

Key press	Content	Instructions
	Master tower knife selection	This button can control the manual selection of the main tool tower. In the manual mode (can not refer to the point mode), when the X1 axis is at the zero position, press the tool tower and select the tool tower. The main tool tower will rotate the next tool number.
	Secondary tower tool selection	This button can control the manual tool selection of the secondary tower. In manual mode (can not refer to the point mode), when the X2 axis is at the zero position, press the secondary tower tool selection, the secondary tower will rotate the next tool number, and rotate once every time you press it.
	Single Section Execution	This button can control the single section execution of the program, in the automatic mode, press the single section execution button, the single section execution light will turn on, the machine will enter the single section mode, the program will stop after the execution of a single section, press again to close the single section execution function.
	Select Stop	This button can control the machine to select stop, in automatic mode, press M01 select stop button, M01 select stop light on, enter M01 in the program section, the program will be paused in M01 single section, press again, close M01 select Stop, the program will skip M01 single section.

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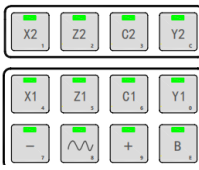
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Key press	Content	Instructions
	Procedu re Jump	This key can control program jump, in the automatic mode, press the program jump key, the program jump light, write "/"n" (slash) code at the beginning of the program segment, then skip the program segment with "/"n" run. When the program segment appears in the middle with "/"n" code, continue to execute the program segment. Press again to turn off the optional segment jump signal and execute the segment with "/"n".
   	Extende d feature s	This button is the extension function of the machine tool, you can add this button according to the need to use the method, purpose, etc. F1, F2 by default, the external interlock alarm is shielded. At the same time, press the F1, F2 button for 10 seconds, and the machine will display the alarm external interlock is being forcibly lifted. Please operate with care. After opening this function, the external alarm can be temporarily lifted to facilitate the operation of some shafts that cannot be moved due to interlock. After leaving the d a area, please press F1 or F2 to turn off this function to prevent the danger of collision.

Key press	Content	Instructions
	Running Empty	In any mode, press the empty run button and the empty run lights up. (1) When the no-run and fast feed signal (RT) in the cutting feed is switched on, it is the maximum cutting speed. At this time, the cutting feed rate and the fast feed rate are invalid. • When the fast feed signal (RT) is off, it is the manual feed speed (*JV1 ~ *JV16). At this time, turn on the manual magnification setting mode (OVSL), then the cutting feed magnification is also effective. (2) Empty run in the fast feed • In order to make the empty run effective for the fast feed (G0, G27, G28, G29, G30), it is necessary to turn on the parameters • If the fast feed signal (RT) is on, the empty run is invalid. • When the fast feed signal (RT) is turned off, the manual feed speed is set at this time. (Note 1) Empty run is not valid for manual run. (Note 2) Even in G84, G74 running hollow runs are valid. Press it again, empty run closes, and the machine resumes all functions.

Key press	Content	Instructions
	Shaft selection function	This button can select the axis you want to move;1. In the hand wheel mode, press the shaft of the shaft selection area, the key light will light up, the machine tool will automatically switch to the selected shaft, shake the hand wheel, the selected shaft will move, the magnification is determined by the hand wheel magnification. 2. In the fast shift mode, press the shaft of the shaft selection area, the key light will light up, the machine automatically switches to the selected shaft, press the + button, the selected shaft will quickly move in the positive direction, the magnification is determined by the fast magnification. Press the ~ button, the selected shaft will quickly move in the negative direction, the magnification is determined by the fast magnification. 3. In the inching mode, press the axis of the selected area of the shaft, the key light will turn on, the machine tool will automatically switch to the selected shaft, press the + button, the selected shaft will slowly move to the positive direction, the magnification is determined by the feed magnification, and press the ~ + button to automatically switch to the fast shift mode. Press the - button, the machine tool will move in the negative direction, the magnification will move from the feed magnification, at the same time, press the ~ button, automatically switch to the fast shift mode. 4. In the reference point mode, press the axis selection area button, the key light will turn on, the machine tool will automatically switch to the selected axis, press the + button, the machine tool will automatically continue to the reference point, press the - button, the machine tool will be interrupted back to the reference point, the magnification is determined by the fast magnification

4. Chip removal machine function

The machine tool is equipped with chain-plate chip removal machine, which can effectively remove iron cutting. The control methods are as follows:

4.1 In any mode, press the forward turning button of the chip removal machine, and the chip removal machine will start the forward turning and cutting, and press again to stop, and the reset will stop.

