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SF -2100 - c fast operation manual

SF - 2100 - c flame/plasma CNC system fast operation manual:

The first chapter system operation panel



【 F1】 -【 F8】 : Function keys, under different interface, with the corresponding prompt functions

【 S ↑/PgUP】 : Under the code interface is up page key, in the hand or automatic interface is cutting torch up

【 S ↓/PgDn】 : Under the code interface is down page button, in the hand or automatic interface is cutting torch falls off

【 F ↑/HOME】 : Under the code interface is key to jump the line first, under the operating interface is to speed up the speed

【 F ↓/END】 : Under the code interface is to jump to the line end , under the operating interface is to slow down speed

【 1】 -【 9】 : Numeric keys, enter the corresponding letter button, please click on the "shift" key



Mobile cutting torch or move the cursor around



The enter key to confirm the input value or select the project



Escape key to exit the current interface or deselect



Function switch, press the button to open the corresponding function



The blank space key, input composite keys for the shift key, according to an effective time, press a button to enter automatic processing interface under the main interface

The second chapter main interface

After the system is powered on, interface is shown in figure 1:

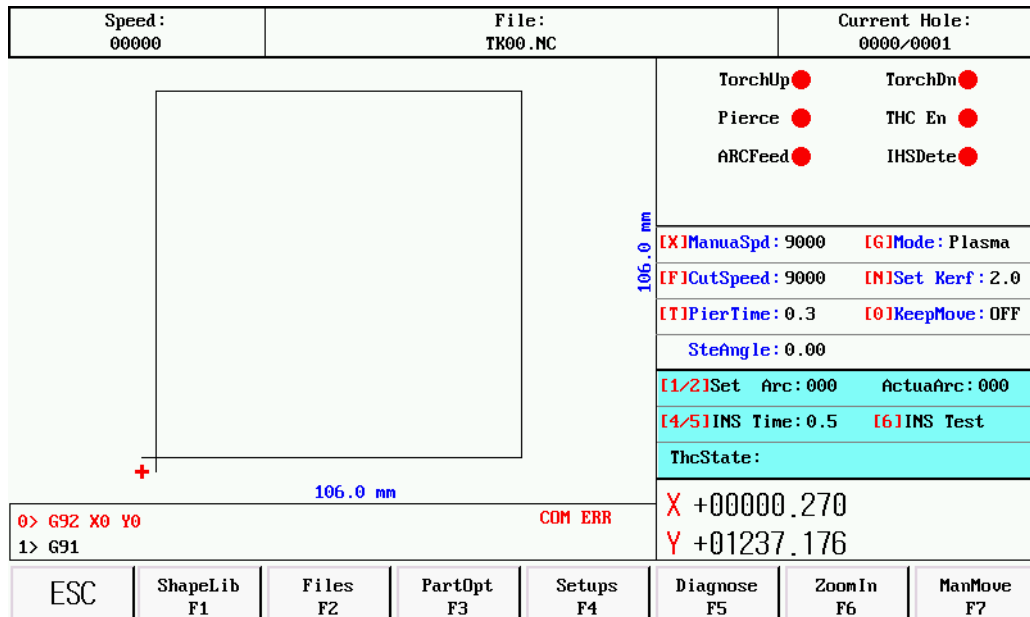


figure 1

Under the main interface, press "F1" - "F8" corresponding to the following functions :

[F1] : Gallery, enter can choose commonly used 24 kinds of graphics libraries, most have die size and pore size.

[F2] file, enter can choose the native file, U disk file, edit, import and export operation, etc.

Options:

[F3] Option, the machining parts for mirror, rotate, starting point, rotation correction, scaling, parts, etc.

[F4] : parameters. All parameters can be set up in this.

"F5" : diagnosis, input and output diagnosis, system Settings, emptying storage file, reduction, the I/O custom parameters.

[F6] : graphics zoom, zoom in graphics, view the perforation, as well as cutting information display.

[F7]: manual, manual mobile machine, coordinate system reset, the back, select the breakpoint.

[G] : set the cutting mode, the optional flame, plasma, demonstrates three modes.

[X] : set manual movement speed.

[F] : set up automatic cutting speed.

[T] : set the preheating time delay.

