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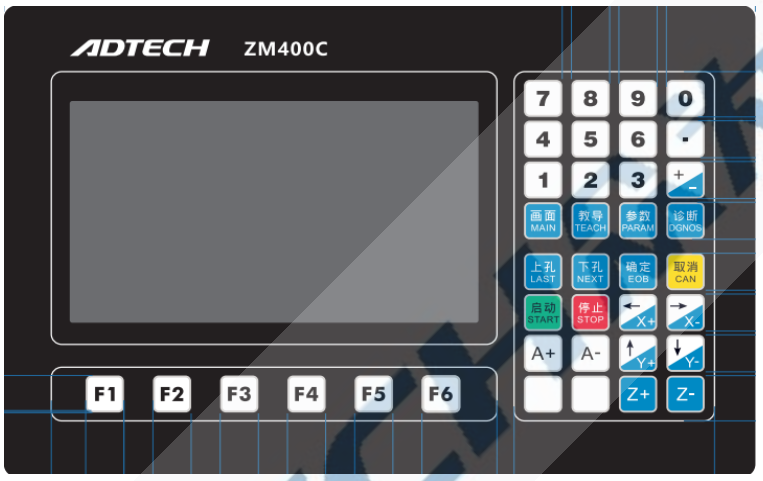
ZMx00C series tufting machine controller

User manual



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Basic Information

This specification is organized by Shenzhen Zhongwei Xing Technology Co., Ltd.

The main author of this manual: Chen can.

First issued on February 1,2021, version 1.0, item number BB 018B010B(ZM200C), BB018B011B(ZM300C), BB018B012B(ZM400 C).

Safety precautions

Transport and storage

- ☞ No more than six layers of packing boxes
- ☞ Do not climb, stand or place heavy objects on the product packing box
- ☞ Do not use cables connected to the product to drag or carry the product
- ☞ No collisions, scratches, panels and displays
- ☞ Product packing cases should avoid damp, sun exposure and rain

open box inspection

- ☞ Please confirm if it is the product you purchased after unpacking
- ☞ Check for damage in transit
- ☞ Check to see if the components are complete and damaged
- ☞ If there is any discrepancy in product model, lack of accessories or transportation damage, please contact us in time

*** Connection**

- ☞ Personnel participating in wiring and inspection must be professionals with appropriate capabilities
- ☞ Products must be reliably grounded, grounding resistance should be less than 4 ohms, neutral line (zero line) can not be used instead of ground wire
- ☞ The wiring must be correct and firm so as not to cause product failure or unexpected consequences
- ☞ Surge absorption diodes connected to the product must be connected in the prescribed direction, otherwise the product will be damaged
- ☞ The power supply must be cut off before plugging the plug or opening the product box

Maintenance

- ☞ Power must be cut off before components are overhauled or replaced
- ☞ In case of short circuit or overload, check the fault before restarting after troubleshooting
- ☞ Do not power off the product frequently, if you need to re-energize after power off, at least 1 minute interval

Other

- ☞ Do not open the casing without permission.
- ☞ Please cut off the power supply for a long time.
- ☞ Pay special attention not to let dust, iron powder into the controller.
- ☞ If the output relay uses a non-solid relay, it must be connected in parallel to the relay coil. Check that the power supply meets the requirements and prevent the controller from burning out.
- ☞ The life of the controller is closely related to the ambient temperature. If the temperature is too high, please install the heat dissipation fan. The controller allows the operating ambient temperature range between 0℃ and 60℃.
- ☞ Avoid use in high temperature, wet, dusty or corrosive gases.
- ☞ Where the vibration is strong, rubber cushion should be added to buffer.

Maintenance

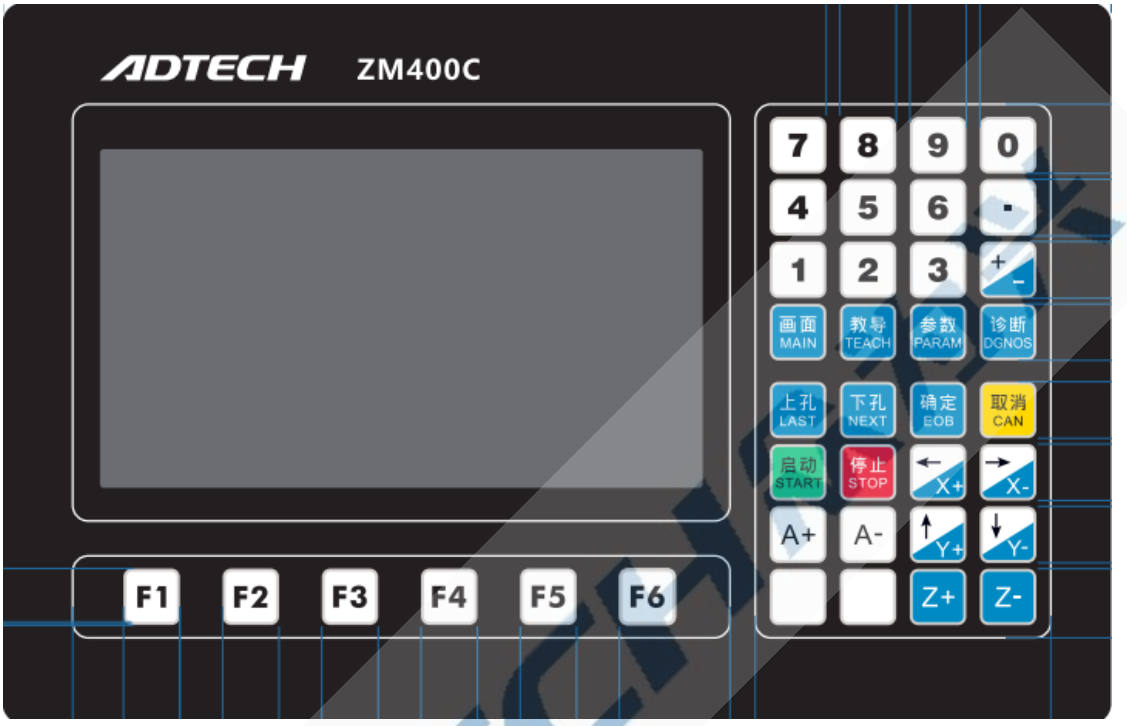
For general conditions of use (environmental conditions: average daily 30℃, load rate 80%, running rate 12 hours per day), please follow the following items for routine inspection and regular inspection.

Routine inspections	Daily routine	● Confirm ambient temperature, temperature, dust and foreign bodies ● Any abnormal vibrations, sounds
Regular inspections	1 year	● Strong parts loose ● Damage to terminal

Directory

Chapter 1 Product Overview

1.1 ZM 400C Series Product Chart



1.2 System fittings

1. Hair grafting machine controller

A copy of the 2.specification (including wiring diagram)

