ADT-TH08HA-D01
Spring Machine Controller
User Manual

Initial information

This user manual is edited by ADTECH (SHENZHEN) TECHNOLOGY CO., LTD.

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This user manual is launched on 23/04/2015 at first, Version A1.00, Project code: BZ001C181A。

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Precautions

※ **Transport and storage**

- ☞ Product package should not exceed six crates stacked
- ☞ It's not available to climb, stand or place heavy objects on the package of product
- ☞ Don't use the connecting cable drag or carry the product
- ☞ Non-collision , scratch panel and display
- ☞ Product package should avoid moisture, isolation and rain

※Unpack checking

- ☞ Unpack then confirm if the product is the same as your purchasing
- ☞ Check if damage to the products during transportation
- ☞ Follow the list to check if parts are complete without damage
- ☞ Please contact our company in time once product model not matched、missing attachments、transport damage，etc.

※Wiring

- ☞ The person who makes wiring and inspection must have the appropriate professional capacity.
- ☞ Products must be grounded, grounding resistance should be less than 4 ohms , you cannot use the neutral line (zero line) instead of ground.
- ☞ Wiring must be properly and securely so as not to cause the product to malfunction or unintended consequences.
- ☞ Connection with the product must be connected to a surge absorption diode predetermined direction; otherwise it will damage the product.
- ☞ Before the plug or open the product chassis, the power supply must be cut off.

※Inspection and repair

- ☞ Cut off the power supply before inspection or components replacement.
- ☞ If short circuit or over load, please check the malfunction、troubleshooting and restart.
- ☞ Product cannot be powered on and off frequently, to be re- energized after a power off at least one minute break.

※Others

- ☞ Don't open the cabinet without permission.
- ☞ Turn off the power supply if product idled long time.
- ☞ Be careful not to let dust , iron powder go into the controller
- ☞ If the outputs relay non- solid state relays, the relay coil shall be parallel freewheeling diodes. Check the connected power supply meets the requirements, to eliminate the controller burned.
- ☞ The life of controller has a great relationship with ambient temperature. If the temperature is too high at the processing site, please install the cooling fan.
- ☞ The controller allows the working ambient temperature range between 0 ℃ -60 ℃.
- ☞ Avoid using in the hot、humid、dusty or corrosive gas environment.
- ☞ In place with strong vibration, rubber shock pad should be added to the buffer.

※Maintenance

Under normal usage conditions (ambient conditions: daily average 30 ℃, load factor 80% , run rate 12 hours a day) , make daily checks and periodic inspections by the following items.

Daily inspection	Daily	☞ Check the ambient temperature, the temperature , dust, foreign matter ☞ If any abnormal vibration , sound
Periodic inspection	One year	☞ Rugged components loose or not ☞ Terminal block damage or not

Content

CHAPTER 1 PRODUCT REVIEW ARTICLES....4

1.1 APPEARANCE EFFECT DIAGRAM....4
1.2 PRODUCT BRIEF INTRODUCTION....5
1.3 CONTROLLER SYSTEM STRUCTURE DIAGRAM....5
1.4 PRODUCT FEATURES....5
1.5 SYSTEM ACCESSORIES....5

CHAPTER2 ELECTRICAL WIRING....6

2.1BACK INTERFACE DEFINITION....6
2.2ELECTRICAL CONNECTION....7
2.2.1 Terminal diagram....7
2.2.2 Terminal description....7
2.2.3 Connection definition....7
2.3 INSTALLATION NOTES....11
2.4 TEST MACHINE....11

CHAPTER 3 FUNCTIONAL OPERATION....12

3.1 OPERATION PANEL DESCRIPTION....12
3.1.1 Keyboard panel and key note....12
3.1.2 Panel button description....14
3.2 OPERATION INTERFACE AND RESOURCE DESCRIPTION....14
3.2.1 Main processing interface....15
3.2.2 Program editor....16
3.2.3 Auxiliary function operation interface....17
3.3 PROGRAM INSTRUCTIONS AND SAMPLE INSTRUCTIONS....24
3.3.1 Instruction definition and description....24
3.3.2 M，J , G Instruction example....27
3.3.3 Program sample instructions....28
3.3.4 Statement interpretation....29
3.4 SYSTEM PARAMETER RECOVERY....30

CHAPTER 4 PROGRAMMING CHAPTER....30

4.1 PROGRAM RECORDING METHOD....31
Method 1.U disk update program....31
Method 2.USB connection update program....31
4.2 VIEW SOFTWARE VERSION INFORMATION....31
5.1 MATTERS NEEDING ATTENTION....31
5.2 MAINTENANCE....32

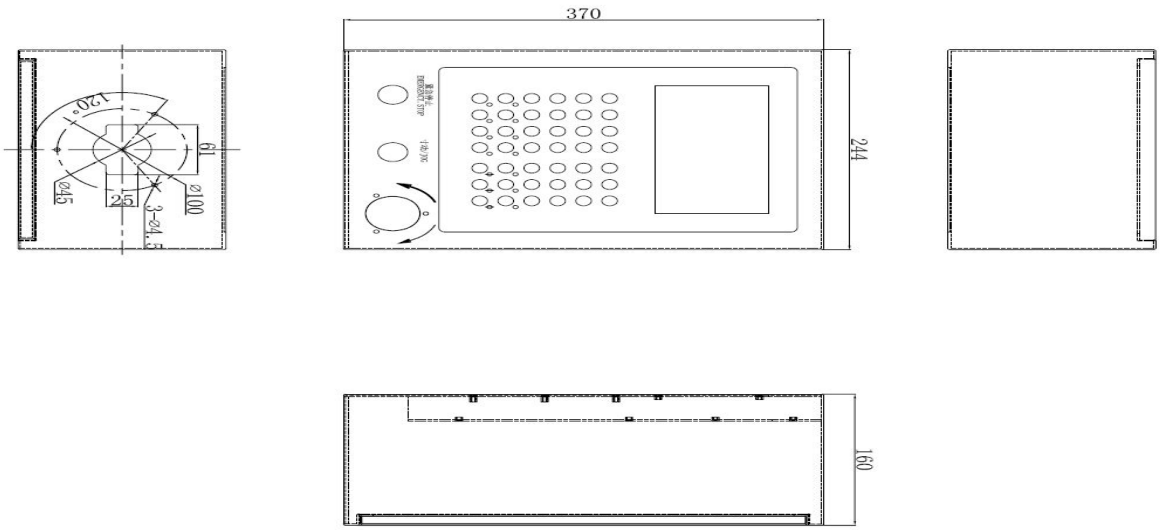
APPENDIX A: ANALYSIS OF COMMON FAILURES....33

APPENDIX B: SETTING OF COMMON SERVO PARAMETERS....33

1, **SYSTEM PARAMETERS (RU)**....33
2, **BASIC PARAMETERS (PA)**....33

Chapter One Product Description

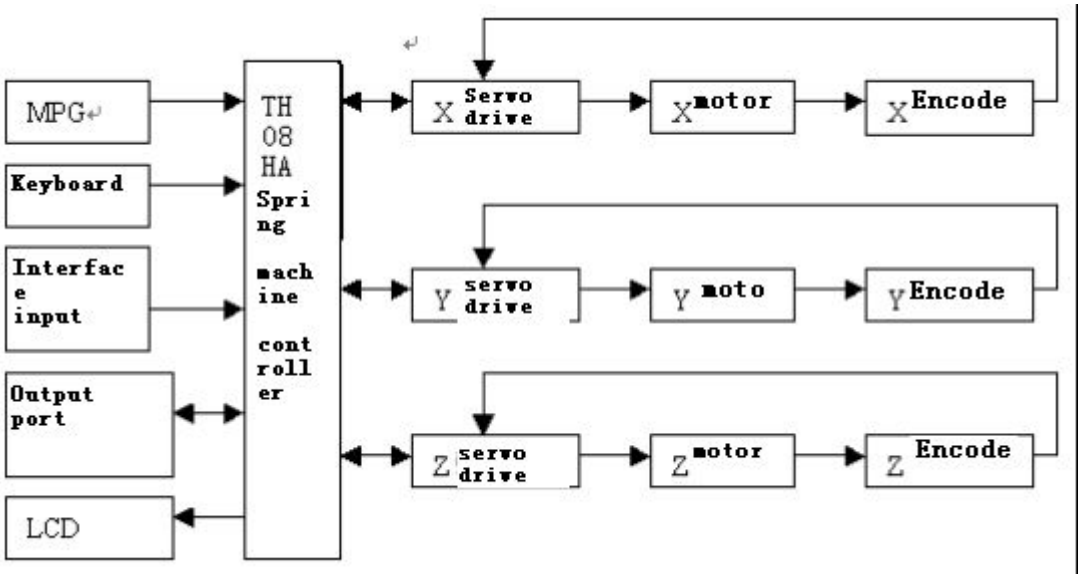
1.1 Effects of appearance



1.2 Product introduction

TH08HA 2-3 Axis Spring Machine Control System: 7-inch LCD display; 2-3 axis servo control; support group 4-8 probe input, 4-8 group of cylinders output; Support send bobbin winding wire, disconnection alarm detection . Supporting applied to various spring, torsion spring machines.

