application, it is only required in darker environments. If it is a hardware failure, it can be returned to the factory for repair.
Blurred screen	Large interference nearby	Stay as far away from the interference while the machine is working
	Unknown reasons result in LCD screen refreshes data in the wrong position	Erroneous display of the screen does not affect the motor control operation. If the motor is running, press the "START STOP" to stop the motor first. In the standby interface, press "HOME" five times in quick succession to refresh the display.
The fan does not turn.	Too much dust on the fan causes stoppage	Remove the dust with soft brush after power down
	The fan is broken or the fan power supply is not in good contact.	Return it to factory for repair.
The motor does not rotate.	The screen displays the speed but it does not actually rotate	Check whether the "Current code" in "Setting" is too small and set the current code consistent with the product.
		Motor connection wire is loose and return it to factory for repair.
		Motor power supply wire is loose and return it to factory for repair.
		Motor power supply wire is loose and return it to factory for repair.
Motor is stalled.	The original valve head/tube can run at a certain speed, but the new valve head/tube cannot run.	The new valve head/tube needs to run for one or two minutes at a lower speed.
	Exceed the maximum speed of the valve head/tube.	Refer to the aforementioned running curve and select the suitable speed corresponding to the valve head/tube.

Chapter 6 Version Description

Version	Description	Release Time
V1.0	Initial Version	2019-09-27
V1.1	Change technical support contact	2022-6-27
V1.2	The LV50 is connected to the MC12B drive Remove RS485 communication interface	2022-10-12

Chapter 7 Technical Service

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Website	www.runzeliuti.com
Shop	https://runzeliuti.en.alibaba.com
Address	No.9 Tianxing West Road, Dongshan Street, Jiangning District, Nanjing, Jiangsu Province, China

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