3.37 One needle and thread

4.37 A needle plate

5.25 Needlework (one male and one female)

6.25 A piece of needle terminal board

7.15 Pin seat (not welded wire)

8.9 Needle seat (without wire welding)

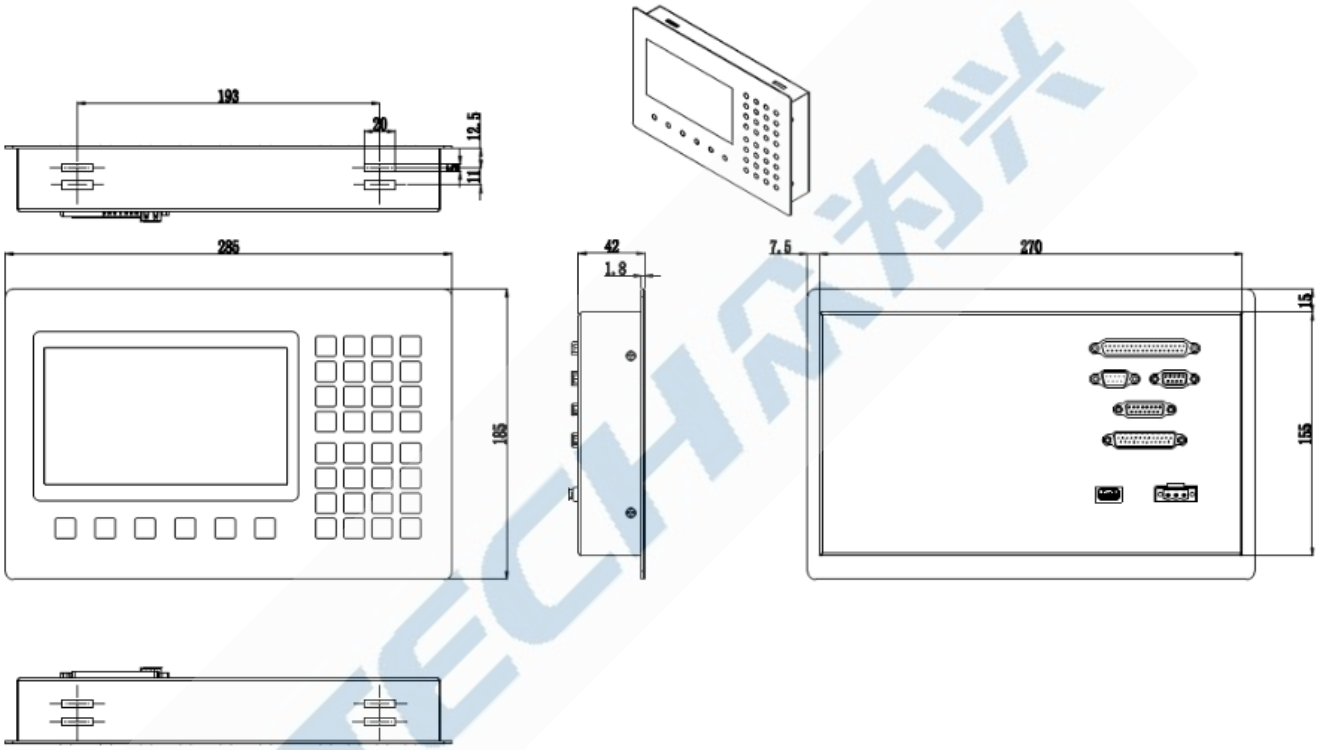
9.22 0 V power cord

1.3 Product selection

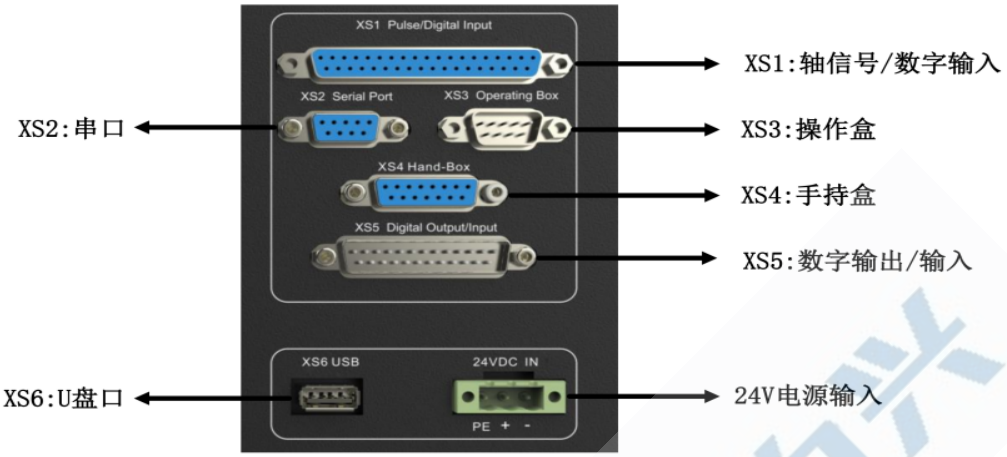
Model	Configuration
ZM200C	Two-axis hair grafting machine
ZM300C	Triaxial hair grafting machine
2M400C	Four-axis hair grafting machine

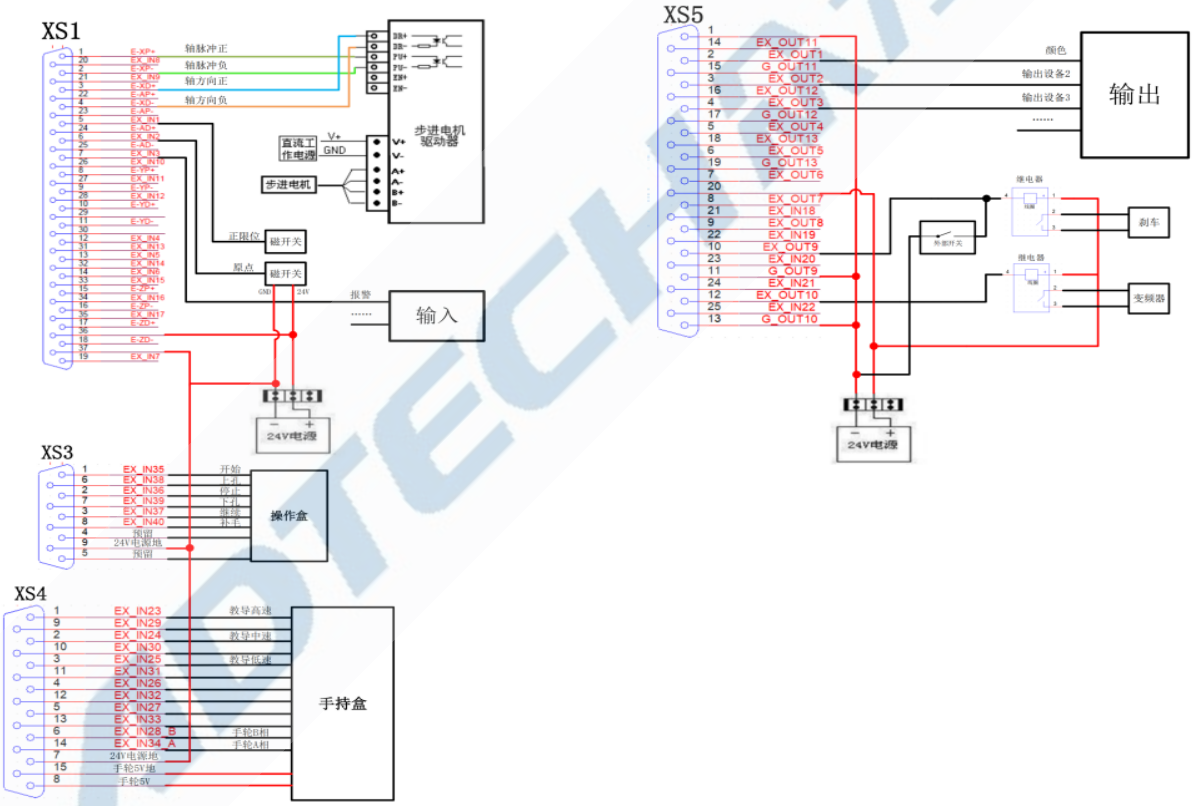
Chapter 2 Dimensions and Electrical Connections

I. Shape dimensions



二、Wiring





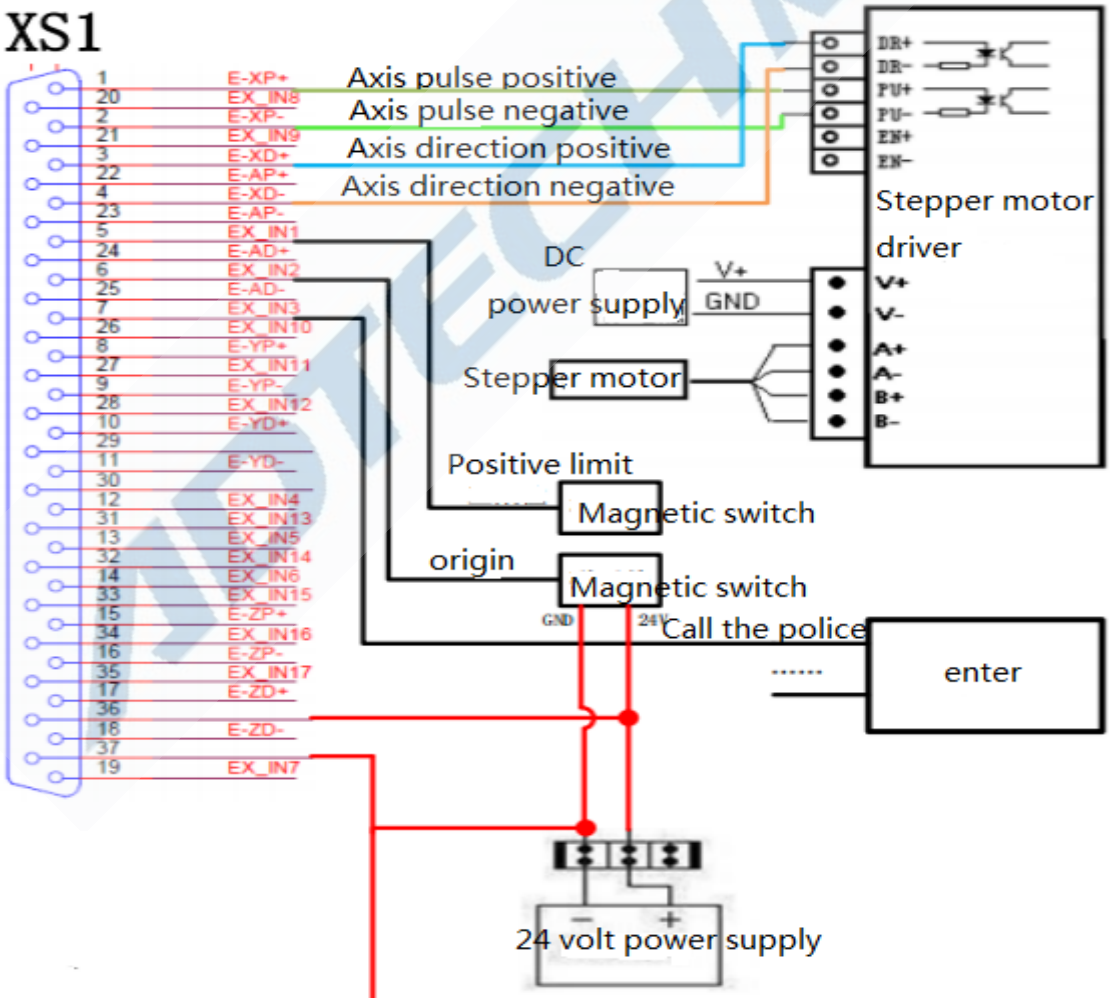
注意：1. XS1的24V电源必须要接，否则手摇轮和操作盒将无效。
2. 电源24V地与5V地是不同的，注意区分。

Note :1. XS1 24 V power supply must be connected, otherwise the hand wheel box operation box will be invalid.

2. power supply 24 V and 5 are different, pay attention to distinguish.