[N] : before the start of the cutting operation, you can set the slot size



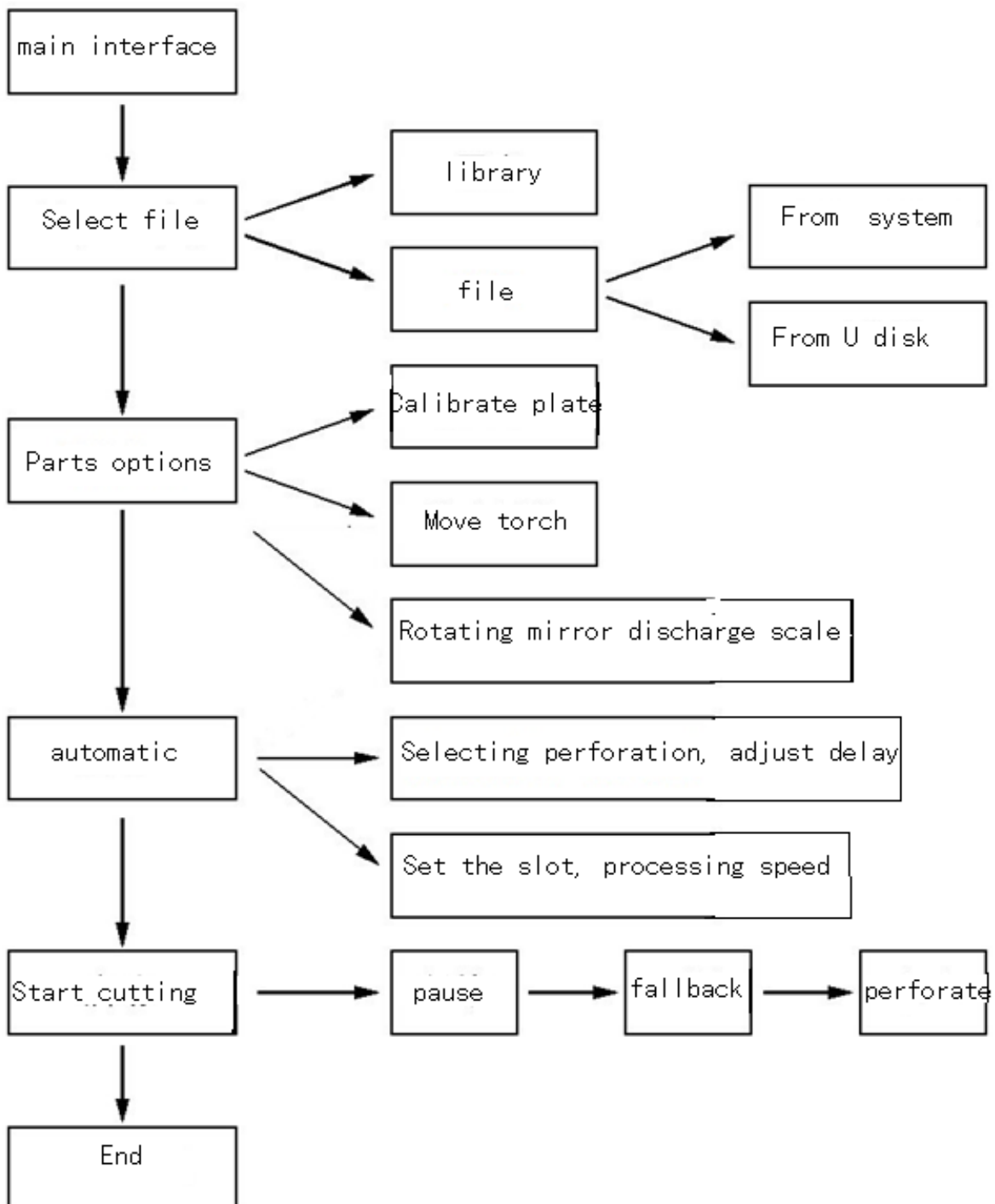
start the cutting



: Pause or stop cutting

The third chapter cutting process

Automatic cutting process diagram

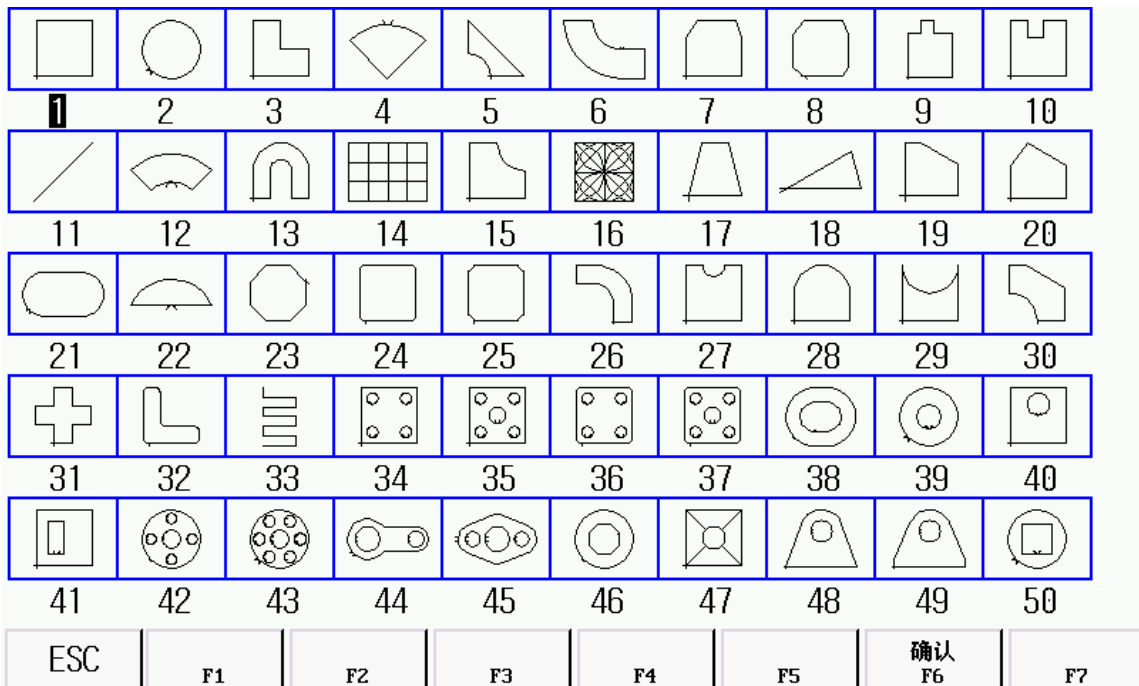


The first section selection processing graphics

This system can select from gallery selection system processing graphics and users from the U disk or storage area to the graphics processing


3.1.1 Library function

System main interface press "F1" button to enter gallery features, main picture below

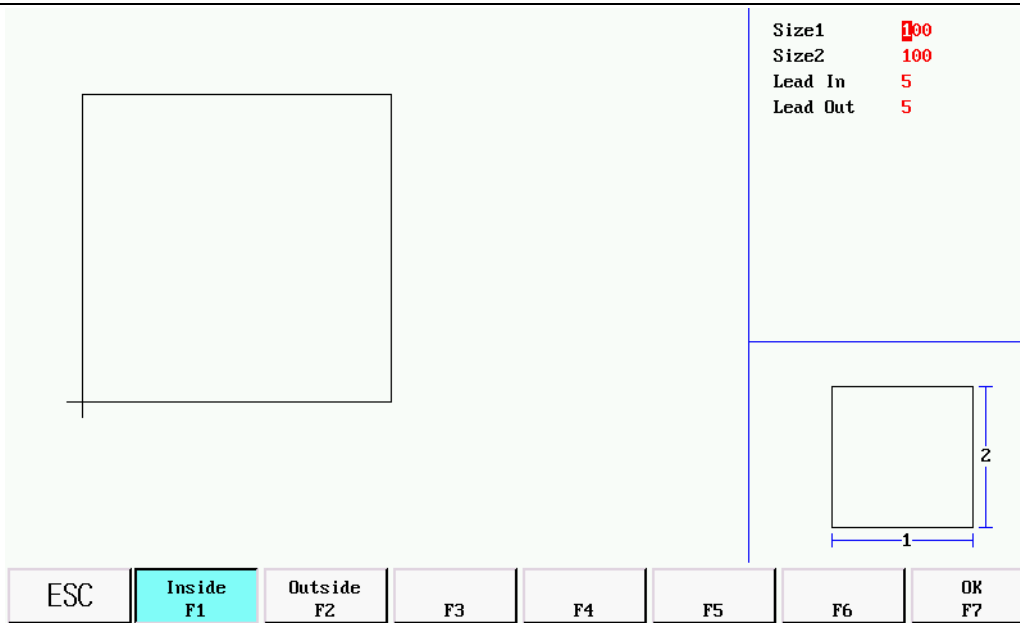


Selection of graphical parts

At present this system provides 24 graphic unit, press the direction key【↑】【↓】【←】【→】mobile highlight cursor,

choose the required graphics,  key confirmation, the confirmation of graphics parameters into the interface