1.3 Controller system configuration diagram



1.4 Product Features

1, 7-inch color LCD

2, Chinese / English interface, suitable for different customers' state system

3, using ARM9 processor, higher processing efficiency

4, 2-3 axis servo control

5, support group probe input 4-8, 4-8 group cylinder output

6, support for sending bobbin winding line break alarm detection

7, hand wheel and jog test trial machining process debugging dual processing capabilities

8, programming intuitive and easy to learn

9, comprehensive and complete information prompts

10, support U disk function, easy software upgrades

11, supports USB and RS232 communication function, convenience and computer on-line

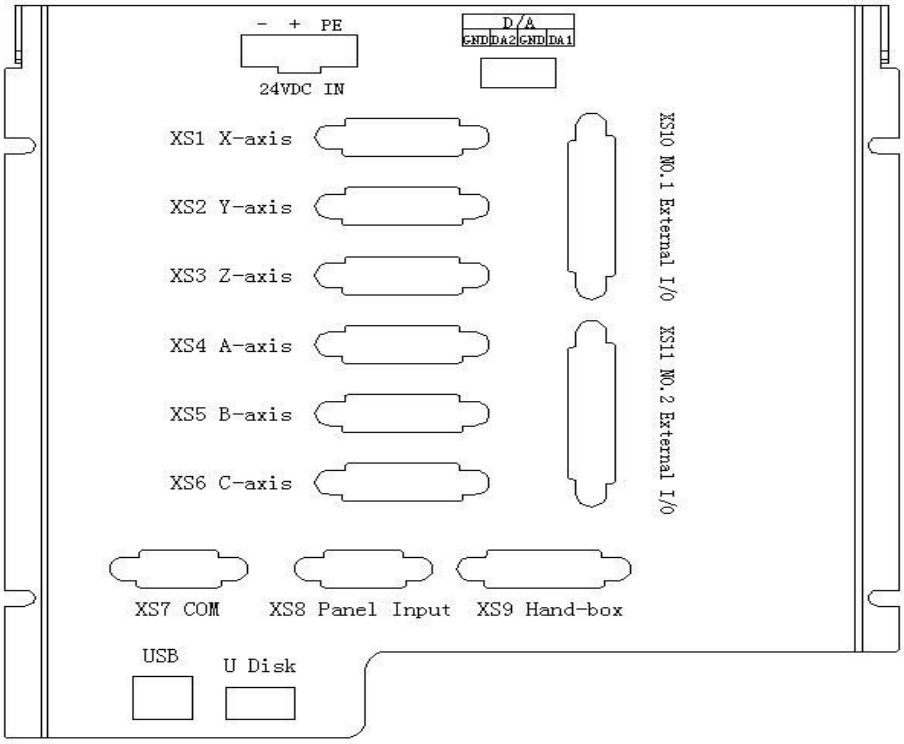
1.5 System Accessories

Item Name	Explanation	Quantity	Remark
Controller	TH08HA	1 set	Standard
control card	TH846(4 axis)	1 piece	Standard
Terminal board	TH834-F5	1 piece	Standard

Shielded wire	DB25 Male to Male	1	Standard
15-pin servo wiring	DB15	2	Standard

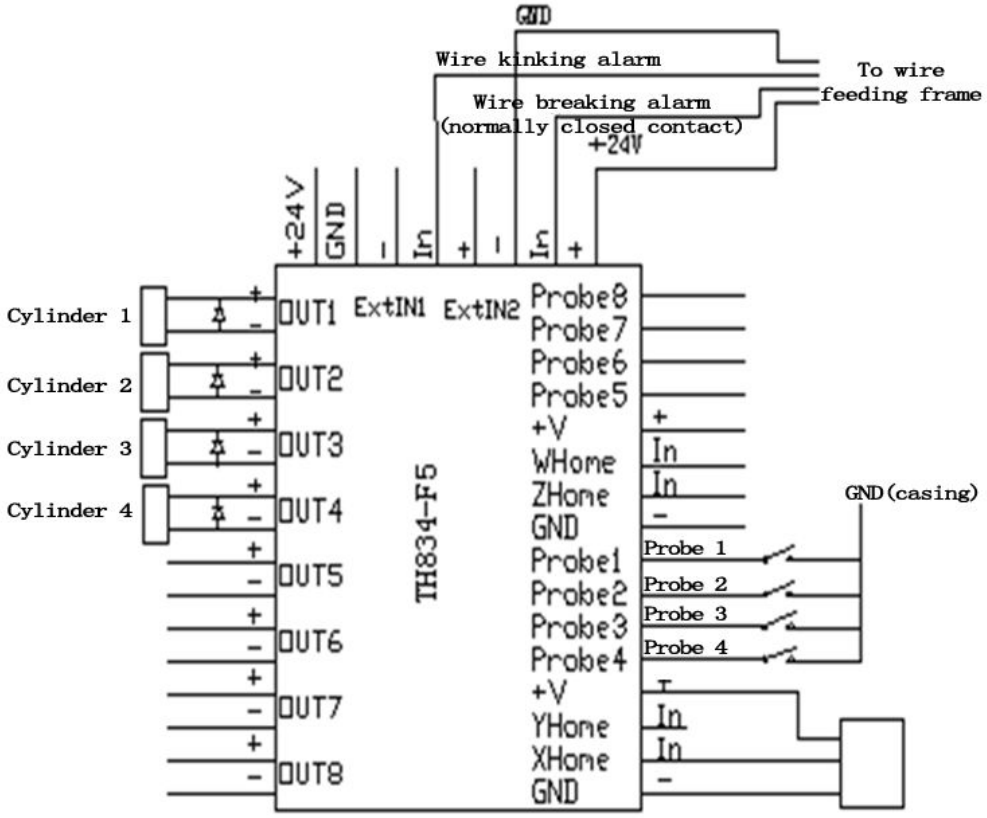
Chapter II electrical wiring

2.1 The definition of the back of the interface



2.2 Electrical connection

2.2.1 Terminal diagram

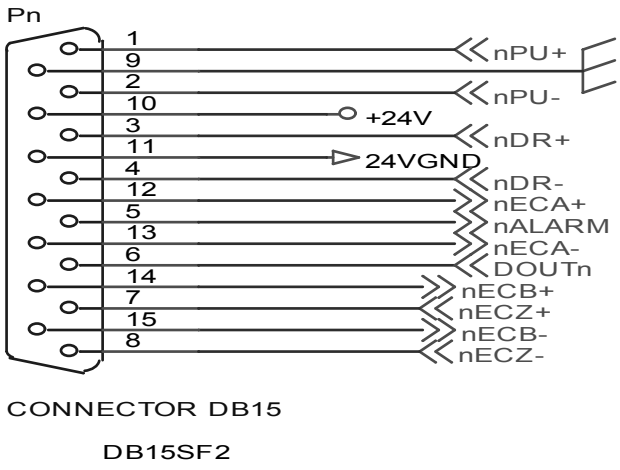


2.2.2 Terminal Description

There are two wiring board (three-axis system has more than 4) origin input signal interface, four (three-axis system has more than eight) probe inputs, four (three-axis system of more than eight) cylinder output interface , a feed bobbin winding line inputs a broken alarm input interface, and another set of + 24V and GND interface for external access to DC24V power supply.

2.2.3 Wiring definitions

15-core signal socket （XS1/ XS2/ XS3/ XS4/ XS5/ XS6）



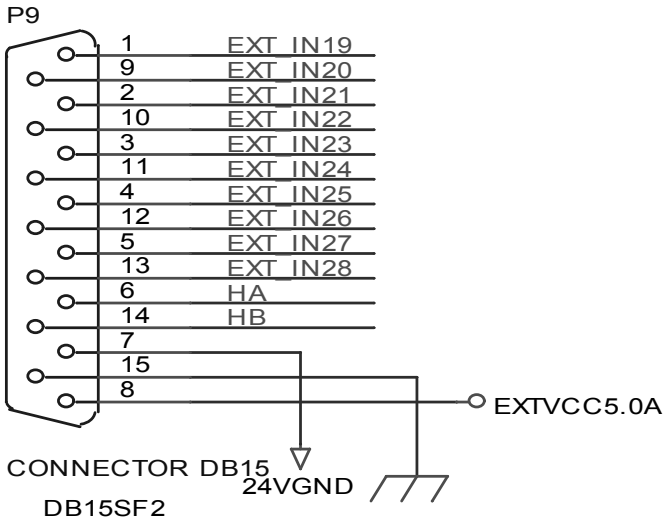
CONNECTOR DB15

DB15SF2

Line number	definition	Features

1	nPU+	Pulse signal +
2	nPU-	Pulse signal -
3	nDR+	Direction signal +
4	nDR-	Direction signal -
5	nALARM	Universal input, can be used as alarm input （X-34 Y-35 Z-36 A-37 B-38 C-39）
6	OUTn	General output point（X-18 Y-19 Z-20 A-21 B-22 C-23）
7	nECZ+	Encoder Z-phase input +（X-42 Y-45 Z-48 A-51 B-54 C-57）
8	nECZ-	Encoder Z-phase input -
9	GND	5V power supply, the internal use
10	+24V	DC24V provided outside power source for the drive signal use, not for a large load power supply
11	24VGND	
12	nECA+	Encoder A-phase input +（X-40 Y-43 Z-46 A-49 B-52 C-55）
13	nECA-	Encoder A-phase input -
14	nECB+	Encoder B-phase input +（X-41 Y-44 Z-47 A-50 B-53 C-56）
15	nECB-	Encoder B-phase input -

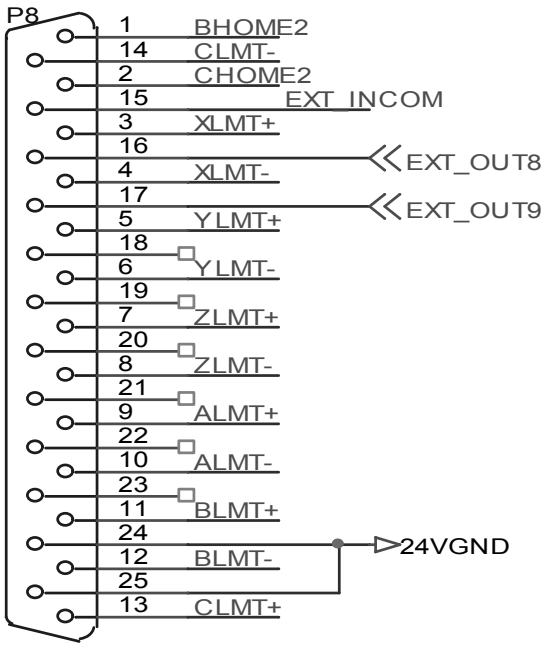
15 pin signal plug （XS9）



Wire No.:	Name	Function
1-5、9-13	Outer input	General input
6	MPG input	MPG A phase
14	MPG input	MPG B phase
7	24V	General input COM
8	EXTVCC5.0A	MPG 5V power supply