3. When wiring, pay attention to the silk screen number of the corresponding interface to avoid wrong connection.

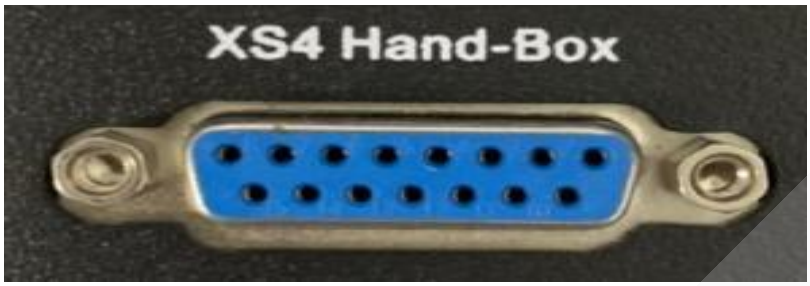
Motor Driver Control Interface

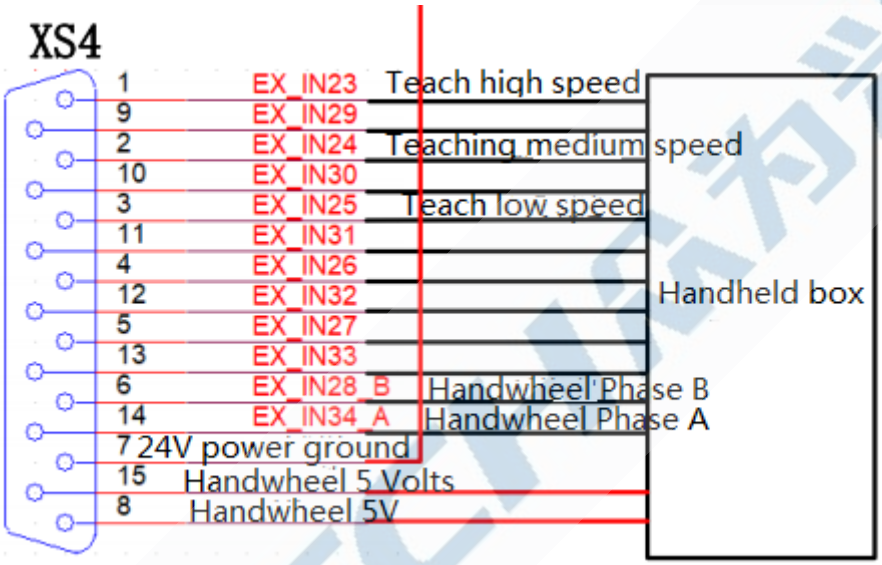


Line number	Definition	Function
1	**E-xP +**	x-axis pulse positive
2	**E-xP-**	x-axis pulse negative
3	**E-xD+**	x-axis direction is positive
4	**E-x D-**	X- axis direction is negative
5	**EX_IN1**	X axis positive limit
6	**EX_IN2**	X axis origin
7	**EX_IN3**	X Servo Alarm
8	E-YP+	Y-axis pulse positive
9	E-YP-	Y-axis pulse negative
10	E-YD+	Y-axis direction is positive
11	E-YD-	Y -axis direction is negative
12	**EX_IN4**	Y axis positive limit
13	**EX_IN5**	Y axis origin
14	**EX_IN6**	Y Servo Alarm
15	E-ZP+	Z-axis pulse positive
16	E-ZP-	Z-axis pulse negative
17	E-ZD+	Z-axis direction is positive
18	E-ZD-	Z-axis direction is negative
19	**EX_IN7**	Z axis positive limit
20	**EX_IN8**	Z axis origin
21	**EX_IN9**	Z Servo Alarm
22	E-AP+	A-axis pulse positive
23	E-AP-	A-axis pulse negative
24	E-AD+	A-axis direction is positive
25	E-AD-	A-axis direction is negative
26	**EX_IN10**	A axis positive limit
27	**EX_IN11**	A axis origin
28	**EX_IN12**	A Servo Alarm
29	ISO-5V	5V isolated power supply
30	GND	5V isolated power ground
31	**EX_IN13**	Electric eye
32	**EX_IN14**	Lower electric eye
33	**EX_IN15**	Heavy wool alarm 1
34	**EX_IN16**	Iron alarm 2
35	**EX_IN17**	Foot pedal
36	EX_24V	24V external power supply
37	GND	24V external power ground

Note: 24V external power ground and 5V isolated power ground are different grounds, pay attention to the distinction!

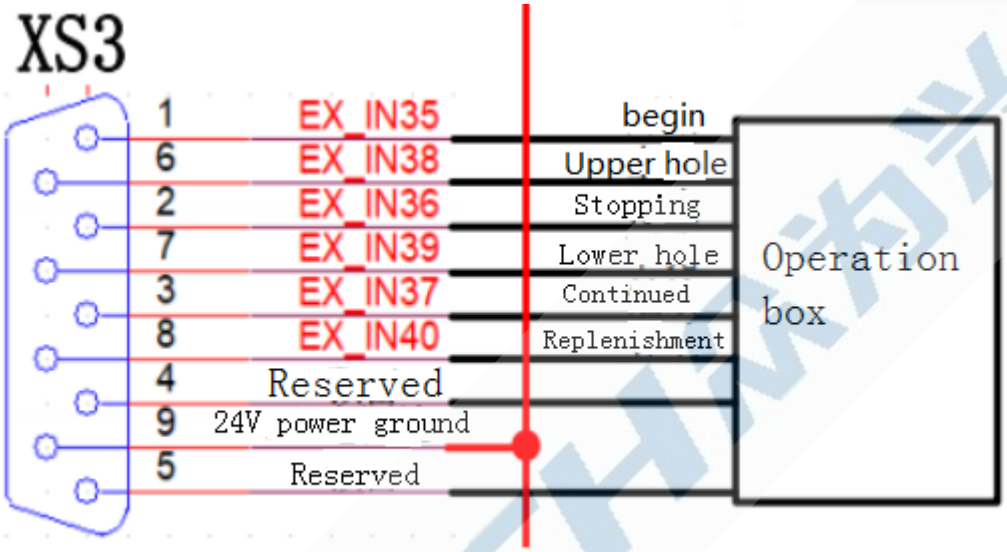
Definition of Handheld Box Input Interface





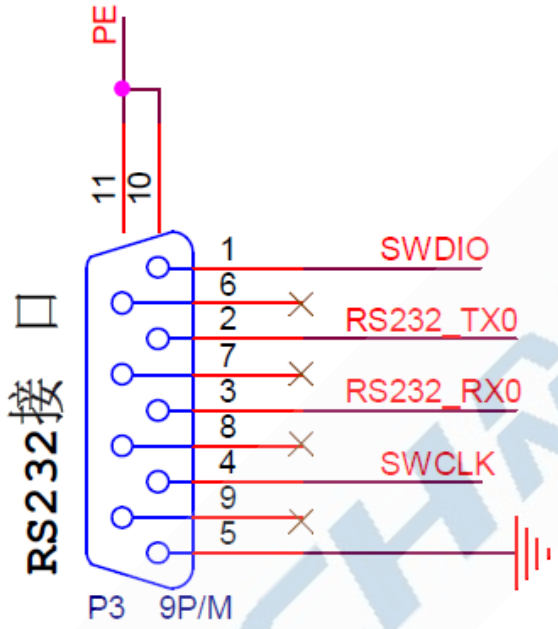
Line number	Name of name	Function
1	**EX_IN23**	Handwheel high speed gear
2	**EX_IN24**	Handwheel medium speed
3	**EX_IN25**	Low speed handwheel
4	EX_IN26	External input 26
5	**EX_IN27**	Teaching confirmation
6	**EX_IN28_B**	Handwheel B phase input
7	GND	External 24V power ground
8	5V	5V power supply
9	**EX_IN29**	Handwheel X shaft
10	**EX_IN30**	Handwheel Y shaft
11	**EX_IN31**	Handwheel Z shaft
12	**EX_IN32**	Handwheel A shaft
13	EX_IN33	External input 33
14	**EX_IN34_A**	Handwheel A phase input
15	GND	5V power ground

Operation Box Input Interface Definition



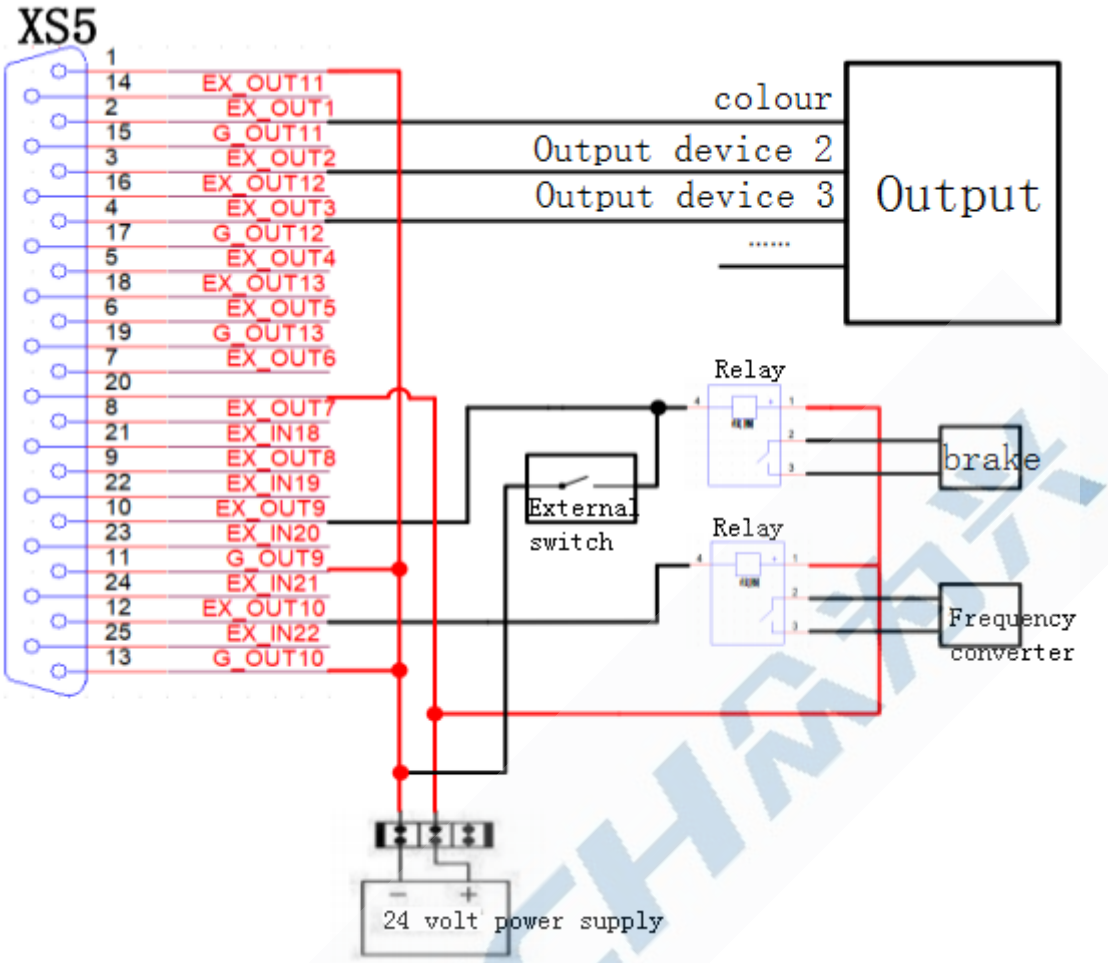
Line number	Port definitions	Function
1	**EX_IN35**	Start
2	**EX_IN36**	Stopping
3	**EX_IN37**	Continued
4	Empty feet	Reserved
5	Empty feet	Reserved
6	**EX_IN38**	Upper hole
7	**EX_IN39**	Lower hole
8	**EX_IN40**	Replenishment
9	GND	Power ground