Graphical interface parameters:

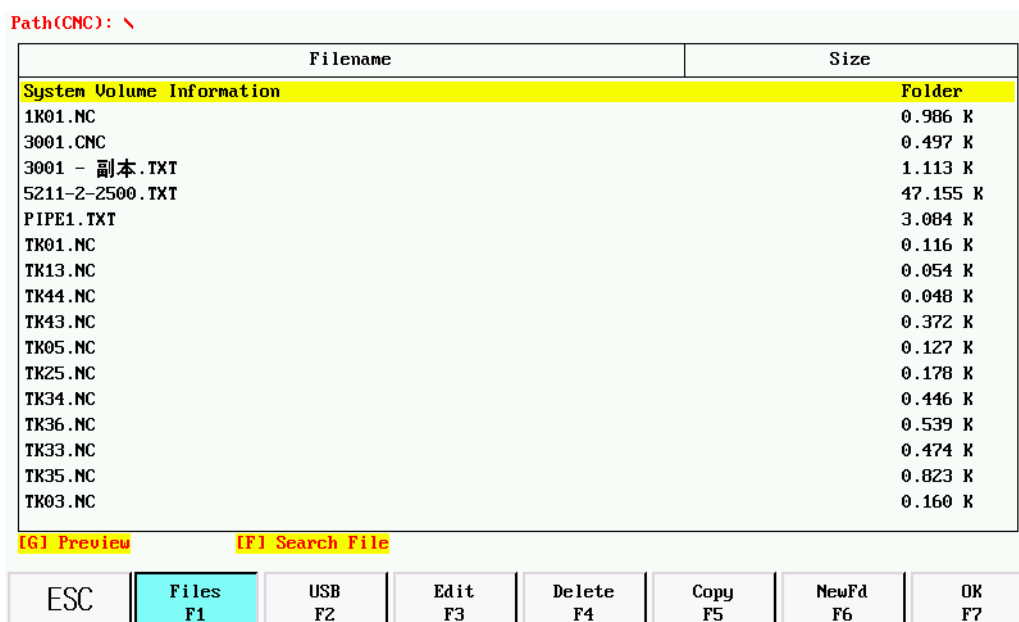


Press the direction key [↑][↓][←][→] Move highlighting the cursor, modify graphics parameters , Press[F1]-[F4] Choose graphically , Rotation discharge. Press[F6] Submit the modified parameters , Press[F7] Confirm the cutting current graphics , Confirmed the system automatically returns to the switch on the main interface, and displays the graphics editor.

3.1.2 Processing file selection

Under the main interface press [F2] , into the interface of File management

As shown in the figure below.



F1 CNC file into the hard disk file list, as shown, the system list file list

F2 USB file documents show U disk directory

F3 EDIT Edit the current cursor file

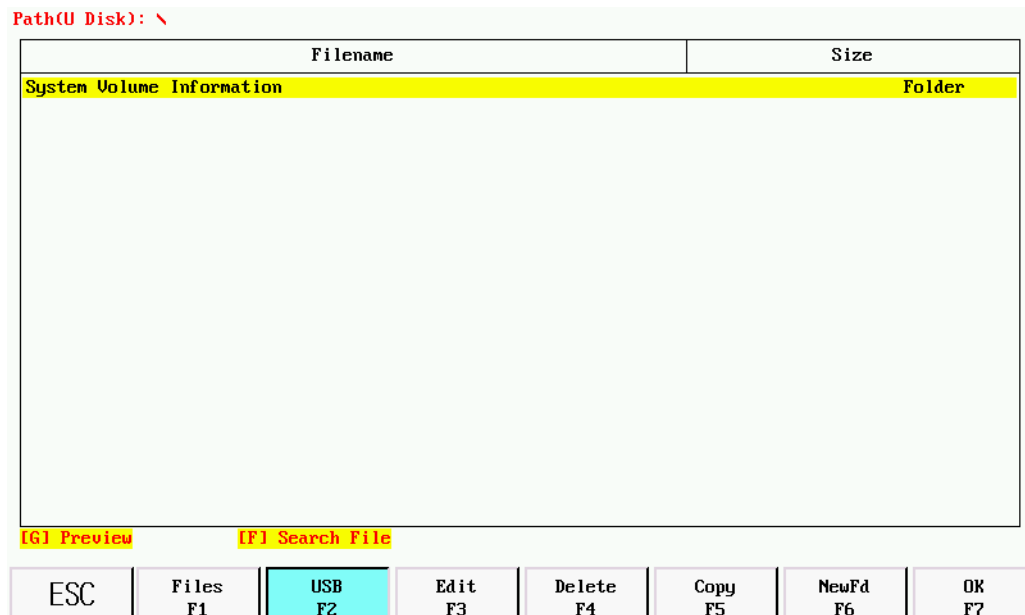
F4 DEL-FILE Delete the current cursor file

F5 COPY TO USB The current cursor file is copied to the external usb drive

F6 NEW FOLDER Can create a folder under the root directory

F7 OK Make sure the current cursor processing file, and exit to the main meeting.

Read U disk file



Under the file management interface , press【 F2】into the Usb file interface, in the interface,【 F5】Automatically from the "copy to usb flash drive" into "copy to the native". In the choice to the corresponding cutting code file, press【 F5】the system will automatically save the file to the file.