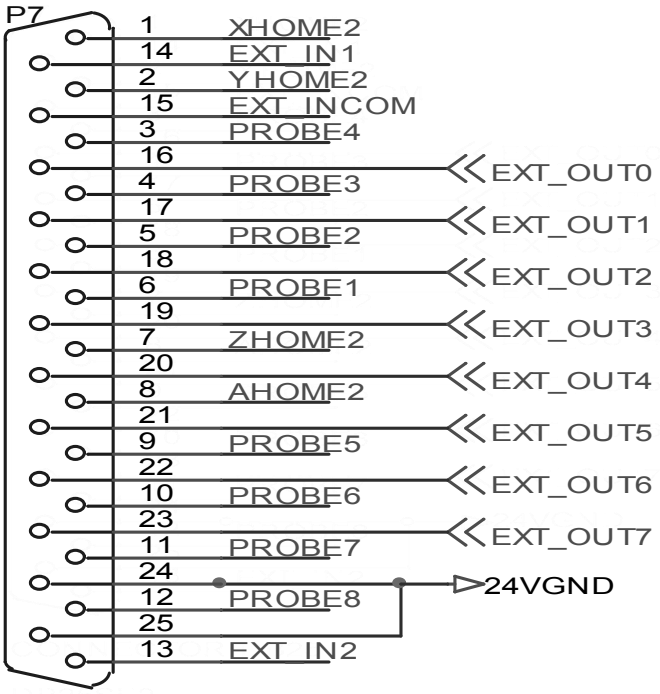
15	GND	MPG 5V Ground

25 pin signal plug （XS11）



Wire No.:	Name	Function
1	BHOME2	B Axis origin point 2
2	CHOME2	C Axis origin point 2
3	XLMT+	X Axis limit+
4	XLMT-	X Axis limit -
5	YLMT+	Y Axis limit +
6	YLMT-	Y Axis limit -
7	ZLMT+	Z Axis limit +
8	ZLMT-	Z Axis limit -
9	ALMT+	A Axis limit +
10	ALMT-	A Axis limit -
11	BLMT+	B Axis limit +
12	BLMT-	B Axis limit -
13	CLMT+	C Axis limit +
14	CLMT-	C Axis limit -
15	EXT_INCOM	Outer input COM(+24V)
16	EXT_OUT8	General output
17	EXT_OUT9	General output
18--23	NC	Empty
24	24VGND	24V POWER GND
25	24VGND	24V POWER GND

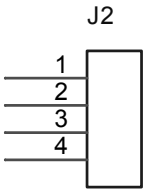
25 pin signal plug （XS10）



Wire No.:	Symbol	Description
1	XHOME2/IN2	X Outer origin signal(input)
2	YHOME2/IN7	Y Outer origin signal(input)
3	PROBE4/IN8	Probe input signal
4	PROBE3/IN9	Probe input signal
5	PROBE2/IN3	Probe input signal
6	PROBE1/IN4	Probe input signal
7	ZHOME2/IN12	Z Outer origin signal(input)
8	AHOME2/IN17	A Outer origin signal(input)
9	PROBE5/IN14	Probe input signal
10	PROBE6/IN13	Probe input signal
11	PROBE7/IN19	Probe input signal
12	PROBE8/IN18	Probe input signal
13	IN21	Input signal
14	IN20	Input signal
15	INCOM1	Input COM connected to outer power positive
16	OUT0	Cylinder output 0
17	OUT1	Cylinder output 1
18	OUT2	Cylinder output 2
19	OUT3	Cylinder output 3
20	OUT4	Cylinder output 4
21	OUT5	Cylinder output 5
22	OUT6	Cylinder output 6

23	OUT7	Cylinder output 7
24	OUTCOM1	Output COM 1 connected to outer power negative
25	OUTCOM1	

D/A Output



1	DAOUT0	Analog Voltage 0
2	DAGND	Analog Voltage Ground
3	DAOUT1	Analog Voltage 1
4	DAGND	Analog Voltage Ground

2.3 Installation and Notes

1. System main power supply：200-230V AC 45-65Hz
2. Controller includes of LED screen which cannot be knocked.
3. Please install in the position without or little vibration。To prevent the vibration, you can add rubber cushion between controller and mounting plate.
4. Do not install under the environment of high temperature, humidity, dust and corrosive gas.
5. Please install under the environment of 0℃-60℃ temperature and 20%-80% humidity.

2.4 Testing Machine

After the installation and wiring is completed and the inspection, you can switch on the power to try to run, the specific operation method is as follows:

1 power will enter the main interface.

2 press the * key to select the input and output diagnosis option to enter the I/O diagnostic test interface.

3 inspection of each input / output signal.

4 after all signal detection is correct can begin the actual spring debugging work

Chapter III Function operation

3. 1 Operation panel explain

3.1.1 Keyboard panel and buttons explain

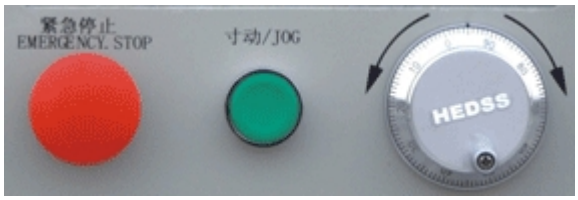
*	The key to select key auxiliary function, push down this button will appear the auxiliary function selection interface, as shown in the auxiliary function instructions section.
Menu	Switch between the main interface and data editing interface.
Read	In the main processing interface and programming interface, when after push down this button, into the program selection interface.
Save	Click this button in the main interface and programming will keep the procedure documents to the hard disk, and processing related data.
Interposition	

Before the white striation, insert a row instruction program.This button is only effective when input program.

attern	Mode switch between automatic and manual, manual mode, a processing.
Alarm cleara	Clear alarm status.
zero	Each shaft automatically reset, if in a certain period of time (usually for 6-10 seconds) did not touch the zero switch, or press the 'stop' button, the display is zero failure.
vertical scroll of painting	When the XY action shaft separate action, press this key that will immediately stop the drive, if you are processing products, need to wait for the current product processing is completed after the completion of the program, press this key to produce a spring, for the purpose of the test.
PageUP	This button only in the programming interface, system parameter setting, parameter setting, the multi line program to roll or parameters page forward.
Pagedown	This button only in the programming interface, system parameter setting, parameter setting, the multi line program down rolling parameters or backward scrolling.
Delete	Remove the program where the cursor is located. This key is valid only when the interface is programmed.
Delete all	In the programming interface, click this button to delete all the procedures, the first standard speed setting program set.
Start-up	In the main processing interface and the programming interface is valid, when the press this key, the motion axis according to the program for action.
Count reset	In the main processing interface and the programming interface, press this button to clear the number of processing. When the number of processing operations to achieve and stop, press this button, the processing can continue.

Probe reset	In the main processing interface and the programming interface, press this key to reset the number of probes failed. When the number of probes failed to achieve the number of failed to stop, press this button, the processing can continue.
Clean up	Empty the white light bar, and this key is valid for any input data or parameter.
Multip	Hand switch encoder and motion axis speed. Optional 1 to 3 speed gear.
ENT	Determine the input data for the document selection interface this key is recognized as the exit key.
instructions	In the programming interface, press this button to select M, S, L, N, J, E, and G instructions.
X Axis Y Axis Z Axis	In the mobile or hand operation, this button to select the corresponding motion axis, the Z axis is an invalid selection.
Zero	In the programming interface, the specified axis of the edit box to zero, and the position to send spools cleared.
—	On behalf of the symbol '-' and '+' key.
⇨ ⇩ ⇦ ⇧	Up and down around the direction of the cursor keys.
single step	Keep the function button, no use.

3.1.2 Panel button description



A control panel has two buttons and a hand wheel.

The red mushroom shaped button for emergency stop button, that is, in the process or return to zero operation when there is an unexpected situation occurs when you can press this button to achieve an emergency stop operation, in addition to the manual mode can be automatically returned to the automatic mode.

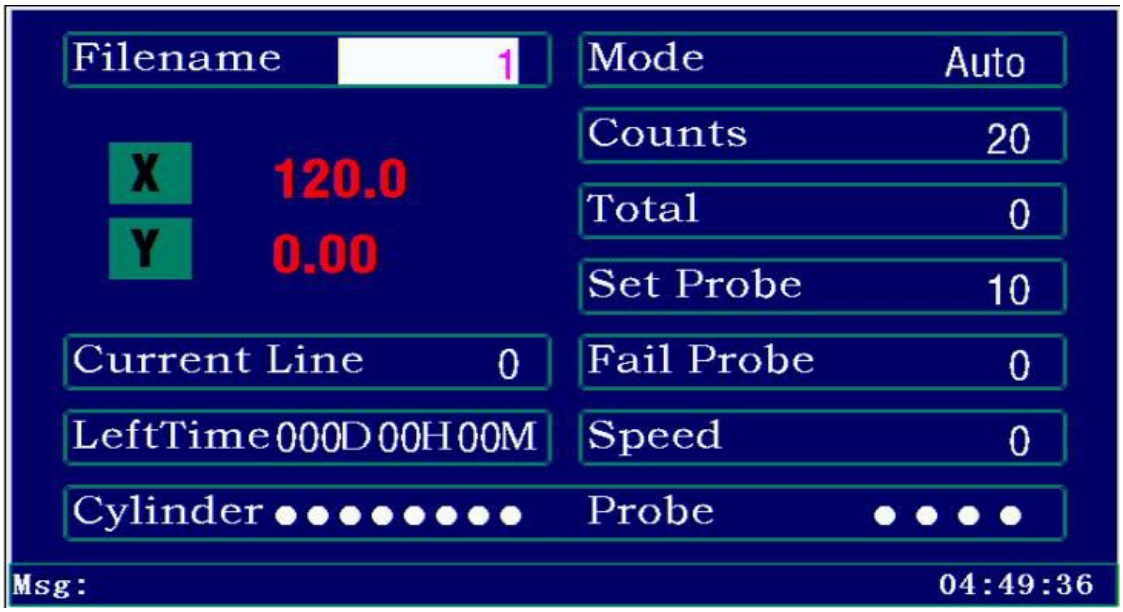
Green point bottom is inch move bottom, that is, press this button after the start of the process, the lifting of the automatic processing, processing speed based on the current set of the rate, the rate of 1 corresponds to the slowest rate, 3 corresponding to the fastest speed, the use of this function can

be very convenient for the trial of the spring to facilitate the adjustment of various models of the spring.

The function of a hand wheel is manually moved the axis only in the programming interface effectively, in automatic programming interface mode, turn the hand wheel corresponding to the shaft (the axis of the cursor) can achieve single shaft manually move, in manual mode is the hand wheel is rotated to multi axis linkage to implement a hand shake processing of spring.

3. 2 Operation interface and resource description

3.2.1 Main processing interface



Resource Description:

1) Program number: This is the stored procedure number, this value can be used in this interface to move the cursor directly to the input (0 ~ 999).

2) Current mode: two types of breaking up and automatic mode

3) Coordinates: display X, Y axis coordinates.

4) Target number: the number of automatic processing products, this value can be adjusted by moving the cursor keys in this interface (1-9999999).

5) Current number: the number of products that have been completed, when this value is equal to the number of targets, the system stops working, as follow:

1. At this point you can press the "enter" automatically cleared the number of

processing.

2. Other conditions will be cleared by the value of the "count reset" key.

6) Probe settings: set the number of probe touch, this value can be adjusted by moving the cursor keys in this interface (0-99999), when the value of 0 when the system does not carry out the number of probes failure detection.