RS232 interface definition



Interface pin	Corresponding signal of this board	Function Description
1	SWDIO	Burn data pin
2	RS232_TX0	Serial signal generator
3	RS232_RX0	Serial signal receiver
4	SWCLK	Burn clock pin
5	GND	Power ground
6、7、8、9	Empty feet	Reserved

Output Interface Definition



Line number	Name of name	Function
1	**24VGND**	Output common end
2	**EX_OUT 1**	Color
3	**EX_OUT 2**	Output 1
4	**EX_OUT 3**	Output 2
5	**EX_OUT 4**	Shoot
6	**EX_OUT 5**	Third stage
7	**EX_OUT 6**	Fixture 1
8	**EX_OUT 7**	Fixture II
9	**EX_OUT 8**	Second stage
10	**EX_OUT 9**	Brake
11	G_OUT9	Negative power supply terminal of output 9
12	**EX_OUT 10**	Frequency converter or clutch
13	G_OUT10	Negative power supply terminal of output 10
14	**EX_OUT 11**	Standby
15	G_OUT11	Negative power supply terminal of output 11
16	**EX_OUT 12**	Standby
17	G_OUT12	Negative power supply terminal of output 12

18	**EX_OUT 13**	Standbys
19	G_OUT13	Negative power supply terminal of output 13
20	**V +24**	Load +24 power input (external supply +12 to +24 V)
21	EX_IN18	External input 18
22	EX_IN19	External input 19
23	EX_IN20	External input 20
24	EX_IN21	External input 21
25	EX_IN22	External input 22

III. Assembly considerations

1. controller is equipped with a special installation, after the controller is put into the installation plate hole, please use the installation lock Fasten and hold.

2. should be installed in a place without vibration or vibration. If unavoidable, the controller and its installation should be A rubber shockproof washer is cushioned between the plates to buffer vibration.

3. installation should avoid high temperature, wet, dusty or corrosive gas environment.

4. shall be installed at an ambient temperature of -10℃-+50℃.

5. non-waterproof structure and avoid outdoor use.

IV. Testing

Installation and commissioning

First enter the test screen to check whether the input and output signals are normal. Make sure the parameters are set correctly.

When entering the teaching screen and moving each axis, it should be confirmed that the axial negative direction is zero.

Above pass, can start normal operation.

1) After boot, confirm the product to be processed, press [back to the starting point] key, back to the starting point, you can Start processing.

2) setthe working mode.

3) press the start button on the operation box to start processing the product.

4) press the "stop" button on the operation box to pause the processing product.

5) press the "continue" button on the operation box to continue processing the product.

After 6) pause, if you need to go to a hole, you can enter the hole number directly on the keyboard, press [hole] or [lower hole] keys directly to the desired hole position (must be in high position).

After the 7) is suspended, if you need to fill a hole, you can enter the hole number directly on the keyboard and press Hole] key directly to the desired hole position after the wool (must be high).

Chapter III Operational Description

I. Introduction to interface functions

the controller has four main pictures, which are switched by the [screen], [teach], [parameters] and [diagnostic] keys on the keyboard.

1. main screen

Press the screen key to enter the following main screen, normal processing tasks are running in this interface.

： specified

1) product number ： currently processed product number.

2) output ： each finished product, data plus 1, can be cleared by [F3]], replace the product after production The quantity is automatically reset to 0.

3) total number of holes ： the current product contains the total number of holes at the starting point.

4) current hole ： indicates the number of holes currently in place.

5) state ： indicates the current machining state. (run/stop/stop)

6) mode ： current working mode. (Automatic/Sautomatic/test machine)

7) information ： displays three columns of information, the next is the latest

8) next column represents the function of the F1-F6 key

9) large numbers represent the current position (relative to the starting point)

Key function under main screen

Press button	Function

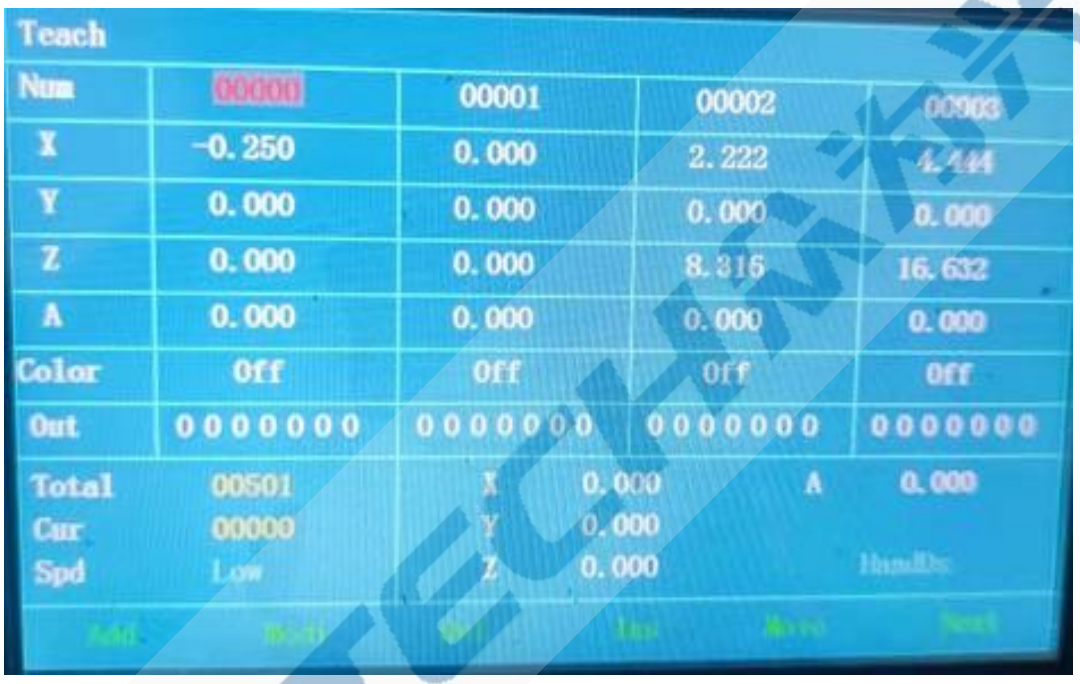
Digital keys	It can be used directly to the required hole position with the key of filling hole and upper and lower hole
F1	Fill the hole, if there is no input number key, hit the current hole position, if the number key is entered, move to the required hole position, and hit again **Requirements to be implemented at high levels for security**
F2	operation mode selection ： press this key to switch in automatic, semi-automatic and test machine mode.
F3	Clearance output
F4	Select the product to process, and create a new product
F5	Back to zero, generally used to establish the starting point of a new product, see "data instruction operation" **Requirements to be implemented at high levels for security**
F6	Back to the starting point, after boot, and after the replacement of the product, must first return to the starting point to ensure the correct position. The process of returning to the starting point is to return to zero and then to the starting point **Requirements to be implemented at high levels for security**
Upper hole	If no digital key is entered, move to the previous hole, and if you enter the numeric key, move directly to the required hole **Requirements to be implemented at high levels for security**
Lower hole	If no digital key is entered, move to the next hole bit, and if you enter the digital lower hole key, move directly to the required hole bit **Requirements to be implemented at high levels for security**
Start	With the start button on the box, you can start processing the selected product

Stopping	The [stop] button on the same operation box can pause the selected product
Cancellation	Number to clear input

Note: only under the main picture, the button above the operation box is valid.

2. Teaching Picture

Press the Teaching key to enter the following screen.



Specify:

1) hole number ： indicates that the following data is the starting point of the hole,

2)n axis ： data representing each axis

Note ： the starting point data is the distance relative to the zero point, so the position value displayed at the starting point position is 0, and the data of the other points is the position relative to the starting point. Modify the starting point data to offset all holes. Modify other point data, only affect the modified hole, others are not affected.

3) Color ： Programmable Output Point

4) output ：7 programmable output points

5) total number of holes ： the current product contains the total

number of holes at the starting point.

6) current hole ： indicates current hole number

7) speed ： indicates the speed of manual movement.

8) next column represents the function of the F1-F6.

9)X、Y、Z、A represents the position of the axes

Handwheel forbidden: indicates the state of the handwheel.