Edit the current file

```

Path(CNC): \
0000:
0001:G71
0002:G91
0003:G00X10.0Y10
0004:G41
0005:M04
0006:G01X105.0Y0.0
0007:G01X3.7Y-28.0
0008:G01X5.0Y-13.1
0009:G01X7.9Y-13.1
0010:G01X10.4Y-13.1
0011:G01X12.1Y-13.1
0012:G01X12.9Y-13.1
0013:G01X-12.9Y-13.1
0014:G01X-12.1Y-13.1
0015:G01X-10.4Y-13.1
0016:G01X-7.9Y-13.1
0017:G01X-5.0Y-13.0
0018:G01X-1.6Y-12.3
0019:G01X-3.1Y-0.8

```

ESC	Add Row F1	Del Row F2	NewFile F3	F4	F5	Preview F6	Save F7
-----	---------------	---------------	---------------	----	----	---------------	------------

Under the file interface, move the cursor to the need to edit the file name, press **[F3]** Edit the file.

Input characters, some of the key is to reuse a key, , reuse is the character that the downside of keys, click on the first **[Shift]**

Press the reuse button again, the input is to reuse the upside of keys.

When editing code, press **[F1]** Can be inserted in the current edit line, press **[F2]** Delete the current line 。 press **[F3]**

Create a new file, press **[F4]** Create a new folder.

3.1.3 Parts option function

Under the main interface, press **[F3]** , into the Parts option interface

Speed: 00000	File: 1K01.NC	Current Hole: 0000/0009
		<input type="checkbox"/> X Mirror <input type="checkbox"/> Y Mirror
		<input type="checkbox"/> ManuaSpd: 4000 <input type="checkbox"/> Mode: Plasma <input type="checkbox"/> CutSpeed: 4000 <input type="checkbox"/> Set Kerf: 0.3 <input type="checkbox"/> PierTime: 0.3 <input type="checkbox"/> KeepMove: OFF SteAngle: 0.00
		<input type="checkbox"/> Set Arc: 130 ActuaArc: 000 <input type="checkbox"/> INS Time: 0.5 <input type="checkbox"/> INS Test
		ThcState:
0> G92X0Y0 1> G91		<input checked="" type="checkbox"/> +00034.050 THC Enable <input checked="" type="checkbox"/> Y +00009.422
ESC	StartP F1	Rotate F2
	Array F3	Scale F4
	SelPier F5	EditFil F6
		Revert F7

[F1] : Starting point selection, continuous key, can choose the starting location.

【 F2】 : Rotation correction, can use plate leveling function and manual rotation function

ROTATE : entering rotation correction interface, mobile cutting torch to plate production start position, press【 F1】Set the starting point, the system coordinates automatically reset, and then move the cutting torch to the side to the other corner of the plate on the same side board, press【 F2】SET The end, the system automatically rotating graphics.After the completion of the correction, if prompted to return to the starting point, if the press【 ENTER】key , Then the system will return to the correction of the starting position, if press【 ESC】 Then the system without any operation, returns to the graphical interface.

【 F3】 : NEST , For simple discharge machining parts.

【 F4】 : SCALE , Scaling set processing parts

【 F5】 : SECTION , Choose from any perforation PM processing

【 F6】 : EDIT , View and modify the current cut file


【 F7】 : RESTORE , Cancel all operations, restore the graphics to the original state.

【 X】 : Graphics to the X axis image

【 Y】 : Graphics to the Y axis image


The second section setting processing parameters

3.2.1 Need to set the following parameters before processing :

Cutting pattern [G] Continuous press the key  , Patterns To switch between in the flame cutting, plasma and presentation ;

Cutting speed [F] press the key  , Modify the numerical change cutting speed , Press enter to confirm

Manual speed [X] press the key  , Modify the numerical change cutting speed , Press enter to confirm

slot [N] press the key  , Modify the numerical change slot size , Press enter to confirm

Preheat time delay [T] press the key , Modify the numerical change preheat time delay , Press enter to confirm

3.2.2 Under the main interface press  Enter the processing interface

【 F1】 : BACKWARD , Cutting nozzle along the trajectory of the original cut back (The I / O port is now closed) 。

【 F2】 : FORWARD , Cutting along the cutting path forward (The I / O port is now closed) ;

【 F3】 : RETURN , Cutting nozzle return to the starting point, namely the starting point of the workpiece。


【 F4】 : N-PIERCE , Select any perforation point to cut

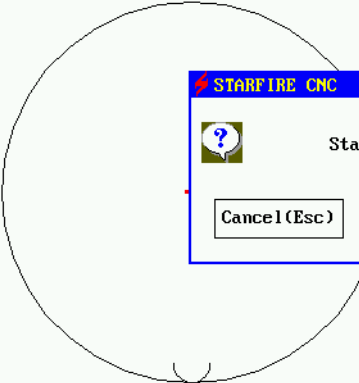
【 F5】 : ZOOMIN , Graphic magnification



【 F6】 : DELAY- , Reduce the preheating time and skip the remaining preheating time. Note: the system does not remember the preheating time.



【 F7】 : DELAY+ , Increase the preheating time, increased to 15 seconds at a time。

3.2.3 Start processing

After selecting machining parts, and finish machining parameter is set, press the key , System interface, the diagram below :

Speed: 00000	File: TR01.NC	Current Hole: 0000/0001
		TorchUp ● TorchDn ● Pierce ● [8] THC En ● ARCFeed ● IHSDeTe ●
		PlasmaSpd: 4000 [G]Mode: Plasma CutSpeed: 4000 [N]Set Kerf: 0.3 PierTime: 0.3 [O]KeepMove: OFF TorchAngle: 0.00
0> G92 X0 Y0 1> G91		[9]Cut Para COM ERR X +00034.050 THC Enable Y +00009.422
ESC	ShapeLib F1	Files F2
	PartOption F3	Setups F4
	Diagnose F5	ZoomIn F6
		ManMove F7


At this point, press the  Start automatic processing , press  Exit the processing , Back to the main interface