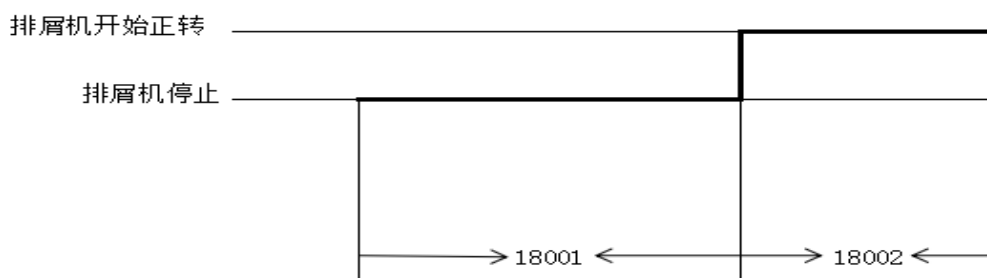
4.2 In any mode, press the reverse button of the chip dispenser, the chip dispenser begins to reverse, and press again to stop, and the reset will stop. This mode can only be used when the material is stuck in reverse and can not be used for a long time.

4.3 When the program is executed M24, the chip dispenser starts to turn forward, and when it is reset or executed M25, the chip dispenser stops.

4.4 When the program is executed M26, the chip extractor begins to reverse, and when it is reset or M25 is executed, the chip extractor stops.

4.5 Automatic parameter control, this control only controls the forward rotation, the time can be modified according to the amount of iron cutting, the specific method is as follows:

Parameter number	Features	Units	Preset values
18001	Interval of positive rotation of the chip extractor	Minutes	10
18002	Chip extractor forward turn time	Minutes	2



If in the operation panel or through the M code control of the chip dispense forward instruction, this parameter control cycle will be re-timed, chip dispense cycle start forward rotation!

5. PLC switch function

The machine tool is equipped with the PLC switch function, which can be opened or closed by setting the PLC switch parameters in the PLC switch, as follows:

5.1 The main chuck inside and outside switching: open this switch, the main chuck clamping

mode from the inside card to the outside support. Close this switch, the main chuck from the outside to the inside card.

5.2 Secondary chuck inside and outside switch: open this switch, secondary chuck clamping mode changed from the inner card to the outside support. Turn off this switch, the secondary chuck from the outside to the inside card.

5.3 Starting does not detect the main chuck: Turn this switch on, and the program can be started regardless of whether the main chuck is clamped when the cycle is started by pressing. Turn this switch off. When starting the program, you can start the program only when the master chuck is clamped.

5.4 Start without detecting secondary chuck: Turn this switch on to start the program with or without the secondary chuck clamped when the cycle is pressed to start. Turn this switch off. When starting the program, you need to start the program when the secondary chuck is clamped.

5.5 Air pressure detection is invalid: open this switch, in the absence of air pressure, the machine can start the program, the air pressure will not alarm.

5.6 Invalid door protection: Turn this switch on and the program can be started when the protective door is opened, and the protective door will not alarm. When this switch is turned off, the program cannot be started when the protective door is opened, and the alarm protective door opening alarm will occur. When this switch is turned off, the air pressure needs to be detected when starting the program, and the alarm will occur when there is no air pressure.