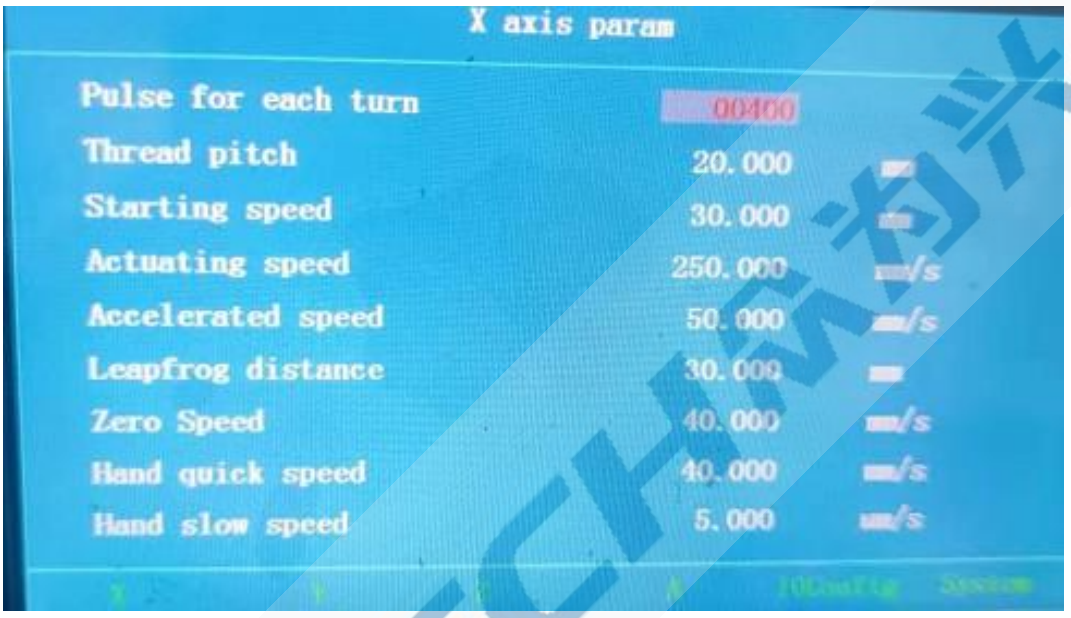
Key function button function

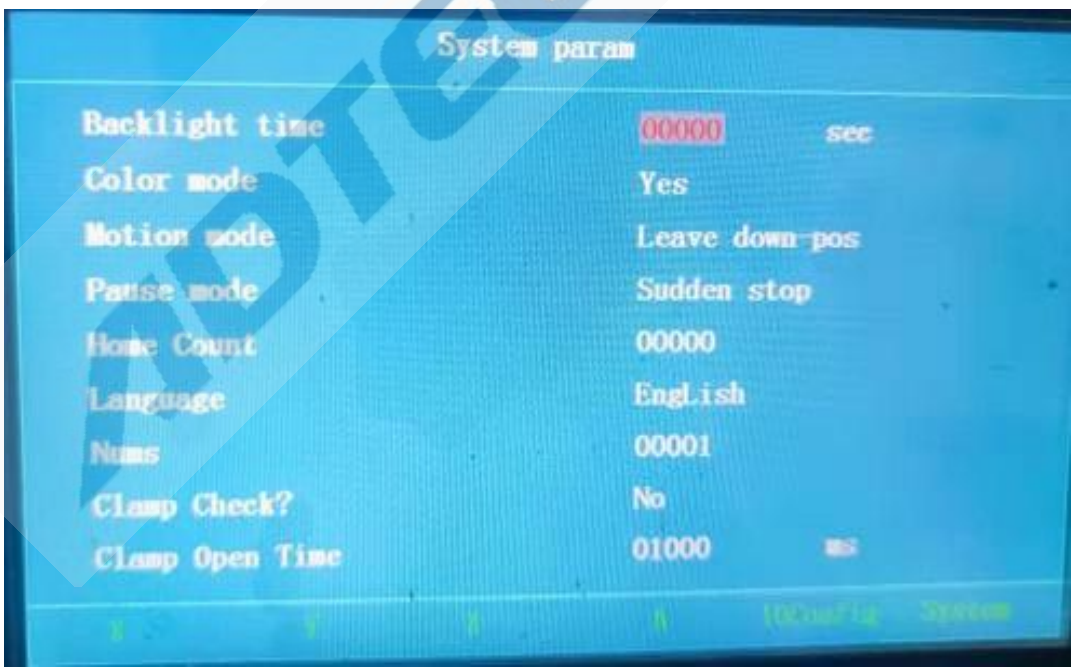
Press button	Function
0、9	0：modify the color output, the actual output synchronization action. 9： Switch Handwheel Status
1-7	Modify 1-7 point output, actual output synchronization action
+/-	Modifying manual movement speed
Upper hole	Move to the upper hole
Lower hole	Move to the next hole
X+/ X- Y+/ Y- Z+/ Z- A+/ A-	Quick click can move 0.1 mm, hold still can move continuously, let go stop immediately
F6	Function of switching F1-F5
F1	Add "： add a hole A "split hole "： increases the average hole between the two holes
F2	Change ：modify hole data "Copy "： copy holes in a specified range
F3	Delete ： delete current hole data "Translation "： translation of holes in a specified range
F4	Insert ： insert a hole in front of the current hole Edit ： edit hole data directly with digital key

F5	Location "： select the number of holes to be moved "Patterns "： generate patterns

3. Parameter Picture

Press the parameter key, then enter the password (654321) and enter the following screen.





Press the up and down arrow to select the parameters to be modified, press the number key to modify the parameters, press [OK] before the real

modification, press [cancel] key to undo the number just entered.

F1-F4 select different axes, F5 enter the IO configuration interface, enter the IO configuration interface, then press the F5, to switch at the input and output port, F6 select the system parameters.

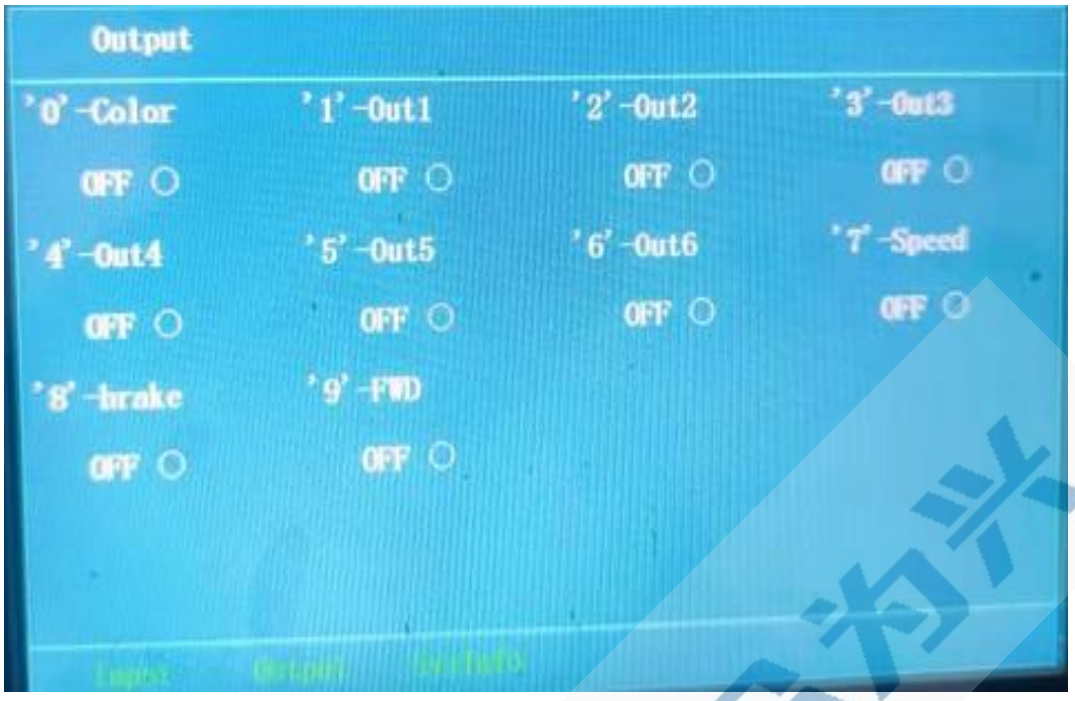
For non-digital selection, you can use the [OK] key to modify directly.

For the detailed meaning of the parameter, see later.

4、Diagnostic screen

Press the Diagnostic key to enter the following screen.

This screen is mainly used to test whether the external input and output are normal. F1、F2、F3 select input, output, system information. In the following output screen, you can use the digital key 0-9 to test whether the output is normal.



5. product selection screen

Click the F4](product button on the main screen to enter the following screen.

Description ： Picture

1）Total number of products ： refers to the total number of products saved on the controller.

2）Current product hole number ： shows the current anti-white product hole number, for reference, press up and down left and right cursor key to select the existing product, press [confirm] key to select and return to the main screen.

When the total number of products is greater than 32, you can press the [upper hole][lower hole] key to turn the page.

Click F1](New button to create a new product,

Click the F2](Delete button to delete the current anti-white product,

Press the F3](copy button to copy the current processing file.

Press the F4](U disk Management) button to enter the operating U disk function (this function is optional)

Press the F5](U SB Communication)No function.

Press the F6](exit button to return to the main screen.

Attention ：

1. The first file displayed in the directory is the current processing file.

2. The current processing file can not be deleted.

3. replication is not to copy the current anti-white product, but to copy the current processing file.

II. Operating instructions

Data teaching

1）**Basic steps**

■ boot into the main screen, press the F4](product button, enter the product selection screen, press F1] New key, enter the required product number, available 1-8 digits arbitrary number. Press [confirm] After the automatic return to the main screen.

■ press [F5]] and the machine goes back to zero, please first confirm that it is in high position to keep safe until The screen shows'back to zero finish'.

■ press the teach button, enter the teach screen, and move the machine to the starting point with the axis moving key, ■ press the screen key, enter the main screen, press the start key, the machine first back to zero, and then

Back to the starting point, the display will all become 0, note ： check the high signal, Until the screen shows'back to the starting point'.

■ press the Teach button to enter the Teach screen and move the machine to the first point with the Axis Move key Set, press add key to increase hole data. The remaining holes can be added by a similar method.

■ data is automatically saved, after all holes are added, the main screen can be returned by the screen, Start processing products.

2）Advanced functions

Modification ： if there is some deviation in the hole position at a certain point, the [upper hole] key or the [positioning] key can be used to move to the hole position to be modified, and then the axis moving key is used to align the hole position and press the [modify] key.