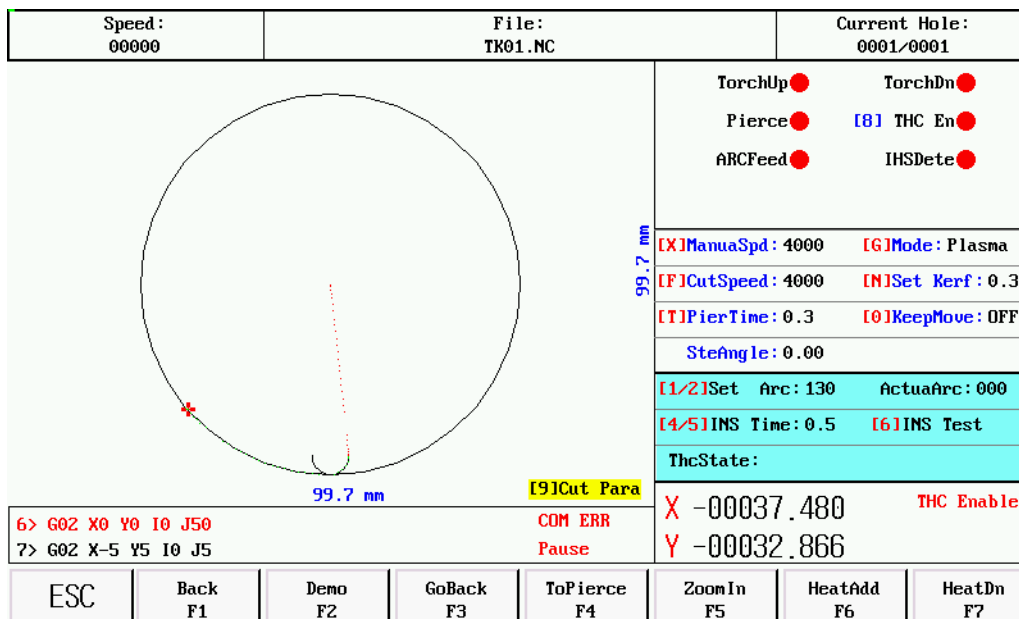
During processing, can press   Adjust the processing speed. Click 1% deceleration, long press 10% deceleration.

The fourth chapter machining process

In the process of the content of this chapter is to introduce the processing needs of processing

4.1 Suspend operations

During processing, flame failure, interruption of arc voltage, or other need to suspend the case, press  , System to stop working, and interface as follow :



【 F1】 : BACKWARD , Cutting nozzle along the trajectory of the original cut back。

【 F2】 : FORWARD , Cutting along the cutting path forward;

【 F3】 : RETURN , Cutting nozzle return to the starting point, namely the starting point of the workpiece。

【 F4】 : N-PIERCE , Select any perforation point to cut




【 F5】 : ZOOMIN , Graphic magnification

【 F6】 : DELAY+ , Increase the preheating time, increased to 10 seconds at a time。

【 F7】 : DELAY END , End of preheating, skip the rest of the preheating time ,

Note: **press【 F7】** end the preheating time delay , The end of the current only delay, not log into the system, if you need

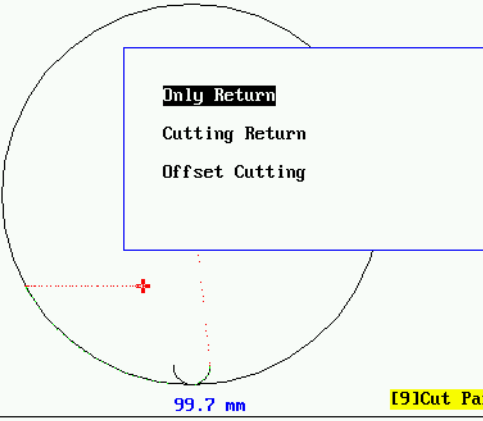
memory the preheating time delay time for system, press  end time delay (memory)at the same time), start punch processing

Press   Choose to change the speed , modify The values , press  to confirm.

After the completion of the modified,press  To continue processing.

4.2 Change perforation position or cutting position after the pause

Mobile cutting after the pause, press start again , appear the following interface

Speed: 00000	File: TK01.NC	Current Hole: 0001/0001
		TorchUp ● TorchDn ● Pierce ● [8] THC En ● ARCFeed ● IHSDeTe ●
6> G02 X0 Y0 I0 J50 7> G02 X-5 Y5 I0 J5		[X]ManuaSpd: 4000 [G]Mode: Plasma [F]CutSpeed: 4000 [N]Set Kerf: 0.3 [T]PierTime: 0.3 [O]KeepMove: OFF SteAngle: 0.00 [1/2]Set Arc: 130 ActuaArc: 000 [4/5]INS Time: 0.5 [6]INS Test TheState:
[9]Cut Para COM ERR Stop		X -00012.738 THC Enable Y -00024.108
ESC	Back F1	Demo F2
GoBack F3	ToPierce F4	ZoomIn F5
HeatAdd F6	HeatDn F7	

Press   Choose corresponding function , Press  Run the corresponding action

1) ORIGINAL PATH RETURN(Only Return)

Return to adjust the starting point at the speed of G00, in this waiting for further operations; At this point according to the corresponding high voltage function keys (such as ignition, preheated perforation, open cutting operations such as oxygen).Suggestion: after preheating, and then press "punch" key, then the system starting from the breakpoint position to continue processing.

2) CUT ON RETURN PATH (Cutting Return)

Again in the first punch, cutting speed along a straight line from the current position to adjust the starting point, don't stop according to the original path to continue processing, a bit like epitaxial perforation, perforation point more smooth;

3) START CUTTING HERE(Offset Cutting)

First perforation, adjust the current coordinates is suspended, the coordinates of the original trajectory continue processing, in order to realize the transfer function of perforation.

Note: (2) and (3) before operation, should be fully preheat (fire), because a but chose operation, punch right away.

Normal practice should be first preheating (fire), then press the "start" key.

4.3 The original track back processing

In processing for failing to cut through, need to the original track back, is as follows:

Speed: 00000	File: TK01.NC	Current Hole: 0001/0001
		TorchUp ● TorchDn ● Pierce ● [8] THC En ● ARCFeed ● IHSDeTe ●
		[X]ManuaSpd: 4000 [G]Mode: Plasma [F]CutSpeed: 4000 [N]Set Kerf: 0.3 [T]PierTime: 0.3 [O]KeepMove: OFF SteAngle: 0.00 [1/2]Set Arc: 130 ActuaArc: 000 [4/5]INS Time: 0.5 [6]INS Test TheState:
6> G02 X0 Y0 I0 J50 7> G02 X-5 Y5 I0 J5		[9]Cut Para COM ERR Pause X -00037.480 THC Enable Y -00032.866
ESC	Back F1	Demo F2
	GoBack F3	ToPierce F4
	ZoomIn F5	HeatAdd F6
		HeatDn F7

Pause, slow down the running system, the system shows "pause" tag, and presented the following figure.