7) Probe failure: when the specified probe did not capture the touch signal and the probe set is not 0, the value will increase, so the value is greater than or equal to the value of the probe set, then processed the current product, automatic shutdown!

8) The current line number: display the current data processing line.

9) Production speed: automatic processing, display the current number of processing per minute.

10) Remaining time: the amount of time needed to complete the target.

11) Cylinder state: shows the current status of the 1 - 4 cylinder.

12) Probe status: displays the current status of the 1 - 4 probe.

13) Message hint: display and hold the last message.

14) Displays the current time, so that the user can refer to.

3.2.2 Program edit

1) Line: line indicating the program.

2) Instruction: the instruction code of the instruction program, range (M, S, L, N, J, G,, E) in the data.

3) Start X: the position of the camshaft (-360 ~ 360)

4) End X: indicating the position of the camshaft (-360 ~ 360)

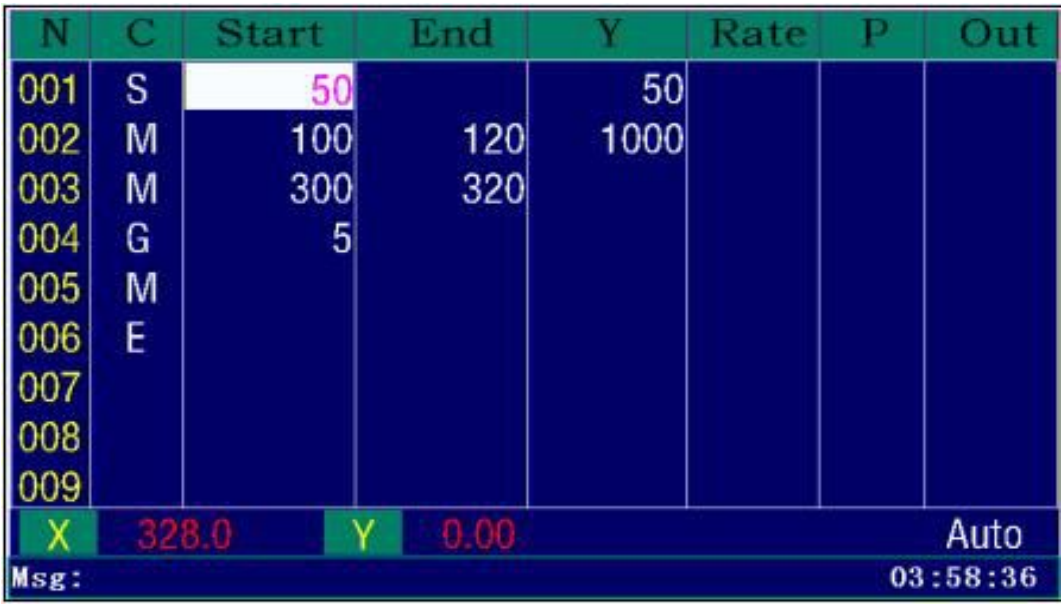
5) Wire feeding: indicating the length of the wire feeding (-9999.99 ~ 79999.99, unit: mm)

6) Ratio: the ratio of the processing speed to achieve the corresponding speed change (0.01~5.0)

7) Probe: probe number input (4 ~ 1)

8) Cylinder: indicates the cylinder number (1111 ~ 0000)

as shown in the figure：



Note: the input data must be completed, according to [into] key, the data saved to the hard drive program, to prevent accidental power loss.

3.2.3 auxiliary function operation interface

(1) according to the "*" button in the main screen appear as shown in figure

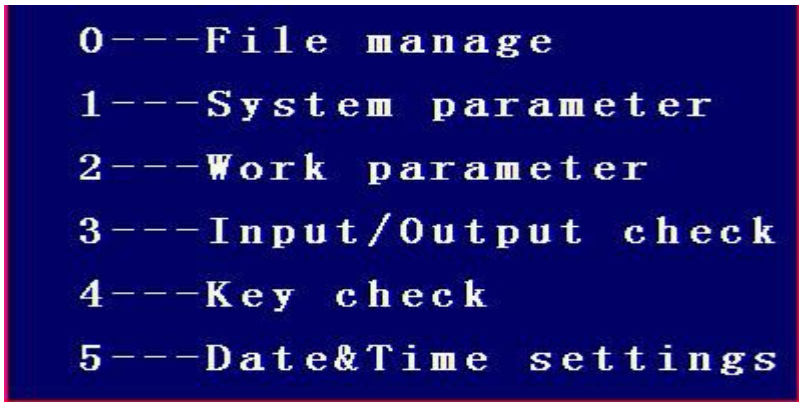


Figure 3.1

At this time by the corresponding number key to enter a different interface.

(2) processing file management interface

After entering the Figure 3.1 according to "0" can enter the processing file management interface as shown in figure

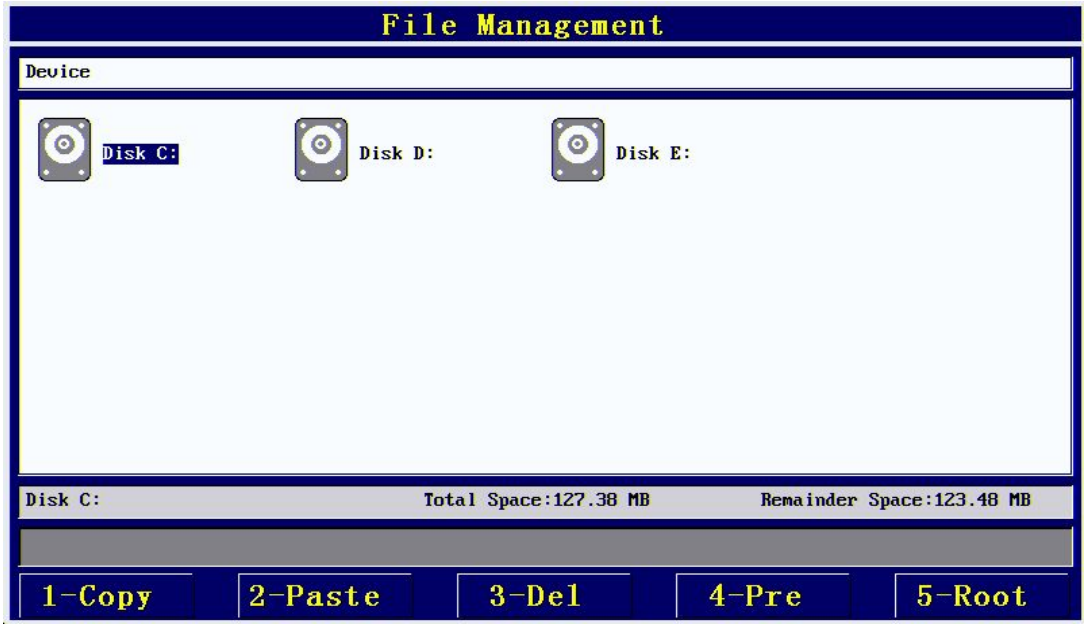


Figure 3.2

At this point you can press up and down arrow keys to select the disk around. C yaffs disk, D disk FAT disk, E disk is connected with the U disk.

Press "ENT" to enter the corresponding disk, as shown in Figure 3.3 below:

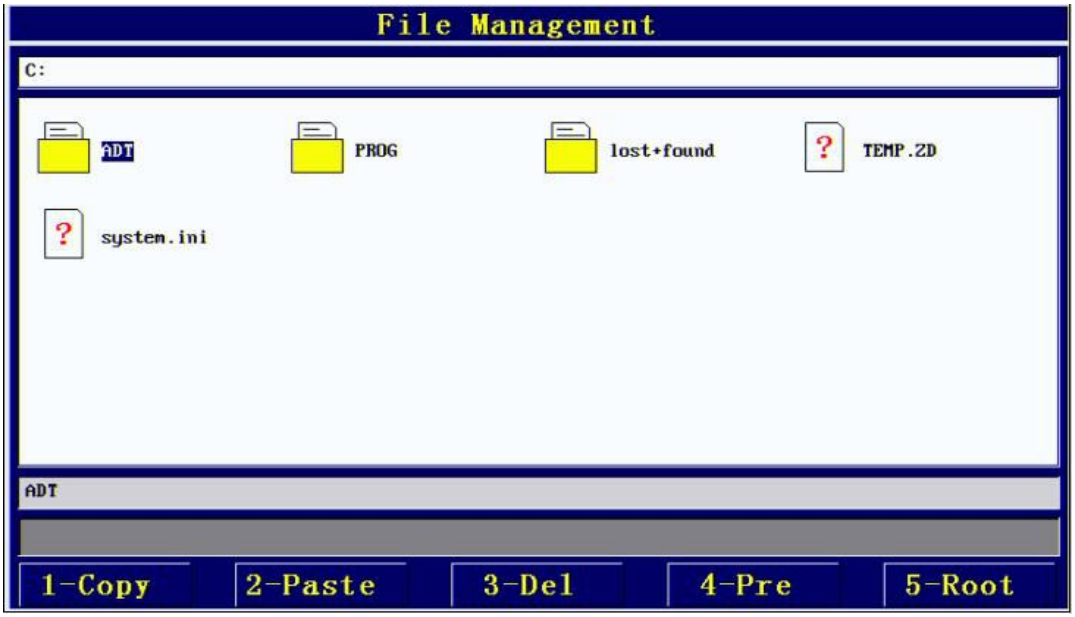


Figure 3.3

According to the "1" can be a file copy, "2" can be copied before the file paste to the current directory; according to "3" delete the current cursor where the file or folder, press the "Y/N" in the system, press "" to cancel the operation; according to "4" can be returned to the previous level directory; "5" can be returned to the root directory; "" can exit the file management system, back to the main processing interface.

Note: when using a mobile U disk operation, the mobile U disk must be formatted as FAT

format, otherwise the file may not be read properly.