Delete ： if you misoperation in the instruction, add a redundant hole, can be [upper hole] down hole] key or [location] key, move to this hole, press [delete] key, and then press OK.

Insert ： if a hole is missing in the instruction, use the [upper hole [lower hole] key or [locate] key to move to the latter hole of this hole, then use the axis moving key to align the hole position to be increased, press the [insert] key. Note here that it is inserted in front of the current hole, not in the back.

Positioning ： in general, the [upper hole][lower hole] key is used to move to the required hole position. However, when the number of holes is large, the key can be pressed to enter the number of holes to be reached.

Hole separation: in some cases, the hole position is evenly distributed, can be quickly generated by the function of hole separation, the specific methods are as follows:

O OOOOOOOOOO

4 5 6 7 8 9 10 11 12 13 14

Assuming that holes 4 to 14 are uniformly distributed, first move to hole 4, add in (3 holes should have been added before), then move to the position of hole 14, add in, then the hole should be hole 5, then press the split hole key, select 9(because there are 9 holes in the middle of 4 to 14), press OK key, the current hole becomes 14 holes and the split hole is complete.

Note: the split hole is to increase the required number of holes between the current hole and the previous hole.

Edit ： In some cases, it is necessary to modify the data directly, such as the starting point data can only be modified by this method, generally used to modify the starting point data.

Replication: if you need to process more than two products on a platform, you can first teach the data of the first product, and then use the replication function to generate the data of the second product. The specific operation is as follows:

1. teach the data of the first product in the normal way.
2. move to the first hole position of the second product.
3. press copy key, starting hole number input 1.

Enter 4. lasthole number of the first product.

5. done.

The above is a copy of the entire product, if used flexibly, can also be used in other cases.

Translation: if the data is copied from another controller, it is generally necessary to modify the data. One method is to modify the starting point directly, but it is not convenient when the position offset is large. The other method is to use the translation function. The specific methods are as follows:

First go back to the starting point, then enter the teaching screen, press the hole key, move to the first hole, the position is different from the actual hole

position, press the moving key, move the head to the actual first hole position, then press the translation key, Enter the last hole number.

The above is the translation of all data, can also be used for the translation of part of the data, as long as the first positioning to the translation of the starting hole position, according to the above operation, do not enter the last point of the hole number, and input the required end hole number.

3)、 programmable output

In the teaching screen, pressing 0-7 key can change the state of 8 programmable output ,(note that the state is automatically saved after ： change), the output state should be set at the same time when teaching hole position, so as not to modify trouble in the future.

： of the working model

Automatic mode ： after processing a product, continue to process the next product.

Note that this mode does not return to the starting point when continuing the next product

After processing a product ： semi-automatic mode, stop at the starting point and wait to press start again

Test mode ： mainly used for test platform, spindle motor does not move.

Note: the above operation should be carried out on the main drawing surface.

： of Teaching Methods

1. At the bottom of the main painting, F5 return to zero, mechanical return to zero.
2. Press the'Teaching' button to enter the X-, of the instruction screen X+, Y-, Y+, Z-, Z+, A-, A+ key to move the head to a point (very convenient to take / put the workpiece) as the starting point, Press'add' to add a point, This point is called the starting point.
3. Press the screen into the main screen, press the F6 back to the starting point set,

the machine will first return to zero, quickly back to the starting point just set, the starting point has been set.

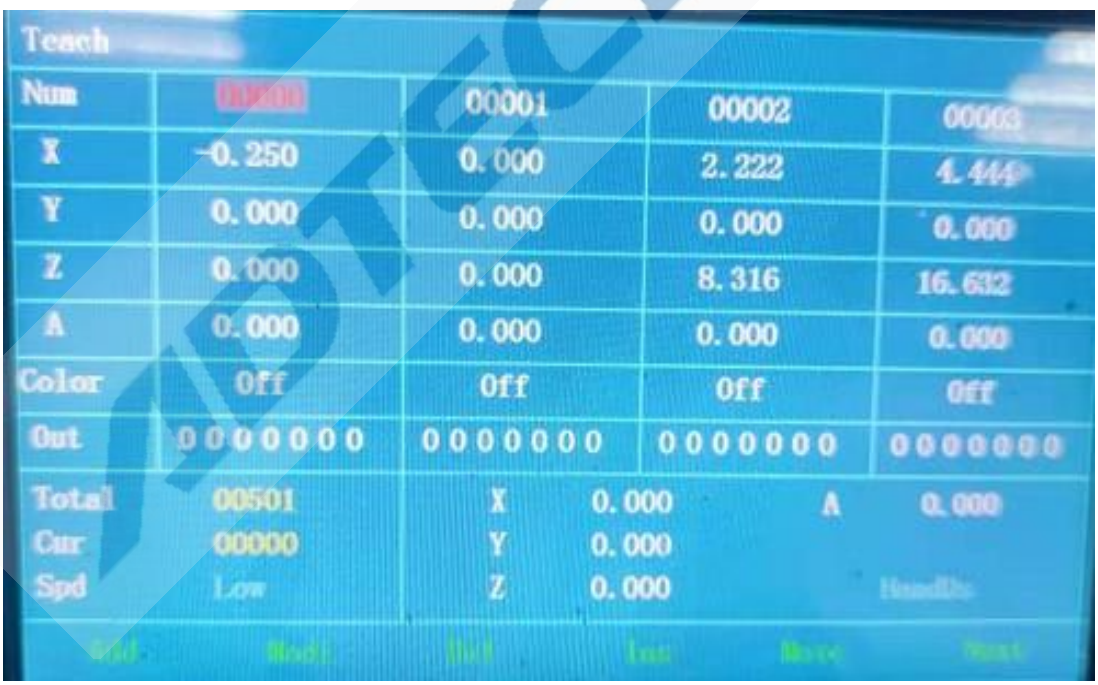
4. Press the'teaching' button to enter the teaching screen, X-, use X+, Y-, Y+, Z-, Z+, A-, A+ key moves the head to the first hole, Press [4 add key, Can generate the first hole, To generate a second, Third, Fourth... until the last hole is taught; Press the screen to exit the instruction screen and save it automatically.

5. If the product is two-color, change the output state'on/off' with the'0' key in the hole before changing the hair'. You can edit when teaching holes, or teach holes to edit again.

6. Control (splint) can be edited by 1~7 numeric keys if other uses are required.

7. If you need to use the external handwheel, press the digital key 9 to change the state of the handwheel.

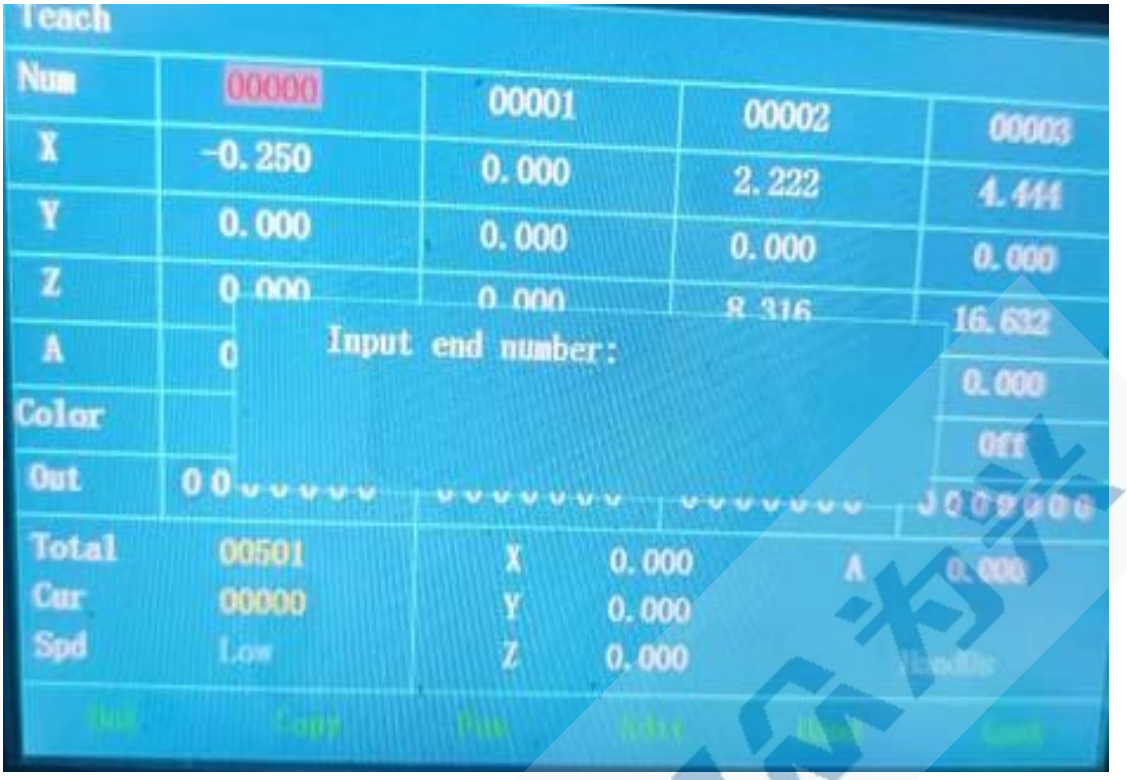
8. The handwheel instruction square hair ： first uses the rotation switch to select the axis number (X,Y,Z,A), then uses the handwheel to teach the hole position, after the hole position is taught, presses the'increase' button, may add a hole.