Press **[F1]**System to perform the original track back, back speed set in the parameter - speed - back.

Press **[F2]**In the back, on the basis of the original trajectory.In the process of back, if do not meet the need of position, can press **[pause]** again, repeat the above process, until it is right.

Meet G00 (arrived at a piercing point) back;

In the process of back, meet G00 suspended (reach a piercing point) system, the operator can choose is to continue to back, or forward;

The operation of back to back

Back to the designated place,

For preheating, then press punch, began to processing

under the condition of the flame , cutting torch up, open oxygen , cutting torch down, system continues to run.

under the condition of plasma , arc open, wait for after the arc, the system to continue running.

The above operation can be repeated, until get the desired effect.

4.4 Breakpoints recovery and restore power

4.4.1. Breakpoints recovery

Power failure in the system for suspension or for processing, the system will automatically save the current cutting torch position for a breakpoint.The breakpoint will be permanent, whether to turn it off or not.

1) automatic recovery, after the power switch on, the system will prompt the diagram below

Speed: 00000	File: TK01.NC	Current Hole: 0000/0001
		TorchUp ● TorchDn ● Pierce ● [8] THC En ● ARCFeed ● IHSDeTe ●
		[X]ManuaSpd: 4000 [G]Mode: Plasma [F]CutSpeed: 4000 [N]Set Kerf: 0.3 [T]PierTime: 0.3 [0]KeepMove: OFF SteAngle: 0.00 [1/2]Set Arc: 130 ActuaArc: 000 [4/5]INS Time: 0.5 [6]INS Test ThcState:
0> G92 X0 Y0 1> G91	[9]Cut Para COM ERR	X -00037.480 THC Enable Y -00032.866

Choose breakpoints recovery , Press "start" button, the system breakpoint began to recover.

2) Entered manually, as long as the current process does not change, can press [F6] find breakpoint function, back to the main interface and then press "start" button, system breakpoint began to recover.

Both breakpoints recovery and restore power, are not allowed to change, the Angle of rotation, scaling, the conditions of the system will automatically save, not affected by the switch machine).Otherwise the system may find the breakpoint.

4.5、 Choose section code function

4.5.1、 Start the function

Passage function to specify system, arbitrary section from the program (or a piercing point) start the processing.

Press "F4" selecting optional perforation function, the system shows the diagram below:

Speed: 00000	File: TK01.NC	Current Hole: 0001/0001
		TorchUp ● TorchDn ● Pierce ● [8] THC En ● ARCFeed ● IHSDeTe ●
		[X]ManuaSpd: 4000 [G]Mode: Plasma [F]CutSpeed: 4000 [N]Set Kerf: 0.3 [T]PierTime: 0.3 [0]KeepMove: OFF SteAngle: 0.00 [1/2]Set Arc: 130 ActuaArc: 000 [4/5]INS Time: 0.5 [6]INS Test ThcState:
6> G02 X0 Y0 I0 J50 7> G02 X-5 Y5 I0 J5	[9]Cut Para COM ERR Pause	X -00037.480 THC Enable Y -00032.866
ESC	Back F1	Demo F2
GoBack F3	ToPierce F4	ZoomIn F5
HeatAdd F6	HeatDn F7	

Perforated dot at this point: direct input, and press enter after confirmation, the system will automatically cutting torch orientation to punch points
Press start from the current point to start cutting

4.6、 The edge of the thick plate perforation

- 1) In the automatic processing, need to use edge perforation method for thick plate processing.
- 2) edge of the perforation of the method is: will be in front of the punch cutting torch to move to the edge of the plate recently.
- 3) Start preheating, when after the preheating, press **[start]** key , Cutting along a straight line and the selected cutting speed cutting to punch, cutting processing again.
- 4) USES the edge notch, the first change parameter control menu of edge notch choice to 1 (said to choose effective).So every hole, the first prompted the diagram below:

SPEED : 00300	PROG : TK20.NC	PIERCE N : 0000	SPARA[N] : 3.0	TORCH UP ● TORCH DN ●
				IGNITE ● HOTUP ●
				CUT ● THC ●
				MODE[G]: FLAME
				MAN SPEED[X]: 04000
				CUT SPEED[F]: 04000
				HEAT TIME[T]: 100.0
				ROTATE: 0.0
				SCALE: 1.0
				HOLE.N#: 0000
				MIRROR: NO MIRROR
XMAX:00101		XMIN:-0001		YMAX:00101
YMIN:-0001				
2> G00 X45.000 Y45.000				X 00044.998
3> G42				Y 00046.500
PREHEA				
ESC	BACKWARD	FORWARD	RETURN	N-PIERCE
				ZOOM IN
				DELAY +
				DELAY END

Location perforation

System position and perforation, for inner hole in common use

Select Edge of the hole

- 1) The operator can press **[↑][↓][←][→]** , Adjust the position of the cutting torch to the outer limits of the steel plate, start preheating;
- 2) When after the preheating, press **[start]** key , Cutting along a straight line distance and the selected cutting speed to punch, cutting processing again.

Don't perforat

No perforation, system run directly from the current perforation position.Blank line to the next hole, a new perforation tip.