(2) system parameter setting interface

After entering Figure 3.1 according to the "1" after the password (the system initialization default password is 123) to enter the system parameters to set the interface as shown in figure 3.4-3.6:

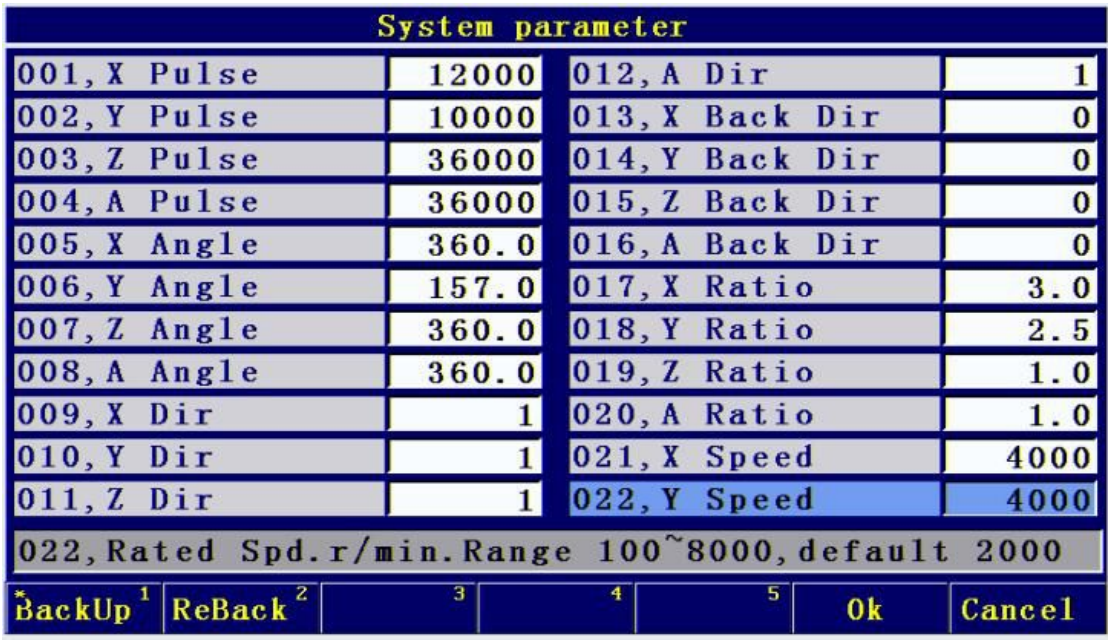


Figure 3.4

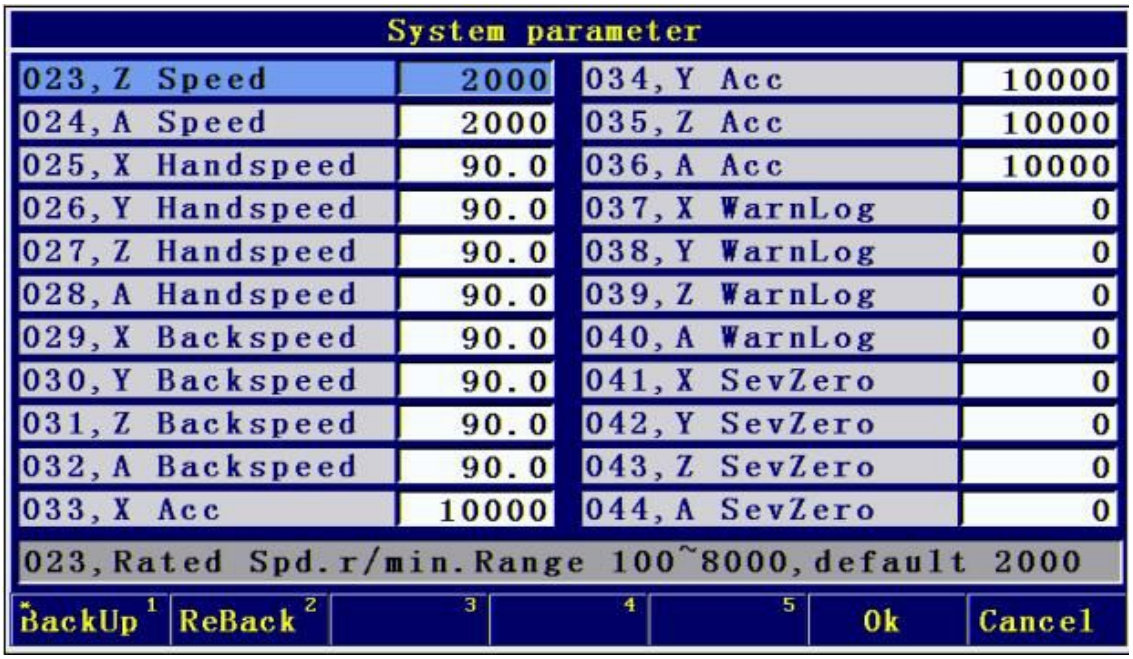


Figure 3.5

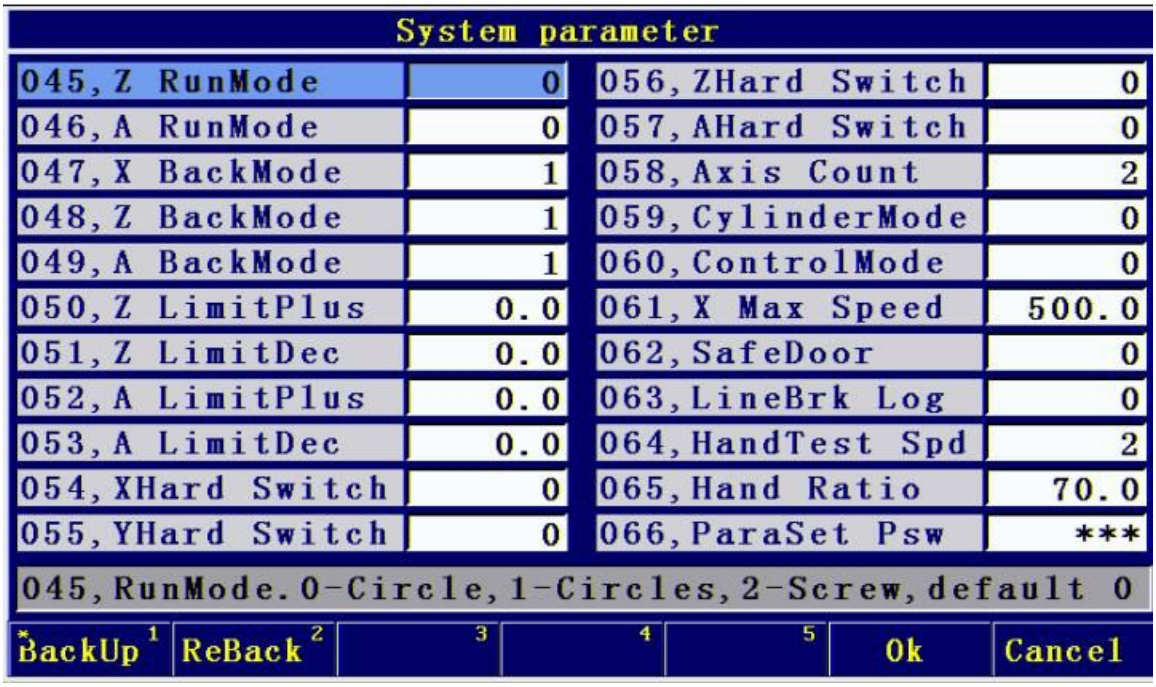


Figure 3.6

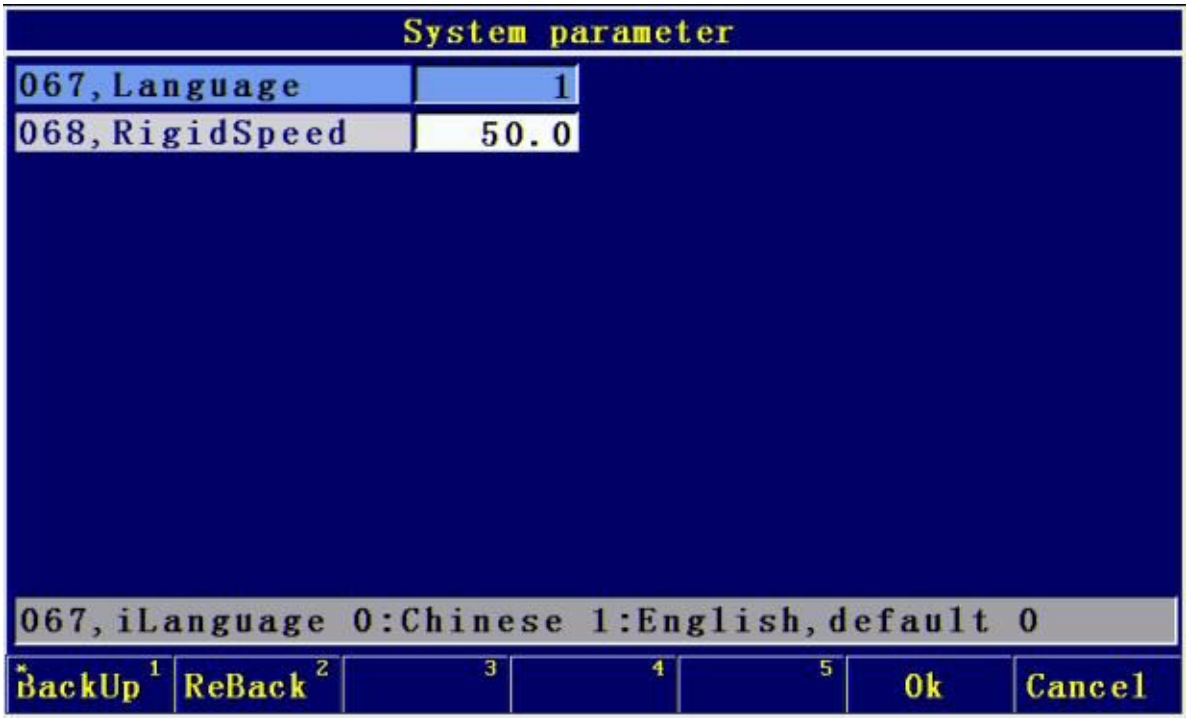


Figure 3.7

1) X, Y, Z, A axis pulse: corresponding to X, Y, Z, U axis every turn of the required pulse number, must be matched with the drive set.
2) X, Z, A rotation angle: X axis in the first set of the corresponding pulse number rotation angle, set to 360
3) X, Y, Z, A running direction: corresponding to X, Y, Z, U running direction.
4) X, Y, Z, A return to zero direction: corresponding to X, Y, Z, U in the zero direction.
5) Y wire length: send in the first reel pulse number set to the length of the line, usually feeding wheel circumference.