5.7 The first system manual processing: Open this switch, the first system into the manual processing mode, the machine tool prompts to enter the manual processing mode, at this time in the automatic mode, shake the hand wheel, you can automatically start to run the program, the rate is controlled by the hand wheel shaking speed, in a single section, switch the hand wheel shaking direction program can run in a single section reverse, the second and third system if in the hand wheel mode will enter the manual propulsion mode. Turn off this switch, the manual processing function is closed.

5.8 Second system manual processing: Open this switch, the second system into the manual processing mode, the machine prompts to enter the manual processing mode, at this time in the automatic mode, shake the hand wheel, you can automatically start the operation program, the rate is controlled by the hand wheel shaking speed, in a single section, the program can be reversed in a single section, the first third system if in the hand wheel mode will enter the manual propulsion mode. Turn off this switch, the manual processing function is closed.

5.9 Third system manual processing: Open this switch, the third system into the manual processing mode, the machine tool prompts to enter the manual processing mode, at this time in the automatic mode, shake the hand wheel, you can automatically start to run the program, the rate is controlled by the hand wheel shaking speed, in a single section, switch the hand wheel

shaking direction program can run in a single section reverse, the first and second system if in the hand wheel mode will enter the manual propulsion mode. Turn off this switch, the manual processing function is closed.

5.10 nto go back, the hand wheel in the negative direction shaking, the program in a single section to go forward. If you press the + button, the program goes back in a single section, press the button, the program goes forward in a single section. Turn this. Manual processing direction reversal: open this switch, in the manual processing mode, the machine tool running direction from the positive to reverse, at this time the hand wheel positive direction shaking, the program in a single section switch off and the manual program goes in the opposite direction.

5.11 Hand wheel /JOG machining: Turn on this switch, when the system enters manual machining, the machine tool will switch from hand wheel machining to JOG machining mode, and the + switch control program will run during manual machining, and the magnate will be controlled by the feed magnate. When this switch is turned off, the manual machining is controlled by the hand wheel.

5.12 Bunker door protection ineffective: Open this switch, bunker door open machine does not alarm. Turn off this switch, the machine tool will alarm when the bunker door is opened. The bunker door is not closed.

5.13 Invalid hand wheel emergency stop: open this switch, the hand wheel emergency stop function is can celled, at this time press the hand wheel emergency stop, the machine tool will not alarm. Turn off this switch, press the hand wheel emergency stop, the machine tool will alarm emergency stop.

5.14 Manipulator MDI mode: open this switch, when the manipulator does not have MDI switch at this time, open this switch, the manipulator system will directly enter the MDI mode and other operating mode switches will be invalid. Turn off this switch, the manipulator operation mode is controlled by the panel.

5.15 Tail stock origin: Turn on this switch, switch the operation mode to reference point mode, press the tail stock back switch, and the machine tool will automatically set this Tail stock to the tail stock origin B0 position. Turn off this switch, and the tail seat origin function will be can celled.

5.16 Tool tower set zero: Turn on this switch, switch the operation mode to the reference point mode, press the manual tool selection, the machine will automatically set the current tool position for the tool tower origin position (No. 1tool). Turn off this switch, and the zero setting function of the cutter tower will be closed.

5.17 Manipulator manual open: open this switch, the manipulator into manual mode, you can switch the operation mode through the operation panel button.

5.18 Mechanical lock: Open this switch, the machine only updates the coordinates and the machine does not move. When this switch is turned off, the mechanical lock function is can celled.

5.19 Chamfer off: When this switch is turned on, the function of performing chamfer in the thread cutting cycle(screw top repair) can be turned on. Ignore the chamfer function in the thread cutting cycle when this switch is turned off.