The fifth chapter interface definitions

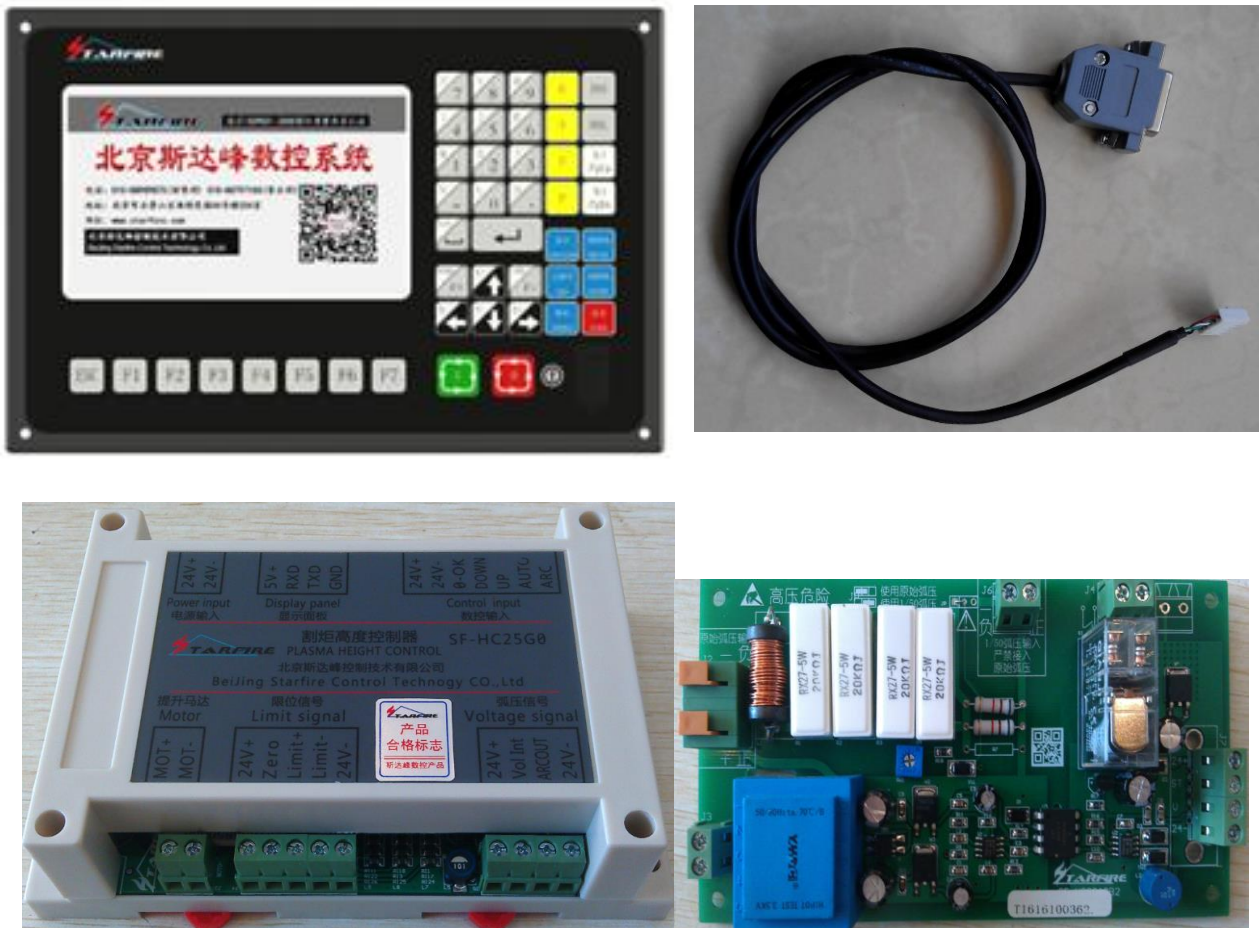
5.1 interface definitions

Pin number	definition	Pin number	definition
1	X direction +	5	COM
9	X direction -	13	RXD
2	X pulse +	6	TXD
10	X pulse -	14	24+
3	Y direction +	7	
11	Y direction -	8	24-
4	Y pulse +	15	
12	Y pulse -		

The Sixth chapter Built-in height control function description

6.1 System composition

The whole set is composed of the numerical control system sf-2100c, communication line, sf-hc25j2 and split-pressure plate, as shown in the figure below:



The communication line needs to be welded by the user according to the length.

6.2 Parameter description

After starting the machine, press [F4] → [F6] to enter the screen of setting up parameters. The parameters are as follows:

The Enable(1)/Disable(0)	<input type="text" value="1"/>	(0 < P < 1)
Dead-band voltage(0.1-10.0V)	<input type="text" value="0.6"/>	(0.1 < P < 10.0)
Sensitivity(1-10)	<input type="text" value="0"/>	(0 < P < 10)
Manual Up/Down Speed	<input type="text" value="100"/>	(0 < P < 100)
Cutting Up/Down Speed	<input type="text" value="100"/>	(0 < P < 100)
INS Speed	<input type="text" value="100"/>	(0 < P < 100)
Zero Low Enable(0)/High Enable(1)	<input type="text" value="0"/>	(0 < P < 1)
Limit+ Low Enable(0)/High Enable(1)	<input type="text" value="1"/>	(0 < P < 1)
Limit- Low Enable(0)/High Enable(1)	<input type="text" value="0"/>	(0 < P < 1)

TCH Version: 0.0

ESC	Speed F1	System F2	Flame F3	Plasma F4	Control F5	THC F6	Save F7
-----	-------------	--------------	-------------	--------------	---------------	-------------------	------------

Built in height adjustment (open 1 / close 0): set the built-in height adjustment to 1, not used to 0, and the default value is 0;

Dead band voltage (0.1-10.0v): when the difference between the set value of arc voltage and the actual value is less than this set value, the cutting gun height will not be adjusted, and the default value is 1.0.

Increase sensitivity (1-10): the greater the setting value, the greater the adjustment range of the cutting gun. The default value is 1.

Manual lifting speed: the speed at which the height is manually adjusted. The default value is 200.

Automatic lifting speed: the speed at which the height is automatically adjusted. The default value is 200.