6) X, Y, Z, A reduction ratio: the mechanical reduction ratio of each shaft.
7) X, Y, Z, A motor speed: set the rated speed of each shaft motor.
8) X, Y, Z, A: the axis of the manual speed manual (hand moving speed of the mobile single axis speed).
9) X, Y, Z, A return to zero speed: the running speed of each axis to zero.
10) X, Y, Z, A alarm logic: each axis servo alarm logic level.
11) X, Y, Z, A servo zero point: each axis is zero.
12) A, Z operation mode: Z axis and A axis operation mode has three kinds of optional, single turn, multi loop, wire rod.
13) Z, X, A return to zero mode: processing to complete the three axis of the return to zero mode optional, close to zero, zero forward, reverse back to zero.
14) A, Z axis of the positive and negative limit: Z axis and A axis as the axis of the wire rod when the positive and negative soft limit.
15) System axis: the number of the system of the spring machine is selected to support the 2 axis and 3 axis mode.
16) A cylinder mode: support for 01 series and + / - match the numbers sequence. Cylinder mode 0, corresponding to the 01 series: 1111 said open cylinders 1-4, 101 said open 1,3 cylinder, close the cylinder 2. Cylinder mode is 1, corresponding to the + / - match sequence of numbers: 1234 said open cylinders 1-4 and -1-2-3 said closed cylinder No. 1,2,3.
17) Start speed: the initial speed of the motor start.
18) Acceleration: the acceleration of the acceleration process after the start of the motor.
19) Maximum speed of X axis: maximum speed of rotation of X axis
20) The ratio of positive and negative delay: the ratio of delay to change.
21) Disconnection alarm logic: logic level of disconnection alarm.
22) Hand speed: set the hand wheel is processing the counting statistics parameters, the numerical large will produce hand processing relative and hand operation to stop the hysteresis phenomenon, more hours may make slow rotating hand wheel in processing jitter phenomenon, generally around 2, please do not easily change.
23) Hand ratio: setting hand processing speed change ratio, numerical large did not change significantly, is small, usually about 20, please don't change easily.
24) System password: set the password to enter the system parameters settings interface.
25) Language selection: system language selection (0: Chinese, 1: English)

Press the "*" key, the activation of the digital function keys, press "*" again, turn off the digital function keys. Activate state, "1" to perform backup function, the system parameters back to the FAT disk; "2" to restore function, if the system parameters before the backup, the backup will be restored to the current parameter settings.

Press on, left, right, on the page and the next page button to move the cursor and page, easy to set parameters.

Press the [deposit] key, save the current change data and exit the interface, press the cancel key, give up the current change data and exit the interface.

A cylinder mode 0, corresponding to the 01 series: 1111 said open cylinders 1-4, 101 said open 1,3 cylinder, close the cylinder 2. Cylinder mode is 1, corresponding to the + / - match sequence of numbers:

1234 said open cylinders 1-4 and -1-2-3 said closed cylinder No. 1,2,3.

（4）working parameter setting interface

After entering Figure 3.1 press "2" to enter the work parameter setting interface as shown in figure 3.7:

Figure 3.7

1) Whether the screen saver: after setting the screensaver time need in automatic processing began to set off the screen display, 1 is closed, 0 is not closed
2) Screensaver time: set automatic processing started long time (in minutes), turn off the screen display.
3) Photo Screensaver: whether to use picture screen saver and need to screen saver function open and choose to use the screensaver photos in the setting of screen time after the arrival of the system automatically calls the start screen screen saver, or turn off the display screen saver.
4) Delivery rack drive: specify the last cylinder output point is the driver to send the wire frame, 1 for the drive, 0 for not driving. Note: this parameter is set to 1 in the cylinder when the column programming, please do not use the fourth cylinders.
5) Alarm output: indicates whether the output of the alarm signal.1 output, 0 does not output.
6) Run the line detection: indicating whether to run the line detection, select the use of running line detection function 1
7) Y line: set down handwheel programming interface under the direction of down line if the hand wheel is rotated separate mobile Y axis, 1 to 0 down line, down the line.Y line: set down handwheel programming interface under the direction of down line if the hand wheel is rotated separate mobile Y axis, 1 to 0 down line, down the line.
8) X axis zero offset: set the X axis offset position, that is, in the X axis to find the zero position switch to turn the angle of the purpose is to facilitate the X axis arbitrarily set the zero position (only three axis above the system effective) (unit: degree).
9) Z axis zero offset: set the Z axis offset position, that is, in the Z axis to find the zero position switch to turn the angle of the purpose is to facilitate the Z axis arbitrarily set the zero position (only three axis above the system effective) (unit: degree).Z axis zero offset:

set the Z axis offset position, that is, in the Z axis to find the zero position switch to turn the angle of the purpose is to facilitate the Z axis arbitrarily set the zero position (only three axis above the system effective) (unit: degree).

10) Stop button to select: on the "single" function key settings. If the parameter value is set to 1, as a single function, the processing is complete a spring stop processing; if the parameter value is set to 0, stop function, the processing state press single bond, immediately stop processing, start again to continue processing.

11) Each batch of output: set a number of output value, when the production quantity to reach the set value, stop waiting.

12) Probe mode: set the probe function is effective, 1 said the probe function is valid, 0 indicates that the probe function is invalid.

According to the key: save the current change of the data and exit the interface, press the [Cancel] key, can give up the current change data and exit the interface.

Note： System parameters are necessary to ensure the operation of the system, under normal circumstances do not easily change. For the Z axis to retain the temporary unused.

（5）Input / output detection interface

After entering the Figure 3.1 press the "3" key to enter the input and output detection interface as shown in figure 3.8：

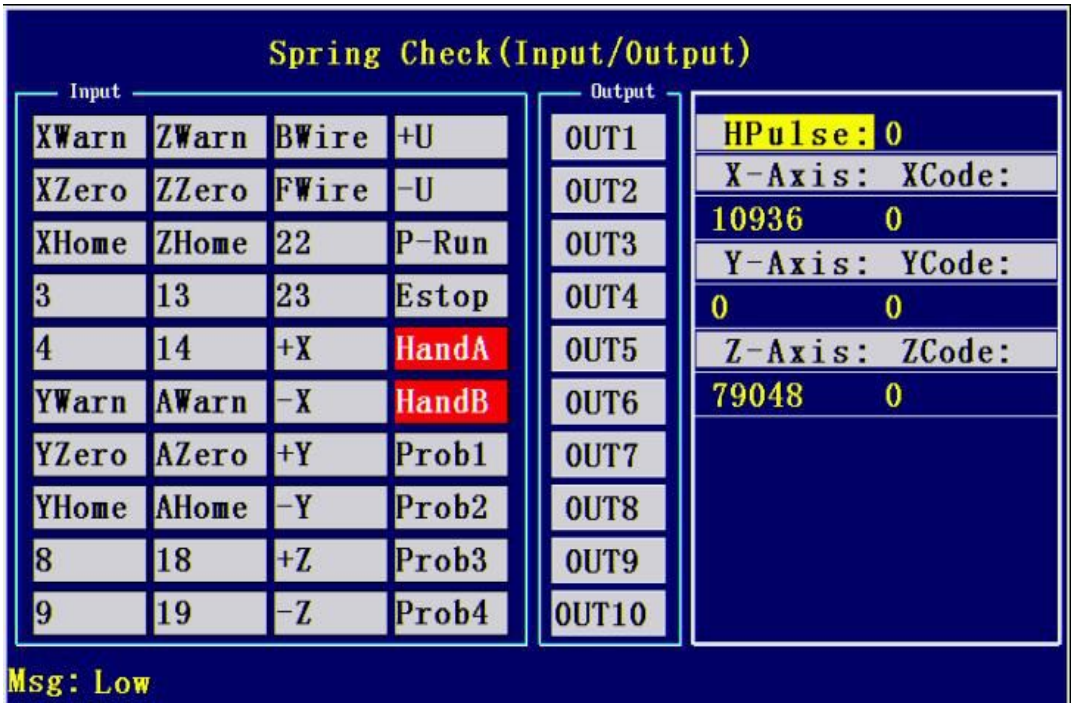


Figure 3.8

1) On the left side of the white rectangle frame of input port, input port of the corresponding with the input signal when the rectangular box for Panchromatic and with a font to display, or with a rectangular box font to display, for probe 1 ~ probe 4 signal detection when the signal in conjunction with the front some expressed in digital signal and color display, if only in front of the digital signal changes behind the probe signals no change is the control card problem need to replace the control card.

2) Intermediate 10 0-9 output port, according to figures 0-9 to 0-9 digital signal output, when

there occurs when the output system for full color display and the corresponding font, otherwise the system display as shown in the figure.

3) Each axis of the right side of the pulse shows that the selected axis in the shaking hand wheel sent after the number of pulses, select one axis and then press the return to zero, zero after the end of the re press the return to zero key to calculate the number of pulses corresponding to the single circle.

4) The lower right corner of the file can through the button "multiple" to switch, divided into low, medium and high speed, with hand wheel control transmit pulse rate.

Press the Cancel button to exit the interface.

（6） Key detection screen

After entering the Figure 3.1 press the 4 button to enter the detection screen as shown in Figure 3.9：

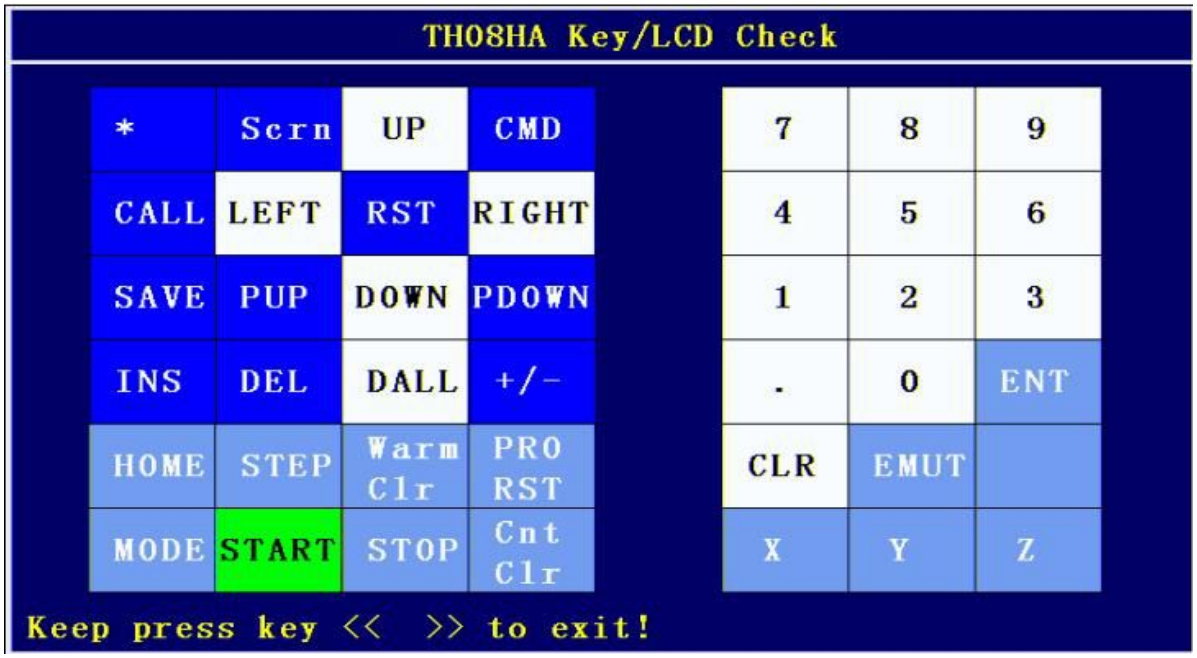


Figure 3.9

Test the function of each button on this interface，Long press "■" the blank key that will exit this interface.