According to the F6, the following picture appears:

Click Copy [F2] in Instruction Mode to see:

Enter the starting hole and press OK to appear as follows:



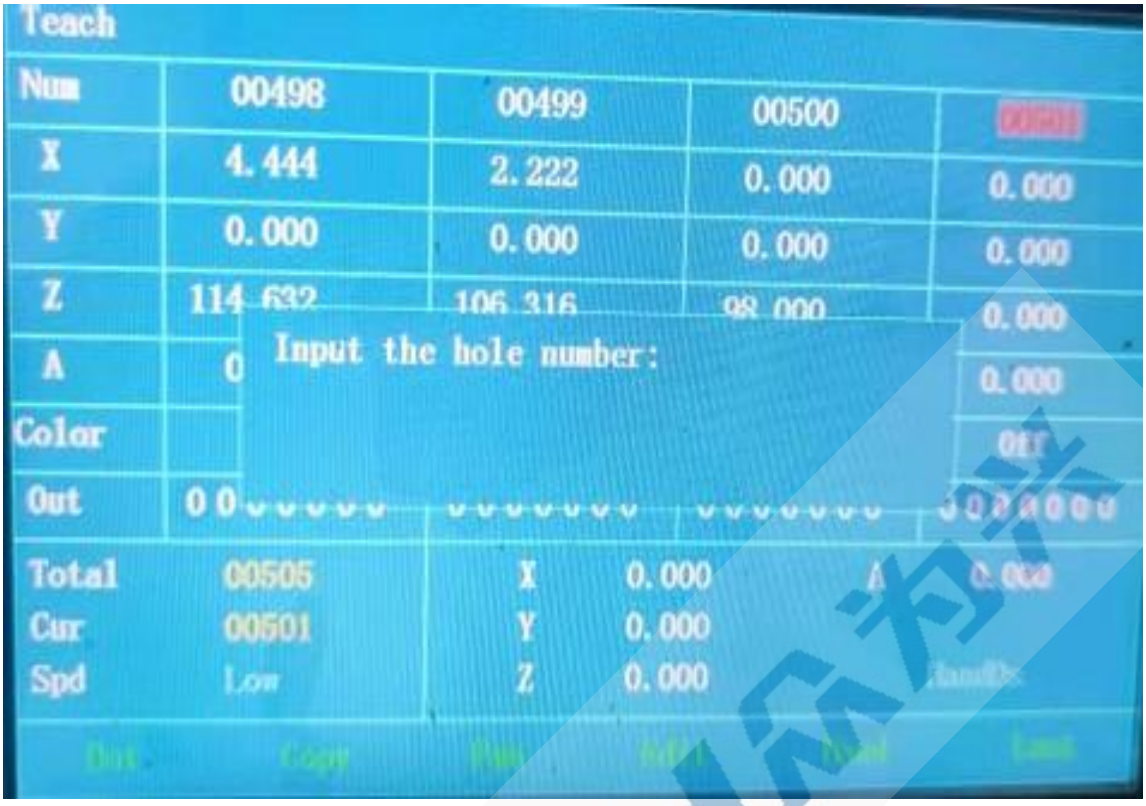
Enter the end hole number and press confirm.

If you need to process more than two products on a platform, you can first teach the data of the first product, and then use the replication function to generate the data of the second product. The specific operation is as follows ：

1. Teach the data of the first product in the normal way.
2. move to the first hole position of the second product.
3. Press the copy key and enter 1.
4. The end hole number is entered into the last hole number of the first product.
5. Completion

The above is a copy of the entire product, if used flexibly, can also be used in other cases.

Click the "split hole" in the instruction mode to appear ： below



Enter the number of holes and press OK.

If the hole position is uniformly distributed, it can be generated quickly by using the function of dividing holes. The specific methods are as follows:

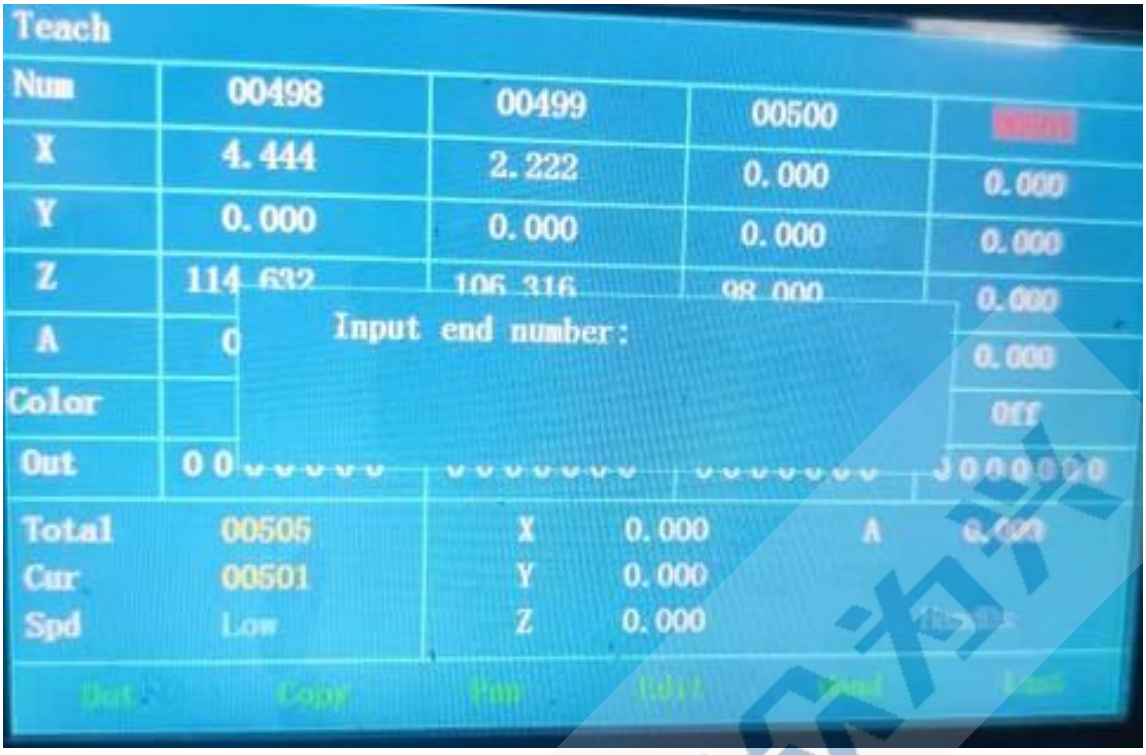
O OOOOOOOOOO

4 5 6 7 8 9 10 11 12 13 14

Assuming that holes 4 to 14 are uniformly distributed, first move to hole 4, add in (3 holes should have been added before), then move to the position of hole 14, add in, then the hole should be hole 5, then press the split hole key, select 9(because there are 9 holes in the middle of 4 to 14), press OK key, the current hole becomes 14 holes and the split hole is complete.

Note: the split hole is to increase the required number of holes between the current hole and the previous hole.

In the instruction mode, press "translation" to appear as follows:



Enter the end hole number and press OK.

First go back to the starting point, then enter the teaching screen, press the lower hole key, move to the first hole, the position is different from the actual hole position, press the moving key, move the head to the actual first hole position, then press the translation key, enter the last hole number.

The above is the translation of all data, can also be used for the translation of part of the data, as long as the first [positioning to the translation of the starting hole position, according to the above operation, do not enter the last point of the hole number, and input the required end hole number.

III. Parameter description

1) Axis Parameters

All four axes have the same meaning

a）Each pulse ：refers to how many pulses the motor needs to rotate.

For two-phase half-step drives, this value is 400.

For two-phase subdivision drives, this value is X200, subdivision

For other drives, please refer to the drive instructions

This parameter must be set according to the actual value.

b）Wire rod pitch ： refers to the pitch of the wire rod used for the X、Y platform, for a rotating shaft or otherwise not A straight-line moving axis with a default MM.20 If the above two parameters are set correctly, The position value on the screen represents the actual distance (in millimeters), and for the axis of rotation, the picture The position value on it has no specific meaning.

c）A starting speed ： can generally be set to 1.5 times the pitch, i.e. a motor speed of 1.5 rpm Start. For stepper motor, this is a more appropriate speed, for servo motor, canAppropriate increase to 2-3 rpm.

d）Drive speed ： generally set to 10-15 times pitch, that is, the maximum speed of the motor can reach per second 10-15 rpm, however, this speed can only be achieved at longer distances, generally not required Set too high.

e）Acceleration ： this value is generally 50 better, independent of the drive's fine fraction and pitch, normThe suggestion is between 0-90, the larger the value, the faster the acceleration, but too fast will cause the motor to lose step.

f）Hop distance ： when the distance exceeds a certain range, the movement can not be completed between the two holes. This is Youneed to stop at a high position, then move to the lower hole, and then continue to plant hair. This value is for spindle electricity Machine speed is related.

g）Back zero speed ： refers to the speed of back zero.

h）Teaching fast ： refers to the manual speed when the instruction is switched to fast. This motion is uniform,Do not set too high to avoid losing step.

i）Teaching slow ： refers to the manual speed when the instruction is switched to slow.

2) system parameters

a） Backlight Turn-off Time ： Set how long to turn off the backlight after not pressing the button to extend the LCD screenLifetime, set to 0 indicates that

the backlight will never turn off.

b） Color change whether high stop ： some color change output speed is slow, must be in-high stopChange the color after stopping.

c） ： is divided into two modes of movement, one is to leave the lower eye step motor can move, thisIt can achieve faster processing speed, one is to sense the movement of stepping motor when the power is on,This case can be used for some deeper holes.

d） Suspension mode: immediately pause or stop high, press pause key after the spindle motion state.

e） Number of products processed back to zero: this parameter is used to set the number of products processed automatically back to zero,If this value is zero, zero is not returned.

f） Chinese 0 r English

g） Number of stations: single, double, four.

h） Fixture detection: check the fixture before processing.

i） **Fixture delay opening time (ms): fixture delay opening time.**

j） Final hole two-stage speed: whether to set two-stage deceleration.

k） Fill hole two-stage speed: whether to set two-stage deceleration.

l） Color change two-stage speed: whether to set two-stage deceleration.

m） Jump two-stage speed: whether to set two-stage deceleration.

n） Color change interval time (ms): the interval time when changing color to prevent color change.

o） The last few holes slow down: start the two-stage speed to the last few holes.

p） X axis positive limit (mm): the maximum length of the X axis when manual.

q） Y axis positive limit (mm): the maximum length of the Y axis when manual.

r） **Whether to open: whether to open the hair.**

s） Shooting time: this parameter is used to set the period of shooting hair.

t） System first offset axis setting :0 means close 1 means X axis, and so on 4 means A Axis.Whether to move the offset axis first when the station moves.

u） Deviation axis offset length: set the offset that the offset axis moves first when the station moves.

v） Starting speed rate: the initial speed rate of station movement.

w） Drive speed rate: the speed rate of the station moving.

x） Acceleration rate: acceleration rate of station movement.

y） X axis to zero order: 0 means not participating in zeroing, from 1 to 4, and so on. 1 means to start to zero first, and 4 to return to zero last.

z） **Y axis to zero order: the same X axis to zero order.**

aa） **Z axis to zero order: the same X axis to zero order.**

bb） **A axis to zero order: the same X axis to zero order.**

cc） Whether the Z axis is limited: if the Z axis is a rotating axis, it can be rotated at any timeFor "No ", the origin of the Z axis only acts at 00:00 and does not limit.

dd） Whether the A axis is limited ： the same Z axis.