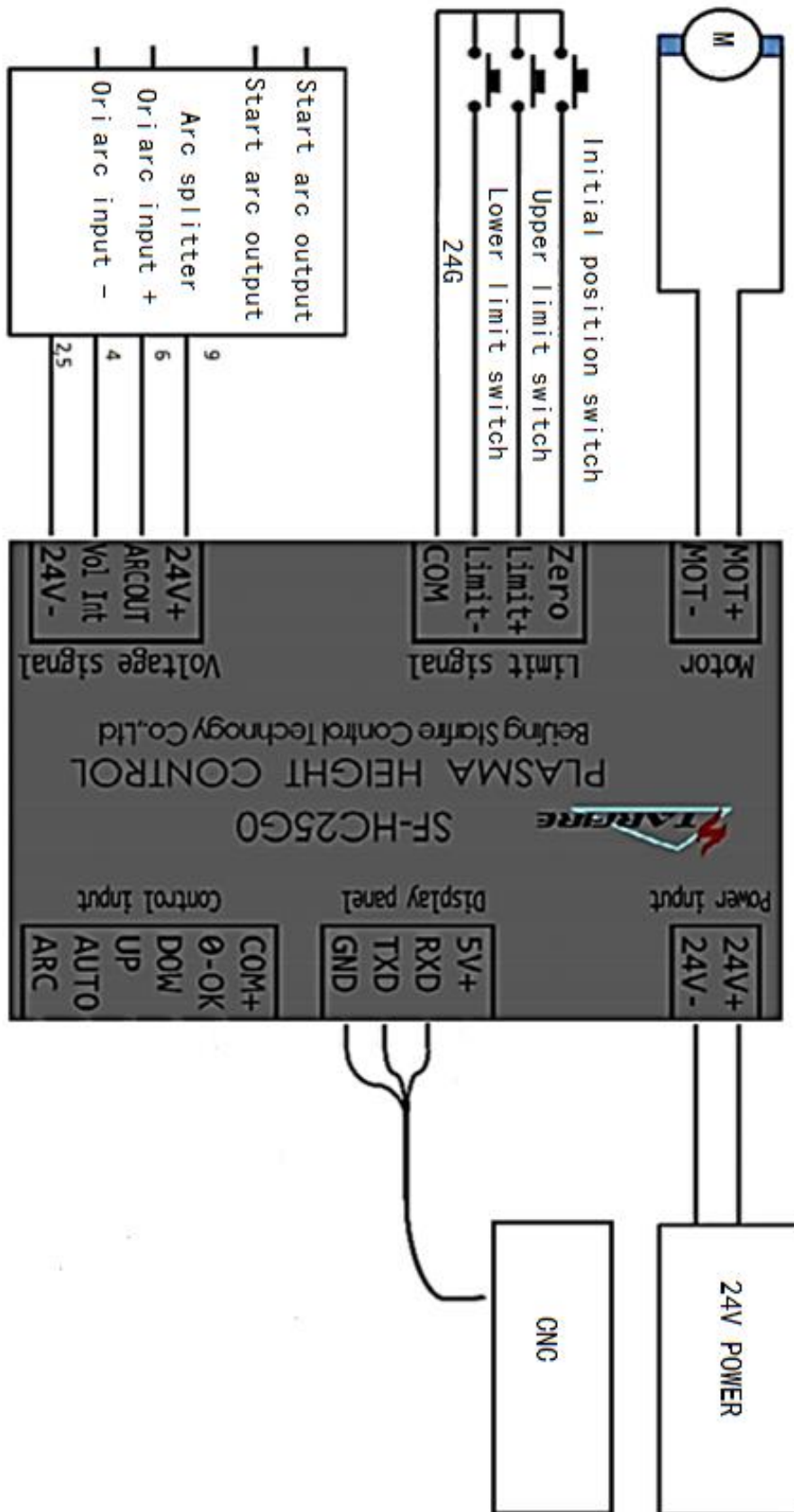
Positioning rise rate: increases the rise rate when positioning. The default value is 200.

Positioning switch 0 low effective / 1 high effective: 0 switch signal low level is effective, 1 switch signal high level is effective, and the default value is 0;

Upper limit switch 0 low effective / 1 high effective: 0 switch signal low level effective, 1 switch signal high level effective, the default value is 0;

Lower limit switch 0 low effective / 1 high effective: 0 switch signal low level effective, 1 switch signal high level effective, the default value is 0;

6.3 Wiring definition



6.4 Fault diagnosis

If the communication line is connected wrong or not connected, enter the automatic screen, and the system will prompt as follows:

Speed: 00000	File: TR00.NC	Current Hole: 0000/0001					
		TorchUp ● TorchDn ● Pierce ● THC En ● ARCFeed ● IHSDeTe ●					
		[X]ManuaSpd: 9000 [G]Mode: Plasma [F]CutSpeed: 9000 [N]Set Kerf: 2.0 [T]PierTime: 0.3 [O]KeepMove: OFF SteAngle: 0.00 [1/2]Set Arc: 000 ActuaArc: 000 [4/5]INS Time: 0.5 [6]INS Test ThecState:					
0> G92 X0 Y0 1> G91		COM ERR X +00000.270 Y +01237.176					
ESC	ShapeLib F1	Files F2	PartOpt F3	Setups F4	Diagnose F5	ZoomIn F6	ManMove F7

At this point, should solve the communication line problem, in order to use the normal high.

6.5 Automatic cutting, adjust the height.

Before and during cutting, press [1] to increase the arc voltage setting value and press [2] to decrease the arc voltage setting value. Press [4] to increase the positioning delay time, and press [5] to decrease the positioning delay time.

Before cutting, the cutting gun positioning test can be pressed [6].

The status signals for THC are as follows (text is displayed when there is a signal and not when there is no signal):

Height adjustment status: automatic ,rising , falling ,origin ,upper ,lower , arcing

Automatic: the height adjustment is in the automatic height adjustment state.

Rising: the height is rising.

falling: the height adjustment is falling.

Origin: the origin switch has a signal.

Upper limit: the upper limit switch has a signal.

Lower limit: the lower limit switch has a signal.

Arcing: the arcing switch has been turned on by adjusting the height.

Appendix 1 software upgrade instructions

Function:

System can be through the U disk, program upgrade.

The specific operations are as follows:

1. Upgrade files

Copy the upgrade file **STARTCNC.EXE** to the usb drive.

2. Operation steps

After inserting the usb stick, press the pause button  on the front panel of the system with your finger.

Turn on the power and power on the system. After the upgrade interface appears on the system screen, release the button.

The system will automatically perform the upgrade operation.

3. End of upgrade

If the program upgrade is successful, the system will prompt "upgrade successful!" And a buzzer will go off.

If the program fails to upgrade, the system will prompt "upgrade failed!" And the buzzer will ring continuously.

4. Start a new program

Turn off the power, pull out the U disk, and turn on the power again to start the new program. The version number of the new program will be displayed on the screen after starting up.

Note:

If the upgrade is not successful, please check the following factors first:

1) the usb flash disk must be in FAT or FAT32 format. It is recommended to use FAT format.

2) the name of the upgrade file must be **STARTCNC.EXE**.

3) if during the upgrade process, there is no prompt to complete the process, but directly return to the main interface of the upgrade, or the upgrade fails due to other accidents.

Can first check the upgrade file name is correct, U disk format is correct;

When excluding the upgrade file and U disk these two factors, you can follow the specific steps to upgrade again;