3.3 Program instructions and sample instructions

3.3.1 Instruction definition and description

1）S Directive: speed command.

Instruction format ：

Line number	instruction	Start X	End X	Wire feeding	Speed ratio	probe	cylinder
line number	S	X Speed		Y Speed			
xx	M	X Start	X End	Feed line	Ratio		

		angle	angle	length	value		

Description: used to set the base speed of the action axis, in order to set before a command action, it is the value of the M command speed ratio multiplied by the value obtained as the interpolation speed of the motor axis.

X speed: indicates that the X axis has motion when the X axis moves the speed Y axis moves to do follow.

Y speed: the X axis does not move, the speed of the Y axis motion. Unit: M / min.

Other items are not valid in the S directive.

2）M instruction: motion command

Instruction format ：

Line number	instruction	Start X	End X	Wire feeding	Speed ratio	probe	cylinder
Line number	S	X Speed		Y Speed			
Line number	M	X Start angle	X End angle	Y length	Speed ratio	Probe number	Cylinder state

Instructions: motion command, X axis first start angle, after the start of the X axis to start the action of the cylinder action, and then the X axis and Y axis synchronization to the X end angle and Y axis wire length of the process to detect the set of the probe signal.

If there is an item in the M instruction that is empty, skip the action of the item.

X start angle: X axis to the first single axis to come to the point of view.

X end angle: X shaft end angle.

Y length: X to the end angle when the Y axis at the same time to send the line length.

Speed ratio: the speed of movement of the M command is the speed of the S instruction set which is above the nearest one. The default is 1 when the speed ratio is not set.

Probe number: set the X axis and the Y axis at the end of the end angle and the length of the wire to check the number of probes.

Cylinder: the X axis is set to go to the cylinder number after the start of the horn.

3）E instruction: end instruction

instruction format：

line number	instruction	Start X	End X	Wire feeding	speed ratio	Probe	Cylinder stator
line number	S	X Speed		Y Speed			
line number	M	X Start angle	X End angle	Y Length	Speed ratio	Probe number	Cylinder state
line number	E						

Description: the end of the instruction, each process must be provided with end directive whether

formatting errors and machining process must eventually come to e instruction can appear otherwise processing cycle of death.

This instruction does not have to be set up.

4) N, L instruction: loop instruction

5) instruction format：

line number	instruction	Start X	End X	Wire feeding	speed ratio	探针	Cylinder stator
line number	S	X Speed		Y Speed			
line number	L	Cycle index					
line number	M	X Start angle	X End angle	Y length	Speed ratio	Probe number	Cylinder state
line number	N						
line number	E						

Description： The L and N instructions.The instructions for processing cycle between the L and N instructions of the program.In the instruction I start the X column for this section of the program cycle times I instruction and N directive must appear in pairs, the L and N instructions up to three layers of nested.

Cycle number: the number of cycles between the L and N instructions section of the program.

Other items of this instruction do not need to be set.

5）J Instruction: conditional jump instruction

instruction format：

line number	instruction	Start X	End X	Wire feeding	speed ratio	Probe	Cylinder stator
line number	S	X Speed		Y Speed			
line number	L	Cycle index					
line number	M	X Start angle	X End angle	Y length	Speed ratio	Probe number	Cylinder state
line number	N						
line number	M	X Start angle	X End angle	Y Length	Speed ratio	Probe number	Cylinder state
line number	J	Jump the line number					
line number	E						

Explain：J instruction is a conditional jump instruction. It required and M instructions, the jump function is used to perform condition, when M instruction detection probe signal in the normal,

does not perform M under the instruction of a J jump instruction, perform a jump when detecting probe signal failure. Jump turned number required for M the command line.

Jump line number: probe testing failed to jump to the line number.

J order other items do not need to be set.

6) G instructions: absolute jump instruction

Instruction format:

Line NO.	Instruction	Start X	End X	Wire Feeding Axis	speed ratio	probe	cylinder
Line NO.	S	X Velocity		Y Velocity			
Line NO.	L	cycle index					
Line NO.	M	X start angle	X end angle	Y length	Scale Velocity	Probe NO.	State of cylinder
Line NO.	N						
Line NO.	M	X start angle	X end angle	Y length	Scale Velocity	Probe NO.	State of cylinder
Line NO.	G	Jump a career change					
Line NO.	E						

Description: G instruction is absolutely jump instruction. When the program execution to the absolute jump instruction is executed to jump to jump career Numbers of set. Jump turned number required for M the command line.

Jump line number: when performing the jump jump to the line number.

G other items do not need to set up.

3.3.2 M, J, G instruction examples

Line NO.	M	20	30	20			01	X 20 degrees first and then recover the no. 1 cylinder, out of no. 2 cylinder, 3, 4 cylinder state is changeless, then cooperate with Y axis linkage. Y axis speed of tracking speed. Y axis line 20 mm
Line NO.	M	45		100			1011	After X to reach 45 degrees, back out of no. 1 and no. 3, no. 2 cylinder, cylinder, 4 Y after conveying line 100 mm linear velocity for S instruction to send the spool speed.
Line NO.	M	30	50	100	0.2	1	1	At the rate of S set X X 0.2 d first after reaching 30 degrees, the speed of the no. 1 cylinder, then cooperate with Y, Y speed of tracking speed, the X axis rotation to 50 degrees, at the same time the Y axis line of 100 mm, and 1 pro

								be touch detection, if touch in the process of running the program automatically stop the current probe signal processing and recovery of the cylinder, turn to the next line continues to carry out after the completion of execution or recover the cylinder, then turn to the next line continue.
Line NO.	J	7						Conditional jump instruction execution, when we have a probe to detect a line on the instructions valid or invalid system will automatically skip bank continue to execute down, then there is a line of probe detection, if there is a touch in the process of running the probe is to perform a jump and order execution or jump down to the specified line number 7 execution down again, pay attention to the rationality of the jump position otherwise there might be an infinite loop to perform a particular section of the program.
Line NO.	M	360						X rotation to 360 degrees
Line NO.	G	6						Absolute jump instruction, the program execution to immediately jump to the designated bank line number 6 continue execution down, with the use of the J instruction can be realized to probe to detect failure of spring for special processing operation in order to more convenient detection of waste
Line NO.	M	100	+	100				X axis running at the speed of S set to 100 °, the X and Y axis movement joint interpolation, the X axis for the main shaft. End Angle of the "+" said processing is to return to zero, the corresponding 360 °; End Angle for "-" said processing in reverse back to zero, the corresponding 0 °.
Line NO.	M	10		100				Due to the Angle of an end to "+", after the X axis rotation to 360 °, will continue to synthetic rotation to 10 °, rather than the reverse back to 10 °. End is empty, the spindle after switching to Y axis, at the speed of the Y axis is set to single shaft or interpolation motion.

Note: when the input data, in addition to the Y axis to send wire can be negative, the value of the other value is greater than or equal to 0. Program input end, must be the procedure in the hard disk, in order to avoid accident data lost after power failure. In the processing is compl

eted, the next processing automatically according to the latest editor at the beginning of data pr ocessing.

3.3.3 Application example shows that

Line NO.	instruction	Start X	End X	Wire Feeding	speed ratio	probe	cylinder
00	S	60		50			
01	M	10	20	20			0001
02	M	30		100			
03	M	45	75	50	0.3	1	1
04	J	14					
05	M	90	100	10			
06	L	6					
07	M	120	150	30		2	01
08	J	14					
09	M	180	200	10			
10	N						
11	M	230	300	5			
12	M	360					0000
13	E						
14	M	180	250	200			
15	M	360					0000
16	G	13					

3.3.4 Statements explain

00: Set the X axis rotation speed of 60 rotations per minute (RPM), Y axis to linear speed of 50 meters per minute.

01: X first rotation to 10 degrees, and then recover the no. 1, 2, 3 cylinders, out of 4 cylind er, the position of the X axis and then rotating to 20 degrees, at the same time Y track line 20 mm.

02: X first rotation to 30 degrees, and then send Y axis line of 100 mm, linear velocity for S instruction set of 50 m/min.

03: Rotate at a speed of 60 X 0.3 X to 45 degrees, the no. 1 cylinder, then the X axis rotat e at a speed of 60 X 0.3 to 75 degrees, at the same time tracking line 50 mm, Y probe touching detection and 1, if the probe signal is detected, the program automatically stop the current lines of program execution, and take no. 1 cylinder, executing the next line program directly, otherwise the bank after the execution to execute a program down.

Note: the probe and the use of the cylinder to be one to one correspondence, no. 1 cylinder pr obe can only corresponding to use no. 1, 2 probe can only use 2 cylinder an analogy, one for cylinder: in the first column says no. 1 cylinder, the second column represents no. 2 cylinder a nd so on, can use the total four cylinders. Wherein the listed as 1 said system arrived at the b ank counter after the starting Angle of the cylinder number, 0 means GaiHao cylinder, a null v alue (no data) when the state of cylinder remains unchanged.

04: If in line detected during the period of execution of the probe signal continued implementation of the program does not jump down, otherwise the program to jump to 14 lines of location to continue downward.

05: X first rotate 90 degrees to the location, and then rotate to 100 degrees and the location of the Y tracking send line 10 mm.

06: Set a loop body began to flag, and cyclic number is 6.

07: X after the first rotation to 120 degrees, stretch out 2 cylinder, then the location of the X axis rotation to 150 degrees, Y track line 30 mm, and 2 probe touching detection, if the probe signal is detected, the program automatically stop the current lines of program execution, and recover the 2 cylinder, executing the next line program directly, otherwise the bank after the execution to execute a program down.