Chapter IV Attention and Maintenance

I. Points for attention

1-1 ： security considerations

（1） Do not open the casing without permission.

（2） When the controller is not used for a long time, please cut off the power supply.

（3） Pay special attention not to let dust, iron powder into the controller.

(

（4） When handling, be careful not to cause damage to the controller.

1-2 Attention ： for proper use

The wrong use will lead to abnormal operation, the worst case will even damage the controller, so please follow the following precautions to use the controller correctly.

（1） If the output relay uses a non-solid relay, it must be connected in parallel to the relay coil. Do not connect 220 AC directly to the terminal board of the controller, which will burn out the controller immediately.

（2） The life of the controller is closely related to the ambient temperature. If the temperature is too high, please install the heat dissipation fan. The controller allows the operating ambient temperature range between -10℃ +50℃.

（3） Avoid use in high temperature, wet, dusty or corrosive gases.

（4） Where the vibration is strong, rubber cushion should be added to buffer.

II. Maintenance

2-1. Points for attention during maintenance and inspection

(1) The power supply of the main circuit should be disconnected before the maintenance of the controller.

(2) The operator shall confirm by himself that the power supply has been disconnected to prevent accidents.

2-2. Inspection items and cycles

Under general conditions of use (environmental conditions ： average 30℃ per day, load rate 80, operating rate 12 hours per day), please follow the following items for daily inspection and regular inspection.

Routine inspections	**Daily routine**	**Confirm ambient temperature, temperature, dust and foreign body daily** **Any abnormal vibrations, sounds**

		The vent is jammed with yarn, etc
Regular inspections	**1 year**	**Strong parts loose** **Damage to terminal**

III. Common failures and solutions

Fault Description	Fault analysis	Treatment
No return	1. Proximity Switch Installation Position Bad	1. re-adjust the eye position
	2. proximity switch malfunction	
	3. proximity switch external connection or no return to zero short circuit, switching power supply abnormal	3. replacement of proximity switches, switching power supply
	4. controller input point damaged	4. maintenance controller or replacement controller
	5. it's too fast	5. reduce the return velocity
Jump hole	Adjusting the position of the 1. down hole is not accurate	1. re-adjust the power hole position
	2. find the interference source, screen it	Eye Treatment 2. External Interference
	3. jump distance setting is not correct	3. sets the jump distance
Deviation	1. processing speed, starting speed is too high	1. reset processing speed
	2. tooling, fixture loosening	2. inspection of tooling
	3. teaching data not available	3. re-education
	Failure of 4. motor and drive	4. repair or replacement of motor, driver
	5. origin switch loose, bad	5. adjust or replace origin switch
	Bad 6. controller	6. maintenance or replacement of controller

	7. mechanical loosening or coupling slip	7. adjustment machinery
	8. external interference	8. check interference sources for shielding or isolation
	Abrasion or bending of 9. tips	9. replacement of mouth or needle
Shutdown, tripping	1. external voltage is too high and unstable	1. increase regulator
	2. internal circuit	2. check short circuit source for processing
	Damage 3. frequency converter, power supply	3. change inverter or power supply
	Bad 4. controller	4. maintenance or replacement of controller
	5. external interference	5. check interference sources for shielding or isolation
No stop position	1. belt loose	1. belt tensioner
	2. inverter slow down too long	2. reduce the deceleration time of the inverter
	3. motor brake or clutch not adjusted	3. regulator motor brake pad and clutch
The change position is wrong	Error editing 1. hair change output point	1. correction of wool change output point (wool change output point should be edited one hole ahead)
	2. mechanical problems	2. adjusting mechanical wool changing device
Cylinder output opposite process	Inlet pipe and outlet pipe	Switch inlet and outlet pipes
Heavy hole	Adjusting the position of the 1. down hole is not accurate	1. re-adjust the power hole position
	Electric eye 2. external interference	2. find the interference source, screen it
	3. jump distance setting is not correct	3. sets the jump distance

Appendix I U Disk Management Operations

U disk management does not need a computer, as long as there is an ordinary U

disk, more convenient than the use of USB communication.

： the following

Start by entering [U disk management], inserting the U disk into the following U disk interface, pressing the [F1](start] key, and starting to look up. Normally, a U disk should be found, and the following menu will add several functions.

where [backup] and [restore] are required.

The backup is to copy all the products on the controller to PRG directory on the U disk, while the recovery is to copy all the products in the PRG directory of the U disk to the controller.

Note ： in order to prevent misoperation, if there are files of the same name in the U disk PRG directory, the files on the disk will not be covered, so if you want to determine all the files on the backup controller, You can delete the directory on the U disk. On recovery, if the controller has a file of the same name, it will not be overwritten.

Appendix II Procedure Burning Method and loading pictures

一、 Preparation for burning

1) One U disk (preferably in FAT format).
2) Corresponding customer controller program (name: m4rom.bin).
3) The corresponding bmp picture (Size: 200 *49， name: logo.bmp)

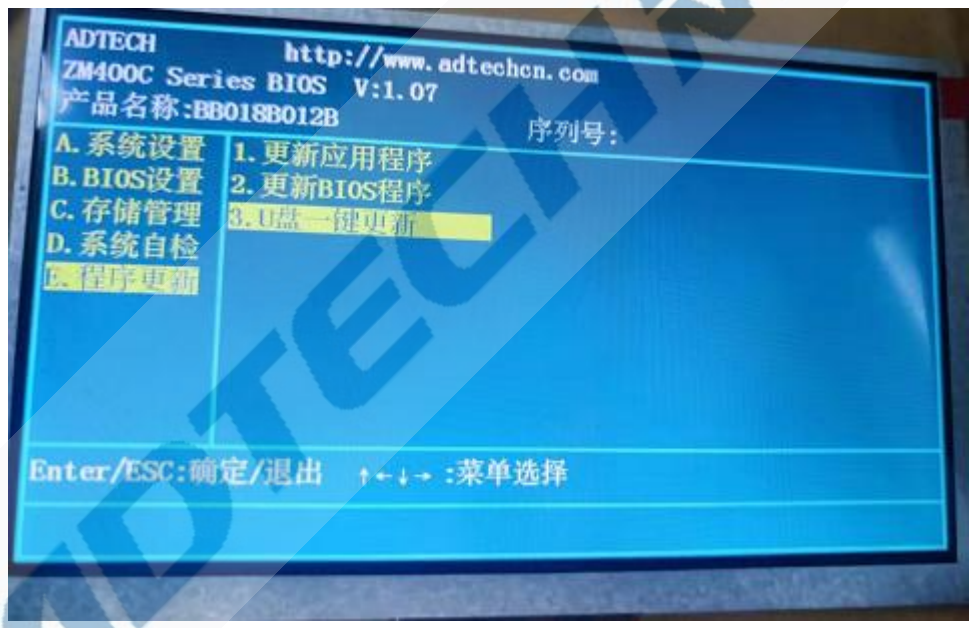
二、 List of appropriate tools

A U plate.

三、 Burning method

Copy the program or picture to be burned into the ADT directory of the U disk, then the U disk is inserted into the USB port after the controller, waiting for one or two seconds, the power is restarted, the controller is opened and the cancellation button on the controller panel is pressed. After about three seconds, the following interface will appear:

Then by pressing the key to select E program update in the 3.U disk one-click update.



Press the controller to determine the button, will prompt whether to update the program, and then press the OK button, waiting for the program to be updated, Power-off restart or first press the button on the button board (the button below the number 0), followed by the number key 9, complete the restart operation.

四、 Notes

1）Make sure the customer program name is correct.

2）Whether the file is placed in the ADT directory of the U disk (whether the U disk format is FAT).

3）When the U disk is not recognized in use, replace the U disk and restart the machine.

4）The best use of USB2.0 and FAT32 format of less than 32 G of the U disk, if the new purchase of the best format can be converted into FAT32 format before use.

Revision of curriculum vitae (1)

Feedback		Feedback date		Current version/total pages	
Problem description					
Engineer Confirmation					
Revised Version		Revised Total pages		Revision	

Revision of curriculum vitae (2)

Feedback		Feedback date		Current version/total pages	
Problem description					
Engineer Confirmation					
Revised Version		Revised Total pages		Revision	

Revised curriculum vitae (iii)

Feedback		Feedback date		Current version/total pages	
Problem description					
Engineer Confirmation					
Revised Version		Revised Total pages		Revision	

Revised curriculum vitae (iv)

Feedback		Feedback date		Current version/total pages	
Problem description					
Engineer Confirmation					
Revised Version		Revised Total pages		Revision	

Revised curriculum vitae (v)

Feedback		Feedback date		Current version/total pages	
Problem description					
Engineer Confirmati					

on					
Revised Version		Revised Total pages		Revision	

Revised curriculum vitae (vi)

Feedback		Feedback date		Current version/total pages	
Problem description					
Engineer Confirmation					
Revised Version		Revised Total pages		Revision	