5.20 Y-axis removal: When the Y-axis of the cutting machine can be removed, open this switch, you can remove the Y-axis without alarm, this Y-axis can not do any control. When turning off this switch, you must connect the Y-axis cable. (Zero must be reset when Y axis is removed and reconnected)

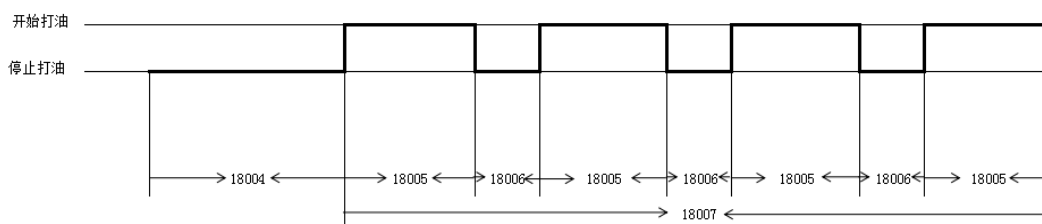
5.21 Power milling out: When the power tool needs to be removed, open this switch, you can remove the power tool shaft without alarm, this power tool shaft can not do any control. When turning off this switch, it is necessary to connect the power tool shaft cable.

5.22 Feed machine alarm is invalid: open this switch, the machine tool feed machine alarm switch will be shielded, ignore the feed machine alarm. When this switch is turned off, the system will also issue an alarm when the feeder has an alarm.

6. Automatic lubricating oil function

The machine tool is equipped with automatic lubricating oil system, with PLC constant parameters to control the oil time and interval time, the specific methods are as follows:

Para meter No.	Features	Units	Preset values
18004	Time interval between turning on and starting oil	seconds	1800
18005	Start greasing time	seconds	5
18006	Time between basting	seconds	3
18007	Greasing time total	seconds	32



This oil beating process runs in an automatic cycle.

Note: alarm will be issued when the amount of lubricating oil is insufficient: low oil level alarm, immediately add lubricating oil when issuing this alarm, no lubricating oil can not automatically go through the program to prevent damage to mechanical parts

7. Tower tool change function

7.1 Manual mode Tool change

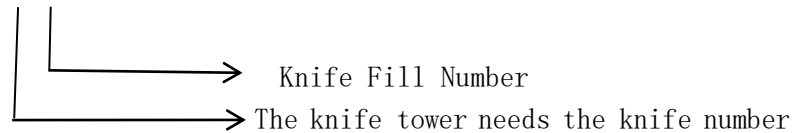
a. The standard tool tower machine is equipped with manual tool selection function, which is convenient to install the tool. The specific method is as follows the tool tower will change the tool in order.

b. In manual mode, press T__ on the key, and the tool tower will directly turn to the position of the tool number entered after T.

7.2 Switch knives in automatic mode

Switch the operation mode to automatic mode (MDI, automatic, DNC), in the program;

T0102



Example program:

G0G28X0.; X-axis back to zero axis back to zero

T0303; Knife tower change to No. 3 knife and perform No. 3 knife fill (knife fill cannot be omitted)

8. Grasping hand function

First, the grasping hand is an optional function of the machine tool, which can be used to grab the finished product to the conveyor belt to achieve automation.

8.1 Grab hand M code

M Code	M260	M261	M262	M263	M264	M265	M17	M18
Features	Grab the stock hand forward	Grab hand back	On the grabbing hand	Grab Material Subordinate	Release the grab handle	Gripper clamping	Conveyor belt on	Conveyor belt off

8.2 Related parameters

Parameter number	Features
18030	Control the mechanical position of the most negative end of the Z3 axis where the grip can go down, the grip can only go down when the Z3 axis moves to this area, shake the Z3 axis to the position of the most negative end where the grip can go down, multiply the mechanical position of the Z3 axis by 1000 to enter this parameter, for example, when the grip can go down, the mechanical position of the Z3 axis is 10.253, Then 18030 is set to 10253.
18031	Control the Z3 axis mechanical position of the most negative end of the grasping hand which can go up and down, the grasping hand can only take material up when the Z3 axis moves to this position, shake the Z3 axis to the position which can take material up, multiply the Z3 axis mechanical position by 1000 input into this parameter, for example, when the grasping hand can go up, the Z3 axis mechanical position is 2.456, Then 18030 is set to 2456.
7501-7502	First system X axis in the zero position of the range, please make sure that the X1 axis returns to zero under the performing grab hand.
7501-7502	Second system X axis in the zero position of the range, please make sure that the X2 axis returns to zero under the performing grab hand.