08: If in line detected during the period of execution of the probe signal continues to implementation of the program does not jump down, otherwise the program to jump to 14 lines of location to continue downward.

09: X First rotate 180 degrees, and then rotate to 200 degrees, Y track line 10 mm.

10: Set a cycle end mark, when the specified the number of cycles is equal to L instruction set, program execution 11 line, otherwise, the loop will down from we reverse run to 6 words continue to execution.

11: X axis rotation first to 230 degrees, and then with the location of the Y axis linkage operation to 300 degrees, Y track line 5 mm.

12: The location of the X axis run to 360 degrees, back to zero. At the same time take all cylinders.

13: End of program

14: X axis the location of the first run to 180 degrees and then cooperate with the location of the Y axis linkage operation to 250 degrees, at the same time the Y axis tracking line is 200 mm.

15: The X axis running position return to zero to 360 degrees.

16: Program to jump to 13 the location of the line, so that the application can run.

17: Note: when editing data, try not to make small X axis rotation Angle, and Y axis to send a long line, so that may lead to send the spool speed too fast, and make the motor alarm. In the input error with prompt invalid data or send line is too long, etc.

3.4 System parameters recovery

In actual operation, is likely to be caused by improper operation or suddenly loses power and the data on the hard drive or system parameters to be eroded, serious can lead to a system error, the above situation, generally will not appear, the system has a default parameter error correction function, if the above situation, the system will appear

"Please update the configuration file

Press any key to continue... "

Statement, at this point you can choose the system after entering the system parameter editing interface manually edit each parameter, and then save the exit, and then restart the controller, if this time still wrong, please contact with the company to seek the solution.

Ps: spring machine program is constantly upgrading, manual we try to do an update, but also has the situation of update does not reach the designated position, if you have anything unclear

on the use or operation does not accord with the instructions, please feel free to contact with t he company, for this inconvenience, please understanding!

Tel：0755-26722719-378

FOUR Programming

4.1 Program burning method

Methods 1. U disk to update the program

1. Start the controller, the buzzer rang, BIOS, click the "delete all" input password 26722719.
2. Insert the usb connection to the controller.
3. Press the "2" into the U disk operations.
4. Press "2" into the U disk data replication, pop-up "file directory management," page.
5. Press "1" to switch disk, into the U disk file directory, choose "2410 test. Bin file, press" 2 "copy files.
6. Press "1" to switch the disk into the controller file directory, choose "ADT" folder, press ent er into this folder, press "3" paste, prompted coverage, according to the Z axis.
7. Continuous press the "delete all" back to the BIOS to the main page.
8. Press "1" to choose the BIOS Settings, enter the password is 26722718.
9. Press "1" to select the program area, suggest whether written, according to the "Y".
10. After the success of the update file, power to restart.

Methods 2. USB connection to update the program.

1. Start the controller, the buzzer rang, BIOS, click the "delete all" input password 26722719.
2. Connect controller and PC with USB cable.
3. Press the "2" controller into the U disk operations.
4. Press "0" into the USB communication controller,
   Controller prompts "wait for USB connection....".
   After the success of the controller connection prompt "USB transmission....." .
5. Open the "my computer" on the computer to find a new "removable disk".
6. Double-click to open the "removable disk", visible three directories "ADT", "PARA", "PROG ".
7. The "2410 test. Bin" directory file is copied to the "ADT" folder.
8. Press the controller "delete all" button to cancel the USB connection.
9. Again press the controller the BIOS "delete all" back to main page.
10. Press "1" to choose the BIOS Settings, enter the password is 26722718.
11. Press "1" to select the program area, suggest whether written, according to the "Y".
12. After the success of the update file, power to restart.

4.2 Check the software version information

Editing interface in the system main interface, or program in accordance with the ".. 79 "four c onsecutive button will pop up the message dialog box shows the software" item number ", "ver sion information", "hardware" and "software finally change the date and time".

Chapter V Precautions and maintenance

5. 1 Precautions

Safety Precautions:

1. without permission, do not open the cabinet.
2. When the controller a long time, turn off the power.
3. Special attention not to let the dust, iron powder into the controller.
4. Handle with care, be careful not to not cause damage controller.

Note the proper use of:

Incorrect operation can lead to abnormal operation, the worst case even damage the controller, so please observe the following precautions for correct use of the controller.

1. Check the connected power supply meets the requirements, to eliminate the controller burned.
2. The controller of life and environmental temperature have a great relationship, if the temperature is too high processing site, install cooling fans. The controller allows the working temperature range between 0 ℃ -60 ℃.
3. Avoid high temperatures, humidity, dust or corrosive gas environment.
4. In the place with strong vibration, should be added to the rubber shock pad for buffering.

5.2 Maintenance

Matters to note when maintenance and inspection

1. First disconnect the power supply to the main circuit again for maintenance controller.
2. The operator should make sure the power is off, to prevent accidents.。

Periodic inspection items

Under normal use conditions (environmental conditions: daily average 30 ℃, the load factor of 80%, run rate 12 hours a day), perform daily checks and periodic inspections by the following items.

Daily Inspection	Daily	● Make sure the ambient temperature, temperature, dust and foreign matter ● Any abnormal vibration, sound ● Have the ventilation holes are plugged yarn etc.
regularly check	1-year	● Whether fixed component is loose ● Whether terminal damage

Appendix A: Common Fault Analysis

1) The "control card can not be found!", Then the board may be a bad contact or DIP switch position error, please re-open the case off the card or Bobo code switch to full ON position when the system starts, if fault can not be ruled out, please contact your supplier.

2) The system has been started, but all or part of the button does not respond, probably due to the keyboard key board have questions, please contact your supplier.

3) The system has been started, but on the screen to cycle X or Y warning alarm, but this time not on the servo drive alarm display, you should check the system wiring, the wiring is no problem if you should change the servo parameters so that the anti-servo alarm output phase servo control system for the servo alarm logic can not change the device parameter setting interface to set the alarm logic it is inverted.

4) The system of hand movement only after the start of each axis in one direction, the other direction sometimes shake once and you should set the drive control pulse + control direction.

5) After starting the system, each axis normal hand moving, but you can not start the machining operation, then first make sure that the correct zero, the second is to check whether there are broken, send wire rack for some signal should not offer short break then break the input signal, since it is normally closed contact. You should also check whether the number of processing exceeds the target amount.

6) The system starts normally, press zero immediately after the show zero fault, and you should check the "stop" button is pressed. If after a period of time show zero zero fault, you should check the origin switch, view the test input signal is valid or checking servo electronic gear set whether the number of pulses per revolution system to match.

7) can not extend the cylinder, make sure the wiring is correct solenoid valve, solenoid valve should also be guaranteed a drive current of less than 500 mA.

8) The probe always fails, make sure the probe set time delay is large enough to ensure that the machine itself should also be common ground with the controller.

9) After the system starts an alarm (Controller long beep) appears and the number of springs may be processed exceeds the number of goal-setting, you can press the "counter reset" or to enter the parameter setting interface reset The target number can be.

After power controller but did not send the pulse motor sports, then filter parameters, please check the wiring, check the connection to the ground, as well as setting the servo

Appendix B: Common servo parameter set

All parameters are reference Sanyo Q series of drives, for other models, please select the appropriate option.

First, the system parameters (ru)

Page	Parameter Meaning	Default value	Set value	Remarks
00	the input source type (three-phase / single-phase)	00	01	00：three-phase 01：single-phase
01	Encoder Type	00	00	00：Incremental 01：Absolute formula
02	incremental encoder set	00	00	
03	Incremental encoder revolutions	------	2000	the number of pulses per revolution of the motor feedback to see motor instructions, usually 2000
08	works	------	02	00：torque mode 01：Speed mode

				02：position mode 03: Speed - torque mode 04: Position - torque mode 05: Location - speed mode The system uses the position control mode
09	position encoder mode select	00	00	00：Internal Encoder 01-02：external encoder
0B	brake resistor selection	------	00	00 00: AM No brake resistance 01: Internal brake resistance 02: External brake resistor

Second, the basic parameters (PA)

Parameter group 0 Group0

Page	Parameter Meaning	Default value	Set value	Remarks
00	Position loop gain	30	60	rigid select Options, increase the setting of this value can increase the rigidity of the system in place to reduce the time
00	Speed loop gain	50	70	rigid select Options, set this value to increase the rigidity can be increased to reduce the time of the system in place
0A	feedforward gain	0	50	rigid select an option, increase the setting of this value can increase the rigidity of the system in place to reduce the time
0C	Acceleration and deceleration time	0（ms）	0	

Parameter Group 1 Group1

Page	Parameter Meaning	Default value	Set value	Remarks
04	Electronic gear ratio	1/1	1/1	1/1 8000 pulses / rev (for 2000 line motor, we must first determine the set number of pulses per revolution of the motor feedback before using this value, at the same time keep the first system parameters the number of pulses corresponding to each axis)

Parameter Group 3 Group3

Page	Parameter Meaning	Default value	Set value	Remarks
00	Pulse filter	00	02	00：800ns（1.25MHz） 01：200ns （5MHz） 02：400ns （2.5MHz） 03：1.6us （625KHz） 04：3.2us（312.5 KHz） 05：6.4us （156KHz） 06：100ns （10MHz）

				07：66.7ns （15MHz）
02	Reversible choose	??	00or 40	

Parameter Group 4 Group4

Page	Parameter Meaning	Default value	Set value	Remarks
00	pulse selection	00	20	00: Pulse / Pulse 10: Quadrature 20: Pulse / Direction The system supports pulse / direction mode and pulse / pulse mode

参数组 8 Group8

Page	Parameter Meaning	Default value	Set value	Remarks
00	Servo ON signal is set	02	01	always effective
04	Forward limit	0D	0C	with CONT6 normally open
05	reversing Limit	0B	0A	normally open with OONT5

Parameter Group 9 Group9

Page	Parameter Meaning	Default value	Set value	Remarks
07	Servo alarm settings	39	38	Servo alarm switch settings

Common alarm

Alarm	Explanation	Approach
41	Overload or UVW wiring error or drive does not match the motor	Reduce the load or change the UVW wiring or change the drive motor model
43	Brake resistor error	Check the brake resistance setting and wiring
61	power supply	Check the power supply
85	Encoder error	Check encoder connection
D2	Positioning command pulse frequency error	Check the third set 00 of pulse filter parameter setting

Sanyo RS2 attached wiring diagram

Line number	definition	Features	RS2
1	nPU+	Pulse signal +	28

2	nPU-	Pulse signal -	29
3	nDR+	Direction signal +	26
4	nDR-	Direction signal -	27