8.3 Method of use

Example program:

\$1	System 1	\$2	Second system
.....	Processing program		Processing program
G28X0.;	X1 axis back to zero	G00B2.345;	Z3 axis positioned to allow grabbing position
M700;	Return to zero complete waiting for pick-up	G28X0. ;	X2 axis back to zero
		M260;	Grab hand forward
		M264;	Release grip
		M700;	Wait for System 1 X axis to return to zero
		M263;	Grab hand
		M265;	Grab hand clamp
		M111;	Secondary spindle loose
		G00B10.000;	Z3 axis backward
		M262;	Grab hand
		M261;	Grab hand back
		M264;	Release grip
		M17;	Conveyor open
		G4X2.0;	Pause 2s
		M18;	Conveyor belt off
		M30;	End of program

9. Automatic loading and unloading function

Machine tool optional automatic loading and unloading function, reserve automatic loading and unloading interface to achieve automatic feeding.

9.1 Relevant M code

M codes	Features
M46	Allow pickup
M47	Discharge allowed
M48	End of fetching
M49	End of discharge

9.2 Action

After the machine is finished, the machine will discharge the material to the loading and unloading system. Input M47 to test whether the unloading is allowed, and then input M49 to the unloading signal of the loading and unloading system. Then enter M46 to test whether the feeder is ready to feed, and the machine begins to take material. After the machine is finished, input M48 to send the feed machine the signal of the end of the feed, and the feed machine begins to prepare to send the next hair.

9.3 Program example

```
.  
.   
.   
.   
Processing program  
M47;          Detect if discharge is allowed  
G00B0;  
G00Y0        The manipulator Y axis discharges material down  
M64;          Manipulator B loose  
M49;          End of discharge  
G00Y100;  
G00B50;  
M46;          Detect if pick-up is allowed  
G00Y0;        The manipulator begins to pick up material  
M63;          Manipulator A clamp  
G00Y100;  
M48;          Pick-up end
```

10. Automatic bar feeder function

The machine tool is equipped with the function of automatic bar feeder, which can realize automatic bar feeder feeding, reserving M code.

10.1 Relevant M code

M codes	Features
M31	Start feeding
M32	End of feed

10.2 Action

After the machine finishes processing the last work piece, remove the work piece, release the chuck, input M31 feed machine signal to start feeding, feed machine signal to end feeding, continue processing.

10.3 Program example

.	
.	
.	Take a piece
M11;	Spindle loose
M31;	The feeder starts feeding
G4X1.0;	Pause for feed
M32;	End of feeder feed
M10;	Spindle clamp

11. Tail stock function

11.1 Tail seat forward



A. Press the button when there is no program, and the tail seat moves forward quickly. Release the tail seat forward button to stop!

B. In the program, input M22, tail top slow forward movement, keep the pressure forward.

11.2 Stern recoil



A. Press the button when there is no program, and the rear seat moves back quickly. Release the rear seat back button to stop!

B. In the program, enter M23, the tail top quickly move back, the back time is controlled by parameter 18008, the unit is milliseconds, the back time to stop the movement of the rear seat.

11.3 Program example (18008 set to 30)

```
M22;                R ear seat slow forward motion
.
.
.                    Resist the work piece processing program
M23;                R ear seat quickly back up and back 30ms to stop
```

12. Dual system M code waiting function

The double system machine tool is equipped with the M code waiting function, which is convenient for the cooperation between the two systems! (Waiting code M700–M799 a total of 100 groups)

Example program:

System 1	System 2
G00X0.; X axis back to zero	G00Y0; Y-axis back to zero
M700; Wait for System 2 to execute M700	G00B0; B axis back to zero
G00Z0; Z axis back to zero	M700; Wait for System 1 to execute M700
	G00A0. A axis returns to zero

Execution timing:

System 1

G00X0.;

M700;

G00Z0;



Second system

G00Y0;

G00B0;

M700;

G00A0.;

